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ACCIDENT PREVENTION PLAN TRUCK FILL STAND SITE ASSESSMENT REVISION 1  
BOCA CHICA NAS KEY WEST FL  
03/01/2012  
CH2MHILL



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March 30, 2012

Ms. Beverly Washington  
NAVFAC Southeast  
Naval Facilities Southeast  
Bldg 903 Yorktown Ave  
Jacksonville, FL 32212-0030

Subject: Final Accident Prevention Plan for the Truck Fill Stand Site Assessment  
Contract No. N62470-10-D-3009  
Task Order JM08

Dear Ms. Washington:

CH2M HILL is pleased to present you with the *Final Accident Prevention Plan for the Truck Fill Stand Site Assessment* at NAS Key West, Boca Chica Key, Florida. If you have any questions concerning the plan or the project in general, please call me at (678) 530-4301 or email at [Greg.Rowell@ch2m.com](mailto:Greg.Rowell@ch2m.com).

Sincerely,

CH2M HILL Inc.

A handwritten signature in blue ink that reads "Greg Rowell".

Greg Rowell  
Project Manager

c: Kola Olowu/DLA  
Robert Courtright/NAS Key West  
Traci Bolanos/FDEP

Revision 1

# Accident Prevention Plan Truck Fill Stand Site Assessment

Naval Air Station Key West  
Boca Chica Key, Florida



Prepared for

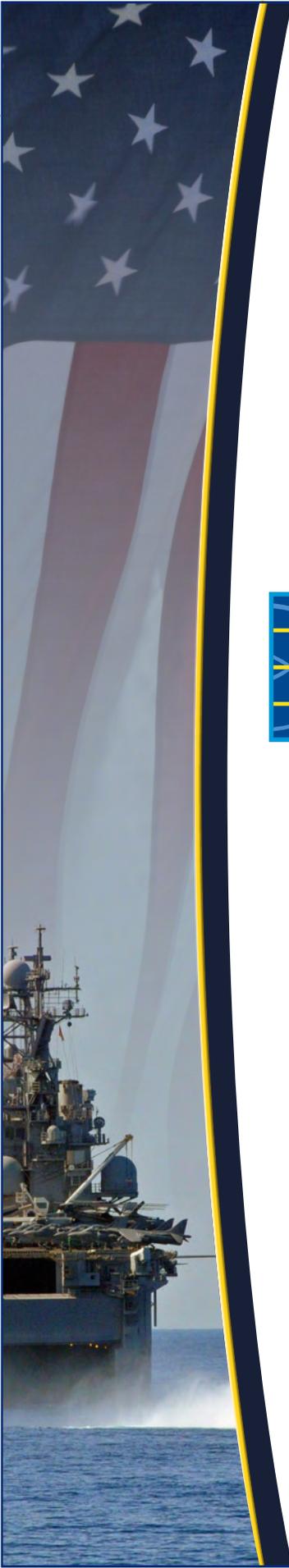
**Department of the Navy**  
Naval Facilities Engineering Command  
Southeast

Contract No.  
N62470-10-D-3009  
CTO-JM08

**March 2012**

Prepared by

**CH2MHILL®**



Revision 1

**Accident Prevention Plan  
Truck Fill Stand: JP-5, Re-Evaluation, Sampling,  
Plume Delineation and Monitoring**

**Naval Air Station Key West  
Boca Chica Key, Florida**

**Contract Task Order JM08**

**March 2012**

Prepared for:

**Department of the Navy  
Naval Facilities Engineering Command  
Southeast**

Under the

**Navy Multimedia Contract  
Contract N62470-10-D-3009**

Prepared by



**Atlanta, Georgia**

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**Appendix**

Appendix A Site Safety and Health Plan

# Acronyms and Abbreviations

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ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
BCTF	Boca Chica Tank Farm
CFR	Code of Federal Regulations
CO/COR	Contracting Officer/Representative
CPR	cardiopulmonary resuscitation
CSHO	Corporate Safety and Health Officer
EAP	Employee Assistance Program
EMR	Experience Modification Rate
HAZWOPER	Hazardous Waste Operations and Emergency Response
HMIS	Hazardous Materials Information System
HSM	Health and Safety Manager
IARC	International Agency for Research on Cancer
IDW	investigation-derived waste
IIPP	Injury and Illness Prevention Program
LWD	Lost Workday
MSDS	Material Safety Data Sheet
NASKW	Naval Air Station Key West
NFPA	National Fire Prevention Agency
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
PTSP	Pre-Task Safety Planning
SSC	Site Safety Coordinator
SSHP	Site Safety and Health Plan
TFS	Truck Fill Stand
USACE	U.S. Army Corps of Engineers

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SECTION 1

# Signature Page

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**Accident Prevention Plan**

Truck Fill Stand Site Assessment  
Naval Air Station Key West  
Boca Chica Key, Florida

Date: March 2012

Program Safety and Health Manager:  \_\_\_\_\_

Name Date:  
CH2M HILL  
Program Health and Safety Manager  
404/790-4769

Plan Concurrence and Project Manager:  \_\_\_\_\_ 2-29-2012

Name of PM Date:  
CH2M HILL  
Project Manager  
678/530-4301

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## SECTION 2

# Background Information

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This Accident Prevention Plan (APP) has been developed to protect and guide the personnel conducting monitoring well installation, well plugging, groundwater sampling, sediment, and surface water sampling. The site covered in this investigation consists of the Truck Fill Stand (TFS) area located at Naval Air Station Key West (NASKW) on Boca Chica Key, Florida. This APP has been prepared to meet applicable requirements of the U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual EM 385-1-1 (USACE, 2008), the *Code of Federal Regulations*, 29 CFR 1910.1200 Hazard Communication Standard, Hazardous Waste Operations or emergency response as required by 29 CFR 1910.120 and 29 CFR 1926.65 and the corporate safety and health policies of CH2M HILL, Inc. Various portions of this work will also be conducted under Non-Hazardous Waste site protocols. The Site Safety and Health Plan (SSHP) for this project is included as Appendix A of this APP.

## 2.1 Contractor

CH2M HILL, Inc.

## 2.2 Contract Number

Contract N62470-10-D-3009

Contract Task Order JM08

## 2.3 Project Name

Truck Fill Stand Site Assessment

Naval Air Station Key West

Boca Chica Key, Florida

## 2.4 Project Description and Location

This APP presents the hazards known or anticipated to be present: NASKW is located in southern Monroe County, Florida, approximately 150 miles southwest of Miami. The TFS at NASKW is located on Boca Chica Key, Florida. The TFS is an active facility used to fill tanker trucks for refueling aircraft. Fuel from the Boca Chica Tank Farm (BCTF), approximately 4,000 feet southwest of the TFS, is pumped to the southwest portion of the TFS via twin 6-inch diameter steel underground pipelines. Fuel is pumped and transferred at the fueling area to standard over-the-road tanker trucks. Trucks routinely leave and return to the site for fueling missions and related airfield operations. The TFS is also referred to as Building A-902 in reference to the former operations building that formerly stood on the southeast side of this facility.

This Project-Specific APP will be used by CH2M HILL and its subcontractors to identify and mitigate task-specific hazards and to select appropriate health and safety protective measures.

Onsite personnel must review the APP and sign an agreement to comply with its provisions prior to commencing onsite work. The APP and attached SSHP are considered operational documents that are subject to revisions in response to various site-specific conditions that may be encountered. However, these documents may be modified or updated only with the approval of the Health and Safety Manager (HSM) and Project Manager.

Specific work activities requiring activity hazard analyses (AHAs) are listed in Section 2.6.

## 2.5 Contractor Accident Experience

CH2M HILL’s exceptional safety performance greatly exceeds the industry average. Our injury and illness rates and our Experience Modification Rate (EMR) have decreased over the past 5 years.

Following are examples of our achievements:

- An EMR of less than 1.0 over the past 5 years, which is the average accident injury experience for the industry, with a 2010 EMR of 0.71 (or 71 percent) of the industry average (NAICS 54133).

Category	2006	2007	2008	2009	2010
Employee Hours	11,997,887	13,744,013	15,290,819	14,673,402	12,842,086
Experience Modification Rate (EMR)	0.76	0.74	0.66	0.72	0.71
Fatalities	0	0	0	0	0
Recordable Incidents	31	27	48	20	8
Recordable Incident Rate *	0.52	0.39	0.63	0.27	0.12
Recordable Incident Rate Average *	1.5	1.4	1.4	1.1	1.2
Lost Workday (LWD) Incidents (DART) **	12	7	11	3	0
LWD Incident Rate (DART)	0.20	0.10	0.14	0.04	0.00

## 2.6 Work Requiring Activity Hazard Analysis

The planned field tasks requiring AHAs are as follows:

- 01 Install and develop three shallow monitoring wells.
- 02 Collect groundwater quality samples from monitoring wells
- 03 Plug and abandon two existing monitoring wells
- 04 Collect four surface water/sediment samples from the wetlands located southwest of the site.
- 05 Survey the locations of the three newly installed wells and four surface water/sediment sampling locations.

AHAs for each of the above field tasks are included in Appendix A.

### SECTION 3

# Statement of Safety and Health Policy and Compliance Procedures

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CH2M HILL is committed to providing a safe and healthful workplace for employees. These conditions will be ensured through an aggressive and comprehensive worker safety and health program that is integrated with other site worker-protection activities. We regard employee protection as a priority and are committed to developing, implementing, and improving safety and health practices that will afford optimal protection to employees and enable continuous improvement of the quality of worker protection performance. The safety and health of employees will take precedence whenever conflicts with production or other objectives arise.

Managers and supervisors are held accountable for worker safety and health. Accountability is achieved by assigning worker protection responsibilities, evaluating personnel performance, and holding personnel accountable for worker protection performance.

In addition to complying with this APP and their corporate safety and health program, persons working under the SSHP are encouraged to be active participants in their workplace safety and health activities, and to actively take advantage of the worker rights in a responsible manner, without reprisal.

The following activities may result in disciplinary action, up to and including discharge of any employee from their corporation:

- Violation of the safety and health requirements of their corporation's policy or of this APP
- Unauthorized or illegal possession, use or sale of alcohol or controlled substances on work premises, during working hours, while engaged in corporate activities, or in corporate vehicles
- Use or sale of firearms or explosives on work premises

See Section 1.0 of Appendix A for further details.

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# Responsibilities and Lines of Authorities

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This section identifies the personnel who have specific safety responsibilities on the project.

## 4.1 Personnel with Safety Responsibilities

Participating personnel are responsible for complying with safety procedures and for proactively making safety awareness part of their day-to-day conduct.

The following positions have specific corporate and project safety responsibilities:

- HSM
- Corporate Safety and Health Officer (CSHO)
- Project Manager
- Site Safety Coordinator (SSC)
- Other project field staff

Appendix A (the SSHP) lists the specific personnel that will fill the stated positions for this project. Lines of authority are also detailed in Appendix A. See Section 4 of Appendix A for details.

All work is conducted under a Behavior Based and Loss Prevention System program. AHAs are a vital part of this work, as well as using Pre-Task Safety Planning (PTSP). All staff are accountable for their own health and safety, and have the authority to request a work stoppage when they feel unsafe behaviors, actions, or situations are occurring.

All work requiring a competent person per Occupational Safety and Health Administration (OSHA) definition (29 CFR 1926.32(f)), will not be started until that competent person is designated and on site. *Competent person* means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Refer to Appendix A, starting at Section 4.

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## SECTION 5

# Subcontractors and Suppliers

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Subcontractors and suppliers providing services onsite will be subject to the safety provisions of this APP and those included in Appendix A. See Section 5.0 of Appendix A for details. At this time, there are four subcontractors planned for use to fulfill this task order.

This APP has been constructed to directly track with the EM 385-1-1 2008 Appendix A “Minimum Basic Outline for Accident Prevention Plan.”

CH2M HILL and any identified subcontractors shall conduct site work in accordance with this APP and associated documents. CH2M HILL shall address compliance with specific safety and health requirements, including those listed in Section 9, through safety meetings at the start of each shift. The specific safety and health requirements and site conditions will be reviewed with field personnel during these meetings. All parties shall also comply with the requirements of their respective Injury and Illness Prevention Programs (IIPPs).

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## SECTION 6

# Training

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Site workers, supervisors, and managers will have training appropriate to their assigned duties and as specified in the SSHP and AHAs that are applicable to the work being performed. As specified in Section 4.0 of Appendix A, the SSC (who will also conduct the project safety and health inspections), will meet the training and indoctrination requirements prescribed in this APP and Appendix A, as well as the Hazardous Waste Operations and Emergency Response (HAZWOPER) supervisory training. All employees engaging in hazardous waste operations or emergency response shall receive appropriate training as required by 29 CFR 1910.120 and 29 CFR 1926.65. At a minimum, the training shall have consisted of instruction in the topics outlined in 29 CFR 1910.120 and 29 CFR 1926.65. As there no tasks planned that require a competent person, competent person level training is not required. Personnel who have not met these training requirements shall not be allowed to engage in hazardous waste operations or emergency response activities.

Details of required training are specified in Section 15.0 of Appendix A.

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# Safety and Health Inspections

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## 7.1 Inspection Details

The project SSC (specifically identified in the attached SSHP) will provide onsite safety and health inspections for this project. The SSC will meet the training and indoctrination requirements as prescribed in this APP and Appendix A, including HAZWOPER supervisory training, cardiopulmonary resuscitation (CPR), first aid, and blood-borne pathogen awareness training. The SSC will also have hands-on experience overseeing these types of tasks.

See Section 21.0 of Appendix A for further inspection details.

## 7.2 Recordkeeping

Project safety and health documentation will be maintained by the CSHOs for the respective companies. Records to be maintained (both in project files of each of the respective companies, and in the onsite field trailer) will include:

- HAZWOPER training certificates
- First aid and CPR training certificates
- Documentation of medical surveillance
- Daily safety and health briefing acknowledgment forms
- Deficiency identification, correction, and follow-up documentation
- Accident reports and investigation records
- Respirator usage and fit training, as applicable
- Material Safety Data Sheet (MSDS) for sample preservatives

## 7.3 External Inspection/Certifications

External inspections or certifications will not be required for this work.

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## SECTION 8

# Accident Reporting

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The SSC and HSM are responsible for all incidents reporting. Specific details are found in Section 22.0 of Appendix A.

Also, all significant accidents shall be reported as soon as possible, but not more than 24 hours afterwards to the Contracting Officer/Representative (CO/COR). The contractor shall thoroughly investigate the incident and submit the findings of the investigation along with appropriate corrective actions to the CO/COR in the prescribed format as soon as possible, but no later than 5 working days following the incident. Implement corrective actions as soon as reasonably possible.

The following occurrences require immediate accident notification:

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

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SECTION 9

# Plans Required By the EM 385-1-1 Safety Manual

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Plans required by the EM 385-1-1 Safety Manual are presented below. Plans and procedures that are not applicable to this project are indicated as such with the non-applicability rationale.

## 9.1 Layout Plan

Site layout will be provided prior to start of work.

## 9.2 Hospital Addresses and Route

Information on the nearest medical facility with emergency care is discussed in Section 9.6 of this APP, as well in Section 19 of Appendix A.

## 9.3 Emergency Response Plan

Details are provided in Section 20 of Appendix A. Medical support for this project will be provided onsite and offsite.

## 9.4 Man Overboard/Abandon Ship (Section 19.A.04)

NOT APPLICABLE: No work will be conducted aboard a ship or on water.

## 9.5 Onsite Medical Support

When two or more field staff are present onsite, at least two will have current certification in basic first aid and CPR, along with Blood-borne Pathogens annual training. Unless injured, the SSC will be the lead person to initiate any required first aid until offsite medical support can be engaged.

## 9.6 Offsite Medical Support

In the event of a medical emergency or if follow up to basic first aid is required, request emergency medical transport as opposed to transporting the injured person in a private or company vehicle where practical. The contact and location information for the nearest offsite medical support is presented below. A map indicating the travel route to the nearest medical facility with emergency care is presented in the SSHP.

### **Lower Keys Medical Center**

5900 College Road  
Key West, Florida 33040  
**Phone:** (305) 294-5531

Emergency #:                      In case of emergency contact the police, fire, and medical emergency at 911

Further specific details are provided in Section 19 of Appendix A.

## 9.7 Alcohol and Drug Abuse Prevention

In order to maintain a drug and alcohol free workplace, the respective parties have established a drug and alcohol free awareness program to educate employees on (1) the danger of drug abuse and alcohol in the workplace; (2) the corporate drug and alcohol free workplace policy; (3) the availability of any drug and alcohol counseling, rehabilitation, and employee assistance programs; and (4) the penalties that may be imposed upon employees for drug abuse and alcohol violations and violations of the corporation's drug and alcohol free workplace. Such education includes the distribution of the drug- and alcohol-free workplace policy at the employment interview; a discussion of the drug- and alcohol-free workplace policy at the new employee orientation session; and inclusion of the company's drug- and alcohol-free workplace policy in the employee handbook and any other personnel policy publications.

## 9.7.1 CH2M HILL

The corporation has vital interests in ensuring a safe, healthy, and efficient working environment for our employees, their coworkers and clients we serve. The unlawful or improper use of controlled substances or alcohol in the workplace presents a danger to everyone. In addition, as a federal contractor we have a duty to comply with the requirement of the Drug-Free Workplace Act of 1988. For these reasons, we have established as a condition of employment and continued employment with the corporation the following drug- and alcohol-free workplace policy.

Employees are prohibited from reporting to work or working while using illegal or unauthorized substances. Employees are prohibited from reporting to work or working when the employee uses any drugs, except when the use is pursuant to a doctor's orders and the doctor has advised the employee that the substance does not adversely affect the employee's ability to safely perform his or her job duties. This does not include the authorized use of alcohol at corporate-sponsored functions or activities.

In addition, employees are prohibited from engaging in the unlawful or unauthorized manufacture, distribution, sale, or possession of illegal or unauthorized substances and alcohol in the workplace including on client paid time, on client premises, in client vehicles, or while engaged in client activities.

In accordance with the Drug-Free Workplace Act of 1988, employees must notify their supervisor of any criminal drug statute conviction for a violation occurring within the workplace within 5 days of such conviction.

Employment with the corporation is conditioned upon an employee's full compliance with the foregoing drug and alcohol free workplace policy. Any violation of this policy may result in disciplinary action, up to and including discharge. Furthermore, any employee who violates this policy who is subject to termination may be permitted in lieu of termination, at the corporation's sole discretion, to participate in and successfully complete an appropriate treatment, counseling, or rehabilitation program as recommended by a substance abuse professional as a condition of continued employment and in accordance with applicable federal, state, and local laws.

Consistent with its fair employment policy, the corporation maintains a policy of nondiscrimination and reasonable accommodation with respect to recovering addicts and alcoholics, and those having a medical history reflecting treatment for substance abuse conditions. We encourage employees to seek assistance before their drug and alcohol use renders them unable to perform their essential job functions or jeopardizes the health and safety of themselves or others. The corporation will attempt to assist its employees through referrals to rehabilitation, appropriate leaves of absence, and other measures consistent with the corporation's policies and applicable federal, state, or local laws.

The corporation further reserves the right to take any and all appropriate and lawful actions necessary to enforce this drug and alcohol free workplace policy including, but not limited to, the inspection of corporation-issued lockers, desks, or other suspected areas of concealment. Employees are required to submit for "post accident" and "for cause" drug and alcohol screening following any incident. Random drug and/or alcohol screening is not a requirement of CH2M HILL unless required by a client.

## 9.7.2 Employee Assistance Program

Employees may participate in CH2M HILL's Employee Assistance Program (EAP) immediately upon hire. The EAP helps eligible employees and their immediate families with a wide range of problems, including marriage and family problems; emotional problems; alcoholism and alcohol abuse; drug abuse and dependency; financial problems; compulsive gambling; and eating disorders. Employee conversations and records under the EAP are strictly confidential. The administrative cost of this program is fully paid by the company.

## 9.8 Site Sanitation Plan (Section 02)

The following constitutes the Site Sanitation Plan for this project.

### 9.8.1 Drinking Water

A cooler containing an adequate supply of drinking water will be available at the site for the site workers and replenished each day. The cooler will be stored outside the exclusion zone on or near the field vehicles.

### 9.8.2 Toilets

Toilets are located in TFS control building.

### 9.8.3 Washing Facilities

Access to washing facilities is available at the same location as the toilets.

### 9.8.4 Food Service

No food service will be provided onsite. Site workers either will bring their food to the site to be consumed outside of the exclusion zone and only after proper decontamination, or will go offsite for food.

### 9.8.5 Waste Disposal

Any investigation-derived waste (IDW) will be stored, profiled, and disposed of in accordance with the project Work Plan.

Nonhazardous waste materials and rubbish will be contained in a garbage bag and disposed of with regular site sanitary service disposal or at an offsite disposal facility.

### 9.8.6 Vermin Control

No enclosed spaces are being constructed for this project and waste materials will be securely stored and transported offsite to provide vermin control.

## 9.9 Access and Haul Road Plan (Section 4.B)

NOT APPLICABLE. No access or haul roads are being constructed for this work.

## 9.10 Respiratory Protection Plan (Section 05.G)

Exposure to respiratory hazards is not anticipated for the scope of work being performed under this APP. Tasks related to only field personnel who have been medically cleared, fit-tested, and trained in the use and maintenance of the appropriate respiratory protection will be allowed to proceed with work under conditions requiring respiratory protection.

See Section 14.2 of Appendix A for specific details if required due to site hazards.

## 9.11 Health Hazard Control Plan (Section 06.A)

Safety and health hazards for performing work covered under this APP are identified through the preparation of AHAs (provided in Appendix A). Each AHA also indicates recommended controls for each identified potential safety/health hazard.

Appropriate personal protective equipment shall be supplied and used at all times for this project. Personal protective equipment (PPE) selection is based on the selected hazard control measures specified in the AHAs (Section 14.1 of Appendix A).

## 9.12 Hazard Communication Program

Chemical products may occasionally be stored and used on the project site, and/or stored on field vehicles. Examples of chemicals include hydrogen peroxide, gases used to calibrate sensing equipment, and lubricants. Other chemicals may be used as well. These chemicals may pose hazards including flammability, corrosiveness, reactivity and incompatibility, and toxicity. Because of these potential hazards, special precautions must be taken including:

- Tracking and controlling hazardous chemical products received and stored

- A hazard evaluation of each chemical product, using such sources as MSDSs
- Informing workers of the potential hazards through training, MSDSs, and appropriate labeling of containers
- Air monitoring in the case of potential respiratory hazards
- Design and implementation of engineering controls such as ventilation and source control
- Developing storage, handling, housekeeping, and decontamination procedures
- Assigning appropriate personal protective equipment such as eye and face protection, gloves, body protection, and respirators; respirator usage by CH2M HILL or subcontractor employees will be in accordance with the employees' IIPP
- Training personnel handling chemicals on safe handling procedures, personal protective equipment, and emergency and spill cleanup procedures

Hazardous substances that may be encountered in soil on the project site are not covered by this program. Appendix A addresses chemical and other hazard assessment and mitigation associated with site contaminants including investigation and remediation of waste materials.

### **9.12.1 Chemicals Covered by this Project Program**

For the purposes of this program, chemicals considered to be hazardous are those:

- Listed in the OSHA Permissible Exposure Limits
- Included in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Chemical Substances (2007)
- Found to be suspected or confirmed carcinogens by the National Toxicology Program in the latest edition of the Annual Report on Carcinogens, or by the International Agency for Research on Cancer (IARC) in the latest edition of the IARC monographs

No chemicals are expected to be used during field activities as part of this scope of work.

Exceptions to this policy, by OSHA definition, include consumer products that are used in a consumer fashion and pose no more of an exposure hazard than a consumer would face.

### **9.12.2 Training**

Employees who work with or are potentially exposed to hazardous chemicals will receive initial training on the elements of this Hazard Communication Program, including the following:

- Content and requirements of this Program and the OSHA Hazard Communication Standard
- The potential physical and toxic hazards of the chemicals used in their work location, and especially the hazards of non-routine tasks
- Chemical inventory and tracking procedures
- Location of this Hazard Communication Program, the chemical inventory, and the MSDSs
- How to read Material Safety Data Sheets
- Methods to detect the release of or exposure to chemicals in their area
- Content and interpretation of labels
- Safe use and handling of chemicals
- Required personal protective equipment
- Basic emergency procedures

Additional training will be provided on an annual basis, whenever a new chemical is added to the workplace, and when non-routine tasks are planned.

### **9.12.3 Labeling**

The SSC will ensure that hazardous chemicals brought onto the site are properly labeled with at least the following information, in English, as a minimum, and the language of non-English-speaking employees who may use the product, as appropriate. This labeling includes the following:

- The identity of the product and chemical components
- Appropriate hazard warnings
- Name and address of the manufacturer, importer or other responsible party

Hazard warnings will also be transmitted in the form of the National Fire Prevention Agency (NFPA) or Hazardous Materials Information System (HMIS) color-coded warnings, which are ranked on a 0 to 4 scale. When chemicals are transferred to a portable container, labels containing chemical identification and hazard warnings must be affixed to the portable container.

### **9.12.4 Current Onsite Inventory**

NOT APPLICABLE.

## **9.13 Process Safety Management Plan (Section 06.B.04)**

NOT APPLICABLE. This work does not include chemical management.

## **9.14 Lead Abatement Plan**

NOT APPLICABLE. Lead is not known to be an exposure concern for this project.

## **9.15 Asbestos Hazard Control Plan**

NOT APPLICABLE. Asbestos is not known to be an exposure concern for this project.

## **9.16 Radiation Safety Program (Section 06.E.03.a)**

NOT APPLICABLE. Radiation hazards not anticipated for this work.

## **9.17 Abrasive Blasting (Section 06.H.01)**

NOT APPLICABLE. This work does not involve abrasive blasting.

## **9.18 Heat/Cold Stress Monitoring Plan (Section 06.I.02)**

See Sections 10.3.1 and 10.3.2 of Appendix A.

## **9.19 Crystalline Silica Monitoring Plan (Section 06.M)**

NOT APPLICABLE. Crystalline silica is not known to be an exposure concern for this project.

## **9.20 Night Operations Lighting Plan**

NOT APPLICABLE. Work will not be conducted at night.

## **9.21 Fire Prevention Plan**

See Section 8.6 of Appendix A for more details.

## **9.22 Wildland Fire Management Plan**

NOT APPLICABLE. Wildland fires are not anticipated as a risk for this work.

## **9.23 Hazardous Energy Control Plan**

NOT APPLICABLE. Servicing or maintenance on a system where the unexpected energizing, startup, or release of kinetic or stored energy that could cause injury or damage to occur is not part of this project.

## **9.24 Critical Lift Procedures**

NOT APPLICABLE. No critical lifts will be performed under this scope of work.

## **9.25 Contingency Plan for Severe Weather**

NOT APPLICABLE. Development of a severe weather contingency plan is related to marine operations and therefore does not apply to this scope of work. However, exterior field work on this project will be suspended in the event of severe weather that could impact field activities. Such work suspension will be communicated immediately to the Project Manager.

## **9.26 Float Plan (Section 19.F.04)**

NOT APPLICABLE. This work is not over water or requiring use of a boat.

## **9.27 Fall Protection Plan**

NOT APPLICABLE. This work does not expose workers to elevated work areas.

## **9.28 Demolition Plan (Engineering and Asbestos Surveys)**

NOT APPLICABLE. This work does not involve demolition.

## **9.29 Excavation/Trenching Plan (Section 25.A.01)**

NOT APPLICABLE. This work does not involve excavation or trenching.

## **9.30 Emergency Rescue (Tunneling)**

NOT APPLICABLE. Tunneling and other underground construction is not necessary for this work.

## **9.31 Compressed Air Plan**

NOT APPLICABLE. Compressed air usage is not necessary for this work, except for calibration gases of very small amounts.

## **9.32 Formwork and Shoring Erection and Removal Plans**

NOT APPLICABLE. This work does not involve forming or shoring.

## **9.33 Jacking Plan (Lift) Slab Plans**

NOT APPLICABLE. These plans are associated with concrete masonry work, which is not part of this project.

## **9.34 Steel Erection Plan**

NOT APPLICABLE. This work does not involve steel erection.

## **9.35 Safety and Health Plan**

An SSHP is attached to this APP as Appendix A. The SSHP meets the requirements for work on hazardous waste sites in accordance with 29 CFR 1910.120 and 29 CFR 1926.65.

Detailed site-specific hazards and controls and AHAs are provided in Appendix A.

## 9.36 Blasting Plan

NOT APPLICABLE. This work does not involve blasting.

## 9.37 Diving Plan

NOT APPLICABLE. This work does not involve diving.

## 9.38 Workplace Fire Hazards

### 9.38.1 Potential Ignition Sources

The only potential ignition source is dry vegetation or other combustible material contacting hot engine or exhaust parts of the support vehicles.

### 9.38.2 Fire Suppression Equipment

The field vehicles will be supplied with a Class ABC fire extinguisher.

### 9.38.3 Responsibility Assignments

Equipment maintenance (truck, fire extinguisher, and sampling equipment) falls under the responsibility of the field staff and will be overseen by the SSC including an inspection of vehicles and fire extinguishers to ensure they are in proper condition.

The SSC will ensure that vehicles are not brought into immediate proximity to dried vegetation that could come in contact with vehicle ignition sources (that is, the undercarriage). The SSC will also ensure proper site housekeeping including collection and disposal of any rubbish.

## 9.39 Confined Space

NOT APPLICABLE. Entry or proximity to confined space is not required for this project.

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SECTION 10

# Risk Management Processes

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The specific processes are addressed in multiple sections of Appendix A, depending on whether classified as physical, chemical, or other type (see Sections 9 through 12), as well as the task-specific AHAs included in Appendix A.

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**Appendix A**  
**Site Safety and Health Plan**

---



Truck Fill Stand Site Assessment  
Naval Air Station Key West  
Boca Chica Key, Florida

Prepared for:

Department of the Navy  
Naval Facilities Engineering Command  
Southeast

March 2012



Northpark 400  
1000 Abernathy Road  
Suite 1600  
Atlanta, Georgia 30328

1.0 INTRODUCTION

CH2MHILL



Health, Safety, Security and Environment Policy

Protection of people and the environment is a CH2M HILL core value. It is our vision to create a culture within CH2M HILL that empowers employees to drive this value into all global operations and achieve excellence in health, safety, security and environment (HSSE) performance. CH2M HILL deploys an integrated, enterprise-wide behavior based HSSE management system to fulfill our mission and the expectations of our clients, staff, and communities based on the following principles:

- We require all management and supervisory personnel to provide the leadership and resources to inspire and empower our employees to take responsibility for their actions of their fellow employees to create a safety, healthy, secure and environmentally-responsible workplace.
- We provide value to clients by tailoring HSSE processes to customer needs and requiring all CH2M HILL employees and subcontractors to delivery projects with agility, personal service, and responsiveness and in compliance with HSSE requirements and company standards to achieve health, safety, and security and pollution prevention excellence. Our performance will aspire to influence others and continually redefine world-class HSSE excellence.
- We systematically evaluate our design engineering and physical work environment to verify safe and secure work conditions and practices are established, consistently followed, and timely corrected.
- We continually assess and improve our HSSE program to achieve and maintain world-class performance by setting and reviewing objectives and targets, reporting performance metrics, and routinely reviewing our program.
- We care about the safety and security of every CH2M HILL employee and expect all employees to embrace our culture, share our core value for the protection of people and the environment, understand their obligations, actively participate, take responsibility, and "walk the talk" on and off the job.

The undersigned pledge our leadership, commitment, and accountability for making this policy a reality at CH2M HILL.

Dated the 29th date of March, 2011.

Lee McIntire Chief Executive Officer	John Madis Chief Human Resources Officer	Mike Lucki Chief Financial Officer
Margaret McLean Chief Legal Officer	Mike McKelvy President, Government, Environment, & Nuclear Division	Bob Card President, Energy & Water Division
Jacqueline Rast President, Facilities & Infrastructure Division	Fred Brune President, International Division	Gene Lupia President, Delivery Excellence
		Keith Christopher Senior Vice President, Health, Safety, Security and Environment

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- Attachment 3 Chemical-Specific Training Form
- Attachment 4 Project Activity Self-Assessment Checklists/Forms/Permits
- Attachment 5 Key Target Zero Program Elements
- Attachment 6 Fact Sheets
- Attachment 7 Observed Hazard Form
- Attachment 8 Stop Work Order Form
- Attachment 9 Agency Inspection Target Zero Bulletin
- Attachment 10 Completed CH2M HILL AHAs
- Attachment 11 Material Safety Data Sheets

# Approval

---

This site-specific Health and Safety Plan (HSP) has been written for use by CH2M HILL only. CH2M HILL claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions and identified scope(s) of work and must be amended if those conditions or scope(s) of work change.

By approving this HSP, the Responsible Health and Safety Manager (RHSM) certifies that the personal protective equipment has been selected based on the project-specific hazard assessment.

## Original Plan

**RHSM Approval:** Michael Goldman

**Date:** January 17, 2012

---

## Revisions

**Revisions Made By:**

**Date:**

**Description of Revisions to Plan:**

**Revisions Approved By:**

**Date:**

---

# 1.0 Introduction

CH2MHILL

HSSE  
Target Zero  
World-Class Performance



## Health, Safety, Security and Environment Policy

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Dated the 29th date of March, 2011.

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President, Facilities & Infrastructure Division

Fred Brune  
President, International Division

Gene Ludwig  
President, Delivery Excellence

Keith Christopher  
Senior Vice President, Health, Safety,  
Security and Environment

## 1.1 CH2M HILL Policy and Commitment

### 1.1.1 Safe Work Policy

It is the policy of CH2M HILL to perform work in the safest manner possible. Safety must never be compromised. To fulfill the requirements of this policy, an organized and effective safety program must be carried out at each location where work is performed.

CH2M HILL believes that all injuries are preventable, and we are dedicated to the goal of a safe work environment. To achieve this goal, every employee on the project must assume responsibility for safety.

Every employee is empowered to:

- Conduct their work in a safe manner;
- Stop work immediately to correct any unsafe condition that is encountered; and
- Take corrective actions so that work may proceed in a safe manner.

Safety, occupational health, and environmental protection will not be sacrificed for production. These elements are integrated into quality control, cost reduction, and job performance, and are crucial to our success.

### 1.1.2 Health and Safety Commitment

CH2M HILL has embraced a philosophy for health and safety excellence. The primary driving force behind this commitment to health and safety is simple: employees are CH2M HILL's most significant asset and CH2M HILL management values their safety, health, and welfare. Also, top management believes that all injuries are preventable. CH2M HILL's safety culture empowers employees at all levels to accept ownership for safety and take whatever actions are necessary to eliminate injury. Our company is committed to world-class performance in health and safety and also understands that world-class performance in health and safety is a critical element in overall business success.

CH2M HILL is committed to the prevention of personal injuries, occupational illnesses, and damage to equipment and property in all of its operations; to the protection of the general public whenever it comes in contact with the Company's work; and to the prevention of pollution and environmental degradation.

Company management, field supervisors, and employees plan safety into each work task in order to prevent occupational injuries and illnesses. The ultimate success of CH2M HILL's safety program depends on the full cooperation and participation of each employee.

CH2M HILL management extends its full commitment to health and safety excellence.

### 1.1.3 Project-Specific Health, Safety, and the Environment Goals

All management and employees are to strive to meet the project-specific Health, Safety, and the Environment (HSE) goals outlined below. The team will be successful only if everyone makes a concerted effort to accomplish these goals. The goals allow the project to stay focused on optimizing the health and safety of all project personnel and, therefore, making the project a great success.

The Project has established eleven specific goals and objectives:

- Create an injury-free environment;
- Have zero injuries or incidents;
- Provide management leadership for HSE by communicating performance expectations, reviewing and tracking performance, and leading by example;

- Ensure effective implementation of the HSP through education, delegation, and team work;
- Ensure 100 percent participation in HSE compliance;
- Continuously improve our safety performance;
- Maintain free and open lines of communication;
- Make a personal commitment to safety as a value;
- Focus safety improvements on high-risk groups;
- Continue strong employee involvement initiatives; and
- Achieve health and safety excellence.

## 2.0 Applicability

This HSP applies to:

- All CH2M HILL staff, including subcontractors and tiered subcontractors of CH2M HILL working on the site; and
- All visitors to the construction site in the custody of CH2M HILL (including visitors from the Client, the Government, the public, and other staff of any CH2M HILL company).

This HSP does not apply to the third-party contractors, their workers, their subcontractors, their visitors, or any other persons not under the direct control or custody of CH2M HILL.

This HSP defines the procedures and requirements for the health and safety of CH2M HILL staff and visitors when they are physically on the work site. The work site includes the project area (as defined by the contract documents) and the project offices, trailers, and facilities thereon.

This HSP will be kept onsite during field activities and will be reviewed as necessary. The HSP will be amended or revised as project activities or conditions change or when supplemental information becomes available. The HSP adopts, by reference, the Enterprise-wide Core Standards and Standard Operating Procedures (SOPs), as appropriate. In addition, the HSP may adopt procedures from the project Work Plan and any governing regulations. If there is a contradiction between this HSP and any governing regulation, the more stringent and protective requirement shall apply.

All CH2M HILL staff and subcontractors must sign the employee sign-off form included in this document as Attachment 1 to acknowledge review of this document. Copies of the signature page will be maintained onsite by the Safety Coordinator (SC).

## 3.0 General Project Information

### 3.1 Project Information and Background

PROJECT NO: 426847

CLIENT: US Naval Facilities Engineering Command Southeast

PROJECT/SITE NAME: Truck Fill Stand Site Assessment

SITE ADDRESS: NAS Key West, Boca Chica Key, Florida

CH2M HILL PROJECT MANAGER: Greg Rowell

CH2M HILL OFFICE: Atlanta, Georgia

DATE HEALTH AND SAFETY PLAN PREPARED: January 11, 2012

DATE(S) OF SITE WORK: TBD

### 3.2 Site Background and Setting

: NAS Key West is located in southern Monroe County, Florida, approximately 150 miles southwest of Miami. The TFS at NAS Key West is located on Boca Chica Key, Florida. The TFS is an active facility used to fill tanker trucks for refueling aircraft. Fuel from the Boca Chica Tank Farm (BCTF), approximately 4,000 feet southwest of the TFS, is pumped to the southwest portion of the TFS via twin 6-inch diameter steel underground pipelines. Fuel is pumped and transferred at the fueling area to standard over-the-road tanker trucks. Trucks routinely leave and return to the site for fueling missions and related airfield operations. The TFS is also referred to as Building A-902 in reference to the former operations building that formerly stood on the southeast side of this facility.

The TFS, including former Building A-902, dates back to the 1940s and was part of the original NAS Key West infrastructure. Building A-902 was the original Administration Building for NAS Key West. The layout of the site has changed since its use as a fueling point beginning in 1945. Documented environmental management activities began in the mid-1970s with the reporting of tank removals, implementation of numbering systems, and tank replacements. No other documented uses of the site exist.

The land at the TFS is generally flat and is mostly paved with asphalt and concrete. The site is not paved at the northern and western areas. Wetland areas lie immediately east and northeast of the site

In March 2000, workers constructing the new Petroleum, Oils, and Lubricants (POL) Laboratory building adjacent to the TFS discovered discolored soil with a strong petroleum odor in trenches excavated for the building footers. Two monitoring wells (TFS-MW-09 and TFS-MW-10) were installed on the north and south sides of the building and sampled for petroleum hydrocarbons. Benzene was found in groundwater samples from both wells at concentrations that exceeded the groundwater cleanup target level (GCTL) of 1 microgram per liter ( $\mu\text{g}/\text{L}$ ), as specified in Chapter 62-777, Florida Administrative Code (F.A.C.), Table I. BBL concluded that the plume was not adequately defined in the area of the new POL building and further assessment was necessary. In addition, BBL personnel measuring groundwater levels in wells at the TFS on March 29, 2000 found 1.92 inches of free product in TFS-MW-01.

On April 27, 2000, approximately 3,200-gallons of JP-5 was spilled the TFS when a valve was left open for three hours. Upon discovery, free product recovery commenced and soil excavation began on April 28, 2000. In some areas excavation was limited by cement foundations. The entire footprint of the spill was said to be excavated and stockpiled. Stockpiled soils were later removed from the site and disposed

of. Dark brown oil was visible near the water table. Several monitoring wells existed since the area was previously contaminated from past spills.

Between June 2009 and March 2010, an extensive site investigation was conducted in the TFS area. The sites investigated included: (1) The perimeter of the petroleum, oil, and lubricant (POL) building where free product was seen in the building footing excavations; (2) The northern area adjacent to the POL building associated with the reported location of a former AST; (3) The area south of the POL building; (4) The area south of the current truck fill stand fueling and tanker parking area/containment area extending to the edge of the taxiway; and (5) The area west of the pumping area where fuel lines have been known to leak, including the current MNA area and west beyond the edge of the taxiway. Surface water samples were also collected from the wetlands southwest of the POL building during the site investigation.

Conclusions of the 2009/2010 Site Investigation in the JP-5 spill area were to: (1) Reevaluate this area since there was no discovery of a distinct source area in this vicinity; (2) Collect sediment and additional surface water samples from the wetlands west of the site, as contamination has migrated to the wetlands.

### 3.3 Description of Tasks

All CH2M HILL and Subcontractor employees engaging in hazardous waste operations (HAZWOPER) or emergency response shall receive appropriate training as required by 29 CFR 1910.120 and 29 CFR 1926.65 (or if required by Subcontract). Personnel who have not met these training requirements shall not be allowed to engage in hazardous waste operations or emergency response activities. See the following tasks that fall under HAZWOPER requirements.

#### 3.3.1 HAZWOPER-Regulated Tasks

- Install and develop three shallow monitoring wells.
- Collect groundwater quality samples from the three new wells and existing wells.
- Plug and abandon existing monitoring wells.
- Collect four surface water/sediment samples from the wetlands located southwest of the site for the analysis of Appendix IV VOCs and SVOCs.
- Perform four quarterly groundwater sampling events.

#### 3.3.2 Non-HAZWOPER-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. The following tasks do not involve exposure to safety or health hazards associated with the hazardous waste operations. Hazwoper training or medical requirements do not apply for the tasks listed below.

##### **TASKS**

- Survey the locations of the three newly installed wells and four surface water/sediment sampling locations.

##### **CONTROLS**

- Brief on hazards, limits of access, and emergency procedures.
- Post areas of contamination as appropriate.
- Perform air sampling/monitoring as specified in this HSP.

## Site Map



**FIGURE 1-1**  
 Site Location Map  
 Truck Fill Stand  
 NAS Key West  
 Boca Chica Key, Florida

Source: Site Assessment for Truck Fill Stand (TtNUS, 2011)  
 F5011012224010KNV

**CH2MHILL.**

## 4.0 Project Organization and Responsibilities

### 4.1 Client

**Contact Name: Beverly Washington**

**Phone:** (904) 542-6881

**Facility Contact Name: Robert Courtright**

**Phone:** (305) 293-2881

### 4.2 CH2M HILL

#### 4.2.1 Project Manager

PM Name: Greg Rowell

CH2M HILL Office: ATL

Telephone Number: 770/604-9182

Cellular Number: 404/630-6267

The project manager (PM) is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HSE management process. The PM has overall management responsibility for the tasks listed below. The PM may explicitly delegate specific tasks to other staff, as described in sections that follow, but retains ultimate responsibility for completion of the following in accordance with this document:

- Incorporate standard terms and conditions, and contract-specific HSE roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors).
- Select safe and competent subcontractors by:
  - Choosing potential subcontractors based on technical ability and HSE performance;
  - Implementing the subcontractor prequalification process;
  - Ensuring that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award; and
  - Ensuring HSE submittals, subcontract agreements, and appropriate site-specific safety procedures are in place and accepted prior field mobilization.
- Ensure copies of training and medical monitoring records, and site-specific safety procedures are being maintained in the project file accessible to site personnel.
- Provide oversight of subcontractor HSE practices per the site-specific safety plans and procedures.
- Manage the site and interfacing with 3<sup>rd</sup> parties in a manner consistent with the contract and subcontract agreements and the applicable standard of reasonable care.
- Ensure that the overall, job-specific, HSE goals are fully and continuously implemented.
- Provide visible support and motivation for HSE programs, rules, procedures, processes, and training, leading by example and encouraging CH2M HILL employees to take ownership of HSE issues.
- Intervene or stop work when an unsafe condition or behavior is observed, and/or when an environmentally compromising condition is encountered.
- Make available to and require CH2M HILL employees to complete required HSE training within established timelines and provide project numbers for such training.

- Consistently and even-handedly enforce HSE rules, procedures, and requirements at the office and/or on project work sites.
- Promptly report all work-related HSE incidents or near misses.
- Wear any required personal protective equipment.
- Ensure CH2M HILL employees complete required HSE training within established timelines.
- Conduct, cooperate, or assist with HSE incident investigations.
- Consult with the Human Resources Delivery Partner before taking any disciplinary action (other than verbal counseling) associated with CH2M HILL Policy 203 and/or HSE programs rules, procedures, processes and training.

#### 4.2.2 CH2M HILL Responsible Health and Safety Manager

RHSM Name: Michael Goldman

CH2M HILL Office: ATL

Telephone Number: 770/604-9182

Cellular Number: 404/790-4769

The RHSM is responsible for the following:

- Review and evaluate subcontractor HSE performance using the pre-qualification process;
- Approve HSP and its revisions as well as Activity Hazard Analyses (AHA);
- Review and evaluate subcontractor site-specific safety procedures for adequacy prior to start of subcontractor's field operations;
- Support the oversight (or SC's direct oversight) of subcontractor and tiered subcontractor HSE practices;
- Permit upgrades and downgrades in respiratory protection after reviewing analytical data;
- Conduct audits as determined by project schedule and coordination with PM; and
- Participate in incident investigations, lessons learned, loss and near loss reporting.

#### 4.2.3 CH2M HILL Project Environmental Manager

EM Name: Lisa Schwan

CH2M HILL Office: ATL

Telephone Number: 770/604-9182 x54312

Cellular Number: 404/414-2505

The Project EM is responsible for the following:

- Provide environmental program support in areas such as training, auditing, planning, permit tracking, and subcontractor oversight as needed or as specified in the project environmental plan;
- Review and evaluate qualifications for subcontractors with a history of environmental non-compliance and for waste transportation and disposal subcontractors;
- Evaluate any spills, releases, or environmental permit incidents for appropriate follow-up actions, notifications, and recordkeeping requirements; and
- Provide environmental compliance and environmental management expertise and advice to the project team as needed during the course of the project.

#### 4.2.4 CH2M HILL Safety Coordinator

SC Name: Adrian Teal

CH2M HILL Office: ATL

Telephone Number: 678/530-4347

Cellular Number: 770/815-7484

The SC is responsible for verifying that the project is conducted in a safe manner including the following specific obligations:

- Verify this HSP is current and amended when project activities or conditions change;
- Verify CH2M HILL site personnel and subcontractor personnel read the HSP and sign the Employee Sign-Off Form, prior to commencing field activities;
- Verify CH2M HILL site personnel have completed any required specialty training (for example, fall protection, confined space entry, among others) and medical surveillance as identified in this HSP;
- Verify that project files include copies of subcontractor training and medical monitoring records, and accepted site-specific safety procedures prior to start of subcontractor's field operations;
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in the HSP;
- Act as the project "Emergency Response Coordinator" and perform the responsibilities outlined in the HSP;
- Post the Occupational Safety and Health Administration (OSHA) job-site poster; the poster is required at sites where project field offices, trailers, or equipment-storage boxes are established. If you work in a state with an OSHA State Plan, make sure the State Plan poster is posted, if required;
- Hold and/or verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (as tasks or hazards change);
- Verify that project health and safety forms and permits are being used as outlined this HSP;
- Perform oversight and assessments of subcontractor HSE practices per the site-specific safety plan and verify that project activity self-assessment checklists are being used as outlined this HSP;
- Coordinate with the RHSM regarding CH2M HILL and subcontractor operational performance, and 3<sup>rd</sup> party interfaces;
- Verify appropriate personal protective equipment (PPE) use, availability, and training;
- Ensure that the overall, job-specific, HSE goals are fully and continuously implemented;
- Conduct accident investigations including root cause analysis;
- Calibrate and conduct air monitoring in accordance with the HSP; maintain all air monitoring records in project file;
- Maintain HSE records and documentation;
- Facilitate OSHA or other government agency inspections including accompanying inspector and providing all necessary documentation and follow-up;
- Deliver field HSE training as needed based on project-specific hazards and activities;
- Consistently and even-handedly enforce HSE rules, procedures, and requirements at the office and/or on project work sites;
- Wear any required personal protective equipment;

- Conduct, cooperate, or assist with HSE incident investigations;
- Contact the PM and RHSM when standards of conduct or CH2M HILL Policy 203 has been violated by a CH2M HILL employee;
- Contact the RHSM and PM in the event of an incident;
- When an apparent imminent danger exists, immediately remove all affected CH2M HILL employees and subcontractors, notify subcontractor safety representative, stop affected work until adequate corrective measures are implemented, and notify the PM and RHSM as appropriate; and
- Document all oral health and safety-related communications in project field logbook, daily reports, or other records.

### 4.3 CH2M HILL Subcontractors

(Reference CH2M HILL SOP HSE-215, *Contracts and Subcontracts*)

Subcontractor: Zebra Environmental (Drilling)

Subcontractor Contact Name: Michael

Telephone: 813/626-1717

Subcontractor: GeoTek Services (Utility locate)

Subcontractor Contact Name: Martin Connor

Telephone:

Subcontractor: Betsy Lindsay, Inc (Surveying)

Subcontractor Contact Name: Betsy Lindsay

Telephone: 772/286-5753

Subcontractor: SWS Environmental Services (IDW T&D)

Subcontractor Contact Name: Jeffry Peleg

Telephone: 954/957.7271

Subcontractors must comply with the following activities, and are responsible to:

- Comply with all local, state, and federal safety standards;
- Comply with project and owner safety requirements;
- Actively participate in the project safety program and either hold or attend and participate in all required safety meetings;
- Provide a qualified safety representative to interface with CH2M HILL;
- Maintain safety equipment and PPE for their employees;
- Maintain and replace safety protection systems damaged or removed by the subcontractor's operations;
- Notify the SC of any accident, injury, or incident (including spills or releases) immediately and submit reports to CH2M HILL within 24 hours;
- Install contractually required general conditions for safety (for example, handrail, fencing, fall protection systems, floor opening covers);
- Conduct and document weekly safety inspections of project-specific tasks and associated work areas;

- Conduct site-specific and job-specific training for all subcontractor employees, including review of the CH2M HILL HSP, subcontractor HSPs, and subcontractor AHAs and sign appropriate sign-off forms; and
- Determine and implement necessary controls and corrective actions to correct unsafe conditions.

The subcontractors listed above may be required to submit their own site-specific HSP and other plans such as lead or asbestos abatement compliance plans. Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit their plans to CH2M HILL for review and acceptance before the start of field work.

Subcontractors are also required to prepare AHAs before beginning each activity posing hazards to their personnel. The AHA shall identify the principle steps of the activity, potential health and safety hazards for each step and recommended control measures for each identified hazard. In addition, a listing of the equipment to be used to perform the activity, inspection requirements, and training requirements for the safe operation of the equipment listed must be identified.

## 4.4 Employee Responsibilities

All personnel are assigned responsibility for safe and healthy operations. This concept is the foundation for involving all employees in identifying hazards and providing solutions. For any operation, individuals have full authority to stop work and initiate immediate corrective action or control. In addition, each worker has a right and responsibility to report unsafe conditions or practices. This right represents a significant facet of worker empowerment and program ownership. Through shared values and a belief that all accidents are preventable, our employees accept personal responsibility for working safely.

Each employee is responsible for the following performance objectives:

- Understanding and abiding by CH2M HILL and client HSE programs, rules, procedures, processes, and training, including any that are project-specific;
- Completing all required HSE training made available and accessible within established timelines;
- Always wearing any required personal protective equipment;
- Intervening or stopping work for you or other CH2M HILL employees when an unsafe condition or behavior is encountered or observed, and/or when an environmentally compromising condition exists;
- Promptly notifying a supervisor, PM, SC, or RHSM when an unsafe condition or behavior is observed, and/or when an environmentally compromising condition exists;
- Promptly reporting a supervisor, PM, SC, or RHSM all work-related health, safety, and environmental incidents or near misses;
- Attending required project HSE pre-task briefings and meeting prior to performing work; and
- Cooperating or assisting with HSE incident investigations.

### 4.4.1 Employee Authority

Each employee on the project has the obligation and authority to shut down any perceived unsafe work and during employee orientation, each employee will be informed of their authority to do so.

## 4.5 Client Contractors

(Reference CH2M HILL SOP HSE-215, *Contracts, Subcontracts and HSE Management Practices*)

Contractor:

Contact Name:

Telephone:

Contractor Task(s):

This HSP does not cover contractors that are contracted directly to the client or the owner. CH2M HILL is not responsible for the health and safety or means and methods of the contractor's work, and we must never assume such responsibility through our actions (such as advising on health and safety issues). In addition to these instructions, CH2M HILL team members should review contractor safety plans so that we remain aware of appropriate precautions that apply to us. Self-assessment checklists are to be used by the SC and CH2M HILL team members to review the contractor's performance only as it pertains to evaluating CH2M HILL exposure and safety. The RHSM is the only person who is authorized to comment on or approve contractor safety procedures.

Health and safety-related communications with contractors should be conducted as follows:

- Request the contractor to brief CH2M HILL team members on the precautions related to the contractor's work;
- When an apparent contractor non-compliance or unsafe condition or practice poses a risk to CH2M HILL team members:
  - Notify the contractor safety representative;
  - Request that the contractor determine and implement corrective actions;
  - If necessary, stop affected CH2M HILL work until contractor corrects the condition or practice; and
  - Notify the client, PM, and RHSM as appropriate.

If apparent contractor non-compliance or unsafe conditions or practices are observed, inform the contractor safety representative (CH2M HILL's obligation is limited strictly to informing the contractor of the observation; the contractor is solely responsible for determining and implementing necessary controls and corrective actions).

If an apparent imminent danger is observed, immediately warn the contractor employee(s) in danger and notify the contractor safety representative (CH2M HILL's obligation is limited strictly to immediately warning the affected individual(s) and informing the contractor of the observation; the contractor is solely responsible for determining and implementing necessary controls and corrective actions).

All verbal health and safety-related communications will be documented in project field logbook, daily reports, or other records.

## 5.0 Standards of Conduct

All individuals associated with this project must work injury-free and drug-free and must comply with the following standards of conduct, the HSP, and the safety requirements of CH2M HILL. Commonly accepted standards of conduct help maintain good relationships between people. They promote responsibility and self-development. Misunderstandings, frictions, and disciplinary action can be avoided by refraining from thoughtless or wrongful acts.

### 5.1 Standards of Conduct Violations

All individuals associated with this project are expected to behave in a professional manner. Violations of the standards of conduct would include, but not be limited to:

- Failure to perform work;
- Inefficient performance, incompetence, or neglect of work;
- Willful refusal to perform work as directed (insubordination);
- Negligence in observing safety regulations, poor housekeeping, or failure to report on-the-job injuries or unsafe conditions;
- Unexcused or excessive absence or tardiness;
- Unwillingness or inability to work in harmony with others;
- Discourtesy, irritation, friction, or other conduct that creates disharmony;
- Harassment or discrimination against another individual;
- Failure to be prepared for work by wearing the appropriate construction clothing or bringing the necessary tools; or
- Violation of any other commonly accepted reasonable rule of responsible personal conduct.

### 5.2 Disciplinary Actions

The Environmental Services (ES) business group employees, employees working on ES business group projects, and subcontractor employees are subject to disciplinary action for not following HSE rules and requirements. Potential disciplinary action is equally applicable to all employees including management and supervision. Disciplinary action may include denial of access to the worksite, warnings, reprimands, and other actions up to and including termination depending on the specific circumstances.

### 5.3 Subcontractor Safety Performance

CH2M HILL should continuously endeavor to observe subcontractors' safety performance and adherence to their plans and AHAs. This endeavor should be reasonable, and include observing for hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. CH2M HILL oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

### 5.3.1 Observed Hazard Form

When apparent non-compliance or unsafe conditions or practices are observed, notify the subcontractor's supervisor or safety representative verbally, and document using the Observed Hazard Form, included as an attachment to this HSP, and require corrective action.

If necessary, stop subcontractor's work using the Stop Work Order Form until corrective actions is implemented for observed serious hazards or conditions. Update the Observed Hazard Form to document corrective actions have been taken. The subcontractor is responsible for determining and implementing necessary controls and corrective actions.

### 5.3.2 Stop Work Order

CH2M HILL has the authority, as specified in the contract, and the responsibility to stop work in the event any CH2M HILL employee observes unsafe conditions or failure of the subcontractor to adhere to its safe-work practices, or observes a condition or practice that may result in a release or violation of an environmental requirement. This authority and action does not in any way relieve the subcontractor of its responsibilities for the means and methods of the work or, therefore, of any corrective actions. Failure to comply with safe work practices can be the basis for restriction or removal of the subcontractor staff from the job site, termination of the subcontract, restriction from future work, or all three.

When an apparent imminent danger is observed, immediately stop work and alert all affected individuals. Remove all affected CH2M HILL employees and subcontractor staff from the danger, notify the subcontractor's supervisor or safety representative, and do not allow work to resume until adequate corrective measures are implemented. Notify the PM, Contract Administrator (KA) and RHSM.

When repeated non-compliance or unsafe conditions are observed, notify the subcontractor's supervisor or safety representative and stop affected work by completing and delivering the Stop Work Order Form (attached to this HSP) until adequate corrective measures are implemented. Consult the KA to determine what the contract dictates for actions to pursue in event of subcontractor non-compliance including work stoppage, back charges, progress payments, removal of subcontractor manager, monetary penalties, or termination of subcontractor for cause.

## 5.4 Incentive Program

Each project is encouraged to implement a safety incentive program that rewards workers for exhibiting exemplary safety behaviors. Actions that qualify are those that go above and beyond what is expected. Actions that will be rewarded include spotting and correcting a hazard, bringing a hazard to the attention of your foreman, telling your foreman about an incident, coming up with a safer way to get the work done, or stopping a crew member from doing something unsafe. The program will operate throughout the project, covering all workers. The incentive program will be communicated to all employees during the project employee orientation and project safety meetings.

## 5.5 Reporting Unsafe Conditions/Practices

Responsibility for effective health and safety management extends to all levels of the project and requires good communication between employees, supervisors, and management. Accident prevention requires a pro-active policy on near misses, close calls, unsafe conditions, and unsafe

practices. All personnel must report any situation, practice, or condition which might jeopardize the safety of our projects. All unsafe conditions or unsafe practices will be corrected immediately. CH2M HILL has zero tolerance of unsafe conditions or unsafe practices.

No employee or supervisor will be disciplined for reporting unsafe conditions or practices. Individuals involved in reporting the unsafe conditions or practices will remain anonymous.

The following reporting procedures will be followed by all project employees:

- Upon detection of any unsafe condition or practice, the responsible employee will attempt to safely correct the condition;
- The unsafe condition or practice will be brought to the attention of the worker's direct supervisor, unless the unsafe condition or practice involves the employee's direct supervisor. If so, the SC needs to be notified at once by the responsible employee;
- Either the responsible employee or responsible employee's direct supervisor is responsible for immediately reporting the unsafe condition or practice to the SC;
- The SC will act promptly to correct the unsafe condition or practice; and
- Details of the incident or situation will be recorded by the SC in the field logbook or use the Observed Hazard Form if subcontractor was involved.

## 6.0 Safety Planning and Change Management

### 6.1 Daily Safety Meetings and Pre-Task Safety Plans

Daily safety meetings are to be held with all project personnel in attendance to review the hazards posed and required HSE procedures and AHAs that apply for each day's project activities. The Pre-Task Safety Plans (PTSPs) serve the same purpose as these general assembly safety meetings, but the PTSPs are held between the crew supervisor and their work crews to focus on those hazards posed to individual work crews.

At the start of each day's activities, the crew supervisor completes the PTSP, provided as an attachment to this HSP, with input from the work crew, during their daily safety meeting. The day's tasks, personnel, tools and equipment that will be used to perform these tasks are listed, along with the hazards posed and required HSE procedures, as identified in the HSP and AHA. The use of PTSPs promotes worker participation in the hazard recognition and control process while reinforcing the task-specific hazard and required HSE procedures with the crew each day.

### 6.2 Change Management

This HSP addresses all known activities and associated hazards. As work progresses, if significant changes are identified which could affect health and safety at the site, coordinate with the RHSM to determine whether a HSP update is necessary.

The following are examples of changes that may require a revision to the plan:

- Change in CH2M HILL staff;
- New subcontractor to perform work;
- New chemicals brought to site for use;
- Change in scope or addition of new tasks;
- Change in contaminants of concern (COCs) or change in concentrations of COCs; and
- New hazards or hazards not previously identified that are not addressed in this HSP.

### 6.3 Agency Inspection Guidance

(Reference CH2M HILL SOP HSE-201, *Agency Inspections and Communications*)

Agency inspections (e.g., OSHA, EPA, other regulatory agencies) are on the rise. CH2M HILL implements safety and environmental programs in order to ensure safety to workers, the public, and the environment. This plan addresses things like labeling containers, completing the hazard communication training using the attachments to this HSP, listing training requirements and PPE requirements, and addressing project-specific hazards. Field personnel need to contact the RHSM to update this plan if hazards are encountered that are not addressed.

[SOP HSE-201](#) addresses agency inspections in detail, and the attached **Target Zero Bulletin on Agency Inspections** provides a good summary of the inspection process and what to do if an agency such as OSHA or EPA shows up at the site. It is critical to make immediate notification to the RHSM if an inspector arrives (and EM if it is environmental-related); they can help facilitate and make additional notifications.

Review the Target Zero Bulletin and keep it with your Health and Safety Plan/Environmental Plan. Make it a topic at a safety meeting and keep it readily available in the event of an inspection.

## 7.0 Project Hazard Analysis

A health and safety risk analysis (Table 1) has been performed for each task. In the order listed below, the RHSM considers the various methods for mitigating the hazards. Employees are trained on this hierarchy of controls during their hazardous waste training and reminded of them throughout the execution of projects:

- Elimination of the hazards (use remote sampling methodology to avoid going into a confined space);
- Substitution (reduce exposure to vapors by using of a geoprobe instead of test pitting);
- Engineering controls (ventilate a confined space to improve air quality);
- Warnings (establish exclusion zones to keep untrained people away from hazardous waste work);
- Administrative controls (implement a work-rest schedule to reduce chance of heat stress); or
- Use of PPE (use of respirators when action levels are exceeded).

The hazard controls and safe work practices are summarized in the following sections of this HSP:

- General hazards and controls;
- Project-specific hazards and controls;
- Physical hazards and controls;
- Biological hazards and controls; and
- Contaminants of concern.

### 7.1 Activity Hazard Analysis

An AHA must be developed for each CH2M HILL job activity. The AHA shall define the work tasks required to perform each activity, along with potential HSE hazards and recommended control measures for each hazard. In addition, a listing of the equipment to be used to perform the activity, inspection requirements to be performed and training requirements for the safe operation of the equipment listed must be identified. Workers are briefed on the AHA before performing the work and their input is solicited prior, during, and after the performance of work to further identify the hazards posed and control measures required. The AHA shall identify the work tasks required to perform each activity, along with potential HSE hazards and recommended control measures for each hazard.

The following hazard controls and applicable CH2M HILL core standards and SOPs should be used as a basis for preparing AHAs.

AHAs prepared for CH2M HILL activities are included as an attachment to this HSP.

### 7.2 Subcontractor Activity Hazard Analysis

CH2M HILL subcontractors are required to provide AHAs specific to their scope of work on the project for acceptance by CH2M HILL. Each subcontractor shall submit AHAs for their field activities, as defined in their scope of work, along with their project-specific safety plan and procedures. Additions or changes in field activities, equipment, tools, or material used to perform work or hazards not addressed in existing AHAs requires either a new AHA to be prepared or an existing AHA to be revised.

Table 1 – General Activity Hazard Analysis

Potential Hazard	Project Activity	Well Installation	Groundwater Sampling	Surface water/sediment sampling	Well abandonment
Benzene			X		X
Biological Hazards		X	X	X	X
Chemical Hazard		X	X	X	X
Drilling		X			X
Electrical Safety		X			X
Field Vehicles		X	X	X	X
Fire Prevention		X			X
Groundwater Sampling			X		
Hand & Power Tools		X	X	X	X
Knife Use		X	X	X	X
Noise		X			X
Pressure Washing Equipment/ Decontamination		X			X
Stream Crossing				X	
Temperature Extremes		X	X	X	X
Ultraviolet Light exposure (sunburn)		X	X	X	X
Utilities (underground/overhead)		X			
Work Over Water		X			X

## 8.0 General Hazards and Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. It is a summarized list of requirements. Always consult the appropriate CH2M HILL SOP to ensure all requirements are implemented.

### 8.1 Bloodborne Pathogens

(Reference CH2M HILL SOP HSE-202, *Bloodborne Pathogens*)

Exposure to bloodborne pathogens may occur when rendering first aid or cardiopulmonary resuscitation (CPR), or when coming into contact with landfill waste or waste streams containing potentially infectious material (PIM).

Employees trained in first-aid/CPR or those exposed to PIM must complete CH2M HILL's 1-hour bloodborne pathogens computer-based training module annually. When performing first-aid/CPR the following shall apply:

- Observe universal precautions to prevent contact with blood or other PIMs. Where differentiation between body fluid types is difficult or impossible, consider all body fluids to be potentially infectious materials;
- Always wash your hands and face with soap and running water after contacting PIMs. If washing facilities are unavailable, use an antiseptic cleanser with clean paper towels or moist towelettes; and
- If necessary, decontaminate all potentially contaminated equipment and surfaces with chlorine bleach as soon as possible. Use one part chlorine bleach (5.25 percent sodium hypochlorite solution) diluted with 10 parts water for decontaminating equipment or surfaces after initially removing blood or other PIMs. Remove contaminated PPE as soon as possible before leaving a work area.

CH2M HILL will provide exposed employees with a confidential medical examination should an exposure to PIM occur. This examination includes the following procedures:

- Documenting the exposure;
- Testing the exposed employee's and the source individual's blood (with consent); and
- Administering post-exposure prophylaxis.

### 8.2 Chemical Storage

The following are general guidelines for storing chemicals and other hazardous materials:

- Keep acids away from bases;
- Keep oxidizers (nitric acid, nitrates, peroxides, chlorates) and organics away from inorganic reducing agents (metals);
- Keep flammables and corrosives in appropriate storage cabinets;
- Do not store paper or other combustibles near flammables;
- Use secondary containment and lipped shelving that is secured; and
- Have a fire suppression system available.

#### 8.2.1 Storage of Flammable/Combustible Liquids

- Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids.

- Approved safety cans shall be used for the handling and use of flammable liquids in quantities of 5 gallons (19 liters) or less. Do not use plastic gas cans.
- For quantities of 1 gallon (3.78 liters) or less, the original container may be used for storage and use of flammable liquids.
- Flammable or combustible liquids shall not be stored in areas used for stairways or normally used for the passage of people.

### 8.2.2 Indoor Storage of Flammable/Combustible Liquids

- No more than 25 gallons (95 liters) of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet.
- Quantities of flammable and combustible liquids in excess of 25 gallons (95 liters) shall be stored in an acceptable or approved cabinet.
- Cabinets shall be conspicuously lettered: "FLAMMABLE: KEEP FIRE AWAY."
- Not more than 60 gallons (228 liters) of flammable or 120 gallons (456 liters) of combustible liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area.

### 8.2.3 Outside Storage of Flammable/Combustible Liquids

- Storage of containers (not more than 60 gallons [228 liters] each) shall not exceed 1,100 gallons (4180 liters) in any one area. No area shall be within 20 feet (6.1 meters) of any building.
- Storage areas shall be graded to divert spills away from buildings and surrounded by an earthen dike.
- Storage areas may not be located near a storm drain. Overflow and spills must be diverted away from storm drains or surface waters.
- Storage areas shall be free from weeds, debris, and other combustible materials.
- Outdoor portable tanks shall be provided with emergency vent devices and shall not be closer than 20 feet (6.1 meters) to any building.
- Signs indicating no smoking shall be posted around the storage area.

### 8.2.4 Storage of Hazardous Waste

- All facilities storing ignitable and combustible liquids and hazardous wastes must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any release of hazardous constituents.
- Flammable wastes should be stored more than 50 feet from the property line.

### 8.2.5 Storage of Chemical Injection Chemicals/Materials

When chemical injection remediation technologies are being used at a site, the following storage guidelines must be followed:

- Some injection chemicals, such as strong oxidizers, may have stringent storage requirements per local or National Fire Codes. Verify that appropriate storage provisions are in place prior to starting work.

**NOTE:** Counties and cities may have requirements specific to storing these chemicals. Also, storage and use of certain chemicals such as potassium permanganate and hydrogen peroxide may be subject to the new Chemical Facility Anti-Terrorism Standards of the Department of Homeland Security – the applicability depends on the chemical, quantity/concentration, and type of facility.

Please contact the project Environmental Manager to determine whether chemicals are subject to these standards.

- Injection chemicals must be stored in a designated, secured area with spill prevention capabilities. Review MSDS or other information to determine potential incompatible materials. Incompatible materials shall not be stored together. Ensure all containers are labeled.

### 8.3 Driving Safety

Follow the guidelines below when operating a vehicle:

- Refrain from using a cellular phone while driving. Pull off the road, put the vehicle in park and turn on flashers before talking on a cellular phone;
- Never operate a personal digital assistant (PDA), or other device with e-mail, internet, or text messaging function while driving a vehicle;
- Obey speed limits; be aware of blind spots or other hazards associated with low visibility. Practice defensive driving techniques, such as leaving plenty of room between your vehicle and the one ahead of you;
- Do not drive while drowsy. Drowsiness can occur at any time, but is most likely after 18 hours or more without sleep;
- Maintain focus on driving. Eating, drinking, smoking, adjusting controls can divert attention from the road. Take the time to park and perform these tasks when parked rather than while driving; and
- Ensure vehicle drivers are familiar with the safe operation of vehicles of the type and size to be operated. Large vehicles such as full size vans and pick-ups have different vision challenges and handling characteristics than smaller vehicles.

### 8.4 Electrical Safety

(Reference CH2M HILL SOP HSE-206, *Electrical Safety*)

Below are the hazard controls and safe work practices to follow when using electrical tools, extension cords, and/or other electrical-powered equipment or when exposed to electrical hazards. Ensure the requirements of the referenced SOP are followed:

- Only qualified personnel are permitted to work on unprotected energized electrical systems;
- Only authorized personnel are permitted to enter high-voltage areas;
- CH2M HILL employees who might from time to time work in an environment influenced by the presence of electrical energy must complete Awareness Level Electrical Safety Training located on the CH2M HILL Virtual Office;
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented;
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service;
- CH2M HILL has selected Ground Fault Circuit Interrupters (GFCIs) as the standard method for protecting employees from the hazards associated with electric shock;
  - GFCIs shall be used on all 120-volt, single phase 15 and 20-ampere receptacle outlets which are not part of the permanent wiring of the building or structure.
- An assured equipment grounding conductor program may be required under the following scenarios:

- GFCIs cannot be utilized;
- Client requires such a program to be implemented; or
- Business group decides to implement program in addition to GFCI protection.
- Extension cords must be equipped with third-wire grounding. Cords passing through work areas must be covered, elevated or protected from damage. Cords should not be routed through doorways unless protected from pinching. Cords should not be fastened with staples, hung from nails, or suspended with wire;
- Electrical power tools and equipment must be effectively grounded or double-insulated and Underwriters Laboratory (UL) approved;
- Operate and maintain electric power tools and equipment according to manufacturers' instructions;
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet (3 meters) from overhead power lines for voltages of 50 kV or less, and 10 feet (3 meters) plus 0.4 inches (1.0 cm) for every 1 kV over 50 kV;
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage; and
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

## 8.5 Field Vehicles

- Field vehicles may be personal vehicles, rental vehicles, fleet vehicles, or project vehicles.
- Maintain a first aid kit, bloodborne pathogen kit, and fire extinguisher in the field vehicle at all times.
- Utilize a rotary beacon on vehicle if working adjacent to active roadway.
- Familiarize yourself with rental vehicle features prior to operating the vehicle:
  - Vision Fields and Blind Spots
  - Vehicle Size
  - Mirror adjustments
  - Seat adjustments
  - Cruise control features, if offered
  - Pre-program radio stations and Global Positioning System (GPS), if equipped
- Always wear seatbelt while operating vehicle.
- Adjust headrest to proper position.
- Tie down loose items if utilizing a van or pick-up truck.
- Close car doors slowly and carefully. Fingers can get pinched in doors.
- Park vehicle in a location where it can be accessed easily in the event of an emergency. If not possible, carry a phone.
- Have a designated place for storing the field vehicle keys when not in use.
- Ensure back-up alarms are functioning, if equipped. Before backing a vehicle, take a walk around the vehicle to identify obstructions or hazards. Use a spotter when necessary to back into or out of an area.

- See the Vehicle Accident Guidance attached to this HSP, if a vehicle incident is experienced in a rental or fleet vehicle.

## 8.6 Fire Prevention

(Reference CH2M HILL SOP HSE-403, *Hazardous Material Handling*)

Follow the fire prevention and control procedures listed below.

### 8.6.1 Fire Extinguishers and General Fire Prevention Practices

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet (30.5 meters). When 5 gallons (19 liters) or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet (15.2 meters). Extinguishers must:
  - be maintained in a fully charged and operable condition;
  - be visually inspected each month; and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post “Exit” signs over exiting doors, and post “Fire Extinguisher” signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet (3 meters) from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Keep areas neat. Housekeeping is important.

### 8.6.2 Dispensing of Flammable/Combustible Liquids

- Areas in which flammable or combustible liquids are dispensed in quantities greater than 5 gallons (22.7 liters) (shall be separated from other operations by at least 25 feet (7.6 meters).
- Drainage away from storm drains or surface waters or other means of containment shall be provided to control spills.
- Adequate natural or mechanical ventilation shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit.
- Dispensing of flammable liquids from one container to another shall be done only when containers are electrically interconnected (bonded).
- Dispensing flammable or combustible liquids by means of air pressure on the container or portable tanks is prohibited.
- Dispensing devices and nozzles for flammable liquids shall be of an approved type.

## 8.7 General Practices and Housekeeping

The following are general requirements applicable to all portions of the work:

- Site work should be performed during daylight hours whenever possible;
- Good housekeeping must be maintained at all times in all project work areas;
- Common paths of travel should be established and kept free from the accumulation of materials;

- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions;
- Provide slip-resistant surfaces, ropes, or other devices to be used;
- Specific areas should be designated for the proper storage of materials;
- Tools, equipment, materials, and supplies shall be stored in an orderly manner;
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area;
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals;
- All spills shall be quickly cleaned up; oil and grease shall be cleaned from walking and working surfaces;
- Review the safety requirements of each job you are assigned to with your supervisor. You are not expected to perform a job that may result in injury or illness to yourself or to others;
- Familiarize yourself with, understand, and follow jobsite emergency procedures;
- Do not fight or horseplay while conducting the firm's business;
- Do not use or possess firearms or other weapons while conducting the firm's business;
- Report unsafe conditions or unsafe acts to your supervisor immediately;
- Report emergencies, occupational illnesses, injuries, vehicle accidents, and near misses immediately;
- Do not remove or make ineffective safeguards or safety devices attached to any piece of equipment;
- Report unsafe equipment, defective or frayed electrical cords, and unguarded machinery to your supervisor;
- Shut down and lock out machinery and equipment before cleaning, adjustment, or repair. Do not lubricate or repair moving parts of machinery while the parts are in motion;
- Do not run in the workplace;
- When ascending or descending stairways, use the handrail and take one step at a time;
- Do not apply compressed air to any person or clothing;
- Do not wear steel taps or shoes with metal exposed to the sole at any CH2M HILL project location;
- Do not wear finger rings, loose clothing, wristwatches, and other loose accessories when within arm's reach of moving machinery;
- Remove waste and debris from the workplace and dispose of in accordance with federal, state, and local regulations;
- Note the correct way to lift heavy objects (secure footing, firm grip, straight back, lift with legs), and get help if needed. Use mechanical lifting devices whenever possible; and
- Check the work area to determine what problems or hazards may exist.

## 8.8 Hazard Communication

(Reference CH2M HILL SOPs HSE-107, *Hazard Communication* and HSE-403, *Hazardous Material Handling*)

The hazard communication coordinator is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using the chemical inventory form included as an attachment to this HSP;
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available;
- Request or confirm locations of material safety data sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed;
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical and include on the chemical inventory sheet (attached to this HSP) and add the MSDS to the MSDS attachment section of this HSP;
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly;
- Give employees required chemical-specific HAZCOM training using the chemical-specific training form included as an attachment to this HSP; and
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

## 8.9 Knife Use

Open-bladed knives (for example, box cutters, utility knives, pocket knives, machetes, and multi-purpose tools with fixed blades such as a Leatherman™) are prohibited at worksites except where the following three conditions are met:

- The open-bladed knife is determined to be the best tool for the job;
- An approved Activity Hazard Analysis (AHA) or written procedure is in place that covers the necessary safety precautions (work practices, PPE, and training); and
- Knife users have been trained and follow the AHA.

## 8.10 Lighting

Lighting shall be evaluated when conducting work inside buildings, confined spaces, or other areas/instances where supplemental light may be needed (e.g., work before sunrise or after sunset). A light meter can be used to evaluate the adequacy of lighting. The following are common requirements for lighting and the conditions/type of work being performed:

- While work is in progress outside construction areas shall have at least 33 lux (lx);
- Construction work conducted inside buildings should be provided with at least 55 lux light;
- The means of egress shall be illuminated with emergency and non-emergency lighting to provide a minimum 11 lx measured at the floor. Egress illumination shall be arranged so that the failure of any single lighting unit, including the burning out of an electric bulb will not leave any area in total darkness.

## 8.11 Manual Lifting

(Reference CH2M HILL SOP HSE-112, *Manual Lifting*)

Back injuries are the leading cause of disabling work and most back injuries are the result of improper lifting techniques or overexertion. Use the following to mitigate the hazards associated with lifting:

- When possible, the task should be modified to minimize manual lifting hazards;

- Lifting of loads weighing more than 40 pounds (18 kilograms) shall be evaluated by the SC using the Lifting Evaluation Form contained in SOP HSE-112;
- Using mechanical lifting devices is the preferred means of lifting heavy objects such as forklifts; cranes, hoists, and rigging; hand trucks; and trolleys;
- Personnel shall seek assistance when performing manual lifting tasks that appear beyond their physical capabilities;
- In general, the following steps must be practiced when planning and performing manual lifts: Assess the situation before you lift; ensure good lifting and body positioning practices; ensure good carrying and setting down practices; and
- All CH2M HILL workers must have training in proper manual lifting training either through the New Employee Orientation or through Manual Lifting module located on the VO.

## 8.12 Personal Hygiene

Good hygiene is essential for personal health and to reduce the potential of cross-contamination when working on a hazardous waste site. Implement the following:

- Keep hands away from nose, mouth, and eyes during work;
- Keep areas of broken skin (chapped, burned, etc.) covered; and
- Wash hands with soap and water prior to eating, smoking, or applying cosmetics.

## 8.13 Shipping and Transportation of Hazardous Materials

(Reference CH2M HILL SOP HSE-417, *Hazardous Materials Transportation*)

The U.S. Department of Transportation (DOT) has specific regulations governing shipping of hazardous materials (also called dangerous goods). Chemicals brought to the site might be defined as hazardous materials by the U.S. DOT. Hazardous wastes that may be shipped offsite are also defined as hazardous materials by U.S. DOT. Other wastes may also be U.S. DOT hazardous materials. To confirm whether a material or a waste is a U.S. DOT hazardous material, check with the ESG Waste Coordinator (Lisa Schwan/ATL), the project EM, or the CH2M HILL Dangerous Goods Shipping Coordinators (John Blasco/BAO or Rob Strehlow/MKW).

All staff who affect shipment of hazardous materials, including receiving hazardous materials, preparing profiles or manifests, packaging hazardous wastes, labeling, or transporting hazardous materials by road, are called HazMat employees (note CH2M HILL cannot transport hazardous wastes by public road). HazMat employees must receive CH2M HILL online training in shipping dangerous goods. CH2M HILL's online Dangerous Goods Shipping course can be found on the CH2M HILL HSSE website.

All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. If the material is a product that is being shipped (e.g., calibration gas), use the HazMat ShipRight tool on the CH2M HILL virtual office (under Company Resources - Online Shipping). Contact the Dangerous Goods Shipping coordinators, the ESG Waste Coordinator or the project EM for additional information.

49 CFR 172 requires that all hazmat employees be aware of potential transportation security concerns. Hazardous materials security is addressed in CH2M HILL's Hazardous Materials SOP (HSE-403). The following points are provided as an overview of security measures to increase awareness of this important matter:

- It is essential that each employee understand the security risks involved with transporting hazardous materials;
- All transporters of hazardous materials must be prequalified by a Contracts Administrator who evaluate the carrier's safety rating, security measures, and employee screening procedures;
- When shipping hazardous materials, check driver credentials and ask about shipping details;
- When receiving a hazardous materials shipment, inspect packages for signs of tampering or damage to the contents. Verify the drivers and company information on the form with the driver; and
- If there is suspicious or unusual behavior (e.g., driver without credentials, evasive answers) or any discrepancies identified, do not offer or accept the shipment, and immediately notify the project manager or the RHSM.

Employees responsible for shipping hazard materials must also review the CH2M HILL Transportation Security Plan (HSE-417 Appendix A).

## 8.14 Substance Abuse

(Reference CH2M HILL SOP HSE-105, *Drug-Free Workplace*)

Employees who work under the influence of controlled substances, drugs, or alcohol may prove to be dangerous or otherwise harmful to themselves, other employees, clients, the company, the company's assets and interests, or the public. CH2M HILL does not tolerate illegal drug use, or any use of drugs, controlled substances, or alcohol that impairs an employee's work performance or behavior.

Prohibitions onsite include:

- Use or possession of intoxicating beverages while performing CH2M HILL work;
- Abuse of prescription or nonprescription drugs;
- Use or possession of illegal drugs or drugs obtained illegally;
- Sale, purchase, or transfer of legal, illegal or illegally obtained drugs; and
- Arrival at work under the influence of legal or illegal drugs or alcohol.

Drug and/or alcohol testing is applicable under CH2M HILL Constructors, Inc. and munitions response projects performed in the United States. In addition, employees may be required to submit to drug and/or alcohol testing as required by clients. When required, this testing is performed in accordance with SOP HSE-105, *Drug-Free Workplace*. Employees who are enrolled in drug or alcohol testing are required to complete annual training located on the CH2M HILL Virtual Office (VO).

## 9.0 Project-Specific Hazard Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the work or the particular hazard. Each person onsite is required to abide by the hazard controls. Always consult the appropriate CH2M HILL SOP to ensure all requirements are implemented. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the RHSM for clarification.

### 9.1 Benzene

(Reference CH2M HILL SOP HSE-503, *Benzene*)

Benzene is considered a “Confirmed Human Carcinogen.” CH2M HILL is required to control employee workplace exposure to benzene when personal exposures is at or above 0.5 parts per million (ppm) as an 8-hour time-weighted average (TWA) or above 5.0 ppm short term exposure limit (STEL), by implementing a program that meets the requirements of the OSHA Benzene standard, 29 CFR 1910.1028. The elements of the CH2M HILL benzene program include the following:

- Exposure monitoring;
- Methods of control, including personal protective equipment (PPE) and respirators;
- Medical surveillance;
- Training on hazards of benzene and control measures (includes project-specific training and the computer-based training on CH2M HILL’s Virtual Office, *Benzene*); and
- Record keeping requirements.

If air monitoring indicates there is potential exposure at the action level concentrations above, notify the RHSM to ensure the above have been adequately addressed. Other exposure control measures include:

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met;
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas;
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person; and
- Review the fact sheet included as an attachment to this HSP.

### 9.2 Drilling Safety

(Reference CH2M HILL SOP HSE-204, *Drilling*)

Below are the hazard controls and safe work practices to follow when working around or performing drilling. Ensure the requirements in the referenced SOP are followed.

- The drill rig is not to be operated in inclement weather.
- The driller is to verify that the rig is properly leveled and stabilized before raising the mast.
- Personnel should be cleared from the sides and rear of the rig before the mast is raised.
- The driller is not to drive the rig with the mast in the raised position.
- The driller must check for overhead power lines before raising the mast. Maintain a minimum distance of 10 feet (3 meters) between mast and overhead lines (<50 kV) and an additional 0.4 inches

for every 1 kV over 50kV. Verify the voltage of nearby overhead power lines to determine the minimum distance.

- If the project site is suspected of munitions or explosives of concern (MEC) contamination, requirements of the *Explosives Usage and Munitions Response (MR)* SOP HSE-610 shall be followed. MECs include unexploded ordnance (UXO), discarded military munitions, materials that present a potential explosive hazard, chemical warfare materials, munitions constituents, and contaminated soil or groundwater. "Down-hole" avoidance support may be required to prevent accidental contact with UXO. Safety requirements will be based on the risk assessment identified within the MR (safety) ORE (Opportunity Risk Evaluation).
- Personnel should stand clear before rig startup.
- The driller is to verify that the rig is in neutral when the operator is not at the controls.
- Become familiar with the hazards associated with the drilling method used (cable tool, air rotary, hollow-stem auger, etc.).
- Do not wear loose-fitting clothing, watches, etc., that could get caught in moving parts.
- Personnel with long hair shall tie hair back to prevent entanglement in machinery.
- Do not smoke or permit other spark-producing equipment around the drill rig.
- The drill rig must be equipped with a kill wire or switch, and personnel are to be informed of its location.
- Be aware and stand clear of heavy objects that are hoisted overhead.
- The driller is to verify that the rig is properly maintained in accordance with the drilling company's maintenance program.
- The driller is to verify that all machine guards are in place while the rig is in operation.
- The driller is responsible for housekeeping (maintaining a clean work area).
- The drill rig should be equipped with at least one fire extinguisher.
- If the drill rig comes into contact with electrical wires and becomes electrically energized, do not touch any part of the rig or any person in contact with the rig, and stay as far away as possible. Notify emergency personnel immediately.
- Use the drilling self-assessment checklist attached to this HSP to evaluate drilling operations.

### 9.3 Groundwater Sampling/Water Level Measurements

Below are the hazard controls and safe work practices to follow when personnel or subcontractors are performing groundwater sampling and/or water level measurements.

- Full coolers are heavy. Plan in advance to have two people available at the end of the sampling effort to load full coolers into vehicles. If two people won't be available use several smaller coolers instead of fewer large ones.
- Wear the appropriate PPE when sampling, including safety glasses, nitrile gloves, and steel toe boots (see PPE section of this HSP).
- Monitor headspace of wells prior to sampling to minimize any vapor inhalation (refer to the "Site Monitoring" section of this HSP).
- Use caution when opening well lids. Wells may contain poisonous spiders and hornet or wasp nests.
- Use the appropriate lifting procedures (see CH2M HILL SOP HSE-112) when unloading equipment and sampling at each well.

- Avoid sharp edges on well casings.
- If dermal contact occurs with groundwater or the acid used in sample preservation, immediately wash all affected skin thoroughly with soap and water.
- Avoid eating and drinking on site and during sampling.
- Use ear plugs during sampling if sampling involves a generator.
- Containerize all purge water and transport to the appropriate storage area.
- Use two people to transport full coolers/containers whenever possible. If two people are not available use a dolly to move coolers. If the coolers weigh more than 40 pounds Attachment 1 of the HSE-112, *Manual Lifting*, shall be completed by the SC. If the coolers weigh more than 50 pounds they should never be lifted by one person.

## 9.4 Hand and Power Tools

(Reference CH2M HILL, SOP HSE-210, *Hand and Power Tools*)

Below are the hazard controls and safe work practices to follow when personnel or subcontractors are using hand and power tools. Ensure the requirements in the referenced SOP are followed:

- Tools shall be inspected prior to use and damaged tools will be tagged and removed from service;
- Hand tools will be used for their intended use and operated in accordance with manufacturer's instructions and design limitations;
- Maintain all hand and power tools in a safe condition;
- Use PPE (such as gloves, safety glasses, earplugs, and face shields) when exposed to a hazard from a tool;
- Do not carry or lower a power tool by its cord or hose;
- Portable power tools will be plugged into GFCI protected outlets;
- Portable power tools will be Underwriters Laboratories (UL) listed and have a three-wire grounded plug or be double insulated;
- Disconnect tools from energy sources when they are not in use, before servicing and cleaning them, and when changing accessories (such as blades, bits, and cutters);
- Safety guards on tools must remain installed while the tool is in use and must be promptly replaced after repair or maintenance has been performed;
- Store tools properly in a place where they will not be damaged or come in contact with hazardous materials;
- If a cordless tool is connected to its recharge unit, both pieces of equipment must conform strictly with electrical standards and manufacturer's specifications;
- Tools used in an explosive environment must be rated for work in that environment (that is, intrinsically safe, spark-proof, etc.); and
- Working with manual and pistol-grip hand tools may involve highly repetitive movement, extended elevation, constrained postures, and/or awkward positioning of body members (for example, hand, wrist, arm, shoulder, neck, etc.). Consider alternative tool designs, improved posture, the selection of appropriate materials, changing work organization, and sequencing to prevent muscular, skeletal, repetitive motion, and cumulative trauma stressors.

## Machine Guarding

- Ensure that all machine guards are in place to prevent contact with drive lines, belts, chains, pinch points or any other sources of mechanical injury.
- Unplugging jammed equipment will only be performed when equipment has been shut down, all sources of energy have been isolated and equipment has been locked/tagged and tested.
- Maintenance and repair of equipment that results in the removal of guards or would otherwise put anyone at risk requires lockout of that equipment prior to work.

## 9.5 Pressure Washing Operations

Below are the hazard controls and safe work practices to follow when working around or performing pressure washing.

- Only trained, authorized personnel may operate the high-pressure washer.
- Follow manufacturer's safety and operating instructions.
- Inspect pressure washer before use and confirm deadman trigger is fully operational
- The wand must always be pointed at the work area.
- The trigger should never be tied down
- Never point the wand at yourself or another worker.
- The wand must be at least 42 inches (1.1 meter) from the trigger to the tip and utilize greater than 10 degree tips.
- The operator must maintain good footing.
- Non-operators must remain a safe distance from the operator.
- No unauthorized attachment may be made to the unit.
- Do not modify the wand.
- All leaks or malfunctioning equipment must be repaired immediately or the unit taken out-of-service.
- Polycoated Tyvek or equivalent, 16-inch-high steel-toed rubber boots, safety glasses, hard hat with face shield, and inner and outer nitrile gloves will be worn, at a minimum.

## 9.6 Stream Crossing

Traversing streams present significant hazards, including drowning, hypothermia, and abrasions. When crossing streams, be sure to implement the bulleted items below.

- When walking in streams, first plan the route. Look ahead for exits should there be any difficulty during the crossing, and "read" the water for spots to avoid such as drop offs, sunken logs, and tricky currents.
- Do seek out the safest route - narrow, low flow, shallow. Evaluate deeper and faster moving sections with caution. Backtracking is often dangerous or impossible once committed.
- If streams to be crossed are deeper than "knee deep", find an alternate crossing location that is less deep.
- Streams should be crossed while facing upstream, stepping side to side, and using a sturdy walking stick. When possible, wade a stream diagonally, moving downstream. Move slowly, keeping the

foot on the upstream side in the lead and pointed forward. Your rear, or anchor, foot should point downstream and be at right angles to the lead foot. Move the lead foot forward about half a step, feeling for a solid hold. Next, move the anchor foot forward the same distance – shuffle across so that your anchor foot never passes the lead. This way both feet are always in position to lend support. If you must turn around, do so toward the upstream direction.

- Don't attempt to cross above rocky rapids or a cascade. Step on submersed rocks with great care.
- If you are working in streams, algae covered rocks should be assumed slippery until tested. Always be alert for unstable and extremely slippery rocks.
- Rocks with green moss or attached plants offer better traction or even better, look for gravel and sand pockets among the stream boulders, which are much more stable, and use a wading staff (if not carrying one, find a suitable one nearby) to steady your balance while crossing. Use a solid wading staff instead of the collapsible type.
- Be cautious of areas where there are submerged or partially submerged trees/tree branches – these can create entanglement hazards during a crossing or a “swim”.
- If streams are crossed that are deeper than “crotch deep”, personnel must use either ropes and/or wear chest waders.
- Choose the right waders (with RHSM/SC involvement).
- Footwear with felt-bottom soles are ideal for rocky bottom streams. The rough texture cuts through algae growing on the rocks and grips well. For very slippery conditions, consider studded felt soles or a slipover, studded sandal. However, felt soles do not provide good traction on muddy, slippery banks. Cleated soles work well for mud or sand bottom streams (a hard molded tread pattern similar to a hiking boot).
- Wear a wading belt with chest waiters to keep your waders from billowing out like a parachute; the currents will carry you and move you in ways you don't want to move.
- Never wade alone.
- If the wader fills with water, don't panic. Waders full of water weigh less in water than on land and the water inside doesn't add any weight as long as you are in the water. Also a common fear is that air trapped in the waders will raise the feet higher than the head and force the face underwater is unfounded. Waders do streamline your legs and kicking is useless. Follow these steps if the waders fill with water:
  - Don't try to take them off in the water
  - In calm water, wade or swim to shore
  - In fast-moving water, ride the current:
    - Pull your feet up in front of you, bend your knees
    - Point your feet downstream (so the feet, not the head will bounce off the rocks)
    - Sculling with your hands will help direct to the nearest shallow area
    - When you reach calm water, go ashore and empty your waders
    - Don't waste energy in the vertical position going for the bottom. This position is virtually impossible to maintain and leads quickly to exhaustion (the major cause of drowning).
    - Concentrate on getting out of the water and not saving the equipment.
- The higher the elevation you are at, the steeper the stream gradient is. This means the stream can rise quicker and return to lower flow more quickly.

- Always wait out a swollen stream if at all possible.
- If you do slip into the water and are being swept downstream, don't panic. Cold water will be a shock for 2-3 seconds. Pull your knees up, face your feet downstream and lean back, using your hands as best you can to navigate and get to the bank. Keep your head up; you don't want your head underwater banging into rocks. If you stay calm, you can reach water where you can stand up or swim to the bank.
- When walking along stream banks and not entering streams, wear work boots.

## 9.7 Utilities (underground)

An assessment for underground utilities must be conducted where there is a potential to contact underground utilities or similar subsurface obstructions during intrusive activities. Intrusive activities include excavation, trenching, drilling, hand augering, soil sampling, or similar activities.

The assessment must be conducted before any intrusive subsurface activity and must include at least the following elements:

1. A background and records assessment of known utilities or other subsurface obstructions.
2. Contacting and using the designated local utility locating service.
3. Conducting an independent field survey to identify, locate, and mark potential underground utilities or subsurface obstructions. *Note: This is independent of, and in addition to, any utility survey conducted by the designated local utility locating service above.*
4. A visual survey of the area to validate the chosen location.

When any of these steps identifies an underground utility within 5 feet (1.5 meters) of intrusive work, then non-aggressive means must be used to physically locate the utility before a drill rig, backhoe, excavator or other aggressive method is used.

Aggressive methods are never allowed within 2 feet of an identified high risk utility (see paragraph below).

Any deviation from these requirements must be approved by the Responsible HS Manager and the Project Manager.

### Background and Records Assessment of Known Utilities

Identify any client- or location-specific permit and/or procedural requirements (e.g., dig permit or intrusive work permit) for subsurface activities. For military installations, contact the Base Civil Engineer and obtain the appropriate form to begin the clearance process.

Obtain available utility diagrams and/or as-built drawings for the facility.

Review locations of possible subsurface utilities including sanitary and storm sewers, electrical lines, water supply lines, natural gas lines, fuel tanks and lines, communication lines, lighting protection systems, etc. Note: Use caution in relying on as-built drawings as they are rarely 100 percent accurate.

Request that a facility contact with knowledge of utility locations review and approve proposed locations of intrusive work.

### Designated Local Utility Locating Service

Contact your designated local utility locating service (e.g., Dig-Safe, Blue Stake, One Call) to identify and mark the location of utilities. Call 811 in the US or go to [www.call811.com](http://www.call811.com) to identify the

appropriate local service group. Contacting the local utility locating service is a legal requirement in most jurisdictions.

### **Independent Field Survey (Utility Locate)**

The organization conducting the intrusive work (CH2M HILL or subcontractor) shall arrange for an independent field survey to identify, locate, and mark any potential subsurface utilities in the work area. This survey is in addition to any utility survey conducted by the designated local utility locating service.

The independent field survey provider shall determine the most appropriate instrumentation/technique or combinations of instrumentation/techniques to identify subsurface utilities based on their experience and expertise, types of utilities anticipated to be present, and specific site conditions.

A CH2M HILL or subcontractor representative must be present during the independent field survey to observe the utility locate and verify that the work area and utilities have been properly identified and marked. If there is any question that the survey was not performed adequately or the individual was not qualified, then arrangements must be made to obtain a qualified utility locate service to re-survey the area. Obtain documentation of the survey and clearances in writing and signed by the party conducting the clearance. Maintain all documentation in the project file.

If the site owner (military installation or client) can provide the independent field survey, CH2M HILL or the subcontractor shall ensure that the survey includes:

- Physically walking the area to verify the work location and identify, locate, and mark underground utility locations;
- Having qualified staff available and instrumentation to conduct the locate;
- Agreeing to document the survey and clearances in writing.
- Should any of the above criteria not be met, CH2M HILL or subcontractor must arrange for an alternate independent utility locate service to perform the survey.
- The markings from utility surveys must be protected and preserved until the markings are no longer required. If the utility location markings are destroyed or removed before intrusive work commences or is completed, the PM, SC, or designee must notify the independent utility locate service or the designated local utility locating service to resurvey and remark the area.

### **Visual Assessment before and during Intrusive Activities**

Perform a “360 degree” assessment. Walk the area and inspect for utility-related items such as valve caps, previous linear cuts, patchwork in pavement, hydrants, manholes, utility vaults, drains, and vent risers in and around the dig area.

The visual survey shall include all surface landmarks, including manholes, previous liner cuts, patchwork in pavement, pad-mounted transformers, utility poles with risers, storm sewer drains, utility vaults, and fire hydrants.

If any unanticipated items are found, conduct further research before initiating intrusive activities and implement any actions needed to avoid striking the utility or obstruction.

### **Subsurface Activities within 5 feet of an Underground Utility or if there is Uncertainty**

When aggressive intrusive activities will be conducted within 5 feet (1.5 meters) of an underground utility or when there is uncertainty about utility locations, locations must be physically verified by non-aggressive means such as air or water knifing, hand digging, or human powered hand augering. Non-

conductive tools must be used if electrical hazards may be present. If intrusive activities are within 5 feet (1.5 meters) and parallel to a marked existing utility, the utility location must be exposed and verified by non-aggressive methods every 100 feet (30.5 meters). Check to see if the utility can be isolated during intrusive work.

### Intrusive Activities within 2 feet of an Underground Utility

Use non-aggressive methods (hand digging, vacuum excavation, etc.) to perform intrusive activities within 2 feet of a high risk utility (i.e., a utility that cannot be de-energized or would cause significant impacts to repair/replace). Hazardous utilities shall be de-energized whenever possible.

### Spotter

A spotter shall be used to monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon, presence of pea gravel or sand in soils, presence of concrete or other debris in soils, refusal of auger or excavating equipment). If any suspicious conditions are encountered stop work immediately and contact the PM or RHSM to evaluate the situation. The spotter must have a method to alert an operator to stop the intrusive activity (e.g., air horn, hand signals).

## 9.8 Utilities (overhead)

### Proximity to Power Lines

No work is to be conducted within 50 feet (15.2 meters) of overhead power lines without first contacting the utility company to determine the voltage of the system. No aspect of any piece of equipment is to be operated within 50 feet (15.2 meters) of overhead power lines without first making this determination.

**Operations adjacent to overhead power lines are PROHIBITED unless one of the following conditions is satisfied:**

- Power has been shut off, positive means (such as lockout) have been taken to prevent the lines from being energized, lines have been tested to confirm the outage, and the utility company has provided a signed certification of the outage.
- The minimum clearance from energized overhead lines is as shown in the table below, or the equipment will be repositioned and blocked to ensure that no part, including cables, can come within the minimum clearances shown in the table.

**MINIMUM DISTANCES FROM POWERLINES**

Powerlines Nominal System Kv	Minimum Required Distance, Feet (Meters)
0-50	10 (3.0)
50-200	15 (4.6)
201-350	20 (6.1)
351-500	25 (7.6)
501-750	35 (10.7)
751-1000	45 (13.7)
Over 1000	Established by utility owner/operator or by a professional engineer in electrical power transmission/distribution

*(These distances have been determined to eliminate the potential for arcing based on the line voltage.)*

- The power line(s) has been isolated through the use of insulating blankets which have been properly placed by the utility. If insulating blankets are used, the utility will determine the minimum safe operating distance; get this determination in writing with the utility representative's signature.
- All inquiries regarding electric utilities must be made in writing and a written confirmation of the outage/isolation must be received by the PM prior to the start of work.

## 10.0 Physical Hazards and Controls

Physical hazards include exposure to temperature extremes, sun, noise, and radiation. If you encounter a physical hazard that has not been identified in this plan, contact the RHSM so that a revision to this plan can be made.

### 10.1 Noise

(Reference CH2M HILL SOP HSE-108, *Hearing Conservation*)

CH2M HILL is required to control employee exposure to occupational noise levels of 85 decibels, A-weighted, (dBA) and above by implementing a hearing conservation program that meets the requirements of the OSHA Occupational Noise Exposure standard, 29 CFR 1910.95. A noise assessment may be conducted by the RHSM or designee based on potential to emit noise above 85 dBA and also considering the frequency and duration of the task.

- Areas or equipment emitting noise at or above 90dBA shall be evaluated to determine feasible engineering controls. When engineering controls are not feasible, administrative controls can be developed and appropriate hearing protection will be provided.
- Areas or equipment emitting noise levels at or above 85 dBA, hearing protection must be worn.
- Employees exposed to 85 dBA or a noise dose of 50% must participate in the Hearing Conservation program including initial and annual (as required) audiograms.
- The RHSM will evaluate appropriate controls measures and work practices for employees who have experienced a standard threshold shift (STS) in their hearing.
- Employees who are exposed at or above the action level of 85 dBA are required to complete the online Noise Training Module located on CH2M HILL's virtual office.
- Hearing protection will be maintained in a clean and reliable condition, inspected prior to use and after any occurrence to identify any deterioration or damage, and damaged or deteriorated hearing protection repaired or discarded.
- In work areas where actual or potential high noise levels are present at any time, hearing protection must be worn by employees working or walking through the area.
- Areas where tasks requiring hearing protection are taking place may become hearing protection required areas as long as that specific task is taking place.
- High noise areas requiring hearing protection should be posted or employees must be informed of the requirements in an equivalent manner and a copy of the OSHA standard 29 CFR 1910.95 shall be posted in the workplace.

### 10.2 Ultraviolet Radiation (sun exposure)

Health effects regarding ultraviolet (UV) radiation are confined to the skin and eyes. Overexposure can result in many skin conditions, including erythema (redness or sunburn), photoallergy (skin rash), phototoxicity (extreme sunburn acquired during short exposures to UV radiation while on certain medications), premature skin aging, and numerous types of skin cancer. Implement the following controls to avoid sunburn.

#### Limit Exposure Time

- Rotate staff so the same personnel are not exposed all of the time.

- Limit exposure time when UV radiation is at peak levels (approximately 2 hours before and after the sun is at its highest point in the sky).
- Avoid exposure to the sun, or take extra precautions when the UV index rating is high.

### Provide Shade

- Take lunch and breaks in shaded areas.
- Create shade or shelter through the use of umbrellas, tents, and canopies.
- Fabrics such as canvas, sailcloth, awning material and synthetic shade cloth create good UV radiation protection.
- Check the UV protection of the materials before buying them. Seek protection levels of 95 percent or greater, and check the protection levels for different colors.

### Clothing

- Reduce UV radiation damage by wearing proper clothing; for example, long sleeved shirts with collars, and long pants. The fabric should be closely woven and should not let light through.
- Head protection should be worn to protect the face, ears, and neck. Wide-brimmed hats with a neck flap or “Foreign Legion” style caps offer added protection.
- Wear UV-protective sunglasses or safety glasses. These should fit closely to the face. Wrap-around style glasses provide the best protection.

### Sunscreen

- Apply sunscreen generously to all exposed skin surfaces at least 20 minutes before exposure, allowing time for it to adhere to the skin.
- Re-apply sunscreen at least every 2 hours, and more frequently when sweating or performing activities where sunscreen may be wiped off.
- Choose a sunscreen with a high sun protection factor (SPF). Most dermatologists advocate SPF 30 or higher for significant sun exposure.
- Waterproof sunscreens should be selected for use in or near water, and by those who perspire sufficiently to wash off non-waterproof products.
- Check for expiration dates, because most sunscreens are only good for about 3 years. Store in a cool place out of the sun.
- No sunscreen provides 100 percent protection against UV radiation. Other precautions must be taken to avoid overexposure.

## 10.3 Temperature Extremes

(Reference CH2M HILL SOP HSE-211, *Heat and Cold Stress*)

Each employee is responsible for the following:

- Recognizing the symptoms of heat or cold stress;
- Taking appropriate precautionary measures to minimize their risk of exposure to temperature extremes (see following sections); and
- Communicating any concerns regarding heat and cold stress to their supervisor or SC.

### 10.3.1 Heat

Heat-related illnesses are caused by more than just temperature and humidity factors.

**Physical fitness** influences a person's ability to perform work under heat loads. At a given level of work, the more fit a person is, the less the physiological strain, the lower the heart rate, the lower the body temperature (indicates less retained body heat—a rise in internal temperature precipitates heat injury), and the more efficient the sweating mechanism.

**Acclimatization** is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. 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 two continuous hours per day for 5 of the last 7 days to 10 of the last 14 days, a worker can be considered acclimatized. 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 three to four weeks. Because acclimatization is to the level of the heat-stress exposure, a person will not be fully acclimatized to a sudden higher level; such as during a heat wave.

**Dehydration** reduces body water volume. This reduces the body's sweating capacity and directly affects its ability to dissipate excess heat.

The ability of a body to dissipate heat depends on the ratio of its surface area to its mass (surface area/weight). **Heat dissipation** is a function of surface area, while heat production depends on body mass. Therefore, overweight individuals (those with a low ratio) are more susceptible to heat-related illnesses because they produce more heat per unit of surface area than if they were thinner. Monitor these persons carefully if heat stress is likely.

When wearing **impermeable clothing**, the weight of an individual is not as important in determining the ability to dissipate excess heat because the primary heat dissipation mechanism, evaporation of sweat, is ineffective.

SYMPTOMS AND TREATMENT OF HEAT STRESS					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately!

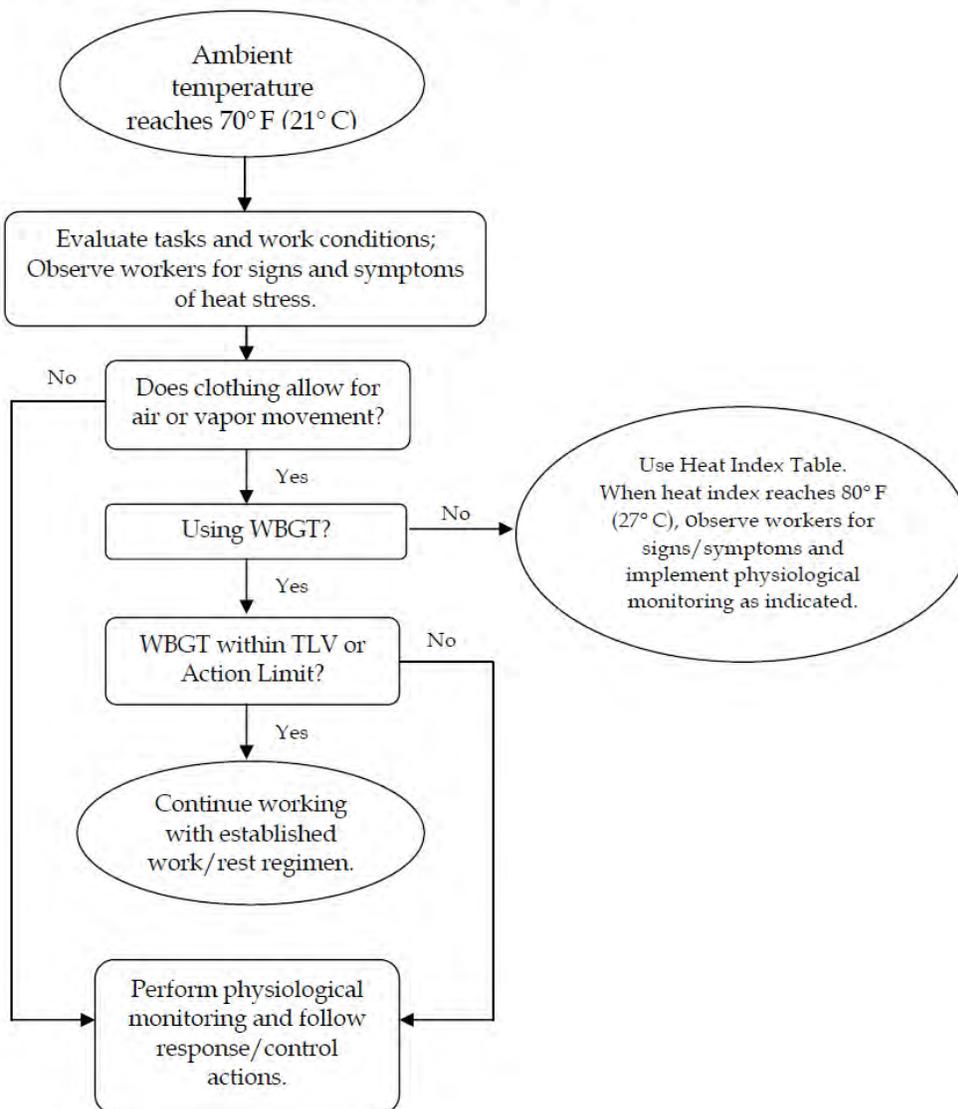
#### Precautions

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°Fahrenheit (10 degrees Celsius [C]) to 60°Fahrenheit (F) (15.6 degrees C) should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons (7.5 liters) per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.

- Acclimate yourself by slowly increasing workloads (do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. PREVENTION and communication is key.

## Thermal Stress Monitoring

### Thermal Stress Monitoring Flow Chart



### Thermal Stress Monitoring – Permeable or Impermeable Clothing

When permeable work clothes are worn (street clothes or clothing ensembles over street clothes), regularly observe workers for signs and symptoms of heat stress and implement physiological monitoring as indicated below. This should start when the heat index reaches 80° F (27° C) [see Heat Index Table below], or sooner if workers exhibit symptoms of heat stress indicated in the table above. These heat index values were devised for shady, light wind conditions; exposure to full sunshine can increase the values by up to 15°F (8°C). Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

When wearing **impermeable clothing** (e.g., clothing doesn't allow for air or water vapor movement such as Tyvek), physiological monitoring as described below shall be conducted when the ambient temperature reaches 70° F (21° C) or at a lower temperature when workers begin to exhibit signs and symptoms of heat stress.

Heat Index	Possible Heat Disorders	Minimum Frequency of Physiological Monitoring
80°F - 90°F (27°C - 32°C)	Fatigue possible with prolonged exposure and/or physical activity	Observe Workers for signs of heat stress and implement physiological monitoring if warranted.
90°F - 105°F (32°C - 41°C)	Sunstroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity	Every 2 hours, or sooner, if signs of heat stress are observed.
105°F - 130°F (41°C - 54°C)	Sunstroke, heat cramps, or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.	Every 60 minutes or sooner if signs of heat stress are observed.
130°F or Higher (54°C or Higher)	Heat/Sunstroke highly likely with continued exposure.	Every 30 minutes or sooner if signs of heat stress are observed.
Source: National Weather Service		

### Physiological Monitoring and Associated Actions

The following physiological monitoring protocol below, using either radial pulse or aural temperature, will occur when the heat index is 80 degrees F or greater (or when personnel exhibit signs of heat stress), the following will be performed:

- The sustained heart rate during the work cycle should remain below 180 beats per minute (bpm) minus the individual's age (e.g. 180 - 35 year old person = 145 bpm). The sustained heart rate can be estimated by measuring the heart rate at the radial pulse for 30 seconds as quickly as possible prior to starting the rest period.
- The heart rate after one minute rest period should not exceed 120 beats per minute (bpm).
- If the heart rate is higher than 120 bpm, the next work period should be shortened by 33 percent, while the length of the rest period stays the same.
- If the pulse rate still exceeds 120 bpm at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent.
- Continue this procedure until the rate is maintained below 120 bpm.
- Alternately, the body temperature can be measured, either oral or aural (ear), before the workers have something to drink.
- If the oral or aural temperature exceeds 99.6° F (37.6 ° F) at the beginning of the rest period, the following work cycle should be shortened by 33 percent.
- Continue this procedure until the oral or aural (ear) temperature is maintained below 99.6 ° F (37.6° C). While an accurate indication of heat stress, oral temperature is difficult to measure in the field, however, a digital aural (aural) thermometer is easy to obtain and inexpensive to purchase.
- Use the form in Attachment 4 to track workers' measurements and actions taken.

### Procedures for when Heat Illness Symptoms are Experienced

- **Always** contact the RHSM when any heat illness related symptom is experienced so that controls can be evaluated and modified, if needed.
- In the case of cramps, reduce activity, increase fluid intake, move to shade until recovered.

- In the case of all other heat-related symptoms (fainting, heat rash, heat exhaustion), and if the worker is a CH2M HILL worker, contact the occupational physician at 1-866-893-2514 and immediate supervisor.
- In the case of heat stroke symptoms, call 911, have a designee give location and directions to ambulance service if needed, follow precautions under the emergency medical treatment of this HSP.
- Follow the Incident Notification, Reporting, and Investigation section of this HSP.

### 10.3.2 Cold

#### General

Low ambient temperatures increase the heat lost from the body to the environment by radiation and convection. In cases where the worker is standing on frozen ground, the heat loss is also due to conduction.

Wet skin and clothing, whether because of water or perspiration, may conduct heat away from the body through evaporative heat loss and conduction. Thus, the body cools suddenly when chemical protective clothing is removed if the clothing underneath is perspiration soaked.

Movement of air across the skin reduces the insulating layer of still air just at the skin's surface. Reducing this insulating layer of air increases heat loss by convection.

Non-insulating materials in contact or near-contact with the skin, such as boots constructed with a metal toe or shank, conduct heat rapidly away from the body.

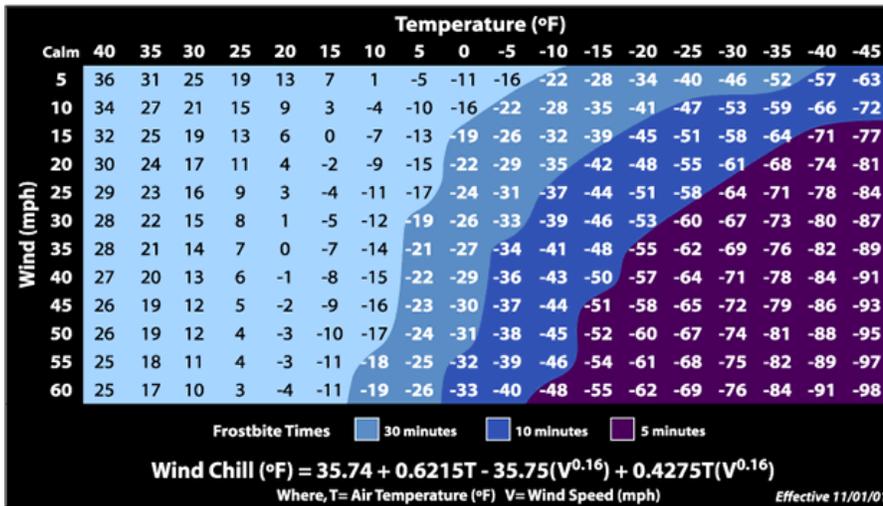
Certain common drugs, such as alcohol, caffeine, or nicotine, may exacerbate the effects of cold, especially on the extremities. These chemicals reduce the blood flow to peripheral parts of the body, which are already high-risk areas because of their large surface area to volume ratios. These substances may also aggravate an already hypothermic condition.

#### Precautions

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in wet weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-Chill Index (below) is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- Persons who experience initial signs of immersion foot, frostbite, and/or hypothermia should report it immediately to their supervisor/PM to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

<b>SYMPTOMS AND TREATMENT OF COLD STRESS</b>			
	<b>Immersion (Trench) Foot</b>	<b>Frostbite</b>	<b>Hypothermia</b>
Signs and	Feet discolored and	Blanched, white, waxy skin, but tissue resilient;	Shivering, apathy, sleepiness;

Symptoms	painful; infection and swelling present.	tissue cold and pale.	rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm—but <b>not</b> hot—water. Have victim drink warm fluids, but <b>not</b> coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but <b>not</b> coffee or alcohol. Get medical attention.



## 10.4 Radiological Hazards

Refer to CH2M HILL’s Core Standard, Radiological Control and Radiological Controls Manual for additional requirements.

### Hazards

None Known

### Controls

None Required

## 11.0 Biological Hazards and Controls

Biological hazards are everywhere and change with the region and season. If you encounter a biological hazard that has not been identified in this plan, contact the RHSM so that a revision to this plan can be made. Whether it is contact with a poisonous plant, a poisonous snake, or a bug bite, do not take bites or stings lightly. If there is a chance of an allergic reaction or infection, or to seek medical advice on how to properly care for the injury, contact the occupational nurse at 1-866-893-2514.

### 11.1 Bees and Other Stinging Insects

Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform your supervisor and/or a buddy. If you are stung, contact the occupational nurse at 1-866-893-2514. If a stinger is present, remove it as soon as possible using something with a thin, hard edge (e.g., credit card) to scrape the stinger out. Be sure to sanitize the object first with hand sanitizer, alcohol or soap and water. Wash and disinfect the wound, cover it, and apply ice. Watch for an allergic reaction if you have never been stung before. Call 911 if the reaction is severe.

### 11.2 Bird Droppings

Large amounts of bird droppings may present a disease risk. The best way to prevent exposure to fungus spores in bird droppings is to avoid disturbing it. A brief inhalation exposure to highly contaminated dust may be all that is needed to cause infection and subsequent development of fungal disease.

If disturbing the droppings or if removal is necessary to perform work, follow these controls:

- Use dust control measures (wetting with water or HEPA vacuuming) for all activities that may generate dust from the accumulated droppings.
- Wear Tyvek with hoods, disposable gloves and booties, and air-purifying respirators with a minimum N95 rating.
- Put droppings into plastic/poly bags and preferably into a 55-gallon drum to prevent bag from ripping.

### 11.3 Coyotes

While far from domesticated, coyotes show little fear of humans and have become comfortable living in close proximity to our communities. Although they tend to do most of their hunting after dusk, coyotes can be active at any time. Under normal circumstances, a coyote is not a danger to humans. They are, however, territorial and will respond aggressively if they or their family are threatened.

If you encounter a coyote that behaves aggressively, you have probably gotten too close to its prey or its family. Try to scare the coyote by yelling and waving your arms. Throw rocks, sticks or other objects. Do not turn away and run.

### 11.4 Feral Dogs

Avoid all dogs – both leashed and stray. Do not disturb a dog while it is sleeping, eating, or caring for puppies. If a dog approaches to sniff you, stay still. An aggressive dog has a tight mouth, flattened ears and a direct stare. If you are threatened by a dog, remain calm, do not scream and avoid eye contact. If you say anything, speak calmly and firmly. Do not turn and run, try to stay still until the dog leaves, or back away slowly until the dog is out of sight or you have reached safety (e.g. vehicle). If attacked,

retreat to vehicle or attempt to place something between you and the dog. If you fall or are knocked to the ground, curl into a ball with your hands over your head and neck and protect your face. If bitten, contact the occupational nurse at 1-866-893-2514. Report the incident to the local authorities.

## 11.5 Fire Ants

There are several types of fire ants in the United States that can cause painful bites and allergic reactions. Fire ants aggressively defend their nests by stinging several times after climbing on their victims. Large ant mounds are easily visible, but there can be smaller mounds or nests with little “worked” soil that can be stepped on inadvertently. They can also be under rocks, wood or other debris. Implement the following when fire ants are observed:

- Be aware of fire ants and take care not to stand on ant nests;
- Use insect repellents on clothing and footwear to temporarily discourage ants from climbing; and
- Tuck pants into socks.

If stung, get away from the area you are standing on, briskly brush off ants – wash affected area with soap. Call the occupational nurse.

## 11.6 Leeches

Leeches are bloodsucking aquatic or terrestrial worms. They can crawl through or over your socks or brush onto you from shrubbery. They carry no disease and there is low risk of significant blood loss. Leech bites do not hurt since they release an anesthetic, but they can bleed profusely due to an anticoagulant they release to facilitate the flow of blood.

### Possible Complications

- Some people suffer allergic reaction from leech bites and require urgent medical care. Symptoms include an ulcer infection, itchy rash, red blotches or an itchy rash over the body, swelling around the lips or eyes, feeling faint or dizzy, and difficulty breathing. If you experience any of these symptoms, seek medical attention immediately.

### Prevention options

- The best protection against leeches is covering up and using tropical strength insect repellent on socks and clothing.
- Use anti leech socks and fit over outer garments which served as a barrier.
- Various reports suggest applying salt, dettol spray, bath soap, eucalyptus oil or lemon juice to your skin.
- Inspect your body after leaving leech-infested waters or area, removing them promptly.

### First Aid

- Locate the head with a sucker attached to the wound. It will be the narrow end of leech’s body.
- Use your fingernail or other flat, blunt object to break the seal of the oral sucker at which point the leech’s jaws will detach. Repeat with the posterior end.
- Quickly flick the leech away before it bites you again and reattaches.
- Treat the wound with soap and water and antiseptic wipes; then bandage to stop bleeding.

- Do not just pull off the leech as this may cause a severe wound and the jaws may stay imbedded in the skin
- If the leech has attached to an orifice such ear, nose or mouth use salt or strong (drinkable) alcohol to cause it to release before it expands.
- Apply pressure to the area and a cold pack to reduce pain or swelling.
- The wound normally itches as it heals, but should not be scratched, as this may complicate healing and introduce other infections. Apply an antihistamine if necessary to reduce itching.
- If assisting a bitten person, use the usual protective universal precautions to protect against blood borne pathogens
- Call the occupational nurse.

## 11.7 Mosquito Bites

Due to the recent detection of the West Nile Virus in the southwestern United States it is recommended that preventative measures be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent:

- Stay indoors at dawn, dusk, and in the early evening;
- Wear long-sleeved shirts and long pants whenever you are outdoors;
- Spray clothing with repellents containing permethrin or N,N-diethyl-meta-toluamide (DEET) since mosquitoes may bite through thin clothing;
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET. Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands; and
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

### Symptoms of Exposure to the West Nile Virus

Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.

The West Nile Virus incubation period is from 3 to 15 days.

Contact the project RHSM with questions, and immediately report any suspicious symptoms to your supervisor, PM, and contact the occupational nurse at 1-866-893-2514.

## 11.8 Poison Ivy, Poison Oak, and Poison Sumac

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Shrubs are usually 12 to 30 inches high, or can also be a tree-climbing vine, with triple leaflets and short, smooth hair underneath. Plants are red and dark green in spring and summer, with yellowing leaves anytime especially in dry areas. Leaves may achieve bright reds in fall, but plants lose its (yellowed, then brown) leaves in winter, leaving toxic stems. All parts of the plant remain toxic throughout the seasons. These plants contain

urushiol a colorless or pale yellow oil that oozes from any cut or crushed part of the plant, including the roots, stems and leaves and causes allergic skin reactions when contacted. The oil is active year round.

Become familiar with the identity of these plants (see below). Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

*Poison Ivy*



*Poison Sumac*



*Poison Oak*



Contamination with poison ivy, sumac or oak can happen through several pathways, including:

- Direct skin contact with any part of the plant (even roots once above ground foliage has been removed).
- Contact with clothing that has been contaminated with the oil.
- Contact from removing shoes that have been contaminated (shoes are coated with urushiol oil).
- Sitting in a vehicle that has become contaminated.
- Contact with any objects or tools that have become contaminated.
- Inhalation of particles generated by weed whacking, chipping, vegetation clearing.

If you must work on a site with poison ivy, sumac or oak the following precautions are necessary:

- Do not drive vehicles onto the site where it will come into contact with poison ivy, sumac or oak. Vehicles which need to work in the area, such as drill rigs or heavy equipment must be washed as soon as possible after leaving the site.
- All tools used in the poison ivy, sumac or oak area, including those used to cut back poison oak, surveying instruments used in the area, air monitoring equipment or other test apparatus must be decontaminated before they are placed back into the site vehicle. If on-site decontamination is not possible, use plastic to wrap any tools or equipment until they can be decontaminated.
- Personal protective equipment, including Tyvek coveralls, gloves, and boot covers must be worn. PPE must be placed into plastic bags and sealed if they are not disposed immediately into a trash receptacle.
- As soon as possible following the work, shower to remove any potential contamination. Any body part with suspected or actual exposure should be washed with Zanfel, Tecnu or other product designed for removing urushiol. If you do not have Zanfel or Tecnu wash with cold water. Do not take a bath, as the oils can form an invisible film on top of the water and contaminate your entire body upon exiting the bath.
- Tecnu may also be used to decontaminate equipment.

- Use IvyBlock or similar products to prevent poison oak, ivy and sumac contamination. Check with the closest CH2M HILL warehouse to see if these products are available. Follow all directions for application.

If you do come into contact with one of these poisonous plants and a reaction develops, contact your supervisor and the occupational nurse 1-866-893-2514.

## 11.9 Scorpions



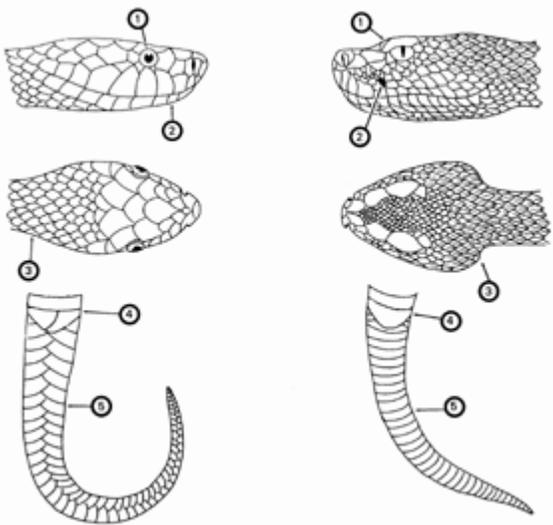
Scorpions usually hide during the day and are active at night. They may be hiding under rocks, wood, or anything else lying on the ground. Some species may also burrow into the ground. Most scorpions live in dry, desert areas; however, some species can be found in grasslands, forests, and inside caves.

When entering an area that has the potential to contain scorpions, the following PPE is recommended: long pants, long sleeved shirts with collars, leather work gloves and leather work boots. Reaching into enclosures or recesses without prior visual inspection is not recommended. Thoroughly inspect each area before accessing. Shake out clothing, jackets, shoes or boots prior to putting them on.

## 11.10 Snakes

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Call the occupational nurse at 1-866-893-2514 immediately. Do not apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings. Below is a guide to identifying poisonous snakes from non-poisonous snakes.

## Identification of Poisonous Snakes

Major Identification Features Non-venomous Snake	Major Identification Features Venomous Snake
<ol style="list-style-type: none"> <li>1. Round pupils</li> <li>2. No sensing pit</li> <li>3. Head slightly wider than neck</li> <li>4. Divided anal plate</li> <li>5. Double row of scales on the underside of the tail</li> </ol>	<ol style="list-style-type: none"> <li>1. Elliptical pupils</li> <li>2. Sensing pit between eye and nostril</li> <li>3. Head much wider than neck</li> <li>4. Single anal plate</li> <li>5. Single scales on the underside of the tail</li> </ol>
	

### 11.11 Spiders - Brown Recluse and Widow

The Brown Recluse spider can be found most anywhere in the United States. It varies in size in shape, but the distinguishing mark is the violin shape on its body. They are typically non-aggressive. Keep an eye out for irregular, pattern-less webs that sometimes appear almost tubular built in a protected area such as in a crevice or between two rocks. The spider will retreat to this area of the web when threatened.

The Black Widow, Red Widow and the Brown Widow are all poisonous. Most have globose, shiny abdomens that are predominantly black with red markings (although some may be pale or have lateral stripes), with moderately long, slender legs. These spiders are nocturnal and build a three-dimensional tangled web, often with a conical tent of dense silk in a corner where the spider hides during the day.

#### Hazard Controls

- Inspect or shake out any clothing, shoes, towels, or equipment before use.
- Wear protective clothing such as a long-sleeved shirt and long pants, hat, gloves, and boots when handling stacked or undisturbed piles of materials.
- Minimize the empty spaces between stacked materials.
- Remove and reduce debris and rubble from around the outdoor work areas.

- Trim or eliminate tall grasses from around outdoor work areas.
- Store apparel and outdoor equipment in tightly closed plastic bags.
- Keep your tetanus boosters up-to-date (every 10 years). Spider bites can become infected with tetanus spores.

If you think you have been bit by a poisonous spider, immediately call the occupational nurse at 1-866-893-2514 and follow the guidance below:

- Remain calm. Too much excitement or movement will increase the flow of venom into the blood;
- Apply a cool, wet cloth to the bite or cover the bite with a cloth and apply an ice bag to the bite;
- Elevate the bitten area, if possible;
- Do not apply a tourniquet, do not try to remove venom; and
- Try to positively identify the spider to confirm its type. If the spider has been killed, collect it in a plastic bag or jar for identification purposes. Do not try to capture a live spider – especially if you think it is a poisonous spider.

Black Widow



Red Widow



Brown Widow



Brown Recluse



If you are stung by a scorpion, call the occupational nurse 1-866-893-2514 and try to note the description of the scorpion. Cleanse the sting area and apply ice.

## 11.12 Stinging Caterpillars



If you find a fuzzy or spiny caterpillar which inflicts a painful sting upon contact, you probably have found a stinging caterpillar. The intensity of the irritation, whether it is caused by “venomous” or “irritating” hairs or barbed hooks and/or sharp, hollow spines, will be dependent on the species of caterpillar and the individual’s sensitivity. Reaction ranges from mild, with local reddening, swelling and itching, to rather severe depending on the susceptibility of the individual, the tenderness of the skin and the place of contact, and may even require hospital care for unusually sensitive persons. Hypersensitive persons may experience symptoms and/or allergic reactions, e.g., severe swelling, nausea, difficulty in breathing and generalized systemic reaction.

Saddleback caterpillars are an example of a stinging caterpillar. These are prevalent along the east coast from Florida to Massachusetts. They are most active within August and September. Contact with this caterpillar may produce a rash and a high fever.

Stings usually occur when people brush against a caterpillar or attempt to remove it from their body or their clothing. Only a few of the many thousand caterpillars can sting.

Avoid handling any hairy caterpillars or material with which they have been in contact. Suitable protective clothing, including safety glasses and gloves should always be worn if handling these insects are necessary. Remember, dead caterpillars can still cause painful stings. Most caterpillar infestations are usually short lived and should be left undisturbed, unless they are causing a problem. All the moth

larvae are leaf feeders, which is where they can be found. Infested shrubs and trees may be vacuumed or sprayed or dusted to reduce or eliminate the caterpillars. Contact the RHSM if caterpillars are abundant and cannot be avoided to determine if spraying foliage or removal of caterpillars is necessary.

If you are stung, call the occupational nurse at 1-866-893-2514. Applying tape, such as adhesive or duct or cellophane transparent and pulling it off may be helpful in removing broken spines. Washing the affected skin area thoroughly with soap and water may also help to remove insect hairs/spines and/or irritating venom. Prompt application of an ice pack and a baking soda poultice may help to reduce pain and prevent swelling.

### 11.13 Ticks

Every year employees are exposed to tick bites at work and at home putting them at risk of illness. Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch (6.4 mm) in size.

In some geographic areas exposure is not easily avoided. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray only outside of clothing with permethrin or permethrin and spray skin with only DEET; and check yourself frequently for ticks.

Where site conditions (vegetation above knee height, tick endemic area) or when tasks (having to sit or kneel in vegetation) diminish the effectiveness of the other controls mentioned above, bug-out suits (check with your local or regional warehouse) or Tyvek shall be used. Bug-out suits are more breathable than Tyvek.

Take precautions to avoid exposure by including pre-planning measures for biological hazards prior to starting field work. Avoid habitats where possible, reduce the abundance through habitat disruption or application of acaricide. If these controls aren't feasible, contact your local or regional warehouse for preventative equipment such as repellants, protective clothing and tick removal kits. Use the buddy system and perform tick inspections prior to entering the field vehicle. If ticks were not planned to be encountered and are observed, do not continue field work until these controls can be implemented.

See Tick Fact Sheet attached to this HSP for further precautions and controls to implement when ticks are present. If bitten by a tick, follow the removal procedures found in the tick fact sheet, and call the occupational nurse at 1-866-893-2514.

Be aware of the symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme disease is a rash that might appear that looks like a bull's eye with a small welt in the center. RMSF is a rash of red spots under the skin 3 to 10 days after the tick bite. In both RMSF and Lyme disease, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, again contact the occupational nurse at 1-866-893-2514.

Be sure to complete an Incident Report (either use the Hours and Incident Tracking System [HITS] system on the VO) if you do come in contact with a tick.

## 12.0 Contaminants of Concern

The table below summarizes the potential contaminants of concern (COC) and their occupational exposure limit and signs and symptoms of exposure. The table also includes the maximum concentration of each COC and the associated location and media that was sampled (groundwater, soil boring, surface soil). These concentrations were used to determine engineering and administrative controls described in the "Project-Specific Hazard Controls" section of this HSP, as well as PPE and site monitoring requirements.

Contaminants of Concern					
Contaminant	Location and Maximum <sup>a</sup> Concentration (ppm)	Exposure Limit <sup>b</sup>	IDLH <sup>c</sup>	Symptoms and Effects of Exposure	PIP <sup>d</sup> (eV)
Benzene	GW: 0.037 SB: UK SS: UK	0.5 ppm	500 Ca	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	9.24
Benzo(b)fluoranthene	GW: 0.00012 SB: UK SS: UK	2 ppm	200 Ca	Central nervous system (CNS) depression, nausea, vomiting, eye and skin irritation, liver and kidney injury, drowsiness, dizziness	11.47
Indeno(1,2,3-CD)pyrene	GW: 0.000061 SB: UK SS: UK	10 ppm	1,000	Skin, eye, and nose irritation; drowsiness; uncoordination; CNS depression	9.07
Ethyl Benzene	GW: ND SB: UK SS: UK	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
1-Methylnaphthalene	GW: 0.0364 SB: UK SS: UK	0.5 ppm	UK	Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant, lung sensitizer). Slightly hazardous in case of skin contact (sensitizer, permeator).	UK
Methyl Tertiary Butyl Ether (MTBE)	GW: ND SB: UK SS: UK	50 ppm	UK	Breathing small amounts of MTBE for short periods may cause nose and throat irritation. Is a flammable liquid with a distinctive, disagreeable odor	UK
Naphthalene	GW: 0.059 SB: UK SS: UK	10 ppm	250	Eye irritation, headache, confusion, excitement, nausea, vomiting, abdominal pain, bladder irritation, profuse sweating, dermatitis, corneal damage, optical neuritis	8.12
Toluene	GW: ND SB: UK SS: UK	20 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82
Total Petroleum Hydrocarbons (TPH)	GW: 0.0108 SB: UK SS: UK	300 ppm	ND Ca	Eye, skin and mucous membrane irritation; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, chemical pneumonia on aspiration, possible liver and kidney damage	UK
Xylenes	GW: ND SB: UK SS: UK	100 ppm	900	Irritated eyes, skin, nose, and throat; dizziness; excitement; drowsiness; incoherence; staggering gait; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis	8.56

Contaminants of Concern					
Contaminant	Location and Maximum <sup>a</sup> Concentration (ppm)	Exposure Limit <sup>b</sup>	IDLH <sup>c</sup>	Symptoms and Effects of Exposure	PIP <sup>d</sup> (eV)

Footnotes:

<sup>a</sup> Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), SS (Surface Soil), SL (Sludge), SW (Surface Water).

<sup>b</sup> Appropriate value of permissible exposure limit (PEL), recommended exposure limit (REL), or threshold limit value (TLV) listed.

<sup>c</sup> IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.

<sup>d</sup> PIP = photoionization potential; NA = Not applicable; UK = Unknown.

eV = electron volt

mg/kg = milligram per kilogram

mg/m<sup>3</sup> = milligrams per cubic meter

ug/m<sup>3</sup> = micrograms per cubic meter

Potential Routes of Exposure

**Dermal:** Contact with contaminated media. This route of exposure is minimized through use of engineering controls, administrative controls and proper use of PPE.

**Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through use of engineering controls, administrative controls and proper use of respiratory protection when other forms of control do not reduce the potential for exposure.

**Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

## 13.0 Site Monitoring

(Reference CH2M HILL SOP HSE-207, *Exposure Monitoring for Airborne Chemical Hazards*)

When performing site monitoring, record all the information, such as in a field logbook. Note date and time, describe monitoring location (for example, in breathing zone, at source and site location), and what the reading is. If any action levels are reached, note it in the field logbook and note the action taken.

Exposure records (air sampling) must be preserved for the duration of employment plus thirty years. Ensure that copies of the field log book are maintained in the project file.

Copies of all project exposure records (e.g., copies of field logbook pages where air monitoring readings are recorded and associated calibration) shall be sent to the regional SPA for retention and maintained in the project files.

### 13.1 Direct Reading Monitoring Specifications

Instrument	Tasks	Action Levels <sup>a</sup>	Action to be Taken when Action Level reached	Frequency <sup>b</sup>	Calibration
<b>PID:</b> MiniRAE PID with 10.6 eV lamp or equivalent	Drilling	< 1 ppm	Level D	Continuous during intrusive work	Daily
	Well	1 to 10 ppm	Level C		
	Abandonment	> 10 ppm	Evacuate work area and contact HSM		
	Groundwater Sampling				
<b>CGI:</b> MSA model 260 or 261 or equivalent	Drilling	0-10% :	No explosion hazard	Continuous during intrusive work	Daily
	Well	10-25% LEL:	Potential explosion hazard		
	Abandonment	>25% LEL:	Explosion hazard; evacuate or vent		
<b>O<sub>2</sub>Meter:</b> MSA model 260 or 261 or equivalent	Drilling	>25% <sup>c</sup> O <sub>2</sub> :	Explosion hazard; evacuate or vent	Continuous during intrusive work	Daily
	Well	20.9% <sup>c</sup> O <sub>2</sub> :	Normal O <sub>2</sub>		
	Abandonment	<19.5% <sup>c</sup> O <sub>2</sub> :	O <sub>2</sub> deficient; vent or use SCBA		

<sup>a</sup> Action levels apply to sustained breathing-zone measurements above background.

<sup>b</sup> The exact frequency of monitoring depends on field conditions and is to be determined by the SC; generally, every 5 to 15 minutes if access frequently may be appropriate.

<sup>c</sup> If the measured percent of O<sub>2</sub> is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O<sub>2</sub> action levels are for working atmospheres, and not to confined-space entry. More-stringent percent LEL and O<sub>2</sub> action levels are required for confined-space entry.

<sup>d</sup> Noise monitoring and audiometric testing also required.

### 13.2 Calibration Specifications

(Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures)

Instrument	Gas	Span	Reading	Method
<b>PID:</b> OVM, 10.6 or 11.7 eV bulb	100 ppm isobutylene	RF = 1.0	100 ppm	1.5 lpm reg T-tubing
<b>PID:</b> MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF = 100	100 ppm	0.5 lpm reg T-tubing
<b>PID:</b> TVA 1000	100 ppm isobutylene	CF = 1.0	100 ppm	1.0 lpm reg T-tubing
<b>CGI:</b> MSA 260, 261, 360, or 361	0.75% pentane	N/A	50% LEL ± 5% LEL	1.5 lpm reg direct tubing

Calibrate air monitoring equipment daily (or prior to use) in accordance with the instrument's instructions. Document the calibration in the field logbook (or equivalent) and include the following information:

- Instrument name
- Serial Number
- Owner of instrument (for example, CH2M HILL, HAZCO)
- Calibration gas (including type and lot number)
- Type of regulator (for example, 1.5 lpm)
- Type of tubing (for example, direct or T-tubing)
- Ambient weather condition (for example, temperature and wind direction)
- Calibration/instrument readings
- Operator's name and signature
- Date and time

### **13.3 Integrated Personal Air Sampling**

Sampling, in addition to real-time monitoring, may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the RHSM immediately if these contaminants are encountered.

#### **Method Description**

Personal air monitoring is not recommended unless site conditions change.

#### **Personal Breathing Zone and Area Samples**

Personal breathing zone and area sampling results must be sent immediately to the RHSM.

Employees potentially exposed to the substances for which air sampling is being performed shall be given the opportunity to observe the exposure measurements, and records shall be made available to all affected employees upon request or when they are required to be provided by a specific regulation. Employees may also receive a copy of their exposure records from the Medical Surveillance Program Administrator (MSPA).

# 14.0 Personal Protective Equipment

(Reference CH2M HILL- SOP HSE-117, *Personal Protective Equipment*)

## 14.1 Required Personal Protective Equipment

PPE must be worn by employees when actual or potential hazards exist and engineering controls or administrative practices cannot adequately control those hazards.

A PPE assessment has been conducted by the RHSM based on project tasks (see PPE specifications below). Verification and certification of assigned PPE by task is completed by the RHSM that approved this plan. Below are items that need to be followed when using any form of PPE:

- Employees must be trained to properly wear and maintain the PPE;
- Employees must be trained in the limitations of the PPE;
- In work areas where actual or potential hazards are present at any time, PPE must be worn by employees working or walking through the area;
- Areas requiring PPE should be posted or employees must be informed of the requirements in an equivalent manner;
- PPE must be inspected prior to use and after any occurrence to identify any deterioration or damage;
- PPE must be maintained in a clean and reliable condition;
- Damaged PPE shall not be used and must either be repaired or discarded; and
- PPE shall not be modified, tampered with, or repaired beyond routine maintenance.

The table below outlines PPE to be used according to task based on project-specific hazard assessment. If a task other than the tasks described in this table needs to be performed, contact the RHSM so this table can be updated.

### Project-Specific Personal Protective Equipment Requirements<sup>a</sup>

Task	Level	Body	Head	Respirator <sup>b</sup>
Surveying General Site Entry	D	Work clothes; safety toed leather work boots and gloves	Hardhat <sup>c</sup> Safety glasses with side shields Ear protection <sup>d</sup>	None required
Ground Water Monitoring Well Installation, Well Abandonment Surface water and sediment sampling	Modified D	Work clothes or cotton coveralls <b>Boots:</b> Safety-toe, chemical-resistant boots OR Safety -toe, leather work boots with outer rubber boot covers <b>Gloves:</b> Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat <sup>c</sup> Safety glasses with side shields Ear protection <sup>d</sup>	None required
Work near vehicular traffic ways or earth moving equipment.	All	Appropriate level of ANSI/ISEA 107-2010 high-visibility safety vests.	Work near vehicular traffic ways or earth moving equipment.	
Equipment decontamination if using pressure washer	Modified D with splash protection	<b>Coveralls:</b> Polycoated Tyvek® <b>Boots:</b> 16-inch-high steel-toed rubber boots <b>Gloves:</b> Inner surgical-style nitrile &	Hardhat <sup>c</sup> Splash shield <sup>c</sup> over safety glasses with	None required.

		outer chemical-resistant nitrile gloves.	side shields or splash goggles Ear protection <sup>d</sup>
Tasks requiring upgrade	C	<b>Coveralls:</b> Polycoated Tyvek® <b>Boots:</b> Safety -toe, chemical-resistant boots OR Safety -toe, leather work boots with outer rubber boot covers <b>Gloves:</b> Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat <sup>c</sup> Splash shield <sup>c</sup> Ear protection <sup>d</sup> Spectacle inserts APR, full face, MSA Ultratwin or equivalent; [Organic vapor] <sup>e</sup> .

## Reasons for Upgrading or Downgrading Level of Protection (with approval of the RHSM)

Upgrade <sup>f</sup>	Downgrade
<ul style="list-style-type: none"> <li>Request from individual performing tasks.</li> <li>Change in work tasks that will increase contact or potential contact with hazardous materials.</li> <li>Occurrence or likely occurrence of gas or vapor emission.</li> <li>Known or suspected presence of dermal hazards.</li> <li>Instrument action levels in the "Site Monitoring" section exceeded.</li> </ul>	<ul style="list-style-type: none"> <li>New information indicating that situation is less hazardous than originally thought.</li> <li>Change in site conditions that decrease the hazard.</li> <li>Change in work task that will reduce contact with hazardous materials.</li> </ul>

<sup>a</sup> Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.

<sup>b</sup> No facial hair that would interfere with respirator fit is permitted.

<sup>c</sup> Hardhat and splash-shield areas are to be determined by the SC.

<sup>d</sup> Ear protection should be worn when conversations cannot be held at distances of 3 feet (1 meter) or less without shouting.

<sup>e</sup> See cartridge change-out schedule.

<sup>f</sup> Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the RHSM, and an SC qualified at that level is present.

## 14.2 Respiratory Protection

(Reference CH2M HILL SOP HSE-121, *Respiratory Protection*)

Implement the following when using respiratory protection:

- Respirator users must have completed appropriate respirator training within the past 12 months. Level C training is required for air-purifying respirators (APR) use.
- Respirator users must complete the respirator medical monitoring protocol and been approved for the specific type of respirator to be used;
- Tight-fitting facepiece respirator (negative or positive pressure) users must have passed an appropriate fit test within past 12 months;
- Respirator use shall be limited to those activities identified in this plan. If site conditions change that alters the effectiveness of the specified respiratory protection, the RHSM shall be notified to amend the written plan;
- Tight-fitting facepiece respirator users shall be clean-shaven and shall perform a user seal check before each use;
- Canisters/cartridges shall be replaced according to the change-out schedule specified in this plan. Respirator users shall notify the SC or RHSM of any detection of vapor or gas breakthrough. The SC shall report any breakthrough events to the RHSM for schedule upgrade;
- Respirators in regular use shall be inspected before each use and during cleaning;
- Respirators in regular use shall be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition;

- Respirators shall be properly stored to protect against contamination and deformation;
- Field repair of respirators shall be limited to routine maintenance. Defective respirators shall be removed from service;
- The SC or designee shall complete the Self-Assessment Checklist – Respiratory Protection included in as attachment to this plan to verify compliance with CH2M HILL’s respiratory protection program.

### Respirator Change-Out Schedule

<b>Contaminant</b>	<b>Change-Out Schedule</b>
Benzene	End-of-service life or end of shift (whichever occurs first)
Benzo(b)fluoranthene	End-of-service life or end of shift (whichever occurs first)
Indeno(1,2,3-CD)pyrene	End-of-service life or end of shift (whichever occurs first)
Ethyl Benzene	End-of-service life or end of shift (whichever occurs first)
1-Methylnaphthalene	End-of-service life or end of shift (whichever occurs first)
Methyl Tertiary Butyl Ether (MTBE)	End-of-service life or end of shift (whichever occurs first)
Naphthalene	End-of-service life or end of shift (whichever occurs first)
Toluene	End-of-service life or end of shift (whichever occurs first)
Total Petroleum Hydrocarbons (TPH)	End-of-service life or end of shift (whichever occurs first)
Xylenes	End-of-service life or end of shift (whichever occurs first)

## 15.0 Worker Training and Qualification

### 15.1 CH2M HILL Worker Training

(Reference CH2M HILL SOP HSE-110, *Training*)

#### 15.1.1 Hazardous Waste Operations Training

All employees engaging in hazardous waste operations or emergency response shall receive appropriate training as required by 29 CFR 1910.120 and 29 CFR 1926.65. At a minimum, the training shall have consisted of instruction in the topics outlined in 29 CFR 1910.120 and 29 CFR 1926.65. Personnel who have not met these training requirements shall not be allowed to engage in hazardous waste operations or emergency response activities.

##### 15.1.1.1 Initial Training

General site workers engaged in hazardous waste operations shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations, unless otherwise noted in the above-referenced standards.

Employees who may be exposed to health hazards or hazardous substances at treatment, storage, and disposal (TSD) operations shall receive a minimum of 24 hours of initial training to enable the employee to perform their assigned duties and functions in a safe and healthful manner.

Employees engaged in emergency response operations shall be trained to the level of required competence in accordance with 29 CFR 1910.120.

##### 15.1.1.2 Three-Day Actual Field Experience

General site workers for hazardous waste operations shall have received three days of actual experience (on-the-job training) under the direct supervision of a trained, qualified supervisor and shall be documented. If the field experience has not already been received and documented at a similar site, this supervised experience shall be accomplished and documented at the beginning of the assignment of the project.

##### 15.1.1.3 Refresher Training

General site workers and TSD workers shall receive 8-hours of refresher training annually (within the previous 12-month period) to maintain qualifications for fieldwork. Employees engaged in emergency response operations shall receive annual refresher training of sufficient content and duration to maintain their competencies or shall demonstrate competency in those areas at least annually.

##### 15.1.1.4 Eight-Hour Supervisory Training

On site management or supervisors who will be directly responsible for, or supervise employees engaged in hazardous waste site operations, will have received at least 8 hours of additional specialized training on managing such operations. Employees designated as Safety Coordinator – Hazardous Waste are considered 8-hour HAZWOPER Site Safety Supervisor trained.

### 15.1.2 First Aid/Cardiopulmonary Resuscitation

First aid and CPR training consistent with the requirements of a nationally recognized organization such as the American Red Cross Association or National Safety Council shall be administered by a certified trainer. A minimum of two personnel per active field operation will have first aid and CPR training. Bloodborne pathogen training located on CH2M HILL's Virtual Office is also required for those designated as first aid/CPR trained.

### 15.1.3 Safety Coordinator Training

SCs are trained to implement the HSE program on CH2M HILL field projects. A qualified SC is required to be identified in the site-specific HSP for CH2M HILL field projects. SCs must also meet the requirements of the worker category appropriate to the type of field project (construction or hazardous waste). In addition, the SCs shall have completed additional safety training required by the specific work activity on the project that qualifies them to implement the HSE program (for example, fall protection, excavation).

### 15.1.4 Site-Specific Training

Prior to commencement of field activities, all field personnel assigned to the project will have completed site-specific training that will address the contents of applicable HSPs, including the activities, procedures, monitoring, and equipment used in the site operations. Site-specific training will also include site and facility layout, potential hazards, risks associated with identified emergency response actions, and available emergency services. This training allows field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and work operations for their particular activity.

### 15.1.5 Project-Specific Training Requirements

Project-specific training for this project includes:

- HSPs/AHAs

## 16.0 Medical Surveillance and Qualification

(Reference CH2M HILL SOP HSE-113, *Medical Surveillance*)

All site workers participating in hazardous waste operations or emergency response (HAZWOPER) will maintain an adequate medical surveillance program in accordance with 29 CFR 1910.120 or 29 CFR 1926.65 and other applicable OSHA standards. Documentation of employee medical qualification (e.g., physician's written opinion) will be maintained in the project files and made available for inspection.

### 16.1 Hazardous Waste Operations and Emergency Response

CH2M HILL personnel expected to participate in on site HAZWOPER tasks are required to have a current medical qualification for performing this work. Medical qualification shall consist of a qualified physician's written opinion regarding fitness for duty at a hazardous waste site, including any recommended limitations on the employee's assigned work. The physician's written opinion shall state whether the employee has any detected medical conditions that would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use.

### 16.2 Job or Site-Specific Medical Surveillance

Due to the nature of hazards for a particular job or work site, specialized medical surveillance may be necessary. This surveillance could include biological monitoring for specific compounds, or specialized medical examinations.

### 16.3 Respirator User Qualification

Personnel required to wear respirators must have a current medical qualification to wear respirators. Medical qualification shall consist of a qualified physician's written opinion regarding the employee's ability to safely wear a respirator in accordance with 29 CFR 1910.134.

### 16.4 Hearing Conservation

Personnel working in hazardous waste operations or operations that fall under 29 CFR 1910.95 and exposed to noise levels in excess of the 85dBA time-weighted average shall be included in a hearing conservation program that includes annual audiometric testing.

## 17.0 Site-Control Plan

### 17.1 Site-Control Procedures

(Reference CH2M HILL SOP HSE-218, *Hazardous Waste Operations*)

Site control is established to prevent the spread of contamination throughout the site and to ensure that only authorized individuals are permitted into potentially hazardous areas.

The SC will implement site control procedures including the following bulleted items.

- Establish support, contamination reduction, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals;
  - Air horn; and
  - Two-way radio or cellular telephone if available.
- Establish offsite communication.
- Establish and maintain the “buddy system.”

### 17.2 Remediation Work Area Zones

(Reference CH2M HILL SOP HSE-218 Hazardous Waste Operations)

A three-zone approach will be used to control areas where site contaminants exist. Access will be allowed only after verification of appropriate training and medical qualification. The three-zone approach shall include an EZ, Contamination Reduction Zone (CRZ) and a Support Zone (SZ). The three-zone approach is not required for construction work performed outside contaminated areas where control of site contamination is not a concern.

Specific work control zones shall be established as necessary during task planning. Site work zones should be modified in the field as necessary, based on such factors as equipment used, air monitoring results, environmental conditions, or alteration of work plans. The following guidelines shall be used for establishing and revising these preliminary zone designations.

#### 17.2.1 Support Zone

The SZ is an uncontaminated area (trailers, offices, field vehicles, etc.) that will serve as the field support area for most operations. The SZ provides field team communications and staging for emergency response. Appropriate sanitary facilities and safety and emergency response equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged and decontaminated materials, or personnel with medical emergencies that cannot be decontaminated.

#### 17.2.2 Contamination Reduction Zone

The CRZ is established between the EZ and the SZ, upwind of the contaminated area where possible. The CRZ provides an area for decontamination of personnel, portable handheld equipment and tools, and heavy equipment. In addition, the CRZ serves as access for heavy equipment and emergency support services.

### 17.2.3 Exclusion Zone

The EZ is where activities take place that may involve exposure to site contaminants and/or hazardous materials or conditions. This zone shall be demarcated to prevent unauthorized entry. More than one EZ may be established if there are different levels of protection to be employed or different hazards that exist in the same work area. The EZ shall be large enough to allow adequate space for the activity to be completed, including field personnel and equipment, as well as necessary emergency equipment.

The EZ shall be demarcated with some form of physical barrier or signage. The physical barrier or signage shall be placed so that they are visible to personnel approaching or working in the area. Barriers and boundary markers shall be removed when no longer needed.

### 17.2.4 Other Controlled Areas

Other work areas may need to be controlled due to the presence of an uncontrolled hazard, to warn workers of requirements, or to prevent unauthorized entry. Examples include general construction work areas, open excavations, high noise areas, vehicle access areas, and similar activities or limited access locations. These areas shall be clearly demarcated with physical barriers (fencing, cones, reinforced caution tape or rope) as necessary and posted with appropriate signage.

## 18.0 Decontamination

(Reference CH2M HILL SOP HSE-218, *Hazardous Waste Operations*)

Decontamination areas will be established for work in potentially contaminated areas to prevent the spread of contamination. Decontamination areas should be located upwind of the exclusion zone where possible and should consider any adjacent or nearby projects and personnel. The SC must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SC. The SC must ensure that procedures are established for disposing of materials generated on the site.

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SC should establish areas for eating, drinking, and smoking.

### 18.1 Contamination Prevention

Preventing or avoiding contamination of personnel, tools, and equipment will be considered in planning work activities at all field locations. Good contamination prevention and avoidance practices will assist in preventing worker exposure and result in a more efficient decontamination process. Procedures for contamination prevention and avoidance include the following:

- Do not walk through areas of obvious or known contamination;
- Do not directly handle or touch contaminated materials;
- Make sure there are no cuts or tears in PPE;
- Fasten all closures in suits and cover them with duct tape, if appropriate;
- Take particular care to protect any skin injuries;
- Stay upwind of airborne contamination, where possible;
- Do not eat or drink in contaminated work areas;
- Do not carry food, beverages, tobacco, or flame-producing equipment into contaminated work areas;
- Minimize the number of personnel and amount of equipment in contaminated areas to that necessary for accomplishing the work;
- Choose tools and equipment with nonporous exterior surfaces that can be easily cleaned and decontaminated;
- Cover monitoring and sampling equipment with clear plastic, leaving openings for the sampling ports, as necessary; and
- Minimize the amount of tools and equipment necessary in contaminated areas.

### 18.2 Personnel and Equipment Decontamination

Personnel exiting an EZ must ensure that they are not spreading potential contamination into clean areas or increasing their potential for ingesting or inhaling potential contaminants. Personal decontamination may range from removing outer gloves as exiting the EZ, to proceeding through an outer layer doffing station including a boot and glove wash and rinse, washing equipment, etc. Equipment that has come into contact with contaminated media must also be cleaned/decontaminated when it is brought out of the EZ.

### **18.3 Decontamination During Medical Emergencies**

Standard personnel decontamination practices will be followed whenever possible. For emergency life saving first aid and/or medical treatment, normal decontamination procedures may need to be abbreviated or omitted. In this situation, site personnel shall accompany contaminated victims to advise emergency response personnel on potential contamination present and proper decontamination procedures.

Outer garments may be removed if they do not cause delays, interfere with treatment, or aggravate the problem. Protective clothing can be cut away. If the outer garments cannot be safely removed, a plastic barrier between the individual and clean surfaces should be used to help prevent contaminating the inside of ambulances or medical personnel. Outer garments can then be removed at the medical facility.

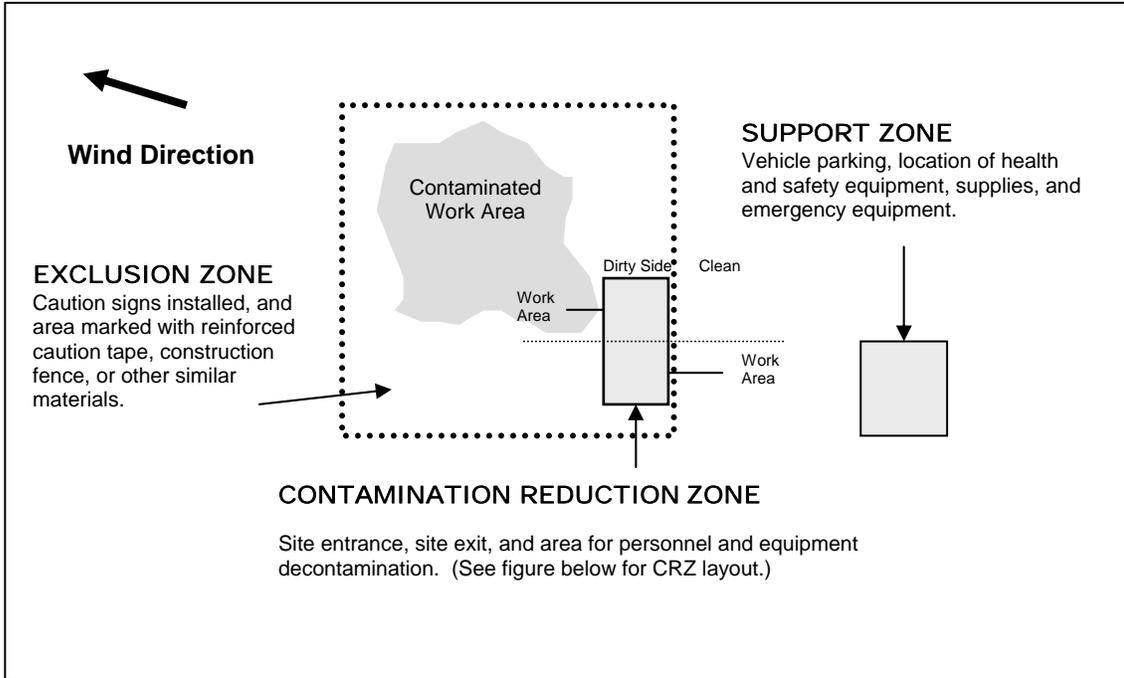
### **18.4 Waste Collection and Disposal**

All contaminated material generated through the personnel and equipment decontamination processes (e.g., contaminated disposable items, gross debris, liquids, sludges) will be properly containerized and labeled, stored at a secure location, and disposed in accordance with the project plans.

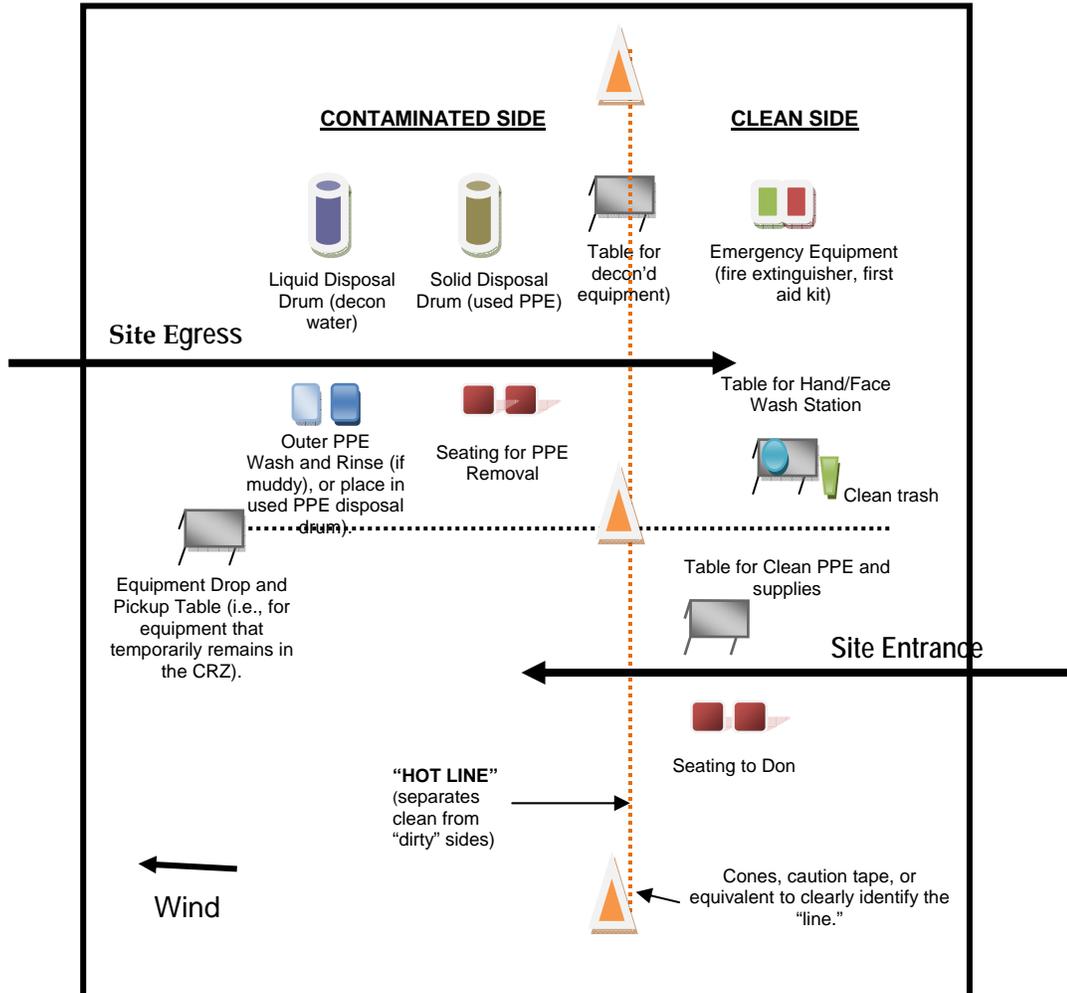
### **18.5 Diagram of Personnel-Decontamination Line**

The following figure illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SC to accommodate task-specific requirements.

Work Area - Set up appropriately based on wind direction



### Typical Contamination Reduction Zone



# 19.0 Emergency Response Plan

(Reference CH2M HILL SOP HSE-106, *Emergency Planning*)

## 19.1 Pre-Emergency Planning

The Emergency Response Coordinator (ERC), typically the SC or designee, performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate. Pre-Emergency Planning activities performed by the ERC include:

- Review the facility emergency and contingency plans where applicable;
- Determine what onsite communication equipment is available (two-way radio, air horn);
- Determine what offsite communication equipment is needed (nearest telephone, cell phone);
- Confirm and post the “Emergency Contacts” page and route to the hospital located in this section in project trailer(s) and keep a copy in field vehicles along with evacuation routes and assembly areas. Communicate the information to onsite personnel and keep it updated;
- Field Trailers: Post “Exit” signs above exit doors, and post “Fire Extinguisher” signs above locations of extinguishers. Keep areas near exits and extinguishers clear;
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures;
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies;
- Inventory and check site emergency equipment, supplies, and potable water;
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases;
- Rehearse the emergency response plan before site activities begin. This may include a “tabletop” exercise or an actual drill depending on the nature and complexity of the project. Drills should take place periodically but no less than once a year;
- Brief new workers on the emergency response plan; and
- The ERC will evaluate emergency response actions and initiate appropriate follow-up actions.

## 19.2 Emergency Equipment and Supplies

The ERC shall ensure the following emergency equipment is on the site. Verify and update the locations of this equipment as needed. The equipment will be inspected in accordance with manufacturer’s recommendations. The inspection shall be documented in a field logbook or similar means to be kept in the project files.

<b>Emergency Equipment and Supplies</b>	<b>Location</b>
20 (or two 10) class A,B,C fire extinguisher	On drill rig/support zone
First aid kit	Support Zone
Eye wash	Support Zone
Potable water	Support Zone
Bloodborne-pathogen kit	Support Zone/Field Vehicle
Additional equipment (specify): Cell phone	On the person of the SSC at all times

## 19.3 Incident Response

In fires, explosions, or chemical releases, actions to be taken include the following:

- Notify appropriate response personnel;
- Shut down CH2M HILL operations and evacuate the immediate work area;
- Account for personnel at the designated assembly area(s);
- Assess the need for site evacuation, and evacuate the site as warranted;
- Implement HSE-111, Incident Notification, Reporting and Investigation; and
- Notify and submit reports to clients as required in contract.

Small fires or spills posing minimal safety or health hazards may be controlled with onsite spill kits or fire extinguishers without evacuating the site. When in doubt evacuate. Follow the incident reporting procedures in the “Incident Notification, Reporting, and Investigation” section of this HSP.

## 19.4 Emergency Medical Treatment

Emergency medical treatment is needed when there is a life-threatening injury (such as severe bleeding, loss of consciousness, breathing or heart has stopped). When in doubt if an injury is life-threatening or not, treat it as needing emergency medical treatment.

- Notify 911 or other appropriate emergency response authorities as listed in the “Emergency Contacts” page located in this section.
- The ERC will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury, perform decontamination (if applicable) where feasible; lifesaving and first aid or medical treatment takes priority.
- Initiate first aid and CPR where feasible.
- Notify supervisor and if the injured person is a CH2M HILL employee, the supervisor will call the occupational nurse at 1-866-893-2514 and make other notifications as required by HSE SOP-111, *Incident Notification, Reporting and Investigation*.
- Make certain that the injured person is accompanied to the emergency room.
- Follow the Serious Incident Reporting process in HSE SOP-111, Incident Notification, Reporting and Investigation, and complete incident report using the HITS system on the VO or if not feasible, use the hard copy forms provided as an attachment to this HSP.
- Notify and submit reports to client as required in contract.

## 19.5 Evacuation

- Evacuation routes, assembly areas, and severe weather shelters (and alternative routes and assembly areas) are to be specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the ERC or designee before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The ERC and a “buddy” will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.

- The ERC will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate assembly area(s).
- The ERC will follow the incident reporting procedures in the “Incident Notification, Reporting and Investigation” section of this HSP.

## 19.6 Evacuation Signals

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.

## 19.7 Inclement Weather

Sudden inclement weather can rapidly encroach upon field personnel. Preparedness and caution are the best defenses. Field crew members performing work outdoors should carry clothing appropriate for inclement weather. Personnel are to take heed of the weather forecast for the day and pay attention for signs of changing weather that indicate an impending storm. Signs include towering thunderheads, darkening skies, or a sudden increase in wind. If stormy weather ensues, field personnel should discontinue work and seek shelter until the storm has passed.

Protective measures during a lightning storm include seeking shelter; avoiding projecting above the surrounding landscape (don't stand on a hilltop--seek low areas); staying away from open water, metal equipment, railroad tracks, wire fences, and metal pipes; and positioning people several yards apart. Some other general precautions include:

- Know where to go and how long it will take to get there. If possible, take refuge in a large building or vehicle. Do not go into a shed in an open area;
- The inclination to see trees as enormous umbrellas is the most frequent and most deadly mistake. Do not go under a large tree that is standing alone. Likewise, avoid poles, antennae, and towers;
- If the area is wide open, go to a valley or ravine, but be aware of flash flooding;
- If you are caught in a level open area during an electrical storm and you feel your hair stand on end, drop to your knees, bend forward and put your hands on your knees or crouch. The idea is to make yourself less vulnerable by being as low to the ground as possible and taking up as little ground space as possible. Lying down is dangerous, since the wet earth can conduct electricity. Do not touch the ground with your hands; and
- Do not use telephones during electrical storms, except in the case of emergency.

Remember that lightning may strike several miles from the parent cloud, so work should be stopped and restarted accordingly. The lightning safety recommendation is 30-30: Seek refuge when thunder sounds within 30 seconds after a lightning flash; and do not resume activity until 30 minutes after the last thunder clap.

High winds can cause unsafe conditions, and activities should be halted until wind dies down. High winds can also knock over trees, so walking through forested areas during high-wind situations should be avoided. If winds increase, seek shelter or evacuate the area. Proper body protection should be worn in case the winds hit suddenly, because body temperature can decrease rapidly.

## Emergency Contacts

**24-hour CH2M HILL Injury Reporting– 1-866-893-2514**

**24-hour CH2M HILL Serious Incident Reporting Contact – 720-286-4911**

<b>Medical Emergency – 911</b> <b>Facility Medical Response #:</b> <b>Local Ambulance #:</b>	<b>CH2M HILL- Medical Consultant</b> WorkCare Dr. Peter Greaney M.D. 300 S. Harbor Blvd, Suite 600 Anaheim , CA 92805 800-455-6155/866-893-2514 714-978-7488
<b>Fire/Spill Emergency – 911</b> <b>Facility Fire Response #:</b> <b>Local Fire Dept #:</b>	<b>CH2M HILL Director – Health, Safety, Security &amp; Environment</b> Andy Strickland/DEN (720) 480-0685 (cell) or (720) 286-2393 (office)
<b>Security &amp; Police – 911</b> <b>Facility Security #:</b> <b>Local Police #:</b>	<b>CH2M HILL Responsible Health and Safety Manager (RHSM)</b> Name: Michael Goldman Phone: 770/604-9095 x 54133 Cell: 404/790-4769
<b>Utilities Emergency Phone Numbers</b> Water: 911 Gas: 911 Electric: 911	<b>CH2M HILL Human Resources Department</b> Phone: Employee Connect toll-free number 1-877-586-4411 (U.S. and Canada)
<b>CH2M HILL Project Manager</b> Name: Greg Rowell Phone: 678.530.4301	<b>CH2M HILL Worker’s Compensation:</b> Contact Business Group HR dept. to have form completed or contact Jennifer Rindahl after hours: (720)891-5382
<b>CH2M HILL Safety Coordinator (SC)</b> Name: Adrian Teal Phone: 770/815-7484	<b>Media Inquiries Corporate Strategic Communications</b> Name: John Corsi Phone: (720) 286-2087
<b>CH2M HILL Project Environmental Manager</b> Name: Lisa Schwan Phone: 404/414-2505	<b>Automobile Accidents</b> Rental: Jennifer Rindahl/DEN: 720-286-2449 CH2M HILL owned vehicle: Linda George/DEN: 720-286-2057
<b>Federal Express Dangerous Goods Shipping</b> Phone: 800/238-5355	<b>CHEMTEL (hazardous material spills)</b> <b>Phone: 800/255-3924</b>
Facility Alarms: TBD by SSC	Evacuation Assembly Area(s): TBD

Facility/Site Evacuation Route(s): TBD by the SSC

## Directions to Local Hospital

**Lower Keys Medical Center**  
 5900 College Road  
 Key West, Florida 33040  
**Phone: (305) 294-5531**



Directions to 5900 College Rd, Key West, FL 33040  
4.7 mi – about 8 mins

Save trees. Go green!  
Download Google Maps on your phone at [google.com/gmm](http://google.com/gmm)

**A** Saratoga Ave



1. Head north on **Saratoga Ave** toward **Yorktown Ave**  
Partial restricted usage road  
About 2 mins



go 0.6  
total 0.6

2. Take the ramp onto **US-1 S/Overseas Hwy**  
About 4 mins



go 3.3  
total 3.9

3. Turn right onto **College Rd**  
Destination will be on the right  
About 2 mins



go 0.8  
total 4.7

**B** 5900 College Rd, Key West, FL 33040



These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from

## 20.0 Spill Containment Procedures

CH2M HILL and subcontractor personnel working at the project site shall be knowledgeable of the potential health, safety and environmental concerns associated with petroleum and other substances that could potentially be released at the project site.

The following is a list of criteria that must be addressed in CH2M HILL's or the subcontractor's plans in the event of a spill or release. In the event of a large quantity spill notify emergency services. Personnel discovering a spill shall (only if safe to do so):

- Stop or contain the spill immediately (if possible) or note source. Shut off the source (e.g., pump, treatment system) if possible. If unsafe conditions exist, then leave the area, call emergency services, inform nearby personnel, notify the site supervisors, and initiate incident reporting process. The SC shall be notified immediately;
- Extinguish sources of ignition (flames, sparks, hot surfaces, cigarettes);
- Clear personnel from the spill location and barricade the area;
- Use available spill control equipment in an effort to ensure that fires, explosions, and releases do not occur, recur, or spread;
- Use sorbent materials to control the spill at the source;
- Construct a temporary containment dike of sorbent materials, cinder blocks, bricks or other suitable materials to help contain the spill;
- Attempt to identify the character, exact source, amount, and extent of the released materials. Identification of the spilled material should be made as soon as possible so that the appropriate cleanup procedure can be identified;
- Assess possible hazards to human health or the environment as a result of the release, fire or explosion; and
- Follow incident notification, reporting, and investigation section of this plan.

# 21.0 Inspections

## 21.1 Project Activity Self-Assessment Checklists

In addition to the hazard controls specified in this document, Project Activity Self-Assessment Checklists are contained as an attachment to this HSP. The Project-Activity Self-Assessment Checklists are based upon minimum regulatory compliance and some site-specific requirements may be more stringent. The objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing these gaps. The self-assessment checklists, including documented corrective actions, shall be made part of the permanent project records and maintained by the SC.

The self-assessment checklists will also be used by the SC in evaluating the subcontractors and any client contractors' compliance on site.

The self-assessment checklists for the following tasks and exposures are required when the task or exposure is initiated and weekly thereafter while the task or exposure is taking place. The checklists shall be completed by the SC or other CH2M HILL representative and maintained in project files.

- Drilling
- Hand and Power Tools
- Biological Hazards

## 21.2 Safe Behavior Observations

Safe Behavior Observations (SBOs) are a tool to be used by supervisors to provide positive reinforcement for work practices performed correctly, while also identifying and eliminating deviations from safe work procedures that could result in a loss.

The SC or designee shall perform at least one SBO each week for any field work performed by subcontractors or when there are at least two CH2M HILL personnel performing field work.

The SC or designee shall complete the SBO form (attached to this HSP) for the task/operation being observed and submit them weekly.

For Federal projects, SBOs may be submitted electronically by e-mailing them to the address, "CH2M HILL ES FED Safe Behavior Observations" when connected to the network or at [CH2MHILLESFEDSafeBehaviorObservation@ch2m.com](mailto:CH2MHILLESFEDSafeBehaviorObservation@ch2m.com).

## 22.0 Incident Notification, Reporting, and Investigation

(Reference CH2M HILL SOP HSE-111, *Incident Notification, Reporting and Investigation*)

### 22.1 General Information

This section applies to the following:

- All injuries involving employees, third parties, or members of the public;
- Damage to property or equipment;
- Interruptions to work or public service (hitting a utility);
- Incidents which attract negative media coverage;
- Near misses;
- Spills, leaks, or regulatory violations; and
- Motor vehicle accidents.

Documentation, including incident reports, investigation, analysis and corrective measure taken, shall be kept by the SC and maintained onsite for the duration of the project.

### 22.2 Section Definitions

**Incident:** An incident is an event that causes or could have caused undesired consequences. An incident may be caused by natural forces, employees, subcontractors, or third parties in any location associated with CH2M HILL operations, including offices, warehouses, project sites, private property, or public spaces. Incidents include:

- Injury or illness to a CH2M HILL employee or subcontractor employee, or member of the public;
- Property damage;
- Spill or release;
- Environmental requirement or permit violation;
- A “near-miss”; or
- Other (e.g., fire, explosion, bomb threat, workplace violence, threats)**Accident:** an incident involving actual loss through injury, damage to assets, or environmental harm.

**Near Miss:** A near-miss occurs when an intervening factor prevented an injury or illness, property damage, spill or release, permit violation or other event from occurring. Examples of near-miss situations include: a hard hat or other personal protective equipment (PPE) prevented an injury; secondary containment or emergency shutoff prevented a spill; or an alert co-worker prevented an incident.

**Serious Incident:**

A Serious Incident must be immediately reported to senior management includes:

- Work related death, or life threatening injury or illness of a CH2M HILL employee;
- subcontractor, or member of the public;
- Kidnap/missing person;
- Acts or threats of terrorism;

- Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than \$ 500,000 in damage; or
- Spill or release of hazardous materials or substances that involves a significant threat of imminent harm to site workers, neighboring facilities, the community or the environment.

## 22.3 Reporting Requirements

All employees and subcontractors' employees shall immediately report any incident (including "near misses," as defined in the section above) in which they are involved or witness to their supervisor.

The CH2M HILL or Subcontractor supervisor, upon receiving an incident report, shall inform his immediate superior and the CH2M HILL SC.

The SC shall immediately report the following information to the RHSM and PM by phone and e-mail:

- Project Name and Site Manager;
- Date and time of incident;
- Description of incident;
- Extent of known injuries or damage;
- Level of medical attention; and
- Preliminary root cause/corrective actions

The RHSM shall immediately inform the EM (or available alternate) of spills, potential environmental permit compliance, or any environmental situation that could result in a notice of violation from an agency.

The CH2M HILL team shall comply with all applicable statutory incident reporting requirements such as those to OSHA, the police, or state or Federal environmental agency.

## 22.4 HITS System and Incident Report Form

CH2M HILL maintains a HITS entry and/or Incident Report Form (IRF) for all work-related injuries and illnesses sustained by its employees in accordance with recordkeeping and insurance requirements. A HITS entry and/or IRF will also be maintained for other incidents (property damage, fire or explosion, spill, release, potential violation, and near misses) as part of our loss prevention and risk reduction initiative.

The SC shall complete an entry into the Hours and Incident Tracking System (HITS) database system located on CH2M HILL's Virtual Office (or if VO not available, use the hard copy Incident Report Form and Root Cause Analysis Form and forward it to the RHSM) within 24 hours and finalize those forms within 3 calendar days.

## 22.5 Injury Management/Return-to-Work (for US/Puerto Rico based CH2M HILL Staff Only)

(Reference CH2M HILL, SOP HSSE-124, Injury Management/Return-to-Work)

### 22.5.1 Background

The Injury Management Program has been established to provide orderly, effective and timely medical treatment and return-to-work transition for an employee who sustains a work-related injury or illness. It also provides guidance and assistance with obtaining appropriate treatment to aid recovery, keep supervisors informed of employee status, and to quickly report and investigate work-related injury/illnesses to prevent recurrence.

To implement the Injury Management/Return-to-Work Program successfully, supervisors and/or SC should:

- Ensure employees are informed of the Injury Management/Return-to-Work Program;
- Become familiar with the Notification Process (detailed below); and
- Post the Injury Management/Return-to-Work Notification Poster.

#### 22.5.2 The Injury Management/Return-to-Work Notification Process:

- Employee informs their supervisor.
- Employee calls the Injury Management Program toll free number 1-866-893-2514 immediately and speaks with the Occupational Injury Nurse. This number is operable 24 hours per day, 7 days a week.
- Supervisor ensures employee immediately calls the Injury Management Program number. Supervisor makes the call with the injured worker or for the injured worker, if needed.
- Nurse assists employee with obtaining appropriate medical treatment, as necessary schedules clinic visit for employee (calls ahead, and assists with any necessary follow up treatment). The supervisor or SC accompanies the employee if a clinic visit is necessary to ensure that employees receive appropriate and timely care.
- Supervisor or SC completes the HITS entry or Incident Report Form immediately (within 24 hours) and forwards it to the Project Manager and RHSM.
- Nurse notifies appropriate CH2M HILL staff by e-mail (supervisor, Health & Safety, Human Resources, Workers' Compensation).
- Nurse communicates and coordinates with and for employee on treatment through recovery.
- Supervisor ensures suitable duties are identified and available for injured or ill workers who are determined to be medically fit to return to work on transitional duty (temporary and progressive).
- Supervisor ensures medical limitations prescribed (if any) by physician are followed until the worker is released to full duty.

## 22.6 Serious Incident Reporting Requirements

(Reference CH2M HILL SOP HSE-111, *Incident Reporting, Notification and Investigation*)

The serious incident reporting requirements ensures timely notification and allows for positive control over flow of information so that the incident is handled effectively, efficiently, and in conjunction with appropriate corporate entities. This standard notification process integrates Health, Safety, Security and Environment and Firm Wide Security Operations requirements for the consistent reporting of and managing of serious events throughout our operations.

### 22.6.1 Serious Incident Determination

The following are general criteria for determining whether an incident on CH2M HILL owned or managed facilities or program sites is considered serious and must be immediately reported up to Group President level through the reporting/notification process:

- Work related death, or life threatening injury or illness of a CH2M HILL employee, subcontractor, or member of the public;
- Kidnap or missing person;
- Acts or threats of terrorism;

- Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than \$ 500,000 in damage; or
- Spill or release of hazardous materials or substances that involves a significant threat of imminent harm to site workers, neighboring facilities, the community or the environment.

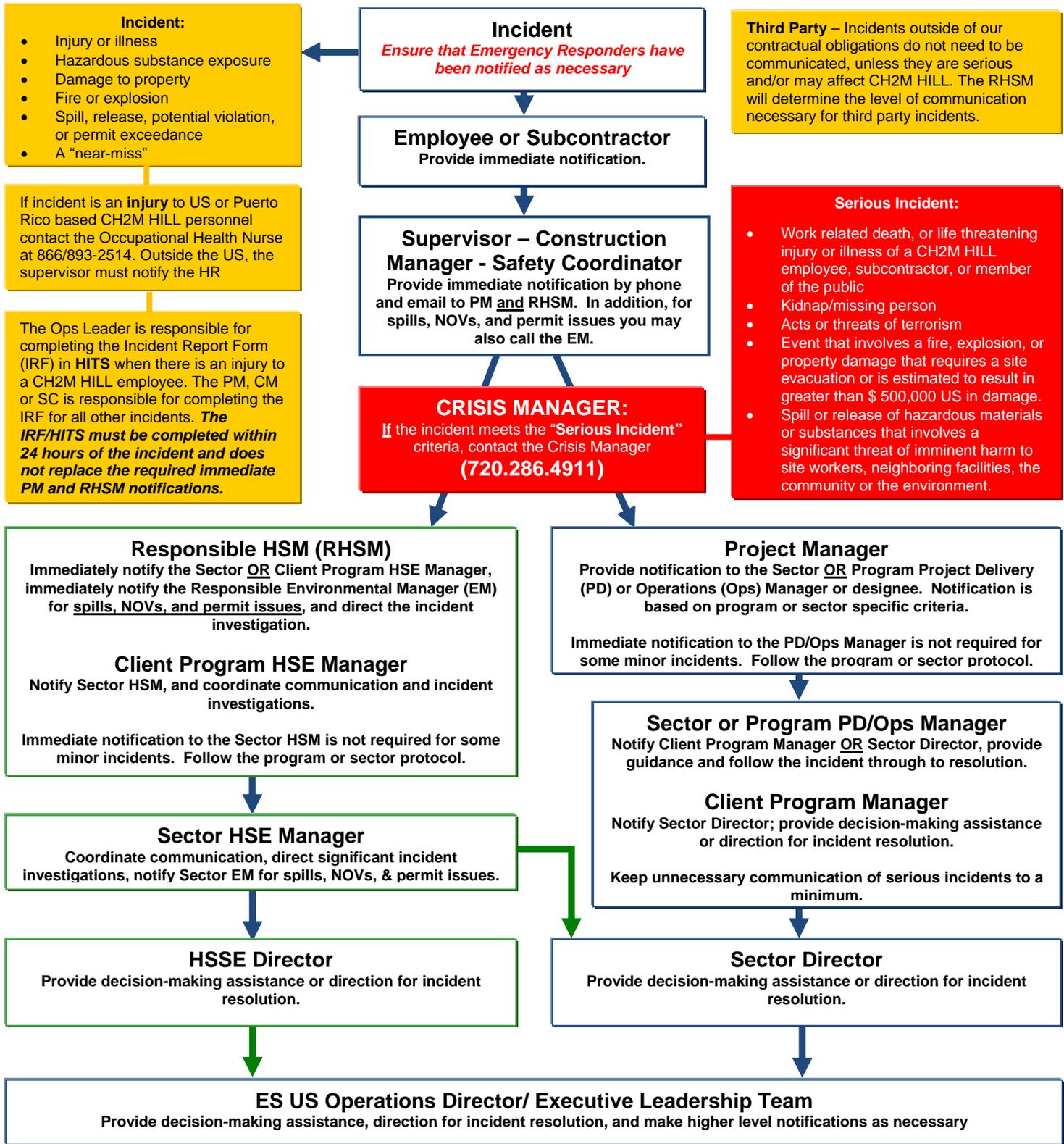
### 22.6.2 Serious Incident Reporting

*If an incident meets the “Serious Incident” criteria, the Project Manager is to immediately contact the Crisis Manager at 720-286-4911, then follow the standard incident reporting procedure.*

For all serious incidents this standard reporting process is implemented immediately so as to ultimately achieve notification to the Business Group President within 2 hours of incident onset or discovery, and notification to appropriate corporate Crisis Management Support Team.

# ESBG US Operations Incident Reporting Flow Diagram

→ Direct Reporting Responsibility     
 → Informational Reporting



**Incident:**

- Injury or illness
- Hazardous substance exposure
- Damage to property
- Fire or explosion
- Spill, release, potential violation, or permit exceedance
- A "near-miss"

If incident is an **injury** to US or Puerto Rico based CH2M HILL personnel contact the Occupational Health Nurse at 866/893-2514. Outside the US, the supervisor must notify the HR

The Ops Leader is responsible for completing the Incident Report Form (IRF) in **HITS** when there is an injury to a CH2M HILL employee. The PM, CM or SC is responsible for completing the IRF for all other incidents. **The IRF/HITS must be completed within 24 hours of the incident and does not replace the required immediate PM and RHSM notifications.**

**Third Party** – Incidents outside of our contractual obligations do not need to be communicated, unless they are serious and/or may affect CH2M HILL. The RHSM will determine the level of communication necessary for third party incidents.

**Serious Incident:**

- Work related death, or life threatening injury or illness of a CH2M HILL employee, subcontractor, or member of the public
- Kidnap/missing person
- Acts or threats of terrorism
- Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than \$ 500,000 US in damage.
- Spill or release of hazardous materials or substances that involves a significant threat of imminent harm to site workers, neighboring facilities, the community or the environment.

**Responsible HSM (RHSM)**  
Immediately notify the Sector OR Client Program HSE Manager, immediately notify the Responsible Environmental Manager (EM) for spills, NOVs, and permit issues, and direct the incident investigation.

**Client Program HSE Manager**  
Notify Sector HSM, and coordinate communication and incident investigations.  
Immediate notification to the Sector HSM is not required for some minor incidents. Follow the program or sector protocol.

**Sector HSE Manager**  
Coordinate communication, direct significant incident investigations, notify Sector EM for spills, NOVs, & permit issues.

**HSSE Director**  
Provide decision-making assistance or direction for incident resolution.

**Project Manager**  
Provide notification to the Sector OR Program Project Delivery (PD) or Operations (Ops) Manager or designee. Notification is based on program or sector specific criteria.  
Immediate notification to the PD/Ops Manager is not required for some minor incidents. Follow the program or sector protocol.

**Sector or Program PD/Ops Manager**  
Notify Client Program Manager OR Sector Director, provide guidance and follow the incident through to resolution.

**Client Program Manager**  
Notify Sector Director; provide decision-making assistance or direction for incident resolution.  
Keep unnecessary communication of serious incidents to a minimum.

**Sector Director**  
Provide decision-making assistance or direction for incident resolution.

**ES US Operations Director/ Executive Leadership Team**  
Provide decision-making assistance, direction for incident resolution, and make higher level notifications as necessary

**Post-emergency incident communications regarding serious incidents at a CH2M HILL office or project (regardless of the party involved) shall be considered sensitive in nature and must be controlled in a confidential manner.**

## 22.7 Incident Root Cause Analysis

The accident analysis is essential if all causes of the incident are to be identified for the correct remedial actions to be taken to prevent the same and similar type of incident from recurring. Root Cause Analysis (RCA) shall be completed for all recordable injuries, property damage incidents in excess of \$5000.00 (US), environmental permit violations, spills and releases which are required to be reported to regulatory agencies, and any other incident, including near misses where they RHSM or PM determines an RCA is appropriate. The RHSM/REM is responsible for ensuring it is completed and results entered in the incident report form in HITS. RCA's must be completed using a Team that includes, at least the RHSM or designee, the involved party(ies), a responsible operations representative (e.g. PM, construction manager, crew supervisor, etc.) and an independent management representative not associated with the incident.

The Root Cause Analysis Form must be completed for all Loss Incidents and Near Loss Incidents. This form must be submitted to the investigation team for review.

For minor losses or near losses, the information may be gathered by the supervisor or other personnel immediately following the loss. Based on the complexity of the situation, this information may be all that is necessary to enable the investigation team to analyze the loss, determine the root cause, and develop recommendations. More complex situations may require the investigation team to revisit the loss site or re-interview key witnesses to obtain answers to questions that may arise during the investigation process.

Photographs or videotapes of the scene and damaged equipment should be taken from all sides and from various distances. This point is especially important when the investigation team will not be able to review the loss scene.

The investigation team must follow the Root Cause Analysis Flow Chart (see Attachment 4 of the SOP) to assist in identifying the root cause(s) of a loss. Any loss may have one or more root causes and contributing factors. The root cause is the primary or immediate cause of the incident, while a contributing factor is a condition or event that contributes to the incident happening, but is not the primary cause of the incident. Root causes and contributing factors that relate to the person involved in the loss, his or her peers, or the supervisor should be referred to as "personal factors." Causes that pertain to the system within which the loss or injury occurred should be referred to as "job factors."

Personal factors include:

- Lack of skill or knowledge;
- Correct way takes more time and/or requires more effort;
- Short-cutting standard procedures is positively reinforced or tolerated; or
- Person thinks there is no personal benefit to always doing the job according to standards.

Job Factors include:

- Lack of or inadequate operational procedures or work standards;
- Inadequate communication of expectations regarding procedures or standards; or
- Inadequate tools or equipment.

The root cause(s) could be any one or a combination of these seven possibilities or some other uncontrollable factor. In the vast majority of losses, the root cause is very much related to one or more of these seven factors. Uncontrollable factors should be used rarely and only after a thorough review eliminates all seven other factors.

### 22.7.1 Corrective Actions

Include all corrective actions taken or those that should be taken to prevent recurrence of the incident. Include the specific actions to be taken, the employer and personnel responsible for implementing the actions, and a timeframe for completion. Be sure the corrective actions address the causes.

Once the investigation report has been completed, the PM shall hold a review meeting to discuss the incident and provide recommendations. The responsible supervisors shall be assigned to carry out the recommendations, and shall inform the SC upon successful implementation of all recommended actions.

- Evaluation and follow-up of the IRF will be completed by the type of incident by the RHSM, EM, or FWSO.
- Incident investigations must be initiated and completed as soon as possible but no later than 72 hours after the incident.

## 23.0 Records and Reports

An organized project filing system is essential for good documentation and recordkeeping. There are many benefits to an organized filing system:

- Other CH2M HILL employees can easily and quickly find documents;
- Records are readily available for review;
- Records may be needed during OSHA investigations, audits, or other legal matters;
- Records may be needed on short notice in case of an accident, illness or other emergency; and
- Systematic recordkeeping aids in overall project organization.

The project filing system shall be established at the beginning of the project and maintained throughout all phases of construction and archived in accordance with CH2M HILL's Records Retention Policy. The information contained in the filing system shall be updated regularly and/or as specified in this document. The PM and SC are responsible for collecting documentation, including subcontractor documentation, and maintaining a complete and organized filing system.

Below are examples of records that must be maintained as the project progresses:

- Exposure records includes air monitoring data (including calibration records), MSDSs, exposure modeling results;
- Physical hazard exposure records include noise, ionizing radiation, non-ionizing radiation, vibration, and lasers exposure assessments and measurements;
- Respiratory fit test records;
- Training records;
- Incident reports, investigations and associated back-up information such as agency notifications, calculations, and corrective actions taken;
- Federal or state agency inspection records;
- Other Records:
  - Ergonomic evaluations;
  - HSE audits and assessments;
  - Project-specific HSE plans;
  - Confined space entry permits;
  - Equipment inspections;
  - Equipment maintenance;
  - Emergency equipment inspection records;
  - SBOs;
  - Self-assessment checklists
- The RHSM shall coordinate with the PM or designee to ensure that final project-specific HSE records described in this section, including negative exposure determinations, are maintained with the project files in accordance with the CH2M HILL records retention schedule, or forwarded to the Medical Surveillance Program Administrator, as appropriate. Records retention requirements are detailed in the Recordkeeping and Access to Records SOP, HSE-119.

**CH2M HILL Health and Safety Plan**  
**Attachment 1**

**Health and Safety Plan Employee Sign-off Form**



**CH2M HILL Health and Safety Plan**  
**Attachment 2**

**Chemical Inventory/Register Form**



**CH2M HILL Health and Safety Plan**  
**Attachment 3**

**Chemical-Specific Training Form**

**CHEMICAL-SPECIFIC TRAINING FORM**

Refer to SOP HSE-107 Attachment 1 for instructions on completing this form.

Location:	Project # :
HCC:	Trainer:

**TRAINING PARTICIPANTS:**

NAME	SIGNATURE	NAME	SIGNATURE

**REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:**


The HCC shall use the product MSDS to provide the following information concerning each of the products listed above.

- Physical and health hazards
- Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)
- Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants shall have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and CH2M HILL's written hazard communication program shall be made available for employee review in the facility/project hazard communication file.

# CH2M HILL Health and Safety Plan

## Attachment 4

### Project Activity Self-Assessment Checklists/Permits/Forms

Biological Hazards

Drilling

Hand and Power Tools

Heat Stress Monitoring

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's written safety plan.

This checklist is to be used at locations where: 1) CH2M HILL employees are potentially exposed to drilling hazards, 2) CH2M HILL staff are providing support function related to drilling activities, and/or 3) CH2M HILL oversight of a drilling subcontractor is required.

Safety Coordinator may consult with drilling subcontractors when completing this checklist, but shall not direct the means and methods of drilling operations nor direct the details of corrective actions. Drilling subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately, or all exposed personnel shall be removed from the hazard until corrected.

Project Name: \_\_\_\_\_ Project No.: \_\_\_\_\_  
 Location: \_\_\_\_\_ PM: \_\_\_\_\_  
 Auditor: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

This specific checklist has been completed to:

- Evaluate CH2M HILL employee exposures to drilling hazards (complete Section 1).
  - Evaluate CH2M HILL support functions related to drilling activities (complete Section 2)
  - Evaluate a CH2M HILL subcontractor's compliance with drilling safety requirements (complete entire checklist).
- Subcontractors Name: \_\_\_\_\_

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the drilling subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in SOP HSE-35.

### SECTION 1 - SAFE WORK PRACTICES (4.1)

	Yes	No	N/A	N/O
1. Personnel cleared during rig startup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Personnel clear of rotating parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Personnel not positioned under hoisted loads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Loose clothing and jewelry removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Smoking is prohibited around drilling operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Personnel wearing appropriate personal protective equipment (PPE), per written plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Personnel instructed not to approach equipment that has become electrically energized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### SECTION 2 - SUPPORT FUNCTIONS (4.2)

#### FORMS/PERMITS (4.2.1)

8. Driller license/certification obtained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Well development/abandonment notifications and logs submitted and in project files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Water withdrawal permit obtained, where required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Dig permit obtained, where required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### UTILITY LOCATING (4.2.2)

12. Location of underground utilities and structures identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<b>SECTION 2 (Continued)</b>				
<b>WASTE MANAGEMENT (4.2.3)</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>N/O</b>
13. Drill cuttings and purge water managed and disposed properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILLING AT HAZARDOUS WASTE SITES (4.2.4)</b>				
14. Waste disposed of according to project's written safety plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Appropriate decontamination procedures being followed, per project's written safety plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILLING AT ORDNANCE EXPLOSIVES (OE)/UNEXPLODED ORDNANCE (UXO) SITES (4.2.5)</b>				
16. OE plan prepared and approved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. OE/UXO avoidance provided, routes and boundaries cleared and marked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Initial pilot hole established by UXO technician with hand auger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Personnel remain inside cleared areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>SECTION 3 - DRILLING SAFETY REQUIREMENTS (4.3)</b>				
<b>GENERAL (4.3.1)</b>				
20. Only authorized personnel operating drill rigs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Daily safety briefing/meeting conducted with crew	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Daily inspection of drill rig and equipment conducted before use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG PLACEMENT (4.3.2)</b>				
23. Location of underground utilities and structures identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Safe clearance distance maintained from overhead power lines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Drilling pad established, when necessary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Drill rig leveled and stabilized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Additional precautions taken when drilling in confined areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG TRAVEL (4.3.3)</b>				
28. Rig shut down and mast lowered and secured prior to rig movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Tools and equipment secured prior to rig movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Only personnel seated in cab are riding on rig during movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Safe clearance distance maintained while traveling under overhead power lines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Backup alarm or spotter used when backing rig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG OPERATION (4.3.4)</b>				
33. Kill switch clearly identified and operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. All machine guards are in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Rig ropes not wrapped around body parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Pressurized lines and hoses secured from whipping hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Drill operation stopped during inclement weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Air monitoring conducted per written safety plan for hazardous atmospheres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Rig placed in neutral when operator not at controls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG SITE CLOSURE (4.3.5)</b>				
40. Ground openings/holes filled or barricaded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Equipment and tools properly stored	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. All vehicles locked and keys removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG MAINTENANCE (4.3.6)</b>				
28. Defective components repaired immediately	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Lockout/tagout procedures used prior to maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Cathead in clean, sound condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Drill rig ropes in clean, sound condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Fall protection used for fall exposures of 6 feet (U.S.) 1.5 meters (Australia) or greater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Rig in neutral and augers stopped rotating before cleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

34. Good housekeeping maintained on and around rig

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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# HS&E Self-Assessment Checklist—Biological Prevention Measures

**CH2MHILL**

## HS&E Self-Assessment Checklist

Page 1 of 3

This checklist shall be used by Navy CLEAN personnel and shall be completed by each crew entering the work area at the frequency of one per day or otherwise specified in the project’s Health and Safety Plan/Field Safety Instruction (HSP/FSI). The checklist should be completed prior to entry and at the end of the day to document that appropriate checks have been completed.

This checklist is to be used at locations where the possibility exists that contact with biological hazards is possible.

Site Safety Coordinator (SSC) will request any CH2M HILL subcontractor to take necessary precautions in eliminating the exposure to biological hazards, but shall not direct the means and methods.

Project Name: _____	Project No.: _____
Location: _____	PM: _____
Auditor: _____	Title: _____ Date: _____

- Check “Yes” if an assessment item is complete or correct.
- Check “No” if an item is incomplete or deficient. Section 2 must be completed for all items checked “No.”
- Check “N/A” if an item is not applicable.
- Check “N/O” if an item is applicable but was not observed during the assessment.

	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
<b><u>SECTION 1 – PRE-ENTRY</u></b>				
<b>SITE HAZARD EVALUATION</b>				
1. Inform field members of hazards (types, symptoms)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Can work be completed without entering the work zone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Have controls been implemented where possible (clearing vegetation, spraying)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Has an inspection been made to identify nests, hives or areas where insects may concentrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Will working at different time will reduce exposure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>SENSATIVITIES</b>				
6. Does any staff have existing reactions to stings or bites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. If yes to #6, is special required and medication available on site (epi-pen)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Has anyone with an existing condition briefed other team members about symptoms and first aid which may be required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EMERGENCY RESPONSE</b>				
9. Are first aid kits, along with tick removal kits, readily available to all staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Does each member of the field staff have ability to communicate (phone, radios, and visual)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Are emergency contacts available (base emergency, local police, or local EMT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. If working in remote areas, is transport readily available (less than 5 minutes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Have you planned an emergency exit from the site in the event of a swarm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SECTION 2 - PPE**

**Yes No N/A N/O**

**SELECTION OF PPE**

- 14. Will weather (heat, rain, ice) impact the safety of workers wearing protective suits
- 15. Will visibility be limited to unacceptable levels if a hood is worn
- 16. Will the use of equipment be difficult if a suit is worn
- Will heavy vegetation be encountered that could rip or damage a suit
- 17. Will a Bug-Out suit or Tyvek suit be used by staff (if not, please give additional rationale in writing in Section 4)

**TYPE OF PPE USED OTHER THAN BUG-OUT OR TYVEK SUIT**

- 19. Is staff wearing light-colored clothes
- 20. Is staff wearing long sleeve shirts
- 21. Are pant legs tucked into socks
- 22. Are shirts tucked into pants
- 23. Has tape been placed around sock/pant leg line and around waist
- 24. Have hand and wrist areas been sealed
- 25. Are hats being worn
- 26. Have clothes been pre treated with Permethrin
- 27. Has team member inspected coworker's suits or clothing to ensure no spaces exist for insects to penetrate

**SECTION 3 – CHECKS AND DECONTAMINATION**

**Yes No N/A N/O**

**DAILY CHECKS (TO BE COMPLETED DURING AND AT END OF DAY)**

- 28. Were tick/insect checks performed during the day (if not, please provide reason in Section 4)
- 29. Was one unclothed tick check completed
- 30. Were ticks found on the outerwear (if yes, please note the number in Section 4)
- 31. Were ticks found inside the Bug-Out, Tyvek, or personal clothing
- 32. Were suits turned inside out and inspected prior to putting away
- 33. Were showers taken by field staff immediately upon arrive from the field
- 34. Were clothing placed in a garbage bag and sealed to prevent any insects from spreading
- 35. If ticks were found embedding in skin, were they properly removed and saved
- 36. Have vehicles been inspected for ticks on a daily basis and before the vehicle is turned in

**REPORTING**

- 37. If a tick was found on your skin, could you tell where it entered so that it could be addressed
- 38. If a tick was found embedded, did you contact the PM, complete a HITS form and contact the Occupational Physician at 1-866-893-2514
- 39. Did you contact field staff on the project to provide potential corrective measures
- 40. Did you follow the IM/RTW procedure to ensure you received the proper medical attention (if not, provide an explanation in Section 4)



This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project’s HSP/FSI. This checklist is to be used at locations where: (1) CH2M HILL employees are exposed to hand and power tool hazards and/or (2) CH2M HILL provides oversight of subcontractor personnel who are exposed to hand and power tool hazards. SC may consult with subcontractors when completing this checklist, but shall not direct the means and methods of hand and power tool use nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Project Name: \_\_\_\_\_ Project No.: \_\_\_\_\_

Location: \_\_\_\_\_ PM: \_\_\_\_\_

Auditor: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

This specific checklist has been completed to:

Evaluate CH2M HILL employee exposure to hand and power tool hazards.

Evaluate a CH2M HILL subcontractor’s compliance with hand and power tool requirements.

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

- Check “Yes” if an assessment item is complete/correct.
  - Check “No” if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked “No.”
  - Check “N/A” if an item is not applicable.
  - Check “N/O” if an item is applicable but was not observed during the assessment.
- Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-210.

**SECTION 1**

**Yes No N/A N/O**

**SAFE WORK PRACTICES (5.1)**

1. All tools operated according to manufacturer’s instructions and design limitations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. All hand and power tools maintained in a safe condition and inspected and tested before use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Defective tools are tagged and removed from service until repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. PPE is selected and used according to tool-specific hazards anticipated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Power tools are not carried or lowered by their cord or hose.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Tools are disconnected from energy sources when not in use, servicing, cleaning, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Safety guards remain installed or are promptly replaced after repair.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Tools are stored properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Cordless tools and recharging units both conform to electrical standards and specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Tools used in explosive environments are rated for such use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Knife or blade hand tools are used with the proper precautions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stressors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SECTION 2**

**Yes No N/A N/O**

**GENERAL (5.2.2)**

- 13. PPE is selected and used according to tool-specific hazards anticipated.  Yes  No  N/A  N/O
- 14. Tools are tested daily to assure safety devices are operating properly.  Yes  No  N/A  N/O
- 15. Damaged tools are removed from service until repaired.  Yes  No  N/A  N/O
- 16. Power operated tools designed to accommodate guards have guards installed.  Yes  No  N/A  N/O
- 17. Rotating or moving parts on tools are properly guarded.  Yes  No  N/A  N/O
- 18. Machines designed for fixed locations are secured or anchored.  Yes  No  N/A  N/O
- 19. Floor and bench-mounted grinders are provided with properly positioned work rests.  Yes  No  N/A  N/O
- 20. Guards are provided at point of operation, nip points, rotating parts, etc.  Yes  No  N/A  N/O
- 21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid.  Yes  No  N/A  N/O

**ELECTRIC-POWERED TOOLS (5.2.3)**

- 22. Electric tools are approved double insulated or grounded and used according to SOP HSE-206.  Yes  No  N/A  N/O
- 23. Electric cords are not used for hoisting or lowering tools.  Yes  No  N/A  N/O
- 24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed.  Yes  No  N/A  N/O
- 25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool.  Yes  No  N/A  N/O
- 26. Portable, power-driven circular saws are equipped with proper guards.  Yes  No  N/A  N/O

**ABRASIVE WHEEL TOOLS (5.2.4)**

- 27. All employees using abrasive wheel tools are wearing eye protection.  Yes  No  N/A  N/O
- 28. All grinding machines are supplied with sufficient power to maintain spindle speed.  Yes  No  N/A  N/O
- 29. Abrasive wheels are closely inspected and ring-tested before use.  Yes  No  N/A  N/O
- 30. Grinding wheels are properly installed.  Yes  No  N/A  N/O
- 31. Cup-type wheels for external grinding are protected by the proper guard or flanges.  Yes  No  N/A  N/O
- 32. Portable abrasive wheels used for internal grinding are protected by safety flanges.  Yes  No  N/A  N/O
- 33. Safety flanges are used only with wheels designed to fit the flanges.  Yes  No  N/A  N/O
- 34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength.  Yes  No  N/A  N/O

**PNEUMATIC-POWERED TOOLS (5.2.5)**

- 35. Tools are secured to hoses or whip by positive means to prevent disconnection.  Yes  No  N/A  N/O
- 36. Safety clips or retainers are installed to prevent attachments being expelled.  Yes  No  N/A  N/O
- 37. Safety devices are installed on automatic fastener feed tools as required.  Yes  No  N/A  N/O
- 38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded.  Yes  No  N/A  N/O
- 39. Manufacturer’s safe operating pressure for hoses, pipes, valves, etc. are not exceeded.  Yes  No  N/A  N/O
- 40. Hoses are not used for hoisting or lowering tools.  Yes  No  N/A  N/O
- 41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure.  Yes  No  N/A  N/O
- 42. Airless spray guns have required safety devices installed.  Yes  No  N/A  N/O
- 43. Blast cleaning nozzles are equipped with operating valves, which are held open manually.  Yes  No  N/A  N/O
- 44. Supports are provided for mounting nozzles when not in use.  Yes  No  N/A  N/O
- 45. Air receiver drains, handholes, and manholes are easily accessible.  Yes  No  N/A  N/O
- 46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water.  Yes  No  N/A  N/O
- 47. Air receivers are completely drained at required intervals.  Yes  No  N/A  N/O
- 48. Air receivers are equipped with indicating pressure gauges.  Yes  No  N/A  N/O
- 49. Safety, indicating, and controlling devices are installed as required.  Yes  No  N/A  N/O
- 50. Safety valves are tested frequently and at regular intervals to assure good operating condition.  Yes  No  N/A  N/O

**HSE Self-Assessment Checklist—HAND AND POWER TOOLS**  
**SECTION 2 (continued)**

**Yes No N/A N/O**

**LIQUID FUEL-POWERED TOOLS (5.2.6)**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining.                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 52. Liquid fuels are stored, handled, and transported in accordance with SOP HSE-403                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HSE-203.           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 54. Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**POWDER-ACTUATED TOOLS (5.2.7)**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 55. Only trained employee operates powder-actuated tools.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Powder-actuated tools are not loaded until just prior to intended firing time.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Tools are not pointed at any employee at any time.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 58. Hands are kept clear of open barrel end.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 59. Loaded tools are not left unattended.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 60. Fasteners are not driven into very hard or brittle materials.                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 61. Fasteners are not driven into easily penetrated materials unless suitable backing is provided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 62. Fasteners are not driven into spalled areas.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 63. Powder-actuated tools are not used in an explosive or flammable atmosphere.                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 64. All tools are used with correct shields, guards, or attachments recommended by manufacturer.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**JACKING TOOLS (5.2.8)**

- |   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 65. Rated capacities are legibly marked on jacks and not exceeded.                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 66. Jacks have a positive stop to prevent over-travel.                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 67. The base of jacks are blocked or cribbed to provide a firm foundation, when required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 68. Wood blocks are place between the cap and load to prevent slippage, when required.    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 69. After load is raised, it is cribbed, blocked, or otherwise secured immediately.       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 70. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 71. All jacks are properly lubricated.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 72. Jacks are inspected as required.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 73. Repair or replacement parts are examined for possible defects.                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 74. Jacks not working properly are removed from service and repaired or replaced.         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**HAND TOOLS (5.2.9)**

- |  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 75. Wrenches are not used when jaws are sprung to the point of slippage.                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 76. Impact tools are kept free of mushroomed heads.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 77. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



## HEAT STRESS PHYSIOLOGICAL MONITORING FORM

Project:

Date:

Company:

1. Take and record measurement of temperature and pulse at the frequency indicated on the Heat Index Table.
2. Follow the Physiological Monitoring Protocol on the back of this form.
3. Never continue work if your body temperature is more than 100.4° F/38° C, or if you are experiencing sudden and severe fatigue, nausea, dizziness, or lightheadedness.

Employee:

Describe action taken below if measurements are exceeded:

Time								
Temp								
Pulse								

Employee:

Describe action taken below if measurements are exceeded:

Time								
Temp								
Pulse								

Employee:

Describe action taken below if measurements are exceeded:

Time								
Temp								
Pulse								

Employee:

Describe action taken below if measurements are exceeded:

Time								
Temp								
Pulse								

Employee:

Describe action taken below if measurements are exceeded:

Time								
Temp								
Pulse								

# **CH2M HILL Health and Safety Plan**

## **Attachment 5**

### **Key Target Zero Program Elements**

**(blank forms for field use)**

**Activity Hazard Analysis**

**Pre-Task Safety Plans**

**Safe Behavior Observation**

**Incident Report and Investigation**

**(use electronic form when possible)**

[HITS](#)

**Lessons Learned Template**

## ACTIVITY HAZARD ANALYSIS

<b>Activity:</b>	<b>Date:</b>
<b>Description of the work:</b>	<b>Project Name:</b>
	<b>Site Supervisor:</b>
	<b>Site Safety Officer:</b>
	<b>Review for latest use: Before the job is performed</b>

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)

## ACTIVITY HAZARD ANALYSIS

<b>Work Activity Sequence</b> (Identify the principal steps involved and the sequence of work activities)	<b>Potential Health and Safety Hazards</b> (Analyze each principal step for potential hazards)	<b>Hazard Controls</b> (Develop specific controls for each potential hazard)

<b>Equipment to be used</b> (List equipment to be used in the work activity)	<b>Inspection Requirements</b> (List inspection requirements for the work activity)	<b>Training Requirements</b> (List training requirements including hazard communication)

# ACTIVITY HAZARD ANALYSIS

PRINT NAME

SIGNATURE

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

\_\_\_\_\_

Date/Time: \_\_\_\_\_

Safety Officer Name: \_\_\_\_\_

\_\_\_\_\_

Date/Time: \_\_\_\_\_

Employee Name(s): \_\_\_\_\_

\_\_\_\_\_

Date/Time: \_\_\_\_\_

# CH2MHILL

## Pre-Task Safety Plan (PTSP) and Safety Meeting Sign-in Sheet

Project: _____ Location: _____ Date: _____		
Supervisor: _____ Job Activity: _____ _____		
Attendees:	Print Name	Sign Name
List Tasks and verify that applicable AHAs have been reviewed: _____ _____ _____		
Tools/Equipment Required for Tasks (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools): _____ _____ _____		
Potential H&S Hazards, including chemical, physical, safety, biological and environmental (check all that apply):		
<input type="checkbox"/> Chemical burns/contact	<input type="checkbox"/> Trench, excavations, cave-ins	<input type="checkbox"/> Ergonomics
<input type="checkbox"/> Pressurized lines/equipment	<input type="checkbox"/> Overexertion	<input type="checkbox"/> Chemical splash
<input type="checkbox"/> Thermal burns	<input type="checkbox"/> Pinch points	<input type="checkbox"/> Poisonous plants/insects
<input type="checkbox"/> Electrical	<input type="checkbox"/> Cuts/abrasions	<input type="checkbox"/> Eye hazards/flying projectile
<input type="checkbox"/> Weather conditions	<input type="checkbox"/> Spills	<input type="checkbox"/> Inhalation hazard
<input type="checkbox"/> Heights/fall > 6 feet	<input type="checkbox"/> Overhead Electrical hazards	<input type="checkbox"/> Heat/cold stress
<input type="checkbox"/> Noise	<input type="checkbox"/> Elevated loads	<input type="checkbox"/> Water/drowning hazard
<input type="checkbox"/> Explosion/fire	<input type="checkbox"/> Slips, trip and falls	<input type="checkbox"/> Heavy equipment
<input type="checkbox"/> Radiation	<input type="checkbox"/> Manual lifting	<input type="checkbox"/> Aerial lifts/platforms
<input type="checkbox"/> Confined space entry	<input type="checkbox"/> Welding/cutting	<input type="checkbox"/> Demolition
<input type="checkbox"/> Underground Utilities	<input type="checkbox"/> Security	<input type="checkbox"/> Poor communications
Other Potential Hazards (Describe): _____ _____ _____		

Hazard Control Measures (Check All That Apply):			
<b>PPE</b> <input type="checkbox"/> Thermal/lined <input type="checkbox"/> Eye <input type="checkbox"/> Dermal/hand <input type="checkbox"/> Hearing <input type="checkbox"/> Respiratory <input type="checkbox"/> Reflective vests <input type="checkbox"/> Flotation device <input type="checkbox"/> Hard Hat	<b>Protective Systems</b> <input type="checkbox"/> Sloping <input type="checkbox"/> Shoring <input type="checkbox"/> Trench box <input type="checkbox"/> Barricades <input type="checkbox"/> Competent person <input type="checkbox"/> Locate buried utilities <input type="checkbox"/> Daily inspections <input type="checkbox"/> Entry Permits/notification	<b>Fire Protection</b> <input type="checkbox"/> Fire extinguishers <input type="checkbox"/> Fire watch <input type="checkbox"/> Non-spark tools <input type="checkbox"/> Grounding/bonding <input type="checkbox"/> Intrinsically safe equipment	<b>Electrical</b> <input type="checkbox"/> Lockout/tagout <input type="checkbox"/> Grounded <input type="checkbox"/> Panels covered <input type="checkbox"/> GFCI/extension cords <input type="checkbox"/> Power tools/cord inspected <input type="checkbox"/> Overhead line clearance <input type="checkbox"/> Underground utils ID'd
<b>Fall Protection</b> <input type="checkbox"/> Harness/lanyards <input type="checkbox"/> Adequate anchorage <input type="checkbox"/> Guardrail system <input type="checkbox"/> Covered opening <input type="checkbox"/> Fixed barricades <input type="checkbox"/> Warning system	<b>Air Monitoring</b> <input type="checkbox"/> PID/FID <input type="checkbox"/> Detector tubes <input type="checkbox"/> Radiation <input type="checkbox"/> Personnel sampling <input type="checkbox"/> LEL/O2 <input type="checkbox"/> No visible dust <input type="checkbox"/> Other	<b>Proper Equipment</b> <input type="checkbox"/> Aerial lift/ladders/scaffolds <input type="checkbox"/> Forklift/heavy equipment <input type="checkbox"/> Backup alarms <input type="checkbox"/> Hand/power tools <input type="checkbox"/> Crane with current inspection <input type="checkbox"/> Proper rigging <input type="checkbox"/> Operator qualified	<b>Welding &amp; Cutting</b> <input type="checkbox"/> Cylinders secured/capped <input type="checkbox"/> Cylinders separated/upright <input type="checkbox"/> Flash-back arrestors <input type="checkbox"/> No cylinders in CSE <input type="checkbox"/> Flame retardant clothing <input type="checkbox"/> Appropriate goggles
<b>Confined Space Entry</b> <input type="checkbox"/> Isolation <input type="checkbox"/> Air monitoring <input type="checkbox"/> Trained personnel <input type="checkbox"/> Permit completed <input type="checkbox"/> Rescue	<b>Medical/ER</b> <input type="checkbox"/> First-aid kit <input type="checkbox"/> Eye wash <input type="checkbox"/> FA-CPR trained personnel <input type="checkbox"/> Route to hospital	<b>Heat/Cold Stress</b> <input type="checkbox"/> Work/rest regime <input type="checkbox"/> Rest area <input type="checkbox"/> Liquids available <input type="checkbox"/> Monitoring <input type="checkbox"/> Training	<b>Vehicle/Traffic</b> <input type="checkbox"/> Traffic control <input type="checkbox"/> Barricades <input type="checkbox"/> Flags <input type="checkbox"/> Signs
<b>Permits</b> <input type="checkbox"/> Hot work <input type="checkbox"/> Confined space <input type="checkbox"/> Lockout/tagout <input type="checkbox"/> Excavation <input type="checkbox"/> Demolition <input type="checkbox"/> Energized work	<b>Demolition</b> <input type="checkbox"/> Pre-demolition survey <input type="checkbox"/> Structure condition <input type="checkbox"/> Isolate area/utilities <input type="checkbox"/> Competent person <input type="checkbox"/> Hazmat present	<b>Inspections:</b> <input type="checkbox"/> Ladders/aerial lifts <input type="checkbox"/> Lanyards/harness <input type="checkbox"/> Scaffolds <input type="checkbox"/> Heavy equipment <input type="checkbox"/> Drill rigs/geoprobe rigs <input type="checkbox"/> Cranes and rigging <input type="checkbox"/> Utilities marked	<b>Training:</b> <input type="checkbox"/> Hazwaste (current) <input type="checkbox"/> Construction <input type="checkbox"/> Competent person <input type="checkbox"/> Task-specific <input type="checkbox"/> FA/CPR <input type="checkbox"/> Confined Space <input type="checkbox"/> Hazcom
<b>Underground Utilities</b> <input type="checkbox"/> Dig alert called <input type="checkbox"/> 3 <sup>rd</sup> Party locater <input type="checkbox"/> As-builts reviewed <input type="checkbox"/> Interview site staff <input type="checkbox"/> Client review <input type="checkbox"/> soft locate necessary?	<b>Incident Communications</b> <input type="checkbox"/> Work stops until cleared by TM/CM <input type="checkbox"/> Immediate calls to TM/CM <input type="checkbox"/> Client notification <input type="checkbox"/> 24 hour notification setup <input type="checkbox"/> Clear communications	<b>AHA' s</b> <input type="checkbox"/> reviewed and approved by HSM <input type="checkbox"/> on site and current <input type="checkbox"/> applicable for this day's work <input type="checkbox"/> Communication and incident processes included?	
<b>Field Notes (including observations from prior day, etc.):</b> <hr/> <hr/> <hr/>			

Name (Print): \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

<b>Safe Behavior Observation Form</b>			
<input type="checkbox"/> Federal or <input type="checkbox"/> Commercial Sector (check one)		<input type="checkbox"/> Construction or <input type="checkbox"/> Consulting (check one)	
Project Number:		Client/Program:	
Project Name:		Observer:	Date:
Position/Title of worker observed:		Background Information/ comments:	
Task/Observation Observed: _____			
<ul style="list-style-type: none"> <li>❖ Identify and reinforce safe work practices/behaviors</li> <li>❖ Identify and improve on at-risk practices/acts</li> <li>❖ Identify and improve on practices, conditions, controls, and compliance that eliminate or reduce hazards</li> <li>❖ Proactive PM support facilitates eliminating/reducing hazards (do you have what you need?)</li> <li>❖ Positive, corrective, cooperative, collaborative feedback/recommendations</li> </ul>			
Actions & Behaviors	Safe	At-Risk	Observations/Comments
Current & accurate Pre-Task Planning/Briefing (Project safety plan, STAC, AHA, PTSP, tailgate briefing, etc., as needed)			<b>Positive Observations/Safe Work Practices:</b>
Properly trained/qualified/experienced			
Tools/equipment available and adequate			
Proper use of tools			<b>Questionable Activity/Unsafe Condition Observed:</b>
Barricades/work zone control			
Housekeeping			
Communication			
Work Approach/Habits			
Attitude			<b>Observer's Corrective Actions/Comments:</b>
Focus/attentiveness			
Pace			
Uncomfortable/unsafe position			
Inconvenient/unsafe location			
Position/Line of fire			<b>Observed Worker's Corrective Actions/Comments:</b>
Apparel (hair, loose clothing, jewelry)			
Repetitive motion			
Other...			

For ES Federal Sector projects please email completed forms to: [CH2M HILL ES FED Safe Behavior Observation](#)  
 For ES Commercial Sector projects please email completed forms to: [CH2M HILL ES COM Safe Behavior Observation](#)  
 For CNR ES staff please email completed forms to: [cnressafe@ch2m.com](mailto:cnressafe@ch2m.com)

# HITS Incident Report Hardcopy (Phase 1 – Initial Entry)

## Phase 1 – Initial Entry

### Type of Incident (May select more than one)

- |  |   |                                    |
|--|---|------------------------------------|
| <input type="checkbox"/> Injury/Illness  | <input type="checkbox"/> Spill/Release      | <input type="checkbox"/> Near Miss |
| <input type="checkbox"/> Property Damage | <input type="checkbox"/> Environment/Permit | <input type="checkbox"/> Other     |

### General Information Section

Preparer's Name: \_\_\_\_\_ Preparer's Phone Number: \_\_\_\_\_

Date of Incident: \_\_\_\_\_ Time of Incident: \_\_\_\_\_ AM / PM

What Business Group is accountable for this incident: \_\_\_\_\_

What Business Group SubGroup is accountable for this incident: \_\_\_\_\_

What CH2M HILL Company is accountable for this incident: \_\_\_\_\_

### Where did the Incident occur?

- United States, Geographic Region: \_\_\_\_\_
- Canada, Province/Territory: \_\_\_\_\_
- International, County: \_\_\_\_\_

### Location of Incident?

- Company Premises, CH2M HILL Office (use 3 letter office code if available): \_\_\_\_\_
- Project, Project name: \_\_\_\_\_
- In Transit  
Traveling from: \_\_\_\_\_  
Traveling to: \_\_\_\_\_
- At Home
- Other, Specify: \_\_\_\_\_

Describe the incident: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Describe how this event could have been prevented: \_\_\_\_\_

\_\_\_\_\_

### Provide Witness Information:

Name: _____	Phone: _____
Name: _____	Phone: _____
Name: _____	Phone: _____

### Personnel Notified of Incident (Provide name, date and time):

CH2M HILL Personnel:

\_\_\_\_\_

Client Personnel:

\_\_\_\_\_

### Additional Comments:

\_\_\_\_\_

\_\_\_\_\_

### Injury/Illness Section [Complete only if Injury/Illness Incident type selected]

#### Who was injured?

- CH2M HILL Employee or CH2M HILL Temp Employee
- Subcontractor to CH2M HILL (Non-LLC Joint Venture Project)
- LLC Joint Venture Partner Employee
- LLC Joint Venture Project Subcontractor/Contractor
- Other

Name of Injured: \_\_\_\_\_ Job Title: \_\_\_\_\_

Employer Name: \_\_\_\_\_ Supervisor of Employee: \_\_\_\_\_

### Complete for CH2M HILL Employee Injuries

Business Group of Injured Employee: \_\_\_\_\_

Has the employee called the Injury Management Administrator (1-800-756-1130)?

Yes  No  Not Sure

Has the injured employee's supervisor been notified of this incident?

Yes  No  Not Sure

**Complete for Non-CH2M HILL Employee Injuries**

Has the project safety coordinator been notified of this incident?

Yes  No  Not Sure

Project Safety Coordinator: \_\_\_\_\_

Body Part Affected: \_\_\_\_\_

Injury/Illness (Result): \_\_\_\_\_

Describe treatment provided (if medication provided, identify whether over-the-counter or prescription): \_\_\_\_\_

Describe any work restriction prescribed (include dates and number of days): \_\_\_\_\_

**Physician/Health Care Provider Information**

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

Was treatment provided away from the worksite?

No  
 Yes

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

Address: \_\_\_\_\_

City: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Was injured treated in an emergency room?

No  Yes

Was injured hospitalized overnight as an in-patient?

No  Yes

**General Information Environmental Section [Complete only if Environment/Permit or Spill/Release Incident type selected]**

Who had control of the area during the incident?

- CH2M HILL, Company: \_\_\_\_\_
  - Subcontractor, Company: \_\_\_\_\_
  - Joint Venture Partner/Contractor/Subcontractor, Company: \_\_\_\_\_
  - Other, Company: \_\_\_\_\_
- Relationship to CH2M HILL: \_\_\_\_\_

**Property Damage Section [Complete only if Property Damage Incident type selected]**

Property Damaged: \_\_\_\_\_

Property Owner: \_\_\_\_\_

Damage Description: \_\_\_\_\_

Estimated US Dollar Amount: \_\_\_\_\_

**Spill or Release Section [Complete only if Spill/Release Incident type selected]**

Substance: \_\_\_\_\_

Estimated Quantity: \_\_\_\_\_

Did the spill/release move off the property?: \_\_\_\_\_

Spill/Release From: \_\_\_\_\_

Spill/Release To: \_\_\_\_\_

**Environment/Permit Section [Complete only if Environment/Permit Incident type selected]**

Describe Environmental or Permit Issue: \_\_\_\_\_

Permit Type: \_\_\_\_\_

Permitted Level or Criteria (e.g., discharge limit): \_\_\_\_\_

Permit Name and Number (e.g., NPDES No. ST1234): \_\_\_\_\_

Substance and Estimated Quantity: \_\_\_\_\_

Duration of Permit Exceedence: \_\_\_\_\_



# Lessons Learned

[Date] ESBG LL-11-xx

<b>Subject</b>	[Insert Descriptive Name of Lessons Learned]
<b>CH2M HILL Project?</b>	[Yes or No]
<b>Situation</b>	[Describe incident or situation that occurred in general terms. Try to be brief and avoid unnecessary details such as names of people or projects, business groups, divisions, dates, location, etc.]
<b>Lessons Learned (Recommendations and Comments)</b>	<ul style="list-style-type: none"><li>• Bullet out any lessons learned, recommendations or other important “take away” information that would benefit others. Tie the recommendations to the incident or event, and avoid including information that is not directly tied to the event.</li></ul>
<b>Submitted By</b>	[Name/Office Location/Phone]
<b>Additional Information Contact</b>	[Name/Office Location/Phone]
<b>Keywords/Categories</b>	[Insert any keywords or incident categories that would aid in a search for this lessons learned]

Send completed Lessons Learned to the ESBG HSSE Director for posting and distribution. Please include a recommended distribution list.

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**CH2M HILL Health and Safety Plan**  
**Attachment 6**

**Fact Sheets**  
**Tick Fact Sheet**  
**Vehicle Accident Guidance**  
**Working Alone**

## Tick-Borne Pathogens — A Fact Sheet

Most of us have heard of Lyme disease or Rocky Mountain Spotted Fever (RMSF), but there are actually six notifiable tick-borne pathogens that present a significant field hazard. In some areas, these account for more than half of our serious field incidents. The following procedures should be applied during any field activity—even in places that are predominantly paved with bordering vegetation.

### Hazard Recognition

An important step in controlling tick related hazards is understanding how to identify ticks, their habitats, their geographical locations, and signs and symptoms of tick-borne illnesses.

### Tick Identification

There are five varieties of hard-bodied ticks that have been associated with tick-borne pathogens. These include:

- Deer (Black Legged) Tick (eastern and pacific varieties)
- Lone Star Tick
- Dog Tick
- Rocky Mountain Wood Tick

These varieties and their geographical locations are illustrated on the following page.

### Tick Habitat

In eastern states, ticks are associated with deciduous forest and habitat containing leaf litter. Leaf litter provides a moist cover from wind, snow, and other elements. In the north-central states, is generally found in heavily wooded areas often surrounded by broad tracts of land cleared for agriculture.

On the Pacific Coast, the bacteria are transmitted to humans by the western black-legged (deer) tick and habitats are more diverse. For this region, ticks have been found in habitats with forest, north coastal scrub, high brush, and open grasslands. Coastal tick populations thrive in areas of high rainfall, but ticks are also found at inland locations.

### Illnesses and Signs & Symptoms

There are six notifiable tick-borne pathogens that cause human illness in the United States. These pathogens may be transmitted during a tick bite—normally hours after attachment. The illnesses, presented in approximate order of most common to least, include:

- Lyme (bacteria)
- RMSF (bacteria)
- Ehrlichiosis (bacteria)
- STARI (Southern Tick-Associated Rash Illness) (bacteria)
- Tularemia (Rabbit Fever) (bacteria)
- Babesia (protozoan parasite)

Symptoms will vary based on the illness, and may develop in infected individuals typically between 3 and 30 days after transmission. Some infected individuals will not become ill or may develop only mild symptoms. These illnesses present with some or all of the following signs & symptoms: fever, headache, muscle aches, stiff neck, joint aches, nausea, vomiting, abdominal pain, diarrhea, malaise, weakness, small solid, ring-like, or spotted rashes. The bite site may be red, swollen, or develop ulceration or lesions. For Lyme disease, the bite area will sometimes resemble a target pattern. A variety of long-term symptoms may result if the illness is left untreated, including debilitating effects and death.



Deer Tick



Distribution of Deer Tick (dark green)



From Left: adult female, adult male, nymph, and larvae Deer Tick (cm scale)



Distribution of Pacific Deer Tick (dark green)



Lone Star Tick



Distribution of Lone Star Tick (Green)



Dog Tick



Yellow indicates approximate distribution area



Rocky Mountain Wood Tick



Yellow indicates approximate distribution area

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### Hazard Control

The methods for controlling exposure to ticks include, in order of most- to least-preferred:

- Avoiding tick habitats and ceasing operations in heavily infested areas
- Reducing tick abundance through habitat disruption or application of acaricide
- Personal protection through use of repellants and protective clothing
- Frequent tick inspections and proper hygiene

Vaccinations are not available and preventative antibiotic treatment after a bite is generally not recommended.

### Avoidance and Reduction of Ticks

To the extent practical, tick habitats should be avoided. In areas with significant tick infestation, consider stopping work and withdrawing from area until adequate tick population control can be achieved. Stopping and withdrawing should be considered as seriously as entering an area without proper energy control or with elevated airborne contaminants—tick-borne pathogens present risk of serious illness!

In areas where significant population density or infestation exists, tick reduction should be considered. Tick reduction can be achieved by disrupting tick habitats and/or direct population reduction through the use of tick-toxic pesticides (Damminix, Dursban, Sevin, etc.).

Habitat disruption may include only simple vegetative maintenance such as removing leaf litter and trimming grass and brush. Tick populations can be reduced by between 72 and 100 percent when leaf litter alone is removed. In more heavily infested areas, habitat disruption may include grubbing, tree trimming or removal, and pesticide application (Damminix, Dursban, Sevin, etc.). This approach is practical in smaller, localized areas or perimeter areas that require occasional access. Habitat controls are to be implemented with appropriate health and safety controls, in compliance with applicable environmental requirements, and may be best left to the property owner or tenant or to a licensed pesticide vendor. Caution should be exercised when using chemical repellents or pesticides in or around areas where environmental or industrial media samples will be collected for analysis.

### Personal Protection

After other prevention and controls are implemented, personal protection is still necessary to control exposure to ticks. Personal protection must include all of the following steps:

- So that ticks may be easily seen, wear light-colored clothing. Full-body New Tyvek (paper-like disposable coveralls) may also be used
- To prevent ticks from getting underneath clothing tuck pant legs into socks or tape to boots
- Wear long-sleeved shirts, a hat, and high boots
- Apply DEET repellent to exposed skin or clothing per product label
- Apply permethrin repellent to the outside of boots and clothing before wearing, per product label
- Frequently check for ticks and remove from clothing
- At the end of the day, search your entire body for ticks (particularly groin, armpits, neck, and head) and shower

- To prevent pathogen transmission through mucous membranes or broken/cut skin, wash or disinfect hands and/or wear surgical-style nitrile gloves any time ticks are handled

Pregnant individuals and individuals using prescription medications should consult with their physician and/or pharmacists before using chemical repellents. Because human health effects may not be fully known, use of chemical repellents should be kept to a minimum frequency and quantity. Always follow manufacturers' use instructions and precautions. Wash hands after handling, applying, or removing protective gear and clothing. Avoid situations such as hand-to-face contact, eating, drinking, and smoking when applying or using repellents.

Remove and wash clothes per repellent product label. Chemical repellents should not be used on infants and children.

Vaccinations are generally not available for tick-borne pathogens. Although production of the LYMERix™ Lyme disease vaccination has been ceased, vaccination may still be considered under specific circumstances and with concurrence from the consulting physician.

#### Tick Check

A tick check should be performed after field survey before entering the field vehicle (you do not want to infest your field vehicle with ticks). Have your field partner check your back; the backs of your legs, arms, and neck; and your hairline. Shake off clothing as thorough as possible before entering the vehicle. Once the field day is complete, repeat this procedure and perform a thorough self check.

If a tick has embedded itself into the skin, remove the tick as described below.

#### Tick Removal

1. Use the tick removal kit obtained through the CH2M HILL Milwaukee warehouse, or a fine-tipped tweezers or shield your fingers with a tissue, paper towel, or nitrile gloves.

**Error! Objects cannot be created from editing field codes.**

2. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. If this happens, remove mouthparts with tweezers. Consult your healthcare provider if infection occurs.



3. Avoid squeezing, crushing or puncturing the body of the tick because its fluids (saliva, hemolymph, gut contents) may contain infectious organisms. Releasing these organisms to the outside of the tick's body or into the bite area may increase the chance of infectious organism transmission.

4. Do not handle the tick with bare hands because infectious agents may enter through mucous membranes or breaks in the skin. This precaution is particularly directed to individuals who remove ticks from domestic animals with unprotected fingers. Children, elderly persons, and immunocompromised persons may be at greater risk of infection and should avoid this procedure.

5. After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.

6. Should you wish to save the tick for identification, place it in a plastic bag, with the date of the tick bite, and place in your freezer. It may be used at a later date to assist a physician with making an accurate diagnosis (if you become ill).

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**Note:** Folklore remedies such as petroleum jelly or hot matches do little to encourage a tick to detach from skin. In fact, they may make matters worse by irritating the tick and stimulating it to release additional saliva, increasing the chances of transmitting the pathogen. These methods of tick removal should be avoided. In addition, a number of tick removal devices have been marketed, but none are better than a plain set of fine tipped tweezers.

#### First-Aid and Medical Treatment

Tick bites should always be treated with first-aid. Clean and wash hands and disinfect the bite site after removing embedded tick. Individuals previously infected with Lyme disease does not confer immunity—re-infection from future tick bites can occur even after a person has contracted a tick-borne disease.

The employee should contact the Injury Management/Return To Work provider (IMRTW), WorkCare using the toll-free number 866-893-2514 to report the tick bite. WorkCare will follow-up with each CH2M Hill employee who reports a tick bite and is at risk of developing Lyme disease by monitoring for symptoms up to 45 days, and will refer the employee to a medical provider for evaluation and treatment as necessary.



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## 2011 Vehicle Accident Guidance – ESBG

Remember that if you are **renting** a non-CH2M HILL owned vehicle (short-term rental) in the U.S., you should carry the [insurance card](#) from the state where your driver's license is issued.

If you operate a **fleet vehicle**, carry the [insurance card](#) where the vehicle is registered.

### **For ALL Vehicles if you are in an accident:**

1. If you are injured, call 911 for emergency medical treatment or 1-866-893-2514 to contact the CH2M HILL Occupational Nurse/Physician for minor injuries. If you feel you have not been injured, contact the RHSM for guidance on whether calling the CH2M HILL Occupational Nurse/Physician is applicable.
2. **Call the Police**--For any vehicle accident/damage, it is recommended that the local police (or site security/emergency services if working on a client site that provides such services) be called to determine if a report needs to be filed. In some instances, a report may not be required (during accident alerts, or in public parking lots). Document that the authorities were called and follow up with any guidance they give you. State requirements vary. If a report is filed, obtain a copy.
3. Notify Supervisor, (and PM/RHSM if working on a project site)
4. Complete a HITS report on the VO.

### **Additional Steps**

To report an auto accident, and before a claim can be taken by telephonic reporting, have available your name (the company name alone is no longer accepted, a driver's name must be provided even for fender benders), location of accident and your office address if different than the accident location, business group and project number. A claim cannot be taken without your name, address, business group and your project number. By location the state where the accident occurred, and which office you are aligned to, i.e., accident occurs in Idaho, but you are out of the Denver office. Advise the claim recorder the accident occurred in ID, but that your office location is Denver. This will assist the claim intake person in identifying location coding for the claims.

### **Auto accidents involve two different sections of an Auto policy:**

- 1) Liability to others due to Bodily Injury and Property Damage
- 2) Physical Damage - Comprehensive and Collision - damage to the vehicle CH employee is driving

CH2M Hill has Liability coverage for any auto - our policy will respond on either a primary or excess basis.

Refer to the table below for additional notifications to make based on the type of accident experienced and type of vehicle being used.



### Liability - Bodily Injury or Property Damage to Others

Scenario	Which Coverage Responds	What to do if in an accident
CH2M Hill fleet, pool or project vehicle - long term lease - lower 48	CH2M Hill - Primary	Contact Broadspire (1-800-753-6737); Jennifer Rindahl/DEN (720-286-2449); Linda George/DEN (720-286-2057)
CH2M Hill fleet, pool or project vehicle - long term lease - Alaska (North Slope)	CH2M Hill - Primary	Contact Jennifer Rindahl/DEN (720-286-2449)
Client vehicle driven by CH2M Hill employee	Client's auto policy unless client has made CH2M Hill responsible for vehicle	Contact Broadspire (1-800-753-6737); Contact Jennifer Rindahl/DEN (720-286-2449); contact client;
Short term lease (30 days or less)	Rental car company if rented through Enterprise, Budget or Hertz; CH2M Hill excess	Contact Broadspire (1-800-753-6737); Contact local branch of rental car company where vehicle leased (ERAC includes 24 hour roadside assistance) and Jennifer Rindahl/DEN (720-286-2449)
Short term lease (30 days or less)	CH2M Hill - Primary if rented through company other than our national agreements; \$100,000 deductible	Contact Broadspire (1-800-753-6737); Contact rental car company and Jennifer Rindahl/DEN (720-286-2449)
Personal vehicle used on business	Employee's personal auto policy; CH2M Hill on an excess basis	Contact personal auto insurance company; contact Jennifer Rindahl/DEN (720-286-2449)

### Physical Damage - damage to vehicle CH employee was driving

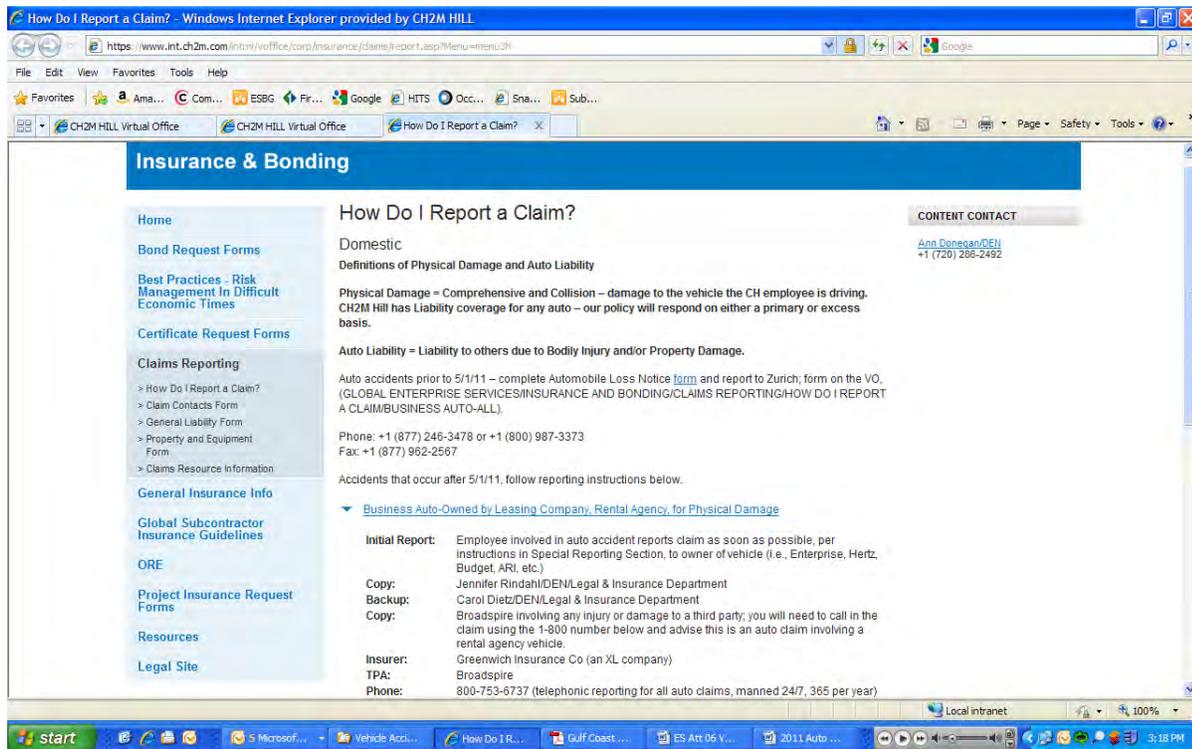
Scenario	Which Coverage Responds	What to do if in an accident
CH2M Hill fleet, pool or project vehicle - long term lease - lower 48	CH2M Hill ONLY if vehicle is scheduled on policy - \$5,000 deductible	Contact Broadspire (1-800-753-6737); Jennifer Rindahl/DEN (720-286-2449); Linda George/DEN (720-286-2057)
CH2M Hill fleet, pool or project vehicle - long term lease - Alaska (North Slope)	CH2M Hill Equipment Schedule if scheduled on policy	Contact Jennifer Rindahl/DEN (720-286-2449)
CH2M Hill fleet, pool or project vehicle - long term lease	ARI if physical damage coverage purchased - \$500 deductible	Contact Jennifer Rindahl/DEN 720.286.2449; call ARI at 1-800-221-1645 give them Client Code and ARI fleet vehicle number; and notify Linda George/DEN - Fleet Coordinator - 720-286-2057
Client vehicle CH2M Hill Employee is driving	Client's auto policy unless client has made CH2M Hill contractually responsible for vehicle	Contact Jennifer Rindahl/DEN (720-286-2449); contact client; contact Broadspire (1-800-753-6737)
Short term lease (30 days or less) using corporate VISA	VISA if corporate credit card used and vehicle is not a pickup, truck, cargo van or used off-road	Contact VISA - 1-800-847-2911 or <a href="http://www.visa.com/eclaim">http://www.visa.com/eclaim</a>
Short term lease (30 days or less) through Enterprise (ERAC) and vehicle is used off-road and physical damage coverage included when vehicle leased	ERAC up to \$3,000 in damage; CH2M Hill's coverage is excess	Notify Rental Car Company; contact Jennifer Rindahl/DEN (720-286-2449) if damage over \$5,000
Short term lease (30 days or less) did <b>not</b> use corporate VISA	CH2M Hill - \$5,000 deductible (project responsibility)	Contact Broadspire (1-800-753-6737); Contact Jennifer Rindahl/DEN 720-286-2449; contact VISA - 1-800-847-2911 or <a href="http://www.visa.com/eclaim">http://www.visa.com/eclaim</a>
Personal vehicle used on business	CH will reimburse the amount of the deductible carried on the employee's policy up to \$500 whichever is less	Contact Jennifer Rindahl/DEN (720-286-2449); contact client; contact Broadspire (1-800-753-6737)



Details for reporting a claim on the CH2M Hill VO are accessed by going to the VO home page and clicking: GLOBAL ENTERPRISE SERVICES/INSURANCE & BONDING/CLAIMS REPORTING

HOW DO I REPORT A CLAIM TAB or access the following URL:

<https://www.int.ch2m.com/intrnl/voffice/corp/insurance/claims/report.asp?Menu=menu3h>



### **For Personally Owned Vehicles (POVs):**

CH2M HILL does not provide auto insurance for POVs, it is responsibility of the owner. If you are in a vehicle accident conducting company business, contact the police as above, supervisor, and 911 or CH2M HILL's occupational nurse/physician as stated above. Complete a HITS report. Contact Jennifer Rindahl/DEN for assistance for meeting personal insurance deductibles (up to \$500) with proof of insurance and deductible.

If using your POV for extended project use, notify the PM to make sure a rental car is not needed. Check your insurance policy for guidance on using the POV for business use.

### **Additional Resources:**

[Claims Resource Manual](#)

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**WORKING ALONE PROTOCOL  
CALL - IN CONTACT FORM**

Date of site work: \_\_\_\_\_ Expected start time: \_\_\_\_\_

Name of CH2M HILL employee in the field: \_\_\_\_\_

Name of CH2M HILL employee responsible to receive contact:

Client Emergency Contact (if any):

CH2M HILL employee's contact numbers:

Radio # \_\_\_\_\_

Cell Phone # \_\_\_\_\_

Address and Location of work: \_\_\_\_\_

Directions/Map:

Planned Activity: \_\_\_\_\_

Specified Frequency and time for call in: \_\_\_\_\_

Time

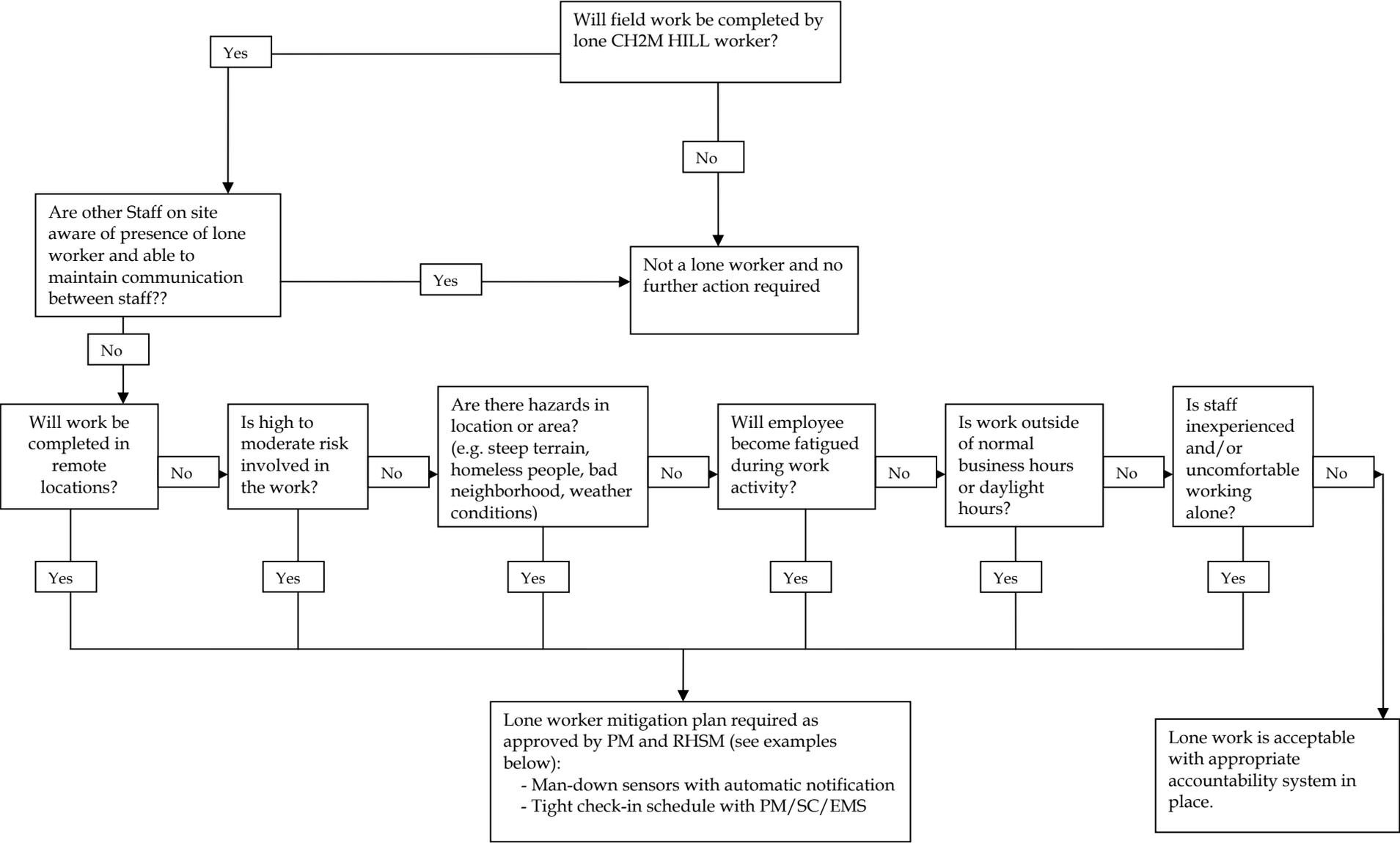
Verified

Location

If lone worker fails to call in at specified frequency/time:

- 1) Call worker's radio and cell to determine if an emergency exists.
- 2) If no reply, immediately call Client security/emergency service if there is one at the site.
- 3) If there is no client security call Emergency Services (911). Inform the dispatcher there is a lone worker that cannot be contacted and there may be an emergency on site. Provide the lone worker's name, their last known location, and your contact information.
- 4) After Emergency Services have been contacted, call the other emergency contacts, Project Manager, and Responsible Health and Safety Manager.

# Lone Worker Protocol



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# **CH2M HILL HEALTH AND SAFETY PLAN**

## **Attachment 7**

### **Observed Hazard Form**

**OBSERVED HAZARD FORM**

Name/Company of Observer (*optional*):

Date reported: \_\_\_\_\_

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

Contractor/s performing unsafe act or creating unsafe condition:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Unsafe Act or Condition:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Location of Unsafe Act or Condition:

**Name of CH2M HILL Representative:**

\_\_\_\_\_

Corrective Actions Taken: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Project Safety Committee Evaluation: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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# **CH2M HILL HEALTH AND SAFETY PLAN**

## **Attachment 8**

### **Stop Work Order Form**

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**CH2MHILL**

# Stop Work Order

**REPORT PREPARED BY:**

Name:	Title:	Signature:	Date:

---

**ISSUE OF NONPERFORMANCE:**

Description:	Date of Nonperformance:

**SUBCONTRACTOR SIGNATURE OF NOTIFICATION:**

Name:	Title:	Signature:	Date:

---

*\* Corrective action is to be taken immediately. Note below the action taken, sign and return to CCI.\* Work may not resume until authorization is granted by CH2M HILL Constructors, Inc. Representative,*

**SUBCONTRACTOR'S CORRECTIVE ACTION**

Description:	Date of Nonperformance:

**SUBCONTRACTOR SIGNATURE OF CORRECTION**

Name:	Title:	Signature:	Date:

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# **CH2M HILL HEALTH AND SAFETY PLAN**

## **Attachment 9**

### **Agency Inspection Target Zero Bulletin**

# TARGET ZERO BULLETIN

**Subject: HSSE Agency Inspections (OSHA, EPA, DOT, State Health Department)**

## **Do you know what YOU would do if an agency inspector arrived at your site unannounced?**

Recently, a State Occupational Safety and Health Administration (OSHA) inspector made an unannounced visit to one of our Federal project sites. OSHA, U.S. Environmental Protection Agency (EPA), and authorized state or local agencies have authority to inspect any facility that is subject to health, safety, and environmental legislation. Inspections may be announced or unannounced. This particular inspector indicated that the project was targeted for an inspection because the work was funded by the American Recovery and Reinvestment Act (ARRA).

Enterprise Standard Operating Procedure (SOP) HSE-201, *Agency Inspections and Communications*, describes the responsibilities, procedures, and requirements associated with inspections conducted by external regulatory agencies, as well as the methods for communicating information to key individuals. This Target Zero Bulletin is a brief summary of what to do in the event of an agency inspection at your site. Refer to the SOP for more specific guidance.

### **Notification of Inspections**

- If the inspection is an announced regulatory agency inspection, the Project Manager (PM) should notify the Responsible Health and Safety Manager (RHSM) and Responsible Environmental Manager (REM) well in advance of the inspection.
- If an unannounced agency inspector visits one of our projects, Field personnel must immediately notify the project Emergency Response Coordinator (ERC). Typically the ERC is the Safety Coordinator (SC).
- The **ERC must immediately notify the RHSM/REM**, as appropriate, of unannounced inspections, or designate someone to call the RHSM/REM. The RHSM/REMs can provide guidance to the field staff and PM.

### **Inspector Credential Verification**

- Upon arrival, the ERC must request the inspector to provide official credentials. Record the inspector's name and office phone number or obtain the inspector's business card.
- The inspector shall sign the visitors log and be given a site-specific health, safety, and environmental protection briefing.
- The inspector shall meet any site access requirements associated with security clearances, specialized training, and medical monitoring. The CH2M HILL representative shall verify that the inspector possesses these requirements; access will only be granted to those areas where appropriate access requirements are met. Some inspectors have the authority to gain access to any work area at any time, such as an inspector with a search warrant. In these cases, we can stop work operations as necessary to protect the safety of the inspector(s).

### **Opening Conference**

- The CH2M HILL Project Manager, ERC, RHSM, or REM, and the inspector shall determine attendees for the opening conference. The RHSM (for OSHA and other worker health and safety inspections) or REM (for environmental inspections) shall join the opening conference via conference call.
- The inspector shall inform CH2M HILL of the purpose of the inspection and provide a copy of the complaint, if applicable.
- The inspector shall outline the scope of the inspection, including employee interviews conducted in private, physical inspection of the workplace and records, possible referrals, discrimination complaints, and the closing conference(s).

### **Requests for OSHA Logs**

- An OSHA inspector may request to review the project OSHA Injury/Illness log, better known as the OSHA 300 Log. Contact your RHSM for assistance in obtaining the OSHA 300 Log.

- 
- Field projects with a continuous duration of one year or longer are considered to be separate establishments and are required to maintain an OSHA 300 log specific to the project. The project OSHA 300 log should be maintained onsite and kept current.
  - Recordable injuries and illnesses sustained on field projects less than one year in duration are maintained on the CH2M HILL office log where the injured employee is based.

### The Inspection

- The scope of the inspection shall be limited to that indicated by the inspector in the opening conference. The inspector shall be escorted to relevant areas only. The ERC or other designated by the RHSM or REM must accompany the inspector during the inspection.
- Ensure that the inspection is limited to the scope that the inspector disclosed during the opening conference. The ERC should always take notes which identify: areas inspected, machinery or equipment and materials examined, employees or other persons interviewed, and photographs taken by the inspector.
- The inspector will observe safety, health, and environmental conditions and practices and document the inspection process. The inspector may also take photos and instrument readings, examine records, collect air samples, measure noise levels, survey existing engineering controls, and monitor employee exposure to toxic vapors, gases, and dusts.
- CH2M HILL should gather duplicate information (photographs, readings, samples) in the same manner and condition as the inspector. If the equipment needed to take duplicate samples is not onsite, ask the inspector if the sampling can wait until the equipment is available. If samples are taken, request a description of the tests that the agency intends to perform on the samples and request results as soon as they are available.
- Employees may be questioned during the inspection tour. The employee can refuse to speak to an inspector, can speak to the inspector with a company representative (including management) present, or can speak to the inspector privately. It is CH2M HILL policy that employees who wish to speak to the inspector are not discriminated against, intimidated, or otherwise mistreated for exercising their rights during compliance inspections.
- Copies of documents should not be provided to the inspector without the approval of the RHSM or REM or Legal Insurance Department (LID). **DO NOT** voluntarily release documents. Respond only to inspection team requests.
- During the course of the inspection, the inspector may point out violations. For each violation, the CH2M HILL representative should ask the inspector to discuss possible corrective action. Where possible, violations detected by the inspector should be corrected immediately and noted by the inspector as corrected.
- For those items which cannot be corrected immediately, an action plan shall be formulated for timely correction. In any instance, employees exposed to hazards shall be removed from the area.

### Closing Conference

After the inspection, a closing conference is normally held as follows:

- The CH2M HILL PM, ERC, RHSM or REM shall be involved via conference call in the closing conference, at a minimum;
- The inspector shall describe the apparent violations found during the inspection and other pertinent issues as deemed necessary by the inspector. CH2M HILL shall be advised of their rights to participate in any subsequent conferences, meetings or discussions. Any unusual circumstances noted during the closing conference shall be documented by the ERC;
- The inspector shall discuss violations observed during the inspection and indicate for which violations a citation and a proposed penalty may be issued or recommended;
- The ERC shall request receipts for all samples and approved documents photocopied by the inspector, request a photocopy of the inspector's photograph log, and request a copy of the final inspection report; and
- Any documentation from an agency inspection must be transmitted immediately to the RHSM or REM, and LID.

**Unannounced regulatory agency inspections may happen at any time on our projects -**

**Get your RHSM/REM and PM involved immediately if an Inspector arrives.**

# **CH2M HILL HEALTH AND SAFETY PLAN**

## **Attachment 10**

**Completed CH2M HILL AHAs**

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) - Drilling and Well Installation**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
<p>Complete HSP, AHA review Complete Pre-Task Safety Plan Complete Drilling Self Assessment checklist (for observing drilling only)</p>	<p>Vehicle congestion, traffic flow/control, access difficulties, visibility hazards working around heavy equipment</p>	<ul style="list-style-type: none"> <li>• Wear proper PPE as specified in HSP including safety glasses with side shields, hard hat, hearing protection, safety boots, work gloves, and high visibility traffic vest.</li> <li>• Determine appropriate locations for drill rig and support vehicles and ensure that roadways are clear for travel</li> <li>• Use cones or barricades as necessary to identify and control site boundaries and access.</li> </ul>	<p>Standard Level D PPE *</p>
<p>Confirm list of soil borings/wells to be installed, determine locations and route to be taken.</p> <p>Review, inspect and locate safety equipment incl. Fire extinguisher, first aid kit, insect repellent, ice melt, PPE, etc.</p>	<p>Remote areas, biohazards associated with wells in remote areas.</p> <p>Weather related issues (heat and/or cold stress).</p>	<ul style="list-style-type: none"> <li>• Check area for rig accessibility (i.e. clearances, solid ground).</li> <li>• Staff should understand and be able to recognize the signs and/or symptoms of cold and hot weather related illnesses.</li> <li>• Watch for animal hazards in wooded and grassy areas (i.e. snakes, etc.).</li> <li>• Follow the biological hazard precautions, guidelines, and fact sheets in the HSP for ticks, rodents, spiders, snakes, hazardous plants, etc.</li> <li>• If near waterways watch for snakes, slippery surfaces, uneven walkways. Wear sturdy, steel-toe boots.</li> <li>• Wear and use proper clothing and sprays to protect against ticks, mosquitoes, poison ivy, and other biological hazards.</li> <li>• Personnel should dress appropriately for ambient temperatures which would include but not limited to dry layered clothing.</li> <li>• For hot weather, work schedules may need to be adjusted to provide time intervals for replenishing fluids and which is free of contamination.</li> <li>• Review/Inspect safety equipment prior to starting work. Ensure fire extinguisher, spill kit, eye wash unit, and first aid kits are at the location.</li> <li>• Check the fire extinguisher on drill rig to verify inspection and charge.</li> <li>• Know where the kill switch is located on the drill rig in case an emergency shut-down is necessary.</li> </ul>	<p>Standard Level D PPE *</p>

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) - Drilling and Well Installation**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Mobilize to drilling location, drill set up, set up decon area for augers	<p>Contact, caught, fall, and driving hazards. Exertion-heavy lifting.</p> <p>Striking or coming into contact with buried or overhead utilities may potentially expose personnel to hazards including high voltage, electricity, natural gas, industrial wastewater, and raw sewage.</p>	<ul style="list-style-type: none"> <li>• Check well locations for underground and overhead utilities.</li> <li>• All locations will be marked with paint, NASKW will be notified at least 48 hours before beginning work, work will not proceed until underground utilities have been cleared.</li> <li>• Observe rig mast set up, so no contact with overhead obstacles.</li> <li>• Ensure that all overhead utilities are at least 20 feet away from the mast of the drilling rig</li> <li>• Proper rig set up and leveling. Remind everyone never to leave hand tools on rig.</li> <li>• Utilize proper lifting procedure when loading and unloading vehicles and equipment (i.e. augers, sand bags, and bentonite). Use mechanical means when available or necessary.</li> <li>• Bend down at the knees and lift with your legs rather than bending and lifting with your back. Do not lift and twist.</li> <li>• Personnel should stay out of the operator's blind spots while equipment is being moved and set up between borings.</li> <li>• Wear high visibility traffic vests.</li> <li>• Ensure that all heavy equipment has reverse alarms.</li> <li>• Remain alert and attentive to location of and movement of all drilling equipment.</li> </ul>	Standard Level D PPE *
	Fire/explosion/Spill Hazards associated with drill rig	<ul style="list-style-type: none"> <li>• Use non-sparking tools as potential to contact free product (gasoline) is possible.</li> <li>• Ensure drill rig is grounded.</li> <li>• Have spill materials and 20-lb ABC fire extinguisher in the area.</li> <li>• Have fire extinguisher accessible within work area. Where exposure to free product is possible, use non-sparking tools. Monitor work area and breathing zone with CGI. If CGI indicates LEL of 5% or greater (or oxygen contact below 19.5% or greater than 23.5%), suspend work. If readings are sustained, contact HSM.</li> <li>• Eliminate static electricity by grounding, where applicable/feasible.</li> <li>• Keep ignition sources away from the work area.</li> <li>• No smoking in the area and set-up zones large enough to keep public at safe distance.</li> </ul>	Standard Level D PPE *
Drilling on the active flight line	Disruption of air traffic. Collision with aircraft on taxiways or aircraft parking apron. Foreign object damage to aircraft engines	<ul style="list-style-type: none"> <li>• Do not setup drilling rig within 150 feet of taxiway center line.</li> <li>• Face drill rig away from taxiway, if possible. Lower mast at the end of each day. Wear orange safety vests.</li> <li>• Inspect vehicles and tires for soil and rocks before entering the flight line and before leaving the site. Remove any rocks or soil or rocks from vehicles tires before entering the flight line or leaving the site.</li> </ul>	Standard Level D PPE *

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) - Drilling and Well Installation**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
<p>Hand clear soil boring location to assure no underground improvements (if appropriate and necessary).</p> <p>(Hand dig to 5 feet bgs in areas where suspected utilities may be but not showing on utility surveys.)</p>	<p>Contact, Exposure, Exertion Hazards</p> <p>Striking or coming into contact with buried or overhead utilities may potentially expose personnel to hazards including high voltage, electricity, natural gas, industrial wastewater, and raw sewage.</p>	<ul style="list-style-type: none"> <li>• Hand clear slowly, do not force through soil may contact/break underground lines (“soft dig” technologies recommended).</li> <li>• If an obstruction is encountered, suspend work and determine what it is. If it cannot be determined, contact client or project representative – location may have to be moved.</li> <li>• Wear proper PPE: safety glasses with side shields, hard hat, safety boots, leather gloves, high visibility traffic vest, chemical resistant over-gloves, if necessary.</li> <li>• Slowly hand clear and use a balanced stance with feet shoulder width apart to avoid back, neck, and wrist strain.</li> <li>• Take turns to avoid fatigue</li> <li>• Drink plenty of water (hot, warm, and cold weather).</li> </ul>	<p>Standard Level D PPE *</p>

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida**  
**ACTIVITY HAZARD ANALYSIS (AHA) - Drilling and Well Installation**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Begin Drilling/ Soil Boring	<p>Exposure to loud noise, flying debris, dust, chemical contamination, and entanglement with rotating equipment.</p> <p>Exposure to overhead suspended loads</p>	<ul style="list-style-type: none"> <li>• Do not allow the drill rig to be running when the driller is not present.</li> <li>• If an obstruction is encountered, suspend work and determine what it is. If it cannot be determined, contact client or project representative – location may have to be moved.</li> <li>• Stay away from moving rotating parts (i.e. augers, drill drive shaft)</li> <li>• Personnel will not wear loose fitting clothing to avoid the potential for entanglement with rotating equipment.</li> <li>• Personnel with long hair shall tie hair back to prevent entanglement in machinery..</li> <li>• Do not attempt to operate drill unless emergency shut-down is operational.</li> <li>• Bend down at the knees and lift with your legs rather than bending and lifting with your back.</li> <li>• Drink plenty of water/ gatorade.</li> <li>• Air monitoring will be performed in breathing zone in accordance with site HSP. Action levels will be followed in site HSP.</li> <li>• Wear proper PPE: safety glasses with side shields, hard hat, safety boots, high visibility safety vest, leather and/or chemical resistant gloves, hearing protection, if necessary, and coveralls or tyvek if there is potential for contacting potentially contaminated soil.</li> <li>• Personnel conducting oversight duties shall wear hearing protection if it is not possible to communicate with another person standing next to you using your normal voice.</li> <li>• If necessary to keep personal clothing clean, or if in areas with potential contamination, personnel shall wear Tyvek to minimize contact with contaminated dust/soil that may be generated during drilling activities.</li> <li>• Use good housekeeping practices, keeping the work area clear of trip hazards</li> <li>• Ensure water does not accumulate in the drilling area. Designate a specific area to place all soil cuttings, try to place the cuttings in a location that is outside of the general work flow</li> <li>• Be aware of the symptoms of associated with heat- related physical disorders</li> <li>• Wear appropriate field clothing, including layers and rain gear in cold weather</li> <li>• Do NOT stand beneath suspended loads.</li> </ul>	Standard Level D PPE *
Receiving sample containers (possibly preserved)	<p>Glass containers/broken glass, cuts to hands</p> <p>Packaging material / acid leak</p>	<ul style="list-style-type: none"> <li>• Use caution when opening package and removing containers</li> <li>– Wear proper PPE including safety glasses with sideshields or goggles, Nitrile gloves, and splash protection as necessary (apron or tyvek).</li> </ul>	Standard Level D PPE *

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) - Drilling and Well Installation**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Preparation of sample containers	Handling of chemicals/spilling of chemicals on skin, clothes or eyes.	<ul style="list-style-type: none"> <li>• Never leave open chemicals unattended.</li> <li>• Know location of nearest eyewash station.</li> <li>• Wear proper PPE including safety glasses with sideshields or goggles, Nitrile gloves, and splash protection as necessary (apron or tyvek).</li> <li>• Keep prep and pack area well ventilated (open window)</li> <li>• Read MSDS for preservation material</li> <li>• Know location of MSDS, absorbent spill cloth, Hazmat spill kit</li> <li>• Do not hold sample containers on your lap when adding preservative</li> <li>• Make sure all caps are secure</li> </ul>	Standard Level D PPE *
Installation of well (Riser, screen, sand pack, and bentonite) and manway/concrete pad	Contact, Exposure, Exertion, Slips, Trips, Fall Hazards	<ul style="list-style-type: none"> <li>• Bend down at the knees and lift with your legs rather than bending and lifting with your back while carrying bentonite and sand bags.</li> <li>• Make sure work area is clean, pick up all tools, sweep up all soil, and maintain walkways.</li> <li>• While mixing concrete, use a balance stance and mix slowly to avoid splashing concrete. Ensure proper PPE is worn (hard hat, safety glasses with side shields or goggles, safety boots, and dermal protection as necessary, i.e., coveralls or tyvek.)</li> </ul>	Standard Level D PPE *
Well Development	Exposure, Exertion Hazards	<ul style="list-style-type: none"> <li>• Whether using pumps or manually developing a well, use proper lifting techniques and take breaks as necessary.</li> <li>• Wear proper PPE: safety glasses with side shields or chemical goggles if there is a splash hazard, hard hat, safety boots, high visibility safety vest, leather and/or chemical resistant gloves, and an apron or coated tyvek if there is potential for contacting potentially contaminated groundwater.</li> <li>• Conduct air monitoring in breathing zone in accordance with site HSP. Follow action levels in HSP and stop work if action levels are exceeded.</li> <li>• Appropriately containerize purge water and use mechanical means to move drums (drum dolly, lift gate, etc.)</li> </ul>	Standard Level D PPE *

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) - Drilling and Well Installation**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Preparation to mob to next drilling location or leave site.	Contact, Caught, Exposure, Exertion Hazards	<ul style="list-style-type: none"> <li>• Ensure an observer is watching the lowering of the drill rig mast so no lines or overhead obstacles are contacted.</li> <li>• Prior to lowering rig off of outriggers make sure all tools and personnel are clear of the drill rig.</li> <li>• Bend down at the knees and lift with your legs rather than bending and lifting with your back while loading tools.</li> <li>• Wear proper PPE (hard hat, safety glasses with side shield, hearing protection (while rig is operational) steel toe boots, leather work gloves.</li> <li>• Prior to driving to next location make sure auger racks are in.</li> <li>• While rig is moving on site have spotters verify clearance so no overhead obstacles are contacted and no obstacles are hit while backing.</li> <li>• Properly remove PPE and wash hands and face, no smoking, drinking, eating in the work area, exclusion zone or contamination reduction zone.</li> </ul>	Standard Level D PPE *
Decontamination of drill rig, augers, bits (as necessary, based on site contaminants)	High noise levels Injury from high water pressure Slip, trip, & fall Muscle strains - heavy lifting Ergonomic - awkward positions (bending down to pressure wash); fatigue Wet and/or cold stress	<ul style="list-style-type: none"> <li>• Hearing protection required if noise levels may exceed 85 dBa</li> <li>• Polycoated Tyvek or equivalent, 16-inch-high steel-toed rubber boots, safety glasses, hard hat with face shield, and inner and outer nitrile gloves will be worn, at a minimum.</li> <li>• Inspect pressure washer before use and confirm deadman switch fully operational</li> <li>• Operator will maintain a firm grip on the wand assembly when operating the unit. The trigger will not be tied down or blocked open and the operator will not leave the equipment unattended.</li> <li>• The operator will ensure that hands and other body parts are never placed in front of the wand while in operation and that the wand is never directed towards people or electrical components. Wand extension used to prevent awkward positions.</li> <li>• Be aware of potential slip and trip hazards such as wet surfaces and hoses.</li> <li>• Ergonomic concerns such as muscle fatigue and heat stress (from wearing rain gear) may exist.</li> <li>• Contain all decon water and dispose of properly</li> <li>• Properly dispose of decontamination water and PPE in designated areas.</li> <li>• Become familiarized with the detergent (i.e. Alconox) MSDS before beginning decontamination.</li> </ul>	Standard Level D PPE *
Load Truck	Back strain - Improper lifting technique	<ul style="list-style-type: none"> <li>• Utilize proper lifting procedure when loading coolers and equipment back into truck. (to avoid lifting heavy/awkward coolers leave cooler on tailgate to load samples and ice into).</li> <li>• Bend down at the knees and lift with your legs rather than bending and lifting with your back.</li> </ul>	Standard Level D PPE *

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) - Drilling and Well Installation**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Take down work area (cones, flags, barricades)	Traffic which includes being struck by pedestrian or other vehicles.  Pedestrian traffic trying to cross work area-slips, trips, falls  Damage to equipment.  Injury to other personnel.  Slips, trips, falls.  Back strain - Improper lifting technique	<ul style="list-style-type: none"> <li>Wear highly visible clothing such as orange reflective traffic vests or clothing.</li> <li>Stay alert to surroundings and traffic (if possible move truck over to work area to reduce take down time and loading, use flashing light and truck hazard lights for added safety).</li> <li>Load all equipment into truck neatly.</li> <li>Keep work area clear of caution tape and cords during removal of traffic control.</li> <li>Utilize proper lifting procedure when loading traffic control equipment back into truck.</li> </ul>	Standard Level D PPE *
Depart From Site	Traffic, pedestrian, and obstacle hazards	<ul style="list-style-type: none"> <li>Ensure site is clean and nothing is left behind.</li> <li>Drive defensively, wear your seatbelt, obey all traffic laws, and know the route to site prior to trip.</li> </ul>	Standard Level D PPE *

Notes: \* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task, chemical resistant gloves, disposable suits/boot covers in accordance with the HSP.

<b>EQUIPMENT REQUIRED</b>	<b>INSPECTION REQUIREMENTS</b>	<b>TRAINING REQUIREMENTS</b>
<ul style="list-style-type: none"> <li>Hand and power tools</li> <li>Drill rig, heavy equipment</li> <li>Sampling equipment/containers</li> <li>Well installation supplies</li> <li>CGI/PID</li> <li>Fire extinguisher(s)</li> <li>Fuel storage/equipment</li> <li>Portable eye wash</li> <li>First Aid/Bloodborne pathogen/CPR kit</li> <li>Support vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Inspection of all equipment and tools prior to each use</li> <li>Calibrate CGI and PID prior to use</li> <li>Visual Inspections of work area daily</li> <li>Use of applicable project self-assessment checklists</li> <li>Inspect vehicles prior to operation</li> </ul>	<ul style="list-style-type: none"> <li>OSHA 40-hour HAZWOPER initial training, current refresher, 3-day OJT, and medical clearance.</li> <li>Hazard Communication training, as appropriate</li> <li>Training on CH2M HILL HSP and Subcontractor's HSP (and applicable AHAs)</li> <li>Qualified subcontractor operators (for equipment such as drill rigs, forklifts, aerial lifts)</li> <li>Documented training on MSDSs for any chemicals used.</li> <li>Qualified SHSO (with SC-HW training)</li> </ul>

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Supervisor Name:

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Date/Time: \_\_\_\_\_

Safety Officer Name:

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Date/Time: \_\_\_\_\_

Site Personnel:

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Date/Time: \_\_\_\_\_

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) – Monitoring Well Plugging and Abandonment**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Monitoring Well Plugging and Abandonment	Traffic and obstacles - accidents Parking vehicles, drilling activities, health and safety issues, traffic flow control, access difficulties	<ul style="list-style-type: none"> <li>• Drive defensively and obey all traffic laws.</li> <li>• Park in a secure area where vehicle is out of traffic pattern so meeting can be performed safely.</li> <li>• Complete tailgate safety meeting.</li> <li>• Cover job scope and drilling protocol.</li> <li>• Drill rig inspection checking safety devices (kill switches), cables, hydraulic hoses, etc.</li> </ul>	NA
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slip/trip hazards in the work area, such as wet/steep slopes, stumps/ roots, unprotected holes, ditches, rip rap, utilities, ground protrusions, equipment, power cords, tubing, tools. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Mark potential slip/trip hazard locations if related to ground protrusions, open holes, etc.</li> <li>• Institute and maintain good housekeeping practices.</li> </ul>	Standard Level D PPE *
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to loud working environments such as around heavy equipment (i.e., drill rig) or grout pumps shall wear hearing protection.</li> </ul>	Standard Level D PPE * Hearing Protection
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide fluids to prevent worker dehydration.</li> <li>• Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>• Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Standard Level D PPE * (light colored clothing)
	Manual Lifting	<ul style="list-style-type: none"> <li>• CH2M HILL or subcontract personnel must notify supervisors or safety representatives of pre-existing medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available, have someone assist with the lift— especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads whenever possible.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> <li>• Avoid carrying heavy objects above shoulder level.</li> </ul>	Standard Level D PPE *
	Biological	<ul style="list-style-type: none"> <li>• Observe ground surfaces especially in or near wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>• Observe ground surfaces or surrounding vegetation or structures for presence of fire ants, spiders, bee/wasp hives etc.</li> <li>• Observe areas for presence of stinging insects. <b>Notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>• Use insect repellent. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>• Check for ticks and chiggers frequently, use tick removal kit if ticks are found and follow CH2M HILL policy for removal, storage, and notification.</li> <li>• Avoid exposure to blood borne pathogens by wearing PPE and use blood borne pathogen kit.</li> </ul>	Standard Level D PPE *

\* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses, steel toed work boots, work gloves and/or nitrile gloves.

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) – Monitoring Well Plugging and Abandonment**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
		<ul style="list-style-type: none"> <li>•</li> </ul>	
	Electric Hazards	<ul style="list-style-type: none"> <li>• If/when electrical extension cords are required to complete work, extension cords must be:               <ul style="list-style-type: none"> <li>- Equipped with third-wire grounding.</li> <li>- Covered, elevated, or protected from damage when passing through work areas.</li> <li>- Protected from pinching if routed through doorways.</li> <li>- Not fastened with staples, hung from nails, or suspended with wire.</li> <li>- Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>- Rated to handle the voltage/amperage of equipment.</li> </ul> </li> <li>• Inspect all electrical equipment for integrity prior to use (plugs, cords, grommets, etc)</li> </ul>	Standard Level D PPE*
	Preparing Portland cement grout	<ul style="list-style-type: none"> <li>• Bend down at the knees and lift with your legs rather than bending and lifting with your back while carrying concrete bags.</li> <li>• Make sure work area is clean, pick up all tools, sweep up all soil and maintain walk ways.</li> <li>• Wear latex gloves during construction and installation of well materials to avoid cross contamination.</li> <li>• While mixing concrete use a balanced stance and mix slowly to avoid splashing concrete.</li> <li>• Wear a dust mask during mixing and pumping procedures to minimize inhalation of fine material dust particles.</li> </ul>	Standard Level D PPE*
	Fire Prevention	<ul style="list-style-type: none"> <li>• Appropriately sized, 10lb or 20lb, easily accessible ABC fire extinguisher must be in each CH2M HILL vehicle.</li> </ul>	Standard Level D PPE *
	Other	<ul style="list-style-type: none"> <li>• Always use a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals.</li> <li>• Cell phone use or two way radio use is NOT permitted <u>while driving</u> on military/government facilities unless a hands free telephone device is used. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>• Shut down operations in heavy rain and/or if lightning is observed within 15 second count.</li> <li>• Base Emergency Dispatch numbers are listed on the HSP and field instructions. Have hospital route maps readily available.</li> <li>• Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> </ul>	NA

\* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses, steel toed work boots, work gloves and/or nitrile gloves.

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) – Monitoring Well Plugging and Abandonment**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
		<ul style="list-style-type: none"> <li>• Site work should always be performed with adequate lighting.</li> <li>• Site equipment, materials, and waste should be maintained according to good housekeeping practices.</li> <li>• No fixed open blades are permitted onsite, a self-retracting safety blade is permissible.</li> <li>• Perform tick checks periodically during day on yourself and other co-workers.</li> </ul>	

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> <li>• Fire extinguisher (with fuel and electrical sources)</li> <li>• Eye wash (small portable type)</li> <li>• Miscellaneous power and manual hand tools.</li> <li>• Miscellaneous rigging.</li> </ul>	<ul style="list-style-type: none"> <li>• Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>• Equipment inspections and maintenance.</li> <li>• Inspections of hand tools (power) and extension chords if used.</li> </ul>	<ul style="list-style-type: none"> <li>• Review AHA with all task personnel</li> <li>• Review Site Specific Health and Safety Plan for new site personnel.</li> <li>• Review operations/safety manuals for all equipment utilized.</li> <li>• Behavior Based Loss Prevention Training (supervisors).</li> <li>• Power tool and equipment operators qualified by previous training or experience.</li> </ul>

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\* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses, steel toed work boots, work gloves and/or nitrile gloves.

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) – Groundwater Sampling and Surveying**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Groundwater Sampling	Manual Lifting	<ul style="list-style-type: none"> <li>• CH2M HILL or subcontract personnel must notify supervisors or safety representatives of pre-existing medical conditions that may be aggravated or re-injured by lifting activities.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available, have someone assist with the lift— especially for heavy (&gt; 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads whenever possible.</li> <li>• Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift.</li> <li>• Avoid carrying heavy objects above shoulder level.</li> </ul>	Standard Level D PPE *
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>• Be aware of poor footing, potential slip/trip hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions, equipment, power cords, tubing, tools. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Mark potential slip/trip hazard locations if related to ground protrusions, open holes, etc.</li> <li>• Institute and maintain good housekeeping practices.</li> </ul>	Standard Level D PPE *
	Noise	<ul style="list-style-type: none"> <li>• Personnel exposed to loud working environments shall wear hearing protection. Hearing protection is not required during sampling/surveying unless working near the drill rig.</li> </ul>	Standard Level D PPE * Hearing Protection
	High Ambient Temperature	<ul style="list-style-type: none"> <li>• Provide fluids to prevent worker dehydration.</li> <li>• Monitor for heat stress in accordance with HSP (maintain use of buddy system).</li> <li>• Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.</li> </ul>	Standard Level D PPE * (light colored clothing)
	Low Ambient Temperature	<ul style="list-style-type: none"> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather. Cover exposed skin surfaces.</li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature and prevent dehydration.</li> <li>• Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>• Observe one another (buddy system) for initial signs of cold-related disorders.</li> </ul>	Standard Level D PPE (layered cold weather clothing)
	Biological	<ul style="list-style-type: none"> <li>• Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>• Observe ground surfaces or surrounding vegetation or structures for presence of fire ants, spiders, bee/wasp hives etc.</li> <li>• Observe areas for presence of stinging insects. <b>Notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>• Use insect repellent. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>• Check for ticks and chiggers frequently, use tick removal kit if ticks are found and follow CH2M HILL policy for removal, storage, and notification.</li> <li>• Avoid exposure to blood borne pathogens by wearing PPE and use blood borne pathogen kit.</li> </ul>	Standard Level D PPE *

\* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses, steel toed work boots, work gloves and/or nitrile gloves.

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) – Groundwater Sampling and Surveying**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
	Struck/ pinched	<ul style="list-style-type: none"> <li>• Ensure equipment has operable back-up alarms, use spotter when moving equipment.</li> <li>• Avoid positioning between fixed objects and operating equipment.</li> <li>• Wear work gloves when opening wells and setting up sampling equipment.</li> <li>• Use tubing cutter, wire snipper, or safety blade to cut tubing. No fixed open blades allowed onsite.</li> </ul>	Standard Level D PPE *
	Electric Hazards	<ul style="list-style-type: none"> <li>• If/when electrical extension cords are required to complete work, extension cords must be:               <ul style="list-style-type: none"> <li>- Equipped with third-wire grounding.</li> <li>- Covered, elevated, or protected from damage when passing through work areas.</li> <li>- Protected from pinching if routed through doorways.</li> <li>- Not fastened with staples, hung from nails, or suspended with wire.</li> <li>- Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.</li> <li>- Rated to handle the voltage/ampereage of equipment.</li> </ul> </li> <li>• Inspect all electrical equipment for integrity prior to use (plugs, cords, grommets, etc)</li> </ul>	Standard Level D PPE*
	Fire Prevention	<ul style="list-style-type: none"> <li>• Appropriately sized, 10lb or 20lb, easily accessible ABC fire extinguisher must be in each CH2M HILL vehicle.</li> </ul>	Standard Level D PPE *
	Chemical Exposure	<ul style="list-style-type: none"> <li>• All personnel performing this task shall be trained in accordance with 29CFR1910.120 and be deemed “fit for duty” via participation in a medical surveillance program. .</li> <li>• Measure breathing zone at each well location using an FID initially when opening well caps, if sustained level &gt;1ppm, evacuate area. Continue monitoring at 10 minute intervals until breathing zone levels are &lt;1ppm. Do not initiate sampling until breathing zone readings are &lt;1ppm. Record all notes and readings in field book. Refer to Table 5-1 in HSP for additional information. Sustained readings in breathing zone are defined as 1ppm above background conditions for greater than 3 to 5 minutes.</li> <li>• Do not allow dermal contact or incidental ingestion of impacted groundwater. Avoid skin contact with contaminated water, debris, or equipment as much as possible. Do not kneel or step in potentially contaminated media (soil or ground water). If dermal contact with contaminated media is made, immediately wash/brush off exposed area.</li> <li>• Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Eat and drink in designated areas. Smoking is not permitted onsite.</li> <li>• Following sample collection, sample container lids should be tightened securely to prevent any leaks, and the containers should be rinsed with clean water to ensure that they are free of chemical constituents.</li> <li>• Use care when transferring purge water/decon water into buckets, drums or poly tanks. Avoid pouring too fast to minimize splash hazards as much as possible. Open drum and poly tank lids to facilitate pouring or use transfer pump. Avoid vapor hazards by not putting your face above the poly tank opening while inspecting liquid contents.</li> </ul>	Standard Level D PPE *

\* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses, steel toed work boots, work gloves and/or nitrile gloves.

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) - Groundwater Sampling and Surveying**

<b>Task Breakdown</b>	<b>Potential Hazards</b>	<b>Critical Safety Practices</b>	<b>Personal Protective Clothing and Equipment</b>
Surveying	Traffic	<ul style="list-style-type: none"> <li>Minimize time working along road shoulder areas, use traffic cones and trucks as barricades to oncoming traffic. Utilize truck hazard lights and magnetic strobe light flashers on top of vehicles as much as possible. Always face oncoming traffic while working. Work on road side shoulder during minimal traffic times to reduce potential hazard.</li> </ul>	Standard Level D PPE *
	Biological	<ul style="list-style-type: none"> <li>Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous).</li> <li>Observe ground surfaces or surrounding vegetation or structures for presence of fire ants, spiders, bee/wasp hives etc.</li> <li>Observe areas for presence of stinging insects. <b>Notify supervisors of known allergies to stinging insects and location of antidotes.</b></li> <li>Use insect repellent. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders.</li> <li>Check for ticks and chiggers frequently, use tick removal kit if ticks are found and follow CH2M HILL policy for removal, storage, and notification.</li> <li>Avoid exposure to blood borne pathogens by wearing PPE and use blood borne pathogen kit.</li> </ul>	Standard Level D PPE *
Groundwater Sampling & Surveying	Other	<ul style="list-style-type: none"> <li>Always use a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals.</li> <li>Cell phone use or two way radio use is NOT permitted <u>while driving</u> on military/government facilities unless a hands free telephone device is used. Violating these rules may result in loss of military/government facility driving privileges.</li> <li>Shut down operations in heavy rain and/or if lightning is observed within 15 second count.</li> <li>Base Emergency Dispatch numbers are listed on the HSP and field instructions. Have hospital route maps readily available.</li> <li>Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.</li> <li>Site work should always be performed with adequate lighting.</li> <li>Site equipment, materials, and waste should be maintained according to good housekeeping practices.</li> <li>No fixed open blades are permitted onsite, a self-retracting safety blade is permissible.</li> <li>Perform tick checks periodically during day on yourself and other co-workers.</li> </ul>	NA

<b>EQUIPMENT REQUIRED</b>	<b>INSPECTION REQUIREMENTS</b>	<b>TRAINING REQUIREMENTS</b>
<ul style="list-style-type: none"> <li>Fire extinguisher (with fuel and electrical sources)</li> <li>Eye wash (small portable type)</li> <li>Miscellaneous power and manual hand tools.</li> <li>Miscellaneous rigging.</li> </ul>	<ul style="list-style-type: none"> <li>Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>Equipment inspections and maintenance.</li> <li>Inspections of hand tools (power) and extension chords if used.</li> </ul>	<ul style="list-style-type: none"> <li>Review AHA with all task personnel</li> <li>Review Site Specific Health and Safety Plan for new site personnel.</li> <li>Review operations/safety manuals for all equipment utilized.</li> <li>Behavior Based Loss Prevention Training</li> </ul>

\* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses, steel toed work boots, work gloves and/or nitrile gloves.

		(supervisors). • Power tool and equipment operators qualified by previous training or experience.
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SIGNATURE

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

\_\_\_\_\_

Date/Time: \_\_\_\_\_

Safety Officer Name: \_\_\_\_\_

\_\_\_\_\_

Date/Time: \_\_\_\_\_

Site Personnel: \_\_\_\_\_

\_\_\_\_\_

Date/Time: \_\_\_\_\_

\* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses, steel toed work boots, work gloves and/or nitrile gloves.

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) – Sediment and Surface Water Sampling**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Sediment and Surface Water Sampling	Chemical Exposure	<ul style="list-style-type: none"> <li>• All personnel performing this task shall be trained in accordance with 29CFR1910.120 and been rolled in a medical monitoring program.</li> <li>• Regulated or hazardous waste or materials shall not be transported by company or employee's vehicle.</li> <li>• Be cognizant of the potential of harmful gas or vapor build-up in the well head areas or worker breathing zone.</li> <li>• Adhere to PPE and action monitoring level requirements identified in the sections 5.0 and 6.0 of the site specific HSP.</li> <li>• Review contaminants of concern for the project and consult project specific HSP.</li> <li>• Practice "no hand-face" contact at all times.</li> <li>• Always wash hands before eating, drinking, smoking and leaving site.</li> <li>• Do not allow dermal contact or incidental ingestion of impacted groundwater or recovered free product. Skin contact with contaminated water, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media without first donning proper PPE.</li> <li>• Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Only eat, drink, smoke or chew tobacco in designated areas.</li> </ul>	Standard Level D PPE *
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>• Clear walkways work areas of objects Institute and maintain good housekeeping practices. Observe/avoid debris in a work area.</li> <li>• Only walk or climb only on surfaces designed for personnel access.</li> <li>• Be aware of poor footing and potential slipping and tripping hazards in the work area (holes, ditches, rip rap, utilities, and wet surfaces). Observe and avoid areas of unprotected holes and ground penetrations or protrusions. Employees walking in ditches, swales and other drainage structures adjacent to roads, across undeveloped land or in controlled industrial work/process areas must use caution to prevent slips and falls, which could result in twisted or sprained ankles, knees, and backs.</li> <li>• Sturdy, hard toe work boots will be worn for all tasks.</li> </ul>	Standard Level D PPE *
	Visible Lighting	<ul style="list-style-type: none"> <li>• Perform tasks in daylight hours.</li> <li>• Do not enter poorly lit areas without first providing portable illumination.</li> <li>• Use reflective vests/high visibility clothing in high traffic areas or areas with heavy equipment.</li> </ul>	Standard Level D PPE *
	Sharp Objects	<ul style="list-style-type: none"> <li>• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects.</li> <li>• Do not use razor knives.</li> <li>• Cut away from the body and never towards another worker.</li> <li>• Maintain all hand and power tools in a safe condition. Remove damaged hand and power tools from service.</li> </ul>	Standard Level D PPE *

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida**  
**ACTIVITY HAZARD ANALYSIS (AHA) – Sediment and Surface Water Sampling**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
	Fire Prevention	<ul style="list-style-type: none"> <li>• Provide ABC (or equivalent) fire extinguisher in the work area where electrical or stored fuel is used.</li> <li>• Store flammable and combustible materials in approved containers (metal safety cans) in well ventilated areas.</li> <li>• Eliminate ignition sources in work area (open flame, sparks, and electric sources).</li> <li>• Do not smoke in areas containing flammable/ combustible liquids, gases, vapors or fumes. Only smoke in designated areas.</li> </ul>	Standard Level D PPE *
	Biological	<ul style="list-style-type: none"> <li>• Observe areas for presence of stinging or biting or stinging insects and nests such as spiders (widows/recluse), bee/wasp hives, fire ants mounds etc. Frequently check body and clothing for ticks, chiggers, spiders. Prior to starting field activities, notify supervisors of known allergies to stinging insects and location and quantity of antidote in the event the employee becomes incapacitated as a result of an insect bite.</li> <li>• Observe work area for presence of snakes (cottonmouth as primary, copperhead and rattlers as secondary).</li> <li>• Observe wetland/ creek, river areas for presence of alligators (nests, eggs)</li> <li>• Protect yourself from and avoid exposure to blood bourn pathogens when administering first aid.</li> <li>• Consider utilizing insect repellent. For personnel sensitive to skin rashes, consider the use of products with lower s DEET concentrations such as “children’s cutters” or “skin so soft” products.</li> <li>• Avoid exposure to blood borne pathogens. Use universal precautions to protect against exposure to blood borne pathogens.</li> <li>• Consider using lightweight disposable coveralls/suits (bugout suits) where exposures to ticks and chiggers are likely. Tape boots to pant legs and ensure interface is well sealed.</li> </ul>	Standard Level D PPE *
	Manual Lifting	<ul style="list-style-type: none"> <li>• Personnel to notify supervisors or safety representatives of pre-existing medical conditions that may be aggravated or re-injured by lifting activities such that an evaluation of operational procedures may be performed with regard to the required task.</li> <li>• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports should be considered.</li> <li>• Plan storage and staging to minimize lifting or carrying distances.</li> <li>• Split heavy loads into smaller loads.</li> <li>• Have someone assist with the lift – especially for heavy (&gt; 40lbs.) or awkward loads.</li> <li>• Make sure the path of travel is clear prior to the lift.</li> <li>• Do not lift manhole covers, open/lift hatches or other access points to vessels, tanks or subsurface structures without proper authorization to do so, proper tools and proper personnel protective equipment.</li> <li>• Use carts, hand trucks additional personnel etc. to move large, awkward loads.</li> <li>• Avoid carrying heavy objects above shoulder level.</li> </ul>	Standard Level D PPE *

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) - Sediment and Surface Water Sampling**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
	General Site Control	<ul style="list-style-type: none"> <li>• Ensure new site workers review and understand HSP requirements.</li> <li>• Determine if there is a potential of being exposed to hazardous chemicals. If yes, what precautions/training are required?</li> <li>• Determine/know how an emergency be reported. Determine and have available the <b>Facility EMS, Fire, Security Dispatch#</b>. <b>Identify exact facility location and position (where possible)</b>.</li> <li>• <b>Have a readily available copy of the Hospital Route Map.</b></li> <li>• Determine what standard facility emergency alarms/signals are.</li> <li>• Designate an emergency evacuation route.</li> <li>• Designate an evacuation assembly area.</li> <li>• Know how, what, when injuries/accidents are reported and treated.</li> <li>• <b>Project managers and field team leaders to 1) evaluate and ensure worker safety in remote/secluded work areas, 2) confirm if potentially dangerous activities could be occurring in or adjacent to any contract work areas that may jeopardize worker health and safety and 3) reschedule field activities when potentially dangerous activities are not occurring adjacent to contract work locations. Ensure proper two communications with workers in remote work areas. ALWAYS Utilize the buddy system during field operations.</b></li> </ul>	Standard Level D PPE *

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida**  
**ACTIVITY HAZARD ANALYSIS (AHA) – Sediment and Surface Water Sampling**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
	<p>High Ambient Temperature/ Low Ambient Temperature</p>	<ul style="list-style-type: none"> <li>• Provide and drink fluids to prevent worker dehydration.</li> <li>• Minimize intake of caffeinated fluids.</li> <li>• Institute a proper work-break regiment in a cool area to avoid heat stress symptoms and overexertion.</li> <li>• Monitor for signs and symptoms of heat stress (maintain use of buddy system) when the ambient air temperature exceeds 70°F, the relative humidity is high (&gt;50 percent), or when workers exhibit symptoms of heat stress and especially when wearing disposable or other types of coveralls.               <ol style="list-style-type: none"> <li>1) Heat Syncope = Sluggishness or fainting while standing erect or immobile in heat.  <i>Treatment = Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.</i></li> <li>2) Heat Rash = Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.  <i>Treatment = Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.</i></li> <li>3) Heat Cramps = Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.  <i>Treatment = Remove to cooler area. Rest lying down. Increase fluid intake.</i></li> <li>4) Heat exhaustion = Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low.  <i>Treatment = Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.</i></li> <li>5) Heat Stroke = Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.  <i>Treatment = Cool rapidly by soaking in cool-but not cold-water. Call ambulance, and get medical attention immediately!</i></li> </ol> </li> <li>• Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.</li> <li>• Frequent intake of non-caffeinated fluids to maintain body core temperature.</li> <li>• Frequent intake of non- caffeinated to prevent dehydration.</li> <li>• Obtain and review weather forecast – be aware of predicted weather systems.</li> <li>• Observe one (buddy system) another for initial signs of cold-related disorders.            Frequent observance of Wind Chill Chart (HSP) to assist with work warming regiment determination and frostbite avoidance</li> </ul>	<p>Standard Level D PPE * (light colored clothing)</p>

**Contract Task Order (CTO)-JM08, Truck Fill Stand Site Assessment, NAS Key West, Boca Chica Key, Florida  
ACTIVITY HAZARD ANALYSIS (AHA) – Sediment and Surface Water Sampling**

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
	Traffic Hazards (pinched, struck by caught in between)	<ul style="list-style-type: none"> <li>• Shut off and secure site vehicles prior to exiting them. Park on level ground where possible. If parking on an incline, engage parking brake. If the vehicle has a manual transmission, ensure the transmission is in gear (not neutral) and the parking brake is engaged before exiting the vehicle.</li> <li>• Exercise caution when exiting traveled way or parking along street— avoid sudden stops, use flashers, etc.</li> <li>• Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.</li> <li>• All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.</li> <li>• Remain aware of factors that influence traffic-related hazards and required controls— sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.</li> <li>• Always remain aware of an escape route -- behind an established barrier, parked vehicle, guardrail, etc.</li> <li>• Always pay attention to moving traffic - never assume drivers are looking out for you.</li> <li>• Work as far from traveled way as possible to avoid creating confusion for drivers.</li> <li>• When workers must face away from traffic, a “buddy system” should be used, where one worker is looking toward traffic.</li> <li>• Work area should be protected by a physical barrier such a riprap fence or caution tape.</li> </ul>	Standard Level D PPE *

Notes: \* Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task, chemical resistant gloves, disposable suits/boot covers in accordance with the HSP.

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> <li>• Fire extinguisher (with fuel and electrical sources)</li> <li>• Eye wash (small portable type)</li> <li>• Miscellaneous power and manual hand tools.</li> <li>• Miscellaneous rigging.</li> </ul>	<ul style="list-style-type: none"> <li>• Visual Inspections of designated work areas identify and address hazardous conditions.</li> <li>• Equipment inspections and maintenance.</li> <li>• Inspections of hand tools (power) and extension chords if used.</li> </ul>	<ul style="list-style-type: none"> <li>• Review AHA with all task personnel</li> <li>• Review Site Specific Health and Safety Plan for new site personnel.</li> <li>• Review operations/safety manuals for all equipment utilized.</li> <li>• Behavior Based Loss Prevention Training (supervisors).</li> <li>• Power tool and equipment operators qualified by previous training or experience.</li> </ul>

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SIGNATURE

Supervisor Name:

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\_\_\_\_\_

Date/Time: \_\_\_\_\_

Safety Officer Name:

\_\_\_\_\_

\_\_\_\_\_

Date/Time: \_\_\_\_\_

Site Personnel:

\_\_\_\_\_

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Date/Time: \_\_\_\_\_

# **CH2M HILL HEALTH AND SAFETY PLAN**

## **Attachment 11**

### **Material Safety Data Sheets**



Health	3
Fire	0
Reactivity	1
Personal Protection	

## Material Safety Data Sheet Hydrochloric acid MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Hydrochloric acid

**Catalog Codes:** SLH1462, SLH3154

**CAS#:** Mixture.

**RTECS:** MW4025000

**TSCA:** TSCA 8(b) inventory: Hydrochloric acid

**CI#:** Not applicable.

**Synonym:** Hydrochloric Acid; Muriatic Acid

**Chemical Name:** Not applicable.

**Chemical Formula:** Not applicable.

**Contact Information:**

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: 1-800-901-7247

International Sales: 1-281-441-4400

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

**Toxicological Data on Ingredients:** Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Slightly hazardous in case of skin contact (sensitizer). **CARCINOGENIC EFFECTS:** Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid], **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Serious Ingestion:** Not available.

#### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** of metals

**Explosion Hazards in Presence of Various Substances:** Non-explosive in presence of open flames and sparks, of shocks.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:**

Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammable gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrogen gas.

**Special Remarks on Explosion Hazards:**

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl<sub>4</sub> Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca<sub>3</sub>P<sub>2</sub> Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO<sub>4</sub> Hexalithium disilicide H<sub>2</sub>SO<sub>4</sub> Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U<sub>3</sub>P<sub>4</sub>, Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

## Section 6: Accidental Release Measures

### Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

### Large Spill:

Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m<sup>3</sup>) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m<sup>3</sup>) [United Kingdom (UK)] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Pungent. Irritating (Strong.)

**Taste:** Not available.

**Molecular Weight:** Not applicable.

**Color:** Colorless to light yellow.

**pH (1% soln/water):** Acidic.

**Boiling Point:**

108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

**Melting Point:**

-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

**Critical Temperature:** Not available.

**Specific Gravity:**

1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

**Vapor Pressure:** 16 kPa (@ 20°C) average

**Vapor Density:** 1.267 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.25 to 10 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether.

**Solubility:** Soluble in cold water, hot water, diethyl ether.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials, water

**Incompatibility with various substances:**

Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

**Corrosivity:**

Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothermic reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the following can cause explosion or ignition on contact or

**Special Remarks on Corrosivity:**

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinum, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

### Toxicity to Animals:

Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

### Chronic Effects on Humans:

**CARCINOGENIC EFFECTS:** Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

### Other Toxic Effects on Humans:

Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

### Special Remarks on Toxicity to Animals:

Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

### Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (fetotoxicity). May affect genetic material.

### Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjunctivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and laryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well as headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomiting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophageal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

### Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

### Section 14: Transport Information

**DOT Classification:** Class 8: Corrosive material

**Identification:** : Hydrochloric acid, solution UNNA: 1789 PG: II

**Special Provisions for Transport:** Not available.

### Section 15: Other Regulatory Information

**Federal and State Regulations:**

Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

**DSCL (EEC):**

R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**HMIS (U.S.A.):**

**Health Hazard:** 3

**Fire Hazard:** 0

**Reactivity:** 1

**Personal Protection:**

**National Fire Protection Association (U.S.A.):**

**Health:** 3

**Flammability:** 0

**Reactivity:** 1

**Specific hazard:**

**Protective Equipment:**

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

### Section 16: Other Information

**References:**

-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangereuses au Canada. Centre de conformité international Ltée. 1986.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:45 PM

**Last Updated:** 11/01/2010 12:00 PM

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# Material Safety Data Sheet

## Nitric acid, 20-70%

ACC# 16550

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Nitric acid, 20-70%

**Catalog Numbers:** AC124660000, AC124660010, AC124660011, AC124660025, AC124660026, AC124665000, AC124665001, AC133620000, AC133620010, AC133620011, AC133620025, AC133620026, AC424000000, AC424000025, AC424000026, AC424000250, AC424005000, AC424005001, AC613205000, A198C-212, A198C4X-212, A200-212, A200-500, A200-500LC, A200-612GAL, A200212LC, A200C-212, A200C212EA, A200C212LC, A200C4X-212, A200C4X212L, A200S-212, A200S-500, A200S212LC, A200SI-212, A206C-212, A206C4X-212, A467-1, A467-2, A467-250, A467-500, A483-212, A509-212, A509-212LC, A509-500, A509SK-212, A509SK-212LC, MCC-030822, NC9596579, S719721, S71972SC

**Synonyms:** Azotic acid; Engraver's acid; Aqua fortis.**Company Identification:**

Fisher Scientific  
1 Reagent Lane  
Fair Lawn, NJ 07410

**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	30-80	231-791-2
7697-37-2	Nitric acid	20-70	231-714-2

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: clear to yellow liquid.

**Danger!** May be fatal if inhaled. Causes severe eye and skin burns. Causes severe respiratory and digestive tract burns. Strong oxidizer. Contact with other material may cause a fire. Acute pulmonary edema or chronic obstructive lung disease may occur from inhalation of the vapors of nitric acid. Corrosive to metal.

**Target Organs:** Lungs, eyes, skin, mucous membranes.**Potential Health Effects**

**Eye:** Causes severe eye burns. Direct contact with liquid may cause blindness or permanent eye damage.

**Skin:** Causes skin burns. May cause deep, penetrating ulcers of the skin. Concentrated nitric acid dyes human skin yellow on contact.

**Ingestion:** May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. May cause systemic effects.

**Inhalation:** Effects may be delayed. Causes chemical burns to the respiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Aspiration may lead to pulmonary edema. May cause systemic effects. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema. Depending on the conditions, the vapor or fumes of nitric acid may actually be a mixture of nitric acid and various oxides of nitrogen. The composition may vary with temperature, humidity, and contact with other organic materials.

**Chronic:** Exposure to high concentrations of nitric acid vapor may cause pneumonitis and pulmonary edema which may be fatal. Symptoms may or may not be delayed. Continued exposure to the vapor & mist of nitric acid may result in a chronic bronchitis, & more severe exposure results in a chemical pneumonitis. The vapor & mists of nitric acid may erode the teeth, particularly affecting the canines & incisors.

## Section 4 - First Aid Measures

**Eyes:** Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

**Skin:** Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

**Ingestion:** Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. May react with metal surfaces to form flammable and explosive hydrogen gas. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

**Extinguishing Media:** Use extinguishing media most appropriate for the surrounding fire.

**Flash Point:** Not applicable.

**Autoignition Temperature:** Not available.

**Explosion Limits, Lower:** Not available.

**Upper:** Not available.

**NFPA Rating:** (estimated) Health: 4; Flammability: 0; Instability: 0; Special Hazard: OX

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Provide ventilation. Evacuate unnecessary personnel. Approach spill from upwind. Use water spray to cool and disperse vapors and protect personnel.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Discard contaminated shoes. Do not use with metal spatula or other metal items. Use only with adequate ventilation or respiratory protection.

**Storage:** Do not store near combustible materials. Do not store in direct sunlight. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from metals. Store away from alkalies. Separate from organic materials. Inspect periodically for damage or evidence of leaks or corrosion.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use a corrosion-resistant ventilation system.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Nitric acid	2 ppm TWA; 4 ppm STEL	2 ppm TWA; 5 mg/m <sup>3</sup> TWA 25 ppm IDLH	2 ppm TWA; 5 mg/m <sup>3</sup> TWA

**OSHA Vacated PELs:** Water: No OSHA Vacated PELs are listed for this chemical. Nitric acid: 2 ppm TWA; 5 mg/m<sup>3</sup> TWA

### Personal Protective Equipment

**Eyes:** Wear chemical splash goggles and face shield.

**Skin:** Wear butyl rubber gloves, apron, and/or clothing.

**Clothing:** Wear appropriate clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear to yellow

**Odor:** strong odor - acrid odor - suffocating odor

**pH:** 1.0 (0.1M soln)

**Vapor Pressure:** 51 mm Hg @ 25 deg C  
**Vapor Density:** 2.17 (air=1)  
**Evaporation Rate:** Not available.  
**Viscosity:** 0.761 cps @ 25 deg C  
**Boiling Point:** 86 deg C  
**Freezing/Melting Point:** -42 deg C  
**Decomposition Temperature:** Not available.  
**Solubility:** Soluble in water.  
**Specific Gravity/Density:** 1.4  
**Molecular Formula:** HNO<sub>3</sub>  
**Molecular Weight:** 63.01

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable. Decomposes when in contact with air, light, or organic matter. The yellow color is due to release of nitrogen dioxide on exposure to light.

**Conditions to Avoid:** High temperatures, light, confined spaces.

**Incompatibilities with Other Materials:** Metals, reducing agents, strong bases, acetic acid, alcohols, acetone, aniline, hydrogen sulfide, metal powders, carbides, aldehydes, organic solvents, combustible materials, chromic acid, flammable liquids, cyanides, sulfides, Incompatible with many substances.

**Hazardous Decomposition Products:** Nitrogen oxides.

**Hazardous Polymerization:** Has not been reported.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS# 7732-18-5:** ZC0110000

**CAS# 7697-37-2:** QU5775000; QU5900000

**LD50/LC50:**

**CAS# 7732-18-5:**

Oral, rat: LD50 = >90 mL/kg;

**CAS# 7697-37-2:**

Inhalation, rat: LC50 = 260 mg/m<sup>3</sup>/30M;

Inhalation, rat: LC50 = 130 mg/m<sup>3</sup>/4H;

Inhalation, rat: LC50 = 67 ppm(NO<sub>2</sub>)/4H;

**Carcinogenicity:**

**CAS# 7732-18-5:** Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**CAS# 7697-37-2:** Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** No information found

**Teratogenicity:** No information found

**Reproductive Effects:** No information found

**Mutagenicity:** No information found

**Neurotoxicity:** No information found

**Other Studies:**

## Section 12 - Ecological Information

**Ecotoxicity:** No data available. No information available.

**Environmental:** Terrestrial: During transport through the soil, nitric acid will dissolve some of the soil material, in particular, the carbonate based materials. The acid will be neutralized to some degree with adsorption of the proton also occurring on clay materials. However, significant amounts of acid are expected to remain for transport down toward the ground water table. Upon reaching the ground water table, the acid will continue to move, now in the direction of the ground water flow.

**Physical:** No information available.

**Other:** No information available.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

## Section 14 - Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	NITRIC ACID	NITRIC ACID
<b>Hazard Class:</b>	8	8
<b>UN Number:</b>	UN2031	UN2031
<b>Packing Group:</b>	II	II

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 7697-37-2 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

#### CERCLA Hazardous Substances and corresponding RQs

CAS# 7697-37-2: 1000 lb final RQ; 454 kg final RQ

#### SARA Section 302 Extremely Hazardous Substances

CAS# 7697-37-2: 1000 lb TPQ

**SARA Codes**

CAS # 7697-37-2: immediate, delayed, fire.

**Section 313**

This material contains Nitric acid (CAS# 7697-37-2, 20-70%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

**Clean Air Act:**

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

**Clean Water Act:**

CAS# 7697-37-2 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

CAS# 7697-37-2 is considered highly hazardous by OSHA.

**STATE**

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7697-37-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

**California Prop 65**

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations****European Labeling in Accordance with EC Directives****Hazard Symbols:**

C

**Risk Phrases:**

R 35 Causes severe burns.

**Safety Phrases:**

S 23 Do not inhale gas/fumes/vapour/spray.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36 Wear suitable protective clothing.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**WGK (Water Danger/Protection)**

CAS# 7732-18-5: No information available.

CAS# 7697-37-2: 1

**Canada - DSL/NDSL**

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 7697-37-2 is listed on Canada's DSL List.

**Canada - WHMIS**

This product has a WHMIS classification of E, C, D1A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

**Canadian Ingredient Disclosure List**

CAS# 7697-37-2 is listed on the Canadian Ingredient Disclosure List.

<b>Section 16 - Additional Information</b>
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**MSDS Creation Date:** 9/30/1998

**Revision #16 Date:** 2/11/2008

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*



Health	3
Fire	0
Reactivity	0
Personal Protection	

## Material Safety Data Sheet

### Sulfuric Acid 50% (w/w) Solution MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Sulfuric Acid 50% (w/w) Solution

**Catalog Codes:** SLS1573

**CAS#:** Mixture.

**RTECS:** Not applicable.

**TSCA:** TSCA 8(b) inventory: Sulfuric acid; Water

**CI#:** Not applicable.

**Synonym:** Sulfuric Acid, 50% (w/w) Solution

**Chemical Name:** Not applicable.

**Chemical Formula:** Not applicable.

**Contact Information:**

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: 1-800-901-7247

International Sales: 1-281-441-4400

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**  
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Sulfuric acid	7664-93-9	50
Water	7732-18-5	50

**Toxicological Data on Ingredients:** Sulfuric acid: ORAL (LD50): Acute: 2140 mg/kg [Rat.]. VAPOR (LC50): Acute: 510 mg/m<sup>3</sup> 2 hours [Rat.]. 320 mg/m<sup>3</sup> 2 hours [Mouse].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion. Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive). Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-irritating to the eyes. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs.

**CARCINOGENIC EFFECTS:** Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA [Sulfuric acid]. Classified A2 (Suspected for human.) by ACGIH [Sulfuric acid]. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED] [Sulfuric Acid 50% (w/w) Solution]. The substance may be toxic to the reproductive system, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

#### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Slightly explosive in presence of oxidizing materials. Non-explosive in presence of open flames and sparks, of shocks.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:**

Mixtures of sulfuric acid and any of the following can explode: p-nitrotoluene, pentasilver trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride. Nitramide decomposes explosively on contact with concentrated sulfuric acid. 1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decomposition. (Sulfuric acid)

## Section 6: Accidental Release Measures

### Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

### Large Spill:

Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, combustible materials, organic materials, metals, acids, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

Sulfuric acid TWA: 1 STEL: 3 (mg/m<sup>3</sup>) [Australia] Inhalation TWA: 1 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] Inhalation TWA: 1 STEL: 3 (mg/m<sup>3</sup>) from ACGIH (TLV) [United States] [1999] Inhalation TWA: 1 (mg/m<sup>3</sup>) from NIOSH [United States] Inhalation TWA: 1 (mg/m<sup>3</sup>) [United Kingdom (UK)]3 Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Odorless.

**Taste:** Not available.

**Molecular Weight:** Not applicable.

**Color:** Colorless. Clear

**pH (1% soln/water):** Acidic.

**Boiling Point:** The lowest known value is 100°C (212°F) (Water). Weighted average: 195°C (383°F)

**Melting Point:** May start to solidify at 10.36°C (50.6°F) based on data for; Sulfuric acid.

**Critical Temperature:** Not available.

**Specific Gravity:** Weighted average: 1.3 (Water = 1)

**Vapor Pressure:** The highest known value is 2.3 kPa (@ 20°C) (Water).

**Vapor Density:** The highest known value is 3.4 (Air = 1) (Sulfuric acid). Weighted average: 2.01 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water.

**Solubility:** Easily soluble in cold water, hot water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents, combustible materials, organic materials, metals, acids, alkalis.

**Corrosivity:**

Extremely corrosive in presence of aluminum, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Incompatible with the following materials: potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals as non powders(yields hydrogen gas), metal compounds, metals as powders, strong oxidizing and reducing agents. Concentrated solutions react violently with water, spattering and liberating heat.

**Special Remarks on Corrosivity:**

Concentrated acid is non-corrosive to lead and mild steel, but diluted acid attacks most metals. Attacks and corrodes many metals releasing hydrogen. Minor corrosive on bronze. No data for copper, zinc or brass.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact.

**Toxicity to Animals:** Acute oral toxicity (LD50): 4280 mg/kg (Rat.) (Calculated value for the mixture).

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA [Sulfuric acid]. Classified A2 (Suspected for human.) by ACGIH [Sulfuric acid]. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/

female, Reproductive system/toxin/male [SUSPECTED] [Sulfuric Acid 50% (w/w) Solution]. May cause damage to the following organs: the reproductive system, teeth.

**Other Toxic Effects on Humans:**

Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (irritant), of ingestion, . Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** May cause adverse reproductive effects and Cancer.

**Special Remarks on other Toxic Effects on Humans:**

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

### Section 14: Transport Information

**DOT Classification:** Class 8: Corrosive material

**Identification:** : Sulfuric Acid, Solution (Sulfuric acid) UNNA: 2796 PG: II

**Special Provisions for Transport:** Not available.

### Section 15: Other Regulatory Information

**Federal and State Regulations:**

Illinois toxic substances disclosure to employee act: Sulfuric acid New York release reporting list: Sulfuric acid Rhode Island RTK hazardous substances: Sulfuric acid Pennsylvania RTK: Sulfuric acid Minnesota: Sulfuric acid Massachusetts RTK: Sulfuric acid New Jersey: Sulfuric acid TSCA 8(b) inventory: Sulfuric acid; Water SARA 302/304/311/312 extremely hazardous substances: Sulfuric acid SARA 313 toxic chemical notification and release reporting: Sulfuric acid 50% CERCLA: Hazardous substances.: Sulfuric acid: 1000 lbs. (453.6 kg);

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:**

**WHMIS (Canada):**

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

**DSCL (EEC):**

R35- Causes severe burns. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S30- Never add water to this product. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**HMIS (U.S.A.):**

Health Hazard: 3

Fire Hazard: 0

Reactivity: 0

Personal Protection:

**National Fire Protection Association (U.S.A.):**

Health: 3

Flammability: 0

Reactivity: 2

Specific hazard:

**Protective Equipment:**

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

**Section 16: Other Information****References:** Not available.**Other Special Considerations:** Not available.**Created:** 10/09/2005 11:59 PM**Last Updated:** 11/01/2010 12:00 PM

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