Work Plan

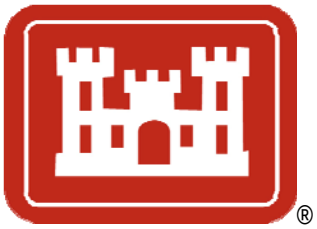
Hazardous, Toxic, and Radioactive Waste Site Inspection at DERP-FUDS Site IO2PR006800

Former Lower Camp Debris Site Culebra Island, Puerto Rico

Revision No. 00

Contract No. W912DY-09-D-0060
Task Order No. 0002

Submitted to:



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September 2010

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Prepared by:

CH2MHILL Constructors, Inc.

September 2010

Prepared/Approved By:

Tom Beisel, P.G., Project Manager — September 20, 2010 (Date)

Approved By:

Ben Redmond, Program Manager — September 20, 2010 (Date)

Client Acceptance:

USACE, Responsible Authority — Date

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A QC Attachments

- Contractor Daily Quality Control Report
- Contractor Daily Production Report
- Preparatory Phase Report Form
- Submittal Register

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Acronyms and Abbreviations

AHA	activity hazard analysis
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH2M HILL	CH2M HILL Constructors, Inc.
DFOW	definable feature of work
DoD	Department of Defense
DQCR	Daily Quality Control Report
E&E	Ecology and Environment, Inc.
EDB	ethylene dibromide
EPA	U.S. Environmental Protection Agency
ERIS	Environmental Restoration Information System
GPR	ground penetrating radar
GPS	global positioning system
HTRW	hazardous, toxic, and radioactive waste
MSDS	material safety data sheet
PAHs	polynuclear aromatic hydrocarbons
PREQB	Puerto Rico Environmental Quality Board
QC	quality control
QCP	Quality Control Plan
SHSS	Site Health and Safety Specialist
SI	Site Inspection
TO	Task Order
TRPHs	total recoverable petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers
USACEHNC	U.S. Army Engineering and Support Center, Huntsville
USFWS	U.S. Fish and Wildlife Service

1.0 Introduction

CH2M HILL Constructors, Inc. (CH2M HILL) has been contracted by the U.S. Army Corps of Engineers (USACE), U.S. Army Engineering and Support, Huntsville (USACEHNC), to prepare this Work Plan under the terms and conditions of Contract Number W912DY-09-D-0060, Task Order (TO) Number 0002. The purpose of this Work Plan is to outline the field work that will be performed at the Former Lower Camp Debris Site on Culebra Island, Puerto Rico.

The objective of this project is to complete a Hazardous, Toxic, and Radioactive Waste (HTRW) Site Inspection (SI) and perform a relative site risk evaluation at the Former Lower Camp Debris Site on Culebra Island, Puerto Rico. The SI will be performed to collect additional data to determine the presence or absence of contamination at the site, and prepare an SI Report that will form the foundation for evaluating the relative risk posed by the site in relation to other Department of Defense (DoD) sites. Previously collected data, including analytical, historical, and current conditions, indicate a possible impact by the site to the environment; these data will be evaluated. During the completion of the work, CH2M HILL will abide by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan, as appropriate. Additionally, CH2M HILL will perform the work in accordance with the Guidance for Performing Preliminary Assessment Under CERCLA, September 1992 (U.S. Environmental Protection Agency [EPA] 540-R-92-021, Directive 9345.1-05); the Relative Risk Site Evaluations Primer, Summer 1997 (Revised Edition), DoD; and the U.S. Army Corps of Engineers Safety and Health Requirements Manual (effective 12 January 2009).

1.1 Work Plan Objectives and Organization

The objectives of this Work Plan are to:

- Communicate to the project team (i.e., EPA, Puerto Rico Environmental Quality Board [PREQB], U.S. Fish and Wildlife Service [USFWS], USACE, and CH2M HILL) the scope of work and the necessary technical requirements to maintain contract (W912DY-09-D-0060, TO Number 0002) compliance during the work.
- Communicate to the project team roles and responsibilities during the work.
- Communicate CH2M HILL's understanding of the project and proposed approach to USACE for approval.

This Work Plan is organized into sections of text as follows:

- Section 1, Introduction, includes the site background and project objectives.
- Section 2, Project Execution Plan, details the required scope of work and the project schedule.

- Section 3, Quality Control Plan, includes the testing requirements for work described in this Work Plan. The site-specific project organization for this TO is also included in this section.
- Section 4, References, contains a list of the reference documents cited in this Work Plan.

Appendices to this Work Plan include:

- Appendix A, QC Attachments
- Appendix B, Accident Prevention Plan

1.2 Site Description and Background

Culebra Island is located approximately 17 miles east of the Puerto Rican mainland, 12 miles west of St. Thomas, and 9 miles north of Vieques (Figure 1-1).

After Spain ceded all of Puerto Rico to the United States in 1898 at the end of the Spanish-American War, President Roosevelt placed all of Culebra's public lands under Navy control in 1901. These areas included all of Culebra Island, nearby keys, and all surrounding water for a total area of approximately 92,500 acres (7,300 acres of land and 85,000 acres of water) (Figure 1-2). After acquisition in 1901, the Navy built permanent camps and used the area for naval exercises by the Caribbean Fleet. In addition, the Marines used Culebra for training from 1903 until 1941, and the Navy used Culebra as a bombing and gunnery range from 1935 until 1975. In September 1980, the Navy transferred the property to the U.S. Department of Interior.

The Former Lower Camp Debris Site encompasses a 40,000-square-foot section (100 feet by 400 feet) of marine wetland located along the eastern shoreline of Ensenada del Cementerio. The area is located adjacent to the Department of Conservation auto shop facility, and is currently under the jurisdiction of the Commonwealth of Puerto Rico and the Authority for Conservation and Development of Culebra (Figure 1-3). Historically, the area east of the wetland was used by the Navy as a housing facility from the early 1940s until 1980. The concrete foundation, currently occupied by the Department of Conservation auto shop, was previously a bathroom facility. Between the early 1940s and 1980, various materials were discarded into the wetland area west of the bathroom facility.

1.2.1 Previous Site Investigation

On July 19, 1996, Ecology and Environment, Inc. (E&E) performed an SI and prepared an SI Report (E&E, 1996) that was submitted to the USACE on October 4, 1996. A summary of the work performed as part of the 1996 SI is provided below. The site map from the previous site investigation is shown on Figure 1-4.

N

0 4 8 16

Miles

1 in = 10 miles

FIGURE 1-1
Puerto Rico Site Location Map
Former Lower Camp Debris Site
Culebra, Puerto Rico

Imagery Source: World Imagery, ESRI Online v92, 2007

FIGURE 1-2
Culebra Site Location Map
Former Lower Camp Debris Site
Culebra, Puerto Rico

Approximate Location of Desalinization Pipeline

Estimated Site Walk and Visual Inspection Area

Imagery Source: World Imagery, ESRI Online v92, 2007

N

0 75 150 300

Feet

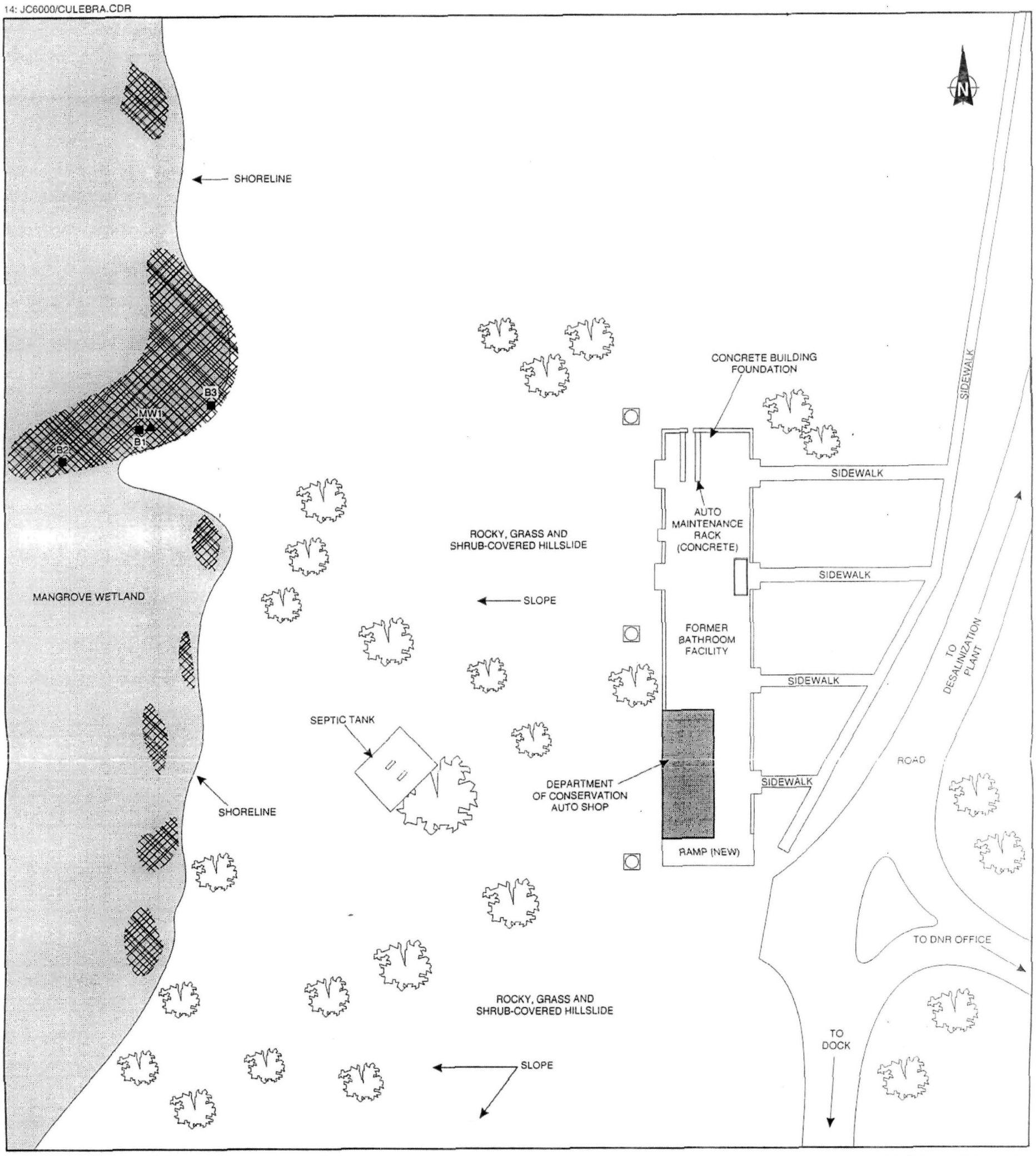
1 in = 150 feet

FIGURE 1-3
Former Lower Camp Debris Site Location
Former Lower Camp Debris Site
Culebra, Puerto Rico

CH2MHILL

\\GALILEO\PROJ\USNAVY\PUERTORICO_CULEBRA\MAPFILES\CULEBRA\SITEMAP.MXD LSUBER1 7/16/2010 11:09:35

14: JC6000/CULEBRA.CDR



SOURCE: Ecology and Environment, Inc., 1996

SCALE
0 40 80 FEET

KEY:
- Tree
- Building
- Septic System Manway
- Sediment Sampling Location
- Visible Areas of Metal Debris
- Monitoring Well

FIGURE 1-4
Site Map from 1996 Site Investigation by Ecology and Environment, Inc.
Former Lower Camp Debris Site
Culebra, Puerto Rico

General Information

- Debris was scattered along approximately 400 feet of the shoreline and extended from 20 feet to 100 feet into the wetland.
- The highest concentration of debris occupied an area of approximately 4,800 square feet (40 feet by 120 feet). The debris consists primarily of rusted metal building materials such as steel beams and reinforcing rods, corrugated steel sheeting, and bolts.
- Other material observed in the wetland area included broken glass and automobile parts.
- The eastern edge of the wetland area is approximately 180 feet west (downslope) of a 35-foot by 160-foot concrete pad. The pad was part of a Navy lavatory facility, but is now used by the Department of Conservation as an automotive maintenance facility.
- The hillside between the automotive maintenance facility and the wetland area is scattered with auto body parts and corrugated steel sheeting that appears relatively new (i.e., within 10 to 15 years as of 1996).
- No freshwater bodies, streams, or water supply wells are located in the immediate vicinity of the site.
- A water intake for the Culebra Island Desalinization Plant is located in Ensenada Honda Bay, about 700 feet south of the debris area (50 to 100 feet offshore). However, the desalinization plant is currently not in use, and drinking water to Culebra Island is pumped through pipes from the main island of Puerto Rico to Vieques Island, and from Vieques Island to Culebra Island.

Soil and Groundwater Investigation

- Three soil borings (B-1, B-2, and B-3) were advanced within the wetland in an area of concentrated debris (Figure 1-4). Boring B-1 was advanced to 4 feet below ground surface (bgs), and borings B-2 and B-3 were advanced to 2 feet bgs. Soil samples were collected from each boring for lithologic description, headspace screening, and chemical analysis. Composite soil samples were collected at 2-foot intervals from the ground surface to the boring completion depth. Soil samples were analyzed for the following: purgeable aromatic hydrocarbons, purgeable aromatic halocarbons, ethylene dibromide (EDB), polynuclear aromatic hydrocarbons (PAHs), total recoverable petroleum hydrocarbons (TRPHs), and eight metals (lead, arsenic, cadmium, chromium, barium, selenium, silver, and mercury).
- A 2-inch diameter, temporary monitoring well, screened from 0.5 to 5 feet bgs, was installed in the wetland area immediately adjacent to soil boring B-1 (Figure 1-4). The well was purged and groundwater samples were analyzed for the same parameters as soil.

Soil and Groundwater Results

- Lithology from ground surface to the completion depth of the borings was characterized as black organic silt and peat.

- Groundwater was encountered at 0.3 foot bgs.
- No odor, visible evidence of contamination (staining and/or sheens) or elevated headspace readings were observed in the soil and groundwater.
- Soil/sediments have been impacted by metals and benzo(k)fluoranthene (Table 1-1).
- Elevated (above background and regulatory levels) levels of metals were detected in the unfiltered groundwater sample (Table 1-1).
- The filtered groundwater sample detected elevated concentrations of lead and barium (Table 1-1).

TABLE 1-1
Summary Analytical Results – Sediment/Soil and Groundwater Samples
Former Lower Camp Debris Site, Culebra, Puerto Rico

Parameter	Soil Samples (mg/kg)		Groundwater Sample (µg/L)	
	B-1 (0-2 feet bgs)	B-2 (0-2 feet bgs)	MW1	
TRPHs	660	ND	ND	
Benzo(k)fluoranthene	16	0.24	ND	
Metals			**Total[a]**	**Dissolved[b]**
Arsenic	17	8.6	220	ND
Barium	540	120	2300	54
Chromium	38	7.6	750	ND
Lead	460	52	4700	9.8
Selenium	ND	0.94	29	ND
Mercury	0.17	0.049	0.82	ND

Notes:
[a] total (unfiltered) metals concentration
[b] filtered (0.45 micron) metals concentration
bgs = below ground surface
mg/kg = milligrams per kilogram
µg/L = micrograms per liter
ND = not detected
TRPHs = total recoverable petroleum hydrocarbons
Source: Ecology and Environment, 1996

1.3 Technical Project Planning Meeting

On July 8, 2010, CH2M HILL personnel attended a Technical Project Planning meeting in San Juan, Puerto Rico. Attendees included USACE personnel and representatives from the EPA, PREQB, and USFWS (see July 8, 2010 Meeting Minutes in Appendix A). The meeting was held to present the investigation approach developed to complete the SI and gain regulatory acceptance of the approach prior to the execution of field activities.

At the conclusion of meeting all parties agreed that additional work would include:

- Completion of a site visit to corroborate the locations of debris identified by E&E in 1996; and
- Completion of a geophysical survey to locate and estimate the extent of buried debris.

The EPA and USFWS also requested that vegetation not be cleared during completion of the geophysical work to prevent damage to the mangroves.

1.4 Project Objectives

The objective of this project is to complete an SI and perform a relative site risk evaluation of the Former Lower Camp Debris Site on Culebra Island, Puerto Rico. In order to complete these objectives, the following activities will be conducted:

- Perform a site visit to obtain additional site information regarding the type, location, and distribution of debris.
- Perform a geophysical survey to locate and delineate, to the extent possible, buried metal debris.
- Prepare a Site Investigation Report.

2.0 Project Execution Plan

The scope of work activities and project schedule are described in this section.

2.1 Scope of Work

The following tasks will be performed:

- Mobilization
- Site walk and visual inspection
- Site geophysical screening
- Demobilization
- Deliverables

Specific project activities are described below.

2.1.1 Mobilization

CH2M HILL will mobilize all resources necessary to perform the scope of work. These resources will include personnel, equipment, materials, and supplies. A lower tier subcontractor will perform the geophysical work.

2.1.2 Site Walk and Visual Inspection

A site walk and visual survey will be performed to record detailed information regarding the type, location, and estimated extent of debris currently at the site. Site activities will be scheduled to occur during low tide to expose and identify debris that may be covered by water. The extent of metal debris based on the 1996 SI is shown on Figure 1-4 and the site walk area is shown on Figure 1-3. Information gathered during the site walk will be compared to the 1996 data to determine if the debris piles identified in 1996 are still present, and also to determine whether additional debris is present. Once located, the debris areas will be marked with flagging, marking-paint, or stakes. The debris will be then be photographed and a written description recorded in a field notebook. In addition, the latitude and longitude of the debris will be determined using a handheld global positioning system (GPS) unit. The debris areas identified will serve as a starting point to conduct the geophysical survey to identify the locations of the buried debris.

2.1.3 Site Geophysical Screening

Geophysical screening will be performed immediately following the site walk to determine the extent of buried debris. The geophysical survey will involve the use of ferromagnetic and/or electromagnetic instruments to identify metallic objects, and in areas that are unobstructed, the use of ground penetrating radar (GPR) to identify the orientation and burial depth of both metallic and non-metallic objects. The geophysical investigation will begin in the areas where the debris was visually observed at land surface and will continue away from these areas until the 100-foot by 400-foot area of the site has been traversed. A

handheld GPS unit will be used to determine the location where the subsurface debris was encountered, and notes will be made based on interpretation of the GPR signature regarding the probable type of debris encountered. Note that during the completion of the geophysical survey work, no vegetation will be cleared because both the EPA and USFWS indicated that the mangroves remain undisturbed. Also note in areas with heavy vegetation, a GPR survey will not be performed because of mobility restrictions. Following completion of the geophysical screening, a site map will be produced showing the major areas of metallic debris and estimated extent. This information will be used to complete the SI document.

2.1.4 Deliverables

CH2M HILL will prepare an SI Report following completion of the fieldwork described above. The report will present the results of the newly acquired data and summarize the results obtained from the 1996 investigation, and will include recommendations for additional work based on the review of the historical and newly acquired data. The SI Report will form the foundation for evaluating the relative risk posed by the site in relation to other DoD sites.

2.2 Project Schedule

The schedule is summarized as follows:

Task	Date
Technical Project Planning Meeting Work Plan	July 8, 2010September 4, 2010
Draft Site Inspection Work Plan/UFP-QAPP - Regulatory Review	Sept 16, 2010 – October 19,
Final Site Inspection Work Plan/UFP-QAPP	Oct 20, 2010 – Nov 2, 2010
Site Inspection Field Work	Dec 11, 2010 – Dec 17, 2010
Draft Site Inspection Report – Regulatory Review	March 2, 2011 – March 31, 2011
Final Site Inspection Report Site Geophysical Screening	April 8, 2011 – April 27, 2011

Work hours for site investigation activities are tentatively scheduled from 8:00 A.M. to 5:00 P.M. during week days, but are subject to change based upon travel times to/from Culebra Island and low tide cycles. Additionally, the schedule provided above may change based on inclement weather and subcontractor availability.

3.0 Quality Control Plan

This section of the Work Plan details the Quality Control Plan (QCP) that will be used during completion of the work. The section also presents an organizational chart (Figure 3-1) for the project that depicts the chain-of-command for this TO. Additionally the roles and responsibilities for individuals assigned to the project are also described. Individual roles and responsibilities of TO personnel are summarized in Table 3-1.

3.1 Project QC Manager

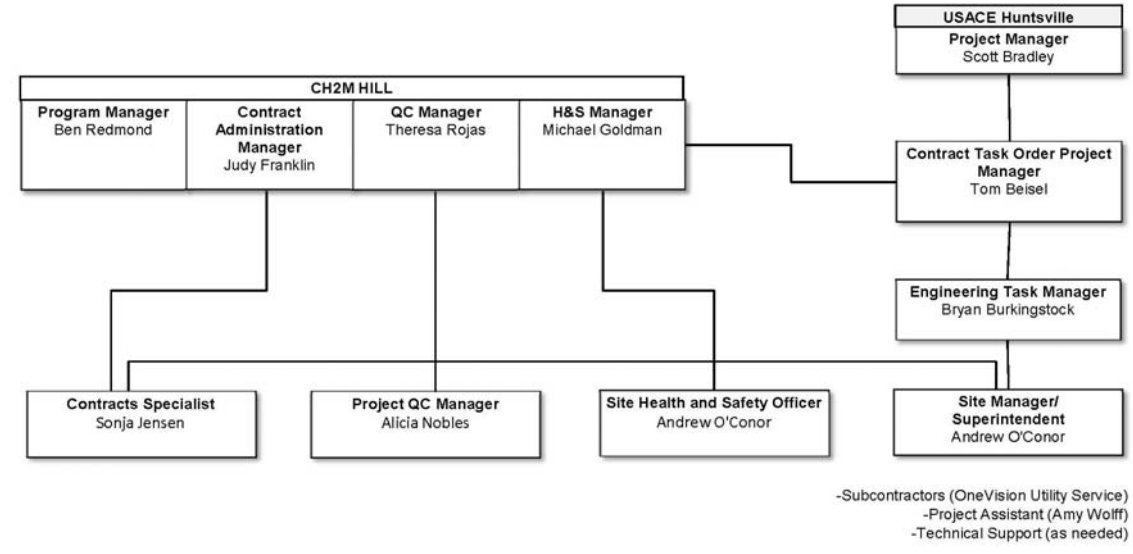
The Project QC Manager for this project is Ms. Alicia Nobles.

3.2 Inspections

The Project QC Manager will perform inspections of the materials and overall work activities. The inspections are performed so that safe, efficient, high quality work is performed, while meeting the objectives and requirements of the plans and specifications.

The project tasks for this TO are grouped into definable features of work (DFOW), which are work activities that are significant enough to warrant distinct plans and specifications. The work activities for this project are:

- Mobilization
- Site walk and visual inspection
- Site geophysical screening
- Demobilization



CH2MHILL Constructors, Inc.

FIGURE 3-1
Project Organization Chart
Former Camp O'Reilly
Guraloo, Puerto Rico

TABLE 3-1
Roles, Responsibilities, and Authorities of Key Project Personnel
Former Lower Camp Debris Site, Culebra, Puerto Rico

Role	Responsibility	Authority
Project Manager	• Management and Technical Direction of work • Communication with USACE Project Manager • Overview subcontractor performance • Select TO staff • Develop TO Work Plan and supporting plans • Meet TO Performance Objectives • Prepare status reports	• Approve subcontractor selection • Approve invoices to USACE Project Manager • Approve TO baseline schedule • Stop work at the site for any reason • Approve payment to vendors and suppliers • Approve payment to subcontractors
Engineering Task Manager	• Monitor and oversee subcontractor compliance with scope of work • Review requests for changes in scope of work • Review technical qualifications of subcontractors • Prepare Field Change Requests • Respond to Design Change Notices • Recommend improvements in work techniques or metrics • Recommend work-around to Site Superintendent	• Approve Field Change Requests below ceiling amount • Approve Design Change Notices
Site Superintendent/ Site Manager	• Responsible for all site activities • Provide direction to subcontractors • Act for Project Manager • Provide daily status reports • Prepare TO Work Plan • Conduct daily safety meetings • Review subcontractor qualifications • Stop work for unsafe conditions or practices	• Stop work for subcontractors • Approve corrective action for site work • Approve materials and labor costs for site operations • Resolve subcontractor interface issues • Approve daily and weekly status reports
Project Assistant	• Maintain TO files and correspondence • Coordinate TO schedule and monitor deliverables • Maintain change management records • Maintain Action Tracking System log	• Submit Action Tracking System log • Assign correspondence log numbers

TABLE 3-1
Roles, Responsibilities, and Authorities of Key Project Personnel
Former Lower Camp Debris Site, Culebra, Puerto Rico

Role	Responsibility	Authority
Project QC Manager/ QC Inspector(s)	• Monitor and report on subcontractor quality and quantities • Maintain Submittal Register • Participate in Continuous Improvement Team • Stop work for non-compliant operations • Maintain Lessons Learned Log	• Stop work for non-compliant operations • File daily quantities report • File Lessons Learned Log Sheet • Approve resumption of work for resolved quality issues
Site Health and Safety Specialist (SHSS)	• Monitor and report on subcontractor safety and health performance • Record and report safety statistics • Conduct needed site safety and health orientation • Maintain Environmental Log	• Stop work for unsafe practices or conditions • Enforce subcontractor site specific Accident Prevention Plan • Set weekly safety objectives • Approve resumption of work for resolved safety issues
Subcontract Specialist	• Prepare bid packages • Maintain subcontract log	

The DFOW will be inspected in accordance with the three phases of control. The three phases include Preparatory, Initial, and Follow-up. An overview of the inspection provisions is outlined in the subsections that follow.

3.2.1 Three Phases of Control

The USACE established the three phases of control protocol that must be implemented throughout delivery of all task orders under the contract. The process formalizes specific actions that are prudent to delivery of any project, and establishes guidelines which allow CH2M HILL to better know and understand USACE expectations. The three phases of control are comprised of:

1) Preparatory Phase
2) Initial Phase
3) Follow-Up Phase

The three phases of control will be performed for each DFOW to ensure that work complies with contract and specification requirements. A definable feature of work (DFOW) is a task or feature that has a distinct beginning and end, as well as specific QC features and tests. DFOW are specified in the QCP.

The three phases of control shall adequately cover appropriate onsite and offsite work.

Preparatory Phase

The preparatory phase culminates with the planning and design process leading up to actual remediation of a specific site or sites. Successful completion of the Preparatory Phase

verifies that the work, QC, and accident prevention plans have been completed and are ready to be implemented. For each DFOW established in the QCP, the following events must be performed during the preparatory phase by the Project QC Manager with the Site Superintendent/Manager, the Site Health and Safety Specialist (SHSS), and other QC personnel (as applicable) responsible for the DFOW:

- Review each paragraph of applicable specifications.
- Review the task order drawings.
- Check to assure that all materials and/or equipment have been tested, submitted, and approved.
- Review provisions that have been made to provide required control inspection and testing.
- Examine the work area to assure that all required preliminary work has been completed and is in compliance with the basic contract and task order.
- Perform a physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- Review the appropriate activity hazard analysis (AHA) to ensure safety requirements are met.
- Confirm that the appropriate material safety data sheets (MSDS) have been identified and properly submitted.
- Discuss procedures for controlling quality of the work including repetitive deficiencies.
- Document construction tolerances and workmanship standards for that feature of work.
- Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- Discuss the initial control phase.

The USACE and other associated personnel shall be notified at least 48 hours in advance of beginning the preparatory control phase. The results of the preparatory phase actions will be documented on the Preparatory Phase Report Form by the Project QC Manager and attached to the Daily Quality Control Report (DQCR) (See Appendix A). CH2M HILL will instruct applicable workers as to the acceptable level of workmanship required in order to meet basic contract and task order specifications.

Initial Phase

The initial phase occurs at the startup of remedial activities, or construction, associated with a specific DFOW. The initial phase confirms that the QCP is being effectively implemented and the desired results are being achieved. As is the case with the preparatory phase, it is required that the USACE and other associated personnel are notified at least 48 hours in advance of beginning the initial phase of a DFOW.

During the initial phase, the initial segment of the DFOW is observed and inspected to ensure that the work complies with contract and specification requirements. The initial phase should be repeated for each new crew to work onsite or any time that acceptable quality standards are not being met.

The following shall be performed for each DFOW:

- Check the work to ensure that it is in full compliance with basic contract and task order requirements. Review minutes of the preparatory meeting.
- Verify adequacy of controls to ensure full basic contract and task order compliance. Verify required control inspection and testing.
- Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- Resolve conflicts. The Project QC Manager will serve to guide the Site Manager in resolving conflicts. Should conflicts arise in establishing the baseline quality for the DFOW, the responsibility to resolve the conflict falls to the Project QC Manager. Should the conflict not be resolved in a manner that satisfies contract requirements, the Project QC Manager must elevate the conflict to the QA Program Manager and issue a non-conformance report. The Project QC Manager may direct a cessation of work activity, with the concurrence of the QA Program Manager, should the issue jeopardize the results of the definable feature of work, or put the project at risk of non-compliant performance.
- Evaluate the Accident Prevention Plan and AHAs against actual work conditions with the Site Manager to ensure that the hazard analysis conducted to prepare the Accident Prevention Plan adequately addressed field conditions. Confirm that applicable safety requirements are being implemented during construction activities. Review the AHAs with each worker.
- Observe and evaluate the performance of field testing technicians. Confirm with the Site Manager that testing is being performed in accordance with the testing plan and that all required protocols are being observed. Review all reports and documentation associated with extraction, packaging, transporting, and testing of samples. Note any discrepancies and direct correction accordingly.

Upon completion of the initial phase activities, results are to be documented in the DQCR (See Appendix A). Should results be unsatisfactory, the initial phase will be rescheduled.

Follow-Up Phase

Completion of the initial phase of QC activity then leads directly into the follow-up phase, which addresses the routine day-to-day activities on the construction site. Daily checks will be performed to assure control activities, including control testing, are providing continued compliance with basic contract and task order requirements, until completion of the particular feature of work. Final follow-up checks will be conducted and all deficiencies corrected prior to the start of additional features of work, which may be affected by the deficient work. No work will be built upon nor conceal non-conforming work.

Inspection activities associated with each DFOW are to be addressed within the Contractor Production Report and the DQCR (See Appendix A). Specific concerns associated with the follow-up include:

- Inspection of the work activity to ensure work is in compliance with the contracted remedial action
- Evaluation and confirmation that the quality of workmanship is being maintained at a level no less than that established during the initial phase
- Evaluation and confirmation that required testing is being performed in accordance with procedures established during the preparatory phase and confirmed during the initial phase
- Confirmation that non-conforming work is being corrected promptly and in accordance with the direction provided by the Project QC Manager.

3.2.2 Additional Preparatory and Initial Phases

Additional preparatory and initial phases will be conducted on the same DFOW:

- If the quality of ongoing work is unacceptable,
- If there are changes in the applicable QC staff, onsite production supervision or work crew,
- If work on a DFOW is resumed after a substantial period of inactivity, or
- If other problems develop.

3.3 Mobilization

As part of the mobilization activity, a pre-task meeting will be held to review the preparedness to begin the project, the overall project scope and schedule, communications, and reporting. The preparedness check will verify that site preparation provisions such as permitting/approvals, demarcating the work zones, and staging of equipment and material, as necessary, are in place to begin the work activities. Additionally, equipment and materials will be verified functional and in good working condition prior to starting the project.

A meeting will be arranged with site representatives to address scope of work, schedule, security, fire safety, health and safety, and other project concerns. The Accident Prevention Plan for the site is included in Appendix B.

Preparatory Phase

The preparatory phase will include a review of the relevant (AHAs, the project Work Plan, project schedule, and confirmation of appropriate materials and equipment.

Initial Phase

Inspections will be made as necessary to ensure project limits are defined, and materials are staged in designated areas.

Follow-up Phase

The Project QC Manager will provide continuous oversight of the site preparation activities to verify that the work is completed in accordance with the requirements provided in this Work Plan. Deficiencies will be noted and corrected. Table 3-2 lists the QC procedures that will be implemented during mobilization activities.

TABLE 3-2
Quality Control Procedures for Mobilization
Former Lower Camp Debris Site, Culebra, Puerto Rico

Task	Inspection/Construction Control
Mobilization	• Review qualifications of personnel to ensure that they meet the specification and Workman requirements (e.g., certifications, licenses). • Confirm that project activities are meeting the project schedule. • Confirm that appropriate site security measures are in place. • Review layout drawings for completeness and accuracy. • Confirm that equipment condition is acceptable and that features (such as backup alarms) function properly. • Confirm that personnel are properly trained and certified to perform the work. • Ensure personnel have proper personal protective equipment (PPE) to perform the work.

3.4 Site Walk and Visual Inspection

Preparatory Phase

The preparatory phase will include a review of the relevant AHAs, the requirements provided in this Work Plan, and the site-specific Accident Prevention Plan (refer to Appendix B).

Initial Phase

Inspections will be made as necessary to verify that areas of visual debris are defined and marked. As the activities proceed, the Project QC Manager will monitor the work completed to verify conformity with this Work Plan. Deficiencies will be documented and corrected as necessary.

Follow-Up Phase

The Project QC Manager will be responsible for the ongoing inspection of the site activities and surveillance to verify that the work is being completed according to the provisions in this Work Plan. Deficiencies will be documented and corrected as necessary. Table 3-3 lists the QC procedures that will be implemented during inspection activities.

TABLE 3-3
Quality Control Procedures for Site Walk and Visual Inspection
Former Lower Camp Debris Site, Culebra, Puerto Rico

Task	Procedure Details
Site Walk and Visual Inspection	• Electronic and hard copy data deliverables, including Environmental Restoration Information System (ERIS) deliverable. • Document site conditions and collect photographic records, photo log

3.5 Site Geophysical Screening

Preparatory Phase

The preparatory phase will include a review of the Accident Prevention Plan, relevant AHAs, the project Work Plan, project schedule, and submittal status. It will also confirm that appropriate materials and equipment are onsite or are in the process of mobilizing to the site.

Initial Phase

Inspections will be made as necessary to verify that areas of visual debris are defined and the estimated extent of buried debris marked.

Follow-Up Phase

The Project QC Manager will be responsible for the ongoing inspection of the site activities and surveillance to verify that the work is being completed according to the provisions in this WP. Deficiencies will be noted and corrected. Table 3-4 lists the QC procedures that will be implemented during geophysical screening activities.

TABLE 3-4
Quality Control Procedures for Geophysical Screening
Former Lower Camp Debris Site, Culebra, Puerto Rico

Task	Procedure Details
Visual Debris Limit Confirmation	Verify the predetermined visual debris limit has been confirmed and coordinates established using GPS unit.
Buried Debris	Verify the buried debris areas are marked using marking paint and/or visible stakes. Ensure coordinates established using GPS unit

3.6 Demobilization

Equipment utilized to perform the site work will be decontaminated in accordance with the provisions of the site-specific Accident Prevention Plan (Appendix B). Pre-final inspection for cleanliness will be performed by the Site Superintendent/Site Health and Safety Specialist. Final equipment inspections will be performed and documented by the Project QC Manager or his/her designee.

Equipment and personnel will demobilize from the site following the completion of the work activities identified in this Work Plan. The Project QC Manager will verify that the objectives of associated investigation activities have been met. A final inspection will be conducted to verify completion of all project activities. Findings, should any be identified, will be tracked, resolved, and documented during a final site walk-through inspection.

Preparatory Phase

The preparatory phase will include a review of decontamination procedures, the site specific Accident Prevention Plan, and relevant AHAs.

Initial Phase

The Site Superintendent will perform inspections to confirm that the objectives of the decontamination activities have been met and that the rework items, if any, have been completed to the satisfaction of CH2M HILL and the USACE.

Follow-up Phase

The Project QC Manager will provide continuous oversight of the decontamination and demobilization to verify that the work is completed in accordance with the requirements provided in this Work Plan. Deficiencies will be noted and corrected. Table 3-5 lists the QC procedures will be implemented during demobilization activities.

TABLE 3-5
Quality Control Procedures for Demobilization
Former Lower Camp Debris Site, Culebra, Puerto Rico

Task	Inspection/Construction Control
Demobilization	• Inspect work areas to ensure proper housekeeping and cleaning has been performed. • Conduct completion inspection when work has been substantially completed. • Create a punch lists on outstanding items. • Conduct orderly site demobilization. • Conduct collation of site records and documents. • Conduct records and documentation transfer to the Project Management Office. • Confirm that purchase order have been closeouts. • Confirm the final reports and deliverables have been completed and submitted.

3.7 Submittal Procedures and Initial Submittal Register

CH2M HILL will follow the procedures relative to submittals to the government as defined in the contract documents. Each submittal will include a transmittal form properly identifying each submittal. The Project QC Manager is responsible for the completeness and accuracy of all submittals and will be assisted in this task by the Project Manager.

The Project QC Manager will review submittal packages in detail for completeness and compliance with contract requirements for documentation. In addition, the Project QC Manager will certify each submittal. Exceptions must be noted and expressly stated. This procedure will ensure that field data are adequate for the intended use and meet contract requirements. Each member of the project QC team in the chain of command is responsible for preparation and review of pertinent QC material and field log documents.

The Site Superintendent will document daily field activities and safety procedures and submit the appropriate documentation to the Project QC Manager for organization and review. The Project QC Manager will complete the review and submit the information to the Project Manager. Following a final review and organization by the Project Manager, applicable data and information relating to overall project quality control will be forwarded to USACE. The Project Manager has the authority to sign submittals and present them to the government or reject the documents and have them returned to the project team or subcontractor for revision.

The Submittal Register, provided in Appendix A of this Work Plan, documents submittals in accordance with the basic contract. CH2M HILL, USACE, or others will approve submittals as identified in the submittal register. All approved submittals will be distributed by CH2M HILL to USACE and to the project file.

4.0 References

Ecology and Environment, Inc. (E&E). 1996. *Site Investigation Report for the Culebra Island National Wildlife Refuge Site, Culebra Island, Puerto Rico (DERP-FUDS Site No. I02PR006800; Contract No. DACW17-95-D-0010; Delivery Order No. 2)*. October.

Appendix A
QC Attachments

Submittal Register

Contract Number: W912DY-09-D-0060	**TO No.:** 0002	**TO Title:** Hazardous, Toxic, and Radioactive Waste (HTRW) Site Inspection at DERP-FUDS Site IO2PR006800, Former Lower Camp Debris Site	**Location:**	**Contractor:** CH2M HILL Constructors, Inc.

Spec Section	Item Description		Para. Number	Approving Authority	Other Reviewers	Submittal Number	Scheduled Submission Date	CH2M Review Date	CH2M Disposition	CH2M HILL Transmit Date	QC Admin Received Date	QC Disposition	QC Admin Transmit Date	Contracting Officer Received	Contracting Officer Disposition	Contracting Officer Return	Remarks
		Schedules															
		Project Schedule															
		Reports															
		Geophysical Surveyor Report															
		Certificates															
		Surveyor License															
		Records															
		List of Contractor Personnel															
		Contractor Production Reports															
		Contractor QC Reports															
		GPS Data															
		Site Drawings															

CH2MHILL Constructors, Inc. **Contract No.** W912DY-09-D-0060	**CONTRACTOR PRODUCTION REPORT**	**DATE OF REPORT:** **REVISION NO:** **REVISION DATE:**
CTO NO:0002	**PROJECT NAME/LOCATION:**	**REPORT NO:**

PROJECT NO:	**SUPERINTENDENT:**	**SITE H&S SPECIALIST:**	
AM WEATHER:	**PM WEATHER:**	**MAX TEMP:**	**MIN TEMP:**

SUMMARY OF WORK PERFORMED TODAY

JOB SAFETY

Was A Job Safety Meeting Held This Date?	☐ Yes ☐ No	**TOTAL WORK HOURS ON JOB SITE THIS DATE** (Including Continuation Sheets)	
Were there any lost-time accidents this date? (If Yes, attach copy of completed OSHA report)	☐ Yes ☐ No	CH2M HILL On-Site Hours	
Was a Confined Space Entry Permit Administered This Date? (If Yes, attach copy of each permit)	☐ Yes ☐ No	On-Site Hours	
Was Crane/ Man-lift/ Trenching/ Scaffold/ HV Electric/High Work/ HAZMAT Work Done? (If Yes, attach statement or checklist showing inspection performed)	☐ Yes ☐ No	**Total On-Site Hours This Date**	
		Cumulative Total of Work Hours From Previous Report	
Was Hazardous Material/Waste Released into the Environment? (If Yes, attach description of incident and proposed action)	☐ Yes ☐ No	**Total Work Hours From Start of Construction**	

SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED ***(Include safety violations, corrective instructions given, corrective actions taken, and results of safety inspections conducted):***

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB

DESCRIPTION OF EQUIPMENT/MATERIAL RECEIVED	UNIT OF MEASURE	INSPECTION PERFORMED BY	NUMBER/ VOLUME/ WEIGHT

EQUIPMENT DESCRIPTION	**EQUIPMENT MAKE/MODEL**	**SAFETY CHECK PERFORMED BY**	**NUMBER OF HOURS**		
			USED	**IDLE**	**REPAIR**

CHANGED CONDITIONS/DELAY/CONFLICTS ENCOUNTERED ***(List any conflicts with the delivery order [i.e., scope of work and/or drawings], delays to the project attributable to site and weather conditions, etc.):***

VISITORS TO THE SITE:

LIST OF ATTACHMENTS ***(OSHA report, confined space entry permit, incident reports, etc.):***

SAFETY REQUIREMENTS HAVE BEEN MET ☐

SUPERINTENDENT'S SIGNATURE _____ DATE _____

CH2MHILL **Contract No.** W912DY-09-D-0060	**CONTRACTOR PRODUCTION REPORT**	**DATE OF REPORT:** **REVISION NO:** **REVISION DATE:**
CTO NO: 0002	**PROJECT NAME/LOCATION:**	**REPORT NO:**

WORK PERFORMED TODAY

EMPLOYEE	WORK PERFORMED	EMPLOYER	EMPLOYEE NUMBER	TITLE/TRADE	HRS
				Total For Today	

INCLUDE ALL PERSONNEL WORK HOURS IN THE TOTAL WORK HOURS ON JOB SITE

SAFETY REQUIREMENTS HAVE BEEN MET ☐

SUPERINTENDENT'S SIGNATURE _____ DATE _____

CH2MHILL

Contract No.
W912DY-09-D-0060

CONTRACTOR QUALITY CONTROL REPORT

S(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE OF REPORT:
REVISION NO:
REVISION DATE:

CTO NO: 0002	**PROJECT NAME/LOCATION:**	**REPORT NO:**
PROJECT NO:	**PROJECT QC MANAGER:**	**SITE H&S SPECIALIST**:

SAFETY MEETINGS AND INSPECTIONS

WAS A SAFETY MEETING HELD THIS DAY?	☐ YES ☐ NO	IF YES, ATTACH SAFETY MEETING MINUTES.
WAS CRANE USED ON THE SITE THIS DAY?	☐ YES ☐ NO	IF YES, ATTACH DAILY CRANE REPORT OF INSPECTION AND CONTRACTOR CRANE OPERATION CHECKLIST.

DEFINABLE FEATURES OF WORK STATUS

DFOW No.	Definable Feature Of Work	Preparatory	Initial	Follow-Up
1		☐	☐	☐
2		☐	☐	☐
3		☐	☐	☐
4		☐	☐	☐
5		☐	☐	☐
6		☐	☐	☐
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
10		☐	☐	☐
11		☐	☐	☐
12		☐	☐	☐
13		☐	☐	☐
14		☐	☐	☐
15		☐	☐	☐

PREPARATORY

WAS PREPARATORY PHASE WORK PERFORMED TODAY? ☐ YES ☐ NO

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.

DFOW No.(from list above).	TASK/ACTIVITY	PREPARATORY PHASE REPORT NO.

INITIAL AND FOLLOW-UP FEATURE OF WORK COMMENTS

DFOW No.(from list above)	Phase	Comment/Finding/Action
1	Initial ☐ Follow up ☐	
2	Initial ☐ Follow up ☐	
3	Initial ☐ Follow up ☐	
4	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	
	Initial ☐ Follow up ☐	

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)			**REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)**	
TASK/ACTIVITY	DATE ISSUED	DESCRIPTION	TASK/ACTIVITY	CORRECTIVE ACTION(S) TAKEN

CH2MHILL **Contract No.** W912DY-09-D-0060	**CONTRACTOR QUALITY CONTROL REPORT** (ATTACH ADDITIONAL SHEETS IF NECESSARY)	**DATE OF REPORT:** **REVISION NO:** **REVISION DATE:**

CTO NO: 0002	**PROJECT NAME/LOCATION:**	**REPORT NO:**
PROJECT NO:	**PROJECT QC MANAGER:**	**SITE H&S SPECIALIST:**

SAMPLING/TESTING PERFORMED

SAMPLING/TESTING PERFORMED	SAMPLING/TESTING COMPANY	SAMPLING/TESTING PERSONNEL

MATERIALS/EQUIPMENT INSPECTION (Materials received and inspected against specifications)

MATERIAL/EQUIPMENT DESCRIPTION	SPECIFICATION	MATERIAL ACCEPTED?	COMMENT/REASON/ACTION
		YES ☐ NO ☐	
		YES ☐ NO ☐	
		YES ☐ NO ☐	
		YES ☐ NO ☐	
		YES ☐ NO ☐	
		YES ☐ NO ☐	
		YES ☐ NO ☐	

SUBMITTALS INSPECTION / REVIEW

SUBMITTAL NO	SUBMITTAL DESCRIPTION	SPEC/PLAN REFERENCE	SUBMITTAL APPROVED?	COMMENT/REASON/ACTION
			YES ☐ NO ☐	
			YES ☐ NO ☐	
			YES ☐ NO ☐	
			YES ☐ NO ☐	

OFF-SITE SURVEILLANCE ACTIVITIES, INCLUDING ACTIONS TAKEN: None.

ACCUMULATION/STOCKPILE AREA INSPECTION

INSPECTION PERFORMED BY:		SIGNATURE OF INSPECTOR:					
ACCUMULATION/ STOCKPILE AREA LOCATION							
NO OF CONTAINERS:		NO OF TANKS:		NO OF ROLL-OFF BOXES:		NO OF DRUMS:	

INSPECTION RESULTS: **Not on location to perform inspection of rolloff**

TRANSPORTATION AND DISPOSAL ACTIVITIES/SUMMARY/QUANTITIES:

GENERAL COMMENTS (rework, directives, etc.):
Visitors:

LIST OF ATTACHMENTS (examples, as applicable: preparatory phase checklist, QC meeting minutes, safety meeting minutes, crane inspections, crane operation checklist, COCs, weight tickets, manifests, profiles, rework item list, testing plan and log, etc.):

On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.			
	PROJECT QC MANAGER'S SIGNATURE		DATE
On behalf of the contractor, I attest that the work for which payment is requested, including stored material, is in compliance with contract requirements.			
	PROJECT QC MANAGER'S SIGNATURE		DATE

CH2MHILL Constructors, Inc.	**PREPARATORY PHASE REPORT**	REPORT NO:	REPORT DATE: REVISION NO: REVISION DATE:	TO NO:
PROJECT NO:	DEFINABLE FEATURE OF WORK:	SITE/ACTIVITY:		

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

SUBMITTALS

REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER.	HAVE ALL SUBMITTALS BEEN APPROVED? YES ☐ NO ☐

IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED?

ARE ALL MATERIALS ON HAND? YES ☐ NO ☐

IF NO, WHAT ITEMS ARE MISSING?

CHECK APPROVED SUBMITTALS AGAINST DELIVERED MATERIAL. (THIS SHOULD BE DONE AS MATERIAL ARRIVES).

COMMENTS:

MATERIAL STORAGE

ARE MATERIALS STORED PROPERLY? YES ☐ NO ☐

IF NO, WHAT ACTION IS TAKEN?

SPECIFICATIONS

REVIEW EACH PARAGRAPH OF SPECIFICATIONS.

DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK.

CLARIFY ANY DIFFERENCES.

PRELIM WORK & PERMITS

ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.

IF NO, WHAT ACTION IS TAKEN?

CH2M HILL	**PREPARATORY PHASE REPORT**	REPORT NO:	REPORT DATE: REVISION NO: REVISION DATE:	TO NO:
PROJECT NO:	DEFINABLE FEATURE OF WORK:	SITE/ACTIVITY:		

TESTING

IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM.

TEST	FREQUENCY	PERFORMER

WHEN REQUIRED?

WHERE REQUIRED?

REVIEW TESTING PLAN.

HAVE TEST FACILITIES BEEN APPROVED?

TEST FACILITY	APPROVED?
	YES ☐ NO ☐
	YES ☐ NO ☐

SAFETY

ACTIVITY HAZARD ANALYSIS APPROVED? YES ☐ NO ☐

REVIEW APPLICABLE PORTION OF EM 385-1-1 AND AHA.

MEETING COMMENTS

NAVY/ROICC COMMENTS DURING MEETING.

OTHER ITEMS OR REMARKS

OTHER ITEMS OR REMARKS:

PROJECT QC MANAGER NAME	PROJECT QC MANAGER'S SIGNATURE		DATE	

SUPPLEMENTAL PREPARATORY PHASE REPORT INSTRUCTIONS

Entry	Entry Instructions
General	In order to use this form electronically, it must be protected prior to being used. This is performed as follows: Under "Tools", choose "Protect Document". Then, choose "Forms". It is not necessary to assign a password. This will allow the user to check boxes and enter information such that the entry area automatically expands to accommodate the entry.
Report No.	Report number should be sequential for the life of the CTO. The report number format is as follows: **XXXXXX-PPR-000** where XXXXX = Project Number and 000 = sequential number in 001, 002, 003, etc. format
QC Manager	Name and signature of the Project QC Manager that is present at the site on the day of the report.

Technical Project Planning (TPP) Meeting Culebra SI

From: **Tom Beisel - CH2M HILL**
Date: **July 9, 2010**
Contract: **W912DY-09-D-0060 CH2M HILL- Task Order 2**

Attendees:

Name	Organization	Email Address	Telephone Number
Scott Bradley	USACE	Scott.G.Bradley@usace.army.mil	256-895-1637
Jose Mendez	USACE	Jose.M.Mendez@usace.army.mil	787-729-6877 x 3099
Wilmarie Rivera	PREQB	wilmarierivera@jca.gobierno.pr	787-767-8181 x 6141
Katarina Rutkowski	TRC Solutions	krutkowski@trcsolutions.com	860-298-6202
Ana M. Román	USFWS	ana_roman@fws.gov	787-742-0115
Susan Silander	NWR		787-851-7258 x 238
Daniel Rodriquez	USEPA	Rodriquez.daniel@epa.gov	787-741-5201
Bryan Burkingstock	CH2M HILL	bburking@ch2m.com	678-530-4060
Tom Beisel	CH2M HILL	tbeisel@ch2m.com	678-530-4033

The TPP meeting for site inspection services to be performed under contract W912DY-09-D-0060 Task Order 2 was held on July 8, 2010 in Puerto Rico. The TPP meeting started at 1:00 pm. The TPP meeting was lead by Jose Mendez and Tom Beisel. The TPP meeting was adjourned at 2:30 pm.

The meeting objectives were as follows:

- Introduce the team members and associated stakeholders for the Culebra SI site.
- Introduce and discuss the TPP process.
- Familiarize the stakeholders with the COE TPP process.
- Discuss the approach and objectives outlined in the 4 phases of the TPP process to be followed.
- Reach agreement on the site specific approach for data collection to complete the Site Inspections.
- Review and discuss the scope of work and objectives for the Culebra SI site as presented in the TPP Power Point presentation.

The Team discussed the scope of work overview to complete Site Inspections and Relative Risk Evaluations at the Culebra NWR Site.

In addition to the review of the TPP presentation, the following general topics and comments were discussed:

- Modify page 10 of the TPP presentation to include Richard Henry with the FWS and Daniel Rodriquez with the EPA.
- Locate and add stakeholders from PRDNER (Puerto Rico Department of Natural and Environmental Resources) and ACDEC (Authority for Conservation and Development of Culebra).
- The Culebra NWR site is on a property owned by Commonwealth of Puerto Rico.
- Rename the site, "Former Lower Camp Debris Site," to reduce confusion with other existing sites on Culebra.
- Culebra currently receives fresh water via a pipeline from the main island of Puerto Rico to Vieques to Culebra.
- The desalinization plant close to the site is currently not in operation or not frequently used.
- During field activities, the outlet of the existing septic tank will be located using visual observations and/or geophysical screening equipment.
- A UFP-SAP will not be created for this site.
- Field activities will be conducted during low tide to expose as much of the debris area as possible.
- During additional phases of work at this site, UXO specialist needs to be included in the field team while intrusive activities occur.
- Field activities will be as non-invasive as possible.

Work Plan Action Items:

	POC	Item
1	Tom	Page 10: add Daniel Rodriquez with the EPA to the stakeholder contact list.
2	Tom	Page 10: add Richard Henry with the FWS to the stakeholder contact list.
3	Jose	Locate stakeholders from PRDNER (Puerto Rico Department of Natural and Environmental Resources) and ACDEC (Authority for Conservation and Development of Culebra).
4	Tom	Page 18: revise to include the water supply from the main island of Puerto Rico.

Appendix B
Accident Prevention Plan

Accident Prevention Plan

Hazardous, Toxic, and Radioactive Waste Site Inspection at DERP-FUDS Site IO2PR006800

Former Lower Camp Debris Site
Culebra Island, Puerto Rico

Revision No. 00

Contract No. W912DY-09-D-0060
Contract Task Order No. 0002

Submitted to:

U.S. Army Engineering and Support, Huntsville

Prepared by:

CH2MHILL Constructors, Inc.
Northpark 400
1000 Abernathy Road
Suite 1600
Atlanta, GA 30328

September 2010

Contents

Attachments

Approval

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

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

Original Plan

RHSM Approval: Josh Painter **Date**: 08/30/2010

Field Operations Manager Approval: **Date:**

Revisions

Revisions Made By: **Date:**

Description of Revisions to Plan:

Revisions Approved By: **Date:**

1.0 Introduction

CH2MHILL

HSSE Target Zero

Health, Safety, Security, and Environment Policy

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

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

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

Dated the 1st day of October 2009.

Lee A. McIntire
Chief Executive Officer

Garry Higdon
President, Energy Division

Jacqueline Rast
President, Major Programs Group

Robert C. Allen
Chief Human Resources Officer

Mark Lemmon
President, Transportation Business Group

Catherine Santos
Chief Financial Officer

D.E. Card
President, Facilities & Infrastructure Division

Margaret McLean
Chief Legal Officer

Thomas G. Searle
President, International Division

Bill Delta
Senior Vice President, Special Projects

Michael E. McElroy
President, Government, Environment, and Nuclear Division

Nancy R. Tuor
Vice-Chair, International

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

1.1 CH2M HILL Policy and Commitment

1.1.1 Safe Work Policy

It is the policy of CH2M HILL Constructors, Inc. (CH2M HILL) to perform work in the safest manner possible. Safety must never be compromised. To fulfill the requirements of this policy, an organized and effective safety program must be carried out at each location where work is performed.
CH2M HILL believes that all injuries are preventable, and we are dedicated to the goal of a safe work environment. To achieve this goal, every employee on the project must assume responsibility for safety.

Every employee is empowered to:

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

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

1.1.2 Health and Safety Commitment

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

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

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

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

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

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

The Project has established eleven specific goals and objectives:

- Create an injury-free environment.
- Have zero injuries or incidents.
- Provide management leadership for HSE by communicating performance expectations, reviewing and tracking performance, and leading by example.
- Ensure effective implementation of the ACCIDNET PREVENTION PLAN through education, delegation, and team work.
- Ensure 100 percent participation in HSE compliance.
- Continuously improve our safety performance.
- Maintain free and open lines of communication.
- Make a personal commitment to safety as a value.
- Focus safety improvements on high-risk groups.
- Continue strong employee involvement initiatives.
- Achieve health and safety excellence.

2.0 Applicability

This ACCIDENT PREVENTION PLAN applies to:

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

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

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

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

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

3.0 General Project Information

3.1 Project Information and Background

Project Number: 405262
Client: USACOE
Project/Site Name: Former Lower Camp Debris Site, Culebra Island
Site Address: Culebra, Puerto Rico
CH2M HILL Project Manager: Tom Beisel
CH2M HILL Office: Atlanta
DATE Accident Prevention Plan Prepared: 07/29/2010
Date(s) of Site Work: November 2010

3.2 Site Background and Setting

Culebra Island is located approximately 17 miles east of the Puerto Rican mainland, 12 miles west of St. Thomas, and 9 miles north of Vieques.

After Spain ceded all of Puerto Rico to the United States in 1898 at the end of the Spanish-American War, President Roosevelt placed all of Culebra's public lands under Navy control in 1901. These areas included all of Culebra Island, nearby keys, and all surrounding water for a total area of approximately 92,500 acres (7,300 acres of land and 85,000 acres of water). After acquisition in 1901, the Navy built permanent camps and used the area for naval exercises by the Caribbean Fleet. In addition, the Marines used Culebra for training from 1903 until 1941, and the Navy used Culebra as a bombing and gunnery range from 1935 until 1975. In September 1980, the Navy transferred the property to the U.S. Department of Interior.

The Former Lower Camp Debris Site encompasses a 40,000-square-foot section (100 feet by 400 feet) of marine wetland located along the eastern shoreline of Ensenada del Cementerio. The area is located adjacent to the Department of Conservation auto shop facility, and is currently under the jurisdiction of the Commonwealth of Puerto Rico and the Authority for Conservation and Development of Culebra (ADEC). Historically, the area east of the wetland was used by the Navy as a housing facility from the early 1940s until 1980. The concrete foundation, currently occupied by the Department of Conservation auto shop, was previously a bathroom facility. Between the early 1940s and 1980, various materials were discarded into the wetland area west of the bathroom facility.

3.3 Description of Tasks

The objective of this project is to complete an SI and perform a relative site risk evaluation of the Former Lower Camp Debris Site on Culebra Island, Puerto Rico. In order to complete these objectives, the following activities will be conducted:

- Perform a site visit to obtain additional site information regarding the type, location, and distribution of debris.

- Perform a geophysical survey to locate and delineate, to the extent possible, buried metal debris.

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

3.3.1 Hazwoper-Regulated Tasks

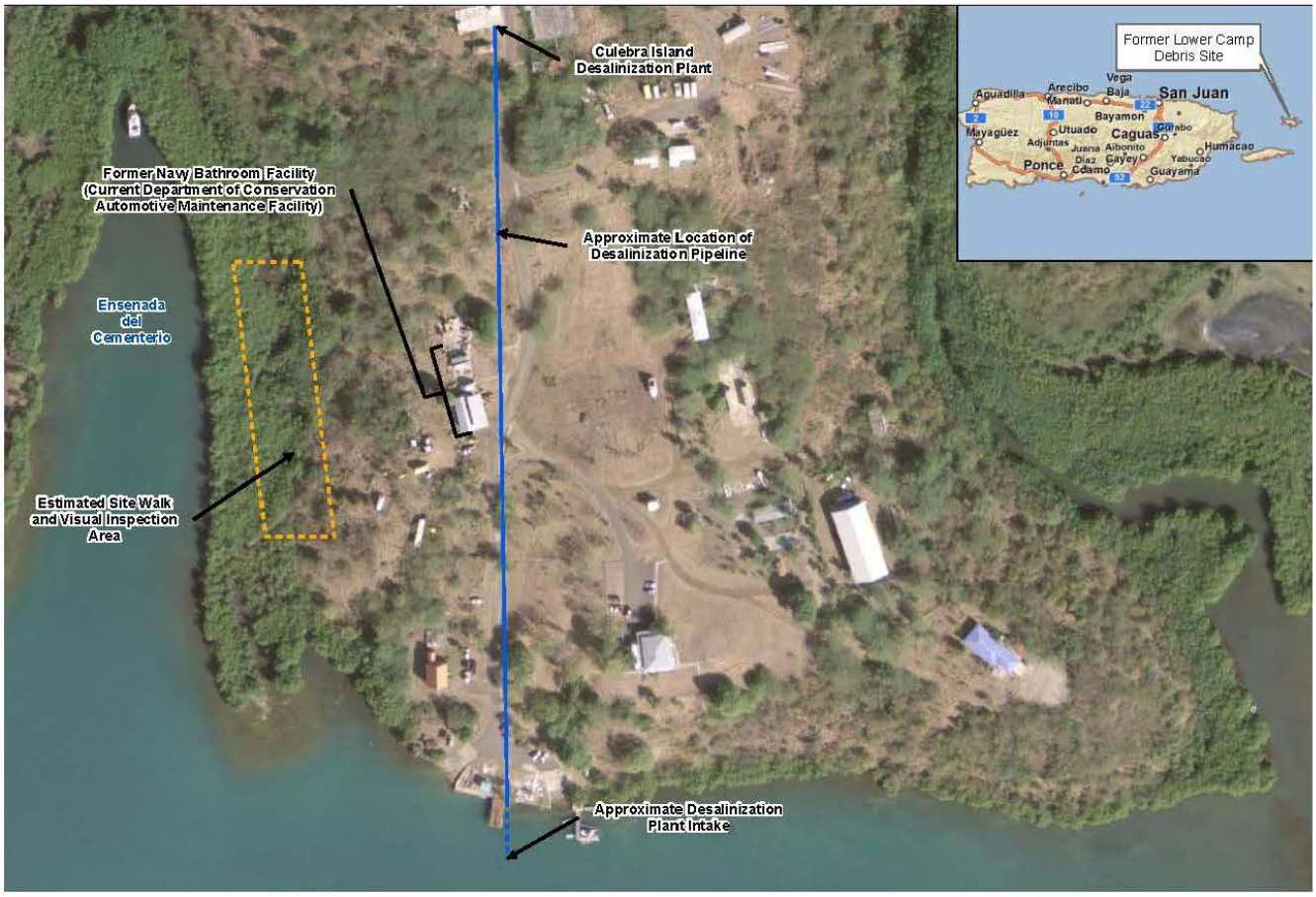
- Site investigation and geophysical survey

3.3.2 Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. **Contact the Responsible Health and Safety Manager prior to using non-Hazwoper-trained personnel for the following tasks when working on a regulated hazardous waste site.**

TASKS	CONTROLS
• Mobilization/Demob	• Brief on hazards, limits of access, and emergency procedures. • Post areas of contamination as appropriate. • Perform air sampling/monitoring as specified in this Accident Prevention Plan.

Site Map


Culebra Island Desalinization Plant
Former Navy Bathroom Facility (Current Department of Conservation Automotive Maintenance Facility)
Approximate Location of Desalinization Pipeline
Ensenada del Cementerio
Estimated Site Walk and Visual Inspection Area
Approximate Desalinization Plant Intake
Former Lower Camp Debris Site
San Juan
Caguas
Ponce
Mayagüez
Arecibo
Bayamon
Humacao
Guayama

4.0 Project Organization and Responsibilities

4.1 Client

Contact Name: CEHNC-ED-CS-P, Scott Bradley
Telephone Number: 256-895-1637
Email: Scott.G.Bradley@usace.army.mil
Facility Contact Name: NA
Phone: NA

4.2 CH2M HILL

4.2.1 Project Manager

Project Manager Name: Tom Beisel
Job Title: Project Manager
CH2M HILL Office: Atlanta, Georgia
Telephone Number: 678-530-4033
Cellular Number: 678-429-8273
Email: tbeisel@ch2m.com

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

- Incorporate standard terms and conditions, and contract-specific HSE roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors).
- Select safe and competent subcontractors by:
  - Choosing potential subcontractors based on technical ability and HSE performance;
  - Implementing the subcontractor prequalification process;
  - Ensuring that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award; and
  - Ensuring HSE submittals, subcontract agreements, and appropriate site-specific safety procedures are in place and accepted prior field mobilization.
- Ensure copies of training and medical monitoring records, and site-specific safety procedures are being maintained in the project file accessible to site personnel.
- Provide oversight of subcontractor HSE practices per the site-specific safety plans and/or procedures.

- Manage the site and interfacing with 3rd parties in a manner consistent with the contract and subcontract agreements and the applicable standard of reasonable care.
- Ensure that the overall, job-specific, HSE goals are fully and continuously implemented.
- Support and implement use of stop-work orders when subcontractor safety performance is not adequate.

4.2.2 CH2M HILL Responsible Health and Safety Manager

RHSM Name: Mike Goldman/ATL
Job Title: Sr. HSSE Mgr. Federal Sector
CH2M HILL Office: ATL
Telephone Number: 770-604-9182
Cellular Number: 770-331-3127

The RHSM is responsible for the following:

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

4.2.3 CH2M HILL Safety Coordinator

SC Name: Andrew O'Conor
Job Title: Field/Construction Engineer
CH2M HILL Office: Atlanta, Georgia
Cellular Number: 843-200-3825
Email: Andrew.OConor@CH2M.com

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

- Verify this Accident Prevention Plan is current and amended when project activities or conditions change.
- Verify CH2M HILL site personnel and subcontractor personnel read the Accident Prevention Plan and sign the Employee Sign-Off Form, prior to commencing field activities.

- Verify CH2M HILL site personnel have completed any required specialty training (for example, fall protection, confined space entry, among others) and medical surveillance as identified in this Accident Prevention Plan.
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractor's license, training and medical monitoring records, and accepted site-specific safety procedures prior to start of subcontractor's field operations.
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in the Accident Prevention Plan.
- Act as the project "Emergency Response Coordinator" and perform the responsibilities outlined in the Accident Prevention Plan.
- Post the Occupational Safety and Health Administration (OSHA) job-site poster; the poster is required at sites where project field offices, trailers, or equipment-storage boxes are established.
- Hold and/or verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (as tasks or hazards change).
- Verify that project health and safety forms and permits are being used as outlined this Accident Prevention Plan.
- Perform oversight and assessments of subcontractor HSE practices per the site-specific safety plan and verify that project activity self-assessment checklists are being used as outlined this Accident Prevention Plan.
- Coordinate with the RHSM regarding CH2M HILL and subcontractor operational performance, and 3rd party interfaces.
- Verify appropriate personal protective equipment (PPE) use, availability, and training.
- Ensure that the overall, job-specific, HSE goals are fully and continuously implemented.
- Conduct accident investigations including root cause analysis.
- Calibrate and conduct air monitoring in accordance with the Accident Prevention Plan; maintain all air monitoring records in project file.
- Maintain HSE records and documentation.
- Facilitate OSHA or other government agency inspections including accompanying inspector and providing all necessary documentation and follow-up.
- Deliver field HSE training as needed based on project-specific hazards and activities.
- Contact the RHSM and PM in the event of an incident.

- When an apparent imminent danger exists, immediately remove all affected CH2M HILL employees and subcontractors, notify subcontractor safety representative, stop affected work until adequate corrective measures are implemented, and notify the PM and RHSM as appropriate.
- Document all oral health and safety-related communications in project field logbook, daily reports, or other records.

4.3 CH2M HILL Subcontractors

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

Subcontractor: OneVision Utility Services
Subcontractor Contact Name: Sean Byers
Address: 975 Cobb Place Blvd, Kennesaw, GA 30144
Telephone Number: 678-391-6018
Cellular Number: 678-409-3429

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

- Comply with all local, state, and federal safety standards.
- Comply with project and owner safety requirements.
- Actively participate in the project safety program and either hold or attend and participate in all required safety meetings.
- Provide a qualified safety representative to interface with CH2M HILL.
- Maintain safety equipment and PPE for their employees.
- Maintain and replace safety protection systems damaged or removed by the subcontractor's operations.
- Notify the SC of any accident, injury, or incident immediately and submit reports to CH2M HILL within 24 hours.
- Install contractually required general conditions for safety (for example, handrail, fencing, fall protection systems, floor opening covers).
- Conduct and document weekly safety inspections of project-specific tasks and associated work areas.
- Conduct site-specific and job-specific training for all subcontractor employees, including review of the CH2M HILL Accident Prevention Plan, subcontractor Accident Prevention Plans, and subcontractor AHAs and sign appropriate sign-off forms.
- Determine and implement necessary controls and corrective actions to correct unsafe conditions.

The subcontractors listed above may be required to submit their own site-specific Accident Prevention Plan and other plans such as lead or asbestos abatement compliance plans. Subcontractors are responsible for the health and safety procedures specific to their work,

and are required to submit their plans to CH2M HILL for review and acceptance before the start of field work.

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

4.4 Employee Responsibilities

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

Each employee is responsible for the following performance objectives:

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

4.4.1 Employee Authority

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

4.5 Client Contractors

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

This Accident Prevention Plan does not cover contractors that are contracted directly to the client or the owner. CH2M HILL is not responsible for the health and safety or means and methods of the contractor's work, and we must never assume such responsibility through our actions (such as advising on health and safety issues). In addition to these instructions, CH2M HILL team members should review contractor safety plans so that we remain aware

of appropriate precautions that apply to us. Self-assessment checklists are to be used by the SC and CH2M HILL team members to review the contractor's performance only as it pertains to evaluating CH2M HILL exposure and safety. The RHSM is the only person who is authorized to comment on or approve contractor safety procedures.

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

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

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

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

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

5.0 Standards of Conduct

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

5.1 Standards of Conduct Violations

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

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

5.2 Disciplinary Actions

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

5.3 Subcontractor Safety Performance

CH2M HILL should continuously endeavor to observe subcontractors' safety performance and adherence to their plans and AHAs. This endeavor should be reasonable, and include

observing for hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. CH2M HILL oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

5.3.1 Observed Hazard Form

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

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

5.3.2 Stop Work Order

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

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

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

5.4 Incentive Program

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

workers. The incentive program will be communicated to all employees during the project employee orientation and project safety meetings.

5.5 Reporting Unsafe Conditions/Practices

Responsibility for effective health and safety management extends to all levels of the project and requires good communication between employees, supervisors, and management. Accident prevention requires a pro-active policy on near misses, close calls, unsafe conditions, and unsafe practices. All personnel must report any situation, practice, or condition which might jeopardize the safety of our projects. All unsafe conditions or unsafe practices will be corrected immediately. CH2M HILL has zero tolerance of unsafe conditions or unsafe practices.

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

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

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

6.0 Safety Planning and Change Management

6.1 Daily Safety Meetings and Pre-Task Safety Plans

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

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

6.2 Change Management

The evaluation form below should be reviewed on a continuous basis to determine if the current site Accident Prevention Plan adequately addresses ongoing project work, and should be completed whenever new tasks are contemplated or changed conditions are encountered.

PROJECT HSE Change Management Form				
Project Task:		Project/Task Manager:		
Project Number:		Project Name:		
Evaluation Checklist			**Yes**	**No**
1.	Has the CH2M HILL staff listed in the original Accident Prevention Plan changed?			
2.	Has a new subcontractor been added to the project?			
3.	Is any chemical or product to be used that is not listed in Attachment 2 of the plan?			
4.	Have additional tasks been added which were not originally addressed in the "Project Information" section of this Accident Prevention Plan?			
5.	Have new contaminants or higher than anticipated levels of original contaminants been encountered?			
6.	Has other safety, equipment, activity or environmental hazards been encountered that are not addressed in this Accident Prevention Plan?			

If the answer is "YES" to the questions above, Accident Prevention Plan revision may be needed. For questions 2-6, contact RHSM prior to continuing work. In addition to contacting the RHSM, the following actions can be taken for questions 1-3:

- Confirm that staff's medical and training status is current – check training records at: http://www.int.ch2m.com/hands (or contact your regional safety program assistant [SPA]), and confirm subcontractor qualifications.
- Confirm with the project RHSM that subcontractor safety performance has been reviewed and is acceptable.
- Confirm with the RHSM that subcontractor safety procedures, plans, and/or AHAs have been reviewed and are acceptable.
- Add the new chemical or product information to the Chemical Inventory Form, inform the RHSM, and ensure that personnel handling the chemical or product have been trained, and that training is documented using the Chemical-Specific Training Form included as an attachment to this Accident Prevention Plan. Add the Material Safety Data Sheet(s) (MSDS) for chemicals handled or used at the project to this Accident Prevention Plan. AHAs may need to be developed or amended to account for new chemicals. The RHSM shall review the AHAs prior to the chemical use.

7.0 Project Hazard Analysis

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

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

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

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

7.1 Activity Hazard Analysis

An AHA 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. The AHA shall identify the work tasks required to perform each activity, along with potential HSE hazards and recommended control measures for each hazard. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified. The following hazard controls and applicable CH2M HILL core standards and SOPs should be used as a basis for preparing AHAs.

AHAs must be prepared for CH2M HILL activities and included as an attachment to this Accident Prevention Plan.

7.2 Subcontractor Activity Hazard Analysis

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

Table 1 – General Activity Hazard Analysis

Potential Hazard	Project Activity
	Site Investigation and Survey
Arsenic	X
Biological Hazards	X
Field Vehicles	X
Hand & Power Tools	X
Lead	X
Manual Lifting	X
Temperature Extremes	X
Ultraviolet Light exposure (sunburn)	X
Work Over Water/Boating Safety	X

8.0 General Hazards and Controls

8.1 General Practices and Housekeeping

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

- Site work should be performed during daylight hours whenever possible.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, or other devices to be used.
- Specific areas should be designated for the proper storage of materials;.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up; oil and grease shall be cleaned from walking and working surfaces.
- Review the safety requirements of each job you are assigned to with your supervisor. You are not expected to perform a job that may result in injury or illness to yourself or to others.
- Familiarize yourself with, understand, and follow jobsite emergency procedures.
- Do not fight or horseplay while conducting the firm's business.
- Do not use or possess firearms or other weapons while conducting the firm's business.
- Report unsafe conditions or unsafe acts to your supervisor immediately.
- Report emergencies, occupational illnesses, injuries, vehicle accidents, and near misses immediately.
- Do not remove or make ineffective safeguards or safety devices attached to any piece of equipment.
- Report unsafe equipment, defective or frayed electrical cords, and unguarded machinery to your supervisor.

- Shut down and lock out machinery and equipment before cleaning, adjustment, or repair. Do not lubricate or repair moving parts of machinery while the parts are in motion.
- Do not run in the workplace.
- When ascending or descending stairways, use the handrail and take one step at a time.
- Do not apply compressed air to any person or clothing.
- Do not wear steel taps or shoes with metal exposed to the sole at any CH2M HILL project location.
- Do not wear finger rings, loose clothing, wristwatches, and other loose accessories when within arm's reach of moving machinery.
- Remove waste and debris from the workplace and dispose of in accordance with federal, state, and local regulations.
- Note the correct way to lift heavy objects (secure footing, firm grip, straight back, lift with legs), and get help if needed. Use mechanical lifting devices whenever possible.
- Check the work area to determine what problems or hazards may exist.

8.2 Driving Safety

Follow the guidelines below when operating a vehicle:

- Refrain from using a cellular phone while driving. Pull off the road, put the vehicle in park and turn on flashers before talking on a cellular phone.
- Never operate a personal digital assistant (PDA), or other device with e-mail, internet, or text messaging function while driving a vehicle.
- Obey speed limits; be aware of blind spots or other hazards associated with low visibility. Practice defensive driving techniques, such as leaving plenty of room between your vehicle and the one ahead of you.
- Do no drive while drowsy. Drowsiness can occur at any time, but is most likely after 18 hours or more without sleep.
- Maintain focus on driving. Eating, drinking, smoking, adjusting controls can divert attention from the road. Take the time to park and perform these tasks when parked rather than while driving.
- Ensure vehicle drivers are familiar with the safe operation of vehicles of the type and size to be operated. Large vehicles such as full size vans and pick-ups have different vision challenges and handling characteristics than smaller vehicles.

8.3 Personal Hygiene

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

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

8.4 Bloodborne Pathogens

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

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

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

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

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

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

8.5 Hazard Communication

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

The hazard communication coordinator is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using the chemical inventory form included as an attachment to this Accident Prevention Plan.

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

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

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

8.6 Substance Abuse

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

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

Prohibitions onsite include:

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

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

8.7 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 RHSM or the Warehouse Coordinator for additional information.

9.0 Project-Specific Hazard Controls

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

9.1 Arsenic

(Reference CH2M HILL, SOP HSE-501, *Arsenic*)

Arsenic is considered a "Confirmed Human Carcinogen." CH2M HILL is required to control employee exposure to arsenic when exposures are at or above 5.0 micrograms per cubic meter ($\mu g/m^3$), or if there is the possibility of skin or eye irritation from arsenic. The elements of the CH2M HILL arsenic program include the following:

- Exposure monitoring
- Methods of control, including PPE and respirators
- Medical surveillance
- Training on hazards of arsenic and control measures (includes project-specific training and the computer-based training on CH2M HILL's Virtual Office, *Arsenic Exposure)*
- Recordkeeping requirements

If air monitoring indicates there is potential exposure at the action level concentrations, notify the RHSM to ensure the above have been adequately addressed. Full implantation of SOP HSE-501, Arsenic, will be required. Other exposure control measures include:

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas
- Avoid skin and eye contact with liquid and particulate arsenic or arsenic trichloride
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person
- Review the fact sheet included as an attachment to this Accident Prevention Plan

9.2 Electrical Safety

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

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

9.2.1 General Electrical Safety

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- CH2M HILL employees who might from time to time work in an environment influenced by the presence of electrical energy must complete Awareness Level Electrical Safety Training located on the CH2M HILL Virtual Office.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- CH2M HILL has selected Ground Fault Circuit Interrupters (GFCIs) as the standard method for protecting employees from the hazards associated with electric shock.
  - GFCIs shall be used on all 120-volt, single phase 15 and 20-amphere receptacle outlets which are not part of the permanent wiring of the building or structure.
- An assured equipment grounding conductor program may be required under the following scenarios:
  - GFCIs cannot be utilized;
  - Client requires such a program to be implemented; or
  - Business group decides to implement program in addition to GFCI protection.
- Extension cords must be equipped with third-wire grounding. Cords passing through work areas must be covered, elevated or protected from damage. Cords should not be routed through doorways unless protected from pinching. Cords should not be fastened with staples, hung from nails, or suspended with wire.
- Electrical power tools and equipment must be effectively grounded or double-insulated and Underwriters Laboratory (UL) approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at

least 10 feet (3 meters) from overhead power lines for voltages of 50 kV or less, and 10 feet (3 meters) plus ½ inch (1.27 cm) (for every 1 kV over 50 kV.

- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

9.2.2 Portable Generator Hazards

- Portable generators are useful when temporary or remote electric power is needed, but they also can be hazardous. The primary hazards to avoid when using a generator are carbon monoxide (CO) poisoning from the toxic engine exhaust, electric shock or electrocution, and fire.
- NEVER use a generator indoors or in similar enclosed or partially-enclosed spaces. Generators can produce high levels of carbon monoxide (CO) very quickly. When you use a portable generator, remember that you cannot smell or see CO. Even if you can't smell exhaust fumes, you may still be exposed to CO.
- If you start to feel sick, dizzy, or weak while using a generator, get to fresh air RIGHT AWAY. DO NOT DELAY. The CO from generators can rapidly lead to full incapacitation and death.
- If you experience serious symptoms, get medical attention immediately. Inform project staff that CO poisoning is suspected. If you experienced symptoms while indoors have someone call the fire department to determine when it is safe to re-enter the building.
- Follow the instructions that come with your generator. Locate the unit outdoors and away from doors, windows, and vents that could allow CO to come indoors.
- Keep the generator dry and do not use in rain or wet conditions. To protect from moisture, operate it on a dry surface under an open, canopy-like structure. Dry your hands if wet before touching the generator.
- Plug appliances directly into the generator. Or, use a heavy duty, outdoor-rated extension cord that is rated (in watts or amps) at least equal to the sum of the connected appliance loads. Check that the entire cord is free of cuts or tears and that the plug has all three prongs, especially a grounding pin.
- Most generators come with Ground Fault Circuit Interrupters (GFCI). Test the GFCIs daily to determine whether they are working
- If the generator is not equipped with GFCI protected circuits plug a portable GFCI into the generator and plug appliances, tools and lights into the portable GFCI.
- Never store fuel near the generator or near any sources of ignition.
- Before refueling the generator, turn it off and let it cool down. Gasoline spilled on hot engine parts could ignite.

9.3 Field Vehicles

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

9.4 Fire Prevention

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

Follow the fire prevention and control procedures listed below.

9.4.1 Fire Extinguishers and General Fire Prevention Practices

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet (30.5 meters). When 5 gallons (19 liters) or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet (15.2 meters). Extinguishers must:

  - be maintained in a fully charged and operable condition;
  - be visually inspected each month; and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet (3 meters) from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.

9.5 Hand and Power Tools

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

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

- Tools shall be inspected prior to use and damaged tools will be tagged and removed from service.
- Hand tools will be used for their intended use and operated in accordance with manufacturer's instructions and design limitations;
- Maintain all hand and power tools in a safe condition.
- Use PPE (such as gloves, safety glasses, earplugs, and face shields) when exposed to a hazard from a tool.
- Do not carry or lower a power tool by its cord or hose.
- Portable power tools will be plugged into GFCI protected outlets; and
- Portable power tools will be Underwriters Laboratories (UL) listed and have a three-wire grounded plug or be double insulated.
- Disconnect tools from energy sources when they are not in use, before servicing and cleaning them, and when changing accessories (such as blades, bits, and cutters).
- Safety guards on tools must remain installed while the tool is in use and must be promptly replaced after repair or maintenance has been performed.
- Store tools properly in a place where they will not be damaged or come in contact with hazardous materials.
- If a cordless tool is connected to its recharge unit, both pieces of equipment must conform strictly with electrical standards and manufacturer's specifications.

- Tools used in an explosive environment must be rated for work in that environment (that is, intrinsically safe, spark-proof, etc.).
- Working with manual and pistol-grip hand tools may involve highly repetitive movement, extended elevation, constrained postures, and/or awkward positioning of body members (for example, hand, wrist, arm, shoulder, neck, etc.). Consider alternative tool designs, improved posture, the selection of appropriate materials, changing work organization, and sequencing to prevent muscular, skeletal, repetitive motion, and cumulative trauma stressors.

Machine Guarding

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

9.6 Lead

(Reference CH2M HILL SOP HSE-508, *Lead*)

CH2M HILL is required to control employee exposure to lead when exposures are at or above 30 µg/m^3 by implementing a program that meets the requirements of the OSHA Lead standard, 29 CFR 1910.1025 and 29 CFR 1926.62. The elements of the CH2M HILL lead program include the following:

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

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

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

- Review the fact sheet included as an attachment to this Accident Prevention Plan.

9.7 Manual Lifting

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

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

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

9.8 Traffic Control

(Reference CH2M HILL SOP HSE-216, *Traffic Control*)

The following precautions must be taken when working around traffic, and in or near an area where traffic controls have been established by a sub contractor. Ensure the requirements in the referenced SOP are followed.

- Exercise caution when exiting traveled way or parking along street – avoid sudden stops, use flashers, etc.
- Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.
- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.
- Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.

- Always remain aware of an escape route (e.g., behind an established barrier, parked vehicle, guardrail, etc).
- Always pay attention to moving traffic – never assume drivers are looking out for you.
- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from traffic, a "buddy system" should be used, where one worker is looking towards traffic.
- When working on highway projects, obtain a copy of the contractor's traffic control plan.
- Work area should be protected by a physical barrier – such as a K-rail or Jersey barrier.
- Review traffic control devices to ensure that they are adequate to protect your work area. Traffic control devices should: 1) convey a clear meaning, 2) command respect of road users, and 3) give adequate time for proper traffic response. The adequacy of these devices are dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.
- Either a barrier or shadow vehicle should be positioned a considerable distance ahead of the work area. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion (TMCC). All vehicles within 40 feet (12.2 meters) of traffic should have an orange flashing hazard light atop the vehicle.
- Except on highways, flaggers should be used when 1) two-way traffic is reduced to using one common lane, 2) driver visibility is impaired or limited, 3) project vehicles enter or exit traffic in an unexpected manner, or 4) the use of a flagger enhances established traffic warning systems.
- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers.
- Vehicles should be parked at least 40 feet (12.2 meters) away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.
- Traffic control training module on the VO shall be completed when CH2M HILL workers who work in and around roadways and who exposed to public vehicular traffic.

9.9 Working Over Water and Boating Safety

Working Over or Near Water

If any activities pose a risk to drowning implement the following during the activity:

- Fall protection should be provided to prevent personnel from falling into water. Where fall protection systems are not provided and the danger of drowning exists, U.S. Coast Guard-approved personal flotation devices (PFDs), or a life jacket, shall be worn.

- Provide employees with an approved (USCG for U.S. operations) life jacket or buoyant work vest.
  - Employees should inspect life jackets or work vests daily before use for defects. Do not use defective jackets or vests.
- Post ring buoys with at least 90 feet (27.4 meters) of 3/8-inch solid-braid polypropylene (or equal) line next to the work area. If the work area is large, post extra buoys 200 feet (61 meters) or less from each other.
- Provide at least one life saving skiff, immediately available at locations where employees are working over or adjacent to water.
  - Ensure the skiff is in the water and capable of being launched by one person and is equipped with both motor and oars.
- Designate at least one employee on site to respond to water emergencies and operate the skiff at times when there are employees above water.
  - If the designated skiff operator is not within visual range of the water, provide him or her with a radio or provide some form of communication to inform them of an emergency.
  - Designated employee should be able to reach a victim in the water within three to four minutes.
- Ensure at least one employee trained in CPR and first aid is on site during work activities.

Boating Safety

Personnel who will operate a boat during the course of a project shall first demonstrate to the site manager that they are experienced in operating boats similar to those used for the project and that they are knowledgeable of the U.S. Coast Guard Boating Safety requirements (33 CFR Subchapter S). Project boats shall be operated by experienced boat operators only. Boat operators shall also possess basic mechanical knowledge necessary to troubleshoot common mechanical problems that can and do occur. The boat operator shall be responsible for the safety of all personnel on board the boat he or she is operating and for the integrity of all boat and safety equipment.

Each designated boat operator shall give a safety briefing to all occupants of the boat prior to leaving the shore. Boats are to be occupied during use by not less than one qualified operator plus one additional person.

The boat skipper has the final authority with regard to boat safety and navigational safety.

Use the attached boat safety checklist to evaluate and verify necessary equipment prior to leaving shore.

9.9.1 Boat Requirements

All project boats will meet or exceed U.S. Coast Guard requirements for safety equipment, as applicable to the operation and type of boat. These requirements are summarized below for small craft (less than forty feet [12 meters] in length).

9.9.2 Flame Arresters

All gasoline engines, except outboard motors, installed in a boat must have an approved flame arrestor (backfire preventer) fitted to the carburetor.

9.9.3 Sound Signaling Devices

Boats shall carry at least one air horn or similar sound-signaling device. Radio or cell-phone communication must be in place as well.

9.9.4 Personal Flotation Devices

All personnel and passengers shall wear an approved personal flotation device (PFD) at all times when operating or being transported in a boat. A positively buoyant wet suit or dry suit may be substituted for a PFD. PFDs shall be Type II or higher (capable of turning its wearer in a vertical or slightly backward position in the water). In addition, each boat shall be equipped with at least one Type IV PFD, designed to be thrown to a person in the water and grasped and held by the user until rescued. A buoyant boat cushion equipped with straps and a float ring are two common examples of a Type IV PFD.

9.9.5 Fire Extinguishers

Each boat shall carry at least one Type B-I or B-II fire extinguisher (for use in gasoline, oil and grease fires) approved by Underwriters Laboratories (UL). Each fire extinguisher shall be inspected to ensure that it is sufficiently charged and that the nozzles are free and clear. Discharged fire extinguishers shall be replaced or recharged immediately.

9.9.6 Emergency Planning

As part of the project Accident Prevention Plan and AHAs, emergencies and response actions must be addressed for potential emergencies such at fire, sinking, flooding, severe weather, man over-board, hazardous material incidents, etc.

9.9.7 Load Capacity

Boats shall not be loaded (passengers and gear) beyond the weight capacity printed on the U.S. Coast Guard information plate attached to the stern. In addition, several factors must be considered when loading a boat: distribute the load evenly, keep the load low, do not stand up in a small boat or canoe, and do not overload the boat.

9.9.8 Tool Kit

All motorized boats shall carry a tool kit sufficient for the boat operator to troubleshoot common mechanical problems such as fouled spark plugs, flooded carburetor, electrical shorts, etc. Boats operated in remote areas shall also carry appropriate spare parts (propellers, shear pins, patch kits, air pumps, etc). The tool kit shall be maintained by the boat operator and supplies used up shall be replaced immediately.

9.9.9 Communications

All boats operated shall carry a two-way radio or cellular telephone that enables communication back to the field camp or other pre-established location.

9.9.10 Good Housekeeping

Personnel using a boat shall properly stow and secure all gear and equipment against unexpected shifts when underway. Decks and open spaces must be kept clear and free from clutter and trash to minimize slip, trip, and fall hazards.

9.9.11 Fuel Management

Personnel shall utilize the "one-third rule" in boating fuel management. Use one-third of the fuel to get to the destination, one-third to return, and keep one-third in reserve.

No smoking is permitted on board vessels or during refueling operations.

9.9.12 Pollution Control

The Refuse Act of 1989 prohibits the throwing, discharging, or depositing of any refuse matter of any kind (including trash, garbage, oil, and other liquid pollutants) into the waters of the United States. The Federal Water Pollution Control Act prohibits the discharge of oil or hazardous substances in quantities that may be harmful into U.S. navigable waters. No person may intentionally drain oil or oily wastes from any source into the bilge of any vessel. Larger vessels equipped with toilet facilities must be equipped with a U.S. Coast Guard-approved marine sanitation device.

Employees shall report any significant oil spills to water to the Field Team Lead, who must report the spill to the U.S. Coast Guard or other applicable regulatory agency. The procedure for incident reporting and investigation shall be followed when reporting the spill.

9.9.13 Training

All operators and passengers shall be trained on the requirements outlined above, as well as trained on the Accident Prevention Plan/AHA(s), including emergency response actions.

10.0 Physical Hazards and Controls

10.1 Ultraviolet Radiation (sun exposure)

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

Limit Exposure Time

- Rotate staff so the same personnel are not exposed all of the time.
- Limit exposure time when UV radiation is at peak levels (approximately 2 hours before and after the sun is at its highest point in the sky).
- Avoid exposure to the sun, or take extra precautions when the UV index rating is high.

Provide Shade

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

Clothing

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

Sunscreen

- Apply sunscreen generously to all exposed skin surfaces at least 20 minutes before exposure, allowing time for it to adhere to the skin.
- Re-apply sunscreen at least every 2 hours, and more frequently when sweating or performing activities where sunscreen may be wiped off.

- Choose a sunscreen with a high sun protection factor (SPF). Most dermatologists advocate SPF 30 or higher for significant sun exposure.
- Waterproof sunscreens should be selected for use in or near water, and by those who perspire sufficiently to wash off non-waterproof products.
- Check for expiration dates, because most sunscreens are only good for about 3 years. Store in a cool place out of the sun.
- No sunscreen provides 100 percent protection against UV radiation. Other precautions must be taken to avoid overexposure.

10.2 Temperature Extremes

Each employee is responsible for the following:

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

Heat-related illnesses are caused by more than just temperature and humidity factors. **Physical fitness** influences a person's ability to perform work under heat loads. At a given level of work, the more fit a person is, the less the physiological strain, the lower the heart rate, the lower the body temperature (indicates less retrained body heat—a rise in internal temperature precipitates heat injury), and the more efficient the sweating mechanism.

Acclimatization is the degree to which a worker's body has physiologically adjusted or acclimatized to working under hot conditions. Acclimatization affects their ability to do work. Acclimatized individuals sweat sooner and more profusely than un-acclimatized individuals. Acclimatization occurs gradually over 1 to 2 weeks of continuous exposure, but it can be lost in as little as 3 days in a cooler environment.

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

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

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

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

Precautions

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°Fahrenheit (10 degrees Celsius [C]) to 60°Fahrenheit (F) (15.6 degrees C) should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons (7.5 liters) per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. PREVENTION and communication is key.

Thermal Stress Monitoring

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

- The heart rate should be measured by the radial pulse for 30 seconds, as early as possible in the resting period.
- The heart rate at the beginning of the rest period should not exceed 110 beats per minute, or 20 beats per minute above resting pulse.
- If the heart rate is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same.
- If the pulse rate still exceeds 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent.
- Continue this procedure until the rate is maintained below 110 beats per minute, or 20 beats per minute above resting pulse.
- Alternately, the oral temperature can be measured before the workers have something to drink.
- If the oral temperature exceeds 99.6 degrees F (37.6 °C) at the beginning of the rest period, the following work cycle should be shortened by 33 percent.
- Continue this procedure until the oral temperature is maintained below 99.6 degrees F (37.6 °C). While an accurate indication of heat stress, oral temperature is difficult to measure in the field.

Procedures for when Heat Illness Symptoms are Experienced

- **Always** contact the RHSM when any heat illness related symptom is experienced so that controls can be evaluated and modified, if needed.
- In the case of cramps, reduce activity, increase fluid intake, move to shade until recovered.
- In the case of all other heat-related symptoms (fainting, heat rash, heat exhaustion), and if the worker is a CH2M HILL worker, contact the occupational physician at 1-866-893-2514 and immediate supervisor.
- In the case of heat stroke symptoms, call 911, have a designee give location and directions to ambulance service if needed, follow precautions under the emergency medical treatment of this Accident Prevention Plan.
- Follow the Incident Notification, Reporting, and Investigation section of this Accident Prevention Plan.

10.2.1 Cold

General

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

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

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

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

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

Precautions

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

SYMPTOMS AND TREATMENT OF COLD STRESS			
	Immersion (Trench) Foot	**Frostbite**	**Hypothermia**
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm–but **not** hot–water. Have victim drink warm fluids, but **not** coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but **not** coffee or alcohol. Get medical attention.

Wind Chill Chart

Wind (mph) \ Temperature (°F)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

10.3 Radiological Hazards

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

Hazards	Controls
None Known	None Required

11.0 Biological Hazards and Controls

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

11.1 Bees and Other Stinging Insects

Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform your supervisor and/or a buddy. If you are stung, contact the occupational nurse at 1-866-893-2514. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for an allergic reaction if you have never been stung before. Call 911 if the reaction is severe.

11.2 Bird Droppings

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

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

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

11.3 Feral Dogs

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

a ball with your hands over your head and neck and protect your face. If bitten, contact the occupational nurse at 1-866-893-2514. Report the incident to the local authorities.

11.4 Hantavirus

Hantavirus pulmonary syndrome (HPS) is a disease caused by a virus which can be transmitted from certain rodents to humans and is prevalent throughout the southwestern United States. Avoid disturbing rodent nests.

Nesting material and droppings must be removed if work is necessary in a rodent-infested area. PPE for removal shall include:

- Tyvek coveralls
- Rubber boots or disposable shoe covers
- Rubber, latex, or vinyl gloves
- Respiratory protection such as a full face or half-mask air-purifying respirator with a high-efficiency particulate air (HEPA) filter
- Protective goggles if wearing a half-mask respirator

Spray any urine, droppings, and nesting materials with either a bleach and water solution (1 parts bleach to 9 parts water) or a household disinfectant prepared according to the label instructions for dilution and disinfection time. Soak well and let stand for 15 minutes. Use a paper towel or rag to pick up the materials and dispose of them.

Mop floors after spraying them using bleach and water solution or a disinfectant. Dirt floors can be sprayed with either bleach and water solution or a disinfectant.

Personal protective gear shall be decontaminated upon removal at the end of the day. All potentially infective waste material (including respirator filters) from clean-up operations shall be double-bagged in plastic bags.

Symptoms of HPS

Symptoms develop between 14 and 31 days after exposure to infected rodents and include fatigue, fever, and muscle aches, especially the large muscle groups--thighs, hips, back and sometimes shoulders. About half of all HPS patients also experience headaches, dizziness, chills and/or abdominal pain. Four to 10 days after the initial phase of the illness, late symptoms of HPS may appear. These include coughing and shortness of breath. If you develop symptoms suggestive of HPS, call the occupational nurse at 1-866-893-2514.

11.5 Mosquito Bites

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

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

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

Symptoms of Exposure to the West Nile Virus

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

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

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

11.6 Spiders - Brown Recluse and Widow

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

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

Hazard Controls

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

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

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

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

Black Widow ***Red Widow*** ***Brown Widow*** ***Brown Recluse***




11.7 Scorpions

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

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

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

11.8 Other Anticipated Biological Hazards

The following paragraphs identify the potential hazards associated with flora and fauna on Culebra Island. If additional concerns are identified, they will be added to this Accident Prevention Plan.

11.8.1 Hazardous Flora

Incidence of contact by individuals to poisonous/thorny plants is high, especially during surface water and sediment sampling activities; therefore, bare skin should be covered (i.e., long pants and shirt, steel toe boots, leather or cotton gloves, safety glasses, and head protection) asmuch as practical when working in forested or densely vegetated areas. Personnel should avoid entering an area in the direct path of known poisonous flora; a secondary route should be selected. Care should also be taken when walking in such areas as uneven terrain or vines may present a tripping hazard. Acacia and Mesquite are widespread, and have dangerous thorns. Dried dead thorny sticks of these plants on the ground can cause thorns to penetrate sturdy work boot soles (and have in the past), so watch for dead thorny branches when walking, and clear them from the pathways and work areas. Wear eye protection when traveling through thorny vegetation, and make sure no one is in the way when releasing a branch after you pass.

While attempting to cut into dense underbrush, hazards exist from the sharp machete and gas-powered weed cutter. Therefore, care should be taken when using such devices. (Note: Hearing protection, steel toe boots, gloves, and safety glasses are required when using weed cutters.) All rashes and other injuries will be reported to the SHSO as soon as they are known.

Comocladia dodonaea

Several plants on Culebra Island are known to be skin irritating. They include:

Croton discolor

- *Comocladia dodonaea* - Commonly known as Christmas-bush, this is a fairly small shrub that has waxy looking leaves that have a small spine at the end of each of them. The leaves can vary in color from green to yellow to red. The sap and residue on the leaves contain a chemical similar to those found in poison ivy but in a higher concentration.
- *Croton discolor* – This plant is a fairly large bush (up to 7 feet tall) that looks like it is drying out and doesn't have long to live. There are two species on the island, but both look very similar and have very hairy leafs. The leaves have a tendency to stick to your clothing because of the hairs of the leaves.

Tragia volubilis

- *Tragia volubilis* - This plant is commonly known as Pica-Pica, as well as Cowitch. It is a vine that, if cut or disturbed, will release hairs that can cause skin irritations.
- *Malpighia fucata* – Commonly known as palo bronco, this evergreen shrub (or small tree) is identified by its opposite, blunt-pointed leaves. Upper leaf surfaces are green and lower surfaces are a paler green with many yellowish, needle-like hairs. Flowers have white/pink

Pictetia aculeate

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Pictetia aculeate

- *Cordia rupicola* – This is a small shrub with red fruit. Previously thought to be endemic to Puerto Rico and known only from one area, it has recently been reported from the island of Anegada's wooded hills among low dense brush.
- *Pictetia aculeate* – Commonly known as tachuelo, gumbo limbo, or turpentine tree, this tree has a reddish, peeling bark and produces an intensely aromatic resin not unlike the pine tree resins that are used to produce true turpentine.

- *Hippomane Mancinella* - Occasional evergreen canopy or subcanopy tree (10-20 m) and an integral component of the vegetation that fringes the sandy coastline. Appreciated for the shade it provides along harsh and hot tropical beaches, this species is at the same time a dangerous one, due to the large quantities of caustic sap contained in its leaves, twigs, bark, and fruit. Its sap produces lesions similar to chemical burns.

Ricinus Communis (Castor Bean) - The "stalked leaves consist of usually eight radiating, pointed leaflets with slightly serrated edges and prominent central veins. Many varieties are green, but some are reddish brown."(Cooper and Johnson) The flowers are green and inconspicuous, but pink or red in the pigmented varieties. Many stamens are near the base and branching pistils are near the top of the flower. The soft-spined fruits containing attractively mottled seeds are distinctive features of the plant. The seeds from the castor bean plant, Ricinus communis, are poisonous to people, animals and insects. One of the main toxic proteins is "ricin," named by Stillmark in 1888 when he tested the beansí extract on red blood cells and saw them agglutinate.

11.8.2 Hazardous Fauna

Mosquitoes and sand flies pose a nuisance and physical hazard to field personnel; they distract workers, leading to accidents, and pose a physical threat by transmitting live microorganisms. Sand fly bites that are repeatedly scratched can cause secondary infections. Avoiding the use of perfumes and scented deodorants and donning light colored clothing is preferable. The use of Avon's "Skin So Soft" or other insect repellent is encouraged

The potential exists to come in contact with other dangerous insects. These include centipedes, fire ants, bees, wasps, hornets, mites, fleas, and spiders. All personnel should perform "checks" on each other periodically and at the end of the work shift, especially when working in grassy or forested areas. All insect bites must be reported to the SSC.

No poisonous snakes are indigenous to Puerto Rico, only nonpoisonous snakes such as the Boa Constrictor. Feral (wild) dogs and cats have been observed.

Mongooses, rats, and mice have been documented to (potentially) carry rabies. There is some evidence that mongooses can be infected with the rabies virus in an attenuated form, allowing them to carry and spread the virus for considerable time before succumbing to the disease. Any observed unusual behavior by mongooses and other mammals must be reported. Signs of rabies can be characterized in two forms. Furious rabies exhibits agitation and viciousness followed by paralysis and death. Dumb rabies exhibits lethargy and paralytic symptoms followed by death. Behavioral indicators for both include fearlessness and change in nocturnal/diurnal rhythms.

Working in wet or swampy areas unprotected shall not be allowed because of the presence of a variety of etiologic (disease-causing) agents. Contact with surface water will be kept to a minimum. There have been several incidents of infection by schistosomes (blood flukes) from contact with surface water. The aquatic snail vector, *Australorbis Glabratus*, transmits the schistosomes into surface waters, predominantly drainage ditches. Even momentary contact (especially in the presence of blisters, cuts, and open sores) with contaminated surface water is sufficient to acquire an infection. Accidental skin contact requires that the area be washed with isopropyl alcohol (as directed by SSC). Symptoms of infection are fever, diarrhea, itchy skin, and central nervous system (CNS) damage. Schistosomiasis is hard to treat; once established in its host, it may remain for several years.

Prior to initiating site activities, each individual shall be questioned as to any known sensitivities to the previously mentioned organisms or agents.

11.8.3 Dengue Fever and Other Illnesses

According to the Centers for Disease Control (CDC), **Dengue Fever** is primarily a viral infection transmitted by mosquito bites in residential areas. The mosquitoes are most active during the day, especially around dawn and dusk, and are frequently found in and around human habitations. The illness is flu-like and characterized by sudden onset, high fever, severe headaches, joint and muscle pain, and rash. The rash appears 3 to 4 days after the onset of fever. Since no vaccine or specific treatment exists, prevention is important. To reduce mosquito bites, travelers should wear clothes that cover most of the body. Travelers should also take insect repellent with them to use on any exposed areas of skin. The most effective repellent is DEET (N,N-diethyl meta-toluamide). Avoid applying high-concentration DEET (greater than 35 percent) products to the skin and refrain from applying repellent to portions of the hands that are likely to come in contact with the eyes and mouth. Rarely, toxic reactions or other problems have developed after contact with DEET. Please note that p**ersonnel performing water sampling should refrain from using DEET because the breakdown products can show up as false positive results in lab analysis.** For greater protection, clothing can be soaked in or sprayed with permethrin, which is an insect repellent licensed for use on clothing. If applied according to directions, permethrin will repel insects from clothing for several weeks.

Traveler's Diarrhea is the most frequent health problem for travelers. It can be caused by viruses, bacteria, or parasites which are found universally throughout the region. Transmission is most often through contaminated food or water. Purchase food and beverages from vendors that are professional. Avoid small roadside stands and drink bottled beverages when possible. The use of over-the-counter or prescriptions medications can reduce the length of the attack.

Hepatitis A is a viral infection of the liver transmitted by the fecal oral route; through direct person to person contact; from contaminated water, ice, or shellfish; or from fruits or uncooked vegetables contaminated through handling. Symptoms include fatigue, fever, loss of appetite, nausea, dark urine, jaundice, vomiting, aches and pains, and light stools. No specific therapy exists, and only supportive care is available. The virus is inactivated by boiling or cooking to 85 degrees centigrade for 1 minute; therefore, eating thoroughly cooked foods and drinking only treated water serve as general precautions. The CDC recommends hepatitis A vaccine as a precaution. When sampling wastewater, or wastewater lagoon soils, wear gloves and decontaminate all sampling tools and any items immersed very carefully.

12.0 Contaminants of Concern

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

Contaminants of Concern

Contaminant	Location and Maximum[a] Concentration (mg/kg)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Arsenic	GW: SB: 17 SS:	0.01 mg/m^3	5 Ca	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA
Chromium (as Cr(II) & Cr(III))	GW: SB: 38 SS:	0.5 mg/m^3	25	Irritated eyes, sensitization dermatitis, histologic fibrosis of lungs	NA
Lead	GW: SB: 460 SS:	0.05 mg/m^3	100	Weakness lassitude, facial pallor, pal eye, weight loss, malnutrition, abdominal pain, constipation, anemia, gingival lead line, tremors, paralysis of wrist and ankles, encephalopathy, kidney disease, irritated eyes, hypertension	NA
Mercury	GW: SB: 0.17 SS:	0.05 mg/m^3	10	Skin and eye irritation, cough, chest pain, difficult breathing, bronchitis, pneumontitis, tremors, insomnia, irritability, indecision, headache, fatigue, weakness, GI disturbance	

Footnotes:

[a] Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), SS (Surface Soil), SL (Sludge), SW (Surface Water).
[b] Appropriate value of permissible exposure limit (PEL), recommended exposure limit (REL), or threshold limit value (TLV) listed.
[c] IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.
[d] PIP = photoionization potential; NA = Not applicable; UK = Unknown.

eV = electron volt
mg/kg = milligram per kilogram
mg/m^3 = milligrams per cubic meter
ug/m^3 = micrograms per cubic meter

Potential Routes of Exposure		
Dermal: Contact with contaminated media. This route of exposure is minimized through use of engineering controls, administrative controls and proper use of PPE.	**Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through use of engineering controls, administrative controls and proper use of respiratory protection when other forms of control do not reduce the potential for exposure.	**Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

13.0 Site Monitoring

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

Site air monitoring is not anticipated at this time due to the nature of the tasks being primarily non-intrusive, metals detected and due to site conditions of mostly wet soils.

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

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

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

13.1 Direct Reading Monitoring Specifications

Instrument	Tasks	Action Levels[a]	Action to be Taken when Action Level reached	Frequency [b]	Calibration
Dust Monitor: DataRAM or equivalent	N/A	5 mg/m^3 >5 mg/m^3	Level D Level C	Continuously during field work	Zero Daily

[a] Action levels apply to sustained breathing-zone measurements above background.
[b] The exact frequency of monitoring depends on field conditions and is to be determined by the SC; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate.
[c] If the measured percent of O_2 is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O_2 action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry.
[d] Noise monitoring and audiometric testing also required.

13.2 Calibration Specifications

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

Instrument	Gas	Span	Reading	Method
Dust Monitor: DataRAM	Dust-free air	Not applicable	0.00 mg/m^3 in "Measure" mode	Dust-free area OR Z-bag with HEPA filter

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

- Instrument name
- Serial Number
- Owner of instrument (for example, CH2M HILL, HAZCO)
- Calibration gas (including type and lot number)

- Type of regulator (for example, 1.5 lpm)
- Type of tubing (for example, direct or T-tubing)
- Ambient weather condition (for example, temperature and wind direction)
- Calibration/instrument readings
- Operator's name and signature
- Date and time

14.0 Personal Protective Equipment

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

14.1 Required Personal Protective Equipment

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

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

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

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

Project-Specific Personal Protective Equipment Requirements[a]

Task	Level	Body	Head	Respirator [b]
Mobilization to site	D	Work clothes; safety toed leather work boots and gloves	Safety glasses with side shields Ear protection [d]	None required
Site survey and geophysical survey	Modified D	Work clothes or cotton coveralls **Boots:** Safety-toe, chemical-resistant boots OR Safety -toe, leather work boots with outer rubber boot covers Gloves: Leather work gloves, if handling soil use inner nitrile gloves.	Safety glasses with side shields Ear protection [d]	None required

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

Upgrade[f]	Downgrade
• Request from individual performing tasks. • Change in work tasks that will increase contact or potential contact with hazardous materials. • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazards. • Instrument action levels in the "Site Monitoring" section exceeded.	• New information indicating that situation is less hazardous than originally thought. • Change in site conditions that decrease the hazard. • Change in work task that will reduce contact with hazardous materials.

[a] Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.
[b] No facial hair that would interfere with respirator fit is permitted.
[c] Hardhat and splash-shield areas are to be determined by the SC.
[d] Ear protection should be worn when conversations cannot be held at distances of 3 feet (1 meter) or less without shouting.
[e] See cartridge change-out schedule.
[f] Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the RHSM, and an SC qualified at that level is present.

15.0 Worker Training and Qualification

15.1 CH2M HILL Worker Training

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

15.1.1 Hazardous Waste Operations Training

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

Initial Training

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

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

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

Three-Day Actual Field Experience

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

Refresher Training

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

Eight-Hour Supervisory Training

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

15.1.2 First Aid/Cardiopulmonary Resuscitation

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

15.1.3 Safety Coordinator Training

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

15.1.4 Site-Specific Training

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

15.1.5 Project-Specific Training Requirements

Project-specific training for this project includes:

- Accident Prevention Plans/AHAs
- Training on subcontractor procedures and AHAs
- Hazard Communication training (provided by SC and/or subcontractor, as appropriate)
- Lifting Training (provided in New Employee Orientation or on CH2M HILL's VO)

16.0 Medical Surveillance and Qualification

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

16.1 Hazardous Waste Operations and Emergency Response

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

16.2 Job or Site-Specific Medical Surveillance

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

16.3 Respirator User Qualification

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

16.4 Hearing Conservation

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

17.0 Site-Control Plan

17.1 Site-Control Procedures

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

- The SC will implement site control procedures.
- The SC 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 Accident Prevention Plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SC 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 Core Standard, *OSHA Postings*.
- Establish support, contamination reduction, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Initial air monitoring is conducted by the SC in appropriate level of protection.
- The SC is to conduct periodic inspections of work practices to determine the effectiveness of this plan. Deficiencies are to be noted, reported to the RHSM, and corrected.

17.2 Hazwoper Compliance Plan

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

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks listed in the "General Project Information" section of this Accident Prevention Plan might occur consecutively or concurrently with respect to non-Hazwoper tasks (also specified in the "General Project Information" section).

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

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site, or while non-Hazwoper-trained staff is working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The RHSM must approve the interpretation of these data.
- When non-Hazwoper-trained personnel are at risk of exposure, the SC 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 hour of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must not enter the TSDF area of the site.

18.0 Decontamination

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

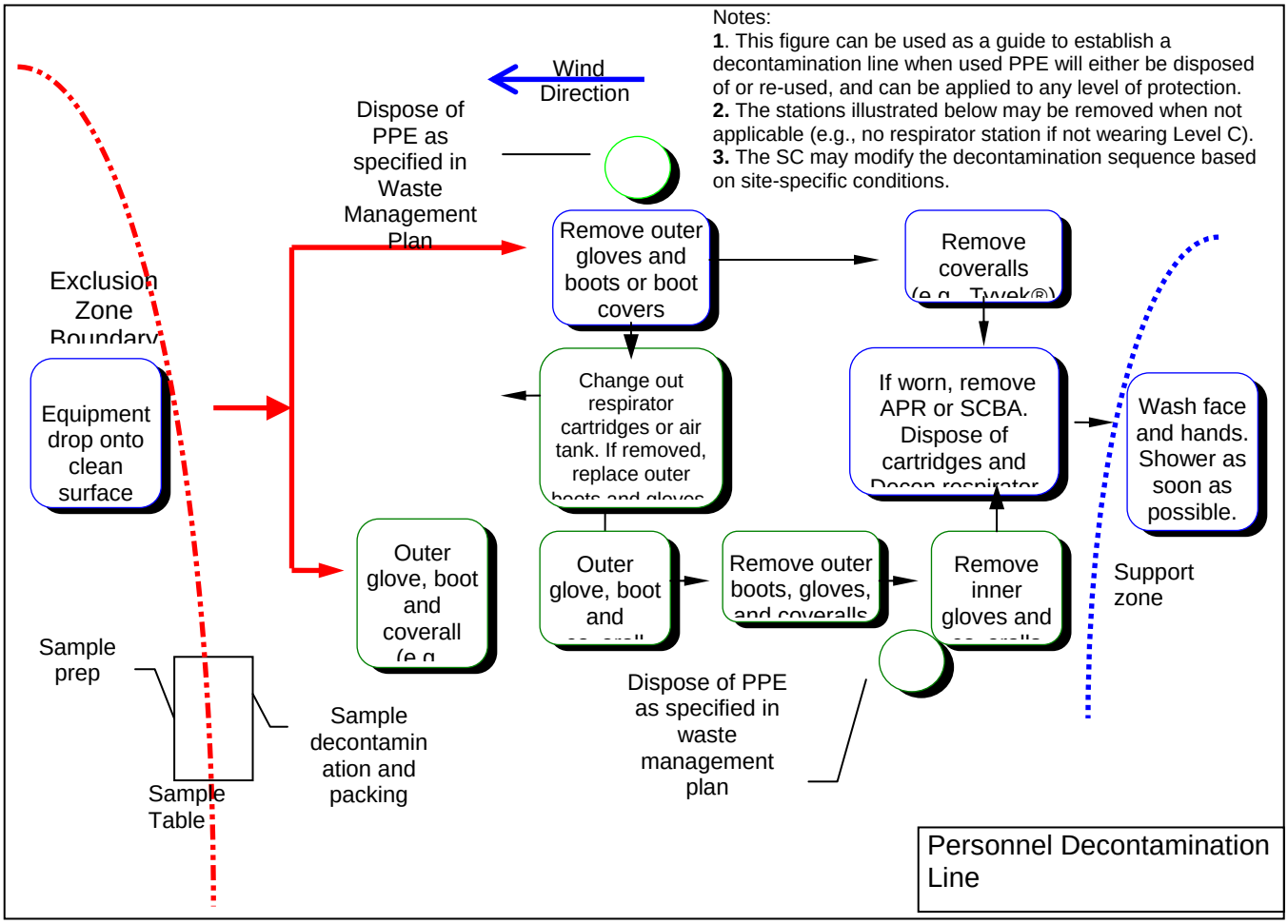
The SC must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SC. The SC must ensure that procedures are established for disposing of materials generated on the site.

18.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
• Boot wash/rinse • Glove wash/rinse • Outer-glove removal • Inner-glove removal • Hand wash/rinse • Face wash/rinse • Shower ASAP • Dispose of PPE in municipal trash, or contain for disposal • Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal	• Wash/rinse equipment •	• **N/A**

18.2 Diagram of Personnel-Decontamination Line

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SC should establish areas for eating, drinking, and smoking. The following figure illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SC to accommodate task-specific requirements.


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

19.0 Emergency Response Plan

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

19.1 Pre-Emergency Planning

- The Emergency Response Coordinator (ERC), typically the SC or designee, performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate. Pre-Emergency Planning activities performed by the ERC include:
- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post the "Emergency Contacts" page and route to the hospital located in this section in project trailer(s) and keep a copy in field vehicles along with evacuation routes and assembly areas. Communicate the information to onsite personnel and keep it updated.
- Field Trailers: Post "Exit" signs above exit doors, and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- 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. Drills should take place periodically but no less than once a year.
- Brief new workers on the emergency response plan.
- The ERC will evaluate emergency response actions and initiate appropriate follow-up actions.

19.2 Emergency Equipment and Supplies

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

Emergency Equipment and Supplies	Location
First aid kit	Field vehicle for all listed equipment.
Eye Wash	
Potable water	
Bloodborne-pathogen kit	
Additional equipment (specify):	

19.3 Incident Response

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

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

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

19.4 Emergency Medical Treatment

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

- Notify 911 or other appropriate emergency response authorities as listed in the "Emergency Contacts" page located in this section.
- The ERC will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury, perform decontamination (if applicable) where feasible; lifesaving and first aid or medical treatment takes priority.
- Initiate first aid and CPR where feasible.
- Notify supervisor and if the injured person is a CH2M HILL employee, the supervisor will call the occupational nurse at 1-866-893-2514 and make other notifications as required by HSE SOP-111, *Incident Notification, Reporting and Investigation*.

- Make certain that the injured person is accompanied to the emergency room.
- Follow the Serious Incident Reporting process in HSE SOP-111, Incident Notification, Reporting and Investigation, and complete incident report using the HITS system on the Virtual Office or if not feasible, use the hard copy forms provided as an attachment to this Accident Prevention Plan.
- Notify and submit reports to client as required in contract.

19.5 Evacuation

- Evacuation routes, assembly areas, and severe weather shelters (and alternative routes and assembly areas) are to be specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the ERC or designee before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The ERC and a "buddy" will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.
- The ERC will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate assembly area(s).
- The ERC will follow the incident reporting procedures in the "Incident Notification, Reporting and Investigation" section of this Accident Prevention Plan.

19.6 Evacuation Signals

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

19.7 Inclement Weather

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

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

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

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

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

Emergency Contacts

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

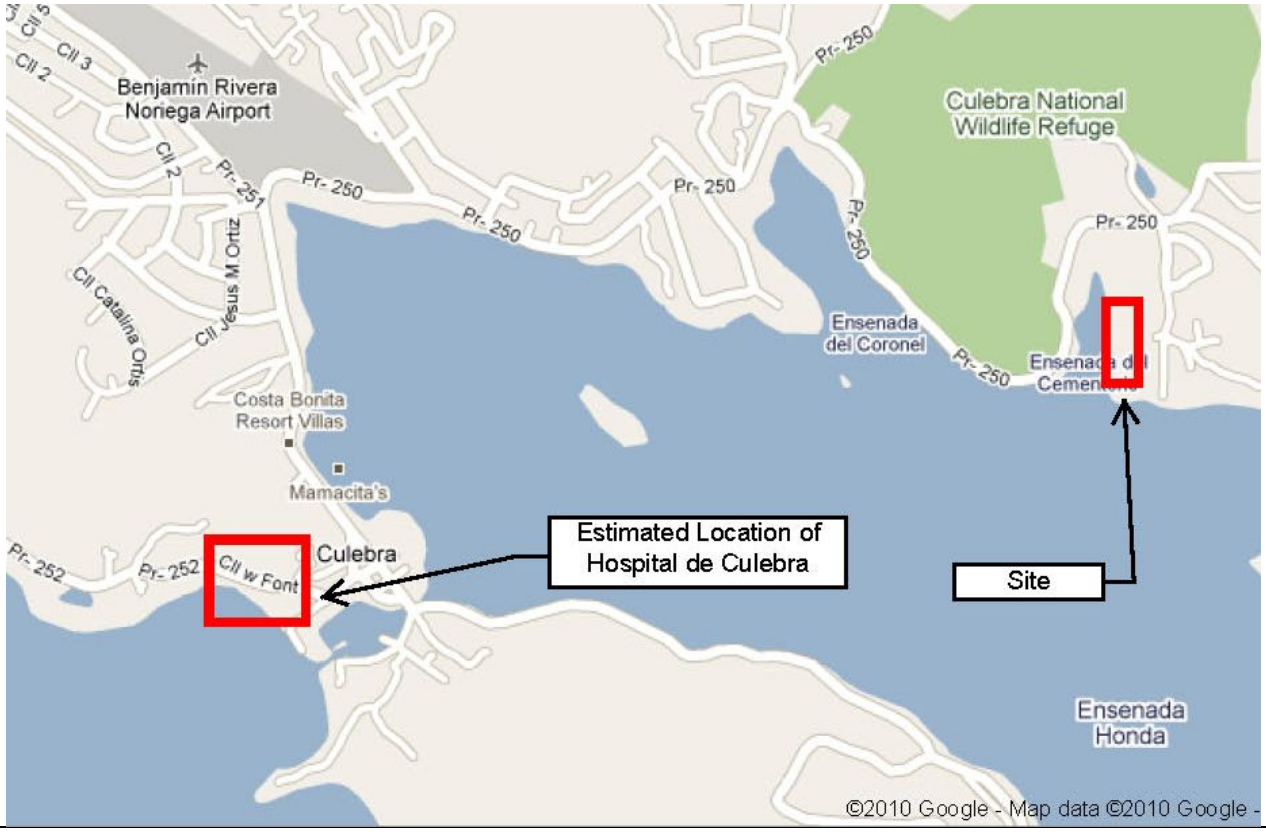
Medical Emergency – 7423511 **Facility Medical Response #:** **Local Ambulance #:742-3501**	**CH2M HILL- Medical Consultant** WorkCare Dr. Peter Greaney M.D. 300 S. Harbor Blvd, Suite 600 Anaheim , CA 92805 800-455-6155/866-893-2514 714-978-7488
Fire/Spill Emergency – 911 **Facility Fire Response #:** **Local Fire Dept #:**	**CH2M HILL Director – Health, Safety, Security & Environment** Andy Strickland/DEN (720) 480-0685 (cell) or (720) 286-2393 (office)
Security & Police – 742-3501 **Facility Security #:** **Local Police #:**	**CH2M HILL Responsible Health and Safety Manager (RHSM)** Name: Mike Goldman/ATL Phone: 770-604-9182 x54133 cell: 770-331-3127
Utilities Emergency Phone Numbers Water: Gas: Electric:	**CH2M HILL Human Resources Department** Name: Employee Connect Phone: 1.877.586.4411
CH2M HILL Project Manager Name: Tom Beisel Phone: 678-530-4033 Cell: 678-429-8273	**CH2M HILL Worker's Compensation:** Contact Business Group HR dept. to have form completed or contact Jennifer Rindahl after hours: (720)891-5382
CH2M HILL Safety Coordinator (SC) Name: Andrew O'Conor Cell: 843-200-3825	**Media Inquiries Corporate Strategic Communications** Name: John Corsi Phone: (720) 286-2087
CH2M HILL Project Environmental Manager Name: Nancy Ballantyne/DEN Phone: (303) 885-9954	**Automobile Accidents** Rental: Linda Anderson/COR 720/286-2401 CH2M HILL owned vehicle: Linda George 720-286-2057
Federal Express Dangerous Goods Shipping Phone: 800/238-5355	**CHEMTEL (hazardous material spills)** **Phone: 800/255-3924**
Facility Alarms: TBD by SC prior to the start of work	Evacuation Assembly Area(s): TBD by SC prior to the start of work

Facility/Site Evacuation Route(s):
TBD by SC prior to the start of work and posted on the site map.

Directions to Local Hospital

Medical Services: Hospital de Culebra (hospital and ambulance service ☎ 742-3511 or 742-0001) at the end of C. William Font, in the building marked "recetas" (prescriptions) at the top of the hill.

Small Health Clinic: Small pharmacy open M-F 8am-4pm. Emergency room 24hr. Clinic open M-F 8am-4pm.



20.0 Spill Containment Procedures

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

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

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

21.0 Inspections

21.1 Project Activity Self-Assessment Checklists

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

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

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

- Hand and Power Tools

21.2 Manual Lifting Safe Behavior Observations

Safe Behavior Observations (SBOs) shall be conducted by SC or designee for specific work tasks or operations comparing the actual work process against established safe work procedures identified in the project-specific Accident Prevention Plan and AHAs. SBOs are a tool to be used by supervisors to provide positive reinforcement for work practices performed correctly, while also identifying and eliminating deviations from safe work procedures that could result in a loss. The SC or designee shall perform at least one SBO each week for tasks/operations addressed in the project-specific Accident Prevention Plan or AHA. The SC or designee shall complete the SBO form (attached to this Accident Prevention Plan) for the task/operation being observed and submit them weekly to the regional point of contact. For ES West projects, SBOs may be submitted electronically by e-mailing them to the address "CH2M HILL WST ES Safe Behavior Observations" when connected to the network or at WSTESSBO@ch2m.com.

22.0 Incident Notification, Reporting, and Investigation

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

22.1 General Information

This section applies to the following:

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

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

22.2 Section Definitions

Incident: an undesired event which results or could have resulted in loss through injury, damage to assets or environmental harm. This includes all of the definitions below.

Accident: an incident involving actual loss through injury, damage to assets, or environmental harm.

Near Miss: an unsafe act or incident which, in other circumstances, could have resulted in loss through injury, damage to assets, or environmental harm.

Serious Incident:

- All fatalities including contractors, subcontractors, third parties, or members of the public
- Kidnap/Missing Person
- Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than $ 500,000 in damage.
- Acts or threats of terrorism
- Spill or release of hazardous materials or substances that involves a significant threat of imminent harm to site workers, neighboring facilities, the community or the environment.

22.3 Reporting Requirements

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

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

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

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

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

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

22.4 HITS System and Incident Report Form (IRF)

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

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

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

22.5.1 Background

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

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

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

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

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

22.6 Serious Incident Reporting Requirements

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

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

22.6.1 Serious Incident Determination

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

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

22.6.2 Serious Incident Reporting

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

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

22.7 Incident Root Cause Analysis

The accident analysis is essential if all causes of the incident are to be identified for the correct remedial actions to be taken to prevent the same and similar type of incident from recurring. The investigation team will consist of the SC (with support from RHSM), appropriate subcontractor personnel as necessary, the PM, and the responsible supervisor. More participants may be involved as needed to complete the investigation.

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

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

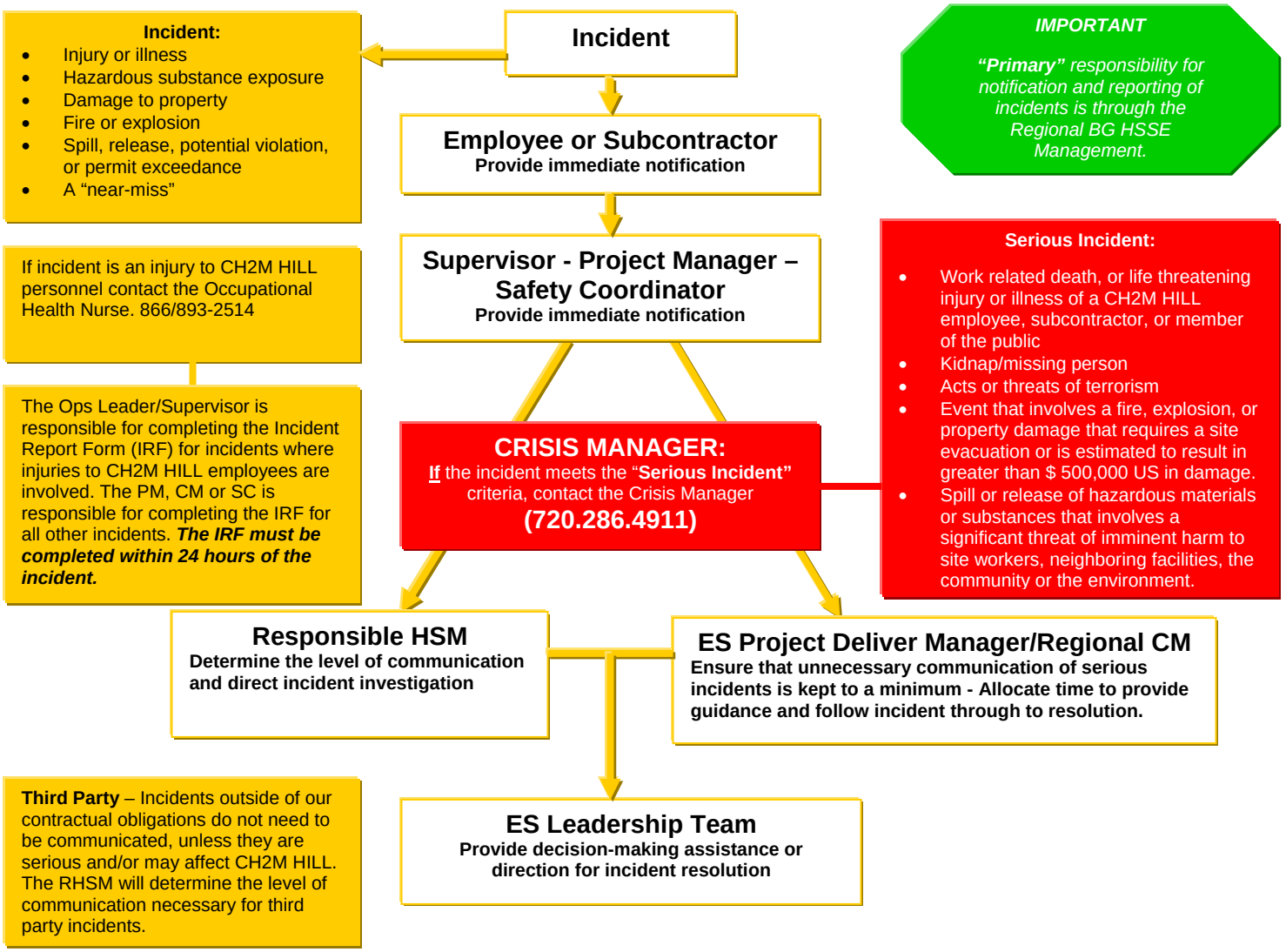
Photographs or videotapes of the scene and damaged equipment should be taken from all sides and from various distances. This point is especially important when the investigation team will not be able to review the loss scene.

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

22.7.1 Personal Factors

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

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



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

22.7.2 Job Factors

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

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

22.7.3 Corrective Actions

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

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

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

23.0 Records and Reports

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

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

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

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

- Exposure records includes air monitoring data (including calibration records), MSDSs, exposure modeling results.
- Physical hazard exposure records include noise, ionizing radiation, non-ionizing radiation, vibration, and lasers exposure assessments and measurements.
- Training Records
- Injury/illness reports and investigations
- Federal or State Agency Inspection Records
- Other Records
  - Project-Specific HSE Plans
  - Equipment inspections
  - Equipment maintenance
  - SBOs

CH2M HILL Accident Prevention Plan

Attachment 1

Accident Prevention Plan Employee Sign-off Form

EMPLOYEE SIGNOFF FORM
Accident Prevention Plan

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

Project Name: **Project Number:**

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

CH2M HILL Accident Prevention Plan

Attachment 2

Chemical Inventory/Register Form

CH2MHILL

CHEMICAL INVENTORY/REGISTER FORM

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

Location:
HCC:
☐ Office ☐ Warehouse ☐ Laboratory ☐ Project:
Project No.:

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

MSDS for the listed products will be maintained at:

CH2M HILL Accident Prevention

Attachment 3

Chemical-Specific Training Form

CH2MHILL

CHEMICAL-SPECIFIC TRAINING FORM

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

Location:	Project # :
HCC:	Trainer:

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

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

☐ Physical and health hazards

☐ Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)

☐ Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

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

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

CH2M HILL Accident Prevention Plan

Attachment 4

Project Activity Self-Assessment Checklists/Permits/Forms

Hand and Power Tools

Manual Lifting

CH2MHILL

HSE Self-Assessment Checklist—HAND AND POWER TOOLS

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI.

This checklist is to be used at locations where: (1) CH2M HILL employees are exposed to hand and power tool hazards and/or (2) CH2M HILL provides oversight of subcontractor personnel who are exposed to hand and power tool hazards.

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

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate CH2M HILL employee exposure to hand and power tool hazards.
☐ Evaluate a CH2M HILL subcontractor's compliance with hand and power tool requirements.
Subcontractors Name: _____

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

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-210.

SECTION 1

	Yes	No	N/A	N/O
SAFE WORK PRACTICES (5.1)				
1. All tools operated according to manufacturer's instructions and design limitations.	☐	☐	☐	☐
2. All hand and power tools maintained in a safe condition and inspected and tested before use.	☐	☐	☐	☐
3. Defective tools are tagged and removed from service until repaired.	☐	☐	☐	☐
4. PPE is selected and used according to tool-specific hazards anticipated.	☐	☐	☐	☐
5. Power tools are not carried or lowered by their cord or hose.	☐	☐	☐	☐
6. Tools are disconnected from energy sources when not in use, servicing, cleaning, etc.	☐	☐	☐	☐
7. Safety guards remain installed or are promptly replaced after repair.	☐	☐	☐	☐
8. Tools are stored properly.	☐	☐	☐	☐
9. Cordless tools and recharging units both conform to electrical standards and specifications.	☐	☐	☐	☐
10. Tools used in explosive environments are rated for such use.	☐	☐	☐	☐
11. Knife or blade hand tools are used with the proper precautions.	☐	☐	☐	☐
12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stressors.	☐	☐	☐	☐

HSE Self-Assessment Checklist—HAND AND POWER TOOLS

SECTION 2	Yes	No	N/A	N/O
GENERAL (5.2.2)				
13. PPE is selected and used according to tool-specific hazards anticipated.	☐	☐	☐	☐
14. Tools are tested daily to assure safety devices are operating properly.	☐	☐	☐	☐
15. Damaged tools are removed from service until repaired.	☐	☐	☐	☐
16. Power operated tools designed to accommodate guards have guards installed.	☐	☐	☐	☐
17. Rotating or moving parts on tools are properly guarded.	☐	☐	☐	☐
18. Machines designed for fixed locations are secured or anchored.	☐	☐	☐	☐
19. Floor and bench-mounted grinders are provided with properly positioned work rests.	☐	☐	☐	☐
20. Guards are provided at point of operation, nip points, rotating parts, etc.	☐	☐	☐	☐
21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid.	☐	☐	☐	☐
ELECTRIC-POWERED TOOLS (5.2.3)				
22. Electric tools are approved double insulated or grounded and used according to SOP HSE-206.	☐	☐	☐	☐
23. Electric cords are not used for hoisting or lowering tools.	☐	☐	☐	☐
24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed.	☐	☐	☐	☐
25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool.	☐	☐	☐	☐
26. Portable, power-driven circular saws are equipped with proper guards.	☐	☐	☐	☐
ABRASIVE WHEEL TOOLS (5.2.4)				
27. All employees using abrasive wheel tools are wearing eye protection.	☐	☐	☐	☐
28. All grinding machines are supplied with sufficient power to maintain spindle speed.	☐	☐	☐	☐
29. Abrasive wheels are closely inspected and ring-tested before use.	☐	☐	☐	☐
30. Grinding wheels are properly installed.	☐	☐	☐	☐
31. Cup-type wheels for external grinding are protected by the proper guard or flanges.	☐	☐	☐	☐
32. Portable abrasive wheels used for internal grinding are protected by safety flanges.	☐	☐	☐	☐
33. Safety flanges are used only with wheels designed to fit the flanges.	☐	☐	☐	☐
34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength.	☐	☐	☐	☐
PNEUMATIC-POWERED TOOLS (5.2.5)				
35. Tools are secured to hoses or whip by positive means to prevent disconnection.	☐	☐	☐	☐
36. Safety clips or retainers are installed to prevent attachments being expelled.	☐	☐	☐	☐
37. Safety devices are installed on automatic fastener feed tools as required.	☐	☐	☐	☐
38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded.	☐	☐	☐	☐
39. Manufacturer's safe operating pressure for hoses, pipes, valves, etc. are not exceeded.	☐	☐	☐	☐
40. Hoses are not used for hoisting or lowering tools.	☐	☐	☐	☐
41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure.	☐	☐	☐	☐
42. Airless spray guns have required safety devices installed.	☐	☐	☐	☐
43. Blast cleaning nozzles are equipped with operating valves, which are held open manually.	☐	☐	☐	☐
44. Supports are provided for mounting nozzles when not in use.	☐	☐	☐	☐
45. Air receiver drains, handholes, and manholes are easily accessible.	☐	☐	☐	☐
46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water.	☐	☐	☐	☐
47. Air receivers are completely drained at required intervals.	☐	☐	☐	☐
48. Air receivers are equipped with indicating pressure gauges.	☐	☐	☐	☐
49. Safety, indicating, and controlling devices are installed as required.	☐	☐	☐	☐
50. Safety valves are tested frequently and at regular intervals to assure good operating condition.	☐	☐	☐	☐

SECTION 2 (continued)

	Yes	No	N/A	N/O
LIQUID FUEL-POWERED TOOLS (5.2.6)				
51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining.	☐	☐	☐	☐
52. Liquid fuels are stored, handled, and transported in accordance with SOP HSE-403	☐	☐	☐	☐
53. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HSE-203.	☐	☐	☐	☐
54. Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded.	☐	☐	☐	☐
POWDER-ACTUATED TOOLS (5.2.7)				
55. Only trained employee operates powder-actuated tools.	☐	☐	☐	☐
56. Powder-actuated tools are not loaded until just prior to intended firing time.	☐	☐	☐	☐
57. Tools are not pointed at any employee at any time.	☐	☐	☐	☐
58. Hands are kept clear of open barrel end.	☐	☐	☐	☐
59. Loaded tools are not left unattended.	☐	☐	☐	☐
60. Fasteners are not driven into very hard or brittle materials.	☐	☐	☐	☐
61. Fasteners are not driven into easily penetrated materials unless suitable backing is provided.	☐	☐	☐	☐
62. Fasteners are not driven into spalled areas.	☐	☐	☐	☐
63. Powder-actuated tools are not used in an explosive or flammable atmosphere.	☐	☐	☐	☐
64. All tools are used with correct shields, guards, or attachments recommended by manufacturer.	☐	☐	☐	☐
JACKING TOOLS (5.2.8)				
65. Rated capacities are legibly marked on jacks and not exceeded.	☐	☐	☐	☐
66. Jacks have a positive stop to prevent over-travel.	☐	☐	☐	☐
67. The base of jacks are blocked or cribbed to provide a firm foundation, when required.	☐	☐	☐	☐
68. Wood blocks are place between the cap and load to prevent slippage, when required.	☐	☐	☐	☐
69. After load is raised, it is cribbed, blocked, or otherwise secured immediately.	☐	☐	☐	☐
70. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.	☐	☐	☐	☐
71. All jacks are properly lubricated.	☐	☐	☐	☐
72. Jacks are inspected as required.	☐	☐	☐	☐
73. Repair or replacement parts are examined for possible defects.	☐	☐	☐	☐
74. Jacks not working properly are removed from service and repaired or replaced.	☐	☐	☐	☐
HAND TOOLS (5.2.9)				
75. Wrenches are not used when jaws are sprung to the point of slippage.	☐	☐	☐	☐
76. Impact tools are kept free of mushroomed heads.	☐	☐	☐	☐
77. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool.	☐	☐	☐	☐

CHAIN SAWS (5.2.10)	Yes	No	N/A	N/O
78. Chainsaw equipped with spark arrestor and fully functioning chain brake	☐	☐	☐	☐
79. Chainsaw operator's manual readily available	☐	☐	☐	☐
80. Fully stocked first aid kit and multipurpose fire extinguisher available	☐	☐	☐	☐
81. Appropriate personal protective equipment available and worn	☐	☐	☐	☐
82. Clothing free of loose edges that could become entangled in the saw	☐	☐	☐	☐
83. Chainsaw handles kept dry, clean, and free of oil or fuel mixture	☐	☐	☐	☐
84. Chainsaws held firmly with both hands and used right-handed	☐	☐	☐	☐
85. Operator standing to the left of the saw out of the plane of the chain	☐	☐	☐	☐
86. Saw used between the waist and mid-chest level	☐	☐	☐	☐
87. Full throttle maintained while cutting	☐	☐	☐	☐
88. Operator aware of position of guide bar tip, does not contact tip with anything being cut	☐	☐	☐	☐
89. Bumper spikes maintained as close to the object as possible	☐	☐	☐	☐
90. Operator aware of what is in the saw's downward path after the cut	☐	☐	☐	☐
91. No attempt to made to cut material that is larger than the guide bar of the saw	☐	☐	☐	☐
92. Cuts avoided that will cause chain to jam	☐	☐	☐	☐
93. Non-metallic wedges used to prevent compression cuts from jamming the blade	☐	☐	☐	☐
94. Bystanders and helpers kept at a safe distance from operation	☐	☐	☐	☐
95. Chainsaw not operated when fatigued	☐	☐	☐	☐
96. Fire extinguisher present when operating the chainsaw in forest or brushy areas	☐	☐	☐	☐

CH2MHILL

HSE Self-Assessment Checklist—Lifting

This checklist shall be used **only** by CH2M HILL personnel 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 perform manual lifting activities (office or projects), and/or (2) CH2M HILL provides oversight of a subcontractor performing manual lifting activities.
SC or Office Safety Coordinators/Committee members may consult with subcontractors (if applicable) when completing this checklist but shall not direct the means and methods of activities nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies, and we must carefully rely on their expertise. Conditions considered imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazardous area until corrected.
Complete the appropriate project or office information:

Project Information
Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

Office Information
Office Location: _____
Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:
☐ Evaluate CH2M HILL employee manual lifting activities.
☐ Evaluate a CH2M HILL subcontractor's manual lifting activities.
Subcontractor Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor.
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-112.

Planning Activities	**Yes**	**No**	**N/A**	**N/O**
1. Efforts have been made to inquire about receiving equipment or supplies in containers weighting less than 50 pounds (23 kilograms).	o	o	o	o
2. Equipment or supplies are being delivered as close as possible to their use point.	o	o	o	o
3. Heavy equipment or supplies are being stored off the ground and no lower than knee height.	o	o	o	o
4. Adequate space has been provided to access and lift equipment or supplies without reaching or twisting.	o	o	o	o
Safe Work Practices (5.1)	**Yes**	**No**	**N/A**	**N/O**
5. Tasks or activities have been modified to reduce or minimize manual lifting.	o	o	o	o
6. All employees performing manual lifting have received training on how to lift safely.	o	o	o	o
7. Manual lifting control measures are evaluated during assessments.	o	o	o	o
8. Manual lifting incidents are reviewed as part of the HSE Program reviews.	o	o	o	o

9. Manual lifting incidents are reviewed as part of the HSE Program reviews.	o	o	o	o
Office Environments (5.1.1)	**Yes**	**No**	**N/A**	**N/O**
10. Employees have received lifting training.	o	o	o	o
11. Mechanical devices are readily available to employees handling equipment or supplies weighing more than 40 pounds (18 kilograms).	o	o	o	o
Field Projects (5.1.2)	**Yes**	**No**	**N/A**	**N/O**
12. All manual lifting tasks or activities have been addressed in the written site safety plan.	o	o	o	o
13. Employees have received safe lifting training as required by the written site safety plan.	o	o	o	o
Mechanical Lifting (5.2)	**Yes**	**No**	**N/A**	**N/O**
14. Hand trucks and trolleys are visually inspected before use.	o	o	o	o
15. Hand trucks and trolleys do not have any broken or damaged parts.	o	o	o	o
16. Hand truck and trolley paths are free of uneven surfaces, water, oil, or cracks and holes.	o	o	o	o
17. Loads carried by hand trucks are balanced and sturdy.	o	o	o	o
18. Hand trucks or dollies are being pushed when on level ground.	o	o	o	o
19. When going up or down a slope using a hand truck or trolley, the load is downslope of the person.	o	o	o	o
20. Employees using hand trucks or dollies are moving slowly and cautiously.	o	o	o	o
21. Employees using hand trucks or trolleys are able to see over the load.	o	o	o	o
Assisted Lifting (5.3)	**Yes**	**No**	**N/A**	**N/O**
22. Personnel are not performing manual lifting beyond their physical capabilities.	o	o	o	o
23. Loads are evenly distributed when being handled by multiple people.	o	o	o	o
Manual Lifting (5.4)	**Yes**	**No**	**N/A**	**N/O**
24. Before the lift, the load and path was assessed.	o	o	o	o
25. Loads being lifted are free of sharp edges, slivers, or wet or greasy spots.	o	o	o	o
26. Gloves are used for manual lifts of loads with sharp or splintered edges.	o	o	o	o
27. Employees performing manual lifts use the proper lifting techniques.	o	o	o	o
28. Special tools fabricated for lifting grates or manhole covers are used.	o	o	o	o

Item #	Corrective Action Planned/Taken	Date Corrected

Auditor: _____ Project Manager: _____

CH2M HILL Accident Prevention Plan

Attachment 5

Behavior Based Loss Prevention System Forms

Activity Hazard Analysis

Pre-Task Safety Plans

Safe Behavior Observation

Incident Report and Investigation

(use electronic form when possible)

HITS

CH2M HILL Accident Prevention Plan

Attachment 6

Material Safety Data Sheets
(provided onsite)

CH2M HILL Accident Prevention Plan

Attachment 7

Working Alone Standard

CALL – IN CONTACT FORM

Date of site work:_____ Expected start time:_____

Name of CH2M HILL employee in the field:_____

Name of CH2M HILL employee responsible to receive contact:

Client Emergency Contact (if any):

CH2M HILL employee's contact numbers:

Radio #_____

Cell Phone #_____

Address and Location of work:_____

Directions/Map:

Planned Activity:_____

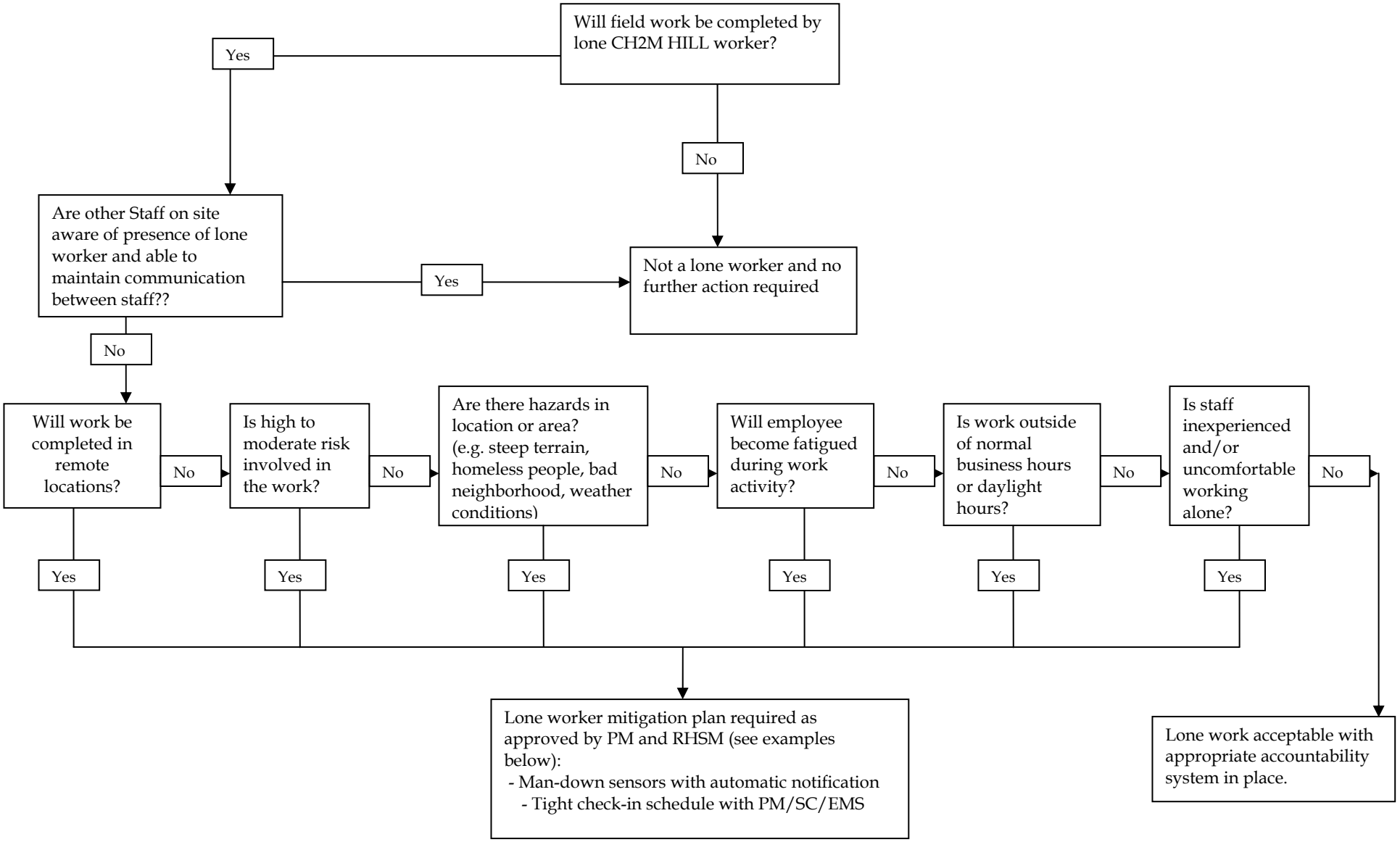
Specified Frequency and time for call in:_____

Time	Verified	Location

If lone worker fails to call in at specified frequency/time:

1) Call worker's radio and cell to determine if an emergency exists.
2) If no reply, immediately call Client security/emergency service if there is one at the site.
3) If there is no client security call Emergency Services (911). Inform the dispatcher there is a lone worker that cannot be contacted and there may be an emergency on site. Provide the lone worker's name, their last known location, and your contact information.
4) After Emergency Services have been contacted, call the other emergency contacts, Project Manager, and Responsible Health and Safety Manager.

Lone Worker Protocol



CH2M HILL Accident Prevention Plan

Attachment 8

Observed Hazard Form

CH2MHILL

OBSERVED HAZARD FORM

Name/Company of Observer (*optional*):

Date reported:_____

Time reported:_____

Contractor/s performing unsafe act or creating unsafe condition:

1. _____

2. _____

3. _____

Unsafe Act or Condition:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Location of Unsafe Act or Condition:

Name of CH2M HILL Representative:

_____

Corrective Actions Taken: Date: _____

_____
_____
_____
_____
_____

Project Safety Committee Evaluation: Date: _____

_____
_____
_____
_____
_____

CH2M HILL Accident Prevention Plan

Attachment 9

Stop Work Order Form

CH2MHILL

Stop Work Order

REPORT PREPARED BY:

Name:	**Title:**	**Signature:**	**Date:**

ISSUE OF NONPERFORMANCE:

Description:	Date of Nonperformance:
	_____

SUBCONTRACTOR SIGNATURE OF NOTIFICATION:

Name:	**Title:**	**Signature:**	**Date:**

**** Corrective action is to be taken immediately. Note below the action taken, sign and return to CCI.* Work may not resume until authorization is granted by CH2M HILL Constructors, Inc. Representative,***

SUBCONTRACTOR'S CORRECTIVE ACTION

Description:	Date of Nonperformance:
	_____

SUBCONTRACTOR SIGNATURE OF CORRECTION

Name:	**Title:**	**Signature:**	**Date:**

CH2M HILL Accident Prevention Plan

Attachment 10

Activity Hazard Analyses

General Construction Survey

CH2MHILL

Activity Hazard Analysis

Activity: **General Construction Activities**	**Date**:
	Project:
Description of the work: The objective of this project is to complete an SI and perform a relative site risk evaluation of the Former Lower Camp Debris Site on Culebra Island, Puerto Rico. In order to complete these objectives, the following activities will be conducted: • Perform a site visit to obtain additional site information regarding the type, location, and distribution of debris. • Perform a geophysical survey to locate and delineate, to the extent possible, buried metal debris.	**Site Supervisor**: **Site Safety Officer**: **Review for latest use:** **Before the job is performed.**

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	**Potential Health and Safety Hazards** (Analyze each principal step for potential hazards)	**Hazard Controls** (Develop specific controls for each potential hazard)
Use of power tools	• Electrical shock • Contact with moving parts • Contact with sharp edges • Pinch points • Sparks	• Inspect all tools before each use. • Personnel will be trained in the proper use of all tools. • All power tools will be energized through a GFCI or double insulated. • Use the appropriate tool for the job. • Wear proper PPE (hard hat, safety glasses with side shields, safety-toed boots and work gloves). • Keep hands and clothing away from moving parts or areas that could pinch extremities. • Use tools in compliance with manufacturer's guidelines and only for applications for which they were designed. Do not remove guards. • Maintain ready access to fire extinguishers.

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	**Potential Health and Safety Hazards** (Analyze each principal step for potential hazards)	**Hazard Controls** (Develop specific controls for each potential hazard)
		• Ensure all fire extinguishers have current monthly inspections.
Use of hand tools	• Pinch points • Contact with sharp edges • Contact with edge burrs	• Inspect all tools before each use. • Personnel will be trained in the proper use of all tools. • Use the appropriate tool for the job. • Use tools in compliance with manufacturer's guidelines and only for applications for which they were designed. • Wear proper PPE (hard hat, safety glasses with side shields, safety-toed boots and work gloves).
Activities in areas where the potential for slips or trips exist	Slips, trips, or falls on walking and working surfaces	• Maintain clean work areas by following good housekeeping procedures. • Be alert for uneven terrain and steep slopes. • Footwear should have tread in good condition. • Be alert to potential deterioration of walking and working surfaces and support structures.
Activities presenting the potential for eye injury	Eye injury due to vegetation or flying particulate	• Safety glasses with side shields will be worn in construction work areas and other areas where eye hazards are present. • If material gets into a worker's eye(s), immediately flush the eye(s) for 15 minutes at an emergency eye wash station.
Work with heavy loads or objects	Back injury from lifting and moving heavy or awkward loads	• Use proper lifting techniques such as keeping back straight, lifting with legs, limiting twisting. • Mechanical devices (e.g., fork lifts and hand trucks) should be used to reduce manual handling of materials. • Team lifting should be utilized if mechanical devices are not available.

Activity Hazard Analysis

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	**Potential Health and Safety Hazards** (Analyze each principal step for potential hazards)	**Hazard Controls** (Develop specific controls for each potential hazard)
Work in areas of vehicular traffic	Vehicle/pedestrian collisions	• Spotters will be used when backing up trucks, heavy equipment and earth moving equipment in congested areas. • High visibility traffic vests shall be worn in areas of traffic, construction vehicles, and roadways.
Work in hot environments	Heat stress	• Read and follow heat stress precautions specified in the HSP. • Acclimate to hot weather work. • Be conscious of your individual tolerance to work in hot weather and monitor yourself and co-workers for signs and symptoms of heat stress. • Take breaks as necessary in shady or cool areas and drink copious amounts of liquids.

Equipment to be Used (List equipment to be used in the work activity)	**Inspection Requirements** (List inspection requirements for the work activity)	**Training Requirements** (List training requirements including hazard communication)
• Hand and power tools • Various other construction equipment	• Inspection of all equipment and tools prior to each use	• OSHA 40-hour HAZWOPER initial training and current refresher.

Activity Hazard Analysis

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

CH2MHILL

ACTIVITY HAZARD ANALYSIS

Task: Geophysical Survey	**Date:**
	Project:
Description of the work: The objective of this project is to complete an SI and perform a relative site risk evaluation of the Former Lower Camp Debris Site on Culebra Island, Puerto Rico. In order to complete these objectives, the following activities will be conducted: • Perform a site visit to obtain additional site information regarding the type, location, and distribution of debris. • Perform a geophysical survey to locate and delineate, to the extent possible, buried metal debris.	**Site Supervisor:** **Site Safety Officer:**

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Site walks, surveys Drive survey truck onto site, set up field equipment (tripods, instruments,) walk to each area to be marked for survey.	Slips/trips/falls Uneven ground surface Biological Hazards (Insects, Bees and Wasps, gnats)	• Always wear your seatbelt. • Drive defensively and follow posted speed limits. • Use a spotter to maneuver in tight areas. • Be aware of all restricted areas and obey rules regarding access to those areas. In general, avoid restricted areas whenever possible. • Use a buddy when necessary to haul equipment and supplies. • The area will be walked prior to carrying equipment to identify trip hazards, holes in the ground, etc. • Be alert for uneven terrain and steep slopes. • Footwear should have tread in good condition. • Be aware of bees and wasp nests in the activity

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
		areas. Do not disturb nests. • Follow the biological hazard precautions, guidelines, and fact sheets in the HSP for rodents, spiders, centipedes, scorpions, hazardous plants, etc.
	Vehicular traffic in work area	• While on site, no vehicles are anticipated to be encountered. Cones or site control devices will be used if necessary to identify and control access to work areas. • Wear high visibility vests at all times when working in areas with traffic.
	Heat stress	• Wear sun screen and hydrate properly • Read and follow heat stress precautions specified in the HSP. • Be familiar with signs and symptoms of heat stress. • Acclimatize to hot weather work • Be conscious of your individual tolerance to work in hot weather and monitor yourself and co-workers for signs and symptoms of heat stress • Take breaks as necessary in shady or cool areas and drink plenty of liquids

Equipment to be used (List equipment to be used in the work activity)	Inspection Requirements (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)
• Survey Equipment	• Inspection of all equipment and tools prior to each use	• Personnel conducting sampling will be trained on the use of their equipment. • Hazard Communication training, as appropriate • Training on CH2M HILL HSP

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