APPENDIX A

Health and Safety Plan

Appendix A: Health and Safety Plan

Former Galena Forward Operating Location Project

Prepared for

Air Force Center for Engineering and the Environment (AFCEE)

August 2010

CH2MHILL
949 East 36th Avenue
Suite 500
Anchorage Alaska 99508

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: **John Culley/SPK, CIH** **Date**:

Field Operations Manager Approval: **Date:**

Revisions

Revisions Made By: **Date:**

Description of Revisions to Plan:

Revisions Approved By: **Date:**

ATTACHMENTS

Attachment A-1	Employee Signoff Form – Health and Safety Plan
Attachment A-2	Chemical Inventory/Register Form
Attachment A-3	Chemical-Specific Training Form
Attachment A-4	Project Activity Self-Assessment Checklists/Forms/Permits
Attachment A-5	Behavior Based Loss Prevention System Forms
Attachment A-6	Material Safety Data Sheets

Project HS&E Change Management Form

*This evaluation form should be reviewed on a **continuous** basis to determine if the current site health and safety plan adequately addresses ongoing project work, and should be completed whenever new tasks are contemplated or changed conditions are encountered.*

Project Task:

Project Number: Project/Task Manager:

Name: Employee #:

Evaluation Checklist	Yes	No
1. Have the CH2MHILL staff listed in the original HSP/Field Safety Instructions (FSI) changed?		
2. Has a new subcontractor been added to the project?		
3. Is any chemical or product to be used not listed in Attachment A-2 of the plan?		
4. Have additional tasks been added to the project that were not originally addressed in the plan?		
5. Have new contaminants or higher than anticipated levels of original contaminants been encountered?		
6. Have other safety, equipment, activity, or environmental hazards been encountered that are not addressed in the plan?		

If the answer is "YES" to Question 3, an HSP/FSI revision is NOT needed. Please take the following actions:

- Add the chemical to **Attachment A-2**, ensure that employees handling the chemical are trained, and add training documentation to **Attachment A-3**.

If the answer is "YES" to Questions 1, 2, 4, 5, or 6, an HSP/FSI revision MAY BE NEEDED. Please contact HS&E directly.

Emergency Contacts

24-hour CH2M HILL Injury Reporting– 1-866-893-2514
24-hour CH2M HILL Serious Incident Reporting Contact – 720-286-4911

Medical Emergency – 911 **Facility Medical Response #:** **Local Ambulance #:**	**CH2M HILL – Medical Consultant** WorkCare Dr. Peter Greaney M.D. 300 S. Harbor Blvd, Suite 600 Anaheim, CA 92805 800/455-6155 714/978-7488
Local Medical Clinic Galena Health Clinic, 77 Antoski Road, Galena, AK 99741 907/656-1266	**CH2M HILL Director – Health, Safety, Security & Environment** Andy Strickland/DEN 720/480-0685 (cell) or 720/286-2393 (office)
Fire/Spill Emergency – 911 **Facility Fire Response #:** **Local Fire Dept #:**	**Responsible Health and Safety Manager (RHSM)** Name: John Culley/SPK Phone: 206/660-3367
Security & Police – 911 **Facility Security #:** **Local Police #:** 907/656-2177	**Human Resources Department** Name: Lisa Havens/SEA Phone: 425/453-5000
Utilities Emergency Phone Numbers Water: Gas: Electric:	**Worker's Compensation:** Contact Business Group Human Resources Department to have form completed or contact Jennifer Rindahl after hours: 720/891-5382
Safety Coordinators (Safety Coordinator-Hazardous Waste) Name: Ronny Fields/ANC and Jeremiah Knuth/ ANC Phone: Galena cell 907/656-7087, cell 423/310-6556 907/762-1388, Galena cell 907/656-7087	**Media Inquiries Corporate Strategic Communications** Name: John Corsi Phone: 720/286-2087
Project Manager Name: Win Westervelt/ANC Phone: 907/646-0289	**Automobile Accidents** Rental: Linda Anderson/COR 720/286-2401 CH2M HILL owned vehicle: Linda George 720/286-2057
Federal Express Dangerous Goods Shipping Phone: 800/238-5355	**CHEMTEL (hazardous material spills)** **Phone: 800/255-3924**

Hospital Name/Address:	Galena Health Clinic 77 Antoski Road, Galena, AK 99741	**Hospital Phone #:** 907/656-1266

Directions to Hospital

DIRECTIONS

See map next page


Antoski Rd
Sccga Dr
Galena Air
Louden Loop
Denega Ln
Nollner Dr
Gabes Dr
Tiger Fwy
Yukon
Galena Health Clinic
77 Antoski Road
Galena, AK 99741
907/656-1266

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Abbreviations and Acronyms

°	degree
3R	Recognize, Retreat, Report
AFCEE	Air Force Center for Engineering and the Environment
AHA	Activity Hazard Analysis
AKDOT&PF	State of Alaska Department of Transportation and Public Facilities
AOC	area of concern
APR	air-purifying respirators
BBLPS	Behavior Based Loss Prevention System
BTEX	benzene, toluene, ethylbenzene, and xylene
C	Celsius
CA	potential occupational carcinogen
CCI	CH2M HILL Constructors, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm	centimeter
COC	contaminants of concern
CPR	cardiopulmonary resuscitation
CS	Core Standards
dBA	decibels (A weighted scale)
DD	Decision Document
DEET	N,N-diethyl-meta-toluamide
DoD	U.S. Department of Defense
ERC	Emergency Response Coordinator
ES	Environmental Services
eV	electron volt
F	Fahrenheit
FA	first aid
FOL	Forward Operating Location

FSI	Field Safety Instructions
FWSO	Firm Wide Security Operations
GFCI	Ground Fault Circuit Interrupter
GPR	Ground Penetrating Radar
GPS	Global Positioning System
HAZCOM	Hazardous Communication
HAZWOPER	hazardous waste operations and emergency response
HITS	Hours and Incident Tracking System
HS&E	Health, Safety, & Environment
HSP	Health and Safety Plan
HSSE	Health, Safety, Security, & Environment
IDLH	immediately dangerous to life and health
IDW	investigation-derived waste
IRF	Incident Report Form
KA	Contract Administrator
kV	Kilovolts
MEC/ MPPEH	munitions and explosives of concern/munitions potentially presenting an explosive hazard
mg/m^3	milligrams per cubic meter
mm	Millimeter
MSDS	Material Safety Data Sheet
NA	not applicable
NL	no limit found in reference materials
NSC	National Safety Council
O_2	Oxygen
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PAPR	powered air-purifying respirators
PDA	Personal Digital Assistant
PIM	potentially infectious material

PIP	photoionization potential
PM	Project Manager
PPE	personal protective equipment
PTSP	Pre-Task Safety Plan
RAC	Risk Assessment Code
REM	Responsible Environmental Manager
RF	Radio Frequency
RHSM	Responsible Health and Safety Manager
ROD	Record of Decision
SAR	supplied-air respirators
SBO	Safe Behavior Observation
SCBA	self-contained breathing apparatus
SI	Site Inspection
SOP	Standard Operating Procedure
SPF	sun protection factor
STS	standard threshold shift
TBD	To be determined
TSD	treatment, storage, and disposal
TSDF	treatment, storage, and disposal facility
UK	Unknown
UL	Underwriters Laboratory
UV	Ultraviolet

1.0 Applicability

This Health and Safety Plan (HSP) applies to:

- All CH2M HILL staff, including subcontractors and tiered subcontractors of CH2M HILL working on the site
- 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. This HSP will be amended or revised as project activities or conditions change or when supplemental information becomes available. This HSP adopts, by reference, the Enterprise-wide Core Standards (CS) and Standard Operating Procedures (SOPs), as appropriate. In addition, this 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 Signoff Form included in this document as **Attachment A-1** to acknowledge review of this document. Copies of the signature page will be maintained onsite by the Safety Coordinator.

2.0 General Project Information

2.1 Project Information and Background

PROJECT NO: 394439

CLIENT: Air Force Center for Engineering and the Environment (AFCEE)

PROJECT/SITE NAME: Former Galena Forward Operating Location (FOL) Project

SITE ADDRESS: Galena Airport, Galena, AK

CH2M HILL PROJECT MANAGER: Win Westervelt/ANC

DATE HEALTH AND SAFETY PLAN PREPARED: January 2010

DATE(S) OF SITE WORK: June 2010 through December 31, 2011

SITE ACCESS: Permits from Department of Transportation (DOT) must be acquired prior to commencing field activities. All materials, equipment, and personnel will be flown-in to the site via Fairbanks or Anchorage.

2.2 Site Background and Setting

This site is a former U.S. Air Force installation. The goal of this TO is to complete the environmental restoration process of the Former Galena FOL, beginning with a Preliminary Assessment/Site Inspection (PA/SI) through a Record of Decision (ROD) for Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) sites, and through a Decision Document (DD) for petroleum-contaminated sites subject to State corrective action requirements. The sites under this TO include, but are not limited to:

2.3 Description of Tasks

Refer to project documents (i.e., Work Plan) for detailed task information. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin. Refer to Section 16.0, Site-Control Plan, of this HSP for procedures related to "clean" tasks that do not involve hazardous waste operations and emergency response (HAZWOPER).

2.3.1 HAZWOPER-Regulated Tasks

- Drilling/direct-push
- Well installation
- Soil sampling
- Soil gas sampling
- Groundwater sampling
- Investigation-derived waste (IDW) management

2.3.2 Non-HAZWOPER-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or State HAZWOPER regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-HAZWOPER-

trained personnel. **Prior approval from the Responsible Health and Safety Manager (RHSM) is required before these tasks are conducted on regulated hazardous waste sites.**

TASKS	CONTROLS
• Surveying • Utility locating	• Brief on hazards, limits of access, and emergency procedures • Post areas of contamination as appropriate • Perform air sampling/monitoring as specified in Section 12.0 • Wear appropriate personal protective equipment (PPE) as outlined in Section 13.0

ES030810213738RDD_Location_Map

FIGURE 1-1
LOCATION MAP
Health and Safety Plan
Former Galena Forward Operating Location, Alaska

4.0 Project Organization and Responsibilities

4.1 Client

Contact Name: Al Weilbacher
Phone: 210/536-4541

If the activities performed by CH2M HILL occur on land that is leased or owned by the City of Galena, School District, or Alaska Dept of Transportation and Public Works (AKDOT&PF; including the Airport), CH2M HILL will contact the following people:

City of Galena
Russ Sweetsir - Mayor 907/656-1223
Tom Corrigan - City Manager 907/656-1301

School District
Jim Smith - Superintendent 907/656-1883

AKDOT&PF
Bill O'Halloran - Airport Manager 907/656-1236
Collette Foster - Leasing Officer (Permits) 907/451-5201
Sam Myers - DOT Environmental 907/451-5291

Louden Tribal Council
March Runner - CEO 907/656-1711

4.2 CH2M HILL

4.2.1 Project Manager

PM Name: Win Westervelt/ANC
Phone: 907/646-0289

The Project Manager (PM) is responsible for providing adequate resources (budget and staff) for project-specific implementation of the Health, Safety, & Environment (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

  - Ensuring that HSE submittals, subcontract agreements, and appropriate site-specific safety procedures are in place and accepted prior field mobilization

- Ensure that 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/procedures
- Manage the site and interfacing with third 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
- Support/implement use of stop work orders when subcontractor safety performance is not adequate

4.2.2 CH2M HILL Responsible Health and Safety Manager

Name: John Culley/SPK
Cellular Number: 206/660-3367

The Responsible Health and Safety Manager (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 (AHAs)
- Review and evaluate subcontractor site-specific safety procedures for adequacy prior to the start of subcontractor's field operations
- Support the oversight (or Safety Coordinator's direct oversight) of subcontractor and tiered subcontractor HSE practices
- Permit upgrades/downgrades in respiratory protection after reviewing analytical data
- Conduct audits as determined by project schedule and coordination with the PM
- Participate in incident investigations, lessons learned, and loss/near loss reporting

4.2.3 CH2M HILL Safety Coordinator-Hazardous Waste

Name: Tom Beck/ANC, Jeremiah Knuth/ANC
Telephone Number:

The Safety Coordinator 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 that CH2M HILL site personnel and subcontractor personnel read this HSP and sign the Employee Signoff Form (Attachment A-1) prior to commencing field activities.

- Verify that CH2M HILL site personnel have completed any required specialty training (e.g., fall protection, confined-space entry) and medical surveillance as identified in this HSP.
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractor's license, training and medical monitoring records, and accepted site-specific safety procedures prior to the start of subcontractor's field operations.
- Act as "Hazard Communications Coordinator" and perform the responsibilities outlined in this HSP.
- Act as "Emergency Response Coordinator" and perform the responsibilities outlined in this HSP.
- Hold/verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (e.g., as tasks or hazards change).
- Verify that project health and safety forms and permits are being used as outlined in this HSP.
- Perform oversight and/or assessments of subcontractor HSE practices per the site-specific safety plan and verify that project activity self-assessment checklists are being used as outlined in this HSP.
- Coordinate with the RHSM regarding CH2M HILL and subcontractor operational performance, and third-party interfaces.
- Verify appropriate PPE use, availability, and training.
- Ensure that the overall, job-specific, HSE goals are fully and continuously implemented.
- Calibrate and conduct air monitoring in accordance with this HSP. Maintain all air monitoring records in project file.
- Maintain HSE records and documentation.
- Facilitate Occupational Safety and Health Administration (OSHA) or other government agency inspections, including accompanying inspector and providing all necessary documentation and follow-up.
- Deliver field HSE training on an as-needed based on project-specific hazards and activities.
- 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 the subcontractor's safety representative, and stop affected work until adequate corrective measures are implemented. Notify the PM and RHSM, as appropriate.

- Document all oral-health and safety-related communications in the project field logbook, daily reports, or other records.

4.3 CH2M HILL Subcontractors

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

Subcontractor: To be determined (**TBD)**
Subcontractor Contact Name:
Telephone:
Subcontractor Task: **General field support**

Safety Procedures Required: Subcontractor must comply with the provisions outlined in this HSP, and produce documentation verifying current 40-hour HAZWOPER training and medical monitoring in accordance with 29 Code of Federal Regulations (CFR) 1910.120.

Subcontractor: **TBD**
Subcontractor Contact Name:
Telephone:
Subcontractor Tasks: **Drilling/Direct-push**

Safety Procedures Required: Subcontractor must have their company's safe drilling procedures onsite when field activities commence, and complete the AHA in **Attachment A-5**.

Subcontractor: **TBD**
Subcontractor Contact Name:
Telephone:
Subcontractor Task: **Utility locates**

Safety Procedures Required: Subcontractor must complete the AHA in **Attachment A-5**, and provide information on the types of equipment that will be used to locate underground utilities.

Subcontractor: **TBD**
Subcontractor Contact Name:
Telephone:
Subcontractor Task: **Surveying**

Safety Procedures Required: Subcontractor must complete the AHA in **Attachment A-5**.

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

- Complying with all local, State, and federal safety standards
- Complying with project and owner safety requirements
- Participating in the project safety program and holding/attending/participating in all required safety meetings
- Providing a qualified safety representative to interface with CH2M HILL
- Maintaining safety equipment and PPE for their employees

- Maintaining and replacing safety protection systems damaged or removed by the subcontractor's operations
- Immediately notifying the Safety Coordinator of any accident, injury, and/or incident and submitting reports to CH2M HILL within 24 hours
- Installing contractually required general conditions for safety (for example, handrail, fencing, fall protection systems, floor opening covers, etc.)
- Conducting and documenting weekly safety inspections of project-specific tasks and associated work areas
- Conducting site-specific and job-specific training for all subcontractor employees, including reviewing the CH2M HILL HSP, subcontractor HSPs, and subcontractor AHAs, and signing appropriate signoff forms
- Determining and implementing necessary controls and corrective actions to correct unsafe conditions

The subcontractors listed above 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 fieldwork. 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/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:

- Perform work in a safe manner and produce quality results
- Perform work in accordance with company policies, and report injuries, illnesses, and unsafe conditions
- Complete work without injury, illness, or property damage
- Report all incidents immediately to supervisor, and file proper forms with a human resources representative
- Report all hazardous conditions and/or hazardous activities immediately to supervisor for corrective action

Each employee on the project has the obligation and authority to shut down any perceived unsafe work; 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 HSSE Management Practices)

Contractor: **None at this time**
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 (e.g., 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 Safety Coordinator 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/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
  - Notify the client, PM, and RHSM, as appropriate

If apparent contractor non-compliance/unsafe conditions or practices are observed, inform the contractor's 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's 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.)

Document all verbal health and safety-related communications in the 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, this 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 actions 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
- 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 supervisory. 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/safety representative verbally, document using the Observed Hazard Form, (included as an attachment to this HSP), and require corrective action.

If necessary, stop the subcontractor's work using the Stop Work Order Form until corrective action is implemented for observed serious hazards or conditions. Update the Observed Hazard Form to document corrective actions that 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. 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 supervisory/safety representative, and do not allow work to resume until adequate corrective measures have been implemented. Notify the PM, Contract Administrator (KA), and RHSM.

When repeated non-compliance or unsafe conditions are observed, notify the subcontractor's supervisory/safety representative and stop affected work by completing and delivering the Stop Work Order Form (attached to this HSP) until adequate corrective measures have been implemented. Consult the KA to determine what the contract dictates for actions to pursue in event of subcontractor non-compliance (i.e., work stoppage, back charges, progress payments, removal of subcontractor manager, monetary penalties, 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, like wearing your own safety equipment, seatbelt, etc. Actions that will be rewarded include spotting and correcting a hazard, bringing a hazard to the attention of one's foreman, telling one's foreman about an incident, coming up with a safer way to get the work done, stopping a crew member from doing something unsafe, etc. 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 that 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 Safety Coordinator needs to be notified at once by the responsible employee.
- Either the responsible employee or the responsible employee's direct supervisor is responsible for immediately reporting the unsafe condition or practice to the Safety Coordinator.
- The Safety Coordinator will act promptly to correct the unsafe condition or practice.
- The Safety Coordinator will record details of the incident or situation will be recorded the field logbook and/or use the Observed Hazard Form if a subcontractor was involved.

6.0 Safety Planning and Change Management

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 in **Attachment A-5** 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 this HSP and the 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.

7.0 Project Hazard Analysis

A health and safety risk analysis (see Table A1) 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 (e.g., using remote sampling methodology to avoid going into a confined space)
- Substitution (e.g., reducing exposure to vapors by using a geoprobe instead of test pitting)
- Engineering controls (e.g., ventilating a confined space to improve air quality)
- Warnings (e.g., establishing exclusion zones to keep untrained people away from hazardous waste work)
- Administrative controls (e.g., implementing a work-rest schedule to reduce the chance of heat stress)
- Use of PPE (e.g., using 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 (Section 7.0)
- Project-Specific Hazards and Controls (Section 8.0)
- Physical Hazards and Controls (Section 9.0)
- Biological Hazards and Controls (Section 10.0)
- Contaminants of Concern (Section 11.0)

An AHA defines the activity being performed, the hazards posed, and control measures required to perform the work safely. Workers are briefed on the AHA before doing the work, and their input is solicited prior to, 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. 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. The hazards and controls in the following sections, and applicable CH2M HILL CSs and SOPs, should be used as a basis for preparing AHAs.

AHAs have been prepared for CH2M HILL activities and are included as an attachment to this HSP. See **Attachment A-5**.

TABLE A1
General Hazard Analysis

	TASKS					
POTENTIAL HAZARDS	**Drilling, Geo-probe, and Well Installation**	**Groundwater Sampling**	**Soil Sampling and Soil Gas Sampling**	**IDW Management**	**Utility Locating**	**Surveying**
Flying debris/objects	X		X	X		
Noise > 85 dBA	X		X	X		
Electrical	X	X			X	
Suspended loads	X			X		
Buried utilities, drums, tanks	X		X		X	
Slip, trip, fall	X	X	X	X	X	X
Back injury	X	X	X		X	X
Visible lightning	X	X		X	X	X
Vehicle traffic				X	X	X
Elevated work areas/falls						
Fires	X					
Entanglement	X					
Drilling	X					
Heavy equipment	X		X	X		
IDW management	X	X	X	X		

8.0 General Hazards and Controls

8.1 General Practices and Housekeeping

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

- Perform site work during daylight hours, whenever possible.
- Maintain good housekeeping at all times in all project work areas.
- Establish common paths of travel and keep them 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, and/or other devices to be used.
- Designate specific areas for the proper storage of materials.
- Store tools, equipment, materials, and supplies in an orderly manner.
- As work progresses, neatly store scrap and unessential materials or remove them from the work area.
- Provide containers for collecting trash and other debris and remove them at regular intervals.
- Quickly clean up all spills.
- Clean oil and grease 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, adjusting, or repairing it. 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 it in accordance with federal, State, and local regulations.
- Note the correct way to lift heavy objects (secure footing, firm grip, straight back, lift with the legs), and get help if needed. Use mechanical lifting devices whenever possible.
- Check the work area to determine what problems or hazards may exist.

8.2 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 device's Personal Digital Assistant (PDA), 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 your focus on driving. Eating, drinking, smoking, and adjusting controls can divert your attention from the road. Take the time to park, and perform these tasks when parked rather than while driving.

8.3 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
- Wash hands with soap and water prior to eating, smoking, or applying cosmetics

8.4 Bloodborne Pathogens

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

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

Employees trained in FA/CPR or exposed to PIM must complete CH2M HILL's 1-hour bloodborne computer-based training module annually. When performing FA/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 PIMs.
- 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.
- 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)
- Administering post-exposure prophylaxis

8.5 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 the following:

- 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
- 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. (CCI) 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.

8.6 Shipping and Transportation of Chemical Products

(Reference CH2M HILL's Procedures for Shipping and Transporting Dangerous Goods)

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. Trained staff must properly identify, label, pack, and document all hazardous materials that are shipped (e.g., via Federal Express) or transported by road. Contact the RHSM or the Warehouse Coordinator for additional information.

9.0 Project-Specific Hazards and 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 site or the particular hazard. 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 Safety Coordinator-Hazardous Waste (Safety Coordinator-Hazardous Waste) for clarification.

9.1 Drilling Safety

- 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. A minimum distance of 15 feet between mast and overhead lines (<50 kilovolts [kV]) is recommended. Increased separation may be required for lines greater than 50 kV.
- 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.
- Personnel should become familiar with the hazards associated with the drilling method used (cable tool, air rotary, hollow-stem auger).
- Personnel should not wear loose-fitting clothing, watches, etc., that could get caught in moving parts.
- Personnel should 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.
- Personnel should 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, no one should touch any part of the rig or any person in contact with the rig, and people should stay as far away as possible. Personnel should notify emergency personnel immediately.

9.1.1 Proximity to Power Lines

No work is to be conducted within 50 feet 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 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)
0-50	10
51-100	12
101-200	15
201-300	20
301-500	25
501-750	35
751-1000	45

(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 that 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.

9.2 Noise Hazards

Previous surveys indicate that heavy equipment such as drilling or excavation equipment may produce continuous and impact noise at or above the action level of 85 decibels (A-weighted scale) (dBA). All CH2M HILL personnel within 25 feet of operating equipment, or near an operation that creates noise levels high enough to impair conversation, shall wear hearing protective devices (either muffs or plugs). Personnel will wash their hands with

soap and water prior to inserting ear plugs to avoid initiating ear infections. Additional information regarding CH2M HILL's Hearing Conservation Program is located in of the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual*. Access to this document can be easily obtained on the CH2M HILL H&S Intranet Site. All CH2M HILL field staff should complete the training module on Noise Hazards located on the CH2M HILL Virtual Office before fieldwork begins.

9.3 Soil Sampling

- Tie down loose items
- Utilize a spotter if backing vehicles or equipment towards the sampling location
- Inspect the sampling area for obstructions and poison ivy and poison oak, or other physical hazards
- If sample locations are located in dense tall grassy areas consider utilizing a "Bug-Out" suit or DuPont™ Tyvek® to mitigate the potential for tick bites
- If lifting heavy equipment from a vehicle, move items to the rear and get assistance when lifting
- Be alert for bees, wasps, and other insects when sampling
- Log calibration of the Direct Reading Instrument in either a field log book or on the attached form
- Notify others in the area that the task is going to be performed; delineate an exclusion zone, as applicable
- Don personal protective equipment (PPE) as specified in Section 4 of this site-specific HSP
- Position yourself upwind prior to sampling, if possible
- Do not handle sample jars without nitrile gloves

9.4 Electrical Safety

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

Below are the hazard controls and safe work practices to follow when CH2M HILL employees are required to use electrical tools, extension cords, and/or other electrical-powered equipment or when they may be exposed to electrical hazards. Ensure the requirements of the referenced SOP are followed.

9.4.1 General Electrical Safety

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- 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.

- Employees should 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.
- Employees should inspect electrical equipment, power tools, and extension cords for damage prior to use. Employees should not use defective electrical equipment; it should be removed 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 that 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
  - 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.
- Employees should operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Employees should protect all electrical equipment, tools, switches, and outlets from environmental elements.

9.5 Field Vehicles

- Use personal vehicles, rental vehicles, fleet vehicles, or project vehicles as field vehicles.
- Maintain a first aid kit, a bloodborne pathogen kit, and a fire extinguisher in the field vehicle at all times.
- Utilize a rotary beacon on the vehicle if working adjacent to an active roadway.
- If renting a vehicle, select a car that meets the following requirements:
  - Dual air bags
  - Antilock brakes
  - Midsize or larger
- Familiarize yourself with rental vehicle features prior to operating the vehicle:

  - Mirror adjustments
  - Seat adjustments
  - Cruise control features, if offered
  - Pre-program radio stations and Global Positioning System (GPS), if equipped

- Always wear a seatbelt while operating a vehicle.
- Adjust the headrest to the 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 the vehicle in a location where it can be accessed easily in the event of an emergency. If that is not possible, carry a phone.
- Have a designated place for storing the field vehicle keys when not in use.
- Ensure that back-up alarms are functioning, if equipped. Before backing up a vehicle, take a walk around the vehicle to identify obstructions/hazards. Use a spotter when necessary to back into or out of an area.

9.5.1 Initial Emergency Response Instructions

Please note the following changes under the Vehicle Accident Reporting Procedures. Staff would call the following phone numbers in the event of:

- Physical damage to a vehicle rented for 31 days or less (SUV, mini-van, passenger car) due to an incident: 1-800-VISA-911.
- Any accident involving a fleet vehicle or a rental car: contact Zurich, toll free: 1-877-246-3478 or 1-800-987-3373 or complete and submit the Auto Loss Notice on the CH2M HILL Virtual Office.
- Any accident involving an ARI or other leased vehicle, also contact Linda George/DEN (720-286-2057).

For Corporate Insurance Program assistance, please contact Linda Anderson/DEN (720/286-2401), with Jennifer Rindahl/DEN (720/286-2449) as backup.

9.6 Fire Prevention

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

Follow the fire prevention and control procedures listed below.

9.6.1 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

  - Undergo a maintenance check each year

- The area in front of extinguishers must be kept clear.
- 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.

9.6.2 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 (3.8 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.

9.6.3 Indoor Storage of Flammable/Combustible Liquids

- No more than 25 gallons (113.7 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 (113.7 liters) shall be stored in an acceptable or approved cabinet.
- Cabinets shall be conspicuously lettered: "FLAMMABLE: KEEP FIRE AWAY."
- Not more than 60 gallons (272.8 liters) of flammable or 120 gallons (545.5 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.

9.6.4 Outside Storage of Flammable/Combustible Liquids

- Storage of containers (not more than 60 gallons [272.8 liters] each) shall not exceed 1,100 gallons (5,000 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 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.

9.6.5 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 or other means 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.

9.7 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.

- Inspect tools prior to use, and damaged tools will be tagged and removed from service.
- Use hand tools for their intended use and operate them in accordance with manufacturers' 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.
- Plug portable power tools into GFCI-protected outlets.
- Use only portable power tools that are Underwriters Laboratories (UL)-listed and have a three-wire grounded plug or are 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).
- Keep safety guards on tools installed while the tool is in use and promptly replace them 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, ensure that both pieces of equipment conform strictly with electrical standards and manufacturer's specifications.

- Ensure that tools used in an explosive environment are rated for work in that environment (that is, intrinsically safe, spark-proof, etc.).
- Note that 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.
- 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.
- Only unplug jammed equipment 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.

9.8 Hazard Communication

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

- Complete an inventory of chemicals brought onsite by CH2M HILL using the chemical inventory form included as **Attachment A-2** to this HSP
- Confirm that an inventory of chemicals brought onsite 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 onsite, obtain an MSDS for each hazardous chemical, include on the chemical inventory sheet (**Attachment A-2** to this HSP), and add the MSDS to **Attachment A-6** of this HSP
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly
- Give employees required chemical-specific Hazardous Communication (HAZCOM) training using the chemical-specific training form included as **Attachment A-3** to this HSP
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions

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
- Have a fire suppression system available

9.9 Knife Use

Open-bladed knives (e.g., 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)
- Knife users have been trained and follow the AHA

9.10 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, modify the task to minimize manual lifting hazards
- Have the Safety Coordinator evaluate the lifting of loads weighing more than 40 pounds (18 kilograms) using the Lifting Evaluation Form contained in SOP HSE-112
- Use mechanical lifting devices (such as forklifts; cranes, hoists, and rigging; hand trucks; and trolleys) as the preferred means of lifting heavy objects
- Seek assistance when performing manual lifting tasks that appear beyond your physical capabilities
- In general, practice the following steps 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
- Obtain training; all CH2M HILL workers must have training in proper manual lifting either through the New Employee Orientation or through the Manual Lifting module located on the CH2M HILL Virtual Office

9.11 Pressure Washing Operations

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

- Have only trained, authorized personnel operate the high-pressure washer
- Follow the manufacturer's safety and operating instructions
- Inspect the pressure washer before use and confirm that the deadman trigger is fully operational
- Always point the wand at the work area
- Never tie down the trigger
- Never point the wand at yourself or another worker
- Ensure that the wand is at least 42 inches (1.1 meters) from the trigger to the tip and use >10 degree tips
- Maintain good footing when operating the pressure washer
- Have non-operators remain a safe distance from the operator
- Do not make an unauthorized attachment to the unit
- Do not modify the wand
- Repair all leaks or malfunctioning equipment immediately or take it out-of-service
- At a minimum, wear polycoated DuPont™ Tyvek® or equivalent, 16-inch-high steel-toed rubber boots, safety glasses, hard hat with face shield, and inner and outer nitrile gloves

9.12 Utilities (Underground)

Local Utility Mark-Out Services

Name: **TBD**
Phone:

Do not begin subsurface construction activities (e.g., trenching, excavation, drilling, etc.) until a check for underground utilities and similar obstructions has been conducted. The use of as-built drawings and utility company searches must be supplemented with a geophysical or other survey by a qualified, independent survey contractor to identify additional and undiscovered buried utilities.

Examples of the types of geophysical technologies include:

- **Ground Penetrating Radar (GPR),** which can detect pipes, including gas pipes, tanks, conduits, cables, etc., both metallic and non-metallic, at depths up to 30 feet (9.1 meters), depending on equipment. Sensitivity for both minimum object size and maximum depth detectable depends on equipment selected, soil conditions, etc.

- **Radio Frequency (RF),** which involves inducing an RF signal in the pipe or cable and using a receiver to trace it. Some electric and telephone lines emit RF naturally and can be detected without an induced signal. This method requires knowing where the conductive utility can be accessed to induce the RF field, if necessary.
- **Dual RF**, a modified version of RF detection using multiple frequencies to enhance sensitivity but with limitations similar to RF.
- **Ferromagnetic Detectors**, which are metal detectors that will detect ferrous and non-ferrous utilities. Sensitivity is limited (e.g., a 100-millimeter [mm] iron disk to a depth of about one meter or a 25 mm steel paper clip to a depth of about 20 centimeters [cm]).
- **Electronic markers,** which are emerging technologies that impart a unique electronic signature to materials such as polyethylene pipe to facilitate location and tracing after installation. These are promising for future installations, but not helpful for most existing utilities already in place.

The following procedures shall be used to identify and mark underground utilities during subsurface construction activities on the project:

- Have the survey contractor determine the most appropriate geophysical technique or combination of techniques to identify the buried utilities on the project, based on the survey contractor's experience and expertise, types of utilities anticipated to be present, and specific site conditions.
- Have the survey contractor employ the same geophysical techniques used on the project to identify the buried utilities, to survey the proposed path of subsurface construction work, and to confirm that no buried utilities are present.
- Identify customer-specific permit and/or procedural requirements for excavation and drilling activities. For military installations, contact the Base Civil Engineer and obtain the appropriate form to begin the clearance process.
- Contact utility companies or the State/regional utility protection service at least two (2) working days prior to excavation activities to advise them of the proposed work. Ask them to establish the location of the utility underground installations prior to the start of actual excavation.
- Schedule the independent survey.
- Obtain utility clearances for subsurface work on both public and private property.
- Obtain clearances in writing, signed by the party conducting the clearance.
- Physically verify underground utility locations by hand digging using wood- or fiberglass-handled tools when any adjacent subsurface construction activity (e.g., mechanical drilling, excavating) work is expected to come within 5 feet (1.5 meters) of the marked underground system. If subsurface construction activity is within 5 feet (1.5 meters) and parallel to a marked existing utility, the utility location must be exposed and verified by hand digging every 100 feet (30.5 meters).

- Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is completed, the PM must notify the utility company or utility protection service to inform them that the markings have been destroyed.
- Conduct a site briefing for employees regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the method used to isolate the utility and the hazards presented by breaching the isolation.

9.13 Munitions Response (Recognize, Retreat, Report - 3R)

Any CH2M HILL project located on a present or former U.S. Department of Defense (DoD) facility, even if it is now under the control of a city, State, or private owner, should plan on the potential to encounter munitions and explosives of concern/munitions potentially presenting an explosive hazard (MEC/MPPEH). A contingency plan developed during pre-mobilization that addresses the 3Rs of MEC/MPPEH (recognize the potential hazard, retreat upwind a safe distance, and report in accordance with approved plans) will lessen the impact to the project and enhance employee safety if MEC/MPPEH is encountered.

For information or clarification, call Dan Young, 251/962-2963, regardless of time/day.

10.0 Physical Hazards and Controls

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 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 the 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 90 dBA 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 84 dBA or a noise dose of 50 percent must participate in the hearing conservation program, including initial and annual (as required) audiograms.
- The RHSM will evaluate appropriate control 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 the CH2M HILL 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 repaired or discarded if damaged or deteriorated.
- In work areas where actual or potential high noise levels are present at any time, employees working or walking through the area must wear hearing protection.
- 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.

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.

10.2.1 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

10.2.2 Provide Shade

- Take lunch and breaks in shaded areas.
- Create shade or shelter through the use of umbrellas, tents, and canopies.
- Use fabrics such as canvas, sailcloth, awning material, and synthetic shade cloth because they 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.

10.2.3 Wear 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.
- Wear head protection 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.

10.2.4 Use 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.
- Select waterproof sunscreens 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.
- Remember—no sunscreen provides 100-percent protection against UV radiation. Other precautions must be taken to avoid overexposure.

10.3 Temperature Extremes

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)
- Communicating any concerns regarding heat and cold stress to their supervisor or Safety Coordinator

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 (which indicates less retrained body heat—a rise in internal temperature precipitates heat injury), and the more efficient the sweating mechanism.
- **Acclimatization** is the degree to which a worker's body has physiologically adjusted or acclimatized to working under hot conditions. Acclimatization affects their ability to do work. Acclimatized individuals sweat sooner and more profusely than un-acclimatized individuals. Acclimatization occurs gradually over 1 to 2 weeks of continuous exposure, but it can be lost in as little as 3 days in a cooler environment.
- **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 degrees (°) Fahrenheit (F) (10° Celsius [C]) to 60°F (15.6°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 (e.g., 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-brimmed hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shelter/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. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the Safety Coordinator to avoid progression of heat-related illness.

Thermal Stress Monitoring

The following procedures should be implemented when the ambient air temperature exceeds 70°F (21°C), the relative humidity is high (greater than 50 percent), or when the workers exhibit symptoms of heat stress.

- The heart rate should be measured by the radial pulse for 30 seconds, as early as possible in the resting period.
  - The heart rate at the beginning of the rest period should not exceed 110 beats per minute, or 20 beats per minute above resting pulse.

  - If the heart rate is higher, 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 110 beats per minute 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 110 beats per minute, or 20 beats per minute above resting pulse.
- Alternately, the oral temperature can be measured before the workers have something to drink.
  - If the oral temperature exceeds 99.6°F (37.6°C) at the beginning of the rest period, the following work cycle should be shortened by 33 percent.
  - Continue this procedure until the oral 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.

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.

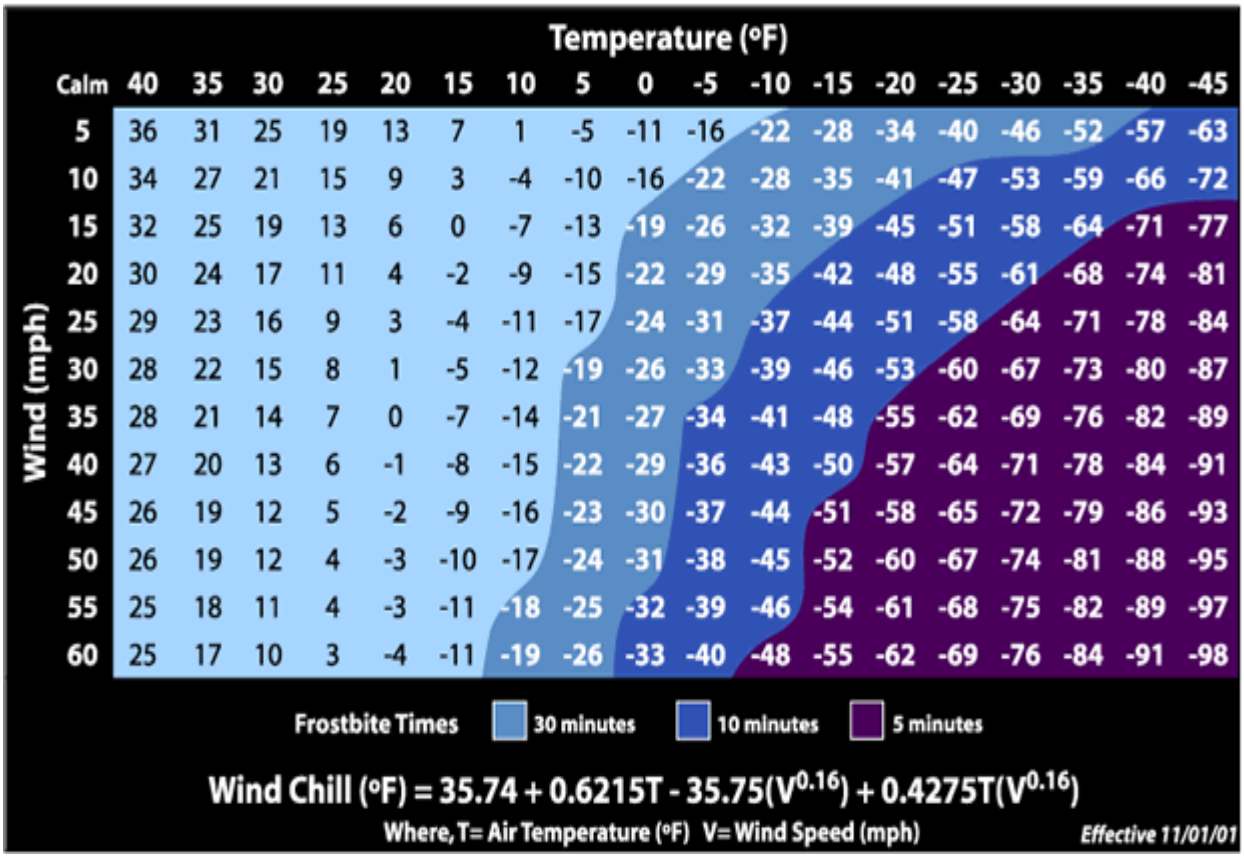
Precautions

- 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).

- Use the Wind-Chill Chart (below) 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.
- If experiencing initial signs of immersion foot, frostbite, and/or hypothermia, report it immediately to your supervisor/PM to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review a weather forecast. Be aware of predicted weather systems along with sudden drops in temperature, increases in winds, and precipitation.

SYMPTOMS AND TREATMENT OF COLD STRESS

	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; 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 not hot–water. Have victim drink warm fluids, but not 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 not 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	Controls
None Known	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 HSP, contact the RHSM so that a revision to this HSP can be made. Whether it is contact with a poisonous plant, a poisonous snake, or a bug bite, do not take bites/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 Black Bears

Bears may inhabit wooded areas where there is scarce continuous human presence.

- Make your presence known—especially when vegetation and terrain make it hard to see.
- Make noise, sing, or talk loudly.
- Avoid thick brush.
- Try to walk with the wind at your back so your scent will warn bears of your presence.
- Give bears plenty of room. Every bear has a "personal space"—the distance within which a bear feels threatened—that can be from a few feet to a few hundred feet. If you stray within that zone, a bear may act aggressively. Never approach bears, even if only out of curiosity, and never attempt to feed bears.
- If a bear cannot recognize you, it may come closer or stand on its hind legs for a better view. You may try to back away slowly diagonally, but if the bear follows, stop and stand your ground. If the bear moves closer or acts aggressively, stay close together and wave your arms and shout.
- Do not climb a tree—black bears are good climbers.
- Do not run. Bears have been clocked at speeds of up to 35 miles per hour and, like dogs, will chase fleeing animals. Bears often make bluff charges, sometimes up to 10 feet away, without making contact. Continue waving your arms and shouting. Never imitate bear sounds or use high-pitched squeals.
- If attacked, do not run. Clasp your hands tightly over the back of your neck or, if you are carrying a backpack, use it to protect your head and neck and remain still. For black bears, if the attack lasts for more than a few seconds, respond aggressively—use sticks, rocks, your fists or noise. Black bears will sometimes back off if they are challenged.

11.2 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 carefully with tweezers.
  - 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.

11.3 Coyotes or Wolves

While far from domesticated, coyotes and wolves 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 and wolves can be active at any time. Under normal circumstances, they are 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 or wolf that behaves aggressively, you have probably gotten too close to its prey or its family.

- Try to scare the animal 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 Mosquito Bites

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, at 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) because mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35 percent DEET. Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- 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.
- Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

12.0 Contaminants of Concern

The following table summarizes the potential contaminants of concern (COC), their occupational exposure limits, and signs and symptoms of exposure. The table also includes the maximum concentration of each COC and the associated location and media that were sampled (e.g., groundwater, soil boring, surface soil). These concentrations were used to determine the engineering and administrative controls (described in Section 8, Project-Specific Hazards and Controls), as well as PPE and site monitoring requirements.

CONTAMINANTS OF CONCERN

Contaminant	Location and Maximum[a] Concentration	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Diesel Range Organics	Potential	100 mg/m^3 (REL)	NL	Primary system effect is CHS depression. Inhalation of vapors may cause nausea, confusion, drowsiness, convulsions, and coma. Liquid may cause skin and eye irritation	UK
Gasoline Range Organics	Potential	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
Benzene	Potential	0.5 ppm	500 CA	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	9.24
Ethyl Benzene	Potential	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
Lead	Potential; especially at the GUN site	0.05 mg/m^3	100	Weakness, lassitude, facial pallor pal eye weight loss, malnutrition, abdominal pain, constipation, anemia, gingival lead line, tremors, paralysis of wrist and ankles, encephalopathy, kidney disease, irritated eyes, hypotension	NA
Toluene	Potential	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
Trichloroethylene	Potential	10 ppm	1,000 CA	Headache, vertigo, visual disturbance, eye and skin irritation, fatigue, giddiness, tremors, sleepiness, nausea, vomiting, dermatitis, cardiac arrhythmia, paresthesia, liver injury	9.45
Xylenes	Potential	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

[a] 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).

[b] Appropriate value of PEL, REL, or TLV listed.

[c] 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.

[d] PIP = photoionization potential; NA = not applicable; UK = unknown.

mg/m^3 = milligrams per cubic meter
ppm = parts per million

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 Assessment 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 (e.g., in breathing zone, at source, etc., and site location), and what the reading is. If any action levels are reached, note them in the field logbook and note the action(s) taken.

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

13.1 Air Monitoring Specifications

AIR MONITORING SPECIFICATIONS

Instrument	Tasks	Action Levels[a]	Frequency [b]	Calibration
PID: MultiRAE with 10.6eV lamp or GasTech	• Drilling/Direct-push • Well installation • Soil sampling • Soil gas sampling • Groundwater sampling • IDW management	<1 ppm → Level D >1 ppm → Collect colormetric tubes, if Benzene I S NOT detected, then: 1-10 ppm → Level D > 10 ppm → Stop work; Notify HSM If Benzene IS detected, then: 1-25 ppm → Level C > 25 ppm → Stop work; Notify HSM	Initially and periodically during task	Daily
CGI: MultiRAE or equivalent	• Drilling/Direct-push • Well installation	0-10% : → No explosion hazard 10-25% LEL: → Potential explosion hazard >25% LEL: → Explosion hazard; evacuate or vent	Continuous during advance-ment of boring or trench	Daily
O_2Meter: MultiRAE or equivalent	• Drilling/Direct-push • Well installation	>23.5%[c] O_2: → Explosion hazard; evacuate or vent 20.9%[c] O_2: → Normal O_2 <19.5%[c] O_2: → O_2 deficient; vent or use SCBA	Continuous during advance-ment of boring or trench	Daily
Colormetric Tube: Drager Benzene specific	See PID	No Color Change → See PID Color Change → See PID	Initially and periodically when PID >1 ppm	Not applicable
Dust Monitoring: Visual	During all invasive tasks	No Visual Dust → Continue operations Visual Dust → Implement control measures	Continuous	Not applicable

[a] Action levels apply to sustained breathing-zone measurements above background for more than 5 minutes.

[b] The exact frequency of monitoring depends on field conditions and is to be determined by the Safety Coordinator-Hazardous Waste; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., “Breathing Zone/MW-3,” “at surface/SB-2,” etc.).

[c] If the measured percent of oxygen (O_2) is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O_2 action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry (refer to Section 2).

eV = electron volt
ppm = parts per million

13.2 Calibration Specifications

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

CALIBRATION SPECIFICATIONS

Instrument	Gas	Span	Reading	Method
PID: OVM, 10.0eV bulb	100 ppm isobutylene	RF = 0.68	68 ppm	1.5 lpm reg T-tubing
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF=53	53 ppm ±5 ppm	1.5 lpm reg T-Tubing
PID: MultiRAE 10.6 eV bulb	Per Manufacturer's Specification			
CGI/O_2 Meter: MultiRAE	Per Manufacturer's Specification			
Colormetric tubes: Benzene specific	Per Manufacturer's Specification			

eV = electron volt
O_2 = oxygen
ppm = parts per million

13.3 Air Sampling

Air sampling is not required at this time.

14.0 Personal Protective Equipment

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

14.1 Required PPE

- 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 or designee.
- Employees must be trained to properly wear and maintain 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.
- PPE shall not be modified, tampered with, or repaired beyond routine maintenance.

The following table outlines PPE to be used according to task based on a 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.

PPE SPECIFICATIONS[a]

Task	Level	Body	Head	Respirator[b]
• Surveying • Utility Locates	NA	**Body**: Standard field attire (long pants and shirts with sleeves) **Boots**: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots	Hardhat[c] Safety glasses[c] Ear protection[d]	None required
• Drilling/Direct-push • Well installation • Soil sampling • Soil gas sampling • Groundwater sampling • IDW management	Modified D	**Coveralls**: Cotton coveralls; uncoated Tyvek® if cotton coveralls cannot be kept clean. **Boots**: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots. **Gloves**: Inner surgical-style nitrile and outer chemical-resistant nitrile gloves	Hardhat[c] Safety glasses Ear protection[d]	None required
When Action Levels in Section 12 are	C	**Coveralls**: Polycoated Tyvek®	Hardhat[c]	Air-purifying respirator (APR),

PPE SPECIFICATIONS[a]

Task	Level	Body	Head	Respirator[b]
exceeded for the tasks specified		**Boots**: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers **Gloves**: Inner surgical-style nitrile and outer chemical-resistant nitrile gloves	Splash shield[c] Ear protection[d] Spectacle inserts	full face, MSA Advantage 1000 or equivalent; with GME-H cartridges or equivalent for organic vapors.[e,f]

Reasons for Upgrading or Downgrading Level of Protection

Upgrade[e]	Downgrade
• Request from individual performing tasks • Change in work tasks that will increase contact or potential contact with hazardous materials • Occurrence or likely occurrence of gas or vapor emission • Known or suspected presence of dermal hazards • Instrument action levels (Section 5) exceeded	• New information indicating that situation is less hazardous than originally thought • Change in site conditions that decreases the hazard • Change in work tasks that will reduce contact with hazardous materials

[a] Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees. (Refer to the CH2M HILL Personal Protective Equipment Reimbursement Guidelines).

[b] No facial hair that would interfere with respirator fit is permitted.

[c] Hardhat and splash-shield areas are to be determined by the Safety Coordinator-Hazardous Waste.

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

[e] Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is >85%, or if organic vapor measurements are > midpoint of Level C range (refer to Section 5)--then at least every 4 hours. If encountered conditions are different than those anticipated in this HSP, contact the HSM.

[f] 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 HSM, and an Site Safety Coordinator qualified at that level is present.

14.2 Respiratory Protection

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

- Respirator users must have completed appropriate respirator training within the past 12 months. Level C training is required for air-purifying respirator (APR) use and Level B training is required for supplied-air respirator (SAR) and self-contained breathing apparatus (SCBA) use. Specific training is required for the use of powered air-purifying respirators (PAPRs).
- Respirator users must complete the respirator medical monitoring protocol and be 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 the past 12 months.
- Respirator use shall be limited to those activities identified in this plan. If site conditions change that alter 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 Safety Coordinator or RHSM of any detection of vapor or gas breakthrough. The Safety Coordinator 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.
- When breathing air is supplied by cylinder or compressor, the Safety Coordinator or RHSM shall verify that the air meets Grade D air specifications.

Respirator Change-Out Schedule

Contaminant	Change-Out Schedule
Benzene/benzene, toluene, ethylbenzene, and xylene (BTEX)	End-of-service life or end of shift (whichever occurs first)

15.0 CH2M HILL Worker Training

(Reference CH2M HILL SOP HSE-110, Heath, Safety, Environment Training Program)

15.1 Hazardous Waste Operations Training

All employees engaging in hazardous waste operations or emergency response shall have received 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 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 employees 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.

15.1.2 Three-Day Actual Field Experience

General site workers for hazardous waste operations shall have received 3 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.

15.1.3 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.

15.1.4 Eight-Hour Supervisory Training

Onsite managers 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 (Safety Coordinator-Hazardous Waste) are considered 8-hour HAZWOPER Site Safety Supervisor trained.

15.2 First Aid/Cardiopulmonary Resuscitation

First aid (FA) and cardiopulmonary resuscitation (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 FA/CPR training. Bloodborne pathogen training (located on the CH2M HILL Virtual Office) is also required for those designated as FA/CPR trained.

15.3 Safety Coordinator Training

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

15.4 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 fieldworkers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and work operations for their particular activity.

15.5 Project-Specific Training Requirements

Project-specific training for this project includes the following:

- **Safety Coordinator**. CH2M HILL Safety Coordinator-Hazardous Wastes must have current Safety Coordinator-HazWaste training.
- **Hazardous Waste**. CH2M HILL employees performing activities specified in Section 1.1.1 must have current HAZWOPER training and be medically monitored.
- **FA/CPR**. The assigned Safety Coordinator-Hazardous Waste onsite must have current FA/CPR training.
- **Fire Extinguisher**. The assigned Safety Coordinator-Hazardous Waste onsite must take the online fire extinguisher training course.
- **Waste Management**. The assigned Safety Coordinator-Hazardous Waste onsite must take the online waste management training course.
- **Bloodborne Pathogen**. The assigned Safety Coordinator-Hazardous Waste must take the CH2M HILL online bloodborne pathogen training course.
- **Dangerous Goods Shipping**. The assigned Safety Coordinator-Hazardous Waste onsite must take the online dangerous goods training course.

- **Hazard Communication**. All assigned personnel onsite must have site-specific HazCom training if using chemicals in order to perform their jobs. See **Attachments A-2** and **A-3**.

16.0 Medical Surveillance and Qualification

All site workers participating in hazardous waste operations or emergency response 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 onsite hazardous waste operations or emergency response 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 85 dBA 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)*

- Have the Safety Coordinator implement site control procedures.
- Have the Safety Coordinator conduct a site safety briefing before starting field activities or as tasks and site conditions change. Topics for briefing onsite safety include the following:
  - General discussion of HSP
  - Site-specific hazards
  - Locations of work zones
  - PPE requirements
  - Equipment
  - Special procedures
  - Emergencies
- Have the Safety Coordinator record attendance at safety briefings in a logbook and document the topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location in accordance with CH2M HILL Core Standard, *OSHA Postings*.
- Establish support, contamination reduction, and exclusion zones. Delineate these zones 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
  - Two-way radio or cellular telephone, if available
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Have the Safety Coordinator conduct initial air monitoring in the appropriate level of protection.
- Have the Safety Coordinator conduct periodic inspections of work practices to determine the effectiveness of this plan. Deficiencies are to be noted, reported to the RHSM, and corrected.

17.2 HAZWOPER Compliance Plan

(Reference CH2M HILL SOP HSE-220, *Written Plans,* and HSE-218, *Hazardous Waste Operations*)

Certain parts of the site work are covered by State or federal HAZWOPER standards and, therefore, require training and medical monitoring. Anticipated HAZWOPER tasks listed in

Section 2, General Project Information, might occur consecutively or concurrently with respect to non-HAZWOPER tasks (also specified in Section 2).

This section outlines procedures to be followed when the approved non-HAZWOPER activities do not require 24- or 40-hour training. Non-HAZWOPER-trained personnel also must be trained in accordance with all other State and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-HAZWOPER-trained personnel are allowed on the site, or while non-HAZWOPER-trained staff work in proximity to HAZWOPER activities. Other data (e.g., soil) also must document that there is no potential for exposure. The RHSM must approve the interpretation of these data.
- When non-HAZWOPER-trained personnel are at risk of exposure, the Safety Coordinator must post the exclusion zone and inform non-HAZWOPER-trained personnel of the following:
  - Nature of the existing contamination and its locations
  - Limitations of their access
  - Emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-HAZWOPER-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-HAZWOPER-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.
- Related to remediation treatment system start-ups, once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the HAZWOPER standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only HAZWOPER-trained personnel (minimum of 24 hours of training) will be permitted to enter the site. All non-HAZWOPER-trained personnel must not enter the TSDF area of the site.

18.0 Decontamination

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

The Safety Coordinator must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the Safety Coordinator. The Safety Coordinator must ensure that procedures are established for disposing of materials generated on the site.

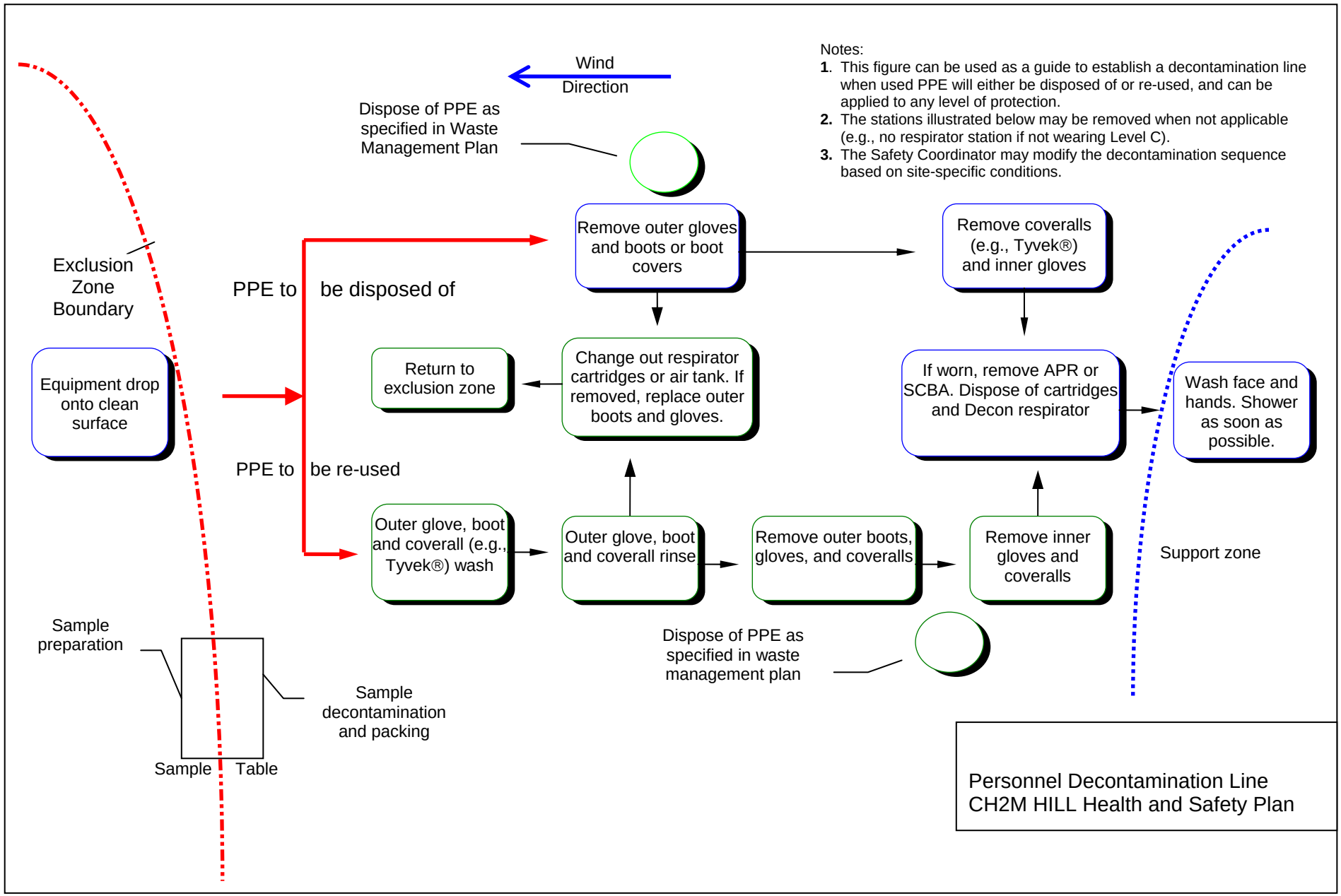
18.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
• Boot wash/rinse • Glove wash/rinse • Outer-glove removal • Body-suit removal • Inner-glove removal • Respirator removal • Hand wash/rinse • Face wash/rinse • Shower as soon as possible • Dispose of PPE in municipal trash or contain for disposal • Dispose of personnel rinse water to facility or sanitary sewer or contain for offsite disposal	• Wash/rinse equipment • Solvent-rinse equipment • Contain solvent waste for offsite disposal	• Power wash • Steam clean • Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

18.2 Diagram of Personnel Decontamination Line

No eating, drinking, or smoking is permitted either in contaminated areas or in exclusion or decontamination zones. The Safety Coordinator should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

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


Notes:
1. This figure can be used as a guide to establish a decontamination line when used PPE will either be disposed of or re-used, and can be applied to any level of protection.
2. The stations illustrated below may be removed when not applicable (e.g., no respirator station if not wearing Level C).
3. The Safety Coordinator may modify the decontamination sequence based on site-specific conditions.
Wind Direction
Dispose of PPE as specified in Waste Management Plan
Exclusion Zone Boundary
Equipment drop onto clean surface
PPE to be disposed of
PPE to be re-used
Remove outer gloves and boots or boot covers
Remove coveralls (e.g., Tyvek®) and inner gloves
Change out respirator cartridges or air tank. If removed, replace outer boots and gloves.
Return to exclusion zone
If worn, remove APR or SCBA. Dispose of cartridges and Decon respirator
Wash face and hands. Shower as soon as possible.
Outer glove, boot and coverall (e.g., Tyvek®) wash
Outer glove, boot and coverall rinse
Remove outer boots, gloves, and coveralls
Remove inner gloves and coveralls
Support zone
Dispose of PPE as specified in waste management plan
Sample preparation
Sample decontamination and packing
Sample Table
Personnel Decontamination Line
CH2M HILL Health and Safety Plan

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 Safety Coordinator 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 the following:

- Review the facility emergency and contingency plans, where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post the "Emergency Contacts" page and route to the hospital located in this section in project trailer(s). Keep a copy in field vehicles, along with evacuation routes and assembly areas. Communicate the information to onsite personnel and keep it updated.
- In 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.
- Designate one vehicle as the emergency vehicle. Place hospital directions and the map inside. Keep the keys in the ignition during field activities.
- 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, including the driving route to the hospital. Drills should take place periodically but no less than once a year.
- Brief new workers on the emergency response plan.
- Have the ERC evaluate emergency response actions and initiate appropriate follow-up actions.

19.2 Emergency Equipment and Supplies

The ERC should mark the locations of emergency equipment on the site map and post the map.

Emergency Equipment and Supplies	Location
20 (or two 10) class A,B,C fire extinguisher(s)	Required with drill rig and Field Vehicle
First aid kit	Field Vehicle
Bloodborne-pathogen kit	Field Vehicle
Additional equipment (specify): Cell phone	Field Vehicle

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*
- 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 Section 21, Incident Notification, Reporting, and Investigation.

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/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 at the front of this HSP
- Have the ERC 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 take priority
- Initiate FA/CPR, where feasible
- Notify supervisor and, if the injured person is a CH2M HILL employee, have the supervisor 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 an incident report using the Hours and Incident Tracking System (HITS) system on the CH2M HILL Virtual Office 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 Section 21, Incident Notification, Reporting, and Investigation.

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 (e.g., 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.
- Do not go under a large tree that is standing alone. Likewise, avoid poles, antennae and towers. The inclination to see trees as enormous umbrellas is the most frequent and most deadly mistake.
- 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, because the wet earth can conduct electricity. Do not touch the ground with your hands.
- Do not use telephones during electrical storms, except in the case of an emergency.

Remember that lightning may strike several miles from the parent cloud, so work should be stopped/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 thunderclap.

High winds can cause unsafe conditions, and activities should be halted until the 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.

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 hazardous 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 an oil/petroleum spill or release of any other hazardous substance. In the event of a large quantity spill, notify emergency services. Personnel discovering a spill shall (only if safe to do so):

- Stop the spill immediately (if possible) or note the source. If unsafe conditions exist, then leave the area, call emergency services, inform nearby personnel, notify the site supervisors, and initiate the incident reporting process. Notify the Safety Coordinator immediately.
- Extinguish sources of ignition (e.g., flames, sparks, hot surfaces, cigarettes, etc.).
- Clear personnel from the spill location and barricade the area.
- Utilize 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.
- Complete a Spill Report, including a description of the event, root causes, and corrective actions.

21.0 Behavior Based Loss Prevention System

(Reference CH2M HILL SOP HSE-103, Behavior Based Loss Prevention System)

A Behavior Based Loss Prevention System (BBLPS) is a system to prevent or reduce losses using behavior-based tools and proven management techniques to focus on behaviors or acts that could lead to losses. The four basic loss prevention tools that will be used by CH2M HILL projects to implement the BBLPS are:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plans (PTSPs)
- Safe Behavior Observations (SBOs)
- Self-Assessment Checklists

The Safety Coordinator or designated CH2M HILL representative onsite is responsible for implementing the BBLPS on the project site. The PM remains accountable for its implementation. The Safety Coordinator or designee shall only oversee the subcontractor's implementation of their AHA and PTSP processes on the project.

21.1 Activity Hazard Analysis

An Activity Hazard Analysis (AHA) defines the activity being performed, the hazards posed, and control measures required to perform the work safely. Workers are briefed on the AHA before doing the work and their input is solicited prior to, during, and after the performance of work to further identify the hazards posed and control measures required.

An AHA will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in **Attachment A-5**. The AHA shall identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. 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.

An AHA shall be prepared for all field activities performed by CH2M HILL and subcontractor activities during the course of the project. Hazard Controls (found in Section 2.0 and its subsections of this HSP), the Hazard Analysis Table (Table A1), and applicable CH2M HILL CSs and SOPs should be used as a basis for preparing AHAs.

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 work plan/scope of work, along with their project-specific safety plan/accident prevention plan. Additions to or changes in CH2M HILL or subcontractor field activities, equipment, tools, or material to perform work or additional/different hazard(s) encountered that require additional/different hazard control measures require either a new AHA to be prepared or an existing AHA to be revised.

21.2 Pre-Task Safety Plans

Daily safety meetings are held with all project personnel in attendance to review the hazards posed and required H&S procedures/AHAs that apply for each day's project activities. The 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 in **Attachment A-5)**, 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 H&S procedures, as identified in the AHA. The use of PTSPs better promotes worker participation in the hazard recognition and control process, while reinforcing the task-specific hazards and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

21.3 Safe Behavior Observations

Safe Behavior Observations (SBOs) shall be conducted by the Safety Coordinator or designee for specific work tasks or operations comparing the actual work process against established safe work procedures identified in the project-specific HSP and AHAs. 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 Safety Coordinator or designee shall perform at least one SBO each week for tasks/operations addressed in the project-specific HSP or AHA. The Safety Coordinator or designee shall complete the SBO form in **Attachment A-5** for the task/operation being observed and submit the SBO form weekly to Leanne Uhrig/KWO.

21.4 Project Activity Self-Assessment Checklists

In addition to the hazard controls specified in this document, Project Activity Self-Assessment Checklists are contained in **Attachment A-4**. 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 Safety Coordinator.

The self-assessment checklists will also be used by the Safety Coordinator in evaluating the subcontractors and any client contractors' compliance onsite.

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 Safety Coordinator or other CH2M HILL representative and maintained in project files.

- Drilling
- Hand and Power Tools

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 (e.g., hitting a utility)
- Incidents that attract negative media coverage
- Near misses
- Spills, leaks, or regulatory violations
- Motor vehicle accidents

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

22.2 Section Definitions

- **Incident**: An undesired event that results or could have resulted in loss through injury, damage to assets, or environmental harm. This includes all of the definitions below.
- **Accident**: An incident involving actual loss through injury, damage to assets, or environmental harm.
- **Near Miss**: An unsafe act or incident that, in other circumstances, could have resulted in loss through injury, damage to assets, or environmental harm.
- **Serious Incident**:
  - All fatalities including contractors, subcontractors, third parties, or members of the public
  - Kidnap/missing person
  - An 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
  - Acts or threats of terrorism
  - A 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 Safety Coordinator.

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

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

The Safety Coordinator shall complete an entry into the Hours and Incident Tracking System (HITS) database system located on the CH2M HILL Virtual Office (or, if the Virtual Office is not available, the Safety Coordinator shall 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.

The CH2M HILL team shall comply with all applicable statutory incident reporting requirements, such as those to OSHA and the police.

22.4 HITS System and Incident Report Form (IRF)

It is the policy of CH2M HILL to maintain 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.

22.5 Injury Management/Return-to-Work (for CH2M HILL Staff Only)

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

22.5.1 Background

The Injury Management/Return-to-Work 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 quickly report and investigate work-related injuries/illnesses to prevent recurrence.

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

- Ensure that employees are informed of the Injury Management/Return-to-Work Program
- Become familiar with the Notification Process (detailed below)
- 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 that 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) with the supervisor or Safety Coordinator accompanying the employee if a clinic visit is necessary to ensure that employee receives appropriate and timely care.
- Supervisor/Safety Coordinator completes the HITS entry or IRF immediately (within 24 hours) and forwards it to the PM 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 that suitable duties are identified and available for injured/ill workers who are determined to be medically fit to return to work on transitional duty (temporary and progressive).
- Supervisor ensures that 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 Notification, Reporting and Investigation)

The Serious Incident Reporting Requirements ensure timely notification and allow for positive control over the 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, & Environment (HSSE) and Firm Wide Security Operations (FWSO) 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 the 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/missing person

- An 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
- Acts or threats of terrorism
- A 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 PM 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 the incident onset or discovery, and notification to the appropriate corporate Crisis Management Support Team.

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. The investigation team will consist of the Safety Coordinator (with support from the RHSM), appropriate subcontractor personnel (as necessary), the PM, and the responsible supervisor. More participants may be involved, as needed, to complete the investigation.

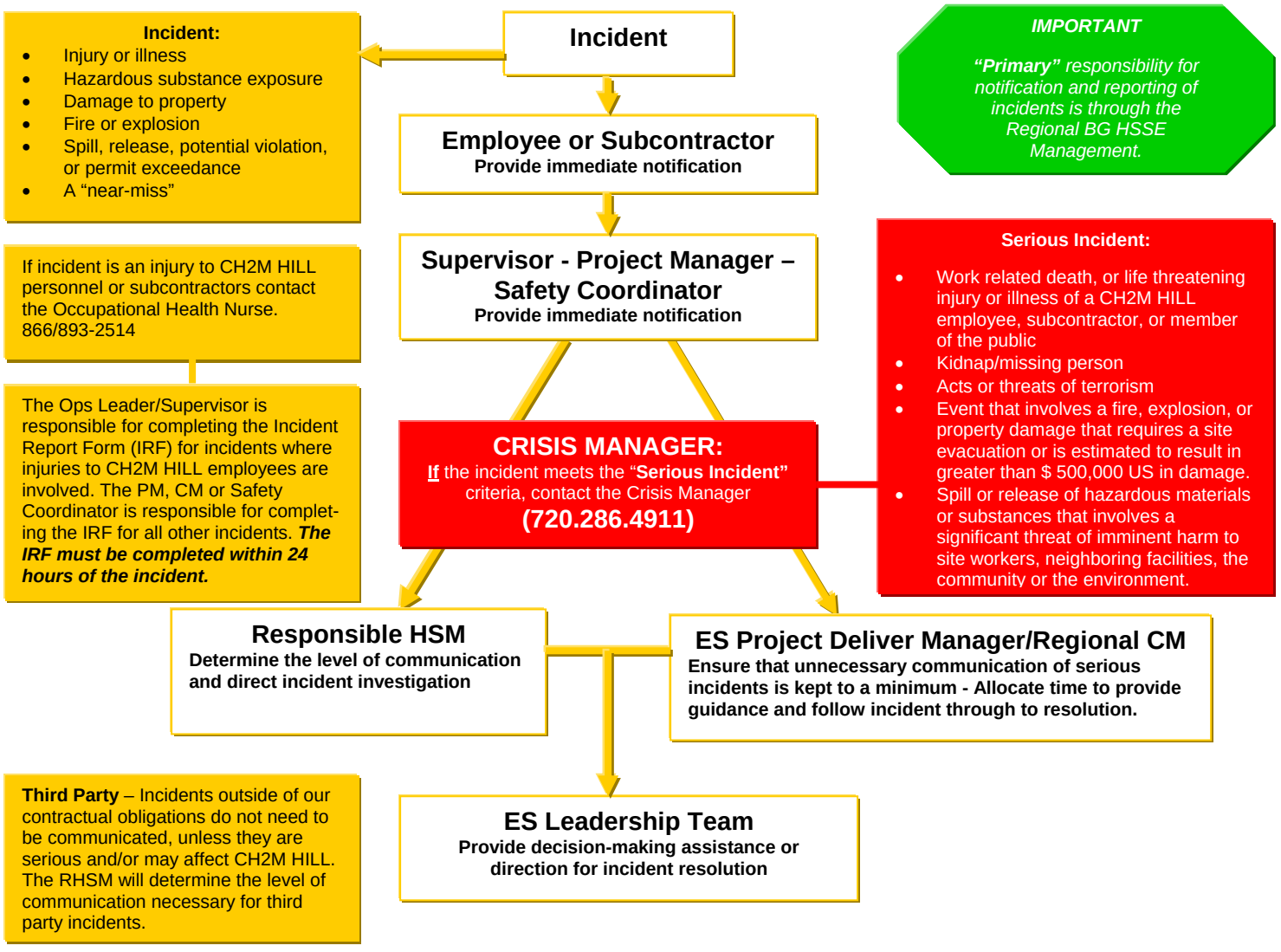
The Root Cause Analysis Form must be completed for all Loss Incidents and Near Loss Incidents. This form must be submitted to the investigation team for review.

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 use the Root Cause Analysis Flow Chart 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."

The purpose of this basic flowchart is to provide direction on the standard notification and reporting process for incidents and serious incidents. This process ensures timely notification to the appropriate Business Group Management and allows for **positive control** over flow of information, so that the incident is handled effectively, efficiently, and in conjunction with appropriate corporate entities.



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.

22.7.1 Personal Factors

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

22.7.2 Job Factors

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

22.7.3 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 Safety Coordinator upon successful implementation of all recommended actions.

- The RHSM will inform the Responsible Environmental Manager (REM) of any environmental incidents.
- Evaluation and follow-up of the IRF will be completed by the type of incident by the RHSM, REM, or FWSO. The Business Group HSE Lead will review all Business Group incidents and modify as required.
- Incident investigations must be initiated and completed as soon as possible, but no later than 72 hours after the incident.
- See the following flowcharts for Immediate Incident Reporting and Serious Incident Reporting.

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
- 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. The information contained in the filing system shall be updated regularly and/or as specified in this HSP. The PM and Safety Coordinator are responsible for collecting documentation and maintaining a complete and organized filing system.

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

- Exposure records, which include air monitoring data (including calibration records), MSDSs, exposure modeling results
- Physical-hazard exposure records, which include noise, ionizing radiation, non-ionizing radiation, vibration, and laser exposure assessments and measurements
- Respiratory-fit-test records
- Training records
- Injury/illness reports and investigations
- 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

CH2M HILL HEALTH AND SAFETY PLAN
ATTACHMENT A-1

Employee Signoff Form – Health and Safety Plan

EMPLOYEE SIGNOFF FORM
Health and Safety Plan

The CH2M HILL project employees and subcontractors listed below have been provided with a copy of this HSP, have read and understood it, and agree to abide by its provisions.

Project Name: **Project Number:**

EMPLOYEE NAME (Please print)	**EMPLOYEE SIGNATURE**	**COMPANY**	**DATE**

CH2M HILL HEALTH AND SAFETY PLAN
ATTACHMENT A-2

Chemical Inventory/Register Form

CH2MHILL

CHEMICAL INVENTORY/REGISTER FORM

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

Location:

HCC:

☐ Office ☐ Warehouse ☐ Laboratory ☐ Project:

Project No.:

Regulated Product	Location	Container labeled (✓if yes)	MSDS available (✓if yes)

MSDS for the listed products will be maintained at:

CH2M HILL HEALTH AND SAFETY PLAN
ATTACHMENT A-3

Chemical-Specific Training Form

CH2MHILL

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 A-4

Project Activity Self-Assessment Checklists/Permits/Forms

Hand and Power Tools Checklist

Drilling Checklist

CH2MHILL

H&S Self-Assessment Checklist – HAND AND POWER TOOLS

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.

Safety Coordinator-Hazardous Waste or Designated Safety Coordinator 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.

Completed checklists shall be sent to the HS&E Staff for review.

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.

SECTION 1

SAFE WORK PRACTICES (3.1)

	Yes	No	N/A	N/O
1. All tools operated according to manufacturer's instructions and design limitations.	☐	☐	☐	☐
2. All hand and power tools maintained in a safe condition and inspected and tested before use.	☐	☐	☐	☐
3. Defective tools are tagged and removed from service until repaired.	☐	☐	☐	☐
4. PPE is selected and used according to tool-specific hazards anticipated.	☐	☐	☐	☐
5. Power tools are not carried or lowered by their cord or hose.	☐	☐	☐	☐
6. Tools are disconnected from energy sources when not in use, servicing, cleaning, etc.	☐	☐	☐	☐
7. Safety guards remain installed or are promptly replaced after repair.	☐	☐	☐	☐
8. Tools are stored properly.	☐	☐	☐	☐
9. Cordless tools and recharging units both conform to electrical standards and specifications.	☐	☐	☐	☐
10. Tools used in explosive environments are rated for such use.	☐	☐	☐	☐
11. Knife or blade hand tools are used with the proper precautions.	☐	☐	☐	☐
12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stressors.	☐	☐	☐	☐

CH2MHILL

H&S Self-Assessment Checklist – HAND AND POWER TOOLS

SECTION 2	Yes	No	N/A	N/O
GENERAL (3.2.1)				
13. PPE is selected and used according to tool-specific hazards anticipated.	☐	☐	☐	☐
14. Tools are tested daily to assure safety devices are operating properly.	☐	☐	☐	☐
15. Damaged tools are removed from service until repaired.	☐	☐	☐	☐
16. Power operated tools designed to accommodate guards have guards installed.	☐	☐	☐	☐
17. Rotating or moving parts on tools are properly guarded.	☐	☐	☐	☐
18. Machines designed for fixed locations are secured or anchored.	☐	☐	☐	☐
19. Floor and bench-mounted grinders are provided with properly positioned work rests.	☐	☐	☐	☐
20. Guards are provided at point of operation, nip points, rotating parts, etc.	☐	☐	☐	☐
21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid.	☐	☐	☐	☐
ELECTRIC-POWERED TOOLS (3.2.2)				
22. Electric tools are approved double insulated or grounded and used according to SOP.	☐	☐	☐	☐
23. Electric cords are not used for hoisting or lowering tools.	☐	☐	☐	☐
24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed.	☐	☐	☐	☐
25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool.	☐	☐	☐	☐
26. Portable, power-driven circular saws are equipped with proper guards.	☐	☐	☐	☐
ABRASIVE WHEEL TOOLS (3.2.3)				
27. All employees using abrasive wheel tools are wearing eye protection.	☐	☐	☐	☐
28. All grinding machines are supplied with sufficient power to maintain spindle speed.	☐	☐	☐	☐
29. Abrasive wheels are closely inspected and ring-tested before use.	☐	☐	☐	☐
30. Grinding wheels are properly installed.	☐	☐	☐	☐
31. Cup-type wheels for external grinding are protected by the proper guard or flanges.	☐	☐	☐	☐
32. Portable abrasive wheels used for internal grinding are protected by safety flanges.	☐	☐	☐	☐
33. Safety flanges are used only with wheels designed to fit the flanges.	☐	☐	☐	☐
34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength.	☐	☐	☐	☐
PNEUMATIC-POWERED TOOLS (3.2.4)				
35. Tools are secured to hoses or whip by positive means to prevent disconnection.	☐	☐	☐	☐
36. Safety clips or retainers are installed to prevent attachments being expelled.	☐	☐	☐	☐
37. Safety devices are installed on automatic fastener feed tools as required.	☐	☐	☐	☐
38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded.	☐	☐	☐	☐
39. Manufacturer's safe operating pressure for hoses, pipes, valves, etc. are not exceeded.	☐	☐	☐	☐
40. Hoses are not used for hoisting or lowering tools.	☐	☐	☐	☐
41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure.	☐	☐	☐	☐
42. Airless spray guns have required safety devices installed.	☐	☐	☐	☐
43. Blast cleaning nozzles are equipped with operating valves, which are held open manually.	☐	☐	☐	☐
44. Supports are provided for mounting nozzles when not in use.	☐	☐	☐	☐
45. Air receiver drains, handholes, and manholes are easily accessible.	☐	☐	☐	☐
46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water.	☐	☐	☐	☐
47. Air receivers are completely drained at required intervals.	☐	☐	☐	☐
48. Air receivers are equipped with indicating pressure gauges.	☐	☐	☐	☐
49. Safety, indicating, and controlling devices are installed as required.	☐	☐	☐	☐
50. Safety valves are tested frequently and at regular intervals to assure good operating condition.	☐	☐	☐	☐

SECTION 2 (continued)

	Yes	No	N/A	N/O
LIQUID FUEL-POWERED TOOLS (3.2.5)				
51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining.	☐	☐	☐	☐
52. Liquid fuels are stored, handled, and transported in accordance with SOP.	☐	☐	☐	☐
53. Liquid fuel-powered tools are used in confined spaces in accordance with SOP.	☐	☐	☐	☐
54. Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded.	☐	☐	☐	☐
POWDER-ACTUATED TOOLS (3.2.6)				
55. Only trained employee operates powder-actuated tools.	☐	☐	☐	☐
56. Powder-actuated tools are not loaded until just prior to intended firing time.	☐	☐	☐	☐
57. Tools are not pointed at any employee at any time.	☐	☐	☐	☐
58. Hands are kept clear of open barrel end.	☐	☐	☐	☐
59. Loaded tools are not left unattended.	☐	☐	☐	☐
60. Fasteners are not driven into very hard or brittle materials.	☐	☐	☐	☐
61. Fasteners are not driven into easily penetrated materials unless suitable backing is provided.	☐	☐	☐	☐
62. Fasteners are not driven into spalled areas.	☐	☐	☐	☐
63. Powder-actuated tools are not used in an explosive or flammable atmosphere.	☐	☐	☐	☐
64. All tools are used with correct shields, guards, or attachments recommended by manufacturer.	☐	☐	☐	☐
JACKING TOOLS (3.2.7)				
65. Rated capacities are legibly marked on jacks and not exceeded.	☐	☐	☐	☐
66. Jacks have a positive stop to prevent over-travel.	☐	☐	☐	☐
67. The base of jacks are blocked or cribbed to provide a firm foundation, when required.	☐	☐	☐	☐
68. Wood blocks are place between the cap and load to prevent slippage, when required.	☐	☐	☐	☐
69. After load is raised, it is cribbed, blocked, or otherwise secured immediately.	☐	☐	☐	☐
70. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.	☐	☐	☐	☐
71. All jacks are properly lubricated.	☐	☐	☐	☐
72. Jacks are inspected as required.	☐	☐	☐	☐
73. Repair or replacement parts are examined for possible defects.	☐	☐	☐	☐
74. Jacks not working properly are removed from service and repaired or replaced.	☐	☐	☐	☐
HAND TOOLS (3.2.8)				
75. Wrenches are not used when jaws are sprung to the point of slippage.	☐	☐	☐	☐
76. Impact tools are kept free of mushroomed heads.	☐	☐	☐	☐
77. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool.	☐	☐	☐	☐

CH2MHILL

H&S Self-Assessment Checklist – HAND AND POWER TOOLS

<u>SECTION 3</u>

Complete this section for all items checked “No” in Sections 1 or 2. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

CH2MHILL

HS&E Self-Assessment Checklist - DRILLING

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-204.

SECTION 1 - SAFE WORK PRACTICES (4.1)

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

SECTION 2 - SUPPORT FUNCTIONS (4.2)

FORMS/PERMITS (4.2.1)

8. Driller license/certification obtained	☐	☐	☐	☐
9. Well development/abandonment notifications and logs submitted and in project files	☐	☐	☐	☐
10. Water withdrawal permit obtained, where required	☐	☐	☐	☐
11. Dig permit obtained, where required	☐	☐	☐	☐

UTILITY LOCATING (4.2.2)

12. Location of underground utilities and structures identified	☐	☐	☐	☐

SECTION 2 (Continued)

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

SECTION 4

Complete this section for all items checked “No” in previous sections. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

Auditor: ________________________________ Project Manager: __________________________________

CH2M HILL HEALTH AND SAFETY PLAN ATTACHMENT A-5

Behavior Based Loss Prevention System Forms

Activity Hazard Analysis

Pre-Task Safety Plan (PTSP)

Safe Behavior Observation Form

CH2MHILL

ACTIVITY HAZARD ANALYSIS

Date Prepared:	***Task Risk Assessment Code (RAC):***	***L, M, H, or E***
Job/Activity:		
Project:	***E = Extremely High Risk***	***Probability***
Prepared by(Safety Coordinator):	***H = High Risk***	
Reviewed by (PM/Site Supervisor/H&S):	***M = Moderate Risk***	

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

Description of the work:

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)

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

PRINT NAME	SIGNATURE	
Supervisor Name:		**Date/Time:**
Safety Officer Name:		**Date/Time:**
Employee Name(s):		**Date/Time:**
		Date/Time:
		Date/Time:
		Date/Time:
		Date/Time:
		Date/Time:
		Date/Time:
		Date/Time:
		Date/Time:

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Pre-Task Safety Plan (PTSP)

Project: _____ Location: _____Date:_____

Supervisor: _____ Job Activity:_____

_____

Task Personnel:

_____

_____

_____

_____

List Tasks:

_____

_____

_____

_____

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):

__ Chemical burns/contact	__ Trench, excavations, cave-ins	__ Ergonomics
__ Pressurized lines/equipment	__ Overexertion	__ Chemical splash
__ Thermal burns	__ Pinch points	__ Poisonous plants/insects
__ Electrical	__ Cuts/abrasions	__ Eye hazards/flying projectile
__ Weather conditions	__ Spills	__ Inhalation hazard
__ Heights/fall > 6 feet	__ Overhead Electrical hazards	__ Heat/cold stress
__ Noise	__ Elevated loads	__ Water/drowning hazard
__ Explosion/fire	__ Slips, trip and falls	__ Heavy equipment
__ Radiation	__ Manual lifting	__ Aerial lifts/platforms
__ Confined space entry	__ Welding/cutting	__ Demolition

Other Potential Hazards (Describe):

_____

_____

_____

_____

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Hazard Control Measures (Check All That Apply):			
PPE __ Thermal/lined __ Eye __ Dermal/hand __ Hearing __ Respiratory __ Reflective vests __ Flotation device	Protective Systems __ Sloping __ Shoring __ Trench box __ Barricades __ Competent person __ Locate buried utilities __ Daily inspections	Fire Protection __ Fire extinguishers __ Fire watch __ Non-spark tools __ Grounding/bonding __ Intrinsically safe equipment	Electrical __ Lockout/tagout __ Grounded __ Panels covered __ GFCI/extension cords __ Power tools/cord inspected
Fall Protection __ Harness/lanyards __ Adequate anchorage __ Guardrail system __ Covered opening __ Fixed barricades __ Warning system	Air Monitoring __ PID/FID __ Detector tubes __ Radiation __ Personnel sampling __ LEL/O2 __ Other	Proper Equipment __ Aerial lift/ladders/scaffolds __ Forklift/heavy equipment __ Backup alarms __ Hand/power tools __ Crane with current inspection __ Proper rigging __ Operator qualified	Welding & Cutting __ Cylinders secured/capped __ Cylinders separated/upright __ Flash-back arrestors __ No cylinders in CSE __ Flame retardant clothing __ Appropriate goggles
Confined Space Entry __ Isolation __ Air monitoring __ Trained personnel __ Permit completed __ Rescue	Medical/ER __ First-aid kit __ Eye wash __ FA-CPR trained personnel __ Route to hospital	Heat/Cold Stress __ Work/rest regime __ Rest area __ Liquids available __ Monitoring __ Training	Vehicle/Traffic __ Traffic control __ Barricades __ Flags __ Signs
Permits __ Hot work __ Confined space __ Lockout/tagout __ Excavation __ Demolition __ Energized work	Demolition __ Pre-demolition survey __ Structure condition __ Isolate area/utilities __ Competent person __ Hazmat present	Inspections: __ Ladders/aerial lifts __ Lanyards/harness __ Scaffolds __ Heavy equipment __ Cranes and rigging	Training: __ Hazwaste __ Construction __ Competent person __ Task-specific (THA) __ Hazcom
Field Notes:_____ _____ _____			

Name (Print): _____

Signature:_____ Date:_____

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Safe Behavior Observation Form		
Project Number:	Client/Program:	☐CCI ☐INC
Project Name:	Observer:	Date:
Position/Title of worker observed:	Background Information/ comments:	
Task/Observation Observed:		

- ❖ Identify and reinforce safe work practices/behaviors
- ❖ Identify and improve on at-risk practices/acts
- ❖ Identify and improve on practices, conditions, controls, and compliance that eliminate or reduce hazards
- ❖ Proactive PM support facilitates eliminating/reducing hazards (do you have what you need?)
- ❖ Positive, corrective, cooperative, collaborative feedback/recommendations

Actions & Behaviors	Safe	At-Risk	Observations/Comments
Current & accurate Pre-Task Planning/Briefing (Project safety plan, STAC, AHA, PTSP, tailgate briefing, etc., as needed)			**Positive Observations/Safe Work Practices:**
Properly trained/qualified/experienced			
Tools/equipment available and adequate			
Proper use of tools			**Questionable Activity/Unsafe Condition Observed:**
Barricades/work zone control			
Housekeeping			
Communication			
Work Approach/Habits			
Attitude			
Focus/attentiveness			**Observer's Corrective Actions/Comments:**
Pace			
Uncomfortable/unsafe position			
Inconvenient/unsafe location			
Position/Line of fire			
Apparel (hair, loose clothing, jewelry)			
Repetitive motion			**Observed Worker's Corrective Actions/Comments:**
Other…			

CH2M HILL HEALTH AND SAFETY PLAN
ATTACHMENT A-6

Material Safety Data Sheets