

N61165.AR.004353
CNC CHARLESTON
5090.3a

WORK PLAN AND HEALTH AND SAFETY PLAN AREA OF CONCERN 724 (AOC 724) CNC
CHARLESTON SC
3/1/2003
CH2M HILL

AOC 724.

Work Plan + Health and Safety Plan.

CH2M HILL SOUTH DIV RAC N62467-01-D-0331	CONTRACTOR PRODUCTION REPORT (ATTACH ADDITIONAL SHEETS IF NECESSARY)	DATE OF REPORT: 03-17-2003 REVISION NO: 0 REVISION DATE: 0
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CTO NO. 0005	PROJECT NAME/LOCATION: AOC 724 Utility Corridor, CNC Charleston, SC	REPORT NO 001
PROJECT NO 177511	SUPERINTENDENT: Lester Hendy, ORO/CCI	SITE H&S SPECIALIST: Lester Hendy, ORO/CCI
AM WEATHER Rain Overcast	PM WEATHER Rain. Overcast.	MAX TEMP: 65 °F MIN TEMP. 54 °F

SUMMARY OF WORK PERFORMED TODAY

0700 Project Site Inspection – noted presence of suspected medical waste openly visible on previously excavated spoil piles.
0800 Frac tank delivered and set up.
1000 Pre-Construction Meeting – Attendees Listed below.
1200 Lunch.
1300 Second Site Inspection with all Pre-Construction Meeting Attendees. Discussed suspected medical waste materials present on site which were not included in the original SOW. CCI to re-evaluate current SOW and re-submit to include medical waste remediation.
1400 Begin sourcing sample taking materials to take samples of water from existing trench for analysis and characterization.
1600 Prepared AHA for proposed sampling activity. (Copy attached)
1800 Begin sample activity. CCI personnel only. Level D PPE Modified to include splash protection and Blood Borne Pathogen awareness.
1900 Complete sampling activity. Samples packed and delivered to FedEx for shipping. PPE used placed in biohazard bags for disposal.
2000 All personnel off site.

JOB SAFETY	Was A Job Safety Meeting Held This Date? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	TOTAL WORK HOURS ON JOB SITE THIS DATE (Including Continuation Sheets)
	Were there any lost-time accidents this date? (If Yes, attach copy of completed OSHA report) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	CH2MHILL On-Site Hours 48
	Was a Confined Space Entry Permit Administered This Date? (If Yes, attach copy of each permit) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	JA JONES On-Site Hours 0
	Was Crane/Manlift/Trenching/Scaffold/HV Elec/High Work/Hazmat Work Done?? (If Yes, attach statement or checklist showing inspection performed) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Subcontractor On-Site Hours 18
	Was Hazardous Material/Waste Released into the Environment? (If Yes, attach description of incident and proposed action) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Total On-Site Hours This Date 66
		Cumulative Total of Work Hours From Previous Report 0
	Total Work Hours From Start of Construction 66	

SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED (Include Safety Violations, Corrective Instructions Given, Corrective Actions Taken, and Results of Safety Inspections Conducted).

AHA prepared for waste water sampling activity. This activity not covered in original scope of works. AHA reviewed and signed by participating personnel.

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB

DESCRIPTION OF EQUIPMENT/MATERIAL RECEIVED	MAKE/ MODEL/ MANUFACTURER	EQUIPMENT/ LOT NUMBER	INSPECTION PERFORMED BY	NUMBER/ VOLUME/ WEIGHT
None				

EQUIPMENT USED ON JOB SITE TODAY.

EQUIPMENT DESCRIPTION	EQUIPMENT MAKE/MODEL	SAFETY CHECK PERFORMED BY	NUMBER OF HOURS		
			USED	IDLE	REPAIR
Frac Tank		L Hendy – CCI	8	0	0
Trackhoe		C Richardson – USA Environmental			

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

VISITORS TO THE SITE: Rob Harrel – Navy RPM, Bill Mieke – RDA, Gene Isley- RDA, Tom Deer- CR Hipp Co., Andy ? – CR Hipp Co.

LIST OF ATTACHMENTS: Water Sampling Activity AHA.

SAFETY REQUIREMENTS HAVE BEEN MET <input checked="" type="checkbox"/>	 SUPERINTENDENT'S SIGNATURE	03-17-2003 DATE
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CH2M HILL SOUTH DIV RAC IV		CONTRACTOR QUALITY CONTROL REPORT (ATTACH ADDITIONAL SHEETS IF NECESSARY)			DATE 03-17-2003	
CTO NO: 005		PROJECT NAME/LOCATION: Excavation of AOC 724 Utility Corridor, Charleston Naval Complex, Charleston, SC			REPORT NO: 001	
PROJECT NO: 177511		PROJECT QC MANAGER: Gwendolyn Jordan		SITE H&S SPECIALIST: Lester Hendy		
SAMPLING/TESTING PERFORMED						
SAMPLING/TESTING PERFORMED		SAMPLING/TESTING COMPANY		SAMPLING/TESTING PERSONNEL		
Sample [REDACTED]		Kemron/Ch2m Hill		Ed Woodford/Gwendolyn Jordan		
MATERIALS/EQUIPMENT INSPECTION (Materials received and inspected against specifications)						
MATERIAL/EQUIPMENT DESCRIPTION		SPECIFICATION	MATERIAL ACCEPTED?		COMMENT/REASON/ACTION	
Frac Tank 20 K		WMP	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		Frac tank contained a oily substance not visible in excavation but visible on water once pumped into frac tank	
Sample Containers		SAP	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>			
			YES <input type="checkbox"/> NO <input type="checkbox"/>			
SUBMITTALS INSPECTION / REVIEW						
SUBMITTAL NO	SUBMITTAL DESCRIPTION		SPEC/PLAN REFERENCE	SUBMITTAL APPROVED?		COMMENT/REASON/ACTION
				YES <input type="checkbox"/> NO <input type="checkbox"/>		
				YES <input type="checkbox"/> NO <input type="checkbox"/>		
				YES <input type="checkbox"/> NO <input type="checkbox"/>		
				YES <input type="checkbox"/> NO <input type="checkbox"/>		
OFF-SITE SURVEILLANCE ACTIVITIES, INCLUDING ACTIONS TAKEN:						
ACCUMULATION/STOCKPILE AREA INSPECTION						
INSPECTION PERFORMED BY:		SIGNATURE OF INSPECTOR:				
ACCUMULATION/ STOCKPILE AREA LOCATION						
NO OF CONTAINERS:		NO OF TANKS:	1	NO OF ROLL-OFF BOXES:		NO OF DRUMS:
INSPECTION RESULTS:						
TRANSPORTATION AND DISPOSAL ACTIVITIES/SUMMARY/QUANTITIES:						
As of date approximately 4000 gallons stored in frac tank.						
GENERAL COMMENTS (rework, directives, etc.):						
Stop work activities issued after site walk following Pre-Construction and Coordination and Mutual Understanding Meeting. CCI and its subcontractors did not excavate any soils from open corridor area. A [REDACTED] sampling, required PPE obtained prior to sampling and w [REDACTED]						
LIST OF ATTACHMENTS (examples, as applicable: preparatory phase checklist, QC meeting minutes, safety meeting minutes, crane inspections, crane operation checklist, COCs, weight tickets, manifests, profiles, rework item list, testing plan and log, etc.):						
COC 177511-01-031703,						
On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.				03-17-2003		
				 PROJECT QC MANAGER'S SIGNATURE		DATE
On behalf of the contractor, I attest that the work for which payment is requested, including stored material, is in compliance with contract requirements.				03-17-2003		
				 PROJECT QC MANAGER'S SIGNATURE		DATE

CH2M HILL SOUTH DIV RAC IV		CONTRACTOR QUALITY CONTROL REPORT (ATTACH ADDITIONAL SHEETS IF NECESSARY)		DATE 03-17-2003	
CTO NO: 005		PROJECT NAME/LOCATION: Excavation of AOC 724 Utility Corridor, Charleston Naval Complex, Charleston, SC		REPORT NO: 001	
PROJECT NO: 177511		PROJECT QC MANAGER: Gwendolyn Jordan	SITE H&S SPECIALIST: Lester Hendy		
SAFETY MEETINGS AND INSPECTIONS					
WAS A SAFETY MEETING HELD THIS DAY?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	IF YES, ATTACH SAFETY MEETING MINUTES	
WAS CRANE USED ON THE SITE THIS DAY?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	IF YES, ATTACH DAILY CRANE REPORT OF INSPECTION AND CONTRACTOR CRANE OPERATION CHECKLIST	
DEFINABLE FEATURES OF WORK STATUS					
DFOW No.	Definable Feature Of Work		Preparatory	Initial	Follow-Up
1	Mobilization and Site Preparation		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PREPARATORY	WAS PREPARATORY PHASE WORK PERFORMED TODAY? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
	IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST				
	DFOW No.(from list above).	TASK/ACTIVITY		PREPARATORY PHASE REPORT NO.	
	1	Mobilization and Site Preparation		177511-PPR-001	
INITIAL AND FOLLOW-UP FEATURE OF WORK COMMENTS					
DFOW No.(from list above)	Phase	Comment/Finding/Action			
001	Initial <input checked="" type="checkbox"/> Follow up <input type="checkbox"/>	USA Environmental received excavator and frac tank on-site . Began pumping water from the open excavation left on site by C.R.Hipp Construction. Pumped approximately 4000 gallons of water into the frac tank. Water was pumped into the frac tank 3ft pumping 2 hours later. During site walk discovered that soil excavated and stockpiled next to open excavation by Utility Installation Subcontractor contained materials that were typical of medical waste (sharps, needles, syringes, and other materials) also visible in the excavation to be hazardous . Materials were deemed non hazardous and flagged .Stop work activities issued and personnel instructed to leave site to contact and discuss path forward.			
	Initial <input type="checkbox"/> Follow up <input type="checkbox"/>				
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)			REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)		
TASK/ACTIVITY	DATE ISSUED	DESCRIPTION	TASK/ACTIVITY	CORRECTIVE ACTION(S) TAKEN	

DETAILED ACTIVITY HAZARD ANALYSIS

Task: Water Sampling	Date: March 17, 2003
	Project: CNC Charleston, CTO – 0005
Description of the work: Extracting water samples for analysis.	Site Supervisor: Lester Hendy, ORO/CCI
	Site Safety Officer: Lester Hendy, ORO/CCI
	Review for latest use: Before the job is performed.

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
Collect Samples Fill Sample Containers Pack Filled Sample Containers into Cooler for Shipping.	Possible Blood Borne Pathogen contamination from unknown medical waste previously excavated from trench. Water has Unknown Chemical Properties. Possible breakage and splash hazards.	CCI Personnel involved will be trained to CH2Mhill SOP HS 36 – Blood Borne Pathogens. (BBP's) Persons extracting and handling samples will be required to use PPE to Level D Modified. Splash protection to include: Poly coated Tyvek, Face Shield, Steel Shank/Puncture Resistant Boots, Double layered gloves (nitrile) Persons handling samples will be required to wear PPE to Level D Modified, to include safety glasses, nitrile gloves, and splash protection to avoid skin contact with possible BBP's
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
PPE First Aid Kit Teflon Bailers Sample Containers. Cooler for shipping	None Check for correct fitting tops to avoid leakage after filling. Ensure stability of contents to avoid possible breakage/damage during shipping	40 Hour Training per 29 CFR 1910 120 Site Orientation Correct use of equipment to extract suitable samples. Knowledge of packing requirements to ensure samples are received by lab in satisfactory condition

PRE-CONSTRUCTION MEETING AGENDA

Meeting Date:	March 17, 2003	Prepared by:	Gwendolyn Jordan
Meeting Location:	CNC	Date Prepared:	
Project Name/Location:	Charleston , SC	CTO No	0005
Project No.	177511	Contract No:	
Task/Activity/Site:			
Attendees:	Gwendolyn Jordan	Lester Hendy	
	Greg Wilfley		
Copies to:			

The Preconstruction and Coordination and Mutual Understanding Meeting will be combined. The Purpose for each scope of the meeting is discussed below.

Preconstruction Meeting

Purpose: The purpose of this meeting is to ensure that all parties involved in the project understand and agree on the scope of work, schedule, submittal requirements, documentation requirements, change management processes and procedures, construction means and methods, reporting and communication requirements, health and safety requirements and protocols, etc.

Coordination and Mutual Understanding

Purpose: The purpose of this meeting is to develop a mutual understanding of the QC details, including forms to be used; administration of on-site and off-site work; schedule and method for transmitting submittals; and coordination of CCI's management, production, and the Project QC Manager's duties with the Contracting Officer or designated representative.

- I. Introduction
 - A. Meeting attendees introduction
 - B. Purpose of the meeting
- II. Review of Scope of Project
 - A. Overview of base activities
 - B. Review CTO-specific scope of work

PRE-CONSTRUCTION MEETING AGENDA

- III. Communications
 - A. Project communication links
 - 1. Offsite contacts
 - a. Operations
 - b. Accounts payable/accounts receivable
 - c. Subcontracts
 - 2. Onsite contacts
 - a. Site management
 - b. Quality control
 - c. Health and safety
 - 3. Communication
 - a. Timely and open
 - b. Confidentiality
- IV. Health and safety
 - A. Employee paperwork
 - B. Activity hazard analysis
 - C. Meetings
 - D. Conduct
 - E. Emergency procedures
- V. Submittals (Subcontractor and Navy)
 - A. Daily reports (CPR and CQCR)
 - B. Monthly invoicing (DBA and schedule of values)
 - C. Sampling / analytical records
 - D. Testing reports
 - E. Waste disposal packages (characterization data, profiles, manifest)
 - F. Waste documentation (facility-signed manifests, weight tickets, certificates of disposal/destruction/recycling)
- VI. Change Management
 - A. Request for information

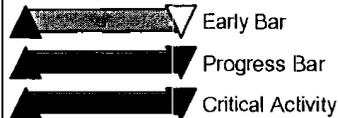
PRE-CONSTRUCTION MEETING AGENDA

- B. Change in scope of work
 - C. Change approval prior to initiating work
 - D. Change in work plans
- VII. Weekly Meetings
- A. Progress meetings
 - B. QC meetings
- VIII. Schedule
- VIII. Operations
- A. Construction means and methods
 - B. Personnel, equipment, resources

_____	_____
CH2M Hill Representative	Title
_____	_____
Subcontractor's Representative	Company/Title
_____	_____
Subcontractor's Representative	Company/Title
_____	_____
Subcontractor's Representative	Company/Title
_____	_____
Subcontractor's Representative	Company/Title

Act IL	WBS	% Comp	Activity Description	Orig Dur	Rem Dur	ly Part	Early Finish	2003			
								MAR	APR	MAY	JUN
CTO #0005 - CNC - Charleston, SC											
Subtotal		29		68	55	20FEB03A	27MAY03				
PHASE 3											
Subtotal		29		68	55	20FEB03A	27MAY03				
AOC 724 UTILITY CORRIDOR											
Subtotal		29		68	55	20FEB03A	27MAY03				
FUNDING AUTHORIZATION											
AE3100000		100	Phase 3 Award - NTP	0	0	20FEB03A					
PROJECT MANAGEMENT											
AE3100101	FMAL.01.01	50	PMD	106	53	20FEB03A	22MAY03				
AE3100201	9922.01.01	27	Project Management	73	53	20FEB03A	22MAY03				
PRE-CONSTRUCTION PLANS & SUBMITTALS											
AE31010390	31.01.03.90	100	OE Avoidance Plan	10	0	24FEB03A	07MAR03A				
AE31010391		100	South Div Review & Comment	2	0	10MAR03A	11MAR03A				
MOBILIZATION & PREPARATORY WORK											
AE31010290	31.01.02.90	0	Subcontractor Mobilization	1	1	17MAR03	17MAR03				
AE31010102		0	CCI Mobilization	1	1	17MAR03	17MAR03				
AE31010103	99.01.01.03	0	Kick-Off Meeting/Site Preparation	1	1	17MAR03	17MAR03				
AE31010291		0	Subcontractor Mobilization	1	1	09APR03	09APR03				
AE31010101	99.01.01.01	0	CCI Mobilization	1	1	09APR03	09APR03				
ENGINEERING, SURVEY & QC											
AE31220410	31.22.04.10	0	Surveying	5	5	17MAR03	21MAR03				
SAMPLING & ANALYSIS											
AE31020305	31.02.03.05	0	Waste Characterization	15	15	19MAR03	08APR03				
AE31021492	31.02.14.92	0	Data Evaluation & Management	15	15	19MAR03	08APR03				
ORDNANCE & EXPLOSIVES											
AE31040109	31.04.01.09	0	Corridor Excavation	2	2	18MAR03	19MAR03				
TRANSPORTATION AND DISPOSAL											
AE31192092	31.19.20.92	0	Stockpile Materials/Maint.	19	19	18MAR03	11APR03				
AE31192090	31.19.20.90	0	Load-Out Material	2	2	10APR03	11APR03				
AE31192290	31.19.22.90	0	T&D - Subtitle D Landfill - 700 TN	2	2	10APR03	11APR03				
SITE RESTORATION											
AE31200103	31.20.01.03	0	Purchase Backfill	3	3	18MAR03	20MAR03				

Start Date 18DEC02
 Finish Date 27MAY03
 Data Date 11MAR03
 Run Date 12MAR03 09:38



RAC4 - C005

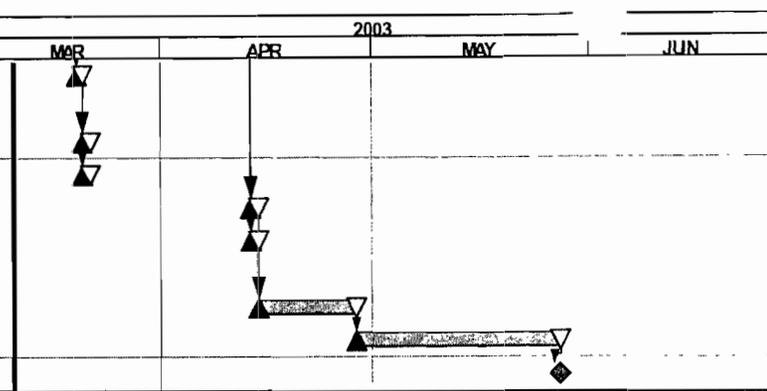
Sheet 1 of 2

CTO #0005 - CNC - Charleston, SC
 CTO COMPLETION SCHEDULE
 NAVY RAC SOUTHERN DIVISION



CH2MHILL
 Constructors, Inc.

Acti ID	WBS	% Comp	Activity Description	Orig Dur	Rem Dur	y Start	Early Finish	2003			
								MAR	APR	MAY	JUN
AE31200106	31.2001.06	0	Spread Backfill	1	1	20MAR03	20MAR03				
DEMOBILIZATION											
AE31210690	31.21.06.90	0	Subcontractor Demobilization	1	1	21MAR03	21MAR03				
AE99210601	99.21.06.01	0	CCI Demobilization	1	1	21MAR03	21MAR03				
AE31210691		0	Subcontractor Demobilization	1	1	14APR03	14APR03				
AE99210602		0	CCI Demobilization	1	1	14APR03	14APR03				
POST CONSTRUCTION											
AE31210692	31.21.06.92	0	Sub's Post-Con Submittals	10	10	15APR03	28APR03				
AE31210696	31.21.06.96	0	Project Completion Report	20	20	29APR03	27MAY03				
AE31210697		0	Submit Project Completion Report	0	0		27MAY03				



CTO-005

**Borrow Source Soil
Hits Only Tabl**

Sample No: 82-103002BKF2

Backfill

Sample collected 10/30/02

Parameter	Result	Region III RBCs for Residential Soil	Zone H Background Concentration for Soil *
Mercury	J 0.0107	NL	
Aluminum	19,600	78,214	
Arsenic	1.19	0.43	9.3
Barium	21.9	5,475	
Beryllium	J 0.0779	156	1.7
Cadmium	J 0.0537	39	
Calcium	13.9	NL	
Chromium	12.3	235	
Cobalt	0.554	1,564	
Copper	J 0.474	3,129	426
Iron	6,210	23,464	
Lead	8.57	NL	
Magnesium	141	NL	
Manganese	5.34	1,564	
Nickel	4.25	1,564	
Potassium	86.1	NL	
Selenium	J 0.534	391	
Sodium	11.7	391	
Vanadium	21.5	548	22.7
Zinc	2.82	23,464	3,382

All Results and Limits in mg/kg

All 8260 volatile organic compounds were non-detect with a reporting limit of < 0.00517 mg/kg

All 8270 semivolatile organic compounds were non-detect with a reporting limit of < 0.386 mg/kg

All 8270 Poly Aromatic Hydrocarbon compounds were non-detect with a reporting limit of < 0.0386 mg/kg

All 8081 single component pesticides were non-detect with a reporting limit of < 0.00154 mg/kg

Chlordane was non-detect with a reporting limit of < 0.00965 mg/kg

Methoxychlor was non-detect with a reporting limit of < 0.00772 mg/kg

Toxaphene was non-detect with a reporting limit of < 0.0386 mg/kg

All herbicides were non-detect with a reporting limit of < 0.0116 mg/kg

All 8082 Arochlors (PCBs) were non-detect with a reporting limit of < 0.00386 mg/kg

Data from: Ensafe Inc. Zone H RFI Report, NAVBASE Charleston. Revision 0. July 1996, with update on June 24, 1997, and June 18, 1998.

Activity Hazard Analysis (AHA)

Activity: UXO Avoidance Support	Date: March 2003
	Project: CTO-0005
Description of the work: Employ approved UXO avoidance techniques and methods during trenching and excavating operations.	Site Supervisor: Greg Wilfley/ATL
	Site Safety Officer:
	Review for latest use: Each time before the job is performed

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
Locate Anomalies/surface OE	Potential OE. Unplanned detonations.	Observe all OE safety precautions, such as movement, heat, shock, and friction Only UXO trained personnel will locate anomalies. Only UXO qualified personnel will escort non-UXO personnel. Be Alert Mark and report any OE encountered Establish Exclusion Zones based on the known hazards. Only UXO qualified personnel will handle OE items if encountered Wear the appropriate PPE for the task being performed. Keep personnel to a minimum during operations. Properly position personnel for observing spoils for OE/UXO and establish safety arc prior to commencing operations. Use and enforce the buddy system. Ensure 1 st . Aid Kits and Fire Extinguishers are in place No smoking, except in designated areas.
Identify/Mark Anomalies/surface OE.	Potential OE Unplanned Detonations Unauthorized personnel.	Observe all OE safety precautions, and follow safe work practices. Identification of OE items will be made by 2 UXO qualified personnel. Be alert. Cease operations if unsafe conditions arise Identify safety/hazardous zones of operations. Maintain positive site control, cease operations if unauthorized entry is made, do not allow entry into the trench/excavation without proper engineering controls and equipment. Cease operations if unauthorized personnel enter the area Keep personnel to a minimum during operations.
Avoid Anomalies/surface OE	Potential OE. Unplanned Detonations.	Mark, avoid and report all OE/UXO encountered. Do not allow unauthorized personnel into the area of operations Maintain positive site control and enforce safe separation

Activity Hazard Analysis (AHA)

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
		distances Record all OE/UXO encountered by size, type, condition, and location
	Wildlife, insects, poisonous/toxic plants Sunburn/windburn, slips, trips, and falls. Heat and cold stress	Avoid and do not handle wildlife IAW the SSHP briefing. Use insect repellent as necessary. Avoid suspect plants IAW the SSHP briefing. Use barrier creams/ointments as necessary. Decontaminate person and equipment as necessary Use sunscreen/barrier cream as necessary. Be aware of footing and terrain, watch for slips, trips, and falls hazards. Avoid obstacles when possible. Wear approved and appropriate work boots Dress for the weather, in layers of removable clothing. Drink the appropriate fluids on a frequent basis Know the signs and symptoms of Heat and Cold Stress Enforce buddy system monitoring Observe safe work practices, operating precautions, and instructions for the equipment in use. Wear the proper PPE for the task being performed.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Magnetometer. Communications Equipment. OE/UXO flagging material First Aid Kit. PPE	Daily serviceability check of instrument. Daily communications checks. Type and quantity check of flagging material. Daily checks of first aid kits and weekly inventory of kits. Daily check for serviceability, fit, and comfort of PPE	Instrument familiarity as required Knowledge of the Emergency Response and Notifications procedures IAW the SSHP Techniques for OE/UXO avoidance First Aid and CPR training as required by the SSHP Safe work practices and precautions associated with task being performed IAW the WP. Specific response training IAW the WP/SSHP Personnel will meet requirements IAW the applicable regulations for the training and use of PPE Evacuation and emergency procedures IAW the SSHP. UXO identification and safety precautions for UXO and Non-UXO personnel IAW the WP/SSHP. OSHA qualifications and training as required IAW the WP/SSHP.

Activity Hazard Analysis (AHA)

PRINT

SIGNATURE

Supervisor Name:

Date/Time:

Safety Officer Name:

Date/Time:

Employee Name(s):

Date/Time:

Activity Hazard Analysis (AHA)

Activity: Operation of Earth Moving Machines	Date: March 2003
	Project: CTO-0005
Description of the work: Use EMM to remove soil from a utility corridor 10' wide by 6' deep by 200' long.	Site Supervisor: Greg Wilfley/ATL
	Site Safety Officer:
	Review for latest use: Each time before the job is performed

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
Placement of EMM for operations	Potential OE Equipment accident. Fuel/oil spills. Unauthorized entry of personnel.	Observe all OE safety precautions, and follow safe work practices Be Alert. Mark and report any OE encountered Wear the appropriate PPE for the task being performed Only EMM qualified personnel will operate equipment Follow and complete all checklist that apply to operation, equipment, and task being performed Keep personnel at a safe distance during movement of EMM. Ensure personnel have communications capability. Ensure spills containment materials for EMM are available. Properly position EMM and establish safety arc, and post barriers and barricades as necessary prior to commencing operations. Use and enforce the buddy system. Ensure 1 st . Aid Kits and Fire Extinguishers are in place No smoking, except in designated areas Be alert Cease operations if unsafe conditions arise. Check area before moving/ backing equipment, ensure backup signal is working. Ensure all personnel wear Level D PPE to include: hardhat, steel toed work boots, safety glasses, gloves, and hearing protection as needed. Maintain positive site control, cease operations if unauthorized entry is made, do not allow entry into the trench/excavation without proper engineering controls and equipment. Cease operations if unauthorized personnel enter the area.
EMM operation.	Unintentional detonation Equipment accident. Personnel injury.	Observe all OE safety precautions, do not move EMM through areas without clearance Be Alert. Mark and report any suspect OE encountered. Observe approved trenching techniques, methods, and trench

Activity Hazard Analysis (AHA)

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
		placement requirements to ensure safe operations. Traverse EMM using care, use ground guide, verbal communications, and hand signals as needed. Use approved checklist or follow the manufactures recommendation for EMM operations, checks, services, cautions, and warnings Wear appropriate PPE for the task being performed to include hard hat, safety boots, vest, and hearing protection as deemed necessary. Cease operations and report unsafe conditions should they arise.
	Wildlife, insects, poisonous/toxic plants. Sunburn/windburn, slips, trips, and falls Heat and cold stress Cuts and crushing hazards	Avoid and do not handle wildlife IAW the SSHP briefing Use insect repellent as necessary Avoid suspect plants IAW the SSHP briefing Use barrier creams/ointments as necessary Use sunscreen/barrier cream as necessary. Be aware of footing and terrain, watch for slips, trips, and falls hazards. Avoid obstacles when possible Wear approved and appropriate work boots. Dress for the weather, in layers of removable clothing. Drink the appropriate fluids on a frequent basis. Know the signs and symptoms of Heat and Cold Stress Enforce buddy system monitoring. Observe safe work practices, operating precautions, and instructions for the equipment in use. Wear the proper PPE for the task being performed Use care when handling material, and equipment watch for sharp edges and contaminated surfaces. Do not insert extremities into, over, around, or under equipment having pinch points, cutting, crushing, or burning hazards.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
EMM Communications Equipment Fire Extinguishers. First Aid Kits. Spills Containers and Handling Equipment. PPE.	Daily PMCS for EMM. Load limit checked on data plate. Daily communications checks Daily checks of fire extinguishers. Daily checks of first aid kits and weekly inventory of kits Serviceability and quantity check of spills containment material. Daily check for serviceability, fit, and comfort of PPE.	Valid drivers license/operators permit/certificate. EMM familiarity as required prior to operations commencing. Knowledge of the Emergency Response and Notifications procedures IAW the SSHP Limitations and placement of extinguishers IAW the SSHP. Techniques for the use of extinguishers IAW the SSHP. Size and type of extinguisher required by task IAW the SSHP. First Aid and CPR training as required by the SSHP. Universal safety precautions for bloodborne pathogens IAW the SSHP Safe work practices and precautions associated with task being performed IAW the WP Equipment inspection, quantity, and type IAW the WP/SSHP and Spills Containment. Specific response training IAW the WP/SSHP.

Activity Hazard Analysis (AHA)

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
		Personnel will meet requirements IAW the applicable regulations for the training and use of PPE. Evacuation and emergency procedures IAW the SSHP. UXO identification and safety precautions for UXO and Non-UXO personnel IAW the WP/SSHP. OSHA qualifications and training as required IAW the WP/SSHP

Activity Hazard Analysis (AHA)

PRINT

SIGNATURE

Supervisor Name:

Date/Time:

Safety Officer Name:

Date/Time:

Employee Name(s):

Date/Time:

Activity Hazard Analysis (AHA)

Activity: Trenching and Excavating Operation	Date: March 2003
	Project: CTO-0005
Description of the work: Trenching and excavation of soil removed from a utility corridor 10' wide by 6' deep by 200' long utilizing EMM.	Site Supervisor: Greg Wilfley/ATL
	Site Safety Officer:
	Review for latest use: Each time before the job is performed

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
Placement and positioning of EMM for trenching and excavations	Potential OE. Unplanned detonations. Fuel/oil spills.	Observe all OE safety precautions, and follow safe work practices. Be Alert Mark and report any OE encountered Only UXO qualified personnel will handle OE items if encountered. Wear the appropriate PPE for the task being performed. Only EMM qualified personnel will operate equipment. Follow all checklist that apply to operation Keep personnel to a minimum during operations Ensure personnel remain clear during placement of EMM Ensure spills containment materials for EMM are available Properly position EMM and establish safety arc prior to commencing operations. Use and enforce the buddy system. Ensure 1 st . Aid Kits and Fire Extinguishers are in place. No smoking, except in designated areas.
Trenching and Excavating of soil.	Trench wall failure. Unauthorized entry of personnel	Post signs and safety barriers/barricades as required by 29 CFR 1926.650. Observe all OE safety precautions, and follow safe work practices Be alert. Cease operations if unsafe conditions arise. Identify safety/hazardous zones of operations Check area before moving/ backing equipment, ensure backup signal is working Ensure all personnel wear Level D PPE to include hardhat, steel toed work boots, safety glasses, gloves, and hearing protection as needed. Ensure proper sloping of trench walls and placement of spoils IAW 29 CFR 1926 650 Ensure personnel remain at a safe distance from trench opening Maintain positive site control, cease operations if unauthorized entry is made, do not allow entry into the trench/excavation without

Activity Hazard Analysis (AHA)

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
		<p>proper engineering controls and equipment. Cease operations if unauthorized personnel enter the area. Have oversight by a competent person, as defined by OSHA in 29 CFR 1926.650, for daily inspections, soils evaluations, and decisions regarding trenching, sloping, and safe to enter requirements for personnel during routine and emergency conditions.</p>
	<p>Wildlife, insects, poisonous/toxic plants. Sunburn/windburn, slips, trips, and falls. Heat and cold stress. Cuts and crushing hazards</p>	<p>Avoid and do not handle wildlife IAW the SSHP briefing Use insect repellent as necessary Avoid suspect plants IAW the SSHP briefing. Use barrier creams/ointments as necessary. Decontaminate person and equipment as necessary. Use sunscreen/barrier cream as necessary. Be aware of footing and terrain, watch for slips, trips, and falls hazards. Avoid obstacles when possible Wear approved and appropriate work boots. Dress for the weather, in layers of removable clothing Drink the appropriate fluids on a frequent basis. Know the signs and symptoms of Heat and Cold Stress. Enforce buddy system monitoring Observe safe work practices, operating precautions, and instructions for the equipment in use Wear the proper PPE for the task being performed Use care when handling material, and equipment watch for sharp edges and contaminated surfaces. Do not insert extremities into, over, around, or under equipment having pinch points, cutting, crushing, or burning hazards.</p>
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>EMM Communications Equipment Fire Extinguishers. First Aid Kits. Spills Containers and Handling Equipment. PPE.</p>	<p>Daily PMCS for EMM Load limit checked on data plate Daily communications checks. Daily checks of extinguishers. Daily checks of first aid kits and weekly inventory of kits. Serviceability check of spills containment material. Daily check for serviceability, fit, and comfort of PPE.</p>	<p>Valid drivers license/operators permit/certificate. Competent person training IAW 29 CFR 1926.650. EMM familiarity as required. Equipment familiarity. Knowledge of the Emergency Response and Notifications procedures IAW the SSHP Limitations and placement of extinguishers IAW the SSHP. Techniques for the use of extinguishers IAW the SSHP. Size and type of extinguisher required by task IAW the SSHP. First Aid and CPR training as required by the SSHP. Universal safety precautions for bloodborne pathogens IAW the SSHP Safe work practices and precautions associated with task being performed IAW the WP Equipment inspection, quantity, and type IAW the WP/SSHP and Spills SOP Specific response training IAW the WP/SSHP.</p>

Activity Hazard Analysis (AHA)

Task Breakdown	Identify & Analyze the Hazards	Identify Hazard Controls
		Personnel will meet requirements IAW the applicable regulations for the training and use of PPE.
		Evacuation and emergency procedures IAW the SSHP. UXO identification and safety precautions for UXO and Non-UXO personnel IAW the WP/SSHP. OSHA qualifications and training as required IAW the WP/SSHP.

PRINT

SIGNATURE

Supervisor Name:

Date/Time:

Safety Officer Name:

Date/Time:

Employee Name(s):

Date/Time:

Activity Hazard Analysis (AHA)

Date/Time: _____



CH2MHILL
Constructors, Inc.

TRANSMITTAL

To: Mr. Lawrence Moss
ROICC Charleston
2120 Quality Circle
Goose Creek, SC 29445

From: Greg Wilfley
CH2M HILL Constructors, Inc.
115 Perimeter Center Pl., N.E.
Suite 700
Atlanta, GA 30346

Date: March 12, 2003

Contract: Navy Contract # N62467-01-R-0331

CTO: Contract Task Order No. 0005
Charleston Naval Complex (CNC) – Charleston, South Carolina

Re: Activity Hazard Analysis (AHA's) for OE/UXO Subcontractor – USA
Environmental, Inc.

Quantity	Description
1	<i>AHA – UXO Avoidance Support</i>
1	<i>AHA – Operation of Earth Moving Machines</i>
1	<i>AHA – Trenching and Excavating Operation</i>

If material received is not as listed, please notify us at once

CC: Mark Hitchcock/CCI
Theresa Rojas/CCI
CCI Project File No. 177511AHA

Work Plan No. 01
Excavation of AOC 724 Utility Corridor
Charleston Naval Complex
Charleston, South Carolina

Contract No. N62467-01-D-0331
Contract Task Order No. 0005

Revision 00

Submitted to:

U.S. Naval Facilities
Engineering Command
Southern Division

Prepared by:



CH2MHILL
Constructors, Inc.

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

March 2003

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Acronyms and Abbreviations

AFCEE	Air Force Center for Environmental Excellence
AHA	Activity Hazard Analysis
AOC	Area of Concern
bgs	below ground surface
BIP	blow in place
CEHNC	U.S. Army Engineering and Support Center, Huntsville
CNC	Charleston Naval Complex
COC	Chain of Custody
CTO	Contract Task Order
CWM	Chemical Warfare Material
DOD	Department of Defense
EISOPQAM	Environmental Investigative Standard Operating Procedures and Quality Assurance Manual
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
EZ	Exclusion Zone
FSP	Field Sampling Plan
GPS	Global Positioning System
HE	High Explosives
IDLH	Immediately Dangerous to Life and Health
IRCDQM	Navy Installation Restoration Chemical Data Quality Manual
IRP	Installation Restoration Program
lb	pound
mm	millimeters
MSDS	Material Safety Data Sheet
MEC	Munitions and Explosives of Concern
NAVFAC	Naval Facilities Engineering Command
ORS	ordnance related scrap
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
RDA	Redevelopment Authority
ROICC	Resident Officer in Charge of Construction

RPM	Remedial Project Manager
SOP	Standard Operating Procedures
SOW	Scope of Work
SSHO	Site Safety and Health Officer
TAT	turnaround time
TSDF	treatment, storage and disposal facility
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance

1.0 Introduction

CH2M HILL Constructors, Inc. (CCI) has been contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command (Southern Division, NAVFAC), to prepare this Work Plan. This document addresses the scope of work (SOW) for excavation of a utility corridor at Area of Concern (AOC 724) on Charleston Naval Complex (CNC), Charleston, South Carolina. The work is being performed under Contract No. N62467-01-D-0331, Contract Task Order (CTO) 0005.

This work plan describes the methods and protocols that will be implemented in the excavation of a utility corridor on the east side of Halsey Street, north of Bainbridge Avenue on CNC. Previous excavation unearthed munitions and explosives of concern (MEC), which stopped the progress of a utility contractor working in the area. This work will remove all soil and MEC from the proposed utility path so that the contractor may complete the utility installation. The utility corridor will begin at the point where two MEC items were unearthed on October 17, 2002, south along Halsey Street to the force main surface vent just north of Bainbridge Avenue. No activities have been conducted at the site since the MEC was discovered. Currently, the open excavation is surrounded by piles of excavated material and is holding surface water.

The work to be performed at this site includes the excavation and MEC screening of all material in a 10-foot wide by 6-foot deep by approximately 200 feet long utility corridor, and subsequent excavation backfilling. The following tasks are included in these services:

- Develop preparatory submittals including a work plan and MEC avoidance plan.
- Mobilize resources to the site.
- Prepare access to the site and stockpile area.
- Develop layout of the utility corridor limits with utility contractor personnel.
- Excavate soil and debris in the corridor with heavy equipment by two qualified UXO technicians.
- Inspect thin lifts of material by two unexploded ordnance (UXO) technicians to allow screening for MEC.
- Place inspected material into stockpiles.
- Locate the utility corridor by state plane coordinates by global positioning system (GPS) equipment.
- Backfill the excavation with clean offsite material.
- Load and transport all excavated material to a Subtitle D landfill.
- Submit a report documenting site operations, offsite transportation and disposal on contaminated material and all laboratory analysis, including GPS locations.

The following sections describe in detail the manner that CCI proposes to conduct the work.

2.0 Project Activities

2.1 Mobilization and Setup of Temporary Facilities and Site Controls

This task will consist of the mobilization of personnel and equipment to the work site and establishing temporary facilities, consisting primarily of an equipment decontamination area and portable sanitary facilities. Project management and scheduling activities, including contractor coordination, will be achieved in the field with support from the CCI offices located in Atlanta, Georgia. Office supplies, field equipment, and personal protective equipment (PPE) will be stored at the site in temporary containers.

Prior to the commencement of any excavation activity, site controls including construction barricades and roadway signs, will be installed. If necessary, security fencing will also be installed. The excavation area at the work site will be marked with paint and stakes, as appropriate, and an underground utility survey will be conducted. CCI will coordinate with *RDA* the Resident Officer in Charge of Construction (ROICC) to acquire utility layout plans of the ~~area~~ *not ROICC*. Utilities that traverse the excavation area will be physically verified by the locating service. All marked utility lines in the excavation area will be uncovered with hand tools. Erosion control measures will be implemented if soil is stockpiled or an excavation remains open overnight. Plastic sheeting, silt fences, and hay bales will be available onsite should weather conditions warrant covering and berming stockpiled material to control runoff or dust emissions.

Prior to and during site activities, environmental protection measures will be implemented. Along the downgradient areas of the trench and stockpile, erosion control measures to direct water flows and prevent material migration will be installed and maintained. Plastic sheeting, silt fences, clean earth, and hay bales will be installed to control erosion and sediment run-on, and run-off. Additional materials will be available onsite should weather conditions warrant. Stockpiles will be underlined and covered with polyethylene and bermed with earth or hay bales to control runoff or material migration. Staked silt fencing will be installed at the down gradient locations of the perimeter of any open excavation and drainage feature. Field personnel may elect to reinforce discharge areas or preferred drainage paths if the weather warrants. Upon completion of field activities, all environmental control measures, along with any collected sediments, will be collected and properly disposed.

2.2 Utility Corridor Excavation

Once the site has been readied for activity, the limits of the corridor demarcated, and the area is under the control of CCI, the utility corridor will be excavated and all the material inspected. A backhoe or excavator will be used to excavate the utility corridor. All material removed will be inspected and any munitions materials excavated will be inspected to

determine if it poses any explosive risk. All material will be removed and placed on polyethylene (6 mil or thicker) sheet adjacent to the utility corridor where the inspection will occur. At the completion of excavation and screening activities, the limits will be located with GPS equipment prior to backfilling.

The UXO support will focus on both the point of the excavation and the material removed from the excavation. The UXO personnel will conduct a visual and magnetometer assisted survey of the proposed excavation site, as well as the location adjacent to the site where the excavation spoils will be placed. Due to the potential for significant subsurface anomalies, the results of the geophysical instrument survey will be cautiously evaluated since the project area is located in a landfill area that may have a large amount of subsurface metal. The UXO technician will be responsible for constant visual inspection of the point of excavation. The second UXO technician will inspect the excavated material and support other field activities as needed. All project personnel near the excavation will accomplish their assigned tasks while minimizing unnecessary exposure to the operation. The intent of this effort is to assess and characterize the utility corridor area. If any excavation activity encounters a cache or pit containing multiple MEC and/or large amounts of ordnance scrap, then operations will be suspended at that excavation until the Navy Remedial Project Manager (RPM) can assess the situation. Incidental UXO disposal is addressed in Section 4.3.3. ← me. !?

2.3 Waste Management

Once the waste material is removed from the utility corridor and thoroughly inspected to verify that no MEC are in the stockpiles, it will be prepared for disposal at a Subtitle D Landfill. Samples will be collected and analyzed to provide information for waste characterization and disposal approval. Waste characterization will be conducted in accordance with the procedures and protocols described in the Sampling and Analysis Plan and the Waste Management Plan for this project. While the waste is pending approval it will be covered with polyethylene sheet and secured from the weather and unauthorized access. When the waste is approved for disposal, the waste will be loaded by heavy equipment into dump trucks or roll-off boxes for transport to the treatment, storage and disposal facility (TSDF) by licensed waste transporters. Each truckload of waste will be documented with the use of a waste manifest.

2.4 Site Restoration

Excavated areas will be backfilled with clean fill material and returned to original grade. An excavator will be used to provide an even distribution of fill material. The backfill material will be compacted to a firm, non-yielding surface with the bucket of the excavator or tracked equipment. Compaction testing will not be performed since the utility contractor will immediately dig the clean fill to install the new pipeline.

Clean fill will be obtained from an offsite source that has provided acceptable material to CNC in the past. Testing of the material will be performed to verify that it does not contain targeted constituents above acceptable levels. CCI will verify that the source of the material is the same as previous. Upon completion of backfill operations, the site will be restored to

its previous condition. The site will be graded to provide drainage, but not grassed; the grassing operation will be performed by the utility contractor.

2.5 Decontamination

Personnel and equipment will be decontaminated prior to leaving the site. Equipment will be properly decontaminated to remove all contamination that may be adhering to the equipment components. All decontamination waste generated by excavation activities will be properly contained and disposed of at a facility permitted to accept the waste.

2.6 Demobilization

During demobilization, temporary facilities, utilities, and equipment will be removed from the site. In addition, any debris or solid waste material remaining from excavation activities will be removed and properly disposed.

3.0 UXO Personnel and Responsibilities

3.1 Personnel Qualifications

The following qualification requirements are promulgated by the U.S. Army Corps of Engineers Huntsville Engineering Support Center (CEHNC) and will be followed for this project:

“UXO personnel will be graduates of either the U.S. Army Bomb Disposal School, Aberdeen Proving Ground, MD; the U.S. Naval School of Explosive Ordnance Disposal (EOD), Indian Head, MD; the EOD Assistants Course, Redstone Arsenal, AL; or the EOD Assistant Course at Eglin Air Force Base, FL or a DOD-approved course.”

In addition to these general training requirements, the following experience requirements apply to specific positions of responsibility on MEC/UXO projects for the effort at CNC:

- **UXO Technician III.** The UXO Technician III will serve as the UXO Supervisor. This role will be filled by the most Senior UXO person onsite. This individual will supervise all onsite UXO activities. The UXO Technician III must have at least 10 years combined active duty military EOD and contractor UXO experience and be qualified to operate a backhoe and excavator.
- **UXO Technician II.** The second UXO Technician onsite during this effort will be qualified at or above the level of UXO Technician II. A UXO Technician I (graduate of either of the two previously noted EOD Assistant courses) with at least 5 years of combined EOD and contractor UXO experience also qualifies to work as a UXO Technician II. This technician should also be qualified to operate a backhoe and excavator.

3.2 Personnel Responsibilities

The following is an explanation of the duties of the personnel within the project MEC/UXO organization.

- **UXO Technician III** For this field effort the UXO Technician III serves as the supervisor and reports directly to the CCI Site Supervisor. He will implement the approved plans in the field and must review and approve any changes to the approved UXO plans. The UXO Technician III is responsible for the safety and efficiency of the performance of the UXO Team. The UXO Supervisor can temporarily stop work in order to bring an unsafe condition or procedure to the attention of the CCI Site Supervisor.

The UXO Technician III must be able to fully perform all of the functions enumerated in Sweep Personnel, UXO Technician I and II plus:

- Supervise and perform the on-site disposal of recovered UXO and demolition materials
- Prepare an explosive storage plan in accordance with all applicable guidance
- Prepare required UXO remediation administrative reports
- Prepare standard operating procedures for on-site remediation project
- Perform risk, hazard analysis
- Conduct daily site safety briefings
- Supervise the conduct of all on-site evolutions directly related to UXO remediation

The functions for the Sweep Personnel and UXO Technician I are described in the RAC IV basic contract Section 3.16.5.

- **UXO Technician II.** The UXO Technician II reports directly to the assigned UXO Technician III and is responsible for the safe and efficient performance of specific field tasks. This individual is also responsible for complete familiarity with the approved plans and for adherence to the procedures described in the plans. The UXO Technician II shall have the authority to temporarily stop work in order to bring an unsafe condition or procedure to the attention of the project UXO Supervisor (UXO Technician III).

The UXO Technician II must be able to fully perform all the functions enumerated in Sweep Personnel and UXO Technician I plus:

- Properly store explosive materials in accordance with applicable guidance
- Perform field maintenance on military and/or civilian ordnance detectors

4.0 MEC Operations Plan

This section presents procedures to be used while providing MEC support for environmental operations at CNC. Avoidance procedures are implemented to prevent site workers from accidentally coming into contact with MEC when working in areas suspected to contain MEC. When MEC is believed to be present and pose a threat to site workers a subcontract UXO Technician(s) will be assigned to provide technical UXO support. The recommended site training procedures to be followed and equipment to be used by the UXO team in the performance of their duties are described below.

4.1 MEC Awareness Training

MEC awareness training is an appropriate safety precaution for all personnel working on CNC. MEC awareness consists of initial and repetitive training in basic UXO characteristics, identification, and reporting procedures.

4.1.1 Initial MEC Training

Initial MEC training will be provided to all field workers prior to engaging in field operations. The intention of the initial MEC training is to prepare a previously untrained person to recognize UXO and to properly respond to the discovery of UXO.

Initial training may be given by the UXO Technician III. Health and Safety personnel should not present the initial training unless they are a qualified UXO Technician to avoid the possibility of conveying inaccurate information on MEC. This training will cover the following topics, at a minimum:

- **Ordnance types.** Describe the basic characteristics, deployment and functioning of the following ordnance:
 - Bombs
 - Rockets/missiles
 - Projectiles
 - Mines
 - Grenades
 - Small arms
- **MEC identification.** Describe the typical identification features of MEC. It is beneficial to supplement this training with photos, diagrams, and inert training aids:
 - What to look for (general shapes, lines that indicate venturi, rotating bands, ogives, etc.)
 - Natural camouflage of MEC caused by rust, vegetation, and partial burial
 - Chemical Warfare Material (CWM)

- Procedures to use upon finding a suspected MEC:
 - Do not disturb
 - Mark site with whatever is available (flagging tape, shovel, etc.)
 - Report find to field supervisor immediately

4.1.2 Repetitive MEC Training

In addition to the initial MEC training described above, site workers should receive repetitive MEC training. Repetitive training is intended to add to the site worker's knowledge of MEC hazards, reporting procedures, and to periodically reemphasize the possibility of encountering hazardous UXO. Repetitive MEC training will be accomplished for all on-site personnel during the daily tailgate safety meeting. In the absence of a UXO Technician, Health and Safety personnel may provide general MEC Awareness Training if they have attended a specialized training session and have the appropriate training materials.

4.2 MEC Avoidance Procedures

This section presents procedures to be used while conducting MEC avoidance procedures in support of environmental operations on CNC.

4.2.1 Safety Escort

The objective of the Safety Escort Procedure is to ensure that the planned work at the site is performed without disturbing hazardous MEC. This will be accomplished by having qualified UXO personnel escort field workers as they perform their duties. Specific procedures for UXO Avoidance and Safety Escort are outlined below.

Safety escort may be performed by a UXO Technician assigned to escort a work team while they are working on a site suspected to contain MEC. Multiple field teams working concurrently will require an escort for each team. Each UXO Technician must be equipped with the appropriate geophysical instrument, to detect and avoid potentially hazardous objects while escorting the field personnel.

The UXO Technician will use the geophysical instrument to inspect the path to the objective location for the presence of MEC. Suspected MEC will be avoided by walking around the objects without disturbing them. The field personnel being escorted will walk behind the safety escort and stay within the path that has been determined to be free of potentially hazardous objects. Upon reaching the objective location, the safety escort will continue to escort the field personnel as they perform their assigned tasks.

The safety escort will ensure that field personnel do not touch or otherwise disturb found objects without the escort's approval. Hazardous items detected on the surface will be marked to assist in avoiding that same item in the future and to aid in relocating the hazardous item by responding personnel. The location of UXO that are discovered will be recorded and reported to the CCI Site Supervisor.

4.2.2 MEC Observation

UXO support at CNC is required for the trench excavation due to the potential to encounter MEC. Accordingly, UXO Technicians will be involved during the excavation of the trench to visually locate and identify MEC. Specific procedures for MEC observation are outlined below.

For the CNC project, one of the UXO Technicians qualified to operate earthmoving machinery will excavate the utility corridor. The second UXO Technician will observe the excavation operation by standing in a safe area to the side of the excavator outside of the swing radius of the excavation machinery and will be responsible for examining the face of the excavation and the material as it is placed on the spoils pile. The face of the excavation will be carefully observed to visually detect MEC before they are disturbed. The UXO Technician will take advantage of natural or placed protective structures to shield himself from the potential hazard of falling or projected debris. All mechanized excavation will be performed in lifts limited to 6 inches unless otherwise directed by the UXO Technician to insure that potential buried MEC is not subjected to unnecessary stress

[REDACTED]

The UXO Technician observing the operation will communicate with the excavator operator to stop the excavation if suspected MEC are observed. When signaled, the excavator operator will immediately place the excavator bucket on the ground. The UXO Technician III will then examine the item to determine if it is MEC/UXO. If the item is determined to be MEC/UXO, it will be reported to the CCI Site Supervisor.

[REDACTED]

4.3 Site Setup, Control and Exclusion Zones

4.3.1 Exclusion Zone General MEC Operations

For general MEC operations, including site reconnaissance, surface clearance, and geophysical data acquisition, an exclusion zone (EZ) will be established that extends 100 feet beyond the boundary of the work site. This EZ will be established by the UXO Technicians during initial site reconnaissance. After establishing the site boundary, the Survey Team will install flagging or easily visible tape around the site in a 100-foot radius from the site boundary.

4.3.2 Exclusion Zone for Excavation

The CNC project site is anticipated to have a very low probability of encountering MEC based upon site history. The EZ for excavation activities will remain established for the general operation. If MEC are encountered, the EZ will be modified for the item or material encountered. The UXO Technician III will communicate the location of the EZ to the Project Safety Officer, the CCI Site Supervisor, the CNC Project Manager, and other organizations

identified in the Site Health and Safety Plan (Appendix A) to ensure that no other activities are planned or take place within the EZ.

4.3.3 Exclusion Zone UXO Disposal

Disposal of incidental MEC/UXO will be performed by Military EOD personnel designated by CNC. All MEC items determined to be safe to move will be relocated to a designated area to await disposal by Military EOD personnel. If an MEC item is unsafe to move is encountered, then an emergency EOD response will be requested from a neighboring EOD Unit through the CNC Redevelopment Authority (RDA) representative. Physical security/control of the MEC/UXO item prior to disposal will be coordinated through the CNC Safety Office.

An exclusion zone will be established to protect the public and other site workers from exposure to MEC hazards. Yellow barrier tape affixed to wooden stakes or nonmetallic pin flags will be used to delineate cleared from uncleared areas. The exclusion zone will encompass the area of activity and will have access and egress control. Only the EOD authority designated by CNC will be authorized for unescorted access to the exclusion zone. All work activities will cease immediately if non-EOD/UXO or unauthorized personnel enter the exclusion zone.

4.4 Removal of MEC Related Scrap

The UXO Team will collect non-hazardous surface scrap metal from path ways and access points. The UXO Technician III will inspect each piece of scrap for obvious explosive hazards and the scrap will be staged on-site at the pre-determined location. Demilitarization and certification of ordnance related scrap (ORS) is the responsibility of CNC.

4.5 Communications

During MEC field operations the UXO Team will maintain radio/telephone communications with the CCI Site Supervisor. In the event of loss of communications, all MEC/UXO operations will be halted until communications are reestablished. The UXO Team will ensure that radio/telephone communications devices are charged each night and tested before each work day begins.

4.6 Field Equipment

The following materials and equipment may be needed to support MEC Operations at CNC:

- Magnetometer (1)
- White All Metals Detector (or equivalent) (1)
- Radio or communication device
- Shovel
- Hand Rakes (Small Garden Type)
- Bundle Wooden Stakes (48-inch)
- Bundle of small Wooden Stakes (12-inch)

- Bundle Pin Flags
- Roll of ¼-inch White Nylon Line (100-inch)
- Hard Hats
- Safety Glasses
- Water Cooler w/drinking cups
- 5-gallon Plastic Buckets
- 50-foot Measuring Tape
- Access to General Shop Tools (hammer, screwdriver, etc.)

The UXO Technician III may adjust this list as site conditions dictate.

4.7 Vegetation Removal

The CNC project site is not expected to require vegetation removal, but, if required, CCI field personnel, under the supervision of the UXO Team, will cut and remove brush from the work area. Vegetation will be cleared only to the extent needed to allow for safe passage of equipment and personnel to excavation and sampling sites. Clearing will be conducted by using a weed whacker, chain saw or another appropriate device.

4.8 Chemical Warfare Material

Chemical warfare material (CWM) is not expected to be encountered, but the following information is included as a standard precautionary measure to ensure the proper response from UXO personnel in the event that suspected CWM is unexpectedly discovered.

The discovery of CWM, or suspected CWM, on the project site will require that normal site activities immediately stop until the CWM has been recovered and disposed. Field personnel will take the following actions upon discovering possibly chemical filled UXO or other CWM:

- The discoverer will immediately notify the UXO Technician III.
- The UXO Technician III will immediately direct the work team to stop work and exit the site in an upwind direction.
- The UXO Technician III should note the location of the suspected CWM to help with its identification and relocation.
- When the work team has been evacuated to at least 2,000-feet from the suspected CWM the UXO Technician III will immediately notify the CCI Site Supervisor who will initiate the emergency notification procedure as outlined in the Work Plan and the SSHP.
- The CCI Site Supervisor will ensure that all field personnel are accounted for and establish a perimeter security area around the suspected CWM no closer that 2,000 feet.

5.0 Sampling and Analysis Plan

This Sampling and Analytical Plan (SAP), describes CCI's tasks and responsibilities with respect to the sampling and analysis associated with the work effort. CCI intends this document to be a site-specific guide for use by the field team while performing the project-required sampling and analysis. Any changes to the activities described in this SAP must be documented as an addendum to this SAP and approved by the Project Manager and Project Chemist.

The sampling team will be qualified under the Navy Installation Restoration Chemical Data Quality Manual (IRCDQM), 1999 sampling requirements. Samples will be collected in accordance with the U.S. Environmental Protection Agency (EPA) Region IV Environmental Investigative Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), November 2001.

A Navy-, United States Army Corps of Engineers (USACE)-, or Air Force Center for Environmental Excellence (AFCEE)- and South Carolina Department of Health and Environmental Control (SCDHEC)-approved laboratory will be used for all sample analyses.

5.1 Data Quality Levels for Measurement Data

The data quality levels for each sampling task described above are listed in Table 1. The sampling and analytical requirements, along with the required level of quality and data packages are listed in Table. The quantitation, project action, accuracy, precision, and completeness limits by which the data will be evaluated will be provided by the selected laboratory and approved by CCI's Quality Assurance Chemist.

A Navy-,USACE-, or AFCEE- and SCDHEC- approved laboratory will be used for all sample analyses.

The data for waste characterization will be evaluated by the Waste Coordinator. A CCI Level B data package will be required along with appropriate Quality Control samples for the required analyses. All analytical data will be submitted by both hard copy and electronic files.

TABLE 5 1
Data Quality Levels

Sampling Activity	Data Quality Objective Category
Waste, Disposal, and Decon water characterization (offsite laboratory analyses)	Definitive

TABLE 5-2
Sampling and Analytical Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT ¹	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
<i>Soil/Solids Characterization Sampling</i>													
Soil/Solids Characterization Sampling	Stockpiles (1 per 200 yds ³)	Soil	1 per 200 cy	approx 2	Composite 5 random grabs into 1 sample (do not composite VOCs)	SS auger, SS spoon, SS bowl	7 day	CCI Level B	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	(3) 8 oz glass
									Explosives	8330	14 days ext; 40 days analysis	Cool to 4°C	
									TCLP Metals	1311/6010B/7470A	6 month TCLP extr; 6 month analysis Hg: 28 day TCLP extr; 28 day analysis	Cool to 4°C	
									TCLP Pesticides	1311/8081A	14 day TCLP extr; 7 day extr; 40 day analysis	Cool to 4°C	
									TCLP Herbicides	1311/8151A	14 day TCLP extr; 7 day extr; 40 day analysis	Cool to 4°C	
									Explosives	8330	14 days ext; 40 days analysis	Cool to 4°C	
									PCBs	8082	14 day extr; 40 day analysis	Cool to 4°C	
									Corrosivity	9045C	ASAP	Cool to 4°C	
									Ignitability	1010/1020	ASAP	Cool to 4°C	

TABLE 5-2
Sampling and Analytical Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT ¹	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
<i>Water Characterization Sampling</i>													
Characterization of Decontamination Water	Aqueous disposal waste	Water	1 Per 10 drums or Frac Tank	1 (or as needed for disposal)	Grab	Drum thief or dip jar	7 days	CCI Level B	TCL Volatiles	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 ml vial
									TCL Semi-volatiles	8270C	14 days ext; 40 days analysis	Cool to 4°C	(3) 1L amber glass
									TCL Pesticides	8081A	14 days ext; 40 days analysis		
									TCL Herbicides	8151A	7 day extr, 40 day analysis		
									TAL Metals	6010B/7470A	180 days, Hg = 28 days	HNO3 pH< 2; Cool to 4°C	(1) 500ml HDPE
									Ignitability	9040B	ASAP	Cool to 4°C	(1) 250 mL amber glass
									Corrosivity	Chapter 7.3	ASAP		(1) L amber glass

5.3 Sampling Objectives

The sampling objectives for this project will be as follows:

- Collect samples for waste characterization of stockpiled contaminated soil
- Collect samples for water used in equipment decontamination and/or entrained excavation water if necessary

5.4 Waste Characterization and Disposal Sampling

Waste characterization samples will be collected to evaluate the handling, transportation, and disposal requirements of the excavation soil accumulated during investigation activities. It is anticipated that soil will be placed into stockpiles for storage and shipment. Solid samples will be collected as follows, delivered to a Navy-, USACE-, or AFCEE- and SCDHEC-approved laboratory and analyzed for the parameters listed in Table 5-2.

The stockpile(s) will be sampled at a frequency of one per every two hundred cubic yards. It is estimated that only two samples will be needed to perform characterization of the waste. The samples will be collected in the following manner and analyzed in accordance with Table 5-2.

Procedure For collecting volatile fractions.

1. At the selected sample location, using an auger, split spoon, or other similar device retrieve a core .
2. Fill the appropriate sample jars completely full with the sample from the core.
3. Close the jar, label, and package the sample for shipment to the laboratory.

Procedure for Collecting Non-Volatile Samples

1. From four randomly selected sample locations, collect several spoonfuls of the soil into a stainless steel bowl.
2. Homogenize the four samples by the quartering techniques using the stainless steel spoon.
3. Fill the appropriate sample jars approximately three-fourths full with the homogenized sample
4. Close the jar, label, and package the sample for shipment to the laboratory.

A CCI Level B package will be required along with appropriate Quality Control samples for the required waste characterization and incidental waste stream samples. All analytical data will be submitted by both hard copy and electronic files.

5.5 Decontamination/Excavation Water Characterization Sampling

The excavation may contain entrained water that will need to be collected in a frac tank. If any such water is encountered it will be stored in a frac tank. In the event that it is necessary to decontaminate equipment using water, the contained decontamination water and any water contained within the excavation will be combined and sampled as follows and analyzed in accordance with Table 5-2.

1. Using a bailer or dip jar collect a water sample from the frac tank or drums.
2. The sample containers for volatile analyses will be filled first. The 40-ml vials will be filled so that there is no headspace in each vial.
3. The sample containers for the remaining analyses will then be filled.
4. label and package the samples for shipment to the laboratory.

A CCI Level B package will be required along with appropriate Quality Control samples for the required waste characterization and incidental waste stream samples. All analytical data will be submitted by both hard copy and electronic files.

5.6 Sample Documentation

Sampling documentation will include the following:

- Numbered Chain-of-Custody (COC) Reports
- Sample Log Book which includes the following information:
 - Name of laboratories and contacts to which the samples were sent, turnaround time (TAT) requested, and data results, when possible
 - Termination of a sample point or parameter and reasons
 - Unusual appearance or odor of a sample
 - Measurements, volume of flow, temperature, and weather conditions
 - Additional samples and reasons for obtaining them
 - Levels of protection used (with justification)
 - Meetings and telephone conversations held with the Southern Division, NTR, regulatory agencies, project manager, or supervisor
 - Details concerning any samples split with another party
 - Details of QC samples obtained
 - Sample collection equipment and containers, including their serial or lot numbers
 - Details of QC samples obtained

- Field analytical equipment, and equipment utilized to make physical measurements shall be identified
- Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment
- Property numbers of any sampling equipment used, if available
- Sampling station identification
- Date and Time of sample collection
- Description of the sample location
- Description of the sample
- Samplers' names and company
- How the sample was collected
- Diagrams of processes
- Maps/sketches of sampling locations
- Weather conditions that may affect the sample (e.g., rain, extreme heat or cold, wind, etc.)
- Sample Labels
- Custody Seals (minimum of two on each shipping container)

5.7 Field Quality Control

One trip blank sample will be provided at a frequency of one per sample cooler containing volatile samples for the backfill sampling. Field quality control is not required for disposal samples. Quantity and frequency are detailed in Table 5-2.

5.8 Analytical Methods

Samples will be collected for analytical methods summarized in Table 5-2.

Preliminary analytical results will be faxed to Bonnie Hogue at the following fax number per the turn-around-times listed in Table 5-2 from day of sample receipt. The final hardcopy data and electronic file will be delivered to Melissa Aycock within 14 days of sample receipt.

Bonnie J. Hogue
 Laboratory Coordinator
 CCI
 770-604-9182 ext 263
 EFax: 678-579-8106
bhogue@ch2m.com

Melissa Aycock
 CCI
 115 Perimeter Center Place, Suite 700
 Atlanta, GA 30346
 (770) 604-9182 ext 614
maycock@ch2m.com

6.0 Quality Control Plan

This Quality Control Plan details the quality administrators and the project organization for the work to be completed at CNC.

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

The site-specific project organization chart (Figure 6-1) depicts the chain-of-command for this CTO and the individuals responsible for executing the work as indicated. Individual roles and responsibilities of CTO personnel are summarized in Table 6-1.

6.1 Project QC Manager

The Project QC Manager for this project is yet to be determined. The resume and appointing letter will be forwarded at a later date, but prior to performing any site work.

6.2 Phases of Control

The SOW is grouped into work activities, which are considered definable features of work. That is, definable features are work activities that are significant enough to warrant distinct plans and specifications. The definable features of work for this project are: mobilization and site preparation, soil excavation and backfill, OE screening, field sampling, transportation and disposal of wastes, and demobilization.

The definable features of work will be inspected in accordance with the three phases of control. The three phases include Preparatory, Initial, and Follow-up. The general inspection guidelines and provisions for the definable features are outlined in the subsections that follow.

6.2.1 Mobilization and Site Preparation

Site preparation activities includes obtaining utility clearances, demarcating the work zones, and staging of equipment and material as necessary to begin work. Layout of the AOC utility corridor limits will be performed with the RDA.

Preparatory Phase

The preparatory phase will include a review of the relevant activity hazard analyses (AHAs), the project work plan, communications matrix, project schedule, submittal status, and confirmation of appropriate materials and equipment.

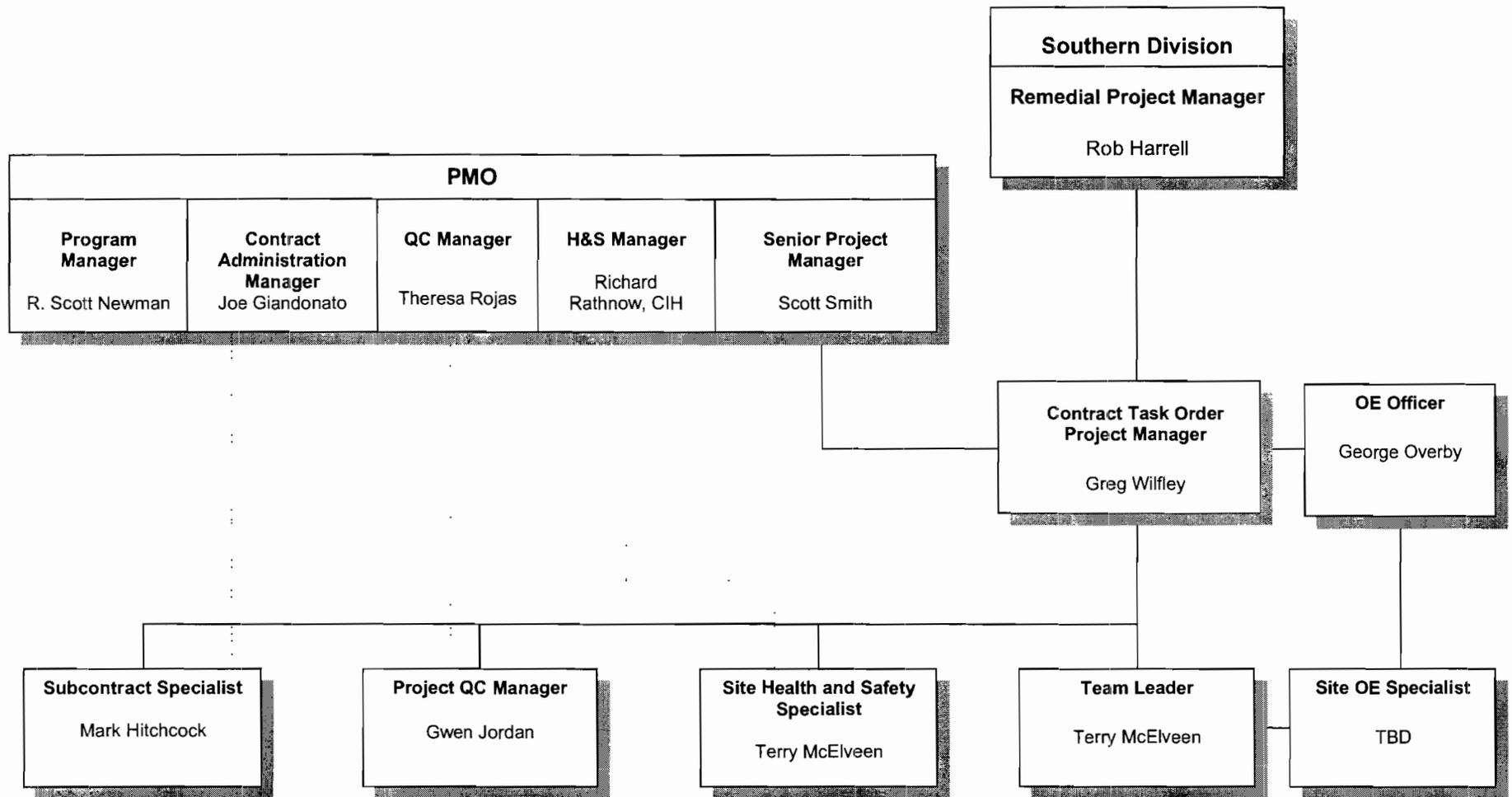


TABLE 6-1
Roles, Responsibilities, and Authorities of Key Project Personnel

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
Resident Engineer	<ul style="list-style-type: none"> • Monitor and oversee subcontractor compliance with scope of work • Review requests for changes in scope of work • Review technical qualifications of subcontractors • Prepare Field Change Requests • Respond to Design Change Notices • Recommend improvements in work techniques or metrics • Recommend work-around to Site Superintendent 	<ul style="list-style-type: none"> • Approve Field Change Requests below ceiling amount • Complete daily compliance report
Field Accountant	<ul style="list-style-type: none"> • Provide project scheduling coordination • Responsible for site cost tracking and reporting • Maintain record of site purchases • Maintain government property records 	<ul style="list-style-type: none"> • Approve payables for disposable items
Transportation and Disposal Coordinator	<ul style="list-style-type: none"> • Develop site specific procedures for transport and disposal practices • Plan and coordinate the transport and disposal of waste • Review subcontractor qualifications • Audit T&D subcontractors compliance with contract requirements 	<ul style="list-style-type: none"> • Approve subcontractors daily report of waste material removed from the site • Approve corrective action plans from T&D subcontractor

TABLE 6-1 (CONTINUED)
Roles, Responsibilities, and Authorities of key Project Personnel

Role	Responsibility	Authority
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/ QC Inspector(s)	<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 	

Initial Phase

Inspections will be made as necessary to ensure construction limits are defined, utilities marked, and material staged in the designated areas.

Follow-up Phase

The Project QC Manager will provide continuous oversight of the site preparation activities to verify that the work is completed in accordance with the requirements provided in this work plan. Deficiencies will be noted and corrected.

6.2.2 Soil Excavation, MEC Screening, Stockpiling, and Backfilling Activities

Preparatory Phase

The preparatory phase will include a review of the relevant AHAs, the requirements provided in the work plan, review of the proposed utility corridor excavation area, verifying acceptance and approval of the utility clearance; confirming acceptability of the backfill and other required materials; and confirming that appropriate equipment (screening, water handling, etc.) and craftsmen are available to complete the work. The excavation competent person and lead UXO technician (for MEC screening) will be identified, and the logistical

approach to conducting the soil excavation while screening for OE related materials will be discussed.

Prior to the commencement of excavation activity, site controls including construction barricades, roadway signs, and security fencing will be installed as necessary. The excavation area at the work site will be marked with paint and stakes, as appropriate. In addition, the progress of excavation conducted with machinery will be continuously monitored for signs of buried obstructions and MEC materials. Stockpiles and waste staging areas will be prepared and managed in accordance with the protocols of the waste management plan. All soil screening and handling will be at the direction of the UXO trained technicians.

Initial Phase

Prior to excavation activities, the Project QC Manager will complete the initial inspection to verify that the utility corridor excavation follows the planned pathway based on the layout of the corridor limits defined by the RDA. Deficiencies will be documented and corrected as necessary.

Follow-up Phase

The Project QC Manager will be responsible for the overall daily surveillance of the excavation and backfilling activities. The daily surveillance will verify that the work is being completed according to the work plan provisions as necessary. Attention will be placed on maintaining grade, backfilling to achieve suitable soil compaction, and management of wastes. Backfill activities will be inspected to verify proper placement, handling of water accumulated within the excavation, and compaction method.

6.2.3 Transportation and Disposal of Contaminated Soil and Groundwater

Preparatory Phase

The preparatory stage for transportation and disposal of contaminated soil and groundwater includes a review of the disposal, recycling or treatment facility(s) qualifications, transportation schedule for hauling material offsite, and confirming that the appropriate equipment and materials, such as waste manifests, are available to commence the work activity. Review and acceptance of the waste disposal package by the CCI waste coordinator is required prior to submitting the package to the Navy for approval. Prior to any work, the relevant AHAs will be reviewed and discussed.

Initial Phase

This phase includes inspecting the waste transport vehicles (rolloffs, end-dumps, transports, etc.) prior to accepting on the job. Containers used for soil transport shall be lined prior to loading. Containers used for transporting liquids shall be free of liquids or other foreign materials prior to filling.

Information provided on the waste manifest must be verified to be complete and accurate including, but not limited to, generator name and signature, date, type of material being hauled, designated recycling or treatment facility, and volume and/or weight of material. Any discrepancies on waste manifest documents must be corrected.

Follow-up Phase

This phase includes verifying the recycling or treatment facility has accepted and treated the waste material at their facility and has sent the required completed manifest to the generator or the generator's technical representative. Receipt of the certificate of recycling or disposal from the designated facility must be verified, as well as that the invoice is complete and accurate. A field logbook and an electronic log of all transportation and disposal shipments must be maintained.

Containers, tanks, and roll-off boxes will be inspected for signs of contamination and/or deterioration and inventoried upon arrival onsite using the Transportation and Disposal Log. Waste storage areas (including areas with stockpiles, containers, tanks, roll-off boxes) visually inspected on a daily basis for releases or signs of corrosion, deterioration or other conditions that could result in a release. In the event of a release, prompt response will be taken in the event of any evidence of failure to contain the wastes. These results of these inspections will be recorded.

6.2.4 Field Sampling

Preparatory Phase

The preparatory phase for sample collection activities includes a review of the sampling procedures provided in the sampling and analysis plan, verifying acceptance of the selected laboratory, and confirming that the appropriate equipment and materials are available to complete the sampling activities.

Initial Phase

Waste characterization samples will be collected and subsequently analyzed at an approved laboratory in accordance with requirements outlined in the work plan or sampling and analysis plan. Sample collection activities including proper chain-of-custody documentation will follow the protocols outlined in the project specific sampling and analysis plan. Samples will be collected of excavated material, backfill soil, and contact/decontamination water.

Follow-up Phase

Sample collection locations and activities will be properly documented throughout each sampling event. Analytical reports from the approved laboratory will be reviewed for accuracy and quality. If required, data validation information from the laboratory will be reviewed to verify discrepancies in the analytical data. CCI quality assurance personnel will review and tabulate laboratory data and field sampling results.

6.2.5 Surveying

Under the provisions of the Contract Documents, all lines and grades are to be established by CCI from existing baselines or benchmarks. The Site Superintendent is responsible for verifying conformance of final lines and grades with the Contract Documents, and coordinating confirmation with the Project QC Manager. The final survey map of the project work areas shall be completed with 1-meter contours and spot elevations surveyed every 30 meters. All spot elevations shall have a horizontal accuracy of 0.25 meters and a vertical accuracy of 0.1 meter.

The surveyed horizontal geographic position and state plane coordinates shall be referenced to permanent or semi-permanent control points existing on the project site and shall be accurate 0.25 meter, plus or minus. Horizontal control shall be referenced to the North American Datum of 1983 [NAD83]. Data conversions from the metric system to the English system shall use the U.S. Survey Foot definition (1 meter = 39.37 inches). All drawings and calculations shall contain a prominent note stating same.

Using the GPS, the clearance boundaries and the perimeter corners of the utility corridor clearance areas shall be surveyed. The location of all confirmed UXO items found during the MEC screening operations, fence lines and other significant monuments shall be located. All location surveys of UXO shall have a horizontal accuracy on one meter and a vertical accuracy of 0.25 meters.

6.2.6 Demobilization

Subcontractors will demobilize equipment and personnel from the site following the completion of the work activities identified in this work plan. The Project QC Manager shall verify that the objectives of associated remedial activities have been met.

Preparatory Phase

The preparatory phase will include a review of decontamination procedures, the site specific health and safety plan, the waste management plan, and relevant AHA forms.

Initial Phase

The site superintendent will perform inspections to confirm that the objectives of the decontamination activities have been met and that the rework items, if any, have been completed to the satisfaction of CCI and the Navy ROICC.

Follow-up Phase

The Project QC Manager will provide continuous oversight of the demobilization to verify that the work is completed in accordance with the requirements provided in the work plan. Daily observation will verify compliance with the objectives of the work plan. Deficiencies will be noted and corrected.

6.3 Testing Requirements

6.3.1 Construction

Construction testing is not anticipated for this project; however, construction inspections will be performed while executing the work. In the case that construction testing becomes necessary, the Testing Plan and Log (Appendix B) will be used to record the results of any field testing.

6.3.2 Environmental

Laboratories performing analysis of environmental samples will be Navy-, USACE-, or AFCEE- and SCDHEC-approved.

6.3.3 Sample Collection and Testing

CCI will sample the soil and all generated or accumulated aqueous wastes.

Environmental samples will be collected in accordance with 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.

The Project QC Manager shall verify the following items:

- Recording forms, including all of the test documentation requirements, have been prepared.
- The surveyed limits of the excavated utility corridor have been recorded by GPS, to the accuracy as stated.
- The selected backfill material is approved and that the compactive effort for the backfilled corridor is acceptable.
- The offsite shipment of all liquid and solid wastes has been completed.

6.4 CTO Support Organizations

The CTO support organization have yet to be determined.

Appendix A

Project Schedule

Activity ID	WBS	% Comp	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Cost to Date	Cost to Complete	Cost at Completion	Budgeted Cost	Cost Variance	2003		
CTO #0005 - CNC - Charleston, SC															
Subtotal		18		122	92	18DEC02A	10JUN03	12,206.34	141,818.74	154,025.08	153,756.00	-269.08			
PHASE 1															
Subtotal		100		19	0	18DEC02A	15JAN03A	6,947.42	12,162.58	19,110.00	19,110.00	0.00			
PHASE 1B															
Subtotal		100		19	0	18DEC02A	15JAN03A	6,947.42	12,162.58	19,110.00	19,110.00	0.00			
FUNDING AUTHORIZATION															
AE 150000	15.01.02.00	100	Project Authorization	0	0	18DEC02A		0.00	0.00	0.00	0.00	0.00			
CTO SETUP/SITE VISIT															
AE15010290	15.01.02.90	100	CTO Setup	1	0	19DEC02A	19DEC02A	83.77	11.23	95.00	95.00	0.00			
AE15010000		100	Submit Remedial Technology Evaluation	1	0	15JAN03A	15JAN03A	0.00	0.00	0.00	0.00	0.00			
AE15010291	15.01.02.91	100	Site Visit Prep/Tech Review	2	0	15JAN03A	15JAN03A	0.00	2,240.00	2,240.00	2,240.00	0.00			
AE15010292	15.01.02.92	100	Site Visit	1	0	15JAN03A	15JAN03A	657.46	6,220.54	6,878.00	6,878.00	0.00			
AE15010293	15.01.02.93	100	Technology Meeting	1	0	15JAN03A	15JAN03A	3,868.47	1,647.53	5,516.00	5,516.00	0.00			
AE15010294	15.01.02.94	100	Technology review/comment	5	0	15JAN03A	15JAN03A	2,337.72	2,043.28	4,381.00	4,381.00	0.00			
PHASE 2															
Subtotal		28		47	35	15JAN03A	20MAR03	5,258.92	24,843.16	30,102.08	29,833.00	-269.08			
PHASE 2															
Subtotal		28		47	35	15JAN03A	20MAR03	5,258.92	24,843.16	30,102.08	29,833.00	-269.08			
PROJECT MANAGEMENT															
AE20010399	20.01.03.99	50	Project Management (Phase 2)	60	28	15JAN03A	11MAR03	269.08	0.00	269.08	0.00	-269.08			
AEPMAL0101	PM.AL.01.01	50	PMO	60	28	15JAN03A	11MAR03	0.00	1,426.00	1,426.00	1,426.00	0.00			
COST PROPOSAL PREPARATION															
AE20010326	20.01.03.26	100	Develop Cost Estimate/Schedule	2	0	30JAN03A	31JAN03A	4,989.84	971.16	5,961.00	5,961.00	0.00			
AE20010327		100	Submit Cost Proposal to Client	0	0		31JAN03A	0.00	0.00	0.00	0.00	0.00			
AE 2000001		100	Phase 3 Award	0	0		05FEB03A	0.00	0.00	0.00	0.00	0.00			
BID PACKAGE PREP/AWARD															
AE20010391	20.01.03.91	0	Prepare Bid Packages	7	7	13FEB03*	21FEB03	0.00	5,373.00	5,373.00	5,373.00	0.00			
AE 20150		0	Issue RFB to Subcontractors	0	0		21FEB03	0.00	0.00	0.00	0.00	0.00			
AE20010393	20.01.03.93	0	Subcontractor Pre-Bid Meeting/Site Visit	1	1	26FEB03	26FEB03	0.00	2,478.00	2,478.00	2,478.00	0.00			
AE 20165		0	Subcontractor Bids Due	0	0		05MAR03	0.00	0.00	0.00	0.00	0.00			
AE20010392	20.01.03.92	0	Evaluate Bid Packages	3	3	06MAR03	10MAR03	0.00	1,238.00	1,238.00	1,238.00	0.00			
AE 20188		0	Issue Letter of Intent to Award	0	0		10MAR03	0.00	0.00	0.00	0.00	0.00			
Start Date	18DEC02	Early Bar		C005										Sheet 1 of 3	
Finish Date	10JUN03	Progress Bar		CTO #0005 - CNC - Charleston, SC											
Data Date	31JAN03	Critical Activity		CTO COMPLETION SCHEDULE											
Run Date	13FEB03 08:38			NAVY RAC SOUTHERN DIVISION											
© Primavera Systems, Inc.															

Activity ID	WBS	% Comp	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Cost to Date	Cost to Complete	Cost at Completion	Budgeted Cost	Cost Variance	2003
AE 20181		0	Submit Subcontractor Plans & Submittals	5	5	11MAR03	17MAR03	0.00	0.00	0.00	0.00	0.00	
AE 20180		0	Subcontractor Plans Due	0	0		17MAR03	0.00	0.00	0.00	0.00	0.00	
AE 20189		0	Review Subcontractor Plans & Submittals	3	3	18MAR03	20MAR03	0.00	0.00	0.00	0.00	0.00	
AE 20210		0	Award Subcontracts	0	0		20MAR03	0.00	0.00	0.00	0.00	0.00	
AE 20211		0	Project Mobilization	0	0	20MAR03		0.00	0.00	0.00	0.00	0.00	
WORK PLANS PREPARATION													
AE20010301	20.01.03.01	0	Sampling and Analysis Plan	10	10	13FEB03*	26FEB03	0.00	2,725.00	2,725.00	2,725.00	0.00	
AE20010304	20.01.03.04	0	Environmental Protection Plan	10	10	13FEB03	26FEB03	0.00	615.00	615.00	615.00	0.00	
AE20010306	20.01.03.06	0	Pollution Control Plan	10	10	13FEB03	26FEB03	0.00	1,196.00	1,196.00	1,196.00	0.00	
AE20010308	20.01.03.08	0	Site - Specific H&S Plan	10	10	13FEB03	26FEB03	0.00	106.00	106.00	106.00	0.00	
AE20010313	20.01.03.13	0	General Site Work Plan	10	10	13FEB03	26FEB03	0.00	2,914.00	2,914.00	2,914.00	0.00	
AE20010314	20.01.03.14	0	Quality Control Plan	10	10	13FEB03	26FEB03	0.00	106.00	106.00	106.00	0.00	
AE20010315	20.01.03.15	0	Transportation & Disposal Plan	10	10	13FEB03	26FEB03	0.00	2,070.00	2,070.00	2,070.00	0.00	
AE20010390	20.01.03.90	0	Hazardous Waste Mgmt Plan	10	10	13FEB03	26FEB03	0.00	3,625.00	3,625.00	3,625.00	0.00	
AE 20290		0	Submit Draft Work Plans	0	0		26FEB03	0.00	0.00	0.00	0.00	0.00	
AE 20185		0	Southern Division WP Comment Period	10	10	27FEB03	12MAR03	0.00	0.00	0.00	0.00	0.00	
AE 20190		0	Incorporate WP Comments	3	3	13MAR03	17MAR03	0.00	0.00	0.00	0.00	0.00	
AE 20191		0	Submit Final WP to Southern Division	0	0		17MAR03	0.00	0.00	0.00	0.00	0.00	
AE 2095		0	Work Plan Approval Received	0	0		20MAR03	0.00	0.00	0.00	0.00	0.00	
PHASE 3													
Subtotal		0		89	89	05FEB03	10JUN03	0.00	104,813.00	104,813.00	104,813.00	0.00	
AOC 724 UTILITY CORRIDOR													
Subtotal		0		89	89	05FEB03	10JUN03	0.00	104,813.00	104,813.00	104,813.00	0.00	
FUNDING AUTHORIZATION													
AE31000000		0	Phase 3 Award - NTP	0	0	05FEB03*		0.00	0.00	0.00	0.00	0.00	
PROJECT MANAGEMENT													
AE99220101	99.22.01.01	0	Project Management	73	73	12FEB03	23MAY03	0.00	21,887.00	21,887.00	21,887.00	0.00	
PRE-CONSTRUCTION PLANS & SUBMITTALS													
AE31010390	31.01.03.90	0	OE Avoidance Plan	10	10	13FEB03	26FEB03	0.00	1,119.00	1,119.00	1,119.00	0.00	
AE31010391		0	SouthDiv Review & Comment	5	5	27FEB03	05MAR03	0.00	0.00	0.00	0.00	0.00	
MOBILIZATION & PREPARATORY WORK													
AE31010290	31.01.02.90	0	Subcontractor Mobilization	1	1	21MAR03	21MAR03	0.00	5,856.00	5,856.00	5,856.00	0.00	
AE99010102		0	CCI Mobilization	1	1	21MAR03	21MAR03	0.00	0.00	0.00	0.00	0.00	
AE99010103	99.01.01.03	0	Kick-Off Meeting/Site Preparation	1	1	24MAR03	24MAR03	0.00	3,578.00	3,578.00	3,578.00	0.00	
AE31010291		0	Subcontractor Mobilization	1	1	23APR03	23APR03	0.00	0.00	0.00	0.00	0.00	
AE99010101	99.01.01.01	0	CCI Mobilization	1	1	23APR03	23APR03	0.00	5,207.00	5,207.00	5,207.00	0.00	
ENGINEERING, SURVEY & QC													
AE31220410	31.22.04.10	0	Surveying	5	5	24MAR03	28MAR03	0.00	2,673.00	2,673.00	2,673.00	0.00	
SAMPLING & ANALYSIS													
AE31020905	31.02.09.05	0	Waste Characterization	15	15	02APR03	22APR03	0.00	1,988.00	1,988.00	1,988.00	0.00	

Activity ID	WBS	% Comp	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Cost to Date	Cost to Complete	Cost at Completion	Budgeted Cost	Cost Variance	2003
AE31021492	31.02.14.92	0	Data Evaluation & Management	15	15	02APR03	22APR03	0.00	902.00	902.00	902.00	0.00	
ORDNANCE & EXPLOSIVES													
AE31040109	31.04.01.09	0	Corridor Excavation	2	2	25MAR03	26MAR03	0.00	5,221.00	5,221.00	5,221.00	0.00	
TRANSPORTATION AND DISPOSAL													
AE31192092	31.19.20.92	0	Stockpile Matenals/Maint.	22	22	27MAR03	25APR03	0.00	3,388.00	3,388.00	3,388.00	0.00	
AE31192090	31.19.20.90	0	Load-Out Material	2	2	24APR03	25APR03	0.00	5,221.00	5,221.00	5,221.00	0.00	
AE31192290	31.19.22.90	0	T&D - Subtitle D Landfill - 700 TN	2	2	24APR03	25APR03	0.00	26,378.00	26,378.00	26,378.00	0.00	
SITE RESTORATION													
AE31200103	31.20.01.03	0	Purchase Backfill	3	3	27MAR03	31MAR03	0.00	3,587.00	3,587.00	3,587.00	0.00	
AE31200106	31.20.01.06	0	Spread Backfill	1	1	01APR03	01APR03	0.00	2,611.00	2,611.00	2,611.00	0.00	
DEMOBILIZATION													
AE31210590	31.21.05.90	0	Subcontractor Demobilization	1	1	02APR03	02APR03	0.00	2,365.00	2,365.00	2,365.00	0.00	
AE99210501	99.21.05.01	0	CCI Demobilization	1	1	02APR03	02APR03	0.00	3,780.00	3,780.00	3,780.00	0.00	
AE31210591		0	Subcontractor Demobilization	1	1	28APR03	28APR03	0.00	0.00	0.00	0.00	0.00	
AE99210502		0	CCI Demobilization	1	1	28APR03	28APR03	0.00	0.00	0.00	0.00	0.00	
POST													
AE31210692	31.21.06.92	0	Sub's Post-Con Submittals	10	10	29APR03	12MAY03	0.00	1,604.00	1,604.00	1,604.00	0.00	
AE31210696	31.21.06.96	0	Project Completion Report	20	20	13MAY03	10JUN03	0.00	7,448.00	7,448.00	7,448.00	0.00	
AE31210697		0	Submit Project Completion Report	0	0		10JUN03	0.00	0.00	0.00	0.00	0.00	

Appendix B

Health and Safety Plan

**Health and Safety Plan
Excavation of AOC 724 Utility Corridor
Charleston Naval Complex
Charleston, South Carolina**

**Contract No. N62467-98-D-0995
Contract Task Order No. 0005**

Revision 00

Submitted to:

**U.S. Naval Facilities
Engineering Command
Southern Division**

Prepared by:



CH2MHILL
Constructors, Inc.

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March 2003

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- Attachment 5 Project Activity Self-Assessment Checklist/Permits
- Attachment 6 Behavior Based Loss Prevention System Forms
- Attachment 7 Applicable Material Safety Data Sheets
- Attachment 8 Subcontractor H&S Plans/Procedures

Acronyms

°F	degrees Fahrenheit
ALARA	as low as reasonably achievable
APR	air-purifying respirator
ATL	Atlanta
BIP	blow in place
CCI	CH2M HILL Constructors, Inc.
CNC	Charleston Naval Complex
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
CWM	chemical warfare material
dBA	decibel A-rated
DOT	Department of Transportation
EOD	explosive ordnance disposal
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
lb	pound
LEL	lower explosive limit
MEC	munitions and explosives of concern
mg/m ³	milligrams per cubic meter
MSDS	Material Safety Data Sheet
mW/cm ²	milliwatt per square centimeter
NAVFAC	U.S. Navy Facilities Engineering Command
NDG	nuclear density gauge
NSC	National Safety Council
OE	Ordnance and explosives
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
PDF	personal flotation device
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
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
TBD	to be determined
TMCC	truck-mounted crash cushion
TSDf	treatment, storage, and disposal facility
UXO	Unexploded ordnance

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 (CCI's) personnel and subcontractors must sign Attachment 1.

1.0 Project Information and Description

CONTRACT TASK ORDER (CTO) No.: 0005

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

PROJECT/SITE NAME: AOC 724 Utility Corridor, Charleston Naval Complex, Charleston, SC

SITE ADDRESS: Charleston Naval Complex, Charleston SC

CCI PROJECT MANAGER: Greg Wilfley

CCI OFFICE: Atlanta, Georgia (ATL)

DATE HEALTH AND SAFETY PLAN PREPARED: March 2003

DATE(S) OF SITE WORK: March 2003- February 2004

SITE BACKGROUND AND SETTING: This work plan describes the methods and protocols that will be implemented in the excavation of an utility corridor on the east side of Halsey Street, north of Bainbridge Avenue on the CNC. Previous excavation unearthed ordinance and explosives (OE) stopping the progress of the contractor. This work will remove all search and remove all OE from the proposed utility path so that the contractor may complete the utility installation. The utility corridor will begin at the point where, during the installation of a ductile iron force main two OE items were unearthed on October 17, 2002, south along Halsey street to the force main surface vent just north of Bainbridge Avenue. No activities have been conducted at the site since the OE was found and there is currently an open excavation in holding surface water and surrounded by piles of excavated material.

DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED: The work to be performed at this site includes the excavation and OE screening of all material in a 10-foot wide by 6-foot deep by approximately 200-foot long utility corridor, and subsequent excavation backfilling. The following tasks are included in these services:

- Prepare submittals including a work plan and OE avoidance plan.
- Mobilize to the site.
- Prepare access to the site and stockpile area.
- Layout the utility corridor limits with utility contractor personnel.
- Excavate the soil and debris in the corridor with heavy equipment by two qualified explosive ordnance disposal (EOD) technicians.
- Inspection of thin lifts of material by two qualified EOD technicians to allow a detailed screening for OE items.
- Place inspected material into stockpiles.

- Locate the utility corridor by state plane coordinates by global positioning system (GPS) equipment.
- Backfill the excavation with clean offsite material.
- Load and transport all excavated material to a Subtitle D landfill.
- Submit a report documenting site operations, off-site transportation and disposal on contaminated material and all laboratory analysis, including GPS locations.

2.0 Tasks to be Performed Under this Plan

2.1 Description of Tasks

(Reference Field Project Start-up Form)

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.

2.1.1 Hazwoper-Regulated Tasks

- Preparation of access to the site and stockpile area.
- Layout of the utility corridor limits with utility contractor personnel.
- Excavation of the soil and debris in the corridor with heavy equipment by two qualified EOD technicians.
- Inspection of thin lifts of material by two qualified EOD technicians to allow a detailed screening for OE items.
- Place inspected material into stockpiles.
- Locate the utility corridor by state plain coordinates by GPS equipment.
- Backfill the excavation with clean off-site material.
- Load and transport all excavated material to a Subtitle D landfill.

2.1.2 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">• Prepare preparatory submittals including a work plan addendum and OE avoidance plan.• Mobilization to the site• Submit a report documenting site operations, off-site transportation and disposal on contaminated material and all laboratory analysis, including GPS locations.	<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

	Mobilization and Setup	Preparation of access to the site and stockpile area	Layout of the utility corridor limits with utility contractor personnel	Excavation of the soil and debris in the corridor with heavy equipment by two qualified EOD technicians	Inspection of thin lifts of material by two qualified EOD technicians to allow a detailed screening for OE items	Place inspected material into stockpiles	Locate the utility corridor by state plain coordinates by GPS equipment	Backfill the excavation with clean off-site material	Load and transport all excavated material to a Subtitle D landfill
Manual Lifting (HS-29)	X	X	X	X	X	X	X		X
Fire Prevention (HS-22)	X			X					
Electrical Safety (HS-23)	X		X				X		
Lockout /Tagout (HS-33)	X								
Ladders & Stairs(HS-25)	X	X		X					X
Compressed Gas Cylinders (HS-63)	X								
Buried Utilities	X			X	X	X	X	X	
Excavations (HS-32)			X	X	X		X		
Fall Protection (HS-31)	X								X
Heavy Equipment (HS-27)	X	X	X	X	X	X	X	X	X
Confined Space Entry (HS-17)									
Concrete & Masonry Work (HS-43)									
Cranes and Hoisting (HS-44)									
Demolition (HS-45)									
Scaffolding(HS-73)									
Steel erection (HS-62)									
Welding and cutting (HS-22)	X								
Aerial Lifts (HS-41)									
Hand & Power Tools (HS-50)	X	X	X	X	X	X	X	X	X
Forklifts (HS-48)	X								X
Drilling (HS 35)									
Noise (HS-39)	X	X	X	X	X	X		X	X
Pressurized Lines/Equipment	X								X
Pressure Washing/Equip Decon									X
Vacuum Truck/Pumping Operations									
Suspended Loads									
Vehicle Traffic	X								X
Haul Truck Operations			X			X		X	X
Visible Lighting	X	X	X	X	X	X	X	X	X
Mechanical Guarding Hazards	X			X	X				X
Asbestos Hazard									
Lead Hazard									
Chemical Hazard-Dermal/Inhalation	X		X	X					
Dust Hazard (Silica/Metals)									
Fire/Explosion Hazards		X	X	X	X	X	X	X	X

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. CCI employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CCI 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 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 CCI 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 shall 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 Welding/Cutting with Compressed Gas Cylinders

(Reference CH2M HILL, SOP HS-22, *Welding and Cutting*)

- Complete hot work permit.
- Wear appropriate personal protective equipment.
- Remove or combustible materials in the immediate hot work area.
- Station fire watch with fire extinguisher.

- 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 positioned to avoid being struck or knock over; coming in contact with electrical circuits or extreme heat sources; and shielded from welding and cutting operations.
- Cylinders must be secured on a cradle, basket or pallet when hoisted; they may not be hoisted by choker slings.

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 Excavation (Reference CH2M HILL SOP HS-32, *Excavations*)

The requirements of this section shall be followed by CCI employees who are potentially exposed to hazards associated with excavation activities, regardless of the company performing the excavation operation. These requirements also pertain to excavation subcontractor personnel when CCI is providing oversight.

- Do not enter the excavations unless completely necessary, and only after the competent person has completed the daily inspection and has authorized entry.
- Follow all excavation entry requirements established by the competent person.
- Do not enter excavations where protective systems are damaged or unstable.

- Do not enter excavations where objects or structures above the work location may become unstable and fall into the excavation.
- Do not enter excavations with the potential for a hazardous atmosphere until the air has been tested and found to be at safe levels.
- Do not enter excavations with accumulated water unless precautions have been taken to prevent excavation cave-in.
- H&S Self-Assessment Checklist – Excavations, found in Attachment 5 of this plan, should be used to evaluate excavations prior to entry.
- Munitions and explosives of concern (MEC)/unexploded ordnance (UXO) avoidance must be conducted during excavation operations on known or suspect MEC sites.
- Prior to excavation crews entering any of the sites, the EOD/UXO team will conduct a reconnaissance and MEC avoidance activities to provide clear access routes to each site, according to the following procedures:
 - The EOD/UXO team will identify, and clearly mark the boundaries of a clear approach path for the sampling crews, vehicles, and equipment to enter the site. This path will be, at a minimum, twice the width of the widest vehicle. No personnel will be allowed outside any marked boundary.
 - If MEC is encountered on the ground surface, the EOD/UXO team will clearly mark the area where it is found, report it to the proper authorities, and divert the approach path around it.
 - The EOD/UXO team will conduct a access survey using the appropriate geophysical instrument over the approach path for avoidance of MEC that may be in the subsurface. If a magnetic anomaly is encountered, it will be assumed to be MEC and the approach path will be diverted around the anomaly. EOD/UXO personnel only will operate the appropriate geophysical instrument and identify MEC.

MEC Excavation Operations (HSE-91 sec 4.2.6)

- Hand Excavation is the most reliable method for uncovering MEC.
- Earthmoving machinery may be used to excavate overburden from suspect MEC. Earthmoving machinery will not be used to excavate within 12 inches of suspect MEC.
- Excavation operations, whether by hand or by earthmoving machinery, will employ a step-down or offset access method.

3.1.4 Operating Heavy Equipment

(Reference CH2M HILL, SOP HS-27, *Earthmoving Equipment*)

- CCI authorizes only those employees qualified by training or previous experience to operate material handling equipment.
- Equipment must be checked at the beginning of each shift to ensure the equipment is in safe operating condition and free of apparent damage. The check should include: service brakes, parking brakes, emergency brakes, tires, horn, back-up alarm, steering

mechanism, coupling devices, seat belts and operating controls. All defects shall be corrected before the equipment is placed in service. Documentation of this inspection must be maintained onsite at all times.

- Equipment must be on a stable foundation such as solid ground or cribbing; outriggers are to be fully extended.
- Equipment must not be used to lift personnel; loads must not be lifted over the heads of personnel.
- Equipment, or parts thereof, which are suspended must be substantially blocked or cribbed to prevent shifting before personnel are permitted to work under or between them. All controls shall be in a neutral position, with the motors stopped and brakes set.
- Equipment which is operating in reverse must have a reverse signal alarm distinguishable from the surrounding noise or a signal person when the operators view is obstructed.
- When equipment is used near energized powerlines, the closest part of the equipment must be at least 10 feet from the powerlines < 50 kV. Provide an additional 4 feet for every 10 kV over 50 kV. A person must be designated to observe clearances and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. All overhead powerlines must be considered to be an energized until the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
- Underground utility lines must be located before excavation begins; refer to Section 3.2.11 "Procedures for locating buried utilities".
- Operators loading/unloading from vehicles are responsible for seeing that vehicle drivers are in the vehicle cab or in a safe area.
- The parking brake shall be set whenever equipment is parked, wheels must be chocked when parked on inclines.
- When not in operation, the blade/bucket must be blocked or grounded; the master clutch must be disengaged when the operator leaves the cab. When equipment is unattended, power must be shut off, brakes set, blades/buckets landed and shift lever in neutral. .

3.1.5 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).

3.1.6 Rigging

- Stay as clear as possible of all hoisting operations. Loads shall not be hoisted overhead of personnel.
- Hoists shall not be used to lift or lower personnel.
- Do not exceed hoist load limits.
- Ensure load is level and stable before hoisting
- Inspect all rigging equipment prior to use. Do not use defective rigging for any reason.
- Only use rigging equipment for the purpose it was designed and intended.
- A Weight Handling Equipment Incident Report shall be provided to the Contracting Officer within 30 days of any accident.

3.1.7 Munitions and Explosives of Concern

(Reference CH2M HILL SOP HSE-91, (Munitions and Explosives of Concern (MEC) Standards of Practice)

- MEC is a compilation of UXO, Chemical Weapons Material (CWM), MEC Contaminated Soils and Groundwater, Range Maintenance, Ordnance Demilitarization (Demil), and Demining.
- MEC/UXO may be encountered during field activities. Sites potentially contaminated with MEC/UXO will be screened by qualified EOD/UXO technicians prior to and during field activities.
- The requirements of this section shall be followed by CCI employees who are potentially exposed to hazards associated with MEC activities, regardless of the company or individuals performing the MEC operation. These requirements also pertain to MEC subcontractor personnel when CCI is providing oversight.
- Only qualified UXO Technicians or EOD personnel will locate, identify, handle, remove, transport, store or dispose of MEC/UXO items.
- Personnel knowledgeable of MEC/UXO safety precautions must observe these precautions at all times. They must also advise others in the vicinity of proper precautions for the protection of all personnel in an MEC/UXO danger area.
- The preferred and safest method for disposal of MEC/UXO is to destroy it in its original position by demolition (Blow in Place – BIP) whenever circumstances permit. By this method, both the ordnance and the hazard it poses are eliminated in one operation.
- Munitions that have been determined to be “safe to move” by authorized EOD/UXO technician can be transported to an approved holding area or disposal site.
- One person acting alone should never conduct operations involving contact with MEC/UXO.
- MEC/UXO must not be moved or disturbed in any way unless it has been determined to be safe to do so by a qualified EOD/UXO technician. Operations in the vicinity of MEC/UXO should only be conducted after a complete work plan, including emergency procedures, has been established.
- Do not activate electronic equipment capable of emitting electromagnetic radiation (radios, cellular phones) in the vicinity of known or suspect electrically initiated ordnance.
- Do not rely on color coding for positive identification of ordnance. Munitions having no, incomplete or improper color-coding are not uncommon.
- Avoid inhalation of, and skin contact with smoke, fumes, and vapors of explosives and related hazardous materials.
- Consider MEC/UXO that has been exposed to fire or detonation as extremely hazardous. Chemical and physical changes may have occurred to the contents, which render it more sensitive than its original state.

- Attempt to positively identify MEC/UXO items encountered. Carefully examine the item for markings and other identifying features such as shape, size, and external fittings. Do not move the item to inspect it.
- Approach ordnance from the side and avoid the forward and rear ends. Munitions may contain an ejection hazard, shaped charge explosive jet hazard, rocket motor, or fuzing sensitive to movement.
- Do not allow unnecessary personnel to remain in the vicinity of MEC or UXO.
- Always consider all ordnance items to be armed and dangerous.
- Do not assume fired ammunition or ordnance to be safe.
- Do not collect souvenirs.
- Ordnance items larger than .50 cal are considered UXO and may contain High Explosives.

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 CCI using Attachment 2.
- Confirm that an inventory of chemicals brought on site by CCI subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CCI 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 CCI training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

3.2.4 Lifting

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

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

3.2.5 Fire Prevention

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

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

- be maintained in a fully charged and operable condition,
 - be visually inspected each month, and
 - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
 - Post “Exit” signs over exiting doors, and post “Fire Extinguisher” signs over extinguisher locations.
 - Combustible materials stored outside should be at least 10 feet from any building.
 - Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
 - Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

3.2.6 Electrical

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

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

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

3.2.7 Stairways and Ladders

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

- Stairway or ladder is generally required when a break in elevation of 19 inches or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails
- Ladders shall not be moved, shifted, or extended while in use.
- User must use both hands to climb; use rope to raise and lower equipment and materials
- Straight and extension ladders must be tied off to prevent displacement
- Ladders that may be displaced by work activities or traffic must be secured or barricaded
- Portable ladders must extend at least 3 feet above landing surface
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder
- Stepladders are to be used in the fully opened and locked position
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder
- Fixed ladders \geq 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than six feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

3.2.8 Heat Stress

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

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 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.

	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
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!

Monitoring Heat Stress

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

3.2.9 Cold Stress

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

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

Symptoms and Treatment of Cold Stress

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

3.2.10 Compressed Gas Cylinders

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

3.2.11 Procedures for Locating Buried Utilities

- 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 permethrin 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 mosquitos whenever possible. Mosquitos 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 mosquitos 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% DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35%) 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.

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

(Refer to Project Files for more detailed contaminant information)

3.5.1 Chemical Warfare Materials

CWM is not expected at these work sites. If, at any time during the fieldwork, suspected CWM is encountered, the EOD/UXO team will stop all work activities immediately. Field sampling teams will withdraw from the site along the cleared approach paths, away from the area where the suspected CWM is found. The EOD/UXO team will immediately report the event to the CH2M HILL Site Manager who will in turn notify the CNC RDA Project Manager and Safety Office. A EOD/UXO team consisting of a minimum of two EOD/UXO qualified personnel will secure the suspected CWM discovery and standby in an upwind location until relieved by the government representative. The initial exclusion zone for chemical weapons is 450 feet upwind per FM 9-15, Explosive Ordnance Disposal Service and Unit Operations. The UXO team will provide the CNC designated POC with a Suspect CWM Report. If the government representative confirms the presence of CWM, they will report the chemical event to the appropriate agencies.

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 5.

Inhalation: Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Section 6.

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 CCI 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
Greg Wilfley	ATL	Project Manager	FA-CPR
Jon Overholzer	ATL	Project Engineer	FA-CPR
Rich Rathnow	ORO	HSM	SC-HW, SC-C/FA-CPR
Terry McElveen	ATL	SHSS	SC-HW, SC-C/FA-CPR

4.2 Field Team Chain of Command and Communication Procedures

4.2.1 Client: Southern Division, U.S. Navy Facilities Engineering Command

Contact Name: ACO - Eva Clement, COTR - Jimmy Jones

Phone: 843/820-5544

Facility Contact Name: TBD

Phone:

4.2.2 CCI

Program Manager: Scott Newman/ATL

Project Manager: Greg Wilfley/ATL

Health and Safety Manager: Rich Rathnow/ORO

Team Leader: Terry McElveen

Site Health and Safety Specialist: Terry McElveen

The CCI 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 CCI 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 CCI 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 CCI H&S Manager 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 CCI site personnel and subcontractor personnel read this HSP and sign Attachment 1 "Employee Signoff Form" prior to commencing field activities
- Verify CCI 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 CCI 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 CCI 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 CCI 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 CCI 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). CCI oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

CCI 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. CCI is not responsible for exhaustive observation for hazards and unsafe practices. In addition to this level of observation, the SHSS is responsible for confirming CCI 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 CCI 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 CCI 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)

Personal protective equipment (PPE) is listed in Table 5-1.

TABLE 5-1
Personal Protective Equipment

Task	Level	PPE Specifications ^a		
		Body	Head	Respirator ^b
General site entry Surveying Observation of material loading for offsite disposal Oversight of remediation and construction	D	Work clothes; steel-toe, leather work boots; work glove	Hardhat ^c Safety glasses Ear protection ^d	None required
Surface water sampling Sediment sampling Surface soil sampling Hand augering Geoprobe boring Test pit excavation	Modified D	Work clothes or cotton coveralls 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 Safety glasses Ear protection ^d	None required
Groundwater sampling Soil boring Investigation-derived waste (drum) sampling and disposal	Modified D	Coveralls: Uncoated 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 Safety glasses Ear protection ^d	None required.
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 geophysical survey in contamination area	Modified D	Work clothes or cotton coveralls Boots: Compositel-toed, OR leather work boots Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves. As required	Hardhat ^c Safety glasses Ear protection ^d	None required
Tasks requiring OE/UXO anomaly reacquisition in contamination area	Modified D	Work clothes or cotton coveralls Boots: Steel-toed, chemical-resistant boots ^g OR steel-toed, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves. As required	Hardhat ^c Safety glasses Ear protection ^d	None required
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.

^a Modifications are as indicated. CCI will provide PPE only to CCI 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.

5.1 Reasons for Upgrading or Downgrading Level of Protection

Upgrade	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.

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
Dust Monitor: Visual Assessment	All dust generating tasks	No Visible Dust	Level D	Initially and periodically during tasks	Zero Daily
		Visible Dust	Use dust suppression measures to eliminate/control		
Nose-Level Monitor^e:	Use as needed for specific concerns	<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 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.

Results must be sent immediately to the HSM. Regulations may require reporting to monitored personnel. Results reported to the HSM.

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.

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.

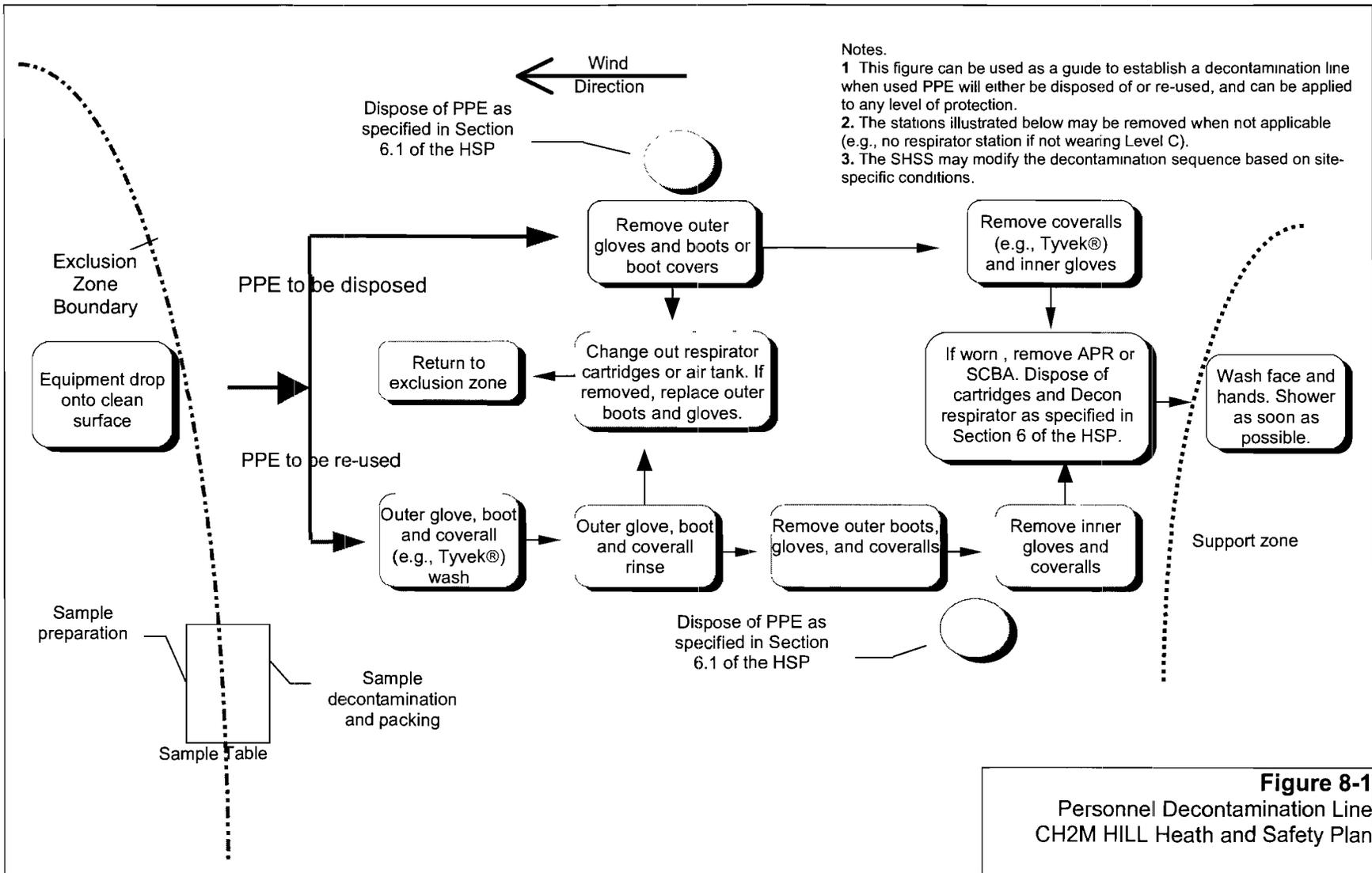


Figure 8-1
 Personnel Decontamination Line
 CH2M HILL Health and Safety Plan

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 (Section 2) might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities specified in Section 2 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 hour 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 CCI 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
Additional equipment (specify):	

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 CCI requirements, **all personal injuries, near-misses, or property damage incidents involving CCI or subcontractor project personnel be reported IMMEDIATELY to the HSM Rich Rathnow/ORO, Program Manager Scott Newman/ATL, or CCI 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 CCI 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 listed in Section 9.8 (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 9.7.

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 CCI 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 CCI and subcontractor during the course of the project by the Site Supervisor/SHSS. The Project-Specific and General Hazards (Sections 2.1 and 2.2, respectively) of the HSP, the Hazard Analysis Table (Table 2.1), and applicable CH2Mhill Standards of Practice (SOPs) should be used as a basis for preparing CCI's AHAs.

CCI subcontractors are required to provide AHA's specific to their scope of work on the project for acceptance by CCI. 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 CCI 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/JSA's, 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 JSA. 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 (LPO's) 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. LPO's 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 CCI 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: 2-25-03

Approved By: Rich Rathnow

Date: 2-25-03



12.2 Revisions

Revisions Made By:

Date:

Revisions to Plan:

Revisions Approved By:

Date:

Attachment 1

Employee Sign Off Form

Attachment 2

Project-Specific Chemical Product Hazard Communication Form

Attachment 3

Chemical-Specific Training Form

CHEMICAL-SPECIFIC TRAINING FORM

Location:	Project # :
HCC:	Trainer:

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

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

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

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

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

Attachment 4

Emergency Contacts

Emergency Contacts

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

Medical Emergency – 911

Facility Medical Response #:
Local Ambulance #:

CH2M HILL- Medical Consultant

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

Fire/Spill Emergency – 911

Facility Fire Response #:
Local Fire Dept #:

Local Occupational Physician

Security & Police – 911

Facility Security #:
Local Police #:

Navy RAC Program Manager

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

Utilities Emergency

Water:
Gas:
Electric:

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: Terry McElveen
Phone: 678-247-2144 (cell)

CCI Human Resources Department

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

Project Manager

Name: Greg Wilfley/ATL
Phone: 770/604/9182

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:

Medical University of South Carolina Medical Center
169 Ashley Avenue
Charleston, SC 29425

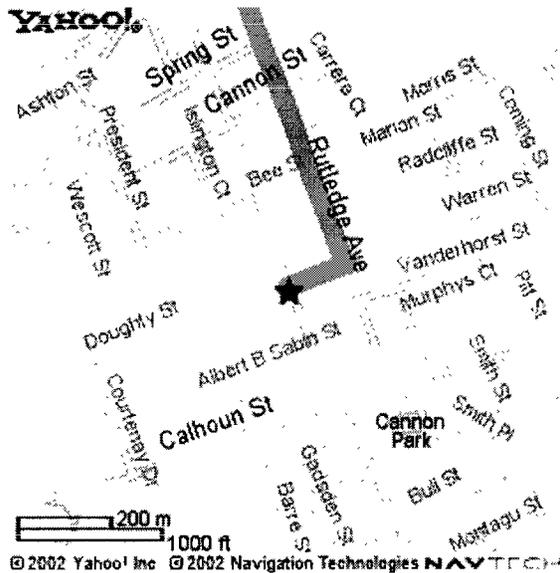
Hospital Phone #: Hospital

Phone #: (843) 792-2300 or call
911 ("0" on a cellular phone)

Directions to Hospital

Hospital Name/Address:

Medical University of South Carolina Medical Center
169 Ashley Avenue
Charleston, SC 29425



Driving Directions:

Start out going Southwest on McMillan St. towards US-78 East / US 52 East
Turn Left on AVENUE E S (US-78 East / US 52 East)
Turn Right on COSGROVE AVE (SC-7 South) (0.5 miles)
Continue on SC-7 (1.1 miles)
Bear Right to take the I-26 EAST ramp towards CHARLESTON (4.4 miles)
Take the US-17 SOUTH exit towards KING ST/SAVANNAH, exit number 221A .

Bear Right onto SEPTIMA CLARK EXPY
Turn Left on RUTLEDGE AVE
Turn Right on DOUGHTY ST

Attachment 5

Project Activity Self-Assessment Checklists/Permits

- **OE Operations**
- **Forklifts**
- **Earthmoving Equipment**
- **Excavations**
- **Hand and Power Tools**

HS&E Self-Assessment Checklist—OE Operations

CH2MHILL

HS&E Self-Assessment Checklist - ORDANCE EXPLOSIVES (OE)

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project’s HSP/FSI. The Safety Coordinator (SC) position must be filled by a qualified UXO technician to provide field assessment of OE activities.

This checklist is to be used at locations where: 1) CH2M HILL employees are involved with OE activities (complete entire checklist). 2) CH2M HILL oversight of an OE subcontractor is required (complete entire checklist).

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

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

Project Name: _____	Project No.: _____
Location: _____	PM: _____
Auditor: _____	Title: _____ Date: _____
This specific checklist has been completed to:	
<input type="checkbox"/> Evaluate CH2M HILL employee exposures to OE hazards <input type="checkbox"/> Evaluate a CH2M HILL subcontractor’s compliance with OE HS&E requirements Subcontractor Name: _____	

<p>Check “Yes” if an assessment item is complete/correct.</p> <p>Check “No” if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the OE subcontractor. Section 3 must be completed for all items checked “No.”</p> <p>Check “N/A” if an item is not applicable.</p> <p>Check “N/O” if an item is applicable but was not observed during the assessment.</p> <p>Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-91.</p>
--

SECTION 1

Yes No N/A N/O

PROJECT PLANNING (2.0)

- | | | | | |
|--|---|---|---|---|
| 1. CH2MHILL employees and sub contractors have completed the training requirements. | ☐ | ☐ | ☐ | ☐ |
| 2. All UXO personnel are qualified as UXO. | ☐ | ☐ | ☐ | ☐ |
| 3. CH2MHILL employees and sub contractors have met the requirement for medical surveillance. | ☐ | ☐ | ☐ | ☐ |
| 4. CH2MHILL employees and sub contractors have participated in the drug screening program.. | ☐ | ☐ | ☐ | ☐ |
| 5. A qualified OE/UXO competent person is assigned to oversee OE operations | ☐ | ☐ | ☐ | ☐ |
| 6. Site personnel are wearing appropriate PPE, per HSP/FSI | ☐ | ☐ | ☐ | ☐ |
| 7. Project plans address the required support needed for OE operations | ☐ | ☐ | ☐ | ☐ |

CH2MHILL

HS&E Self-Assessment Checklist - ORDANCE EXPLOSIVES (OE)

SECTION 2

Yes No N/A N/O

GENERAL SAFETY CONCERNS and PROCEDURES (4.2.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 6. OE operations are being conducted with approved plans. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Only qualified UXO technicians or Explosive Ordnance Disposal (EOD) personnel will locate, identify, handle, remove, transport, store or dispose of OE/UXO items | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Proper PPE is being worn as required in the HASP | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

OE SAFETY PRECAUTIONS (4.2.2)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 9. Ordnance items are being properly identified, classified and safely handled. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. OE/UXO items are not taken off site as souvenirs. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Personnel know and understand the procedures if CWM is encountered. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Approach routes of OE/UXO items are being properly observed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. OE/UXO safety precautions are being observed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

OE STORAGE/TRANSPORTATION (4.2.3-4.2.4)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 14. OE Storage is in compliance with plans and directives | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. OE Storage meets minimum physical security standards | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. OEW is properly identified, classified and stowed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. OE is properly transported in appropriate containers and vehicles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

OE EXCLUSION ZONES (4.2.5)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 17. OE Exclusion Zones (EZ) established | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Multiple UXO teams working onsite have safe separation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Only essential personnel are allowed in the exclusion zone | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. When non-essential personnel enter the EZ, OE activities are stopped and an escort provided | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

OE EXCAVATION OPERATIONS (4.2.6)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 21. Hand excavation methods are used to excavate from 12 inches to OE item | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Earth Moving Machinery (EMM) is used to excavate overburden (greater than 12 inches) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Earth Moving Machinery (EMM) excavations are supervised by a qualified UXO Technician | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. All OE excavations employ a step down off set method. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

OE DISPOSAL OPERATIONS (4.2.7)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 25. Proper demolition procedures are being observed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. OE sub contractor conducting disposal, has proper explosive license/permits | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Protective measures are taken to reduce shock, blast over pressure and fragmentation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Minimum safe separation distances are established | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. OE accountability is tracked "Cradle to Grave" as required | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

OEW DISPOSAL (4.2.8)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 30. OEW is properly characterized | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. OEW is properly stored treated and disposed of | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. OEW accountability is tracked "Cradle to Grave" as required | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

CH2MHILL

H&S Self-Assessment Checklist - FORKLIFTS

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:		
<input type="checkbox"/> Evaluate CH2M HILL employee exposures to forklift hazards.		
<input type="checkbox"/> 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"/> |

SECTION 2

Yes No N/A N/O

GENERAL (3.2.1)

- 10. Only certified personnel operating forklifts.
- 11. Daily safety briefing/meeting conducted with forklift operators.
- 12. Daily inspection of forklift and forklift accessories conducted before use.
- 13. Rated capacity of forklift visible to operator.
- 14. Modifications and attachments used approved by forklift manufacturer.
- 15. High-lift forklifts have load backrest and overhead guard.
- 16. Seat belts are provided and used.
- 17. Backup alarm or spotter used when backing forklift.
- 18. Operational horn provided and used as necessary.
- 19. Braking system capable of stopping capacity load.
- 20. Forklifts equipped with lights for low-light operations.
- 21. Carbon monoxide concentrations below PEL (50ppm).
- 22. At least one fire extinguisher available at the forklift operating area.

DESIGNATIONS AND LOCATIONS (3.2.2)

- 23. Atmosphere/locations classified as hazardous or non-hazardous.
- 24. Only properly designated forklifts used in hazardous locations.

FORKLIFT OPERATION (3.2.3)

- 25. Forklift operated on safe roadways and grades.
- 26. Grades ascended/descended properly.
- 27. Forklift operated at safe speed, kept under control at all times
- 28. Operators slow down and use horn at areas with obstructed vision.
- 29. Forklifts operating in reverse when load obstructs vision.
- 30. Operator keeping clear view of path of travel.
- 31. Forklifts do not pass other stopped vehicles at areas with obstructed vision.
- 32. Operators maintain safe distance from edge or ramps and platforms.
- 33. Overhead clearance maintained from installations.
- 34. Forklifts not parked within 8 feet of center of railroad tracks. Tracks crossed diagonally.
- 35. Forklift parked correctly when operator is dismounted.
- 36. Personnel platforms secured to forklift and shut off means provided on platform.
- 37. Trucks, trailers, railroad cars secured from movement before entering with forklift.
- 38. Dockplates/bridgeplates secured before use; capacity not exceeded.
- 39. Truck, trailer, railroad car flooring checked for weakness before forklift boarding.
- 40. Operator handles only loads within rated capacity, adjusts for long or tall loads.
- 41. Loads are stabilized before forklift travel.
- 42. Operator using proper tilt to stabilize load, uses caution when tilting elevated loads.
- 43. When two forklifts lift a load in unison, operators stay in close communication.

FORKLIFT MAINTENANCE (3.2.4)

- 44. Forklifts with unsafe conditions removed from service and tagged as such to prevent use.
- 45. Forklifts repaired in designated, non-hazardous locations by authorized personnel.
- 46. Battery disconnected when repairing electrical systems.
- 47. Additions or omissions of parts not performed without manufacturer's approval.
- 48. Good housekeeping maintained on and around forklift.
- 49. Water mufflers checked daily, kept at 75% full.
- 50. Forklifts removed from service if sparks, flames, or elevated operating temperatures occur.
- 51. Suspended forklifts or forklift parts are supported prior to work under or between.
- 52. Forklifts properly parked before fueling/battery charging.
- 53. Fueling/battery charging conducted in designated, well-ventilated area.
- 54. Fueling/battery charging areas properly equipped for task.
- 55. No smoking in fueling/battery charging areas.
- 56. Spillage of fuel properly cleaned up before starting forklift.
- 57. Forklifts with fuel leaks taken out of service.

CH2MHILL

H&S Self-Assessment Checklist - EARTHMOVING EQUIPMENT

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 earthmoving equipment operations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of a earthmoving equipment subcontractor is required (complete entire checklist).

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

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

Project Name: _____	Project No.: _____
Location: _____	PM: _____
Auditor: _____	Title: _____ Date: _____
This specific checklist has been completed to:	
<input type="checkbox"/> Evaluate CH2M HILL employee exposures to earthmoving equipment hazards <input type="checkbox"/> Evaluate a CH2M HILL subcontractor's compliance with earthmoving equipment H&S 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 earthmoving equipment 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-27.

<u>SECTION 1</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
PERSONNEL SAFE WORK PRACTICES (3.1)				
1. Only authorized personnel operating earthmoving equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Personnel maintaining safe distance from operating equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Personnel and equipment operator in close communication when personnel must be in proximity of operating equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Personnel approach operating equipment safely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Personnel wearing high-visibility and/or reflective vests when close to operating equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Personnel riding only in seats of equipment cab and using seat belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Personnel not positioned under hoisted loads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Personnel not hoisted by equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Personnel instructed not to approach equipment that has become electrically energized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Personnel wearing appropriate PPE, per HSP/FSI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CH2MHILL

H&S Self-Assessment Checklist - EARTHMOVING EQUIPMENT

SECTION 2

Yes No N/A N/O

GENERAL (3.2.1)

- 11. Daily safety briefing/meeting conducted with crew Yes No N/A N/O
- 12. Daily inspection of equipment and equipment accessories conducted before use Yes No N/A N/O
- 13. At least one fire extinguisher available at the equipment operating area Yes No N/A N/O

EARTHMOVING EQUIPMENT COMPONENTS (3.2.2)

- 14. Backup alarm or spotter used when backing equipment Yes No N/A N/O
- 15. Operational horn provided on bi-directional equipment Yes No N/A N/O
- 16. Seat belts are provided and used Yes No N/A N/O
- 17. Rollover protective structures (ROPS) provided Yes No N/A N/O
- 18. Braking system capable of stopping full payload Yes No N/A N/O
- 19. Headlights and taillights operable when additional light required Yes No N/A N/O
- 20. Brake lights in operable condition Yes No N/A N/O
- 21. Cab glass provides no visible distortion to the operator Yes No N/A N/O
- 22. Hauling equipment (dump trucks) provided with cab shield or canopy Yes No N/A N/O
- 23. Dump truck beds provided with positive means of support during maintenance or inspection Yes No N/A N/O
- 24. Dump truck operating levers provided with latch to prevent accidental dumping Yes No N/A N/O

EARTHMOVING EQUIPMENT PLACEMENT (3.2.3)

- 25. Location of underground utilities identified Yes No N/A N/O
- 26. Safe clearance distance maintained while working under overhead powerlines Yes No N/A N/O
- 27. Safe distance is maintained while traveling under powerlines Yes No N/A N/O
- 28. Unattended equipment visibly marked at night Yes No N/A N/O
- 29. Parking brake set when equipment parked and equipment chocked when parked on incline Yes No N/A N/O

EARTHMOVING EQUIPMENT OPERATION (3.2.4)

- 30. Equipment operated on safe roadways and grades Yes No N/A N/O
- 31. Equipment operated at safe speed Yes No N/A N/O
- 32. Equipment not operated during inclement weather, lightning storms Yes No N/A N/O
- 33. Using equipment to lift loads, other than earth, done according to equipment manufacturer specifications Yes No N/A N/O
- 34. Lifting and hauling capacities are not exceeded Yes No N/A N/O
- 35. Equipment components lowered when not in use Yes No N/A N/O
- 36. All machine guards are in place Yes No N/A N/O
- 37. Air monitoring conducted per HSP/FSI for hazardous atmospheres Yes No N/A N/O

EARTHMOVING EQUIPMENT MAINTENANCE (3.2.5)

- 38. Defective components repaired immediately Yes No N/A N/O
- 39. Suspended equipment or equipment parts are supported prior to work under or between Yes No N/A N/O
- 40. Lockout/tagout procedures used prior to maintenance Yes No N/A N/O
- 41. Tires on split rims removed using safety tire rack or cage Yes No N/A N/O
- 42. Good housekeeping maintained on and around equipment Yes No N/A N/O

EXCAVATING AT HAZARDOUS WASTE SITES (3.2.6)

- 43. Waste disposed of according to HSP Yes No N/A N/O
- 44. Appropriate decontamination procedures being followed, per HSP Yes No N/A N/O

CH2MHILL

HS&E Self-Assessment Checklist - EXCAVATIONS

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 enter excavations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of an excavation subcontractor is required (complete entire checklist).

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

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

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

Check "Yes" if an assessment item is complete/correct.
Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the excavation 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-32.

SECTION 1

Yes No N/A N/O

PERSONNEL SAFE WORK PRACTICES (4.1)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Competent person has completed daily inspection and has authorized entry | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Personnel aware of entry requirements established by competent person | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Protective systems are free from damage and in stable condition | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Surface objects/structures secured from falling into excavation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Potential hazardous atmospheres have been tested and found to be at safe levels | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Precautions have been taken to prevent cave-in from water accumulation in the excavation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Personnel wearing appropriate PPE, per HSP/FSI | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

CH2MHILL

HS&E Self-Assessment Checklist - EXCAVATIONS

SECTION 2

	Yes	No	N/A	N/O
GENERAL (4.2.1)				
8. Daily safety briefing/meeting conducted with personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Excavation and protective systems adequately inspected by competent person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Defective protective systems or other unsafe conditions corrected before entry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Guardrails provided on walkways over excavation 6' or deeper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Barriers provided at excavations 6' or deeper when not readily visible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Barriers or covers provided for wells, pits, shafts, or similar excavation 6' or deeper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Excavating equipment operated safely (use earthmoving equipment checklist in HS-27)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PRIOR TO EXCAVATING (4.2.2)				
15. Location of underground utilities and installations identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Soils characterized prior to excavation where contamination may be present	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Excavation area checked for wetlands, endangered species, cultural/historic resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Stockpile construction and management plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. ECC consulted and plan established for wastewater disposal from excavation dewatering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. SWPPP prepared for construction site 1-5 acres (depending on project location)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EXCAVATING ACTIVITIES (4.2.3)				
21. Rocks, trees, and other unstable surface objects removed or supported	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Exposed underground utility lines supported	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Undermined surface structures supported or determined to be in safe condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Warning system used to remind equipment operators of excavation edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Stockpile, excavation covers, liners, silt fences in place, where required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Fugitive dust suppressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EXCAVATION ENTRY (4.2.4)				
27. Trenches > 4' deep provided with safe means of egress within 25'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Structure ramps designed and approved by competent person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Potential hazardous atmospheres tested prior to entry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Rescue equipment provided where potential for hazardous atmospheres exists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Ventilation used to control hazardous atmospheres and air tested frequently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Appropriate respiratory protection used when ventilation does not control hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Precautions taken to prevent cave-in from water accumulation in the excavation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Precautions taken to prevent surface water from entering excavation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Protection provided from falling/rolling material from excavation face	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Spoil piles, equipment, materials restrained or kept at least 2' from excavation edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EXCAVATION PROTECTIVE SYSTEMS (4.2.5)				
37. Protective systems used for excavations 5' or deeper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Protective systems for excavation deeper than 20' designed by registered PE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. If soil unclassified, maximum allowable slope is 34 degrees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Protective systems free from damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Protective system used according to manufacturer recommendations and not subjected to loads exceeding design limits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Protective system components securely connected to prevent movement or failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Cave-in protection provided while entering/exiting shielding systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Personnel removed from shielding systems when installed, removed, or vertical movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROTECTIVE SYSTEM REMOVAL (4.2.6)				
45. Protective system removal starts and progresses from excavation bottom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Protective systems removed slowly and cautiously	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Temporary structure supports used if failure of remaining components observed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Backfilling taking place immediately after protective system removal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EXCAVATING AT HAZARDOUS WASTE SITES (4.2.7)

49. Waste disposed of according to HSP and RCRA regulations

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

50. Appropriate decontamination procedures being followed, per HSP

BACKFILL (4.2.8)

51. Backfill certified clean when required by client or local regulation

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

FORMS/PERMITS (4.3)

52. Waste discharge/NPDES permit obtained for excavation de-watering, where required

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

53. Dig permit obtained, where required by client/facility

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

54. USDA soil permit obtained (for south/southeast and coastal states)

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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CH2MHILL

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

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

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

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

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

Project Name: _____	Project No.: _____	
Location: _____	PM: _____	
Auditor: _____	Title: _____	Date: _____
This specific checklist has been completed to:		
<input type="checkbox"/> Evaluate CH2M HILL employee exposure to hand and power tool hazards.		
<input type="checkbox"/> Evaluate a CH2M HILL subcontractor's compliance with hand and power tool requirements.		
Subcontractors Name: _____		

Check "Yes" if an assessment item is complete/correct.
Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
Check "N/A" if an item is not applicable.
Check "N/O" if an item is applicable but was not observed during the assessment.
Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-50.

SECTION 1

Yes No N/A N/O

SAFE WORK PRACTICES (3.1)

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

CH2MHILL

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

SECTION 2

Yes No N/A N/O

GENERAL (3.2.1)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 13. PPE is selected and used according to tool-specific hazards anticipated. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Tools are tested daily to assure safety devices are operating properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Damaged tools are removed from service until repaired. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Power operated tools designed to accommodate guards have guards installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Rotating or moving parts on tools are properly guarded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Machines designed for fixed locations are secured or anchored. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Floor and bench-mounted grinders are provided with properly positioned work rests. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Guards are provided at point of operation, nip points, rotating parts, etc. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

ELECTRIC-POWERED TOOLS (3.2.2)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 22. Electric tools are approved double insulated or grounded and used according to SOP HS-23. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Electric cords are not used for hoisting or lowering tools. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Portable, power-driven circular saws are equipped with proper guards. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

ABRASIVE WHEEL TOOLS (3.2.3)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 27. All employees using abrasive wheel tools are wearing eye protection. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. All grinding machines are supplied with sufficient power to maintain spindle speed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Abrasive wheels are closely inspected and ring-tested before use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Grinding wheels are properly installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Cup-type wheels for external grinding are protected by the proper guard or flanges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Portable abrasive wheels used for internal grinding are protected by safety flanges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Safety flanges are used only with wheels designed to fit the flanges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

PNEUMATIC-POWERED TOOLS (3.2.4)

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 35. Tools are secured to hoses or whip by positive means to prevent disconnection. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. Safety clips or retainers are installed to prevent attachments being expelled. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Safety devices are installed on automatic fastener feed tools as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Manufacturer's safe operating pressure for hoses, pipes, valves, etc. are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Hoses are not used for hoisting or lowering tools. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Airless spray guns have required safety devices installed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Blast cleaning nozzles are equipped with operating valves, which are held open manually. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Supports are provided for mounting nozzles when not in use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Air receiver drains, handholes, and manholes are easily accessible. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Air receivers are completely drained at required intervals. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Air receivers are equipped with indicating pressure gauges. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Safety, indicating, and controlling devices are installed as required. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 50. Safety valves are tested frequently and at regular intervals to assure good operating condition. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION 2 (continued)

Yes No N/A N/O

LIQUID FUEL-POWERED TOOLS (3.2.5)

- 51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining.
- Liquid fuels are stored, handled, and transported in accordance with SOP HS-21
- Liquid fuel-powered tools are used in confined spaces in accordance with SOP HS-17.
- Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded.

POWDER-ACTUATED TOOLS (3.2.6)

- Only trained employee operates powder-actuated tools.
- Powder-actuated tools are not loaded until just prior to intended firing time.
- Tools are not pointed at any employee at any time.
- Hands are kept clear of open barrel end.
- Loaded tools are not left unattended.
- Fasteners are not driven into very hard or brittle materials.
- Fasteners are not driven into easily penetrated materials unless suitable backing is provided.
- Fasteners are not driven into spalled areas.
- Powder-actuated tools are not used in an explosive or flammable atmosphere.
- All tools are used with correct shields, guards, or attachments recommended by manufacturer.

JACKING TOOLS (3.2.7)

- Rated capacities are legibly marked on jacks and not exceeded.
- Jacks have a positive stop to prevent over-travel.
- The base of jacks are blocked or cribbed to provide a firm foundation, when required.
- Wood blocks are placed between the cap and load to prevent slippage, when required.
- After load is raised, it is cribbed, blocked, or otherwise secured immediately.
- Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.
- All jacks are properly lubricated.
- Jacks are inspected as required.
- Repair or replacement parts are examined for possible defects.
- Jacks not working properly are removed from service and repaired or replaced.

HAND TOOLS (3.2.8)

- Wrenches are not used when jaws are sprung to the point of slippage.
- Impact tools are kept free of mushroomed heads.
- Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool.

Attachment 6

Behavior Based Loss Prevention System Forms

Activity Hazard Analysis

Pre-Task Safety Plans

Loss Prevention Observation

Incident Report and Investigation

Work Tasks	Identify & Analyze the Hazards	Identify Hazard Controls
		<p>UXO trained personnel will escort non-UXO personnel at all times.</p> <p>Surface sweeps will be conducted with magnetometers or other suitable geophysical instrumentation to identify potential OE.</p>
Transportation of OE Waste ¹	<p>Accidental detonation of explosives</p> <p>Accidental detonation of explosives</p> <p>Vehicle operations</p>	<p>No personnel allowed in OE cargo department of vehicle.</p> <p>No OE allowed in passenger compartment of vehicle.</p> <p>Block, brace, secure OE.</p> <p>No smoking in vehicles used for transport of OE/UXO waste.</p> <p>Placard vehicle in accordance with U.S. Department of Transportation (DOT) regulations.</p> <p>Vehicles transporting explosives offroad will not exceed 25 mph.</p> <p>Drivers will observe all posted speed limits while operating a motor vehicle on a public roadway.</p>

Work Tasks	Identify & Analyze the Hazards	Identify Hazard Controls
OE-Related Scrap Demilitarization	<p>Accidental detonation of explosives</p> <p>Shredder Operations</p>	<p>Only UXO technicians will perform explosive demilitarization of OE-related scrap.</p> <p>Stay clear of moving mechanical parts.</p> <p>Ensure that only inspected scrap is fed into shredder.</p>
Inspection/Certification of OE Related Scrap	Accidental detonation of explosives	<p>Only UXO technicians will inspect OE-related scrap.</p> <p>Personnel in the immediate vicinity of OE-related scrap inspections will be kept to the minimum necessary for safe operations but no less than two UXO technicians.</p> <p>Observe requirements of DoD 4160.21-M-1.</p>
Anomaly Reacquisition	Accidental detonation	<p>Only UXO technicians will excavate or handle UXO.</p> <p>Personnel in the immediate vicinity of UXO operations will be kept to the minimum necessary for safe operations, but no less than two UXO technicians.</p>

Work Tasks	Identify & Analyze the Hazards	Identify Hazard Controls
	Non-UXO personnel	<p>Do not subject UXO to heat, shock, or friction.</p> <p>Only hand excavation permitted when within 1 foot of UXO.</p> <p>Magnetometers will be used frequently to pinpoint the location of UXO.</p> <p>Establish EZ; post warning signs, maintain site control.</p> <p>Stop all UXO operations when non-UXO trained personnel are within the EZ.</p>

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):

PPE <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	Protective Systems <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	Fire Protection <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	Electrical <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
Fall Protection <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	Air Monitoring <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	Proper Equipment <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	Welding & Cutting <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
Confined Space Entry <input type="checkbox"/> Isolation <input type="checkbox"/> Air monitoring <input type="checkbox"/> Trained personnel <input type="checkbox"/> Permit completed <input type="checkbox"/> Rescue	Medical/ER <input type="checkbox"/> First-aid kit <input type="checkbox"/> Eye wash <input type="checkbox"/> FA-CPR trained personnel <input type="checkbox"/> Route to hospital	Heat/ Cold Stress <input type="checkbox"/> Work/rest regime <input type="checkbox"/> Rest area <input type="checkbox"/> Liquids available <input type="checkbox"/> Monitoring <input type="checkbox"/> Training	Vehicle/Traffic <input type="checkbox"/> Traffic control <input type="checkbox"/> Barricades <input type="checkbox"/> Flags <input type="checkbox"/> Signs
Permits <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	Demolition <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	Inspections: <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	Training: <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. _____		



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 ¹	Corrective Action Lead	Due Date	Completion Date	Date Verified
¹ RC = Root Cause; ² CC = Contributing Factors (check which applies)							
Investigation Team Members							
Name		Job Title				Date	
Results of Solution Verification and Validation							
Reviewed By							
Name		Job Title				Date	

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

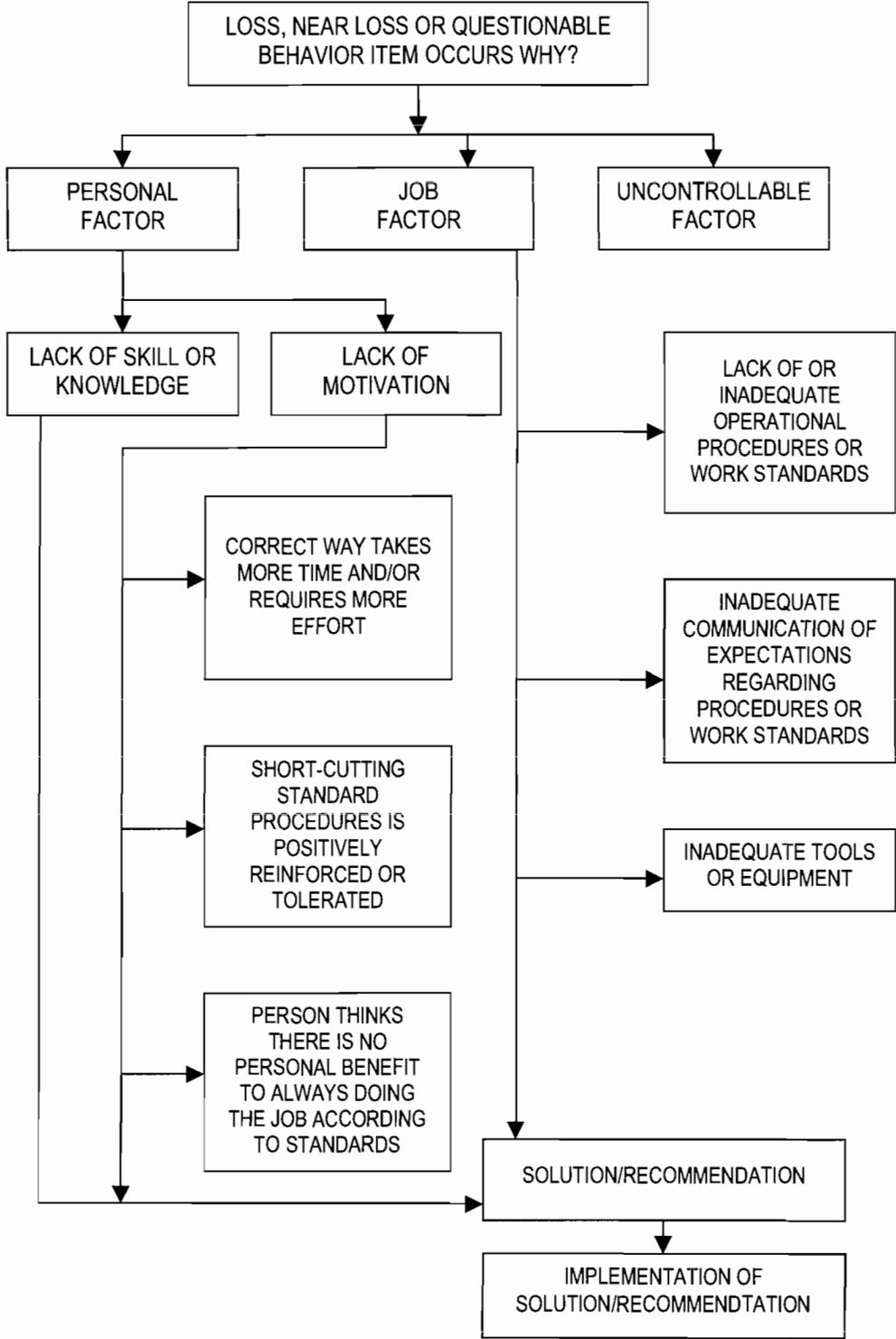
Lack of or inadequate operational procedures or work standards.

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.

Root Cause Analysis
Flow Chart



Attachment 7

Applicable Material Safety Data Sheets
(Available onsite)

Attachment 8

Subcontractor H&S Plans/Procedures

Appendix C

Quality Control Forms

**Submittal Register
Testing Plan and Log**

