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FINAL WORK PLAN ADDENDUM NUMBER 5 FOR SOIL AND GROUNDWATER SAMPLING
REVISION NUMBER 1 SITES 8 AND 24 NAS PENSACOLA FL
6/18/2003
CH2MHILL

CH2M HILL
115 Perimeter Center Place, N.E.
Suite 700
Atlanta, GA
30346-1278
Tel 770.604.9095
Fax 770.604.9282

June 18, 2003

Mr. Bill Hill, ES31
Southern Division, Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, SC 29419-9010

Subject: Contract No. N62467-98-D-0095
Contract Task Order 0085
Naval Air Station (NAS) Pensacola – Pensacola, Florida
Final Work Plan Addendum No. 05 for the Soil and Groundwater Sampling Operable Unit 13 - Sites 8 and 24, Revision No. 01

Dear Bill:

CH2M HILL Constructors (CCI) is pleased to provide one copy of the above-referenced work plan. This work plan presents the SPLP soil sampling plan as well as the permanent groundwater monitoring well installation and sampling for OU-13 as discussed at the January 2003 partnering team meeting. Copies have also been sent to USEPA, FDEP, and the rest of the NAS Pensacola Partnering Team.

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

Sincerely,

CH2M HILL

Amy Twitty, P.G.
Project Manager

cc: Gena Townsend/EPA
Tracie Vaught/FDEP
Gerry Walker/TtNUS
Greg Wilfley/CCI
Greg Campbell/NASP
Allison Harris/EnSafe
Brian Caldwell/EnSafe
Paul Stoddard/EnSafe
CCI Project File No. 171578

Work Plan Addendum No. 05
Soil and Groundwater Sampling
Operable Unit 13 - Sites 8 and 24
Naval Air Station Pensacola
Pensacola, Florida

Revision No. 01

Contract No. N62467-98-D-0995
Contract Task Order No. 0085

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

June 2003

Work Plan Addendum No. 05
Soil and Groundwater Sampling
Operable Unit 13 - Sites 8 and 24

Naval Air Station Pensacola
Pensacola, Florida

Revision No. 01

Contract No. N62467-98-D-0995
Contract Task Order No. 0085

Submitted to:

U.S. Naval Facilities
Engineering Command
Southern Division

Prepared by:

CH2MHILL
Constructors, Inc.

June2003

Prepared/Approved By:

Amy Twitty, Project Manager — June 3, 2003 Date

Approved By:

Scott Smith, Acting Program Manager — June 4, 2003 Date

Client Acceptance:

U.S. Navy Responsible Authority — 6-16-03 Date

Contents

Acronym List ..... **iv**
1.0 Introduction **1-1**
1.1 Work Plan Organization 1-1
1.2 Background 1-2
1.3 Previous Investigations 1-5
1.3.1 Site 8 1-7
1.3.2 Site 24 1-7
2.0 Execution Plan **2-1**
2.1 Scope of Work Tasks 2-1
2.1.1 Site Preparation 2-1
2.1.2 Mobilization and Site Setup 2-1
2.1.3 Site Utilities Clearance 2-2
2.1.4 Soil Investigation 2-2
2.1.5 Groundwater Investigation 2-2
2.1.6 Temporary Monitoring Well Abandonment 2-2
2.1.7 Surveying 2-3
2.1.8 Waste Management and Disposal 2-3
2.1.9 Decontamination and Demobilization 2-3
2.2 Project Schedule 2-3
2.3 Communications Plan 2-4
3.0 Sampling and Analysis Plan **3-1**
3.1 Data Quality Objectives for Measurement Data 3-1
3.2 Soil Sampling 3-1
3.2.1 Soil Characterization 3-6
3.3 Groundwater Investigation 3-13
3.3.1 Monitoring Well Installation 3-14
3.3.2 Site 8 Groundwater Sampling 3-16
3.3.3 Site 24 Groundwater Sampling 3-16
3.3.4 Decontamination / Well Development Water 3-16
4.0 Waste Management Plan **4-1**
4.1 Waste Characterization 4-1
4.2 Waste Management 4-1
4.2.1 Waste Storage Time Limit 4-1
4.2.2 Labels 4-2
4.2.3 General Waste Management Requirements 4-2
4.3 Transportation 4-4
4.3.1 Manifests / Shipping Documentation 4-4
4.3.2 Transporter Responsibilities 4-4
4.3.3 Transportation and Disposal Log 4-5
4.4 Disposal of Wastestreams 4-6
5.0 Quality Control Plan **5-1**
5.1 Project QC Manager 5-1

5.2 Testing Requirements 5-1
5.2.1 Identification and Certification of Testing Laboratories 5-1
5.2.2 Construction 5-1
5.2.3 Testing and Sampling 5-4
5.3 Site Inspections 5-4
5.3.1 Mobilization 5-5
5.3.2 Surveying 5-5
5.3.3 Monitoring Well Installation 5-6
5.3.4 Soil and Groundwater Sampling 5-6
5.3.5 Demobilization 5-6
5.4 Test Control 5-7
5.5 CTO Support Organizations 5-7
6.0 Environmental Protection Plan 6-1
7.0 References 7-1

Appendices

A Ensafe UCL Memo
B Health and Safety Plan
C Project Schedule
D Submittal Register
E Testing Plan and Log
F Project QC Manager Appointment Letter

Tables

1-1 Soil Target Concentrations for COCs 1-7
2-1 Communications Matrix 2-4
2-2 Project Personnel Directory 2-4
3-1 Data Quality Objectives 3-1
3-2 Soil Sample Collection and Analysis Summary 3-4
3-3 Sampling and Analysis Summary 3-7
3-4 Groundwater Sample Collection and Analysis Summary 3-13
5-1 Roles, Responsibilities, and Authorities of Individuals Assigned to a CTO 5-3
5-2 Mobilization Activities 5-5
5-3 Surveying Activities 5-5
5-4 Monitoring Well Installation Activities 5-6
5-5 Soil and Groundwater Sampling Activities 5-6
5-6 Demobilization Activities 5-7

Figures

1-1 Site Layout Map 1-3
1-2 Site Location Map 1-4
1-3 Site 8 Soil Analytical Results and Outline of Contaminated Areas 1-8
1-4 Site 24 Soil Analytical Results and Outline of Contaminated Areas 1-10
3-1 Site 8 Soil Boring Locations 3-3
3-2 Site 24 Soil Boring Locations 3-5
3-3 Site 8 and 24 Monitoring Well Locations 3-16
5-1 Project Organization Chart 5-2

Acronym List

ASTM	American Society for Testing and Materials
bls	below land surface
CCI	CH2M HILL Constructors, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-term Environmental Navy
COCs	contaminants of concern
CTO	Contract Task Order
DDT	d(ichloro)d(iphenbyl)t(richloroethane)
DPT	direct push technology
EISOPQAM	EPA Region IV Environmental Investigation Standard Operating Procedures and Quality Assurance Manual
EnSafe	EnSafe, Inc.
EGIS	Environmental Geographical Information System
EPA	U.S. Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FPDWS	FDEP primary drinking water standard
GCTL	Groundwater Cleanup Target Level
LTM	long-term monitoring
LUCs	Land Use Controls
µg/L	micrograms per liter
MS/MSD	matrix spike/matrix spike duplicate
msl	mean sea level
NAS	Naval air Station
NAVFAC	Naval Facilities Engineering Command
NEESA	Naval Energy and Environmental Support Activity
NGVD	National Geodetic Vertical Datum
OU	Operable Unit
PPE	personal protective equipment
ppb	parts per billion
ppm	parts per million
PRG	preliminary remediation goal
PWC	Public Works Center
QA	quality assurance
QC	quality control

RI/FS	Remedial Investigation/Feasibility Study
RG	remedial goal
SAP	Sampling and Analysis Plan
SCTLs	soil cleanup target levels
SSL	soil screening level
TAT	turnaround time
UCL	Upper Confidence Level

1.0 Introduction

CH2M HILL Constructors, Inc. (CCI) has been contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command (NAVFAC), to prepare this Work Plan Addendum for work to be performed by CCI at Naval Air Station (NAS) Pensacola in Pensacola, Florida. The work is being performed under Contract No. N62467-98-D-0995, Contract Task Order (CTO) No. 0085, and in accordance with the management approach outlined in the CCI Contract Management Plan dated July 1998. Sampling activities at Operable Unit (OU) 13 are regulated under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1.1 Work Plan Organization

This Work Plan Addendum is organized into seven sections and five appendices as follows:

Section 1.0 Introduction will include the site history, the required scope of work (SOW), and individual project schedule.

Section 2.0 Execution Plan provides a description of the tasks to be performed under this CTO, the project schedule, and the communications plan.

Section 3.0 Sampling and Analysis Plan provides the sample collections and analysis methodology including sample handling, labeling, and required collection of quality assurance and quality control samples.

Section 4.0 Waste Management Plan discusses the characterization, disposal, handling, and transportation of wastes encountered or generated during the work completed at NAS Pensacola.

Section 5.0 Quality Control Plan details the quality administrators, the project organization, and the definable features of work for each project site.

Section 6.0 Environmental Protection Plan addresses the various methods that CCI will employ in order to eliminate or minimize any potential impacts to the environment while performing the work.

Section 7.0 References provides a listing of documents referenced in this Work Plan Addendum.

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

- Appendix A Ensafe UCL Memo
- Appendix B Health and Safety Plan
- Appendix C Project Schedule
- Appendix D Submittal Register
- Appendix E Testing Plan and Log
- Appendix F Project QC Manager Appointment Letter

1.2 Background

NAS Pensacola is located in Escambia County, approximately 5 miles west of the Pensacola city limits. The approximately 5,000-acre installation was constructed in the 1800s. Prior to construction, the facility was undeveloped and sparsely vegetated. Land use at NAS Pensacola consists of various military housing, training, and support facilities as well as large industrial complexes for major repairs and refurbishment of aircraft engines and frames. Sites 8 and 24 are located along the eastern side of John Tower Road, south of Taylor Road in the middle of the NAS complex (Figure 1-1); and are included in OU 13.

Site 8 is an approximate 450- by 600-foot area currently occupied by Building 3561, which houses the NAS Pensacola Pubic Works Center (PWC) Maintenance/Material Department (Figure 1-2). An extensive asphalt-paved area surrounds Building 3561 to the north, east, and west, covering nearly all land surface. An approximate 20-foot wide concrete apron immediately surrounds the building to the east and west and is covered by an awning. The PWC stores building materials on the paved area west of the building. Site 8 is generally flat with a land surface elevation averaging 29 feet above mean sea level (msl). Miscellaneous office trailers and fences storage, including Building 3678, are north of the Building 3561 (EnSafe, Inc. [EnSafe], 2000). The paved area east of the building is used for PWC storage and employee parking. Sidewalks and a grassy median are to the south, between Buildings 3560 and 3561. Most of the site is surrounded by a chain-link fence.

Site 8 is the former base rifle range and disposal area. Various solid wastes and dry refuse were reportedly placed in trenches and burned there in the late 1950s and early 1960s (EnSafe, 2000). Aerial photographs and maps from the 1950s and 1960s show a rifle range at the current location of Building 3561. Earlier aerial photographs show an excavation at the northern end of the rifle range, while later photographs show the excavated area overgrown with vegetation (EnSafe, 2000). Most of the excavation noted in the earlier photographs is currently covered by Building 3561 and the surrounding paved area, which were covered in the mid 1970s. Facility personnel reported no waste or residue was identified during the building's construction (Naval Energy and Environmental Support Activity [NEESA], 1983). Site 24 is immediately north of Building 3561 (Figure 1-2) near the northwest corner of the Barrancas National Cemetery. Nearly three quarters of the site is now part of the Barrancas National Cemetery and contains multiple gravesites. Only the southwestern corner of the site, now covered with grass, does not contain gravesites. A paved road transects the site from east to west which leads to the circular drive surrounding the columbarium. Figure 1-1 presents the site layout. Cemetery personnel have reported finding buried metal, rubber, and plastic aircraft parts during excavation along the eastern boundary of Site 24 (EnSafe, 2000).

The fenced storage area around Building 3678, located in the northern portion of Site 24, has a gravel/crushed shell land surface. The site is generally flat with land elevations between 24 and 26 feet above msl.

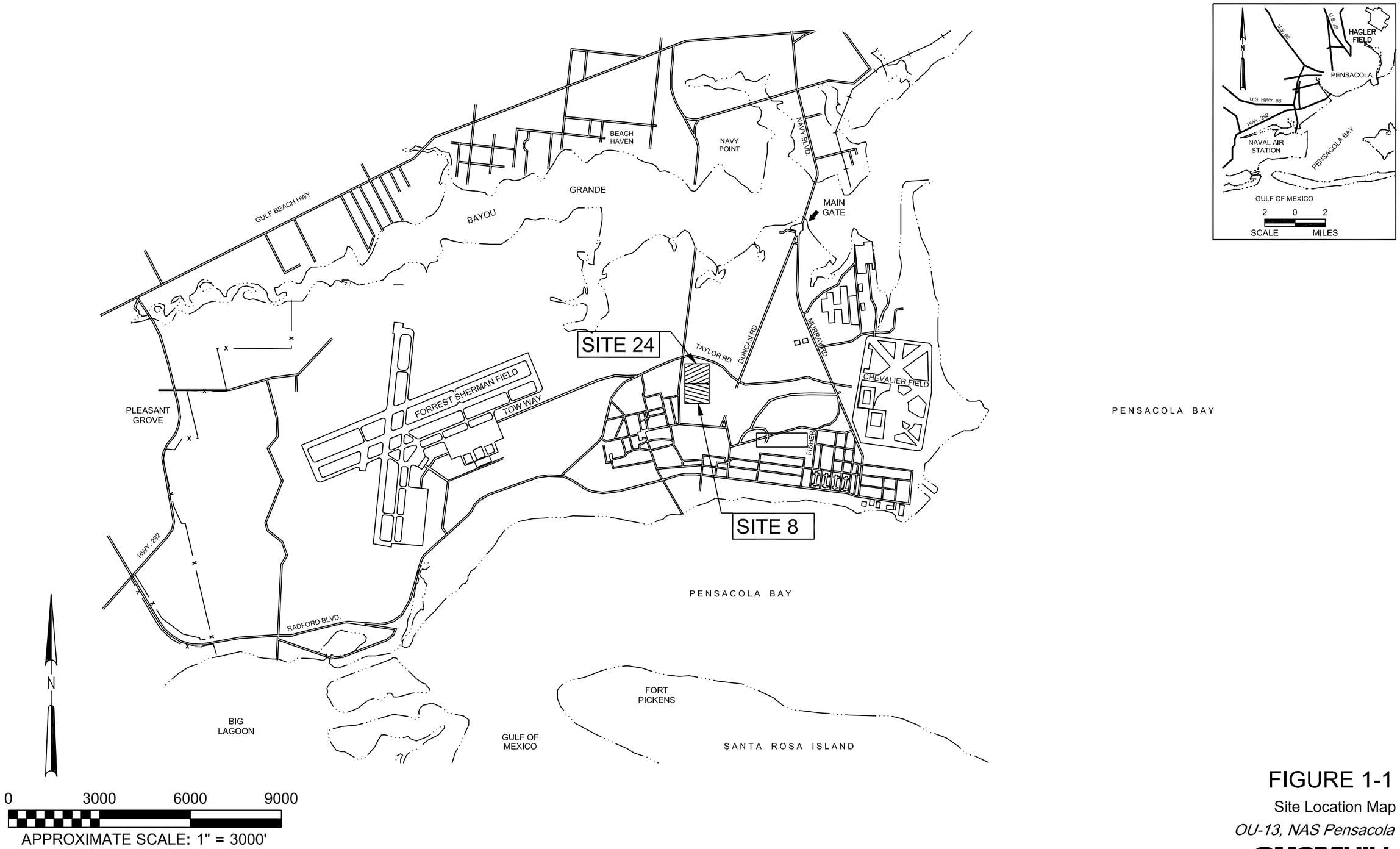

FIGURE 1-1

Site Location Map

OU-13, NAS Pensacola

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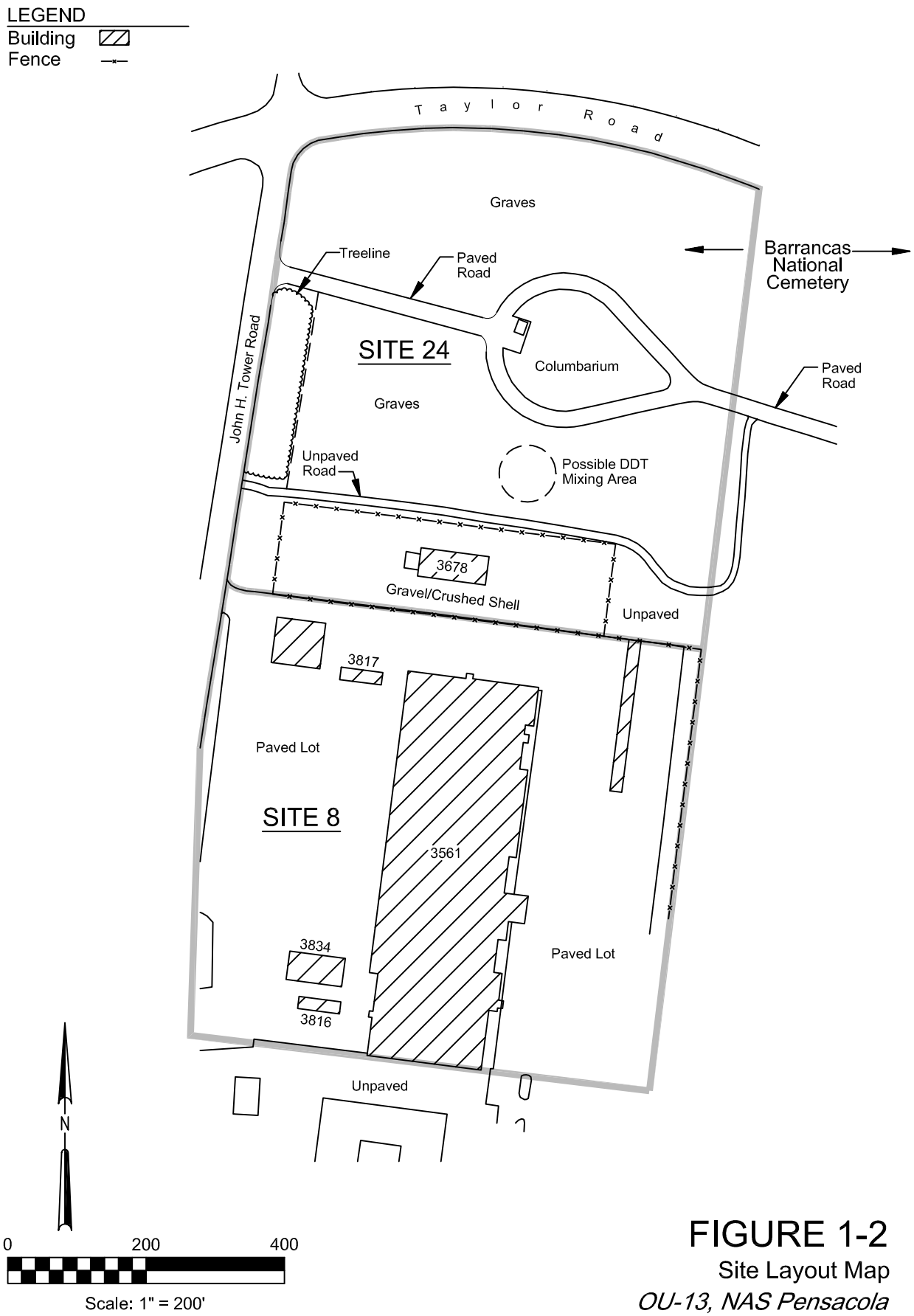

FIGURE 1-2

Site Layout Map

OU-13, NAS Pensacola

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From the early 1950s until the early 1960s, Site 24 was used to mix DDT with diesel fuel for mosquito control. DDT reportedly spilled in the mixing area while being transferred from drums to spray tanks and may have contaminated local soil and groundwater (EnSafe, 2000). DDT was aerially applied for at least 10 years to control mosquito outbreaks. In later years, DDT was applied by a fogger machine. On average, two or three mosquito outbreaks occurred each year during the spring and summer. Following each outbreak, DDT was typically applied for a 1-week period (EnSafe, 2000). For each application, 500 gallons of 20 percent DDT solution was mixed with 300 gallons of diesel fuel. The fogger machine used 300 gallons of 20 percent DDT mixed with 300 gallons of diesel fuel. It is estimated that up to 20 gallons of the 20 percent solution may have been spilled during the approximate 10-year period of DDT mixing at the site (NEESA, 1983).

1.3 Previous Investigations

An Initial Assessment Study was completed by NEESA in 1983, which evaluated Site 8 based on information from historical records, field inspections, and interviews with NAS Pensacola personnel. No evidence of hazardous waste disposal was identified at Site 8.

A Phase I screening investigation was completed in 1991 by Ecology & Environmental, Inc. at Site 24. Lead, total recoverable petroleum hydrocarbons (TRPHs), polynuclear aromatic hydrocarbons (PAHs), and the carbamate pesticide, fluometuron, were detected in soil. Metals, tetrachloroethene, and the carbamante pesticide, methomyl, were detected in groundwater. DDT was not detected. As a result, additional assessment was recommended (Ensafe, 2000).

Remedial Investigation activities were conducted by Ensafe at Sites 8 and 24 from 1995 to 1997. Two soil contamination areas were identified beneath the asphalt pavement at Site 8 in the vicinity of previous sample locations at 08S01 and 08S03. Sample 08S01 was taken from the western side of Building 3561 and sample 08S03 was taken adjacent to the eastern side of Building 3561. It was determined that sample 08S01 exhibited cadmium levels at 10.9 milligrams per kilogram (mg/kg) at 4 to 6 feet bls and 15.9 mg/kg at 7 to 9 feet bls. Both of these samples exceeded the U.S. Environmental Protection Agency (EPA) soil screening level (SSL) of 6 mg/kg for cadmium in subsurface soil. In addition, sample 08S03 exhibited a dieldrin concentration of 2.01 mg/kg in surface soil (0 to 1 feet bls), and 0.49 mg/kg (5 to 7 feet bls) and 0.134 mg/kg (9 to 11 feet bls) in subsurface soil. Each of these samples exceeded the surface and subsurface soil remediation goal (RG) of 0.04 mg/kg and 0.001 mg/kg respectively, for dieldrin.

Groundwater samples collected in 1996 and 1997 from temporary monitoring wells at the Site 8 did not reveal the presence of dieldrin. The preliminary RG for dieldrin in groundwater during the RI was 0.1 micrograms per liter (µg/L). Cadmium was detected in four temporary wells ranging from 19 to 32 µg/L, all above the applicable Florida Department of Environmental Protection (FDEP) primary drinking water standard (FPDWS) of 5 µg/L for cadmium during the RI.

The results of the RI identified four soil contamination areas at Site 24 in the vicinity of samples 24S01, 24S10, 24S11, and 24S12. Initially, dieldrin was identified as a chemical of concern (COC) based on an exceedance of the then target concentration of 0.001 milligrams

per kilogram (mg/kg). However, the remediation goal for dieldrin in subsurface soil subsequently was changed to the leachability-based Florida soil cleanup target level (SCTL) of 0.004 mg/kg. Consequently, the dieldrin concentration detected in sample 24S01 no longer exceeded the cleanup level for dieldrin. Samples 24S10 and 24S12 still exceeded the subsurface SCTL for dieldrin. Sample 24S10 also exceeded the surface soil remedial goals for arsenic and benzo(a)pyrene and sample 24S11 exceeded the surface soil remediation goal for arsenic.

Groundwater samples collected in 1995 and 1996 from temporary monitoring wells at the site did not reveal the presence of benzo(a)pyrene. Only the sample collected from 24GS01 (located at former boring 24S01) exceeded the applicable RG of 0.1 µg/L for dieldrin during the RI (0.26 and 0.34 µg/L). Samples collected from wells 24GS01 and 24GS03 (located at former boring 24S03) exhibited dieldrin in excess of the current RG of 0.005 µg/L. Both of these temporary wells were located on the western portion of the property. The sample collected from temporary well 24GS03 also exhibited an arsenic concentration of 10.6 µg/L. This concentration did not exceed the applicable RG of 50 µg/L during the RI; however, it slightly exceeds the new federal maximum contaminant level (MCL) of 10 µg/L.

In April 2002, EnSafe performed a statistical evaluation for the COCs in surface soil at OU 13. The evaluation was conducted in conjunction with the FDEP's *Use of the 95 Percent Upper Confidence Limit in Developing Exposure Point Concentrations of Contaminants in Soil* (May 11, 1999). This memo is included as Appendix A. This evaluation (upper confidence limit [UCL95%]) resulted in estimated UCL95% levels above the target RG. Therefore the highest concentration areas in surface soil are identified for removal in order for the UCL95% to be below the target RG levels. Based on their statistical analysis using the UCL95%, the new interim action called for the removal of two surface soil "hot spots" and four subsurface "hot spots" to residential criteria resulting in the elimination of LUCs for soil. The target levels for the COCs are listed in Table 1-1.

TABLE 1-1
Soil Target Concentrations for COCs
CTO 85, OU 13 Sites 8 and 24

COC	Target Concentration (mg/kg)	Source	Rationale
Arsenic	2.4	3 x SCTL	Residential land use, direct exposure (UCL95%)
Benzo(a)pyrene	0.3	3 x SCTL	Residential land use, direct exposure (UCL95%)
Cadmium (subsurface)	8	Chapter 62-777	Leachability to groundwater
Dieldrin (surface)	0.21	3 X SCTL	Residential land use, direct exposure (UCL95%)
Dieldrin (subsurface)	0.004	Chapter 62-777	Leachability to groundwater

mg/kg = milligrams per kilogram
COC = contaminant of concern
SCTL = soil cleanup target level from Chapter 62-777 Florida Administrative Code (FAC)

Prior to soil removal activities, CCI conducted soil sampling at Sites 8 and 24 in August 2002 to delineate COCs and the extent for soil excavation. In addition to the scope outlined in the

June 2002 Sampling and Analysis Plan for soil delineation, CCI also collected one groundwater sample in each area of soil contamination to evaluate whether the groundwater was affected by the chemicals detected in soil at the site. The results of additional investigations by CCI are described below.

1.3.1 Site 8

From August 13-14, 2002, a total of 20 subsurface samples were collected by CCI in the vicinity of former sample 08S01 for the source delineation of cadmium. Delineation of the cadmium contamination at former sample 08S01 was performed by collecting subsurface soil samples from 5 to 7 feet and 10 to 12 feet below land surface (bls). Figure 1-3 indicates the layout for each soil sample location.

Additionally, a total of six surface and 12 subsurface samples were collected by CCI in the vicinity of former sample 08S03 for the source delineation of dieldrin. Delineation of the dieldrin contamination at former sample 08S03 was achieved by collecting surface and subsurface samples from 0 to 1 foot, 5 to 7 feet, and 10 to 12 feet bls. Refer to Figure 1-3 for soil sample locations.

Subsurface results for cadmium and dieldrin were compared to the FDEP soil cleanup target levels (SCTLs) listed in Table 1-1. As discussed previously, the surface criterion for dieldrin was established at 0.21 mg/kg using the UCL95%. Of the eight initial samples collected and analyzed for cadmium and the nine initial samples collected and analyzed for dieldrin, no samples exceeded the remediation cleanup goals. Figure 1-3 presents the soil sample results.

In addition to the soil investigation, a direct push drill rig was used to collect two groundwater samples at Site 8 to determine whether the soil contamination had impacted groundwater. The groundwater samples were collected at the most downgradient locations to former samples 08S01 and 08S03 at locations 08S104 and 08S113, respectively. Refer to Figure 1-3 for groundwater sampling locations.

Groundwater sample results indicate cadmium was not detected above the groundwater cleanup target level (GCTL) of 5.0 µg/L (Chapter 62-550, FAC). In addition, dieldrin was not detected in groundwater above the laboratory detection limit. The Method Detection Limit for dieldrin is 0.025 µg/L, which is above the GCTL of 0.005 µg/L (Chapter 62-777, FAC). Based on the groundwater results, there does not appear to be an impact to groundwater in the vicinity of the soil contamination, although the dieldrin results are not definitive.

1.3.2 Site 24

From August 14-15, 2002, a total of eight surface, 13 subsurface samples were collected by CCI in the vicinity of former sample 24S10 for the source delineation of arsenic, benzo(a)pyrene, and dieldrin. Delineation of the dieldrin subsurface soil contamination at former sample 24S10 was performed by taking soil samples from 5 to 7 feet and at various depths depending on the depth to groundwater, which was found as high as 9 feet bls. In addition, surface soil samples were collected and analyzed for arsenic and benzo(a)pyrene.

LEGEND

Building	
Fence	
New Soil Boring	▲
Previous Soil Boring	•
Groundwater Sample Collected	○
Not Detected	ND
No Exceedance	NE

Notes:

1. Soil analytical results are shown in mg/kg.
2. The applicable subsurface soil criterion for cadmium is 8.0 mg/kg.
3. The applicable surface soil criterion for dieldrin is 0.210 mg/kg.
4. The applicable subsurface soil criterion for dieldrin is 0.004 mg/kg.

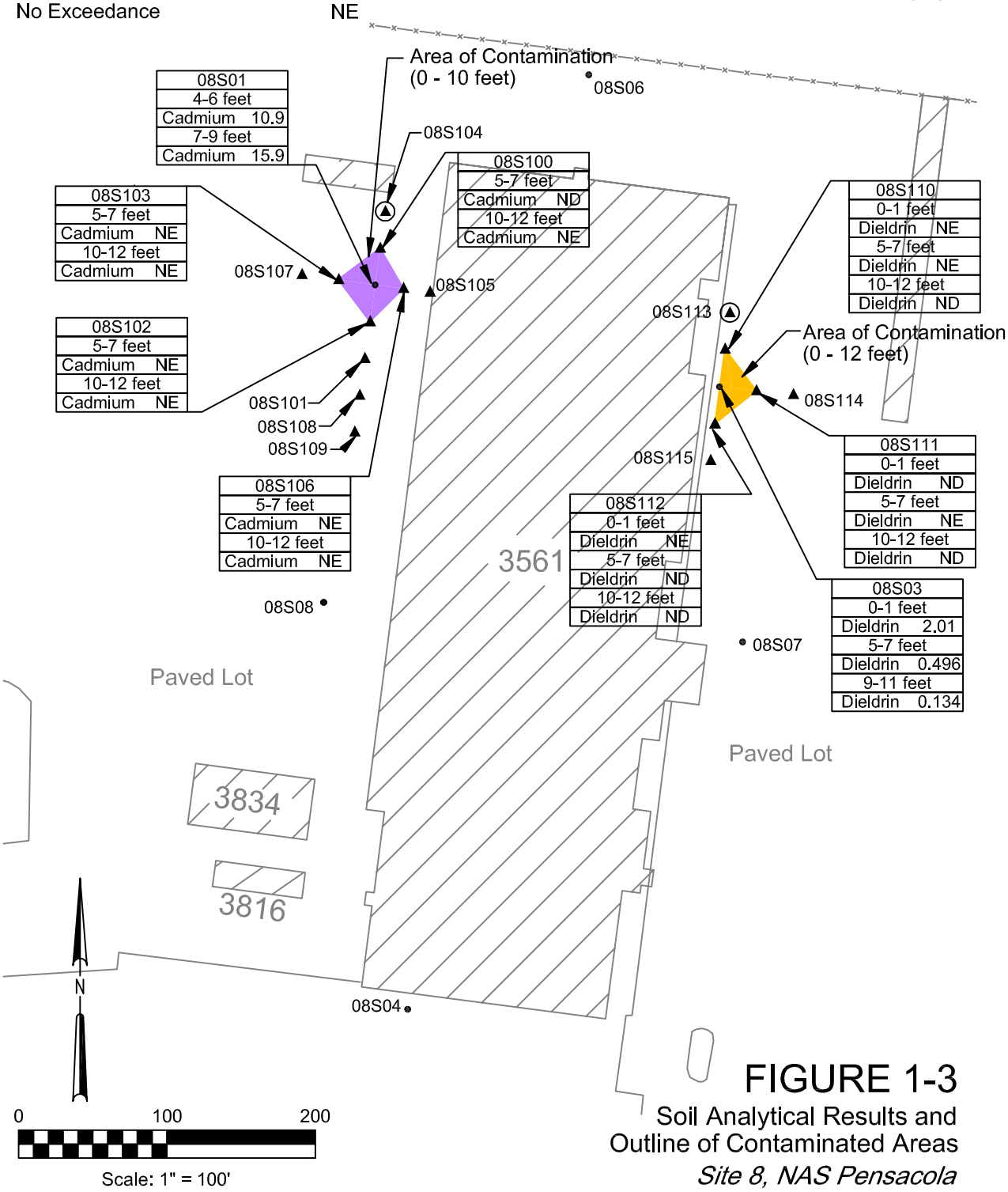

FIGURE 1-3

Soil Analytical Results and Outline of Contaminated Areas

Site 8, NAS Pensacola

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Additionally, a total of one surface and 11 subsurface samples were collected by CCI in the vicinity of former sample 24S12 for the source delineation of arsenic and dieldrin, respectively. Delineation for dieldrin contamination in the subsurface soil at the location of former sample 24S12 was performed by collected samples from 5 to 7 feet bls. Figure 1-4 indicates the layout for each soil sample and location.

One sample was collected south of former sample 24S11 in order to delineate the arsenic surface soil contamination. Analytical results for subsurface soil were compared to the SCTLs listed in Table 1-1. As stated previously, the surface criterion for the COCs was established using the UCL95%.

Of the four initial surface samples collected and analyzed for arsenic and benzo(a)pyrene in the vicinity of sample 24S10, arsenic was found exceeding the UCL95% in sample 24S55, while all four samples analyzed for benzo(a)pyrene exceeded the UCL95% of 0.3 mg/kg.

Of the seven initial subsurface samples collected and analyzed for dieldrin near sample 24S10, samples 24S51, 24S55, and 24S57 exceeded the SCTL of 0.004 mg/kg for subsurface soil. Sample 24S65, located south of original sample 24S11, was analyzed for surface arsenic in order to define the southern extent of surface arsenic contamination. Arsenic results were not above the PRG for this sample.

Of the four initial samples collected from 5-7 feet bls and analyzed for dieldrin in the vicinity of sample 24S12, none of the samples exceeded the regulatory cleanup goal.

Sample 24S60, east of original sample 24S12 exceeded the regulatory cleanup goal of 0.004 mg/kg for subsurface soil. Figure 1-4 presents the results for soil samples.

A direct push drill rig was used to collect two groundwater samples and one duplicate sample. The purpose of the sampling was to determine whether the soil contamination had impacted groundwater. Groundwater samples were collected at the most downgradient locations to former samples 24S10 and 24S12 at locations 24S51 and 24S59, respectively. Select samples were analyzed for arsenic using EPA Method 6010B, benzo(a)pyrene using EPA Method 8270C, and dieldrin.

Groundwater sample results indicate arsenic, benzo(a)pyrene, and dieldrin were not detected in groundwater above the GCTLs of 50.0 µg/L, 0.2 µg/L, and 0.005 µg/L, respectively. It should be noted that the Method Detection Limit for dieldrin is 0.025 µg/L (above the associated GCTL) so the dieldrin results are not definitive; however, based on the groundwater results, there does not appear to be an impact to groundwater. Refer to Figure 1-4 for groundwater sampling locations at Site 24.

CCI submitted two technical memoranda for the sites in October 2002, *Evaluation of Site Conditions Based on Results of Soil and Groundwater Sampling, Operable Unit 13 – Site 8, Revision 01*(CCI 2002a) and *Evaluation of Site Conditions Based on Results of Soil and Groundwater Sampling, Operable Unit 13 – Site 24, Revision 01* (CCI 2002b). Based on the review of these memoranda, EPA and FDEP recommended further soil sampling using the Synthetic Precipitation Leaching Procedure (SPLP) in the hot spot areas to determine if the contaminants in the soil have the potential to leach into groundwater, as well as installing and sampling permanent groundwater monitoring wells to verify the presence/absence of groundwater contamination in the hot spot areas.

LEGEND

Building

Fence

New Soil Boring

Previous Soil Boring

Groundwater Sample Collected

Estimated Value J

No Exceedance NE

Notes:

1. Soil analytical results are shown in mg/kg.
2. The applicable subsurface soil criterion for dieldrin is 0.004 mg/kg.
3. The remedial goal for arsenic in surface soil is 2.4 mg/kg based on the 95% UCL.
4. The remedial goal for benzo(a)pyrene in surface soil is 0.300 mg/kg based on the 95% UCL.

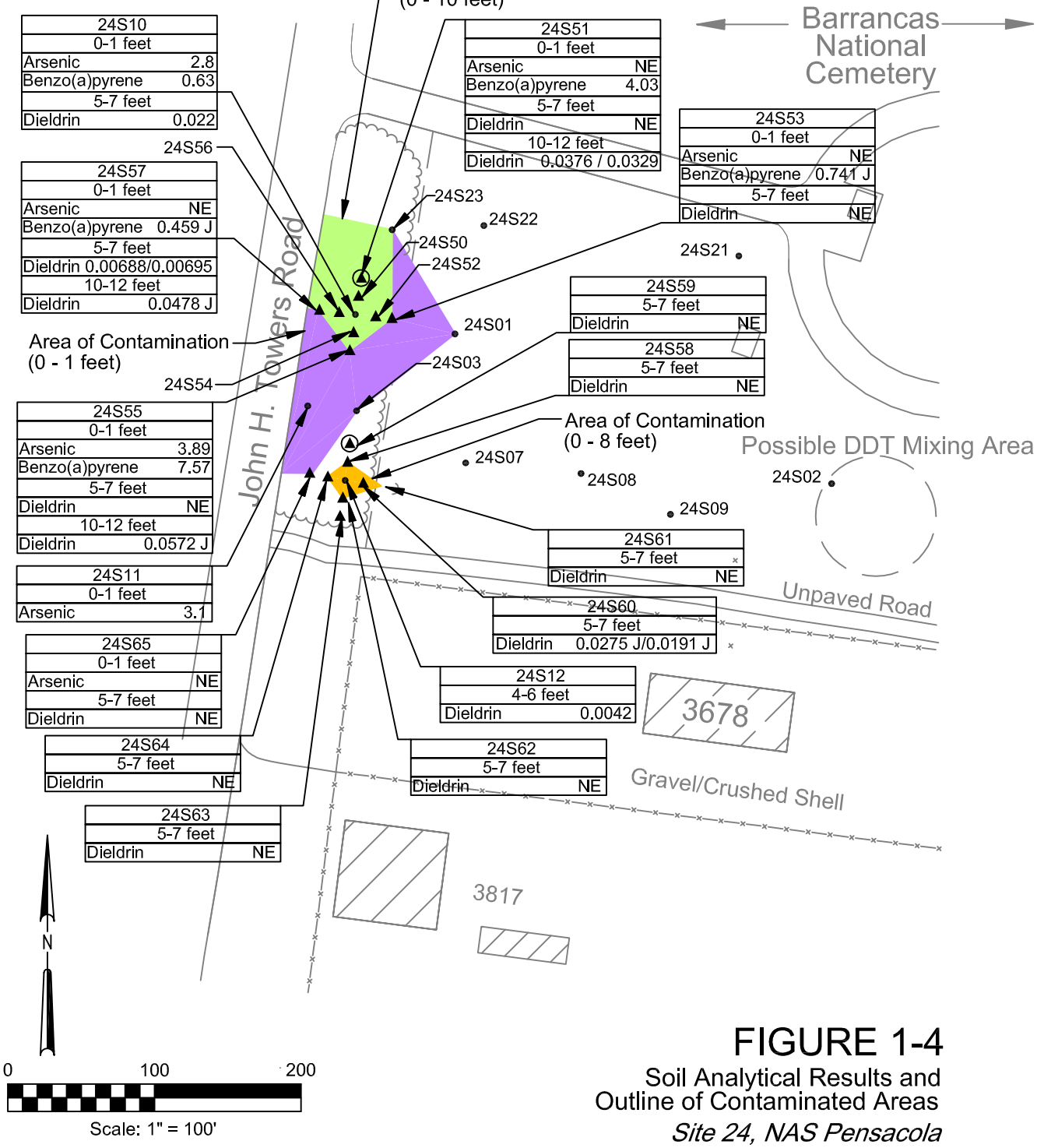

FIGURE 1-4

Soil Analytical Results and Outline of Contaminated Areas

Site 24, NAS Pensacola

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2.0 Execution Plan

This section includes a description of scope of work tasks to be completed, in addition to the project schedule and communication plan.

2.1 Scope of Work Tasks

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

- Site preparation
- Mobilization and site setup
- Site utilities clearance
- Soil Sampling
- Groundwater monitoring well installation
- Groundwater sampling
- Temporary monitoring well abandonment
- Waste management and disposal
- Decontamination and demobilization

2.1.1 Site Preparation

In preparation for the soil and groundwater investigation, a utility survey will be conducted and coordinated through NAS Pensacola. All underground utilities identified in the proposed monitoring well areas will be clearly delineated.

2.1.2 Mobilization and Site Setup

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

Prior to the commencement of activities and as needed, signs and barricades will be placed to prohibit access to the work area.

A laydown/decontamination area will be mutually agreed upon by NAS Pensacola and CCI personnel. This area will also be used for temporary storage of several 55-gallon drums containing either soil cuttings or decontamination and purge water that are anticipated to be

generated during the course of the activities. The 55-gallon drums will be temporarily stored at the laydown area while awaiting transportation to the landfill.

2.1.3 Site Utilities Clearance

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

2.1.4 Soil Investigation

In order to determine the leachable properties of the soil contaminants, a minimum of three samples will be collected from each identified soil area. The soil areas will be adjacent to and in the vicinity of RI samples 08S01 and 08S03 at Site 8, and 24S10 and 24 S12 at Site 24. The samples will be collected at the same depths which had the highest concentration of the contaminant of concern (COCs) during the August 2002 soil investigation. These samples will be analyzed using the SPLP methodology.

2.1.5 Groundwater Investigation

CCI will install and sample seven permanent monitoring wells, four at Site 8 and three at Site 24, to determine the presence/absence of COCs. CCI will also inventory and properly abandon all temporary monitoring wells at OU 13.

All four wells at Site 8 will be analyzed for total cadmium. Additionally, wells 08GR02 and 08GR05 will be analyzed for dieldrin in accordance with Method 8081A. Because the draft FS proposes long term monitoring (LTM) for iron, lead and manganese, CCI will also analyze all four wells at Site 8 for these constituents to verify their current concentrations and determine the need for LTM.

The well installed at soil boring location 24S10 at Site 24 will be analyzed for arsenic, benzo(a)pyrene and dieldrin. Because the draft FS proposes LTM for iron and manganese, CCI will analyze all three wells at Site 24 for these constituents to verify their current concentrations and determine the need for LTM.

2.1.6 Temporary Monitoring Well Abandonment

CCI will inventory and properly abandon all temporary monitoring wells at Sites 8 and 24. All monitoring wells will be abandoned by a well driller licensed in the State of Florida. The monitoring wells will be plugged by filling them from bottom to top with neat cement grout using a tremie pipe. After the well has been plugged the vault structure will be demolished. The surface completions will match the existing type and grade. The current number of wells for abandonment is not known.

2.1.7 Surveying

CH2M HILL will contract a local, Florida Registered Surveyor to survey all sampling locations relative to an arbitrary benchmark. The surveyor will locate local benchmarks, provided by NAS Pensacola personnel, which will reference the National Geodetic Vertical Datum (NGVD). Horizontal control surveying (X-, Y-coordinates) will be performed at the ground surface of each sampling location. Vertical control surveying (Z-coordinate) will be performed on the monitoring wells at the top of casing and the ground surface. The survey coordinates will be used to locate the sampling points on the maps and to draw the shallow groundwater contours.

2.1.8 Waste Management and Disposal

CCI will contain, store, maintain, and properly dispose of waste generated during this work including solid and liquid wastes. Although none of the waste is expected to be hazardous, it will be managed in accordance with applicable state and federal regulations, as outlined in Section 4.0, Waste Management Plan of this work plan addendum. Thorough daily inspections of the work area and waste storage areas will be conducted while personnel are onsite. Specifically, inspections will ensure that no potential or offsite migration of contaminates is allowed to occur.

Waste characterization samples will be collected as outlined in Section 4.0, Waste Management Plan. Upon receipt of the disposal profile results, the material will be profiled for offsite disposal. Waste manifest will be generated for each load of material transported offsite. The Waste Management Plan describes waste disposal tracking procedures.

2.1.9 Decontamination and Demobilization

Prior to leaving the sampling area, personnel and equipment will be decontaminated after coming in contact with contaminated material. All debris and/or rinsate generated during decontamination activities will remain inside the exclusion zone until it can be containerized and stored properly for legal disposal.

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

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

Prior to traveling from an exclusion zone to a clean area, all decontaminated equipment will be inspected and documented by the Site Health and Safety Specialist (SHSS), Site Quality Control Manager, or Site Superintendent.

2.2 Project Schedule

The anticipated project schedule is provided in Appendix C.

2.3 Communications Plan

A communication matrix outlining the lines of communication for Southern Division and CCI personnel is presented in Table 2-1. Table 2-2 provides a project personnel directory.

TABLE 2-1
Communications Matrix
CTO 85, OU 13 Sites 8 and 24

CCI Position	Navy Direct Report
Scott Newman, Program Manager	Richard Stanley, Administrative Contracting Officer
Scott Smith, Deputy Program Manager	Jimmy Jones, Contracting Officer's Technical Representation
Amy Twitty, CTO Project Manager	Bill Hill, Remedial Project Manager
	Greg Campbell, Base Environmental Engineer – Environmental Department, NAS Pensacola

TABLE 2-2
Project Personnel Directory
CTO 85, OU 13 Sites 8 and 24

Contact	Company
Scott Newman Scott Smith Theresa Rojas Darryl Moseley	CH2M HILL Constructors, Inc. 115 Perimeter Center Place, N.E. Suite 700 Atlanta, GA 30346-1278 770/604-9182
Joe Giandonato	CH2M HILL Constructors, Inc. 9428 Baymeadows Road, Suite 200 Jacksonville, FL 32256 904/733-9119
Rich Rathnow Health And Safety Manager	CH2M HILL Constructors, Inc. 151 Lafayette Drive Suite 110 Oak Ridge, TN 37830 855/483-9032
Amy Twitty	CH2M HILL Constructors, Inc. 1766 Sea Lark Lane Navarre, FL 32566 850/939-8300 ext. 17
Richard Stanley	Southern Division Naval Facilities Engineering Command P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5916
Jimmy Jones	Southern Division Naval Facilities Engineering Command P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5544
Bill Hill	Southern Division Naval Facilities Engineering Command P.O. Box 190010 North Charleston, SC 29419-9010 843/820-7324
Greg Campbell	NAS Pensacola 520 Turner Street, Building 746 Pensacola, Florida 32508-5225 850-452-4616, x103

3.0 Sampling and Analysis Plan

This Sampling and Analysis Plan (SAP) outlines the required sampling activities at Sites 8 and 24. The scope of work will consist of determining the leachable properties of the soil contaminants at high, medium, and low concentrations of the COCs during the August 2002 soil investigation. Seven permanent monitoring wells will be installed and sampled to determine if the COCs have migrated into the groundwater. In addition, CCI will also inventory and properly abandon all temporary monitoring wells at OU 13.

Samples will be collected in accordance with the FDEP Standard Operating Procedures, Department of Environmental Regulation QA-001/92 and EPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), 1996, revised 1997.

3.1 Data Quality Objectives for Measurement Data

The data quality objectives for each sampling task described above are listed in Table 3-1. The sampling and analytical requirements, are listed in Table 3-2.

All samples will be delivered to Kemron Environmental Services in Marietta, Ohio (a Navy-approved laboratory) for sample analyses. This laboratory is certified by Florida through the National Environmental Laboratory Accreditation Conference.

TABLE 3-1
Data Quality Objectives
OU 13, NAS Pensacola

Sampling Activity	Data Quality Objective Category
Soil SPLP sampling	Definitive
Groundwater investigation sampling	Definitive
Waste characterization of the contaminated soils (offsite laboratory analyses)	Definitive
Waste characterization of the aqueous waste (offsite laboratory analyses)	Definitive

3.2 Soil Sampling

At Site 8, a volume of soil measuring approximately 50 by 43 feet by 15 feet deep has been identified as an area of concern from the vicinity of former sample 08S01 based on total cadmium in subsurface soil. Groundwater sampled directly downgradient of the area did not contain cadmium in excess of the groundwater RG. However, temporary wells in the area sampled in 1996 did contain cadmium exceedances. In order to determine leachable properties of the contamination in the soil, three soil borings will be advanced in the area adjacent to and in the immediate vicinity of subsurface soil sample 08S01. Discreet soil samples will be collected from 7 to 9 feet bls and analyzed using the SPLP for cadmium.

Another area of concern is in the vicinity of former soil sample 08S03, which is located adjacent to the east side of Building 3561. Soil collected from this boring exceeded the surface and subsurface RG for dieldrin. Three discreet surface (0 to 1 feet bls) and three discreet subsurface (5 to 7 feet bls) soil samples will be collected adjacent to and in the immediate vicinity of 08S03 and analyzed for dieldrin using the SPLP. Figure 3-1 presents the proposed soil boring locations for Site 8. Components of the soil sampling plan for Site 8 are listed in Table 3-2.

Surface soil at sample 24S10 exceeded the RG for benzo(a)pyrene. Subsurface soil at samples 24S10 and 24S12 exceeded the RG for dieldrin to at least 7 feet bls.

A total of three discreet soil samples will be collected in the vicinity of and adjacent to 24S10 from 0 to 1 feet bls and analyzed for benzo(a)pyrene using the SPLP. In addition, three discreet soil samples will be collected in the vicinity of and adjacent to 24S10 from 10 to 12 feet bls and analyzed for dieldrin using the SPLP. To determine the leachable properties of dieldrin in the soils adjacent to and in the vicinity of 24S12, three samples will be collected from 5 to 7 feet bls and analyzed independently using the SPLP. It was determined arsenic may be naturally occurring in this area (and below future cleanup goals) and will not be sampled. Figure 3-2 presents the proposed soil boring locations for Site 24. Components of the soil sampling plan for Site 24 are listed in Table 3-2.

Soil samples will be collected using either a stainless steel hand auger or a drill rig equipped with hollow stem augers. Soil will be placed into stainless steel bowls, thoroughly mixed using stainless steel spoons, and placed in 8-ounce glass jars. No samples will be composited. All sampling will be conducted in accordance with CCI's Basewide Work Plan for NAS Pensacola (CCI, 2000), FDEP Standard Operating Procedures, and the EPA Region IV EISOPQAM dated May 1996, revised 1997.

The sampling and analytical requirements, the required level of quality, data packages, and field QC samples will be collected during sampling events and are outlined in Table 3-3. Field duplicate samples will be collected at a minimum frequency of 10 percent times the total number of samples collected for an analysis and rounded to the nearest whole number. Pre-cleaned equipment blank samples will be collected at a minimum frequency of 10 percent times the total number of samples collected for an analysis for each site and rounded to the nearest whole number. Field-cleaned equipment blank samples will be collected at a minimum frequency of 5 percent times the total number of samples collected for an analysis for each site and rounded to the nearest whole number. One trip blank sample will be provided at a frequency of one per sample cooler containing volatile samples. Matrix spike / matrix spike duplicates (MS / MSD) will be required at a minimum frequency of one per twenty samples.

All samples will be delivered to Kemron Environmental Services for sample analyses on standard 2-week turnaround time (TAT). Level III Data Quality Objectives will be used for reporting purposes.

Field documentation, waste handling, and decontamination will be conducted in accordance with the Basewide Work Plan (CCI, 2000).

LEGEND

Building	
Fence	
New Soil Boring	△
Previous Soil Boring	•
Groundwater Sample Collected	○
Not Detected	ND
No Exceedance	NE

Notes:

1. Soil analytical results are shown in mg/kg.
2. The applicable subsurface soil criterion for cadmium is 8.0 mg/kg.
3. The applicable surface soil criterion for dieldrin is 0.210 mg/kg.
4. The applicable subsurface soil criterion for dieldrin is 0.004 mg/kg.
5. Soil samples near 08S01 to be analyzed for cadmium (7-9' bls).
6. Soil samples near 08S03 to be analyzed for dieldrin (0-1' bls and 5-7' bls).

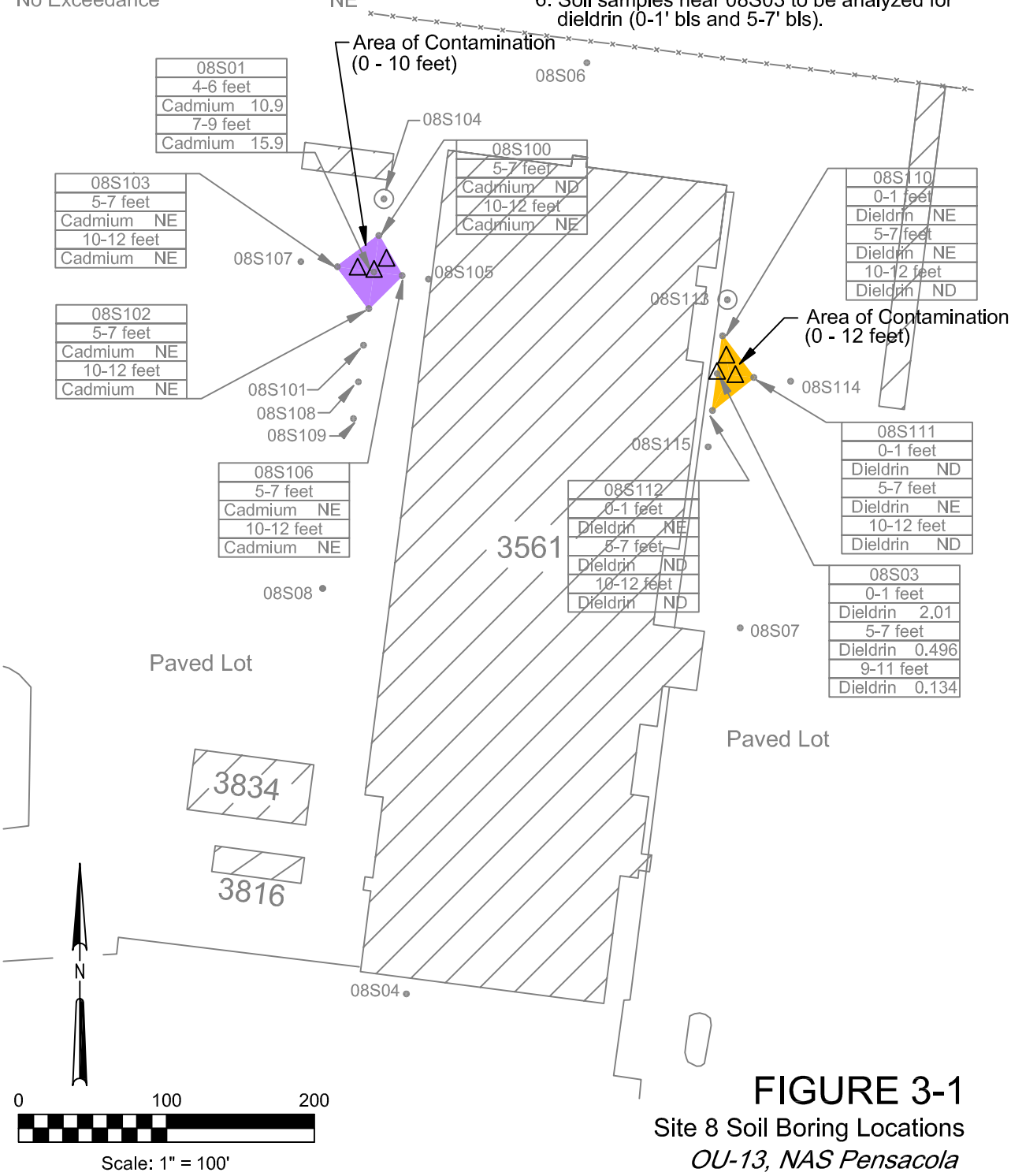

FIGURE 3-1

Site 8 Soil Boring Locations

OU-13, NAS Pensacola

wp2_ou-13_f3-1.dwg
28-Mar-2003

TABLE 3-2
Soil Sample Collection and Analysis Summary
CTO 85, OU 13 Sites 8 and 24

Previous Sample Location	Station IDs	Depth (feet bls)	Cadmium SPLP	Benzo(a)pyrene SPLP	Dieldrin SPLP
Surface Soil Sampling					
08S01	085-08-113-S-9	7-9	1		
	085-08-114-S-9	7-9	1		
	085-08-115-S-9	7-9	1		
08S03	085-08-116-S-1	0-1			1
	085-08-117-S-1	0-1			1
	085-08-118-S-1	0-1			1
08S03	085-08-119-S-10	5-7			1
	085-08-120-S-10	5-7			1
	085-08-121-S-10	5-7			1
24S10	085-24-67-S-1	0-1		1	
	085-24-68-S-1	0-1		1	
	085-24-69-S-1	0-1		1	
24S10	085-24-70-S-12	10-12			1
	085-24-71-S-12	10-12			1
	085-24-72-S-12	10-12			1
24S12	085-24-73-S-7	5-7			1
	085-24-74-S-7	5-7			1
	085-24-75-S-7	5-7			1
Total Number of Samples			3	3	12

LEGEND

Building	
Fence	
New Soil Boring	△
Previous Soil Boring	•
Groundwater Sample Collected	○
Estimated Value	J
No Exceedance	NE

Notes:

1. Soil analytical results are shown in mg/kg.
2. The applicable subsurface soil criterion for dieldrin is 0.004 mg/kg.
3. The remedial goal for arsenic in surface soil is 2.4 mg/kg based on the 95% UCL.
4. The remedial goal for benzo(a)pyrene in surface soil is 0.300 mg/kg based on the 95% UCL.
5. Soil samples near 24S10 to be analyzed for benzo(a)pyrene (0-1' bls) and dieldrin (10-12' bls).
6. Soil samples near 24S12 to be analyzed for dieldrin (5-7' bls).

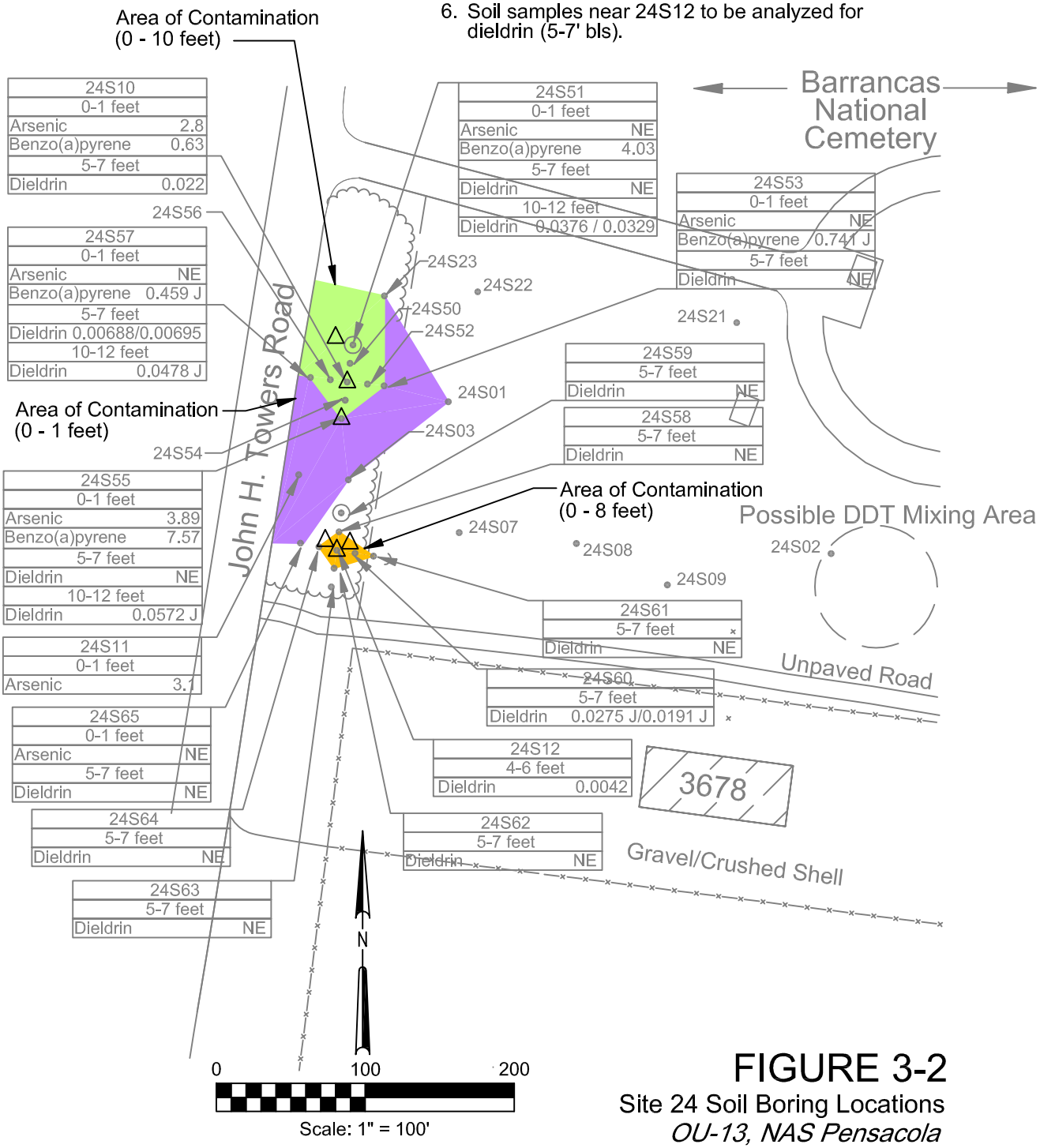

FIGURE 3-2

Site 24 Soil Boring Locations

OU-13, NAS Pensacola

wp2_ou-13_f3-2.dwg

28-Mar-2003

3.2.1 Soil Characterization

Waste characterization samples will be collected to evaluate the handling, transportation, and disposal requirements of the soil cuttings accumulated during monitor well installation. It is anticipated that soil will be placed into 55-gallon drums for storage and shipment. Solid samples will be collected as follows, delivered to a Navy, United States Army Corp of Engineer's (USACE), or Air Force Center for Environmental Excellence (AFCEE) and FDEP approved laboratory and analyzed for the parameters listed in Table 3-3.

The drum(s) will be sampled at a frequency of one per every six drums. It is estimated that only one sample will be needed to perform characterization of the waste. The samples will be collected in the following manner.

Collecting Volatile Fractions

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

Collecting Non-Volatile Samples

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

TABLE 3-3
Sampling and Analysis Summary
CTO 85, OU 13 Sites 8 and 24

Sample Task	Previous Sample Location(s)	Station ID	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Soil Sampling														
Surface Soil Sampling Site 8	08S03	085-08-116-S-1, 085-08-117-S-1, 085-08-118-S-1 Sample taken from depth 0-1 ft	Soil	Once	3 samples+ 1 duplicate +1 MS/MSD = 5	Auger down to various depths	SS Auger, SS Spoons, SS Bowl	14 days	CCI Level C	SPLP (Dieldrin) only	1312/8081A	14 day SPLP extr; 7 day extr; 40 day analysis	Cool to 4°C	(1) 8 oz glass
	08S03	085-08-119-S-10, 085-08-120-S-10, 085-08-121-S-10 Sample taken from depth 5-7 ft			3 samples								Cool to 4°C	(1) 8 oz glass
Surface Soil Sampling Site 24	24S12	085-24-73-S-12, 085-24-74-S-12, 085-24-75-S-12 Sample taken from depth 5-7 ft			3 samples								Cool to 4°C	(1) 8 oz glass
	24S10	085-24-70-S-12, 085-24-71-S-12, 085-24-72-S-12 Sample taken from depth 10-12 ft			3 samples								Cool to 4°C	(1) 8 oz glass
Total samples for SPLP Dieldrin = 14														
Surface Soil Sampling Site 24	24S10	085-24-67-S-1, 085-24-68-S-1, 085-24-69-S-1 Sample taken from depth 0-1 ft	Soil	Once	3 samples +1 duplicate +1 MS/MSD = 5 Samples	Auger down to various depths	SS Auger, SS Spoons, SS Bowl	14 days	CCI Level C	SPLP (Benzo(a)pyrene) Only	1312/8270C	14 day SPLP extr; 7 day extr; 40 day analysis	Cool to 4°C	(1) 8 oz glass
Total samples for SPLP Benzo(a)pyrene = 5														

TABLE 3-3
Sampling and Analysis Summary
CTO 85, OU 13 Sites 8 and 24

Sample Task	Previous Sample Location(s)	Station Id's	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Soil Sampling Cont.														
Surface Soil Sampling Site 8	08S01	085-08-113-S-9, 085-08-114-S-9, 085-08-115-S-9 Sample taken from depth 7-9 ft	Soil	Once	1 sample +1 duplicate +1 MS/MSD	Auger down to various depths	SS Auger, SS Spoons, SS Bowl	14 days	CCI Level C	Cadmium	1312/6010B	6 month SPLP extr; 6 month analysis	Cool to 4°C	(1) 8 oz glass
Total samples for SPLP Cadmium = 5														
		Pre-Equipment Rinsate Blank	Water	1 per set of pre-cleaned equipment (10%)	1	Prepared in Field	Analyte-free water, SS funnel	14 days	CCI Level C	Cadmium	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
										Pesticides (Dieldrin) only	8081A	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
										Benzo(a)pyrene only	8270C	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
		Post-Equipment Rinsate Blank	Water	1 per set of field-cleaned equipment (10%)	1 (or as needed)	Prepared in Field	Analyte-free water, SS funnel	14 days	CCI Level C	Cadmium	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
										Pesticides (Dieldrin) only	8081A	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
										Benzo(a)pyrene only	8270C	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
(if equipment is decontaminated in the field)														
Total samples for Equipment Rinsate = 2														
Total samples for Soil Sampling = 26														

TABLE 3-3
Sampling and Analysis Summary
CTO 85, OU 13 Sites 8 and 24

Sample Task	Sample Location	Station Id's	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Ground Water Sampling														
Groundwater Monitoring Site 8	**08GR01**	**08-MW-01**	Water	Once	1	Low-flow purge	Peristaltic pump / Teflon tube for volatiles	14 days	CCI Level C	Cadmium, Iron, Manganese, and Lead	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
	08GR02	**08-MW-02**			1				CCI Level C	Cadmium, Iron, Manganese, and Lead	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
	08GR03	**08-MW-03**				1 samples +1 duplicate +1 MS/MSD = 4 Samples			CCI Level C	Cadmium, Iron, Manganese, and Lead	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
									CCI Level C	Pesticides (Dieldrin) Only	8081A	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
	08GR05	**08-MW-04**			1				CCI Level C	Cadmium, Iron, Manganese, and Lead	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
									CCI Level C	Pesticides (Dieldrin) Only	8081A	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
Groundwater Monitoring Site 24	**24GS08**	**24-MW-01**			1				CCI Level C	Iron and Manganese	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
	24S10	**24-MW-02**				1 samples +1 duplicate +1 MS/MSD = 4 Samples			CCI Level C	Arsenic, Iron, and Manganese	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
									CCI Level C	Pesticides (Dieldrin) Only	8081A	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
									CCI Level C	Benzo(a)pyrene Only	8270C	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
	24S12	**24MW03**			1				CCI Level C	Iron and Manganese	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
									CCI Level C	Pesticides (Dieldrin) Only	8081A	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
		Pre-Equipment Rinsate Blank	Water	1 per set of pre-cleaned equipment (10%)	1	Prepared in Field	Analyte-free water, SS funnel	14 days	CCI Level C	Arsenic, Cadmium, Iron, and Manganese	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
										Pesticides (Dieldrin) Only	8081A	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
										Benzo(a)pyrene Only	8270C	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass

TABLE 3-3
Sampling and Analysis Summary Table
CTO 85, OU 13 Sites 8 and 24

Sample Task	Sample Location	Station Id's	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Ground Water Sampling Cont.														
		Post-Equipment Rinsate Blank	Water	1 per set of field-cleaned equipment (10%)	1 (or as needed)	Prepared in Field	Analyte-free water, SS funnel	14 days	CCI Level C	Arsenic, Cadmium, Iron, and Manganese	6010B	6 months	HNO3 pH<2; Cool to 4°C	(1) 500 mL HDPE
										Pesticides (Dieldrin) Only	8081A	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass
										Benzo(a)pyrene Only	8270C	7-day extra; 40-day analysis	Cool to 4°C	(1) L amber glass

(if equipment is decontaminated in the field)

Total samples for Equipment Rinsate = 2

Total samples for Groundwater Sampling = 15

TABLE 3-3
Sampling and Analysis Summary Table
CTO 85, OU 13 Sites 8 and 24

Soil/Solids Characterization Sampling

Sample Task	Sample Location	Station Id's	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Soil Characterization Sampling	Drums	NA	Soil	Drums (1 sample/ 6 Drums)	approx. 2	Composite 5 random grabs into 1 sample (do not composite VOCs)	SS auger, SS spoon, SS bowl	14 days	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
										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	
										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 3-3
Sampling and Analysis Summary Table
CTO 85, OU 13 Sites 8 and 24

Sample Task	Sample Location	Station Id's	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Water Characterization Sampling														
Characterization of Decontamination Water	Drums	NA	Water	1 Per 6 drums	1 (or as needed for disposal)	Grab	Drum thief or dip jar	14 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		
										PCBs	8082	14 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

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.

3.3 Groundwater Investigation

During the RI, the groundwater at OU 13 was monitored using temporary monitoring wells which are not ideal for monitoring inorganic chemicals due to commonly recognized presence of particulate interference/introduction of metals into water samples. However, no COCs were detected from the direct push technology groundwater samples collected during the recent investigation (August 2002) conducted by CCI 50 feet downgradient of the original soil boring (hot spot) locations. In order to verify the presence/absence of groundwater COCs, a total of seven permanent groundwater wells will be installed and sampled at OU 13 for the COCs listed in Table 3-4.

TABLE 3-4
Groundwater Sample Collection and Analysis Summary
CTO 85, OU 13 Sites 8 and 24

Sample Location	Station IDs	Arsenic	Cadmium	Benzo (a) pyrene	Dieldrin	Iron	Manganese	Lead
Site 8								
08GR01	**08-MW-01**		1			1	1	1
08GR02	**08-MW-02**		1			1	1	1
08GR03	**08-MW-03**		1		1	1	1	1
08GR05	**08-MW-04**		1		1	1	1	1
Site 24								
24GS08	**24-MW-01**					1	1	
24S10	**24-MW-02**	1		1	1	1	1	
24S12	**24-MW-03**				1	1	1	
Total Number of Samples		1	4	1	4	7	7	4

Samples will be collected according to the EPA Region IV EISOPQAM, dated May 1996 revised 1997 and the EPA Region IV low-flow sampling protocol (EPA, 1998) as well as the FDEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities, FDEP-QA-001/92.

Field QC samples will be collected during sampling events and are outlined in Table 3-3. Field duplicate samples will be collected at a minimum frequency of 10 percent times the total number of samples collected for an analysis and rounded to the nearest whole number. Pre-cleaned equipment blank samples will be collected at a minimum frequency of 10 percent times the total number of samples collected for an analysis for each site and

rounded to the nearest whole number. Field-cleaned equipment blank samples will be collected at a minimum frequency of 5 percent times the total number of samples collected for an analysis for each site and rounded to the nearest whole number. One trip blank sample will be provided at a frequency of one per sample cooler containing volatile samples. MS/MSD will be required at a minimum frequency of one per twenty samples.

All samples will be delivered to Kemron Environmental Services for sample analyses on standard two week TAT. Level III Data Quality Objectives will be used for reporting purposes.

Field documentation, waste handling, and decontamination will be conducted in accordance with the Basewide Work Plan.

3.3.1 Monitoring Well Installation

Four shallow monitoring wells will be installed at Site 8 to an approximate depth of 18 feet bls. The permanent monitoring wells will replace the former temporary wells 08GR01, 08GR02, 08GR03 and 08GR05. The well locations for Site 8 are shown on Figure 3-3.

Three shallow monitoring wells will be installed at Site 24 to an approximate depth of 15 feet bls. The wells will be installed at former temporary well location 24GS08 and at soil boring locations 24S10 and 24S12. The proposed well locations for Site 24 are shown on Figure 3-3.

Monitoring wells will be installed in accordance with American Society for Testing and Materials (ASTM) Method D-5092, Design and Installation of Groundwater Monitoring Wells in Aquifers. Hollow stem augers will be used to advance 8-inch diameter boreholes to the total drilling depths. Soil samples will be classified in accordance with the Unified Soil Classification System. Soil sample descriptions will include color, moisture content, density, grain size, odor, discoloration, and any other pertinent information. Soil boring logs and well completion logs will be prepared.

The drill rig, as well as all downhole tools and equipment, will be decontaminated between each monitoring well location to minimize the potential for cross contamination. All wells will be installed at the desired depth so that the screen extends both below and above the water level in the boring. The wells will be constructed with 10 feet of 2-inch diameter 0.010-inch machine slotted polyvinyl chloride (PVC) well screen and flush joint threaded PVC riser casing.

A washed, graded, 20/30 sand pack will be placed around the well screen to a maximum of 2 feet above the top of the screen. A 1- to 2-foot thick bentonite seal will be placed above the sand pack. After the bentonite seal has been allowed to hydrate for a minimum of 1 hour, cement grout will be added to ground surface. Grout will be placed by the tremie method except when grouting is done within 5 feet of ground surface, in which case the tremie method is not required.

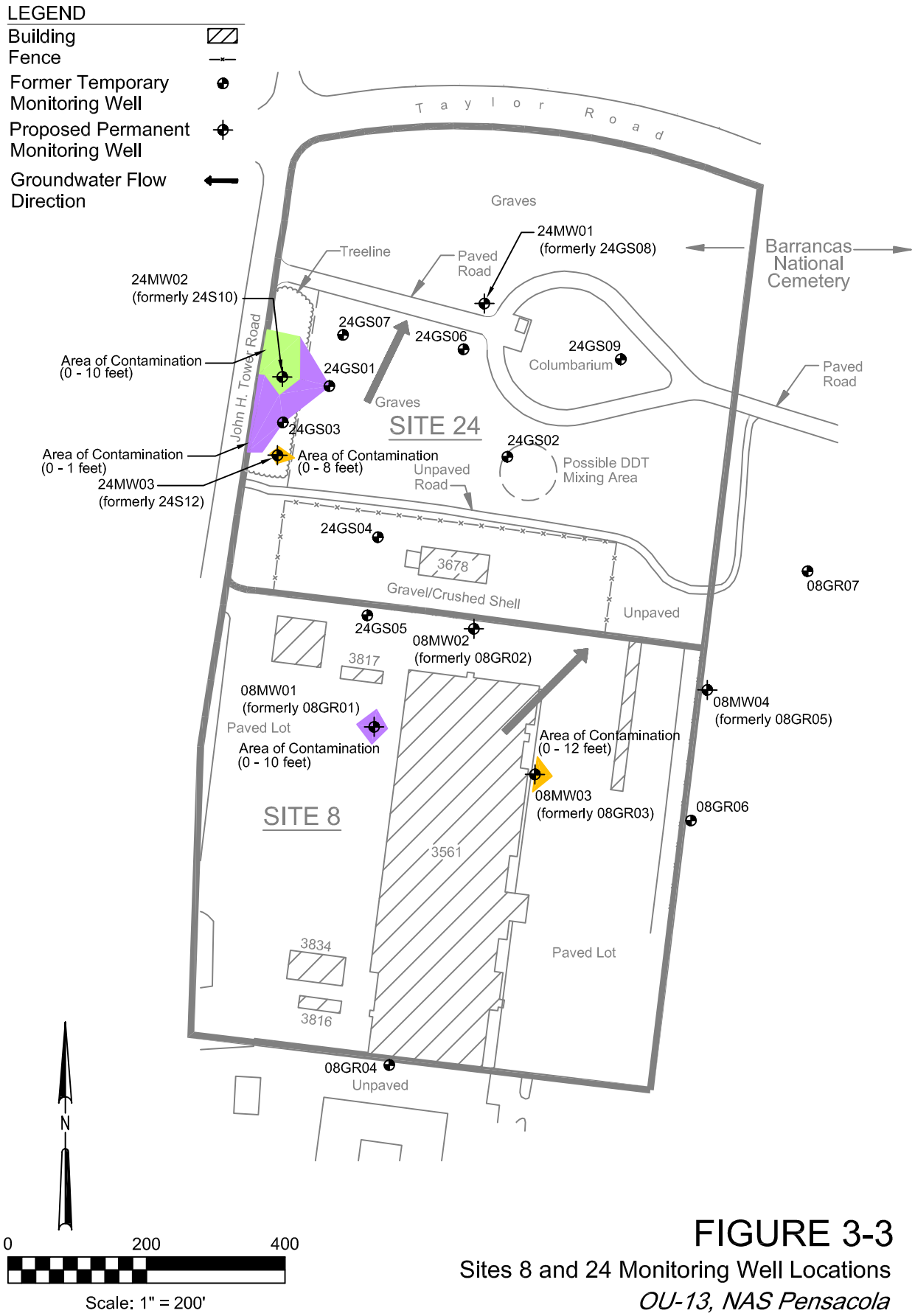

FIGURE 3-3

Sites 8 and 24 Monitoring Well Locations

OU-13, NAS Pensacola

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All wells will be completed with flush mount covers. A freely draining valve box with a locking bolt-down cover will be installed over the PVC well casing. The casing will be cut approximately 3 inches bls and equipped with a water tight cap. A 2-foot by 2-foot by 6-inch deep concrete pad will be installed and sloped to drain water away from the valve box. The pad and well will be marked with the well ID number. Each well will be equipped with a lock. All locks will be keyed alike so that one key opens locks on all wells. After completion, each well will be developed for up to 1 hour by pumping and surging until the well produces clear water with a minimum of sediment.

3.3.2 Site 8 Groundwater Sampling

All four wells at Site 8 will be analyzed for total cadmium in accordance with Method 6010B. Additionally, wells 08GR02 and 08GR05 will be analyzed for dieldrin in accordance with Method 8081A. Because the draft FS proposes long-term monitoring (LTM) for iron, lead and manganese, CCI will also analyze all four wells at Site 8 for these constituents using Method 6010B to verify their current concentrations and determine the need for LTM. The sampling and analytical requirements, along with the required level of quality and data packages are listed in Table 3-3.

3.3.3 Site 24 Groundwater Sampling

The well installed at soil boring location 24S10 at Site 24 will be analyzed for arsenic, benzo(a)pyrene and dieldrin in accordance with EPA Methods 6010B, 8270C, and 8081A, respectively. During the August 2002 groundwater sampling event, arsenic results ranged from 27.3 to 31.2 micrograms per liter (µg/L), which was below the FDEP GCTL of 50 µg/L, but above EPA MCL. However, arsenic was included in this sampling event due to a proposed FDEP rule change which will reduce the arsenic GCTL to 10 µg/L in 2005.

The well installed at soil boring location 24S12 will be analyzed for dieldrin in accordance with EPA Method 8081A. Because the draft FS proposes LTM for iron and manganese, CCI will analyze all three wells at Site 24 for these constituents using Method 6010B to verify their current concentrations and determine the need for LTM. The sampling and analytical requirements, along with the required level of quality and data packages are listed in Table 3-3.

3.3.4 Decontamination/Well Development Water

Waste characterization samples will be collected to evaluate the handling, transportation, and disposal requirements of the water accumulated during the development of the monitor wells, and water used for decontamination. It is anticipated that water will be placed into 55-gallon drums for storage and disposal.

The drum(s) will be sampled at a frequency of one per every six drums. It is estimated that only one sample will be needed to perform characterization of the waste. Water will be sampled as described below for the parameters listed in Table 3-3.

Using a bailer or dip jar collect a water sample from the drums. The sample containers for volatile analyses will be filled first. The 40-milliliter (ml) vials will be filled so that there is no headspace in each vial. The sample containers for the remaining analyses will then be filled. Label and package the samples for shipment to a Navy-approved 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.

4.0 Waste Management Plan

The Waste Management Plan describes the waste management requirements and procedures for remediation activities at OU 13, NAS Pensacola. Wastes generated from these activities will be managed and disposed in accordance with FDEP and federal hazardous and solid waste regulations.

The wastestreams associated with this scope of work may include:

- Clean and contaminated soil
- Aqueous wastes, including decontamination and purge water
- PPE
- Uncontaminated general construction debris (such as caution tape, barricades, signs, packing materials)

4.1 Waste Characterization

Section 3.0 Sampling and Analysis Plan provides detailed information on the waste sampling requirements. However, in some cases, offsite facilities may require additional analyses to evaluate the waste stream prior to acceptance. All wastes will be classified per 40 CFR 261 to determine if they are hazardous.

Typically, uncontaminated wastes such as general construction debris will be characterized using process knowledge and generally will be classified as municipal solid waste. Waste characterization information for wastes will be documented on a waste profile form provided by the offsite treatment or disposal facility as part of the waste acceptance process. An approved copy of the waste profile will be received prior to offsite transportation of the material. If generator certification and/or signature are required, Navy personnel will provide them. The profile typically requires the following information:

- Generator (Navy) information including name, address, contact, and phone number
- Site name including street/mailing address
- Activity generating waste (soil investigation and remediation)
- Historical chemical use for area
- Physical state of waste (e.g., soil)

4.2 Waste Management

4.2.1 Waste Storage Time Limit

Any hazardous waste generated will be removed within 90 days from generation. Other wastes will be removed from the site as soon as possible. The date of generation is the day that a waste is first placed in the container.

4.2.2 Labels

All containers / drums, tanks an roll-off boxes will be labeled, and labels will be visible. Hazardous waste labels will be used where a site has been pre-characterized, and known to be contaminated with listed or characteristic hazardous wastes. Pre-printed "Hazardous Waste" labels will include the following information:

- Accumulation start date
- Generator Name: U.S. Navy
- Site EPA ID number
- Hazardous waste codes
- Waste-specific information (e.g., contaminated decon water)

For containers of less than 110 gallons, the manifest number must be on the label before transporting.

Containers, tanks, and roll-off boxes of non-hazardous waste will have pre-printed "Non-Hazardous Waste" labels that include the following information:

- Accumulation start date
- Generator Name: U.S. Navy
- Site EPA ID Number
- Waste-specific information (e.g., contaminated decon water)

When waste characterization is unknown and analytical results are pending, the pre-printed "Analysis Pending" label will be used until analytical results are received and reviewed, and a waste designation determined. These wastes will contain the equivalent information provided on a Hazardous Waste label:

- Accumulation start date
- Generator Name: U.S. Navy
- Site EPA ID Number
- Waste-specific information (e.g., contaminated decontamination water)

4.2.3 General Waste Management Requirements

All wastes will be contained. Hazardous wastes will be segregated from non-hazardous wastes. Additionally, incompatible wastes will be segregated.

Soil with observed staining, free liquid, or other signs of contamination will be segregated and characterized for disposal.

Discharge of wastewater to the ground is prohibited unless approved by the CCI Compliance Coordinator, the Project Manager, and the Navy. Decontamination water and contaminated water accumulated in secondary containment will be contained in 55-gallon drums.

Accumulation Area Location and Security Requirements

Wastes will be stored in a temporary accumulation area identified or approved by the Navy. Security will be provided for these areas according to the risks associated with the wastes'

hazard and the proximity or accessibility of the public. In general, a barrier will be provided for hazardous waste accumulation areas and for accumulation areas that are accessible to the general public.

Waste Storage Areas

Containers of hazardous wastes will be stored in a temporary accumulation area designated by the Navy. If the Navy has not designated an accumulation area, CCI will temporarily store hazardous wastes in a secure area.

Hazardous waste storage areas will contain emergency equipment including fire extinguishers, decontamination equipment, and an alarm system (if radio equipment is not available to all staff working in storage area). Spill control equipment (e.g., sorbent pads) will be available in all waste storage areas, and where liquids are transferred from one vessel to another.

Waste generated at NAS Pensacola will be stored in 55-gallon drums according to the following requirements:

- Drums and small containers of hazardous waste will be transported to the temporary accumulation areas on wood pallets and will be secured together with non-metallic bonding.
- Drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.
- Adequate aisle space (e.g., 30 inches) will be provided for containers such as 55-gallon drums to allow the unobstructed movement of personnel and equipment. A row of drums should be no more than two drums wide.
- Drums may not be stacked more than two high.
- Each drum will be provided with its own label.
- Drums will remain covered except when removing or adding waste to the drum. Covers will be properly secured at the end of each workday.
- Drums will be disposed of with the contents. If the contents are removed from the drums for offsite transportation and treatment or disposal, the drums will be decontaminated prior to re-use or before leaving the site.
- Secondary containment will be provided for drums of liquid hazardous waste or hazardous wastes that are incompatible with other wastes or materials stored nearby.

Areas used for waste accumulation will be inspected daily for malfunctions, deterioration, discharges, and leaks that could result in a release.

Waste accumulation areas will be inspected each day of operation during the scheduled shift (i.e., Monday through Friday). If operations will suspend for more than 7 days, alternate inspection arrangements will be made. Prior to demobilization, all hazardous wastes or materials will be removed from the site.

Inspections will be recorded in the Contractor Quality Control Report, and copies of the report will be maintained onsite, and available for review.

4.3 Transportation

Each transportation vehicle and load of waste will be inspected before leaving the site. The quantities of waste leaving the site will be recorded. A contractor licensed for commercial transportation will transport non-hazardous wastes. For hazardous waste, the transporter will have an EPA Identification number, and will comply with transportation requirements of 49 CFR 171-179 (Department of Transportation) and 40 CFR 263.11 and 263.31 (Hazardous Waste Transportation). A copy of the documentation indicating that the selected transporter has appropriate licenses and identification numbers will be received prior to transport of any waste material.

4.3.1 Manifests/Shipping Documentation

Each load of waste material will be manifested prior to leaving the site. At a minimum, the manifest form will include the following information:

- Transporter information including name, address, contact and phone number
- Generator information including name, address, contact, and phone number
- Site name including street / mailing address
- Description of waste (e.g.: hazardous waste, liquid)
- Type of container
- Quantity of waste (volumetric estimate)

Additionally, each shipment of waste will also have a waste profile, a Land Disposal Restriction Notification / Certification for hazardous wastes, and a haul ticket.

If the signed hazardous waste manifest from the designated offsite facility is not received within 35 days, CCI will contact the transporter or the designated facility to determine the status of the waste. If the signed hazardous waste manifest has not been received within 45 days, CCI will prepare an "Exception Report" for the Navy to submit to the State of Florida, as required under 40 CFR 262.42.

4.3.2 Transporter Responsibilities

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

The transporter will observe the following practices when hauling and transporting wastes offsite:

- Minimize impacts to general public traffic

- Repair road damage caused by construction and / or hauling traffic
- Cleanup material spilled in transit
- Line and cover trucks / trailers used for hauling contaminated materials to prevent releases and contamination
- Decontaminate vehicles prior to re-use, other than hauling contaminated material
- Seal trucks transporting liquids

All personnel involved in offsite disposal activities will follow safety and spill response procedures outlined in the Health and Safety Plan. No materials from other projects will be combined with materials from NAS Pensacola.

In the event of a spill or release of any waste, the transporter must immediately notify CCI and local authorities. The pertinent facts and information about the spill will be reported to CCI, and recorded, including:

- Type of material (e.g., soil, sludge, water) and contaminant
- Location
- Estimated volume
- Media affected (e.g., spilled on concrete pad or soil)
- Time of spill / release
- Final disposal of spilled material

The transporter will also report any spill or release of hazardous waste, as required by 49 CFR 171.15, to the National Response Center (NRC) at 800-424-8802 or 202-426-2675. The transporter must also report in writing, as required by 49 CFR 171.16, to the Director, Office of Hazardous Materials Regulations, Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590.

For any spill of hazardous waste water from a bulk shipment (e.g., tanker), the transporter will immediately notify the NRC (800-424-8802 or 202 - 267-2675), as required in 40 CFR 263.30.

The transporter will clean up any spill or release of waste (including soil or water) that occurs during transportation, or take such action as may be required or approved by federal, state, or local officials. Spilled waste will be immediately cleaned up, including soils on the outside of the trucks or other container (e.g., rail car) and on the ground or road surface. Where appropriate, the spilled material (e.g., soil), will be returned to the original waste container. In any case the spilled material will be properly contained and disposed.

4.3.3 Transportation and Disposal Log

Transportation of wastes will be inventoried the day of transportation from the site using the Transportation and Disposal Log. A carbon copy of the initial manifest form for each load will be retained onsite and attached to the daily Production Report. All required transportation manifests will be prepared by CCI and signed by an NAS Pensacola representative.

4.4 Disposal of Wastestreams

Offsite treatment or disposal facilities will use the waste profile and supporting documentation (e.g., analytical data) to determine if they will accept a waste. Hazardous wastes will be sent to the appropriate, permitted, Resource Conservation and Recovery Act (RCRA) Subtitle C treatment, storage, or disposal (TSD) facility. Non-hazardous, contaminated wastes such as petroleum-contaminated soil will be disposed at a RCRA Subtitle D facility or a municipal landfill, as appropriate. The TSD facility will be responsible for providing a copy of the final waste manifest and for a certificate of treatment or disposal for each load of waste received.

Consistent with CERCLA Offsite Policy (58 FR 49200, September 22, 1993), hazardous wastes treated or disposed at an offsite facility determined acceptable by EPA Regional Off-Site Contact (i.e., offsite facility approval). According to 40 CFR 300.400(b), the Regional Contact determines that the facility has no significant violations, and has no releases of hazardous substances (for RCRA Subtitle C facilities). CCI will obtain a record of the facility's approval under this policy.

5.0 Quality Control Plan

This site- and task- specific Quality Control Plan (QCP) supplements the general quality control provisions provided in the Basewide Work Plan. This QCP details the quality administrators, the project organization for the work to be completed for CTO 0085 NAS Pensacola, and the definable features of the soil and groundwater sampling work for the OU 13 site.

The Submittal Register, included in Appendix D of this Work Plan Addendum, documents submittals in accordance with Appendix C of CCI's Contract Management Plan (CCI, 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 (CO, ROICC [in duplicate], etc.), the project site, and to the project file.

The site-specific project organization chart (Figure 5-1) depicts the chain-of-command for this CTO and the individuals responsible for executing the work as indicated. Roles and responsibilities are summarized in Table 5-1.

5.1 Project QC Manager

The Project QC Manager will be Mr. Ryan Bitely. Mr. Bitely's appointing letter is provided in Appendix F.

5.2 Testing Requirements

This section describes monitoring well installation requirements and the environmental analysis laboratories and their certifications. The Testing Plan and Log is provided in Appendix E.

5.2.1 Identification and Certification of Testing Laboratories

Kemron Environmental Services in Marietta, Ohio (a Navy approved laboratory) will function as the environmental testing laboratory.

5.2.2 Construction

The monitoring wells will be installed in accordance with ASTM method D-5092, Design and Installation of Groundwater Monitoring Wells in Aquifers.

Figure 5-1
Project Organization Chart

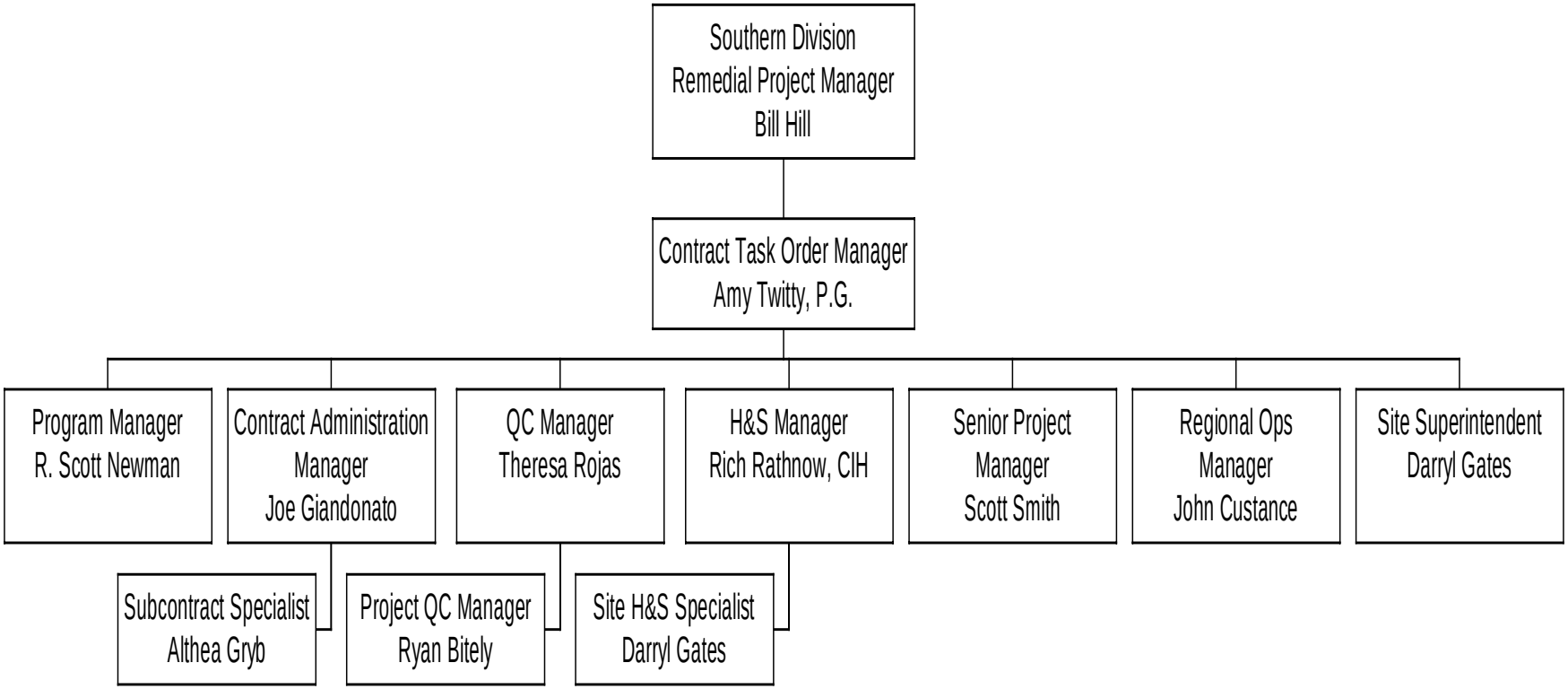

TABLE 5-1
Roles, Responsibilities, and Authorities of Individuals Assigned to a CTO

CTO 85, OU 13 Sites 8 and 24

Role	Responsibility	Authority
Project Manager	• 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	• 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	• 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	• 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	• Monitor and oversee subcontractor compliance with scope of work • Review requests for changes in scope o9f work • Review technical qualifications of subcontractors • Prepare Field Change Requests • Respond to Design Change Notices • Recommend improvements in work techniques or metrics • Recommend work-around to Site Superintendent	• Approve Field Change Requests below ceiling amount • Complete daily compliance report
Field Accountant	• Provide project scheduling coordination • Responsible for site cost tracking and reporting • Maintain record of site purchases • Maintain government property records	• Approve payables for disposable items
Transportation and Disposal Coordinator	• 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	• Approve subcontractors daily report of waste material removed from the site • Approve corrective action plans from T&D subcontractor

TABLE 5-1 (CONTINUED)
Roles, Responsibilities, and Authorities of Individuals Assigned to a CTO
CTO 85, OU 13 Sites 8 and 24

Role	Responsibility	Authority
Project Assistant	• Maintain CTO files and correspondence • Coordinate CTO schedule and monitor deliverables • Maintain change management records • Maintain Action Tracking System log	• Submit Action Tracking System log • Assign correspondence log numbers
Project QC Manager and/or QC Inspectors	• 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	• 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	• 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	• 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	• Prepare bid packages • Purchase disposable materials • Maintain subcontract log	

5.2.3 Testing and Sampling

Soil and water (development, purge, and decontamination) will be sampled by CCI or its Subcontractor, at CCI's direction. A Navy certified and FDEP approved laboratory will be used for all sample analyses.

5.3 Site Inspections

The planned site activities at NAS Pensacola will be performed in accordance with the three phases of control while performing the work. The definable features of work for activities included in this work plan addendum are surveying, mobilization, monitoring well installation, soil and groundwater sampling, and demobilization.

5.3.1 Mobilization

As part of the mobilization activity, a pre-construction meeting will be held to review the preparedness to begin the project and procedures and schedule to complete the project. As part of the preparedness check, the permitting/approvals will be verified to be in place for the planned monitoring well installation, soil and groundwater sampling activities, and the resources mobilized to the field have been inspected and verified to be in conformance with the project specifications and in good working conditions for the completion of the site activities. The mobilization task and will include the protection of existing structures, preparation of decontamination, staging and temporary waste storage areas. The following quality controls will be implemented during the mobilization activities.

TABLE 5-2
Mobilization Activities
CTO 85, OU 13 Sites 8 and 24

Task	Inspection
Pre-construction Meeting	-Verification of well installation permit from FDEP -Verification of utility clearance -Verification of designated locations of equipment, material and waste staging, and decontamination area
Pre-construction submittals	-Subcontractor plans and specifications -Environmental testing laboratories certification -Subcontractor personnel qualification and certifications
Temporary Facilities	-Verification of temporary waste storage area and decontamination area for conformance in accordance with the Basewide Work Plan

5.3.2 Surveying

The locations of the soil sample points and installed monitoring wells will be surveyed to obtain the x, y, z coordinates.

TABLE 5-3
Surveying Activities
CTO 85, OU 13 Sites 8 and 24

Task	Inspection
Surveying	-Review AHAs for the task -Surveyor qualifications/license -Verification of existing monuments and structures -Instrument calibration and accuracy -Review of well list (refer to Figure 5) for locations -Reference to applicable plane coordinates and vertical Datum, information collected in English units -Review as-built drawings for accuracy and completeness -Electronic and hard copy data deliverables

5.3.3 Monitoring Well Installation

The groundwater monitoring system will consist of a total of seven shallow monitoring wells. Four wells installed at Site 8 and three wells installed at Site 24.

TABLE 5-4
Monitoring Well Installation Activities
CTO 85, OU 13 Sites 8 and 24

Task	Inspection
Monitoring Well Installation	-Review AHAs associated with the task -Verify driller's qualifications (licensed in the State of Florida) -Drill rig and boring equipment inspection -Inspect well construction materials for compliance with construction details -Instrument calibration and accuracy -Inspection of equipment and decontamination between wells -Well logs and development records, satisfactory development -Review monitor well completion report for completeness -Inventory and observe proper abandonment of temporary wells -Inspect temporary waste storage areas for containment, proper labeling, and integrity -Verify surface completions match the existing type and grade -Ensure correct well identification tags and well lock installed

5.3.4 Soil and Groundwater Sampling

The soil sample collection will consist of 18 locations plus 4 QA/QC samples for a total of 22. The groundwater sample collection will consist of 7 locations plus 4 QA/QC samples for a total of 11. Samples required for waste characterization shall be collected once the well installation and development activities are completed.

TABLE 5-5
Soil and Groundwater Sampling Activities
CTO 85, OU 13 Sites 8 and 24

Task	Inspection
Soil and Groundwater Sampling	-Verify proper depth for collection of soil borings and subsequent samples -Observe description of borings with the USCS -Inspect sampling protocol and document -Instrument calibration and accuracy -Inspection of equipment decontamination between sampling locations -Verify completion of well development and purge -Proper use of PPE -Review of Chain of Custody and sample containers -Verify required QA/QC samples are collected

5.3.5 Demobilization

After the completion of the monitoring wells installation/construction activities, the site will be inspected for acceptance by the Navy that the construction is complete in accordance with the approved plans and procedures.

TABLE 5-6
Demobilization Activities
CTO 85, OU 13 Sites 8 and 24

Task	Inspection
Construction completion	-Prefinal site inspection and develop punch-list items -Complete resolution of punch-list items -Final site inspection -Orderly Site Demobilization

5.4 Test Control

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 will verify the following:

- Facilities and testing equipment are available and comply with testing standards.
- Completed temporary well points are abandoned in accordance with the FDEP requirements and state and local regulations.
- The field instruments are calibrated in accordance with manufacturers' recommendations.
- Recording forms, including boring logs, have been prepared and are accurate and complete.
- Activity Hazard Analysis (AHAs) are accurate and complete for each appropriate task.

5.5 CTO Support Organizations

Kemron Environmental Services is the environmental laboratory currently on record for this CTO. Their subcontract will be amended to include this work. The other supporting organizations are yet to be determined.

6.0 Environmental Protection Plan

The Environmental Protection Plan included in the Basewide Work Plan provides general information on the appropriate requirements to be adhered to during the performance of the work at NAS Pensacola.

7.0 References

CH2M HILL Constructors, Inc. 2000. *Basewide Work Plan, NAS Pensacola, Pensacola, Florida.*

CH2M HILL Constructors, Inc. 2002a. *Evaluation of Site Conditions Based on Results of Soil and Groundwater Sampling, Operable Unit 13 – Site 8, Revision 01*. October 31, 2002.

CH2M HILL Constructors, Inc. 2002b. *Evaluation of Site Conditions Based on Results of Soil and Groundwater Sampling, Operable Unit 13 – Site 24, Revision 01*. October 30, 2002.

CH2M HILL Constructors, Inc. 2002. Soil *Sampling and Analysis Plan, Operable Unit 13-Sites 8 and 24, Revision 0. June 2002, NAS Pensacola, Pensacola, Florida.*

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Naval Energy and Environmental Support Activity. 1983. *Initial Assessment Study of Naval Air Station Pensacola, Pensacola, Florida.* (NEESA 13-015).

U.S. Environmental Protection Agency. May 1996. *EPA Region IV Environmental Investigation Standard Operating Procedures and Quality Assurance Manual.* Revised 1997.

Appendix A

Ensafe UCL Memo

Technical Memorandum
Naval Air Station C Pensacola, Florida

To: NAS Pensacola Partnering Team
From: EnSafe
Date: April 29, 2002

Subject: 95% UCL Calculations for OU 13

Background

The *Focused Feasibility Study (FFS) — OU 13, NAS Pensacola, Florida* (EnSafe Inc., May 3, 2000) and the *Focused Feasibility Study Addendum* (EnSafe Inc. September, 2001) evaluated several remedial alternatives for removing contaminated surface and/or subsurface soil at OU 13. These remedial alternatives address the residential and industrial risk scenarios developed in the Baseline Risk Assessment of the *Final Remedial Investigation Report — OU 13, NAS Pensacola, Florida* (EnSafe Inc. 1997), and leaching of contaminants to groundwater.

In 1999, the Methodology Focus Group of the Florida Department of Environmental Protection (FDEP) Contaminated Soils Forum published its paper *Use of the 95% Upper Confidence Limit in Developing Exposure Point Concentrations for Contaminants in Soil* (May 11, 1999). This paper discusses how, in most cases, risks from contaminated soils are evaluated based on chronic exposure. If an individual's contact with a contaminated area is random, the best representation of the concentration the individual is exposed to is the average contaminant concentration over that area. To more accurately generate an average concentration across a given area, the United States Environmental Protection Agency (USEPA) recommends use of a 95% upper confidence limit (95% UCL) of the mean generated from the data. The 95% UCL of the mean concentration is generally considered a conservative basis for comparing site contaminant concentrations to soil cleanup target levels (SCTLs). The paper also addressed hot-spots, saying that an upper limit for contaminant concentrations of 3-times the SCTL should be health protective.

Application to OU 13

In order to refine the remedial alternatives developed in the FFS, the methods developed by FDEP's Contaminated Soils Forum were applied to surface soil data from OU 13. First, surface soil data were compared to the appropriate SCTL. Constituents with maximum detected concentrations below their applicable residential SCTL were not evaluated. The only constituents that exceeded the appropriate SCTLs in surface soil at OU 13 were arsenic, benzo(a)pyrene, and dieldrin. 95% UCL calculations were determined for these parameters for OU 13. Table 1 presents the 95% UCLs for OU 13 surface soil data.

Table 1
95% UCL Calculations
OU 13

Contaminant	95% UCL	Residential SCTL/Reference Concentration	Hot-Spot/Removal Area*	Concentration	Recalculated 95% UCL
Arsenic	1.46 mg/kg	0.8 mg/kg/ 1.56 mg/kg	024S010 024S011	2.6 mg/kg 3.1 mg/kg	NC
Benzo(a)pyrene	204.47 µg/kg	100 µg/kg	024S010	730 µg/kg	124 µg/kg
Dieldrin	42.4 µg/kg	70 µg/kg	08S003	2,010 µg/kg	NC

Notes:

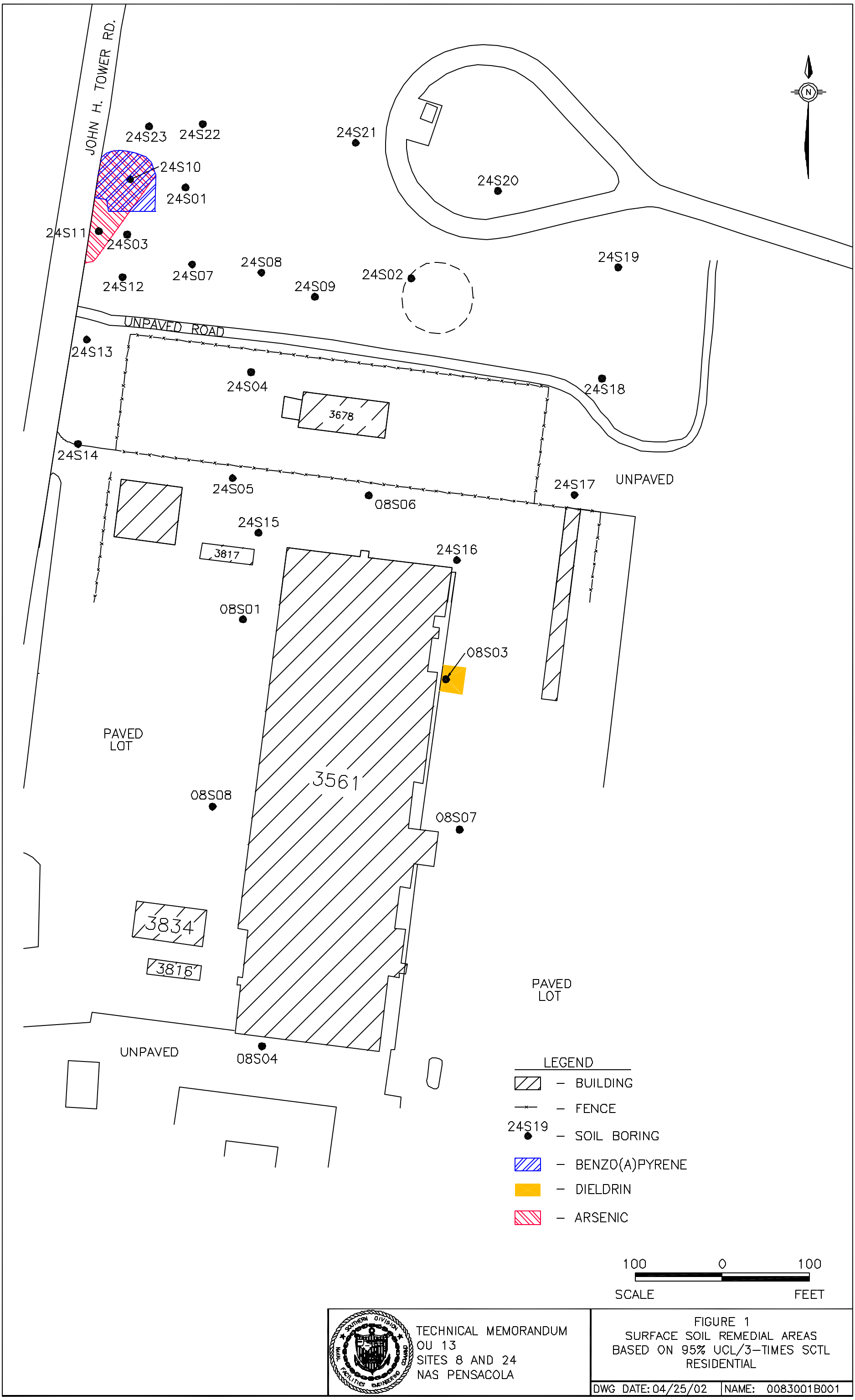
*	=	Hot spots denote sample locations with detections greater than 3 X the FDEP SCTL.
SCTL	=	Soil cleanup target level.
UCL	=	Upper confidence limit.
NC	=	Because the original 95% UCL is below the SCTL/reference concentration, the UCL was not recalculated.

As can be seen in the table, three locations are identified for removal using the 95% UCL and three-times the SCTL approach. At Site 24, arsenic hot spots are at sample locations 24S10 and 24S11, while benzo(a)pyrene has a hot-spot at 24S10. These sample locations are near each other, where the site borders John Tower Road. At Site 8, a dieldrin hot-spot exists at sample location 08S03, on the east side of Building 3561. Figure 1 shows the surface soil remedial areas for the combined sites.

Recommendation

The Navy recommends removal of the surface soil areas identified in Table 1. With those removals and the previously agreed upon subsurface soil removals, OU 13 will meet residential requirements, and no further action is required for site soil.

Figure 1 Surface Soil Remedial Areas Based on Residential RGOs


JOHN H. TOWER RD.
N
24S23
24S22
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24S11
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24S19
24S08
24S07
24S02
24S12
24S09
UNPAVED ROAD
24S13
24S04
24S18
3678
24S14
24S05
24S17
UNPAVED
08S06
24S15
3817
24S16
08S01
08S03
PAVED
LOT
3561
08S08
08S07
3834
3816
PAVED
LOT
UNPAVED
08S04
LEGEND
– BUILDING
– FENCE
24S19
– SOIL BORING
– BENZO(A)PYRENE
– DIELDRIN
– ARSENIC
100
0
100
SCALE
FEET
TECHNICAL MEMORANDUM
OU 13
SITES 8 AND 24
NAS PENSACOLA
FIGURE 1
SURFACE SOIL REMEDIAL AREAS
BASED ON 95% UCL/3–TIMES SCTL
RESIDENTIAL
DWG DATE: 04/25/02
NAME: 0083001B001

Appendix B

Health and Safety Plan

Health and Safety Plan
Soil and Groundwater Sampling
Operable Unit 13 - Sites 8 and 24
Naval Air Station Pensacola
Pensacola, Florida

Contract No. N62467-98-D-0995
Contract Task Order No. 0085

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

April 2003

Contents

Acronyms ..... **iv**
1.0 Project Information and Description **1-1**
2.0 Tasks to be Performed Under this Plan **2-1**
2.1 Hazwoper-Regulated Tasks 2-1
2.2 Non-Hazwoper-Regulated Tasks 2-1
3.0 Hazard Control **3-1**
3.1 Project-Specific Hazards 3-1
3.1.1 Drilling Safety 3-1
3.1.2 Welding/Cutting with Compressed Gas Cylinders 3-2
3.1.3 Working around Material Handling Equipment 3-3
3.1.4 Excavation Activities 3-3
3.1.5 Operating Heavy Equipment 3-4
3.1.6 Fall Protection Activities 3-5
3.1.7 Scaffolding Activities 3-5
3.1.8 Lockout/Tagout Activities 3-5
3.1.9 Use of Aerial Lifts 3-6
3.1.10 Confined Space Entry 3-7
3.1.11 Concrete and Masonry Construction Activities 3-7
3.1.12 Forklift Operations 3-8
3.1.13 Exposure to Public Vehicular Traffic 3-9
3.1.14 Rigging 3-10
3.2 General Hazards 3-10
3.2.1 General Practices and Housekeeping 3-10
3.2.2 Hazard Communication 3-11
3.2.3 Shipping and Transportation of Chemical Products 3-11
3.2.4 Lifting 3-11
3.2.5 Fire Prevention 3-11
3.2.6 Electrical 3-12
3.2.7 Stairways and Ladders 3-13
3.2.8 Heat Stress 3-14
3.2.9 Cold Stress 3-15
3.2.10 Compressed Gas Cylinders 3-16
3.2.11 Procedures for Locating Buried Utilities 3-16
3.3 Biological Hazards and Controls 3-17
3.3.1 Snakes 3-17
3.3.2 Poison Ivy and Poison Sumac 3-17
3.3.3 Ticks 3-17
3.3.4 Bees and Other Stinging Insects 3-17
3.3.5 Bloodborne Pathogens 3-17
3.3.6 Mosquito Bites 3-18
3.3.7 Other Anticipated Biological Hazards 3-18
3.4 Radiological Hazards and Controls 3-19

3.5 Chemical Hazards 3-19
3.6 Potential Routes of Exposure 3-19
4.0 Project Organization and Personnel 4-1
4.1 CCI Employee Medical Surveillance and Training 4-1
4.2 Field Team Chain of Command and Communication Procedures 4-2
4.2.1 Client: Southern Division, U.S. Navy Facilities Engineering Command 4-2
4.2.2 CCI 4-2
4.2.3 CCI Subcontractors 4-4
5.0 Personal Protective Equipment 5-1
6.0 Air Monitoring/Sampling 6-1
6.1 Air Monitoring Specifications 6-1
6.2 Calibration Specifications 6-1
6.3 Air Sampling 6-2
7.0 Decontamination 7-1
7.1 Decontamination Specifications 7-1
7.2 Diagram of Personnel-Decontamination Line 7-1
8.0 Spill-Containment Procedures 8-1
9.0 Site Control Plan 9-1
9.1 Site Control Procedures 9-1
9.2 Hazwoper Compliance Plan 9-1
10.0 Emergency Response Plan 10-1
10.1 Pre-Emergency Planning 10-1
10.2 Emergency Equipment and Supplies 10-2
10.3 Incident Reporting, Investigation and Response 10-2
10.4 Emergency Medical Treatment 10-3
10.5 Evacuation 10-3
10.6 Evacuation Signals 10-4
10.7 Incident Notification and Reporting 10-4
11.0 Behavior Based Loss Prevention System 11-1
11.1 Activity Hazard Analysis 11-1
11.2 Pre-Task Safety Plans 11-2
11.3 Loss Prevention Observations 11-2
11.4 Loss/Near Loss Investigations 11-2
12.0 Approval 12-1
12.1 Original Plan 12-1
12.2 Revisions 12-1

Figures

7-1 Personnel Decontamination Line 7-2

Tables

3-1 Contaminants of Concern 3-18
5-1 PPE Specifications 5-1
6-1 Air Monitoring Specifications 6-1
6-2 Air Monitoring Equipment Calibration Specifications 6-2
7-1 Decontamination Specifications 7-1
10-1 Emergency Equipment 10-2
10-2 Evacuation Signals 10-4

Attachments

1 Employee Signoff Form
2 Project-Specific Chemical Product Hazard Communication Form
3 Chemical-Specific Training Form
4 Emergency Contacts
5 Activity Hazard Analysis Form
6 Project Activity Self-Assessment Checklists/Permits
7 Incident Reporting Forms
8 Material Safety Data Sheets

Acronyms

°F	degrees Fahrenheit
AHA	Activity Hazard Analysis
ALARA	as low as reasonably achievable
APR	air-purifying respirator
ATL	Atlanta
BBLPS	Behavior Based Loss Prevention System
CCI	CH2M HILL Constructors, Inc.
CNS	central nervous system
COC	Contaminant of Concern
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
dBA	decibel A-rated
DOT	Department of Transportation
FA	first aid
FID	flame ionization detector
GFCI	ground fault circuit interrupter
HAZCOM	hazard communication
HR	heart rate
HSM	Health and Safety Manager
HSP	Health and Safety Plan
IDLH	immediately dangerous to life and health
IDW	investigation-derived waste
IRF	Incident Report Form
lb	pound
LEL	lower explosive limit
LPO	Loss Prevention Observation
mg/m^3	milligrams per cubic meter
MSDS	Material Safety Data Sheet
mW/cm^2	milliwatt per square centimeter
NAS	Naval Air Station
NDG	nuclear density gauge
NEESA	Naval Energy and Environmental Support Activity
NLI	Near Loss Investigation
NSC	National Safety Council
NTR	Navy Technical Representative
NVR	Navarre, Florida
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

PTSP	Pre-Task Safety Plan
PWC	Public Works Center
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

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

Project No: Contract Task Order (CTO) No. 0085

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

Project/Site Name: Operable Unit 13, Sites 8 and 24

Site Address: NAS Pensacola, Pensacola FL

Navy RAC Project Manager: Amy Twitty/Navarre, Florida (NVR)

CCI Office: ATL

Date Health And Safety Plan Prepared: August 2002

Date Health And Safety Plan Revised: March 2003

Date(s) of Site Work: April 2003

Site Background and Setting: Site 8 is an approximately 450 by 600 foot area currently occupied by Building 3561, which houses the NAS Pensacola Pubic Works Center (PWC) Maintenance/Material Department. An extensive asphalt-paved area surrounds Building 3561 to the north, east, and west, covering nearly all land surface. An approximately 20-foot wide concrete apron immediately surrounds the building to the east and west and is covered by an awning. The PWC stores building materials on the paved area west of the building. Miscellaneous office trailers and fences storage, including Building 3678, are north of the building. The paved area east of the building is used for PWC storage and employee parking. Sidewalks and a grassy median are to the south, between Buildings 3560 and 3561. Most of the site is surrounded by a chain-link fence.

Site 8 is the former base rifle range and disposal area. Various solid wastes and dry refuse were reportedly placed in trenches and burned there in the late 1950s and early 1960s. Aerial photographs and maps from the 1959s and 1969s show a rifle range at Building 3561's current location. Earlier aerial photographs show an excavation at the northern end of the rifle range, while later photographs show the excavated area overgrown with vegetation. Most of the excavation noted in the earlier photographs is currently covered by Building 3561 and surrounding paved area, which were covered in the mid 1970s. Facility personnel reported no waste or residue was identified during the building's construction (Naval Energy and Environmental Support Activity [NEESA], 1983). However, cemetery personnel have reported finding buried metal, rubber, and plastic aircraft parts during excavation along Site 24's eastern boundary.

Site 24 (DDT Mixing Area) is immediately north of Building 3561 near the northwest corner of the Barrancas National Cemetery. Nearly three quarter's of the site is now part of the Barrancas National Cemetery and is filled with gravesites. Only the southwestern corner of the site, now covered with grass, is free of graves. A paved road transects the site from east to west which leads to the circular drive surrounding the Columbarium Complex.

The fenced storage area around Building 3678, in Site 24's northern portion has a gravel/crushed shell land surface. The site is generally flat with land elevations between 24 and 26 feet above msl. The Cemetery is anxious to use the remaining free space of Site 24.

From the early 1950s until the early 1960s, Site 24 was used to mix DDT with diesel fuel for mosquito control. DDT, reportedly spilled in the mixing area while being transferred from drums to spray tanks, may have contaminated local soil and groundwater. DDT was aerially applied for at least 10 years to control mosquito outbreaks. In later years, DDT was applied by a fogger machine. On the average, two or three mosquito outbreaks occurred each year during the spring and summer. Following each outbreak, DDT was generally applied during a 1-week period. For each application, 500 gallons of 20 percent DDT solution was mixed with 300 gallons of diesel fuel. The fogger machine used 300 gallons of a 20 percent DDT mixed with 300 gallons of diesel fuel. It is estimated that up to 20 gallons of the 20 percent solution may have been spilled during the approximate 10 years of mixing at the site.

Description of Specific Tasks to be Performed: The scope of work will consist of determining the leachable properties of the soil contaminants which had the highest concentration of contaminants of concern (COCs) during the August 2002 soil investigation. COCs include dieldrin, benzo(a)pyrene, and cadmium. Seven permanent monitoring wells will be installed and sampled to determine if the COCs have migrated into the groundwater. COCs include dieldrin, iron, manganese, lead, benzo(a)pyrene, and arsenic. In addition, CCI will also inventory and properly abandon all temporary monitoring wells at OU 13.

2.0 Tasks to be Performed Under this Plan

(Reference Field Project Start-up Form)

Refer to the Work Plan for detailed task information. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin. Refer to Section 8.2 for procedures related to "clean" tasks that do not involve hazardous waste operations and emergency response (Hazwoper).

2.1 Hazwoper-Regulated Tasks

- Surface soil sampling
- Subsurface soil sampling
- Installation of groundwater monitoring wells
- Groundwater sampling
- Temporary groundwater monitoring well abandonment

2.2 Non-Hazwoper-Regulated Tasks

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

TASKS

- General heavy equipment work (excavation, grading, etc.)

CONTROLS

- Brief on hazards, limits of access, and emergency procedures
- Post contaminant areas as appropriate
- Sample and monitor as appropriate

3.0 Hazard Control

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2MHILL employees and subcontractors who do not understand any of these provisions should contact the Site Health and Safety Specialist (SHSS) for clarification.

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

Activity Hazard Analysis (AHA) will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in Attachment 5 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 6. 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 Drilling Safety

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

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

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

3.1.2 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.

3.1.3 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.

3.1.4 Excavation Activities

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

- CCI personnel must notify and be granted authorization from the excavation competent person prior to entering any excavation. CCI personnel must follow all excavation requirements established by the competent person.
- The competent person must inspect the trench and/or excavation everyday and after everyday hazard increasing event. Documentation of this inspection must be maintained onsite at al times.
- Excavations must be protected from cave-ins by adequate protective systems unless the excavation is less than 5 feet in depth and a competent person determines there is no indication of cave-in or the excavation is made entirely in stable rock that is not fractured.
- Prior to excavating at a location, buried utilities in the area must be identified; refer to Section 3.2.8 “Procedures for locating buried utilities”.
- CCI personnel must not enter any excavation where protective systems are deficient at any time, for any reason. The competent person must be notified of such conditions.

- Refer to CH2M HILL SOP HS-32 "Excavations and Trenching" for more specific details on excavation requirements.

3.1.5 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.

3.1.6 Fall Protection Activities

(Reference CH2M HILL, SOP HS-31, *Fall Protection*)

- CCI personnel exposed to fall hazards must complete the Fall Protection training course in the Basic Program and receive project-specific fall protection training. Personnel may not use fall protection systems on which they have not been trained.
- The CCI SHSS must complete the Project Fall Protection Evaluation Form and provide project-specific fall protection training to all CCI personnel exposed to fall hazards. The Project Fall Protection Evaluation Form is provided in Attachment 8.
- Fall protection systems must be used to eliminate fall hazards of 6 feet or greater.
- All components of the personal fall arrest system must be inspected for proper working condition prior to each use.
- Personal fall arrest system anchorages must be capable of supporting 5000 pounds per individual.
- Refer to CH2M HILL SOP HS-31 "Fall Protection" for more specific details on fall protection requirements.

3.1.7 Scaffolding Activities

(Reference CH2M HILL, SOP HS-73, *Scaffolds*)

- CCI personnel must notify and be granted authorization from the scaffolding competent person prior to climbing any scaffold.
- Personnel must follow all requirements established by the competent person or as identified on the "safe-to-climb" scaffold tag.
- The competent person must perform a detailed daily inspection of the scaffold and all components. Documentation of this inspection must be maintained onsite at all times.
- Personnel must not use boxes, ladders or any other device on the scaffold platform to increase the working level height.
- Personnel must remain within the scaffold guardrails; do not cross or lean over the guardrails.
- Ladders, stairways or integral prefabricated scaffold ladders must be used to access the platform; scaffold crossbracing may not be used as a means of access.
- CCI personnel must have completed CCI's fall protection training when personal fall arrest systems (harness, lanyard, linelines, etc.) are required to be used on scaffolding.
- Personnel working from suspended scaffolding are required to wear a full body harness with lanyard attached to an independent lifeline.

3.1.8 Lockout/Tagout Activities

(Reference CH2M HILL, SOP HS-33, *Lockout and Tagout*)

- Only qualified personnel may work on energized equipment that has not been deenergized by lockout/tagout procedures.
- When CCI controls the work, CCI must verify that subcontractors affected by the unexpected operation of equipment develop a written lockout/tagout program, provide training on lockout/tagout procedures and coordinate its program with other affected subcontractors. This may include compliance with the owner or facility lockout/tagout program.
- When CCI personnel are affected by the unexpected operation of equipment they must complete the lockout/tagout training course in the Basic Program. Project training may also be required onsite specific lockout procedures.
- Standard lockout/tagout procedures include the following six steps: 1) notify all personnel in the affected area of the lockout/tagout, 2) shut down the equipment using normal operating controls, 3) isolate all energy sources, 4) apply individual lock and tag to each energy isolating device, 5) relieve or restrain all potentially hazardous stored or residual energy, and 6) verify that isolation and deenergization of the equipment has been accomplished. Once verified that the equipment is at the zero energy state, work may begin.
- All safe guards must be put back in place, all affected personnel notified that lockout has been removed and controls positioned in the safe mode prior to lockout removal. Only the individual who applied the lock and tag may remove them.
- Refer to CH2M HILL SOP HS-33 "Lockout and Tagout" for more specific details on lockout/tagout requirements.

3.1.9 Use of Aerial Lifts

(Reference CH2M HILL, SOP HS-41, *Aerial Lifts*)

- Only authorized personnel are permitted to operate aerial lifts.
- Personnel shall wear a full body harness and attach their lanyard to the boom or basket; never attach to an adjacent structure. Personnel working in or operating a scissors lift are not required to wear fall protection as long as they are working totally within the confines of the lift, with both feet on the floor of the lift.
- Personnel shall remain in the basket at all times and shall not climb on the lift to gain access to elevated work location.
- Personnel shall always stand on the floor of the basket and not on the guardrails, planks, ladders or other devices to extend reach.
- Aerial lifts shall be positioned on level surfaces when possible and the brakes shall be set. If outriggers are provided, they shall be positioned on solid surfaces or cribbing. Wheel chocks shall be installed before using lifts on inclines.
- Lifts shall be provided with upper and lower controls and these controls shall be tested for proper function before each day's use. The lower controls shall not be operated

unless permission has been obtained from personnel in the lift, except in the case of emergency.

- Boom and basket load limits, as specified by the manufacturer, shall be known and shall not be exceeded.
- Aerial lifts shall be prohibited from moving with workers in the basket, unless specifically designed for this type of operation.
- Personnel shall not work on elevated platforms when winds exceed 20 miles per hour.
- Lifts shall be lowered before moving horizontally.
- An aerial lift shall not be used as a material hoist.

3.1.10 Confined Space Entry

(Reference CH2M HILL SOP HS-17, Confined Space Entry)

Project personnel are not anticipated to enter permit-required confined spaces during field activities.

The following requirements must be met prior to confined space entry:

- CCI personnel entering a confined spaces must have completed the 8-hour confined space entry training in the Recovery Center.
- Prior to entry, a confined space permit must be completed identifying entry requirements. Entrants must review the permit prior to each entry to verify the requirements have been satisfied.
- The atmosphere in the space must be tested with air monitoring equipment. CCI personnel must confirm the test results are consistent with acceptable entry conditions.
- Mechanical ventilation (portable blower) shall be applied to the space when these atmospheric conditions are not met during entries. Re-entry may only occur when the above atmospheric conditions are met and mechanical ventilation is continuously applied to maintain these conditions.
- CCI personnel entering confined spaces requiring respiratory protection must have completed respiratory protection training in the Basic program, received a respirator fit test and completed respirator wearer medical surveillance.
- Refer to CH2M HILL SOP HS-17 “Confined Space Entry” for more specific details on confined space entry requirements.

3.1.11 Concrete and Masonry Construction Activities

- Protruding reinforcing steel (rebar), onto which personnel could fall, must be guarded to eliminate the hazard of impalement
- During post-tensioning, only those personnel essential to the operation are permitted behind the tensioning jacks.

- Personnel shall not ride concrete buckets nor position themselves in areas where buckets are lifted overhead.
- Personnel shall maintain a safe distance from formwork and shoring being removed from concrete structures.
- Personnel shall maintain a safe distance from precast and lift-slab concrete being lifted into position until physically secured.
- Personnel shall not enter limited access zones during masonry wall construction.

3.1.12 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).

3.1.13 Exposure to Public Vehicular Traffic

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

- Exercise caution when exiting traveled way or parking along street – avoid sudden stops, use flashers, etc.
- Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.
- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.
- Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.
- Always remain aware of an escape route -- behind an established barrier, parked vehicle, guardrail, etc.
- Always pay attention to moving traffic – never assume drivers are looking out for you.
- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from traffic, a "buddy system" should be used, where one worker is looking towards traffic.
- When working on highway projects, obtain a copy of the contractor's traffic control plan.
- Work area should be protected by a physical barrier – such as a K-rail or Jersey barrier.
- Review traffic control devices to ensure that they are adequate to protect your work area. Traffic control devices should: 1) convey a clear meaning, 2) command respect of road users, and 3) give adequate time for proper traffic response. The adequacy of these devices are dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.
- Either a barrier or shadow vehicle should be positioned a considerable distance ahead of the work area. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion (TMCC). All vehicles within 40 feet of traffic should have an orange flashing hazard light atop the vehicle.
- Except on highways, flaggers should be used when 1) two-way traffic is reduced to using one common lane, 2) driver visibility is impaired or limited, 3) project vehicles enter or exit traffic in an unexpected manner, or 4) the use of a flagger enhances established traffic warning systems.

- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers. Vehicles should be parked at least 40 feet away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.

3.1.14 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.

3.2 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 onsite 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 > 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than 6 feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

3.2.8 Heat Stress

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

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

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.

Symptoms and Treatment of Heat Stress

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 0.75 inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing with permethrin or permanone and spray skin with only DEET; and check yourself frequently for ticks. Bug repellents will not be used if it is determined the active ingredient(s) will interfere with target sample list.

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

3.3.4 Bees and Other Stinging Insects

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

3.3.5 Bloodborne Pathogens

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

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

3.3.6 Mosquito Bites

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

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% 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.

3.3.6.1 Symptoms of Exposure to the West Nile Virus

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

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

If you have any questions or to report any suspicious symptoms, contact the project Health and Safety Manager.

3.3.7 Other Anticipated Biological Hazards

No other biological hazards are anticipated.

3.4 Radiological Hazards and Controls

No known radiological hazards are anticipated. If a radiological hazard is encountered, 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 Chemical Hazards

The following describes the chemical hazards posed by remedial activities at the project. Chemical contaminants of concern (COC), along with their maximum concentration in soil/groundwater, the applicable exposure limit/IDLH and symptoms of exposure are listed in Table 3-1.

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 Sections 5 and 6, respectively.
- **Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

TABLE 3-1
Contaminants of Concern
(Refer to Project Files for more detailed contaminant information)

Contaminant	Location and Maximum[a] Concentration	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Arsenic	GW: 32.1 µg/L (085-24-51-GW-16 [F]) SB: N/A SS: 3.89 mg/kg (085-24-55-S-1 [F])	0.01 mg/m^3	5 Ca	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA
Cadmium	GW:Undetected SB: 1.34 mg/kg (085-08-102-S-12[E]) SS: N/A	0.005 mg/m^3	9 Ca	Pulmonary edema, coughing, chest tightness/pain, headache, chills, muscle aches, nausea, vomiting, diarrhea, difficulty breathing, loss of sense of smell, emphysema, mild anemia	NA
Dieldrin	GW: 0.0291 µg/L (085-24-51-GW-16[F]) SB: .0572 mg/kg (085-24-55-S-11[F]) SS: 0.0123 mg/kg (085-08-110-S-1[E])	0.25 mg/ m^3	50 mg/ m^3 Ca	Headaches, dizziness; nausea, vomiting, malaise; sweating; myoclonic jerks of limbs; clonic, tonic convulsions; coma; [carc]	UK
Benzo(a)pyrene	GW: Undetected SB: N/A SS: 4.030 mg/kg (085-24-51-S-1[F])	0.1 mg/ m^3	80 mg/ m^3 Ca	Dermatitis, bronchitis [card]	N/A

Footnotes:
[a] Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), S (Surface Soil), SL (Sludge), SW (Surface Water).
[b] Appropriate value of PEL, REL, or TLV listed.
[c] IDLH = immediately dangerous to life and health (units are the same as specified “Exposure Limit” units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.
[d] PIP = photoionization potential; NA = Not applicable; UK = Unknown.
[E] Sample collected from Site 8
[F] Sample collected from Site 24

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
Amy Twitty	NVR	Project Manager	40 HR, SC-HW; FA-CPR
Rich Rathnow	ORO	HSM	SC-HW-C; FA-CPR
Darryl Gates	NVR	SHSS	SHSS; 40HR, FA-CPR; 10 HR Construction
Ryan Bitely	NVR	Project QC Manager	40HR, FA-CPR
Phyllis Zerangue	NVR	Field Technician	40HR, FA-CPR
Taj Goodpaster	NVR	Field Technician	40HR, FA-CPR
Chris Posey	NVR	Field Technician	40HR, 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 – Richard Stanley, COTR – Jimmy Jones
Phone: 843/820-5544
Facility Contact Name: Greg Campbell
Phone (850)492-4611 ext. 103

4.2.2 CCI

Program Manager: Scott Newman/ATL
Project Manager: Amy Twitty/NVR
Health and Safety Manager: Rich Rathnow/ORO
Field Team Leader: Darryl Gates
Site Safety Coordinator: Darryl Gates

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

- Include standard terms and conditions, and contract-specific HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors)
- Select safe and competent subcontractors by:
  - obtaining, reviewing and accepting or rejecting subcontractor pre-qualification questionnaires
  - ensuring that acceptable certificates of insurance, including 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
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented

The CCI Navy RAC 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 onsite 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 these HSP are current and amended when project activities or conditions change
- Verify CCI site personnel and subcontractor personnel read these FSI 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 these FSI and applicable subcontractor health and safety plan(s)
- Act as the project "Hazard Communication Coordinator"
- 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 7, 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 6, 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
- Coordinate with the HS&E manager regarding CH2M HILL and subcontractor operational performance, 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
- OHSA 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 CCI 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, who will be identified at a later date, 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 5 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 6 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) specifications are listed in Table 5-1.

TABLE 5-1
PPE Specifications[a]

Task	Level	Body	Head	Respirator [b]
General site entry Soil Sampling Excavation and Hauling Support Personnel with no potential exposure to contaminated soil.	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat [c] Safety glasses Ear protection [d]	None required
Excavation and Hauling Personnel in direct contact to contaminated soil	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 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.

It is anticipated the level of protection used for employees will be Level D. 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. PPE levels may be upgraded for the following reasons:

- 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 6) exceeded

PPE levels may be downgraded for the following reasons:

- 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

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	Contaminant Concentration	Action Levels[a]	Frequency [b]	Calibration
PID: OVM with 10.6eV lamp or equivalent	Intrusive Operations	< 5 ppm > 5 ppm ppm	Level D Level C Level B – Not Approved	Initially and periodically during task	Daily
Dust Monitor: Miniram model PDM-3 or equivalent	All Operations	< 1.0 mg/m^3 > 1.0 mg/m^3	Level D Level C	Initially and periodically during tasks	Zero Daily
Detector Tube: Drager benzene specific 0.5/c (0.5 to 10 ppm range) with pre-tube, or equivalent		<0.5 ppm 0.5-1 ppm >1 ppm	Level D Level C Level B	Initially and periodically when PID/FIB >1 ppm	Not applicable
Colormetric Tube: Drager vinyl chloride specific (0.5 to 30 ppm range) with pre-tube, or equivalent		<0.5 ppm 0.5 ppm	Level D Level B	Initially and periodically when PID/FID >1 ppm	Not applicable

[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 O_2 is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O_2 action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry (refer to Section 2).
[d] Refer to SOP HS-10 for instructions and documentation on radiation monitoring and screening.
[e] Noise monitoring and audiometric testing also required.

6.2 Calibration Specifications

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

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

TABLE 6-2
Air Monitoring Equipment Specifications

Instrument	Gas	Span	Reading	Method
PID: OVM, 10.6 or 11.8 eV bulb	100 ppm isobutylene	RF = 1.0	100 ppm	1.5 lpm reg T-tubing
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF = 100	100 ppm	1.5 lpm reg T-tubing
PID: TVA 1000	100 ppm isobutylene	CF = 1.0	100 ppm	1.5 lpm reg T-tubing

TABLE 6-2
Air Monitoring Equipment Specifications

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

6.3 Air Sampling

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

If air samples are needed, results must be sent immediately to the HSM. Regulations may require reporting to monitored personnel.

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

Decontamination specifications are listed in Table 7-1.

TABLE 7-1
Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
• Boot wash/rinse • Glove wash/rinse • Outer-glove removal • Body-suit removal • Inner-glove removal • Respirator removal • Hand wash/rinse • Face wash/rinse • Shower ASAP • Containerize PPE separately pending laboratory results	• Wash/rinse equipment • Solvent-rinse equipment • Contain solvent waste for offsite disposal	• Power wash • Steam clean • Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

7.2 Diagram of Personnel-Decontamination Line

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

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

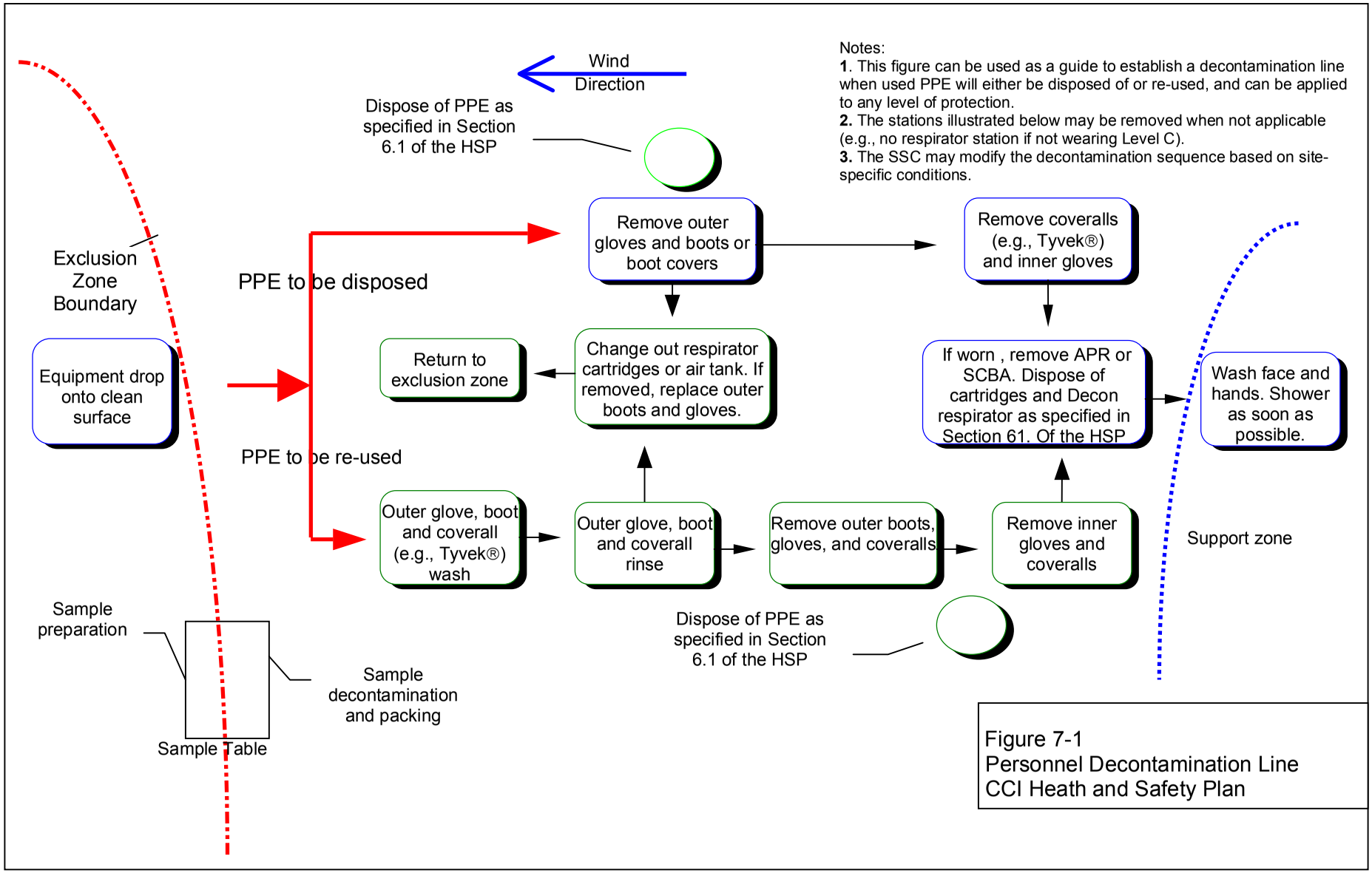


Figure 7-1
Personnel Decontamination Line
CCI Heath and Safety Plan

8.0 Spill-Containment Procedures

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

9.0 Site Control Plan

9.1 Site Control Procedures

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

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

9.2 Hazwoper Compliance Plan

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

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities specified in Section 3.2 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 hours of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must not enter the TSDF area of the site.

10.0 Emergency Response Plan

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

10.1 Pre-Emergency Planning

The SHSS performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with 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 is listed in Table 10-1.

TABLE 10-1
Emergency Equipment

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. CCI employee injuries and illnesses (including overexposure to contaminants) must be reported to their respective Human Resource contacts 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 CCI medical consultant, depending on whose employee is injured. During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities listed in Section 10.8 (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 10.7.

10.5 Evacuation

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

- The SHSS and a "buddy" will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.
- The SHSS will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate assembly area(s).
- The SHSS will write up the incident as soon as possible after it occurs and submit a report to the Corporate Director of Health and Safety.

10.6 Evacuation Signals

Evacuation signals are listed in Table 10-2.

TABLE 10-2
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 CCI work-related injuries or illnesses, contact the respective Human Resources contact listed in Attachment 4. For CCI incidents the HR administrator will complete an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.
- For CCI subcontractor incidents, complete the Subcontractor Accident/Illness Report Form (Attachment 7) 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 CCI projects to implement the BBLPS include:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plan (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 it's 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 3.1 and 3.2, respectively) of the HSP and applicable CH2M HILL 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/AHAs, that apply for each day's project activities. The PTSPs serve the same purpose as these general assembly safety meetings, but the PTSPs are held between the crew supervisor and their work crews to focus on those hazards posed to individual work crews. At the start of each day's activities, the crew supervisor completes the PTSP, provided in Attachment 6, with input from the work crew, during their daily safety meeting. The day's tasks, personnel, tools and equipment that will be used to perform these tasks are listed, along with the hazards posed and required H&S procedures, as identified in the AHA. The use of PTSPs, better promotes worker participation in the hazard recognition and control process, while reinforcing the task-specific hazard and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

11.3 Loss Prevention Observations

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

11.4 Loss/Near Loss Investigations

Loss/Near Loss Investigations shall be performed for the all 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 CCI only. CCI 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/ORO **Date: 8/9/02**

Approved By: Rich Rathnow/ORO **Date: 8/9/02**

12.2 Revisions

Revisions Made By: **Date:**

Revisions Approved By: **Date:**

Attachment 1

Employee Signoff Form

EMPLOYEE SIGN-OFF FORM

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

Project Name: **Project Number:**

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

Attachment 2

Project-Specific Chemical Product Hazard Communication Form

Project-Specific Chemical Product Hazard Communication Form

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

Project Name: **Project Number:**

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

Hazardous Chemical Products Inventory

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

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

Attachment 3

Chemical specific Training Form

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 #:434-4811
Local Ambulance #:911

CH2M HILL- Medical Consultant
Dr. Jerry H. Berke, M.D., M.P.H.
Health Resources
600 West Cummings Park, Suite 3400
Woburn, MA 01801-6350
1-781-938-4653
1-800-350-4511

Fire/Spill Emergency -- 911
Facility Fire Response #:435-1703
Local Fire Dept #:435-1703 Escambia Fire Department

Local Occupational Physician

Security & Police – 911
Facility Security #:Base Security, 452-6604
Local Police #: 911

Navy RAC Program Manager
Name: Scott Newman/ATL
Phone: 770/604/9182

Utilities Emergency
Water: 452-5555
Gas: 452-5555
Electric:452-5555

Navy RAC Health and Safety Manager (HSM)
Name: Rich Rathnow/ORO
Phone: 865/483-9005 (Office); 865/607-7867(Cell)
865/531-2933(Home)

Site Health and Safety Specialist (SHSS)
Name: Darryl Gates/NVR
Phone: (850)939-8300 ext. 22

CCI Regional Human Resources Department
Name: Nancy Orr/COR
Phone: 303/771-0900

Navy RAC Project Manager
Name: Amy Twitty/ NVR
Phone: (850)939-8300 ext. 17
cell(850)501-4417

CH2M HILL 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):

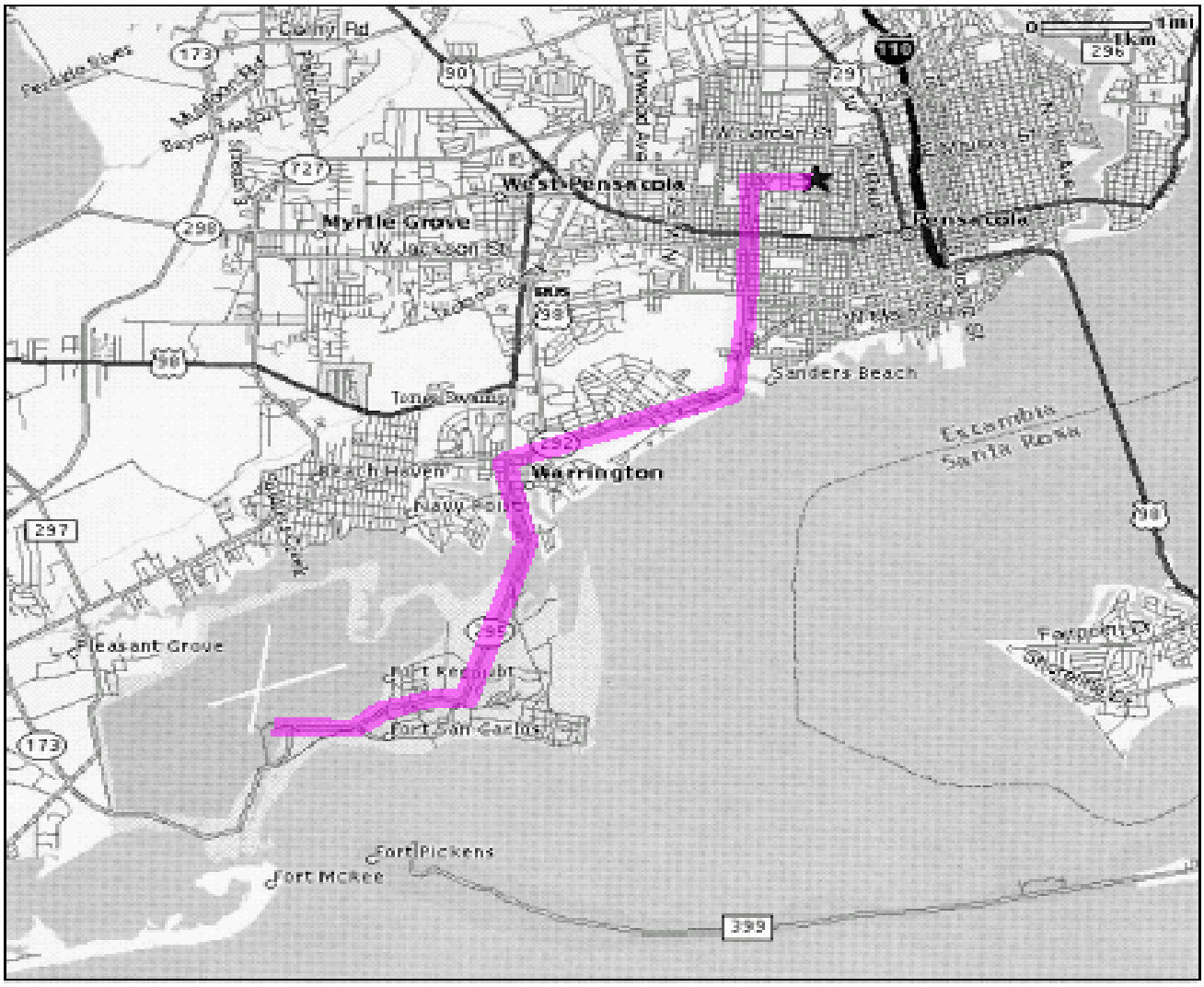
Facility/Site Evacuation Route(s):

Hospital Name/Address:
Baptist Hospital
1000 W. Moreno St.
Pensacola, FL 32501

Hospital Phone #:
(850) 434-4011

Directions to Hospital

From the site, turn right onto John H. Tower Road, then turn right onto Taylor Road. Follow ½ mile to Duncan Road (Route SR-295). Turn left and follow to Main Gate of NAS Pensacola. Proceed on SR-295 for 1.5 miles then turn right onto SR-292 and proceed for approximately 4 miles to West Moreno Street. Turn right and proceed for eight blocks to Baptist Medical Center. Refer to next page for map.


Cobb Rd
Perdido River
Muldoon Rd
Bayou Marcus
Lillian Hwy
Blue Angel Pkwy
Scenic Hwy
Navy Blvd
Mobile Hwy
Pensacola Blvd
Wright St
Cervantes St
Gregory St
Garden St
Intercoastal Wy
Bayou Texar
West Pensacola
Myrtle Grove
W Jackson St
Pensacola
Sanders Beach
Tenn Dwang
Beach Haven
Warrington
Navy Point
Escambia
Santa Rosa
Pleasant Grove
Fort Redoubt
Fort San Carlos
Fort Pickens
Fort McRee
Perdido Key
Sorrento Beach
0
1 mi
1 km
173
90
29
10
296
727
98
33
95
297
399

Attachment 5

Activity Hazard Analysis Form

Activity Hazard Form

Activity:	**Date:**
	Project:
Description of the work:	**Site Supervisor:**
	Site Safety Officer:
	Review for latest use: Before the job is performed.

Work Tasks	Identify & Analyze the Hazards	Identify Hazard Controls

Work Tasks	Identify & Analyze the Hazards	Identify Hazard Controls

Equipment to be used	Inspection Requirements	Training Requirements

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

Attachment 6

Project Activity Self-Assessment Checklists/Permits

- **Earthmoving Equipment**
- **Excavations**

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:

☐ Evaluate CH2M HILL employee exposures to earthmoving equipment hazards
☐ 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.

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

SECTION 2	Yes	No	N/A	N/O
GENERAL (3.2.1)				
11. Daily safety briefing/meeting conducted with crew	☐	☐	☐	☐
12. Daily inspection of equipment and equipment accessories conducted before use	☐	☐	☐	☐
13. At least one fire extinguisher available at the equipment operating area	☐	☐	☐	☐
EARTHMOVING EQUIPMENT COMPONENTS (3.2.2)				
14. Backup alarm or spotter used when backing equipment	☐	☐	☐	☐
15. Operational horn provided on bi-directional equipment	☐	☐	☐	☐
16. Seat belts are provided and used	☐	☐	☐	☐
17. Rollover protective structures (ROPS) provided	☐	☐	☐	☐
18. Braking system capable of stopping full payload	☐	☐	☐	☐
19. Headlights and taillights operable when additional light required	☐	☐	☐	☐
20. Brake lights in operable condition	☐	☐	☐	☐
21. Cab glass provides no visible distortion to the operator	☐	☐	☐	☐
22. Hauling equipment (dump trucks) provided with cab shield or canopy	☐	☐	☐	☐
23. Dump truck beds provided with positive means of support during maintenance or inspection	☐	☐	☐	☐
24. Dump truck operating levers provided with latch to prevent accidental dumping	☐	☐	☐	☐
EARTHMOVING EQUIPMENT PLACEMENT (3.2.3)				
25. Location of underground utilities identified	☐	☐	☐	☐
26. Safe clearance distance maintained while working under overhead powerlines	☐	☐	☐	☐
27. Safe distance is maintained while traveling under powerlines	☐	☐	☐	☐
28. Unattended equipment visibly marked at night	☐	☐	☐	☐
29. Parking brake set when equipment parked and equipment chocked when parked on incline	☐	☐	☐	☐
EARTHMOVING EQUIPMENT OPERATION (3.2.4)				
30. Equipment operated on safe roadways and grades	☐	☐	☐	☐
31. Equipment operated at safe speed	☐	☐	☐	☐
32. Equipment not operated during inclement weather, lightning storms	☐	☐	☐	☐
33. Using equipment to lift loads, other than earth, done according to equipment manufacturer specifications	☐	☐	☐	☐
34. Lifting and hauling capacities are not exceeded	☐	☐	☐	☐
35. Equipment components lowered when not in use	☐	☐	☐	☐
36. All machine guards are in place	☐	☐	☐	☐
37. Air monitoring conducted per HSP/FSI for hazardous atmospheres	☐	☐	☐	☐
EARTHMOVING EQUIPMENT MAINTENANCE (3.2.5)				
38. Defective components repaired immediately	☐	☐	☐	☐
39. Suspended equipment or equipment parts are supported prior to work under or between	☐	☐	☐	☐
40. Lockout/tagout procedures used prior to maintenance	☐	☐	☐	☐
41. Tires on split rims removed using safety tire rack or cage	☐	☐	☐	☐
42. Good housekeeping maintained on and around equipment	☐	☐	☐	☐
EXCAVATING AT HAZARDOUS WASTE SITES (3.2.6)				
43. Waste disposed of according to HSP	☐	☐	☐	☐
44. Appropriate decontamination procedures being followed, per HSP	☐	☐	☐	☐

SECTION 3

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

Item #	Corrective Action Planned/Taken	Date Corrected

CH2MHILL

HS&E Self-Assessment Checklist - 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:

☐ Evaluate CH2M HILL employee exposures to excavation hazards
☐ 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	☐	☐	☐	☐
2. Personnel aware of entry requirements established by competent person	☐	☐	☐	☐
4. Protective systems are free from damage and in stable condition	☐	☐	☐	☐
4. Surface objects/structures secured from falling into excavation	☐	☐	☐	☐
5. Potential hazardous atmospheres have been tested and found to be at safe levels	☐	☐	☐	☐
6. Precautions have been taken to prevent cave-in from water accumulation in the excavation	☐	☐	☐	☐
7. Personnel wearing appropriate PPE, per HSP/FSI	☐	☐	☐	☐

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

EXCAVATING AT HAZARDOUS WASTE SITES (4.2.7)				
49. Waste disposed of according to HSP and RCRA regulations	☐	☐	☐	☐
50. Appropriate decontamination procedures being followed, per HSP	☐	☐	☐	☐
BACKFILL (4.2.8)				
51. Backfill certified clean when required by client or local regulation	☐	☐	☐	☐
FORMS/PERMITS (4.3)				
52. Waste discharge/NPDES permit obtained for excavation de-watering, where required	☐	☐	☐	☐
53. Dig permit obtained, where required by client/facility	☐	☐	☐	☐
54. USDA soil permit obtained (for south/southeast and coastal states)	☐	☐	☐	☐

SECTION 3

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

Item #	Corrective Action Planned/Taken	Date Corrected

Attachment 7

Incident Reporting Forms

- **Incident Report Form**
- **Near Loss Investigation Form**
- **Root Cause Analysis Form**

Incident Report Form

Fax completed form to:
425.462.5957
CH2M HILL Seattle Office
Attention: Corporate HS&E Department

Type of Incident (Select at least one)

- ☐ Injury/Illness
- ☐ Environmental/Permit Issue
- ☐ Property Damage
- ☐ Near Miss
- ☐ Spill/Release
- ☐ Other

General Information (Complete for all incident types)

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

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

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

Location of Incident (Select one)

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

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

- ☐ Northeast
- ☐ Southeast
- ☐ Northwest
- ☐ Southwest
- ☐ Corporate
- ☐ Canadian
- ☐ Asia Pacific
- ☐ Europe Middle East
- ☐ Latin America

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

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

_____

_____

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

If CH2M HILL employee injured

Employee Name: _____ Employee Number: _____

If CH2M HILL Subcontractor employee injured

Employee Name: _____ Company: _____

Injury Type

- ☐ Allergic Reaction
- ☐ Amputation
- ☐ Asphyxia
- ☐ Bruise/Contusion/Abrasion
- ☐ Burn (Chemical)
- ☐ Burn/Scald (Heat)
- ☐ Cancer
- ☐ Carpal Tunnel
- ☐ Concussion
- ☐ Cut/Laceration
- ☐ Dermatitis
- ☐ Dislocation
- ☐ Electric Shock
- ☐ Foreign Body in eye
- ☐ Fracture
- ☐ Freezing/Frost Bite
- ☐ Headache
- ☐ Hearing Loss
- ☐ Heat Exhaustion
- ☐ Hernia
- ☐ Infection
- ☐ Irritation to eye
- ☐ Ligament Damage
- ☐ Multiple (Specify) _____
- ☐ Muscle Spasms
- ☐ Other (Specify) _____
- ☐ Poisoning (Systemic)
- ☐ Puncture
- ☐ Radiation Effects
- ☐ Strain/Sprain
- ☐ Tendonitits
- ☐ Wrist Pain

Part of Body Injured

- ☐ Abdomen
- ☐ Ankle(s)
- ☐ Arms (Multiple)
- ☐ Back
- ☐ Blood
- ☐ Body System
- ☐ Buttocks
- ☐ Chest/Ribs
- ☐ Ear(s)
- ☐ Elbow(s)
- ☐ Eye(s)
- ☐ Face
- ☐ Finger(s)
- ☐ Foot/Feet
- ☐ Hand(s)
- ☐ Head
- ☐ Hip(s)
- ☐ Kidney
- ☐ Knee(s)
- ☐ Leg(s)
- ☐ Liver
- ☐ Lower (arms)
- ☐ Lower (legs)
- ☐ Lung
- ☐ Mind
- ☐ Multiple (Specify) _____
- ☐ Neck
- ☐ Nervous System
- ☐ Nose
- ☐ Other (Specify) _____
- ☐ Reproductive System
- ☐ Shoulder(s)
- ☐ Throat
- ☐ Toe(s)
- ☐ Upper Arm(s)
- ☐ Upper Leg(s)
- ☐ Wrist(s)

Nature of Injury

- ☐ Absorption
- ☐ Bite/Sting/Scratch
- ☐ Cardio-Vascular/Respiratory System Failure
- ☐ Caught In or Between
- ☐ Fall (From Elevation)
- ☐ Fall (Same Level)
- ☐ Ingestion
- ☐ Inhalation
- ☐ Lifting
- ☐ Mental Stress
- ☐ Motor Vehicle Accident
- ☐ Multiple (Specify) _____
- ☐ Other (Specify) _____
- ☐ Overexertion
- ☐ Repeated Motion/Pressure
- ☐ Rubbed/Abraded
- ☐ Shock
- ☐ Struck Against
- ☐ Struck By
- ☐ Work Place Violence

Initial Diagnosis/Treatment Date: _____

Type of Treatment

- ☐ Admission to hospital/medical facility
- ☐ Application of bandages
- ☐ Cold/Heat Compression/Multiple Treatment
- ☐ Cold/Heat Compression/One Treatment
- ☐ First Degree Burn Treatment
- ☐ Heat Therapy/Multiple treatment
- ☐ Multiple (Specify) _____
- ☐ Heat Therapy/One Treatment
- ☐ Non-Prescriptive medicine
- ☐ None
- ☐ Observation
- ☐ Other (Specify) _____
- ☐ Prescription- Multiple dose
- ☐ Prescription- Single dose
- ☐ Removal of foreign bodies
- ☐ Skin Removal
- ☐ Soaking therapy- Multiple Treatment
- ☐ Soaking Therapy- One Treatment
- ☐ Stitches/Sutures
- ☐ Tetanus
- ☐ Treatment for infection
- ☐ Treatment of 2nd /3rd degree burns
- ☐ Use of Antiseptics – multiple treatment
- ☐ Use of Antiseptics – single treatment
- ☐ Whirlpool bath therapy/multiple treatment
- ☐ Whirlpool therapy/single treatment
- ☐ X-rays negative
- ☐ X-rays positive/treatment of fracture

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

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

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

Property Damage (Complete for Property Damage incidents only)

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

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

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

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

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

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

CH2M HILL Personnel Notified: _____
Client Notified: _____

Witnesses (Complete for all incident types)

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

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

Additional Comments:
_____
_____

NEAR LOSS INVESTIGATION FORM

Employer Information

Company Name: _____

Project Name: _____ Project Number: _____

Project Location: _____

CHIL Project? Yes ☐ No ☐

Task Location: _____

Job Assignment: _____ Business Group: _____

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

Near Loss Incident Specific Information

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

Location of incident:
☐Company premises ☐Field ☐In Transit ☐Other:_____

Address where the incident occurred: _____

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

Describe any property damage: _____

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

_____

_____

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

_____

_____

Describe the specific incident and how it occurred:

_____

_____

_____

_____

Describe how this incident may have been prevented:
_____
_____
_____

Contributing Factors (Describe in detail why incident occurred):
_____
_____
_____

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

NEAR LOSS INVESTIGATION FORM

Witness Information (First Witness)

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

Witness Information (Second Witness)

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

Additional information or
comments:_____
_____

Root Cause Analysis Form

Root Cause Analysis (RCA)

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

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

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

Investigation Team Members

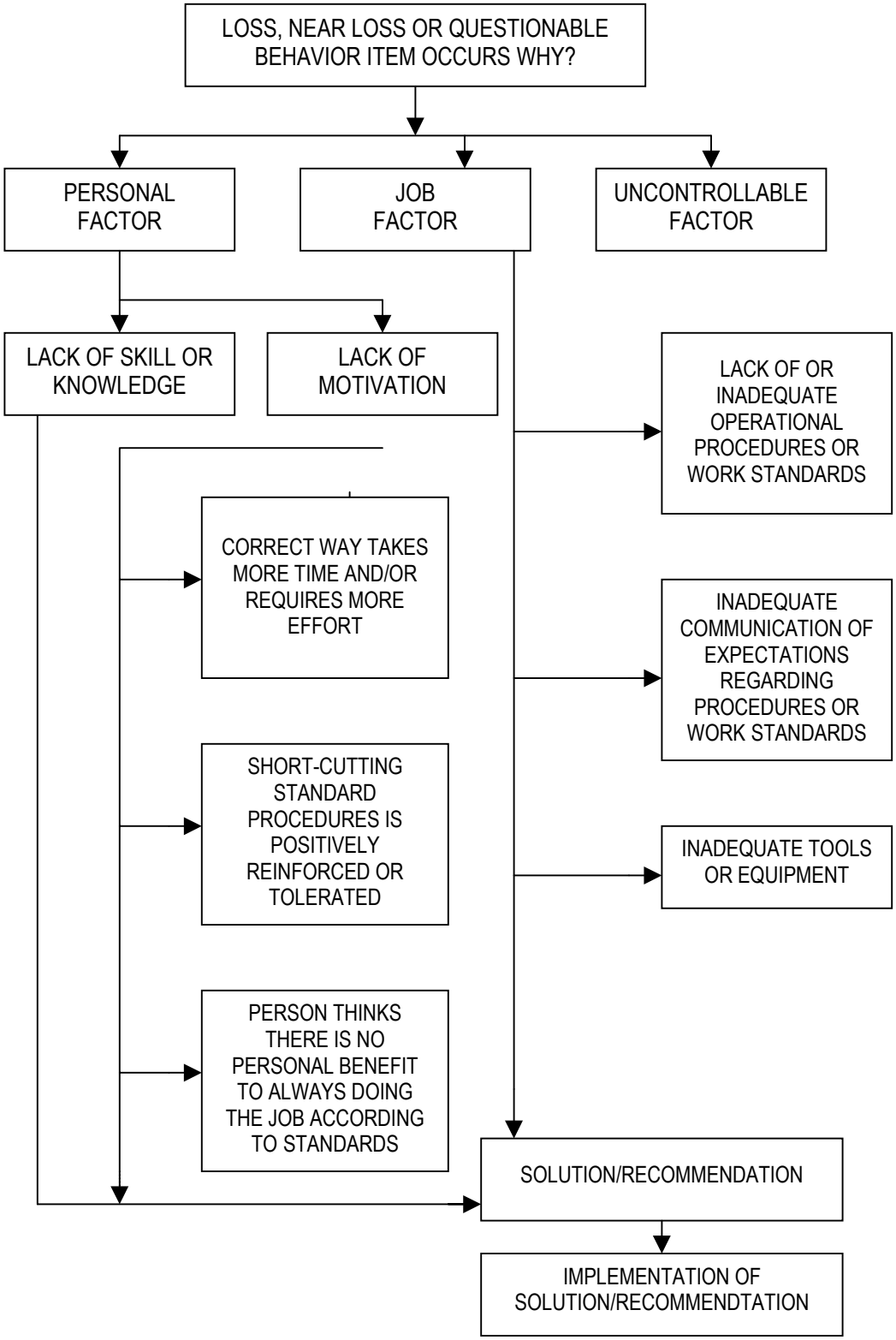
Name	Job Title	Date

Results of Solution Verification and Validation

Reviewed By

Name	Job Title	Date

Root Cause Analysis Flow Chart



Determination of Root Cause(s)

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

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

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

<u>Personal Factors</u>

- Lack of skill of 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

<u>Job Factors</u>

- 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.

Attachment 8

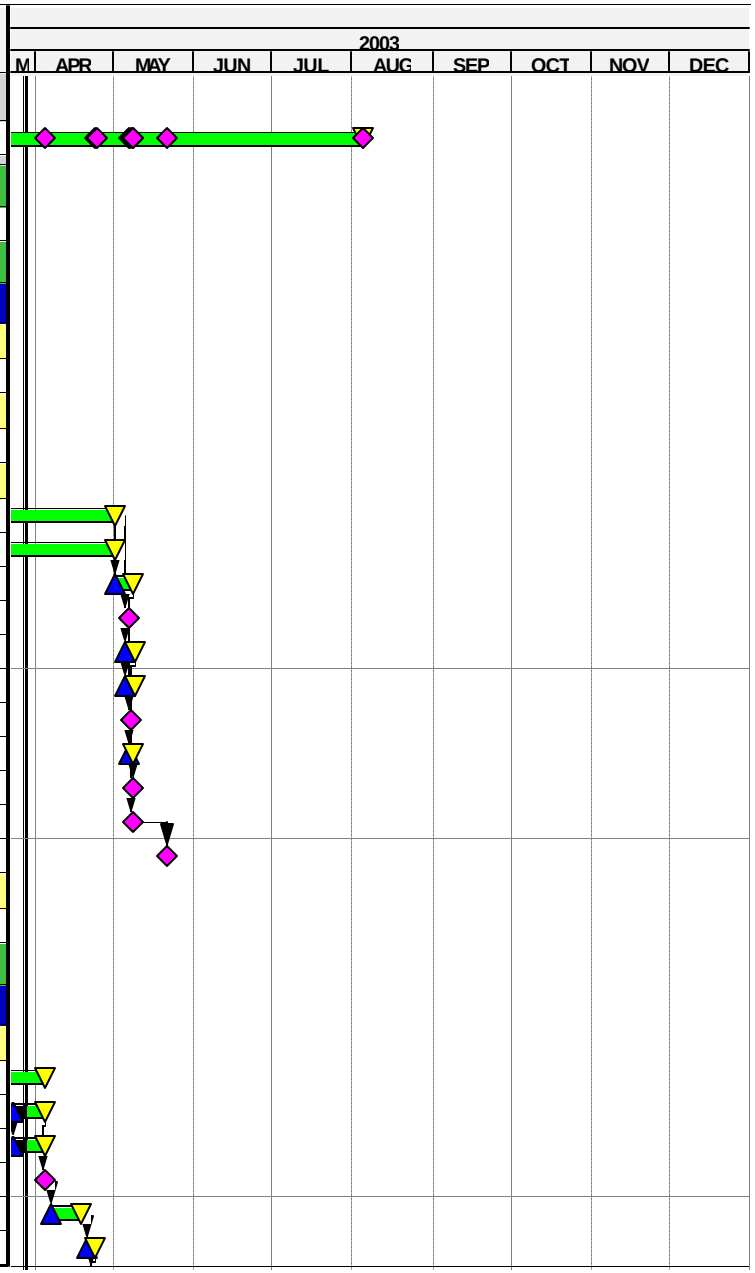
Material Safety Data Sheets

(Available onsite)

Appendix C

Project Schedule

Activity ID	WBS CHARGE #	% Comp	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish
CTO #0085 - NAS - PENSACOLA, FL							
Subtotal		58		349	90	22MAR02A	04AUG03
+ PHASE 1							
		100		9	0	22MAR02A	03APR02A
PHASE 2							
PHASE 2							
+ PROJECT MANAGEMENT							
	20.01.03.99	100		175	0	31MAY02A	28JAN03A
+ COST PROPOSAL PREPARATION							
		100		40	0	31MAY02A	26JUL02A
BID PACKAGE PREP/AWARD							
CM20010391	20.01.03.91	80	PREPARE BID PACKAGE	235	25	31MAY02A	01MAY03
CM 20210		70	Award Subcontracts	154	25	12AUG02A	01MAY03
CM20010393	20.01.03.93	0	EVALUATE BID PACKAGE	5	5	02MAY03	08MAY03
CM 20150		0	Issue RFB to Subcontractors	0	0		06MAY03
CM 20181		0	Submit Subcontractor Plans & Submittals	4	4	06MAY03	09MAY03
CM 20189		0	Review Subcontractor Plans & Submittals	4	4	06MAY03	09MAY03
CM 20188		0	Issue Letter of Intent to Award	0	0		07MAY03
CM20010392	20.01.03.92	0	Subcontractor Pre-Bid Meeting/Site Visit	2	2	07MAY03	08MAY03
CM 20165		0	Subcontractor Bids Due	0	0		08MAY03
CM 20180		0	Subcontractor Plans Due	0	0		08MAY03
CM 20211		0	Project Mobilization	0	0	22MAY03	
+ WORK PLANS PREPARATION							
		100		101	0	31MAY02A	22OCT02A
PHASE 2, TASK 2							
PHASE 2							
WORK PLANS PREPARATION							
CM21010304	21.01.03.04	40	Pollution Control Plan	10	6	28FEB03A	04APR03
CM21010301	21.01.03.01	40	Sampling & Analysis Plan	10	6	24MAR03A	04APR03
CM21010313	21.01.03.13	40	General Site Work Plan	10	6	24MAR03A	04APR03
CM 2099		0	Submit Draft Work Plans	0	0		04APR03
CM 2100		0	Southern Division WP Comment Period	10	10	07APR03	18APR03
CM 2101		0	Incorporate WP Comments	3	3	21APR03	23APR03



Start Date	22MAR02
Finish Date	04AUG03
Data Date	28MAR03
Run Date	11APR03 08:04

Early Bar
Progress Bar
Critical Activity

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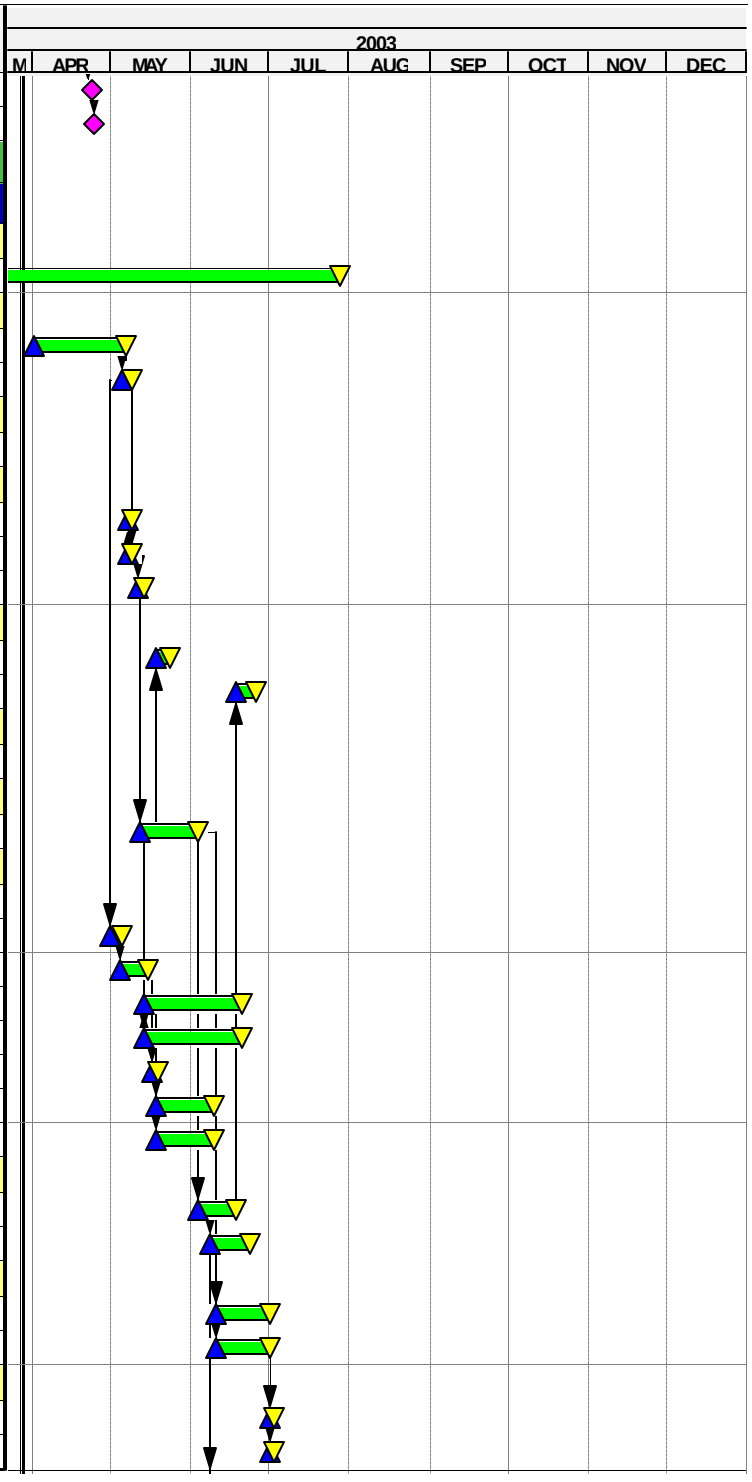
NFAC - CO85

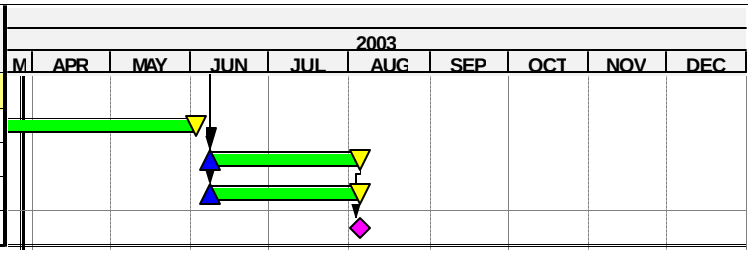
CTO #0085 - NAS, PENSACOLA, FL
CTO COMPLETION SCHEDULE
NAVY RAC SOUTHERN DIVISION

CH2MHILL Constructors, Inc.

Activity ID	WBS CHARGE #	% Comp	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish
CM 2102		0	Submit Final WP to Southern Division	0	0		23APR03
CM 2103		0	Work Plan Approval Received	0	0		24APR03
PHASE 3							
DELINEATION - SITE 24 EXCAVATION							
PROJECT MANAGEMENT							
CM99220101	99.22.01.01	18	Project Management	123	85	06AUG02A	28JUL03
PRE-CONSTRUCTION PLANS & SUBMITTALS							
CM31010394	31.01.03.94	0	Subcontractor's Pre-Con Submittals	25	25	02APR03*	06MAY03
CM31010395	31.01.03.95	0	Review Subcontractor Plans/Submittals	4	4	06MAY03	09MAY03
+ MOBILIZATION & PREPARATORY WORK							
		100		4	0	12AUG02A	15AUG02A
SITE SETUP							
CM31010430	31.01.04.30	0	Erosion Control	2	2	08MAY03	09MAY03
CM99010401	99.01.04.01	0	Initiate Job-Site Presence	2	2	08MAY03	09MAY03
CM31010424	31.01.04.24	0	Temporary Fencing	2	2	12MAY03	13MAY03
ENGINEERING, SURVEY & QC							
CM99220426	99.22.04.26	0	Project QA/QC Audit	5	5	19MAY03	23MAY03
CM31220410	31.22.04.10	0	Final Survey	5	5	19JUN03	25JUN03
+ INSTITUTIONAL CONTROLS							
	31.01.08.01	100		1	0	06AUG02A	06AUG02A
EXCAVATION							
CM31080102	31.08.01.02	0	Excavation/Stockpile/Capping	15	15	13MAY03	03JUN03
SAMPLING & ANALYSIS							
CM31020602	31.02.06.02	100	Soil Delineation	3	0	13AUG02A	15AUG02A
CM31020502	31.02.05.02	0	Soil Sampling	3	3	01MAY03	05MAY03
CM31020402	31.02.04.02	0	Well Installation	9	9	05MAY03	15MAY03
CM31020905	31.02.09.05	0	Waste Characterization	27	27	14MAY03	20JUN03
CM31020907	31.02.09.07	0	Lab Analysis	27	27	14MAY03	20JUN03
CM31020605	31.02.06.05	0	GW Sampling	3	3	17MAY03	19MAY03
CM31021490	31.02.14.90	0	Independent Data Validation	15	15	19MAY03	09JUN03
CM31021491	31.02.14.91	0	Data Evaluation & Management	15	15	19MAY03	09JUN03
BACKFILL							
CM31200103	31.20.01.03	0	Backfill Excavations	11	11	04JUN03	18JUN03
CM31200107	31.20.01.07	0	Regrading & Hydro-mulching	11	11	09JUN03	23JUN03
TRANSPORTATION AND DISPOSAL							
CM31192290	31.19.22.90	0	T&D Solids, Non-Hazardous	15	15	11JUN03	01JUL03
CM31192292	31.19.22.92	0	T&D Liquids, Non-Hazardous	15	15	11JUN03	01JUL03
DEMOBILIZATION							
CM31210591	31.21.05.91	0	Subcontractor Demobilization	1	1	02JUL03	02JUL03
CM99210590	99.21.05.90	0	CCI Demobilization	1	1	02JUL03	02JUL03



Activity ID	WBS CHARGE #	% Comp	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish
POST CONSTRUCTION							
CM31210603	31.21.06.03	45	Technical Memorandum	87	56	30AUG02A	02JUN03
CM31210605	31.21.06.05	0	Construction Documentation Report	40	40	09JUN03	04AUG03
CM31210690	31.21.06.90	0	Project Abstract	40	40	09JUN03	04AUG03
CM31210606		0	Submit Construction Documentation Report	0	0		04AUG03



Appendix D

Submittal Register

Submittal Register

Contract Number: N62467-98-D-0995		CTO No.: 0085			CTO Title: NAS PENSACOLA					Location: Pensacola, FL				Contractor: CH2M HILL Constructors, Inc.		
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Spec Section	Item Description	Para. Number	Approving Authority	Other Reviewers	Submittal Number	Scheduled Submission Date	CCI Review Date	CCI Disposition	CCI Transmit Date	QC Admin Received Date	QC Disposition	QC Admin Transmit Date	Contracting Officer Received	Contracting Officer Disposition	Contracting Officer Return	Remarks
	SD-07 **Schedules**															
	Construction Schedule															
	SD-09 **Reports**															
	Analytical Laboratory Reports															
	Monitor Well Completion Report															
	SD-13 **Certificates**															
	Analytical Lab Certification															
	Land Surveyor Certification															
	Waste Disposal Permit															
	Well Drillers Permit															
	SD-18 **Records**															
	As-Built Records															
	Weight Tickets															
	Waste Disposal Manifests															
	Certificates of Disposal															
	Environmental Conditions Report															
	List of Contractor Personnel															
	Surveyors Notes															
	Well Construction/Development Records															

Appendix E

Testing Plan and Log

Testing Plan and Log

CH2M HILL Constructors, Inc.

Contract Number: N62467-98-D-0995		CTO No.: 0085 NAS PENSACOLA						Location: Pensacola, FL			
Activity	Matrix	Sampled By	Proposed Lab	COC #	Sample #	Sample Type	Test Location	Date Test Made	Analysis Req'd	Test Results	Remarks
Site 08											
Drill Cuttings Characterization	Soil										
Liquid Characterization	Water										
Site 24											
Drill Cuttings Characterization	Soil										
Liquid Characterization	Water										

Appendix F

QC Manager Appointment Letter

CH2M HILL
115 Perimeter Center Place, N.E.
Suite 700
Atlanta, GA
30346-1278
Tel 770.604.9095
Fax 770.604.9282

March 31, 2003

Mr. Ryan Bitely
CH2M HILL
1766 Sea Lark Lane
Navarre, FL 32566-7472

RE: Contract No. N62467-98-D-0995
Contract Task Order No. 0085
Naval Air Station (NAS) Pensacola – Pensacola, Florida
Project Quality Control Manager Letter of Appointment

Dear Mr. Bitely:

Herein describes the responsibilities and authority delegated to you in your capacity as the Project QC Manager at the NAS Pensacola site, Contract Task Order (CTO) 0085 under the Navy RAC Contract No. N62467-98-D-0995.

In this position, you assist and represent the Program QC Manager in continued implementation and enforcement of the Project QC Plans. Your primary role is to ensure all requirements of the contract are met. Consistent with this responsibility, you will: (i) implement the QC program as described in the Navy RAC contract; (ii) manage the site-specific QC requirements in accordance with the Project QC Plans; (iii) attend the coordination and mutual understanding meeting; (iv) conduct QC meetings; (v) oversee implementation of the three phases of control; (vi) perform submittal review and approval; (vii) ensure testing is performed; (viii) prepare QC certifications and documentation required in the Navy RAC Contract; and, (ix) furnish a Completion Certificate to the Contracting Officer or designated representative, upon completion of work under a contract task order , attesting that "the work has been completed, inspected, and tested, and is in compliance with the contract."

Your responsibilities further include identifying and reporting quality problems, rejecting nonconforming materials, initiating corrective actions, and recommending solutions for nonconforming activities.

You have the authority to control or stop further processing, delivery, or installation activities until satisfactory disposition and implementation of corrective actions are achieved. You have the authority to direct the correction of non-conforming work. All work requiring corrective action will be documented on daily reports, and, in the event non-conforming work is not immediately corrected you are required to submit a non-conformance report to the PM and

copy the Program QC Manager. A status log will be kept of all non-conforming work. You shall immediately notify the Program QC Manager in the event of any stop work order.

It is imperative that you comply with all terms of the basic contract. In particular, Section C, Paragraph 6.5.2, which states:

> *"No work or testing may be performed unless the QC Program Manager or Project QC Manager is on the work site."*

In the event that you are not able to be at the work site when work or testing is to be performed, it is your responsibility to inform the Program QC Manager and Project Manager, in advance, so that other arrangements can be made.

Further, if you are requested to perform the duties of the Site Supervisor, it is your responsibility to inform the Program QC Manager so that approval can be obtained in advance from the Contracting Officer or designated representative, in accordance with Section C Paragraph.6.2.1of the contract.

You are a key member of the Project Manager's team. You ensure that work meets the specific requirements and intent of the work plan, the Navy's scope of work and the basic contract. Should you have any questions regarding this role, you should immediately contact the Program QC Manager, Theresa Rojas. Your day-to-day activities on the site should be coordinated with all site personnel and the Project Manager. In event of any deficient items, the Superintendent and Project Manager should be advised immediately so they have opportunity to remedy the situation.

Sincerely,

CH2M HILL Constructors, Inc.

R. Scott Newman
Program Manager

cc: Amy Twitty/ATL
Scott Smith/ATL
Theresa Rojas/ATL
CCI Project File No. 171578