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FINAL ACCIDENT PREVENTION PLAN MUNITIONS AND EXPLOSIVES OF CONCERN
SURFACE CLEARANCE NOMANS LAND ISLAND NAS SOUTH WEYMOUTH MA
08/01/2014
TETRA TECH EC INC

**DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62470-13-D-8007
CONTRACT TASK ORDER NO. WE05**

**FINAL
ACCIDENT PREVENTION PLAN
MUNITIONS AND EXPLOSIVES OF CONCERN, SURFACE CLEARANCE
NOMANS LAND ISLAND, MASSACHUSETTS
CHILMARK, MASSACHUSETTS**

August 2014

Prepared for



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

and

Base Realignment and Closure
Program Management Office, Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Prepared by

Tetra Tech EC, Inc.
5250 Challedon Drive
Virginia Beach, Virginia 23462

<u>Revision</u>	<u>Date</u>	<u>Prepared by</u>	<u>Approved by</u>	<u>Pages Affected</u>
0	8/21/14	S. Neill	B. Corbett	All

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TABLE OF CONTENTS

1.0	APPROVALS	1
2.0	BACKGROUND INFORMATION.....	2
2.1	Contractor	2
2.2	Contract Number.....	2
2.3	Project Name.....	2
2.4	Site Location	2
2.5	Site History	2
2.6	Project Description.....	3
2.6.1	MEC and MPPEH	3
2.7	Phases of Work Requiring Activity Hazard Analyses (AHAs).....	4
3.0	STATEMENT OF SAFETY AND HEALTH POLICY	5
4.0	RESPONSIBILITIES AND LINES OF AUTHORITY	6
4.1	Statement of Responsibility	6
4.2	Identification and Accountability	6
4.2.1	Project Management.....	6
4.2.2	Project Manager (PM) – Brian Corbett	7
4.2.3	Corporate SHM – Roger Margotto, CIH, CSP.....	8
4.2.4	Unexploded Ordnance Safety Manager – Steve Neill.....	8
4.2.5	Site Superintendent/Senior UXO Supervisor – TBD	8
4.2.6	UXO Safety Officer/Quality Control Manager – TBD	10
4.2.7	Field Crew Personnel – Various (TtEC personnel, UXO technicians, and/or subcontractors)	12
4.2.8	Subcontractors and Suppliers/Vendors.....	12
4.2.9	Competent Persons	12
4.2.10	Pre-task Safety and Health Analysis	12
4.3	Lines of Authority.....	13
4.3.1	Policies Regarding Noncompliance	13
4.3.2	Manager and Supervisor Accountability for Safety	13
5.0	SUBCONTRACTORS AND SUPPLIERS/VENDORS.....	13
5.1	Identification of Subcontractors and Suppliers/Vendors	13
5.2	Means for Controlling and Coordinating Subcontractors	14
5.3	Safety Responsibilities of Subcontractors and Suppliers/Vendors	14
6.0	TRAINING	14
6.1	New Hire Training	15
6.2	On-the-Job Training.....	15
6.3	Periodic Safety and Health Training.....	15
6.4	Hazardous Waste Operations Training and Refresher.....	15
6.5	Hazard Communication Training	15

6.6	Site-Specific Training	16
6.7	First Aid and Cardiopulmonary Resuscitation.....	16
6.8	Bloodborne Pathogens Training	17
6.9	UXO Technician Training and Qualification	17
6.10	Use of Portable Fire Extinguishers	17
6.11	Hearing Protection	17
6.12	On-Site Health and Safety Briefings.....	17
6.13	Training Certificates	17
6.14	APP Acceptance Form.....	18
7.0	SAFETY AND HEALTH INSPECTIONS	19
7.1	Specific Assignment of Responsibility for a Minimum Daily Job Site Safety and Health Inspection During Periods of Work Activity	19
7.2	Proof of Inspector’s Training/Qualifications	19
7.2.1	Documentation Procedures.....	19
7.2.2	Deficiency Tracking System	19
8.0	ACCIDENT REPORTING	20
8.1	Exposure Data.....	20
8.2	Accident Investigations, Reports, and Logs	20
8.3	Immediate Notification of Major Accidents.....	20
9.0	PLANS (PROGRAMS, PROCEDURES) REQUIRED BY EM 385-1-1, THE SAFETY MANUAL (AS APPLICABLE).....	21
9.1	Layout Plans.....	21
9.2	Emergency Response Plans	22
9.2.1	Procedures and Tests	23
9.2.1.1	Pre Emergency Planning	23
9.2.1.2	Personnel and Lines of Authority for Emergency Situations..	24
9.2.1.3	Emergency Signal, Assembly and Evacuation Procedures	24
9.2.1.4	Emergency Equipment	25
9.2.2	Spill Plans.....	26
9.2.3	Firefighting Plan.....	27
9.2.4	Posting of Emergency Telephone Numbers	28
9.2.5	Man Overboard/Abandon Ship.....	28
9.2.6	Medical Support	29
9.2.6.1	First Aid.....	29
9.2.6.2	Medical Emergency.....	30
9.2.6.3	Fatal Injury	31
9.2.6.4	Medical Data Sheet	31
9.2.6.5	Medical Surveillance.....	31
9.2.6.6	Decontamination during Medical Emergencies	32
9.3	Plan for Prevention of Alcohol and Drug Abuse	32
9.4	Site Sanitation Plan.....	33
9.5	Access and Haul Road Plan	33

9.6	Personal Protective Equipment	33
9.7	Respiratory Protection Plan	34
9.7.1	Protective Equipment	36
9.8	Health Hazard Control Program	37
9.8.1	Site Control Measures	38
9.8.1.1	Exclusion Zone.....	39
9.8.1.2	Contamination Reduction Zone.....	39
9.8.1.3	Support Zone	39
9.8.2	Personal Hygiene and Decontamination	39
9.8.2.1	Responsibilities	39
9.8.2.2	Contamination Avoidance.....	39
9.8.2.3	Decontamination	40
9.8.2.4	Personnel Decontamination Guidance	40
9.8.2.5	Equipment Decontamination Guidance	41
9.8.3	Biological Hazards	41
9.8.3.1	Insects.....	41
9.8.3.2	West Nile Virus.....	42
9.8.3.3	Lyme Disease	43
9.8.3.4	Poisonous Plants.....	44
9.8.3.5	Snakes.....	45
9.8.3.6	Bloodborne Pathogens.....	46
9.9	Hazard Communication Program	46
9.10	Process Safety Management Plan	47
9.11	Lead Abatement Plan.....	47
9.12	Asbestos Abatement Plan	47
9.13	Radiation Safety Program.....	47
9.14	Abrasive Blasting.....	47
9.15	Heat/Cold Stress Monitoring Plan	47
9.16	Crystalline Silica Monitoring Plan (Assessment).....	51
9.17	Night Operations Lighting Plan	51
9.18	Fire Prevention Plan.....	51
9.19	Wild Land Fire Management Plan.....	52
9.20	Hazardous Energy Control Plan.....	52
9.21	Critical Lift Plan	53
9.21.1	General Requirements	53
9.21.2	Crane Activities	54
9.22	Contingency Plan for Severe Weather	56
9.22.1	Hurricane Preparedness and Prevention Plan.....	56
9.23	Float Plan	58
9.24	Site-Specific Fall Protection and Prevention Plan	59
9.25	Demolition Plan (Engineering and Asbestos Surveys).....	59
9.26	Excavation/Trenching Plan	59
9.27	Emergency Rescue (Tunneling).....	59
9.28	Underground Construction Fire Prevention and Protection Plan	59
9.29	Compressed Air Plan	59

9.30	Formwork and Shoring Erection and Removal Plans.....	59
9.31	Precast Concrete Plan	59
9.32	Lift Slab Plans.....	60
9.33	Steel Erection Plan.....	60
9.34	Site Safety and Health Plan for HTRW Work	60
9.35	Blasting Safety Plan.....	60
9.36	Diving Plan	61
9.37	Confined Spaces.....	61
9.38	Physical Hazards and Controls	62
9.38.1	Noise.....	62
9.38.2	Motor Vehicles and Heavy Equipment	62
9.38.3	Boating Safety	64
9.38.4	Electrical Hazards.....	66
9.38.4.1	Portable Generators	67
9.38.4.2	Overhead Electrical Hazards	67
9.38.4.3	Underground Utilities.....	67
9.38.5	Slips, Trips, and Falls	67
9.38.6	Head Injuries	68
9.38.7	Falling Objects.....	68
9.38.8	Heavy or Awkward Lifting	68
9.38.9	Portable Power Hand Tools.....	69
10.0	RISK MANAGEMENT PROCESSES.....	70
11.0	REFERENCES	71

LIST OF TABLES

Table 3-1	Comparison of TtEC and 2012 BLS Data for NAICS Code 237990 (TRIR and DART Rates)
Table 9-1	Type and Location of Emergency Equipment
Table 9-2	Emergency Contact List
Table 9-3	Personal Protective Equipment Selection
Table 9-4	Nomans Land Island – Chemical Data
Table 9-5	Progressive Clinical Symptoms of Hypothermia

LIST OF FIGURES

Figure 4-1	Organizational Chart
Figure 9-1	Site Layout and Emergency Evacuation Area
Figure 9-2	Route and Directions to Martha’s Vineyard Hospital

LIST OF ATTACHMENTS

Attachment 1 Poison Ivy Training Materials

LIST OF APPENDICES

Appendix A Activity Hazard Analyses
Appendix B Corporate Safety and Health Policy Statement
Appendix C EHS Programs and Procedures
Appendix D Field Inspection Forms
Appendix E Contractor Significant Incident Report (CSIR)
Appendix F Medical Data Sheet
Appendix G Hazardous Material Inventory and Material Safety Data Sheets/Safety Data Sheets

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ACRONYMS AND ABBREVIATIONS

AED	automated external defibrillator
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHMM	Certified Hazardous Materials Manager
CIH	Certified Industrial Hygienist
CIRS	Contractor Incident Reporting System
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CSIR	Contractor Significant Incident Report
CSP	Certified Safety Professional
DCN	Design Change Notice
DOL	Department of Labor
EC	Emergency Coordinator
EHS	Environmental Health and Safety
EM	Engineer Manual
ESS	Explosives Safety Submission
EZ	exclusion zone
°F	degrees Fahrenheit
FCR	Field Change Request
FEAD	Facility Engineering and Acquisition Division
GFCI	Ground-Fault Circuit Interrupter
HAZCOM	hazard communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
MDAS	Material Documented as Safe
MEC	Munitions and Explosives of Concern
MPPEH	Material Potentially Presenting and Explosive Hazard
MRS	Munitions Response Site
MSDS	Material Safety Data Sheet
NAVFAC MIDLANT	Mid Atlantic Naval Facilities Engineering Command
Navy	U.S. Navy
NCR	Nonconformance Report
NTR	Navy Technical Representative
NWIRP	Naval Weapon Industrial Reserve Plant
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PM	Project Manager (Tetra Tech)
PPE	personal protective equipment
QC	quality control
RPM	Remedial Project Manager

SDS	Safety Data Sheet
SHM	Safety and Health Manager
SS	Site Superintendent
SSHO	Site Safety and Health Officer
SZ	support zone
TtEC	Tetra Tech EC, Inc.
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance
UXOSO	UXO Safety Officer
UXOQCM	UXO Quality Control Manager
VP	Vice President
ZIP	Zero Incident Performance

1.0 APPROVALS

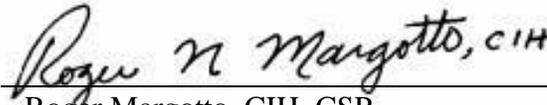
By their signatures, the undersigned hereby certify that this Accident Prevention Plan (APP) has been prepared in accordance with the requirements of EM 385 1-1 (current version including revisions) and has been reviewed and approved for use during field operations at the Nomans Land Island site.

Approved by:



Brian Corbett
Project Manager
(617) 443-7517

Concurrence:



Roger Margotto, CIH, CSP
TtEC, Inc. Program Health and Safety Manager
(619) 471-3503



Carl Tippmann, PE
TtEC, Inc. Program Manager
(215) 702-4044

2.0 BACKGROUND INFORMATION

2.1 Contractor

Contractor: Tetra Tech EC, Inc. (TtEC)

2.2 Contract Number

Contract Number: N62470-13-D-8007, Task Order WE5

2.3 Project Name

Munitions and Explosives of Concern Surface Clearance at Nomans Land Island, Chilmark, Massachusetts.

2.4 Site Location

Nomans Land Island is an island located approximately 2.7 miles southwest of Martha's Vineyard, Massachusetts. The island is approximately 628 acres. East to west, the island is 1.6 miles long, and slightly more than 1.0 miles wide, north to south. Two large fresh water ponds and several smaller ones dot the island. The island is heavily vegetated and dominated by rolling hills. Fifty feet high cliffs rise on the eastern shoreline and continue along the southern portion of the island. The highest point on the island, 110 feet above sea level, is on the southern half of the island, near the island's north south axis.

2.5 Site History

The U.S. Government has used the Island as a target range to train pilots since 1943. No civilians have lived on the island since 1943. The military has designated the island as Restricted Area R-4105. Because the island was used as an active military target range, civilians were not permitted to visit the Island without a military escort. Despite warnings posted on shore and nautical charts, trespassing is known to occur on the island.

The U.S. Navy began leasing the island in November 1943 for use as a practice bombing site. At the conclusion of World War II, the island contained large numbers of unexploded ordnance (UXO) and craters. The Navy retained control of the island and continued training exercises substituting inert, dummy ordnance for the live ordnance used during the war. The Navy purchased the island from the Crane Estate in 1952. Use of the island for target practice ceased in the summer of 1996.

The Fish and Wildlife Service and environmental groups requested that the military protect the island as a key nesting area for migratory birds in the late 1960s. In 1970, the Navy and the Department of Interior (DOI) agreed to protect wildlife on the island. In 1975 the DOI signed a joint management agreement of Nomans land Island with the Department of Navy. The agreement included a continued military use of the island and management portions of the island for migratory birds and other wildlife. As a result of this agreement, the Navy designated the

Eastern third of the island as a wildlife sanctuary that was managed by the Department of Interior's Fish and Wildlife Service. There has been no military use of the island since the cessation of target activities in 1996 which has created a defacto wildlife habitat over the entire island.

Large placards along the shoreline warn boaters to stay clear of the island because of its use as a military target range. The remains of a wooden pier jut into the small cove on the northern shore. This has been determined to be the best location for entering the island. The remains of two concrete block buildings and another concrete pad sit on a small hill overlooking the pier. These were supposedly used by the Navy Construction Battalion (Seabees) to maintain the military target facilities on the island during World War II (Parsons 1991). Other signs of the Navy's use noted during the October 1995 site visit include, telephone poles across the middle of the island, target buoys on the western half of the island, a jet target on the south side of the island, evidence of a landing strip and trails, plywood silhouette targets, and numerous small and large practice ordnance rounds. Several low stone walls on the northern side of the island and a wood and stone cistern near the center of the island provide evidence of the community that lived on the island before 1943. The target buoys, jet target, plywood silhouettes, and other targets have been removed from the island.

2.6 Project Description

The project scope includes the surface sweep of selected grids to remove MEC, MPPEH and other debris that is encountered on, or protruding from the ground surface. During the course of the surface sweep, the following material will be located and marked for removal:

- MEC
- MPPEH
- Other debris

2.6.1 MEC and MPPEH

MPPEH is material potentially containing explosives or munitions (e.g., munitions containers and packaging material, munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or material potentially containing a concentration of explosives high enough to present an explosive hazard. All MPPEH requires a dual inspection process, where items are certified and verified to be either material documented as safe (MDAS) or material documented as hazardous (MDAH). Once material is determined to be MDAS, it need not be managed as explosive and is, from an explosives safety perspective, safe for transfer or release from the Department of Defense (DOD) control without specific explosives safety management requirements. MDAS is not MPPEH. Similarly, MDAH is material formerly suspected of being MPPEH that has been inspected or processed and documented as to the hazards that are known or suspected to be present. This material is also not MPPEH because it does present an explosive hazard and must be managed as ammunition and explosives.

Excluded from MPPEH are MEC items (derived from military munitions) in one of two categories, UXO or discarded military munitions (DMM).

TtEC will follow standard operating procedures contained in the Work Plan that will be followed during execution of MEC-related work tasks.

The elements of this APP comply with the informational requirements of the following regulations and guidance:

- Occupational Safety and Health Administration (OSHA)
 - 29 CFR 1926.65[b][4][ii]
 - 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response
- U.S. Army Corps of Engineers (USACE)
 - USACE Safety and Health Requirements Manual, Engineer Manual (EM) 385-1-1, Section 28B (Sep 2008 consolidated August 2011)

2.7 Phases of Work Requiring Activity Hazard Analyses (AHAs)

An Activity Hazard Analysis (AHA) is developed for each planned activity and operation occurring in each major phase of work. This AHA identifies the sequence of work, specific hazards anticipated, and the control measures to be implemented to minimize or eliminate each hazard. This AHA is used to augment daily safety meetings intended to heighten safety and hazard awareness on the job. This pre task briefing will be documented and may be combined with the daily tailgate safety meeting. AHAs are the focal point for safe conduct of work on a project. Each task is described and evaluated; therefore, workers should be better prepared to perform work safely. In summary, the AHA will be covered during the Preparatory Phase Meeting of all definable tasks in the planned work. This will be documented in the daily Contractor Quality Control report as having been covered in the preparatory inspection meeting. The AHAs follow the guidance of TtEC Corporate Procedure EHS 3-5.

The UXOSO will discuss the risks and precautions associated with each task identified in the Work Plan. Daily “tailgate” safety meetings are held at the start of each shift. Prior to the day’s activity, the safety meeting discusses the potential chemical, physical, and environmental hazards, and preventive safety measures. During a work day, if there are any changes or new conditions, the UXOSO will ensure that the AHA is updated and that workers review the amended AHA. Attendance is mandatory for all employees involved in the specific work. Amended AHAs must be reviewed by the PESM. If a change must be implemented immediately the PESM and the UXO Safety Manager will be contacted. The UXOSO will forward a copy of the change to the PESM/UXO Safety Manager as soon as possible and leave a voice mail phone message for the PESM/UXO Safety Manager. Once the changes are approved and the NTR notified the changes will be considered approved.

AHAs are included in Appendix A of this APP. AHAs have been developed for the following phases of work:

- Mobilization and Site Setup.
- Vegetation Clearing.
- Transportation of Materials/Equipment by Boat/Barge.
- Explosive demolition activities.
- MPPEH certification and verification.
- Site Demobilization.
- Hoisting/Lifting and Rigging.
- Utility Vehicle Operations.

The activities addressed above will consist of several primary work tasks, each of which is addressed in an Activity Hazard Analysis (AHA) (see Appendix A) of this APP. AHAs will be updated or developed accordingly when a process changes, new information is obtained (e.g., upon review of work tasks with subcontractors who will perform much of the work), or when new tasks will be performed. The AHAs are not necessarily in order for the work tasks to be performed.

The activities included in these tasks present hazards to workers. Mitigations for the hazards associated with the work are presented in this APP. All personnel involved in the tasks listed above are required to review and be familiar with the requirements of the APP and specifically, to review and sign the AHA for the task elements they will be involved with during the fieldwork.

3.0 STATEMENT OF SAFETY AND HEALTH POLICY

TtEC is committed to providing our employees with a safe and healthful workplace. It is the goal of TtEC to continue excellent safety performance on all work that we undertake. TtEC will perform work in a manner that is consistent with our Zero Incident Performance® (ZIP) philosophy. We plan to perform the work in a manner that integrates safety and health considerations so that we eliminate risk of workers' injuries or illnesses, environmental releases/impacts, or property damage. In addition to the line and staff management functions described in this APP, each individual performing work under this contract is responsible for his/her own personal health and safety and for assisting in ensuring the health and safety of coworkers. This employee responsibility includes observing specified health and safety requirements and communicating with the designated Site Superintendent (SS) as appropriate, on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.

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

Health and safety-related information is communicated to employees through meetings, postings, written communications, and hazard reports.

Our Corporate Safety and Health Policy Statement is included as Appendix B to this APP.

3.1 Contractor Accident Experience

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

This data comparison illustrates that TtEC’s performance is very good and that our rates are significantly lower than the most recent national averages for heavy construction industry.

TtEC’s Experience Modification Rates are as follows:

(Policy Year October 1–September 30):

2011–2012:	0.76
2012–2013:	0.76
2013-2014:	0.80

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

4.1 Statement of Responsibility

TtEC is ultimately responsible for the implementation of its Environmental Health and Safety (EHS) program. No person will be required or instructed to work in surroundings or under conditions that are unsafe or dangerous to his or her health. Each employee is responsible for complying with applicable safety and occupational health requirements, wearing prescribed safety and health equipment, reporting unsafe conditions/activities, preventing avoidable accidents, and working in a safe manner.

4.2 Identification and Accountability

This section identifies the roles and responsibilities of TtEC personnel and subcontractors, who are conducting field activities during the surface clearance at Nomans Land Island, Chilmark, Massachusetts.

4.2.1 Project Management

Line management, managers, and supervisors ensure that the project activities are executed in accordance with TtEC’s EHS programs, procedures, and applicable regulations. Line managers have primary EHS responsibility and have EHS personnel to support them in fulfilling this responsibility. Line managers have the responsibility to integrate loss-control principles into operations and to ensure:

- TtEC safety culture is preserved by demonstrating commitment and program involvement; safety remains a major project goal and is not subordinated to other demands.
- Project-specific continuous improvement goals and objectives are developed based on EHS events and issues and are communicated to TtEC's employees and subcontractors.
- Projects are implemented in compliance with environmental, safety, and health laws and regulations, as well as EHS program requirements.
- EHS plans are developed, approved, and implemented in accordance with TtEC's requirements.
- Personnel understand the requirements of the project's EHS plan(s) and that each individual understands his/her responsibility for plan implementation.
- Personnel have the required training and capabilities to perform the assigned tasks.
- Corporate professionals or external resources, such as private consultants, are available for project support as needed.
- Project staff members are aware of, and have access to, technical information that TtEC maintains, various EHS databases, and online regulatory subscription services.
- Additional EHS reference books and technical information are made available to project staff upon request.
- Facilities and equipment meet TtEC and government regulations.
- Work rules are enforced.
- Inspections and incident investigations are conducted per EHS program requirements.
- Effective corrective actions are implemented in a timely manner following inspections, audits, incident investigations, etc.
- Employees, including subcontractors, are not only encouraged but also required to notify their supervisor(s) of any actual or potential health and safety hazards in the workplace and to develop safe work methods and controls to be implemented in project AHAs.
- Employees and subcontractors are assured they will be rewarded for reporting health and safety concerns.
- Clients are notified of TtEC's incident reporting procedures.
- Appropriate disciplinary action is implemented by line supervision when necessary.
- Management responsibilities necessary to maintain a safe, healthful, and environmentally compliant workplace are identified in each procedure of TtEC's EHS program.

4.2.2 Project Manager (PM) – Brian Corbett

With respect to the EHS program, it is the responsibility of the PM to:

- Ensure implementation of this APP through coordination with the Senior Unexploded Ordnance (UXO) Supervisor (SUXOS), and Safety and Health Manager (SHM).
- Conduct quarterly inspections (when required) jointly with the SHM.
- Participate in the incident investigations.
- Ensure the APP has the required approvals before any site work is conducted.

- Ensure the SHM and SUXOS are informed of project scope changes that require modifications of the APP.
- Assume overall project responsibility for health and safety.
- Ensure adequate resources are provided to the field staff to carry out their responsibilities (as outlined in this APP).

4.2.3 Corporate SHM – Roger Margotto, CIH, CSP

The SHM will review and approve this APP and any amendments prior to their adoption. The SHM will assist with implementation of the APP and provide project support on health and safety issues. The SHM will verify field personnel training, medical surveillance, and respirator fit test requirements. The SHM will advise the Unexploded Ordnance Safety Officer (UXOSO) and SUXOS regarding industrial hygiene concerns, interpretation and evaluation of analytical exposure data, and other safety-related issues, as needed. Subcontractor EHS plans will be reviewed by the SHM. It is also the SHMs responsibility to:

- Provide for the development and approval of the APP.
- Serve as the primary contact to review any health and safety matters that arise.
- Approve revised or new safety protocols for field operations.
- Approve individuals who are assigned Site Safety and Health Officer (SSHO) responsibilities (for this project, the UXOSO is also the SSHO).
- Approve the UXOSO (in the role of SSHO) to fulfill other project roles.
- Approve any revisions of this APP.
- Approve upgrading or downgrading of personal protective equipment (PPE).
- Assist in the investigation of incidents.

4.2.4 Unexploded Ordnance Safety Manager – Steve Neill

The UXO Safety Manager is responsible for overseeing munitions- and ordnance-related safety and health programs. In addition, the UXO Safety Manager will:

- Assign all UXO technicians and verify all training, certification and experience, and other requirements.
- Report any MEC safety and health issues to the SHM.
- Advise the SHM and PM regarding any concerns and other safety related issues, as needed.
- Have discretionary authority to shut down MEC/MPPEH-related field operations.

4.2.5 Site Superintendent/Senior UXO Supervisor – TBD

The Site Superintendent coordinates all construction activities and/or the Senior Unexploded Ordnance Supervisor (SUXOS) will supervise the surface sweep and MEC/MPPEH removal activities. Because of the relatively small size of this project, the SUXOS will act as the Site Superintendent and ensure that all work is performed in accordance with the contract requirements in a safe and healthful manner.

A SUXOS must be able to fully perform all of the functions enumerated for the UXO Technicians I, II, and III whom he supervises. The SUXOS coordinates all MEC/MPPEH-related investigation and removal activities. The SUXOS is responsible for ensuring that all work is performed in accordance with the contract requirements in a safe and healthful manner. As a line manager, the SUXOS has the same responsibilities for safety and health program implementation as the PM. With respect to the safety and health program for this project, it is the responsibility of the SUXOS to:

- Verify the identification of all MPPEH.
- Ensure site personnel comply with the APP and SSHP.
- Direct all MEC/MPPEH-related operations.
- Coordinate with the UXOSO and SHM/UXO Safety Manager on matters regarding site safety and health.
- Maintain control of the work area and prevent any unauthorized persons from entering the exclusion zone (EZ). If the unauthorized persons refuse to leave, the field crew personnel shall cease operations and notify the local authorities who will remove these individuals.
- Halt or modify any work conditions or remove personnel from the task site if conditions are unsafe.
- Report all incident reports to the SHM/UXO Safety Manager the same day who may be required to notify OSHA of the incident. Investigate and provide documentation of all accidents at the site as required.
- Ensure all task site personnel understand and comply with all munitions response safety requirements.
- Monitor team member's performance, including safety and quality control.
- Be responsible for overall direction of on-site intrusive and screening activities.
- Be responsible for the day-to-day munitions response-related work at the site.
- Be responsible for implementing and enforcing all work plans related to munitions response operations.
- Certify Ammunition, Explosives, and Dangerous Articles as ready to turn in for disposal in accordance with current policies and procedures identified in the Work Plans and approved ESS).

In addition, the SUXOS, as the senior on-site authority, will:

- Conduct daily activities such as: supervising employees in munitions response operations, overseeing the implementation of specified levels of personal protective equipment (PPE), identifying potential problem areas and making corrective action recommendations to the PM, implementing all corrective actions, and maintaining a daily log of work activities including noting any extraordinary occurrences.
- Conduct weekly safety inspections jointly with the UXOSO.
- Conduct incident investigations.
- Initiate corrective actions for observed safety violations.

- Conduct daily safety meetings.
- Ensure completion of the project on schedule and within budget, in accordance with the permits and project plans.
- Ensure that appropriate change management procedures are in place.
- Ensure compliance with all environmental, health, and safety requirements, including corporate policies, programs, and procedures; OSHA; Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard; EM 385-1-1 requirements; and any client-specific requirements included in this plan.
- Ensure that adequate site security, appropriate for the activities being performed, is maintained.
- Implement material control requirements in accordance with Government Property Control Procedures.
- Ensure that an adequate labor force is assigned to the project with the proper training, education, experience, skills, tools, equipment, and materials to complete the tasks and minimize potential impacts to the environment.
- Act as Emergency Coordinator (EC) for all emergencies.
- Prepare and submit (electronically) the Daily Contractor Production Report to the Navy Technical Representative (NTR), RPM, Facility Engineering and Acquisition Division (FEAD), and PM.

4.2.6 UXO Safety Officer/Quality Control Manager – TBD

The UXOSO/UXOQC will fulfill the duties and responsibilities as defined in corporate procedures. The UXOSO is also qualified in the role of Site Safety and Health Officer (SSHO) and will have completed the 30-hour OSHA construction safety class or equivalent. The UXOSO has 5 years of construction experience and has had 24 hours of formal health and safety training in the last 4 years. The UXOSO reports to the SHM/UXO Safety Manager and assists with the on-site implementation of TtEC EHS programs and procedures (presented in Appendix C) and with regard to MEC safety, programs, and procedures, also reports to the UXO Safety Manager. As the UXOQC he has the QC training required to verify and document compliance with contract specifications and reporting requirements. The UXOSO helps to ensure that operations are performed in compliance with applicable client- and site-specific requirements and government regulations. For MEC- related task oversight, the UXOSO will be the equivalent of a UXO Technician III as well as meeting the qualifications listed above.

The UXOSO will be responsible for the following:

- Ensure that TtEC employees and subcontractors understand the requirements of the TtEC EHS program and procedures through training and communications.
- Assist the SUXOS with implementation of the APP.
- Conduct daily EHS briefings in accordance with corporate procedures. Ensure that tailgate safety meetings are conducted prior to starting work or changing work assignments.

- Conduct daily informal inspections of the project site and recording observations in the logbook.
- Ensure that TtEC employees and subcontractors understand the requirements of the TtEC EHS program and procedures through training and communications.
- Assist with implementation of the APP.
- Conduct daily EHS briefings in accordance with corporate procedures.
- Verify that project safety equipment and hand tools are inspected daily prior to use.
- Update the Safety and Health Deficiency Log on a daily basis.
- Assist the SUXOS with weekly health and safety inspections. Ensure corrective actions identified are being addressed and corrected.
- Exercise stop work authority when warranted by conditions, in accordance with the project plans.
- Ensure that TtEC site personnel have received required EHS regulatory and program training, in accordance with corporate procedure training.
- Support the PM and SUXOS in accident and incident investigations.
- Function as a technical resource for all environmental, safety, loss control, and industrial hygiene issues.
- Ensure that the specific responsibilities for EHS personnel identified in the TtEC EHS programs and the EHS plan(s) are fulfilled.
- Perform on-site monitoring to determine appropriate levels and use of personal protective equipment (PPE).
- Perform site surveillances, hazard identification, and health risk analysis.
- Implement procedures and programs to eliminate risk to site personnel, including initiating changes to the plan.
- Act as EC when the SUXOS is not immediately available or is involved in the emergency.
- Implement site control measures.
- Maintain the field health and safety logbook.
- Provide summaries of field operations and progress to the SHM/UXO Safety Manager.
- Submit man-hour reporting to the UXO Safety Manager weekly as well as incident reporting and ZIP Slips which identify site safety issues.
- Maintain First Aid and CPR qualifications and ensure at least one additional team member is qualified.
- Maintain the MSDS/SDS files and Hazardous Material inventory for the site. Brief all team members of hazards involved on site.
- Report to the SUXO all incidents/accident for further reporting requirements.
- Verifying that all personnel have the necessary training and medical clearance prior to entering exclusion zones (EZs). (The UXOSO will inform the Site Superintendent of any site personnel with medical restrictions).

For this project, the UXOSO is also the UXO Quality Control Manager (UXOQCM). The roles and responsibilities of the UXOQCM are addressed in work documents outside of this APP.

4.2.7 Field Crew Personnel – Various (TtEC personnel, UXO technicians, and/or subcontractors)

Field crew personnel include the other persons entering the work site for the purpose of assisting in the completion of the project. This includes, but is not limited to, engineers, surveyors, UXO technicians, facility representatives, TtEC management personnel, subcontractors, regulatory personnel. It is the responsibility of field crew personnel to:

- Report any unsafe or potentially hazardous conditions to the SUXOS.
- Maintain knowledge of the information, instructions, and emergency actions contained in this APP.
- Comply with rules, regulations, and procedures set forth in this APP and any instituted revisions.
- Initiate the Incident Report when involved in an incident/accident (if able to do so).
- Prevent admittance to work sites by unauthorized personnel (If the unauthorized persons refuse to leave, the field crew personnel will cease operations and notify the SUXOS, who will notify the NTR for guidance.).
- Perform daily inspections of tools and equipment, including PPE, prior to use.
- Conduct daily operations check of electronic equipment and annotate in the team's logbook.
- Assist the SUXOS with implementation and compliance with the APP.

4.2.8 Subcontractors and Suppliers/Vendors

TtEC directs the subcontractor's supervisor regarding the work and the manner in which the tasks are to be performed. Subcontractors are responsible for assigning specific tasks to their employees; ensuring their employees are properly trained and are in compliance with applicable regulations; and allocating sufficient time, materials, and equipment to safely complete activities in accordance with this APP and their individual EHS plans. Subcontractors will attend TtEC's daily health and safety meeting prior to starting fieldwork.

4.2.9 Competent Persons

Competent person(s) for anticipated health and safety-related issues that may arise on the project will be designated by the PM and stated by name in the AHA or section of this APP where a competent person is specifically required by task. If the name of the competent person is not known after the APP and AHAs are finalized, the name of the competent person will be added to the plan by FCR when the person is designated. Subcontractor personnel will provide competent persons when their tasks require a competent person. The subcontractor competent persons must also be designated by name.

4.2.10 Pre-task Safety and Health Analysis

This plan requires the preparation of an AHA for each task. This plan also requires that these task analyses are reviewed with all workers and that workers acknowledge their review of safety

and health requirements for each task. Where subcontractors are used to perform certain work activities, the SUXOS will ask the subcontractor to provide an AHA for review or the UXOSO will work with the subcontractor in the preparation of the AHA. The AHA must be reviewed by the Contracting Officer and the SHM. The UXO Safety Manager will also review and approve of the MEC related AHAs. As new activities are identified or the work environment of the task changes, new or revised AHAs are prepared by TtEC. These revisions or new AHAs will be submitted to the SHM, UXO Safety Manager (as appropriate), and the Contracting Officer.

Each worker performing tasks described in an AHA must receive training in the AHA and be allowed to make comments and suggestions regarding the AHA to ensure that all hazards are properly identified and that control measures are in place to mitigate these hazards.

4.3 Lines of Authority

An organizational chart depicting the lines of authority is included as Figure 4-1. TtEC will require that the personnel and subcontractors follow the requirements in this APP and verify that this requirement is being met.

4.3.1 Policies Regarding Noncompliance

TtEC has a discipline program that is discussed in all new employee orientations and is also written in the TtEC Project Orientation, Rules and Safety Guidelines Handbook (TtEC 2009), a booklet that is given to every company employee. Briefly, the rules implement a progressive disciplinary program. However, if at any time there is a significant compromise of safety procedures; immediate termination of an employee is allowed by the procedure. The UXOSO will immediately report to the PM and SHM, and UXO Safety Manager (as required), observations of noncompliance in the performance of the subcontractor or workers.

4.3.2 Manager and Supervisor Accountability for Safety

TtEC EHS 1-1 of the Corporate Safety Program requires that:

“Line Management, the Project Manager, and supervisors, ensure that all company activities are executed in accordance with TtEC EHS programs, procedures, and applicable regulations. Line managers have primary EHS responsibility and have EHS personnel support to help them fulfill this responsibility.”

5.0 SUBCONTRACTORS AND SUPPLIERS/VENDORS

5.1 Identification of Subcontractors and Suppliers/Vendors

Subcontractors working on this project include:

Subcontractors (TBD) will be brought on board to complete the following tasks:

- Boat/barge operations – TBD.
- Transportation and disposal subcontractor(s) – TBD.
- Donor explosives supplier and transporter – TBD.

5.2 Means for Controlling and Coordinating Subcontractors

TtEC directs the subcontractor's supervisor on the tasks to be performed and the manner in which tasks are performed. Subcontractors are responsible for assigning specific tasks to their employees; ensuring that their employees are properly trained and are in compliance with applicable regulations; and allocating sufficient time, materials, PPE, and equipment to safely complete activities in accordance with this APP, and their individual EHS plans. Subcontractors' EHS plans are reviewed by the UXOSO or the SHM and as required, the UXO Safety Manager.

5.3 Safety Responsibilities of Subcontractors and Suppliers/Vendors

Individuals employed by subcontractors and suppliers/vendors will receive a site-specific briefing regarding the site specific physical, chemical, or biological hazards present on the work site; required safety activities; and their individual roles and responsibilities for safety practices. While on site, all subcontractors will be under the direct supervision of the SUXOS.

Subcontractors are responsible for complying with this APP and other applicable regulations. Subcontractor personnel must receive a briefing from the UXOSO prior to accessing the project work site. They must fulfill the requirements established by this APP and must acknowledge receipt of the plan and the hazard communication briefing. On-site subcontractors are responsible for providing their personnel with appropriate PPE as specified by the plan, however it is the ultimate responsibility of the SUXOS to ensure the Safety Plan is followed. Prior to the commencement or continuation of work, subcontractor and third-party personnel have the authority to request a work area hazard assessment by the SUXOS. Any member of the work party observing an imminent safety hazard or potentially dangerous situation will immediately suspend field activities.

Most subcontractors have their own EHS plans and/or corporate policies that are specific to their specialty services. TtEC management is responsible for ensuring that subcontractor employees follow the policies and procedures of TtEC and this APP. If subcontractors' EHS plans are more restrictive, the subcontractor supervisors must ensure that their EHS plans are also followed.

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, both in the subcontractor's EHS plan and during the daily health and safety briefing. The contractor will inform the UXOSO of these hazards and assist in the development and/or revision of AHAs.

6.0 TRAINING

The following training is required on projects under this contract.

6.1 New Hire Training

Project personnel, including new hires (if any are assigned to the project), will receive new hire training consisting of the following topics (at a minimum) before they will be allowed to work at the site in addition to the site-specific and other training outlined in the following sections.

- Employee and supervisor responsibilities for reporting all accidents and near misses.
- Requirements and responsibilities for accident prevention and the maintenance of a safe and healthful work environment.
- Procedures for reporting and correcting unsafe conditions and practices.
- General safety and health policies and procedures.
- Project Orientation, Rule, and Safety Guidelines Handbook.
- Subcontractor safety orientation video (for subcontractor new hires).

6.2 On-the-Job Training

In addition to the required initial training, each employee will receive three days of directly supervised on-the-job training (i.e., close supervision during the first three days working in the field). This training will address the duties the employees are expected to perform.

6.3 Periodic Safety and Health Training

The UXOSO will have completed the OSHA 30-hour Construction Safety Course. In order to remain current with respect to 30-hour Construction Safety training, the UXOSO, as required for the role of SSHO will receive 24 hours of formal health and safety training every 4 years. As mentioned, all project personnel will receive site orientation training at the start of work. This training will be repeated as necessary whenever work activities and site conditions change.

6.4 Hazardous Waste Operations Training and Refresher

Nomans Land Island will be implemented in a manner consistent with CERCLA. Workers who interact directly with or break the surface of the soil or screen the soil have some risk for contact with MEC/MPPEH and may have the potential for contact with site contaminants, if present in surface or subsurface soils. Site workers (limited to the UXO technicians performing intrusive investigations and working within the exclusion zone) on this project are required by 29 CFR 1910.120/1926.65 to have completed 40 hours of hazardous waste operations training and an 8-hour annual refresher course. Supervisors such as the SUXOS, UXOSO and UXO Technician III, and subcontractor's supervisors (as applicable), must have completed 8 hours of relevant supervisory health and safety training and first aid/cardiopulmonary resuscitation (CPR)/bloodborne pathogen training.

6.5 Hazard Communication Training

In accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200 and 29 CFR 1926.59), copies of material safety data sheets (MSDS) and Safety Data Sheets (SDS) for hazardous chemical materials that are used during site operations or that may be present on site

will be available from the on-site UXOSO. The UXOSO will conduct hazard communication (HAZCOM) training in accordance with 29 CFR 1910.1200 and 29 CFR 1926.59, Engineer Manual (EM) 385-1-1 (current version), and the HAZCOM program. Training will include, but will not be limited to, all hazards or potential hazards associated with work activities and any hazardous chemical materials brought to or found on the site. Effective December 1, 2013, all workers must have received training in the new OSHA HAZCOM standard incorporating the new labeling requirements, use of pictograms of chemical hazards, and the new SDS form which is replacing the MSDS.

6.6 Site-Specific Training

Prior to commencement of field activities, the UXOSO will provide site-specific orientation training on each element of this APP to all personnel assigned to the site. Site-specific training will address the activities, procedures, monitoring, and equipment for the work operations. Training will include site layout, hazards, evacuation route(s), emergency services at the site, and the HAZCOM program; and will highlight all provisions contained within the APP. This training will also allow field workers to clarify anything they do not understand and to reinforce each individual's responsibilities regarding health and safety for his or her particular activity. If additional training is required for completion of field tasks during the site work, then the SHM, UXO Safety Manager or UXOSO will either conduct the training or manage site personnel to ensure that tasks are conducted by appropriately trained personnel.

Personnel will also be trained in the site-specific emergency response plan, including: employee alarm system; evacuation procedures, routes, meeting places, and accountability; control of fuel sources; fire extinguisher education, minor spill control and cleanup procedures; reporting requirements; and rescue operations as applicable.

Additional training will be performed as appropriate based on the tasks that may be performed, which are addressed in Section 9.0 of this APP when applicable (e.g., poison ivy awareness, fall protection, etc.)

6.7 First Aid and Cardiopulmonary Resuscitation

The UXOSO will identify those individuals who have current first aid, automated external defibrillator (AED), and cardiopulmonary resuscitation (CPR) training. At a minimum, two people (including the UXOSO) will have current CPR/first aid certification. Due to the remote location of this project all other UXO technicians, including the UXOSO and SUXOS are required to be CPR and first aid trained. The names of all CPR/first aid-qualified workers will be posted on the site bulletin board and briefed to site personnel.

A first-aid kit meeting the requirements of OSHA and EM 385-1-1, Section 03.B.01, will be readily available at each work site by having the kit visible and ready for use. The location of each first-aid kit will be clearly marked, and kits will be protected from the weather and maintained clean. The kit must contain all the items listed in Table 3-1 of the EM 385-1-1 manual and include one pocket mouthpiece or CPR barrier and latex gloves. Additional items

may be included in the first aid kit at the direction of the UXO Safety Manager or SHM. The kit will be inspected weekly, and items will be replaced as they are used.

6.8 Bloodborne Pathogens Training

Individuals on site who have first aid and CPR certification and who may provide first aid and/or CPR will have completed training in accordance with the TtEC Bloodborne Pathogens Program and OSHA Bloodborne Pathogen Standard, 29 CFR 1910.1030.

6.9 UXO Technician Training and Qualification

UXO personnel will be trained and qualified in accordance with Department of Defense Explosives Safety Board Technical Paper (TP) #18 for the position to which they are assigned.

6.10 Use of Portable Fire Extinguishers

Project personnel will receive OSHA-compliant fire extinguisher education (29 CFR 1910.157[g]) for the use of portable fire extinguishers to respond to incipient stage fires. Typically this is given during site orientation.

6.11 Hearing Protection

Users of personal hearing protection will receive OSHA hearing conservation program and hearing protector use training (29 CFR 1910.95[i],[k]). Typically this is given during site orientation.

6.12 On-Site Health and Safety Briefings

Project personnel and visitors will participate in daily on-site health and safety briefings conducted by the SUXOS, UXOSO, or designee to assist site personnel in safely conducting their work activities. Health and safety briefings will be conducted at the start of new work activities using AHAs, which are provided in Appendix A of this APP. The briefings will include information on new operations, 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, identify performance deficiencies related to safety during daily activities or as a result of safety inspections, and review any events (near-misses, injuries, material release, etc.). Work will be stopped and a safety briefing will be conducted following any event that could compromise the safety of personnel or the environment.

6.13 Training Certificates

Copies of the required training certificates and licenses (as applicable) will be maintained on site and will be made available for government inspection upon request. Subcontractors will provide TtEC with copies upon request.

7.0 SAFETY AND HEALTH INSPECTIONS

Vehicle inspections will be performed daily on all site vehicles and heavy equipment by the operator in accordance with TtEC Construction Procedure CP-7.

Weekly site inspections will be completed by the UXOSO and/or SUXOS in accordance with TtEC EHS Procedure 3-3. Subcontractor personnel may be asked to participate in inspections.

Daily inspections on the day(s) of scheduled field activities will be performed by the SUXOS and UXOSO and will be noted in the site activity logbook and TtEC Field Inspection Forms referenced above are included as Appendix D of this APP. If any deficiencies are identified during the inspections, they will be noted on a deficiencies log as required by EM 385-1-1, Section 01.A.12d and corrected. Deficiencies to safety devices or equipment will be corrected before use or removed from service until they are fixed.

The inspections will be tracked for follow-up action on each of the respective forms. After the performance of the quarterly SHM inspections (if required), the inspection reports are reviewed and action items are followed-up. The SHM, or his or her designee (e.g., the UXO Safety Manager), may conduct an unannounced inspection of the project.

7.1 Specific Assignment of Responsibility for a Minimum Daily Job Site Safety and Health Inspection During Periods of Work Activity

Daily site safety inspections will be conducted by the UXOSO during this field effort to ensure safe work areas and compliance with the APP, OSHA regulations, and EM 385-1-1 requirements.

7.2 Proof of Inspector's Training/Qualifications

The UXOSO has completed the 30-hour OSHA Construction Safety Training and meets the requirements of EM 385 1-1 Section 01.A.17 in the role of SSHO. Competent persons designated for excavation, hoisting and rigging, fall protection, and/or other areas of expertise (if required) will be responsible for inspections performed in their assigned roles as competent person for that task and be designated as competent persons by the PM.

7.2.1 Documentation Procedures

The UXOSO will record any deficiencies in the on-site field logbook or in a daily safety report that is submitted daily to the project QC Manager and to the SHM/UXO Safety Manager.

7.2.2 Deficiency Tracking System

Deficiencies will be logged as required by EM 385-1-1, Section 01.A.12d. The items noted during field audits will be communicated to the TtEC EHS managers who maintain a corrective/preventive action database. Responsibility for resolving each item noted during these audits is assigned and tracked through resolution. Results from field audits are also regularly

communicated within TtEC through training and electronic means as a method of continuous program improvement.

8.0 ACCIDENT REPORTING

When an incident occurs, the SUXOS will orally notify the PM, NTR/FEAD, and the UXOSO immediately. The PM will notify the RPM. The UXOSO will notify the SHM and UXO Safety Manager. If the incident is an injury requiring more than first aid or government property damages exceeding \$2,000, the PM will immediately notify the Contracting Officer.

8.1 Exposure Data

The UXOSO calculates exposure data on a weekly basis. Labor-hours worked are obtained from hours charged to a project for payroll purposes. The UXOSO also collects the number of subcontractor labor-hours worked by reviewing daily project production reports and recording the hours on those reports. The UXOSO will forward the labor-hours along with the Weekly Safety Report to the SHM or UXO Safety Manager, who will compile the monthly total and report that to the Contracting Officer.

8.2 Accident Investigations, Reports, and Logs

After the oral report, the SUXOS or UXOSO must complete a written-event report form within 24 hours. This form can be either prepared manually using the form found in the corporate procedure or electronically using the corporate database. Within 72 hours, a completed investigation report must be submitted. The investigation report is part of the initial written report form. These forms can be completed by persons involved in the incident, but the investigation must be completed by a supervisor and/or the UXOSO. All reports will be reviewed by the PM and the SHM and/or UXO Safety Manager upon submission. 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.

In addition, the PM or the UXOSO will complete, within 48 hours, a Contractor Significant Incident Report (CSIR) (Appendix E), as required for any injury beyond first aid or for any government property damages \$2,000 or greater. The SUXOS or the UXOSO will ensure that a report is prepared and the forms are completed as requested by the NTR/FEAD, RPM, and/or the PM and SHM or UXO Safety Manager. In addition, all recordable injuries, near-miss incidents, high loss potential incidents, property damage incidents costing more than \$500, first aid cases, and environmental spills (greater than reportable quantity) will be entered on the Tetra Tech program incident safety database (Total). This database summarizes the accident/incident history of the program from the start of the contract and on a year-to-date basis.

8.3 Immediate Notification of Major Accidents

Immediate reporting of incidents is required within TtEC. In addition, the Contracting Officer will be immediately notified by the PM (or a designee) of an accident (see list below) that is

required to be reported by EM 385-1-1. An accident that must be reported immediately to Mid Atlantic Naval Facilities Engineering Command (NAVFAC MIDLANT) is any injury requiring more than first aid or any government property damage in excess of \$2,000. For each reportable mishap described above, a verbal report will be made to the NTR/FEAD and RPM as soon as possible. The NTR may follow up with a request for submission of the CSIR within 48 hours. The NTR may initiate a report into the Navy Contractor Incident Reporting System (CIRS) that will generate an e-mail to a TtEC Manager or the UXOSO so that data can be made into the CIRS. TtEC will give the NTR the name and e-mail address of the PM or other designated person. The PM will be required to access the CIRS and complete the report with all available information and resubmit the updated report online to NAVFAC MIDLANT within 24 hours of receiving the link.

List of accidents or events to be immediately reported:

- a. Fatal injury/illness;
- b. Permanent totally disabling injury/illness;
- c. Permanent partial disabling injury/illness;
- d. Three or more persons hospitalized as inpatients as a result of a single occurrence; Note: it is TtEC practice to inform our clients of any accident requiring hospitalization of our employees or subcontractors;
- e. \$200,000 or greater accidental property damage or damage in an amount specified by USACE in current accident reporting regulations (currently we report government property damage \$2,000 or greater);
- f. Arc Flash Incident/Accident;
- g. Three or more individuals become ill or have a medical condition which is suspected to be related to a site condition, or a hazardous or toxic agent on the site.

9.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY EM 385-1-1, THE SAFETY MANUAL (AS APPLICABLE)

TtEC has established written requirements for complying with OSHA and other Federal regulations and implementing TtEC policy to prevent accidents and injuries. This section describes how some of these programs are implemented specifically for this project.

9.1 Layout Plans

Approval to stage materials and equipment and set up work areas and access to these areas (support area). Portable toilet and hand washing facilities will also be established for use by field personnel. The support area and general site layout is shown on Figure 9-1.

There is no electrical, phone, or internet facilities in the area. Phones will be cellular telephones and internet will be via portable wireless device. Electrical hookups and connections will be made by a qualified and licensed electrician where required. It is anticipated that a portable generator will be used. Fuel for heavy equipment use and generator use, expected to be diesel fuel, will be brought out on a supply boat, as needed. The trucks and heavy equipment will be

fueled via site personnel using a truck-bed mounted, U.S. Department of Transportation-approved 110-gallon (or less) fuel tank.

Security of the site is provided by existing land use controls and restricted area signage. There is no active or patrolled security. Work sites, equipment, fuel tanks, and conexes will be secured and locked appropriately to minimize potential unauthorized access and tampering or theft of TtEC or government property. TtEC will conspicuously mark any equipment and materials in possession for identification.

TtEC personnel and any subcontractors will become familiar with and obey local requirements including safety, fire, traffic, and security procedures. TtEC and subcontractor personnel will keep within the limits of the established work area and avenues of ingress and egress and will not enter any restricted areas or exclusion zones.

Exclusion zones will be established based on the distances required in the ESS, which will be enforced by the SUXOS during active MEC/MPPEH operations. An MPPEH holding area and material documented as safe (MDAS) area will also be established in accordance with the ESS.

9.2 Emergency Response Plans

Emergency situations that may be encountered during site activities will normally be recognized by visual observation. Emergencies involving physical hazards, including fires and explosions are generally readily apparent visually. Injuries and medical emergencies, including potential exposure to hazardous materials may not always be so apparent. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in this APP and associated AHAs. Early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. The SUXOS and/or the UXOSO, along with competent persons for specific tasks will be responsible for performing surveys of work areas prior to initiating site operations and periodically while operations are being conducted. Survey findings are documented by the SUXOS and/or the UXOSO in the site health and safety logbook. Site personnel are responsible for reporting situations they perceive as hazardous and correcting those hazards which are immediately correctable (e.g., removing tools or materials that may present a trip hazard).

The above actions will provide early recognition for potential emergency situations, and allow TtEC to instigate necessary control measures. However, if the SUXOS and the UXOSO determine that control measures are not sufficient to eliminate the hazard, TtEC will withdraw from the site until the hazard can be effectively managed or eliminated and notify the appropriate response agencies whenever a hazard presents an emergency situation.

In the event of an emergency during on-site work, the primary response action by on-site personnel will be to safely assemble and evacuate to an area unaffected by the emergency and notify the SUXOS and UXOSO and render the appropriate level of response and support as is included in these plans.

Local county emergency services are capable of providing the most effective response to site emergencies in the event of a fire or explosion, injury or medical emergency occurs. The PM, SHM (or UXO Safety Manager (as appropriate) as well as the NTR/FEAD, RPM, and Contracting Officer will be notified if these response agencies are contacted.

TtEC personnel will provide insipient emergency prevention activities such as:

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

9.2.1 Procedures and Tests

9.2.1.1 Pre Emergency Planning

Based on the nature of the planned activities, emergencies resulting from physical or chemical hazards, including unplanned fires, and/or explosions related to MEC/MPPEH. To minimize or eliminate the potential for these emergency situations, pre-emergency planning activities will include the following (which are the responsibility of the SUXOS and/or UXOSO with participation as required by field personnel):

- Coordinating with the local emergency response personnel and local emergency hospital prior to the commencement of work to ensure that TtEC emergency action activities are compatible with existing emergency response procedures.
- Establishing and maintaining information at the project staging areas (support zone [SZ]) for easy access in the event of an emergency.
- Enforcing the EZs required by the ESS.
- Creating and maintaining documents on site that can be important in the event of an emergency situation, including:
 - A chemical inventory of hazardous chemicals on site.
 - Corresponding MSDS and/or SDS.
 - Completed medical data sheets (Appendix F) for on-site personnel.
 - A entry/exit log identifying personnel on site and in the EZ each day.
 - Site layout and emergency evacuation routes (Figure 9-1).
 - Hospital route map with directions from site (Figure 9-2).
 - Emergency equipment inventory – (Table 9-1).
 - Emergency notification list – phone numbers (Table 9-2).

At the beginning of the field work, the EC (SUXOS primary, UXOSO secondary) will hold an emergency evacuation drill.

The drill requires evacuations of the site to the designated evacuation area. At the evacuation area, the UXOSO will brief the crew on the routes to reach the hospital. The SUXOS and

UXOSO will, after the drill, conduct a written debrief meeting with all participants. The UXOSO will prepare a short report with recommendations for improvement of the evacuation plan.

9.2.1.2 Personnel and Lines of Authority for Emergency Situations

The SUXOS will serve as the EC until emergency response personnel arrive on site and take command. If the SUXOS is not present or is involved in the emergency, the UXOSO is the alternate EC and will take all necessary precautions and measures to initiate the emergency response, including notification of emergency personnel. In the event of an emergency, personnel will safely halt operations and evacuate to a safe area and the EC will be in charge until emergency responders arrive and take command. TtEC will not provide emergency response support beyond their on-site capabilities and their training.

9.2.1.3 Emergency Signal, Assembly and Evacuation Procedures

In the event of an emergency situation such as fire or explosion, the UXOSO (or a supervisor) will activate an air horn (or vehicle horn) indicating the initiation of evacuation procedures. An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety, or welfare of site workers. Specific examples of conditions that may initiate an evacuation include, but are not limited to, the following: severe and sudden weather conditions, unplanned fire or explosion, evidence of acute personnel overexposure to a chemical, discovery of unanticipated waste materials that are unknown, and could also occur due to activities of other contractors, Base operations, or conditions not directly related to site work.

In an emergency, personnel in affected work zones will immediately and safely stop work and assemble near the support zone (SZ), or other safe area as identified by the SUXOS or UXOSO where accountability of personnel will be performed. Personnel will then proceed to the designated evacuation area. The base camp has been designated as the primary evacuation area; however, if the base camp is not considered to be safe, an alternate evacuation area and route may be required.

The location of assembly and evacuation areas will be upwind of the site as determined by the wind direction whenever possible. Prior to the start of site activities, and as required thereafter, the UXOSO will establish and verify safe egress routes from the site to the assembly and designated evacuation areas and will coordinate this procedure with the subcontractor personnel as required. The UXOSO will prepare a drawing or a map that diagrams these safe egress routes and location of assembly areas to keep this plan current. All site personnel will be briefed of the assembly and evacuation locations and routes (including alternate locations for each work location and will be updated whenever these change).

Figure 9-1 has been included to show the site layout and location of primary evacuation area (base camp). From these points, the maps showing the route to the nearest emergency hospital (Figure 9-2), to the Martha's Vineyard Hospital will be used if emergency medical services are required (See Section 9.2.6 below).

For efficient and safe site evacuation and assessment of the emergency situation, the EC will have the authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given and the order to evacuate is issued. Once the alarm has been sounded, the EC must establish that access for emergency equipment is provided and that the equipment that may cause combustion has been shut down. As soon as possible, and while the safety of the personnel is being confirmed, emergency agency notification will commence. The SUXOS or UXOSO will brief site personnel each day or when the location of either the assembly or evacuation area is revised.

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

- Declare the evacuation via radio communications, cellular telephones, hand signals, voice commands, line of site communication, or vehicle/ air horns.
- The following signals shall be used when communication via vehicle horn or air horn is necessary:
 - **Steady long beeps will be used to indicate emergency situations**
- Report to the designated refuge point.
- Once nonessential personnel are evacuated, appropriate response procedures will be enacted to control the situation.
- Describe incident precipitating the evacuation to the SUXOS with pertinent incident details.

9.2.1.4 *Emergency Equipment*

The following emergency equipment listed in Table 9-1 will be strategically placed and maintained on site in accessible locations where active work is taking place:

- Fire extinguishers will be maintained on site and shall be immediately available for use in the event of an emergency.
- If fuel will be transferred from portable fuel cans, they will be UL approved safety cans properly labeled. If greater than 25 gallons is stored on site, a minimum 40B:C fire extinguisher will be mounted within 50 feet of a fueling location.

Fire extinguishers will be inspected monthly to ensure:

- Sufficient charge.
- No physical damage.
- Tamper indicators are in place.
- Up-to-date inspection tag.

Site personnel will be trained in the use of the fire extinguisher as part of site-specific training.

9.2.2 Spill Plans

In addition to training, the following procedures are required to prevent and minimize releases of hazardous (or potentially hazardous) materials including fuel:

- Containers and fuel tanks located on-site will be labeled as to contents and associated hazards.
- Hazardous materials will only be brought to the site in the minimum quantities needed to get the immediate task performed.
- A Hazardous Material Inventory and MSDS/SDS for hazardous materials used on-site (currently limited to small quantities of gasoline, diesel fuel and lubrication oil or grease for heavy equipment, and generator operation and maintenance) will be kept in a binder at the field office/base camp. The Hazardous Material Inventory and MSDS/SDS are included in Appendix G, which will be updated if additional hazardous material is identified for use on the project.
- Containers will be constructed with closeable lids, which will be kept closed except when in direct use.
- Fuel containers will be metal, UL-listed and in good condition.
- Tanks used to contain fuel will be double walled and tanks and hoses will be National Fire Protection Association-rated.
- Preventative maintenance will be performed on construction equipment and vehicles minimize chances for hose and other equipment failure.
- Good housekeeping operations will be followed and hazardous materials will be stored in authorized storage areas.
- Absorbent materials (e.g., sorbent pads, sorbent socks, chemical protective gloves, and bags) will be staged in the SZ for responding to potential spills that could occur during heavy equipment operations and refueling tasks. Spill control equipment will include, at minimum, absorbent pads, chemical protective gloves, and disposable bags as well as tools such as shovels and brooms will be available.
- Portable spill basins or secondary containment structures will be placed under refueling points.
- Refueling of equipment will be done by the operator who is in constant supervision of that task. Overfill prevention during refueling will be verified visually by the operator.
- Tanks will be filled only to their listed capacity (not overfilled) to allow for expansion.
- Project wastes will be kept in designated areas in closed containers, separated as required based on compatibility and managed in accordance with the Waste Management Plan.
- Personnel handling waste and hazardous materials, including selection of proper packaging, will be properly trained as required in the Waste Management Plan.
- Hazardous materials operations will not be conducted when the weather could cause significant risk to surrounding area if a spill should occur.
- Perform the transfer of any hazardous materials in a well-ventilated area.

In the event of a spill:

- The SUXOS or UXOSO will notify the PM, NTR/FEAD.
- The PM will notify the RPM and Contracting Officer.
- The SSHO will notify the SHM.
- Any spill quantity is reportable the NTR/FEAD, RPM, as well as to the PM and SHM.
- TtEC will assist the RPM or NTR/FEAD with any required notification to regulatory agencies if the spill is reportable.
- In no case will TtEC report a spill to a regulatory agency without the RPM, NTR/FEAD, and/or Contracting Officer concurrence.
- An investigation and incident report will be prepared and corrective actions identified.

Spills of hazardous material or petroleum that occur in the State of Massachusetts will be reported to agencies as follows:

MassDEP Emergency Response	1-888-304-1133
National Response Center	1-800-424-8802

9.2.3 Firefighting Plan

Workers will not fight any fires other than incipient stage fires. There will be at least one fire extinguisher (refer to Table 9-1) at each active work location. Fire extinguishers will also be located in each piece of mobile construction equipment and in the crew pickup trucks. The fire extinguishers are intended to fight only small fires that have recently occurred and can be reasonably extinguished immediately (incipient stage fires). In no case will workers attempt to fight any fire that cannot be reasonably extinguished within 30 seconds to 1 minute.

If a fire breaks out onsite, call (or designate someone) to call 911 before attempting to put out the fire (incipient stage only) and only if fighting the fire does not put anyone at further risk. Ensure a means of egress is available in the event the fire cannot be extinguished.

To use the fire extinguisher, remember the word P.A.S.S. – pull the pin, aim the nozzle at the base of the fire, squeeze the lever, and sweep side to side at the base of the fire. Workers will be given fire extinguisher training during project orientation.

Fire extinguishers will be inspected by the UXOSO initially and then on a monthly basis (at a minimum). Additionally, all fire extinguishers will be inspected and serviced annually by a qualified professional. Any defective or partially-used fire extinguisher will be red-tagged and taken out of service until such time that it can be serviced. Fire extinguishers will be secured or supported when transported and in storage. During project demobilization, all fire extinguishers and other hazardous material will be properly dispositioned for further use at other TtEC projects. If fire extinguishers and other hazardous materials will be sent by a carrier, TtEC will ensure that the proper hazardous material declarations are prepared by a qualified individual for ground shipment only.

In the event of a fire or explosion, contact the appropriate emergency authorities by calling 911 as specified in Table 9-2 – Emergency Contact Information. Any fire must also be reported to the NTR/FEAD, RPM, and the SHM. The person reporting the fire is required to provide the following information to emergency personnel:

- His/her name.
- Location of the fire.
- Number of injured persons 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.
- Any other pertinent information.

9.2.4 Posting of Emergency Telephone Numbers

The list of emergency telephone numbers in Table 9-2 will be maintained at the telephone communications points in the field office and in the SZ.

9.2.5 Man Overboard/Abandon Ship

Prior to the start of field activities, the boat operator will give a detailed health and safety briefing on the location and use of all vessel safety equipment and the procedures for addressing on-board emergencies (i.e., fire or explosion onboard, mechanical failure, man overboard situation, abandon ship, etc.) and a man overboard/abandon ship drill will be rehearsed. The buddy system is to be used onboard boats so that man overboard retrieval can be performed expediently in the event a person goes into the water.

General boating requirements and boater safety are discussed in Section 9.35.9.

In the event that a man overboard or an abandon ship order is given, the situation will be treated as an emergency. In the event of a man overboard, the following will occur:

- The person who observes the man overboard will shout out “man overboard” and what side of the boat (port [left] or starboard [right]).
- The person who goes overboard should shout out to those on the boat if it is not noticed that they are in the water or use the whistle on the PFD.
- At no time shall a person enter the water to rescue another person. Throw a life ring over the side as near as possible to the person in the water.
- Notify the boat operator as quickly as possible and make sure to keep track of the person in the water so they are not lost from sight.
- Direct the boat operator to the direction of the person so that recovery can be made. If the vessel (including barge) is not able to be maneuvered to retrieve the person, the support vessel will be contacted to retrieve the person.

- A portable or fixed ladder will be available on boats that are not readily accessible from the water, to ease re-entry back onto the boat.
- Once the person is retrieved, the person will be brought onto the vessel cabin (or back to the dock and site office if boat does not have a cabin) where they will don dry clothing and blankets and be assessed for potential hypothermia due to cold water immersion.
- Notify the SUXOS, UXOSO, PM, SHM and UXO Safety Manager about the event. The PM will notify the Navy. An incident investigation and report will follow.
- In the event the need arises to abandon ship, the following will occur:
- Follow the direction of the boat operator; who will direct personnel to the appropriate station onboard the vessel.
- Ensure PFD is securely fastened.
- Note the location of and distance to the nearest land and stay with your group until instructed to abandon ship.
- Deploy rescue raft (if equipped) on windward side of the boat and await orders to board.
- Boat operator or designated person will activate the ships emergency communication devices (marine distress call via radio, air horn, etc.) as capable based on the nature of the emergency and will grab survival kit as applicable.
- Enter the water by the safest means. If ladder is present, use ladder to get into the water before jumping overboard.
- If the boat is on fire or there is risk of explosion, stay at least 200 yards from the boat.
- If raft is equipped, stay in raft and try to flag down a rescue boat and paddle toward shore. If the current tries to take you away from shore, try to paddle perpendicular to the current, toward areas where more land is visible or more boaters may be present.
- As a group, or if personnel are separated and in the water, remain calm. To conserve energy and reduce risk of hypothermia, float on your back with your knees bent toward your chest. If together as a group, huddle together until retrieved.
- Notify the SS, SSHO, PM, SHM and Diving Safety Manager about the event. The PM will notify the Navy. An incident investigation and report will follow.

9.2.6 Medical Support

9.2.6.1 First Aid

A minimum of two people have current certifications in CPR, AED, first aid, and bloodborne pathogens. Two UXO technicians, including the SUXOS and UXOSO have current CPR and first aid training. Other than rendering basic CPR and first aid, these employees are not expected to perform emergency medical duties; however, they are authorized to perform emergency rescue or other duties up to the level of their training.

For first aid injuries that are not deemed an emergency situation, appropriate care may include stabilization and transport (e.g., in TtEC site vehicle) to a nearby urgent care: **East Falmouth Walk-In Medical Center, 309 Teaticket Hwy, E. Falmouth, MA**. Subcontractors will be instructed to do the same. WorkCare® will be contacted immediately following appropriate first

responder patient care or when the patient is transferred to emergency responder personnel in order to help assist with patient and case management and recommendations.

9.2.6.2 *Medical Emergency*

In the event of a medical emergency, first aid and CPR assistance will be provided by CPR, first aid, and, if an AED is onsite, AED trained individuals (all UXO technicians are trained). The injured party will be moved as minimally as possible if the scene remains safe for the injured or ill person and first aid responders or responding emergency personnel. If it is safe to move the person without further injury or the location may become compromised, the person will be moved to the nearest location for continued care. No person will enter an unsafe location; however, to rescue an injured worker if the scene poses a hazard that could injure or trap the would-be rescuer.

Medical emergencies, should they occur on the project site, will typically rely on emergency responders (e.g., ambulance service) for patient stabilization and transport to the hospital. In the event of a medical emergency in which actual or suspected serious injury occurs, the following procedures will be implemented:

- Survey the scene and evaluate whether the area is safe for entry.
- Render first aid, CPR, and AED (if available) as necessary.
- Obtain emergency medical services for ambulance transport to a local hospital by calling 911 from a cell phone or landline. This procedure will be followed even if there is no visible injury. Provide the following information to the emergency dispatch personnel:
 - Identify location by address (or nearest cross-street intersection), request medical assistance, and provide a name and telephone number. Stay on the line as requested.
- Other personnel in the work area will be evacuated to a safe distance until the EC determines that it is safe for work to resume. If there is any doubt regarding the condition of the area, work will not commence until the hazard control issues are resolved.
- Notify the PM and SHM and UXO Safety Manager as well as the NTR/FEAD. The PM and/or SHM will notify the RPM and Contracting Officer.

The nearest emergency hospital to Nomans Land Island site is the **Martha's Vineyard Hospital, 1 Hospital Road, Oak Bluffs, Massachusetts 02557.**

The nearest occupational medicine clinic to Nomans Land Island project site is **East Falmouth Walk-In Medical Center, 309 Teaticket Hwy., E. Falmouth, MA.**

The location of and directions to the emergency hospital are included in Figure 9-2 and contact numbers for the hospital and ambulance services and, occupational medical clinic, and WorkCare® are provided in Table 9-2. The UXOSO is instructed to drive by the emergency hospital to ensure that it is accessible and available and that the most efficient routes (primary and alternate) are identified during mobilization.

In the event of a medical emergency involving major trauma, emergency medical services may be obtained by helicopter transport. A landing zone has been established on Nomans Island with Boston Medical Flight ((800)-233-8998) and the injured person will be air lifted directly to a trauma unit in Boston, MA.

9.2.6.3 *Fatal Injury*

If a fatal injury occurs, the following additional steps will be followed:

- Notify the SSHO immediately.
- Notify the SHM, who will initiate contact with OSHA within 8 hours and other appropriate agencies.
- The work activities on the project must be stopped for 24 hours.
- Assist the SHM and OSHA, as directed.

9.2.6.4 *Medical Data Sheet*

Each field team member, including visitors and subcontractors, will be asked to complete and submit a copy of the Medical Data Sheet (see Appendix F). This sheet will be provided to the UXOSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention. Any pertinent information regarding allergies to medications or other special conditions should be documented. This data sheet will be maintained confidential by the UXOSO and information shared only to the extent necessary to support medical care of the individual.

9.2.6.5 *Medical Surveillance*

TtEC requires that site workers involved in specific tasks participate in a medical surveillance program that meets the requirements of 29 CFR, Part 1910.120(f). The medical surveillance program, managed by the TtEC medical consultant, is certified by the American Board of Preventive Medicine-Occupational Medicine, will be instituted for the following employees:

- The employees who are, or who may be, exposed to hazardous substances or health hazards at or above the permissible exposure limits, or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.
- The employees who wear a respirator for 30 days or more a year or as required by 29 CFR, Part 1910.134.
- The employees who are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

A copy of the certification of participation in the medical surveillance program shall be maintained in the project files by the UXOSO. The certification must include the employee's name, date of last examination, expiration of current examination and the name of the examining physician(s).

Employees who are expected to participate in on-site activities where they are potentially exposed to health or safety hazards will be required to complete a baseline physical examination. The workers who must enter an exclusion zone, or who meet the criteria listed above, must provide the UXOSO with a written opinion from a licensed physician attesting to the employee's fitness for duty at a hazardous waste site. A physician's written opinion of the employee's ability to wear a respirator is also required when there is reasonable possibility that a respirator may be required for site work. The physician's written opinion must be dated within the previous 12-month period, or an alternate time period as determined by the physician, for continued work. There are no additional specific medical surveillance requirements for this project.

The UXOSO will maintain a file for each person on site. This file will have a copy of the physician's statement of employee's fitness for duty, the employee's ability to wear a respirator, and work restrictions, if any. The UXOSO will confirm the employee and project supervisors comply with medical work restrictions, if any. The UXOSO will also ask each employee to complete a form to indicate known allergies, prescription medications, and other medical information that will allow the UXOSO to respond to a medical emergency in an appropriate manner. At no time will the UXOSO maintain the copy of any actual medical records. These records are maintained by the TtEC medical consultant, WorkCare®.

9.2.6.6 Decontamination during Medical Emergencies

Based on the nature of the planned activities, the need for specific personal decontamination activities in an emergency medical situation is possible and may include fuel product in the event of a spill. If decontamination becomes necessary, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of the involved personnel. Decontamination will be postponed if the incident warrants immediate evacuation.

As soon as possible and prior to transportation to a medical center:

- The contaminated site worker will be washed and rinsed as necessary.
- Contaminated clothing will be removed and disposed of.
- First aid treatment will be rendered.
- If decontamination is not feasible, as much information as is known will be provided to emergency responders about the potential contaminants.

9.3 Plan for Prevention of Alcohol and Drug Abuse

TtEC has a Drug-Free Workplace Program. All contractors and subcontractors on this project are subject to drug and alcohol testing at any time. Supervisors, managers, and the UXOSO are to determine the fitness of their workers, including assessing whether their workers may be under

the influence of any alcohol or drugs, including over-the-counter and prescription medications. During the initial site orientation and training conducted at the beginning of the project, all workers are reminded of the program and policies. The program and policies are also described in the Work Rules. Workers are encouraged to confidentially list their medications on a medical information form that is provided to them and retained by the UXOSO. If a worker is injured or involved in an accident, the worker(s) involved may be asked to be tested. If a supervisor observes any worker who appears to be under the influence of drugs or alcohol, the supervisor may request testing of the worker.

9.4 Site Sanitation Plan

TtEC will provide portable toilet and hand washing facilities at the project worksite. These facilities will be serviced on and as needed, but not to exceed a weekly basis, maintained in good condition, and located in an accessible location to work activities.

Workers will discard all food debris and other detritus in a designated refuse container onsite. Project wastes generated from the field activities will be packaged and disposed of as specified in the Waste Management Plan following applicable federal, state, and local laws and regulations and Navy instruction after characterization.

Potable water will be provided for washing hands and face and for any drinking water provided to employees. If non-potable water is used on the project (not currently anticipated), there will be no cross-connections and the water source and containers holding the water will be posted “CAUTION – WATER UNSAFE FOR DRINKING, WASHING, OR COOKING.”

9.5 Access and Haul Road Plan

Not applicable.

9.6 Personal Protective Equipment

This section outlines the respiratory protection and PPE to be used on this project as well as reasons for downgrade or upgrade.

Reasons to upgrade level of protection:

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas or vapor emission.
- Change in work task that will increase contact or potential contact with hazardous materials.
- Request of the individual performing the task.

Reasons to downgrade level of protection:

- New information indicating that the situation is less hazardous than was originally thought.

- Change in site condition that decreases the hazard.
- Change in work task that will reduce contact with hazardous materials.

9.7 Respiratory Protection Plan

The presence of poison ivy poses an increased hazard to the equipment operator while performing brush clearing activities. As such, a respirator will be required to be worn by the equipment operator during brush clearing. All other personnel must maintain a safe distance during brush clearing activities to avoid exposure to poison ivy.

Based on the site characterization data, the following groups of chemicals may also pose a potential hazard to personnel conducting investigative activities causing potential disturbance of contaminated soils during the exposure and removal of partially buried munitions: volatile and semi-volatile organic compounds – primarily those related to the presence and use of fuels at the site (diesel and gasoline) and ordnance-related materials – white and red phosphorus, black powder, lead azide and trinitrotoluene (TNT). Material Safety Data Sheets can be found in Appendix G. The level of exposure to the site contaminants is expected to be very low. The original quantities of these materials were not present in large concentrations and are diluted and are not typically encountered in their pure form; Table 9-4 lists the potential site contaminants of concern, their exposure limits, significant physical and chemical data, and potential health effects.

Symptoms of exposure to the potential site contaminants include irritation of skin, mucous membranes and other sensitive tissues such as the eyes, to nausea and vomiting, fatigue, lightheadedness/dizziness and headache. Potential damage of major organ systems (e.g., liver, kidneys, and central nervous system) could result from chronic exposure or acute exposure to high concentrations of the materials. Some of the site contaminants that may potentially be encountered are suspected carcinogens (cancer-causing). Exposure to lead has been associated with CNS depression, kidney effects and reproductive system effects.

The need for respiratory protection for this project is only anticipated to be required during brush clearing activities. Beyond this task, respiratory protection is not anticipated to be required because chemical contamination is not anticipated or known to be present in the soil in the area to be cleared. In addition, potential exposures to other hazardous materials on this project (e.g., diesel fuel, grease, lube oil for heavy equipment, routine maintenance, and gasoline) (see Appendix G) are not anticipated to present exposures to chemicals above the permissible exposure limit (PEL) when used in accordance with manufacturer's application recommendations and when used outdoors.

During all field activities, engineering controls such as effective dust control and good hygiene practices such as hand washing will be implemented and proper PPE will be used as specified in this plan and the AHAs to minimize inhalation of respirable dusts and minimize the potential for contact with potential contaminants in soil and during use of very limited hazardous materials on this project.

Should visible dusts be generated during minimal soil removal to expose partially buried munitions, this situation presents a potential for respirable dust exposure for workers. Dust will be controlled through use of water mist or spray as required during removal tasks. If dust controls are not effective, the UXOSO will notify the SHM because this situation presents a potential exposure issue for workers and the SSHO will have workers who could be exposed to dusts wear full face air purifying respirators with P-100 cartridges. Dust is not anticipated to be generated, as minimal surface clearance is expected.

Should unanticipated chemical contamination be discovered during excavation tasks (odor, stained or discolored soil, discovered buried containers, etc.), work will stop and the PM and SHM as well as the NTR/FEAD and RPM will be notified as this is a changed condition. This plan will be updated to include requirements for monitoring, chemical sampling and any upgrades to PPE and respiratory protection required.

The UXOSO, with input from the SHM, will implement TtECs Corporate Respiratory Protection Procedure, EHS 5-2 and this Respiratory Protection Plan if respiratory protection will be used. This plan will be updated as necessary by the SSHO or SHM. All personnel who wear a respirator will work within the requirements of this Respiratory Protection Plan, under the direct supervision of the SSHO.

All employees who wear a respirator will be trained and be fit tested. This training will occur initially, any time requirements change significantly due to process changes or changes in site-specific operations, and at least annually. Training documentation will be maintained by the SSHO and will be available upon request. Training topics will include the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- Limitations and capabilities of the respirator;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, don, doff, use, and check the seals of the respirator;
- Procedures for maintenance (including cleaning) and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- The general requirements of the OSHA respirator standard at 29 CFR 1910.134.

Employees assigned to use PPE, including respirators, are required to inspect the equipment before and after each use; discard any defective equipment; clean and maintain the equipment according to manufacturers' recommendations; and store their PPE in a clean, secure area on the site each day. Specific PPE inspection, cleaning, and maintenance procedures vary according to the type of equipment being used. Prior to being assigned to their jobs, employees will be informed of these equipment-specific use and maintenance procedures.

A respirator cartridge change-out (if APR is used) schedule will be developed in consultation with the SHM based on duration of exposures, relevant safety factors applied, and manufacturer guidelines. The SSHO will maintain the change-out schedule for workers. Workers will be informed to notify the SSHO should any signs of breakthrough be encountered. However, breakthrough is not used in evaluating the change-out schedule. Cartridges will in almost all cases be required to be changed long before there is breakthrough. Breakthrough prior to a cartridge change out schedule is usually an indication of an improperly fitted respirator.

Employees who wear a respirator will undergo medical evaluation to ensure they are fit to wear the selected respirator. This medical evaluation includes a physical examination supervised by a Board-Certified Occupational Medicine Physician. Copies of current medical evaluation and fitness to wear a respirator will be maintained onsite by the SSHO and made available upon request.

Employees who wear a respirator will be qualitatively fit tested to ensure that the selected respirators achieve a proper face piece seal. Fit testing will be performed prior to initial use of the selected respirator, whenever respirator size, make, or model is changed, and at least annually thereafter. Records of fit testing will be maintained onsite by the SSHO and made available upon request.

9.7.1 Protective Equipment

The SHM has reviewed the applicable work plans and other available information and has evaluated each major work activity to determine the appropriate level of PPE needed for the work. This evaluation included a consideration of potential hazards present; work operations to be performed; potential routes of exposure; concentrations of contaminants present or reasonably expected; characteristics, capabilities, and limitations of PPE; and, any hazards that the PPE may create or exacerbate (e.g., heat stress). Evaluation findings and recommendations are listed in the AHA matrix and include the date the evaluation was conducted, the activity evaluated, PPE recommendations, and the name of the person(s) performing the assessment.

The initial and basic level of PPE selection, as required by 29 CFR 1910.132, on the project site includes a hardhat when overhead hazards are present (including when working around heavy equipment and trossel and during tree felling tasks), safety glasses with side shields, safety boots that comply with ASTM F2412 and ASTM F2413 (steel or composite toe), leather work gloves, work clothes, ear plugs when working around power tools, trossel, chainsaw, and heavy equipment, high visibility vest when working around heavy equipment or vehicle traffic and when felling trees, and weather-appropriate clothing.

One item of particular note with regard to PPE is for poison ivy at this site. For tasks that involve the possibility of coming into contact with poisonous plants, lightweight disposable coveralls will be worn. During brush clearing activities, the equipment operator will be required to wear a respirator.

Ticks are reportedly prevalent at this site. It is very important to stress to workers the need to tuck in pant legs to socks and tuck in shirts and wear long sleeve shirts as well as using DEET on clothing and skin.

UXO technicians who physically handle and inspect items for identification will wear leather work gloves. If an item is broken open and contains exposed filler material, the technicians will wear Nitrile gloves under or over the leather work gloves as appropriate.

Additional tasks not included in the AHA matrix will be reviewed by the SSHO and SHM. Any additional PPE requirements will be incorporated into the APP and/or AHAs by completing a field change request (FCR) form. The FCR forms and PPE selection will require approval by the SHM.

9.8 Health Hazard Control Program

The primary physical health hazards associated with this project are associated with MEC/MPPEH operations, including the potential for unanticipated fires or explosions to occur; heavy equipment operations, including use of a backhoe; use of a skidsteer with mower attachment for vegetation removal; and use of a fork lift for handling of materials. The physical hazards, if not properly controlled or if safe work practices are not followed, can lead to strains, sprains or breaks; punctures, lacerations, cuts, bruises or contusions; struck-by or caught-in injuries; and/or ergonomic strains from repetition or improper task positioning.

Chemical hazards at the present time include hazards related to use of fuel, oil, and lubricants for the operation and routine maintenance of heavy equipment use. The MSDS/SDS and inventory (See Appendix G) will be onsite and workers will be trained to the Hazard Communication Standard (see Section 9.8 of this APP). The known chemical contaminants in the soil on Nomans Island are presented in Table 9-4. Due to the limited amount of disturbance required for surface clearance, exposure to these chemicals is not anticipated during site activities. As stated in Section 9.6.1 above, should unanticipated chemical contamination be discovered during excavation tasks (odor, stained or discolored soil, discovered buried containers, etc.), work will stop and the PM and SHM as well as the NTR/FEAD and RPM will be notified as this is a changed condition. This plan will be updated to include requirements for monitoring, chemical sampling and any upgrades to PPE and respiratory protection required.

Biological hazards may be present onsite as well and include bloodborne pathogens (e.g., if first aid or CPR are required) and the potential for contact with poisonous plants and snakes and bites or stings by insects, namely ticks – which are prevalent at this location.

TtEC will create systems and procedures to prevent and control physical, chemical, biological, and environmental hazards identified through the risk analysis. The hierarchy of controls is engineering, administrative, work practice, and PPE. Whenever feasible, engineering, administrative, or work practice controls will be instituted even if they do not eliminate the hazard or reduce exposure. Use of such controls in conjunction with PPE will help reduce the

hazard or exposure to the lowest practical level. The basic formula for controlling workplace hazards, in order of preference, includes:

- Eliminating the hazard from the method, material, or the facility.
- Abating the hazard by limiting exposure or controlling it at its source.
- Training personnel to be aware of the hazard and to follow safe work procedures to avoid it.
- Prescribing PPE for protecting employees against the hazard and ensuring they not only use it, but they know how to use it correctly.

9.8.1 Site Control Measures

This section outlines the means by which TtEC will delineate work zones and use these work zones in conjunction with basic decontamination procedures (Section 9.7.2) to prevent the off-tracking of soil into other areas of the site.

It is anticipated that for the planned work activities, a two-zone approach will be used during work at this site as there is currently no anticipated potential for coming into contact with site contaminants. The two-zone approach will include an Exclusion Zone (EZ) as defined in the ESS and Work Plan and an Support Zone (SZ) where the EZ is the controlled work zone around the active MEC/MPPEH work areas in which special precautions are required to protect from MEC-related hazards and the SZ is for staging of safety equipment (e.g., fire extinguisher, first aid kit, etc.). Even with a two-zone approach without chemical contamination, equipment and materials leaving a work area must still be inspected and any adhering soil and materials in tracks or on equipment buckets must be removed prior to their release from the work area.

When there is a potential for coming into contact with or spreading of site contaminants (currently not anticipated), a three-zone approach will be used. The three-zone approach will be comprised of an exclusion zone (EZ), a contamination reduction zone (CRZ), and a support zone (SZ). The degree of control and the requirements for establishment and management of these zones will be at direction of the UXOSO based on site conditions, the potential for spreading of or contact with contaminants, and activities being performed.

Site control requires the establishment of a regulated area and designated site work zones appropriate to the work task.

To minimize the transfer of potentially hazardous substances from the site (in areas where this is a concern, if such areas are identified) and to control access into potentially hazardous areas where work is being performed (the EZ), project personnel will:

- Schedule operations that use minimum numbers of personnel.
- Establish site work zones around each worksite location as appropriate and post signage.
- Implement appropriate decontamination procedures.
- Keep the client and other affected contractors informed of changing work zones.

9.8.1.1 *Exclusion Zone*

EZs will be formed where active work areas and tasks are being performed where entry by unauthorized or uninformed persons could be hazardous or require additional controls. Barricades or cones, along with caution tape, will delineate the EZ. The EZ for MEC-related operations is addressed in more detail in the Work Plan and ESS.

For EZs that are set up to control chemical exposures or contamination (if the need arises), workers will place contaminated tools and equipment on plastic sheeting (when required) in the EZ to prevent contamination of the surrounding area as required until the tools are appropriately decontaminated and removed from use.

9.8.1.2 *Contamination Reduction Zone*

Adjacent to the EZ, the CRZ will serve as a buffer zone to prevent the spread of contamination beyond the work area. Workers will either wrap contaminated tools and equipment with plastic, or workers will decontaminate the equipment and themselves in this area before moving to the next work area. The appropriate level of decontamination will depend upon the work task and whether the tools and/or personnel were in contact with the contaminated soil and whether any soil adheres to the worker's PPE or tools. The UXOSO will assist in recommending the proper levels of decontamination for work tasks.

9.8.1.3 *Support Zone*

The SZ will be arranged considering accessibility, utility availability, wind direction, and line-of-sight to work. Typically, the SZ is located in an upwind direction from the work areas. This is where equipment such as a fire extinguisher, first aid kit, spill kit, hand washing facility and any other appropriate support is located.

9.8.2 Personal Hygiene and Decontamination

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

9.8.2.1 *Responsibilities*

The SUXOS is responsible for establishing and maintaining appropriate equipment and personnel decontamination areas and ensuring that subcontractors follow this plan. The UXOSO will assist the SUXOS to ensure that adequate decontamination procedures are identified for tasks and followed to prevent contamination of individuals or the environment beyond the EZ.

9.8.2.2 *Contamination Avoidance*

Avoiding contamination is the first and best method for preventing the transfer of contamination, including adhering soil and mud to personnel or to non-contaminated or clean areas. Each person

involved in site operations must regularly practice the methods, listed below, for contamination reduction.

- Know the limitations of the protective equipment being used.
- Do not sit or lean against anything in a contaminated area and try to limit the need for excessive contact with contaminated media.
- Use the proper tools to safely conduct the job.
- Inspect tools and equipment for gross contamination with soil and/or mud before tracking out of work area or onto paved roads.

9.8.2.3 *Decontamination*

Decontamination for this project involves physically removing contaminants from equipment and/or PPE. Decontamination, proper PPE-donning and doffing procedures, and management of work zones minimize the chance of cross-contamination from protective clothing to wearer, equipment to personnel, and one area to another.

In general, decontamination will consist of:

- Removing residual materials regardless of their source before taking breaks or engaging in hand-to-mouth activities.
- Employing soap and water wash and rinse for hands. Hygiene wipes may also be used but is not a substitute to hand washing with soap and water.
- Keeping break areas clean. No potentially contaminated PPE or equipment will be permitted in these locations or offices.
- Proper doffing of used and contaminated PPE and proper storage of reusable PPE after decontamination and between uses.

9.8.2.4 *Personnel Decontamination Guidance*

It is anticipated that in most instances with this project, PPE will not be contaminated and can be doffed and stowed for further use (other than disposable Nitrile gloves, which will be removed and disposed of in a designated waste receptacle). However there may be a need to use a boot wash or other minor wet decontamination if workers walk in areas of soils or sediments and have mud adhering to PPE or boots (no soap solution required).

If a respirator is worn solely for dusts, procedures will be identical to that performed above except that air purifying respirators will be removed at the very end of the decontamination sequence. Respirators, once removed, will be placed into plastic bags and taken to a separate respirator wash station where they will be cleaned according to manufacturer's recommendations, dried, inspected, repaired if necessary, sealed in plastic bags, and stored in a clean, dry location. Cartridges will be replaced as required by a cartridge change-out schedule developed by the SHM (currently a minimum of once per day, end of shift). The SHM will perform calculations based on the contaminants and the levels present and the type and manufacturer of the respirator cartridges if alternate change-out schedule is required.

A hand washing station will be available for workers to wash their hands and face (if required) before leaving the work area or taking breaks. Workers will be instructed to wash hands before going on breaks.

Decontamination levels may require amendment should chemical contamination be discovered in the work area.

9.8.2.5 *Equipment Decontamination Guidance*

It is anticipated that heavy equipment, such as excavator buckets and portable hand tools such as shovels will be cleaned of adhering soil or mud (if present) along with any loose debris prior to being moved out of the work area using brooms or wipes. Heavy equipment tires, tracks and buckets are not anticipated to come into contact with contaminated soil and wet decontamination methods are not anticipated to be required for equipment at this time. Tracked vehicles will not be operated onto roadways.

The SUXOS will be responsible for evaluating equipment both arriving on site and leaving the site. The Equipment Inspection Checklist included in Appendix D will be used to document these inspections. Equipment will only be authorized access or exit with this authorization. Evaluation will consist of a visual inspection to ensure that visible contamination has been effectively removed.

9.8.3 Biological Hazards

Biological hazards may be encountered on site in the form of biting or stinging insects, venomous snakes, potential wild animals that could bite, contact with poisonous plants, and bloodborne pathogens in the event that first aid/CPR is performed. Workers should anticipate the likelihood of encountering insect, snake, and wild animals, especially in undeveloped outdoor areas. Insect bites and insect stings can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. In sensitized individuals, however, effects can be more serious such as anaphylactic shock, which can lead to severe reactions in the circulatory, respiratory, and central nervous system and, in some cases, even death. The SSHO will identify personnel with a known reaction to bites and stings at the pre-job safety orientation meeting.

Personnel will not attempt to capture or feed any wild or semi-wild animals such as cats, rats, or ground squirrels due to the possibility of a bite or parasitic infestation. Additionally:

- Animal and bird droppings often contain mold, fungus, or bacteria that represent a significant respiratory hazard, including lung diseases and allergies. Personnel will not touch such droppings.

9.8.3.1 *Insects*

Insects, including bees, wasps, hornets, spiders, and especially ticks, may be present at this site making the chance of a bite or sting possible. Some individuals may have a severe allergic

reaction to an insect bite or sting that can result in a life threatening condition; any individuals who have been bitten or stung by an insect will notify the UXOSO. Field personnel who may have insect allergies will provide this information to the UXOSO prior to commencing work, and are instructed to have allergy medication (that prescribed to them by their physician) on-site. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and as often as needed throughout the work shift. Apply DEET (vapor-active repellent) to any exposed skin surface (except eyes and lips), and apply the permethrin repellent spray to field clothing. Note: Allow the permethrin to dry before using the treated clothing.
- Wear proper protective clothing (work boots, socks and pants).
- Tuck pant legs into socks and wear long-sleeved shirts (see more information in tick section below).
- When walking in vegetated areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Avoid placing bare hands under rocks or loose debris.

Mild insect stings or bites should be treated by applying a baking soda paste or ice wrapped in a wet cloth. Bee stingers should be gently scraped off the skin, working from the side of the stinger. The suction device in commercially available snake bite kits can also be used to remove the stinger. If insect bites become red or inflamed or symptoms such as nausea, dizziness, shortness of breath, etc., appear, medical care will be sought immediately. Immediate medical care is essential for persons who are allergic to insect bites/stings. If an allergic person receives a spider bite or insect bite/sting, seek immediate medical attention, keep the victim calm, and check vital signs frequently. Rescue breathing should be given, if necessary, to supply oxygen to the victim. Various spiders may be encountered at the site and many spiders have the potential to bite and cause localized itching or discomfort; however, there is a very limited potential for dangerous spiders of particular concern (Northern Black Widow, Sac spiders) in the area. Report any suspected spider bites to the UXOSO and observe for any signs that the bite may be more serious (very itchy, painful, red, ulcerating, body temperature or blood pressure increasing, excessive sweating, nausea, vomiting). Seek medical attention if an allergic reaction or venomous bite is suspected.

9.8.3.2 *West Nile Virus*

West Nile virus (WNV) encephalitis is a mosquito-borne viral disease that can cause an inflammation of the brain. WNV is transmitted to people by the bite of a mosquito that has become infectious after feeding on a bird infected with the virus. Birds serve as the reservoir hosts of WNV, and the principal vector in the transmission from one bird to another is the mosquito. Humans and horses are known as dead end hosts, because once a human or horse is infected, the virus is no longer transmitted.

Most infections produce no symptoms in people, or symptoms are mild or moderate. Approximately 80 percent of those infected with WNV will show no symptoms. About 20 percent of cases produce mild symptoms including: fever, headache, and body aches, often with

skin rash and swollen lymph glands. Less than 1 percent of cases show more severe infections marked by headache, high fever, neck stiffness, muscle weakness, stupor, disorientation, convulsions, paralysis, coma, and, rarely, death. Persons age 50 years or older and immune-compromised individuals are at a higher risk of developing a more severe infection. Symptoms of WNV will generally last a few days, although even some healthy people report having the illness last for several weeks. The symptoms of severe disease (encephalitis or meningitis) may last several weeks, although neurological effects may be permanent.

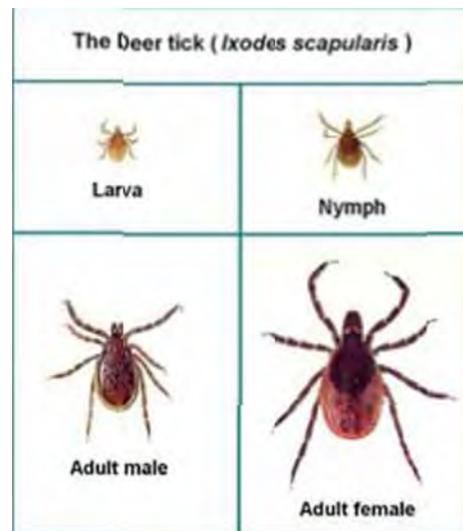
Control measures to prevent contacting WNV include:

- Mosquitoes are most active at dawn and dusk. Limit outdoor activities at those times, when possible.
- Wear long-sleeved shirts and long pants.
- Spray DEET on your skin and permethrin on clothing and work boots.

9.8.3.3 *Lyme Disease*

Lyme disease is caused by an infection from the bite of a deer tick, which is about the size of the head of a pin. During the painless tick bite and following the blood meal, a microorganism (spirochete) may be transmitted into the bloodstream that may lead to Lyme disease. A 24- to 48-hour period is necessary for the tick to feed and become engorged. During this time period, it is unlikely that the tick has regurgitated its stomach contents into the host and therefore, infection is unlikely.

Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibiotics has been successful in preventing more serious symptoms from developing. 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. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis.



Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October, when ticks are most active. A large expanding skin rash usually develops around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and a tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one third of those with Lyme disease never get the rash. Joint or muscle pain may be an early sign of Lyme

disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis. Lyme disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

Control measures to prevent contracting Lyme disease include:

- 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 neck, hairline, groin, and body after working in areas that may contain deer ticks. Shower immediately after returning home from the job site.

If a tick is found biting an individual, the UXOSO will be contacted immediately. The tick can be removed by grasping the tick with tweezers as close to the skin as possible, and pulling gently or using a tick removal system (e.g., Pro-Tick, www.scs-mall.com/store/). The affected area should then be disinfected with alcohol or similar antiseptic. If personnel feel sick or have signs similar to those above, they will notify the UXOSO immediately. Additionally, employees finding engorged ticks on their body will be given a medical examination. The removed tick should be saved in small bottle and labeled with the date and location of origin. The tick can then be tested for Lyme pathogens.

9.8.3.4 *Poisonous Plants*

Poison ivy or poison sumac may present in Massachusetts and may be encountered in vegetated areas of the site if such plants have become established in these areas. The potential for contact with poisonous plants exists when performing fieldwork in undeveloped and vegetated areas. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison ivy has white berries and red or yellow foliage in the fall of the year. Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety "down." Poison sumac has white, hairy berry clusters.

Contact with poison ivy may lead to a skin rash in susceptible individuals. A rash results from a toxin found in the sap; it is extruded from the leaves and contained in the stems and roots. The

rash is characterized by reddened, itchy, blistering skin requiring first aid treatment. In the event of contact with one of these plants, immediately wash skin thoroughly with Dawn soap and cool water, Technu or Zanafel, taking care not to touch face or other body parts.

Avoidance of plant/sap contact is the only effective means of preventing the poisoning. A person experiencing symptoms of poisoning should remove contaminated clothing; wash the exposed areas thoroughly with Dawn soap and cool water, taking care not to touch face or other body parts. Apply Technu or Zanafel to wash the affected area, use calamine or other poison ivy lotion if the rash is mild. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity. Employees will be trained in the identification of these species and will be advised to wear protective clothing such as gloves and long-sleeved shirts when working conditions permit. Employees should also consider applying barrier lotions (e.g. Ivy Block) to skin that has the potential to contact these species. Alcohol wipes, Dawn liquid soap and Technu can be used to decontaminate skin and reusable clothing to prevent exposure to poison ivy. Gloves should be worn when removing and decontaminating clothing potentially exposed to poison ivy.

Additional guidance on the prevention of contact with poison ivy is provided in Attachment 1.

9.8.3.5 *Snakes*

There are only two species of snakes indigenous to the state of Massachusetts known to be venomous. These snakes include the copperhead, and the timber rattlesnake. Numerous harmless snakes also may be present, and though not venomous, could also bite if cornered. If a snake is encountered, slowly and quietly back away from the snake and let it retreat. Avoid placing hands in dark spaces, including burrows, crevices, and under materials or debris. Do not attempt to move or kill a snake, as certain snakes are protected under state and federal laws. In the event of snakebite, wipe off the skin and notify the UXOSO immediately. If the snake is suspected of being one of the venomous varieties or if you do not know whether it is or is not:

- Seek immediate medical attention and safely try to document as much information about the snake as possible (color, markings, size, etc.) and record the time the bite occurred.
- Keep the affected area below heart level to reduce the flow of venom.
- Remove rings or constricting items as the bite area can swell.
- Give the person first aid and treat for possible shock.
- Apply a bandage, wrapped two to four inches above the bite to help slow the venom but not tight enough to cut off the flow of blood.

Do NOT – apply cold compresses, apply a tourniquet, cut into the bite, attempt to suck out the venom, give the person any medications or anything by mouth but water, or raise the site of the bite above the level of the person’s heart. Await or transport the person to emergency medical care.

If the snake is determined not to be venomous, apply first aid to avoid infections and contact WorkCare® for medical follow up and recommendation to prevent infection.

9.8.3.6 *Bloodborne Pathogens*

Bloodborne pathogens enter the human body and blood circulation system through punctures, cuts, or abrasions of the skin or mucous membranes. They are not transmitted through ingestion (swallowing), through the lungs (breathing), or by contact with whole, healthy skin. However, under the principle of universal precautions, all blood should be considered infectious, and all skin and mucous membranes should be considered to have possible points of entry for pathogens. Two primary bloodborne pathogens include Hepatitis B and human immunodeficiency virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS).

Potential bloodborne pathogen exposures include:

- Contact with contaminated medical equipment or medical waste or sharps
- Medical emergency response operations such as administering first aid or cardiopulmonary resuscitation (CPR)

To reduce the risk of contracting a bloodborne pathogen, take the following precautions:

- Avoid contact with blood and other bodily fluids.
- Use protective equipment when giving first aid/CPR, such as disposable gloves and breathing barriers.
- Thoroughly wash your hands with soap and water immediately after giving care.

When cleaning up blood or other bodily fluids:

- Clean up the spill immediately or soon as possible after the spill occurs.
- Use disposable gloves and other PPE when cleaning spills.
- Wipe up the spill with paper towels or other absorbent materials.
- After the area has been wiped up, flood the area with a solution of one quarter cup of liquid chlorine bleach to 1 gallon of fresh water and allow it to stand for at least 20 minutes.
- Dispose of the contaminated material used to clean up the spill in a labeled biohazard container.

The UXOSO should be notified of any potential contact with blood or bodily fluids resulting from first aid or CPR administered on the job. Site personnel will be given bloodborne pathogens training.

9.9 **Hazard Communication Program**

Specific hazardous materials or chemicals that will be brought onto the project site are anticipated to be minimal (e.g., fuel, oil, lubricants necessary to perform routine maintenance of or operation of equipment). However, larger quantities of asphalt sealant will be on-hand for sealing of the asphalt cap. This material may also present some hazard to workers handling it and the MSDS or SDS will be reviewed with all affected personnel. When any material or

chemical is brought onto the site, a MSDS or SDS must be provided to the UXOSO. This includes all hazardous materials brought onsite by the subcontractors for their operations.

A Hazardous Materials Inventory is included in Appendix G along with associated MSDS or SDS as appropriate (as can be identified presently). This inventory, and associated MSDS or SDS will be updated whenever additional hazardous materials to be used onsite become known.

The SSHO will file the MSDSs and SDSs in a notebook that will be available in the field office. The SSHO will review the MSDSs and SDSs with the workers, and this training will be documented on the daily safety meeting form. All workers will have general HAZCOM training (See Section 6) that explains how the program is managed at the site and that specifically requires them to notify the SSHO when any new material is brought onto the site.

All containers will be labeled specifying the content and hazards of the material in the container.

9.10 Process Safety Management Plan

Not applicable.

9.11 Lead Abatement Plan

Not applicable.

9.12 Asbestos Abatement Plan

Not applicable.

9.13 Radiation Safety Program

Not applicable.

9.14 Abrasive Blasting

Not applicable.

9.15 Heat/Cold Stress Monitoring Plan

There is a potential for heat stress and cold stress or related injuries during the performance of the planned activities at the Nomans Land Island site from exposure to ambient temperatures and season in which the work is conducted, effects of wind chill, effects of radiant loading, level of work activity, and level of PPE worn during work tasks and other factors, which can add significant heat stress to otherwise routine tasks. TtEC Procedure EHS 4-6 – Temperature Extremes will be followed during work activities.

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 is characterized by dry skin due to lack of sweating, dry mouth, mental confusion and convulsions.

A person exhibiting signs of heat stress should be removed from the work area and moved to a shaded/cool area immediately. The injured person should be soaked with water and fanned to promote evaporation. Medical attention must be obtained immediately. **EARLY RECOGNITION AND PROMPT TREATMENT OF HEAT STRESS SYMPTOMS, INCLUDING HEAT STROKE, ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.** 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:

- Adjust work schedules.
- Monitor temperature with a wet bulb globe thermometer (WBGT).
- 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. 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.

The following strategies may be useful:

- Maintain water temperature at 50° to 60 degrees Fahrenheit (°F) (10°-16.6 degrees Celsius [°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 a cup or two 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.
- Cooling vests when impermeable clothing is worn.

Early symptoms of heat stress related problems may include:

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

In summary, proper training and preventive measures will aid in averting loss of worker productivity and serious illness from heat stress. 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, maintain worker's body fluids and electrolytes at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluids 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) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.

Cold weather in Massachusetts could present the potential for cold stress during spring, fall, and especially winter months and temperatures may drop below freezing. As a result of the potential for freezing rain, snow, sleet and wet weather, with the added potential for wind chill, cold stress will be discussed as follows:

- Exposure to low temperatures presents a risk to employee safety and health through the direct effect of the low temperature on the body and collateral effects such as slipping on ice, decreased dexterity, and reduced dependability of equipment.
- Work conducted in the winter months can become a hazard for field personnel due to cold exposure. The personnel must exercise increased care when working in cold

environments to prevent accidents that may result from the cold. The effects of cold exposure include frostbite and hypothermia. Wind increases the impact of cold on a person's body. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite. Recognition of the symptoms of cold-related illnesses will be discussed during the health and safety briefing conducted prior to the onset of site activities.

- Hypothermia is a life-threatening condition in which the core body temperature falls below 95°F. Hypothermia can occur at temperatures above freezing particularly when the skin or clothing becomes wet. During exposure to cold, maximum shivering occurs when the core temperature falls to 95°F. As hypothermia progresses, depression of the central nervous system becomes increasingly more severe (Table 9-5). This accounts for the progressive signs and symptoms ranging from sluggishness and slurred speech to disorientation and eventually unconsciousness.

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 could be a concern in Massachusetts during this field effort if the fieldwork is conducted in the winter months. 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:

- Frostnip – 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.

In preventing cold stress, the UXOSO must consider factors relating both to the worker and the environment. Training, medical screening, establishment of administrative controls, selecting proper work clothing, and wind-chill monitoring contribute to the prevention of hypothermia and frostbite. Recognizing the early signs and symptoms of cold stress can help prevent serious injury. Thus, workers will be trained to recognize the symptoms of hypothermia and frostbite and have appropriate first aid instruction. When the air temperature is below 50°F, the UXOSO will inform workers of the proper clothing requirements and any work practices that are in effect to reduce cold exposure.

- Cold injuries and illnesses recognition and prevention measures will be emphasized during daily safety briefings when the potential for cold injuries and illnesses exists.
- Work will cease under unusually hazardous conditions.
- Phenothiazine (a sedative) and beta blocker drug use will be prohibited.
- A heated area will be available on site.
- Temperature will be recorded daily on site.
- Warm beverages will be available on site.

The UXOSO will establish a work/rest schedule based upon worker monitoring. At the first sign of uncontrollable shivering, the worker will be rested in a heated shelter. Work will be stopped when the air temperature reaches 0°F.

Workers will be encouraged to layer clothing when air temperature is below 50°F. Clothing that has a high insulation value will be worn under protective garments. Insulated gloves will be worn when the wind chill index is below 32°F (i.e., air temp 50°F and wind speed > 20 miles per hour [mph] or air temp 40°F and wind speed > 5 mph). Insulating dry clothes will be available.

9.16 Crystalline Silica Monitoring Plan (Assessment)

Not applicable.

9.17 Night Operations Lighting Plan

Night operations are not anticipated to be required during the fieldwork. All work will be performed during daylight hours.

9.18 Fire Prevention Plan

Fire prevention and protection measures require preplanning. Fire extinguishers will be located at each work area, refueling areas, and within each site vehicle and each piece of heavy equipment as specified in Table 9-1. Use of heavy equipment, including refueling of the equipment must be done using extreme caution. Do not refuel equipment in vegetated areas in the event of a spill and do not refuel equipment while it is running or until the equipment has cooled down. In addition, there will be no smoking except in specifically designated smoking areas and never in dry grassy or vegetated areas.

Employees will follow safe work practices, including proper storage of flammable and combustible liquids, and the following rules:

- Smoking is permitted only in those areas designated specifically by the PM, SUXOS, or UXOSO.
- The ESS and Work Plan include procedures related to MEC/MPPEH operations, including proper use of donor explosives. Explosive detonation will only be performed in an area that does not have dry surface vegetation to minimize the chance of a wildland fire.
- Refueling will be performed only in a designated area that is free of dry surface vegetation to minimize the chance of a wildland fire.
- Equipment must be refueled with the equipment turned off.
- No refueling will be performed unattended.
- Latching on fueling hoses is prohibited. Smoking is prohibited in any area where refueling is performed or in any areas of dry surface vegetation.

- Compressed gases, if present onsite, will be secured only in an upright position. Flammable gases will be stored separately from oxygen gas cylinders. Any flammable cylinder storage areas (if any) will be posted as “FLAMMABLE, NO SMOKING.”
- Flammable liquids will be stored in an approved storage cabinet in UL-approved metal containers or National Fire Protection Association-rated fuel tank, hoses, and nozzles.
- Fuel tanks will have a means of preventing overfilling (visual or other indicator of fuel level).
- Non-sparking and explosion-proof equipment and tools will be used whenever the potential for ignition of flammable or explosive gases, vapors, or liquids exists.
- No hot work will be performed unless TtEC hot work procedures are followed and applicable conditions are met and a hot work permit is issued by the UXOSO.

Hot work is not planned, but, if required (for instance if grinding or cutting will create sparks), no hot work is permitted until it is determined that the area is gas-free and that there are no flammable or combustible materials stored within 50 feet of the work area. The TtEC Hot Work Procedure, EHS 6-5 and its’ permit system will be implemented if any work is considered to be hot work, including fire watch.

9.19 Wild Land Fire Management Plan

Not applicable. In the event of a wildland fire, the situation constitutes an emergency and an evacuation will commence.

9.20 Hazardous Energy Control Plan

TtEC Procedure EHS 6-4, Lockout/Tagout, establishes the Control of Hazardous Energy Program. This program applies to all TtEC 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)

Details on the methods used to control hazardous energy for a defined task must be documented in the AHA for that task. The UXOSO will ensure appropriate Lockout/Tagout procedures are evaluated and implemented, as necessary. The specific control of hazardous energy procedures required will be based on the manufacturer’s instructions of equipment. A copy of the equipment user’s manual will be available onsite and referenced. The AHA will be reviewed and approved by the SHM and Contracting Officer, then the approved AHA will be reviewed with workers prior to performing the task so that workers understand the need for Lockout/Tagout as it relates to use of this equipment and how it is to be implemented. Energy may be present in the form of electrical, pneumatic, hydraulic, and kinetic forms and the specific Lockout/Tagout means and methods must be suitable to the hazard presented by the equipment and the activities that will be performed.

9.21 Critical Lift Plan

The lifts for this task are not anticipated to be critical lifts. A barge with a crane will be brought in to place the temporary floating pier structure in an area that is accessible to barge and crane. In addition to crane use for this specific task, hoisting operations (lifting of equipment [not personnel]) by means of mechanical equipment such as an excavator/backhoe) may occasionally be required for loading and unloading of equipment and materials. Hoisting and rigging by mechanical means is not a critical lift activity as critical lifts only apply to lifting by crane. This section addresses hoisting and rigging performed by the crane subcontractor as well as hoisting and rigging activities by construction equipment that may be performed on this project.

The concrete-filled Mk 82 (500 lb) bombs planned for removal will require lifting by mechanical means. If the munitions along the shore line are accessible by heavy equipment, they will be removed using mechanical equipment (excavator/skidsteer/backhoe), or similar. In the event that these munitions are not accessible from the shoreline, the munitions will be removed using ordnance handling equipment (OHE) in the form of non-metallic slings, shackles and tag lines. The major concern of the OHE used in this project is that the safe working load of the slings used is sufficient to safely lift the primary MGF D Mk 83 bomb, which weighs 1,000 pounds or the contingency Mk 84 bomb, which weighs 2000 pounds. To ensure the OHE is capable of lifting this weight, at least 2-inch nylon slings (18,000 pound breaking strength) or 3/8-inch wire rope (12,200 pound breaking strength) tag lines will be used to stop the sway of items being lifted.

OHE will be verified by the manufacturer to have been load tested. When the project is completed, use of the OHE will be discontinued; therefore, the 4-year inspection requirement required by OP 5, Chapter 10, will not be necessary.

9.21.1 General Requirements

Hoisting and crane operations will be suspended during excessive inclement weather at the discretion of the Competent Person (SUXOS is Competent Person for TtEC, subcontractor to provide and designate a Competent Person). Equipment manufacturer's recommendations will be followed to determine ability to perform safe hoisting operations based on wind calculations. All rigging used in hoisting operations will be inspected by the competent person each day before use. Defective equipment or equipment showing excessive wear will be taken out of service. Rigging equipment will be used in accordance with the equipment manufacturer's instructions and will not be used for loads in excess of rated capacity. Rigging will be properly stored and maintained when not in use. Only positive latching devices will be used to secure the load and rigging. Design, testing, and capacities of fabricated lifting devices will be maintained on site.

All hoisting equipment documentation, including inspection, training, certification records, and load data will be maintained on site. If any unsafe conditions or faulty equipment are detected, the equipment will not be used until the problem is resolved and satisfactory inspections have been completed. Daily pre-use inspections will be performed each day hoisting operations are to

be performed. Inspections will include all functioning parts and systems, mechanical structures, and site conditions associated with hoisting operations.

Hazards during hoisting operations include being struck by loads during movement, being crushed underneath loads during placement, and being cut or pinched while handling loads or its rigging. Other hazards could include equipment rollover or boom collapse due to side loading of the boom. Controls that will be used to mitigate hazards will include the following:

- Implementation of the above requirements for equipment and personnel performing hoisting operations.
- Crane load charts will be used to plan picks based on crane and boom configuration.
- Only authorized and qualified persons will be involved in hoisting and rigging operations. Personnel involved in hoisting will use standard signal systems for communication during operations. The crane or equipment operator and rigger will have the authority to stop or suspend work if there is a safety concern related to the hoisting operation. A signal person will be used during all hoisting operations and is the only person directly communicating with the crane or equipment operator.
- Personnel will not be allowed to enter the swing radius of the crane or heavy equipment while equipment is in motion. When rigging and unrigging a load, whenever possible, all heavy equipment and rigging devices will be grounded. If grounding is not possible, all loads including the rigging devices will be lowered to the extent possible, all motion will be stopped, and eye contact will be made between the rigger and operator before attempting to unsecure the rigging.
- A guide rope will be attached to the load to allow positioning without requiring personnel in the vicinity of the placement location.
- Leather work gloves will be worn while handling the load, the guide rope, and the rigging, to protect against rope burns, cuts, scrapes, and pinch points.
- Prior to performing hoisting operations, the work area will be inspected and evaluated for hazards and unstable surface conditions. Hoisting operations will only be performed if adequate space is available for maneuvering and on stable ground surfaces.

9.21.2 Crane Activities

A subcontractor will be used to perform the lift, placement, and removal of the floating pier structure components, as well as the lifting of the 500 lb munitions, if necessary. Each crane operation will require development of a Lift Plan, which will be developed by the subcontractor specifically for this task as a separate deliverable. If the lift is a critical lift, the plan will be developed in accordance with TtEC Corporate Procedure CP-13 – Critical Lifts and will be a Critical Lift Plan.

This Lift Plan will meet include all the required elements and provide details on the specific crane configuration and capacity as well as hoisting and rigging and personnel who will be used to accomplish the task. The lift plan(s) will be submitted through the NTR to the Navy's Crane Safety Department as part of a Crane Package. Names of the competent persons (crane operator, rigger[s]), certifications and inspection packages for the crane and rigging/hoisting equipment,

and other required information will be included in the package. Crane and hoisting operations and equipment, operators and rigging specialists, and inspections and certifications will meet the requirements in Section 16 of EM 385-1-1 as well as any OSHA and any Massachusetts Department of Labor requirements, whichever are more stringent. EM 385-1-1, Section 16L has specific requirements for cranes mounted on barges and other naval craft such as floating platforms. The selected subcontractor will review this section of the manual and will document that they and their equipment comply with requirements. Equipment specifications and procedures will be reviewed by a TtEC Competent Person.

Operational testing will be performed on the crane used for hoisting operations prior to initial use and after servicing major equipment components. An operational test will be performed to demonstrate that the test load and rigging can be safely lifted, maneuvered, controlled, stopped, and landed. The operational test will be performed in a manner that represents all the aspects of the operation including rigging equipment, configuration, positioning, and all necessary ranges of motion and travel. Operational testing will be performed using a load that is equivalent to the maximum anticipated load to be lifted by each piece of equipment during the course of the project. Details of the testing and results will be documented. An AHA has been included for the Hoisting/Lifting and Rigging, which includes crane rigging and lifting hazards.

9.21.3 Hoisting and Rigging by Mechanical Equipment

Hoisting operations performed using on-site hydraulic excavators or loaders will only be by equipment and operators meeting the requirements of this section will be used for hoisting operations. If manufacturer procedures for lifting and transport of hoisted loads are unavailable, the equipment will not be used for hoisting. Because hoisting and rigging using mechanical equipment is may be performed on this project, an AHA has been prepared and will be followed when hoisting and rigging is used. The requirements of EM 385 1-1 (USACE 2011), Section 16.S –Hydraulic Excavators, Wheel/Track/Backhoe Loaders Used to Transport or Hoist Loads with Rigging, have been incorporated into the AHA in accordance with Section 16.S.03.a. The AHA includes the following:

- Written proof of qualifications of equipment operators, riggers, and others involved in the operations.
- Operational testing performed as per EM 385 1-1 Section 16.S.03.b.
- Proper operating procedures in accordance with the equipment manufacturer’s operating manual.
- Proper use and on-site availability of manufacturer’s load rating capacities or charts.
- Proper use of rigging, including positive latching devices to secure the load and rigging.
- Inspection of rigging.
- Use of tag lines to control the load.
- Adequate communications.
- Establishment of a sufficient swing radius (equipment, rigging, and load).
- Stability of surfaces beneath the hydraulic excavating equipment.

Heavy equipment used for hoisting will be certified for the application by the equipment manufacturer and will be selected based on capacity to meet the load requirements of the project.

Before heavy equipment intended to be used for hoisting operations is used, it will be inspected, tested, and certified by a competent person (in this case, the SUXOS) to be in accordance with the manufacturer's recommendations for use. An operational test with the selected hydraulic excavating equipment will be performed in the presence of the government-designated authority (if present). Heavy equipment used for hoisting operations will be supplied and operated in accordance with equipment operations manuals, guides, procedures/instructions, and load charts.

Operational testing will be performed using a load equivalent to the maximum anticipated load to be lifted by each piece of equipment during the course of the project. Details of the testing and results will be documented.

9.22 Contingency Plan for Severe Weather

The potential for severe weather is possible as the site is located near the Atlantic seaboard where storms can occasionally be severe, including severe winds and occasional heavy rain or snow. In addition, thunderstorms are possible. The UXOSO will monitor the weather forecast daily. In preparation for an approaching storm, all equipment will be secured, and all doors and windows of the equipment and offices will be closed. All tools and supplies will be stored in a designated secure location. Open excavations and current work tasks will be safely idled and secured as necessary.

If particularly ominous weather conditions are predicted, the UXOSO will monitor radio broadcasts or National Weather Service reports regularly. Nearby thunderstorms could have lightning associated with them. Whenever a thunderstorm arises, the UXOSO will determine if lightning is within 10 miles of the site. If lightning is close to the site, work will stop until no lightning activity is observed for a minimum of 30 minutes and workers will seek shelter in a full enclosed vehicle cab or other fully enclosed structure. A lightning meter will be available on-site as an indicator of approaching storms.

The SUXOS and the UXOSO will assess what work procedures can be safely performed when wind conditions exceed 25 mph, including lesser wind speeds may require consideration of work suspension for certain tasks if they contribute to unsafe conditions. Consideration will be given to fugitive dust generation, the safety of equipment in high winds, and protection of workers from flying debris and dust.

A Hurricane Preparedness and Prevention Plan is included in the following subsection.

9.22.1 Hurricane Preparedness and Prevention Plan

Hurricane season starts June 1 and ends November 30. The following information is from www.nhc.noaa.gov/prepare/wwa.php:

- **Tropical Storm Watch:** An announcement that tropical-storm conditions are possible within the specified area.

- **Hurricane Watch:** An announcement that hurricane conditions are possible within the specified area.

Because outside preparedness activities become difficult once winds reach tropical storm force, watches are issued 48 hours in advance of the anticipated onset of tropical-storm-force winds.

Action: During a watch, prepare and review your plan for evacuation in case a Hurricane or Tropical Storm Warning is issued. Listen closely to instructions from local officials.

- **Tropical Storm Watch:** An announcement that tropical-storm conditions are possible within the specified area.
- **Hurricane Watch:** An announcement that hurricane conditions are possible within the specified area.

Because outside preparedness activities become difficult once winds reach tropical storm force, warnings are issued 36 hours in advance of the anticipated onset of tropical-storm-force winds.

Action: During a warning, complete storm preparations and immediately leave the threatened area if directed by local officials.

- **Extreme Wind Warning:** Extreme sustained winds of a major hurricane (115 mph or greater), usually associated with the eyewall, are expected to begin within an hour.

Action: Take immediate shelter in the interior portion of a well-built structure.

When a warning of gale force winds is issued, the SUXOS will have supervisors and workers take precautions to minimize danger to persons, and protect the work and nearby TtEC and Government property. These precautions include, but are not limited to: closing openings; removing loose materials, tools and equipment from exposed locations; and securing temporary work. Close openings in the work areas (e.g., windows, doors, bins, equipment cabs, etc.) when storms of lesser intensity pose a threat to the work or any nearby TtEC or Government property.

It is advised that before an emergency, each contractor secure emergency disaster kit with nonperishable food, potable water (at least one gallon per person for each day) and other supplies (e.g., flashlights, first aid kit, emergency NOAA weather radio, blankets, toiletries, etc.) in sufficient quantity for their personnel to last for at least 72 hours. In addition, persons should, if time allows, have their prescription medicines with them when they seek shelter and let the PM know the location where sheltering will occur.

There are four hurricane conditions of hurricane readiness. Unless directed otherwise, the SS and SSHO will comply with the following directives and direct contractor and subcontractor personnel as follows:

- a. **Condition FOUR** (Sustained winds of 50 knots or greater expected within 72 hours):

Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove all debris, trash, or objects that could become missile hazards.

b. **Condition THREE** (Sustained winds of 50 knots or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness. Contact COR for weather and Condition of Readiness updates and completion of required actions.

c. **Condition TWO** (Sustained winds of 50 knots or greater expected within 24 hours): Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact COR for weather and Condition of Readiness updates and completion of required actions.

d. **Condition ONE.** (Sustained winds of 50 knots or greater expected within 12 hours): Secure the jobsite, and leave Government premises.

Personnel will leave the site upon a notice to leave Government premises and each supervisor will ensure their personnel and families (as applicable) are instructed to gather together offsite in a safe place of refuge such as a storm shelter. The TtEC SUXOS will notify the PM as to the status of the crew and evacuation notice. Stay away from windows and doors during a hurricane and stay indoors. Await official word from emergency personnel if a hurricane does occur before leaving safety of shelter or driving on any roads. Prior to returning to work after a hurricane, the TtEC SUXOS and UXOSO will (with Government permission) conduct an evaluation of any worksite damages and precautions that may be required prior to allowing workers to return to work and will report damages to the PM, SHM, and Contracting Officer.

9.23 Float Plan

A boat will be located near shore, either mooring or on the temporary dock during site activities, as a safety measure. A float plan will be prepared by the boat operator in advance when mooring or traveling alone longer than 4 hours. The plan shall be filed with the boat operator's supervisor and shall contain the following information, at minimum:

- Vessel information (make/model or local identifier);
- Personnel on-board;

- Activity to be performed;
- Expected time of departure, route, and time of return;
- Means of communication (adequate means of communication shall be provided).

9.24 Site-Specific Fall Protection and Prevention Plan

There is currently no situation where workers will be exposed to a potential fall of 6 feet or more in performance of the current work tasks. Workers will not climb onto the top of a work trailer or onto any other platform that exposes them to a fall of 6 feet or more.

Should a worker be exposed to a fall hazard of 6 feet or more or a task be identified where a worker will need to access an area that is higher than 6 feet from lower level without proper guardrails, they wear fall protection and a competent person develops, submits and implement onsite, a Site-Specific Fall Protection and Prevention Plan in accordance with Section 21.C of EM 385 1-1. This plan, if required shall include, in detail, the specific practices, equipment and methods used to protect workers from falling to lower levels. The plan will be updated as conditions change and at least every 6 months.

9.25 Demolition Plan (Engineering and Asbestos Surveys)

Not applicable.

9.26 Excavation/Trenching Plan

There is no excavation required as part of this project, as removal efforts are limited to surface clearance. A formal excavation/trenching plan is currently not required.

9.27 Emergency Rescue (Tunneling)

Not applicable.

9.28 Underground Construction Fire Prevention and Protection Plan

Not applicable.

9.29 Compressed Air Plan

Not applicable.

9.30 Formwork and Shoring Erection and Removal Plans

Not applicable.

9.31 Precast Concrete Plan

Not applicable.

9.32 Lift Slab Plans

Not applicable.

9.33 Steel Erection Plan

Not applicable.

9.34 Site Safety and Health Plan for HTRW Work

Elements of Section 28 of EM 385-1-1 have been included within this APP.

9.35 Blasting Safety Plan

The Work Plan contains TtEC's standard operating procedures that pertain to the handling of MEC/MPPEH and the disposal of MEC using donor explosives. The ESS contains additional information about MEC disposal and required safety distances, and has been approved by the Naval Ordnance Safety and Security Activity. These procedures and requirements will be followed during execution all MEC/MPPEH operations. These methods and procedures have been reviewed and approved by the UXO Program Manager and the UXO Safety Manager and will be followed during the project.

Munitions have the potential to kill or cause serious injury if improperly handled. All site personnel working on this project are trained and qualified UXO Technicians with experience in the safety precautions and identification and handling of MEC, MPPEH, and donor explosives. Other workers, including any subcontractors used for vegetation removal, will have MEC awareness training as part of site orientation. In addition, MEC avoidance procedures will be implemented in accordance with TtEC procedures (included in the work plan) for tasks that include digging, stake pounding, or other intrusive tasks not directly related to the MEC excavation.

The following sections address general MEC/MPPEH safety. More specific information is contained in the Work Plan.

The area where surface clearance will be conducted, as well as the surrounding area, even though investigation and removal activities have been performed, may contain MEC and associated broken up MPPEH and related debris. The term MEC, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, includes UXO, as defined in 10 United States Code (USC) 101(e)(5); discarded military munitions (DMM), as defined in 10 USC 2710(e)(2); or munitions constituents (MC) (e.g., trinitrotoluene, Royal Demolition Explosive), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard. UXO are military munitions that have been primed, fuzed, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard; and remain unexploded whether by malfunction or design. DMM are military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term DMM

does not include UXO, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations.

Any suspected munitions item found will be reported to the SUXOS. Non UXO workers will never handle, touch, or move any item suspected of being a munition. Report the find and location to the SUXOS and halt work in the immediate area until the item can be investigated and confirmed by the SUXOS.

Historical records do not indicate that chemical warfare materiel (CWM) was managed in the former dunnage yard. However, if suspected CWM (e.g., material with strange or unidentified odors, unusual or marked buried containers) is encountered during work, operations will cease; the find shall be reported immediately to the SSHO, SUXOS, SHM, and UXO Safety Manager; the site will be evacuated up wind and secured; and the Navy RPM and NTR/FEAD will be notified as soon as practically possible upon initial detection. No entry into the area will be allowed until the potential hazard can be evaluated by Navy personnel and the area is deemed safe for entry by the Navy and the UXO Safety Manager.

9.36 Diving Plan

Not applicable.

9.37 Confined Spaces

A confined space is any enclosed area having a limited means of egress where ventilation is not adequate to remove a toxic or flammable atmosphere or oxygen deficiency that may exist. Examples of confined spaces include, but are not limited to tanks, boilers, vessels, bins, manholes, tunnels, pipelines, underground utility vaults, and any open-top spaces more than 4 feet in depth such as pits, excavations, tubes, trenches, and vessels. Prior to the start and during the conduct of work at each site, the UXOSO and the SUXOS will identify confined spaces. The UXOSO will not allow entry into these spaces unless specifically authorized in this plan. The UXOSO will evaluate the site for any potential confined spaces and ensure they are appropriately marked with warning signs and that personnel are informed that entry into these spaces is prohibited other than as outlined below.

Site workers are provided confined space awareness training as part of the project orientation training. As part of this awareness training, workers are instructed on how to identify confined spaces, what entry requirements there are, and who to contact if they believe a confined space exists. The awareness class is not the required training class if entry into a confined space is required.

Workers who enter, attend, or supervise entry into a confined space, including rescue must have additional training in compliance with 29 CFR 1910.146 and be designated as qualified to perform their assigned tasks related to confined space entry by their employer. At the present time, confined space entry tasks will not be performed.

9.38 Physical Hazards and Controls

Physical hazards not otherwise addressed in the above sections are covered in the following sections.

9.38.1 Noise

Site activities will involve the use of equipment exceeding occupational noise exposure limit action levels. Exposure to noise equal to or exceeding the OSHA 8-hour time-weighted average (TWA) sound level [85 decibels adjusted (dBA)] could result in hearing loss. To minimize this hazard, the SSHO will ensure the following measures are employed:

- Noise monitoring (as required) and worker education on hearing conservation principles
- Effective use of hearing protection by all personnel working near excessive occupational noise sources
- The use of engineering and/or administrative controls to reduce employee exposures to noise, where possible

Sound level monitoring may be conducted on site using a noise survey meter. Personnel with a standard threshold shift will be restricted from high noise exposure, or will be required to wear hearing protection. Workers on site will be instructed to observe the “noise rule of thumb” on this project, described as follows:

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

9.38.2 Motor Vehicles and Heavy Equipment

The project will use a backhoe to perform MEC removal and hoisting activities, and a skidsteer with mower attachment to perform vegetative clearing activities. In addition, other large and smaller trucks may be used for deliveries or to haul waste and materials on and off site (to and from the barge). This equipment poses unique and immediate hazards that, if uncontrolled, can result in severe injury or fatality. While Nomans Land Island is a restricted area, traffic may be present at Martha’s Vineyard which can present a hazard to workers while loading/unloading equipment on the barge. Injuries can result from malfunctioning equipment, improper operation, or personnel placing themselves in operator “blind spots” or between pieces of the equipment, or between equipment and immovable objects.

Personnel will receive initial and regular reminders that it is their responsibility to remain out of the operating areas of any moving heavy equipment to avoid being injured. In addition, the following precautions will be taken to help prevent injuries and accidents:

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horns, and other safety devices will be checked at the beginning of each work day.

- Examination of hydraulic lines will emphasize those lines in close proximity to the operator.
- A piece of paper or cardboard will be employed to check for high pressure leaks in this area that could result in hydraulic fluids being injected into the skin. Using gloved or bare hands for this inspection is prohibited.
- Large equipment will not be backed up unless equipped with a reverse signal alarm, audible above the surrounding noise level, and backup warning lights, or unless the vehicle is backed up only when an observer signals that it is safe to do so.
- Motor vehicle cabs will be kept free of all non-essential items and all loose items including equipment and/or samples will be secured.
- The parking brake, for vehicles so equipped, will be set before shutting off and dismounting a vehicle.
- Wearing of seat belts is mandatory.
- During periods of rain, fog, or other adverse weather conditions, the use of headlights is mandatory.
- All posted traffic signs and directions from flagmen (if present) will be observed.
- Personnel will be prohibited from placing themselves between operating equipment and immovable objects.
- Personnel will wear high-visibility vests to increase visual recognition whenever working within 15 feet of an established traffic pattern/route or working near heavy equipment.
- Efforts will be directed to minimize the number of personnel within an area.

Heavy equipment operators have a limited field of vision and may not be aware that someone is near the equipment being operated. Therefore, although heavy equipment is required to be equipped with warning devices such as backup alarms, and the operator is required to operate with caution, it is incumbent on personnel in the area to maintain sufficient distances from the equipment. For example, a sufficient distance is beyond the reach of an excavator turning a full 360 degrees with its bucket and boom fully extended. It is also incumbent on personnel in the area to ensure that they have made eye contact with the operator prior to moving within the reach of the excavator or other mechanical equipment. The operator must cease operations and rest the bucket (or other extension) on the ground before personnel approach. Caution will be exercised at all times. It will be emphasized that personnel should NEVER place themselves between operating heavy equipment and immovable objects due to the potential for crushing injuries and death.

Heavy equipment, if brought on site (e.g., excavator) will be controlled via the following measures:

- Ensuring that only appropriately qualified/experienced personnel are permitted to operate heavy equipment.
- Initial and periodic inspections of heavy equipment to provide safe operation will be documented by using the Equipment Inspection Checklist found in Appendix D.
- Keeping heavy equipment operations areas clear and otherwise adequate to allow for the safe movement of the equipment without endangering personnel or property.

- Implementing appropriate vehicle maintenance and decontamination operations.

Safe and proper practices will be followed at all times, or vehicle operating privileges will be suspended or revoked at the discretion of the UXOSO. The UXOSO will be responsible for ensuring that these requirements are implemented on site.

TtEC personnel will follow local traffic rules. Site vehicles will yield to pedestrians, if present. Personnel working in areas subject to vehicular traffic (streets, parking lots, and so forth) will wear high-visibility safety vests. Flashing light or reflectorized barricades will be used for roads that are blocked due to equipment/material loading. Fences may be used to delineate controlled work zones when necessary to keep unauthorized personnel out of the work area and to secure the area during not work hours.

9.38.3 Boating Safety

The risk of a boating accident can be reduced by ensuring that boat operators are experienced and qualified; operating the vessel in compliance with USCG rules and regulations; maintaining the vessel in good mechanical order; avoiding bad weather and dangerous seas; and ensuring emergency equipment is available on board (life vests, life rings, life boats, fire extinguishers, communication equipment, etc.).

Boats will be operated by experienced crewmembers that have successfully completed a boating safety course meeting the criteria of the U.S. Coast Guard Auxiliary, National Association of Safe Boating Law Administrators or equivalent, and motorboat handling training, based on the type of boats they will operate, provided by qualified instructors. Additional USCG licensing and qualification may be required for working boats such as tugboats and for performing towing operations with a barge. Operators of such equipment will have appropriate USCG licensing when required.

All boats will meet USCG license and registration requirements and be equipped to safely support maximum rated crew and passenger sizes. The maximum number of passengers and weight shall be conspicuously posted on each vessel. The number of passengers shall not exceed the number of personal flotation devices (PFDs) onboard. Each boat shall have sufficient room, freeboard, and stability to safely carry cargo and the number of persons allowed with consideration given to the weather and water conditions in which it will be operated. Boats shall be equipped with kill switches and shall meet 33 CFR 183 requiring level floatation after flooding or swamping.

The boating checklist in TtEC Corporate Procedure EHS 6-6 – Boating (or subcontractor equivalent), will be used by the boat operator before boat launching to ensure proper safety devices and equipment is are onboard and functioning and that equipment are of the proper type and quantity. The boating checklist is included in Appendix D. The SSHO will verify that the inspections are being performed and action items are identified and corrected, as required. The boat operator is responsible for the safety of all personnel on the boat and for the integrity of the vessel and its safety equipment.

Before the start of field activities, the boat operator will give a detailed health and safety briefing on the location and use of all vessel safety equipment and the procedures for addressing on-board emergencies (i.e., fire, mechanical failure, man overboard situation, etc.). Persons performing deckhand duties will have the appropriate level of training in the routine duties of this position. Other boat traffic in and around the marina and cove may be present during in-water work tasks. The boat operator will adhere to USCG vessel operating requirements during travel, including rights of way for vessel traffic. Active dive sites will be delineated and controlled as per the Dive Plan.

Personnel working from boats, barges, or skiffs, on structures or equipment extending over or next to the water (except where guard rails or personal fall protection systems are provided), or whenever there is a drowning hazard, will wear an inherently buoyant Type II or higher PFD (capable of turning its wearer in a vertical or slightly backward position in the water) unless the SHM approves Type III PFD based on conditions. PFDs shall have an attached whistle or other suitable device in the event of a man overboard. PFDs will be of an international orange (or orange/red) or American National Standards Institute ANSI 107 yellow-green color.

Each boat up to 26 feet in length shall be equipped with at least one Type IV PFD, ring buoy, 24 inches in diameter with 90 feet of buoyant line attached, designed to be thrown to a person in the water and grasped and held by the user until rescued. Larger boats require two Type IV PFDs to be onboard. In addition, the barge will have a Type IV PFD (life ring with 90 feet of line) onboard. A buoyant boat cushion equipped with straps or float rings are two common examples of additional types of life rings that can qualify as a Type IV PFD and help in a rescue.

In addition, each boat less than 26 feet in length will have at least one sound signaling device (air horn), USCG compliant navigation lights, visual distress signals (pyrotechnic and non-pyrotechnic) a 1-A:10-B:C fire extinguisher, and at least one vessel-mounted or hand-held radio to communicate with shore-based support facilities and other vessels operating nearby.

Boats less than 16 feet will have one electric distress light or three combination (day/night) red flares when operating between sunset and sunrise.

Boats greater than 16 feet but less than 40 feet will have one orange distress flag and one electric distress light, or three hand-held or floating orange smoke signals and one electric distress light, or three combination (day/night) red flares: hand-held, meteor or parachute type.

Other equipment required to be onboard boats includes:

- A tool kit sufficient for the boat operator to troubleshoot common mechanical problems.
- Appropriate spare parts such as a propeller, spark plugs, shear pins, patch kits, air pumps, etc.).
- (When travel is required) A survival kit containing some additional first aid equipment, high energy food, drinking water, blankets, heat source, signaling devices, waterproof

matches, and other items necessary to ensure survival for a minimum of 24 hours for the entire crew.

- (When travel is required) Boat operators shall utilize the "one-third rule" in boating fuel management. Use one-third of the fuel to get to the destination, one-third to return, and keep one-third in reserve.

9.38.4 Electrical Hazards

In order to prevent accidents caused by electric shock, the UXOSO will inspect any electrical connections on a daily basis, where applicable. The UXOSO will shut down and lock out any equipment that is found to have frayed or loose connections until a qualified electrician is contacted and repairs are made. The equipment will be de-energized and tested before any electrical work is done. The equipment will be properly grounded prior to, and during, work. In addition, ground fault circuit interrupters (GFCIs) will be installed for each circuit between the power source and tool for outdoor use. In the event that generators are used to supply power, these generators will contain GFCIs.

Requirements for electrical safety include:

- Electrical wiring and equipment will be listed by an OSHA-recognized testing laboratory. The usual recognized testing laboratories are Underwriters Laboratory (UL), Canadian Standards Association (US), and Factory Mutual.
- Live parts of wiring and equipment will be guarded to protect persons or objects from harm. Un-insulated live wires must be placed at various heights and distances from the ground and from buildings, depending on the voltage carried by those lines. (Consult the SHM if un-insulated live wires are anticipated.)
- Transformer banks and high-voltage equipment will be protected from unauthorized access.
- A qualified electrician will perform the work on electrical power supplies and lines.
- Flexible cords (extension cords) will contain the number of conductors required for service, plus a ground wire. Cords will be rated for hard usage (S, SE, SEO, SO, SOO, ST, STO, STOO). Flexible cords are not allowed to pass through doors or windows, or to be placed on the ground where they are subject to being run over by vehicles. If flexible cords must pass through walls, the cords will be protected by bushings or fittings.
- Flexible cords must be inspected on each day of use. No splices or fraying are allowed.
- Flexible cords will not be secured with staples, hung from nails, or suspended by bare wire. (Plastic tie straps, commonly used today, are acceptable.)
- Portable lamps must have bulbs protected by a substantial guard and attached to the lamp holder handle.
- The circuit breaker panels and electrical transformers and supply equipment must be labeled as to the voltage contained therein.
- The circuit breaker panels must be labeled as to what each breaker controls.
- The breaker panels and electrical panels must have a cover protecting any live exposed wires.

- At least a 30-inch clearance must be maintained on three sides of the circuit breaker boxes, transformers, and electrical supply equipment so as to provide ready access to the equipment in the event of an emergency. A 36-inch clearance is required for higher voltages. TtEC requires a 36-inch clearance of the breaker boxes, and so forth.
- Circuit breaker boxes that are locked, or kept in locked rooms, must have a key readily available in the event of an emergency.

9.38.4.1 Portable Generators

Portable generators, if used, must meet the requirements for grounding as specified in the NEC National Fire Protection Association 70. NEC 250-6 has certain exemptions for the grounding of portable and vehicle-mounted generators. Refer to EM 385-1-1, Section 11, for additional details. Portable generators will be operated in open air only, where there is sufficient ventilation to prevent accumulation of exhaust gases, including carbon monoxide.

9.38.4.2 Overhead Electrical Hazards

Overhead power lines may present a hazard to equipment and personnel. To prevent equipment contact with power lines and to prevent arcing, adequate clearance must be maintained. TtEC requires a minimum clearance of 15 feet. If adequate clearance cannot be maintained, electrical disconnects may be required to secure against a contact hazard. The voltage of overhead lines must be ascertained in order to determine if more than 15 feet clearance is required.

9.38.4.3 Underground Utilities

A high-loss-potential hazard includes ground disturbing activities with its associated potential for contact with underground utilities. When conducting intrusive activities such as excavation, the opportunity to encounter fire, explosion, or electrocution hazards exists from inadvertent contact with underground utilities. Therefore, the locations of underground utilities will be verified prior to performing any intrusive activities and precautions will include: white-lining the area of excavation; having utilities located using a private locating service; and performing a geophysical survey to clear utilities in the area of the intrusive operations.

9.38.5 Slips, Trips, and Falls

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

- Uneven terrain due to cultural debris or depressions.
- Working at or near the shoreline where surface clearance is performed.
- Workplace clutter
- Wet or slippery surfaces.

Hazards of this nature and the potential consequences of injury from a slip, trip, or fall are more likely when personnel are maneuvering and carrying equipment on these work sites or are busy with tasks and not paying attention to surroundings.

Control measures may include the following:

- Selecting the best approach routes to work areas and locations, keeping in mind that these may not be the shortest routes.
- Applying traction grit such as sand over slippery surfaces.
- Maintaining good housekeeping practices.
- Using barricades or other appropriate warnings to demarcate hazard areas.
- Proper selection and use of portable ladders (as required).
- Proper selection and use of fall protection equipment (as required).

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

9.38.6 Head Injuries

At a minimum, workers will don hard hats if they have an overhead hazard or when working around heavy equipment. This will prevent minor injuries caused by bumping one's head while working around the site.

9.38.7 Falling Objects

Raised items will be slowly lowered to the ground using proper rigging or material handling equipment. No personnel will work under equipment or suspended loads at any time. Also, the supervisor will verify that a sufficiently wide area is clear of personnel while the equipment is in operation. An AHA has been prepared for hoisting operations using mechanical equipment (such as an excavator) if required.

9.38.8 Heavy or Awkward Lifting

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

- Use machinery, lifting-assist devices (two wheeled carts or dollies), or multiple personnel for heavy lifts, where possible. (TtEC prohibits lifting more than 50 pounds without assistance.)
- Use proper lifting techniques.

- Plan your lifts: place heavy items on shelves between the waist and chest and lighter items on higher shelves. Also, if the load must be carried to another location, plan and inspect the route to ensure that slipping/tripping hazards are absent.
- Stretch and limber muscles prior to and after extended periods/frequent lifts.
- “Test” the lift; before attempting to fully lift or move an object, give the object a “nudge” to assess its approximate weight and your ability to safely lift and move it without injury. If you are not confident that you can complete the lift without hurting yourself, either get a lifting aid (such as a dolly or mechanical hoist), get help from others, or both.
- Move as close to the load as possible, and ensure that good hand holds are obtainable. Wear gloves where necessary to improve hand holds.
- Lift with your legs, not your back; bend your knees and avoid turning and twisting at the waist when lifting, carrying, or depositing loads.
- Break lifts into steps if the vertical distance from the starting point to the placement of the lift is excessive.
- Periods of high-frequency lifts or extended-duration lifts should include sufficient breaks to guard against fatigue and injury.

Other considerations associated with lifting injuries and muscle strains include the following:

- Assess the area available to maneuver the lift.

Rearrange the area, remove clutter, and minimize the necessity of twisting and turning.

- Evaluate the area of the lift.
 - Investigate conditions of the walking/working surfaces where the lift will occur, over the planned path of travel, and at the location the load will be deposited.
 - Conditions such as poor housekeeping/clutter, slippery surfaces, and rough or uneven terrain may magnify the potential for injury during a lift.
- Take into account your overall physical condition
 - Report previous injuries on your Medical Data Sheet or inform supervisor of limitations.
 - DO NOT attempt to lift items that will put you at risk.
 - Break loads that you must carry into smaller, manageable loads, and get assistance whenever significant lifting tasks are involved.

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

9.38.9 Portable Power Hand Tools

Any portable power tools (e.g., saws, drills, pressure washers, etc.) used in the work area must have appropriate guarding, interlocks, or controls to ensure safe operation. Machinery and equipment must be inspected for defects in the guarding, electrical safety, and operation before each use.

The following specific precautions regarding power hand tools will be used to help prevent injuries and accidents:

- Never remove, make inoperative, or reduce the effectiveness of any equipment or machine guard.
- Never override any safety interlock or attempt to operate any piece of equipment or machinery without guards or other required safety devices in place and fully functional.
- Never operate any piece of equipment or machinery when it is functioning improperly or at any time when operation would constitute a hazard. Malfunctioning equipment must be repaired immediately or removed from the premises.
- Do not use electrically-powered tools near flammable materials or within an explosive atmosphere, unless they are of the explosion-proof type meeting the National Electric Code (NEC) requirements for explosive areas. Employees operating the equipment should be aware of sparks and/or metal fragments when using this equipment.
- At no time will electrical power equipment be operated without proper grounding. All electrical cords and cables, including extension cords, must include a third wire ground.
- All electrical power tools will be listed by a nationally recognized laboratory and marked to indicate that they have double insulation if they are not internally grounded.
- Do not use electrical tools in wet or damp areas.
- Use tools only for their intended purpose (e.g., do not use a wrench to hammer an object). Defective tools (e.g., with mushroomed heads or split or defective handles) are to be taken out of service until they can be repaired, or they are to be replaced.
- Do not use conductive (i.e., metal) tools around energized electrical sources. Test insulated
- Select the correct size and type of wrench for each job. Wrench handles will not be extended with a pipe or “cheater” bar.
- Repair mushroomed punch, drift, and chisel heads or take the tool out of service and replace. Metal particles may break off and fly into the face or eyes of nearby workers when mushroomed heads are struck.
- Wear eye protection at all times when using hand tools (powered or manual).
- All hand tools and power tools will be inspected prior to use. TtEC employs inspection checklists and colored stickers and/or tape, as previously described, to indicate that equipment has been inspected and is ready for use.

9.39 Air Monitoring Plan

Air monitoring is not planned at this time.

10.0 RISK MANAGEMENT PROCESSES

AHAs for the planned activities are included in Appendix A of this APP and listed in Section 2.4. If any new tasks are identified, or if planned activities vary from the written AHAs, the UXOSO (with the assistance of the workers or subcontractors, etc.) will develop or alter the

existing AHAs to address the specific activities. The AHAs listed will be reviewed by the SHM and will be submitted to the Contracting Officer for review and approval.

11.0 REFERENCES

TtEC. 2014. Project Orientation, Rules and Safety Guidelines Handbook. February

USACE. 2008. Safety and Health Requirements. Engineer Manual (EM) 385-1-1, Sep 2008 Consolidated. August 2011.

U.S. Department of Labor, Occupational Health and Safety Administration; 1910 – Occupational Safety and Health Standards, General Industry. Code 29 of Federal Regulations (CFR). Parts 1910.95, 1910.120, 1910.132, 1910.134, and 1910.147.

U.S. Department of Labor, Occupational Health and Safety Administration; 1926 – Occupational Safety and Health Standards, Construction Industry. Code 29 of Federal Regulations (CFR). Parts 1926.59, 1926.601, and 1926.602.

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TABLES

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Table 3-1. Comparison of TtEC and 2012BLS Data for NAICS Code 237990 (TRIR and DART Rates)

	NAICS 237990 Heavy Construction other than Highways 2012	TtEC 2011	TtEC 2012	TtEC 2013
Total Recordable Incident Rate (TRIR)	2.5	0.92	0.30	0.59
Days Away/Restricted Duty/Transfer Rate (DART)	1.2	0.35	0.15	0.59

Table 9-1. Type and Location of Emergency Equipment

Equipment	Location
Industrial First Aid Kit with Bloodborne Pathogens Kit	SZ for active work locations
Fire Extinguisher, one 10-A-60:BC	SZ for active work locations
Fire Extinguisher, one 1A-10:BC	Site vehicles and heavy equipment
Fire Extinguisher, one 40:BC	Refueling areas
Portable eye wash (15-minute/0/4 gallon per minute)	Active work location
Air Horn (if not equipped with vehicle horn)	Active work location
Spill Kit (appropriately stocked with sorbent pads, gloves, and bags)	Each active work location and refueling areas.
Cellular Telephones	Minimum of SS, SSHO, each field supervisor, (others as required for safety and communication purposes)
Burn Blanket	SZ for MEC operations
Sterile Water	SZ for MEC operations

Table 9-2. Emergency Contact List

Ambulance/Fire/Police (cellular or land line)	911
Medical Hospital: Martha’s Vineyard Hospital 1 Hospital Road Oak Bluffs, MA 02557 (See Figure 9-2)	911 (508) 693-0410 (Emergency Services)
WorkCare® approved clinic for non-emergency injuries only (this clinic is on the mainland, so suggest using MV Hospital in Oak Bluffs as a closer facility, but must call WorkCare as soon as possible)	(508) 540-6790
East Falmouth Walk-In Medical Center 309 Teaticket Hwy., E. Falmouth	
Workcare – CA	1-800-455-6155
Poison Control	1-800-222-1222
Navy NTR, Robert Krivinskas	(401) 841-1761
Navy FEAD/CSO, David Barney	(617) 753-4656
Navy RPM, Brian Helland	(215) 897-4912
Navy Contracting Officer, Zane Perry	(757) 322-4777
TtEC PM, Brian Corbett	(617) 443-7517 (office phone) (617) 470-8651 (cellular phone)
TtEC SHM, Roger Margotto, CIH	(619) 471-3503 (office phone) (619) 988-0520 (cellular phone)
TtEC UXO Safety Manager, Steve Neill	(770) 330-7068
TtEC SUXOS, TBD	(xxx) xxx-xxxx (office phone) (xxx) xxx-xxxx (cellular phone)
TtEC SSHO/UXO Technician, TBD	(xxx) xxx-xxxx (office phone) (xxx) xxx-xxxx (cellular phone)

Abbreviations and Acronyms:

- CIH – Certified Industrial Hygienist
- ET – Engineering Technician
- NTR – Navy Technical Representative
- PM – Project Manager
- RPM – Remedial Project Manager SS – Site Superintendent
- SSHO – Site Safety and Health Officer
- SHM – Safety and Health Manager
- SUXOS – Senior UXO Specialist
- TtEC – Tetra Tech EC, Inc.
- UXO – Unexploded Ordnance

**Table 9-3 Personal Protective Equipment Selection
(Initial and Ongoing Activities for Each Task)**

TASK	HEAD	EYE/ FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
Mobilization including transportation-related work activities	None	SG	If lifting heavier items that pose a foot hazard if dropped, STB or Composite boots approved for toe protection (made w/non-metallic material) are required. (If not, then standard work boots are adequate.)	LWG	WC	None	Level D
MEC, MPPEH and debris collection and removal	None	SG	If lifting heavier items that pose a foot hazard if dropped, Composite boots approved for toe protection (made w/non-metallic material) are required. (If not lifting heavy items, then standard work boots are adequate.)	LWG	WC	None	Level D HH when working around heavy equipment
Boat/Barge activities on or adjacent to water	None	SG	STB* / OB *If lifting heavier items that pose a foot hazard if dropped, STB or Composite boots approved for toe protection (made w/non-metallic material) are required. (If not, then standard work boots are adequate.)	LWG	WC or Cot Cov and PFD	None	Level D

**Table 9-3 Personal Protective Equipment Selection
(Initial and Ongoing Activities for Each Task)**

TASK	HEAD	EYE/ FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
MDAS/MDAS documentation	None	SG	STB* / OB or Rub *If lifting heavier items that pose a foot hazard if dropped, STB or Composite boots approved for toe protection (made w/non-metallic material) are required. (If not, then standard work boots are adequate.)	Neoprene, Latex or Nitrile	Cot Cov or Tyvek	None	Level D If action levels are not exceeded.
Demobilization	None	None	If lifting heavier items that pose a foot hazard if dropped, STB or Composite boots approved for toe protection (made w/non-metallic material) are required. (If not, then standard work boots are adequate.)	LWG	WC	None	Level D

Notes:

- | | | | |
|---------|-----------------------|-----|--|
| Cot Cov | = Cotton coverall | OB | = Overboot |
| EM | = Ear Muffs | Rub | = Rubber boot |
| EP | = Ear plugs | SG | = ANSI approved safety glasses with side shields |
| HH | = Hard hat | STB | = Leather work boots with steel toe |
| LWG | = Leather work gloves | WC | = Work Clothes |
| Neo | = Neoprene | PFD | = Personal Flotation Device |
| Nit | = Nitrile | PFS | = Protective Face Shield |

Table 9-4. Nomans Land Island - Chemical Data

COMPOUND	ACGIH TLV	OSHA PEL	IDLH	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS	PHYSICAL DATA
Benzene	10 ppm	0.5 ppm – Action Level 1 ppm – PEL	500 ppm	Inhalation, Skin Absorption, Ingestion, Skin Contact	Irritating eyes, skin, nose, respiratory system, nausea; potential carcinogen	Eyes, skin, respiratory system, CNS, bone marrow	FP: 12° F IP: 9.24 eV LEL: 1.2% UEL: 7.8% VP: 75 mm
Ethyl Benzene	100 ppm	100 ppm	800 ppm	Inhalation Ingestion Skin Contact	Eye, skin, mucus membrane irritation; headache; dermatitis, narcosis; coma	Eyes, skin, respiratory system, CNS	FP: 55° F IP: 8.76 eV LEL: 0.8% UEL: 6.7% VP: 7 mm
Lead azide	0.05mg/m3 as lead	0.05mg/m3 as lead	none	Inhalation Ingestion Skin Contact	Headaches, irritability, weakness, CNS	kidney, skin, brain, blood	is a crystalline, cream-colored compound which is practically insoluble in water; Lead azide reacts with copper, zinc, cadmium, or alloys containing these metals to form other azides. For example, copper azide is even more explosive
Naphthalene	10 ppm	10 ppm	250 ppm	Inhalation, Skin Absorption, Ingestion, Skin Contact	Eye irritation; headache, confusion excitement, malaise; nausea, vomiting, abdominal pain; irritable bladder; profuse sweating; jaundice; kidney problems; dermatitis; eye and optical nerve damage	Eyes, skin, blood, liver, kidneys, CNS	FP: 174° F IP: 12 eV LEL: 0.9% UEL: 5.94% Sp. Gr.: 1.15
Phosphorous (yellow/white)	0.1 mg/m ³	0.1 mg/m ³	5 mg/m ³	Inhalation Ingestion Skin Contact	Eye, respiratory system irritating eye, skin burns; abdominal pain, nausea, jaundice, gray skin pallor; dental pain, salivation, jaw swelling and pain	Eyes, skin, resp system, liver, kidneys, jaw, teeth, blood	VP: 0.03 mm Flammable Solid – can ignite spontaneously in air
Titanium Dioxide	10 mg/m ³	15 mg/m ³	5000 mg/m ³	Inhalation	Fibrous changes to the lungs; potential carcinogen	Resp system	White odorless powder
Trinitrotoluene (2,4,6-;TNT)	0.1 mg/m ³	1.5 mg/m ³ (skin)	500 mg/m ³	Inhalation, Skin Absorption, Ingestion, Skin Contact	Skin, mucus membrane irritation, dermatitis; liver damage, jaundice, cyanosis (blue pallor) sneezing; cough, sore throat; peripheral nerve effects – numbness, tingling; muscle pain; kidney damage; irregular heart beat; cataract formation	Eyes, skin, resp system, blood, liver, CVS, CNS, kidneys	IP: 10.59 eV VP: 0.0002 mm
Toluene	50 ppm	200 ppm	500 ppm	Inhalation, Skin Absorption, Ingestion, Skin Contact	Eye, nose irritation; fatigue, weakness, confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscle fatigue, insomnia, tingling in limbs; dermatitis	Eyes, skin, resp system, CNS, liver, kidneys	FP: 40° F IP: 8.82 eV LEL: 1.1% UEL: 7.1% VP: 21 mm
Xylene	100 ppm	100 ppm	900 ppm	Inhalation, Skin Absorption, Ingestion, Skin Contact	Eye, skin, nose, throat irritation; dizziness, excitement, drowsiness; incoordination, staggering gait; corneal damage; appetite loss, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, resp system	FP: 90° F IP: 8.56 eV LEL: 0.9% UEL: 6.7% VP: 9 mm

Table 9-5. Progressive Clinical Symptoms of Hypothermia

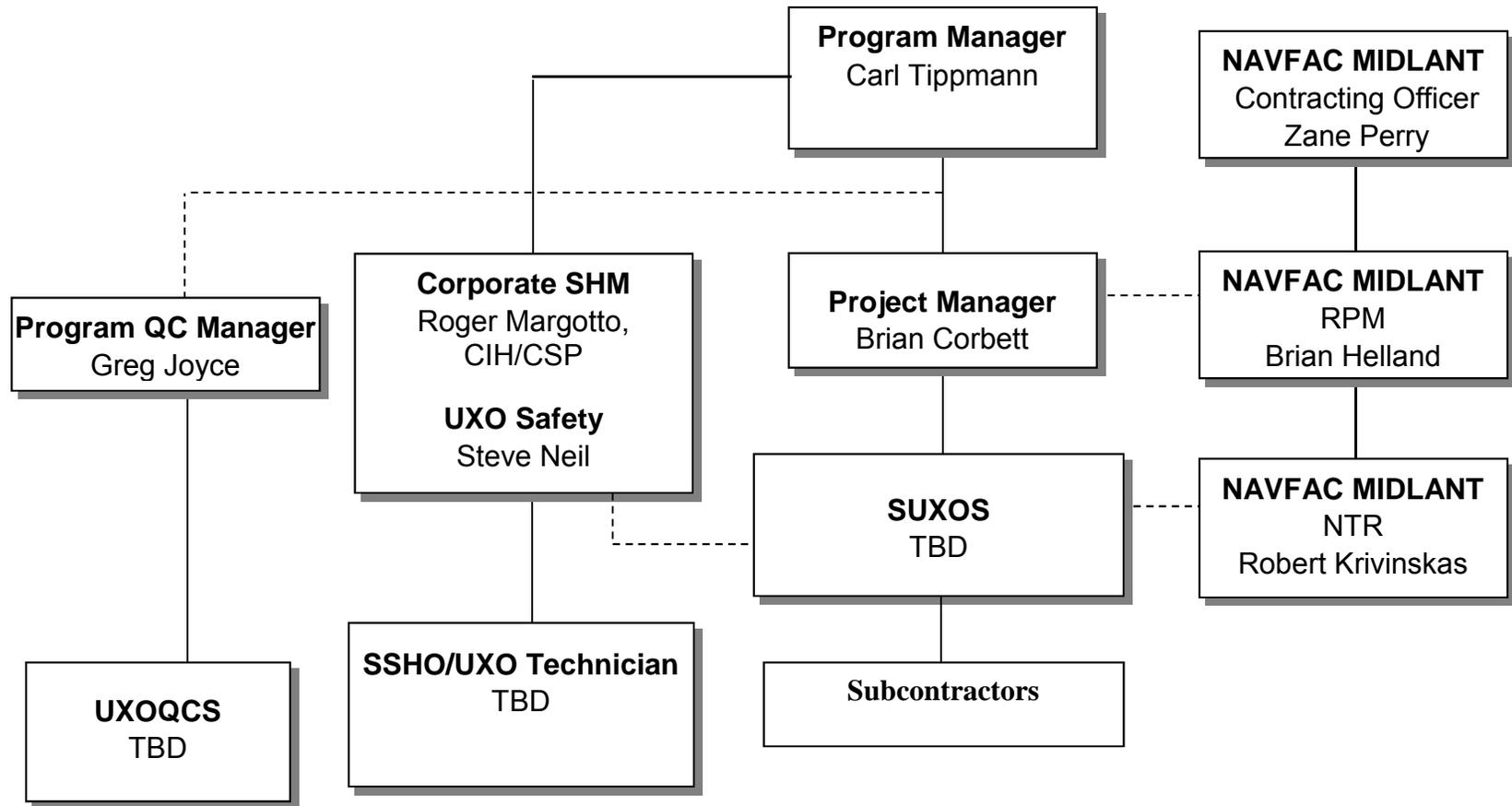
Core Temperature	Clinical
95°	Maximum shivering.
87°-	Consciousness clouded; blood pressure becomes difficult to obtain;
84°-	Progressive loss of consciousness; muscular rigidity; respiratory
79°	Victim rarely conscious.
70°-	Maximum risk of ventricular fibrillation.

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FIGURES

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Figure 4-1. Organizational Chart



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Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2014 TerraMetrics

Google earth

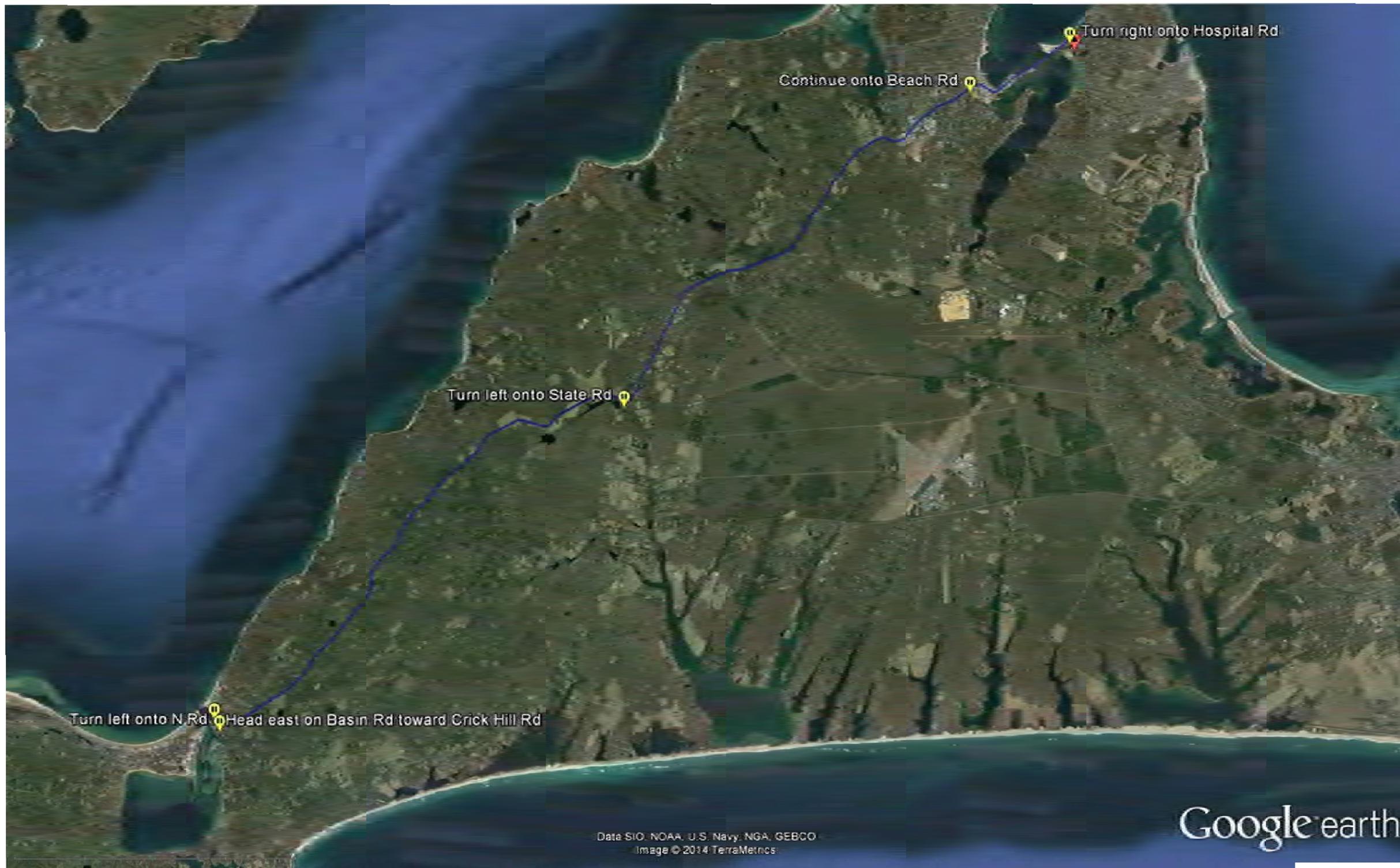
Google Earth Pro



FIGURE 9-1

NOMANS LAND ISLAND
CHILMARK, MASSACHUSETTS
LIMITED MUNITIONS AND EXPLOSIVES OF
CONCERN SURFACE CLEARANCE
SITE LAYOUT AND
EMERGENCY EVAC. MAP

SCALE: AS SHOWN



Directions to 1 Hospital Rd,
Vineyard Haven, MA 02568
13.3 mi

Basin Rd, Chilmark, MA 02535
 1. Head east on Basin Rd
toward Crick Hill Rd
 2. Turn left onto N Rd About
12 mins
 3. Turn left onto State Rd
About 11 mins
 4. Continue onto Beach Rd
About 3 mins
 5. Turn right onto Hospital Rd
Destination will be on the left
1 Hospital Rd, Vineyard Haven,
MA 02568

Turn left onto N Rd Head east on Basin Rd toward Crick Hill Rd

Turn left onto State Rd

Continue onto Beach Rd

Turn right onto Hospital Rd

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2014 TerraMetrics

Google earth

Google Earth Pro



FIGURE 9-2

NOMANS LAND ISLAND
CHILMARK, MASSACHUSETTS
LIMITED MUNITIONS AND EXPLOSIVES OF
CONCERN SURFACE CLEARANCE
ROUTE, AND DIRECTIONS TO
MARTHA'S VINEYARD HOSPITAL

SCALE: AS SHOWN

APPENDIX A
ACTIVITY HAZARD ANALYSES

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Activity Hazard Analysis (AHA) #1

Activity/Work Task: Mobilization and Site Setup	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Nomans Land Island, Chilmark, MA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-13-D-8007	Severity	Probability
Date Prepared: April 2014		Frequent Likely Occasional Seldom Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by: Roger Margotto, CIH, CSP, CHMM	Marginal	H M M L L
	Negligible	M L L L L
<p>Notes: (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p>Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest.</p>	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.	RAC Chart
	“ Severity ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	H = High Risk
		M = Moderate Risk
		L = Low Risk

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	Hazards	Controls	RAC
Mobilization - transportation of personnel and materials to Nomans Land Island by boat	General boat operation hazards	Review AHA #3 Boating Operations in addition to this AHA.	
Arrival at Location	Lack of Emergency Preparedness and Health and Safety (General) before beginning work	Get to know the location if not familiar. SSHO to locate the emergency hospital and ensure routes are correct as shown in Figure 9-1. Coordinate with FEAD and Navy personnel as required. Conduct site orientation with the personnel involved in mobilization tasking including establishment of a staging area, base camp, and floating pier, unpacking and unloading and staging of materials and equipment, review of the APP, this AHA, and the Emergency Response Plan. Ensure training is documented. Ensure communications are established and	M

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	Hazards	Controls	RAC
Arrival at Location (continued)		working properly among team members. Develop a plan for mobilization, organization, and tasking, and emphasize communication. Ensure emergency and basic safety equipment and PPE is located and available for use prior to starting site work. Use buddy system. SSHO/UXOSO will have site workers fill out medical data sheets that are included in an appendix to the APP.	
Set up work areas	Workers could be exposed to chemical hazards (Refer to APP Table 9-4).	<ul style="list-style-type: none"> • Delineate exclusion zones and use PPE as required by type of material being used. • Refer to MSDSs. • Identify all chemical hazards and receive training (MSDSs) regarding safe handling of chemicals. The UXOSO will file copies of all MSDSs at site.	M
	Noise from site setup could cause hearing loss.	Hearing protection is required when sound levels exceed 85 dBA continuously. Usually this will only be for workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment.	M
	Slip, trip, and fall hazards could be present.	<ul style="list-style-type: none"> • Work areas will be visually inspected and slip, trip, and fall hazards will be marked, barricaded, or eliminated, if feasible. • Work area will be kept neat and in an orderly state of housekeeping. • Supplies will always be placed in areas away from normal foot traffic. • Equipment and tools will always be placed in a safe location and will not present a trip hazard to nearby workers. • Maintain proper illumination in all work areas. Work is authorized normally during daylight hours only. Refer to EHS Procedure 3-8, Fall Protection.	M
	Sharp objects could cause punctures.	<ul style="list-style-type: none"> • Wear cut-resistant work gloves when sharp edges or other objects may cause the possibility of lacerations or other injury. • When possible, sharp edges will be blunted. Workers should not stand or walk on equipment or supplies.	M
	Strains from manually moving materials and equipment could occur.	<ul style="list-style-type: none"> • Personnel will be directed to 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 of hand truck will be encouraged. Employees will not lift more than 50 pounds. • Obtain assistance from another worker or use a mechanical device. Refer to EHS Procedure 3-1, Ergonomics.	M
	Workers could be exposed to extreme temperatures.	<ul style="list-style-type: none"> • Monitor for heat stress in accordance with EHS Procedure 4-6, (<i>Temperature Extremes</i>). Provide fluids and rest breaks during warm weather and while wearing	M

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	Hazards	Controls	RAC
Set up work areas (continued)		impermeable protective clothing.	
	Eye hazards could be present.	Safety glasses are the minimum required eye protection for all work areas.	M
	Electrocution could occur from generator used to operate power tools.	<ul style="list-style-type: none"> Inspect all extension cords daily for structural integrity, ground continuity, and damaged areas. Extension cord must be rated for hard usage or extra hard usage (Table 400-4, National Electrical Code). Inspect extension cord connection. Use GFCIs on all outdoor 115- to 120-volt, 20-ampere or less circuits. 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 (cover only in accordance with National Electrical Code requirements). Keep plugs and receptacles out of water, unless they are approved, submersible types. Ground all electrical circuits in accordance with the National Electrical Code or other applicable standards and regulations. I If a generator is used, be sure it is a type that does not require grounding.	M
	Lack of communication in widely dispersed areas could lead to delayed response in an emergency.	<ul style="list-style-type: none"> Ensure that each work team has a cellular telephone for communication. Ensure each work team has a 2-way radio that can reach the base camp If more than one team at a time is working, ensure that there is communication between the teams and the base camp. Use the buddy system.	M
	Workers could be struck by or against heavy equipment.	<ul style="list-style-type: none"> Wear high-visibility reflective vests when exposed to vehicle traffic. Make eye contact with operators before approaching equipment. Understand and review posted hand signals. Traffic barricades, signs, flags, and backup spotters will be used during field activities (as necessary).	M
Install temporary floating pier	Hazards associated with transportation of floating pier to Nomans Land Island by boat	Review AHA #3 Boating Operations in addition to this AHA.	M
	Lifting and Rigging hazards setting the pier components in place	Review AHA #7 Hoisting/Lifting and Rigging in addition to this AHA.	M
	General hazards	Review and adhere to manufacturer's installation procedures.	L
	Improper use of power and hand tools could cause injury or damage tools.	<ul style="list-style-type: none"> Inspect all tools before each use. Personnel will be trained in the proper use of hand tools. All power tools will be grounded, protected by GFCI, or double-insulated.	M

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	Hazards	Controls	RAC
Install temporary floating pier (continued)	Material handling could cause injury.	<ul style="list-style-type: none"> Identify and avoid pinch points. Maintain communication with others involved in material handling. Use appropriate PPE.	M
	Strains from handling materials could occur.	<ul style="list-style-type: none"> Personnel will be directed to 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 of hand trucks will be encouraged. Personnel will work at a steady pace. Refer to EHS Procedure 3-1, Ergonomics.	M
Unloading and initial staging of materials and equipment (general site hazards) Note: two existing conex boxes will be used in support of project activities	Vehicle operations could cause injury to personnel or others onsite	Workers operating company or subcontractor vehicles will have a valid state issued driver's license. Any Commercial Driver's License (CDL) truck and trailers will be operated by CDL qualified drivers. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use parking brake when parked. Use chocks when parked on inclines. Use dedicated spotter and standard hand signals for backing operations. Wear high visibility vest when working around operating vehicle traffic.	M
	CONEX boxes may have deteriorated or have biological hazards (mice, rates, snakes, insects)	Upon arrival at site inspect the CONEX boxes for damage and for animals and insects. Look for any damage that may affect safe use of the containers.	L
	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed.	M
	Ergonomic hazards such as sprains, strains, or back injury from lifting or repetitive actions	Use mechanical lifting equipment or team lift when possible rather than by hand and tool methods. Do not bend at the waist, bend at the knees. Do not twist at the waist and turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds (may be lesser for some personnel) alone. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task.	M
	Slips, trips, and falls could lead to injuries	Keep work areas free of debris and equipment in work paths. Follow good housekeeping in work areas. Correct hazards when seen, such as holes or other trip hazards. If they cannot be removed, they must be marked.	M
	Handling sharp objects or using hand tools could cause cuts, punctures, or scrapes	Wear leather work gloves when handling materials that may be sharp or have sharp edges. Be familiar with the proper use and limitations of hand tools. Report even minor injuries to your supervisor for evaluation. Have a first aid kit available and have a minimum of 2 persons with first aid and CPR training onsite.	M

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	Hazards	Controls	RAC
Unloading and initial staging of materials and equipment (continued)	Cold or heat stress and weather hazards	Properly dress for the weather. SSHO to monitor weather and implement heat stress and cold stress controls as specified in the APP. Provide breaks for personnel to get either into cool or warm environment. Encourage a steady work pace. Ensure adequate drinking water is available. Know the signs and symptoms of exposure and keep an eye on your partner. SSHO to implement EHS 4-6, Temperature Extremes.	M
	Eye injuries from dust or debris	Wear safety glasses with side shields at all times when working. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt. To keep dust down, travel at slower speeds on unpaved roads and laydown areas. If required, water mist can be used to control dust on roads and in laydown areas.	M
	Noise could cause hearing loss and make it difficult to communicate	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule applies to personnel working near or on heavy equipment and any other sources of loud noise.	M
	Lack of proper illumination in work areas could cause hazards to not be recognized or eye strain	During mobilization, if lighting is not yet set up, temporary lighting such as portable bright lumen flashlights may be necessary if ambient lighting is not sufficient. Work during daylight hours or provide adequate lighting source for work areas to minimize potential for injuries to occur from lack of visibility.	L
	Fall hazards (falls from heights of 6 feet or greater)	No person will climb upon any equipment, shipping container, building, etc. where there is exposure to a fall of 6 feet or greater (no proper guarding and rails in place) without a means of fall protection designed by a Competent Person. At the present time, there is no fall protection plan in place to cover this task. A fall protection plan would need to be developed and implemented prior to doing the activity.	M
	Head injuries from struck by or falling objects	Wear hard hat when overhead hazards exist and when working in areas with operating construction equipment.	M
	Contact with biting or stinging insects	Workers will apply DEET to work clothing following manufacturer's instructions as a preventative measure for biting insects as required. Workers with allergies will let the SSHO know using the medical data sheet and will carry their own prescription medication as applicable. First aid and medical attention as required.	L

AHA #1 – Activity/Work Task: Mobilization and Site Setup			
Job Steps	Hazards	Controls	RAC
Unloading and initial staging of materials and equipment	Electrical hazards could be present during tool use	Ensure that power cords are inspected and in good condition for use, that GFCIs are used properly, and portable generators are not overloaded. Ensure any power tools used are in good working condition and have third prong on cord or are double insulated. All live electrical work requires arc flash protection and a permit from the government designated authority as required by EM 385-1-1 , section 11.A.02.c.	M

AHA #1 – Activity/Work Task: Mobilization and Site Setup		
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.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
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. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
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. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used
Industrial hygiene monitoring equipment	SSHO must be familiar with use/limitations of the monitoring equipment, calibration procedures, and industrial hygiene strategy.	Calibration and function checks before use. Contact SHM regarding monitoring requirements and strategies that may be necessary on this project. (At the time of the preparation of this AHA, air monitoring requirements are dependent on additional analytical information.)

Abbreviations and Acronyms:

AHA - activity hazard analysis
 APP – Accident Prevention Plan
 CIH – Certified Industrial Hygienist
 CSP – Certified Safety Professional
 dBA – decibel A-scale

EHS – Environmental, Health, and Safety
 GFCI – ground fault circuit interrupter
 MSDS – Material Safety Data Sheet
 NRTL – Nationally Recognized Testing Laboratory
 OSHA – Occupational Safety and Health Administration

SHM – Safety and Health Manager
 SSHO – Site Safety and Health Officer
 SS – Site Superintendent
 UXOSO – Unexploded Ordnance Safety Officer

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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Activity Hazard Analysis (AHA) #2

Job/Task: Vegetation Clearing and Surface Clearing	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Nomans Land Island, Chilmark, MA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-13-D-8007	Severity	Probability
Date Prepared: April 2014		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Becky Whalen, Remediation Engineer	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM	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. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures. Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.	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.	RAC Chart
	“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	E = Extremely High Risk
		H = High Risk
		M = Moderate Risk
	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.	L = Low Risk

AHA #2 – Job/Task: Vegetation Clearing and Surface Clearing			
Job Steps	Hazards	Controls	RAC
Surface Sweep Operations on Roadway	Contacting MPPEH materials. (Some MPPEH may be classified where and when found)	<ul style="list-style-type: none"> Evacuate all non-essential personnel from area before any processing MPPEH. Only UXO personae I will handle MPPEH. Mark MEC with flags and avoid positive targets. Travel routes will be cleared by UXO Technicians Don't pick up, touch, step on or otherwise bother any items that could be MPPEH until positively identified. Notify the supervisor if any MPPEH is suspect. Don't enter any area in which MPPEH is suspected without authorization. Immediately evacuate to safe zones when notified to do so. Conduct drill prior to start of work and have periodical refresher; Train each new worker in the evacuation procedures. Review TtEC procedure UXO-4 –General UXO Safety Precautions with all site workers. 	M

AHA #2 – Job/Task: Vegetation Clearing and Surface Clearing

Job Steps	Hazards	Controls	RAC
Initial Surface Sweep Operations on Roadway (continued)	Exposure to poison ivy or oak.	<p>As area is inspected, identify any “suspicious” vegetation that may be poison oak and/or ivy. Mark these areas with warning tape or spray paint in preparation for vegetation clearance. Avoid contact with these plants. Wear long sleeve shirts and pants. Wear disposable gloves. Wear an “ivy blocker” and have Technu[®] or Zanfel post-exposure washing agent available.</p> <p>These plants need to be removed carefully to avoid spreading vegetation throughout the site or spraying plant debris on personnel or equipment. Also cutting tools that cut this vegetation need to be cleaned and handled carefully as the oils can remain on cutting surfaces.</p> <p>Review APP Attachment 1 in addition to this AHA.</p> <p>Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.</p>	M
	Slips, trips, and falls	Pay attention to where you are walking. Locate and mark surface debris that could present a trip hazard. Store and stage tools and equipment properly and follow good worksite housekeeping practices.	M
	Marking paint can be an inhalation hazard	Review MSDS for spray paint before use. Position upwind when spraying paint to mark limits.	L
	Failure to observe and prepare for encounter with insects, rodents, or snakes could cause injury to worker.	Observe for insects, rodents, and snakes. Use a “tapping” stick, if necessary, in any brush area to flush out or expose snakes before walking in brushy areas. Wear snake chaps (gaiters). Apply DEET as necessary. Avoid placing hands in concealed areas. Wear protective gloves. Use tools wherever possible to dislodge objects first, before placing hands low to ground to move objects.	M
Cutting vegetation (includes grass and other vegetation cutting) using mechanized mowing equipment	Exposure to poison ivy or oak.	<p>As area is inspected, identify any “suspicious” vegetation that may be poison oak. Mark these areas with warning tape or spray paint in preparation for vegetation clearance. Avoid contact with these plants. Wear long sleeve shirts and pants. Wear disposable gloves. Wear an “ivy blocker” and have Technu[®] or Zanfel post-exposure washing agent available.</p> <p>These plants need to be removed carefully to avoid spreading vegetation throughout the site or spraying plant debris on personnel or equipment. Also cutting tools that cut this vegetation need to be cleaned and handled carefully as the oils can remain on cutting surfaces. Use Isopropyl alcohol with garden hose for washing materials that have come into contact with poison oak and/or ivy.</p> <p>UXO Technicians performing the initial surface clearance should maintain a safe distance upwind of the brush hog operations to avoid inhalation of</p>	M

AHA #2 – Job/Task: Vegetation Clearing and Surface Clearing

Job Steps	Hazards	Controls	RAC
Cutting vegetation (includes grass and other vegetation cutting) using mechanized mowing equipment (continued)		airborne poison ivy. The brush hog operator will be required to wear a respirator in addition to other PPE during cutting operations as a safety precaution. Review APP Attachment 1 in addition to this AHA. Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.	
	Noise could cause hearing loss while using grass cutting equipment	Hearing protection is required when sound levels exceed 84 dBA continuously. This rule also applies to personnel working around heavy equipment.	M
	Struck by or against heavy equipment	Wear high-visibility safety vests when working on ground in vicinity of powered or other clearing equipment. Make eye contact with operators before approaching equipment.	M
	Refueling of equipment could cause fires or spills.	Ensure equipment is turned off and allowed to cool before being refueled. Do not overfill by ensuring a small size fuel can is used which the worker can maintain good control over during refueling. Place equipment on a spill pad for refueling. Visually inspect refueling point to ensure overfill is not done. Do not fill to capacity; leave space for expansion in the tank. Do not smoke in or near refueling areas. Do not refuel in back of a pickup truck. Have a fire extinguisher present at the refueling site and ensure workers are trained in their use.	L
	Strains to workers from use of tools, such as weed cutters.	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 them in good condition.	M
	Flying debris from cutting heads in motion	Ensure equipment used has guards in place. Wear long sleeved shirts and pants and lightweight coveralls. Wear leather work gloves and for face, wear safety glasses and mesh or plastic (ANZI Z87.1) face shield.	M
	Punctures, cuts, scrapes, from vegetation debris such as sharp limbs	Remove limbs that present a puncture hazard in areas being worked in. When removing limbs using saw, watch where you are going and do not walk backwards.	M
	Slips, trips, and falls	Pay attention to where you are walking. Locate and mark surface debris that could present a trip hazard. Store and stage tools and equipment properly and follow good worksite housekeeping practices.	L
	Encounters with insects, rodents, or snakes could cause injury to worker.	Observe for insects, rodents, and snakes. Use a “tapping” stick, if necessary, in any brush area to flush out or expose snakes before walking in brushy areas. Apply DEET as necessary. Avoid placing hands in concealed areas. Wear protective gloves. Use tools wherever possible to dislodge objects first, before placing hands low to ground to move objects.	L
	Construction equipment could cause	Workers operating construction equipment will be qualified and designated	M

AHA #2 – Job/Task: Vegetation Clearing and Surface Clearing			
Job Steps	Hazards	Controls	RAC
	injury to personnel	operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. All workers will wear high visibility safety vests. Hard hats should be a bright color.	
All vegetation removing activities	Workers could be exposed to extreme temperatures and sunburn.	Monitor for heat or cold stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing protective clothing. Wear broad-spectrum sunscreen lotion of SPF 15 or better.	M
	Exposure to poison ivy or oak.	As area is inspected, identify any “suspicious” vegetation that may be poison oak. Mark these areas with warning tape or spray paint in preparation for vegetation clearance. Avoid contact with these plants. Wear disposable coveralls/Tyvek during brush clearing activities. Wear disposable gloves. Wear an “ivy blocker” and have Technu® or Zanfel post-exposure washing agent available. These plants need to be removed carefully to avoid spreading vegetation throughout the site or spraying plant debris on personnel or equipment. Also cutting tools that cut this vegetation need to be cleaned and handled carefully as the oils can remain on cutting surfaces. Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.	M
	Lack of communication could lead to a delayed response in an emergency.	Ensure that each work team has a cellular telephone, or access to a cellular telephone, for emergency communication. A work team may substitute a 2-way radio for a cellular phone if the other radio party has access to a phone. 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.	M
	Cuts, scrapes, and hand injuries from handling debris	Wear leather work gloves when handling debris. Only pick up and handle as much debris as can be fed into the chipper at a time. Remember hazard associated with handling poison oak or ivy.	M

AHA #2 – Job/Task: Vegetation Clearing		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
1. Vehicles	Drivers must have current state-issued driver's license.	Receipt inspection by SS. Daily and before use by operator. Use equipment safety checklist.
2. Mobile construction equipment	Only trained equipment operators may operate mobile construction equipment.	Receipt inspection by SS. Operator qualification by SS. Inspect all equipment upon arrival at site and on each day of use. Use equipment checklist. Have operations manual onsite and be familiar with proper use of equipment and attachments.
3. Cutting tools	Specific training for power and hand tools will be provided. Review operators' manual for each tool and ensure that directions are followed.	Inspect before each use. Maintain as per manufacturer's recommendation. Review operators' manual for each tool and ensure that directions are followed.
4. 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.	First aid kits must be inspected weekly as required by OSHA. Fire extinguishers must be inspected monthly. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis

APP – Accident Prevention Plan

CIH – Certified Industrial Hygienist

CRL – Corporate Reference Library

EHS – environmental health and safety

EM – Engineer Manual

MEC – munitions and explosives of concern

MPPEH – material potentially presenting an explosives hazard

OSHA – Occupational Safety and Health Administration

PPE – personal protective equipment

RAC – Risk Assessment Code

SPF – sun protection factor

SS – Site Superintendent

SSHO – Site Safety and Health Officer

UXO – unexploded ordnance

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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Activity Hazard Analysis (AHA) #3

Job/Task: Transportation of Materials/Equipment by Boat/Barge	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Nomans Land Island, Chilmark, MA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-13-D-8007	Severity	Probability
Date Prepared: April 2014		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Becky Whalen, Remediation Engineer	Catastrophic	E E H H M
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM	Critical	E H H M L
	Marginal	H M M 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. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures. Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.	Negligible	M L L L L
	<p>Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (see above).</p> <p>“Probability” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.</p> <p>“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.</p>	
		<p>RAC Chart</p> <p style="background-color: #f8d7da; padding: 2px;">E = Extremely High Risk</p> <p style="background-color: #fff3cd; padding: 2px;">H = High Risk</p> <p style="background-color: #fff9c4; padding: 2px;">M = Moderate Risk</p> <p style="background-color: #d4edda; padding: 2px;">L = Low Risk</p>

AHA #3 – Job/Task: Transportation of Materials/Equipment by Boat/Barge			
Job Steps	Hazards	Controls	RAC
Loading/Unloading of Barge/Boat	Back injuries	<ul style="list-style-type: none"> Site personnel will be instructed on proper lifting techniques Mechanical devices should be used to reduce manual handling of materials; Team lifting should be utilized if mechanical devices are not available. 	M

AHA #3 – Job/Task: Transportation of Materials/Equipment by Boat/Barge			
Job Steps	Hazards	Controls	RAC
Loading/Unloading of Barge/Boat (continued)	Vehicular Traffic onto and off of barge	<ul style="list-style-type: none"> Spotters will be used when backing up trucks and heavy equipment and moving equipment. Ramps for access/egress of vehicles and similar equipment to barges, or between barges must be of adequate strength, provided with side boards, well maintained, and properly secured. 	M
	Slip, trip, and fall hazards could be present.	<ul style="list-style-type: none"> Work areas will be visually inspected and slip, trip, and fall hazards will be marked, barricaded, or eliminated, if feasible. Work area will be kept neat and in an orderly state of housekeeping. Supplies will always be placed in areas away from normal foot traffic. Equipment and tools will always be placed in a safe location and will not present a trip hazard to nearby workers. Maintain proper illumination in all work areas. Work is authorized normally during daylight hours only. Refer to EHS Procedure 3-8, Fall Protection. 	M
	Sharp objects could cause punctures.	<ul style="list-style-type: none"> Wear cut-resistant work gloves when sharp edges or other objects may cause the possibility of lacerations or other injury. When possible, sharp edges will be blunted. Workers should not stand or walk on equipment or supplies. 	M
	Strains from manually moving materials and equipment could occur.	<ul style="list-style-type: none"> Personnel will be directed to 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 of hand truck will be encouraged. Employees will not lift more than 50 pounds. Obtain assistance from another worker or use a mechanical device. Refer to EHS Procedure 3-1, Ergonomics. 	M
	Workers could be exposed to extreme temperatures.	<ul style="list-style-type: none"> Monitor for heat stress in accordance with EHS Procedure 4-6, (<i>Temperature Extremes</i>). Provide fluids and rest breaks during warm weather and while wearing impermeable protective clothing. 	M
	Water Hazard/Drowning	<ul style="list-style-type: none"> Personnel working over or near water must be provided with a USCG-approved life jacket (PFD) or buoyant work vest which must be inspected before and after each use. Ring buoys (minimum 30" diam.) with 90' of attached line must be available for emergency use; one (1) buoy is required for every 200' of distance. At least one lifesaving skiff must be immediately available for rescue where employees are working over or adjacent to water. 	M

AHA #3 – Job/Task: Transportation of Materials/Equipment by Boat/Barge			
Job Steps	Hazards	Controls	RAC
Loading/Unloading of Barge/Boat (continued)	Noise	<ul style="list-style-type: none"> Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHM or SSHO will determine the need for hearing protection; All equipment will be equipped with manufacturer's required mufflers. 	M
	Eye Injuries	Safety glasses meeting ANSI/ASSE Standard Z87.1 will be worn.	M
	Overhead Hazards during loading, unloading, and transport	<ul style="list-style-type: none"> Personnel will be required to wear hard hats that meet ANSI Standard Z89.1. All fiber/wire ropes, slings, chains will be rated for the load in which it is expected to lift. All lifting devices will be inspected at the beginning of each work shift. If defective items are found, they will be tagged and removed from service. All ground personnel will stay clear of suspended loads. All equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects. All overhead hazards will be identified prior to commencing work operations. Means of access/egress must be located (if feasible) so that loads will not pass over employees. All equipment will stay a minimum of 15 feet from energized electrical lines (50 kV). This distance will increase .4 inches for each 1 kV above 50 kV. 	M
	Workers could be struck by or against heavy equipment.	<ul style="list-style-type: none"> Wear high-visibility reflective vests when exposed to vehicle traffic. Make eye contact with operators before approaching equipment. Understand and review posted hand signals. Traffic barricades, signs, flags, and backup spotters will be used during field activities. 	M

AHA #3 – Job/Task: Transportation of Equipment/Materials by Boat		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
1. Fork truck or similar equipment	Only trained equipment operators may operate mobile construction equipment.	Receipt inspection by SS. Operator qualification by SS. Inspect all equipment upon arrival at site and on each day of use. Use equipment checklist. Have operations manual onsite and be familiar with proper use of equipment and attachments.
2. Level D PPE including USCG-approved personal flotation device (PFD)	Training in proper use and limitations of PFDs. Auto-inflatable PFDs will not be authorized for this project. Boat captain will brief workers on the use and limitations of PFDs and the location stowed on boats (when stowed vs.	Daily inspection by users.

AHA #3 – Job/Task: Transportation of Equipment/Materials by Boat		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
	worn). Training in how to inspect and what to inspect for different types of PFDs.	
3. Throw ring(s) (30 inch minimum) and 90 feet of attached throw line on each ring.	Training in proper use and limitations of throw rings.	Daily inspection.
4. Fire extinguishers	Fire extinguisher training including use/limitations.	At least monthly by SSHO or designee.
5. 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.	First aid kits must be inspected weekly as required by OSHA. Fire extinguishers must be inspected monthly. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.

Abbreviations and Acronyms:

- AHA – Activity Hazard Analysis
- ANSI – American National Standards Institute
- APP – Accident Prevention Plan
- CIH – Certified Industrial Hygienist
- EHS – environmental health and safety
- EM – Engineer Manual
- kV – kilovolt
- OSHA – Occupational Safety and Health Administration
- PFD – Personal Flotation Device
- PPE – personal protective equipment
- RAC – Risk Assessment Code
- SS – Site Superintendent
- SSHO – Site Safety and Health Officer
- UXO – unexploded ordnance

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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Activity Hazard Analysis (AHA) #4

Job/Task: Explosive Demolition Activities	Overall Risk Assessment Code (RAC) (Use highest code)	H
Project Location: Nomans Land Island, Chilmark, MA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-13-D-8007	Severity	Probability
Date Prepared: April 2014		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Becky Whalen, Remediation Engineer	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM	Marginal	H M M L L
	Negligible	M L L L L
<p>Notes: (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.</p>	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.	RAC Chart
	“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	E = Extremely High Risk
		H = High Risk
		M = Moderate Risk
		L = Low Risk
	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.	

AHA #4 – Job/Task: Explosive Demolition Activities			
Job Steps	Hazards	Controls	RAC
Explosive Demolition	Exposure to MEC	<ul style="list-style-type: none"> Follow the procedures detailed in the Work Plan and reference EP 385-1-95a. Only UXO qualified personnel will assess and handle MEC/UXO. UXO personnel will not handle or move MEC/UXO until a positive identification can be made. UXO personnel will not move MEC or UXO potentially containing all-ways-acting fuzes. 	H
	Explosive transport of donor explosives by vehicle/boat operation	<ul style="list-style-type: none"> Driver training. Ensure vehicle meets the requirements of 49 CFR 100 to 199 and is operated under the guidance of NAVSEA OP-2239. Only the driver and one helper shall ride in a vehicle transporting explosive material. 	H

AHA #4 – Job/Task: Explosive Demolition Activities			
Job Steps	Hazards	Controls	RAC
Explosive Demolition (continued)		<ul style="list-style-type: none"> For boat operations, review AHA # 3 Boat Operations, in addition to this AHA 	
	Back Injuries and strains	<ul style="list-style-type: none"> Mechanical devices should be used to reduce manual handling of materials. Team lifting should be utilized if mechanical devices are not available. An individual will not lift loads greater than 50 pounds. Know your own limits – may be less than 50 lbs. 	M
	Slips/Trips/Falls	<ul style="list-style-type: none"> Visually inspect work areas and mark, barricade, or eliminate slip, trip and fall hazards if feasible. Maintain work areas safe and orderly Unloading areas should be on even terrain. Watch and prepare for uneven terrain, stumps, and vegetation in walk areas. Replace work boots when worn out or the tread on the sole does not provide traction. Tools and supplies/equipment will be properly stored. 	M
	Sharp Objects/punctures	<ul style="list-style-type: none"> Leather (minimum) or cut resistant gloves will be worn depending on the material working with. All hand and power tools will be maintained in a safe condition. When possible, blunt all sharp objects. First aid kits will be available by the work area. 	M
	Noise	<ul style="list-style-type: none"> Hearing protection with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs) will be worn during heavy equipment and metal cutting operations (equipment operator and workers within 50 feet). All equipment will be equipped with manufacturer’s required mufflers. Workers will be given auditory exams and hearing conservation training. 	M
	Eye Injuries	<ul style="list-style-type: none"> ANSI approved safety glasses will be worn for all field operations. A portable 15-minute eye wash station will be located adjacent to work activities. 	M
	Fire	<ul style="list-style-type: none"> Only use NFPA-approved fuel cans with a pouring spout or funnel. Smoking and open flames are not permitted in fueling areas. A 2A:20B:C fire extinguisher will be located at each work site within the exclusion zone; and, a 10A:120BC fire extinguisher will be located within 50 to 75 feet of all flammable/combustible liquid storage areas and refueling points. All gasoline-powered equipment will be grounded before fueling. 	M

AHA #4 – Job/Task: Explosive Demolition Activities			
Job Steps	Hazards	Controls	RAC
Explosive Demolition (continued)	Biological Hazards; stings, bites, allergic reaction, rabies and claw wounds.	<ul style="list-style-type: none"> Equip all heavy equipment with BC-type fire extinguishers. Avoid putting hands into hidden areas, holes, burrows, under structures, etc. Be alert when walking; snakes may be present on roadways or in streambeds. If evidence of biological hazards exists, review the procedures in the APP and coordinate with the UXOSO for control measures. If allergic to bees/wasps, ensure an epinephrine (MSDS needed on site) kit is readily available (by prescription only). Make sure the UXOSO and SUXOS are informed of the condition and that the Medical Data sheet is updated and contains the necessary information. 	M
	Temperature Extremes	<ul style="list-style-type: none"> Site personnel will be trained about signs and symptoms of heat/cold stress; The UXOSO will monitor daily temperatures and determine work/rest schedules. Adequate cool water or electrolyte beverage (e.g. Gatorade®) will be available for all workers 	M
	Lightning	<ul style="list-style-type: none"> Follow the 30-second rule (time between lightning strike and thunder) for shutdown of operations, or as determined by the UXOSO. Seek shelter in building (preferred) or vehicle. Immediately suspend operations when lightning is in the immediate vicinity and seek shelter. 	M
	High Wind	<ul style="list-style-type: none"> Ensure that all debris/materials are secured. Shut down operations when wind speed is greater than 30 mph sustained. 	M
	Exposure to MEC and/or high explosives	<ul style="list-style-type: none"> Ensure a minimum of three UXO Technicians per team will be used to conduct disposal operations. Ensure the safety observer is located in the safe area maintains visual contact with the team down range Ensure site radios are working Review the Demolitions SOP Provide a specific brief with an operation overview Ensure all required materials are present Ensure the EZ has been put in place Review CRL Procedure UXO-3 and the general safety precautions Review emergency procedures Review explosives handling procedures Ensure required notifications have been made Ensure all nonessential personnel are outside the EZ and man the barricades (if used) 	H

AHA #4 – Job/Task: Explosive Demolition Activities			
Job Steps	Hazards	Controls	RAC
Explosive Demolition (continued)		<ul style="list-style-type: none"> Ensure the 5 minute and 1 minute warning horns are sounded Ensure misfire wait times are enforced 	
MEC Removal(includes removal of 500 lb practice bombs)	MEC/MPPEH Hazards	<ul style="list-style-type: none"> UXO operations will be conducted by trained UXO Technicians. Non-UXO personnel will be clear of the area during donor explosives handling and demolition activities. Exclusion zone distances will be defined based on those specified in the Work Plan and ESP. MEC/MDEH will be destroyed on the same day it is found if possible. If not possible it will be guarded until destroyed. Donor explosives will be delivered on an “as needed basis”. Donor explosives will be guarded until used. 	
	Explosives Handling	<ul style="list-style-type: none"> Only UXO Technicians will be permitted to handle and/or transport explosives and detonators. Only UXO Technicians will be permitted to load and detonate explosive materials per this scope of work. 	M
	Initiating Explosives	<ul style="list-style-type: none"> Segregation - Strict adherence will be practiced with regard to the segregation of initiating devices (cord and detonators) from the donor explosives during storage and transport. Non-essential personnel will be restricted from operating area 	M
	Slips/trips/falls	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. Establish good footing. Wear work boots with soles that have good traction. Work carefully in non-level steep slope areas. Consider use of clamp-on shoe spikes for walking on slopes. Workers will not climb slopes greater than 45° unless they are wearing a full body harness tied off to a lifeline (attached to a stationary object and system designed to support 5,000 pounds).	M

AHA #4 – Job/Task: Explosive Demolition Activities		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
Heavy equipment, hand tools, power tools	Only trained equipment operators may operate heavy equipment Specific training for power tools, hand tools, and electrical safety.	Daily or before use. Equipment must be inspected and certified as operational by a competent person.

AHA #4 – Job/Task: Explosive Demolition Activities		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
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.	First aid kits must be inspected weekly as required by OSHA. Fire extinguishers must be inspected monthly. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.

Abbreviations and Acronyms:

- AHA – Activity Hazard Analysis
- APP – Accident Prevention Plan
- CIH – Certified Industrial Hygienist
- CRL – Corporate Reference Library
- EM – Engineer Manual
- MEC – munitions and explosives of concern
- mph – miles per hour
- MPPEH – material potentially presenting an explosives hazard
- OSHA – Occupational Safety and Health Administration
- PPE – personal protective equipment
- RAC – Risk Assessment Code
- SSHO – Site Safety and Health Officer
- UXO – unexploded ordnance

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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Activity Hazard Analysis (AHA) #5

Job/Task: MPPEH Certification and Verification	Overall Risk Assessment Code (RAC) (Use highest code)	H
Project Location: Nomans Land Island, Chilmark, MA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-13-D-8007	Severity	Probability
Date Prepared: April 2014		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Becky Whalen, Remediation Engineer	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM	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. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures. Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.	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.	RAC Chart
	“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	E = Extremely High Risk
		H = High Risk
		M = Moderate Risk
	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.	L = Low Risk

AHA #5 – Job/Task: MPPEH Certification and Verification			
Job Steps	Hazards	Controls	RAC
Surface Sweep Operations	Contacting MPPEH materials. (Some MPPEH may be classified where and when found)	<ul style="list-style-type: none"> Evacuate all non-essential personnel from area before any processing MPPEH. Mark MEC avoid positive targets. Travel routes which have been cleaned by UXO Technicians Don't pick up, touch, step on or otherwise bother any items that could be MPPEH. Notify the supervisor if any MPPEH is suspect. Don't enter any area in which MPPEH is suspected without authorization. Immediately evacuate to safe zones when notified to do so. Conduct drill shall prior to start of work and have periodical refresher; Train each new worker in the evacuation procedures. Review TtEC procedure UXO-4 –General UXO Safety Precautions with all site workers. 	H

AHA #5 – Job/Task: MPPEH Certification and Verification

Job Steps	Hazards	Controls	RAC
MPPEH Processing (includes initial processing to occur at Nomans Island and final inspection/processing and packaging to occur at Martha’s Vineyard)	MPPEH classification Certification and Verification material is MDAS (unplanned detonation) Exposure to MEC or MDAH	<ul style="list-style-type: none"> • Install exclusion zone (EZ) • Evacuate all non-essential personnel from EZ before processing MPPEH • Ensure the Senior UXO Supervisor or designated UXO Tech III is present. • Performed by an UXO Tech III and SUXO with-qualified personnel only • Under no circumstances will personnel work alone. • Positively identify all munitions. • Keep all spark- and flame-producing materials away from energetic materials. • Do not handle ammunition and explosives roughly or carelessly. Extra care should be taken because in most cases the hazards of the ammunition and/or explosives increase with age, deterioration, or damage. 	H
	Ergonomic hazards such as sprains, strains, or back injury from lifting or repetitive actions	Use mechanical lifting equipment or team lift when possible rather than by hand and tool methods. Do not bend at the waist, bend at the knees. Do not twist at the waist and turn while lifting. Keep the load centered and close to body. Do not lift more than 50 pounds (may be lesser for some personnel) alone. Rotate tasks and take breaks when performing repetitive tasks and try to find the best position possible to perform the task. Review AHA #7 Hoisting/Lifting and Rigging where applicable.	M
	Heavy equipment hazards	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers will wear high visibility vests	M
	Material handling could cause injury.	<ul style="list-style-type: none"> • Identify and avoid pinch points. • Maintain communication with others involved in material handling. Use appropriate PPE.	M
	Handling sharp objects or using hand tools could cause cuts, punctures, or scrapes	Wear leather work gloves when handling materials that may be sharp or have sharp edges. Be familiar with the proper use and limitations of hand tools. Report even minor injuries to your supervisor for evaluation. Have a first aid kit available and have a minimum of 2 persons with first aid and CPR training onsite.	M
Transport of MDAS to Martha’s Vineyard for Final Processing	Boating Operations	Review AHA #3 Boat Operations, in addition to this AHA.	H

AHA #5 – Job/Task: MPPEH Certification and Verification		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
Vehicles, equipment, hand tools.	Only DMV-licensed personnel will operate vehicles. Specific training for power tools and hand tools will be provided.	Daily and before use. Use the equipment safety checklist
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.	First aid kits must be inspected weekly as required by OSHA. Fire extinguishers must be inspected monthly. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.

Abbreviations and Acronyms:

- AHA – Activity Hazard Analysis
- APP – Accident Prevention Plan
- CIH – Certified Industrial Hygienist
- CPR – Cardiopulmonary Resuscitation
- EM – Engineer Manual
- EZ – Exclusion Zone
- MEC – munitions and explosives of concern
- MPPEH – material potentially presenting an explosives hazard
- OSHA – Occupational Safety and Health Administration
- PPE – personal protective equipment
- RAC – Risk Assessment Code
- SSHO – Site Safety and Health Officer
- UXO – unexploded ordnance

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

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Activity Hazard Analysis (AHA) #6

Activity/Work Task: Site Demobilization	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Nomans Land Island, Chilmark, MA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-13-D-8007	Severity	Probability
Date Prepared: April 2014		Frequent Likely Occasional Seldom Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by: Roger Margotto, CIH, CSP, CHMM	Marginal	H M M L L
	Negligible	M L L L L
<p>Notes: (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest.</p>	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.	RAC Chart
	“ Severity ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	H = High Risk
		M = Moderate Risk
		L = Low Risk

AHA #6 – Activity/Work Task: Demobilization			
Job Steps	Hazards	Controls	RAC
Removal of materials and equipment from work areas and consolidate for offsite removal and demobilization	Construction equipment could cause injury to personnel.	Wear high visibility vests when exposed to vehicular traffic. Exit equipment slowly and maintain three point contact. Review and follow standard hand signals. Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds and obey local traffic speeds and rules. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will make contact with the operator and have operator acknowledgment prior to approaching. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator. Operator's	M

AHA #6 – Activity/Work Task: Demobilization			
Job Steps	Hazards	Controls	RAC
		manual required for each piece of equipment.	
Removal of materials and equipment from work areas and consolidate for offsite removal and demobilization (continued)	Noise could cause hearing loss while using saws or working around operating heavy equipment	Hearing protection is required when sound levels exceed 84 dBA continuously.	M
	Hoisting and Rigging for unloading of materials or equipment (if used during this AHA)	Refer to AHA 7 – Hoisting/Lifting and Rigging, which will be followed in addition to this AHA.	M
	Workers could experience strains from manually moving materials and equipment.	Direct personnel to use proper lifting techniques, such as keeping the back straight, lifting with the legs without twisting at the waist, and getting help when moving bulky/heavy materials and equipment. 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. Use equipment as much as possible to maneuver heavy or awkward items.	M
	Slips, trips, and falls	Work areas can be slippery and materials can be in the way. Use caution when walking on slopes and especially when carrying tools as falls with tools can injure the person. Follow good housekeeping practices with materials in the worksite. Clear walkways and work areas of equipment, tools, and debris, mark or barricade other obstructions. Clean mud from boots before climbing on equipment.	M
	Punctures, cuts, scrapes, from cutting and removing silt fence and other materials	Wear leather work gloves when handling cutting tools and removing fence posts. If knives are used, they will be retractable blade. Never carry a knife in a pocket on one's body. Always cut away from the body.	M
	Workers could be exposed to extreme temperatures and sunburn.	Monitor for heat or cold stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather, and while wearing protective clothing. Wear broad-spectrum sunscreen lotion of SPF 15 or better.	M
	Exposure to poison ivy or oak.	Provide training for recognizing poison ivy and avoid contact with these plants. Wear long sleeve shirts and pants. Wear durable disposable coveralls and disposable gloves. Wear an "ivy blocker" and have Technu® or Zanfel, and an isopropyl alcohol post-exposure washing agent available.	M

AHA #6 – Activity/Work Task: Demobilization			
Job Steps	Hazards	Controls	RAC
		Review APP Attachment 1 in addition to this AHA. Refer to Health and Safety Guideline (HSG) 2-8 in the CRL for details.	
Removal of materials and equipment from work areas and consolidate for offsite removal and demobilization (continued)	Failure to observe and prepare for encounter with insects could cause injury to worker.	Wear protective clothing, such as work boots, socks, and pants. Use insect repellent as necessary. Be sure to wear protective gloves. Use insect repellent as necessary.	M
	Workers could be injured by high winds of sudden storms.	Ensure that all debris/materials are secured. Shut down operations when wind speed is greater than 30 mph sustained or lesser based on potential hazards (e.g., tree limbs could fall) or lightning within 10 miles. Monitor the local weather report daily and as necessary for any severe weather warnings. Know the procedures to follow in the event of severe weather emergencies. Have a lightning detector on hand.	M
	Eye injuries with dust or debris	Workers will wear safety glasses. Locate a portable emergency eye wash at each work area. If something enters the eye, do not rub. Set up portable eyewash for flushing of eye to try to remove object. Notify supervisor so eye can be monitored. If object still irritates or stays in the eye, seek medical attention as soon as possible. Follow up with eye exam is recommended any time an object gets into an eye since it is necessary to ensure object does not remain, even if it cannot be felt. To keep dust down, travel at slower speeds on unpaved roads and laydown areas.	M
	Improper use of hand tools such as shovels, hammers, and rakes can cause injury	Use the right tool for the job. Inspect tools before use. Do not use defective tools. Wear gloves when using any pounding tools or shovels and rakes.	M
Transporting and loading/unloading of personnel and equipment by boat	General	Review AHA #3 Boat Operations, in addition to this AHA.	M

AHA #6 – Activity/Work Task: Site Restoration and Demobilization		
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.	Daily vehicle inspection by drivers. Receipt inspection by SS.
Heavy Equipment	Operators will be qualified and experienced operators for use of the equipment they operate	Receipt inspection by SS. Daily inspection by operator.
Hand 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. Inspect tools and power cords to ensure they are listed by a NRTL. Inspect for damage to tool and to cords.
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. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used

- Abbreviations and Acronyms:**
- AHA – Activity Hazard Analysis
 - APP – Accident Prevention Plan
 - CHMM – Certified Hazardous Materials Manager
 - CIH – Certified Industrial Hygienist
 - CSP – Certified Safety Professional
 - EHS – Environmental, Health, and Safety
 - HSG – Health and Safety Guideline
 - NRTL – National Technical Reports Library
 - SS – Site Superintendent

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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Activity Hazard Analysis (AHA) # 7

Activity/Work Task: Hoisting/Lifting and Rigging	Overall Risk Assessment Code (RAC) (Use highest code)	H
Project Location: Nomans Land Island, Chilmark, MA	Risk Assessment Code (RAC) Matrix	
Contract Number: N62470-13-D-8007	Severity	Probability
Date Prepared: April 2014		Frequent Likely Occasional Seldom Unlikely
Prepared by: Becky Whalen, Remediation Engineer	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by: Roger Margotto, CIH, CSP, CHMM	Marginal	H M M L L
	Negligible	M L L L L
<p>Notes: (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.</p> <p>Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.</p>	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.	RAC Chart
	“ Severity ” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on the AHA. Annotate the overall highest RAC at the top of the AHA.	H = High Risk
		M = Moderate Risk
	L = Low Risk	

AHA # 7 – Activity/Work Task: Hoisting/Lifting and Rigging			
Job Steps	Hazards	Controls	RAC
Operation of heavy equipment, general	Construction equipment could cause injury to personnel	Workers operating construction equipment will be qualified and designated operators. Operate at safe speeds. Wear seat belt while seated. Use dedicated spotter and standard hand signals for backing operations. Construction equipment will have backup alarms installed. Workers working around construction equipment will stay out of the swing radius and to enter the swing radius, must make contact with the operator and have operator acknowledgement prior to entry. Only personnel necessary to perform work tasks will be in controlled work zones around heavy equipment and must remain visible to the operator.	M

AHA # 7 – Activity/Work Task: Hoisting/Lifting and Rigging			
Job Steps	Hazards	Controls	RAC
General Precautions	Task hazards and general precautions on use of this AHA.	Refer to AHAs for work tasks in which hoisting and rigging will be performed as part of that task (e.g., mobilization and site setup and MEC removal). Materials being hoisted and the hazards will vary based on what is being lifted and where it is being placed. All hoists and all rigging situations will be unique and must be properly evaluated by the Competent Person (TBD) and the operator of the heavy equipment being used. Tasks in which hoisting and rigging may be performed may include mobilization and demobilization, MEC removal, transportation of equipment/materials by boat, etc. All these tasks have unique hazards to consider. This AHA addresses general precautions for performing hoisting and rigging tasks.	M
	MEC hazards	<ul style="list-style-type: none"> • Travel routes which have been cleaned by UXO Technicians • Ensure MEC have been marked and avoid positive targets. • Don't pick up, touch, step on or otherwise bother any items that could be MPPEH. • Notify the supervisor if any MPPEH is suspect. Don't enter any area in which MPPEH is suspected without authorization. • Immediately evacuate to safe zones when notified to do so. • Train each new worker in the evacuation procedures. Review TtEC procedure UXO-4 –General UXO Safety Precautions with all site workers.	M
	Slips, trips, and falls	Clear area to be worked in of loose debris and trip hazards. Ensure a travel path for rigging team.	L
	Heavy lifting and awkward positions	Team-lift or use material handling devices as required. Use good posture when lifting or moving materials. Do not self-lift more than 50 pounds alone. Avoid jerking movements or rotating while walking.	L
Rigging and hoisting operations	Improper hoisting and rigging experience and training could result in injuries to workers or equipment damage	The hoisting and rigging competent person, (TBD) will oversee all use of rigging and all hoisting operations performed onsite on a task specific basis. Persons performing equipment operation and rigging tasks will have written proof of qualifications for these tasks. The subcontractor, when required, will provide a qualified rigger to perform the rigging within the EZ when required. This person, when name becomes known, will be added to this AHA as a competent person.	M
	Improper stability of equipment or swing radius could cause equipment failure or damage	The operator will ensure that adequate swing radius for equipment, rigging, and load is established prior to performing the pick.	M

AHA # 7 – Activity/Work Task: Hoisting/Lifting and Rigging			
Job Steps	Hazards	Controls	RAC
Rigging and hoisting operations (continued)		The ground under the hydraulic excavating equipment will be stable and verified sufficient for equipment and load stability. Load charts will be consulted for the lift as applicable.	
	Failure of rigging or equipment used to perform the hoist could result in injury or equipment damage	Operational testing will be performed as required by EM 385 1-1 Section 16.S.03.b. This testing will be documented by the competent person. More than one test may be required depending upon the materials being hoisted and the rigging being used. All equipment used for hoisting will meet the manufacturer's guidelines for use in performing hoisting tasks (or the equipment will not be used for this purpose). All operating procedures will be per the manufacturer's operating manual, including load rating capacities and charts if required. No hoisting or rigging tasks will be done that constitute a critical lift. If load capacity is within 20 % of capacity, a larger piece of equipment or another means of lifting will be provided. Never allow persons to be positioned under a suspended load.	M
	Improper or damaged rigging could cause injury or loss of load	Only positive latching devices will be used to secure the load and rigging. All rigging used to perform the hoist will be inspected by the competent person to ensure it is properly rated, is in good condition, and is properly configured for the lift. Taglines will be used to control the load being hoisted and moved as necessary to control the load movement.	M
	Setting up of rigging could lead to cause pinch points, cuts, or scrapes	Ensure neutral configuration of rigging and slack in rigging before attaching straps. Ensure communication with operator before attaching rigging so that boom and bucket on excavator are not engaged. Wear leather work gloves. Watch out when running hands underneath or on equipment or materials due to sharp edges or pinch points. Wear leather work gloves when handling rigging and materials.	M
	Improper communications and planning	The rigger and the operator will be in visual and verbal communication.	M

AHA # 7 – Activity/Work Task: Hoisting/Lifting and Rigging			
Job Steps	Hazards	Controls	RAC
Rigging and hoisting operations (continued)	could lead to confusion and errors in the pick	Standard and recognized hand signals will be used for communication. Rigger and operator to verify that non-involved persons are clear of the load (not underneath or in swing radius). Lift will not occur until rigger notifies operator to do so.	
	Release of rigging could lead to cause pinch points	Ensure neutral configuration of rigging and slack in rigging before releasing straps. Ensure communication with operator before removing rigging so that boom and bucket on excavator are not engaged. Wear leather work gloves.	M
Barge Crane Operations - Lift planning (pre planning).	General – Hazard assessment and lift planning for crane operations.	<p>A subcontractor Competent Person (TBD) (will be included at a later date) will evaluate and weight, pick points, access and egress, work location, and other factors in advance of bringing a crane on the barge and develop a site-specific Lift Plan. A portion of the work with this crane may be a critical lift and a Critical Lift Plan will need to be developed for that activity (e.g., floating pier placement). A Crane package will be developed, including the Lift Plan that details all the required information, including rigging and inspection/certification details for the crane and all rigging.</p> <p>This AHA task hazard analysis may be revised based on input from the subcontractor depending on the specific required activities, tools, and equipment used after the subcontract is in place and identify more detailed work steps.</p>	M
Barge Crane Operations - Provide for adequate clearance and stability of crane on barge	Potential for restricted motion of crane in swing radius as well as potential development of pinch points on barge deck	Prior to using crane, the area around the crane will be evaluated for material that may be within this zone.	M
Barge Crane Operations - Crane operational testing and pre-ops inspections	Lack of load testing within full operational range could lead to destabilizing of crane, side load of boom, or unstable picks	Competent person (TBD) to perform all required inspections of equipment and rigging before use. Qualified rigger and crane operator will perform with inspections and testing and the SUXOS and SSHO will observe prior to commencing with placement of agent. Navy representative may also be present during inspections and operational testing. Conduct required operational testing and document the testing. Barge will be spudded.	H
	Improper rigging of crane could cause injury or result in load shift or drops	Operator and rigger(s) and any other parties of the lift team will review Lift Plan and plan each step of the lift in advance and sign the lift plan.	H

AHA # 7 – Activity/Work Task: Hoisting/Lifting and Rigging			
Job Steps	Hazards	Controls	RAC
Barge Crane Operations - Crane operational testing and pre-ops inspections (continued)		<p>Riggers will be Competent Persons (TBD) for rigging inspection and use/limitations. The crane operator will be a Competent Person (TBD) for crane operation. Rigging use will be per the approved Crane Package. Changes to Lift Plan must be approved in advance. Rigging will be inspected by a Competent Person before use, and any deficient or damaged rigging will be taken out of service. All required tags and certifications will be on rigging and visible for inspection. Tag lines, as necessary, will be put into place with the load prior to lift.</p> <p>Ensure that the load is in a neutral and secure position (not under tension) prior to placing hands, feet, or other body parts in any potential pinch points of the load or rigging.</p> <p>Use tools properly. Only use tools that are meant for the task. Do not use damaged or worn tools.</p>	
Removal of 500-lb munitions in the event that munitions are not accessible from the shoreline.	General hazards.	<p>Review Section 9.21 of the APP in addition to this AHA.</p> <p>The munitions will be removed using ordnance handling equipment (OHE) in the form of non-metallic slings, shackles and tag lines. The major concern of the OHE used in this project is that the safe working load of the slings used is sufficient to safely lift the primary MGF D Mk 83 bomb, which weighs 1,000 pounds or the contingency Mk 84 bomb, which weighs 2000 pounds. To ensure the OHE is capable of lifting this weight, at least 2-inch nylon slings (18,000 pound breaking strength) or 3/8-inch wire rope (12,200 pound breaking strength) tag lines will be used to stop the sway of items being lifted.</p> <p>OHE will be verified by the manufacturer to have been load tested. When the project is completed, use of the OHE will be discontinued; therefore, the 4-year inspection requirement required by OP 5, Chapter 10, will not be necessary.</p>	M

AHA # 7 – Activity/Work Task: Hoisting/Lifting and Rigging		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
Excavator or loader (equipped properly for attachment of rigging)	Trained and experienced operators will operate heavy equipment.	Receipt inspection by SS. Daily inspection by users/operators. Task observation of operators by SS. Ensure equipment meets manufacturer's guidelines for performing hoisting. Have copy of manufacturer's operation manual onsite.
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.
Hoisting and Rigging Equipment	Competent person (TBD) is responsible for hoisting and rigging	Initial and before use inspection of equipment and material used for hoisting and rigging, operational testing of the equipment and material.

Abbreviations and Acronyms:

- AHA – Activity Hazard Analysis
- APP – Accident Prevention Plan
- CHMM – Certified Hazardous Materials Manager
- CIH – Certified Industrial Hygienist
- CSP – Certified Safety Professional
- MPPEH – material potentially presenting an explosives hazard
- OHE – Ordnance Handling Equipment
- SSHO – Site Safety and Health Officer
- SS – Site Superintendent
- PPE – personal protective equipment
- TBD – To be determined

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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Activity Hazard Analysis (AHA) #8

Job/Task: Utility Vehicle Operations	Overall Risk Assessment Code (RAC) (Use highest code)	M									
Project Location: Nomans Land Island, Chilmark, MA	Risk Assessment Code (RAC) Matrix										
Contract Number: N62470-13-D-8007	Severity	Probability									
Date Prepared: April 2014		Frequent Likely Occasional Seldom Unlikely									
Prepared by (Name/Title): Becky Whalen, Remediation Engineer	Catastrophic	E E H H M									
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, CHMM	Critical	E H H M L									
	Marginal	H M M L L									
	Negligible	M L L L L									
	<p>Notes: (Field Notes, Review Comments, etc.)</p> <p>In addition to the information listed in this AHA, all field personnel must review and be familiar with all provisions of the approved APP. EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures. Operators and riders must comply with EM 385-1-1 SECTION 18.J</p> <p>Utility vehicles are specialty vehicles designed to perform off-road utility tasks such as passenger and cargo transportation. (e.g. Rangers, Rhino, M-Gators, Gators, Mules, etc.)</p> <p style="color: red;">Personal Protective Equipment for this AHA will consist of hard hat (when overhead safety hazards exist), safety toed boots, safety glasses with side shields, standard work uniform (long pants, ¾ length sleeve shirt). Hearing protection (as required). Work gloves worn when indicated, High visibility safety vest. Additional PPE as specified below.</p>										
<p>Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (see above).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"> <p>“Probability” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.</p> </td> <td style="text-align: center;">RAC Chart</td> </tr> <tr> <td rowspan="2"> <p>“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.</p> </td> <td style="text-align: center;">E = Extremely High Risk</td> </tr> <tr> <td style="text-align: center;">H = High Risk</td> </tr> <tr> <td></td> <td style="text-align: center;">M = Moderate Risk</td> </tr> <tr> <td></td> <td style="text-align: center;">L = Low Risk</td> </tr> </table>			<p>“Probability” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.</p>	RAC Chart	<p>“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.</p>	E = Extremely High Risk	H = High Risk		M = Moderate Risk		L = Low Risk
<p>“Probability” is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.</p>	RAC Chart										
<p>“Severity” is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.</p>	E = Extremely High Risk										
	H = High Risk										
	M = Moderate Risk										
	L = Low Risk										

AHA #8 – Job/Task: Utility Vehicle Operations			
Job Steps	Hazards	Controls	RAC
Daily Inspection – Including walk-around, preventative maintenance checks, horn test, lights operation, seat belts, etc.	Minimal – Walking, Inspecting	<ul style="list-style-type: none"> Inspector will maintain an “eyes-on” mentality. Inspection personnel will be suitably dressed with appropriate PPE. Daily inspection sheet will be used for inspection by a qualified operator. 	L

AHA #8 – Job/Task: Utility Vehicle Operations			
Job Steps	Hazards	Controls	RAC
Operation of Utility Vehicle	Struck by other vehicles	<ul style="list-style-type: none"> Utility Vehicles will be equipped with a whip and high visibility flag. Utility vehicles will not be operated on public roadways. Lights will be used during low visibility. Brake lights will be kept visible and clean. 	M
	Lack of visibility	<ul style="list-style-type: none"> If visibility conditions warrant additional light, all vehicles will be equipped with at least two headlights, two taillight and a yellow flashing light or equivalent 	M
	Falling from	<ul style="list-style-type: none"> Personnel will ride in designated seats with seat belts fastened. No personnel allowed to ride in bed or other positions. Personnel will not wear excessively loose clothing, scarves, etc. that can become entangled outside the vehicle or catch on controls within the vehicle Personnel will fasten seatbelts before releasing brake and moving. 	M
	Vehicle Rollover	<ul style="list-style-type: none"> Utility Vehicles speed will be limited to 15 MPH max. Personnel will not engage the differential lock while moving Vehicle Rollover Protective System (ROPS) will not be modified or removed. If vehicle is not equipped with ROPS, operators and riders will wear approved helmet meeting DOT 218 standards (motorcycle helmet). Hard hats do not meet this standard. 	M
	Loss of control - Travel at high speeds, traveling up or down steep grades, or towing loads greater the allowed by the manufacturer, or improper loading can cause loss of steering or control	<ul style="list-style-type: none"> No “cross country” type driving is allowed. Vehicle will stay on project roads. Towed and carried loads will be in accordance with manufacturer’s directions. All cargo, if carried, will remain within the “platform” of the vehicle. No item will hand off the vehicle as that can affect the center of gravity of the vehicle. Brakes and other controls will be un-obscured by debris, cargo, etc. Maximum cargo in bed is 1100 lbs. Cargo is not to be carried on the ROPS. Carrying heavy material high on the vehicle will affect the center of gravity and handling. Do not engage the front wheel drive when traveling at speed. Travel is restricted to project roadways (no public roads driving – vehicle is not licensed or insured). Speed is limited to 15 MPH – slower when rough surfaces are encountered. Be fully in the driver’s seat before starting engine and releasing parking break. Wear seat belts. 	M

AHA #8 – Job/Task: Utility Vehicle Operations			
Job Steps	Hazards	Controls	RAC
Operation of Utility Vehicle (continued)	Striking others, materials falling from vehicle, shifting materials affecting control	<ul style="list-style-type: none"> • Cargo will be secured by full placement within the bed sides. Larger pieces will be secured by use of tie down straps. • Larger items will be transported using other site vehicles with sufficient capacity 	L
	Vehicle Rollaway	<ul style="list-style-type: none"> • Vehicle stopped with transmission in neutral and the parking brake applied. • Be fully in the driver’s seat before starting engine and releasing parking break. • Avoid parking on steep slopes, if unavoidable, park across the slope. 	M
	Driver distraction	<ul style="list-style-type: none"> • Personnel will not operate vehicle while communicating on radio, or conversing on a cell phone. • Horse play is not allowed at any time, particularly while operating a vehicle. 	M
	Dust or dirt in eyes	<ul style="list-style-type: none"> • Speed will be restricted to 15 mph or less to minimize wind in eyes, bugs dirt and debris. • Without windshields operators and passengers will wear goggles at all times when vehicle is in motion (18.J.11) (utility vehicles are not required to have windshields). 	M
Servicing Vehicle	Fueling	<ul style="list-style-type: none"> • Shut off engine prior to fueling (diesel). Fuel only in designated fueling area. (Fire extinguisher available in the area. Vehicle must have a mounted 10 B:C minimum fire extinguisher.) 	L
	Maintenance	<ul style="list-style-type: none"> • Follow instructions in manufacturer’s instructions. Disconnect the battery if working on or near electrical systems. • Chock wheels if working under vehicle or if working on brakes, or drive train. • Remove key from ignition and pocket it whenever working on vehicle to prevent others from starting/moving it. 	L

AHA #8 – Job/Task: Utility Vehicle Operations		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
Utility Vehicle Operation	Only Trained and authorized personnel will operate off road vehicles. Personnel will be familiar with the Operator’s Manual. Training will be documented. Training must comply with EM 385-1-1 Section 18.J.02	Document that operators and passengers have received training. See training requirements below.

AHA #8 – Job/Task: Utility Vehicle Operations		
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
Utility Vehicle Inspection	Trained Operators will be considered to be competent to perform daily inspections. Receipt inspection will be performed by Mechanic, SSHO and Superintendent.	Daily inspection by users/operators. Operators manual must be available at all times. Conduct inspections as required by operators manual.
Fire extinguishers	Fire extinguisher training including use/limitations.	At least monthly by SSHO or designee.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis
 APP – Accident Prevention Plan
 CHMM – Certified Hazardous Materials Manager
 CIH – Certified Industrial Hygienist
 CSP – Certified Safety Professional
 DOT – Department of Transportation
 EM – Engineer Manual
 mph – miles per hour
 PPE – personal protective equipment
 RAC – Risk Assessment Code
 ROPS – roll over protective system
 SSHO –site safety and health officer

AHA Signature Sheet

I have reviewed the above AHA and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
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18. J.02 Utility vehicle operators shall be trained.

- a. They must be familiar with the use of all controls and understand proper moving, stopping, turning and their operating characteristics of the vehicle.
- b. Operators must review all training materials provided by the manufacturer for the specific vehicles, and training should be in accordance with appropriate manufacturer recommendations. At a minimum, training shall be documented and shall address:
 - (1) Basic riding tips from the manufacturer's published literature for each vehicle;
 - (2) Reading terrain;
 - (3) Climbing hilly terrain;
 - (4) Descending a hill;
 - (5) Traversing a slope;
 - (6) Riding through water;
 - (7) Cargo carriers and accessories;
 - (8) Loading and unloading;
 - (9) Troubleshooting;
 - (10) Proper preventative maintenance, i.e., oil levels, tire pressure requirements and scheduled maintenance requirements according to the manufacturer's guidelines.

APPENDIX B

CORPORATE SAFETY AND HEALTH POLICY STATEMENT

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STATEMENT OF SAFETY AND HEALTH POLICY

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 expected 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.

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APPENDIX C
EHS PROGRAMS AND PROCEDURES

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Purpose: The purpose of this procedure is to identify minimum requirements, and to provide guidance to Tetra Tech EC, Inc. (TtEC) project personnel concerning the management of construction tools and equipment on a construction project incorporating the Corporate operating principles of 'Do It Right

®
, 'Client Service Quality
®
, and 'Shared Vision
SM
'.

Status:	Complete	Approved By:	John DeFeis
Version Date - Type:	10/16/2009 - Revised	Title:	Construction Tools and Equipment
Category:	Company Procedures	Original Issue	
Sub-Category:	Departmental/Discipline	Date:	
Keyword Index:		Sections:	Construction
		Document	Procedure
		Type:	
		Document	Tom DelMastro
		Owner	

- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 MINIMUM REQUIREMENTS
 - 3.1 DEFINITIONS
 - 3.2 ROLES & RESPONSIBILITIES
 - 3.3 SAFE OPERATION REQUIREMENTS FOR TOOLS
- 4.0 GUIDANCE
 - 4.1 ADDITIONAL CONSIDERATIONS
- 5.0 REFERENCES
- 6.0 ATTACHMENTS

The purpose of this procedure is to identify minimum requirements, and to provide guidance to Tetra Tech EC, Inc. (TtEC) project personnel concerning the management of construction tools and equipment on a construction project incorporating the Corporate operating principles of 'Do It Right[®]', 'Client Service Quality[®]', and 'Shared

This procedure applies to all TtEC projects that include a construction, O&M, and/or UXO component, including remediation construction.

3.1 Definitions

3.1.1 Construction Equipment

For the purposes of this procedure, construction equipment shall mean heavy equipment, such as excavators, scrapers, off-road trucks, dozers, road graders, compactors, dredges, and cranes; light equipment, such as skid-steers, forklifts, generators, and light plants; and operating systems such as screens, crushers, conveyors, pugmills, mobile treatment plants, and pumps. Any discussion of construction equipment shall be understood not to include cars, pickup trucks, flatbed trucks, etc. registered for use on public roadways, which shall be called vehicles hereinafter. Also for the purposes of this procedure, construction equipment shall be synonymous with Contractor's Equipment, a term also commonly used in the construction industry to designate the types of equipment described above.

3.1.2 Terms

The terms "should, may, and might" as used in statements in this procedure are intended to denote a discretionary consideration; the terms "shall & must" are intended to impose a mandatory requirement. The terms "is, are, & will" as used in statements in this procedure are intended to denote discretionary or mandatory requirements that are addressed in other department/disciplines' procedures. However, nothing contained herein should be interpreted as to prohibit development and approval of project-specific procedures or plans that take exception to mandatory direction presented in this procedure provided that the appropriate level of approval (Executive Vice President of Construction, Business Line Executive Vice President, or the Vice President ESQ Services as appropriate) is obtained for deviations from such requirements.

3.1.3 Tools of the Trade

Specific hand tools and or equipment (e.g., manlifts, trucks, trenchers, and pumps) normally provided by or to workers for the performance of their particular work activity.

3.2 Roles & Responsibilities

3.2.1 Equipment Supervisor

Depending on the project's equipment needs, an individual may be designated as the Equipment Supervisor. Responsibilities of the Equipment Supervisor include:

- Determination of the equipment needs for the project;
- Providing input to the Work Plan concerning equipment;
- Identification of Contract and legal/regulatory requirements for mobilization of equipment on client facilities;
- Submittal of required certifications, inspection reports, and test reports for equipment;
- Arranging for the mobilization/demobilization of equipment in support of the project's schedule, providing required notices, such as mobilization details and dates, and obtaining Contractual or

legally required approvals for mobilization;

- Receipt inspection of equipment arriving at the site, including coordination of any client or third party inspection;
- Coordination with equipment yard personnel or vendors regarding equipment maintenance;
- Ensuring implementation of safe work practices for equipment utilization; and

Assuring that the return of demobilized equipment is performed in accordance with the terms of the rental/lease/PO agreement and documented correctly, or, for TtEC owned equipment, that the equipment transfer form is completed and coordinated with the Equipment Manager; and

- All other responsibilities as assigned by the Project Manager or Site Superintendent.

3.3 Safe Operation Requirements for Tools

3.3.1 Manual T-Post Drivers

There shall be no use of manual fence post drivers, such as those typically used to drive T-posts, without prior approval from the Project Environmental Safety Manager (PESM) or the Vice President of Construction. Any approval of the use of such a tool shall require the implementation of an Activity Hazard Analysis (AHA) to identify and control the hazards presented by the tool. The AHA shall address appropriate PPE and position for the task in order to avoid injury to the worker.

3.3.2 Tools

The Site Superintendent shall determine the nature and quantity of tools required for the construction effort and shall ensure that adequate tools are provided in support of the schedule.

Tools may be assigned to workers or crews for the duration of their activities and shall be stored in gang boxes or other secured storage areas when not in use.

The Site Superintendent may designate certain tools to be issued from a tool control area on a daily basis. These tools should be signed out at the beginning of the work, returned to the tool control area at the end of the work, and signed back in.

3.3.3 Worker Provided Personal Tools

Workers may be required to provide personal tools of the trade for their particular work. Master mechanics, for example, may be required to provide tools required for repairs and maintenance of construction equipment and vehicles. Requirements for workers to provide their own tools shall be established based on the project requirements and shall be discussed at the Pre-Job Conference to be held in accordance with the requirements of the Labor Relations Guidelines LR-8, Pre-Job Conferences.

Any worker required or offering to provide personal tools shall be required to present a list of personal tools being provided upon reporting to the project site. The Site Superintendent shall inventory the tools against this list for verification that all listed tools have been provided. The list shall then be maintained for use in performing an inventory of the tools when the worker is to leave the site at the end of the worker's assignment and shall be the basis for any claims for loss or damage.

The Site Superintendent shall ensure that any personal tools brought onto the project site receive a safety inspection. The safety inspection shall include as a minimum, the items addressed in Section 3.3.4 of this procedure.

The Site Superintendent should ensure that secure, lockable facilities are provided for the storage of worker provided personal tools.

The worker shall be responsible for notification of lost or damaged tools immediately on discovery of the loss. The limits of the project's liability (if any) for loss or damage to personal tools provided by the workers should

be established at the Pre-Job Conference.

Use of personal tools, other than addressed above, either by manual or by TtEC nonmanual personnel, should not be allowed except as specifically authorized by the Project Manager or Site Superintendent. Project personnel should be notified that TtEC will not be liable for any theft, loss, or damage of unauthorized personal tools on the project site.

3.3.4 Tool Safety Inspection

OSHA 29 CFR Part 1926 Subpart I Tools – Hand and Power provides guidance for tool safety. All tools shall be inspected for the following minimum features by the person using the tool prior to starting the work:

- Proper general condition of tools, electrical cords, and air hoses;
- Presence and serviceability of guards and safety devices;
- Proper electrical grounding or double insulation protection;
- Power tools properly equipped with constant pressure switches;
- Tool retainers installed on pneumatic tools;
- Proper adjustment of the tool; and
- Confirming that the load rating of the tool is sufficient for the work to be performed.

Unsafe tools shall be removed from service and the Site Superintendent advised of the condition for corrective action. An Out of Service tag should be placed on all unsafe or defective tools to prevent their inadvertent use by others. These tools should be physically segregated from the acceptable tools.

3.3.5 Environmental Safety and Quality Policy Implementation

TtEC's Environmental Safety and Quality (ESQ) Policy, as included in Environmental Management System (EMS), shall be considered in the selection and utilization of construction equipment and vehicles for use in association with TtEC's construction projects.

Selection of the construction equipment and vehicles shall consider relevant TtEC-wide and project-specific significant environmental aspects, objectives, and targets, as defined in EMS and as identified by the Project Manager in the project management planning documents required under Project Initiations/Operations Procedure, PO-1, Project Management Planning.

Selection of construction equipment and vehicles may have significant impacts on the environment, either adverse or beneficial. Proper selection of the size and type of equipment and vehicles can reduce the adverse impacts from their operation.

Project procurement practices for construction equipment, parts, supplies, lubricants, and fuel shall be consistent with the principles of pollution prevention as discussed in the EMS and identified through the TIP process using CRL Procedure PO-2, Task Initiation. (For example, consideration should be given to such factors as rent versus buy options, disposable versus reusable filters, recycled versus virgin oils/fluids, recycling versus disposal of spent fluids and used parts, and fuel efficiency and economy of operation.)

Spent fluids, filters, and used parts shall be recycled to the extent practical, or otherwise disposed of in accordance with the environmental compliance elements of the Work Plan or EHS plan.

Proper utilization of construction equipment and vehicles can also reduce adverse impacts on the environment. (For example, it is TtEC's policy to not allow unattended equipment and vehicles to be left with motors running. This is not only a safety consideration; it reduces adverse environmental impacts and is generally cost effective due to reduced fuel consumption.)

3.3.6 Insurance

The Project Manager shall ensure that all construction equipment, including TtEC-owned or rental/lease equipment, is covered by appropriate insurance policies for the intended use of the equipment. Property insurance on construction equipment is normally arranged by TtEC if TtEC bears the risk of loss or if TtEC is required to arrange such insurance. However, all rented/leased construction equipment valued in excess of \$100,000, and all cranes regardless of their value shall be reported to the Administration and Compliance Department via the 'Insurance Request for Leased Equipment' (Attachment 5, and available in Tetra Links and from procurement) for specific inclusion under the TtEC property insurance policy. The procurement representative should be contacted to ensure that this occurs in each case. Notification is not required for equipment valued under \$100,000 except when the construction equipment provider requests a certificate of insurance be provided, or the equipment is a crane.

The Project Manager, usually through the designated procurement representative, should ensure that duplicate insurance coverage is not provided through the equipment provider since this will increase the rental rates. In those cases where the provider requires insurance certificates to verify coverage by TtEC, the procurement representative should be contacted to obtain the appropriate documentation.

A Vehicle Insurance Form (available from the Vehicle Insurance Coordinator, Tetra Links or procurement) shall be processed and sent to the Vehicle Insurance Coordinator for all vehicles (leased, rented, or owned) which are registered and operated off jobsites on public highways.

3.3.7 Receipt and Inspection

All construction equipment shall be subject to a receipt inspection by a competent person and any Contract or otherwise required additional person(s) prior to acceptance at the project site. The inspections and tests shall be in accordance with the manufacturer's recommendations. Most vendors provide a form for notation of any existing damage to the equipment to be filled out on receipt. The equipment should be inspected carefully to determine its condition, including any damage, missing or non-functional equipment. The agreement should be used as a basis to determine that everything required (e.g., the equipment, its condition, manuals, spares, documentation of inspections, and certifications) has been provided. All discrepancies should be noted on the form. A pre-inspection of the equipment prior to transport to the Project site should be considered. Particular attention shall be given to the following items:

- All safety equipment and its condition;
- Operator (when provided) certification for the equipment;
- Posted operating and safety instructions;
- All pollution control devices and their condition;
- Safe entry and egress, with steps, ladders, handholds, and platforms provided as required, including safe access to perform routine checks, maintenance, and refueling operations;
- Leaking fluids, such as hydraulic oil, engine oil, transmission fluid, and coolant;
- Deteriorated or cracked hydraulic and coolant hoses which could result in leaks or spills; and
- Presence of the manufacturer operation and maintenance manual.

Equipment or vehicles with deficient conditions relating to safety or protection of the environment shall not be placed into service until the deficiencies have been corrected and documented.

All construction equipment shall be subject to an operational check prior to acceptance at the project site. The operational check should verify that the equipment has the capability to function as intended or as required through the full range of its intended use.

Receipt of construction equipment shall be documented; with a copy of the receipt inspection report provided to the Equipment Supervisor and to the equipment purchase order file. Documentation should include

entries for date and time of receipt, condition of equipment, mileage or engine hours at time of receipt, information on next scheduled maintenance, and a record of operating and maintenance manuals received with the equipment. Photographs or a video record of the equipment on receipt should be taken if conditions are noted that would warrant further documentation.

Construction equipment providers will often include terms and conditions on receipt documentation to be signed when construction equipment is delivered to the project site. **Project personnel requested to sign this receipt documentation shall not sign any delivery forms unless authorized to do so by Legal of the Project Manager. Further, if they are required to sign delivery forms, they shall be instructed to cross out all terms and conditions, on both the front and back of the forms, before signing.** Alternately, the person receiving the construction equipment should enter the following statement in the immediate vicinity of their signature: "In lieu of the terms and conditions set forth on this document, the Original Purchase Order (or appropriate form of agreement) terms and conditions apply to the receipt of this item(s)." These actions are necessary to avoid acceptance of additional or different terms and conditions.

Construction equipment delivered to the project site should be accompanied with operating and maintenance manuals. Cranes and lifting equipment shall include certification of satisfactory completion of annual inspection and have load charts posted in the cab. Additionally, some construction equipment may be supplied with common replacement parts, such as filters and belts, and any specialized tools required for routine operation or maintenance. (i.e. forks, buckets, lift arms, and tool carries) These items should be carefully inventoried upon receipt, and documented on the receipt inspection report. Responsibility for protection and maintenance of the construction equipment shall be verified, and all measures necessary to protect the construction equipment from damage or loss will be instituted in accordance with the agreement, operating, and maintenance manuals or other instructions as appropriate.

Disposition requirements for construction equipment found to not be in accordance with the rental/lease/sale agreement when received shall be confirmed with the vendor immediately.

A sample Equipment/Vehicle Inspection Report is included as Attachment 1 to this procedure.

3.3.8 Protection from Environmental Extremes

Consideration shall be given to the environmental conditions to which the construction equipment will be exposed to during its time at the project site or during transportation. The manufacturer's instructions shall be reviewed and followed to ensure adequate protection from damage due to environmental conditions.

Adequate protection to the construction equipment's cooling system shall be verified by ensuring that the appropriate coolant/antifreeze mixture, as recommended by the manufacturer, has been used.

Appropriate procedures for operating or storing construction equipment, such as water treatment systems, shall be developed in accordance with the manufacturer's instructions. Measures such as draining and venting the system, providing auxiliary heat sources (e.g., heat tape), dry storage, shaft rotation, fluid levels, shall be taken to protect construction equipment subject to damage from environmental conditions.

Manufacturer's instructions concerning periodic operation of construction equipment shall be followed.

A means of ensuring that appropriate protective measures are instituted and performed as required should be implemented through the establishment of site procedures, logs, and/or checklists.

3.3.9 Equipment Inspections

All construction equipment shall be inspected daily (when in use) for safety and operability, including manufacturer's recommended daily inspections. The inspection form/checklist should note any deficiencies for correction and serve as documentation of the inspection performance. The Equipment Supervisor shall be notified of any deficiency immediately. A Daily Equipment Inspection form, a sample of which is included as Attachment 2 to this procedure, should be filled out at the start of the shift and provided to the Equipment Supervisor. [Other supplemental forms which may be used in conjunction with Attachment 2 are the](#)

[equipment specific "Pre-operation Inspection" and/or "Function Tests" forms, which are normally supplied by the equipment manufacturer. This information is usually found in the equipment's Operation Manual.](#)

Government property control procedures usually require the implementation of a vehicle utilization log for vehicles when used on government projects; other projects should also implement a similar system for logging use of these vehicles. The log should be kept in the vehicle and an entry made for each use, including name of the driver, purpose of the trip, starting mileage, ending mileage, fuel purchased, maintenance performed, and any damage incurred. The log sheets should be transmitted as required in the contract documents and the project's documentation plan. Copies of the log sheets will be maintained and filed as discussed in Section 3.3.12 of this procedure.

A separate Daily Equipment Inspection Report should be filled out for each shift if construction equipment is utilized on multiple shifts.

The Equipment Supervisor should use the information on Daily Equipment Inspection forms to schedule any repairs or preventive maintenance required for the equipment. Equipment with missing or defective safety features should not be put in service until repairs have been performed to bring the equipment into compliance with any applicable TtEC EHS Program and/or regulatory requirements.

Implementation of the daily equipment inspections should be the subject of periodic verification inspections performed by the Project Manager, Site Superintendent, and/or the Environmental and Safety Supervisor (ESS). These periodic inspections should include verification that the required maintenance is being performed in a timely manner to ensure that unsafe conditions or impacts to the environment (e.g., spills, releases, and discharges) are not created by delays in correcting deficiencies noted on the Daily Equipment Inspection Forms.

Rigging equipment, wire rope, nylon or KEVLAR slings and chokers shall be inspected by a competent person prior to use each shift; particular attention shall be paid to the rigging condition and presence of load/certification tags.

Cranes (weight handling equipment) shall be subjected to annual and certification inspections per OSHA guidelines. Mobile and crawler cranes shall be inspected on a monthly basis; a sample checklist form is included as Attachment 3 to this procedure.

Construction equipment to be demobilized shall be given a final inspection, similar to the receipt inspection, to identify and document, by means of written description and pictures, the condition of the equipment as it leaves the project site. Where possible, a concurrent inspection by the vendor is preferred. Additionally, some projects, particularly USACE projects, require a certificate of decontamination prior to the equipment leaving the site.

3.3.10 Operator Qualifications

TtEC employees operating vehicles or construction equipment on public rights of way shall be required to have in their possession a valid driver's license appropriate to the location where the item is being operated and containing the appropriate endorsement for the type of vehicle or construction equipment being operated. A Commercial Driver's License (CDL) may be required for operation of some construction equipment on public rights of way, or as a specific requirement of a client's safety program. In addition, individual states may require specific licenses or certifications for operators of certain equipment, such as forklifts, and hoisting equipment. Additionally, the client's safety program may include license or certification requirements for personnel operating equipment on their property. The contract documents should be reviewed carefully to ensure that any such requirements are incorporated into the project's Work Plan or EHS Plan. The Site Superintendent shall verify that the operator possesses the required license(s). Copies of licenses should be maintained in the on-site project employee file.

Any agreements for the rental or lease of vehicles or equipment should be reviewed for any provider's requirements for licensing or certification of operators to ensure that any such requirements are incorporated into the project's Work Plan or EHS Plan.

Operators shall be required to demonstrate their proficiency in operating the construction equipment to be assigned to them prior to being allowed to work. Crane operators shall have qualifications for the type of crane to be operated.

Operator proficiency may be demonstrated through a performance test such as those developed by the International Union of Operating Engineers, or by equipment manufacturers such as Caterpillar. These performance tests include exercises developed to demonstrate operator proficiency in various aspects of equipment operation, including daily operator inspections, ability to follow directions, ability to understand equipment limitations and operating guidelines, safety, and productivity. Also included are checklists that assist an observer in evaluating all of the various aspects of equipment operation. Attachment 4 is an example of Operator/Driver Observation Checklist.

Where it is not possible or practical to demonstrate operator proficiency through a performance test as described above, there should be a period of observation of the operator during the initial period of performance, whether the operator is a new employee or a current employee who is being assigned to a different type of equipment than previously operated on the project site. This observation may be performed by a knowledgeable member of the management team or a designated craft employee such as a foreman or steward. The above referenced checklists could be used for this observation in lieu of the performance test.

3.3.11 Refresher Training and Evaluation

Refresher training in relevant topics shall be provided to Crane (as defined by OSHA 1910.180(a) operators, and Powered Industrial Truck (PIT) as defined by OSHA 1910.178(a)(1) operators prior to be allowed to continue operating when:

- The operator has been observed to operate the PIT/Crane in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals that the operator is not operating the PIT/Crane safely.
- The operator is assigned to operate a different type of PIT/Crane; or
- A condition in the workplace changes in a manner that could affect safe operation of the PIT/Crane.

An evaluation of each PIT/Crane operator's performance shall be conducted at least once every three years.

Refresher training in relevant topics shall be provided to all other construction equipment operators when:

- The operator has been observed to operate the equipment in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals that the operator is not operating the equipment safely.
- The operator is assigned to drive a different type of equipment; or
- A condition in the workplace changes in a manner that could affect safe operation of the equipment.

The employer shall certify that each operator has been trained and evaluated. The certification shall include the name of the operator, the type of equipment, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

3.3.12 Repairs

All construction equipment shall be repaired as necessary and maintained in good working order. Repairs to rented/leased construction equipment shall be in accordance with the terms of the rental/lease agreement. Repairs to rented/leased and TtEC's construction equipment shall be documented and a record of the repairs maintained in the project files. Copies of the repair records are to be forwarded to the equipment yard for TtEC-owned equipment.

Construction equipment with deficiencies noted on the Daily Inspection Report should be repaired promptly.

The Equipment Supervisor, with input from the Environmental and Safety Supervisor as appropriate, should evaluate if a piece of equipment or a vehicle should be removed from service until the deficiency is corrected.

Construction equipment that develops a fluid leak such as engine oil, hydraulic oil, transmission fluid, or coolant shall be removed from service until the deficient condition has been corrected.

Construction equipment with missing or inoperable exhaust systems, including spark or flame arrestors, mufflers, and catalytic converters, shall be removed from service until the deficient condition has been corrected.

Tampering with, removal, modification, or otherwise rendering inoperable any pollution control device on construction equipment shall not be allowed except as specifically authorized by the equipment manufacturer or appropriate authority and the Project Manager or Superintendent's concurrence

Only trained, qualified personnel shall be allowed to repair equipment. The project's Work Plan should address repairs to equipment by designating required actions in the event of an equipment failure.

An Authorization for Capital Expenditure or Lease (AFCEL) is to be completed for all major repair work (i.e., \$1500.00 and over) performed on TtEC-owned construction equipment in accordance with Accounting/Finance Procedure AF-8, Fixed Assets. (Note that on some construction equipment, the cost of a specific item, a replacement tire for example, may require the processing of an AFCEL due to the item cost.)

Costs for major repairs, as well as repairs for deficiencies, to TtEC-owned construction equipment shall be charged back to the project releasing the equipment if the need for repairs is identified within 30 days of the equipment's release and removal from a project and there are indications that the repairs are needed as the result of lack of maintenance or failure of the releasing project to otherwise keep the equipment in good working order.

No repair shall be undertaken for damage covered by an insurance claim until the damage is reported to the Administration and Compliance Department and the insurer approves the repairs.

3.3.13 Documentation and Record Keeping

A file shall be established and maintained for each operator which contains documentation that the operator has the proper qualifications, licenses/certificates, and training to perform his/her job function. Records may include training identified in EHS plans (e.g., OSHA, DOT, Waste Management training), vehicle operator licenses, results of site-administered proficiency testing, and any other special licenses/certificates required by state/local law or the client.

A file shall be established and maintained for each piece of construction equipment, and all records relating to that equipment shall be placed in the file, including the Receipt Inspection Report, annual inspections (for cranes), record of the date the equipment was first placed in service, Daily Equipment Inspection records, maintenance records, repair records, record of the last date that the equipment was in service, demobilization inspection report, and the decontamination certificate, if applicable. For ease of retrieval, all records pertaining to pieces of equipment should be maintained in separate folders for each piece of equipment.

Additional copies of inspection reports and records may be required to be maintained in other project files, such as the procurement files and/or the Environmental Health and Safety files, based on the project's Documentation Plan.

The Equipment Supervisor should ensure that complete and accurate record of equipment utilization, including a list of idle equipment, is provided to the Quality Control Site Manager on a daily basis for inclusion in the Quality Control Daily Report.

It may be useful to maintain equipment utilization information on a spreadsheet depending on the size of the project. Information such as equipment mobilization date, date of first use, utilization of equipment by rental

period (for example, if rental rate is based on hourly usage and is billed on a monthly cycle, there should be an entry for the number of hours the equipment was used in each billing period), scheduled equipment release date, actual release date, and demobilization date. This information may be useful in verification of vendor invoices, in review of production rates, for preparation of requests for change orders or equitable adjustment, or for backup for use in support of (or defense against) claims.

Copies of all maintenance and repair records for TtEC-owned construction equipment shall be forwarded to the TtEC Equipment Manager at the regional equipment yard on a periodic basis. This period should be monthly, and in no circumstances should it exceed quarterly. An Equipment Service Form is available from the Equipment Manager. This form shall be used to report unscheduled and preventative maintenance on TtEC-owned construction equipment.

The Equipment Manager produces a spreadsheet for TtEC-owned construction equipment that is distributed to the projects on a monthly basis. The Equipment Supervisor shall ensure that reports of mileage or meter readings and routine maintenance for all TtEC-owned construction equipment and vehicles assigned to the project are provided to the Equipment Manager for inclusion on the spreadsheet on a monthly basis. A Meter/Mileage Reading Update Form, available from the Equipment Manager, shall be used to report the required information.

The Equipment Supervisor should review the availability date included on the spreadsheet for TtEC-owned equipment and vehicles assigned to the project and inform the Equipment Manager of any required revisions to these dates.

The Equipment Supervisor shall complete an Equipment Transfer Report, available from the Equipment Manager, for all TtEC-owned construction equipment and vehicles to be mobilized to, and demobilized from the project. Copies of the Equipment Transfer Reports shall be provided to the Equipment Manager at the regional equipment yard.

There shall be no equipment disposal action (junk or sale) for TtEC-owned construction equipment or vehicles without prior notification and approval from the TtEC President.

4.1 Additional Considerations

4.1.1 Control of Government Property

Activities involving the use of Government property are to be controlled in accordance with Project Initiation/Operations Procedure PO-12, Government Property Control or by specific procedures negotiated with the Client in accordance with the contract's terms and conditions; such procedures shall be consulted where appropriate. Such activities may involve the handling or installation of Government property, whether furnished by the Government to TtEC or acquired by TtEC for use in the performance of work and for which the Government has retained title.

Government property may include construction tools and equipment purchased as a project cost, as well as permanent materials or equipment purchased for incorporation into the work. Project-specific procedures for control of Government property are to address issues relevant to the use, storage, inventory control, maintenance, and/or final disposition of the Government property.

4.1.2 Spill Control and Emergency Response Dedicated Tools and Equipment

The project's Emergency Response Plan, or Emergency Action Plan (refer to the Environmental, Health & Safety - Programs Procedure EHS 2-1, Emergency Preparedness, for discussion of when each is required) is to identify dedicated personal protective equipment and emergency response tools and equipment to be available for an emergency response to a spill or discharge of hazardous material.

Dedicated emergency response tools and equipment are to be segregated and identified for use in emergency response situations. In accordance with the requirements of EHS Procedure 2-1, Emergency Preparedness the use of dedicated emergency response tools or equipment for any other activity is not to be permitted.

4.1.3 Inventory Control

An individual should be designated as the Material Control Supervisor and should be responsible for inventory control of all tools issued from the tool control area. A log should be maintained for all tools issued and should record, as a minimum, the identification by name and employee number of the individual signing out the tool, the date and time the tool was signed out, the intended use of the tool (by area or system), an indication of when the tool is to be returned, and the time and date when the tool is returned.

Inventory control of tools assigned to individuals or crews should be performed on a daily basis as the tools are returned to the gang box or storage area. The crew foreman should be responsible for inventory control of tools assigned to the foreman's crew.

The Site Superintendent should immediately be made aware of any missing tools and should take the appropriate action to investigate and/or replace the missing tools.

4.1.4 Disposition of Tools at Project Completion

The Project Manager should make a determination of the disposition of tools remaining at the end of the project. The project may not be reimbursed by the client for the purchase of tools on certain cost reimbursable and lump sum projects. On other projects, a dollar value for individual tools may establish whether or not the client provides any reimbursement. The terms and conditions of the contract should provide direction as to the required disposition of the tools.

Tools for which the project has been reimbursed by the client are to be dispositioned in accordance with the client's preferences and the contract terms and conditions.

Tools purchased for the project as a project cost, and which are not to be turned over to the client, should be dispositioned by the Project Manager. Means of disposition may include, but not be limited to, declaring the tools surplus, sale of the tools, or providing the tools to another project. The Project Manager should consult with the appropriate Business Line Executive Vice Presidents, concerning disposition of project tools.

TtEC owned tools (i.e., not purchased as a project cost) should be dispositioned by the Project Manager based on consultation with the appropriate Business Line Executive Vice Presidents. Means of disposition of TtEC-owned tools may include, but not be limited to, declaring the tools surplus, sale of the tools, return of the tools to an equipment yard, or providing the tools to another project.

4.1.5 Company-Owned Equipment

TtEC utilizes regional equipment yard(s) for the temporary storage and maintenance of TtEC-owned construction equipment and vehicles when not currently assigned to a project. Available TtEC-owned equipment should be considered for support of a project's construction effort based on an analysis of the benefits to the project and/or TtEC. When evaluating TtEC owned equipment the requirements discussed in 4.1.6 below should be considered when making the equipment selection.

4.1.6 Rental/Lease Equipment

Agreements for rental/lease of construction equipment should be coordinated through an authorized procurement representative to ensure that appropriate terms and conditions are included in the agreement. The Scope of Work for the agreement should be developed and reviewed carefully, including review by the Site Superintendent or Equipment Supervisor for inclusion of sufficient detail in order to clearly define the

scope of work.

The Equipment Supervisor, or requisitioner if there is no designated Equipment Supervisor, should review the terms and conditions of all rental/lease agreements to determine that the following topics are adequately addressed:

- Receipt and return of the rental or leased equipment and any required accessories;
- Inspection and documentation of receipt and release;
- Provision of documentation required to be submitted, such as Occupational Safety and Health Administration (OSHA) accredited inspection reports, NDE reports, test reports (i.e. load test for cranes), typically annual inspections, and wire rope certification.
- Provision of all safety equipment and accessories, as required, such as fire extinguishers, seat belts, Roll Over Protection Structures (ROPS), Falling Object Protection Structures (FOPS), access steps, handholds, platforms, and anti two-block devices and load moment indicator (cranes);
- Provision of documentation demonstrating operator certification;
- Provision of Certificate of Compliance when required, for instance by NAVFAC P-307 Management of Weight Handling Equipment, Appendix P - Contractor Crane Requirements.
- Provision and requirements of routine and non-routine maintenance and repairs, including payment for labor, parts, filters, lubricants, and fluids;
- Documentation requirements for the above maintenance and repairs;
- Disposal/recycling requirements for used parts, filters, lubricants, and fluids;
- Items such as point of delivery, costs of delivery and return, rental charges during idle time, notification requirements for demobilization, and point of return;
- Appropriate rental rate provisions for straight time and overtime;
- Responsibility for damage to equipment;
- Insurance;
- Indemnification (if included);
- Payment for replacement of parts subject to normal wear and tear, such as tires, tracks, cutting edges, and teeth; and
- Documentation requirements required in support of invoices for basic rental rates and overtime rates, as well as labor, parts, filters, lubricants, and fluids.

Rental agreements should be structured to include normal wear and tear on the equipment in the basic rental rate. In all cases, there should be mutual agreement with the equipment vendor as to the condition of the equipment as it is delivered. This should include items such as the life expectancy of the parts subject to wear and tear, their condition on receipt (i.e., percentage of usable life remaining), and the expected condition on return of the equipment. There should be agreement on minor versus major repairs and on what constitutes normal wear and tear. Mutual agreement is essential to mitigate potential claims from vendors for excessive wear and tear.

4.1.7 Mobilization of Equipment

Mobilization of construction equipment may be a long lead time item and may require client or third party involvement or approvals to gain site access, depending on the required equipment. The Site Superintendent or Equipment Supervisor should determine the lead time required, including Contract submittal and advance notice/approval requirements, and plan for the mobilization of equipment to support the project's schedule.

Planning for mobilization of equipment should include a thorough review of Contract requirements for utilization of each equipment and site access requirements.

Documentation of certification, and OSHA compliant annual inspection, load testing, safety devices (e.g., anti two-block) installed, wire rope certification, and operator's certification for cranes (weight handling equipment) should be reviewed prior to initiating mobilization of cranes.

4.1.8 Equipment Maintenance

The Equipment Supervisor should be responsible for administration of a construction equipment maintenance program for the project. A spreadsheet of all TtEC-owned equipment, titled the Status of All Project Equipment, is maintained by the Construction Department providing notification of the scheduled maintenance requirements for each piece of equipment. Either this spreadsheet, or a project specific spreadsheet, should be maintained and statused on a periodic basis. Specific maintenance requirements may also be contained in specific contract negotiated property procedures or in other TtEC corporate procedures.

As construction equipment is received on site, it should be added to the spreadsheet for tracking of the required maintenance.

A review of the scheduled maintenance should be performed for all construction equipment to be used in the Exclusion Zone to determine the desirability of performing any upcoming scheduled maintenance prior to placing the equipment in service. It may be difficult and expensive to perform the maintenance under the conditions required in the Exclusion Zone, or to decontaminate the construction equipment in order to perform the maintenance under clean conditions. When the maintenance of equipment in the Exclusion Zone is anticipated, the Site Superintendent should ensure that qualified personnel are available with the appropriate medical clearances and certifications to work in the Exclusion Zone.

4.1.9 Construction Equipment Safe Operation Requirements

Standards for safe operation of equipment are contained in the documents identified herein, inclusive and in particular of the requirements for safe operation of lifting and rigging equipment and weight handling equipment. The Contract typically will specify certain documents/codes to be followed for the project. Accessibility of the identified documents is provided in section 5.0 References.

The United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual, EM 385-1-1, Chapters 16, 17, and 18, provide guidance concerning the safe operation of construction equipment.

Safe operation of earth drilling equipment is addressed in the Environmental Health & Safety-Program Procedure EHS 6-2, Drill Rigs.

Safe operation of hand and power tools is addressed in OSHA standard 29CFR Part 1926 Subpart I.

Safe operation of cranes, derricks, hoists, elevators and conveyors is addressed in OSHA standard 29CFR Part 1926 Subpart N.

Safe operation of motor vehicles, mechanized equipment and marine operations is addressed in 29CFR Part 1926 Subpart O.

Rollover protective structures and overhead protection is addressed in 29CFR Part 1926 Subpart W.

The American Society of Mechanical Engineers (ASME) provides guidance in the B30 committee volumes – Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings.

The United States Department of Energy (DOE) provides guidance for safe lifting operations in Technical Standard DOE-STD-1090 – Hoisting and Rigging.

The United States Navy publication NAVFAC P-307 – Management of Weight Handling Equipment includes requirements for Contractor Cranes (see appendix P). Navy facilities issue Instructions

specific to particular facilities such as 'NAVSHIPYDPUGET INSTRUCTION 11262.4A' which provides requirements for weight handling equipment at all Navy facilities within the Puget Sound.

4.1.10 Demobilization of Equipment

Construction equipment should be demobilized when no longer required for the work. The Executive Vice President of Construction should be provided with a status of TtEC-owned construction equipment and scheduled release dates in order to coordinate availability of equipment with other projects.

The Project Manager or designee should request demobilization instructions from the Executive Vice President of Construction or designee to determine the location to receive TtEC-owned equipment.

Construction equipment leaving the Exclusion Zone of a remediation construction project will be decontaminated in accordance with the requirements of the Environmental Health & Safety-Programs, Procedure EHS 3-4, Site and Contamination Control, and the site specific EHS Plan.

Individual state regulations may require cleaning of construction equipment leaving a site, not limited to remediation construction, in order to control the spread of microorganisms contained in the soil. Such requirements are to be identified in the project EHS plans.

Please Describe Your Reference Here

Place Your Link in this Co

1. Accounting/Finance Procedure AF-8, Fixed Assets
2. ASME B30 committee publications "Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings" available at www.ihserc.com Note that this is a commercial subscription and requires a User ID and Password available from the TtEC Librarian
3. DOE Technical Standard DOE-STP-1090 Hoisting and Rigging available at www.directives.doe.gov (select the Tech Standards tab, select DOE Technical Standards, select Approved Standards and select DOE_STD_1090 from the menu)
4. Environmental, Health & Safety - Programs Procedure EHS 2-1, Emergency Preparedness
5. Environmental, Health & Safety -Programs Procedure EHS 3-4, Site and Contaminant Control
6. Environmental, Health & Safety -Programs Procedure EHS 6-2, Drill Rigs
7. Environmental Management System (EMS)
8. Labor Relations Guidelines LR-8, Pre-Job Conferences
9. NAVFAC P-307 Management of Weight Handling Equipment, Available via <http://www.safetycenter.navy.mil/instructions/osh/navfacP307.pdf#search=%22NAVFAC%20P-307%22>
10. The OSHA publications below are available at www.osha.gov/ select Regulations, select OSHA Regulations (Standards - 29 CFR), select Part 1926 Safety and Health Regulations for Construction
11. OSHA 29 CFR Part 1926 Subpart I Tools - Hand and Power
12. OSHA 29 CFR Part 1926 Subpart N Cranes, Derricks, Hoists, Elevators and Conveyors
13. OSHA 29 CFR Part 1926 Subpart O Motor Vehicles, Mechanized Equipment and Marine Operations
14. OSHA 20 CFR Part 1926 Subpart W Rollover Protection Structures Overhead Protection
15. OSHA 29 CFR Part 1910.178 Powered Industrial Trucks
16. OSHA 29 CFR Part 1910.180 Crawler Locomotive and Truck Cranes
17. Project Initiation/Operations Procedure PO-1, Project Management Planning
18. Project Initiation/Operations Procedure PO-2, Task Initiation
19. Project Initiation/Operations Procedure PO-12, Government Property Control

Please Provide a Description of the Attachment

1. Sample Equivalent/Vehicle Inspection Report
2. Sample Daily Equipment Inspection Form
3. Mobile and Crawler Crane Monthly Checklist
4. Operator/Driver Task Observation Checklist
5. Insurance Request for Leased Equipment

Place Your Attachments Here



CP-7 Att-1 -mod 20090924.doc



CP-7 Att-2 Daily Equip Insp_m



CP-7 Att-3 FJ.doc



CP-7 Att-4 Operator Observatio



CP-7 Att-5 FJ.doc

NOTICE OF OWNERSHIP AND CONDITIONS OF USE

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TETRA TECH EC, INC.

Equipment/Vehicle Inspection Report

Date: _____ Unit Number: _____ Description: _____

_____ Miles or _____ Hours: _____ MFG: _____

Unit to be taken from: _____ to: _____

	Good	Satisfactory	Repair Req.	N/A		Good	Satisfactory	Repair Req.	N/A
1. Tires/Track <u>%</u> ¹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17. Interior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Brakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18. Glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Steering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19. Wipers/Review Mirrors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Undercarriage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20. Heater/AC/Defroster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Suspension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21. Safety Equipment/Belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Engine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22. Signal Lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Drive Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23. Mounted Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Fuel System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. Mounted Attachments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Cooling System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25. Blade/Bucket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Electrical System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26. Boom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Exhaust System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. Outriggers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Hydraulic System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28. Fire Ext./First Aid Kit ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Transmission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29. Horn/Backup Alarm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Clutch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30. Manufactuer Operating Manual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31. Head/Tail/Brake Lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. ROP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32. Cleanliness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹ Note estimated percentage of tread/track usefulness remaining

² Fire Ext./First Aid Kit and all items in the cab and/or bed must be secured

Comments: _____

Inspected By: _____

DISTRIBUTION: (1) Sent with equipment (2) [Equipment Supervisor](#) (3) [PO File](#) (4) [Originator](#)
EQUIPMENT TRANSFER REPORT MUST ACCOMPANY THIS FORM



TETRA TECH EC, INC.

DAILY EQUIPMENT INSPECTION

PROJECT _____

MANUFACTURER TYPE _____

UNIT # _____ MODEL _____ DATE _____

ENGINE HRS/MILEAGE _____ / _____ SHIFT _____

Check appropriate column and describe correction needed.

	If Good (✓)	NA	Correction Needed
Steering Mechanisms^{1*}	_____	_____	_____
Service Brakes²	_____	_____	_____
Emergency Brakes¹	_____	_____	_____
Parking Brake¹	_____	_____	_____
Transmission & Controls	_____	_____	_____
Suspension & Springs	_____	_____	_____
Hydraulic Leaks	_____	_____	_____
Exhaust System	_____	_____	_____
Warning Gauges	_____	_____	_____
Windshield¹ & Wipers	_____	_____	_____
Lights (Head & Tail)	_____	_____	_____
Brake Lights¹	_____	_____	_____
Mirrors	_____	_____	_____
Seat and Seat Belts¹ (w/ ROPS)	_____	_____	_____
Tires/Tread¹	_____	_____	_____
Regular Horn	_____	_____	_____
Audible Back-up Alarm¹	_____	_____	_____
Steps, Hand-holds	_____	_____	_____
Fire Extinguisher	_____	_____	_____
Engine Coolant	_____	_____	_____
Engine Oil	_____	_____	_____
Hydraulics & Operating Controls	_____	_____	_____
Fenders/Mudflaps	_____	_____	_____
Heater/defroster	_____	_____	_____
<u>All items in cab or bed secured</u>	_____	_____	_____
<u>Cleanliness inside and outside</u>	_____	_____	_____

Remarks:

¹ Items required to be operational by OSHA 1926.602 before use.

² Service brake must be capable of stopping and holding equipment fully loaded. _____

Operator Name (Printed) _____

Operator Signature _____

Review : Superintendent _____

Date Repairs or adjustments completed: _____

Equipment Supervisor/Mechanic: _____



MOBILE AND CRAWLER CRANE MONTHLY CHECKLIST

Crane Number / ID _____

Date _____

Project Name/No: _____

Item	Consideration	Comments
Crane Structure	Cracks, Corrosion, Deformation	
Foundations to support loads	Cracks, Settlement	
Booms	Cracks, Corrosion, Deformation	
Bolts & Rivets	Tightness, Corrosion	
Boom Angle Indicator & Chart	Accuracy, Visibility	
Load Indicator (s)	Accuracy	
Anti-Two Block Device	Functional	
Engine or Motor	Performance & Safety Compliance	
Chain & Sprocket	Wear and Stretch	
Pawls or Dogs	Wear, Cracks, Distortion	
Pins, Shafts & Axles	Wear, Cracks, Distortion	
Bearings & Rollers	Wear, Cracks, Distortion	
Gears	Wear, Cracks	
Tires & Wheels	Excessive Wear, Damage	
Wire Ropes/Lines	Condition, Lay	
Main Drum Brake	Function, Adjustment	
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
Auxiliary Drum Brake	Function, Adjustment	
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
3 rd , Drum Brake (if any)	Function, Adjustment	
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
Boom Hoist Brakes	Function, Adjustment	

MOBILE AND CRAWLER CRANE MONTHLY CHECKLIST

Crane Number / ID _____

Date _____

Project Name/No: _____

Item	Consideration	Comments
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
Travel Brake or Locks	Function, Adjustment	
Lining	Excessive Wear	
Drum Braking Surface	Wear, Cracks, Distortion	
Linkage & Pins	Wear, Cracks, Distortion	
Actuating Cylinders & Fittings (if any)	Leakage or Deterioration	
Lead Block	Function	
Hooks	Cracks, Distortion	
Hook, Swivel	Cracks, Wear, Function	
Sheaves	Wear, Cracks, Distortion, Rope Fit	
Computers	Calibrated	
Counterweight System	Attaching Linkage OK	

Print Name _____

Signature _____



OPERATOR/DRIVER TASK OBSERVATION CHECKLIST

Project Name _____ Project Number _____
 Operator's Name _____ Observer's Name _____
 Date of observation _____ Type/make of equipment operated _____

Operating Safety Observations	S	U	NA	Comments
A. Pre-use inspection prior to starting				
1. Conducts daily pre-use inspection.				
2. Mounts & dismounts carefully-3 point contact.				
3. Uses the seat belt all times while seated. Sounds horn before starting engine.				
4. Checks equipment warning devices.				
5. Checks hydraulic systems (if so equipped). Ensures system is filled and free from leakage.				
6. Checks air system (if so equipped). Ensures all connections are tight.				
7. Checks engine oil level. Ensures all plugs, filler caps, and other fittings are secure and not leaking.				
8. Checks for broken, missing, excessively worn or damaged parts, and reports immediately.				
9. Checks tires. Looks for serious cuts, bulges, irregularities and abnormal wear. Checks inflation pressures and keeps valve caps in place. Checks for tires rubbing.				
10. For dump trucks, checks front wheel seal oil levels.				
11. Checks fuel level and for fuel system leaks.				
12. Coolant check—Should never open a hot system or pour cold coolant into radiator if the engine is very hot.				
13. For safe visibility, cleans the windshield, mirrors and light lenses.				
14. For articulating machines, checks to ensure that the steering frame lock or link have been removed and properly stored.				
15. Checks for and maintains safe access to the cab (3 point contact). For safe mounting, clears the steps, grab rails, and floor and seat of mud and water.				
16. Secures tools and keeps the floor free of debris.				
17. For safe operation wipes steering wheel, foot pedals, hand levers and knobs clean of oil and grease.				
18. Checks first aid kit and fire extinguisher. Reports missing items to the foreman or supervisor.				
19. Checks equipment for warning tags.				
B. Starting				
1. Mounts & dismounts carefully-3 point contact.				
2. Uses the seat belt at all times while seated. Sounds horn before starting engine.				
3. Checks equipment warning devices.				
4. Uses job specific PPE (e.g., hard hats, safety shoes, safety glasses, overalls, gloves, traffic vests, and ear protection).				
5. Ensures the bowl, bucket, etc. is on the ground.				
6. For starting, checks all controls to be sure they are in proper position.				
7. Does not crank an electric starter for more than 30 seconds, Allows two minutes to cool prior to next attempt.				
8. For steering safety, tests before moving. Turns the wheels to full left and full right.				
9. Checks service and parking breaks for proper operation.				
10. Checks the backup alarm.				
11. Ensures head lamps and safety lighting are in working order.				



Operating Safety Observations	S	U	NA	Comments
C. Operation				
1. Before moving, places the bucket, bowl, blade, etc., into the transport position and secures all accessory equipment.				
2. Obeys traffic & other posted/published site safety practices & rules.				
3. Maintains control of equipment at all times.				
4. Gives right-of-way to loaded machines or trucks.				
5. Minimizes engine overspeed on downgrades & when shifting.				
6. Does not transport passengers without proper provisions.				
7. Does not engage in horseplay.				
8. Crosses ditches at an angle, proceeding slowly.				
9. Avoids large obstacles, deep holes & soft edges.				
10. Slows down before turning.				
11. Stays in gear on a downgrade.				
12. When running across a hillside, proceeds slowly. Never turns sharply uphill or downhill.				
13. Obeys flagmen & spotter signals.				
14. Maintains safe stopping distance behind other equipment.				
15. Shifting				
a. Always stops the machine/truck and runs the engine at low idle speed to shift from forward into reverse.				
b. Downshifts one speed range at a time.				
c. Applies the retarder and/or service brakes to reduce speed before entering sharp turns, fill areas, and downgrades.				
d. For machines, always leaves the shift lever in neutral position when stopped.				
16. Braking				
a. Avoids applying brake continuously on a downgrade unless system is so designed.				
b. Uses the engine for additional brake force-or, if so equipped, the auxiliary retarder.				
c. Anticipates grade and selects proper gear range accordingly.				
d. Brakes firmly in one application. Avoids fanning the brake pedal.				
e. Uses each brake system only for its intended purpose.				
17. Turning				
a. Does not cut corners too close when making sharp turns.				
b. Maintains engine speed high enough for normal steering.				
c. Downshifts when necessary or appropriate.				
d. For machines, carries the load as low as conditions permit to maintain stability.				
18. Hauling				
a. Regulates speed to road conditions. Reduces speed before turning. Avoids over speeding the engine.				
b. Downshifts when approaching a downgrade. Downshifts when necessary on an upgrade to avoid stalling the engine.				
c. Obeys traffic rules and spotters.				
19. Parking Precautions				
a. Selects level ground whenever possible.				
b. When parking on a grade, positions equipment at right angles to the slope; and sets parking brake if so equipped in addition to lowering bowl, bucket, etc.				
c. Parks a reasonable distance from other equipment.				
d. When parking on haul roads, picks the safest place, where the equipment is visible from both directions.				



Operating Safety Observations	S	U	NA	Comments
20. Demonstrates proficiency through smooth operation of controls (e.g., speed of operation appropriate for the conditions, not jerky or hesitant).				
21. Maintains eye contact with other operators, drivers, and ground personnel.				
22. Responds appropriately to signals from flaggers, spotters, operators directing equipment movements.				
23. Stops operation when ground personnel are out of line-of-sight.				
24. Positions and orients machine for safe operation (e.g., safe distance from edge of excavations, tracks perpendicular to excavation, clear distance maintained to fixed obstructions).				
25. Barricades, cones, tape set up to maintain clear zone within swing radius of counterweight.				
26. Maintains safe work area (e.g., windrow at edge of stockpiles, safe slopes).				
D. Shutdown				
1. Lowers the bowl, bucket, etc. to the ground. Lowers and secures the bed on dump trucks.				
2. Reduces engine speed. Sets parking brake.				
3. On machines, places transmission in neutral and locks shift lever if so equipped.				
4. Allows hot engine to cool gradually before stopping it.				
5. Secures equipment to prevent unauthorized starting and movement.				
6. Bleeds the air tanks, if so equipped.				
7. Dismounting—doesn't jump off, uses handrails and steps, and faces the machine/truck when getting off.				
8. Warning tags—attaches appropriate warning tags to steering wheel to prevent accidents.				
E. Overall Appraisal				
Overall appraisal of operator/driver				

S = Satisfactory

U = Unsatisfactory

NA = Non applicable

Note: For unsatisfactory observations also indicate the immediate corrective action taken (e.g., training, verbal or written warning, or reassignment).

Draft Only

Tetra Tech EC, Inc.
Insurance Request for Leased Equipment

FROM:

LOCATION:

TO: **Dan Fisher**

LOCATION: **Morris Plains**

1.	IS THIS ITEM A LICENSED VEHICLE? IF YES, PLEASE PROCESS THE "TTECIVEHICLE INSURANCE REQUEST FORM"	
2.	DATE FORM COMPLETED	
3.	REQUESTOR NAME, PHONE NUMBER AND OFFICE LOCATION	
4.	JOB SITE CONTACT (Name and Phone Number)	
5.	PROJECT NAME	
6.	LESSOR'S COMPLETE NAME AND ADDRESS	
7.	TERM OF THE LEASE (please be specific, i.e., 6/15/98 to 6/15/99)	
8.	TYPE OF EQUIPMENT & SERIAL NUMBER **Please contact Dan Fisher ASAP regarding insurance for cranes**	
9.	DECLARED VALUE OF EQUIPMENT	
10.	CHARGE NUMBER (FOR VALUE OF EQUIPMENT OVER \$500,000)	
11.	HAS LESSOR SPECIFICALLY REQUESTED LOSS PAYEE STATUS? IF YES, PLEASE SPECIFY DATE DUE.	

PO/Subcontract attached
Terms and conditions attached

If guidance is needed, please call Dan Fisher @ (973) 630-8198.

Version 6.

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.

Status:	Complete	Approved By:	John DeFeis
		Title:	Event Reporting and Investigation
Version Date - Type:	12/09/2009 - Revised	Original Issue	02/01/95
		Date:	
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub-Category:	Departmental/Discipline	Document	Procedure
		Type:	
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	Skip Parry
		Owner	

- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 MINIMUM REQUIREMENTS
- 4.0 GUIDANCE
- 5.0 REFERENCES
- 6.0 ATTACHMENTS

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 PESH 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 PESH'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

<u>EVENT TYPE</u>	<u>SUPERVISOR NOTIFIES...</u>	<u>TIMING¹</u>	<u>... WHO NOTIFIES</u>	<u>TIMING¹</u>
Spill/release or Permit Exceedence	ESS	Immediately	PESM and Director, EHS Services	Immediately external rep 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 external rep required
Fatality, Hospitalization of 1 or more persons, Fire, or Explosion	ESS	Immediately	PESM and Director, EHS Services 0 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
	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
Confirmed or Potential OSHA Recordable	Project Manager	Immediately	Area/Program Manager	Same day
			VP Construction, VP Remediation, VP C&E, COO	Same day 24 hours or by contract

Client, if required

Equipment/Property/ Vehicle Damage	ESS	Immediately	PESM and Director, EHS Services	24 hours
	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

¹Timing - 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 exceedance 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 below¹

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 inquiries 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

1. Attachment A - [Event](#)/Near Miss Report and Investigation
2. Attachment B - Quality [Event](#) Report Form
3. Attachment C -[Event](#) Sketch

Place Your Attachments Here



EHS 1-7, Att A, 2007.doc



EHS 1-7, Att B, 2007.doc



EHS 1-7, Att C, 2007.doc

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EHS 1-7 ATTACHMENT B



	HAZARD REPORT AND SUGGESTION FORM	Hazard Type: Condition <input type="checkbox"/> Practice <input type="checkbox"/>	
<p><i>The form is intended to provide a means for any employee to report hazards in the work place, or to make suggestions that will improve safety, environmental protection, quality or productivity. It may also be used to report Near Miss incidents with a low loss potential. If desired, the Report may be submitted anonymously. Please provide enough information to allow an effective evaluation of the hazard or suggestion. Your input is appreciated and all suggestions will be evaluated. If your name is included, we may request further information, and will inform you of the disposition. Thank You!</i></p>			
DESCRIBE CONDITION OR PRACTICE:			
SUBMITTED BY (OPTIONAL):		DATE:	
IMMEDIATE CORRECTIVE ACTION COMPLETED:		COMPLETED BY	COMPLETION DATE
RECOMMENDATIONS FOR FURTHER CORRECTIVE ACTION	RESPONSIBLE PERSON	TARGET DATE	COMPLETION DATE
FOR OFFICE USE ONLY			
POTENTIAL INCIDENT TYPE:			
Slip/Trip/Fall		Strain/Overexertion	
Struck by or against		Chemical Exposure	
Caught in, between or under		Property damage	Other (Explain)
Project/Office/Location: _____			
Report Given To: _____		Date: _____	
Tracking Number: _____			

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:		
<input type="checkbox"/> By something at work <input type="checkbox"/> By something outside the work environment <input type="checkbox"/> No injury or illness		
Did this event occur in one of our major offices? <input type="checkbox"/> Yes <input type="checkbox"/> No List Office:		
Did this event occur in a foreign country? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did this event involve:		
A strain?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire?
A motor vehicle accident?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Property damage (>\$500)?
A repetitive motion injury?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Spill/release?
A fall?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Permit exceedence?
Being struck by something?	<input type="checkbox"/> Yes <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Event Location:		
What employee/employer category was involved in this event?	<input type="checkbox"/> TtEC permanent <input type="checkbox"/> TtEC craft/temp service <input type="checkbox"/> Subcontractor <input type="checkbox"/> Other	
Employer of affected employee?		
Weather conditions:	Adequate Lighting at Scene? <input type="checkbox"/> Yes <input type="checkbox"/> 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

<p>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.</p>		
Section 2, Affected Employee Information		
<p>Include injured person, driver/operator, or employee whose activities resulted in the event. A new event report must be created for each injured employee.</p>		
Employee's name:		Sex <input type="checkbox"/> Male <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Section 3, Injury/Illness Information (If not applicable, check here <input type="checkbox"/> and go to Section 4)		
<p>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."</p>		
<p>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.</p>		
Was First Aid provided? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did the injury/illness result in <input type="checkbox"/> Days away (with or without restricted days) <input type="checkbox"/> Restricted days only <input type="checkbox"/> No or unknown		
Did employee die? <input type="checkbox"/> Yes <input type="checkbox"/> No		
<p>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.</p>		
Was medical treatment provided? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Section 4, Vehicle and Property Damage Information (If not applicable, check here <input type="checkbox"/> 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 <input type="checkbox"/> and go to Section 6)		
<i>Environmental Release</i>		
Substance spilled or released:		
From where:	To where:	
Estimated quantity/duration:	CERCLA Hazardous substance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
RQ exceeded? <input type="checkbox"/> Yes <input type="checkbox"/> No	Specify RQ:	
Reportable to agency? <input type="checkbox"/> Yes <input type="checkbox"/> No	Specify (place telecom in project file):	
Responsibility to report: <input type="checkbox"/> TtEC <input type="checkbox"/> Client <input type="checkbox"/> Other	Time frame:	
Written report (place report in project file): <input type="checkbox"/> Yes <input type="checkbox"/> No		
Response action taken:		
<i>Permit Exceedence</i>		
Type of permit:	Permit #:	
Date of exceedence:	Parameter(s):	
Criteria:	Exceedence levels:	
Exceedence duration:	Reportable to agency: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Specify (place telecom in project file):	Written report: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Time frame:		
Response action taken:		
Section 6, Notifications		
Insert names of TtEC personnel notified below:		
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:		
<i>Note to supervisor:</i> 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		
<i>Report Number:</i>		
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.		
<i>Vehicle Events</i>		
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:	
<i>Event Cost:</i>		
Other event costs: \$	WC claim value: \$	Estimated loss: \$
Cause Analysis		
Was the activity addressed in an AHA? <input type="checkbox"/> Yes (attach applicable section) <input type="checkbox"/> No		
Immediate Causes		
What actions and conditions contributed to this event? Check all that apply:		
Substandard Acts		
<input type="checkbox"/> Operating equipment without authority	<input type="checkbox"/> Horseplay	
<input type="checkbox"/> Failure to warn	<input type="checkbox"/> Using equipment improperly	
<input type="checkbox"/> Failure to secure	<input type="checkbox"/> Failure to follow procedure	
<input type="checkbox"/> Operating at improper speed	<input type="checkbox"/> Personnel not properly qualified	
<input type="checkbox"/> Making safety devices inoperable	<input checked="" type="checkbox"/> Failure to communicate	
<input type="checkbox"/> Removing safety devices	<input type="checkbox"/> Operating equipment outside of specified parameters	
<input type="checkbox"/> Using defective equipment	<input type="checkbox"/> Failure to check equipment prior to acceptance	
<input type="checkbox"/> Failure to use PPE properly	<input type="checkbox"/> Acceptance of defective equipment	
<input type="checkbox"/> Improper loading	<input type="checkbox"/> Failure to provide proper equipment	
<input type="checkbox"/> Improper placement	<input type="checkbox"/> Improper servicing/maintenance of equipment	
<input type="checkbox"/> Improper lifting	<input type="checkbox"/> Other substandard acts	
<input type="checkbox"/> Improper position for task	<input type="checkbox"/> Servicing equipment in operation	
<input type="checkbox"/> Under influence of alcohol/drugs		
Substandard Conditions		
<input type="checkbox"/> Guards or barriers	<input type="checkbox"/> Exposure to hazardous materials	
<input type="checkbox"/> Protective equipment	<input type="checkbox"/> Extreme temperature exposure	
<input type="checkbox"/> Tools/equipment or materials	<input type="checkbox"/> Illumination	
<input type="checkbox"/> Congestion	<input type="checkbox"/> Ventilation	
<input type="checkbox"/> Warning system	<input type="checkbox"/> Visibility	
<input type="checkbox"/> Fire and explosion hazards	<input type="checkbox"/> Radiation	
<input type="checkbox"/> Poor housekeeping	<input type="checkbox"/> Hazardous environmental conditions	
<input type="checkbox"/> Noise exposure	<input type="checkbox"/> 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
<input type="checkbox"/> Inadequate physical/physiological capability	<input type="checkbox"/> Inadequate leadership and/or supervision
<input type="checkbox"/> Inadequate mental/psychological capability	<input type="checkbox"/> Inadequate engineering
<input type="checkbox"/> Physical or physiological stress	<input type="checkbox"/> Inadequate purchasing
<input type="checkbox"/> Lack of knowledge	<input type="checkbox"/> Inadequate maintenance
<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Inadequate tools and equipment
<input type="checkbox"/> Improper motivation	<input type="checkbox"/> Inadequate work standards
<input type="checkbox"/> Other personal factors	<input type="checkbox"/> Excessive wear and tear
	<input type="checkbox"/> Abuse and misuse
	<input type="checkbox"/> Change
	<input type="checkbox"/> 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:

<input type="checkbox"/> Leadership and administration	<input type="checkbox"/> Health control
<input type="checkbox"/> Training	<input type="checkbox"/> System evaluation
<input type="checkbox"/> Planned inspections	<input type="checkbox"/> Engineering controls and change management
<input type="checkbox"/> Task analysis and procedures	<input type="checkbox"/> Personal communications
<input type="checkbox"/> Task observation	<input type="checkbox"/> Group meetings
<input type="checkbox"/> Emergency preparedness	<input type="checkbox"/> General promotion
<input type="checkbox"/> Rules and work permits	<input type="checkbox"/> Hiring and placement
<input type="checkbox"/> Accident/event analysis and corrective and preventive action	<input type="checkbox"/> Materials and services management
<input type="checkbox"/> 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: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
ESQ (PESM) Approval: <input type="checkbox"/> Yes <input type="checkbox"/> 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:			
<input type="checkbox"/> Client concern	<input type="checkbox"/> Nonconformance report	<input type="checkbox"/> Audit report	<input type="checkbox"/> Corrective action request
<input type="checkbox"/> Supervisory review	<input type="checkbox"/> Peer review	<input type="checkbox"/> Project review	<input type="checkbox"/> 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:			
<i>Note to supervisor:</i> 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			
<input type="checkbox"/> Operating equipment without authority		<input type="checkbox"/> Inadequate inspection/peer review	
<input type="checkbox"/> Failure to follow/improper execution of procedure		<input type="checkbox"/> Poor judgment	
<input type="checkbox"/> Using equipment improperly		<input type="checkbox"/> Failure to communicate—written and/or verbal	
<input type="checkbox"/> Improper servicing/maintenance of equipment		<input type="checkbox"/> Acceptance of defective equipment/material	
<input type="checkbox"/> Under influence of alcohol/drugs		<input type="checkbox"/> Other substandard acts	
<input type="checkbox"/> Horseplay			

Corporate ESQ Report # **Insert number here**
 Project Name: **Insert name here**

EHS 1-7, Attachment B Quality Event Report and Investigation

Substandard Conditions	
<input type="checkbox"/> Personnel not properly qualified or trained	<input type="checkbox"/> Inadequate oversight
<input type="checkbox"/> Defective equipment/material	<input type="checkbox"/> 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
<input type="checkbox"/> Inadequate physical/physiological capability	<input type="checkbox"/> Inadequate leadership and/or supervision
<input type="checkbox"/> Inadequate mental/psychological capability	<input type="checkbox"/> Inadequate engineering
<input type="checkbox"/> Physical or physiological stress	<input type="checkbox"/> Inadequate purchasing
<input type="checkbox"/> Lack of knowledge	<input type="checkbox"/> Inadequate maintenance
<input type="checkbox"/> Lack of skill	<input type="checkbox"/> Inadequate tools and equipment
<input type="checkbox"/> Improper motivation	<input checked="" type="checkbox"/> Inadequate work standards
<input type="checkbox"/> Other personal factors	<input checked="" type="checkbox"/> Excessive wear and tear
	<input type="checkbox"/> Abuse and misuse
	<input type="checkbox"/> Change
	<input type="checkbox"/> 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:	
<input type="checkbox"/> Leadership and administration	<input type="checkbox"/> Engineering controls and change management
<input type="checkbox"/> Training	<input type="checkbox"/> Personal communications
<input type="checkbox"/> Planned inspections	<input type="checkbox"/> Group meetings
<input type="checkbox"/> Critical task analysis and procedures	<input type="checkbox"/> General promotion of Loss Control principles
<input type="checkbox"/> Task observation	<input type="checkbox"/> Hiring and placement
<input type="checkbox"/> Rules and work permits	<input type="checkbox"/> Materials and services management
<input type="checkbox"/> Accident/event analysis and corrective and preventive action	<input type="checkbox"/> Quality control
<input type="checkbox"/> System evaluation	

Corporate ESQ Report # **Insert number here**
 Project Name: **Insert name here**

**EHS 1-7, Attachment B
 Quality Event Report and Investigation**

<i>Remedial Actions</i>			
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: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Sign:		Date of Approval:	
ESQ (PESM, QA) Approval: <input type="checkbox"/> Yes <input type="checkbox"/> 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 3-1 : Ergonomics

**Last Revision By: Andrew Hopper on
02/13/2012**

Created By: Lisa Kaminski on 05/20/2002

Purpose:	The purpose of this program is to establish minimum requirements for the implementation of an effective ergonomics program at Tetra Tech EC, Inc. (TtEC). The program is focused on the prevention of cumulative trauma disorders, particularly those associated with the use of computer keyboards and injuries associated with lifting and material handling.		
Version Date:	05/21/2002 - 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, Monitoring, Operational Control, Training	Document Owner:	Skip Parry
Approved By:			

▼ **Table of Contents**

Section

1.0 PURPOSE

2.0 SCOPE

3.0 MAINTENANCE

4.0 DEFINITIONS

4.1 Ergonomics

4.2 Cumulative Trauma Disorder

4.3 Ergonomic Hazard

4.4 Ergonomic Risk Factor

4.5 Health Care Provider/Medical Surveillance Program Administrator

4.6 Qualified person

4.7 Systems Approach

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Line Management

5.1.2 Environmental, Health and Safety Personnel

5.2 Pre-Placement Medical Evaluations

5.3 Workplace Evaluations

5.3.1 Computer Workstation Surveys

5.3.2 Material Handling

5.3.3 Frequency of Workplace Surveys

5.3.4 Action Items and Follow-up Report

5.3.5 Records

5.4 Hazard Prevention and Control

5.4.1 Workstation Configuration

5.4.2 Work Practice Controls for Computer Workstations

5.4.3 Material Handling Controls

5.4.4 Hand Tool Selection

5.5 Personal Protective Equipment

5.6 Training

6.0 REFERENCES

7.0 ATTACHMENTS



1.0 PURPOSE

The purpose of this program is to establish minimum requirements for the implementation of an effective ergonomics program at Tetra Tech EC, Inc. (TtEC). The program is focused on the prevention of cumulative trauma disorders, particularly those associated with the use of computer keyboards and injuries associated with lifting and material handling.



2.0 SCOPE

This program applies to all TtEC operations.



3.0 MAINTENANCE

The Executive 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 Ergonomics

The science that studies the physical effects of workstations, tools, and equipment on the human body.



4.2 Cumulative Trauma Disorder

A term for health disorders arising from repeated biomechanical stress due to ergonomic hazards. Other terms used include: repetitive motion injury, occupational overuse syndrome, and repetitive strain injury. Cumulative trauma disorders (CTDs) are a class of musculoskeletal disorders involving damage to the tendons, tendon sheaths, synovial lubrication of the tendon sheaths, and the related bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck and back. Frequently occurring CTDs include: carpal tunnel syndrome, epicondylitis (tennis elbow), tendinitis, tenosynovitis, synovitis, stenosing tenosynovitis of the fingers, DeQuervain's Disease, and low back pain.



4.3 Ergonomic Hazard

A workplace condition that poses a biomechanical stress to the worker. They include, but are not limited to: faulty work station layout, improper work methods, improper tools, excessive tool vibration, and job design problems that include aspects of work flow, posture, work/rest regimens, and repetition rate.



4.4 Ergonomic Risk Factor

A condition of a job or activity that contributes to the risk of developing CTDs. Examples include: repetitiveness of activity, force required, and awkwardness of posture. They are considered in light of their combined effect in inducing CTDs, i.e., risk factors are synergistic element of ergonomic hazards.



4.5 Health Care Provider/Medical Surveillance Program Administrator

A physician/physicians specializing in occupational health, registered nurse specializing in occupational health, or other health personnel working under the supervision of these individuals.



4.6 Qualified Person

A person with thorough training and experience sufficient to identify ergonomic hazards in the workplace and recommend an effective means of correction.



4.7 Systems Approach

A comprehensive program that addresses workplace processes, activities and conditions as interdependent systems in order to identify and to eliminate or reduce all types of hazard, including ergonomic hazards, to employees.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Line Management

Line managers are responsible for:

- reviewing and [implementing](#) health and safety recommendations which are intended to reduce the probability that ergonomic disorders will occur.
- [contacting ESQ to perform an office ergonomic survey when:](#)
 - [a new employee is hired](#)
 - [an employee moves to another workstation](#)
 - [an employee obtains new furniture](#)
 - [an employee's assignment changes that significantly increases their computer use](#)
 - [an employee informs their supervisor that they are experiencing symptoms which may be associated with their workstation](#)
- [ensuring office-based employees receive ergonomic awareness training, conduct workstation self-assessments, and report any physical discomfort or problems with their workstation immediately.](#)



5.1.2 Environmental, Health and Safety Personnel

The Environmental and Safety Coordinator (ESC) for each office or the Environmental and Safety Supervisor (ESS) for each project is responsible for surveying each workplace per the requirements of this programs, to identify ergonomic hazards and to make recommendations, when necessary, for corrective actions to reduce the probability that ergonomic disorders will occur.

[The ESC shall also respond to employee or supervisory requests for an ergonomic survey.](#)



5.2 Pre-Placement Medical Evaluations

Pre-[placement](#) medical evaluations are not required for office personnel.

TtEC job descriptions contain general information regarding the physical exertion required for each job position including standing, walking, bending, climbing, and lifting. For participants in the TtEC medical surveillance program (hazardous waste workers), per EHS 4-5, Medical Surveillance, this information will assist the Corporate Medical Consultant (CMC) to evaluate an individual's ability to perform the job tasks required by their job position. The objective of this evaluation is to identify pre-existing physical conditions which might be aggravated by routine job duties. The results of the medical evaluation will enable Human Resources and operations personnel to determine when reasonable accommodations can be made to avoid aggravation of pre-existing ergonomic disorders or conditions.

[Pre-employment back evaluations are recommended for craft workers who may be at greater risk of developing low back pain or low back injury. This evaluation may be requested by contacting our Corporate Medical Consultant \(CMC\) and may be performed by the local medical provider under the approval and direction of our CMC.](#)



5.3 Workplace Evaluations

Surveys shall be performed by qualified persons to identify and evaluate tasks which might result in injuries due to ergonomic hazards. The focus of the surveys will be: 1) Computer workstations which are used by a single person on an average of more than 20 hours per week and those which are used by multiple persons, and 2) Operations which involve the manual lifting and moving of objects of excessive weight or asymmetric size.



5.3.1 Computer Workstation Surveys

Workstation Ergonomic Checklist (Attachment A) shall be used for the evaluation of all computer workstations which are used by a single person on an average of more than 20 hours per week or by multiple persons. This checklist is based on guidelines established in the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations.

If the results of the computer workstation survey indicate that the workstation does not meet the desired characteristics or the workstation is not being properly used, recommendations shall be made to modify the workstation and/or provide additional training.



5.3.2 Material Handling

Potential material handling hazards for field operations will be initially identified during the development of Environmental, Health and Safety (EHS) plans pursuant to EHS 3-2, EHS Plans. Potential hazards are to be addressed through the hazard analysis portions of these plans. The effectiveness of the control measures are to be reviewed during inspections (EHS 3-3, Inspections), ESQ audits (C-2, Audits), and routine observations of workplace activities.

During inspections or audits, or when performing routine observations of workplace activities, Attachment B or an equivalent should be used as a screening tool to identify tasks with ergonomic hazards or risk factors. When ergonomic hazards or risk factors for lifting tasks are identified, the NIOSH "Work Practices Guide for Material Handling" are available as guidelines for evaluating the task.

Recommendations shall be made as necessary to modify the work activity and/or provide additional training. The NIOSH evaluation criteria accounts for the following variables for each lifting task: weight of object, horizontal location, vertical location, vertical travel distance, frequency of lifting, and duration of period of lifting.



5.3.3 Frequency of Workplace Surveys

Computer workstation surveys shall be conducted:

- [ergonomic evaluation upon initial assignment, upon a move, upon use or receipt of new furniture/chairs, computers, monitors, \(etc\). and upon request of an employee, supervisor or office manager.](#)
- [for new hires within one month of workstation permanency](#)
- [when an employee moves to another workstation](#)
- [when an employee obtains new furniture](#)
- [when an employee informs their supervisor that they are experiencing symptoms which may be associated with their workstation](#)
- [when requested by an employee or his/her supervisor](#)

Material handling surveys will be conducted as part of the TtEC EHS inspection and audit programs, EHS 3-3, Inspections, and C-2, Audits.



5.3.4 Action Items and Follow-up Report

The ESS or ESC shall develop an Action Item and Closure Report (Attachment C or an equivalent) that identifies the recommendations, proposed schedule for implementation and responsible parties. The Operations Manager ([for field sites](#)) shall complete [and forward](#) the Action Item and Closure Report within 60 days [of receipt](#) to the ESS or ESC. The ESS or ESC shall send copies to Manager, EHS Services and [to the Director, EHS Services. The ESS or ESC will notify the Operations Manager and manager, EHS Services when Closure Reports are delinquent.](#)



5.3.5 Records

Manager, EHS Services shall maintain copies of all ergonomics surveys and completed Action Item and Closure Reports.



5.4 Hazard Prevention and Control



5.4.1 Workstation Configuration

The recommended design specifications for TtEC work stations are:

- Adequate work space to perform the job;
- Consideration of individual body size in relation to design of chair, height of work surface, and access to various elements of the work station, including the monitor screen;

- Work surface, monitor and keyboard height within parameters established in the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations (ANSI/HFS 100-1988), or preferably, a height adjustable work station (including capability to adjust monitor height and keyboard height if VDT is used);
- Adequate leg room;
- No direct reflection of light on screen, adequate illumination (normally 28-50 footcandles), minimum contrast between a monitor screen and the surrounding work area; and
- Direction of air supply ducts away from person.

The recommendations for chair design are:

- Adjustable seatpan, and lumbar-supportive backrest that can be adjusted for height and depth to individual users;
- [five legs](#);
- [adjustable for height](#);
- [laterally and vertically adjustable armrests](#);
- [backrest adjustable for tilt and](#);
- [chair can swivel](#)

Recommendations for miscellaneous workstation accessories include:

- VDT workstations: footrest, [natural shaped keyboard](#), adjustable copy holder, wrist rest, mouse rest, antiglare screen (if needed or wanted).

All newly purchased TtEC workstations, desks, and/or chairs shall meet the above specifications. Existing furniture shall be modified as necessary on the basis of the evaluation using the workstation ergonomic checklist.



5.4.2 Work Practice Controls for Computer Workstations

Work practice controls for workstations include setting the work station up correctly, proper posture, taking eye breaks, and exercises.

The set-up of a VDT workstation should be as follows:

- The center of the screen should be at chin level. Position the screen at 14 to 24 inches from the eyes.
- Adjust the chair to fit body. Keep the back supported, knees at hip level, feet flat on floor or [on a footrest](#).
- Place keyboard low enough so arms hang loosely, [shoulders are relaxed](#), and [the upper arm is at a right angle to the forearm](#).
- Set document holder close to screen and at same distance [from eyes](#) to avoid frequent head and eye movements [and refocusing](#).
- Every 20 minutes, focus on an object at least 20 feet away. Move eyes up down, sideways, and diagonally. Eliminate sources of reflective glare. Correct posture includes holding head and spine upright and sitting well back in the chair - aim buttocks where seat and backrest meet.
- Keep wrist in line with hands and forearms. Maintain a light touch on keyboard.
- [Allow hand to rest on mouse](#).
- [Support lower arms by using the chair armrests to eliminate need to hold up arms and shoulders](#).



5.4.3 Material Handling Controls

Material handling equipment such as lift trucks, hand trucks, lift gates, etc. shall be utilized whenever possible.

When mechanical lifting and moving aids cannot be used, team lifting shall be used as a minimum for loads over 50 pounds and for awkward loads. When team lifting is not indicated, personnel are to be trained in and required to use proper lifting techniques.



5.4.4 Hand Tool Selection

Hand tools shall be selected to minimize the following stressors: chronic muscle contraction or steady force, extreme or awkward finger/hand/arm positions, repetitive forceful motions, excessive gripping, pinching, pressing with hand and fingers.



5.5 Personal Protective Equipment

TtEC shall not provide personal protective equipment (PPE) for reducing ergonomic risk factors without the authorization of the CMC or Manager, EHS Services. This includes, but is not limited to, "back" belts, wrist splints, and forearm wraps for "tennis" elbow.



5.6 Training

The employees identified below and supervisors of such employees shall be trained in accordance with the requirements specified in this section.

- Employees who use a computer workstation on an average of more than 20 hours per week;
- Employees who share work station with multiple persons;
- Employees who conduct operations which involve the manual lifting and moving of objects of excessive weight or asymmetric size; and
- Employees identified through the ergonomic survey as requiring training.

The training shall be geared toward field or office duties, as appropriate. It shall include, but not be limited to:

- Types of ergonomic disorders, especially CTD's and back/upper body strains;
- What risk factors cause or contribute to ergonomic disorders;
- How to recognize and report symptoms;
- Ergonomic hazards associated with their assigned tasks;
- Proper workstation design, use, and posture, if applicable;
- Proper lifting techniques; and
- Work practice controls.
- Summary TtEC Ergonomic program with employees.
- [Employees who experience symptoms/pain possibly associated with their workstation.](#)

This training shall be conducted as part of office or site-specific orientation.



6.0 REFERENCES

ANSI (American National Standards Institute) Human Factors Engineering of Visual Display Terminal Workstations.

Compliance Procedure C-2, Audits

Environmental, Health & Safety - Programs Procedure EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)

Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections

Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance

NIOSH (National Institute for Occupational Safety and Health) Revised Guide for Manual Lifting.

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration) Ergonomics Program Management Guidelines for Meatpacking Plants (1991).

Personal Health Design Bytes of Advice for Comfort and Health, Loudonville, NY (1992).



7.0 ATTACHMENTS

Attachment A - Workstation Ergonomic Checklist
Attachment B - Identification of Ergonomic Risk Factors
Attachment C - Action Item and Closure Report



**EHS 3-1 ATTACHMENT A
WORKSTATION ERGONOMIC CHECKLIST**

Click the icon below to download and complete.



EHS 3-1 Att A-Revision2.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



**EHS 3-1 ATTACHMENT B
IDENTIFICATION OF ERGONOMIC RISK FACTORS**

Click the icon below to download and complete.



EHS 3-1 Attachment B.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



**EHS 3-1 ATTACHMENT C
ERGONOMICS ACTION ITEM AND CLOSURE REPORT**

Click the icon below to download and complete.



EHS 3-1 Attachment C040301.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

Tetra Tech EC, Inc.

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Proprietary Information

Purpose: The purpose of this procedure is to establish a process for periodic inspections of project sites, offices and warehouses.

Status:	Complete	Approved By:	John DeFeis
		Title:	EHS Inspections
Version Date - Type:	11/09/2010 - Revised	Original Issue	02/01/95
		Date:	
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub-Category:	Departmental/Discipline	Document	Procedure
		Type:	
Keyword Index:	EHS Compliance/Waste Management, Field Activities/Environmental H&S, Training, Monitoring, Nonconformance and Corrective and Preventive Action	Document	Skip Parry
		Owner	

See Below

The purpose of this procedure is to establish a process for periodic inspections of project sites, offices and warehouses.

This procedure applies to all Tetra Tech EC, Inc. (TtEC) ("the Company") project sites, offices, and warehouses, including subcontractor activities.

The Project Manager (PM) is responsible for:

- a. Planning and budgeting for inspections as part of the project planning process in accordance with Task Initiation Procedure, PO-2 and the Project's Risk Management Plan.
- b. Ensuring that inspections are conducted in accordance with this procedure.
- c. Reviewing Environmental Health and Safety (EHS) inspection reports with on-site management.

The Site Manager (SM) or PM is responsible for:

- a. Participating in weekly EHS inspections as practicable.

- b. Ensuring that action items are developed, documented, and implemented and tracked to closure.

Site Supervisors are responsible for:

Conducting weekly EHS inspections for their area(s) of responsibility.

Ensuring that weekly inspection action items are implemented and documented in the project files.

The Operations Manager for each office and warehouse is responsible for ensuring that:

- a. Inspections of the office and, if applicable, warehouse are conducted on a quarterly basis.
- b. Action items are implemented and documented in a timely manner.

The Director, EHS Services, is responsible for:

- a. Reviewing and updating the inspection checklists as necessary.
- b. Monitoring conformance with the Project Environmental and Safety Manager (PESM) inspection requirements.
- c. Developing Lessons Learned Reports, Event Reports, or ZIP Bulletins for selected inspection findings

The PESH is responsible for:

- a. Approving and documenting PESH inspection frequency.
- b. Performing the PESH inspections and/or designating the appropriate technical specialist, as necessary, per the project schedule and budget.
- c. Immediately communicating significant violations or potential violations to the Project Manager and the Director, EHS Services.
- d. Preparing PESH inspection reports, issuing the report, and posting to the Company PESH inspection Database located on Lotus Notes within 10 days of the inspection.
- e. Tracking closure of each PESH inspection.
- f. Providing training in proper inspection techniques and as required to address action items.
- g. Reviewing EHS inspection reports.

The ESS is responsible for:

- a. Performing informal daily inspections of the worksite and documenting observations in the safety logbook.
- b. Assisting the PM or SM with weekly inspections.
- c. Reviewing the weekly and monthly inspection checklists for completeness, thoroughness, and trends. [Trends of action items in weekly and monthly EHS inspection results should be reviewed for similar](#)

[situations in other areas.](#)

The Office Environmental and Safety Coordinator (ESC) is responsible for:

- a. Assisting with quarterly inspections of the office and, if applicable, the warehouse.
- b. Training alternate office personnel on how to conduct office inspections.

For projects encompassing 1-week duration or more of consecutive workdays, the Site Supervisor shall conduct a weekly inspection of his/her area(s) of responsibility at the project site. The inspection shall:

- a. Include site conditions, employee and Subcontractor behaviors and work practices, pollution prevention and waste management practices, wastewater and other environmental conditions, or any other applicable requirements specified in the project EHS Plan(s).
- b. Be documented in an inspection report identifying the date, time, site conditions/operations, activities observed, personnel conducting the inspection, findings, recommended action items, individual responsible for implementation of each action item, and schedule for implementation. Attachment B may be used to document the inspection.

PESM inspections are budgeted inspections of remediation, clean construction, and consulting and engineering (C&E) projects. The PESH will either perform the inspection and/or designate an appropriate technical specialist. The PESH shall utilize a hierarchical risk based approach to determine inspection frequency at remediation, C&E, and clean construction projects.

- a. Specific checklist to be used for a given inspection will be determined by the PESH, based on the scope and risks of the project. The pertinent portions of each applicable checklist should be covered during at least one inspection annually.
- b. For programs with multiple task orders, the PESH will identify the task orders which should be inspected. Inspection frequency will be risk based to include an assessment of project scope, complexity, staffing, potential environmental, health, and safety standards.
- c. Inspections should occur soon after site mobilization and initiation of site activities. Subsequent PESH inspections shall be based upon the results of previous inspections; greater risk = increased inspection frequency. The PESH shall coordinate the date and time of the inspection with the PM and the SM.

For C&E field projects the PESH shall evaluate the need for field inspections. The determination of whether an inspection(s) is required should consider the factors described in paragraph b. above

Inspection frequency should be identified in the project EHS Plan.

The PESH shall **immediately** call the Director, EHS Services to report significant inspection findings including those that might require agency reporting. The Director, EHS Services, in conjunction with the legal department, will help the Project Manager and PESH determine if the finding requires agency reporting. If a determination is made that a finding must be reported, the client and agency will be notified

in accordance with EHS 1-7, Event Reporting and Investigation.

The PESM shall post inspection reports, including checklists (Attachment C) and action items (Attachment E or equivalent), to the PESM Inspection Database within 10 days of the inspection.

All Action Items should be classified by the PESM as either Major or Minor, or recommendation. Major findings shall receive first priority schedule for addressing action items.

Action items should be addressed as described in the Action Item Report by the Project Manager and forward the completed Action Item Report to the PESM.

The PESM shall review the completed Action Item Report to ensure completeness and appropriate closure of all Action Items. The PESM shall post completed Action Item Reports to the PESM Inspection Database and close the inspection.

The Operations Manager shall ensure that EHS inspections are conducted at least quarterly at each office and warehouse, except for fire extinguishers and first aid kits which shall be inspected monthly. Attachment F, or an equivalent, shall be used to conduct and document the inspection. The Operations Manager shall send a copy of the completed Inspection Checklist to the Director EHS Services.

The Operations Manager shall ensure implementation and documented closure of all action items using the Action Item Report (Attachment E) or equivalent. The Operations Manager shall send the completed Action Item Report to the Director, EHS Services, within 30 days of conducting the inspection.

Inspection results should be analyzed for root causes. At least annually, the Director, EHS Services OR Director, Quality Programs, or his/her designee, shall review PESM inspection findings to identify trends.

This review should be documented and forwarded to the ESQ Program Directors, and to the Chief Executive Officer.

The ESQ Program Directors and the Chief Executive Officer will utilize the analysis to develop program and environmental objectives and targets, as appropriate.

The Director, EHS Services, shall ensure that individuals responsible for conducting inspections understand the Company's program requirements; applicable federal, state and local laws and regulations; and proper inspection techniques.

Records of all inspections and closure of identified Action Items related to EHS inspections shall be documented and maintained by the office or project as follows:

- a. Informal Inspections - Project Files
- b. Weekly Inspections - Project Files
- c. PESH Inspection Report - PESH Inspection Database
- d. Completed PESH Inspections Action Item Report - PESH Inspection Database
- e. Completed Office/Warehouse Inspections and Action Item Reports - Operations Manager

4.1 Definitions

A finding that indicates the real-time presence of a potential or imminent hazard, significant regulatory violation, or may result in imminent harm to people, property or the environment. Major findings are typically observed in the field at the time of inspection, and require immediate corrective action to reduce the risk of loss. Major findings must receive top priority for correction.

An observed finding which by itself is not a direct hazard, or potential harm to human health or the environment. Minor findings are usually associated with documentation, programmatic deficiencies, recordkeeping, reporting, or management/organizational practices.

Example #1: Findings associated with Stormwater Control Systems

- a. **Major** - A significant breach in erosion control feature (e.g., missing or deteriorated hay bales).
- b. **Minor** - Failure to maintain documentation of required periodic inspections of erosion control features.

Example #2: Compliance with OSHA Ladder Standards

- a. **Major** - Defective extension ladder observed.
- b. **Minor** - Failure to ensure all ladders are routinely inspected.

The ESS and all Company employees and Company subcontractor employees should be continuously aware of workplace and environmental conditions and the work practices of their fellow workers. If a substandard condition of work practice is identified, it shall be brought to the attention of the individual or supervisor, and corrected. Hazard Report and Suggestion Form (Attachment A) can be used to report substandard conditions or work practices. ZIP Slip (Attachment G) can be used to report exceptional practices or substandard conditions. ZIP Slips may be completed electronically using the Company Zip Slip Database. The Compliance Hot Line can also be utilized for anonymous reporting (See PP-18, Employee Reporting, Hotline and Non Retaliation).

The inspector should review project documents (Contract, TIP, Work Plans, EHS Plan(s), any pertinent decision documents, subcontractor approvals, permits, etc.) before the inspection.

The PESH should utilize the appropriate PESH Inspection Checklists (Attachment C) to perform the site inspection. Only the portions of the checklist applicable to the project being inspected will be utilized. The PESH should modify the inspection checklist as necessary for major projects.

Detailed environmental compliance checklists are very useful for the first PESH inspection of a site to ensure nothing is overlooked. (This is especially helpful if you are not the Project Regulatory Compliance Specialist and are not familiar with site activities). For subsequent PESH inspections, the Project's Regulatory Compliance and Waste Management Plans (or relative sections of the EHS Plan or Work Plans) may be used as the basis for the inspection to ensure site is implementing the Plan/s.

The PESH Inspection shall include:

- a. High risk activities (HIPO) and a visual inspection of the site. Areas of the project site that may be accessed and inspected include but are not limited to, exclusion zones, buildings, and waste storage areas.
- b. Completion of applicable and selected portions of the PESH Inspection Checklists or equivalent documentation (Attachment C).
- c. A review of on-site records (e.g., permits, agency approvals, waste analyses, waste profiles, waste manifests, discharge monitoring reports, training records, etc.).
- d. Positive recognition of conformance.
- e. Non-conformance noted by the PESH that can be remedied during the conduct of the inspection will be corrected. Conformance and non-conformance shall be documented on the PESH Inspection Checklists.
- f. Training of project and subcontract personnel, when possible, to address non-conformances.
- g. Identification of any observed positive practices.

The PESH will stop work if any conditions or work practices are identified which pose imminent danger to the environment or to the safety and health of personnel.

Please Describe Your Reference Here

Place Your Link in this Column

1. Environmental Health & Safety Programs, Procedure EHS 1-7, Event Reporting and Investigation
2. Personnel Practices Procedure PP-18, Employee Reporting, Hotline, and Non-Retaliation
3. Project Initiation and Operations Procedure PO-2, Task Initiation (TIP)
- 4.
- 5.
- 6.

Please Provide a Description of the Attachment

- A. Hazard Report and Suggestion Form

- B. EHS Weekly Checklists and Action Item Report

- C. PESH Inspection Checklist(s)

Place Your Attachments Here



ehs 1-7 Attachment B040301.doc



EHS 3-3 Attachment B, 3-24-2011.doc



EHS3-3 Attachment C Air, 8-10-09.doc



EHS 3-3 Attachment C Asbestos 5-24-11.doc



EHS 3-3 Attachment C Conservation, 6-21-06.doc



EHS 3-3 Attachment C Drinking, 6-21-06.doc



EHS 3-3, Attachment C EHS Programs, 6-5-06.doc



EHS 3-3 Attachment C Field Construction 5-24-11.doc



EHS 3-3 Attachment C HazWaste, 5-25-11.doc



EHS 3-3 Attachment C Lead, 6-30-09.doc



EHS 3-3 Attachment C Oil and Haz Subst, 7-6-09.doc



EHS 3-3 Attachment C PCB, 6-27-06.doc



EHS 3-3 Attachment C Solid, 6-27-06.doc



EHS3-3 Attachment C UST AST 5-24-11.doc



EHS 3-3 Attachment C Wetlands, 8-1-09.doc



EHS 3-3 Attachment C Wastewater, 6-30-09.doc



EHS 3-3 Attachment C Hazwaste Perm, 5-25-11.doc



EHS 3-3 Attachment C, Radioactive Mat DOE, 7-25-2005.doc



EHS 3-3 Attachment C, Radioactive Mat NRC, 7-25-2005.doc



EHS 3-3 Attachment C, Radioactive Mat, 7-2005.doc

E. Action Item Report



EHS 3-3 Attachment E.doc

F. EHS Office/Warehouse Inspection Checklist



EHS 3-3 Attachment Fgc122809.doc

G. ZIP Slip

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Purpose: The purpose of this program is to prevent injuries due to falls from elevated work surfaces and to comply with Occupational, Safety and Health Administration (OSHA) fall protection standards in 29 CFR 1926, Subpart M.

Status:	Complete	Approved By:	John DeFeis
		Title:	Fall Protection
Version Date - Type:	03/12/1998 - Revised	Original Issue	02/01/95
		Date:	
Category:	Company Procedures	Sections:	ESQ - Environmental Health & Safety Programs
Sub-Category:	Departmental/Discipline	Document	Procedure
		Type:	
Keyword Index:	Operational Control, Training	Document	Skip Parry
		Owner	

Section

1.0 PURPOSE

2.0 SCOPE

3.0 MAINTENANCE

4.0 DEFINITIONS

4.1 Competent Person

4.2 Dangerous Equipment

4.3 Hole

4.4 Opening

4.5 Personal Fall Arrest System

4.6 Walking/Working Surface

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Line Management

5.1.2 Environmental, Health and Safety Personnel

5.2 General Requirements

5.3 Hoist Areas

5.4 Excavations

5.5 Dangerous Equipment

5.6 Guardrail Systems

5.7 Personal Fall Arrest Systems

5.8 Protection From Falling Objects

5.9 Other Fall Protection Requirements

5.10 Training

5.10.1 General

5.10.2 Retraining

5.10.3 Certification of Training

5.10.4 Previous Training

6.0 REFERENCES

1.0 PURPOSE

The purpose of this program is to prevent injuries due to falls from elevated work surfaces and to comply with Occupational, Safety and Health Administration (OSHA) fall protection standards in 29 CFR 1926, Subpart M.

2.0 SCOPE

This program applies to all Tetra Tech EC, Inc. (TtEC) and/or TtEC subcontractor field 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 Competent Person

A person possessing the skills, knowledge, experience, and judgement to perform assigned tasks or activities satisfactorily.

4.2 Dangerous Equipment

Dangerous equipment means equipment which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment. Examples provided in Subpart M include tanks, degreasing units, machinery, and electrical equipment.

4.3 Hole

Hole means a gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.

4.4 Opening

An opening means a gap or void 30 inches or more high and 18 inches or more wide through which employees can fall to a lower level.

4.5 Personal Fall Arrest System

A personal fall arrest system consists of an anchorage, connectors, body harness, and may include a lanyard, deceleration device, lifeline, or suitable combination of these. Body belts are not permitted in personal fall

arrest systems on TtEC projects.

4.6 Walking/Working Surface

A walking/working surface is any surface, whether horizontal or vertical, on which an employee walks or works, including but not limited to floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel, but not including ladders, vehicles, or trailers on which employees must be to perform their job duties.

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Line Management

Site Supervisors have the responsibility to ensure that fall protection is provided as required by this program and site Environmental, Health and Safety (EHS) plans for all TtEC operations.

5.1.2 Environmental, Health and Safety Personnel

The Project Environmental and Safety Manager (PESM) will audit implementation of this program as part field inspection pursuant EHS 3-3, inspections.

The Environmental and Safety Supervisor (ESS) is responsible for providing fall protection training for all site personnel and monitoring compliance with this program.

5.2 General Requirements

Employees shall only be allowed to work on walking/working surfaces which have the strength and integrity to support employees safely. Walking/working surfaces for this requirement include the edges of trenches.

Employees performing work on a walking/working surface with an unprotected side or edge which is 6 feet or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

For roof work on low-slope roofs, work on steep roofs, and work near wall openings, fall protection provisions as described in 29 CFR 1926.501(b) shall be utilized.

5.3 Hoist Areas

Employees in a hoist area shall be protected from falling 6 feet or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems are removed to facilitate the hoisting operations and the employee must lean out over the edge of the platform to guide the materials being hoisted, then a personal fall arrest system shall be used.

5.4 Excavations

The edge of an excavation 6 feet or more in depth shall be demarcated by guardrail systems, fences, or barricades when the excavation is not readily seen. The measures described above or covers shall be used

for wells, pits, shafts, or similar excavations.

The Site Supervisor and PESH shall determine when employees must use personal fall arrest systems at the edge of an excavation 6 feet or more in depth. The decision shall be based on the condition of the soil at the edge of the excavation, i.e., slippery, stable, etc., and the nature of the work at the edge of the excavation.

5.5 Dangerous Equipment

Each employee working 6 feet or less above dangerous equipment shall be protected by guardrail systems or by equipment guards or if working at more than 6 feet by guardrail systems, personal fall arrest systems or safety net systems.

5.6 Guardrail Systems

Guardrail systems must meet the criteria specified in 29 CFR 1926.502(b).

5.7 Personal Fall Arrest Systems

Personal fall arrest systems shall meet the criteria specified in 29 CFR 1926.502(d).

5.8 Protection From Falling Objects

Toeboards, when used as falling object protection, shall meet the criteria specified in 29 CFR 1926.502(j); shall have a minimum of 3.5 inches from their top edge to the level of the walking working surface; and no more than a 0.25 inch clearance from the bottom edge to the walking/working surface.

5.9 Other Fall Protection Requirements

Whenever a fall hazard of 6 feet or more exists on a TtEC jobsite, 29 CFR 1926, Subpart M shall be consulted for applicable requirements. If Subpart M does not specifically address the fall hazard, then the Site Supervisor and PESM shall determine if fall protection measures are required.

5.10 Training

5.10.1 General

All site personnel who might be exposed to fall hazards on a TtEC jobsite shall receive training by a competent person. The training shall be conducted at the time of the site orientation. The competent person must meet the applicable requirements of 29 CFR 1926.503(a)(2). The training shall include enabling the employee to recognize the hazards of falling and the procedures to be followed in order to minimize fall hazards.

5.10.2 Retraining

Retraining shall be conducted when changes occur in the workplace which present a new fall hazard, when fall protection systems or equipment is changed, or when it appears that the employee has not retained the requisite understanding or skill regarding the fall hazards or protective measures.

5.10.3 Certification of Training

Certification of training or retraining shall include the name of the employee, the date of the training, the content of the training, and the signature of the person who conducted the training.

Training certification shall be maintained as part of the project file.

5.10.4 Previous Training

TtEC shall not rely on fall protection training from other TtEC jobsites or other employers to meet the training requirements of this program unless the Site Supervisor or ESS prepares a new certification record which indicates the date it was determined that the prior training was adequate and why it was considered adequate.

6.0 REFERENCES

29 CFR 1926, Subpart M, Safety Standards for Fall Protection in the Construction Industry
Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections
OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)

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Purpose: The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.

Status:	Complete	Approved By:	John DeFeis
Version Date - Type:	01/28/2011 - Revised	Title:	Temperature Extremes
Category:	Company Procedures	Original Issue	02/01/95
Sub-Category:	Departmental/Discipline	Date:	
Keyword Index:	EHS Compliance/Waste Management, Monitoring, Operational Control, Training	Sections:	ESQ - Environmental Health & Safety Programs
		Document	Procedure
		Type:	
		Document	Skip Parry
		Owner	

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 s 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° 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°F (36°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°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:

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°F (36°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°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

1. Heat and Cold Stress Information
2. Heat Stress Monitoring and Work/Rest Regimens
3. Cold Stress Monitoring and Work/Recovery Regimens
4. Example - WBGT Monitoring Form
- 5.

Place Your Attachments Here



EHS 4-6, Attachment 1 final 11-8-08



EHS 4-6, Attachment 2 Final 11-11-



EHS 4-6, Attachment 3 final 11-8-08



Attachment 4 Example WBGT Monit

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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° F (37° 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° F (38° C) to 104° F (40° 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° 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° F (40° 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° F (39.4° 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° 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° F (36° C). The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold at about 95° F (35° 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° 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° F (0° 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	1
2.0	WBGT-Based Work/Recovery Regimens	3
2.1	Work/Recovery Regimens	3
2.2	Acclimatization	5
2.3	WBGT Determination	5
3.0	Heat strain General work controls.....	5
4.0	Job Specific controls for heat strain stress	6
5.0	Physiological Monitoring	6
5.1	Monitoring Frequencies.....	6
5.2	Pulse Rate Monitoring.....	6
5.3	Body Core Temperature.....	7
5.4	Removal from Exposure.....	7

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.

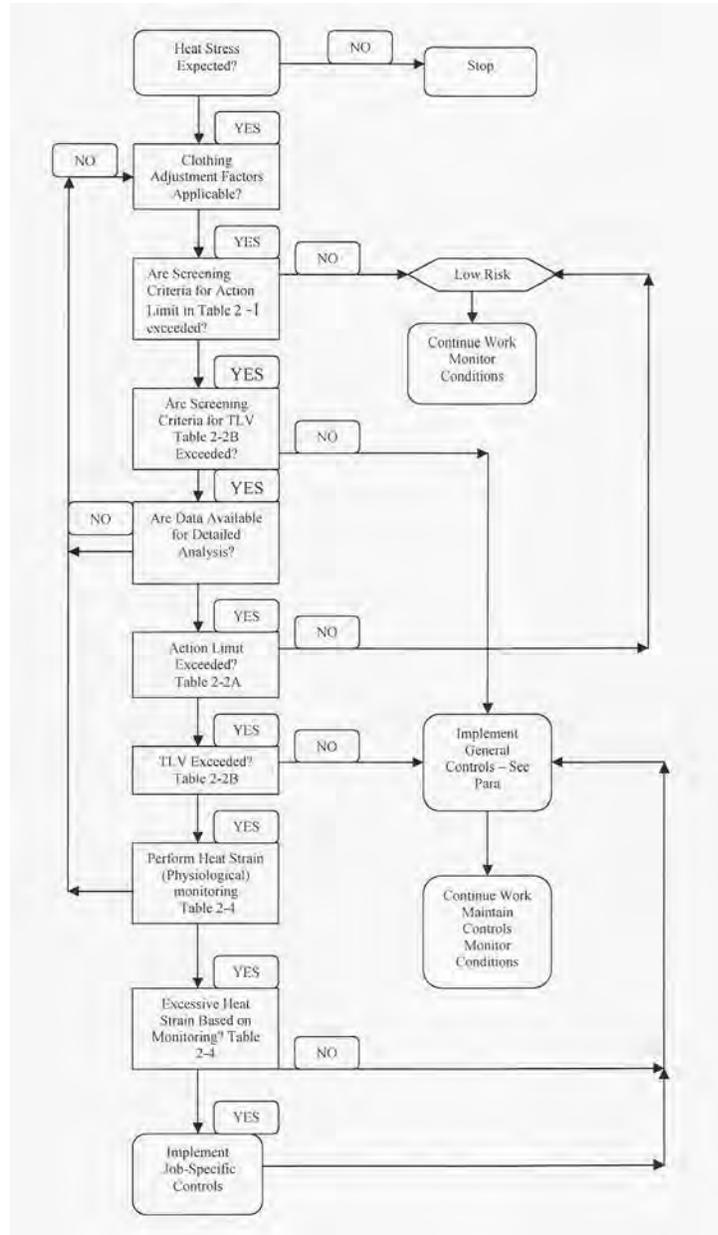
The WBGT, physiological monitors, and personnel heat stress monitors will be used in accordance with manufacturer's instructions. Personnel heat stress monitors will be approved for use by the PESM.

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° F. If double layer woven overalls (5.4° F) are used with acclimatized workers the Corrected Index Temperature is 91.9° 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 (°C) WBGT 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 (°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°C and .1°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 medications (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° F (21° 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° F (38.5° C) for medically selected and acclimatized personnel, or greater than 100.4° F (38° 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° F (37° 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° F (0.3 to 0.6° 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° F (0.3 to 0.6° 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° F (37.5° 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° F (37.5° 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° F (40° 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° F (39° 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° F (36° 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° F (35° 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° F (-32° C). Superficial or deep local tissue freezing will occur only at temperatures below 30.2° F (-1° C) regardless of wind speed. Table 1 provides the Equivalent Chill Temperatures on exposed flesh.

At air temperatures of 35.6° F (2° 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° F (16° 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° F (-1° C).
- If the air temperature falls below 60.8° F (16° C) for sedentary, 39.2° F (4° C) for light, 19.4° F (-7° 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 be 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 be 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° C) so that overall compliance with the TLV can be maintained. Whenever the air temperature falls below 30.2° F (-1° 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° F (-1° 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° F (-24° C) with no wind, or -18° F (0° 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.

Purpose: The purpose of this program is to establish minimum requirements for the proper selection, use, and care of respiratory protection equipment by workers at Tetra Tech EC, Inc. (TtEC) project sites and to ensure compliance with OSHA, 29 CFR 1910.134.

Status:	Complete	Approved By:	John DeFeis
Version Date - Type:	04/04/2000 - Revised	Title:	Respiratory Protection
Category:	Company Procedures	Original Issue	02/01/95
Sub-Category:	Departmental/Discipline	Date:	
Keyword Index:	Monitoring, Operational Control, Training	Sections:	ESQ - Environmental Health & Safety Programs
		Document	Procedure
		Type:	
		Document	Skip Parry
		Owner	

Section

- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 MAINTENANCE
- 4.0 DEFINITIONS
 - 4.1 Hazardous Atmosphere
 - 4.2 Oxygen-Deficient Atmosphere
- 5.0 DISCUSSION
 - 5.1 Responsibilities
 - 5.1.1 Line Management
 - 5.1.2 Environmental, Health and Safety Personnel
 - 5.1.3 Corporate Medical Consultant
 - 5.2 Selection of Respiratory Protective Equipment
 - 5.3 Fit Testing
 - 5.4 Respirator Use
 - 5.5 Cleaning and Storage
 - 5.6 Air Monitoring of Work Areas
 - 5.7 Evaluation of the Program
 - 5.8 Medical Surveillance
 - 5.9 IDLH Atmospheres
 - 5.10 Training
- 6.0 REFERENCES
- 7.0 ATTACHMENTS

1.0 PURPOSE

The purpose of this program is to establish minimum requirements for the proper selection, use, and care of respiratory protection equipment by workers at Tetra Tech EC, Inc. (TtEC) project sites and to ensure compliance with OSHA, 29 CFR 1910.134.

2.0 SCOPE

This program applies to all 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 Hazardous Atmosphere

Any atmosphere containing a potentially toxic gas, vapor, dust, fume, mist, or pesticide, or any oxygen-deficient atmosphere.

4.2 Oxygen-Deficient Atmosphere

An atmosphere containing less than 19.5 percent oxygen by volume at sea level.

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Line Management

Site supervisors are responsible for ensuring that the proper respiratory protective equipment (RPE) is used when required in accordance with the site Environmental, Health and Safety (EHS) plans in the intended manner.

5.1.2 Environmental, Health and Safety Personnel

The Environmental and Safety Coordinators (ESC) are responsible for ensuring that personnel based in their office receive annual training and fit testing for RPE.

The Project Environmental and Safety Manager (PESM) is responsible for selection and specification of RPE in accordance with the requirements of this program, EHS 5-1 (Personal Protective Equipment) and EHS 3-2

(EHS Plans), and applicable regulations.

The Environmental and Safety Supervisor (ESS) is responsible for:

- Ensuring that personnel have the necessary training and fit testing for the use of each type of respirator and ensuring that proper documentation is available
- Monitoring the use of RPE
- Ensuring that RPE is maintained and inspected in accordance with the EHS plans and program requirements
- Evaluating the effectiveness of the respiratory protection program on each site, and
- Recommending changes to the types of RPE being used, as necessary.

5.1.3 Corporate Medical Consultant

The Corporate Medical Consultant (CMC) is responsible for providing clearance for TtEC personnel to use RPE in accordance with EHS 4-5, Medical Surveillance.

5.2 Selection of Respiratory Protective Equipment

All respiratory equipment utilized on TtEC projects shall be certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH). The type of respiratory protection selected is based upon potential hazards at a specific site. Selection of appropriate respiratory protection is documented in the EHS plans (see procedure PO-1, Project Management Planning.) and approved by the ESQ Regional Manager, PESM and/or a Certified Industrial Hygienist.

There are three general classes of respiratory protection available:

- Self-contained breathing apparatus (SCBA),
- Air-supplied devices, and
- Air-purifying devices.

To select which type of respiratory protection is appropriate for a given project, the following questions must be answered:

1. Is there a possibility of an oxygen-deficient atmosphere?
2. Are the contaminants and concentrations in the worker breathing zones known or unknown?
3. What are the allowable concentration limits (permissible exposure limits or threshold limit values) for the contaminants? What are their physical properties?
4. What are the maximum expected concentrations of known contaminants? Are the concentrations Immediately Dangerous to Life and Health (IDLH)?
5. What is the expected duration of personnel exposure?
6. What are the warning properties and symptoms of the contaminants?
7. Can the contaminant be absorbed through the skin and/or eyes?

8. Are the contaminants flammable?
9. Is there any other pertinent information concerning the contaminants that may be pertinent to selecting appropriate respiratory protection?

Atmosphere-supplying respirators (i.e., pressure demand SCBAs or airline systems) shall be used when one of the following occurs: 1) the hazardous substance has been identified and requires the highest level of protection based on the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; 2) site operations involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates; or 3) operations are being conducted in confined, poorly ventilated areas that could contain hazardous concentrations of atmospheric vapors, gases, or particulates and/or reduced oxygen concentrations less than 19.5 percent. Escape packs are used with all airline systems. Note: Employees shall not be required to enter atmospheres that are immediately dangerous to life or health without the approval of the Project Environmental and Safety Manager, or without specific hazardous atmosphere rescue training.

Negative pressure air purifying respirators, equipped with appropriate filter cartridges for the expected contaminants, may be used only when the atmospheric contaminants have been identified, and expected concentrations are within limits that can be effectively removed by the respirator cartridges. For air purifying respirators used for protection against gases or vapors, a cartridge change schedule shall be included in the EHS Plan along with a description of the information or data relied upon to develop the schedule. In most cases this will consist of recommendations by the manufacturers when they become available.

5.3 Fit Testing

A qualitative fit test shall be conducted for each employee during the initial 40-hour health and safety training course and/or at site-specific training and annually thereafter. Fit testing may also be performed when a condition that may effect the face fit of the respirator has occurred, such as weight gain or loss, dental work, facial surgery, or deformity. Employees shall be clean shaven during fit testing.

Qualitative fit tests shall be administered using irritant smoke or Bitrex in accordance with the OSHA respiratory protection standard in 29 CFR 1910.134, Appendix A. ([Attachment A of this procedure contains the protocol for the irritant smoke test.](#) If using the Bitrex test kit, follow the protocol in the OSHA standard.)

Qualitative Fit testing will be limited to situations where a negative pressure respirator is used and a protection factor of 10 or less is needed. If a protective factor of greater than 10 is needed, the EHS plan will require either a positive pressure/pressure demand respirator or quantitative fit-testing of the negative pressure respirator.

All positive pressure/pressure demand respirators with tight-fitting facepieces will be fit-tested qualitatively or quantitatively in the negative pressure mode.

A record of the fit test shall be maintained utilizing the qualitative respirator fit test record form (Attachment B). Records of employee respiratory protection training shall be maintained by each office ESC and by the ESS in each project file.

5.4 Respirator Use

All TtEC personnel are required to:

- Use RPE when required and in the proper manner;
- Inspect RPE prior to each use and obtain replacement equipment when found to be defective;

- Perform a user seal check each time they put on a tight-fitting respirator;
- Take proper care of the RPE;
- Be clean shaven where the seal of the respirator contacts the face whenever using RPE; and
- Leave the respirator use areas whenever necessary to wash their face or respirator to avoid skin irritation; if they detect contaminant breakthrough, a change in breathing resistance, or leakage of the facepiece; or to change filters or cylinders.

Low temperatures may fog the lenses of the respirator and use of anti-fog spray and a nose cup may be beneficial. Nose cups are part of the NIOSH approval for air supplied respirators at ambient temperatures of 32° F and below. Minimum temperatures recommended by the manufacturer for operation of a SCBA shall be consulted prior to use in low temperatures.

Under no circumstances are employees permitted to use escape provisions of atmosphere-supplying respirators for routine and egress of work areas.

Wearing any respirator in conjunction with other types of protective equipment will impose some physiological stress on the wearer. Use of respirators in conjunction with protective clothing can greatly affect human response and endurance, especially in hot environments. See EHS 4-6, Temperature Extremes, for additional information.

5.5 Cleaning and Storage

Each person has the responsibility to clean, disinfect, and care for their respirator in accordance with the training they have received. The following procedure shall be followed for cleaning and storage of respiratory protection equipment.

- Personal respirators shall be cleaned and disinfected after each day's use, or more frequently, if necessary.
- Respirators for emergency use and all SCBAs shall be cleaned and inspected after each use, and inspected on a monthly basis. Monthly inspections shall be documented, including serial number, date, findings, and remedial action and signature inspector.
- Routine cleaning shall be completed as follows:
 - Remove the filters and dispose of per the EHS plan's requirements, if applicable.
 - Wash respirator in disinfecting solution.
 - Rinse respirator in clean water.
 - Allow respirator adequate time to air dry.
- Routine inspection shall be completed as follows:
 - Check all connections for gaskets and "O" rings and proper tightness.
 - Check the condition of the face piece and its parts for tears, cracks, abrasions, or brittleness.
 - Check the condition of the connecting air hose, regulator, and harness, if applicable.
 - Check the condition of the headband for tears, cracks, abrasions, or brittleness.
 - Inspect all rubber or elastic parts for pliability and signs of deterioration.
 - Check alarms, if applicable
 - Report any worn, missing, or broken parts to health and safety personnel on site.
- Clean and dry respirators shall be stored in zippered plastic bags. These bags shall be placed in a clean, dry place out of direct heat and sunlight.

- Repairs and parts replacements will only be made by individuals trained to do so using only the manufacturer's NIOSH approved parts. Only manufacturers or technicians trained by the manufacturer can repair/replace reducing and admission valves, regulators and alarms.

5.6 Air Monitoring of Work Areas

To determine if the selected respiratory protection is appropriate, the work area shall be monitored for contaminant concentrations at the beginning of each phase of work activity as required by the site safety plan. Sampling should be in the breathing zone of the exposed employee. Periodic sampling throughout the project will be conducted per the EHS plans to ensure that the selected respirator protection is appropriate.

5.7 Evaluation of the Program

Site supervisors and the ESS shall monitor the project implementation of the respiratory program during routine and informal inspections. PESM will perform evaluations of project implementation of the program during EHS inspections. The inspections shall include consultation with affected employees required to use respirators. The Director, Health and Safety Programs will evaluate overall program implementation through a review of inspection reports, incident reports and investigations, and audit reports.

See C-2, Audits, and EHS 3-3, Inspections, for information on the TtEC audit and inspection programs.

5.8 Medical Surveillance

Site personnel shall meet the medical surveillance requirements of OSHA 29 CFR 1910.134, 1910.120 and EHS 4-5, Medical Surveillance, for respirator use prior to engaging in any field work requiring or potentially requiring the use of a respirator. Personnel with medical conditions which prevent or limit their ability to wear a respirator shall be notified in writing by the CMC.

5.9 IDLH Atmospheres

TtEC personnel shall immediately evacuate areas where an IDLH atmosphere develops. TtEC personnel shall not enter IDLH atmospheres except for rescue or when authorized by the PESM. If necessary, at least one standby person equipped with proper rescue equipment and a pressure demand SCBA is present. Communication between the field team and the standby person is maintained at all times. If the IDLH atmosphere exists in a confined space, the entry shall be conducted in accordance with EHS 6-1, Confined Space Entry.

5.10 Training

Personnel required to use respiratory protection shall be trained in the selection, use, and maintenance of the equipment. Respiratory protection training is included as part of the initial health and safety training, the 8-hour refresher course, and the site-specific training described in EHS 1-11, Training. The training shall be conducted annually. Site-specific respiratory protection training includes the following:

- Hazard identification to include symptoms of exposure;
- Use of engineering controls to minimize exposure, and an explanation of why engineering controls are not feasible;
- A description of the type of respiratory protection chosen and the protection provided to the employee;

- Assurance that the employee understands the protection capabilities and limitations of the method of respiratory protection utilized;
- Recognition of medical signs and symptoms that may limit or prevent effective use of respirators;
- A thorough demonstration of the selected method of respiratory protection to include how to put it on, how to check the seals, use, troubleshooting, and maintenance followed by hands-on training by the employee;
- How to use the respirator in an emergency, including situations in which the respirator malfunctions; and
- A description of the on-site storage and maintenance facilities for maintaining respiratory protection equipment.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.

6.0 REFERENCES

29 CFR 1910.120, Hazardous Waste Operations and Emergency Response.

29 CFR 1910.134, Respirator Protection.

[Compliance Procedure C-2, Audits](#)

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping

Environmental, Health & Safety - Programs Procedure EHS 1-11, Training

Environmental, Health & Safety - Programs Procedure EHS 3-2, Environmental, Health & Safety Plan(s)

Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections

Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance

Environmental, Health & Safety - Programs Procedure EHS 4-6, Temperature Extremes

Environmental, Health & Safety - Programs Procedure EHS 5-1, Personal Protective Equipment

Environmental, Health & Safety - Programs Procedure EHS 6-1, Confined Space Entry

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)

Project Initiations/Operations Procedure PO-1, Project Management Planning

7.0 ATTACHMENTS

[Attachment A - Irritant Fume Protocol](#)

[Attachment B - Qualitative Respirator Fit Test Form](#)

EHS 5-2 ATTACHMENT A
IRRITANT FUME PROTOCOL

Click the icon below to [launch or download](#).



EHS 5-2 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 5-2 ATTACHMENT B
QUALITATIVE RESPIRATOR FIT TEST RECORD

Click the icon below to [launch or download](#).



EHS 5-2 Attachment B.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

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Proprietary Information

Purpose: The purpose of this program is to establish minimum requirements for boating safety.

Status:	Complete	Approved By:	John DeFeis
Version Date - Type:	01/27/2010 - Revised	Title:	Boating
Category:	Company Procedures	Original Issue	02/01/95
Sub-Category:	Departmental/Discipline	Date:	
Keyword Index:	Field Activities/Science, Training	Sections:	ESQ - Environmental Health & Safety Programs
		Document	Procedure
		Type:	
		Document	Skip Parry
		Owner	

Section

- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 MAINTENANCE
- 4.0 DEFINITIONS
 - 4.1 Boat
- 5.0 DISCUSSION
 - 5.1 Responsibilities
 - 5.1.1 Line Management
 - 5.1.2 Environmental, Health and Safety Personnel
 - 5.2 General Requirements
 - 5.2.1 Boat Towing and Launching
 - 5.2.2 Boat Operators
 - 5.2.3 Boat Passengers
 - 5.3 Float Plan
 - 5.4 Boat Registration and Numbering
 - 5.5 U.S. Coast Guard-Approved Equipment
 - 5.5.1 Flame Arresters
 - 5.5.2 Sound Signaling Devices
 - 5.5.3 Personal Flotation Devices
 - 5.5.4 Fire Extinguishers
 - 5.5.5 Navigation Lights
 - 5.5.6 Visual Distress Signals
 - 5.5.7 Pollution Control
 - 5.6 Load Capacity
 - 5.7 Tool Kit
 - 5.8 Survival Kit
 - 5.9 Communications
 - 5.10 Boating Accident Report
 - 5.11 Good Housekeeping
 - 5.12 Fuel Management

5.13 Training
5.1.4 Operations

6.0 REFERENCES

7.0 ATTACHMENTS

1.0 PURPOSE

The purpose of this program is to establish minimum requirements for boating safety.

2.0 SCOPE

This procedure applies to all Tetra Tech EC, Inc. (TtEC) projects.

3.0 MAINTENANCE

The Director, EHS 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.

4.0 DEFINITIONS

4.1 Boat

Any powered or nonpowered watercraft utilized for the transport of personnel on a body of water.

5.0 DISCUSSION

5.1 Responsibilities

5.1.1 Line Management

The Project Manager (PM) is responsible for coordinating with the appropriate TtEC Project Environmental and Safety Manager (PESM) to implement the requirements of this procedure. The PM shall provide the necessary management support and allocate sufficient project resources to permit project personnel to operate boats in a safe manner.

Site managers and supervisors are responsible for implementation of this boating safety program in the field.

5.1.2 Environmental, Health and Safety Personnel

The PESM shall ensure that the requirements of this program are incorporated into site Environmental Health and Safety (EHS) plans.

5.2 General Requirements

5.2.1 Boat Towing and Launching

TtEC personnel who will tow a boat on a trailer to the launching site will be experienced in this capacity and be responsible for reviewing the Boating Checklist (Attachment 1) prior to departure. Ensure that the boat is not loaded with project equipment that will overload the bearings and axle weight capacity. This equipment should be carried in another or the towing vehicle.

A person experienced in towing a boat, launching, or piloting a vessel must be designated by the Project Manager. This person must be designated by the Project Manager. This person must have the U.S. Coast Guard approved small boat safety training course.

Pre-launch checks will be done before the boat is backed into the water and includes checking the engine oil and/or fuel mixtures in the tanks. Any mixing of fuel and oil will be done in a separate UL approved flammable liquid storage container prior to filling the vessel tanks. This will ensure the gas/oil mixture is correct..

Whenever possible, perform fuel mixing and transfer in an environmentally safe area where spills can be easily cleaned.

To launch the vessel, back part way down the boat ramp, remove the rear tie down straps to the trailer, ensure the boat plug is installed and continue backing into the waters edge. Place the fenders/bumpers on the side that will be in contact with the pier to prevent damage. Ensure that the bow and stern lines are being handled by personnel on the pier as the vessel is backed further into the water until the vessel is floating freely. An alternative is to have the coxswain in the boat lower the engine and start it when the rear is in the water and floating free from the trailer. He can carefully back the boat with the engine clear of the trailer. Pull the truck and trailer forward and park and secure. Secure the bow and stern lines to the dock and load additional equipment. Lower the engine/out drive if necessary and start the engine. Once warm, turn off the engine and restart to ensure that the motor is working properly.

For vessel recovery, reverse the process listed above. Back the truck and trailer down the ramp and place the truck in park with the emergency brake on. Keep the bow winch connected to the vessel until the vessel is out of the water on the trailer. Raise the motor/outdrive and secure in the up position. The vessel is not to be towed or loaded with a person on the vessel. Once the vessel is trailered, remove additional equipment as necessary to reduce weight and secure the vessel to the trailer with bow and stern straps and the safety chain near the winch.

5.2.2 Boat Operators

Only designated TtEC personnel who meet the training requirements under USACOE EM 385-1-1 section 19.F, shall operate a boat during the course of a project.

Boat operators shall possess basic knowledge to troubleshoot common mechanical problems that can occur on the board. The boat operator shall be responsible for the safety of all personnel on board the boat he or she is operating and for the integrity of all boat and safety equipment.

Each designated boat operator shall give a safety briefing to boat occupants prior to leaving shore. **Boats are to be occupied during use by not less than one qualified operator plus one additional person. In the event that the "additional person" is not a qualified operator, a basic safety and operations demonstration will be conducted before launching.**

5.2.3 Boat Passengers

Project personnel riding as passengers in a boat shall comply with U.S. Coast Guard requirements.

5.3 Float Plan

[A float plan shall be developed by](#) the Environmental and Safety Supervisor (ESS) or FOL [for all trips made by boat using the US Coast Guard example Float Plan located in Attachment 2.](#) The ESS or SM/FOL shall be aware of the location of all project boats and personnel using them at all times. If several boats and crews are involved or are traveling to remote areas, each designated boat operator shall file a written float plan with the ESS or SM/FOL. The float plan shall include the following:

- The names of the boat operator and passengers;
- A description and registration numbers of the boat;
- Radio call sign or cellular telephone number if boat is so equipped;
- A trip itinerary with [expected time and location of return](#);
- Steps the ESS or SM/FOL will take to initiate a search response if the expected time of return is exceeded; [and](#)

[A Float Plan shall be prepared by each designated boat operator and approved by the PM, and ESS, and/or qualified person prior to the activity.](#)

5.4 Boat Registration and Numbering

The ESS or SM/FOL shall ensure that all project boats meet U.S. Coast Guard or state boat registration and numbering requirements. The US Coast Guard requires that all motorized boats be numbered in the state of principal use. Many states also require that certain non-motorized boats be numbered (sailboats, rafts, and dinghies). A valid certificate or number showing the numbers issued to the boat is required to be on board the boat whenever the boat is in use. Boat registration numbers are required to be painted or permanently attached to each side of the forward half of the boat. Boat registration must be updated annually.

5.5 U.S. Coast Guard-Approved Equipment

All TtEC project boats will meet or exceed U.S. Coast Guard requirements for safety equipment. These requirements are summarized below for small craft (less than 12 meters in length). The ESS or SM/FOL shall consult with the PESM if larger craft are required.

5.5.1 Flame Arresters

All gasoline engines, except outboard motors, installed in a boat must have an approved flame arrestor (backfire preventer) fitted to the carburetor.

5.5.2 Sound Signaling Devices

Although not required for small craft, all TtEC boats shall carry at least one air horn or similar sound-signaling device.

5.5.3 Personal Flotation Devices

All TtEC personnel and passengers shall wear an approved personal flotation device (PFD) at all times when operating or being transported in a boat. A positively buoyant wet suit or dry suit may be substituted for a PFD. PFDs shall be Type II or higher (capable of turning its wearer in a vertical or slightly backward position in the water) unless [the Project Environmental Safety Manager](#) approves Type III based on conditions. Automatic inflating PFDs can be used providing that [they are approved in the Health and Safety Plan](#), an AHA addresses its use, the PFD is not used by persons less than 90 pounds and, it is inspected, maintained and stored in accordance with the manufacturer's instruction. In addition, each boat [up to 26 feet in length](#) shall be equipped with at least one Type IV PFD, [ring buoy, 24 inches in diameter with 90 feet of buoyant line attached](#), designed to be thrown to a person in the water and grasped and held by the user until rescued. A buoyant boat cushion equipped with straps and a float ring are two common examples of [additional types of](#)

[life rings that can qualify as](#) a Type IV PFD [and help in a rescue](#).

5.5.4 Fire Extinguishers

Each boat used by TtEC personnel [less than 26 feet](#) shall carry at least one [1-A:10:BC](#) fire extinguisher (for use in gasoline, oil and grease fires) approved by Underwriters Laboratories (UL). [Motor boats or skiffs over 26 feet will have a minimum of two 1-A:10BC fire extinguisher available. Larger craft will have additional requirements.](#) Each fire extinguisher shall be inspected by the ESS or SM/FOL at least [once every week](#) to ensure that it is sufficiently charged and that the nozzles are free and clear. Discharged fire extinguishers shall be replaced or recharged immediately. [The number and sizes of extinguishers required will depend on the vessel size and applicable regulations.](#)

0 5.5.5 Navigation Lights

Each boat operated at night shall be equipped with navigation lights and these lights shall be utilized at all times when operating between sunset and sunrise. Navigational lighting shall be in compliance with U.S. Coast Guard requirements. Boats shall be operated at reduced speeds at night and when visibility is reduced.

5.5.6 Visual Distress Signals

All TtEC boats shall carry a selection of pyrotechnic and nonpyrotechnic visual distress signals. Pyrotechnic visual distress signals include red flares, orange smoke, and aerial red meteor or parachute flares. Nonpyrotechnic visual distress signals include an orange distress flag and a flashlight or other electric distress light. No single signaling device is ideal under all conditions and for all purposes. Pyrotechnic visual distress signals shall not be used past the expiration date.

5.5.7 Pollution Control

The Refuse Act of 1989 prohibits the throwing, discharging, or depositing of any refuse matter of any kind (including trash, garbage, oil, and other liquid pollutants) into the waters of the United States. The Federal Water Pollution Control Act prohibits the discharge of oil or hazardous substances in quantities that may be harmful into U.S. navigable waters. No person may intentionally drain oil or oily wastes from any source into the bilge of any vessel. Larger vessels equipped with toilet facilities must be equipped with a U.S. Coast Guard-approved marine sanitation device.

TtEC employees shall report any significant oil spills to water to the PESM who must report the spill to the U.S. Coast Guard or other applicable regulatory agency. The procedure for incident reporting and investigation shall be followed when reporting the spill. (See EHS 1-7, [Event](#) Reporting and Investigation).

5.6 Load Capacity

Boats shall not be loaded (passengers and gear) beyond the weight capacity printed on the U.S. Coast Guard information plate attached to the stern. In addition, several factors must be considered when loading a boat: distribute the load evenly, keep the load low, do not stand up in a small boat or canoe, and do not overload the boat.

5.7 Tool Kit

All TtEC motorized boats shall carry a tool kit sufficient for the boat operator to troubleshoot common mechanical problems such as fouled spark plugs, flooded carburetor, electrical shorts, etc. Boats operated in remote areas shall also carry appropriate spare parts (propellers, shear pins, patch kits, air pumps, etc). The tool kit shall be maintained by the boat operator [with](#) supplies replaced immediately [upon use](#).

5.8 Survival Kit

All TtEC boats utilized in remote areas shall carry a survival kit. The survival kit shall contain, at a minimum,

a first aid kit, high-energy canned or preserved foods, drinking water, blankets, a heat source, signaling devices, waterproof matches, and other items as necessary to ensure survival for a minimum of 24 hours for the entire crew. Survival suits may be required by the EHS plans for operations in cold environments.

5.9 Communications

All TtEC boats operated in remote areas shall carry a two-way radio or cellular telephone that enables communication back to the field camp or other pre-established location. Exceptions to this requirement must be negotiated with the PESM. [Additional communication and locating methods may be utilized such as SPOT Messenger, GPS and satellite telephones.](#)

5.10 Boating Accident Report

The U.S. Coast Guard requires filing of a boating accident report within 24 hours of an accident. TtEC personnel involved in a boating accident shall follow the procedure outlined in EHS plans and EHS 1-7, [Event Reporting and Investigating for accident and injury reporting](#). This procedure will provide for proper notification of the U.S. Coast Guard.

5.11 Good Housekeeping

TtEC personnel using a boat shall properly stow and secure all gear and equipment against unexpected shifts when underway. Decks and open spaces must be kept clear and free from clutter and trash to minimize slip, trip, and fall hazards.

5.12 Fuel Management

TtEC personnel shall utilize the "one-third rule" in boating fuel management. Use one-third of the fuel to get to the destination, one-third to return, and keep one-third in reserve.

5.13 Training

Boat operators shall be trained on and [pass the test of](#) U.S. Coast Guard boating safety requirements. All operators and passengers shall be trained on the requirements of this program. Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.

5.14 Operations

[Operations of motor boats/skiffs in can be hazardous to personnel considering other boaters, weather conditions, the task assigned and the condition of the boat/skiff you are operating. Ensure Attachment 1, Work Boat Inspection Checklist is completed before departing the launch area.](#)

[When operating in restricted waters, near shipping channels, in rough fast flowing water or near obstacles that could damage or capsize the boat, plan for emergency rescue in case the boat motor falls or you become incapacitated from operating the boat and you are in personal danger. Consideration would be for a second motor or a safety boat operating in the area or other rescue capability available.](#)

6.0 REFERENCES

Please Describe Your Reference Here

Place Your Link in this Column

1. 33 CFR Subchapter S, Boating Safety
2. Environmental, Health & Safety Programs, Procedure EHS 1-7 Event Reporting & Investigation
3. Environmental, Health & Safety Programs, Procedure EHS 1-9 Recordkeeping
4. U.S. Department of Transportation, U.S. Coast Guard
5. <http://www.floatplancentral.org>
- 6.
- 7.

<http://www.floatplancentral.org>

Please Provide a Description of the Attachment

- 1. Attachment 1, Boating Checklist

- 2. Attachment 2, U.S. Coast Guard Float Plan

- 2.

Place Your Attachments Here



EHS 6-6 Boat Inspection List 12-08-09 PLBgc12



USCG Float Plan.pdf

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Purpose: The purpose of this guideline is to provide the designated Project Manager, Project Supervisors and the Environmental Safety Supervisor with procedural guidance for planning and implementing measures to control exposures to poisonous plants, provide protection to workers, establish contamination control and medical case management.

Status:	Complete	Approved By:	John DeFeis
Version Date - Type:	10/08/2008 - New	Title:	Poison Ivy, Oak and Sumac Contamination Control
Category:	Reference Documents	Original Issue	
Sub-Category:	Guidelines	Date:	
Keyword Index:		Sections:	Environmental Health & Safety Guidelines
		Document	Guidelines
		Type:	
		Document	Grey Coppi
		Owner	

- 1.0 Purpose
- 2.0 Scope
- 3.0 Maintenance
- 4.0 Definitions
- 5.0 Responsibilities
 - 5.1 Project Manager
 - 5.2 Project Environmental Safety Manager
 - 5.3 Environmental Safety Supervisor
- 6.0 Guideline to Contamination Control
 - 6.1 Discussion
 - 6.2 Properties of Urushiol
 - 6.3 Control Measures to Prevent Exposure to Urushiol
 - 6.4 Preventing Contact
 - 6.5 Recognition of Poisonous Plants
 - 6.6 Personal Protection
 - 6.6.1 Skin Barriers
 - 6.6.2 Personal Protective Equipment
 - 6.7 Decontamination
 - 6.8 Medical Surveillance and Treatment
- 7.0 References

The purpose of this guideline is to provide the designated Project Manager, project supervisors and the Environmental Safety Supervisor with procedural guidance for planning and implementing measures to control exposures to poisonous plants, provide protection to workers, establish contamination control and medical case management

This procedure applies to any field project site where poisonous plants are anticipated or known to be present.

The Director, Environmental Safety and Quality 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 Director Compliance and Corporate Counsel.

Poisonous plants – plants in the family Anacardiaceae, especially *Toxicodendron spp.* (poison oak, poison ivy and poison sumac)

Urushiol – an oil found in poisonous plants that causes a human allergic skin rash on contact.

5.1 Project Manager (PM)

The PM shall ensure that adequate project resources are provided to the ESS to carry out the requirements of this guideline on site. The PM shall ensure that a health and safety budget has been developed and reviewed by the project environmental safety manager. The PM shall require that all field personnel, including subcontractors participating in the work, have had training as required by this guideline.

5.2 Project Environmental Manager (PESM)

The PESM will review Site Health and Safety Plans (SHSP), Injury Illness Prevention Plans (IIPP) and other work plans to ensure that the plans refer to this guidance whenever poisonous plants are anticipated or encountered.

5.3 Environmental Safety Supervisor (ESS)

The ESS is responsible for implementation of the project SHSP or IIPP on site. The ESS will review this guideline, provide training to workers, implement control and protection methods, and ensure medical surveillance and case management is established for affected workers.

6.1 Discussion

The poisonous plants covered by this guidance have an oily substance on their leaves and within the plant that is called urushiol. Skin contact with urushiol can cause a severe rash. Urushiol is not a singular chemical but rather contains a number of different chemicals. The majority of the chemicals that cause the rash are in a chemical class called catechols. These catechols penetrate the skin and stimulate an allergic reaction within 15 minutes after contact with the skin. Since the toxic substance causes a rash, urushiol should be managed and handled as if it were a hazardous chemical. Therefore, this is a guideline on how to prevent exposure, protect the worker, control the spread of contamination, decontaminate clothing, tools, equipment and personnel exposed to the contaminant and to provide treatment to workers exposed to the contaminant.

6.2 Properties of Urushiol

Urushiol is a pale yellow oily liquid similar to petroleum oil. The oil has a boiling point of 200-210 ° C. It is soluble in alcohol, ether and benzene. It is not soluble in water but mixes with water like any oil. This fact is important when decontaminating skin or clothing.

6.3 Control Measures to Prevent Exposure to Urushiol

Control measures are summarized as follows:

Prevent contact

If contact is necessary or likely, wear protective clothing to prevent actual skin contact

If contact is made to clothing, assume the outside of the clothing is contaminated and may result in a rash, and must either be discarded or properly cleaned prior to reusing.

If contact with the skin is made, prompt cleaning is necessary.

The remainder of this guide provides specific information of these elements.

6.4 Preventing Contact

Urushiol is found in the leaves, the sap, the vines and all woody parts of any of the poisonous plants including the roots. The only control measure to prevent exposure is to not contact any poisonous plant. All eradication methods can cause worker exposure. The two worst methods of plant eradication from an exposure perspective are burning and grubbing. When burned, the ash and smoke is extremely toxic and cause significant damage and irritation to the lungs and all exposed skin. Stems, leaves and other parts of the plant, if not completely burned, will still have the oil present and will cause irritation upon contact. Clearing and grubbing mixes the toxic plant debris with other plants and creates a larger volume of debris that may cause exposure. Remember, the oil is like any other oil, it will rub off on anything it contacts. If weed killers are used, the plant will die but the urushiol can remain active up to 5 years. Only complete removal of the plant will minimize future exposure to the urushiol. The only way to prevent exposure is to avoid direct contact or to wear protective clothing and follow up with a decontamination process.

6.5 Recognition of Poisonous Plants

References at the end of this guideline show pictures of the plants. Poison ivy is more common on the east coast. California has predominantly poison oak. Prior to performing work at any job site, the entire work area should be surveyed for any hazards. Among the potential hazards are poisonous plants. If the plants are discovered, the location of the plants should be marked. If possible the work area should be avoided. If work must take place in the area then personal protective equipment and decontamination methods are required.

6.6 Personal Protection

6.6.1 Skin Barriers

There are skin barrier lotions that can be applied to the skin **prior** to working in areas with poisonous plants. The barrier creams, like Ivy Block®, contain bentoquatam, a bentonite derivative. The barrier cream is

effective only as long as the film is visible on the skin. With or without the use of barrier cream additional protection is required. **Post** exposure decontamination is discussed in Section 6.7.

6.6.2 Personal Protective Equipment (PPE)

Any skin, clothing or equipment that comes into contact with a poisonous plant will likely have the oil rubbed off. The first level of protection is to wear long sleeve shirts, long pants banded at the work boots, and gloves with the sleeves banded at the gloves. Workers must avoid any hand to face or any other bare skin contact with the gloves or any other clothing or equipment exposed to the oil. An additional layer of clothing such as coveralls and boot covers can reduce the inadvertent contact with the oil. The use of protective clothing will facilitate an effective decontamination procedure that is described below.

Workers should wear outer coveralls that can be removed at the end of the day and either be discarded, if they are disposable, or placed in a laundry hamper to be washed at a commercial laundry. Disposable boot covers should be worn; otherwise boots (PVC, rubber or similar materials) that can be washed with soap and water before leaving the site will be worn. Leather is not washable to remove the oils, so leather work boots must be covered by a protective boot cover.

The coverall can be made of any material including cotton (washable coveralls), a permeable disposable coverall, like Kleengaurd® or Durafab®, or less permeable or impermeable disposable coveralls like Tyvek®, Saranex®, PVC, etc. Almost any material can be used, provided the oil does not penetrate and come in contact with the skin. Gloves can be any material except cotton. Leather gloves will offer protection but would need to be discarded at the end of the day. Latex or nitrile gloves are the common gloves worn, but use care as they can puncture or be cut easily. Therefore wear an outer protective glove if working around or with anything that may damage the gloves.

6.7 Decontamination

After working in an area with poisonous plants, a properly executed decontamination procedure should minimize exposure to the contaminant as described below:

1. Wash the outer surfaces of all potentially exposed equipment with soapy water. Use soap with good oil removing properties, such as Dawn® dishwashing liquid or Alconox®. Rinse the equipment with clean cool water.
2. Remove boot covers and discard. If the boot covers are non-disposable or only boots were worn, wash the boots with soapy water, rinse the boots, and dry with a paper towel.
3. Remove the coveralls by taking them off from the inside out. That is, as the coverall is removed the inner sleeves are pulled out and the rest of the coverall follows so what was once the outer surface is now inside the coverall. Discard the disposable coverall in ordinary trash bags or place coveralls requiring laundering in a laundry hamper.
4. Remove the gloves from the inside out and discard or place in location to be washed if they can be reused (gloves other than nitrile or latex).
5. Wash hands, wrists, and forearms with soap and water.

Anything that may have come in contact with the contaminant must either be washed or discarded, unless it had a protective cover that has been removed and is either left in the decontamination area or has been discarded. Note protective covers left in the decontamination area must be handled as contaminated. It is preferable to not reuse protective covers.

6. All decontamination water can be disposed as ordinary water waste. The surfactants are biodegradable and have no environmental restrictions for disposal.

Before leaving the site inspect any areas of skin that could have been exposed to the oil. Inspect the areas

between the top of the boots to the lower legs and inspect the forearms, wrists and hands. As an extra precaution these areas can be washed with soap and water and be treated as if they had been exposed as described below:

1. Areas of the skin exposed to the oil need to be washed with cool water as soon as possible. The reaction to the oil can begin 15 minutes upon contact. However, the first noticeable rash may not be visible from anywhere between one hour and even up to 10 days after the exposure. This why if any contact with the oil is even suspected, the worker should immediately wash the area.
2. Urushiol is not soluble in water so there is a high probability of spreading the oil over even more skin if water is used. However, almost any washing technique used has that same potential. Urushiol is soluble in mineral spirits. There are skin washes designed to remove the oil using this solvent. Technu® and Zanfel® are such products.
3. A preferred wash method is to cleanse the skin with the Technu or Zanfel scrub. Follow this by a soapy cool water wash and a cool clean water rinse. Then dry the skin with a towel. Wash only as much of the skin as necessary. When returning to home or quarters, take a cool shower. Do not take a bath as any residual oils you may be unaware of can get in the bath water and expose even more of your skin.

6.8 Medical Surveillance and Treatment

Inspect yourself at least twice a day when working around poisonous plants. Since it may take as long as 10 days for any symptoms to appear, continue to do this inspection at least 10 days after the last day of project work around these plants. Once exposed the skin rash and blistering will be most noticeable in those areas that received the highest exposure to the oil. Later lighter appearance of rash may show but this is not from the rash “spreading” rather it is from lighter exposures to the oil. Breaking a blister will not spread the rash but may increase chances for a skin infection.

Once a rash is noticed immediately notify the ESS so that WorkCare can be contacted and medical counseling can be started. Do this as soon as possible so that the best care can be provided. Do not attempt to self medicate or take care of the rash without the guidance of WorkCare.

Treatment will often include cold wet compresses, short cool baths, calamine lotion, and anti-itch creams. Benadryl® (diphenhydramine) may be taken to control itching and encourage sleep. However in all cases, the best practice is to contact WorkCare first.

Please Describe Your Reference Here

1. Med-Line Plus Medical Encyclopedia
2. Outsmarting Poison Ivy and its Cousins, Food Drug Administration
3. American Academy of Dermatology
4. Poison Ivy, Oak and Sumac Information Center

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APPENDIX D
FIELD INSPECTION FORMS

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TETRA TECH EC, INC.

Equipment/Vehicle Inspection Report

Date: _____ Unit Number: _____ Description: _____

_____ Miles or _____ Hours: _____ MFG: _____

Unit to be taken from: _____ to: _____

	Good	Satisfactory	Repair Req.	N/A		Good	Satisfactory	Repair Req.	N/A
1. Tires/Track <u>%¹</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17. Interior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Brakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18. Glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Steering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19. Wipers/Review Mirrors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Undercarriage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20. Heater/AC/Defroster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Suspension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21. Safety Equipment/Belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Engine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22. Signal Lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Drive Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23. Mounted Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Fuel System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. Mounted Attachments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Cooling System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25. Blade/Bucket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Electrical System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26. Boom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Exhaust System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. Outriggers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Hydraulic System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28. Fire Ext./First Aid Kit ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Transmission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29. Horn/Backup Alarm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Clutch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30. <u>Manufacturer Operating</u> Manual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31. <u>Head/Tail/Brake Lights</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. ROP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32. <u>Cleanliness</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹ Note estimated percentage of tread/track usefulness remaining

² Fire Ext./First Aid Kit and all items in the cab and/or bed must be secured

Comments: _____

Inspected By: _____

DISTRIBUTION: (1) Sent with equipment (2) [Equipment Supervisor](#) (3) [PO File](#) (4) [Originator](#)
EQUIPMENT TRANSFER REPORT MUST ACCOMPANY THIS FORM



TETRA TECH EC, INC.

DAILY EQUIPMENT INSPECTION

PROJECT _____
 MANUFACTURER TYPE _____
 UNIT # _____ MODEL _____ DATE _____
 ENGINE HRS/MILEAGE _____ / _____ SHIFT _____

Check appropriate column and describe correction needed.

	If Good (✓)	NA	Correction Needed
Steering Mechanisms^{1*}	_____	_____	_____
Service Brakes²	_____	_____	_____
Emergency Brakes¹	_____	_____	_____
Parking Brake¹	_____	_____	_____
Transmission & Controls	_____	_____	_____
Suspension & Springs	_____	_____	_____
Hydraulic Leaks	_____	_____	_____
Exhaust System	_____	_____	_____
Warning Gauges	_____	_____	_____
Windshield¹ & Wipers	_____	_____	_____
Lights (Head & Tail)	_____	_____	_____
Brake Lights¹	_____	_____	_____
Mirrors	_____	_____	_____
Seat and Seat Belts¹ (w/ ROPS)	_____	_____	_____
Tires/Tread¹	_____	_____	_____
Regular Horn	_____	_____	_____
Audible Back-up Alarm¹	_____	_____	_____
Steps, Hand-holds	_____	_____	_____
Fire Extinguisher	_____	_____	_____
Engine Coolant	_____	_____	_____
Engine Oil	_____	_____	_____
Hydraulics & Operating Controls	_____	_____	_____
Fenders/Mudflaps	_____	_____	_____
Heater/defroster	_____	_____	_____
<u>All items in cab or bed secured</u>	_____	_____	_____
<u>Cleanliness inside and outside</u>	_____	_____	_____

Remarks:

¹ Items required to be operational by OSHA 1926.602 before use.

² Service brake must be capable of stopping and holding equipment fully loaded. _____

Operator Name (Printed) _____ Operator Signature _____
 Review : Superintendent _____

Date Repairs or adjustments completed: _____
 Equipment Supervisor/Mechanic: _____



OPERATOR/DRIVER TASK OBSERVATION CHECKLIST

Project Name _____ Project Number _____
 Operator's Name _____ Observer's Name _____
 Date of observation _____ Type/make of equipment operated _____

Operating Safety Observations	S	U	NA	Comments
A. Pre-use inspection prior to starting				
1. Conducts daily pre-use inspection.				
2. Mounts & dismounts carefully-3 point contact.				
3. Uses the seat belt all times while seated. Sounds horn before starting engine.				
4. Checks equipment warning devices.				
5. Checks hydraulic systems (if so equipped). Ensures system is filled and free from leakage.				
6. Checks air system (if so equipped). Ensures all connections are tight.				
7. Checks engine oil level. Ensures all plugs, filler caps, and other fittings are secure and not leaking.				
8. Checks for broken, missing, excessively worn or damaged parts, and reports immediately.				
9. Checks tires. Looks for serious cuts, bulges, irregularities and abnormal wear. Checks inflation pressures and keeps valve caps in place. Checks for tires rubbing.				
10. For dump trucks, checks front wheel seal oil levels.				
11. Checks fuel level and for fuel system leaks.				
12. Coolant check—Should never open a hot system or pour cold coolant into radiator if the engine is very hot.				
13. For safe visibility, cleans the windshield, mirrors and light lenses.				
14. For articulating machines, checks to ensure that the steering frame lock or link have been removed and properly stored.				
15. Checks for and maintains safe access to the cab (3 point contact). For safe mounting, clears the steps, grab rails, and floor and seat of mud and water.				
16. Secures tools and keeps the floor free of debris.				
17. For safe operation wipes steering wheel, foot pedals, hand levers and knobs clean of oil and grease.				
18. Checks first aid kit and fire extinguisher. Reports missing items to the foreman or supervisor.				
19. Checks equipment for warning tags.				
B. Starting				
1. Mounts & dismounts carefully-3 point contact.				
2. Uses the seat belt at all times while seated. Sounds horn before starting engine.				
3. Checks equipment warning devices.				
4. Uses job specific PPE (e.g., hard hats, safety shoes, safety glasses, overalls, gloves, traffic vests, and ear protection).				
5. Ensures the bowl, bucket, etc. is on the ground.				
6. For starting, checks all controls to be sure they are in proper position.				
7. Does not crank an electric starter for more than 30 seconds, Allows two minutes to cool prior to next attempt.				
8. For steering safety, tests before moving. Turns the wheels to full left and full right.				
9. Checks service and parking breaks for proper operation.				
10. Checks the backup alarm.				
11. Ensures head lamps and safety lighting are in working order.				



Operating Safety Observations	S	U	NA	Comments
C. Operation				
1. Before moving, places the bucket, bowl, blade, etc., into the transport position and secures all accessory equipment.				
2. Obeys traffic & other posted/published site safety practices & rules.				
3. Maintains control of equipment at all times.				
4. Gives right-of-way to loaded machines or trucks.				
5. Minimizes engine overspeed on downgrades & when shifting.				
6. Does not transport passengers without proper provisions.				
7. Does not engage in horseplay.				
8. Crosses ditches at an angle, proceeding slowly.				
9. Avoids large obstacles, deep holes & soft edges.				
10. Slows down before turning.				
11. Stays in gear on a downgrade.				
12. When running across a hillside, proceeds slowly. Never turns sharply uphill or downhill.				
13. Obeys flagmen & spotter signals.				
14. Maintains safe stopping distance behind other equipment.				
15. Shifting				
a. Always stops the machine/truck and runs the engine at low idle speed to shift from forward into reverse.				
b. Downshifts one speed range at a time.				
c. Applies the retarder and/or service brakes to reduce speed before entering sharp turns, fill areas, and downgrades.				
d. For machines, always leaves the shift lever in neutral position when stopped.				
16. Braking				
a. Avoids applying brake continuously on a downgrade unless system is so designed.				
b. Uses the engine for additional brake force-or, if so equipped, the auxiliary retarder.				
c. Anticipates grade and selects proper gear range accordingly.				
d. Brakes firmly in one application. Avoids fanning the brake pedal.				
e. Uses each brake system only for its intended purpose.				
17. Turning				
a. Does not cut corners too close when making sharp turns.				
b. Maintains engine speed high enough for normal steering.				
c. Downshifts when necessary or appropriate.				
d. For machines, carries the load as low as conditions permit to maintain stability.				
18. Hauling				
a. Regulates speed to road conditions. Reduces speed before turning. Avoids over speeding the engine.				
b. Downshifts when approaching a downgrade. Downshifts when necessary on an upgrade to avoid stalling the engine.				
c. Obeys traffic rules and spotters.				
19. Parking Precautions				
a. Selects level ground whenever possible.				
b. When parking on a grade, positions equipment at right angles to the slope; and sets parking brake if so equipped in addition to lowering bowl, bucket, etc.				
c. Parks a reasonable distance from other equipment.				
d. When parking on haul roads, picks the safest place, where the equipment is visible from both directions.				



Operating Safety Observations	S	U	NA	Comments
20. Demonstrates proficiency through smooth operation of controls (e.g., speed of operation appropriate for the conditions, not jerky or hesitant).				
21. Maintains eye contact with other operators, drivers, and ground personnel.				
22. Responds appropriately to signals from flaggers, spotters, operators directing equipment movements.				
23. Stops operation when ground personnel are out of line-of-sight.				
24. Positions and orients machine for safe operation (e.g., safe distance from edge of excavations, tracks perpendicular to excavation, clear distance maintained to fixed obstructions).				
25. Barricades, cones, tape set up to maintain clear zone within swing radius of counterweight.				
26. Maintains safe work area (e.g., windrow at edge of stockpiles, safe slopes).				
D. Shutdown				
1. Lowers the bowl, bucket, etc. to the ground. Lowers and secures the bed on dump trucks.				
2. Reduces engine speed. Sets parking brake.				
3. On machines, places transmission in neutral and locks shift lever if so equipped.				
4. Allows hot engine to cool gradually before stopping it.				
5. Secures equipment to prevent unauthorized starting and movement.				
6. Bleeds the air tanks, if so equipped.				
7. Dismounting—doesn't jump off, uses handrails and steps, and faces the machine/truck when getting off.				
8. Warning tags—attaches appropriate warning tags to steering wheel to prevent accidents.				
E. Overall Appraisal				
Overall appraisal of operator/driver				

S = Satisfactory

U = Unsatisfactory

NA = Non applicable

Note: For unsatisfactory observations also indicate the immediate corrective action taken (e.g., training, verbal or written warning, or reassignment).

WORK BOAT INSPECTION CHECKLIST

Date of Inspection:		Boat Owner / Operator:		
Boat Registration No.:		Inspected by (Signature):		
		Yes	No	N/A
1	Is the vessel's registration and certification current?			
2	Is the maximum number of passengers that can be safely transported posted?			
3	Is the hull in satisfactory condition? (any obvious leaks?)			
4	Are navigation lights working properly?			
5	Are visual distress signaling devices (day and night) present and up to date? (i.e. signal flares).			
6	Is a signal device provided on the vessel to give signals required by applicable navigation rules? (i.e. air horn.)			
7	Are paddles and/or oars on board and in good condition?			
8	Is bilge pump and discharge (if so equipped) properly located and in good operating condition?			
9	Is a fully stocked first aid kit of the proper size on board?			
10	Has a Type I, II or III or V USCG personal flotation device (PFD) been provided to all boat passengers and properly worn?			
11	Are PFDs inspected for defects?			
12	Are survival suits available for each passenger, where necessary?			
13	Are all PFDs in use equipped with retro-reflective tape?			
14	Is each boat equipped with at least one USCG approved life ring or ring buoy with at least 90 feet of "solid braid polypropylene" line or equal attached?			
15	Is the motorboat equipped with a kill switch?			
16	Are boat seats securely bolted to the boat deck?			
17	Are all launches and motorboats equipped with fire extinguishers of at least the size and rating(s) specified? (Type 1-A:10-B:C)			
18	Are all gasoline engines that are equipped with carburetor have a backfire trap or flame arrestor?			
19	Are fuel tank overflow, fill, and vent pipes so equipped that liquid or vapor cannot escape inside hull or cabin, and will flow overboard?			
20	Are boats that are powered by internal combustion engines, (located within compartments or confined spaces) equipped with a vent fan with fan intakes within one foot of the engine compartment bottom?			
21	Are the lights properly maintained, assuring that they are visible between sunset and sunrise?			
22	Is the boat equipped with a white stern light having a 32 point, 2 mile visibility?			
23	Is the condition of the fuel supply hose satisfactory?			
24	Is there an anchor with adequate line in place and attached to the boat?			
25	Is the boat equipped with a functional radio?			
26.	Is there sufficient fuel to follow the one third rule?			

Other:

LIFEBOAT AND SKIFF INSPECTION CHECKLIST		Yes	No	N/A
1	Is a life saving skiff available where people are working over or near water?			
2	Does the skiff have the following equipment?			
	a. Four oars or equivalent means of propulsion. (two if skiff is motor powered).			
	b. Oar locks attached to oars or gunwales.			
	c. One ball pointed boat hook.			
	d. One ring buoy with 90 feet of 3/8 inch polypropylene or equivalent line attached.			
	e. Personal flotation devices.			
3	Is a suitable motorboat provided where use of oars is impractical?			
4	Is the life skiff kept afloat or is a means for instant safe launching provided?			
5	Are trained persons kept at ready for launching and operating the life skiff?			
6	Is the skiff used for other purposes than drills or emergencies?			
7	When a motor boat is used as a skiff, is it equipped with a compatible fire extinguisher?			
8	Is the maximum capacity of boat posted? (Capacity should be no less than 3.)			
9	Does the horsepower of the motor conform with the capacity plate?			
10	Is the fuel supply hose in satisfactory condition?			
11	Is the hull in good condition? (No obvious leaks.)			

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APPENDIX E

CONTRACTOR SIGNIFICANT INCIDENT REPORT (CSIR)

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- Initial Report
- Follow-up Report
- Final Report

Contractor Significant Incident Report (CSIR)

1. General Information		
Contracting Activity/ROICC Office:		
Accident Classification:		
<input type="checkbox"/> Injury <input type="checkbox"/> Fatality <input type="checkbox"/> Environment <input type="checkbox"/> Procedural Issues <input type="checkbox"/> Lessons Learned <input type="checkbox"/> Illness <input type="checkbox"/> Property Damage <input type="checkbox"/> Other _____		
Involving:		
<input type="checkbox"/> Confined Space <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Heavy Construction Equip.) <input type="checkbox"/> Hazardous Material <input type="checkbox"/> Crane and Rigging <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Material Handling) <input type="checkbox"/> Trenching/Excavation <input type="checkbox"/> Diving <input type="checkbox"/> Equip/Mrt Ver/Mat Handling (Man-Lift/Elevated Platform) <input type="checkbox"/> Waterfront/Marine Operations <input type="checkbox"/> Demolition/Renovation <input type="checkbox"/> Fall from Ladder <input type="checkbox"/> Fall from Scaffold <input type="checkbox"/> Other _____ <input type="checkbox"/> Electrical <input type="checkbox"/> Fall from Roof <input type="checkbox"/> Fire		
2. Personal Information		
Name (Last, First, MI):	Age:	Sex:
Job Title/Description:	Employed By:	
Supervisor Name (Last, First, MI) & Title:	Was the person trained to perform this activity/task? <input type="checkbox"/> Yes <input type="checkbox"/> No	
What type of training was received (OJT, classroom, etc)?	Date of the most recent formal training and topics discussed?	
3. Witness Information		
Witness #1: Name (Last, First, MI):	Job Title/Description:	
Employed By:	Supervisor Name (Last, First, MI):	
Witness #2: Name (Last, First, MI):	Job Title/Description:	
Employed By:	Supervisor Name (Last, First, MI):	
Additional Witnesses: <i>(List any additional witnesses on a separate sheet and attach.)</i>		
<input type="checkbox"/> Yes <input type="checkbox"/> No		

4. Contract Information		
Type of Contract: <input type="checkbox"/> A/E <input type="checkbox"/> BOS <input type="checkbox"/> CLEAN <input type="checkbox"/> Construction <input type="checkbox"/> Design Build <input type="checkbox"/> FSCC <input type="checkbox"/> FSSC <input type="checkbox"/> JOC <input type="checkbox"/> RAC <input type="checkbox"/> Service <input type="checkbox"/> Other _____		
Contract Number & Title:		Industrial Group & Industrial Type:
Prime Contractor Name/Address/Phone & Fax No:		Sub Contractor Name/Address/Phone & FAX No:
Safety Manager (Last, First, MI):		Safety Manager (Last, First, MI):
Insurance Carrier:		Insurance Carrier:
5. Accident Description		
Date of Accident:	Time of Accident:	Exact Location of Accident:
Describe the accident in detail in your words: <i>(Use the back of page if you need additional space)</i>		
Direct Cause(s) of Accident:		

Indirect Cause(s) of Accident:	
Action(s) taken to prevent re-occurrence or provide on-going corrective actions:	
Corrective Action Beginning Date:	Anticipated Completion Date:
Personal Protective Equipment: <input type="checkbox"/> Available and used <input type="checkbox"/> Available and not used <input type="checkbox"/> Not Required <input type="checkbox"/> Not related to Mishap <input type="checkbox"/> Wrong PPE for job List PPE Used:	
Type of Construction Equipment (Make, Model, Serial #, VIN#) Involved:	
Was Hazardous Material Spilled/Released? <input type="checkbox"/> Yes <input type="checkbox"/> No Please List Hazardous Material(s) Involved:	
Who provided first aid or cleanup of mishap site?	
Any blood-borne pathogen exposure, other than EMTs? <input type="checkbox"/> Yes <input type="checkbox"/> No Who?	
List OSHA and EM-385-1-1 standards that were violated:	
Was site secured and witness statements taken immediately? <input type="checkbox"/> Yes <input type="checkbox"/> No By Whom?	

6. Injury Illness/Fatality Information		
Severity of Injury/Illness:		
<input type="checkbox"/> Fatality	<input type="checkbox"/> Lost Workday Case Involving Days Away From Work	
<input type="checkbox"/> Temporary Disability	<input type="checkbox"/> Recordable Workday Case Involving Restricted Duty	
<input type="checkbox"/> Permanent Total Disability	<input type="checkbox"/> Other Recordable Case	<input type="checkbox"/> Recordable First Aid Case
<input type="checkbox"/> Permanent Partial Disability	<input type="checkbox"/> Non-Recordable Case	<input type="checkbox"/> No Injury
Estimated Days Lost:	Estimated Days Hospitalized:	Estimated Days Restricted Duty:
List Primary Body Part Affected:	List Other Body Part(s) Affected:	
Nature of Injury/Illness for Primary Body Part (Examples: Amputation, Burn, Hernia):		
Type of Accident (Examples: Fall same level, Lifting, Bitten, Exerted):		
Source of Accident (Examples: Crane, Carbon Monoxide, Ladder, Welding Equipment):		
7. Causal Factors (Explain answers on supplementary sheet)		
• Design – Design of facility, workplace, or equipment was a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Inspection/Maintenance – Inspection & Maintenance procedures were a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Persons Physical Condition – In your opinion, the physical condition of the person was a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Operation Procedures – Operating procedures were a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Practices – One or more job safety/health practices not being followed when the accident occurred contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Human Factors – One or more human factors, such as a person's size or strength contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Environmental Factors – Heat, cold, dust, sun, glare, etc., contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Chemical and Physical Agent Factors – Exposure to chemical agents, such as dust, fumes, mist, vapors, or physical agents such as noise, radiation, etc., contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Office Factors – Office setting such as lifting office furniture, carrying, stooping, contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Support Factors – Inappropriate tools/resources were provided to perform the task?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• PPE – Improper selection, use or maintenance of PPE contributed to the accident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Drugs/Alcohol – In your opinion, were drugs or alcohol a factor?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Hazard Analysis – The lack of an adequate (IAW-EM-385-1-1 Sec 01.A) activity hazard analysis was a contributing factor.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Job Hazard Analysis – JHA was not site specific and/or did not address the type of work/operations performed when the mishap occurred.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Management – A lack of adequate supervision contributed to the accident.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Management – Inadequate information was provided at pre con meeting.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

8. OSHA Information			
Date OSHA was Notified:	Date(s) of Investigation:	Date of citation: (Attach Copy)	Dollar amount of Penalties:
9. Report Preparer			
Name (Last, First, MI):		Date of Report:	
Title:		Signature:	
Employer:			
Phone #:			

CONTRACTOR SIGNIFICANT INCIDENT REPORT (CSIR) INSTRUCTIONS

Complete Sections Appropriate to Incident (Rev. 06/02).

NOTE: THE ATTACHED CSIR FORM IS TO BE USED BY CONTRACTORS TO RECORD THE RESULTS OF THEIR ACCIDENT/INCIDENTS INVESTIGATIONS AND SHALL BE PROVIDED TO THE CONTRACTING OFFICER WITHIN THE REQUIRED TIMEFRAMES.

GENERAL. Complete a separate report for each person who was injured in the accident. A report needs to be completed for all OSHA recordable accidents, property damage in excess of \$2000.00 (This amount is for record purposes only. GOV is not required to enter property damage reports into FAIR database if it is less than \$10,000.00.), WHE accidents, or near miss/high visibility mishaps. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es), non-applicable sections shall be marked "N/A". If additional space is needed, provide the information on a separate sheet of paper and attach to the completed form.

Mark the report:

INITIAL – If this form is being used as initial notification of a Fatality or High Visibility Mishap. The initial form is due within 4 hours of a serious accident. A form marked 'Follow-up' or 'Final' is required within 5 days.

FOLLOW-UP – If you are providing additional information on a report previously submitted.

FINAL – If you are providing a completed report and expect no changes.

SECTION 1 – GENERAL INFORMATION

CONTRACTING ACTIVITY/ROICC OFFICE - Enter the name and address of the Contracting Office administering the contract under which the mishap took place (e.g. ROICC MCBH, ROICC NORFOLK, PWC GUAM, etc.).

ACCIDENT CLASSIFICATION - INJURY/ILLNESS/FATALITY/PROPERTY DAMAGE/-PROCEDURAL ISSUES/-ENVIRONMENTAL/LESSONS LEARNED/OTHER – Mark the appropriate block(s) if the incident resulted in any of these conditions.

INVOLVING - If the mishap involved any of the conditions listed under "Involving" mark the appropriate box(es). Specific questions associated with each of these conditions are available from the Contracting Officer to assist you in your investigation. When these questions are used they shall be attached as part of this report.

SECTION 2 - PERSONAL INFORMATION

NAME - Enter last name, first name, middle initial of person involved.

AGE - Enter age.

SEX - Enter M for Male and F for Female.

JOB TITLE/DESCRIPTION - Enter the job title/description assigned to the injured person (e.g. carpenter, laborer, surveyor, etc.).

EMPLOYED BY - Enter employment company name of the person involved.

SUPERVISOR'S NAME & TITLE - Enter name and title of the immediate supervisor.

WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? - For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.

TYPE OF TRAINING - Indicate the specific type of training (classroom or on-the-job) that the injured person received before the accident happened.

DATE OF MOST RECENT FORMAL TRAINING/TOPICS DISCUSSED - Enter the month, day, and year of the last *formal* training completed that covered the activity/task being performed at the time of the accident. List topics that were discussed at the training identified above.

SECTION 3 - WITNESS INFORMATION

The following applies to Witness #1 and Witness #2:

WITNESS NAME - Enter last name, first name, middle initial of the witness.

JOB DESCRIPTION/TITLE - Enter the job title/description assigned to the witness (e.g. carpenter, laborer, surveyor, etc.).

EMPLOYED BY - Enter the name of the employment company of the witness.

SUPERVISORS NAME - Enter name of immediate supervisor of the witness.

ADDITIONAL WITNESSES - Provide same information, as above, for each witnesses. Use additional pages if necessary.

SECTION 4 - CONTRACTOR INFORMATION

TYPE OF CONTRACT - Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.

CONTRACT NUMBER/TITLE - Enter complete contract number and title of prime contract (e.g. N62477-85-C-0100, 184 Pearl City Hsg. Revitalization).

CONSTRUCTION INDUSTRIAL GROUP AND INDUSTRIAL TYPE – This is the type of construction that will be done at this project.

1. First, you must choose the Industrial Group. You have 4 choices to choose from: (**NOTE!** Review of the Industrial Types below and knowing what the projects scope of work is will assist you in deciding what the Industrial Group should be.)

- a. Buildings
- b. Heavy Industrial
- c. Infrastructure
- d. Light Industrial

2. Once you have chosen the Industrial Group, you now select the Industrial Type. You have multiple choices under each Group, chose the one you feel fits the project most closely because on most projects there won't be an exact match:

- a. Buildings:
 - (1) Communications Ctr.
 - (2) Dormitory/Hotel
 - (3) High-rise Office
 - (4) Hospital
 - (5) Housing
 - (6) Laboratory
 - (7) Low-rise Office
 - (8) Maintenance Facility
 - (9) Parking Garage
 - (10) Physical Fitness Ctr.
 - (11) Restaurant/Nightclub
 - (12) School
 - (13) Warehouse
- b. Heavy Industrial:
 - (1) Chemical Mfg.
 - (2) Electrical (Generating)
 - (3) Environmental
 - (4) Metals Refining/Processing
 - (5) Mining
 - (6) Natural Gas Processing
 - (7) Oil Exploration/Production
 - (8) Oil Refining
 - (9) Pulp and Paper
- c. Infrastructure:
 - (1) Airport
 - (2) Electrical Distribution
 - (3) Flood Control
 - (4) Highway
 - (5) Marine Facilities
 - (6) Navigation
 - (7) Rail
 - (8) Tunneling
 - (9) Water/Wastewater
- d. Light Industrial:
 - (1) Automotive Assembly/Mfg.
 - (2) Consumer Products Mfg.
 - (3) Foods
 - (4) Microelectronics Mfg.
 - (5) Office Products Mfg.
 - (6) Pharmaceuticals Mfg.

CONTRACTOR'S NAME/ADDRESS/PHONE NUMBER

- (1) PRIME - Enter the exact name (title of firm), address, phone and fax numbers of the prime contractor.
- (2) SUBCONTRACTOR - Enter the exact name, address, phone and fax numbers of any subcontractor involved in the accident.

SAFETY MANAGER'S NAME

- (1) PRIME - Enter the name of the prime contractor safety manager.
- (2) SUBCONTRACTOR - Enter the name of the subcontractors safety manager.

INSURANCE CARRIER

- (1) PRIME - Enter the exact name/title of the prime's insurance company. Policy number not required.
- (2) SUBCONTRACTOR - Enter the exact name of the subcontractor's insurance company. Policy number not required.

SECTION 5 - ACCIDENT DESCRIPTION

DATE OF ACCIDENT - Enter the month, day, and year of accident.

TIME OF ACCIDENT - Enter the local time of accident in military time. Example: 14:30 hrs (not 2:30 p.m.).

EXACT LOCATION OF ACCIDENT - Enter facts needed to locate the accident scene (installation/project name, building/room number, street, direction and distance from closest landmark, etc.).

DESCRIBE THE ACCIDENT IN DETAIL. Fully describe the accident in the space provided. If property damage involved, give estimated dollar amount of damage and/or repair costs involved. If additional space is needed continue on a separate sheet and attach to this report. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Ensure questions below regarding direct cause(s), indirect cause(s), and actions taken are answered. **NOTE!** Review questions in Section 7 below before completing.

DIRECT CAUSE(S) - The direct cause is that single factor which most directly lead to the accident. See examples below.

INDIRECT CAUSE(S) - Indirect cause are those factors, which contributed to, but did not directly initiate the occurrence of the accident.

Examples for Direct and Indirect Cause:

- 1. Employee was dismantling scaffold and fell 12 feet from unguarded opening.

Direct cause: Failure to provide fall protection at elevation

Indirect causes: Failure to enforce safety requirements: improper training/motivation of employee (possibility that employee was not knowledgeable of fall protection requirements or was lax in his attitude toward safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.

2. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by contractor vehicle. (note contractor vehicles was in proper safe working condition.)

Direct cause: Failure of contractor driver to maintain control of and stop contractor vehicle within safe distance.

Indirect cause: Failure of employee to pay attention to driving (defensive driving).

ACTION(S) TAKEN TO PREVENT RE-OCCURRENCE OR PROVIDE ON-GOING CORRECTIVE ACTIONS. Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on back or additional sheets of paper if necessary to fully explain and attach to the complete report form.

CORRECTIVE ACTION DATES -

(1) Beginning - Enter the date when the corrective action(s) identified above will begin.

(2) Anticipated Completion - Enter the date when the corrective action(s) identified above will be completed.

PERSONAL PROTECTIVE EQUIPMENT (PPE) - Mark appropriate box(es) and list PPE which was being used by the injured person at the time of the accident (e.g. protective clothing, shoes, glasses, goggles, respirator, safety belt, harness, etc.)

TYPE OF CONTRACTOR EQUIPMENT - Enter the Serial Number, Model Number and specific type of equipment involved in the mishap (e.g. dump truck (off highway), crane (rubber tire), pump truck (concrete), etc.).

WAS HAZARDOUS MATERIAL SPILLED/RELEASED? - Mark appropriate block and list name(s) of any reportable quantities of hazardous materials spilled/released during the mishap.

WHO PROVIDED FIRST AID OR CLEAN-UP OF MISHAP SITE? - List name(s) of individual(s) and employer, if known.

ANY BLOOD-BORNE PATHOGEN EXPOSURE, OTHER THAN EMT? - Mark appropriate block and list name(s) of individual(s) and employer, if known.

LIST OSHA AND/OR EM 385-1-1 STANDARDS THAT WERE VIOLATED. - Self explanatory.

WAS SITE SECURED AND WITNESS STATEMENT TAKEN IMMEDIATELY? - Mark appropriate block and list by whom.

SECTION 6 - INJURY/ILLNESS/FATALITY INFORMATION

SEVERITY OF INJURY/ILLNESS – Mark appropriate box.

ESTIMATED DAYS LOST - Enter the estimated number of workdays the person will lose from work. Update when final data is known.

ESTIMATED DAYS HOSPITALIZED - Enter the estimated number of workdays the person will be hospitalized. Update when final data is known.

ESTIMATED DAYS RESTRICTED DUTY - Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties. Update when final data is known.

BODY PART(S) AFFECTED - Enter the most appropriate primary and when applicable, secondary, etc. body part(s) affected (e.g. arm: wrist: abdomen: single eye; jaw : both elbows: second finger: great toe: collar bone: kidney, etc.).

NATURE OF INJURY/ILLNESS FOR PRIMARY BODY PART - Enter the most appropriate nature of injury/illness (e.g. amputation, back strain, dislocation, laceration, strain, asbestosis, food poisoning, heart conditions, etc.).

TYPE AND SOURCE OF INJURY/ILLNESS - Type and Source Codes are used to describe what caused the incident.

(1) TYPE Code stands for an "Action" (Example: Worker, installing conduit, lost his balance and fell five feet from a ladder. Type Code: Fell different levels".) Select the most appropriate Type of injury from the list below:

TYPE OF INJURY/ILLNESS

STRUCK BY/AGAINST	CONTACTED CONTACTED WITH (INJURED PERSON MOVING) CONTACTED BY (OBJECT WAS MOVING)
FELL, SLIPPED, TRIPPED SAME LEVEL/DIFFERENT LEVEL/NO FALL	EXERTED LIFTED, STRAINED BY (SINGLE ACTION) STRESSED BY (REPEATED ACTION)
CAUGHT ON/IN/BETWEEN	EXPOSED INHALED/INGESTED/ABSORBED/EXPOSED TO
PUNCTURED, LACERATED PUNCTURED BY/CUT BY/STUNG BY/BITTEN BY	TRAVELING IN

(2) SOURCE Code stands for an "object or substance." (Example: Worker, installing conduit, lost his balance and fell five feet from a ladder. Source Code: "Ladder".) Select the most appropriate Source of injury from the list below:

SOURCE OF INJURY/ILLNESS

BUILDING OR WORKING AREA WALKING/WORKING AREA STAIRS/STEPS LADDER FURNITURE BOILER/PRESSURE VESSEL EQUIPMENT LAYOUT WINDOWS/DOORS ELECTRICITY	DUST, VAPOR, ETC. DUST (SILICA, COAT, ETC.) FIBERS ASBESTOS GASES CARBON MONOXIDE MIST, STEAM, VAPOR, FUME WELDING FUMES PARTICLES (UNIDENTIFIED)
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ENVIRONMENT CONDITION TEMPERATURE EXTREME (INDOOR) WEATHER (ICE, RAIN, HEAT, ETC.) FIRE, FLAME, SMOTE (NOT TABACCO) NOISE RADIATION LIGHT VENTILATION TOBACCO SMOKE STRESS (EMOTIONAL) CONFINED SPACE	CHEMICAL, PLASTIC, ETC. DRY CHEMICAL - CORROSIVE DRY CHEMICAL - TOXIC DRY CHEMICAL - EXPLOSIVE DRY CHEMICAL - FLAMMABLE LIQUID CHEMICAL - CORROSIVE LIQUID CHEMICAL - TOXIC LIQUID CHEMICAL - EXPLOSIVE LIQUID CHEMICAL - FLAMMABLE PLASTIC WATER MEDICINE
MACHINE OR TOOL HAND TOOL (POWERED: SAW, GRINDER, ETC.) HAND TOOL (NON POWERED) MECHANICAL POWER TRANSMISSION APPARATUS GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK) VIDEO DISPLAY TERMINAL PUMP, COMPRESSOR, AIR PRESSURE TOOL HEATING EQUIPMENT WELDING EQUIPMENT	INANIMATE OBJECT BOX, BARREL, ETC. PAPER METAL ITEM, MINERAL NEEDLE GLASS SCRAP, TRASH, WOOD FOOD CLOTHING, APPAREL, SHOES
MACHINE OR TOOL HAND TOOL (POWERED: SAW, GRINDER, ETC.) HAND TOOL (NON POWERED) MECHANICAL POWER TRANSMISSION APPARATUS GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK) VIDEO DISPLAY TERMINAL PUMP, COMPRESSOR, AIR PRESSURE TOOL HEATING EQUIPMENT WELDING EQUIPMENT	INANIMATE OBJECT BOX, BARREL, ETC. PAPER METAL ITEM, MINERAL NEEDLE GLASS SCRAP, TRASH, WOOD FOOD CLOTHING, APPAREL, SHOES
VEHICLE AS DRIVER OF PRIVATELY OWNED, RENTAL VEH. AS PASSENGER OF PRIVATELY OWNED, RENTAL VEH. DRIVER OF GOVERNMENT VEHICLE PASSENGER OF GOVERNMENT VEHICLE COMMON CARRIER (AIRLINE, BUS, ETC.) AIRCRAFT (NOT COMMERCIAL) BOAT, SHIP, BARGE	ANIMATE OBJECT DOG OTHER ANIMAL PLANT INSECT HUMAN (VIOLENCE) HUMAN (COMMUNICABLE DISEASE) BACTERIA, VIRUS (NOT HUMAN CONTACT)
MATERIAL HANDLING EQUIPMENT EARTHMOVER (TRACTOR, BACKHOE, ETC.) CONVEYOR (FOR MATERIAL AND EQUIPMENT) ELEVATOR, ESCALATOR, PERSONNEL HOIST HOIST, SLING CHAIN, JACK CRANE FORKLIFT HANDTRUCK, DOLLY	PERSONAL PROTECTIVE EQUIPMENT PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES RESPIRATOR, MASK DIVING EQUIPMENT SAFETY BELT, HARNESS PARACHUTE

SECTION 7 - CAUSAL FACTORS

Review thoroughly. Answer each question by marking the appropriate block. **NOTE!** If any answer is yes, explain in section 5 above.

- (1) **DESIGN** - Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
- (2) **INSPECTION/MAINTENANCE** - Did inadequately or improperly maintained equipment, tools, workplace, etc., create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?
- (3) **PERSONS PHYSICAL CONDITION** - Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was overexertion a factor?
- (4) **OPERATION PROCEDURES** - Did lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
- (5) **JOB PRACTICES** - Were any of the provisions of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?
- (6) **HUMAN FACTORS** - Was the person under undue stress (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person: i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach strengths, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?
- (7) **ENVIRONMENTAL FACTORS** - Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun temperature changes, wind, tides, floods, currents, terrain; dust, mud, glare, pressure changes, lighting, etc., play a part in the accident?

(8) **CHEMICAL AND PHYSICAL AGENT FACTORS** - Did exposure to chemical agents (either single shift exposure or long-term exposure such as dusts, fibers, (asbestos, etc.), silica, gases (carbon, monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?

(9) **OFFICE FACTORS** - Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?

(10) **SUPPORT FACTORS** - Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized and adequate to provide proper tools, equipment, personnel, site preparation, etc.

(11) **PERSONAL PROTECTIVE EQUIPMENT** - Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?

(12) **DRUGS/ALCOHOL** - Is there any reason to believe the person's mental or physical capabilities, judgment, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".

(13) **JOB/ACTIVITY HAZARD ANALYSIS** - Was a written Job/Activity Analysis completed for the task being performed at the time of the accident? If one was made, did it address the hazard adequately or does it need to be updated? If none made, will one be made? These may also need to be addressed in the Corrective Actions Taken section. Mark the appropriate box. If one was made, attach a copy of the analysis to the report.

(14) **MANAGEMENT** - Did the lack of supervisor or management support play a part in the mishap? Mark the appropriate box.

SECTION - 8 OSHA INFORMATION - Complete this section if applicable

SECTION 9 - REPORT PREPARER

Providing a completed CSIR to the Contracting Officer is the PRIME CONTRACTOR'S RESPONSIBILITY. Enter the name, date of report, title, employer, phone number and signature of person completing the accident report and provide it to the Contracting Officer, or his representative, responsible for oversight of that contractor activity. **NOTE!** If prepared by other than the Prime Contractor, a person employed by the Prime Contractor must sign that they have reviewed and concur with the report and it's findings (e.g. company owner, project supervisor/foreman, Safety Officer, etc.).

APPENDIX F
MEDICAL DATA SHEET

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This Medical Data Sheet must be completed by on-site personnel and kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facility is required.

Project _____
Name _____ Home Telephone _____
Address _____
Age _____ Height _____ Weight _____
Person to notify in the event of an emergency: Name: _____
Phone: _____
Drug or other Allergies: _____

Particular Sensitivities: _____

Do You Wear Contacts? _____

What medications are you presently using? _____

Name, Address, and Phone Number of personal physician: _____

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

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

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

Name (Print clearly)

Signature

Date

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APPENDIX G

HAZARDOUS MATERIAL INVENTORY AND MATERIAL SAFETY DATA SHEETS/SAFETY DATA SHEETS

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Product or Material Name ^{1/}	Primary Hazards	Quantity Maintained Onsite	Total Quantity Required (estimated)	Operation(s) material used for	Container Size and Type	Location Stored*
Gasoline, unleaded (supplier TBD)	Flammable Liquid, Vapors	5 gallons	Up to 50 gallons	Refueling and operation of chainsaws	5 gallon UL and OSHA listed metal fuel containers	Flammable storage locker in designated flammable material storage area if stored onsite
2-cycle oil (supplier TBD)	Petroleum Product, non-flammable	1 quart to 1 gallon	Up to 1 gallon	Mix with gasoline for chainsaw operation	Pint to quart size in manufacturer's container (as purchased)	Maintenance supply area or flammable storage locker away from flammable materials if stored onsite
Multipurpose Grease (supplier and type TBD)	Petroleum Product, non-flammable	1 to 5 gallon	Up to 10 gallons	Regular maintenance and operation of heavy equipment	In manufacturer's container (as purchased)	Maintenance supply area or flammable storage locker away from flammable materials if stored onsite
Diesel fuel	Combustible liquid, petroleum	Small tanks (quantity TBD)	1-2 small fuel tanks	Generator operation	Small tanks (quantity TBD)	NFPA-approved tanks staged by generator and trommel (trommel tank may be intrinsic to trommel equipment)
White Phosphorous	Flammable solid	N/A	N/A	Possible soil contamination	N/A	N/A
Red Phosphorous	Flammable solid	N/A	N/A	Possible soil contamination	N/A	N/A
Black Powder	Explosive	N/A	N/A	Possible soil contamination	N/A	N/A
Lead Azide	Carcinogen	N/A	N/A	Possible soil contamination	N/A	N/A
TNT	Explosive	N/A	N/A	Possible soil contamination	N/A	N/A

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ATTACHMENT 1
POISON IVY INFORMATION

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Poison Ivy Outline

- Where it grows
- How to recognize it
- How to get rid of the plant
- How people get it
- What about immunity?
- What does the rash look like?
- If you have touched it
- If you have the rash



Where it grows

Climbing poison ivy will climb anything, and can be mistaken for the leaves of a host tree.

Latin name for climbing poison ivy:
Toxicodendron radicans

- Almost Everywhere
- On the Ground
- **Climbing**
- Rural Road Sides
- Utility Poles
- New Suburban Areas
- Abandoned Areas



How to Recognize Poison Ivy

- Three leaves
- Notched and Not Shiny and Not
- Spring
- Summer
- Fall
- **Winter**
- What is NOT poison ivy

Ground vines in winter are almost impossible to recognize.

(This poison ivy patch was identified only from visits during the summer)



How to Recognize Poison Ivy

- Three leaves
- Notched and Not Shiny and Not
- Spring
- Summer
- Fall
- Winter
- **What is NOT poison ivy**

Virginia Creeper is commonly mistaken for poison ivy.

Creeper has leaves in groups of 5, poison ivy has leaves in groups of 3.

Both plants often grow side by side.



Question 3

**Is there
poison ivy
here, and if
so where,
exactly?**



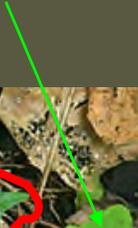


Question 3

**Only these
are
Poison ivy**



Jewelweed



POISON IVY

PREVENTION, SYMPTOMS, AND HOME & MEDICAL TREATMENT

Poison ivy is found throughout the United States. The plant grows in vines (typical in the Midwest, East coast, and South) or small bushes (in the North, West, and Great Lakes region), and has clusters of three leaves. (Hence the popular saying: "Leaves of three, let them be.") The leaves are red in the spring; green throughout the summer; and yellow, red, and orange in the fall when they also produce white berries. They typically possess green berries in the summer.

While direct skin-to-plant contact with poison ivy is probably the most frequent cause of the skin rash, the irritants from the plants can also be passed on indirectly. Urushiol oil (actually more like a resin) can be transmitted to clothing, bedding and linens, tools, shoes, or virtually anything that touches a plant. Resin may last for long periods on contaminated clothing, tools, shoes, & other surfaces. These contaminated items can cause future rashes long after the initial exposure. Any clothing that has been exposed to poisonous plants should be handled carefully and laundered immediately. The same goes for shoes, which are common culprits of harboring urushiol oil. Use latex or other disposable gloves to handle contaminated items and throw them away immediately afterwards.

PREVENTION

Quick Action Needed for Direct Skin Contact

Because urushiol can penetrate the skin within minutes, there's no time to waste if you know you've been exposed. "The earlier you cleanse the skin, the greater the chance that you can remove the urushiol before it gets attached to the skin," says an allergist & immunologist with FDA's Center for Drug Evaluation & Research.

Cleansing may not stop the initial outbreak of the rash if more than 10 minutes has elapsed, but it can help prevent further spread.

At home:

- Take a shower with specific poison ivy cleanser and COOL water. **Water should be COOL, as warm water will open pores and allow any remaining urushiol to penetrate the skin more quickly.**
- Washing clothes & bed linens **every day** is crucial to prevent recurrence. Consider palcing clean towels on car seats to prevent cross contamination of car seats. Try to change out clothing before entering vehicles, homes.

SYMPTOMS

If you don't cleanse quickly enough, or your skin is so sensitive that cleansing didn't help, redness and swelling will appear in about 12 to 48 hours. (s) For those rare people who react after their very first exposure, the rash appears after seven to 10 days.

The rash will only occur where urushiol has touched the skin; it doesn't spread throughout the body. (However, the rash may seem to spread if it appears over time instead of all at once. This is either because the urushiol is absorbed at different rates in different parts of the body or because of repeated exposure to contaminated objects or urushiol trapped under the fingernails).

TREATMENT

Mild Cases:

- Mild case = rash covers < 30% of body; itching from rash is controlled by home treatment; blisters ooze only clear-colored fluid (i.e., not yellow); no odor; no rash on any part of face, genitals, eyes, lips.
- **Call Workcare (WC) local clinic (508) 771-5770 or national WC # 800-455-6155 and speak with Francie Barber, if possible.**
- Ice packs, wet compresses or soaking in cool water may be effective to relieve itching.
- Oral antihistamines (e.g., Benadryl) can also relieve itching.
- Over-the-counter (OTC) corticosteroid creams/ointments (commonly called hydrocortisone [HC] under brand names such as Cortaid & Lanacort) may provide temporary relief of itching. WorkCare recommends using the 1% HC strength and continuing its use until patient is fully recovered.
- There are a number of OTC products that can help dry up the oozing blisters, including:
 - Aluminum acetate (Burrows solution)
 - Baking soda
 - Tub soak in baking soda solution, an oatmeal bath (e.g., Aveeno), or aluminum acetate (Domeboro solution)
 - Aluminum hydroxide gel
 - Calamine
 - Kaolin (clay)
 - Zinc acetate
 - Zinc carbonate
 - Zinc oxide.
- **Remember: Antihistamines cause drowsiness, so only use Benadryl before bedtime.**

Severe Cases:

- **“Severe” cases = Seek medical advice (i.e., contact WorkCare) immediately:**
 - Any rash on face, including eyes or lips
 - Any rash on genitals
 - Rash covers > 30 % of body (i.e., a Systemic Reaction)
 - Swelling of joints (i.e., a Systemic Reaction)
 - Rash appears in new areas after Day 4 (i.e., a Systemic Reaction)
 - Blisters that ooze fluid that is yellow (not clear)
 - Signs of infection (e.g., increased tenderness, pain, swelling, yellow fluid leaking from blisters, pus, bad odor, or fever)
 - Severe itching (cannot be controlled with home treatments).

- **If rash is near the eyes, contact WorkCare ASAP as this could affect your vision if not examined early.**
- If you have any signs of infection (e.g., pain, swelling, pus, or fever), contact WorkCare ASAP in case antibiotics are necessary.
- If your reaction is systemic and you treat it only topically, the cleanser is working if your itch & pain go away. However, new oil will continue to resurface, and the rewashing cycle may go on for weeks. In severe cases, permanent scarring may result. It is important that you contact the doctor to halt further outbreaks. Systemic reactions are best treated with combination of oral prescription corticosteroids plus cleanser.
- The FDA recommends that oral prescription corticosteroids be taken for at least 14 days, & preferably over a 3 week period. (An FDA physician says that shorter courses of treatment may cause a rebound with an even more severe rash). Discuss with WorkCare doctor or nurse case manager.
- Per the American Academy of Dermatology (AAD), people who have had severe reactions in the past should contact a doctor (such as WorkCare) as soon as possible after a new exposure.
- Even prescription-strength HC creams are only effective if treatment begins within a few hours of exposure. "After the blisters form, [the HC cream] isn't going to do much," says Dr. Epstein of the AAD.

Field Decontamination Steps to Minimize Contamination With Poison Ivy Resin (Urushiol)

Personnel Decontamination Station

During completion of daily site activities, personnel should attempt to minimize contact with contaminated PPE and equipment (i.e., items that could have come into contact with poison ivy). This involves a conscientious effort to keep "clean" when removing PPE and decontaminating non-reusable PPE and field equipment.

If possible, consideration will be given to prevailing wind directions so that the decontamination line, the support zone, and contamination reduction zone exit is upwind from the exclusion zone and the first stations of the decontamination line.

The following decontamination equipment is required for work that requires Level D+ and higher protection levels:

- Four small tubs (two sets of wash and rinse water), scrub brush, towels, and bag/drum for contaminated Tyvek disposal and/or bag for reusable contaminated coveralls for transport to laundry facility.
- Isopropyl alcohol and wipes/disposable cloths to apply & rub down reusable PPE.
- Specific poison ivy cleanser (i.e., Tecnu) should be used in the wash step, as outlined in the table.

Personnel Decontamination Sequence

Personnel Decontamination Sequence (Level D+; No Respirator)
1. Equipment drop
2. Outer boot (OB) & outer glove(OG) <u>wipe-down</u> with isopropyl alcohol to help remove urushiol (it's a resin)
3. OB & OG <u>wash</u> with specific poison ivy cleanser (e.g., Tecnu) to further remove urushiol Note: The "double wash" method may not remove 100% of urushiol, so still consider these OBs/OGs as "contaminated."
4. OB & OG <u>rinse</u> with water
5. Tape removal from boot & wrist areas Note: The "double wash" method may not have removed much urushiol on the tape, so still consider the tape as "contaminated."
6. OB & OG removal/disposal: OG Removal Procedure: <ul style="list-style-type: none">• Remove Left OG by using Right hand to grasp Left OG at the cuff and pull off Left OG by turning it INSIDE-OUT until the Left OG is removed, but is still held in the Right hand; Note: the left hand is still covered by an Inner Glove (IG);• Use the Left hand to grasp the INSIDE surface of the removed/inside-out Left OG and use this uncontaminated surface to grasp the cuff of the Right OG and pull off the Right OG;

<ul style="list-style-type: none"> • Properly dispose of the OGS. <p>Note: The “double wash” method may not remove 100% of urushiol, so still consider these OBs/OGs as “contaminated.”</p>
<p>7. Coverall or Tyvek removal/disposal</p> <ul style="list-style-type: none"> • Start at top & remove carefully by turning the garment INSIDE-OUT during removal & only touch the INSIDE (i.e., uncontaminated) surfaces • Remember: Consider this garment “highly contaminated” because it was not wiped down or washed & could still have a lot of urushiol on the surface. • Properly dispose of “contaminated” Tyvek; • Properly bag “contaminated” coveralls for transport to laundry facility.
<p>8. Inner glove (IG) removal/disposal</p> <ul style="list-style-type: none"> • Use same method for removal as in Step 6 for the OGS. • Properly dispose of the IGs.
<p>9. Hand/Face wash with specific poison ivy cleanser (e.g., Tecnu)</p> <p>Note: Scrub under the fingernails with a brush to prevent the urushiol (resin) from spreading to other parts of the body.</p>

Personnel and equipment leaving the exclusion zone shall be thoroughly decontaminated. The following protocol shall be used for the decontamination stations according to levels of protection:

Note: At a minimum, all personnel will thoroughly wash their arms, face, and hands 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 urushiol.

Personnel Hygiene

- Personnel hygiene, coupled with diligent decontamination, will significantly reduce the potential for exposure of off-site areas (i.e., boats, cars, homes) to poison ivy resin (urushiol) from the site.

Hand Held Equipment Decontamination

Hand held equipment includes all equipment, hand tools, and notebooks. The hand held equipment is dropped at the first decontamination station to be decontaminated. These items must be decontaminated or discarded as “contaminated” due to potential urushiol contact prior to removal from the exclusion zone. Washing reusable equipment to remove oil is necessary. Use of alcohol, tecnu is also necessary. Suggest that handling of ‘clean’ equipment be accomplished by wearing gloves. Consider reusing the same equipment over numerous duty cycles and store in same location so that knowledge of contaminated equipment and location amongst EEs is maintained. If possible, do not reuse equipment that can be discarded after each use.

Poison Ivy

Treatment

- Remove contaminated clothing.
- Wash area with mild soap and water.
- Apply HC 1% cream to area.
- Benedryl po for severe reactions and itching.

Prevention:

Recommend long sleeves and long pants to avoid future exposure.

Definition

Poison ivy rash is a common cause of contact dermatitis, an allergic reaction to something that comes in direct contact with the skin. This condition can be quite unpleasant, but does not pose serious health risks. Prevention is better than treatment.

The poison ivy rash usually starts one or two days after exposure, though the delay between contact and onset can be longer, up to several days. This may lead to confusion over where exposure took place. The first signs of the rash are curved lines of red, itchy bumps or blisters. These continue to appear for many days, depending on how much resin touched the skin at a given point. This makes it seem as though the rash is "spreading," although the fluid in blisters is just part of the allergic reaction and contains no chemicals or bacteria. It also makes it appear that there may still be poison ivy in clothes and on pets. Although this is theoretically possible, repeated washing of these often produces no improvement.

Many references emphasize that animals can carry the poison ivy resin. No doubt this is true, but its practical significance may be limited. The first sign of poison ivy, after all, is usually a curved line. Unless your dog is shaped like a curved line, your poison ivy is more likely to have come from a stem or leaf which dragged against the skin, not from your pet.

[**Back to Index**](#)

Poison Ivy

Poison ivy, oak and sumac grow plentifully in the U.S. More than half the population is allergic to urushiol oil - the sticky, resin-like substance found inside the plants. But it's not just the allergy to urushiol that's a problem - it's how potent it is.

- It only takes 1 billionth of a gram of the oil to cause a rash.
- 500 people could itch from the amount that would fit on the head of a pin.
- Urushiol oil can stay active on any surface for up to five years, even on dead plants.

Poison Ivy in the Spring

Like many spring leaves, poison ivy leaves start out bright red, which seems to fend off insects.



Poison Ivy in the Summer

Classic poison ivy in full swing. Some leaves are notched. Some leaves are not.

New leaves are shiny and still somewhat reddish. Older leaves are duller.



Poison Ivy in the FALL

Poison ivy turns all sorts of colors in the fall: yellow, red, orange.
And you can still get itchy from it in the fall.



Poison Ivy in the Winter

This is the same bush as pictured in the summer.

The word is that you CAN get poison ivy from working with the vine in winter AND you can get it in your lungs if you burn it and breathe the smoke.



How do you get poison ivy?

From touching it, or touching something that has touched it, like your clothes or your dog. You normally get it from touching the leaves, but yanking the vine out by the roots - even in winter - will give you a wicked rash.

Using a weed-eater to remove poison ivy will result in spraying your legs with poison ivy. If you are bare-legged and get scratches while splattered with sap from poison ivy, you may be headed to the emergency room.

And there are more unusual ways to get it, like breathing smoke from firewood burning with poison ivy on it. Which can also put people into the hospital.

What if you know you've been exposed to it?

Within an hour or so you should rinse with lots of cold water - like a garden hose. Hot water will open your pores and let the oil in. Taking a shower could be a disaster (see my father's story, "[Washing made it spread.](#)")

For up to about 6 hours washing with alcohol may still help remove the oil, but many say that after 1/2 hour the oil has soaked in and you can't remove it.

The next day is really too late. Check with your doctor to see if early treatment can prevent the rash before it really starts.

What can you do once the itching starts?

For a serious case you **MUST SEE A DOCTOR**. For less serious cases check with your local drugstore or see the list below for remedies.

Here are a list of popular home remedies:

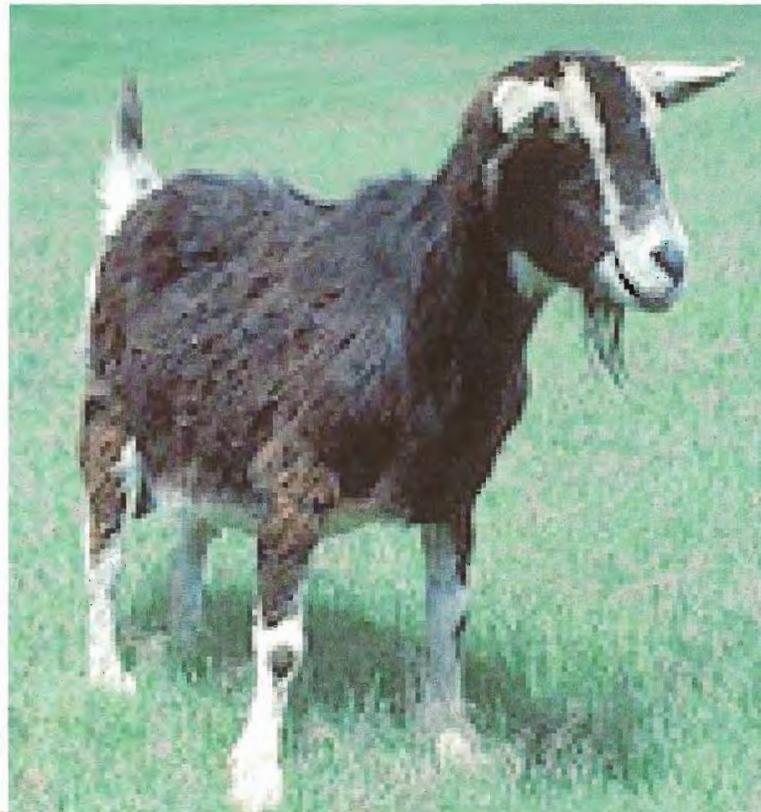
- Take a shower in the hottest water you can stand, for as long as you can stand - this should ease the itch for 8 hours.
- Jewel weed is widely thought to help the rash. Mash the weed and apply to the rash.
- Spray with a deodorant containing aluminum, which most do.

How do you get rid of poison ivy?

- If you rip it out by the roots you can catch a terrible case of poison ivy rash. It will likely grow back until you get every last bit of root. And you can't burn it because the smoke can get in your lungs and make you so sick you won't believe it.
 - If you have it in your yard and keep mowing it, it might give up and die, but be VERY careful about mowing it. When you grind up the leaves you create a nasty soup out of the leaves.
 - You can spray with broadleaf herbicide, but you risk killing lots of harmless plants and who knows what else.
 - Most counties in America have some sort of County Extension Agent that can give you advice about how to handle it in your particular situation.
-

Some have suggested getting a goat - a terrific idea for getting rid of poison ivy. Goats eat PI with no ill effects.

There are some downsides: they will also eat everything else they can reach, and depending on where you live, goats may make you unpopular with the neighbors.



What's good about Poison Ivy?

Poison ivy does have its good points:

- It feeds wild birds and animals who eat it without ill effects.
 - It holds the earth very well against erosion near the ocean.
 - Native Americans had medical uses for it.
-

RECAP

- Know what it looks like.
 - Wear proper clothing and **DON'T BURN IT!!**
 - Rinse with **COLD** water or alcohol.
 - For a serious case you **MUST SEE A DOCTOR.**
 - Your County Extension Agent that can give you advice about how to handle it in your particular situation.
-