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NAS CECIL FIELD, FL  
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"WORK PLAN REVISION 3 WORK PLAN ADDENDUM 12 OPERATION AND MAINTENANCE  
OF REMEDIATION SYSTEMS AT DAY TANK 1, SOUTH FUEL FARM AND 103RD STREET  
AND A AVENUE NAS CECIL FIELD FL"

3/17/2009

CH2MHILL CONSTRUCTORS INC



## WORK PLAN REVISION

REVISION NO: 03

CONTRACT NO: N62467-98-D-0995

PROJECT NAME: RACIII, CTO 0086, Day Tank 1 Site – Biosparge/Soil Vapor  
Extraction Treatment System Decommission and Disposal

CTO NO: 0086

SITE/TASK: Former Naval Air Station Cecil Field, Jacksonville, Florida

WORK PLAN NAME: Work Plan Addendum No. 12, Operation and Maintenance of  
the Remediation Systems at Day Tank 1, South Fuel Farm,  
and 103rd Street and A Avenue, RAC III CTO No. 0062

WORK PLAN DATE: April 2001  
DATE OF REVISION 1: November 2007  
DATE OF REVISION 2: January 2008  
DATE OF REVISION 3: March 2009

REVISION PREPARED BY: Sam Naik

### Modifications/Revisions:

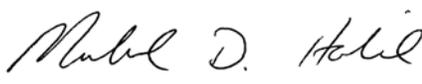
Item No.	Description of Modifications/Revisions
Purpose	<p>The purpose of this Work Plan Revision is to present the activities for decommissioning the biosparge/soil vapor extraction (BS/SVE) system at the Day Tank 1 site at the former Naval Air Station (NAS) Cecil Field, Jacksonville, FL. The decommissioning activities are being completed as part of CH2M HILL’s contract with the U.S. Naval Facilities Engineering Command Southeast (NAVFAC SE) (hereafter referred to as “the Navy”) under Contract No. N62467-98-D-0995, Contract Task Order (CTO) No. 0086.</p> <p>The Day Tank 1 site is located at NAS Cecil Field, approximately 1/8 mile south of the “A” Avenue gate on the former Jet Road, north of Buildings 824 and 824A and west of Building 846. The site formerly contained a 200,000-gallon aboveground storage tank (AST), piping, and associated equipment to supply jet fuel to the high-speed refuelers located on the flightline. Figure 1-1 shows the site location at NAS Cecil Field.</p> <p>Previous investigations at this site indicated significant impact to the subsurface from leaks and operations associated with the AST. The AST was removed and 24,000 tons of contaminated soil were excavated in November 1999 by CH2M HILL/J.A. Jones, LLC (CH2M HILL-Jones). For remediation of contaminated groundwater, the Remedial Action Plan (RAP) prepared to address subsurface contamination specified a BS/SVE system to be installed subsequent to the soil excavation. The remediation system was constructed by CH2M HILL-Jones from January 2000 to February 2000. The BS/SVE system at the Day Tank 1 site was operated from February 2000 to August 2003 by CH2M HILL-Jones and was deactivated in 2003, based on evidence of groundwater cleanup from the groundwater monitoring data collected during routine operation and maintenance (O&amp;M) activities. The Florida Department of Environmental Protection (FDEP) directed that post-active remediation monitoring be commenced at the site in accordance with Chapter 62-770.750, Florida Administrative Code (FAC).</p> <p>In October 2006, FDEP issued a Natural Attenuation Monitoring Plan Approval Order for the site. This groundwater monitoring is being conducted by other contractors for the Navy. The Navy directed CH2M HILL to decommission and dispose of the BS/SVE system equipment and the canopy shed housing the equipment. Attachment 1 includes photographs of the BS/SVE system at the site.</p> <p>Decommissioning activities include verification and confirmation of electrical power disconnection to the site, removal and disposal of liquids collected in the moisture collection tank associated with the BS/SVE system, decontamination and disposal of the polyvinyl moisture collection tank, removal and disposal of BS/SVE treatment equipment (air compressor, blower, and associated</p>

	<p>pipes leading from the air compressor to the buried compressed air lines of the biosparge system, and the soil vapor collection lines connected to the blower, will be cut off and plugged above ground. No well abandonment is required by the Navy in this scope of work. The existing concrete pad will remain in place.</p> <p>Activity hazard analyses (AHAs) for each definable work task are included in this Work Plan Revision as part of a revised Health and Safety Plan (Attachment 2). The existing Site Health and Safety Plan for CTO 86 will be updated to reflect changes in site personnel, activity hazards, emergency medical support contact information, and other relevant details. The site-specific AHAs will be utilized in conjunction with the Health and Safety Plan provided in Work Plan Addendum No. 12 referenced above to perform all work activities.</p>
001	<p><u>Liquid Removal , Liquid Waste Characterization, Decontamination and Disposal of Moisture Collection Tank</u></p> <p>The existing 250-gallon polyvinyl moisture collection tank contains approximately 200 gallons of liquid believed to be moisture collected from the air dryer and SVE blower. This liquid will be transferred to a 275-gallon plastic tote. Based on current practice at NAS Cecil Field petroleum sites, the NAVFAC SE Public Works Department (PWD) from NAS Jacksonville, FL will pick up, transport, and dispose of the waste under an arrangement with the BRAC PMO SE. A Material Safety Data Sheet (MSDS) for the oil used to cool the air compressor and analytical data from groundwater sampling will be provided to the PWD for waste characterization prior to transport and disposal of the liquid.</p>
002	<p><u>BS/SVE Process Equipment and Shed Removal</u></p> <p>At present, there is no power supply to the Day Tank 1 shed. However, CH2M HILL will schedule an inspection by Jacksonville Electric Authority (JEA) to confirm that there is no power supply to the treatment system equipment, that all equipment has been de-energized, and that any existing power supply to this system and the shed has been disconnected by JEA and locked out.</p> <p>Individual components of the BS/SVE system such as system piping, manifolds, control panels, fittings, air compressor, blower, and instrumentation will be dismantled by CH2M HILL's decommissioning subcontractor and staged either in a rolloff or other appropriate container.</p> <p>After all equipment, piping, and fittings have been removed from the shed, the metal roof and wooden trusses will be removed safely by the decommissioning subcontractor and staged in a rolloff for disposal. The 6-inch by 6-inch thick wooden posts will be cut off at the bottom to be flush with the concrete pad and disposed of in the rolloff.</p> <p>The concrete pad will be cleared of all debris and the debris disposed of in the rolloff. Mechanical equipment, including instrumentation, miscellaneous equipment stands, conduit, electrical panels, and wiring will be removed and recycled or disposed in a metal scrapyards or a Subtitle D landfill. The concrete slab will remain in place. The existing chain-link fence around the shed will be removed and disposed of along with the remaining equipment as scrap metal waste.</p>
003	<p><u>Site Restoration</u></p> <p>The removal activities are expected to cause minimal disturbance to the soil and surrounding areas. Areas disturbed during project activities will be restored to conditions existing prior to decommissioning activities.</p>

**Reasons for the Modifications/Revisions:**

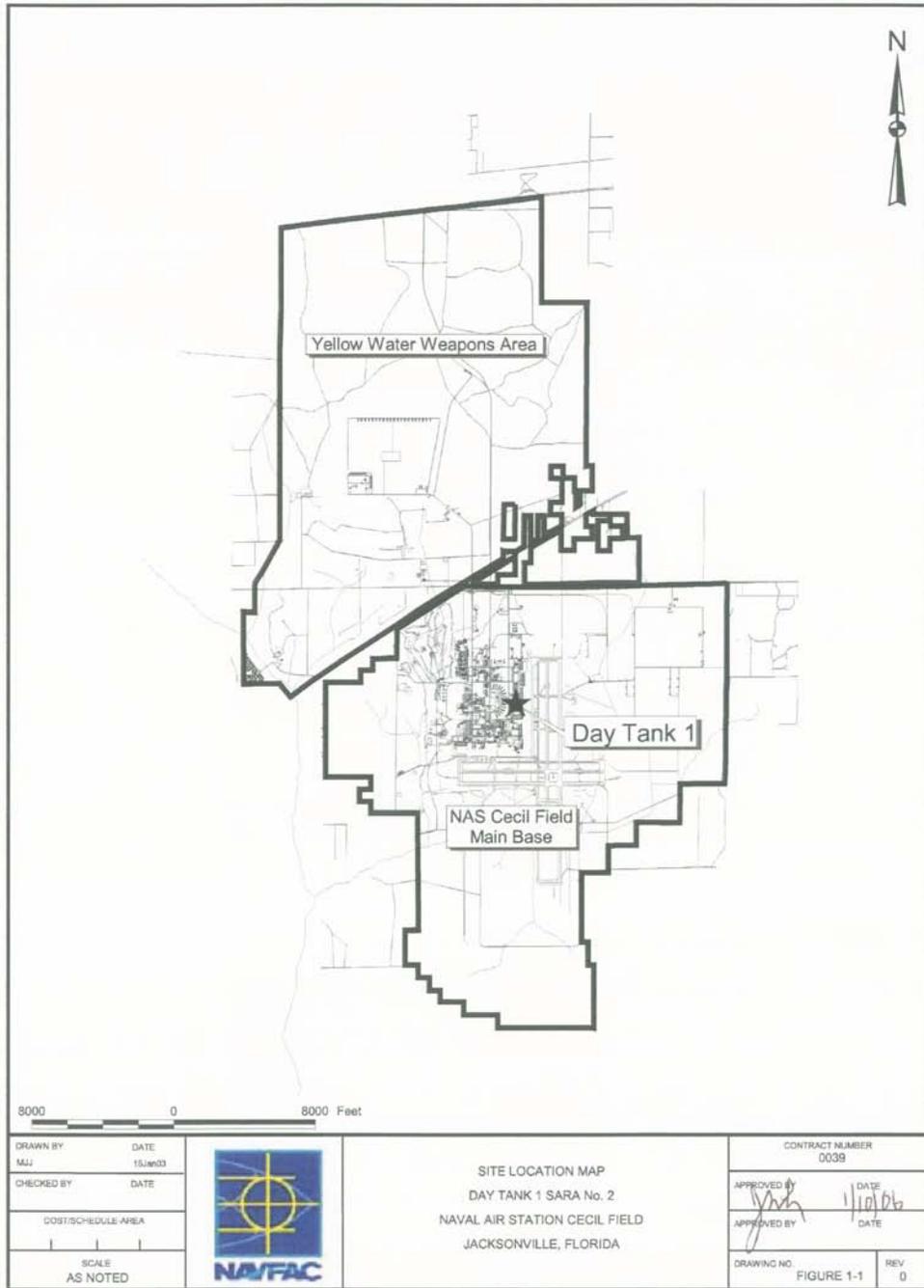
Item No.	Reasons for the Modifications/Revisions
All	This revision to Work Plan Addendum 12 for NAS Cecil Field is being prepared to include tasks required to dismantle and dispose of the BS/SVE system at the Day Tank 1 site, including the air compressor, blower, and associated piping; moisture collection tank, air receiver tank, and miscellaneous process equipment; and the equipment shed and liquid waste.

<p>_____ Sam Naik CTO Project Manager</p>	 _____ Signature	<p>_____ 03/17/2009 Date</p>
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<p>_____ Michael Halil, P.E. Deputy Program Manager</p>	 _____ Signature	<p>_____ 03/17/2009 Date</p>
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<p>_____ U.S. Navy Responsible Authority</p>	<p>_____ Signature</p>	<p>_____ Date</p>
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Document Control Distribution		
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# Attachment 1

## Site Photos

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# Attachment 2

## Site Health and Safety Plan and Activity Hazard Analyses

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# Health and Safety Plan

## Dismantling and Disposal of Abandoned Biosparging/Soil Vapor Extraction System Day Tank 1 Site

Naval Air Station Cecil Field  
Jacksonville, Florida

Contract No. N62467-98-D-0995  
Contract Task Order No. 0086

Revision No. 00

Submitted to:

U.S. Naval Facilities  
Engineering Command  
Southern Division

Prepared by:



1000 Abernathy Road  
Suite 1600  
Atlanta, GA 30328

March 2009

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## Attachments

- 1 Employee Signoff Form – Field Safety Instructions
- 2 Project-Specific Chemical Product Hazard Communication Form
- 3 Chemical-Specific Training Form
- 4 Emergency Contacts
- 5 Project Activity Self-Assessment Checklists/Permits/Forms
- 6 Behavior Based Loss Prevention System Forms
- 7 Applicable Material Safety Data Sheets
- 8 Subcontractor H&S Plans/Procedures

# Acronyms and Abbreviations

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°F	degrees Fahrenheit
AHA	Activity Hazard Analysis
ALARA	as low as reasonably achievable
APR	air-purifying respirator
ATL	Atlanta
BBLPS	Behavior Based Loss Prevention System
CH2M HILL	CH2M HILL Constructors, Inc.
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
dBA	decibel A-rated
DOT	Department of Transportation
FA	first aid
FID	flame ionization detector
GFCI	ground fault circuit interrupter
HAZCOM	hazard communication
HR	heart rate
HSM	Health and Safety Manager
HSP	Health and Safety Plan
IDLH	immediately dangerous to life and health
IDW	investigation-derived waste
IRF	Incident Report Form
Lb	Pound
LEL	lower explosive limit
LPO	Loss Prevention Observations
mg/m <sup>3</sup>	milligrams per cubic meter
MSDS	Material Safety Data Sheet
mW/cm <sup>2</sup>	milliwatt per square centimeter
NAVFAC EFD SOUTH	U.S. Navy Facilities Engineering Command, Southern Division
NDG	nuclear density gauge
NLI	Near Loss Investigation
NS	Naval Station
NSC	National Safety Council
NTR	Navy Technical Representative
OSHA	Occupational Safety and Health Administration
PAHs	polynuclear aromatic hydrocarbons
PAPR	powered air-purifying respirator
PDF	personal flotation device
PID	photoionization detector
PPE	personal protective equipment
Ppm	parts per million
PTSP	Pre-Task Safety Plan
RMSF	Rocky Mountain Spotted Fever

SAR	supplied-air respirator
SCBA	self-contained breathing apparatus
SHSS	Site Health and Safety Specialist
SOP	standard of practice
STEL	short-term exposure limit
SZ	support zone
T&D	Transportation and disposal
TBD	to be determined
TMCC	truck-mounted crash cushion
TRPHs	total recoverable petroleum hydrocarbons
TSDF	treatment, storage, and disposal facility
UST	underground storage tank
VOCs	volatile organic compounds

This Health and Safety Plan (HSP) will be kept on the site during field activities and will be reviewed as necessary. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The plan adopts, by reference, the Standards of Practice (SOPs) in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual*, as appropriate. In addition, this plan adopts procedures in the project Work Plan. The Site Health and Safety Specialist (SHSS) is to be familiar with these SOPs and the contents of this plan. CH2M HILL Constructors Inc.'s (CH2M HILL) personnel and subcontractors must sign Attachment 1.

# 1.0 Project Information and Description

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**CONTRACT TASK ORDER (CTO) No:** 0086, RACIII

**CLIENT:** Southern Division, U.S. Navy Facilities Engineering Command (NAVFAC EFD SOUTH)

**PROJECT/SITE NAME:** Naval Air Station, Cecil Field

**SITE ADDRESS:** Jacksonville, FL

**CH2M HILL PROJECT MANAGER:** Sam Naik/ATL

**CH2M HILL OFFICE:** Atlanta, Georgia

**DATE HEALTH AND SAFETY PLAN PREPARED:** March 6, 2009

**DATE(S) OF SITE WORK:** Week of March 30, 2009

## **SITE BACKGROUND AND SETTING:**

The Day Tank 1 site is located at NAS Cecil Field, approximately 1/8 miles south of the "A" Avenue gate on the former Jet Road, north of Buildings 824 and 824A and west of Building 846. The site formerly contained a 200,000-gallon aboveground storage tank (AST), piping, and associated equipment to supply jet fuel to the high-speed refuelers located on the flightline. Figure 1-1 shows the site location at NAS Cecil Field.

Previous investigations at this site indicated significant impact to the subsurface from leaks and operations associated with the AST. The AST was removed and 24,000 tons of contaminated soil was excavated in November 1999 by CH2M HILL-Jones. For remediation of contaminated groundwater, The Remedial Action Plan (RAP) prepared to address subsurface contamination specified a biosparge/soil vapor extraction system to be installed subsequent to the soil excavation. The remediation system was constructed by CCI/J.A. Jones from January 2000 to February 2000. The BS/SVE system at the Day Tank 1 site operated from February 2000 to August 2003 by CH2M-Jones, LLC and was removed from operation in 2003, based on evidence of groundwater cleanup from the groundwater monitoring data collected during routine operation and maintenance (O&M) activities. The Florida Department of Environmental Protection (FDEP) directed that post-active remediation monitoring be commenced at the site in accordance with Chapter 62-770.750, Florida Administrative Code (FAC).

In October 2006, FDEP issued a Natural Attenuation Monitoring Plan Approval Order for the site. This groundwater monitoring is being conducted by other contractors for the Navy. The Navy directed CH2M HILL to decommission and dispose of the BS/SVE System equipment and the canopy shed housing the equipment.

## **DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED:**

Decommissioning activities include verification and confirmation of electrical power disconnection to the site, removal and disposal of liquids collected in the moisture collection tank associated with the BS/SVE system, decontamination and disposal of the polyvinyl moisture collection tank, removal and disposal of BS/SVE treatment equipment (air compressor, blower and associated piping and instrumentation); demolition and disposal of the wooden canopy shed with metal roof. Header pipes leading from the air compressor to the buried compressed air lines of the biosparge system, and the

soil vapor collection lines connected to the blower, will be cut off and plugged above ground. No well abandonment is required by the Navy in this scope of work. The existing concrete pad will remain in place.

## 2.0 Tasks to be Performed Under this Plan

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Refer to project documents (i.e., Work Plan) for detailed task information. A health and safety risk analysis (Table 2-1) has been performed for each task and is incorporated in this plan through task-specific hazard controls and requirements for monitoring and protection. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin.

### 2.1 Hazwoper-Regulated Tasks

- Mobilization
- Dismantling of biosparge and soil vapor extraction system equipment to include removal of air compressor, blower, control panel, 250-gallon polyvinyl moisture collection tank and associated piping,
- Disposal of liquid collected in moisture collection tank. Dismantling of wooden shed with wooden posts and corrugated sheet metal roof.
- Transportation and Disposal of biosparge and soil vapor extraction system equipment, system shed parts and liquid waste.
- Site Restoration as needed
- Demobilization

### 2.2 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 Health and Safety Manager (HSM) is required before these tasks are conducted on regulated hazardous waste sites.**

Tasks	Controls
<ul style="list-style-type: none"><li>• Database management and Report Writing</li><li>• Data validation and reporting</li></ul>	<ul style="list-style-type: none"><li>• Brief on hazards, limits of access, and emergency procedures</li><li>• Post contaminant areas as appropriate</li><li>• Sample and monitor as appropriate</li></ul>

TABLE 2.1  
Hazard Analysis  
(Refer to Section 3 for hazard controls)

Potential Hazards	Project Activities									
	Mobilization and site preparation	Monitoring Well Installation	Collection of DPT Samples	ORCA Application	Groundwater purging and sampling	Field analysis of samples	Preparation, packaging and shipment of samples	Decontamination	Demobilization	Drum Handling
Manual Lifting (HS-29)	X	X	X	X	X	X	X	X	X	X
Fire Prevention (HS-22)										
Electrical Safety (HS-23)										
Lockout /Tagout (HS-33)										
Ladders & Stairs(HS-25)										
Compressed Gas Cylinders (HS-63)										
Buried Utilities	X	X	X							
Excavations (HS-32)										
Fall Protection (HS-31)										
Heavy Equipment ( HS-27)	X	X	X							X
Confined Space Entry (HS-17)										
Concrete & Masonry Work (HS-43)										
Cranes and Hoisting (HS-44)										
Demolition (HS-45)										
Scaffolding(HS-73)										
Steel erection (HS-62)										
Welding and cutting (HS-22)										
Aerial Lifts (HS-41)										
Hand & Power Tools (HS-50)	X	X	X	X	X	x	X	X	X	X
Forklifts (HS-48)										X
Drilling (HS_35)		X	X							
Noise (HS-39)	X	X	X	X				X	X	
Pressurized Lines/Equipment		X	X					X		
Pressure Washing/Equip Decon		X	X					X		
Vacuum Truck/Pumping Operations										
Suspended Loads										
Vehicle Traffic	X									
Haul Truck Operations										

**TABLE 2.1**  
**Hazard Analysis**  
*(Refer to Section 3 for hazard controls)*

<b>Potential Hazards</b>	<b>Project Activities</b>									
	<b>Mobilization and site preparation</b>	<b>Monitoring Well Installation</b>	<b>Collection of DPT Samples</b>	<b>ORCA Application</b>	<b>Groundwater purging and sampling</b>	<b>Field analysis of samples</b>	<b>Preparation, packaging and shipment of samples</b>	<b>Decontamination</b>	<b>Demobilization</b>	<b>Drum Handling</b>
Visible Lighting										
Mechanical Guarding Hazards		X								
Asbestos Hazard										
Lead Hazard										
Chemical Hazard-Dermal/Inhalation		X	X	X	X	X	X	X	X	X
Dust Hazard (Silica/Metals)										
Fire/Explosion Hazards										
Work Over Water										

## 3.0 Hazard Controls

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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 SHSS for clarification.

The health and safety hazards posed by field activities have been identified for each project activity and is provided in the Hazard Analysis Table (Table 2-1) in this section. Hazard control measures for project-specific and general H&S hazards are provided in 3.1 and 3.2 of this section.

Activity Hazard Analysis will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in the HSP Attachments as a guide. 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. **AHAs shall be submitted to the Navy Technical Representative (NTR) for review at least 15 days prior to the start of each project activity phase.**

**In addition to the controls specified in this section, Project-Activity Self-Assessment Checklists are contained in Attachment 5.** These checklists are to be used to assess the adequacy of CH2M HILL and subcontractor site-specific safety requirements. The objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing these gaps. Self-assessment checklists should be completed early in the project, when tasks or conditions change, or when otherwise specified by the HSM. The self-assessment checklists, including documented corrective actions, should be made part of the permanent project records.

Project-activity self-assessments checklist will be completed weekly by the SHSS during the course of the project, completing the applicable checklist depending on the work performed at the time on the project.

### 3.1 Project-Specific Hazards

#### 3.1.1 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 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.
- Become familiar with the hazards associated with the drilling method used (cable tool, air rotary, hollow-stem auger, etc.).
- Do not wear loose-fitting clothing, watches, etc., that could get caught in moving parts.
- Do not smoke or permit other spark-producing equipment around the drill rig.
- The drill rig must be equipped with a kill wire or switch, and personnel are to be informed of its location.
- Be aware and stand clear of heavy objects that are hoisted overhead.
- The driller is to verify that the rig is properly maintained in accordance with the drilling company's maintenance program.
- The driller is to verify that all machine guards are in place while the rig is in operation.
- The driller is responsible for housekeeping (maintaining a clean work area).
- The drill rig should be equipped with at least one fire extinguisher.
- If the drill rig comes into contact with electrical wires and becomes electrically energized, do not touch any part of the rig or any person in contact with the rig, and stay as far away as possible. Notify emergency personnel immediately

### 3.1.2 Uneven walking surfaces

Employees walking in ditches, swales and other drainage structures adjacent to roads or across undeveloped land must use caution to prevent slips and falls which can result in twisted or sprained ankles, knees, and backs.

Whenever possible operate from a flat surface and do not enter a steep ditch or hillside.

If steep terrain must be negotiated, sturdy leather safety shoes or boots with that provide a high degree of traction and ankle support should be used. The need for ladders or ropes to provide stability should be evaluated.

Avoid extremely tall grass/vegetation areas where the ground surface level can not readily be anticipated or directly observed.

Clear and grub heavily covered areas where possible prior to conducting regular activities in the work area.

### 3.1.3 Utility Vehicle Operation

Utility vehicles may be used on project sites to move people, equipment, and supplies around a work site. These vehicles present the potential for injury to personnel by roll-over and impact accidents. Utility vehicles should be operated in a cautious and safe manner as prescribed in their manufacture's operator's manuals. It is important to remember that these vehicles are not designed for recreational use and that horseplay and recreational use can lead to equipment damage, severe bodily injury, or death.

The following rules apply when ever a utility vehicle is used for project activities.

- Before operation, the vehicle should be inspected for damage or wear.
- Utility vehicles are for off-road use only.
- If equipped, seat belts are to be worn by operator and passenger(s) whenever vehicle is in motion.
- Before operation, personnel should read the operator's manual and view the safety video provided by the manufacturer. (if available)
- Only one rider per seat. Employees are not permitted to ride on the box or anywhere else on the vehicle.
- Never exceed the vehicle's recommended weight capacity.
- Reduce speed on rough and hilly ground and whenever turning the vehicle.
- Never cross any body of water that is deeper than recommended by the manufacturer, or where the depth of the water is unknown.
- Utility vehicles must have operable brakes capable of stopping the vehicle on slopes and when fully loaded

### 3.1.4 Forklift Operations

Forklifts may be required for materials movement during project activities. Forklifts present the potential for damage to equipment, materials and personnel by impaling or striking personnel or materials with the forklift tines. Additionally, forklifts may tip if they are incorrectly loaded, driven at excessive speeds or operated with the forks too high.

The following rules apply whenever a forklift is used on the project:

- A rated lifting capacity must be posted in a location readily visible to the operator.
- A forklift truck must not be used to elevate employees unless a platform with guardrails, a back guard, and a kill switch is provided on the vehicle. When guardrails are not possible, fall arrest protection is required.
- The subcontractor operating the forklift must post and enforce a set of operating rules for forklift trucks.
- Only trained and authorized drivers will operate forklifts.

- Stunt driving and horseplay are prohibited.
- Employees must not ride on the forks.
- Employees must never be permitted under the forks (unless forks are blocked).
- The driver must inspect the forklift once a shift and document this inspection.
- The operator must look in the direction of travel and must not move the vehicle until all persons are clear of the vehicle.
- Forks must be carried as low as possible.
- The operator must lower the forks, shut off the engine, and set the brakes (or block the wheels) before leaving the forklift operator's position unless maintenance or safety inspections require the forklift to be running.
- Trucks must be blocked and have brakes set when forklifts are driven onto their beds.
- Extreme care must be taken when tilting elevated loads.
- Every forklift must have operable brakes capable of safely stopping it when fully loaded.
- Forklifts must have parking brakes and an operable horn.
- When the operator is exposed to possible falling objects, industrial trucks must be equipped with overhead protection (canopy).

### 3.1.5 Adverse Weather

Sudden inclement weather can rapidly encroach upon field personnel. Field crew members performing work outdoors should carry clothing appropriate for bad weather. In severe weather conditions, (i.e., high wind or electrical storms), the field crews should leave the area and find safe shelter until the weather abates and until a decision is made to resume the field activities.

In the event of an adverse weather event, such as a thunderstorm, field personnel may encounter flash flooding. Whenever precipitation is expected, all personnel should stay out of low lying areas until it is apparent that the rain has stopped or the threatening weather system has passed. Areas where personnel may be at risk from flash flooding include, but are not limited to; stream and river beds, valleys, drainage ditches, culverts, etc. Under no circumstances, should any personnel attempt to drive vehicles over or through flooded roadways, bridges or stream crossings. Personnel working in low lying areas or other areas where flash flooding is likely to occur, should plan egress routes and equipment placement to minimize the chance that they may be trapped or swept away by rising water.

Preparedness and caution are the best defenses against lightning. Many lightning deaths and injuries happen before or after a thunderstorm's peak. The site manager or SHSO shall monitor weather forecasts for predictions of electrical storms in the area. At first sight of lightning, operations shall be stopped and only resumed when conditions permit. The site manager or SHSO shall monitor weather conditions to determine when it is appropriate to resume work. The lightning safety recommendation is 30-30: Seek refuge when thunder sounds within 30 seconds after a lightning flash; and do not resume activity until 30 minutes after the last thunder clap. Some other general precautions include:

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

### 3.1.6 Drum Handling/Sampling

Handling of drums should be minimized as much as possible, however, when handling of drums is necessary to stage drums for sampling or storage, securing drums which are leaking or damaged or for other reasons, care should be taken and personnel involved should be aware of the hazards involved.

- Handling of suspected shock sensitive and/or explosive drums is not anticipated during the course of this project, should these types of materials be suspected, additional procedures and control measures will be instituted by the Project Management Team and the Regional/Program HSM.
- Mechanical equipment should be utilized for moving drums whenever possible, appropriate drum grapplers, forklift with drum attachment, slings, etc. When not feasible, manual drum handling equipment i.e., drum dollies, etc. may be used to minimize effort required for moving and lifting drums.
- When transporting drum with drum cart be aware of possible pinch points. Keep fingers and hands away from the area between the drum and the drum cart.
- Wear leather gloves when handling drums. If sharp edges exist on drum lids of chimes use Kevlar gloves for hand protection.
- Use appropriate PPE such as steel toed boots and if manually moving drums use metatarsal guards on safety shoes.
- Any drums suspected of being explosive or reactive (from labeling, crystallization or other information) should be handled with extreme caution, and safety precautions such as blast shields, remote opening devices, etc. used to help protect workers.

- Drums suspected of being pressurized require use of splash protection for workers when opening, this could consist of poly sheeting, splash or blast shield to deflect any spray and/or remote opening devices.
- Non-sparking tools should be used when opening drums containing potential flammable or combustible materials.
- Leaking, damaged, corroded, or otherwise deteriorated drums should be overpacked prior to moving or excessive handling.
- Monitoring for suspected chemical or radiological hazards should be performed continuously while opening and sampling drums using appropriate air monitoring instrumentation.

### 3.1.7 Sample Handling

Sample handling, packaging, and preservation will be conducted in support of several field activities. Employee procedures and work practices to be followed during these activities include:

- Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times.
- Caution should be exercised when filling bottles containing acid or base preservatives. Both liquid and vapor phases of acid can cause severe burns.
- Following sample collection, sample container lids should be tightened securely to prevent any leaks, and the containers should be rinsed with clean water to ensure that they are free of chemical constituents. Sample activities, sample collection, and equipment decontamination procedures.
- The personnel handling acids and the other corrosive materials are required to wear long pants, long-sleeved shirts, and closed-toe shoes (preferably leather). In addition, nitrile gloves and chemical goggles must be worn. All transfers should take place in a properly operational fume hood or a well-ventilated area. In the event of a small spill, the spill area should be thoroughly flushed with water.
- Devices are dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.

## 3.2 General Hazards

### 3.2.1 General Practices and Housekeeping

(Reference CH2M HILL- SOP HS-20, *General Practices*)

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness require enough illumination intensity to read a newspaper without difficulty.
- Good housekeeping must be maintained at all times in all project work areas.

- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.

### 3.2.2 Hazard Communication

(Reference CH2M HILL-SOP HS-05, *Hazard Communication*)

The SHSS is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using Attachment 2.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific HAZCOM training using Attachment 3.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

### 3.2.3 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. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be

properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

### 3.2.4 Lifting

(Reference CH2M HILL-SOP HS-29, *Lifting*)

- Proper lifting techniques must be used when lifting any object.
- Plan storage and staging to minimize lifting or carrying distances.
- Split heavy loads into smaller loads.
- Use mechanical lifting aids whenever possible.
- Have someone assist with the lift -- especially for heavy or awkward loads.
- Make sure the path of travel is clear prior to the lift.

### 3.2.5 Fire Prevention

(Reference CH2M HILL- SOP HS-22, *Fire Prevention*)

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
  - be maintained in a fully charged and operable condition,
  - be visually inspected each month, and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

### 3.2.6 Electrical

(Reference CH2M HILL-SOP HS-23, *Electrical*)

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.

- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.
- Extension cords must be:
  - equipped with third-wire grounding.
  - covered, elevated, or protected from damage when passing through work areas.
  - protected from pinching if routed through doorways.
  - not fastened with staples, hung from nails, or suspended with wire.
- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV.
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

### 3.2.7 Stairways and Ladders

(Reference CH2M HILL-SOP HS-25, *Stairways and Ladders*)

- Stairway or ladder is generally required when a break in elevation of 19 inches or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails

- Ladders shall not be moved, shifted, or extended while in use.
- User must use both hands to climb; use rope to raise and lower equipment and materials
- Straight and extension ladders must be tied off to prevent displacement
- Ladders that may be displaced by work activities or traffic must be secured or barricaded
- Portable ladders must extend at least 3 feet above landing surface
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder
- Stepladders are to be used in the fully opened and locked position
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder
- Fixed ladders > 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than 6 feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

### 3.2.8 Heat Stress

(Reference CH2M HILL- SOP HS-09, *Heat and Cold Stress*)

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50oF to 60oF should be available. Under severe conditions, drink one to two cups every 20 minutes, for a total of 1 to 2 gallons 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-brim 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 SHSS to avoid progression of heat-related illness.

<b>Symptoms and Treatment of Heat Stress</b>					
	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!

### 3.2.8.1 Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress. The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse. If the HR 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 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

### 3.2.9 Cold Stress

(Reference CH2M HILL- SOP HS-09, *Heat and Cold Stress*)

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-Chill Index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For

those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.

- NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.
- Persons who experience initial signs of immersion foot, frostbite, hypothermia should consult the SHSS to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

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 <b>not</b> hot-water. Have victim drink warm fluids, but <b>not</b> coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but <b>not</b> coffee or alcohol. Get medical attention.

### 3.2.10 Compressed Gas Cylinders

- Valve caps must be in place when cylinders are transported, moved, or stored.
- Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.
- Cylinders must be secured in an upright position at all times.
- Cylinders must be shielded from welding and cutting operations and positioned to avoid being struck or knocked over; contacting electrical circuits; or exposed to extreme heat sources.
- Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.

## 3.2.11 Procedures for Locating Buried Utilities

### Local Utility Mark-Out Service

**Name: Dig Tess**

**Phone:800-344-8377**

- Identify and customer specific permit and/or procedural requirements for excavation and drilling activities.
- Make required pre-dig utility notifications for the work location, allowing required time for marking of known utilities to be completed.
- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Instrumented locates are to be used to field verify utility locations and identify utilities not previously identified. A qualified utility survey company shall be hired to locate and verify all subsurface utilities present in the area(s) to be disturbed. Examples of technologies such as:
  - 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 depending on equipment. Sensitivity for both minimum object size and maximum depth detectable depends on equipment selected soil conditions etc.
  - Radio Frequency (RF), involves inducing a 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 RF field if it doesn't emit RF naturally and will not detect non-conductive utilities.
  - Dual RF, a modified version of RF detection using multiple frequencies to enhance sensitivity but with similar limitations to RF
  - Ferromagnetic Detectors, are metal detectors that will detect ferrous and non-ferrous utilities. Sensitivity is limited, e.g. a 100 mm iron disk to a depth of about one meter or a 25 mm steel paper clip to a depth of about 20 cm.
  - Electronic markers are emerging technologies to impart a unique electronic signature to materials such as polyethylene pipe to facilitate location and tracing after installation. Promising for future installations but not of help for most existing utilities already in place.
  - A combination of 2 or more technologies will be identified and used by the locate company based on the specifics of the work location(s) where disturbance will take place.

- This survey shall be conducted within 10 calendar days of initiating work at the site.
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually
- Underground utility locations must be physically verified by hand digging using wood or fiberglass-handled tools when any adjacent construction work is expected to come within two feet of the underground system. If construction is parallel to an existing utility the utility shall be exposed by hand digging every 30 m (100 feet) if parallel within 1.5 m (5 feet) of the excavation.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon during drilling or change in color, texture or density during excavation that could indicate the ground has been previously disturbed).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SSC should confirm that arrangement.

## 3.3 Biological Hazards and Controls

### 3.3.1 Snakes

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

### 3.3.2 Poison Ivy and Poison Sumac

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

### 3.3.3 Ticks

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing with permethrin or permanone and spray skin with only DEET; and check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Look for symptoms of Lyme disease or Rocky Mountain

spotted fever (RMSF). Lyme: a rash might appear that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, seek medical attention.

### 3.3.4 Bees and Other Stinging Insects

Bee 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 the SHSS and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

### 3.3.5 Bloodborne Pathogens

(Reference CH2M HILL- SOP HS-36, *Bloodborne Pathogens*)

Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with landfill waste or waste streams containing potentially infectious material. Exposure controls and personal protective equipment (PPE) are required as specified in CH2M HILL SOP HS-36, *Bloodborne Pathogens*. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

### 3.3.6 Mosquito Bites

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

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35 percent DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35 percent) provides no additional protection.
- 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.

### 3.3.6.1 Symptoms of Exposure to the West Nile Virus

- Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.
- The West Nile Virus incubation period is from 3-15 days.
- If you have any questions or to report any suspicious symptoms, contact the project Health and Safety Manager.

## 3.4 Radiological Hazards and Controls

Refer to CH2M HILL’s Corporate Health and Safety Program, Program and Training Manual, and Corporate Health and Safety Program, Radiation Protection Program Manual, for standards of practice in contaminated areas.

## 3.5 Contaminants of Concern

Contaminants of Concern are listed in Table 3-1.

TABLE 3-1  
Contaminants of Concern

Contaminant	Location and Maximum <sup>a</sup> Concentration (ppm)	Exposure Limit <sup>b</sup>	IDLH <sup>c</sup>	Symptoms and Effects of Exposure	PIP <sup>d</sup> (eV)
Benzene	GW: SB: SS:	1 ppm	2,000	High levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.	11.06
Toluene	GW: SB: SS:	200 ppm	— —	Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe burning sensation.	—
Ethyl benzene	GW: SB: SS:	100 ppm	— —	Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe burning sensation, nausea and nervousness .	—

TABLE 3-1  
Contaminants of Concern

Contaminant	Location and Maximum <sup>a</sup> Concentration (ppm)	Exposure Limit <sup>b</sup>	IDLH <sup>c</sup>	Symptoms and Effects of Exposure	PIP <sup>d</sup> (eV)
xylene	GW: SB: SS:	100 ppm		High levels of xylene for short periods can cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.	
Trichloroethylene (TCE)	GW: SB: SS:	50 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
Footnotes: <sup>a</sup> Specify sample-designation and media: (GW = Groundwater). <sup>b</sup> Appropriate value of PEL, REL, or TLV listed. <sup>c</sup> IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen. <sup>d</sup> PIP = photoionization potential; NA = Not applicable; UK = Unknown.					

### 3.6 Potential Routes of Exposure

**Dermal:** Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 4.

**Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 4 and 5, respectively.

**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).

# 4.0 Project Organization and Personnel

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## 4.1 CH2M HILL Employee Medical Surveillance and Training

(Reference CH2M HILL- SOPs HS-01, *Medical Surveillance*, and HS-02, *Health and Safety Training*)

The employees listed meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SHSS" have completed a 12-hour site safety coordinator course, and have documented requisite field experience. An SHSS with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and CPR. At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. At least two FA-CPR trained employees must be available at each job site/operation. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL-SOP HS-04, *Reproduction Protection*, including obtaining a physician's statement of the employee's ability to perform hazardous activities before being assigned fieldwork.

Employee Name	Office	Responsibility	SHSS/FA-CPR
Robert Plsek	Dallas, TX	Field Team	SC-HW, FA-CPR
Ron McComb	Knoxville, TN	Field Team	SC-HW, FA-CPR
		Field Team	SC-C, FA-CPR
		Field Team	SC-HW, CPR
		Field Team	HW
		Field Team	SC-HW, SC-C, FA-CPR

## 4.2 Field Team Chain of Command and Communication Procedures

### 4.2.1 Client

Contact Name: U.S. Naval Facilities, Engineering Command, Southern Division  
BRAC PMO-SE

- Phone: 843-743-2141

## 4.2.2 CH2M HILL

Program Manager: Sid Allison

Project Manager: Michael Halil, P.E.

Health and Safety Manager: Rich Rathnow

Field Team Leader: Robert Plsek

Site Health and Safety Specialist: TBD

The CH2M HILL project manager (PM) is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HS&E 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 SOP:

- Include standard terms and conditions, and contract-specific HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors)
- Select safe and competent subcontractors by:
- obtaining, reviewing and accepting or rejecting subcontractor pre-qualification questionnaires
- ensuring that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award
- including HS&E submittals checklist in subcontract agreements, and ensuring that appropriate site-specific safety procedures, training and medical monitoring records are reviewed and accepted prior to the start of subcontractor's field operations
- Maintain copies of subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures in the project file accessible to site personnel
- Provide oversight of subcontractor HS&E practices per the site-specific safety plan
- Manage the site and interfacing with 3rd parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented

The CH2M HILL HSM is responsible for:

- Review and accept or reject subcontractor pre-qualification questionnaires that fall outside the performance range delegated to the Contracts Administrator (KA)
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations
- Support the SHSS's oversight of subcontractor (and lower-tier subcontractors) HS&E practices and interfaces with on-site 3rd parties per the site-specific safety plan

- The SHSS is responsible for verifying that the project is conducted in a safe manner including the following specific obligations:
- Verify this HSP remains current and amended when project activities or conditions change
- Verify CH2M HILL site personnel and subcontractor personnel read this HSP and sign Attachment 1 “Employee Signoff Form” prior to commencing field activities
- Verify CH2M HILL site personnel and subcontractor personnel have completed any required specialty training (e.g., fall protection, confined space entry) and medical surveillance as identified in Section 2
- Verify compliance with the requirements of this HSP and applicable subcontractor health and safety plan(s)
- Act as the project “Hazard Communication Coordinator” and perform the responsibilities outlined in Section 2.2.2
- Act as the project “Emergency Response Coordinator” and perform the responsibilities outlined in Section 4
- Post OSHA job-site poster; the poster is required at sites where project field offices, trailers, or equipment-storage boxes are established; posters can be obtained by calling 800/548-4776 or 800/999-9111
- 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 H&S forms and permits, found in Attachment 5, are being used as outlined in Section 2
- Perform oversight and/or assessments of subcontractor HS&E practices per the site-specific safety plan and verify that project activity self-assessment checklists, found in Attachment 5, are being used as outlined in Section 2
- 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, contractors license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor’s field operations
- Manage the site and interfacing with 3rd parties in a manner consistent with our contract/subcontract agreements and the applicable standard of reasonable care
- Coordinate with the HS&E manager regarding CH2M HILL and subcontractor operational performance, and 3rd party interfaces
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented
- The training required for the SHSS is as follows:

- SHSS 10 hour course
- OSHA 10 hour course for Construction
- First Aid and CPR
- Relevant Competent Person Courses (excavation, confined space, scaffold, fall protection, etc.)

The SHSS is responsible for contacting the Field Team Leader and Project Manager. In general, the Project Manager will contact the client. The Health and Safety Manager should be contacted as appropriate.

### 4.2.3 Subcontractors

(Reference CH2M HILL- SOP HS-55, *Subcontractor, Contractor, and Owner*)

Certain subcontractors (drilling, remedial and construction contractors) are required to be pre-qualified for safety by completing the Subcontractor Safety Performance Questionnaire. The subcontractors listed above are covered by this HSP. However, this plan does not address hazards associated with the tasks and equipment that the subcontractor has expertise in (e.g., drilling, excavation work, electrical). Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit these procedures to CH2M HILL for review before the start of field work by following the Subcontractor Safety Procedure Criteria specific to their work.

Subcontractors are also required to prepare Activity Hazard Analysis before beginning each activity posing H&S hazards to their personnel using the AHA form provided in Attachment 6 as a guide. The AHA shall identify the principle steps of the activity, potential H&S 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.

Subcontractors must comply with the established health and safety plan(s). The CH2M HILL SHSS should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established plan(s). CH2M HILL oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

CH2M HILL should continuously endeavor to observe subcontractors' safety performance. 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. In addition to this level of observation, the SHSS is responsible for confirming CH2M HILL subcontractor performance against both the subcontractor's safety plan and applicable self-assessment checklists. Self-assessment checklists contained in Attachment 5 are to be used by the SHSS to review subcontractor performance.

Health and safety related communications with CH2M HILL subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the Employee Signoff Form included in Attachment 1.
- Request subcontractor(s) to brief project team on the hazards and precautions related to their work.
- When apparent non-compliance/unsafe conditions or practices are observed, notify the subcontractor safety representative and require corrective action – the subcontractor is responsible for determining and implementing necessary controls and corrective actions.
- When repeat non-compliance/unsafe conditions are observed, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented.
- When an apparent imminent danger exists, immediately remove all affected CH2M HILL employees and subcontractors, notify subcontractor safety representative, and stop affected work until adequate corrective measures are implemented. Notify the Project Manager and HSM as appropriate.
- Document all oral health and safety related communications in project field logbook, daily reports, or other records.

# 5.0 Personal Protective Equipment

(Reference CH2M HILL- SOP HS-07, *Personal Protective Equipment*, HS-08, *Respiratory Protection*)

PPE Specifications are listed in Table 5-1.

TABLE 5-1  
PPE Specifications<sup>a</sup>

Activity	Level	Body	Head	Respirator <sup>b</sup>
General site entry Oversight of remediation and construction	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat <sup>c</sup> Safety glasses Ear protection <sup>d</sup>	None required
Soil Screening, Sampling, and Analyses T&D of Contaminated/Uncontaminated Materials Sampling and Analyses Drilling Well Installation ORCA application Transfer of liquids	Modified D	Work clothes or cotton coveralls <b>Boots:</b> Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers <b>Gloves:</b> Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat <sup>c</sup> Safety glasses, face shield Ear protection <sup>d</sup>	None required
Tasks requiring upgrade	C	<b>Coveralls:</b> Polycoated Tyvek® <b>Boots:</b> Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers <b>Gloves:</b> Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat <sup>c</sup> Splash shield <sup>c</sup> Ear protection <sup>d</sup> Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H cartridges or equivalent <sup>e</sup> .

## Reasons for Upgrading or Downgrading Level of Protection

Upgrade <sup>f</sup>	Downgrade
<ul style="list-style-type: none"> <li>Request from individual performing tasks.</li> <li>Change in work tasks that will increase contact or potential contact with hazardous materials.</li> <li>Occurrence or likely occurrence of gas or vapor emission.</li> <li>Known or suspected presence of dermal hazards.</li> <li>Instrument action levels (Section 5) exceeded.</li> </ul>	<ul style="list-style-type: none"> <li>New information indicating that situation is less hazardous than originally thought.</li> <li>Change in site conditions that decrease the hazard.</li> <li>Change in work task that will reduce contact with hazardous materials.</li> </ul>

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

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

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

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

<sup>e</sup> 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.

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

# 6.0 Air Monitoring/Sampling

(Reference CH2M HILL- SOP HS-06, *Air Monitoring*)

## 6.1 Air Monitoring Specifications

Air Monitoring Specifications are listed in Table 6-1.

TABLE 6-1  
Air Monitoring Specifications

Instrument	Tasks	Action Levels <sup>a</sup>		Frequency <sup>b</sup>	Calibration
<b>PID:</b> OVM or equivalent  <b>(11.7 eV lamp or equivalent)</b>	All soil intrusive activities where contaminants may be encountered.	<0-1 ppm (in worker BZ)	Modified Level D	Initially during intrusive activities and where unusual odors vapors or fumes, discolored soil/sediment are observed/encountered.	Daily
		1 - 5 ppm (sustained 5 mins in worker BZ)	Level C with benzene, detector tube monitoring <b>or</b> Suspend operations and allow vapors to dissipate to < 1 ppm before continuing in Level D. If benzene is negative proceed with work in Level D up to 5 ppm	Continuously or until 1) level is below 1 ppm, 2) Compound specific action level is exceeded.	
		> 5 ppm (sustained 5 mins. in worker BZ)	Level C or Suspend operations and allow vapors to dissipate to < 5 ppm before continuing in Level D continue with benzene monitoring.  If levels persist for benzene Level B will be required. Consult HSM for proper engineering controls and PPE requirements or before any investigation of "unknown" conditions.	Continuously upon re-start of work to verify 0-1 ppm in worker BZ and until it is determined that compound specific concentrations are less than 50% of the PEL or REL.	
<b>Detector Tube:</b> Drager benzene specific 0.5/c (0.5 to 10 ppm range) with pre-tube, or equivalent	All intrusive operations	<0.5 ppm 0.5-1 ppm >1 ppm	Level D Level C Level B	Initially and periodically when PID/FIB >1 ppm	Not applicable
<b>CGI:</b> MSA model 260 or 261 or equivalent	All intrusive operations	0-10% : 10-25% LEL: >25% LEL:	No explosion hazard Potential explosion hazard Explosion hazard; evacuate or vent	Continuous during advancement of boring or trench	Daily
<b>O<sub>2</sub> Meter:</b> MSA model 260 or 261 or equivalent	All intrusive operations	>25% <sup>c</sup> O <sub>2</sub> : 20.9% <sup>c</sup> O <sub>2</sub> : <19.5% <sup>c</sup> O <sub>2</sub> :	Explosion hazard; evacuate or vent Normal O <sub>2</sub> O <sub>2</sub> deficient; vent or use	Continuous during advancement of boring or trench	Daily

SCBA					
<b>Dust Monitor Visual Assessment</b>	All activities	No Visible Dust	Level D	Initially and periodically during tasks	Zero Daily
		Visible Dust	Use dust suppression methods		
<b>Noise-Level Monitor <sup>e</sup>:</b>	All activities	<85 dB(A)	No action required	Initially and periodically during task	Daily
		85-120 dB(A)	Hearing protection required		
		120 dB(A)	Stop; re-evaluate		

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

<sup>b</sup> The exact frequency of monitoring depends on field conditions and is to be determined by the SHSS; 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.).

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

<sup>d</sup> Refer to SOP HS-10 for instructions and documentation on radiation monitoring and screening.

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

## 6.2 Calibration Specifications

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

Air Monitoring equipment calibration specifications are listed in Table 6-2

TABLE 6-2  
Air Monitoring Equipment Calibration Specifications

Instrument	Gas	Span	Reading	Method
<b>PID:</b> OVM, 10.6 or 11.8 eV bulb	100 ppm isobutylene	RF = 1.0	100 ppm	1.5 lpm reg T-tubing
<b>PID:</b> MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF = 100	100 ppm	1.5 lpm reg T-tubing
<b>PID:</b> TVA 1000	100 ppm isobutylene	CF = 1.0	100 ppm	1.5 lpm reg T-tubing
<b>FID:</b> OVA	100 ppm methane	3.0 ± 1.5	100 ppm	1.5 lpm reg T-tubing
<b>FID:</b> TVA 1000	100 ppm methane	NA	100 ppm	2.5 lpm reg T-tubing
<b>Dust Monitor:</b> Miniram-PDM3	Dust-free air	Not applicable	0.00 mg/m <sup>3</sup> in "Measure" mode	Dust-free area OR Z-bag with HEPA filter
<b>CGI:</b> MSA 260, 261, 360, or 361	0.75% pentane	N/A	50% LEL ± 5% LEL	1.5 lpm reg direct tubing

## 6.3 Air Sampling

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

# 7.0 Decontamination

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(Reference CH2M HILL- SOP HS-13, *Decontamination*)

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

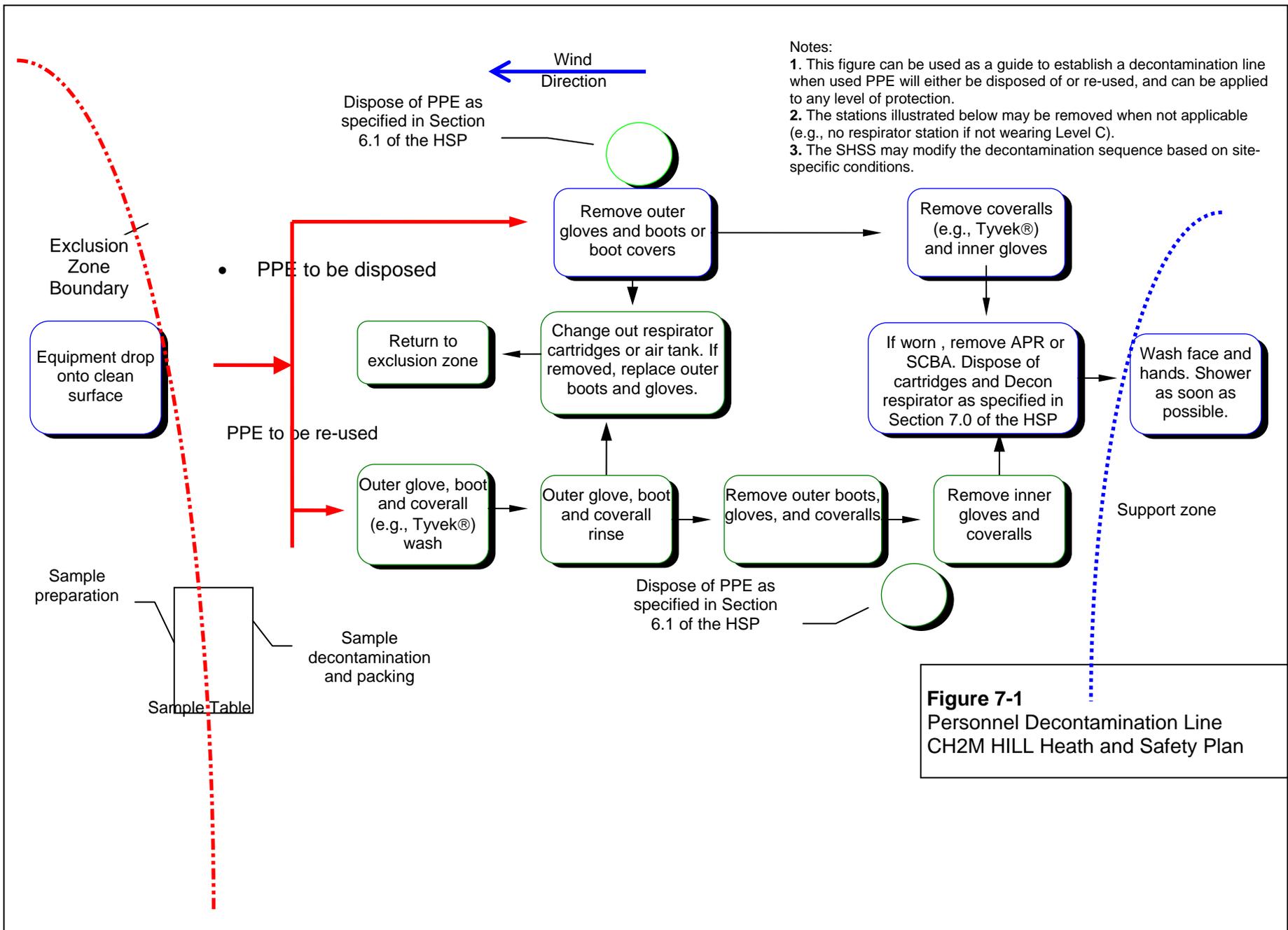
## 7.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
<ul style="list-style-type: none"><li>• Boot wash/rinse</li></ul>	<ul style="list-style-type: none"><li>• Wash/rinse equipment</li></ul>	<ul style="list-style-type: none"><li>• Power wash</li></ul>
<ul style="list-style-type: none"><li>• Glove wash/rinse</li></ul>	<ul style="list-style-type: none"><li>• Solvent-rinse equipment</li></ul>	<ul style="list-style-type: none"><li>• Steam clean</li></ul>
<ul style="list-style-type: none"><li>• Outer-glove removal</li></ul>	<ul style="list-style-type: none"><li>• Contain solvent waste for offsite disposal</li></ul>	<ul style="list-style-type: none"><li>• Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal</li></ul>
<ul style="list-style-type: none"><li>• Body-suit removal</li></ul>		
<ul style="list-style-type: none"><li>• Inner-glove removal</li></ul>		
<ul style="list-style-type: none"><li>• Respirator removal</li></ul>		<ul style="list-style-type: none"><li>•</li></ul>
<ul style="list-style-type: none"><li>• Hand wash/rinse</li></ul>		
<ul style="list-style-type: none"><li>• Face wash/rinse</li></ul>		
<ul style="list-style-type: none"><li>• Shower ASAP</li></ul>		
<ul style="list-style-type: none"><li>• Dispose of PPE in municipal trash, or contain for disposal</li></ul>		
<ul style="list-style-type: none"><li>• Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal</li></ul>		

## 7.2 Diagram of Personnel-Decontamination Line

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

Figure 7-1 illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SHSS to accommodate task-specific requirements.



## 8.0 Spill-Containment Procedures

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Sorbent material will be maintained in the support zone. Incidental spills will be contained with sorbent and disposed of properly.

# 9.0 Site-Control Plan

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## 9.1 Site-Control Procedures

(Reference CH2M HILL- SOP HS-11, *Site Control*)

- The SHSS will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of Health and Safety Plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SHSS records attendance at safety briefings in a logbook and documents the topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location in accordance with CH2M HILL- SOP HS-71, OSHA Postings.
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the “buddy system.”
- Initial air monitoring is conducted by the SHSS in appropriate level of protection.
- The SHSS is to conduct periodic inspections of work practices to determine the effectiveness of this plan (refer to Sections 2 and 3). Deficiencies are to be noted, reported to the HSM, and corrected.

## 9.2 Hazwoper Compliance Plan

(Reference CH2M HILL- SOP HS-19, *Site-Specific Written Safety Plans*)

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved 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 are working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data.
- When non-Hazwoper-trained personnel are at risk of exposure, the SHSS must post the exclusion zone and inform non-Hazwoper-trained personnel of the:
  - 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.
- 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.

# 10.0 Emergency Response Plan

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(Reference CH2M HILL- SOP HS-12, *Emergency Response*)

## 10.1 Pre-Emergency Planning

The SHSS 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.

- 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 emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- 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 map inside; keep keys in 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 driving route to hospital.
- Brief new workers on the emergency response plan.
- The SHSS will evaluate emergency response actions and initiate appropriate follow-up actions.

## 10.2 Emergency Equipment and Supplies

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

Emergency Equipment and Supplies	Location
20 LB (or two 10-lb) fire extinguisher (A, B, and C classes)	Support Zone/Heavy Equipment
First aid kit	Support Zone/Field Vehicle
Eye Wash	Support & Decon Zone/Field Vehicle
Potable water	Support & Decon Zone/Field Vehicle
Bloodborne-pathogen kit	Support Zone/Field Vehicle

## 10.3 Incident Reporting, Investigation and Response

For any accident meeting the definition of Recordable Occupational Injuries or Illnesses or Significant Accidents, the Southern Division, NAVFAC Contracting Officer and Navy Technical Representative (NTR) shall be notified by the HSM or Program Manager soon as practical, but not later than four hours after occurrence. All other incidents must be reported to Southern Division, NAVFAC within 24 hours of incident occurrence.

Therefore in order for the incident to be assessed for reportability purposes it is imperative that according to CH2M HILL requirements, all personal injuries, near-misses, or property damage incidents involving CH2M HILL or subcontractor project personnel be reported IMMEDIATELY to the HSM Rich Rathnow/ORO, Program Manager Scott Newman/ATL, or CH2M HILL Corporate HSM Angelo Liberatore/ATL at the numbers identified in the emergency contact attachment contained in this plan.

The Site Manager or designee must report the following incident information to the HSM immediately after incident occurrence:

- Date and time of mishap
- Project name and project number
- Name and worker classification
- Extent of known injuries
- Level of medical attention
- Injury cause

A written incident investigation shall be performed and submitted to the HSM within 24 hours of incident occurrence by the completing the Incident Report, Near Loss Investigation and Root Cause Analysis provided in the HSP Attachments.

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

- Shut down CH2M HILL operations and evacuate the immediate work area.
- Notify appropriate response personnel.
- Account for personnel at the designated assembly area(s).

- Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

## 10.4 Emergency Medical Treatment

The procedures listed below may also be applied to non-emergency incidents. CH2M HILL employee injuries and illnesses must be reported to the Human Resource contact in Attachment 4. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CH2M HILL medical consultant, depending on whose employee is injured. During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities (e.g., 911).
- The SHSS will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.
- Report incident as outlined in Section 10.7.

## 10.5 Evacuation

- Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the SHSS before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The SHSS 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 SHSS will account for all personnel in the onsite assembly area.

- A designated person will account for personnel at alternate assembly area(s).
- The SHSS will write up the incident as soon as possible after it occurs and submit a report to the Corporate Director of Health and Safety.

## 10.6 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.

## 10.7 Incident Notification and Reporting

- Upon any project incident (fire, spill, injury, near miss, death, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- For CH2M HILL work-related injuries or illnesses, contact the respective Human Resources contact listed in Attachment 4. For CH2M HILL incidents the HR administrator completes an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.
- For CH2M HILL subcontractor incidents, complete the Subcontractor Accident/Illness Report Form (Attachment) and submit to the HSM.
- Notify and submit reports to client as required in contract.

# 11.0 Behavior Based Loss Prevention System

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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 on EE&S CH2M HILL projects to implement the BBLPS include:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plans (PTSP)
- Loss Prevention Observations (LPO)
- Loss and Near Loss Investigations (NLI)

The Site Supervisor serves as the Site Health and Safety Specialist (SHSS) and is responsible for implementing the BBLPS on the project site. When a separate individual is assigned as the SHSS, the SHSS is delegated authority from the Site Supervisor to implement the BBLPS on the project site, but the Site Supervisor remains accountable for its implementation. The Site Supervisor/Safety Coordinator shall only oversee the subcontractor's implementation of their AHAs and PTSPs processes on the project.

## 11.1 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, during and after the performance of work to further identify the hazards posed and control measures required.

Activity Hazard Analysis will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in Attachment 6. 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 during the course of the project by the Site Supervisor/SHSS. The Project-Specific and General Hazards of the HSP, the Hazard Analysis Table (Table 2-1), and applicable CH2M HILL Standards of Practice (SOPs) should be used as a basis for preparing CH2M HILL 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 HSP. Additions or changes in CH2M HILL or subcontractor field activities, equipment, tools or material to perform work or additional/different hazard encountered that require

additional/different hazard control measures requires either a new AHA to be prepared or an existing AHA to be revised.

## 11.2 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 6, 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 hazard and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

## 11.3 Loss Prevention Observations

Loss Prevention Observations (LPOs) shall be conducted by Site Supervisor/SHSS for specific work tasks or operations comparing the actual work process against established safe work procedures identified in the project-specific HSP and AHAs. LPOs 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. Site Supervisor/SHSS shall perform at least one LPO each week for a tasks/operations addressed in the project-specific HSP or AHA. The Site Supervisor/SHSS shall complete the LPO form in Attachment 6 for the task/operation being observed.

## 11.4 Loss/Near Loss Investigations

Loss/Near Loss Investigations shall be performed for the all CH2M HILL and subcontractor incidents involving:

- Person injuries/illnesses and near miss injuries
- Equipment/property damage
- Spills, leaks, regulatory violations
- Motor vehicle accidents

The cause of loss and near loss incidents are similar, so by identifying and correcting the causes of near loss causes, future loss incidents may be prevented. The following is the Loss/Near Loss Investigation Process:

- Gather all relevant facts, focusing on fact-finding, not fault-finding, while answering the who, what, when, where and how questions.
- Draw conclusions, pitting facts together into a probable scenario.

- Determine incident root cause(s), which are basic causes on why an unsafe act/condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.
- Communicate incident as a Lesson Learned to all project personnel.
- Filed follow-up on implemented corrective active action to confirm solution is appropriate.

Site Supervisors/SHSS shall perform an incident investigation, as soon as practical after incident occurrence during the day of the incident, for all Loss and Near Loss Incidents that occur on the project. Loss and Near Loss incident investigations shall be performed using the following incident investigation forms provided in Attachment 6:

- Incident Report Form (IRF)
- Incident Investigation Form
- Root Cause Analysis Form

All Loss and Near Loss incident involving personal injury, property damage in excess of \$1,000 or near loss incidents that could have resulted in serious consequences shall be investigated by completing the incident investigation forms and submitting them to the PM and HSM within 24 hours of incident occurrence. A preliminary Incident Investigation and Root Cause Analysis shall be submitted to the Project Manager and HSM within 24 hours of incident occurs. The final Incident Investigation and Root Cause Analysis shall be submitted after completing a comprehensive investigation of the incident.

# 12.0 Approval

---

This site-specific Health and Safety Plan 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, purposes, dates, and personnel specified and must be amended if those conditions change.

## 12.1 Original Plan

**Written By: Jason Brown**

**Date: July 30, 2007**

---

**Approved By: Rich Rathnow**

**Date: July 31, 2007**



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## 12.2 Revisions

**Revisions Made By: Michael Goldman**

**Date: March 13, 2009**

---

**Revisions to Plan: Updated emergency contacts**

---

**Revisions Approved By: Michael Goldman**

**Date: March 13, 2009**

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Attachment 1  
Employee Signoff Form

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Attachment 2  
Project-Specific Chemical Product  
Hazard Communication Form

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## Project-Specific Chemical Product Hazard Communication Form

This form must be completed prior to performing activities that expose personnel to hazardous chemicals products. Upon completion of this form, the SHSS shall verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to CH2M HILL and subcontractor personnel. Labeling and MSDS systems will also be explained.

**Project Name:** NAS Cecil Field

**Project Number:** 331481

**MSDSs will be maintained at the following location(s):**      Site

### Hazardous Chemical Products Inventory

Chemical	Quantity	Location	MSDS Available	Container labels	
				Identity	Hazard
Methane	1 liter, compressed	Support Zone			
Isobutylene	1 liter, compressed	Support Zone			
Pentane	1 liter, compressed	• Support Zone			
Hydrochloric acid	< 500 ml	Support Zone / sample bottles			
Nitric acid	< 500 ml	Support Zone / sample bottles			
Sulfuric Acid	< 500 ml	Support Zone / sample bottles			
Sodium hydroxide	< 500 ml	Support Zone / sample bottles			
Methanol	< 1 Gallon	Support/Decon Zones			
Hexane	< 1 Gallon	Support/Decon Zones			
pH buffers	< 500 ml	Support Zone			
MSA Sanitizer	< 1 liter	Support/Decon Zones			
Alconox/Liquinox	< 1liter	Support/Decon Zones			

Refer to SOP HS-05 *Hazard Communication* for more detailed information.

Attachment 3  
Chemical Specific Training Form

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## CHEMICAL-SPECIFIC TRAINING FORM

Location: NAS Cecil Field	Project #: 331481
SHSS: <span style="background-color: yellow; color: black;">          </span>	Trainer: <span style="background-color: yellow; color: black;">          </span>

### 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.

Attachment 4  
Emergency Contacts

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# Emergency Contacts-

Reporting work related injuries or illness, contact Injury Management at:  
**866.893.2514**

24-Hour reporting serious incidents and/or crisis situations: **720.286.4911**

---

**Medical Emergency – 911**

Facility Medical Response #: 911  
Local Ambulance #:

**CH2M HILL- Medical Consultant**

Dr. Jerry H. Berke, M.D., M.P.H.  
Health Resources  
600 West Cummings Park, Suite 3400  
Woburn, MA 01801-6350  
781/938-4653  
800/350-4511  
(After hours calls will be returned within 20 minutes)

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**Fire/Spill Emergency -- 911**

Facility Fire Response #: 911  
Local Fire Dept #:

**Local Occupational Physician**

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**Security & Police – 911**

Facility Security #: 911  
Local Police #:

**Navy RAC Program Manager**

Name: Sidney Allison/ATL  
Phone: 843/813-2672

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**Utilities Emergency**

Water:  
Gas:  
Electric:

**Navy RAC Health and Safety Manager (HSM)**

Name: Rich Rathnow/ORO  
Phone: 865/560-2908 (Office); 865/607-6734 (Cell)  
865/531-2933 (Home)

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**Site Health and Safety Specialist (SHSS)**

Name:  
Phone:

**CH2M HILL Human Resources Department**

Name: Nancy Orr/COR  
Phone: 303/771-0952

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**Project Manager**

Name: Sam Naik/ATL  
Phone: (770) 604-9095

**Corporate Human Resources Department**

Name: John Monark/COR  
Phone: 303/771-0900

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**Federal Express Dangerous Goods Shipping**

Phone: 800/238-5355

**Emergency Number for Shipping Dangerous Goods**

Phone: 800/255-3924

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**CH2M HILL Worker's Compensation and Auto Claims**

Sterling Administration Services  
Phone: 800/420-8926 After hours: 800/497-4566

Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.

Contact the Project Manager. Generally, the Project Manager will contact relevant government agencies.

---

**Facility Alarms:** NA**Evacuation Assembly Area(s):**

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**Facility/Site Evacuation Route(s):**

---

**Hospital Name/Address:**

Providence Hospital

**Hospital Phone #:**

---

**Directions to Hospital**

See Map Next Page for directions from Cecil Field to Baptist Medical Center

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Zoom  
In  
1  
2 street  
3  
4 city  
5  
6  
7  
8 state  
9  
10 country  
Zoom  
Out

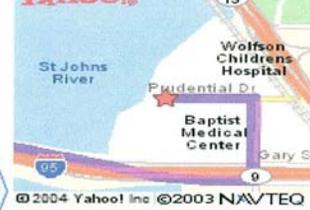


Clicking on Map:

- ⊙ Zoom in & Re-Center
- ⊙ Re-Center Only

**Your Destination**

View Larger Map



What's this?

**SmartView™**

See locations on this map:

- [Restaurants](#)
- [Hotels](#)
- [ATMs](#)
- [Gas Stations](#)
- [More](#)

**Directions**

[Show Turn by Turn Maps](#)

1.	Start on <b>FL-134</b> (at <b>NORMANDY BLVD &amp; 103RD ST</b> in <b>JACKSONVILLE</b> ) - go < 0.1 mi
2.	Bear <b>L</b> on <b>FL-228</b> - go 2.9 mi
3.	Turn <b>L</b> on <b>CHAFFEE RD S</b> - go 2.8 mi
4.	Bear <b>R</b> to take <b>I-10 EAST</b> - go 10.0 mi
5.	Take ramp onto <b>I-95 SOUTH</b> - go 1.2 mi
6.	Take exit # <b>350B</b> - go 0.4 mi
7.	Turn <b>L</b> on <b>PRUDENTIAL DR</b> - go 0.1 mi
8.	Arrive at <b>800 PRUDENTIAL DR, JACKSONVILLE</b> , on the <b>L</b>

Attachment 5  
Project Activity Self-Assessment Checklists/Permits  
Drilling

---

**HS&E Self-Assessment Checklist - DRILLING** Page 1 of 3

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 potentially exposed to hazards associated with drilling operations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of a drilling subcontractor is required (complete entire checklist).

SC 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.

Completed checklists shall be sent to the health and safety manager for review.

Project Name: _____	Project No.: _____
Location: _____	PM: _____
Auditor: _____	Title: _____
Date: _____	
This specific checklist has been completed to:	
<input type="checkbox"/> Evaluate CH2M HILL employee exposures to drilling hazards	
<input type="checkbox"/> Evaluate a CH2M HILL subcontractor's compliance with drilling HS&E 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 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 Standard of Practice HS-35.

<u>SECTION 1</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
<b>PERSONNEL SAFE WORK PRACTICES (3.1)</b>				
1. Only authorized personnel operating drill rig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Personnel cleared during rig startup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Personnel clear of rotating parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Personnel not positioned under hoisted loads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Loose clothing and jewelry removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Personnel instructed not to approach equipment that has become Electrically energized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Smoking is prohibited around drilling operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Personnel wearing appropriate PPE, per HSP/FSI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**HS&E Self-Assessment Checklist - DRILLING** Page 2 of 3

<u>SECTION 2</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
<b>GENERAL (3.2.1)</b>				
9. Aquifer evaluated for contamination, sole source and wellhead protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Daily safety briefing/meeting conducted with crew	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Daily inspection of drill rig and equipment conducted before use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG PLACEMENT (3.2.2)</b>				
12. Location of underground utilities identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Safe clearance distance maintained from overhead powerlines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Drilling pad established, when necessary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Drill rig leveled and stabilized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG TRAVEL (3.2.3)</b>				
16. Rig shut down and mast lowered and secured prior to rig movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Tools and equipment secured prior to rig movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Only personnel seated in cab are riding on rig during movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Safe clearance distance maintained while traveling under overhead powerlines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Backup alarm or spotter used when backing rig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG OPERATION (3.2.4)</b>				
21. Kill switch clearly identified and operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. All machine guards are in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Rig ropes not wrapped around body parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Pressurized lines and hoses secured from whipping hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Drill operation stopped during inclement weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Air monitoring conducted per HSP/FSI for hazardous atmospheres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Rig placed in neutral when operator not at controls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILL RIG MAINTENANCE (3.2.5)</b>				
28. Defective components repaired immediately	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Lockout/tagout procedures used prior to maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Cathed in clean, sound condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Drill rig ropes in clean, sound condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Fall protection used for fall exposures of 6 feet or greater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Rig in neutral and augers stopped rotating before cleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Good housekeeping maintained on and around rig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILLING WASTE MANAGEMENT (3.2.6)</b>				
35. Drill cuttings and purge water managed and disposed properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DRILLING AT HAZARDOUS WASTE SITES (3.2.7)</b>				
36. Waste disposed of according to HSP and RCRA regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Appropriate decontamination procedures being followed, per HSP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>FORMS/PERMITS (3.3)</b>				
38. Driller license/certification and drill rig permit obtained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Well development/abandonment notifications and logs submitted and in project files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Water withdrawal permit obtained, where required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Dig permit obtained, where required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Attachment 6

### Behavior Based Loss Prevention System Forms

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- **Activity Hazard Analysis**
- **Pre-Task Safety Plans**
- **Loss Prevention Observation**
- **Incident Report and Investigation**







PRINT

SIGNATURE

Supervisor Name:

\_\_\_\_\_

\_\_\_\_\_

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

Safety Officer Name:

\_\_\_\_\_

\_\_\_\_\_

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

Employee Name(s):

\_\_\_\_\_

\_\_\_\_\_

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

**CH2MHILL****PRE-TASK SAFETY PLAN**

Project: \_\_\_\_\_ Location: \_\_\_\_\_ Date: \_\_\_\_\_

Supervisor: \_\_\_\_\_ Emergency Number(s): \_\_\_\_\_

## Brief Job Descriptions:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## List Specific Tasks for the Jobs (Match number from above).

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## Tools/Equipment required for Tasks, (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools)match number from above:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Potential H&S Hazards, including chemical, physical, safety, biological and environmental (**Check all that apply and review exposures as they will be encountered in the tasks above**):

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

## Other Potential Hazards (Describe):

\_\_\_\_\_

Hazard Control Measures (Check all that apply):

<p>PPE</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Thermal/lined</li> <li><input type="checkbox"/> Eye</li> <li><input type="checkbox"/> Dermal/hand</li> <li><input type="checkbox"/> Hearing</li> <li><input type="checkbox"/> Respiratory</li> <li><input type="checkbox"/> Reflective vests</li> <li><input type="checkbox"/> Flotation device</li> </ul>	<p>Protective Systems</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sloping</li> <li><input type="checkbox"/> Shoring</li> <li><input type="checkbox"/> Trench box</li> <li><input type="checkbox"/> Barricades</li> <li><input type="checkbox"/> Competent person</li> <li><input type="checkbox"/> Locate buried utilities</li> <li><input type="checkbox"/> Daily inspections</li> </ul>	<p>Fire Protection</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Fire extinguishers</li> <li><input type="checkbox"/> Fire watch</li> <li><input type="checkbox"/> Non-spark tools</li> <li><input type="checkbox"/> Grounding/bonding</li> <li><input type="checkbox"/> Intrinsically safe equipment</li> </ul>	<p>Electrical</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lockout/tagout</li> <li><input type="checkbox"/> Grounded</li> <li><input type="checkbox"/> Panels covered</li> <li><input type="checkbox"/> GFCI/extension cords</li> <li><input type="checkbox"/> Power tools/cord inspected</li> </ul>
<p>Fall Protection</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Harness/lanyards</li> <li><input type="checkbox"/> Adequate anchorage</li> <li><input type="checkbox"/> Guardrail system</li> <li><input type="checkbox"/> Covered opening</li> <li><input type="checkbox"/> Fixed barricades</li> <li><input type="checkbox"/> Warning system</li> </ul>	<p>Air Monitoring</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> PID/FID</li> <li><input type="checkbox"/> Detector tubes</li> <li><input type="checkbox"/> Radiation</li> <li><input type="checkbox"/> Personnel sampling</li> <li><input type="checkbox"/> LEL/O2</li> <li><input type="checkbox"/> Other</li> </ul>	<p>Proper Equipment</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Aerial lift/ladders/scaffolds</li> <li><input type="checkbox"/> Forklift/ Heavy equipment</li> <li><input type="checkbox"/> Backup alarms</li> <li><input type="checkbox"/> Hand/power tools</li> <li><input type="checkbox"/> Crane w/current inspection</li> <li><input type="checkbox"/> Proper rigging</li> <li><input type="checkbox"/> Operator qualified</li> </ul>	<p>Welding &amp; Cutting</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cylinders secured/capped</li> <li><input type="checkbox"/> Cylinders separated/upright</li> <li><input type="checkbox"/> Flash-back arrestors</li> <li><input type="checkbox"/> No cylinders in CSE</li> <li><input type="checkbox"/> Flame retardant clothing</li> <li><input type="checkbox"/> Appropriate goggles</li> </ul>
<p>Confined Space Entry</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Isolation</li> <li><input type="checkbox"/> Air monitoring</li> <li><input type="checkbox"/> Trained personnel</li> <li><input type="checkbox"/> Permit completed</li> <li><input type="checkbox"/> Rescue</li> </ul>	<p>Medical/ER</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> First-aid kit</li> <li><input type="checkbox"/> Eye wash</li> <li><input type="checkbox"/> FA-CPR trained personnel</li> <li><input type="checkbox"/> Route to hospital</li> </ul>	<p>Heat/Cold Stress</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Work/rest regime</li> <li><input type="checkbox"/> Rest area</li> <li><input type="checkbox"/> Liquids available</li> <li><input type="checkbox"/> Monitoring</li> <li><input type="checkbox"/> Training</li> </ul>	<p>Vehicle/Traffic</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Traffic control</li> <li><input type="checkbox"/> Barricades</li> <li><input type="checkbox"/> Flags</li> <li><input type="checkbox"/> Signs</li> </ul>
<p>Permits</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Hot work</li> <li><input type="checkbox"/> Confined space</li> <li><input type="checkbox"/> Lockout/tagout</li> <li><input type="checkbox"/> Excavation</li> <li><input type="checkbox"/> Demolition</li> <li><input type="checkbox"/> Energized work</li> </ul>	<p>Demolition</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pre-demolition survey</li> <li><input type="checkbox"/> Structure condition</li> <li><input type="checkbox"/> Isolate area/utilities</li> <li><input type="checkbox"/> Competent person</li> <li><input type="checkbox"/> Hazmat present</li> </ul>	<p>Inspections:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ladders/aerial lifts</li> <li><input type="checkbox"/> Lanyards/harness</li> <li><input type="checkbox"/> Scaffolds</li> <li><input type="checkbox"/> Heavy equipment</li> <li><input type="checkbox"/> Cranes and rigging</li> </ul>	<p>Training:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Hazwaste</li> <li><input type="checkbox"/> Construction</li> <li><input type="checkbox"/> Competent person</li> <li><input type="checkbox"/> Task-specific (THA)</li> <li><input type="checkbox"/> Hazcom</li> </ul>

FieldNotes: \_\_\_\_\_  
 \_\_\_\_\_

Supervisor signature: \_\_\_\_\_

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



Project: _____	Supervisor: _____	Date: _____
Task/Operation Observed: _____ _____ _____		Job Title of Worker Observed: _____ _____
Background Information/comments: _____ _____ _____		Task Hazard Analysis completed for task (Y/N): _____
<b>Positive Observations/Safe Work Procedures</b> 1. _____ 2. _____ 3. _____ 4. _____		
<b>Questionable Activity/Unsafe Condition Observed</b> 1. _____ 2. _____ 3. _____		
<b>Observed Worker's Comment(s)</b> 1. _____ 2. _____ 3. _____ 4. _____		
<b>Supervisor's Corrective Actions Taken:</b> 1. _____ 2. _____ 3. _____ 4. _____		

# CH2MHILL

## Loss Investigation Report Form

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### Employer Information

Company Name: \_\_\_\_\_

Project Name: \_\_\_\_\_ Project Number: \_\_\_\_\_

Project Location: \_\_\_\_\_

CHIL Project? Yes  No

Task Location: \_\_\_\_\_

Job Assignment: \_\_\_\_\_ Business Group: \_\_\_\_\_

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

### Near Loss Incident Specific Information

Date of Incident: \_\_\_\_\_ Time of Incident: \_\_\_\_\_ a.m./p.m.

Location of incident:

Company premises

Field

In Transit

Other: \_\_\_\_\_

Address where the incident occurred: \_\_\_\_\_

Equipment Malfunction : Yes  No

Activity was a Routine Task: Yes  No

Describe any property damage: \_\_\_\_\_

Specific activity the employee was engaged in when the incident occurred: \_\_\_\_\_

All equipment, materials, or chemicals the employee was using when the incident occurred: \_\_\_\_\_

Describe the specific incident and how it occurred:

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Describe how this incident may have been prevented:

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Contributing Factors (Describe in detail why incident occurred):

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Date employer notified of incident: \_\_\_\_\_ To whom reported: \_\_\_\_\_

**Witness Information (First Witness)**

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

Employee Number (for CH2M HILL employees): \_\_\_\_\_

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

City: \_\_\_\_\_

Zip Code : \_\_\_\_\_

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

**Witness Information (Second Witness)**

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

Employee Number (for CH2M HILL employees): \_\_\_\_\_

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

City: \_\_\_\_\_

Zip Code: \_\_\_\_\_

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

Additional information or comments: \_\_\_\_\_

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**COMPLETE ROOT CAUSE ANALYSIS FORM**

# Root Cause Analysis Form

**Root Cause Analysis (RCA)**

Lack of skill or knowledge Lack of or inadequate operational procedures or work standards Inadequate communication of expectations regarding procedures or work standards Inadequate tools or equipment	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 Uncontrollable
--	---

RCA #	Solution(s): How to Prevent Loss From Occurring	RC <sup>1</sup>	CF <sup>2</sup>	Corrective Action Lead	Due Date	Completion Date	Date Verified

<sup>1</sup> RC = Root Cause; <sup>2</sup> CF = Contributing Factors (check which applies)

**Investigation Team Members**

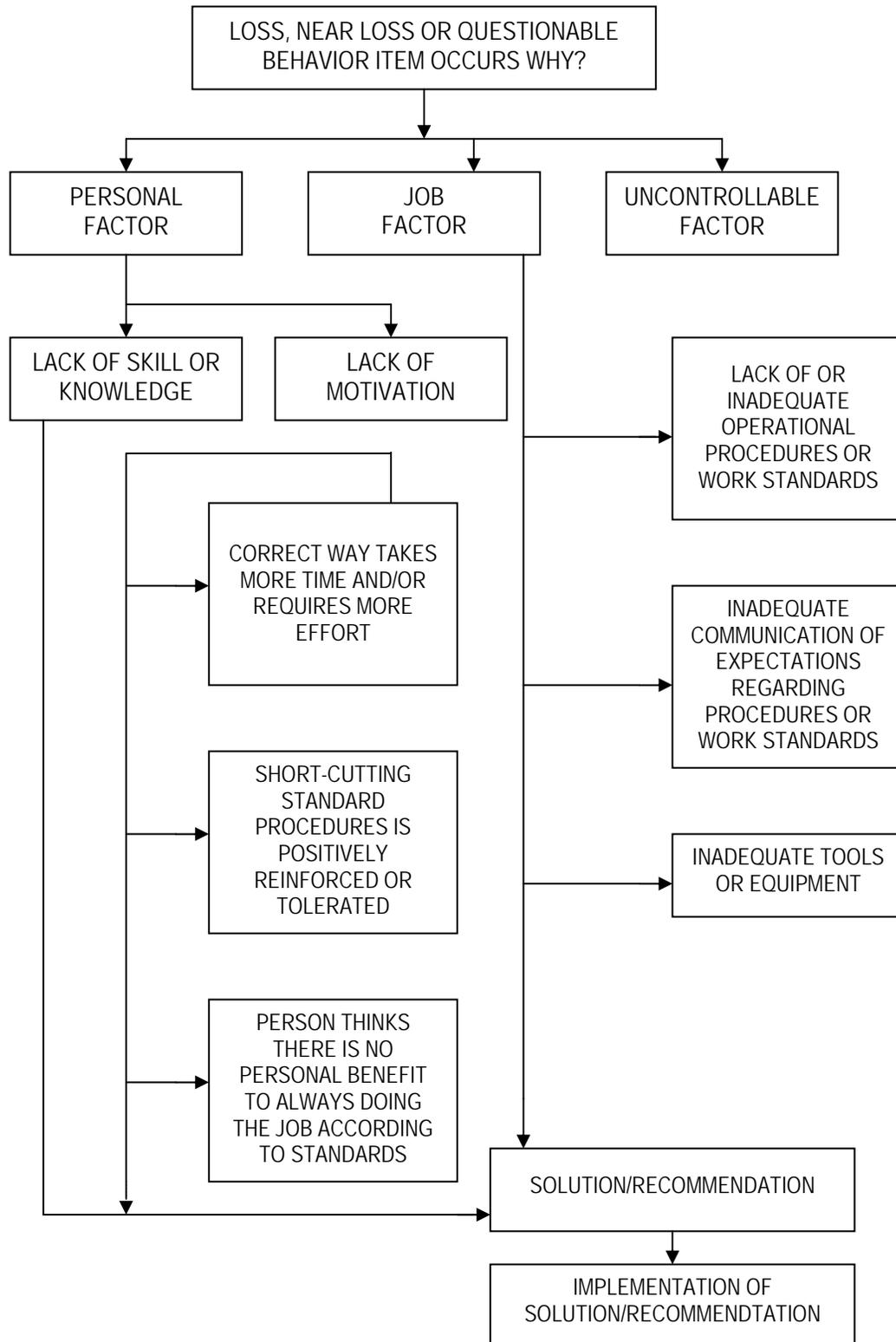
Name	Job Title	Date

**Results of Solution Verification and Validation**


**Reviewed By**

Name	Job Title	Date

# Root Cause Analysis Flow Chart



## Determination of Root Cause(s)

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, to determine the root cause, and to 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".

### 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 that there is no personal benefit to always doing the job according to standards

### 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.

# Incident Report Form

**Fax completed form to:**

**425.462.5957**

CH2M HILL Seattle Office

Attention: Corporate HS&E Department

**Type of Incident** (Select at least one)

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

**General Information** (Complete for all incident types)

Preparer's Name: \_\_\_\_\_ Preparer's Employee Number: \_\_\_\_\_  
Date of Report: \_\_\_\_\_ Date of Incident: \_\_\_\_\_ Time of Incident: \_\_\_\_\_ am/pm

**Type of Activity** (Provide activity being performed that resulted in the incident)

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Asbestos Work                     | <input type="checkbox"/> Excavation Trench-Haz Waste | <input type="checkbox"/> Other (Specify) _____     |
| <input type="checkbox"/> Confined Space Entry              | <input type="checkbox"/> Excavation Trench-Non Haz   |  |
| <input type="checkbox"/> Construction Mgmt- Haz Waste      | <input type="checkbox"/> Facility Walk Through       | <input type="checkbox"/> Process Safety Management |
| <input type="checkbox"/> Construction Mgmt - Non-Haz Waste | <input type="checkbox"/> General Office Work         | <input type="checkbox"/> Tunneling                 |
| <input type="checkbox"/> Demolition                        | <input type="checkbox"/> Keyboard Work               | <input type="checkbox"/> Welding                   |
| <input type="checkbox"/> Drilling-Haz Waste                | <input type="checkbox"/> Laboratory                  | <input type="checkbox"/> Wetlands Survey           |
| <input type="checkbox"/> Drilling-Non Haz Waste            | <input type="checkbox"/> Lead Abatement              | <input type="checkbox"/> Working from Heights      |
| <input type="checkbox"/> Drum Handling                     | <input type="checkbox"/> Motor Vehicle Operation     | <input type="checkbox"/> Working in Roadways       |
| <input type="checkbox"/> Electrical Work                   | <input type="checkbox"/> Moving Heavy Object         | <input type="checkbox"/> WWTP Operation            |

**Location of Incident** (Select one)

- Company Premises (CH2M HILL Office: \_\_\_\_\_)
- Field (Project #: \_\_\_\_\_ Project/Site Name: \_\_\_\_\_ Client: \_\_\_\_\_)
- In Transit (Traveling from: \_\_\_\_\_ Traveling to: \_\_\_\_\_)
- At Home

**Geographic Location of Incident** (Select region where the incident occurred)

- |                                    |                                    |   |
|------------------------------------|------------------------------------|---|
| <input type="checkbox"/> Northeast | <input type="checkbox"/> Southwest | <input type="checkbox"/> Asia Pacific       |
| <input type="checkbox"/> Southeast | <input type="checkbox"/> Corporate | <input type="checkbox"/> Europe Middle East |
| <input type="checkbox"/> Northwest | <input type="checkbox"/> Canadian  | <input type="checkbox"/> Latin America      |

If a CH2M HILL subcontractor was involved in the incident, provide their company name and phone number: \_\_\_\_\_

Describe the Incident (Provide a brief description of the incident): \_\_\_\_\_

**Injured Employee Data** (Complete for Injury/Illness incidents only)

**If CH2M HILL employee injured**

Employee Name: \_\_\_\_\_ Employee Number: \_\_\_\_\_

**If CH2M HILL Subcontractor employee injured**

Employee Name: \_\_\_\_\_ Company: \_\_\_\_\_

### **Injury Type**

- Allergic Reaction
- Amputation
- Asphyxia
- Bruise/Contusion/Abrasion
- Burn (Chemical)
- Burn/Scald (Heat)
- Cancer
- Carpal Tunnel
- Concussion
- Cut/Laceration
- Dermatitis
- Dislocation

- Electric Shock
- Foreign Body in eye
- Fracture
- Freezing/Frost Bite
- Headache
- Hearing Loss
- Heat Exhaustion
- Hernia
- Infection
- Irritation to eye
- Ligament Damage

- Multiple (Specify) \_\_\_\_\_
- Muscle Spasms
- Other (Specify) \_\_\_\_\_
- Poisoning (Systemic)
- Puncture
- Radiation Effects
- Strain/Sprain
- Tendonitis
- Wrist Pain

### **Part of Body Injured**

- Abdomen
- Ankle(s)
- Arms (Multiple)
- Back
- Blood
- Body System
- Buttocks
- Chest/Ribs
- Ear(s)
- Elbow(s)
- Eye(s)
- Face
- Finger(s)
- Foot/Feet

- Hand(s)
- Head
- Hip(s)
- Kidney
- Knee(s)
- Leg(s)
- Liver
- Lower (arms)
- Lower (legs)
- Lung
- Mind

- Neck
- Nervous System
- Nose
- Other (Specify) \_\_\_\_\_
- Reproductive System
- Shoulder(s)
- Throat
- Toe(s)
- Upper Arm(s)
- Upper Leg(s)
- Wrist(s)

- Multiple (Specify) \_\_\_\_\_

### **Nature of Injury**

- Absorption
- Bite/Sting/Scratch
- Cardio-Vascular/Respiratory System Failure
- Caught In or Between
- Fall (From Elevation)
- Fall (Same Level)
- Ingestion

- Inhalation
- Lifting
- Mental Stress
- Motor Vehicle Accident
- Multiple (Specify) \_\_\_\_\_

- Other (Specify) \_\_\_\_\_

- Overexertion
- Repeated Motion/Pressure
- Rubbed/Abraded
- Shock
- Struck Against
- Struck By
- Work Place Violence

- Initial Diagnosis/Treatment Date: \_\_\_\_\_

### **Type of Treatment**

- Admission to hospital/medical facility
- Application of bandages
- Cold/Heat Compression/Multiple Treatment
- Cold/Heat Compression/One Treatment
- First Degree Burn Treatment
- Heat Therapy/Multiple treatment
- Multiple (Specify) \_\_\_\_\_

- Heat Therapy/One Treatment
- Non-Prescriptive medicine
- None
- Observation
- Other (Specify) \_\_\_\_\_

- Prescription- Multiple dose

- Prescription- Single dose
- Removal of foreign bodies
- Skin Removal
- Soaking therapy- Multiple Treatment
- Soaking Therapy- One Treatment
- Stitches/Sutures
- Tetanus
- Treatment for infection
- Treatment of 2<sup>nd</sup> /3<sup>rd</sup> degree burns
- Use of Antiseptics - multiple treatment
- Use of Antiseptics - single treatment
- Whirlpool bath therapy/multiple treatment
- Whirlpool therapy/single treatment
- X-rays negative
- X-rays positive/treatment of fracture

- Number of days doctor required employee to be off work: \_\_\_\_\_  
Number of days doctor restricted employee's work activity: \_\_\_\_\_  
Equipment Malfunction : Yes  No  Activity was a Routine Task: Yes  No   
Describe how you may have prevented this injury: \_\_\_\_\_
- 

Physician Information

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_

Hospital Information

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_

**Property Damage** (Complete for Property Damage incidents only)

Property Damaged: \_\_\_\_\_ Property Owner: \_\_\_\_\_  
Damage Description: \_\_\_\_\_  
Estimated Amount: \$ \_\_\_\_\_

**Spill or Release** (Complete for Spill/Release incidents only)

Substance (attach MSDS): \_\_\_\_\_ Estimated Quantity: \_\_\_\_\_  
Facility Name, Address, Phone No.: \_\_\_\_\_  
Did the spill/release move off the property where work was performed?: \_\_\_\_\_  
Spill/Release From: \_\_\_\_\_ Spill/Release To: \_\_\_\_\_

**Environmental/Permit Issue** (Complete for Environmental/Permit Issue incidents only)

Describe Environmental or Permit Issue: \_\_\_\_\_  
Permit Type: \_\_\_\_\_  
Permitted Level or Criteria (e.g., discharge limit): \_\_\_\_\_  
Permit Name and Number (e.g., NPDES No. ST1234): \_\_\_\_\_  
Substance and Estimated Quantity: \_\_\_\_\_  
Duration of Permit Exceedence: \_\_\_\_\_

**Verbal Notification** (Complete for all incident types)(Provide names, dates and times)

CH2M HILL Personnel Notified: \_\_\_\_\_  
Client Notified: \_\_\_\_\_

**Witnesses** (Complete for all incident types)

Witness Information (First Witness)

Name: \_\_\_\_\_  
Employee Number (CH2M HILL): \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_

Witness Information (Second Witness)

Name: \_\_\_\_\_  
Employee Number (CH2M HILL): \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Zip Code: \_\_\_\_\_  
Phone : \_\_\_\_\_

Additional Comments:

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# NEAR LOSS INVESTIGATION FORM

## Employer Information

Company Name: \_\_\_\_\_

Project Name: \_\_\_\_\_ Project Number: \_\_\_\_\_

Project Location: \_\_\_\_\_

CHIL Project? Yes  No

Task Location: \_\_\_\_\_

Job Assignment: \_\_\_\_\_ Business Group: \_\_\_\_\_

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

## Near Loss Incident Specific Information

Date of Incident: \_\_\_\_\_ Time of Incident: \_\_\_\_\_ a.m./p.m.

Location of incident:

Company premises  Field  In Transit  Other: \_\_\_\_\_

Address where the incident occurred: \_\_\_\_\_

Equipment Malfunction : Yes  No

Activity was a Routine Task: Yes  No

Describe any property damage: \_\_\_\_\_

Specific activity the employee was engaged in when the incident occurred:

\_\_\_\_\_  
\_\_\_\_\_

All equipment, materials, or chemicals the employee was using when the incident occurred:

\_\_\_\_\_  
\_\_\_\_\_

Describe the specific incident and how it occurred:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Describe how this incident may have been prevented:

\_\_\_\_\_  
\_\_\_\_\_

Contributing Factors (Describe in detail why incident occurred):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date employer notified of incident: \_\_\_\_\_ To whom reported: \_\_\_\_\_

**NEAR LOSS INVESTIGATION FORM**

**Witness Information (First Witness)**

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

Employee Number (for CH2M HILL employees): \_\_\_\_\_

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

City: \_\_\_\_\_

Zip Code : \_\_\_\_\_

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

**Witness Information (Second Witness)**

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

Employee Number (for CH2M HILL employees): \_\_\_\_\_

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

City: \_\_\_\_\_

Zip Code: \_\_\_\_\_

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

Additional information or

comments: \_\_\_\_\_

\_\_\_\_\_

Attachment 7  
Applicable Material Safety Data Sheets  
(available onsite)

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Attachment 8  
Subcontractor H&S Plans/Procedures

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