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NAS WHITING FIELD
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REMEDIAL DESIGN BASELINE SAMPLING WORK PLAN ADDENDUM NUMBER 4 FOR SITE
4 NAS WHITING FIELD FL
8/3/2004
CH2M HILL

**Work Plan Addendum No. 04
Remedial Design Baseline Sampling
Site 4 - North AVGAS Tank Sludge Disposal Area
Naval Air Station Whiting Field
Milton, Florida**

Revision No. 02

EPA ID # FL2170023244

**Contract No. N62467-98-D-0995
Contract Task Order No. 0094**

Submitted to:

**Southern Division
Naval Facilities Engineering Command**

Prepared by:



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August 2004

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Prepared/Approved By:

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Amy Twitty, Project Manager

August 3, 2004

Date

Approved By:

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Scott Smith, Senior Project Manager

August 3, 2004

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Client Acceptance:

U.S. Navy Responsible Authority

Date

This Remedial Design Baseline Sampling Work Plan for Site 4, North AVGAS Tank Sludge Disposal Area, Naval Air Station Whiting Field, Milton, Florida, was prepared under the direction of a Florida registered Professional Geologist.



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STATE OF FLORIDA
PROFESSIONAL GEOLOGIST

8-3

Date

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- A Health and Safety Plan
- B Project Schedule
- C Submittal Register
- D Remedial Investigation Reference Drawings
- E Response to Comments

Acronym List

°C	degrees Celsius
°F	degrees Fahrenheit
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
ARAR	applicable or relevant and appropriate requirement
AVGAS	aviation gasoline
bls	below land surface
CFR	Code of Federal Regulations
CH2M HILL	CH2M HILL Constructors, Inc.
CMP	Contract Management Plan
CO	Contracting Officer
CTO	Contract Task Order
EISOPQAM	Environmental Investigation Standard Operating Procedures and Quality Assurance Manual
EPA	U.S. Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
HSP	Health and Safety Plan
LDR	Land Disposal Restriction
ml	milliliters
MSDS	Material Safety Data Sheet
NAS	Naval Air Station
NAVFAC EFD	
SOUTH	Naval Facilities Engineering Command, Southern Division
PPE	personal protective equipment
ppm	parts per million
PRG	Preliminary Remedial Goal
QC	quality control

Acronym List (Continued)

ROICC	Resident Officer in Charge of Construction
SCTL	soil cleanup target level
SHSS	Site Health and Safety Specialist
SRS	Solar Remediation System
SVE	soil vapor extraction
SVOC	semi-volatile organic compound
T&D	transportation and disposal
TAT	turnaround time
TRPH	total recoverable petroleum hydrocarbons
TSSDS	Tri-Service Spatial Data Standards
TVA	total vapor analyzer
UST	underground storage tank
VOC	volatile organic compound

1.0 Introduction

CH2M HILL Constructors, Inc. (CH2M HILL) has been contracted by Naval Facilities Engineering Command, Southern Division (NAVFAC EFD SOUTH) to perform remedial design at Naval Air Station (NAS) Whiting Field in Milton, Florida. The Work Plan was performed under Contract No. N62467-98-D-0995, Contract Task Order (CTO) No. 0094, and in accordance with the management approach outlined in the CH2M HILL Contract Management Plan (CMP) dated July 1998. However, the field activities under this revision of the Work Plan will be performed under Contract No. N62467-01-D-0331, CTO No. 0026. This Work Plan outlines the sampling and analysis necessary to determine the extent of contamination, including characterizing the vadose zone, in the vicinity of the former pilot study area.

1.1 Plan Organization

This Work Plan is organized into the following sections and appendices:

- **Section 1.0 Introduction** includes a discussion of plan organization, site history, and the objective of planned remedial activities.
- **Section 2.0 Sampling and Analysis Plan** outlines the required testing of environmental media. Specific procedures are included in the NAS Whiting Field Basewide Work Plan (CH2M HILL, 1999).
- **Section 3.0 Environmental Protection Plan** addresses measures to be implemented to protect the environment.
- **Section 4.0 Waste Management Plan** addresses the management and disposal or recycling of wastes generated during the execution of this CTO activity.
- **Section 5.0 Quality Control Plan** includes the site-specific project organization chart and describes quality control (QC) testing requirements.
- **Section 6.0 Works Cited** lists documents referenced in this Work Plan Addendum.

The following support documents are presented as appendices to this Work Plan Addendum:

- Appendix A Health and Safety Plan
- Appendix B Project Schedule
- Appendix C Submittal Register
- Appendix D Remedial Investigation Reference Drawings

1.2 Site Background

Site 4 is a former underground storage tank (UST) facility located north of Tow Lane at North Field (Figure 1-1). The former tank farm covers approximately 2.5 acres and is currently covered with grass.

Site 4 contained eight 23,700-gallon steel USTs, one 15,000-gallon UST, and one 750-gallon UST dating back to 1943 when NAS Whiting Field first began operations. Nine USTs at this site were used to store aviation gasoline (AVGAS) and one UST was used to store contaminated jet fuel. All USTs and associated piping were removed in the mid-1990s. There are no records of spills or leaks at Site 4, but petroleum contamination was observed when the USTs were removed. CH2M HILL installed five soil vapor extraction (SVE) treatment wells and nine monitoring points at the site in 2001 and conducted a remedial action pilot study through November 2002. The results of the pilot study are summarized in the *Draft Project Completion Report for the Solar Remediation System Pilot Study at Site 4-North AVGAS Tank Sludge Disposal Area, Naval Air Station Whiting Field, Milton, Florida*, submitted in November 2003 (CH2M HILL, 2003).

1.3 Remedial Design Baseline Sampling Objective

Since completion of the pilot study in November 2002, five solar powered SVE units have been operating full-time at Site 4. Baseline soil samples will be collected to adequately characterize soil conditions at Site 4, to assist in the design of an effective remedial system for this site. In addition, soil samples will be collected in the pilot study area to determine the current soil conditions in that area. Groundwater contamination beneath the site will be addressed under the Site 40 investigation, basewide groundwater.

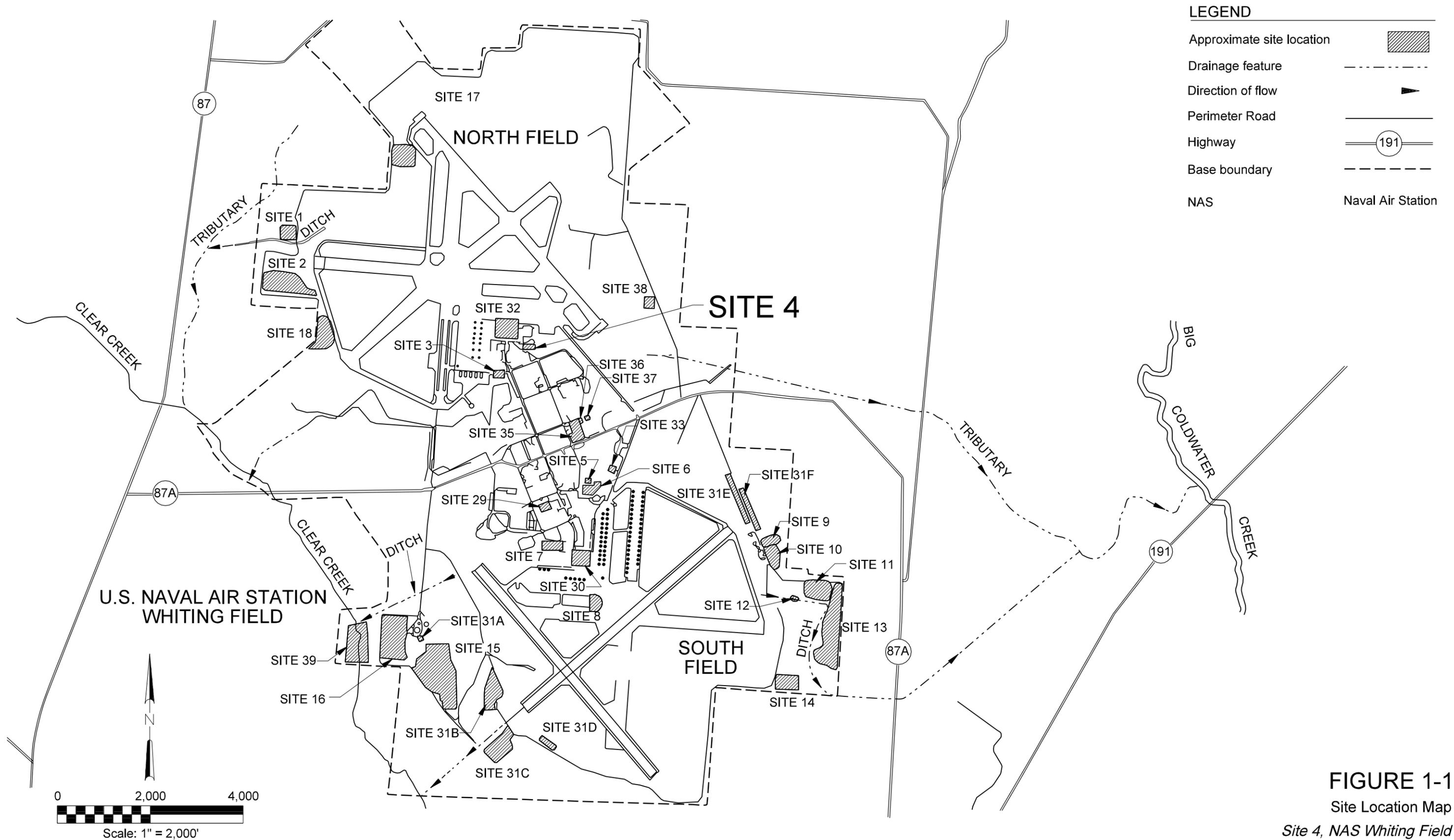


FIGURE 1-1
 Site Location Map
 Site 4, NAS Whiting Field

2.0 Execution Plan

This section includes a description of the remedial tasks, along with the project schedule and communications plan.

2.1 Scope of Work Tasks

The components of the work to be performed under this CTO for NAS Whiting Field include the following:

- Mobilization and setup
- Site utilities clearance
- Soil sampling and analyses
- Survey
- Site restoration
- Waste management and disposal
- Decontamination and demobilization

2.1.1 Mobilization and Site Setup

This task includes mobilizing personnel, equipment, subcontractors, and materials to NAS Whiting Field and establishing temporary facilities to conduct the remedial activities. CH2M HILL will review all Navy rules, regulations, and standard operating procedures regarding vehicle movement and control inside the facility. All location provisions will be observed including notifications and communication requirements. CH2M HILL will minimize disturbance to any operations during project activities and will consult with onsite Navy personnel to evaluate area access, placement of equipment, and traffic flow to minimize the impact of this work to facility operations.

A laydown/decontamination area will be mutually agreed upon by NAS Whiting Field and CH2M HILL personnel.

2.1.2 Site Utilities Clearance

A thorough utility survey will be conducted and coordinated through Mr. Ron Joyner, Base Environmental Engineer, NAS Whiting Field. The survey will include the location of all underground utilities (e.g., fiber optics cable, electric wires, telephone and /or communications leads, sanitary and storm sewer piping, water lines, natural gas pipelines). Any underground utilities identified in the excavation areas will be clearly delineated and Mr. Joyner will be notified.

2.1.3 Soil Sampling

In an effort to delineate the area of soil contamination at Site 4, an estimated 25 soil borings will be completed in the vicinity of the site. Locations were chosen based on areas where data gaps were noted. At each of the 25 soil borings, samples will be collected at 20-foot

intervals to the water table (approximately 100 feet below land surface [bls]) unless results from two consecutive soil samples are below regulatory cleanup goals. Additionally, in accordance with Work Plan Addendum No. 2 Solar Remediation System Pilot Study for Site 4—North AVGAS Tank Sludge Disposal Area (CH2M HILL, 2000), four additional soil borings will be advanced in the former pilot study area to determine the current soil conditions in that area. Soil samples will also be collected in the vadose zone where data gaps are noted. Section 3.0 Sampling and Analysis Plan outlines the sampling effort.

2.1.4 Survey

A Florida-Licensed Professional Land Surveyor will be contracted to locate each boring location area by its state plain coordinates. This survey will include the exact location of the sample points where the delineation and confirmation samples were collected.

All survey data will conform to the Tri-Service Spatial Data Standards (TSSDS). Horizontal controls for graphic and non-graphic information are Mercator Projection, GRS 80, State Plane Coordinate System, North American Datum 1983, Lambert Zones 1 through 6 (or appropriate zone for region to be mapped). Vertical controls are Mean Sea Level, North American Vertical Datum 1988.

QC controls to be inspected or verified include:

- Surveyor qualifications/license
- Verification of existing monuments
- Protection (monuments and control points)
- Instrument calibration and accuracy
- Horizontal and vertical control
- Surveying tolerances (horizontal, vertical, angles)
- Reference to applicable plane coordinates and vertical datum
- Surveyor notes (legibility, accuracy, and completeness)
- Electronic and hard copy data deliverables
- Stake flagging/marking
- As-builts, drawings, maps

2.1.5 Site Restoration

Following the soil sampling activities, the boreholes will be backfilled to grade. The site will be cleared of any sampling materials, equipment and debris.

2.1.6 Waste Management and Disposal

CH2M HILL will contain, store, maintain, and properly dispose of wastes generated during this CTO including construction debris, contaminated solid waste, and contaminated liquid waste. All waste will be managed in accordance with applicable state and federal regulations, as outlined in Section 4.0 Waste Management Plan of this Work Plan Addendum. Thorough daily inspections of the work area and waste storage areas will be conducted while personnel are onsite. Specifically, inspections will ensure no offsite migration of contaminants is allowed to occur.

Soil cuttings from drilling activities will be placed back into their respective boreholes. Any leftover soil will be containerized in drums or a roll-off container. Samples from each wastestream will be composited for disposal profile purposes. Section 3.0 Sampling and Analysis Plan outlines the samples and analysis required. Upon receipt of the disposal profile results, the material will be profiled for offsite disposal. A waste manifest will be generated for each material transported offsite. Section 4.0 Waste Management Plan describes waste disposal tracking procedures.

2.1.7 Decontamination and Demobilization

Prior to leaving the exclusion zone area, personnel and equipment will be decontaminated after coming in contact with contaminated material. All decontaminated equipment will be inspected and documented by the Site Health and Safety Specialist (SHSS), Site QC Manager, or Site Superintendent.

All debris and/or rinsate generated during decontamination activities will remain inside the exclusion zone until it is containerized and stored properly for legal disposal.

Equipment will be thoroughly decontaminated to remove any contamination adhering to the component surfaces. A low volume, high-pressure washer will be used to accomplish equipment decontamination.

Decontamination of personnel and personal protective equipment (PPE) will be performed in accordance with the Health and Safety Plan (HSP) provided in Appendix A and applicable provisions of 29 Code of Federal Regulation (CFR) 1910.120.

Upon completion of the project, both the Base Environmental Restoration Manager and the Resident Officer in Charge of Construction (ROICC) will be notified and a walkthrough inspection of the work will be scheduled. Once the Base Environmental Restoration Manager and ROICC are satisfied with the work in place, personnel and equipment will demobilize from the installation.

2.2 Project Schedule

The anticipated project schedule is provided in Appendix B.

2.3 Communications Plan

A communication matrix outlining the lines of communication for NAVFAC EFD SOUTH and CH2M HILL personnel is presented in Table 2-1; Table 2-2 provides a project personnel directory.

TABLE 2-1
Communications Matrix
Site 4, NAS Whiting Field

CH2M HILL Position	Navy Direct Report
Scott Newman, Program Manager	Cory Price, Administrative Contracting Officer
Scott Smith, Senior Project Manager	Jimmy Jones, Contracting Officer's Technical Representation

Amy Twitty, CTO Project Manager

Linda Martin, Remedial Project Manager

Ron Joyner, Base Environmental Engineer NAS Whiting Field

TABLE 2-2
Project Personnel Directory
Site 4, NAS Whiting Field

Contact	Company
Scott Newman Scott Smith Theresa Rojas Scott Dunbar	CH2M HILL Constructors, Inc. 115 Perimeter Center Place, N.E. Suite 700 Atlanta, GA 30346-1278 770/604-9182
Joe Giandonato, Contracts	CH2M HILL 1700 Market Street, Suite 1600 Philadelphia, PA 19103-3916 215/563-4220 ext. 507
Rich Rathnow Health And Safety Manager	CH2M HILL 151 Lafayette Drive, Suite 110 Oak Ridge, TN 37830 855/483-9032
Amy Twitty	CH2M HILL 1766 Sea Lark Lane Navarre, FL 32566 850/939-8300 ext. 17
Richard Stanley	Southern Division Naval Facilities Engineering Command P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5939
Jimmy Jones	Southern Division Naval Facilities Engineering Command P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5544
Linda Martin	Southern Division Naval Facilities Engineering Command P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5574
Ron Joyner	NAS Whiting Field 7151 USS Wasp Street Milton, Florida 32570-6159 850- 623-7181 ext. 40

3.0 Sampling and Analysis Plan

The Sampling and Analysis Plan provided in this Work Plan outlines the required sampling activities associated with the design of the final remedial system at Site 4, NAS Whiting Field. This plan outlines the required locations and analyses for the soil screening and soil samples to be collected. In addition, this plan provides the required analyses for disposal characterization for wastes generated during sampling activities.

The Basewide Work Plan provides sample collection frequency and sampling methodology for waste characterization and incidental samples collected during the remedial phase of the project completed under this contract, sample quality assurance/quality control procedures to be maintained during all sample collection activities, and sample equipment decontamination procedures (CH2M HILL, 1999).

All sampling will be conducted in accordance with Florida Department of Environmental Protection (FDEP) Standard Operating Procedures for Field Activities (DEP-SOP-001/01, January 1, 2002) and the U.S. Environmental Protection Agency (EPA) Region IV Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM, November 2001).

All soil characterization samples will be analyzed using a Navy- and FDEP-approved laboratory for analysis. Samples will be analyzed for semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), and total recoverable petroleum hydrocarbons (TRPH) constituents. Level III Data Quality Objectives will be used for reporting purposes. Waste profile samples will be analyzed for a full suite of parameters as outlined in Section 3.4. Components of the soil-sampling plan are listed in Table 3-1.

3.1 Data Quality Levels for Measurement Data

The data quality levels for each sampling task described previously are listed in Table 3-1. The sampling and analytical requirements, along with the required level of quality and data packages are listed in Table 3-2. These include the quantitation, project action, accuracy, precision, and completeness limits by which the data will be evaluated. Analytical results will be compared to the FDEP residential, industrial and leachability Soil Cleanup Target Levels (SCTLs) as well as the EPA Region 9 Preliminary Remedial Goals (PRGs). For the delineation sampling, industrial and leachability cleanup goals must be met.

TABLE 3-1
Data Quality Levels
Site 4, NAS Whiting Field

Sampling Activity	Data Quality Level
Soil Sampling (field testing)	Screening
Soil Sampling (laboratory analysis)	Definitive
Waste characterization of the contaminated aqueous waste (offsite laboratory analyses)	Definitive

TABLE 3-2
 Sampling and Analysis Summary
 Site 4, NAS Whiting Field

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No.	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
Soil Waste Characterization													
Soil Characterization Sampling	soil cutting, other generated solids	Soil	Once	1 Composite sample made up of 5 Grab samples for roll-off or 1 composite per 6 drums	Auger down to various depths within rolloff in 5 areas or each of 6 drums	SS Auger, SS Spoons, SS Bowl	14 day	CH2M HILL Level A	TCLP Volatiles	1311/8260B	14 day TCLP extr; 14 day analysis	Cool to 4°C	(1) 4-oz glass
									TCLP Semi-Volatiles	1311/8270C	14 day TCLP extr; 7 day extr; 40 day analysis	Cool to 4°C	(4) 8-oz glass
									TCLP Pesticides	1311/8081A	14 day TCLP extr; 7 day extr; 40 day analysis	Cool to 4°C	see above
									TCLP Herbicides	1311/8151A	14 day TCLP extr; 7 day extr; 40 day analysis	Cool to 4°C	see above
									TCLP Metals	1311/6010B, 7470A	6 month TCLP extr; 6 month analysis Hg: 28 day TCLP extr; 28 day analysis	Cool to 4°C	see above
									TRPH	FL-PRO	14 day extr; 40 day analysis	Cool to 4°C	(1) 8-oz amber glass
									Ignitability	1030	ASAP	none	(1) 16-oz amber glass
									Corrosivity	9045C	ASAP	none	see above see above
Aqueous Waste Characterization													

TABLE 3-2
 Sampling and Analysis Summary
 Site 4, NAS Whiting Field

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No.	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
Disposal of Aqueous Waste	Drums/tanks	Water	Once	1	Grab	Drum thief or dip jar	14 day	CH2M HILL Level A	TCL Volatiles	8260B	14 day	HCl pH< 2; Cool to 4°C	(3) 40-mL glass vial
									TCL Semi-volatiles	8270C	7 day ext; 40 day analysis	Cool to 4°C	(2) 1-L amber glass
									TCL Pesticides	8081A	7 day ext; 40 day analysis	Cool to 4°C	(2) 1-L amber glass
									Herbicides	8151A	7 day extr; 40 day analysis	Cool to 4°C	(2) 1-L amber glass
									TRPH	FL-PRO	7 day extr; 40 day analysis	H ₂ SO ₄ pH< 2; Cool to 4°C	(1) 1-L amber glass
									TAL Metals	6010B/7470A	180 days; Hg: 28 days	HNO ₃ pH< 2; Cool to 4°C	(1) 500-mL HDPE
									Cyanide	335.3	14 days	Cool to 4°C NaOH pH>12	(1) 500-mL HDPE
									Ignitability	1010/1020A	ASAP	none	(1) 1-L amber glass
Corrosivity	9040B	ASAP	none	see above									
													see above

3.2 Baseline Soil Sampling and Analyses

Two types of data will be collected during the baseline soil sampling: physical lithologic data and contaminant concentration data. The physical lithologic data will be used to create geologic cross-sections in an effort to determine the best remedial option for the site. The contaminant concentration data will help determine the boundaries of the remedial system design.

In an effort to delineate the area of soil contamination at Site 4, an estimated 25 soil borings will be completed in the vicinity of the site. Locations were chosen based on areas where data gaps were noted. At each of the 25 soil borings, samples will be collected at 20-foot intervals to the water table (approximately 100 feet bls) or until the results from two consecutive samples are below regulatory cleanup goals. Each sample will be field-screened using a total vapor analyzer (TVA) equipped with a flame ionization detector (FID). If the FID results are greater than 500 parts per million (ppm), samples will continue to be collected at 20-foot intervals. If the FID results are below 500 ppm, drilling will be discontinued pending analytical results. To avoid damage to any underground utilities not previously identified, boreholes will be initially advanced using a post-hole digger to a depth of approximately 4 to 5 feet bls and then bored with a drill rig to the desired depth.

The samples will be analyzed for VOCs, SVOCs, and TRPH. Select VOC samples will be analyzed on 24-hour turnaround-time (TAT) in an effort to locate the next soil boring locations. At each depth interval, lithologic characteristics will be recorded in a field logbook. To search for the presence of a semi-confining clay unit at approximately 18 to 20 feet bls and 80 feet bls, soil samples will also be collected at 15 and 25 feet bls, and 75 feet bls, respectively for lithologic purposes only. Measures will be taken to ensure contamination is not introduced to lower depths.

In accordance with Work Plan Addendum No. 2 (CH2M HILL, 2000), four additional soil borings will be advanced in the former pilot study area to characterize the soil in the immediate area of the SRS units, which have been operating in the extraction mode continuously since November 2003 when the pilot study was completed. The samples will be collected near monitoring points 04-MP-10W, 04-MP-20S, 04-MP-30E, and 04-MP-5N. All samples will be field screened using the TVA/FID and lithologic characteristics will be recorded in a field logbook. Soil samples will be collected at 18, 43, and 72 feet bls near 04-MP-10W, 04-MP-20S, and 04-MP-30E, and at 18, 38, and 66 feet bls near 04-MP-5N, and sent to an offsite laboratory for confirmation analysis. The samples will be analyzed for VOCs, SVOCs, and TRPH.

Headspace sampling will be conducted by half-filling 8- or 16-ounce glass jars. Each soil sample will be split into two jars, the two samples brought to a temperature between 20 degrees Celsius (°C) and 32°C, and the headspace reading will be obtained 5 minutes thereafter. One of the readings will be obtained with the use of an activated carbon filter unless the non-filtered sample is non-detect. The total hydrocarbon measurement will be determined by subtracting the filtered reading from the non-filtered reading.

Table 3-3 presents a summary of the proposed soil sampling. Figure 3-1 shows the locations of the initial proposed soil borings. Based on field headspace screening using the TVA/FID,

additional samples may be collected in the vicinity of these initial soil borings to further delineate the contamination. TVA/FID readings of 500 parts per million (ppm) or less will be considered “clean” soil for field screening purposes. For borings with samples greater than 500 ppm, additional boring will be drilled in 50- to 100-foot increments away from the source for delineation.

VOC soil samples will be collected with a coring device such as a disposable plastic syringe (or other appropriate coring device) and immediately transferred into three VOC vials (having a Teflon-lined lid prepared and weighed at the laboratory with approximately 5 milliliters (ml) of an appropriate preservative). The appropriate preservative for one of the vials (on which the laboratory will run their high level analyses to detect VOCs above approximately 200 micrograms per kilogram [$\mu\text{g}/\text{kg}$]) is methanol and/or polyethylene glycol. The appropriate preservative for two of the vials (the laboratory will run a low-level analysis if VOCs were not detected on the high level analysis) is organic-free reagent-grade water. A small jar will be collected for moisture determination and possibly screening the sample. The jar will not be used for VOC determinative analysis without prior approval.

TABLE 3-3
Proposed Soil Sampling
Site 4, NAS Whiting Field

Depth (feet below land surface) for 20 Delineation Borings	TVA/FID Reading	Samples for Laboratory Analysis	Lithology
15	YES	--	YES
20	YES	YES	YES
25	YES	--	YES
40	YES	YES	YES
60	YES	YES	YES
75	YES	--	YES
80	YES	YES	YES
100	YES	YES	YES
Depth (feet below land surface) for 3 Borings (04-MP-10W, 04-MP-20S, and 04-MP-30E)			
18	YES	YES	YES
43	YES	YES	YES
72	YES	YES	YES
Depth (feet below land surface) for 1 Boring (04-MP-5N)			
18	YES	YES	YES
38	YES	YES	YES
66	YES	YES	YES

From these data, a site-specific geologic cross-section will be generated. Contaminant data will include soil headspace sampling TVA/FID readings and analytical soil concentration (SVOCs, VOCs, and TRPH). The soil headspace will be measured at 20-foot intervals during drilling activities.

Upon sample completion, all soil cuttings will be used as backfill for each soil boring. Additional clean fill, as necessary, will be used to completely fill the soil borings.

A CH2M HILL Level C data package will be required along with appropriate QC samples for the required groundwater and air analyses. Analytical data will be submitted via hard copy and electronically. All data will be reviewed by a third party data validator for accuracy.

3.3 Decontamination

Decontamination of the drill rig, pipes and tools will consist of high pressure, low volume steam cleaning at a Navy approved area. The rear of the drill rig and all tools and drilling equipment to be placed in the drill hole will be steam-cleaned before drilling begins, between each boring, and after work is completed.

Leftover drill cuttings generated during equipment decontamination at each site will be placed on plastic sheeting adjacent to the boring locations and used as fill for the respective soil boring. All cuttings will be placed back into the soil borings. All disposable PPE will be contained in plastic bags and disposed of separately during fieldwork activities. Pending laboratory analysis, decontamination water will be stored in a tank provided by CH2M HILL.

3.4 Waste Characterization and Incidental Wastestream Sampling and Analyses

As stated previously, all soil cuttings will be used as backfill for each soil boring. If any soil is accumulated during drilling activities, it will be stored in 55-gallon drums. Waste characterization samples will be collected to evaluate the handling, transportation, and disposal requirements of any contaminated soil accumulated during drilling activities. Soil samples will be collected as described below, delivered to a Navy- and FDEP-approved laboratory, and analyzed for the parameters listed in Table 3-2.

One composite sample will be collected per six drums or as required by the disposal facility to characterize the material for disposal. Drums will be sampled according to the following procedure:

1. Bore down drum approximately 6 to 12 inches and fill volatile sample container. Container must be packed and have no headspace.
2. Continue to collect several spoonfuls of the soil into a stainless-steel bowl.
3. Homogenize the sample by the quartering techniques using the stainless-steel spoon.
4. Fill the appropriate sample jars approximately three-fourths full with the homogenized sample.
5. Close the jars, label, and package the samples for shipment to the laboratory.

A CH2M HILL Level A package will be required along with appropriate QC samples for the required waste characterization and incidental wastestream samples. Analytical data will be submitted via hard copy and electronically. Disposal data will be reviewed for quality and usability by the CH2M HILL project chemist.

3.5 Water Characterization

Waste characterization samples will be collected to evaluate the handling, transportation, and disposal requirements of generated water. Water samples will be collected as described below, delivered to a Navy-approved and FDEP-certified laboratory, and analyzed for the parameters listed on Table 3-2.

A sample will be collected from the drums using either a dip jar or bailer. The sample containers for volatile analyses will be filled first. The 40-mL vials will be filled so there is no headspace in each vial. The sample containers for the remaining analyses will then be filled.

A CH2M HILL Level A package will be required along with appropriate QC samples for the required waste characterization and incidental wastestream samples. Analytical data will be submitted via hard copy and electronically. Disposal data will be reviewed for quality and usability by the CH2M HILL project chemist.

3.6 Analytical Methods

Samples will be collected for analytical methods summarized in Table 3-2.

Preliminary analytical results will be faxed to Bonnie Hogue at the following fax number per the turn-around-times listed in Table 3-2 from day of sample receipt. The final hardcopy data and electronic file will be delivered to Melissa Osborne within 14 days of sample receipt.

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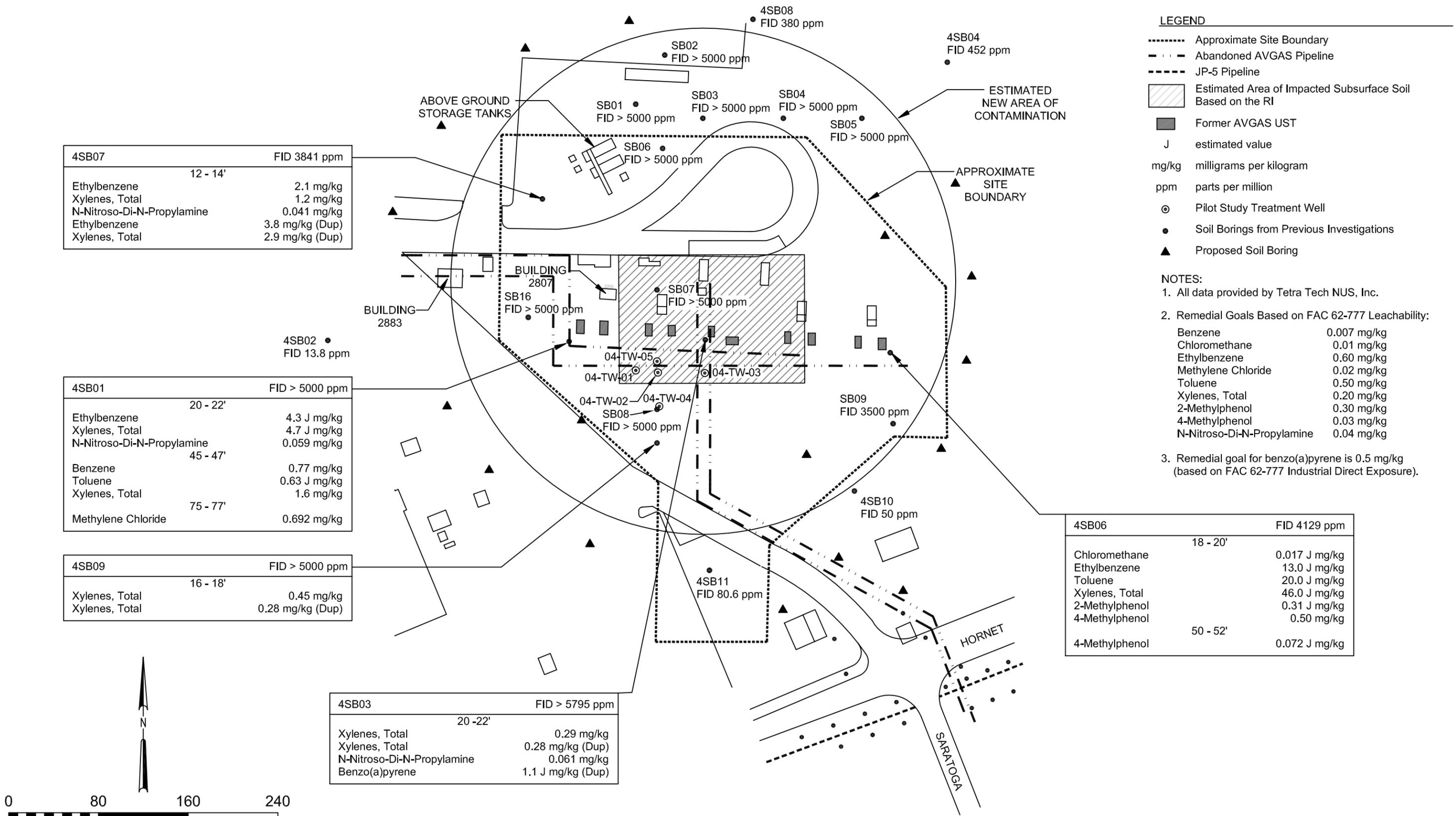


FIGURE 3-1
Initial Proposed Soil Boring Locations
Site 4, NAS Whiting Field

4.0 Environmental Protection Plan

The Environmental Protection Plan of the Basewide Work Plan (CH2M HILL, 1999) addresses general procedures to be implemented to prevent pollution and protect the environment during the Site 4 final remedial design activities at NAS Whiting Field.

5.0 Waste Management Plan

The scope of this work plan addendum includes the management and disposal of wastes generated during baseline remedial design activities at Site 4, North AVGAS Tank Sludge Disposal Area, NAS Whiting Field, to address petroleum contamination associated with AVGAS storage tanks.

5.1 Wastestreams

It is anticipated the following wastes may be generated during this activity:

- Contaminated environmental media generated from soil sampling activities (e.g., drill cuttings).
- Wastewater from decontamination activities.
- Clean and uncontaminated construction debris. Debris includes discarded materials generally considered to be not water soluble, including but not limited to concrete, asphalt material, pipe, and materials used in decontamination (e.g., plastic sheeting and personal protective clothing).

Wastes will be characterized according to the Sampling and Analysis Plan, and consistent with the Basewide Waste Management Plan included in the Basewide Work Plan (CH2M HILL, 1999). Waste characterization information will typically be included on a waste profile form provided by the offsite facility. CH2M HILL will provide analytical data from the most recent characterization sampling and analysis event. However, in some cases, facilities permitted to accept a specific waste material may require specific or additional analyses to evaluate the wastestream prior to acceptance.

5.2 Waste Handling

Wastestreams will be segregated as appropriate to prevent the spread of contamination. Upon sample completion, all soil cuttings will be used as backfill for each soil boring. Liquid wastes, including decontamination water, will be pumped directly into a portable storage tank, sampled and analyzed, and transported offsite to the appropriate facility. All disposable PPE will be contained in plastic bags and disposed of separately during fieldwork activities. Uncontaminated debris will be collected daily, segregated, and containerized prior to offsite transportation.

5.2.1 Waste Storage Time Limits

Wastes will be securely stored onsite prior to transportation and offsite treatment or disposal. All disposable PPE will be contained in plastic bags and all liquid wastes, including decontamination water, will be pumped directly into a portable storage tank. All soil cuttings will be used as backfill for each soil boring. **Hazardous wastes will only be stored onsite for less than 90 days, as required under 40 CFR 262.** Containers and tanks of

hazardous wastes will be stored in a temporary storage area designated by the Navy. If the Navy has not designated a storage area, CH2M HILL will temporarily store hazardous wastes in a secure area. **Additionally, as required under F.A.C. 62-770, petroleum-contaminated soil (including excessively contaminated soil) will not be stored or stockpiled onsite for more than 60 days. However, petroleum-contaminated soil (including excessively contaminated soil) may be containerized in watertight drums and stored onsite for 90 days.**

5.2.2 Container Labels

Waste containers, including 55-gallon drums and portable storage tanks, will be labeled in accordance with 49 CFR 172, 173 and 178. Labels will include the type of waste, location where the waste was generated, and accumulation start date. Drums and portable storage tanks used to store/accumulate waste will be labeled as follows:

- “Analysis Pending” – until analytical results are received and reviewed, these pre-printed labels will be used unless waste is known to be hazardous (e.g., listed hazardous wastes). This label will include the accumulation start date.
- “Hazardous Waste” – for hazardous wastes, pre-printed hazardous waste labels will be used and will include the following information:
 - Accumulation start date
 - Generator Name: U.S. Navy
 - USEPA ID number for site
 - Waste codes
 - Manifest number (mandatory for containers of less than 110 gallons)
- “Non-Hazardous Waste” – for non-hazardous wastes verified by analytical data and/or process knowledge, preprinted labels will be used and will include the following information:
 - Accumulation start date
 - Generator Name: U.S. Navy
 - EPA ID Number
 - Waste-specific information (e.g., contaminated soil)

Where applicable, the major hazards on the label (e.g., flammable, oxidizer, and carcinogen) will be included on the label.

5.2.3 Waste Storage Areas

All drums and portable storage containers of hazardous wastes will be stored in a temporary accumulation area designated by the Navy. If the Navy has not designated an accumulation area, CH2M HILL will temporarily store hazardous wastes in a secure area (such as within a fenced, barricaded, or cordoned area).

Waste storage areas will contain emergency equipment equivalent to hazard posed by waste. Hazardous waste storage areas will include fire extinguishers (in areas where wastes are known or suspected to be flammable or ignitable), decontamination equipment, and an alarm system (if radio equipment is not available to all staff working in storage area). **Spill**

control equipment (e.g., sorbent pads) will be available in hazardous waste storage areas, and where liquids are transferred from one vessel to another.

Drums

- Drums of waste will be maintained in temporary accumulation areas. Drums of hazardous waste will be stored on wood pallets.
- Drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.
- A row of drums should be no more than two drums wide. Adequate aisle space (e.g., 30 inches) will be provided between rows to allow the unobstructed movement of personnel and equipment.
- Each drum will be labeled.
- Drums will remain covered except when removing or adding waste to the drum. Covers will be properly secured at the end of each workday.
- Drums will be disposed of with the contents. If the contents are removed from the drums for offsite transportation and treatment or disposal, the drums will be decontaminated prior to re-use or before leaving the site.
- Secondary containment will be provided for drums of hazardous wastes incompatible with other wastes or materials stored nearby.

Portable Tanks

- Tanks will be inspected upon arrival onsite for signs of deterioration and contamination. Any tank arriving onsite with contents will be rejected.
- Tanks will be provided with covers.
- Each tank will be labeled.
- Tanks containing hazardous waste or incompatible liquids will be provided with secondary containment.

5.2.4 Inspections

Areas used for waste/container storage will be inspected for malfunctions, deterioration, discharges, and leaks possibly resulting in a release. The following inspection schedule will be followed:

- Daily inspection of drums and portable storage tanks will be conducted for leaks, signs of corrosion, or signs of general deterioration.
- Daily inspection of fuel storage areas (e.g., look for eroding containment systems and rusting tanks/ancillary equipment)

Any deficiencies observed or noted during inspection will be rectified immediately. Appropriate measures may include transfer of waste from leaking container to new container, replacement of liner or cover, or repair of containment berm, etc. Inspections will

be recorded in the daily Quality Control Report and include the deficiencies and how issue was rectified. Copies of the report will be maintained onsite, and available for review.

If operations will be suspended for more than 7 days, contact the regulatory compliance manager and alternate inspection arrangements will be made. Prior to demobilization, all hazardous wastes will be removed from the site.

5.3 Waste Transportation and Disposal

5.3.1 Waste Transportation

Containers used to store and/or transport contaminated waste offsite will be inspected prior to filling for signs of deterioration and residual contamination. Any container with contents or in poor condition will be rejected.

Each transportation vehicle and load of waste will be inspected before leaving the site and documented. The quantities of waste leaving the site will be recorded, at a minimum documented on the Transportation and Disposal (T&D) Log. A licensed, commercial transporter will transport non-hazardous wastes. Hazardous waste transporters will be licensed in accordance with 49 CFR 171-179. A copy of the documentation indicating the selected transporter has appropriate licenses will be received prior to transport of any waste.

Small containers such as 55-gallon drums transported onsite or offsite will be either placed on pallets or loaded directly using a drum handler designed to lift 55-gallon drums. Containers will be secured prior to loading a pallet onto a vehicle (e.g., secured together with non-metallic bonding). Similarly, once containers are loaded on a vehicle, they will be secured (e.g., tie-down straps) to prevent shifting or any other condition causing damage to a container.

For large containers, such as portable storage tanks, the transporter will be responsible for weighing loads at a certified scale. For each load of material, weight measurements will be obtained for each full and empty container, dump truck, or tanker truck. Disposal quantities will be based on the difference of weight measurements between the full and empty container, dump truck, or tanker truck. Weights will be recorded on the waste manifest. The transporter will provide copies of weight tickets with the final manifest.

Except for uncontaminated construction debris, each load of waste will be manifested prior to leaving the site. **All required transportation manifests will be prepared by CH2M HILL and signed by a NAS Whiting Field representative.** A bill of lading and weight ticket will be prepared for the transportation of uncontaminated construction debris.

The manifest form, with multiple carbon copies, typically will be provided by the waste transporter or selected treatment or disposal facility. The manifest will accompany the waste material to its final destination. If the waste is hazardous, the manifest will be completed in accordance with 40 CFR 262. The treatment, disposal, or recycling facility will be responsible for providing a copy of the final waste manifest and for providing a certificate of treatment or disposal for each load of waste received.

If the signed hazardous waste manifest from the designated offsite facility is not received within 35 days, CH2M HILL will contact the transporter or the designated facility to determine the status of the waste. If the signed hazardous waste manifest has not been received within 45 days, CH2M HILL will issue an "Exception Report" to the state of Florida, as required under 40 CFR 262.42 (as adopted under Florida Administrative Code [FAC] 62-730).

At a minimum, the non-hazardous or hazardous manifest form will include the following information:

- Transporter information including name, address, contact and phone number
- Generator information including name, address, contact, and phone number
- Site name including street/ mailing address
- Description of waste including reference to characterization form if available
- Type of container
- Quantity of wastes (volumetric estimate)

Additionally, each wastestream transported offsite will also have a waste profile, Land Disposal Restriction (LDR) Notifications/Certifications (for hazardous wastes), and a haul ticket (for soils only).

Transportation of wastes will be inventoried the day of transportation from the site using the T&D Log. A carbon copy of the initial manifest form for each load will be retained on-site and attached to the Daily Production Report.

The following procedures are observed when hauling and transporting wastes:

- Minimize impacts to general public traffic
- Repair road damage caused by construction and/or hauling traffic
- Cleanup material spilled in transit

All personnel involved in offsite disposal activities will follow safety and spill response procedures outlined in the Health and Safety Plan.

No materials from other projects will be combined with materials from NAS Whiting Field.

5.3.2 Disposal

Non-hazardous wastes, including wastewater, will be transported to facilities specifically permitted by the state under FAC 62-701. The following wastes will be disposed at facilities specifically permitted to accept these wastes (as described by Florida regulations):

- Petroleum-contaminated soil will be disposed of in permitted, lined landfills (FAC 62-701.520)
- Construction debris will be disposed in a landfill permitted to accept these wastes (FAC 62-701.730)
- Hazardous wastes will be sent to a facility permitted to treat, store, or dispose of hazardous wastes under (FAC 62-730)

5.4 Recordkeeping

The following records and documents will be maintained:

- Transportation and offsite disposal records, including:
 - Profiles and associated characterization data
 - Manifests, bills of lading, LDR notifications, and other shipping records
 - Offsite facility waste receipts
- Training record
- Inspection records
- Material Data Safety Sheets (MSDS) for chemicals brought onsite

5.4.1 Transportation and Disposal Log

The T&D Log is used to track waste from generation to final disposition. Wastes will be logged into the T&D Log the day waste is generated and placed into containers. Transportation of wastes will be inventoried the day of transportation from the site using the T&D Log. Final disposal will be documented on the T&D Log using the Certificate of Disposal (CD).

6.0 Quality Control Plan

The Quality Control Plan provided in the Basewide Work Plan (CH2M HILL, 1999) details the quality administrators, the project organization for the work to be completed at NAS Whiting Field, and the definable features of work for each project site.

The Submittal Register included in Appendix C of this work plan addendum, documents submittals in accordance with Appendix B of CH2M HILL's Contract Management Plan (dated July 1998). CH2M HILL, the Navy, or others will approve submittals as identified in the Submittal Register. All approved submittals will be distributed by CH2M HILL to the appropriate Navy personnel (Contracting Officer [CO], ROICC (in duplicate), etc.), the project site, and to the job file.

The site-specific project organization chart, provided as Figure 6-1, depicts the chain-of-command for this CTO and the individuals responsible for executing the work as indicated. Roles and responsibilities are summarized in Table 6-1.

6.1 CTO Project QC Manager

Mr. Ryan Bitely will serve as Project QC Manager. His appointment letter is included in Appendix E.

6.2 Testing Requirements

This section identifies environmental sample analysis laboratories and their certifications, environmental sampling and analysis, test control, and construction testing laboratories and their certifications.

6.2.1 Identification and Certification of Testing Laboratories

The laboratories utilized for this CTO project will function as a subcontractor in some cases and in other cases will function as a lower tier subcontractor. These laboratories have not yet been identified.

6.2.2 Environmental

Laboratories used for analysis of environmental samples will be Navy- and FDEP-approved, and shall hold a certification from the Florida Department of Health Environmental Laboratory Certification Program in accordance with FAC 62-160.

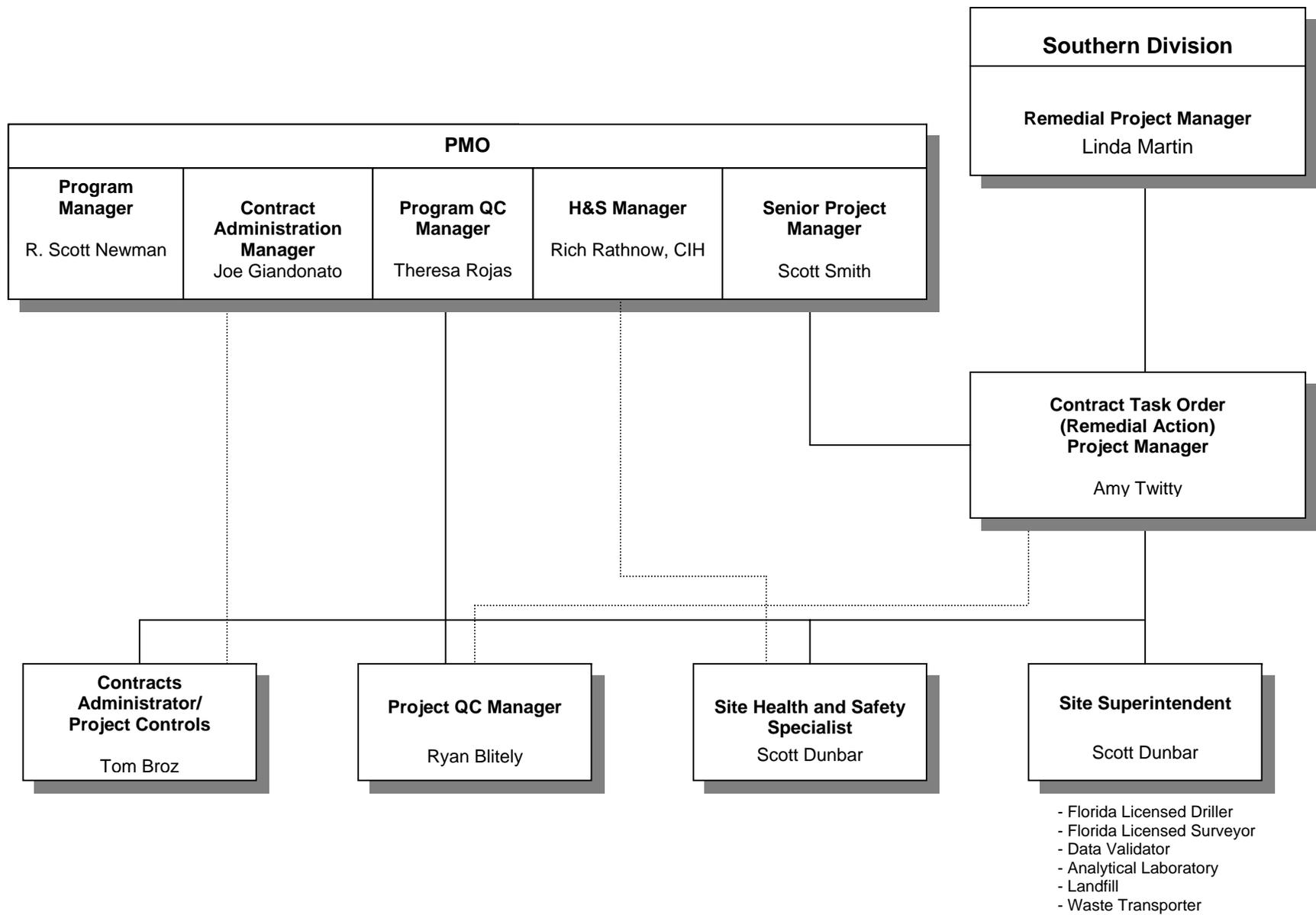


TABLE 6-1
Roles, Responsibilities, and Authorities of Individuals Assigned to CTO 0094
Site 4, NAS Whiting Field

Role	Responsibility	Authority
Project Manager	<ul style="list-style-type: none"> • Management and Technical Direction of work • Communication with Southern Division RPM and NTR • Overview subcontractor performance • Select CTO staff • Develop CTO Work Plan and supporting plans • Meet CTO Performance Objectives • Prepare status reports 	<ul style="list-style-type: none"> • Approve subcontractor selection • Approve invoices to Southern Division • Approve CTO baseline schedule • Stop work at the site for any reason • Approve payment to vendors and suppliers • Approve payment to subcontractors
Site Superintendent	<ul style="list-style-type: none"> • Responsible for all site activities • Provide direction to subcontractors • Act for Project Manager • Provide daily status reports • Prepare CTO Work Plan • Conduct daily safety meetings • Review subcontractor qualifications • Stop work for unsafe conditions or practices 	<ul style="list-style-type: none"> • Stop work for subcontractors • Approve corrective action for site work-arounds • Approve materials and labor costs for site operations • Resolve subcontractor interface issues • Approve daily and weekly status reports
Project Assistant	<ul style="list-style-type: none"> • Maintain CTO files and correspondence • Coordinate CTO schedule and monitor deliverables • Maintain change management records • Maintain Action Tracking System log 	<ul style="list-style-type: none"> • Submit Action Tracking System log • Assign correspondence log numbers
Project QC Manager	<ul style="list-style-type: none"> • Monitor and report on subcontractor quality and quantities • Audit subcontractors offsite fabrication • Maintain Submittal Register • Participate in Continuous Improvement Team • Stop work for non-compliant operations • Maintain Lessons Learned Log 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Stop work for unsafe practices or conditions • Approve subcontractor site specific health and safety plan • Set weekly safety objectives • Approve resumption of work for resolved safety issues
Subcontract Specialist	<ul style="list-style-type: none"> • Prepare bid packages • Purchase disposable materials • Maintain subcontract log 	

6.2.3 Environmental Sampling and Analysis

Environmental sampling and analysis, including QC sampling and analysis, is specified in the project Sampling and Analysis Plan, Section 3.0 of this CTO Work Plan. Samples will be collected in accordance with EPA methods, FDEP standards, and industry standards of practice.

6.2.4 Test Control

Environmental samples will be collected in accordance with FDEP and EPA methods and procedures. Other controls will include, but are not limited to, maintaining a chain of custody; proper handling, packing, and shipping; and the use of qualified laboratories.

6.3 CTO Support Organizations

The supporting organizations are yet to be determined.

7.0 Works Cited

CH2M HILL Constructors, Inc. 1999. Basewide Work Plan Naval Air Station Whiting Field, Milton, Florida, revision No. 00, November.

CH2M HILL Constructors, Inc. 2003. Work Plan Addendum No. 2, Solar Remediation System Pilot Study for Site 4-North AVGAS Tank Sludge Disposal Area, Naval Air Station Whiting Field, Milton, Florida, revision No. 02, October.

CH2M HILL Constructors, Inc. 2003. Draft Project Completion Report Solar Remediation System Pilot Study for Site 4 - North AVGAS Tank Sludge Disposal Area, Naval Air Station Whiting Field, Milton, Florida, Revision No. 00, November.

Florida Department of Environmental Protection (FDEP) Standard Operating Procedures for Field Activities (DEP-SOP-001/01, January 1, 200.

Tetra Tech NUS. 1999. Remedial Investigation Report for Surface and Subsurface Soil Sites 3, 4, 6, 30, 32, and 33, Naval Air Station Whiting Field, Milton, Florida, September.

Tetra Tech NUS. 1999. Feasibility Study for Surface and Subsurface Soil at Sites 3, 4, 6, 30, 32, and 33, Naval Air Station Whiting Field, Milton, Florida, October.

U.S. Environmental Protection Agency. 2001. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual. November.

Appendix A

Health and Safety Plan

**Health and Safety Plan
Remedial Design Baseline Sampling
Site 4 - North AVGAS Tank Sludge Disposal Area
Naval Air Station Whiting Field
Milton, Florida**

**Contract No. N62467-98-D-0995
Contract Task Order No. 0094**

Revision 00

Submitted to:
**Southern Division
Naval Facilities Engineering Command**

Prepared by:



115 Perimeter Center Place, N.E.
Suite 700
Atlanta, GA 30346

April 2004

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Attachments

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

Acronyms

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

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

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

1.0 Project Information and Description

CONTRACT TASK ORDER (CTO) No: 0094

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

PROJECT/SITE NAME: Naval Air Station (NAS) Whiting Field Site 4

SITE ADDRESS: Milton, Florida

CH2M HILL PROJECT MANAGER: Ms. Amy Twitty

CH2M HILL OFFICE: Navarre, Florida

DATE HEALTH AND SAFETY PLAN PREPARED: March 29, 2004

DATE(S) OF SITE WORK: May through August 2004

SITE BACKGROUND AND SETTING: NAS Whiting Field was commissioned on July 16, 1943, and became a training facility for the Navy. Although the aircraft have changed, the mission/function continues today. The facility is listed on the U.S. Environmental Protection Agency (EPA) National Priority List.

Site 4 is a former underground storage tank (UST) facility located north of Tow Lane at North Field. The site contained eight 23,700-gallon steel USTs, one 15,000-gallon UST and one 750-gallon UST dating back to 1943 when NAS Whiting Field first began operations. Nine USTs were used to store aviation gasoline and one to store contaminated jet fuel. All USTs and associated piping were removed in the mid-1990s. There were no records of spills or leaks, but petroleum contamination was observed when the USTs were removed. The former tank farm covers approximately 2.5 acres and is currently covered with grass.

CH2M HILL installed five soil vapor extraction (SVE) treatment wells and nine monitoring points at the site in 2001 and conducted a remedial action pilot study through November 2002. The results of the pilot study are summarized in the *Project Completion Report for the Solar Remediation System Pilot Study at Site 4-North AVGAS Tank Sludge Disposal Area, Naval Air Station Whiting Field, Milton, Florida*, submitted in November 2003 (CH2M HILL 2003).

DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED: The activities associated with the scope of work are as follows:

- Mobilization and site preparation
- Site utilities clearance
- Soil sampling and analyses
- Survey
- Waste characterization
- Transportation and disposal (T&D) of contaminated/uncontaminated materials
- Site restoration
- Decontamination

- Demobilization

2.0 Tasks to be Performed Under this Plan

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

2.1 Hazwoper-Regulated Tasks

- Mobilization and Site Preparation
- Soil Sampling and Analyses
- Survey
- Waste Characterization
- T&D of Contaminated/Uncontaminated Materials
- Site Restoration
- Decontamination
- Demobilization

2.2 Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. **Prior approval from the Health and Safety Manager (HSM) is required before these tasks are conducted on regulated hazardous waste sites.**

Tasks	Controls
<ul style="list-style-type: none">• Preparation and Submittal of a Remedial Design for Site 4	<ul style="list-style-type: none">• Brief on hazards, limits of access, and emergency procedures• Post contaminant areas as appropriate• Sample and monitor as appropriate

TABLE 2-1
Activity Hazard Analysis

Potential Hazards	Soil Sampling and Analysis	T&D of Contaminated/Uncontaminated Materials	Site Restoration	Decontamination	Waste Characterization	Demobilization
Manual Lifting (HS-29)		X		X	X	X
Fire Prevention (HS-22)						X
Electrical Safety (HS-23)						X
Lockout /Tagout (HS-33)						
Ladders & Stairs(HS-25)						
Compressed Gas Cylinders (HS-63)						
Buried Utilities						
Excavations (HS-32)						
Fall Protection (HS-31)						
Heavy Equipment (HS-27)		X	X	X		
Confined Space Entry (HS-17)						
Concrete & Masonry Work (HS-43)						
Cranes and Hoisting (HS-44)						
Demolition (HS-45)						
Scaffolding(HS-73)						
Steel erection (HS-62)						
Welding and cutting (HS-22)						
Aerial Lifts (HS-41)						
Hand & Power Tools (HS-50)	X			X	X	X
Forklifts (HS-48)						
Drilling (HS_35)	X					
Noise (HS-39)	X	X	X	X		X
Pressurized Lines/Equipment				X		
Pressure Washing/Equip Decon				X		
Vacuum Truck/Pumping Operations						
Suspended Loads						
Vehicle Traffic	X		X			X
Haul Truck Operations		X		X	X	
Visible Lighting	X	X	X	X	X	X
Mechanical Guarding Hazards		X				
Asbestos Hazard						
Lead Hazard						
Chemical Hazard-Dermal/Inhalation	X	X	X	X	X	
Dust Hazard (Silica/Metals)						
Fire/Explosion Hazards						

3.0 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 site or the particular hazard. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the SHSS for clarification.

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

Activity Hazard Analysis will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in the HSP Attachments as a guide. The AHA shall identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified. **AHAs shall be submitted to the Navy Technical Representative (NTR) for review at least 15 days prior to the start of each project activity phase.**

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

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

3.1 Project-Specific Hazards

3.1.1 Drilling Safety

- The drill rig is not to be operated in inclement weather.
- The driller is to verify that the rig is properly leveled and stabilized before raising the mast.
- Personnel should be cleared from the sides and rear of the rig before the mast is raised.

- The driller is not to drive the rig with the mast in the raised position.
- The driller must check for overhead power lines before raising the mast. A minimum distance of 15 feet between mast and overhead lines (<50 kV) is recommended. Increased separation may be required for lines greater than 50 kV.
- Personnel should stand clear before rig startup.
- The driller is to verify that the rig is in neutral when the operator is not at the controls.
- Become familiar with the hazards associated with the drilling method used (cable tool, air rotary, hollow-stem auger, etc.).
- Do not wear loose-fitting clothing, watches, etc., that could get caught in moving parts.
- Do not smoke or permit other spark-producing equipment around the drill rig.
- The drill rig must be equipped with a kill wire or switch, and personnel are to be informed of its location.
- Be aware and stand clear of heavy objects that are hoisted overhead.
- The driller is to verify that the rig is properly maintained in accordance with the drilling company's maintenance program.
- The driller is to verify that all machine guards are in place while the rig is in operation.
- The driller is responsible for housekeeping (maintaining a clean work area).
- The drill rig should be equipped with at least one fire extinguisher.

If the drill rig comes into contact with electrical wires and becomes electrically energized, do not touch any part of the rig or any person in contact with the rig, and stay as far away as possible. Notify emergency personnel immediately.

3.1.2 Working around Material Handling Equipment

- Never approach operating equipment from the rear. Always make positive contact with the operator, and confirm that the operator has stopped the motion of the equipment.
- Never approach the side of operating equipment; remain outside of the swing and turning radius.
- Maintain distance from pinch points of operating equipment.
- Because heavy equipment may not be equipped with properly functioning reverse signal alarms, never turn your back on any operating equipment.
- Never climb onto operating equipment or operate contractor/subcontractor equipment.
- Never ride contractor/subcontractor equipment unless it is designed to accommodate passengers; equipped with firmly attached passenger seat.
- Never work or walk under a suspended load.

- Never use equipment as a personnel lift; do not ride excavator buckets or crane hooks.
- Always stay alert and maintain a safe distance from operating equipment, especially equipment on cross slopes and unstable terrain.

3.1.3 Forklift Operations

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

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

- A rated lifting capacity must be posted in a location readily visible to the operator.
- A forklift truck must not be used to elevate employees unless a platform with guardrails, a back guard, and a kill switch is provided on the vehicle. When guardrails are not possible, fall arrest protection is required.
- The subcontractor operating the forklift must post and enforce a set of operating rules for forklift trucks.
- Only trained and authorized drivers will operate forklifts.
- Stunt driving and horseplay are prohibited.
- Employees must not ride on the forks.
- Employees must never be permitted under the forks (unless forks are blocked).
- The driver must inspect the forklift once a shift and document this inspection.
- The operator must look in the direction of travel and must not move the vehicle until all persons are clear of the vehicle.
- Forks must be carried as low as possible.
- The operator must lower the forks, shut off the engine, and set the brakes (or block the wheels) before leaving the forklift operator's position unless maintenance or safety inspections require the forklift to be running.
- Trucks must be blocked and have brakes set when forklifts are driven onto their beds.
- Extreme care must be taken when tilting elevated loads.
- Every forklift must have operable brakes capable of safely stopping it when fully loaded.
- Forklifts must have parking brakes and an operable horn.
- When the operator is exposed to possible falling objects, industrial trucks must be equipped with overhead protection (canopy).

3.1.4 Exposure to Public Vehicular Traffic

The following precautions must be taken when working around traffic, and in or near an area where traffic controls have been established by a contractor.

- 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 – 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 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 away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.

3.2 General Hazards

3.2.1 General Practices and Housekeeping

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

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness require enough illumination intensity to read a newspaper without difficulty.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.

3.2.2 Hazard Communication

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

The SHSS is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using Attachment 2.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.

- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific HAZCOM training using Attachment 3.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

3.2.3 Shipping and Transportation of Chemical Products

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

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

3.2.4 Lifting

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

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

3.2.5 Fire Prevention

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

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

- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

3.2.6 Electrical

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

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

3.2.7 Heat Stress

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

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°F to 60°F should be available. Under severe conditions, drink one to two cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of

water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.

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

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!

3.2.7.1 Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress. The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as

possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

3.2.8 Compressed Gas Cylinders

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

3.2.9 Procedures for Locating Buried Utilities

- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SHSS should confirm that arrangement.

3.3 Biological Hazards and Controls

3.3.1 Snakes

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical

attention immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

3.3.2 Poison Ivy and Poison Sumac

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

3.3.3 Ticks

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

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash might appear that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, seek medical attention.

3.3.4 Bees and Other Stinging Insects

Bee and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SHSS and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

3.3.5 Bloodborne Pathogens

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

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

3.3.6 Mosquito Bites

Due to the recent detection of the West Nile Virus in the Southeastern United States, it is recommended that **preventative measures** be taken to reduce the probability of being bitten

by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent:

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35 percent DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35 percent) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

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

3.3.6.1 Symptoms of Exposure to the West Nile Virus

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

3.4 Radiological Hazards and Controls

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

3.5 Contaminants of Concern

Contaminants of Concern are listed in Table 3-1.

TABLE 3-1
Contaminants of Concern

Contaminant	Location and Maximum ^a Concentration (ppm)	Exposure Limit ^b	IDLH ^c	Symptoms and Effects of Exposure	PIP ^d (eV)
Benzene	SB: 0.39 mg/kg	1 ppm	500 Ca	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	9.24
Ethyl Benzene	SB: 21.2mg/kg	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
Toluene	SB: 23.7 mg/kg	50 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82
Xylenes	SB: 61.3 mg/kg	100 ppm	900	Irritated eyes, skin, nose, and throat; dizziness; excitement; drowsiness; incoherence; staggering gait; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis	8.56
Footnotes: Samples collected in November 2002 ^a Specify sample-designation and media: SB (Soil Boring). ^b Appropriate value of PEL, REL, or TLV listed. ^c IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen. ^d PIP = photoionization potential; NA = Not applicable; UK = Unknown.					

3.6 Potential Routes of Exposure

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

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

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

4.0 Project Organization and Personnel

4.1 CH2M HILL Employee Medical Surveillance and Training

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

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

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

Employee Name	Office	Responsibility	SHSS/FA-CPR
Amy Twitty	NVR	Project Manager	40 HR, SC-HW; FA-CPR
Scott Dunbar	ATL	Site Superintendent	Level C SHSS; FA-CPR
Ryan Bitely	NVR	QC Manager	40HR, SC-HW; FA-CPR; 10HR. Construction, SC-HW
Rich Rathnow	ORO	HSM	SC-HW-C; FA-CPR

4.2 Field Team Chain of Command and Communication Procedures

4.2.1 Client

Contact Name: Linda Martin, Southern Division Naval Facilities Engineering Command
Phone: 843.820.5574

4.2.2 CH2M HILL

Program Manager: Scott Newman/ATL

Project Manager: Amy Twitty/NVR
Health and Safety Manager: Rich Rathnow/ORO
Field Team Leader: Scott Dunbar
Site Safety Coordinator: Scott Dunbar

The CH2M HILL project manager (PM) is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HS&E management process. The PM has overall management responsibility for the tasks listed below. The PM may explicitly delegate specific tasks to other staff, as described in sections that follow, but retains ultimate responsibility for completion of the following in accordance with this SOP:

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

The CH2M HILL HSM is responsible for:

- Review and accept or reject subcontractor pre-qualification questionnaires that fall outside the performance range delegated to the Contracts Administrator (KA)
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations
- Support the SHSS's oversight of subcontractor (and lower-tier subcontractors) HS&E practices and interfaces with on-site 3rd parties per the site-specific safety plan
- The SHSS is responsible for verifying that the project is conducted in a safe manner including the following specific obligations:

- Verify this HSP remains current and amended when project activities or conditions change
- Verify CH2M HILL site personnel and subcontractor personnel read this HSP and sign Attachment 1 “Employee Signoff Form” prior to commencing field activities
- Verify CH2M HILL site personnel and subcontractor personnel have completed any required specialty training (e.g., fall protection, confined space entry) and medical surveillance as identified in Section 2
- Verify compliance with the requirements of this HSP and applicable subcontractor health and safety plan(s)
- Act as the project “Hazard Communication Coordinator” and perform the responsibilities outlined in Section 2.2.2
- Act as the project “Emergency Response Coordinator” and perform the responsibilities outlined in Section 4
- Post OSHA job-site poster; the poster is required at sites where project field offices, trailers, or equipment-storage boxes are established; posters can be obtained by calling 800/548-4776 or 800/999-9111
- Verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (e.g., as tasks or hazards change)
- Verify that project H&S forms and permits, found in Attachment 5, are being used as outlined in Section 2
- Perform oversight and/or assessments of subcontractor HS&E practices per the site-specific safety plan and verify that project activity self-assessment checklists, found in Attachment 5, are being used as outlined in Section 2
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor’s field operations
- Manage the site and interfacing with 3rd parties in a manner consistent with our contract/subcontract agreements and the applicable standard of reasonable care
- Coordinate with the HS&E manager regarding CH2M HILL and subcontractor operational performance, and 3rd party interfaces
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented
- The training required for the SHSS is as follows:
 - SHSS 10 hour course
 - OSHA 10 hour course for Construction

- First Aid and CPR
- Relevant Competent Person Courses (excavation, confined space, scaffold, fall protection, etc.)

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

4.2.3 Subcontractors

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

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

Subcontractors are also required to prepare Activity Hazard Analysis before beginning each activity posing H&S hazards to their personnel using the AHA form provided in Attachment 6 as a guide. The AHA shall identify the principle steps of the activity, potential H&S hazards for each step and recommended control measures for each identified hazard. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

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

CH2M HILL should continuously endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observing for hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. In addition to this level of observation, the SHSS is responsible for confirming CH2M HILL subcontractor performance against both the subcontractor's safety plan and applicable self-assessment checklists. Self-assessment checklists contained in Attachment 5 are to be used by the SHSS to review subcontractor performance.

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

- Brief subcontractors on the provisions of this plan, and require them to sign the Employee Signoff Form included in Attachment 1.

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

5.0 Personal Protective Equipment

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

PPE Specifications are listed in Table 5-1.

TABLE 5-1
PPE Specifications^a

Task	Level	Body	Head	Respirator ^b
General work uniform when no chemical exposure is anticipated	D	Work clothes; steel-toe, steel-shank leather work boots; work gloves	Hardhat ^c Safety glasses Ear protection ^d	None required
Drilling and Sampling	Modified D	Coveralls: Uncoated Tyvek® Boots: Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile glove AND outer chemical-resistant leather or arimid-fiber glove.	Hardhat ^c Splash shield ^c Safety glasses Ear protection ^d	None required
Drilling	C	Coveralls: Polycoated Tyvek® Boots: Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile glove AND outer chemical-resistant nitrile glove.	Hardhat ^c Splash shield ^c Ear protection ^d Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H ^e cartridges or equivalent
Tasks requiring upgrade	C	Coveralls: Polycoated Tyvek® Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat ^c Splash shield ^c Ear protection ^d Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H cartridges or equivalent ^e .
Tasks requiring upgrade	B	Coveralls: Polycoated Tyvek® Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat ^c Splash shield ^c Ear protection ^d Spectacle inserts	Positive-pressure demand self-contained breathing apparatus (SCBA); MSA Ultralite, or equivalent.

TABLE 5-1
PPE Specifications^a

Task	Level	Body	Head	Respirator ^b
Reasons for Upgrading or Downgrading Level of Protection				
Upgrade^f			Downgrade	
<ul style="list-style-type: none"> • Request from individual performing tasks. • Change in work tasks that will increase contact or potential contact with hazardous materials. • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazards. • Instrument action levels (Section 5) exceeded. 			<ul style="list-style-type: none"> • New information indicating that situation is less hazardous than originally thought. • Change in site conditions that decreases 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 SHSS.

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

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

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

6.0 Air Monitoring/Sampling

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

6.1 Air Monitoring Specifications

Air Monitoring Specifications are listed in Table 6-1.

TABLE 6-1
Air Monitoring Specifications

Instrument	Tasks	Action Levels ^a		Frequency ^b	Calibration
PID: OVM with 10.6eV lamp or equivalent	All intrusive operations	Up to 1ppm	Level D	Initially and periodically during task	Daily
		1-5 ppm	Level D; collect benzene tube; benzene action level not exceeded		
		5-25 ppm	Level C: collect benzene tube; benzene action level not exceeded		
		> 25 ppm	Level B: Contact HSM		
CGI: MSA model 260 or 261 or equivalent		0-10% :	No explosion hazard	Continuous during advancement of boring or trench	Daily
		10-25% LEL:	Potential explosion hazard		
		>25% LEL:	Explosion hazard; evacuate or vent		
O₂Meter: MSA model 260 or 261 or equivalent		>25% ^c O ₂ :	Explosion hazard; evacuate or vent	Continuous during advancement of boring or trench	Daily
		20.9% ^c O ₂ :	Normal O ₂		
		<19.5% ^c O ₂ :	O ₂ deficient; vent or use SCBA		
Dust Monitor Visual Assessment	All activities	No Visible Dust	Level D	Initially and periodically during tasks	Zero Daily
		Visible Dust	Use dust suppression methods		
Nose-Level Monitor^e:		<85 dB(A)	No action required	Initially and periodically during task	Daily
		85-120 dB(A)	Hearing protection required		
		120 dB(A)	Stop; re-evaluate		

^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 SHSS; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3", "at surface/SB-2", etc.).

^c If the measured percent of O₂ is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O₂ action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O₂ action levels are required for confined-space entry (refer to Section 2).

^d Refer to SOP HS-10 for instructions and documentation on radiation monitoring and screening.

^e Noise monitoring and audiometric testing also required.

6.2 Calibration Specifications

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

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

TABLE 6-2
Air Monitoring Equipment Calibration Specifications

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

6.3 Air Sampling

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

7.0 Decontamination

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

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

7.1 Decontamination Specifications

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

7.2 Diagram of Personnel-Decontamination Line

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

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

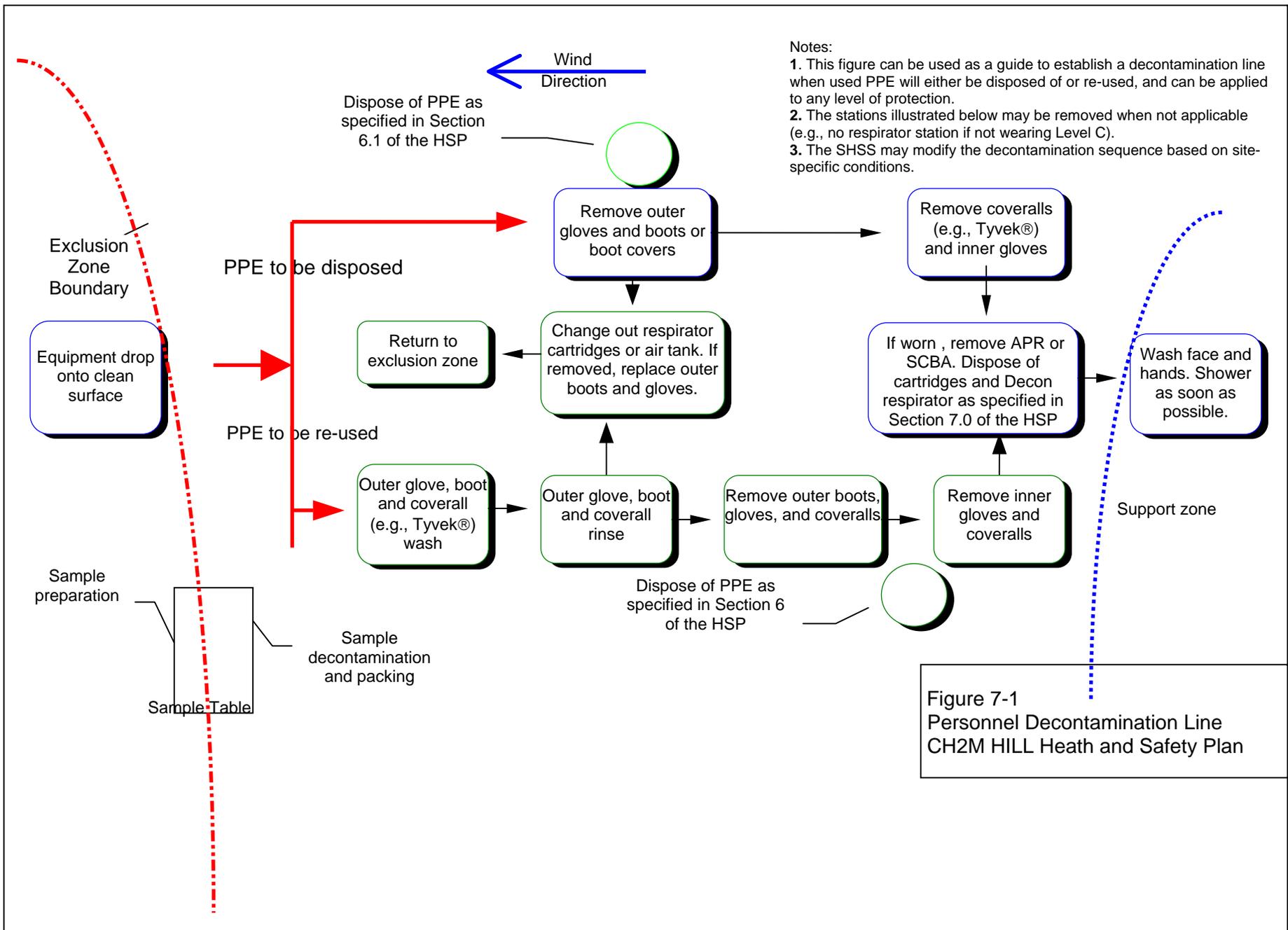


Figure 7-1
Personnel Decontamination Line
CH2M HILL Heath and Safety Plan

8.0 Spill-Containment Procedures

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

9.0 Site-Control Plan

9.1 Site-Control Procedures

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

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

9.2 Hazwoper Compliance Plan

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

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities do not require 24- or 40-hour training. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

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

10.0 Emergency Response Plan

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

10.1 Pre-Emergency Planning

The SHSS performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Field Trailers: Post “Exit” signs above exit doors, and post “Fire Extinguisher” signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital.
- Brief new workers on the emergency response plan.
- The SHSS will evaluate emergency response actions and initiate appropriate follow-up actions.

10.2 Emergency Equipment and Supplies

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

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

10.3 Incident Reporting, Investigation and Response

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

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

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

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

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

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

Shut down CH2M HILL operations and evacuate the immediate work area.

Notify appropriate response personnel.

Account for personnel at the designated assembly area(s).

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

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

10.4 Emergency Medical Treatment

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

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

10.5 Evacuation

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

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

10.6 Evacuation Signals

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

10.7 Incident Notification and Reporting

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

11.0 Behavior Based Loss Prevention System

A Behavior Based Loss Prevention System (BBLPS) is a system to prevent or reduce losses using behavior-based tools and proven management techniques to focus on behaviors or acts that could lead to losses.

The four basic Loss Prevention tools that will be used on EE&S CH2M HILL projects to implement the BBLPS include:

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

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

11.1 Activity Hazard Analysis

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

Activity Hazard Analysis will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in Attachment 6. The AHA shall identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

An AHA shall be prepared for all field activities performed by CH2M HILL and subcontractor during the course of the project by the Site Supervisor/SHSS. The Project-Specific and General Hazards of the HSP, the Hazard Analysis Table (Table 2-1), and applicable CH2M HILL Standards of Practice (SOPs) should be used as a basis for preparing CH2M HILL AHAs.

CH2M HILL subcontractors are required to provide AHAs specific to their scope of work on the project for acceptance by CH2M HILL. Each subcontractor shall submit AHAs for their field activities, as defined in their work plan/scope of work, along with their project-specific HSP. Additions or changes in CH2M HILL or subcontractor field activities, equipment, tools or material to perform work or additional/different hazard encountered

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

11.2 Pre-Task Safety Plans

Daily safety meetings are held with all project personnel in attendance to review the hazards posed and required H&S procedures/AHAs, that apply for each day's project activities. The PTSPs serve the same purpose as these general assembly safety meetings, but the PTSPs are held between the crew supervisor and their work crews to focus on those hazards posed to individual work crews. At the start of each day's activities, the crew supervisor completes the PTSP, provided in Attachment 6, with input from the work crew, during their daily safety meeting. The day's tasks, personnel, tools and equipment that will be used to perform these tasks are listed, along with the hazards posed and required H&S procedures, as identified in the AHA. The use of PTSPs, better promotes worker participation in the hazard recognition and control process, while reinforcing the task-specific hazard and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

11.3 Loss Prevention Observations

Loss Prevention Observations (LPOs) shall be conducted by Site Supervisor/SHSS for specific work tasks or operations comparing the actual work process against established safe work procedures identified in the project-specific HSP and AHAs. LPOs are a tool to be used by supervisors to provide positive reinforcement for work practices performed correctly, while also identifying and eliminating deviations from safe work procedures that could result in a loss. Site Supervisor/SHSS shall perform at least one LPO each week for a tasks/operations addressed in the project-specific HSP or AHA. The Site Supervisor/SHSS shall complete the LPO form in Attachment 6 for the task/operation being observed.

11.4 Loss/Near Loss Investigations

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

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

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

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

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

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

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

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

12.0 Approval

This site-specific Health and Safety Plan has been written for use by CH2M HILL only. CH2M HILL claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

12.1 Original Plan

Written By: Rich Rathnow

Date: 29 March 2004

Approved By: Rich Rathnow

Date: 29 March 2004



12.2 Revisions

Revisions Made By:

Date:

Revisions to Plan:

Revisions Approved By:

Date:

Attachment 1

Employee Signoff Form

Attachment 2

Project-Specific Chemical Product Hazard Communication Form

Attachment 3

Chemical Specific Training Form

CHEMICAL-SPECIFIC TRAINING FORM

Location:	Project # :
SHSS:	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.

Attachment 4

Emergency Contacts

Emergency Contacts-

24-hour CH2M HILL Emergency Beeper – 888/444-1226

Medical Emergency – 911

Facility Medical Response #: 850/623/7444
Local Ambulance #: 911

CH2M HILL- Medical Consultant

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

Fire/Spill Emergency -- 911

Facility Fire Response #: 850/623-7331
Local Fire Dept #: 850/983-5430

Local Occupational Physician

Security & Police – 911

Facility Security #: 850/623-7431
Local Police #: 850/983-5420

Navy RAC Program Manager

Name: Scott Newman/ATL
Phone: 770/604/9182

Utilities Emergency

Water: 850/983-5400
Gas: 850/983-5400
Electric: 850/969-3111

Navy RAC Health and Safety Manager (HSM)

Name: Rich Rathnow/ORO
Phone: 865/483-9005 (Office); 865/607-6734 (Cell)
865/531-2933 (Home)

Site Health and Safety Specialist (SHSS)

Name: Scott Dunbar
Phone: 678/427-2559

CH2M HILL Human Resources Department

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

Project Manager

Name: Amy Twitty
Phone: 850/232-0320

Corporate Human Resources Department

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

Federal Express Dangerous Goods Shipping

Phone: 800/238-5355

Emergency Number for Shipping Dangerous Goods

Phone: 800/255-3924

CH2M HILL Worker's Compensation and Auto Claims

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

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

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

Facility Alarms:

Evacuation Assembly Area(s):

Facility/Site Evacuation Route(s):

Hospital Name/Address:

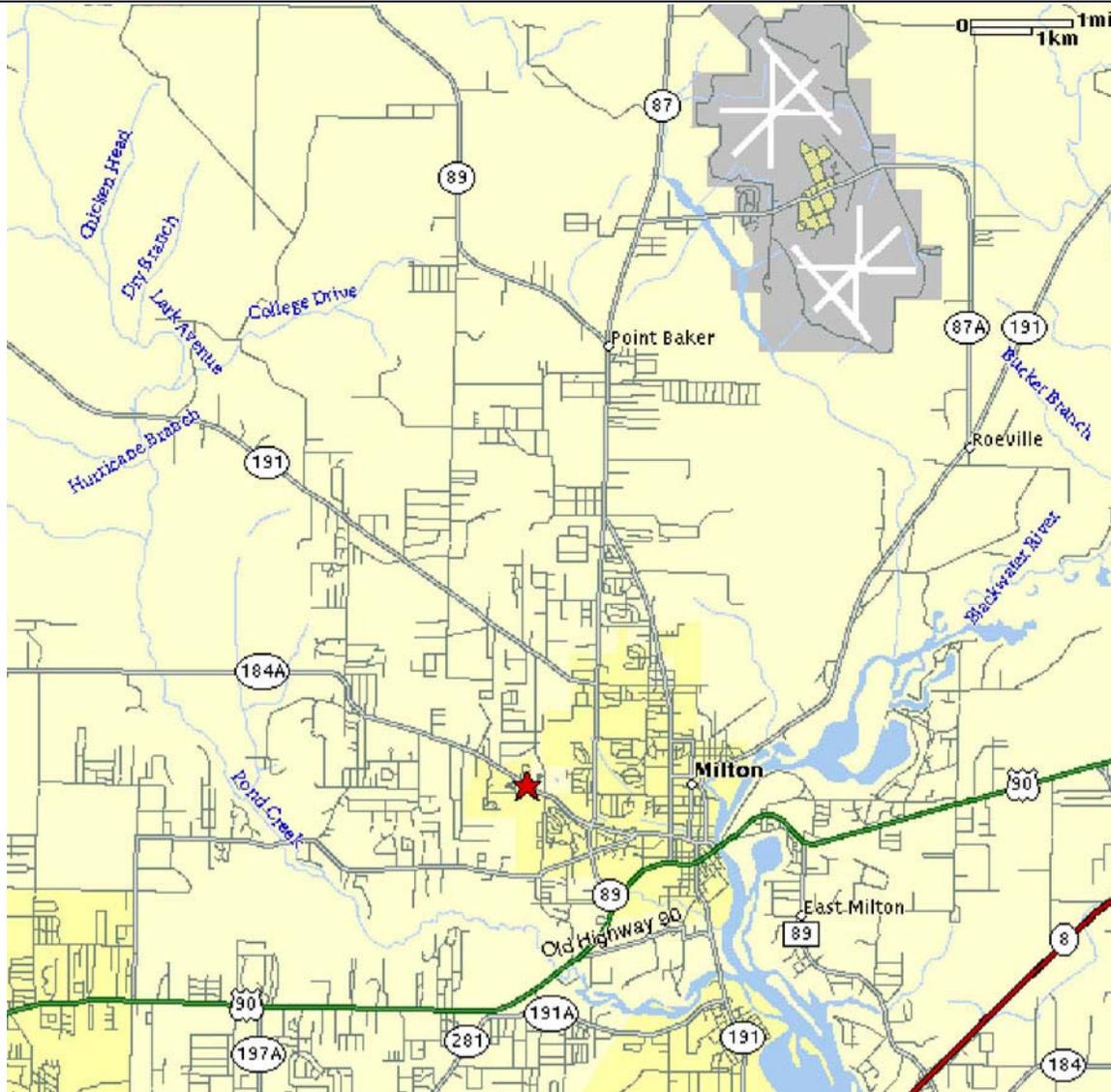
Santa Rosa Medical Center
6002 Berryhill Rd., Milton, FL 32570

Hospital Phone #:

850/626-7762

Directions to Hospital

From the Main Gate (West Gate) proceed west 1 mile (traffic light) to the intersection of State Highway 89 & 87 (Turn Left) travel approximately 3 miles to the division Highways 89 & 87 turn to the right on Highway 89 south and continue through the (first traffic light) intersection of Highway 89 and Willard Norris Road until the (second traffic light) intersection of Highway 89 and Berryhill Road (Turn Right) travel through the (first traffic light) intersection and the Hospital is on the right at the top of the hill.



Attachment 5

Project Activity Self-Assessment Checklists/Permits

Drilling
Forklifts
Electrical
Lockout/Tagout

CH2MHILL

HS&E Self-Assessment Checklist - DRILLING

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

This checklist is to be used at locations where: 1) CH2M HILL employees are potentially exposed to hazards associated with drilling operations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of a drilling subcontractor is required (complete entire checklist).

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

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

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

This specific checklist has been completed to:

- Evaluate CH2M HILL employee exposures to drilling hazards
 - Evaluate a CH2M HILL subcontractor's compliance with drilling HS&E requirements
- Subcontractors Name: _____

Check "Yes" if an assessment item is complete/correct.

Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the drilling subcontractor. Section 3 must be completed for all items checked "No."

Check "N/A" if an item is not applicable.

Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-35.

SECTION 1

Yes No N/A N/O

PERSONNEL SAFE WORK PRACTICES (3.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Only authorized personnel operating drill rig | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Personnel cleared during rig startup | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Personnel clear of rotating parts | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Personnel not positioned under hoisted loads | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Loose clothing and jewelry removed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Personnel instructed not to approach equipment that has become electrically energized | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Smoking is prohibited around drilling operation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Personnel wearing appropriate PPE, per HSP/FSI | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION 2

Yes No N/A N/O

GENERAL (3.2.1)

- 9. Aquifer evaluated for contamination, sole source and wellhead protection
- 10. Daily safety briefing/meeting conducted with crew
- 11. Daily inspection of drill rig and equipment conducted before use

DRILL RIG PLACEMENT (3.2.2)

- 12. Location of underground utilities identified
- 13. Safe clearance distance maintained from overhead powerlines
- 14. Drilling pad established, when necessary
- 15. Drill rig leveled and stabilized

DRILL RIG TRAVEL (3.2.3)

- 16. Rig shut down and mast lowered and secured prior to rig movement
- 17. Tools and equipment secured prior to rig movement
- 18. Only personnel seated in cab are riding on rig during movement
- 19. Safe clearance distance maintained while traveling under overhead powerlines
- 20. Backup alarm or spotter used when backing rig

DRILL RIG OPERATION (3.2.4)

- 21. Kill switch clearly identified and operational
- 22. All machine guards are in place
- 23. Rig ropes not wrapped around body parts
- 24. Pressurized lines and hoses secured from whipping hazards
- 25. Drill operation stopped during inclement weather
- 26. Air monitoring conducted per HSP/FSI for hazardous atmospheres
- 27. Rig placed in neutral when operator not at controls

DRILL RIG MAINTENANCE (3.2.5)

- 28. Defective components repaired immediately
- 29. Lockout/tagout procedures used prior to maintenance
- 30. Cathead in clean, sound condition
- 31. Drill rig ropes in clean, sound condition
- 32. Fall protection used for fall exposures of 6 feet or greater
- 33. Rig in neutral and augers stopped rotating before cleaning
- 34. Good housekeeping maintained on and around rig

DRILLING WASTE MANAGEMENT (3.2.6)

- 35. Drill cuttings and purge water managed and disposed properly

DRILLING AT HAZARDOUS WASTE SITES (3.2.7)

- 36. Waste disposed of according to HSP and RCRA regulations
- 37. Appropriate decontamination procedures being followed, per HSP

FORMS/PERMITS (3.3)

- 38. Driller license/certification and drill rig permit obtained
- 39. Well development/abandonment notifications and logs submitted and in project files
- 40. Water withdrawal permit obtained, where required
- 41. Dig permit obtained, where required

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

This checklist is to be used at locations where: 1) CH2M HILL employees are potentially exposed to hazards associated with forklift operations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of a subcontractor using forklifts is required (complete entire checklist).

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

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

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

- Evaluate CH2M HILL employee exposures to forklift hazards.
- Evaluate a CH2M HILL subcontractor's compliance with forklift H&S requirements.

Subcontractor's 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 HS-48.

SECTION 1

Yes No N/A N/O

PERSONNEL SAFE WORK PRACTICES (3.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Personnel maintaining safe distance from operating forklifts. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Positioning personnel in proximity to operating forklifts is avoided. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Personnel wearing high-visibility vests when close to operating forklifts. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Personnel approach operating forklifts safely. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Personnel only riding in seats equipped with seat belts. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Personnel not lifted or lowered by forklift unless approved for such use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Personnel not positioned under elevated loads or forks. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Personnel avoid placing body between mast uprights or outside running lines during operation. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Personnel instructed not to approach forklift that has become electrically energized. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

<u>SECTION 2</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
GENERAL (3.2.1)				
10. Only certified personnel operating forklifts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Daily safety briefing/meeting conducted with forklift operators.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Daily inspection of forklift and forklift accessories conducted before use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Rated capacity of forklift visible to operator.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Modifications and attachments used approved by forklift manufacturer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. High-lift forklifts have load backrest and overhead guard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Seat belts are provided and used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Backup alarm or spotter used when backing forklift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Operational horn provided and used as necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Braking system capable of stopping capacity load.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Forklifts equipped with lights for low-light operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Carbon monoxide concentrations below PEL (50ppm).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. At least one fire extinguisher available at the forklift operating area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESIGNATIONS AND LOCATIONS (3.2.2)				
23. Atmosphere/locations classified as hazardous or non-hazardous.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Only properly designated forklifts used in hazardous locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FORKLIFT OPERATION (3.2.3)				
25. Forklift operated on safe roadways and grades.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Grades ascended/descended properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Forklift operated at safe speed, kept under control at all times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Operators slow down and use horn at areas with obstructed vision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Forklifts operating in reverse when load obstructs vision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Operator keeping clear view of path of travel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Forklifts do not pass other stopped vehicles at areas with obstructed vision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Operators maintain safe distance from edge or ramps and platforms.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Overhead clearance maintained from installations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Forklifts not parked within 8 feet of center of railroad tracks. Tracks crossed diagonally.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Forklift parked correctly when operator is dismounted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Personnel platforms secured to forklift and shut off means provided on platform.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Trucks, trailers, railroad cars secured from movement before entering with forklift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Dockplates/bridgeplates secured before use; capacity not exceeded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Truck, trailer, railroad car flooring checked for weakness before forklift boarding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Operator handles only loads within rated capacity, adjusts for long or tall loads.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Loads are stabilized before forklift travel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Operator using proper tilt to stabilize load, uses caution when tilting elevated loads.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. When two forklifts lift a load in unison, operators stay in close communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FORKLIFT MAINTENANCE (3.2.4)				
44. Forklifts with unsafe conditions removed from service and tagged as such to prevent use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Forklifts repaired in designated, non-hazardous locations by authorized personnel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Battery disconnected when repairing electrical systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Additions or omissions of parts not performed without manufacturer's approval.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Good housekeeping maintained on and around forklift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Water mufflers checked daily, kept at 75% full.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Forklifts removed from service if sparks, flames, or elevated operating temperatures occur.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Suspended forklifts or forklift parts are supported prior to work under or between.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. Forklifts properly parked before fueling/battery charging.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Fueling/battery charging conducted in designated, well-ventilated area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. Fueling/battery charging areas properly equipped for task.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. No smoking in fueling/battery charging areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Spillage of fuel properly cleaned up before starting forklift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Forklifts with fuel leaks taken out of service.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CH2MHILL

H&S Self-Assessment Checklist-Electrical

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 the following locations: 1) CH2M HILL employees are exposed to electrical hazards or 2) CH2M HILL provides oversight of subcontractor personnel who are exposed to electrical hazards.

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

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

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

- Evaluate CH2M HILL employee exposure to electrical hazards
- Evaluate a CH2M HILL subcontractor's compliance with electrical safety 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 HS-23.

SECTION 1

SAFE WORK PRACTICES (3.1)

	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
1. Only qualified employees conducting installation, adjustment, etc. of electrical equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Only qualified employees working on energized electrical equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Areas under new installation or repair have sufficient guarding with physical barriers and signs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. All temporary wiring supplying electrical tool have GFCI installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Extension cords equipped with 3-wire grounding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Extension cords covered, elevated, or protected when passing through work areas and doorways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Extension cords not fastened with staples, hung from nails, or suspended with wire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Electric power tools and equipment effectively grounded or double-insulated and UL approved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Electric power tools and equipment inspected prior to use. Damaged tools tagged and removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Electric power tools and equipment operated and maintained according to manufacturer's specs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Temporary lights not suspended by their electric cords unless designed to be	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Lights are protected from contact or breakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. All electrical equipment, tools, switches, and outlets protected from environmental elements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CH2MHILL H&S Self-Assessment Checklist-Electrical

SECTION 2

Yes No N/A N/O

General Electrical Safety (3.2.1)

- 14. All electrical conductors and equipment are approved Yes No N/A N/O
- 15. Equipment installed and used in accordance with listings, labels, and certifications Yes No N/A N/O
- 16. Equipment intended to break current is sufficient for the current that must be interrupted Yes No N/A N/O
- 17. Electric equipment is firmly secured to the surface on which it is mounted Yes No N/A N/O
- 18. Electrical equipment is ventilated for cooling as required Yes No N/A N/O
- 19. Conductors requiring splicing are spliced with devices and methods designed as such Yes No N/A N/O
- 20. Electric equipment that produces sparks is enclosed or separated from combustible material Yes No N/A N/O
- 21. Electrical equipment is marked with voltage, current, wattage, or other ratings as necessary Yes No N/A N/O

Clearance Requirements and Working on/Adjacent to Exposed Energized Equipment (3.2.2)

- 22. Open conductors conform to the minimum clearances from sidewalks, traffic, etc. Yes No N/A N/O
- 23. Conductors have at least 3 ft. clearance from windows, doors, fire escapes, or similar locations Yes No N/A N/O
- 24. Conductors above roof space accessible to employees maintain minimum clearances Yes No N/A N/O
- 600 volts or less.**
- 25. Working space is provided about all electric equipment for safe operation and maintenance Yes No N/A N/O
- 26. Workspace not less than 30 inches wide in front of electrical equipment Yes No N/A N/O
- 27. Minimum headroom of working space is 6 feet 3 inches Yes No N/A N/O
- 28. Working space around electrical equipment is not used for storage Yes No N/A N/O
- 29. When normally enclosed live parts are exposed for inspection or servicing, guards are provided Yes No N/A N/O
- 30. Exposed live parts of switchboards or MCCs have at least 3 ft. working space in front Yes No N/A N/O
- 31. Live parts of electric equipment at ≥ 50 volts are adequately guarded against accidental contact Yes No N/A N/O
- Over 600 volts**
- 32. Electrical equipment over 600 volts is accessible to qualified persons only Yes No N/A N/O
- 33. Entrances to buildings, rooms or enclosures containing exposed live parts are locked Yes No N/A N/O
- 34. Exposed energized parts have a minimum clear workspace ≥ 6 ft. 6 in. high; ≥ 3 ft. wide Yes No N/A N/O
- 35. Workspace permits at least a 90-degree opening of doors or hinged panels Yes No N/A N/O
- 36. Minimum clear workspace in front of electric equipment is ≥ 3 ft. or as specified in Table 1 Yes No N/A N/O
- 37. ≥ 30 in. horizontal work space is provided for rear access to work on de-energized equipment Yes No N/A N/O
- 38. SOP HS-44 and HS-41 have been used to establish clearance requirements for overhead lines Yes No N/A N/O

Grounding (3.2.3)

- 39. A GFCI or an assured equipment grounding program is used to protect employees Yes No N/A N/O
- 40. All 120 volt, single-phase 15 and 20 ampere receptacle outlets have GFCIs. Yes No N/A N/O
- 41. A written description of the assured equipment grounding program is available at the jobsite Yes No N/A N/O
- 42. One or more qualified persons is designated to implement the assured equip. grounding program Yes No N/A N/O
- 43. Cord sets, plug/receptacle of cord sets, & equipment connected by cord/plug are inspected daily Yes No N/A N/O
- 44. Relevant equipment is tested for continuity and correct attachment to grounding conductors Yes No N/A N/O
- 45. Tests are performed when necessary but a least at intervals of 3months Yes No N/A N/O
- 46. Records of inspections and testing of each piece of equipment are maintained Yes No N/A N/O
- 47. Frames of portable generators are appropriately grounded, where applicable Yes No N/A N/O
- 48. Vehicle mounted generators are appropriately grounded, where applicable Yes No N/A N/O
- 49. Exposed noncurrent-carrying metal parts of fixed equipment are grounded, where applicable Yes No N/A N/O
- 50. Exposed metal parts of cord- and plug-connected equipment are grounded, where applicable Yes No N/A N/O
- 51. Cord- and plug-connected equipment are grounded, where applicable Yes No N/A N/O
- 52. Cord-and plug-connected portable x-ray equipment and hand lamps are grounded Yes No N/A N/O
- 53. Tools used in wet and/or conductive locations are grounded, where applicable Yes No N/A N/O
- 54. Metal parts of applicable non-electrical equipment are grounded Yes No N/A N/O

SECTION 2 (continued)

Temporary and Portable Electrical Equipment (3.2.4)

Yes No N/A N/O

55. No wiring is installed in ducts used to transport dust, loose stock or flammable vapors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. All requirements for permanent wiring have been applied to temporary wiring installations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Temporary wiring is removed immediately upon completion of construction or intended use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. All conductors are protected by over-current devices at their ampacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Runs of open conductors are located where they will not be subject to physical damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Conductors are fastened at intervals not exceeding 10 feet (3.05 m)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. No branch-circuit conductors are laid on the floor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Branch circuit conductors have separate grounding conductors, where applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. Receptacles are of the grounding type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64. Receptacles are not installed on branch circuits that supply temp. lighting, where applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. Receptacles are not connected to ungrounded conductors of multiwire circuits, where applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. Disconnecting switches or plug connectors are installed properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
67. All lamps for general illumination are protected from accidental contact or breakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
68. Metal-case sockets are grounded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
69. Temporary lights are not suspended by their electric cords unless designed to do so	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70. Portable lights used in wet locations shall be operated at 12 volts or less, or use a GFCI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
71. Flexible cords and cables are protected from damage, sharp edges, and pinch hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
72. Extension cords used with portable electric tools and appliances are of three-wire type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
73. Conductors entering boxes, cabinets, or fittings are protected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
74. All pull boxes, junction boxes, and fittings are provided with covers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
75. In energized installations, each outlet box has a cover, faceplate or fixture canopy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
76. Covers of outlet boxes have bushings installed, where applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
77. Over 600 V, pull/junction boxes have a complete enclosure for the contained conductors/cables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
78. Boxes are closed by covers securely fastened in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79. Covers for boxes are permanently marked "HIGH VOLTAGE."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80. Single-throw knife switches are connected so blades are dead in the open position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
81. Single-throw knife switches are placed so that gravity will not close them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82. Single-throw knife switches used in the inverted position have a locking device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83. Double-throw knife switches are mounted correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
84. Cabinets, boxes, fittings, etc. in damp locations are installed to prevent moisture or water from entering/accumulating within the enclosures. In wet locations the enclosures are weatherproof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85. Switches, breakers, and switchboards in wet locations are enclosed in weatherproof enclosures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
86. All conductors used for general wiring shall be insulated unless otherwise permitted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
87. Conductor insulation is of a type suitable for the voltage, operating temp., and location of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
88. Insulated conductors are distinguishable by appropriate color or other means, as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
89. Flexible cords and cables are suitable for conditions of use and location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
90. Flexible cords and cables are used only for applications specified in this SOP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
91. Flexible cords are used only in continuous lengths without splices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
92. Flexible cords are connected to devices and fittings so that strain relief is provided	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
93. Flexible cords and cables are protected by bushings where passing through covers, boxes, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
94. Portable lamps are wired w/flexible cords and plug of the polarized or grounding type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
95. Portable handlamps with metal shell, paper lined lampholders are not being used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
96. Handlamps are equipped with an insulated handle and substantial guard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
97. Metallic guards on handlamps are grounded w/a grounding conductor run within the cord	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
98. Worn or frayed electric cords or cables are not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
99. Extension cords are not fastened with staples, hung from nails, or suspended by wire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100. All wiring components and equipment in hazardous locations are maintained as appropriate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
101. Conductors or equipment are only located in the environment they are designed for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
102. Equipment approved for use in dry locations only are protected from damage by weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Personnel Protection (3.2.5)

103. Electrical equipment has been de-energizing and grounded or guarded by insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
104. Where the location of underground power is unknown, insulated gloves are provided	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 2 (continued)

Yes No N/A N/O

Personnel Protection (3.2.5) (continued)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 105. Attempts are made to locate all energized electrical circuits before work begins | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 106. Signs are posted and maintained warning employees of electrical hazards | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 107. When energized parts are exposed, barriers or guards are used to prevent accidental contact | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 108. Working space, walkways, and similar are kept clear of cords to prevent tripping hazards | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 109. Controls that are deactivated are locked out and tagged out | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Batteries (3.2.6)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 110. Unsealed batteries are located in well ventilated rooms | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 111. Racks and trays used to store batteries are substantial and resistant to electrolytic damage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 112. Floors are acid resistant or otherwise protected from acid accumulation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 113. Face shields, aprons, and rubber gloves are provided for workers handling acids or batteries | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 114. Eye wash is provided within 25 feet (7.62 m) of battery handling areas | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 115. Facilities are provided for flushing and neutralizing spilled electrolyte and for fire protection | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 116. Battery charging installations are located in designated areas | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 117. Charging apparatus are protected from damage by trucks | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 118. When batteries are being charged, vent caps are kept in place to avoid electrolyte spray | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 119. Vent caps on batteries are maintained in functioning condition | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Lockout-Tagout (3.2.7)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 120. Lockout/tagout procedures are utilized that provide emphasis on verifying de-energization | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 121. De-energization is confirmed using a 3-point testing procedure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 122. If tagout only is performed, one additional safety measure has been implemented | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

H&S Self-Assessment Checklist-Lockout/Tagout

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 the following locations: 1) Where CH2M HILL employees are exposed to equipment requiring lockout/tagout or 2) Where CH2M HILL provides oversight of subcontractor personnel who are exposed to equipment requiring lockout/tagout.

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

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

Project Name: _____ Project No.: _____

 Location: _____ PM: _____

 Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

Evaluate CH2M HILL employee exposure to equipment requiring lockout/tagout
 Evaluate a CH2M HILL subcontractor's compliance with lockout/tagout 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 HS-33.

SECTION 1

SAFE WORK PRACTICES (3.1)

	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
1. Only authorized personnel are performing lockout/tagout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Only qualified personnel working on energized equipment via energized electrical work permit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Contractor lockout/tagout programs have been verified prior to start of work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. All affected employees notified of lockout/tagout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Equipment has been shutdown using normal operating controls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. All energy sources have been isolated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Individual locks and tags have been applied to energy isolating device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Stored or residual energy has been relieve or restrained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Locked/tagged equipment has been tested to verify zero energy state	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. All safe guards have been replaced when lockout/tagout is complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Controls are positioned in the safe mode prior to lockout/tagout removal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Only individuals who apply locks/tags may remove them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Lockout is selected over tagout as preferred method of hazardous energy control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Master or duplicate keys are prohibited and lock removal is controlled by written procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Multiple work group lockout/tagout activities are coordinated on large projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 2

Yes No N/A N/O

GENERAL (3.2.1)

- 16. An energy control program is in place with appropriate procedures
- 17. Lockout or tagout is performed by trained, authorized employees only
- 18. Authorized employees are familiar with facility procedures specific to individual energy types
- 19. Employee do not attempt to start, energize or use equipment that is locked or tagged out
- 20. Affected employees are notified before and after lockout/tagout controls are applied
- 21. Locking is the preferred method of energy control
- 22. Tags are used only where locks cannot be applied
- 23. Additional safety measures are implemented in conjunction with the tagout system

LOCKOUT/TAGOUT DEVICES (3.2.2)

- 24. New or modified equipment is designed to accept a lockout device
- 25. Locks, tags, and other equipment are supplied to employees
- 26. L/T devices are singularly identified and not used for other purposes
- 27. L/T devices are capable of withstanding anticipated environmental conditions of use
- 28. L/T devices are standardized on the project by color, shape, size, print, and format
- 29. Lockout devices are substantial to prevent removal without the use of excessive force
- 30. Tagout devices and their means of attachment, are substantial to prevent inadvertent removal
- 31. L/T devices indicate the identity of the employee applying the device(s)
- 32. Tagout devices warn against hazardous conditions if equipment is energized
- 33. Tags are only removed by authorized user and never bypassed, ignored, or defeated
- 34. Tagout devices are attached at the same location as lockout devices
- 35. Tags shall be legible and understandable by all employees

INITIATING CONTROL (3.2.3)

- 36. Orderly shutdown of equipment is conducted that does not increase hazards
- 37. All devices needed to isolate equipment from energy sources are installed and/or operated
- 38. Lockout/Tagout devices are affixed to equipment by authorized employees
- 39. Lockout/Tagout devices are affixed to secure equipment in the "off" position
- 40. Tags are located as close to or at the energy isolating device
- 41. All hazardous stored or residual energy is relieved, disconnected or restrained.
- 42. Isolation of energy sources has been verified (tested) prior to start of work on equipment

RELEASING CONTROL (3.2.4)

- 43. Work area is inspected prior to removing lockout/tagout devices and re-energization
- 44. Only authorized employees who installed lockout/tagout devices are removing devices
- Written procedure is followed for the removal of lockout/tagout devices when authorized employees are not available
- 46. All affected employees are notified prior to starting equipment previously locked or tagged out

SPECIAL CONDITIONS (3.2.5)

- 47. Group lockout/tagout procedure is used for a crew or work group
- 48. Multiple crews or work groups have designated group supervisor to coordinate energy control
- 49. Designated group supervisors affix a personal lockout/tagout device
- 50. Designated group supervisor lockout/tagout devices are the last to be removed
- 51. Procedures are in place to coordinate shift or personnel change to ensure continuity
- 52. On coming shift or new personnel verify lockout/tagout prior to commencing work

Attachment 6

Behavior Based Loss Prevention System Forms

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

PRINT

SIGNATURE

Supervisor Name:

Date/Time: _____

Safety Officer Name:

Date/Time: _____

Employee Name(s):

Date/Time: _____

Project: _____ Location: _____ Date: _____

Supervisor: _____ Emergency Number(s): _____

Brief Job Descriptions:

1. _____
2. _____
3. _____
4. _____
5. _____

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

1. _____
2. _____
3. _____
4. _____
5. _____

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

1. _____
2. _____
3. _____
4. _____
5. _____

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

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

Other Potential Hazards (Describe):

Hazard Control Measures (Check all that apply):

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

FieldNotes: _____

Supervisor signature: _____

Date: _____

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

CH2MHILL

Loss Investigation Report Form

Employer Information

Company Name: _____

Project Name: _____ Project Number: _____

Project Location: _____

CHIL Project? Yes No

Task Location: _____

Job Assignment: _____ Business Group: _____

Preparer's Name: _____ Preparer's Employee Number: _____

Near Loss Incident Specific Information

Date of Incident: _____ Time of Incident: _____ a.m./p.m.

Location of incident:

Company premises

Field

In Transit

Other: _____

Address where the incident occurred: _____

Equipment Malfunction : Yes No

Activity was a Routine Task: Yes No

Describe any property damage: _____

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

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

Describe the specific incident and how it occurred:

Describe how this incident may have been prevented:

Contributing Factors (Describe in detail why incident occurred):

Date employer notified of incident: _____ To whom reported: _____

Witness Information (First Witness)

Name: _____
Employee Number (for CH2M HILL employees): _____
Address: _____
City: _____
Zip Code : _____
Phone: _____

Witness Information (Second Witness)

Name: _____
Employee Number (for CH2M HILL employees): _____
Address: _____
City: _____
Zip Code: _____
Phone : _____
Additional information or comments: _____

COMPLETE ROOT CAUSE ANALYSIS FORM

Root Cause Analysis Form

Root Cause Analysis (RCA)

Lack of skill or knowledge Lack of or inadequate operational procedures or work standards Inadequate communication of expectations regarding procedures or work standards Inadequate tools or equipment	Correct way takes more time and/or requires more effort Short cutting standard procedures is positively reinforced or tolerated Person thinks there is no personal benefit to always doing the job according to standards Uncontrollable
--	---

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

¹ RC = Root Cause; ² CF = Contributing Factors (check which applies)

Investigation Team Members

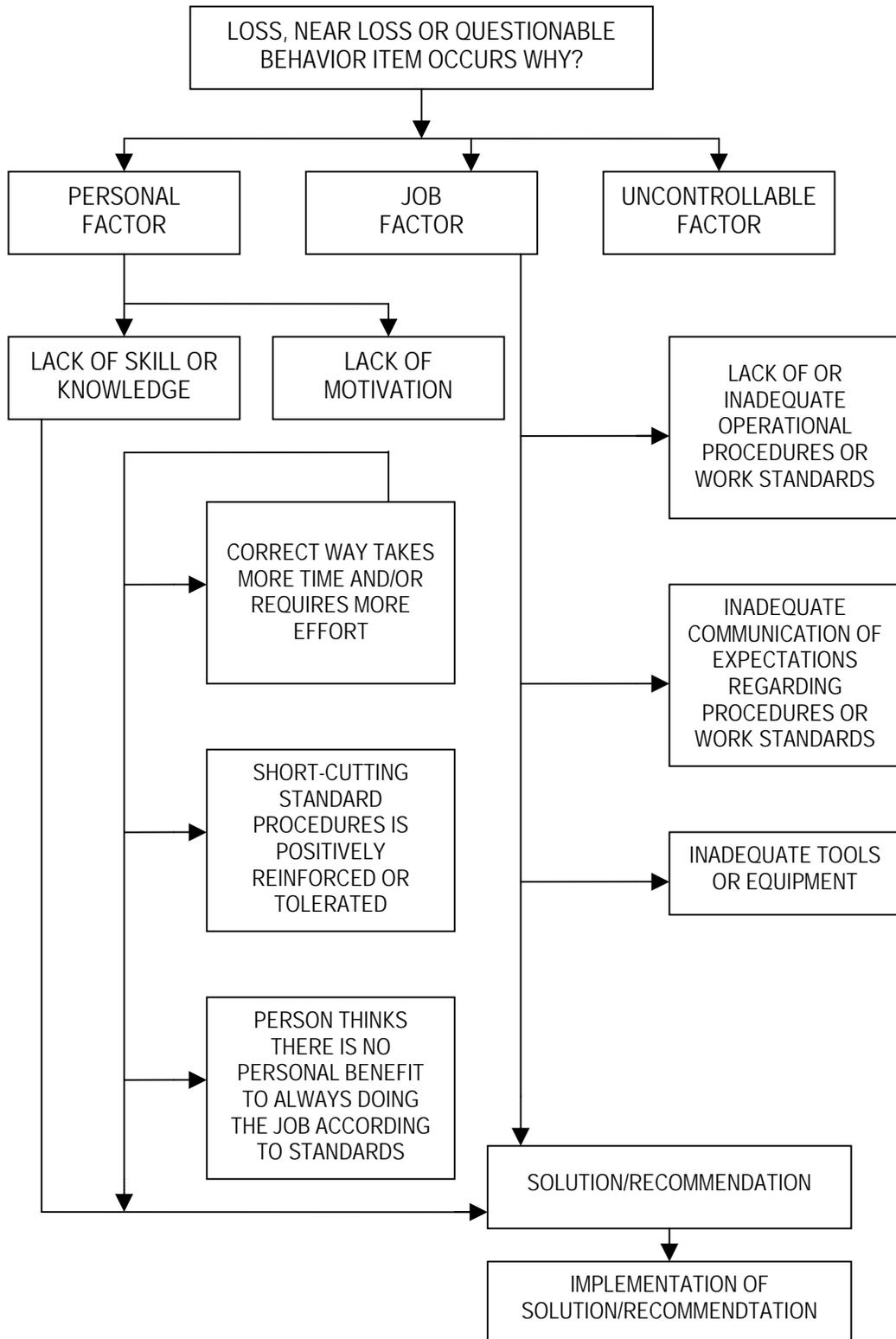
Name	Job Title	Date

Results of Solution Verification and Validation

Reviewed By

Name	Job Title	Date

Root Cause Analysis Flow Chart



Determination of Root Cause(s)

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

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

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

Personal Factors

Lack of skill or knowledge

Correct way takes more time and/or requires more effort

Short-cutting standard procedures is positively reinforced or tolerated

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

Job Factors

Lack of or inadequate operational procedures or work standards.

Inadequate communication of expectations regarding procedures or standards

Inadequate tools or equipment

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

Incident Report Form

Fax completed form to:

425.462.5957

CH2M HILL Seattle Office

Attention: Corporate HS&E Department

Type of Incident (Select at least one)

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

General Information (Complete for all incident types)

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

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

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

Location of Incident (Select one)

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

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

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

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

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

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

If CH2M HILL employee injured

Employee Name: _____ Employee Number: _____

If CH2M HILL Subcontractor employee injured

Employee Name: _____ Company: _____

Injury Type

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

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

Multiple (Specify) _____

- Muscle Spasms
- Other (Specify) _____

- Poisoning (Systemic)
- Puncture
- Radiation Effects
- Strain/Sprain
- Tendonitis
- Wrist Pain

Part of Body Injured

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

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

Multiple (Specify) _____

- Neck
- Nervous System
- Nose
- Other (Specify) _____

- Reproductive System
- Shoulder(s)
- Throat
- Toe(s)
- Upper Arm(s)
- Upper Leg(s)
- Wrist(s)

Nature of Injury

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

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

Other (Specify) _____

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

Initial Diagnosis/Treatment Date: _____

Type of Treatment

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

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

Prescription- Multiple dose

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

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

Physician Information

Name: _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Hospital Information

Name: _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Property Damage (Complete for Property Damage incidents only)

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

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

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

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

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

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

CH2M HILL Personnel Notified: _____
Client Notified: _____

Witnesses (Complete for all incident types)

Witness Information (First Witness)

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

Witness Information (Second Witness)

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

Additional Comments:

NEAR LOSS INVESTIGATION FORM

Employer Information

Company Name: _____

Project Name: _____ Project Number: _____

Project Location: _____

CHIL Project? Yes No

Task Location: _____

Job Assignment: _____ Business Group: _____

Preparer's Name: _____ Preparer's Employee Number: _____

Near Loss Incident Specific Information

Date of Incident: _____ Time of Incident: _____ a.m./p.m.

Location of incident:

Company premises Field In Transit Other: _____

Address where the incident occurred: _____

Equipment Malfunction : Yes No Activity was a Routine Task: Yes No

Describe any property damage: _____

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

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

Describe the specific incident and how it occurred:

Describe how this incident may have been prevented:

Contributing Factors (Describe in detail why incident occurred):

Date employer notified of incident: _____ To whom reported: _____

NEAR LOSS INVESTIGATION FORM

Witness Information (First Witness)

Name: _____

Employee Number (for CH2M HILL employees): _____

Address: _____

City: _____

Zip Code : _____

Phone: _____

Witness Information (Second Witness)

Name: _____

Employee Number (for CH2M HILL employees): _____

Address: _____

City: _____

Zip Code: _____

Phone : _____

Additional information or

comments: _____

Attachment 7

Applicable Material Safety Data Sheets
(available onsite)

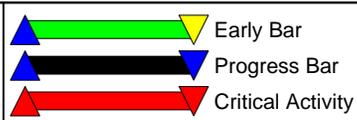
Attachment 8

Subcontractor H&S Plans/Procedures

Appendix B
Project Schedule

Activity ID	WBS	% Comp	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	2004						2005	
								J	AUG	SEP	OCT	NOV	DEC	JAN	
CTO #0026 - NAS Whiting Field, FL															
Subtotal		33		115	66	24MAY04A	29OCT04								
PHASE 3															
Subtotal		33		115	66	24MAY04A	29OCT04								
SITE 4 SOIL BORINGS															
Subtotal		33		115	66	24MAY04A	29OCT04								
FUNDING AUTHORIZATION															
AZ31000000		100	Phase 3 Award	0	0	24MAY04A									
PROJECT MANAGEMENT															
AZPMAL0101	PM.AL.01.01	48	PMO	95	46	24MAY04A	01OCT04								
AZ99220101	99.22.01.01	49	CCI Office Management	94	46	25MAY04A	01OCT04								
AZ99220102	99.22.01.02	0	CCI Field Management	47	46	29JUL04A	01OCT04								
MOBILIZATION & PREPARATORY WORK															
AZ31010394		79	Subcontractor's Pre-Con Submittals	32	7	27MAY04A	09AUG04								
AZ31010292		0	Subcontractor Mobilization	1	1	16AUG04	16AUG04								
MONITORING, SAMPLING, TEST & ANALYSIS															
AZ31020602	31.02.06.02	0	Soil Borings	34	34	16AUG04	30SEP04								
AZ31020603	31.02.06.03	0	Soil Sample Analysis	34	34	16AUG04	30SEP04								
AZ31192201	31.19.22.01	0	Non-Hazardous Liquid Disposal	30	30	20SEP04	29OCT04								
DEMOBILIZATION															
AZ31210591		0	Subcontractor Demobilization	1	1	20SEP04	20SEP04								

Start Date 24MAY04
 Finish Date 29OCT04
 Data Date 30JUL04
 Run Date 04AUG04 10:18



RAC4 - CO26 Sheet 1 of 1

CTO #0026 - NAS Whiting Field, FL
CTO COMPLETION SCHEDULE
NAVY RAC SOUTHERN DIVISION



Appendix C
Submittal Register

Appendix D

Response to Comments



CH2M HILL
1766 Sea Lark Lane
Navarre, FL 32566
Tel 850.939.8300
Fax 850.939.0035

August 2, 2004

Ms. Linda Martin, ES318
Southern Division, Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, SC 29419-9010

Subject: Contract No. N62467-98-D-0995
Contract Task Order 0094-Naval Air Station (NAS) Whiting Field-Milton, Florida
Work Plan Addendum No. 4 Remedial Design Baseline Sampling, Site 4 - North
AVGAS Tank Sludge Disposal Area, Rev. 00, April 2004

Dear Ms. Martin:

CH2M HILL is pleased to provide the responses to the Florida Department of Environmental Protection's (FDEP's) comments to the Work Plan Addendum No. 4 Remedial Design Baseline Sampling, Site 4 - North AVGAS Tank Sludge Disposal Area, Revision 00, NAS Whiting Field, Milton, Florida. Responses to the document will be incorporated into the final completion report upon approval.

Please contact me (850.939.8300, ext. 17) if you have any questions or comments regarding this material.

Sincerely,

CH2M HILL

A handwritten signature in black ink, appearing to read "Amy Twitty".

Amy Twitty, P.G.
Project Manager

cc: Mark Shull/NTR NAS Pensacola
Craig Benedikt/EPA
Jim Cason/FDEP
Terry Hansen/TtNUS
Larry Smith/TtNUS
Ron Joyner/NASWF
CCI Project File No. 275757

RESPONSE TO COMMENTS
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
WORK PLAN ADDENDUM NO. 4 REMEDIAL DESIGN BASELINE SAMPLING,
SITE 4 - NORTH AVGAS TANK SLUDGE DISPOSAL AREA, REV. 00, APRIL 2004
NAVAL AIR STATION WHITING FIELD, MILTON, FLORIDA
EPA SITE ID NO. :FL2170023244

1. Page 2-2, top of page: soil borings will be down to 80 feet BLS. Since I am in communication with Navy regarding the remediation limit proposal for Site 7 of 80 feet BLS, this number caught my attention. Is there not soil contamination below this level? Why the lower limit of assessment at 80 feet BLS? Unless the data indicate otherwise, soil contamination data below 80 feet BLS will be necessary.

***Response:** Soil samples will be collected at 20-foot intervals down to 100 feet below land surface (or the water table, whichever is encountered first). Groundwater at the site is expected to be encountered between 90 and 100 feet BLS. The work plan has been amended to reflect this change.*

2. Immediately following the discussion about the 80 feet limit, it is stated that, "four additional soil borings will be advanced in the pilot study area to determine the effectiveness of the Solar Remediation System." My impression was that that particular study was finished. Please explain the rationale.

***Response:** Since the remedial design will include the former pilot study area, and since the SRS units have been operating since the last soil sampling event in November 2002, additional borings are necessary to determine current soil conditions in the immediate area of the former pilot study.*

3. Other than the above, my only other comment is that, based on the above comments, I am unable to judge the adequacy of the proposed soil sampling, although I have no adverse comments in that regard.

***Response:** Comment noted.*



CH2M HILL
1766 Sea Lark Lane
Navarre, FL 32566
Tel 850.939.8300
Fax 850.939.0035

August 2, 2004

Ms. Linda Martin
Southern Division, Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, SC 29419-9010

Subject: Contract No. N62467-98-D-0995
Contract Task Order 0094-Naval Air Station (NAS) Whiting Field-Milton, Florida
Work Plan Addendum No. 4 Remedial Design Baseline Sampling, Site 4 - North
AVGAS Tank Sludge Disposal Area, Rev. 00, April 2004.

Dear Ms. Martin:

CH2M HILL is pleased to provide the responses to the Environmental Protection Agency's comments to the Work Plan Addendum No. 4 Remedial Design Baseline Sampling, Site 4 - North AVGAS Tank Sludge Disposal Area, Rev. 00, April 2004. Responses to the document will be incorporated into the final completion report upon approval.

Please contact me (850.939.8300, ext. 17) if you have any questions or comments regarding this material.

Sincerely,

CH2M HILL

A handwritten signature in black ink, appearing to read "Amy Twitty".

Amy Twitty
Project Manager

cc: Mark Shull/NTR NAS Pensacola
Craig Benedikt/EPA
Jim Cason/FDEP
Terry Hansen/TtNUS
Larry Smith/TtNUS
Ron Joyner/NASWF
CCI Project File No. 275757

RESPONSE TO COMMENTS
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WORK PLAN ADDENDUM NO. 4 REMEDIAL DESIGN BASELINE SAMPLING, SITE
4 - NORTH AVGAS TANK SLUDGE DISPOSAL AREA, REV. 00, APRIL 2004
NAVAL AIR STATION WHITING FIELD, MILTON, FLORIDA
EPA SITE ID NO. :FL2170023244

1. Throughout the document, the text states samples will be collected at 2-foot intervals down to 80 feet below land surface. In order to properly characterize the vadose zone and to design an appropriate remedial system for the site, samples should be collected down to the water table.

***Response:** Soil samples will be collected at 20-foot intervals down to 100 feet below land surface (or the water table, whichever is encountered first). Groundwater at the site is expected to be encountered between 90 and 100 feet BLS. The work plan has been amended to reflect this change.*

2. Page 2-2, Section 2.1.3. The fourth sentence of this section should also state the purpose of the study is to characterize the vadose zone in the area of the former pilot study.

***Response:** During the RI, soil samples were collected to the vadose zone in the area of the former pilot study. However, vadose zone samples will be collected in areas where data gaps are noted.*