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WORK PLAN ADDENDUM NUMBER 4 FOR ADDITIONAL INVESTIGATION BUILDING 46 SITE 1330 WITH TRANSMITTAL NS MAYPORT FL

12/15/2005

CH2M HILL

CH2MHILL Constructors, Inc.

TRANSMITTAL

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Date: December 15, 2005

Contract: N62467-01-D-0331

CTO: Contract Task Order No. 0012
Naval Station (NS) Mayport
Mayport, Florida

Re: Work Plan Addendum No. 04 for the Additional Investigation at Building 46, Site 1330

Quantity	Description
1	Work Plan Addendum No. 04 for the Additional Investigation at Building 46, Site 1330 Please review and provide comments or approval on this submittal

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

CC: Larry Blackburn/ROICC (CD Only)
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Project File No. 281913

Work Plan Addendum No. 04
Additional Investigation at
Building 46, Site 1330

Naval Station Mayport
Mayport, Florida

Revision No. 00

Contract No. N62467-01-D-0331
Contract Task Order No. 0012

Submitted to:

U.S. Naval Facilities
Engineering Command
Southern Division

Prepared by:

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December 2005

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Acronyms and Abbreviations

AALA	American Association for Laboratory Accreditation
AASHTO	American Association of State Highway and Transportation Officials
AFCEE	Air Force Center for Environmental Excellence
AHA	activity hazard analysis
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
BEI	Bechtel Environmental Inc.
bls	below land surface
°C	degrees Celsius
CAR	Contamination Assessment Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH2M HILL	CH2M HILL Constructors, Inc.
CO	Contracting Officer
CSM	Conceptual Site Model
CTO	Contract Task Order
DO	dissolved oxygen
DOT	Department of Transportation
DPT	direct push technology
EISOPQAM	Environmental Investigative Standard Operating Procedure and Quality Assurance Manual
EPA	U.S. Environmental Protection Agency
ERG	Emergency Response Guide
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
GCTLs	groundwater cleanup target levels
IPB	isopropyl benzene
IRA	initial remedial action
IRCDQM	Installation Restoration Chemical Data Quality Manual
L/min	liters per minutes
LDR	Land Disposal Restriction
mg/kg	milligrams per kilogram
MIP	membrane interface probe
MNA	monitored natural attenuation
MOP	Monitoring Only Plan
MS/MSD	matrix spike/matrix spike duplicate
NAVFAC EFDSOUTH	Naval Facilities Engineering Command, Engineering Field Division South
NGVD	National Geodetic Vertical Datum
NIST	National Institute of Standards and Technology

NS	Naval Station
NTR	Navy Technical Representative
NTU	nephelometric units
NVLAP	National Voluntary Laboratory Accreditation Program
Omega	Omega Environmental Services, Inc.
ORC	oxygen release compound
ORP	oxygen-reduction potential
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROICC	Resident Officer in Charge of Construction
SA	Site Assessment
SAP	Sampling and Analysis Plan
SARA	Site Assessment Report Addendum
SCTL	Soil Cleanup Target Levels
SOPs	Standard Operating Procedures
T&D	transportation and disposal
TAL	target analyte list
TAT	turnaround time
TCL	target compound list
TEAP	terminal electron accepting process
TOC	total organic carbon
TtNUS	Tetra Tech NUS, Inc.
USACE	U.S. Army Corps of Engineers
VOA	volatile organic analytic
µg/kg	micrograms per kilogram

1.0 Introduction

CH2M HILL Constructors, Inc. (CH2M HILL) has been contracted by the U.S. Naval Facilities Engineering Command, Engineering Field Division, Southern Division (NAVFAC EFD SOUTH), to prepare this Work Plan Addendum, under Response Action Contract No. N62467-01-D-0331, Contract Task Order (CTO) No. 0012. The purpose of this Work Plan Addendum is to outline additional investigation activities to confirm the presence or absence of residual fuel components in the fuel piping system remaining at Building 46, Site 1330 (Site 1330) located at Naval Station (NS) Mayport, Mayport, Florida; as well as to outline a proposed quarterly groundwater monitoring program to establish a current data set for the site Remedial Design. The additional investigation activities will focus on resolution of uncertainties in the conceptual site model (CSM).

Additional investigation activities at Site 1330 will include:

- Mobilization and site preparation
- Underground utility location
- Subsurface piping system investigation
- Site restoration
- Post-investigation site survey
- Quarterly groundwater sampling and analysis
- Containerization, characterization, transportation, and disposal (T&D) of generated or accumulated contaminated materials
- Decontamination and demobilization
- Preparation and submittal of an Annual Site Status Report

This Work Plan Addendum is organized into seven sections of text and four appendixes:

Section 1.0 Introduction includes the site description and history and project objectives.

Section 2.0 Project Execution Plan details the required scope of work, the project schedule, the communications plan, and the traffic control plan. The NS Mayport Basewide Work Plan (CH2M HILL, 1999) provides a brief description of the reporting requirements under this Contract.

Section 3.0 Sampling and Analysis Plan (SAP) provides project sample locations, sample collection frequency, and the required laboratory analyses for samples collected during project activities. The NS Mayport Basewide Work Plan (CH2M HILL, 1999) and Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (SOPs) outline the sample collection methodology including sample handling, labeling, and required collection of quality assurance (QA) and quality control (QC) samples.

Section 4.0 Waste Management Plan discusses the characterization, disposal, onsite management, and transportation of wastes encountered or generated during project activities. Waste management forms are provided in Appendix D.

Section 5.0 Environmental Protection Plan contains site-specific environmental provisions and references the NS Mayport Basewide Work Plan (CH2M HILL, 1999), which contains the Environmental Protection Plan for all work completed at NS Mayport.

Section 6.0 Quality Control Plan includes the testing requirements for work described in this Work Plan Addendum. The site-specific project organization for this CTO is also included in this section. The QC attachments (submittal register, testing plan and log, etc.) are provided in Appendix D. All other QC information is contained in the NS Mayport Basewide Work Plan (CH2M HILL, 1999), including information on the quality administrators, the project organization for the work to be completed at NS Mayport, and the definable features of work for each project site.

Section 7.0 References includes references to documents used to prepare this Work Plan Addendum.

The site-specific health and safety plan included in Appendix B addresses the work described in this Work Plan Addendum. Section 5.0 Site Health and Safety Plan of the NS Mayport Basewide Work Plan (CH2M HILL, 1999) addresses project-specific health and safety issues for the remedial activities to be completed at NS Mayport.

1.1 Site Description and History

1.1.1 Site Description

Site 1330 includes Building 46 and extends approximately 200 feet north of the building, west of Building 46 to the taxiway, and east of Building 46 to include Bravo Pier. A site plan of Site 1330 is provided as Figure 1-1. Site 1330 is a large, mostly asphalt covered area with Building 46 located near the center of the investigation area. Building 46 is a recreation hall and laundromat for Navy personnel, and Bravo Pier is an operational pier (Tetra Tech NUS, Inc. [TtNUS], 2003)

Utilities are present in the pier area and include active pressurized steam lines, fuel oil product lines, and oily wastewater lines. Cement structures fitted with utility access points or "igloos" dot the pier providing utility service hook-ups such as electricity, petroleum fuel, steam, oily wastewater return, and water to the docked ships. No overhead utilities are present (TtNUS, 2003).

1.1.2 Site History

Site 1330 is the location of a former fuel depot that reportedly began operations in 1944. This facility distributed "high octane" and "low octane" fuels to ships and seaplanes docked at the turning basin. The facility consisted of a series of four 25,000-gallon, circular concrete underground storage tanks (USTs) (numbered 39, 39A, 39B, and 40) connected by 3- and 4-inch underground piping that connected to the turning basin. The 25,000-gallon tanks were located approximately 200 to 300 feet west of the ship basin near the airport taxiway. A large soil mound (400 feet long by 240 feet wide by 4 feet high) apparently covered the

25,000-gallon tanks. According to design drawings, the main portions of these tanks were about 10 feet below land surface (bls). These tanks and associated piping were allegedly removed sometime in the early 1950s.

In 1969, aboveground storage tanks (ASTs) (numbered 1330 and 1331) holding lubrication oils for the ships were installed along the taxiway in the area between the footprints of the former concrete USTs. Although the history of these tanks is not well documented, the ASTs reportedly were removed in December 1986 or 1988.

A Contamination Assessment Report (CAR) detailing the fuel distribution area located along the taxiway for Site 1330 was prepared by the U.S. Army Corps of Engineers (USACE) and submitted to FDEP in May 1992. FDEP submitted comments in June 1992 and requested additional assessment work due to the presence of impacted soil and groundwater from the fuel distribution system, which included Bravo Pier. The requested supplemental work was performed in October 1992, and a CAR Addendum was submitted in December 1992. The FDEP submitted comments to the CAR addendum in February 1993 and requested removal of petroleum-contaminated soils and additional information about the Bravo Pier soil contamination discovered during the original CAR. Responses to these comments were addressed in March 1993, stating that a soil removal contract would be initiated for Site 1330, and further investigations would be conducted at the Bravo Pier site. At this time, it was not known that concrete USTs were still in place along the airport taxiway. Two areas of investigation emerged as potential sites for additional investigation, the former USTs near the taxiway and the release at Bravo Pier.

During November 1993, the Navy contracted Omega Environmental Services, Inc. (Omega) to remove the contaminated soil at the former UST site. It was discovered during the soil removal process that at least one of the tanks (Tank 39) was still in place. This tank was subsequently abandoned in place by Omega. In December 1993, NS Mayport sent an Interim Report to FDEP detailing this discovery of three additional USTs (39A, 39B, and 40) and proposed a plan of action. The tanks were abandoned in place by Bechtel Environmental, Inc. (BEI) and closure reports were submitted in July 1995 to FDEP representing two separate tank closure activities at Site 1330; one for Tank 39 in December 1993 by Omega and one for Tanks 39A, 39B, and 40 by BEI in 1995.

Between August and September 1995, BEI also performed an Initial Remedial Action (IRA) at Bravo Pier. These activities were completed in response to recommendations made during the CAR for Site 1330. During the assessment of Site 1330, pressure tests were performed on fuel lines that were located in the area of contamination. The pressure test exposed the presence of a small leak in the JP-5 lateral line valve connection. BEI removed approximately 23 tons of impacted soil, an area of 12 feet by 9 feet by 7.5 feet deep. As a result of the work plan limitations, the area of “excessively contaminated “soils was not fully delineated.

A Monitoring Only Plan (MOP) was prepared and submitted for Site 1330, and FDEP approved the MOP in February 1997 (letter dated February 17, 1997). Subsequent sampling and analysis were conducted in accordance with the MOP. Samples were analyzed for volatile aromatic compounds (VOCs) using U.S. Environmental Protection Agency (EPA) Method 602. Isopropyl benzene (IPB) was not included in the target analyte list (TAL) for this method.

In January 1999, TtNUS completed the Site Assessment (SA) Report for Bravo Pier (the location of the JP-5 line leak), identifying petroleum-impacted groundwater but no petroleum impacted soils. IPB was the only contaminant detected above the FDEP Groundwater Cleanup Target Levels (GCTLs). Additional assessment or remediation were not recommended at the Bravo Pier JP-5 fuel leak since the release was not thought to be related to the leaking product line. The source of the IPB release was considered a separate release. However, it became apparent during the TtNUS January 1999 SA that IPB was also impacting Site 1330, which was located to the west across Maine Street. IPB was subsequently added to the TAL for the MOP.

In 2003, TtNUS conducted SA Addendum activities and reported that the areas of IPB identified with the greatest groundwater concentrations are located at Bravo Pier and near the remaining product pipe located in the parking area of Building 46.

In May 2004, a Source Area Investigation was performed by CH2M HILL utilizing direct push technology (DPT) equipped with a membrane interface probe (MIP), along with analysis of soil and groundwater samples collected along the product pipe. The investigation confirmed that the greatest groundwater concentrations are located at Bravo Pier and along the product pipe located in the parking area of Building 46. No apparent "source area" was confirmed during the investigation.

The Site Assessment Report Addendum (SARA) (TtNUS, 2003) was the primary source of information presented in this section.

1.2 Project Objectives

The shape of the IPB plume and the historical piping locations within the former fuel depot strongly suggest that subsurface piping may be responsible for the petroleum products released at the site. The mechanisms of petroleum release(s) to groundwater at the site however, are unclear. Product leaks may have occurred chronically from the piping system during depot operation or acutely at some unknown time after the facility ceased operations. In addition to subsurface piping components of the former fuel distribution system, Bravo Pier also contains several active utility corridors, which run parallel with Maine Street. Historical review of Site 1330 indicates that fuel piping was not located in the areas were lateral spreading of IPB is observed, thus indicating that preferential contaminant migration has occurred in the active utility corridors. An IPB plume delineation map is provided as Figure 1-2.

The project objectives outlined by this Work Plan Addendum are to investigate the subsurface product transfer piping to determine if the piping represents a continuing source of IPB contamination and collect quarterly groundwater analytical data for 1 year to supplement previously collected data. The collected data will then be utilized to determine any potential source areas of IPB contamination and develop the Remedial Design.

Additional Work Plan Addenda will be submitted to outline any future work planned at the site (such as source area removal, monitoring well installation, and oxygen release compound [ORC] injection design).

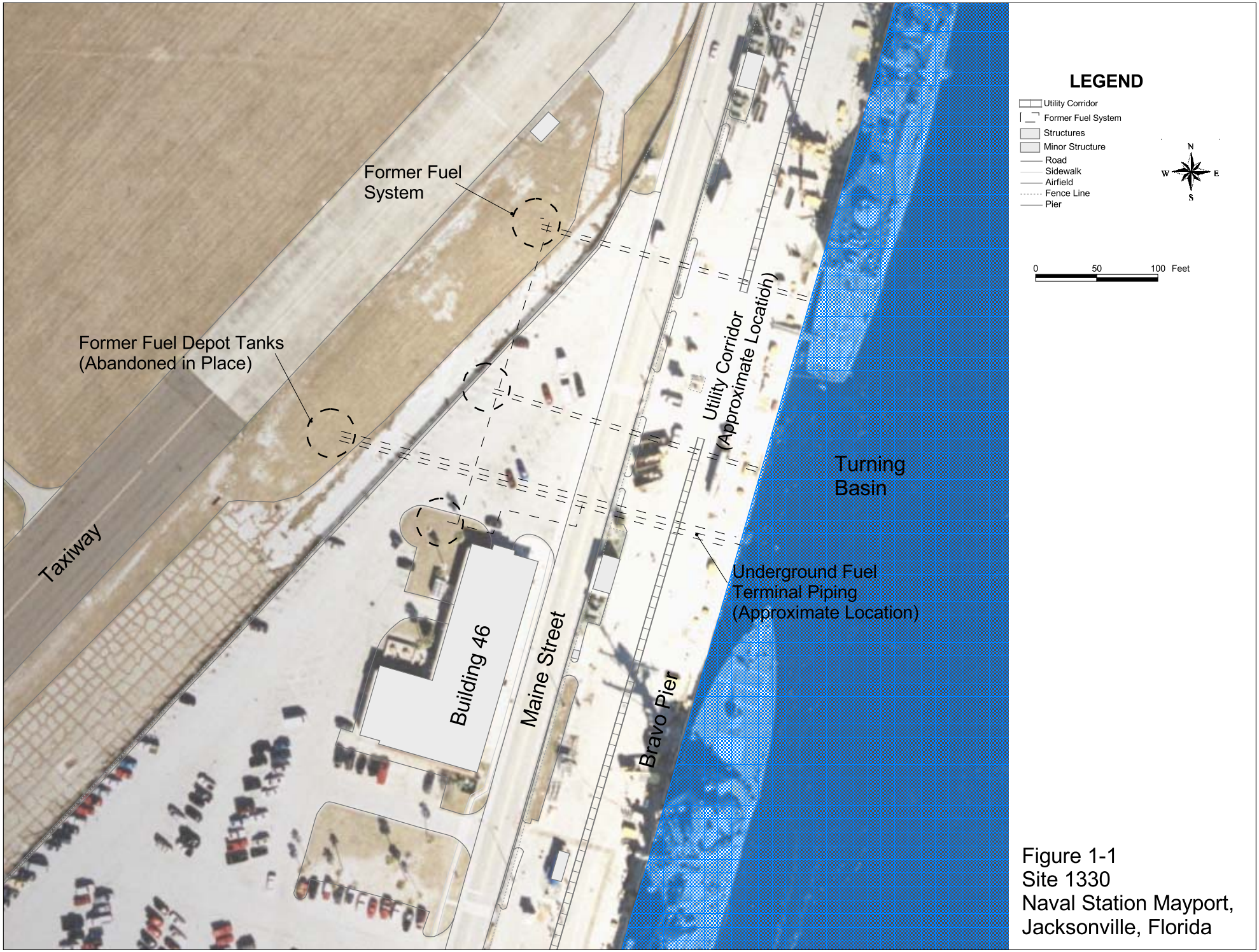

Figure 1-1
Site 1330
Naval Station Mayport,
Jacksonville, Florida

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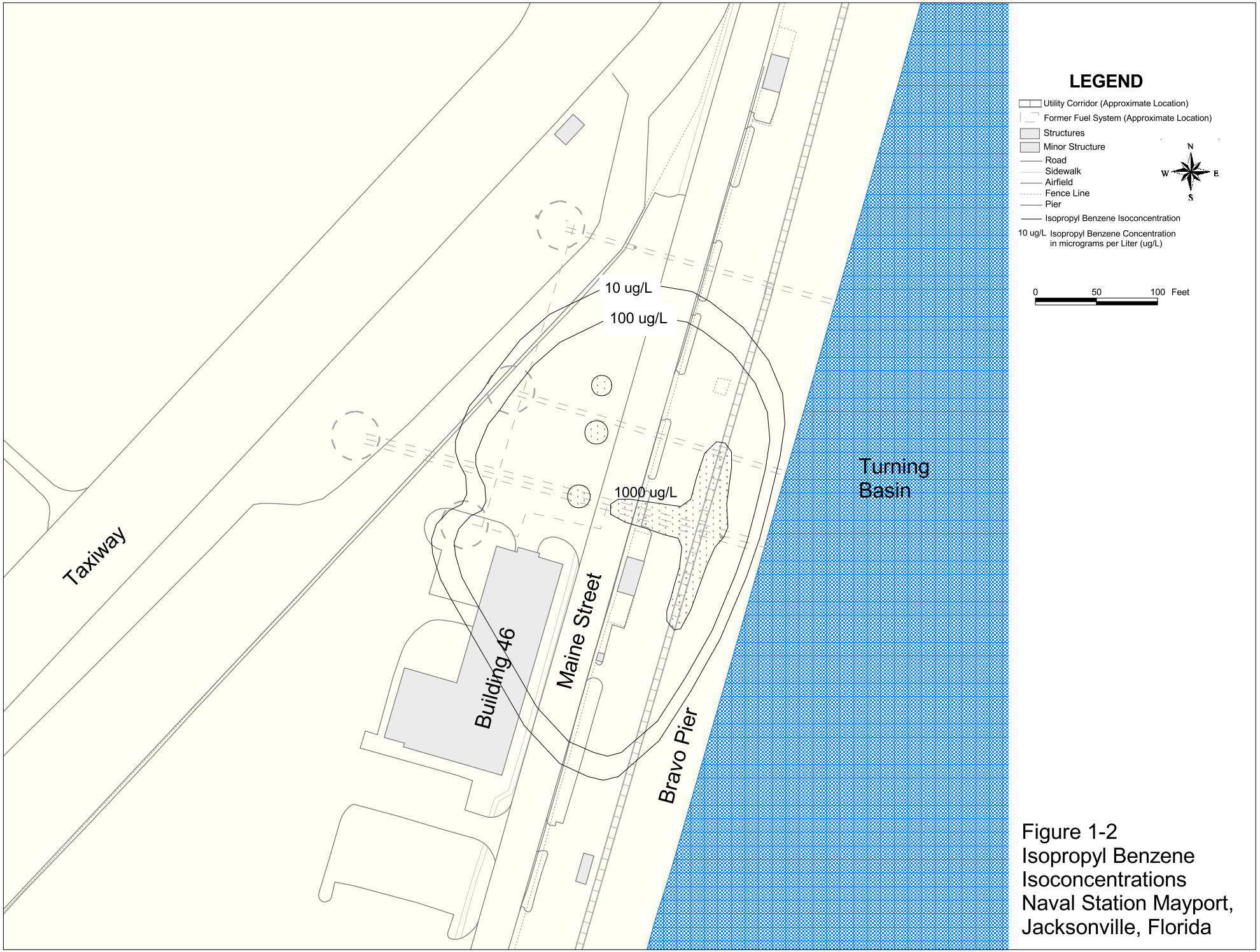

Figure 1-2
Isopropyl Benzene Isoconcentrations
Naval Station Mayport, Jacksonville, Florida

This graphic was generated using the TtNUS EGIS module

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2.0 Project Execution Plan

The scope of work, project schedule, communications plan, and traffic control plan are described in this section.

2.1 Scope of Work

Additional investigation activities at Site 1330 will include:

- Mobilization and site preparation
- Underground utility location
- Subsurface piping system investigation
- Site restoration
- Post-investigation site survey
- Quarterly groundwater sampling and analysis
- Containerization, characterization, and T&D of generated or accumulated contaminated materials
- Decontamination and demobilization
- Preparation and submittal of an Annual Site Status Report

2.1.1 Mobilization and Site Preparation

This task will consist of the mobilization of personnel and equipment to the work site and the establishment of temporary facilities, consisting of portable sanitary facilities, decontamination area, site refuge area, and equipment laydown area. Project management and scheduling activities, including contractor coordination, will be achieved from the CH2M HILL office located at former Naval Air Station Cecil Field.

Prior to the commencement of work, site controls including construction barricades and security fencing will be installed and the decontamination area and equipment laydown area will be prepared. CH2M HILL will coordinate with Sunshine State One Call of Florida, NS Mayport Facilities and Engineering Division, and the Resident Officer in Charge of Construction (ROICC) to complete a site utility survey, acquire utility layout plans of the area, and complete the excavation permit. Utilities in the work areas will be marked with paint and stakes, as appropriate. In addition, the progress of subsurface work will be continuously monitored for evidence of obstructions.

Any damage to underground utilities or subsurface structures will be reported immediately to the ROICC and subsequently repaired by CH2M HILL via methods approved by the ROICC.

Erosion control measures will be implemented if soil is stockpiled or an excavation remains open overnight. Plastic sheeting, silt fencing, and hay bales will be available onsite should weather conditions warrant covering and berming stockpiled material to control runoff or dust emissions. Figure 2-1 provides a detail of the staked silt fencing that will be installed around the perimeter of any open excavation and drainage feature. Figure 2-2 shows a detail of the temporary barricade fencing to be placed around any excavations that remain open overnight. Figure 2-3 presents a detail of the temporary containment of excavated soil in the event soil is staged at the site overnight. This temporary containment will consist of straw bales around the perimeter of the staging area and a polyethylene liner and cover.

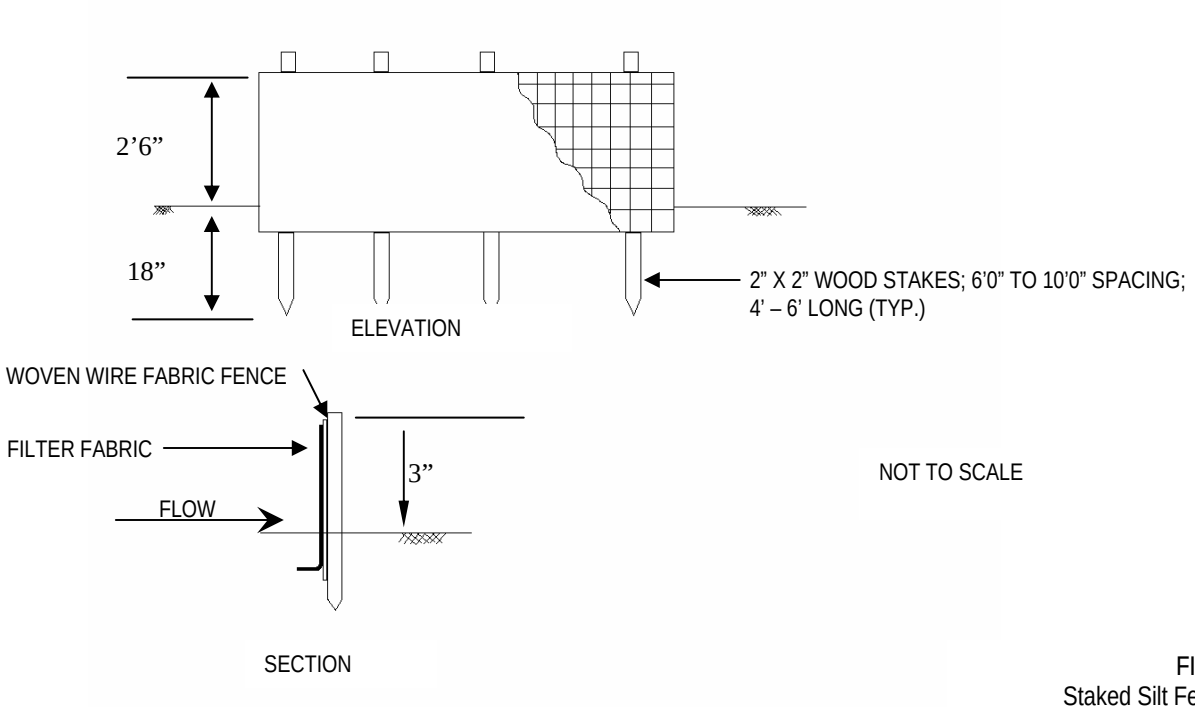
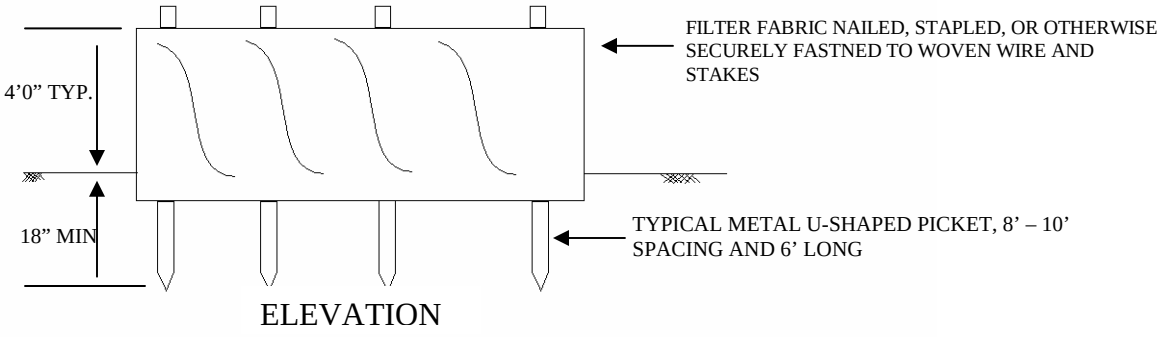


FIGURE 2-1
Staked Silt Fence Detail



ELEVATION

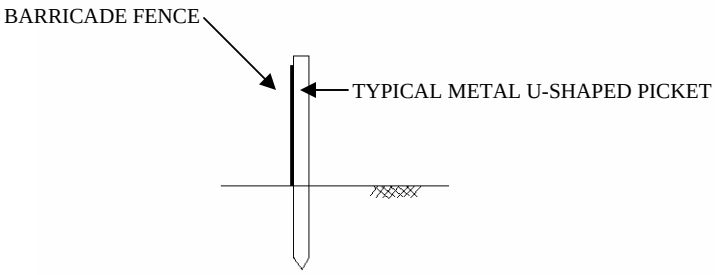


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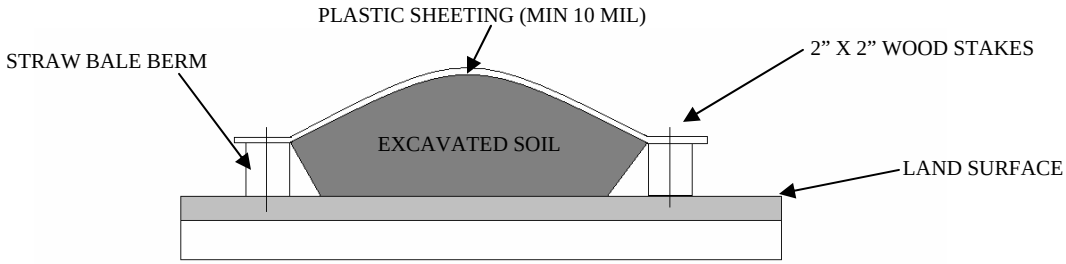
FIGURE 2-2
Barricade Fence Detail



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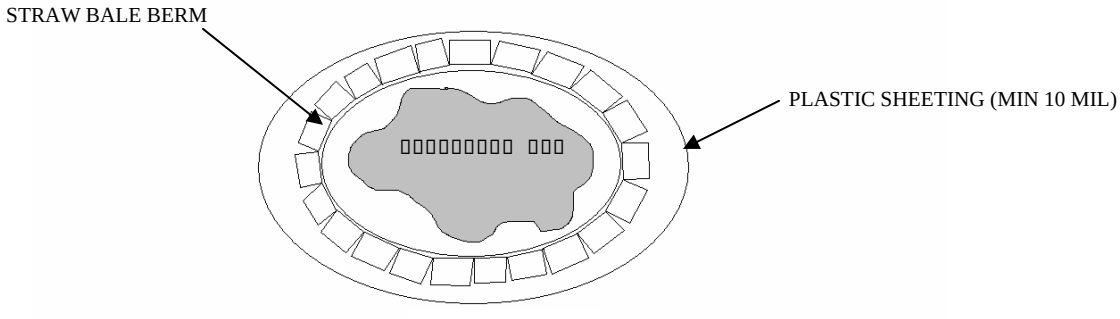

PLAN

FIGURE 2-3
Temporary Containment of Excavated Soil Detail

2.1.2 Subsurface Piping System Investigation

Historical information regarding abandonment procedures for subsurface piping components of the fuel system at Site 1330 is limited. An evaluation of available site documents and historic fuel depot drawings was performed to aid evaluation of potential release mechanisms at the site. The evaluation, included in Appendix C, concluded that the four storage tanks were the only components of the fuel depot that had been formerly abandoned. To confirm the absence or presence of residual fuel components as a contaminant source to soil and groundwater, a focused investigation of piping components located during site characterization will be conducted. The piping components are located below grade; therefore, utility location will be performed prior to the investigation. No intrusive subsurface work will be performed prior to utility location.

Investigation of the subsurface piping will require excavating a section of the pipe(s) to gain access to the distribution pipe(s). Access is needed to verify the absence or presence of petroleum product. Soil excavated to gain access to piping is considered to be uncontaminated. Soil will be excavated using a backhoe excavator or mini-excavator. Special care will be taken to ensure the pipe is not damaged during excavation. A spotter will be used at all times to ensure that the excavator bucket does not come in contact with subsurface piping. Hand digging around and below the subsurface piping will be required (refer to Underground Utility Location requirements described in Section 3.0 Hazard Controls of the site-specific Health and Safety Plan provided in Appendix B).

The pipe(s) may need to be punctured or cut to gain access. If cutting or puncturing is necessary, piping will be cut manually via a cold method (that is, using a 4-wheel pipe cutter). If petroleum product is present, spill containment materials (such as visqueen, sorbent pads, and sorbent booms) and containers (55-gallon drums) will be used to recover, contain, and store the product. In the event a large quantity of petroleum product is present, a vacuum truck will be on standby to recover and contain the product. Recovered petroleum product will be sampled in accordance with Section 3.0 Sampling and Analysis Plan, and managed, transported, and disposed in accordance with Section 4.0 Waste Management Plan of this Work Plan Addendum. If no petroleum product is present, the excavation will be closed without additional pipe abandonment.

The proposed location of the excavation is in the parking area, as illustrated on Figure 2-4. This location was chosen to minimize impacts to traffic on Maine Street and the pier. The actual location may be modified based on field conditions.

Once access to the distribution pipe has been established and any petroleum product present has been removed, the pipe will be probed to evaluate how much of the original pipe is still present. Initial efforts will be made with a non-sparking sewer-type snake. If it is determined that more information is needed and warranted, a video survey of the exposed pipeline may be performed to guide supplemental investigation efforts. Investigation activities may include additional excavation(s) or other appropriate actions to determine the presence or absence of a continuing contaminant source.

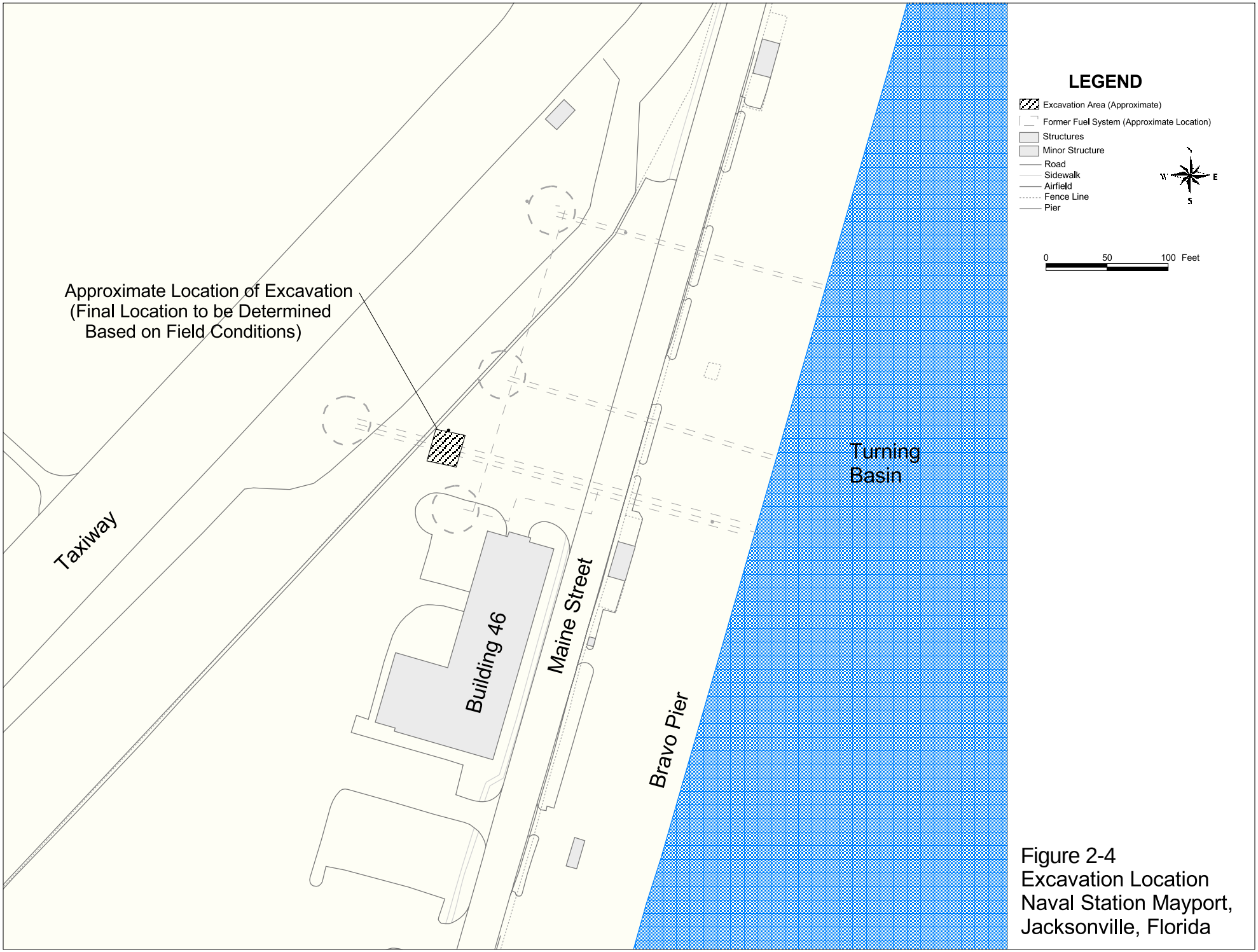

Figure 2-4
Excavation Location
Naval Station Mayport,
Jacksonville, Florida

This graphic was generated using the TtNUS EGIS module

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2.1.3 Site Restoration

Areas disturbed during work at the site will be restored to previous conditions. It is anticipated that excavated material will be useable to backfill excavations. Backfill will be placed in maximum 12-inch lifts and compacted.

If the area disturbed was previously vegetated, the backfilled area will be graded to provide drainage, then fertilized and seeded with landscape grasses (such as bahia) commonly used in the area. The area will then be covered with mulch to retain moisture and to allow the seed to germinate.

If the area disturbed was previous covered with asphalt pavement, a 6-inch limerock sub-base will be placed as the final 6-inch lift. Restoration of disturbed areas of asphalt or concrete will include machine compaction to prevent subsidence, followed by the replacement of like-material asphalt or concrete. Compaction testing will be required on the final limerock sub-base lift at a frequency of one test per subsurface piping investigation excavation area to ensure 95 percent of American Society for Testing and Materials (ASTM) D698 compaction.

All other areas, structures or utilities affected by site operations will be replaced or repaired.

If additional fill materials are necessary, certified clean fill furnished from an offsite source(s) will be used. Approved-laboratory analytical results from a representative sample of each fill material are required to certify clean fill furnished from an offsite source(s). One sample from each fill source is required and the required analyses are specified in Section 3.0 Sampling and Analysis Plan of this Work Plan Addendum. Fill material must meet FDEP Soil Cleanup Target Levels (SCTLs) for Direct Exposure – Residential or Leachability based on Groundwater Criteria, whichever is lower, as specified in Chapter 62-777 Florida Administrative Code (FAC) to be certified as "clean."

2.1.4 Post-investigation Site Survey

On completion of subsurface piping investigation, the site will be surveyed by a Florida-registered professional land surveyor and post-investigation as-built construction drawings prepared. The post-investigation as-built construction drawings will document surface/subsurface structure locations, locations and limits of subsurface piping investigation excavations, locations of discovered subsurface piping, locations of buried utilities, monitoring well locations, and any deviations from this Work Plan Addendum encountered.

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

2.1.5 Quarterly Groundwater Sampling and Analysis

2.1.6 Monitoring Well Rehabilitation

In preparation of this Work Plan Addendum, a site visit was conducted to verify the locations of the monitoring wells proposed for the quarterly groundwater monitoring program. Additional inspection activities to determine the condition of the monitoring wells are planned, and this effort will determine the need for rehabilitation, and/or replacement of site groundwater monitoring wells. Deficiencies noted during the site inspection will be addressed or corrected prior to the groundwater monitoring events described in this Work Plan Addendum.

Groundwater Monitoring

The most recent comprehensive groundwater sampling effort was conducted in support of the SARA in 2002. More recent data are necessary to evaluate IPB concentrations in groundwater and to evaluate plume stability. Therefore, a synoptic groundwater sampling event is planned to determine the current status of groundwater contamination at the site. Groundwater samples will be collected from 10 monitoring wells inside and 7 wells outside of the current designated plume boundary. Proposed monitoring well sampling locations are presented in Table 2-1 and shown on Figure 2-5.

Temporal variations in groundwater contamination have not previously been evaluated. Therefore, the initial synoptic sampling event will be followed by three rounds of quarterly sampling to assess potential seasonal variations in site contaminant concentrations. Groundwater samples will be collected from the same 17 monitoring wells as previously described (Table 2-1 and Figure 2-2).

TABLE 2-1
Monitoring Wells Proposed for Quarterly Sampling (4 Events)

Site 1330, NS Mayport

Monitoring Wells Within Plume	Monitoring Wells Outside Plume
MAY-1330-2 BP-MW5	BP-MW-3 MAY-1330-3
MAY-1330-5 MAY-1330-6	MAY-1330-8 MAY-1330-13
MAY-1330-9 MAY-1330-10	MAY-1330-14 MAY-1330-16
MAY-1330-11 MPT-1330-MW19	MAY-1330-18
MPT-1330-MW20 MW-XX	

Sampling procedures will be in accordance with FDEP SOPs 001/01 FS2200 Groundwater Sampling and are detailed in Section 3.0 Sampling and Analysis Plan of this Work Plan Addendum.

Groundwater samples will be analyzed in accordance with Section 3.0 Sampling and Analysis Plan for IPB and VOCs by EPA Method 8260. Field parameters including dissolved oxygen (DO), conductivity, oxidation-reduction potential (ORP), pH, temperature, and turbidity will also be measured. The data collected will be used to support a risk based closure approach.

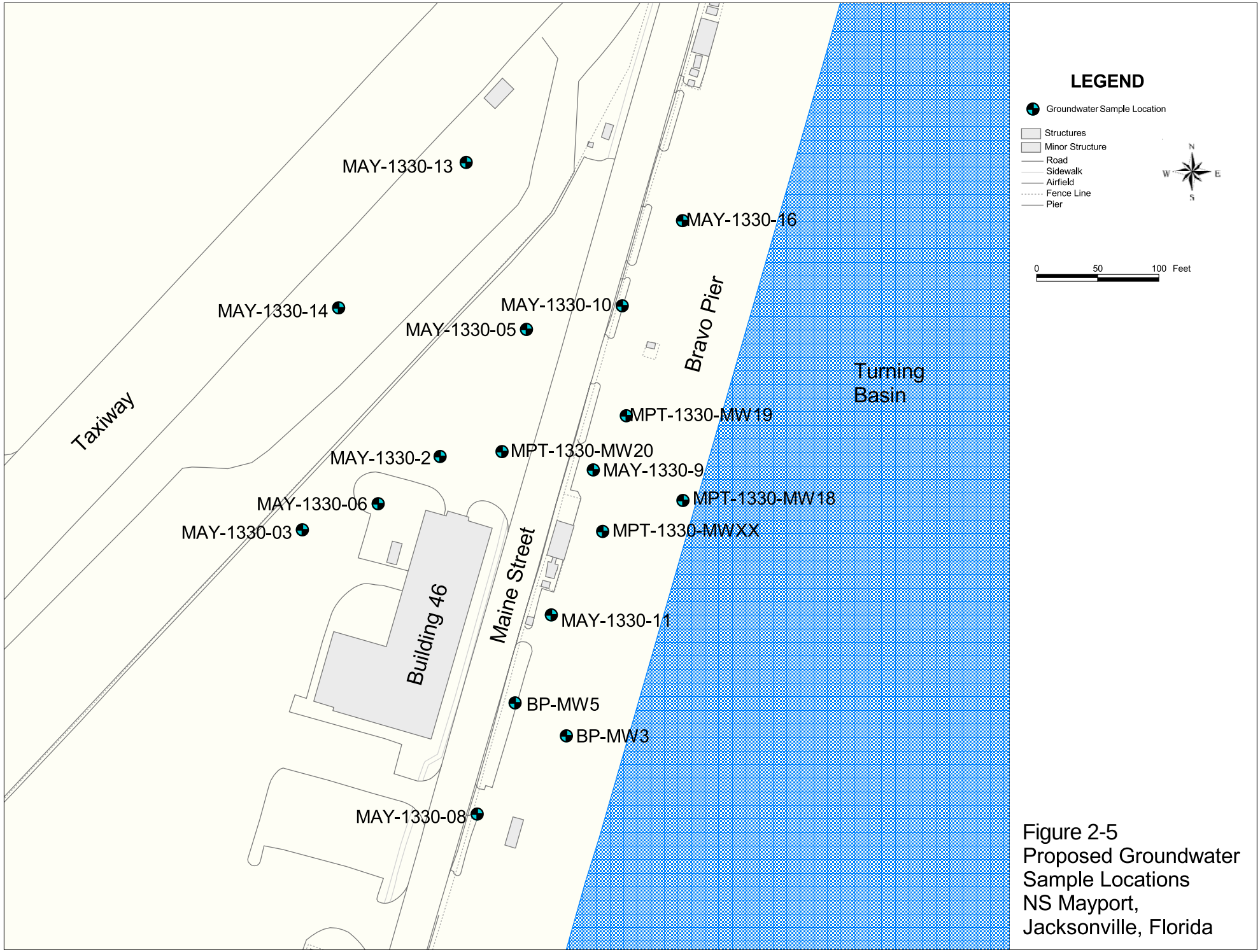


Figure 2-5
Proposed Groundwater Sample Locations
NS Mayport,
Jacksonville, Florida

Based on the documents reviewed, monitored natural attenuation (MNA) has not been previously evaluated at the site. Understanding the terminal electron accepting process (TEAP) would be expected to help guide future remedial actions. Therefore, the initial groundwater sampling event will include collecting MNA parameters for select monitoring wells within and outside the plume. These parameters include the above mentioned field parameters DO, ORP, pH, and temperature, as well as, laboratory MNA parameters iron(II) (dissolved iron), chloride, nitrate, sulfate, sulfide, hydrogen, total organic carbon (TOC), carbon dioxide, methane, and alkalinity.

Groundwater Elevation Measurements

Groundwater elevation measurements are needed to confirm CSM understanding of local groundwater flow conditions. Groundwater level measurements will be made during each of the quarterly groundwater monitoring events. The tidal cycle at the time of measurements will also be recorded to evaluate tidal influence at the site. These data will be evaluated and quarterly potentiometric surface maps for the site developed.

2.1.7 Containerization, Characterization, and T&D of Contaminated Materials

All generated or accumulated contaminated wastes (such as recovered petroleum product, monitoring well purge water, and decontamination water) will be containerized in 55-gallon drums or portable tanks, sampled in accordance with Section 3.0 Sampling and Analysis Plan, and managed, transported, and disposed in accordance with Section 4.0 Waste Management Plan of this Work Plan Addendum.

2.1.8 Decontamination and Demobilization

Personnel and equipment will be properly decontaminated to remove all contamination that may be adhering to personnel or equipment as a result of remedial activities. Any water accumulated during the decontamination process will be containerized in 55-gallon drums or portable tanks, sampled in accordance with Section 3.0 Sampling and Analysis Plan, and managed, transported, and disposed in accordance with Section 4.0 Waste Management Plan of this Work Plan Addendum. Decontamination of personnel and equipment will be performed in accordance with the site-specific Health and Safety Plan provided in Appendix B and the applicable provisions of 29 Code of Federal Regulations (CFR) 1910.120.

During demobilization, temporary facilities, utilities, and equipment will be removed from the site. In addition, any debris or solid waste material remaining from construction activities will be removed and properly disposed of offsite in accordance with Section 4.0 Waste Management Plan of this Work Plan Addendum.

2.1.9 Annual Site Status Report

An Annual Site Status Report will be prepared to document the activities performed and will include:

- Introduction
- Summary of action
- Site survey drawings

- Potentiometric surface maps
- Complete set of all field test and laboratory analytical results, including groundwater field measurements and laboratory analytical results and waste characterization laboratory analytical results
- Site photographs
- Documentation of offsite transportation and treatment of materials, including approved waste disposal profiles, copies of the final manifests and weight tickets, and the certificate of destruction/recycle
- Site recommendations

In addition, quarterly progress updates will provided to the NS Mayport Partnering Team during the scheduled Partnering Team meetings.

2.2 Project Schedule

The major project activities and estimated duration for each are outlined below. Field work will begin following Work Plan Addendum approval. A detailed Project Schedule is included in Appendix A of this Work Plan Addendum.

- Pre-construction meeting/submittal preparation/reviews — 4 weeks
- Mobilization and site preparation — 1 day
- Underground utility location — 2 days
- Subsurface piping system investigation — 2 weeks
- Site restoration — 2 days
- Post-investigation site survey — 1 day
- Quarterly groundwater sampling and analysis (four events at 4 days each) — 1 year
- Annual Site Status Report preparation and submittal — 8 weeks

CH2M HILL anticipates the total project duration will be approximately 58 weeks, with some of the above project activities being completed concurrently. This proposed schedule may vary depending on the actual conditions encountered in the field.

2.3 Communications Plan

A communication matrix outlining the lines of communications for NAVFAC EFD SOUTH and CH2M HILL is presented in Table 2-2. Table 2-3 provides a project personnel directory.

TABLE 2-2
Communications Matrix

CH2M HILL Position	Navy Direct Report
Ray Tyler, Executive Sponsor	Eva Clement, CO
Scott Smith, Program Manager	Dorothy Okamoto, COTR Richard Stanley, ACO
Michael Halil, CTO Project Manager	Dorothy Okamoto, COTR Richard Stanley, ACO Adrienne Wilson, RPM Larry Blackburn, NTR/ROICC Diane Racine, NS Mayport

CO – Contracting Officer
ACO – Administrative Contracting Officer
NTR – Navy Technical Representative
RPM – Remedial Project Manager
COTR – Contracting Officer's Technical Representative

TABLE 2-3
Project Personnel Directory

Contact	Company
Scott Smith, Program Manager Joe Giandonato, Contracts Administration Manager Richard Rathnow, Health and Safety Manager Theresa Rojas, QA/QC Manager	CH2M HILL Constructors, Inc 115 Perimeter Center Place, N.E. Suite 700 Atlanta, GA 30346-1278 770/604-9095
Michael Halil, Project Manager	CH2M HILL Constructors, Inc 6219 Authority Avenue Jacksonville, FL 32221 904/777-4812 x. 233
Eva Clement, CO	NAVFAC EFD SOUTH P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5518
Richard Stanley, ACO	As above 843/820-5939
Dorothy Okamoto, COTR	As above 843/820-5940
Adrienne Wilson, RPM	As above 843/820-5582
Larry Blackburn, NTR/ROICC	Engineering Field Activity Southeast Environmental Programs Coordinator/Resident Officer in Charge of Construction P. O. Box 139, Building 13 NAS Jacksonville, FL 32212-0139 904/542-8745 ext.1116
Diane Racine, NS Mayport	Staff Civil Engineer Environmental Division Building 1538 NS Mayport, FL 32227 904/270-6730 x 208

2.4 Traffic Control Plan

Traffic control will be the responsibility of the CH2M HILL Project Superintendent. CH2M HILL will minimize disturbance to NS Mayport traffic patterns during project activities. CH2M HILL will consult with onsite personnel to evaluate site access, placement of equipment, and traffic flow to minimize the impact of this work to site operations.

3.0 Sampling and Analysis Plan

This Sampling and Analytical Plan (SAP), describes CH2M HILL's tasks and responsibilities related to sampling and analysis activities associated with the work effort. CH2M HILL intends this document to be a site-specific guide for use by the field team while performing the project-required sampling and analysis. Any changes to the activities described in this SAP must be documented as an addendum to this SAP and approved by the Project Manager and Project Chemist.

Samples will be collected in accordance with the EPA Region IV Environmental Investigative Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), November 2001 and FDEP SOPs for Field Activities, DEP-SOP-001/01, February 1, 2004. Where the two documents conflict, the more stringent will apply.

The sampling team will be qualified under the Navy Installation Restoration Chemical Data Quality Manual (IRCDQM), 1999 sampling requirements.

A Navy, U.S. Army Corps of Engineers (USACE)-, or Air Force Center for Environmental Excellence (AFCEE)- and FDEP- approved laboratory will be used for all sample analyses.

3.1 Data Quality Levels for Measurement Data

The data quality levels for each sampling task are listed in Table 3-1. The sampling events, sampling and analytical requirements, and the required level of quality and data packages are listed in Table 3-2. The quantitation, project action, accuracy, precision, and completeness limits by which the data will be evaluated will be provided by the selected laboratory and approved by CH2M HILL's Project Chemist.

TABLE 3-1
Data Quality Levels

Sampling Activity	Data Quality Objective Category
Groundwater Sampling (offsite laboratory analyses)	Definitive
Groundwater Field Parameters (onsite screening)	Screening
Clean Fill Certification (offsite laboratory analyses)	Definitive
Liquid Waste Characterization (offsite laboratory analyses)	Definitive
Solid Waste Characterization (offsite laboratory analyses)	Definitive

TABLE 3-2
Sampling and Analysis Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Groundwater Sampling													
Groundwater Sampling	Monitoring Wells: MAY-1330-2, -1330-3, -1330-5, -1330-6, -1330-8, -1330-9, -1330-10, -1330-11, -1330-13, -1330-14, -1330-16, and -1330-18; BP-MW-3 and -MW-5; MPT-1330-MW19, -1330-MW20, and -XX	Water	Quarterly	17 samples + 2 dup + 1 MS/MSD	Grab	Peristaltic Pump; Teflon Tubing	14 day	CCI Level C	TCL Volatiles	8260B	14 day	HCl pH< 2; Cool to 4°C	(3) 40 mL vials
								CCI Level A	DO, conductivity, ORP, pH, temperature, and turbidity	Flow Through Cell	N/A	N/A	N/A
								CCI Level B	Iron (II)	3500-Fe-D	Immediate	Cool to 4°C	(2) 40 mL vials
									Chloride	300	28 days	Cool to 4°C	250mL plastic
									Nitrate	352.2 or 300.0	48 hours	Cool to 4°C	500mL plastic
									Sulfate	375.1	28 days	Cool to 4°C	500mL plastic
									Sulfide	376.1	7 days	Cool to 4°C; pH>9 w/NaOH & Zinc Acetate	500mL plastic
									Methane	RSK-175	14 days	HCl pH< 2; Cool to 4°C; no headspace	(2) 40 mL vials
									Diss. Hydrogen	AM20GAx	14 days	HCl pH< 2; Cool to 4°C; no headspace	(2) 40 mL vials
									TOC	415.1	28 days	HCl pH< 2; Cool to 4°C	(3) 40 mL vials
									Alkalinity	2320-B	14 days	Cool to 4°C	250mL plastic
									Carbon Dioxide	RSK-175	14 days	Cool to 4°C; no headspace	(2) 40 mL vials
	Pre-Equipment Blank	Water	1 per 10 samples	1	Prepared in Field	Analyte-free water, SS funnel	14 day	CCI Level C	TCL Volatiles	8260B	14 day	HCl pH< 2; Cool to 4°C	(3) 40 mL vials
	Post-Equipment Blank	Water	1 per 10 samples	1	Prepared in Field	Analyte-free water, SS funnel	14 day	CCI Level C	TCL Volatiles	8260B	14 day	HCl pH< 2; Cool to 4°C	(3) 40 mL vials
			(Taken only if equipment cleaned in the field)										
	Trip Blank	Water	1 per cooler containing volatile samples	2	Prepared by Lab	N/A	14 day	CCI Level C	TCL Volatiles	8260B	14 days	0.025% $Na_2S_2O_3$, HCl pH<2; Cool to 4°C	(2) 40 ml vial
Soil/Solids Characterization Sampling													
									TCLP Volatiles	1311/8260B	14 day TCLP extr; 14 day analysis		(1) 4 oz amber glass
									TCLP Semi-Volatiles	1311/8270C	14 day TCLP extr; 7 day extr; 40 day analysis		

Notes:
1. Calendar days

TABLE 3-2
Sampling and Analysis Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
Soil/Solids Characterization Sampling	Drums	Soil/ Solids	As necessary	1	Composite 5 random grabs into 1 sample	SS spoon, SS bowl	7 day	CCl Level B	TCLP Metals	1311/6010A/7470	6 month TCLP extr; 6 month analysis Hg: 28 day TCLP extr; 28 day analysis	Cool to 4°C	(4) 8 oz amber glass
									TCLP Pesticides	1311/8081A	14 day TCLP extr; 7 day extr; 40 day analysis		
									TCLP Herbicides	1311/8151A	14 day TCLP extr; 7 day extr; 40 day analysis		
									PCBs	8082	14 day extr; 40 day analysis		
									Corrosivity	9045a	ASAP		
									Ignitability	1010/1020	ASAP		
Liquid Characterization Sampling													
Liquid Characterization Sampling (to include drummed liquid / plastic and decon water)	Drums	Water	As necessary	1	Grab	Drum thief or dip jar	7 days	CCl Level B	TCL Volatiles	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 ml vial
									TCL Semi-volatiles	8270C	7 days ext; 40 days analysis	Cool to 4°C	(3) 1L amber glass
									TCL Pesticides	8081A	7 days ext; 40 days analysis		
									TCL Herbicides	8151A	7 day extr; 40 day analysis		
									PCBs	8082	7 day extr; 40 day analysis		(1) L amber glass
									TAL Metals	6010B/7470A	180 days; Hg=28 days	HNO3 pH< 2; Cool to 4°C	(1) 500ml HDPE
									Ignitability	1010	ASAP	Cool to 4°C	(1) 250 mL amber glass
									Corrosivity	9040B	ASAP		(1) 250 mL amber glass

Notes:
1. Calendar days

TABLE 3-2
Sampling and Analysis Summary

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservtn	Containers
	Backfill Characterization Sampling												
Characterization of Backfill Material	Once per Off-Site Source	Soil	As necessary	1	Composite 5 random grabs into 1 sample (Do not composite VOCs)	SS spoon, SS bowl, TerraCore samplers, (3) Prepared 40 ml vials (4 or 8 oz jar for stone)	7 days	CCl Level C	TCL Volatiles	5035/8260B	14 day	Methanol; Sodium Bisulfite; H2O; Cool to 4°C	TerraCore samplers, (3) Prepared 40 ml vials and 4 oz jar for stone
									TCL Semi-Volatiles	8270C	14 day extr; 40 day analysis	Cool to 4°C	(4) 8 oz glass
									PAHs (including 1- and 2-Methylnaphthalene)	8270C (low-level)	14 day extr; 40 day analysis		
									TCL Pesticides	8081A	14 day extr; 40 day analysis		
									TCL Herbicides	8151A	14 day extr; 40 day analysis		
									PCBs	8082	14 day extr; 40 day analysis		
									TRPH	FL-PRO	14 day extr; 40 day analysis		
									TAL Metals	6010B/7471	6 month; Hg 28 days		
									pH	9045B	ASAP		
	Trip Blank	Water	1 Per cooler containing volatile samples	1	Prepared by Lab	(2) 40 mL vials	7 days	CCl Level C	TCL Volatiles	8260B	14 day	HCl pH< 2; Cool to 4°C	(2) 40 mL vials

Notes:
1. Calendar days

3.2 Sampling Objectives

The sampling objectives for this project will be as follows:

- Collect groundwater samples from listed monitoring wells for target compound list (TCL) volatiles and MNA analysis.
- Collect samples for characterization of all recovered residual liquids (petroleum product, water).
- Collect samples for characterization of monitoring well purge water and equipment/personnel decontamination water.
- Collect samples for characterization of soil/solids (petroleum-contaminated soil), as necessary.
- Collect samples for verification of backfill materials, as necessary.

3.3 Groundwater Sampling and Analyses

Groundwater samples will be collected from monitoring wells listed in Table 2-1 of this Work Plan Addendum. The samples will be collected in the following manner and analyzed in accordance with Table 3-2.

3.3.1 Pre-purging Activities

The following activities will be performed immediately prior to purging each monitoring well:

1. Check the well for proper identification and location.
2. Using the electronic oil/water interface probe, measure and record the static water level from the reference point to an accuracy of 0.01 foot. Upon removing the water-level wire, rinse it with water from an approved water source and Alconox.
3. Inspect the well head for any signs of forced entry, which could invalidate the sampling data.

3.3.2 Monitoring Well Low-Flow Purging and Sampling

Collection of groundwater samples from monitoring wells is required to characterize the nature and extent of contamination. Because volatiles are being analyzed for, the low-flow purge and sample method will be used.

Purging

The low-flow purge and sample method consists using a submersible or peristaltic pump to purge the well at a very low flow rate (less than 1 liter per minute [L/min]). The pump intake (dedicated Teflon ® tubing) is set approximately in the middle of the well screen, with a stagnant water column over the top of the pump. The well is purged at the low-flow rate until the field parameters (temperature, pH, specific conductance, turbidity, DO, and

ORP) have stabilized. The sample is then collected using the peristaltic pump. The following steps outline the purging and sampling activities:

1. The intake for the peristaltic pump should be set at approximately the middle of the screen. Be careful not to place the pump intake less than 2 feet above the bottom of the well because this may cause mobilization of any sediment present in the bottom of the well. Start pumping the well at less than 1 L/min.

2. The water level in the well should be monitored during pumping and, ideally, the pump rate should equal the well recharge rate with little or no water-level draw down in the well (the water level should stabilize for the pumping rate). There should be at least 1 foot of water over the pump intake so there is no risk of the pump suction being broken or entrainment of air in the sample. Record the pumping rate adjustments and depth(s) to water in the logbook. If the recharge rate of the well is very low and the well is purged dry, then wait until the well has recharged to a sufficient level and collect the appropriate volume of sample with the pump, or use standard purge-and-sample techniques.

3. The well should be purged at a low-flow rate (ideally, less than 1 L/min). During purging, monitor the field parameters (temperature, pH, turbidity, specific conductance, DO, and ORP) using a flow through cell approximately every 5 minutes (or as often as practical) until the parameters have stabilized in accordance with FDEP SOP 001/01, FS2200 over a minimum of three consecutive readings. According to FS2200, purging can be terminated once temperature varies no more than 0.2 degrees Celsius (°C); pH varies no more than 0.2 standard units; specific conductance varies no more than 5 percent; DO is less than or equal to 20 percent of saturation; and turbidity is less than or equal to 20 nephelometric turbidity units (NTU). If the criteria for DO and/or turbidity can not be met, then three consecutive readings for DO and turbidity should not vary more than the greater of 0.2 milligrams per liter (mg/L), or 10 percent; or the greater of 5 NTUs or 10 percent, respectively. In the event that these parameters do not stabilize prior to purging five well volumes, the Field Team Leader may decide to sample the well.

4. Record the in situ parameters (pH, temperature, specific conductance, turbidity, DO, and ORP), along with the corresponding volume purged, on a Groundwater Sample Field Data Record or in a bound field logbook.

Sampling Procedures

Once the field parameters have stabilized, collect the samples using the peristaltic pump. All sample bottles should be filled by allowing the water to flow gently down the inside of the bottle with minimal turbulence. Cap each bottle as it is filled. Volatiles and analytes that degrade by aeration must be collected first. Volatile samples will be collected by shutting off the pump, withdrawing the tubing from the well, and reversing the flow using the water in the tubing to fill the VOC sample containers containing preservatives.

Clean unused tubing should be used for each monitoring well. Used tubing will be disposed of as solid waste.

3.4 Backfill Certification

In order to certify any necessary backfill source materials as uncontaminated or equal to site conditions, one sample for backfill certification will be collected from each site and source used to provide backfill materials. Backfill material must meet FDEP SCTLs for Direct Exposure – Residential or Leachability based on Groundwater Criteria, whichever is lower, as specified in Chapter 62-777 FAC.

The samples will be collected in the following manner and analyzed in accordance with Table 3-2.

Procedure for Collecting Volatile Fractions

1. Using an auger, split spoon, or other device, retrieve a core from the stockpile or borrow source area to be tested.
2. Remove the core from the auger, split spoon, or other device.
3. Using a TerraCore sampler, take an approximate 5-gram sample from the core.
4. Place the 5-gram sample into a pre-preserved volatile organic analytic (VOA) vial and seal the cap tightly. Do this for all vials provided by the laboratory (Note: ideally the entire operation; filling the TerraCore sampler, pushing it into the vial, and capping the vial; should not take more than one minute).
5. After filling the required VOA vials, fill a 4-ounce jar completely full with the remaining core sample. This will be used by the laboratory to determine percent moisture.
6. Label the vials.
7. Place in cooler for shipment to the laboratory.

Procedure for Collecting Non-Volatile Samples

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

A CH2M HILL Level C data package will be required along with appropriate QC samples for required analyses. All analytical data will be submitted by both hard copy and electronic files.

3.5 Soil/Solid Wastes Disposal Characterization

Solid waste from the site will be in the form of excavated petroleum-contaminated soil. It is estimated one sample will be collected for soil/solids disposal characterization. Additional samples may be necessary pending the types of waste streams generated. The samples will be collected in the following manner and analyzed in accordance with Table 3-2.

Procedure for Collecting Volatile Fractions

1. At the selected sample location, using an auger, split spoon, or other similar device retrieve a core.
2. Fill the appropriate (4-ounce jars) sample jars completely full with the sample from the core.
3. Close the jar, label, and package the sample for shipment to the laboratory.

Procedure for Collecting Non-Volatile Samples

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

A CH2M HILL Level B data package will be required along with appropriate QC samples for required analyses. All analytical data will be submitted by both hard copy and electronic files.

3.6 Liquid Wastes Disposal Characterization

Liquid wastes from the site will be in the form of residual petroleum product, petroleum-contact water, monitoring well purge water, or decontamination water. Liquid wastes will be containerized in 55-gallon drums or portable tanks. It is estimated that one sample per waste stream will be needed to perform liquid waste characterization. Additional samples may be necessary pending the types of waste streams generated. The sample will be collected in the following manner and analyzed in accordance with Table 3-2.

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

A CH2M HILL Level B data package will be required along with appropriate QC samples for required analyses. All analytical data will be submitted by both hard copy and electronic files.

3.7 Equipment Decontamination

Sampling methods and equipment have been selected to minimize decontamination requirements and the possibility of cross-contamination. The following procedures will be

used for all sampling equipment used to collect routine samples undergoing trace organic or inorganic analyses.

Reusable sampling equipment will be decontaminated before the initial sample is collected and between sampling locations using the following procedure:

1. Clean with potable water and Alconox® or equivalent laboratory grade detergent using a brush, if necessary, to remove particulate matter and surface films.
2. Rinse thoroughly with potable water.
3. Rinse thoroughly with analyte-free water.
4. Rinse thoroughly with isopropanol (pesticide-grade). Do not rinse PVC or plastic items with isopropanol.
5. Rinse thoroughly with organic/analyte-free water.
6. Allow equipment to air dry completely.

3.8 Sample Documentation

Sampling documentation will include the following:

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

  - Property numbers of any sampling equipment used, if available
  - Sampling station identification
  - Date and time of sample collection
  - Description of the sample location
  - Description of the sample
  - Sampler names and company
  - Collection method
  - Diagrams of processes
  - Maps/sketches of sampling locations
  - Weather conditions that may affect the sample (e.g., rain, extreme heat or cold, wind, etc.)
- Sample Labels
- Custody Seals (minimum of two on each shipping container)

3.9 Field Quality Control

Field duplicate samples and equipment blank 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. 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 maximum frequency of one per sample event or a minimum frequency of 1 per 20 samples. Quantity and frequency are detailed in Table 3-2.

3.10 Analytical Methods

Preliminary analytical results will be faxed to Bethany Garvey at the following fax number per the TAT listed in Table 3-2 from day of sample receipt. The final hardcopy data and electronic file will be delivered to Kama White within 14 days of sample receipt.

Bethany Garvey
Laboratory Coordinator
CH2M HILL
115 Perimeter Center Place, Suite 700
Atlanta, GA 30346
770-604-9182 ext 263
EFax: 678-579-8176
Bgarvey@ch2m.com

Kama White
CH2M HILL
115 Perimeter Center Place, Suite 700
Atlanta, GA 30346
(770) 604-9182 ext 564
Efax: (678) 604-9282
Kama.white@ch2m.com

4.0 Waste Management Plan

The Waste Management Plan addresses the management and disposal requirements for wastes generated during project activities. It is anticipated that the following wastes will be generated:

- Recovered petroleum product
- Petroleum-contact water (mixture of residual product and water)
- Monitoring well purge water
- Decontamination water
- Petroleum-contaminated soil (possibly encountered)
- Debris, including discarded materials generally considered not water-soluble (Debris includes, but is not limited to, materials used in spill prevention and decontamination, for example, plastic sheeting, sorbent materials, sampling materials, and personal protective clothing).
- Sampling-related waste including, but not limited to decontamination water, sampling equipment, gloves, and protective clothing
- Clean and uncontaminated construction debris (Debris includes discarded materials generally considered to be not water-soluble. Debris includes, but is not limited to, concrete and asphalt material.)

4.1 Waste Characterization

Wastes will be characterized according to the SAP in Section 3.0 of this Work Plan Addendum. 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. CH2M HILL will provide analytical data from waste characterization sampling to the designated off-site facilities for review. The profile will be completed by CH2M HILL, and will be submitted to the CH2M HILL Waste Coordinator for approval prior to submission to the Navy for generator signature. Where generator certification and/or signature are required, Navy personnel will provide. The signed profile will then be submitted to the disposal facility for review and approval.

It is assumed that petroleum-contaminated soils that fail the Toxicity Characteristic test for the organic compounds associated with the D018 through D043 waste codes is not hazardous waste because it is a result of petroleum cleanup activities (40 CFR 261.4(b)(10)). However, petroleum contaminated soil that exhibits the Toxicity Characteristic for metals (D004 – D0011) or pesticides (D012 – D017) would be managed as hazardous wastes.

The profile typically requires the following information, including but not limited to:

- Generator (Navy) information including name, address, contact, and phone number
- Site name including street/mailing address
- Activity generating waste (UST/piping site investigation)
- Source of contamination (product from petroleum pipeline)
- Historical use for area
- Waste composition (solid, liquid, etc.)
- Physical state of waste (solid, liquid, etc.)
- Applicable hazardous waste codes

A facility approved copy of the waste profile will be received prior to scheduling of offsite transportation of the waste.

4.2 Waste Management

4.2.1 Waste Storage Time Limit

Hazardous wastes will be removed from the site within 90 days from the date of generation. Additionally, as required under Chapter 62-770 FAC, petroleum-contaminated soil (including excessively contaminated soil) will not be stored onsite for more than 60 days. However, petroleum-contaminated soil (including excessively contaminated soil) may be containerized in watertight drums and stored onsite for 90 days, after which time proper treatment or proper disposal of the contaminated soil will occur. Other wastes will be removed from the site as soon as possible.

4.2.2 Labels

The labeling of waste containers will be in accordance with 49 CFR 172, 173 and 178. Labels will include the type of waste, location from which the waste was generated, and accumulation start date. In specific, containers, and tanks used to store/accumulate waste (including soil and groundwater) will include one of the following labels:

- "Analysis Pending" or "Waste Material" - Temporary or handwritten label until analytical results are received and reviewed. This label will include the accumulation start date.
- "Hazardous Waste" - Pre-printed hazardous waste labels with the following information:
  - Accumulation start date
  - Generator Name
  - EPA ID number
  - Waste codes
  - Manifest number (for containers less than 110-gallon capacity)
- "Non-Hazardous Waste" - Preprinted labels with the following information:
  - Accumulation start date
  - Generator name

- EPA ID number
- Waste-specific information (contaminated soil)

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

It is expected that each type of label will be required for this project.

4.2.3 General Waste Management Requirements

Contaminated soil will be contained in 55-gallon drums, roll-off boxes, in stockpiles or direct loaded onto waiting trucks. Liquid wastes will be contained in drums or tanks for offsite disposal at an approved wastewater treatment facility.

Hazardous wastes will be segregated from non-hazardous wastes. Additionally, incompatible wastes (for example, flammable and corrosive wastes) will be segregated. Wastes of the same matrix, contamination, and the same source may be aggregated to facilitate storage and disposal.

Wastes will be accumulated in an area identified or approved by the Navy. If an accumulation area is not designated, CH2M HILL will accumulate hazardous wastes in an area that is not accessible to the general public and that can be secured.

Waste accumulation areas will contain appropriate emergency response equipment. The Health and Safety Plan in Appendix B identifies the specific emergency response procedures and equipment. Hazardous waste accumulation areas will include fire extinguishers (in areas where wastes are known or suspected to be flammable or ignitable), decontamination equipment, and an alarm system (if radio equipment is not available to all staff working in accumulation area). **Spill control equipment (e.g., sorbent pads) will be available in the waste accumulation areas, and where liquids are transferred from one vessel to another.**

Drums/Small Containers

The following guidelines relate to drums and small containers:

- 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 banding.
- Drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.
- Adequate aisle space (for example, 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.
- Each drum will be provided with its own label, and labels will be visible.
- 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.
- Drums containing liquids or hazardous waste will be provided with secondary containment.

Tanks

- Tanks will be inspected upon arrival onsite for signs of deterioration and contamination. Any tank arriving onsite with contents will be rejected.
- Tanks will be provided with covers and secondary containment.
- Only non-stationary tanks (such as a cargo tank or other wheeled tank) will be used to accumulate hazardous waste.
- Each tank will be labeled as discussed above.

Roll-off Boxes

- Roll-off boxes shall be inspected upon arrival on-site. Any roll-off container arriving with contents or in poor condition shall be rejected.
- Roll-off boxes for hazardous or "excessively contaminated" soil will be provided with covers and disposable liners. Liners shall be disposed of as contaminated debris along with the soil.
- When not in use, securely fastened covers will be installed on all roll-off boxes.
- Old labels will be removed and a new, appropriate label applies as discussed above.
- Roll-off containers shall be inspected by the transporter after removal of the liner and decontaminated in the event of evidence of liner failure.

Soil Stockpiles

- Stockpiles of contaminated soil will be located near the excavation areas and within an area of existing contamination.
- Stockpiles will be provided with liner, cover, and perimeter berm to prevent release or infiltration of liquids.
  - Minimum 10- and 6-mil polyethylene sheeting will be used for liners and covers, respectively.
  - The perimeter berm will be constructed of clean materials (such as hay bales under the liner) and allow for collection of any free liquids draining from the stockpile.
  - Accumulated free liquids will be pumped-out to a container or tank.
- Covers and perimeter berms will be secured in-place when not in use and at the end of each workday, or as necessary to prevent wind dispersion or run-off from major precipitation events.
- Construction materials for the stockpiles that contact contaminated soil will be disposed of as contaminated debris.

- Accumulation start dates will be recorded on a log or a sign located at the stockpile.

Waste/Debris Stockpiles

Where appropriate, construction debris and waste, or scrap equipment may be accumulated in stockpiles. These stockpiles will be managed in such a manner as to maintain good housekeeping, and to prevent the spread of contamination.

- Contaminated debris stockpiles will be provided with containment as indicated for soil stockpiles. Damaged or leaking equipment shall be placed in containers, and may not be stored in storage piles.
- Uncontaminated or decontaminated debris stockpiles, or intact equipment should be placed on a liner. These piles will be covered as necessary to prevent storm water run-on and run-off.

Inspection of Waste Storage Areas

Waste accumulation areas will be inspected for malfunctions, deterioration, discharges, and leaks that could result in a release. The following inspection schedule will be followed:

- At least weekly inspection of containers, tanks and roll-off containers (for leaks, signs of corrosion, or signs of general deterioration).
- At least weekly inspection of stockpiles (for liner and berm integrity).

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

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

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

4.3 Shipping Documentation

Prior to offsite disposal of any waste, CH2M HILL will provide the Navy with a waste approval package for each waste stream. This package will include a waste profile naming the U.S. Navy as the generator of the waste, analytical summary table(s) applicable to the waste, letter of approval from the proposed waste disposal facility to accept the waste, Land Disposal Restriction (LDR) notification for any hazardous wastes, a completed waste manifest, and any other applicable information necessary for the Navy to complete its review of the disposal package and signature as the generator.

The signed profile will then be submitted to the disposal facility for acceptance approval. Once the approval letter is received from the disposal facility, transportation can be scheduled.

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

- Generator information including name, address, contact, and phone number, EPA ID number
- Transporter information including name, address, contact and phone number, EPA ID number (if available/applicable)
- Facility information including name, address, phone number, EPA ID number
- Site name including street address at a minimum, mailing address if available
- For all Hazardous Materials (including hazardous wastes) as defined at 49 CFR 171.8, the U.S. Department of Transportation (DOT) Proper Shipping Name (e.g., Hazardous Waste Solid, n.o.s., 9, UN 3077, PG III (D008))
- Type and number of container(s)
- Quantity of waste (volumetric estimate)
- CTO or job number
- Profile number
- 24-hour emergency phone number

Additional documentation required for each shipment of waste includes the following:

- Haul (weight) ticket
- LDR Notification/Certification (required for **hazardous wastes)** (This form also requires the generator signature and submission to the disposal facility.)
- Copy of the relevant portion of the DOT Emergency Response Guide (ERG) that applies to the hazardous material/waste being shipped (if possible)

The generator (Navy) and the transporter must sign the manifest (and LDR, if applicable) prior to the load of waste leaving the site. A copy of the manifest will be retained on site and included with the daily QCR. The original signed manifest will be returned to the address of the generator. The facility will provide a copy of this signed manifest to CH2M HILL for the final report. The final report will include copies of the facility signed manifest, haul ticket, LDR (if applicable), and the Certificate of Disposal/Destruction/ Recycle.

If the signed hazardous waste manifest from the designated offsite facility is not received within 35 days, CH2M HILL will contact the transporter or the designated facility to determine the status of the waste. If the signed hazardous waste manifest has not been received within 45 days, CH2M HILL, in coordination with the Navy, will issue an "Exception Report" to the state of Florida, as required under 40 CFR 262.42.

4.4 Transportation

Each transportation vehicle and load of waste will be inspected before leaving the site and documented. The quantities of waste leaving the site will be recorded, and at a minimum, documented on the T&D Log. A contractor licensed for commercial transportation will transport non-hazardous wastes. In the event that wastes are hazardous, the transporter must have a EPA Identification number, and will comply with transportation requirements outlined in 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 the appropriate licenses will be received and approved by CH2M HILL prior to transport of any waste.

4.4.1 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. For shipment of bulk solids, disposal quantities will be based on the difference of weight measurements (tare vs. gross) between the full and empty container, dump truck, or tanker truck. For liquids, disposal quantities will be based on gallons. For containerized (drummed) wastes, quantities may be based on gallons for liquids and/or drum weights. Weights and/or volumes will be recorded on the waste manifest. The transporter will provide copies of weight tickets to CH2M HILL.

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.
- Clean up waste spilled in transit.
- Line and cover trucks/trailers used for hauling contaminated waste to prevent releases and contamination.
- Decontaminate vehicles prior to re-use, other than hauling contaminated waste.
- 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 NS Mayport.

4.4.2 Disposal

Offsite treatment, recycling or disposal facilities will use the waste profile and supporting documentation (for example, analytical results and flow-rate data) to determine if they will accept a waste. The treatment, recycling or disposal 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. Wastes are expected to be disposed as follows:

- Hazardous wastes (including environmental media) will be sent to a permitted, RCRA Subtitle C treatment, storage, or disposal (TSD) facility. None of the wastes from this site are expected to be hazardous.
- Non-hazardous wastes will be disposed in a facility permitted to accept the types and quantities of contamination (for example, Subtitle D landfills). Petroleum contaminated soils and other solids, if generated will be sent to a Subtitle D, non-hazardous landfill.
- Petroleum product and petroleum-contaminated liquids will be sent to a qualified recycler.

The waste will generally be placed into drums or portable tanks, transported and disposed of off-site at an appropriate disposal facility based on generator knowledge and analytical results.

Uncontaminated, or decontaminated, construction and demolition debris may be sent to municipal landfills, or landfills designated for construction/demolition debris.

4.4.3 Transportation and Disposal Log

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

5.0 Environmental Protection Plan

The Environmental Protection Plan of the Basewide Work Plan (CH2M HILL, 1999) addresses general procedures that will be implemented to prevent pollution and protect the environment. The purpose of this plan is to provide specific requirements/procedures to protect the environment during the additional investigation activities at Site 1330, NS Mayport.

5.1 Regulatory Drivers

Remedial activities at Site 1330 are regulated under the State of Florida's Petroleum Program. All solid/hazardous waste and media will be characterized and managed according to the requirements of Chapter 62-730 FAC, Hazardous Waste regulations. Management of petroleum contaminated wastes and remedial activities will comply with the provisions of Chapter 62-770 FAC, Petroleum Contamination Site Cleanup Criteria, as appropriate.

5.2 Spill Prevention and Control

The provisions for spill prevention and control establish minimum site requirements. All spills will be reported to the CH2M HILL site supervisor and/or project manager. Refer to the Health and Safety Plan for emergency response procedures and further reporting requirements.

5.3 Spill Prevention

All fuel, chemical, and waste storage areas will be properly protected from on- and off-site vehicle traffic. All tanks (including fuel storage and waste storage) must be equipped with secondary containment. These tanks must be inspected daily for signs of leaks. Accumulated water must be inspected for signs of contamination (such as product sheen, discoloration, and odor) before being discarded. Fire protection provisions outlined in the Health and Safety Plan must be adhered to.

Chemical products must be properly stored, transferred, and used. Should chemical product use occur outside areas equipped with spill control materials, adequate spill control materials must be maintained at the local work area.

5.4 Spill Containment and Control

Spill control materials will be maintained in the support zone, at fuel storage and dispensing locations, and at waste storage areas. Incidental spills will be contained with sorbent and disposed of properly. Spilled materials must be immediately contained and controlled. Spill response procedures include:

- Immediately warn any nearby workers and notify supervisor.
- Assess the spill area to ensure that it is safe to respond.
- Evacuate area if spill presents an emergency.
- Ensure any nearby ignition sources are immediately eliminated.
- Stop source of spill.
- Establish site control for spill area.
- Contain and control spilled material through use of sorbent booms, pads, or other material.
- Use proper personal protective equipment (PPE) in responding to spills.

5.5 Spill Cleanup and Removal

All spilled material, contaminated sorbent, and contaminated media will be cleaned up and removed as soon as possible. Contaminated spill material will be drummed, labeled, and properly stored until material is disposed of. Contaminated spill material will be managed as waste (see Section 4.0 Waste Management Plan) and disposed of according to applicable, federal, state, and local requirements.

5.6 Erosion Control

During those excavation activities that have the potential to disturb the land, CH2M HILL will adhere to the following practices:

- The smallest practical area will be disturbed.
- Temporary erosion and sediment controls will be used to prevent sediment from discharging to any ponds or wetland areas. Structural controls may include the use of straw bales, silt fences, earth dikes, drainage swales, sediment traps, and sediment basins.
- Material staging areas will be properly barricaded for containment and to control run-off.

6.0 Quality Control Plan

This Quality Control Plan details the quality administrators, the project organization, and the construction inspections associated with the work to be completed at Site 1330, NS Mayport.

The Submittal Register, included in Appendix D, documents submittals in accordance with CH2M HILL's Contract Management Plan (dated July 1998). CH2M HILL, the Navy, or others will approve submittals as identified in the Submittal Register. All approved submittals will be distributed by CH2M HILL to the appropriate Navy personnel (CO, ROICC (in duplicate), etc.), the project site, and to the project file.

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

6.1 Project QC Manager

The Project QC Manager for this project is Jeff Marks and the Alternate Project QC Manager is Greg Ramey. The appointment letters for Mr. Marks and Mr. Ramey are included in Appendix D.

6.2 Testing Requirements

This section describes construction testing and environmental analysis laboratories and their certifications; environmental sampling and analysis, and test control. The Testing Plan and Log is provided in Appendix D.

6.2.1 Identification and Certification of Testing Laboratories

The environmental testing laboratories utilized for this project will function as a subcontractor or a lower tier subcontractor, and have not yet been identified.

6.2.2 Construction

Construction testing for the project will be performed using laboratories that are National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program (NVLAP), American Association of State Highway and Transportation Officials (AASHTO), or American Association for Laboratory Accreditation (AALA) certified.

6.2.3 Environmental

Laboratories performing analytical analysis of environmental samples will be approved by the Navy, USACE, or AFCEE, and FDEP. The selected laboratory will possess an approved Quality Assurance Project Plan.

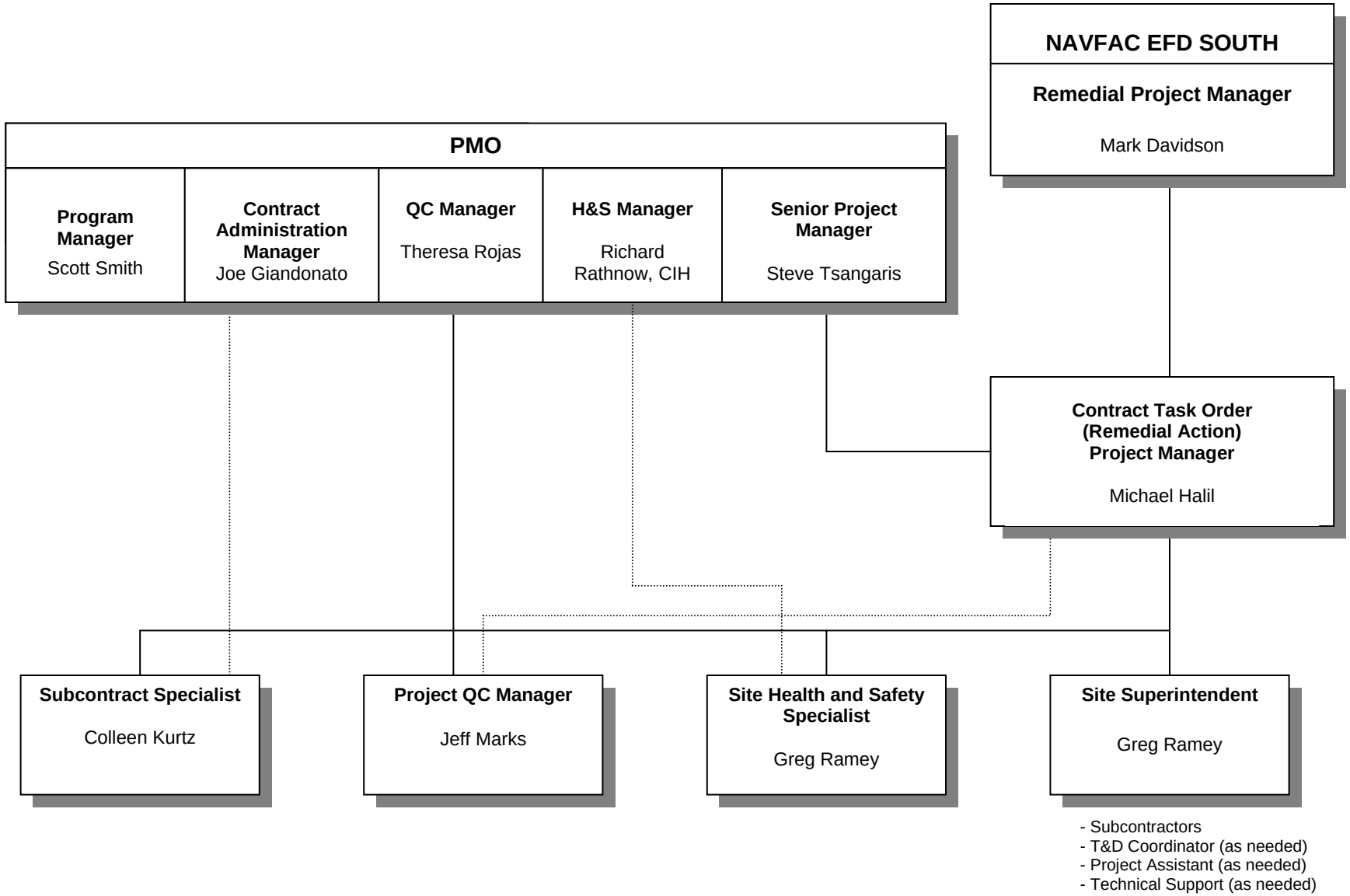


Figure 6-1
Project Organization Chart

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

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
Engineering Manager	• Monitor and oversee subcontractor compliance with scope of work • Review requests for changes in scope of work • Review technical qualifications of subcontractors • Prepare Field Change Requests • Respond to Design Change Notices • Recommend improvements in work techniques or metrics • Recommend work-around to Site Superintendent	• Approve Field Change Requests below ceiling amount • 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 6-1
Roles, Responsibilities, and Authorities of Key Project Personnel

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/ QC Inspector(s)	• 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	

6.3 Construction Inspections

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

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

- Mobilization and site preparation
- Subsurface piping system investigation, includes excavation, backfilling, and site restoration
- Surveying

- Field sampling
- Waste management
- Decontamination and demobilization

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

6.4 Mobilization and Site Preparation

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

6.4.1 Preparatory Phase

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

6.4.2 Initial Phase

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

6.4.3 Follow-up Phase

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

Table 6-2 lists the quality controls that will be implemented during mobilization and site preparation activities.

TABLE 6-2
QC Procedures for Mobilization and Site Preparation

Task	Procedures/Construction Details
Pre-construction Meeting	• Verification of excavation permit and utility clearance from Environmental Division Public Works Center (PWC), NS Mayport • Verification of designated locations of equipment layout, material and waste staging, and decontamination
Site Walk	• Verification of site layout plan • Verification of Environmental Conditions Report
Pre-construction Submittals	• Subcontractor plans and specifications • Subcontractor personnel qualification and certifications

TABLE 6-2
QC Procedures for Mobilization and Site Preparation

Task	Procedures/Construction Details
Temporary Facilities	• Verification of temporary facilities for conformance with NS Mayport requirements • Verification of temporary utility hookups for conformance with the utility and the base requirements • Verify implementation of environmental protection measures (erosion and sediment control)

6.5 Subsurface Piping System Investigation

To confirm the absence or presence of residual fuel components as a contaminant source to soil and groundwater, a focused investigation of piping components located during site characterization will be conducted. The piping components are located below grade; therefore, utility location will be performed prior to the investigation. No intrusive subsurface work will be performed prior to utility location. Investigation of the subsurface piping will require excavating a section of the pipe(s) to gain access to the distribution pipe(s). Soil will be excavated using a backhoe excavator or mini-excavator. Special care will be taken to ensure the pipe in not damaged during excavation. A spotter will be used at all times to ensure that the excavator bucket does not come in contact with subsurface piping. Hand digging around and below the subsurface piping will be required. The pipe(s) may need to be punctured or cut to gain access. If cutting or puncturing is necessary, piping will be cut manually via a cold method (that is, using a 4-wheel pipe cutter). It is anticipated that excavated material will be useable to backfill excavations. Areas disturbed during work at the site will be restored to previous conditions.

Materials and equipment will be inspected to ensure appropriate and functional for the subsurface piping investigation activities. Sufficient quantities, suitable materials of construction, and ample storage capacities for petroleum product recovery will be considered throughout the work activity. Pipe cutters will also be evaluated for efficient and safe pipe cutting after each use.

6.5.1 Preparatory Phase

The preparatory phase will include the following: a review of the relevant AHAs, a review of the requirements provided in the Work Plan Addendum and the site-specific Health and Safety Plan; verifying acceptance and approval of the utility clearance; verifying the fuel system schematic drawings; and confirming the appropriate equipment, resources and craftsmen are available to perform the work. The excavation competent person will be identified and the logistical approach for conducting the excavations and site restoration will be discussed. Containers and waste staging areas will be prepared and managed in accordance with the protocols of the Waste Management Plan. Prior to commencing the work, controls such as barricades, road signs and security fencing will be installed, as necessary, and the proper resources are available for spill prevention and containment.

6.5.2 Initial Phase

Critical to the success of the investigation is the assessment of each piping section planned for excavation and access. The team will discuss excavation means and methods, containment, piping support, means and methods for handling recovered petroleum product to avoid spills, vapor relief mechanisms (to prevent fuel vapor flash), and capping or resealing access locations. These considerations will be discussed as the work progresses at each access point until completion.

Prior to the start of pipeline work activities, the Project QC Manager will complete the initial inspection of the planned operation. The inspection will evaluate personnel qualifications, equipment conditions, site arrangements and containment for the particular section of pipe, spill response preparations, and checklist procedures. Spill response equipment and resources will be in place prior to starting excavation. Deficiencies will be documented and corrected prior to starting the activity. No pipe activity will be started if a deficiency is noted.

6.5.3 Follow-up Phase

The Project QC Manager will be responsible for the ongoing inspection of excavation, pipe investigation, and site restoration activities. Surveillance will verify that the work is completed in accordance with the requirements provided in this Work Plan Addendum. Deficiencies will be noted and corrected. The daily activity will be documented in the Daily Contractor Quality Control Report.

Table 6-3 lists the quality controls that will be implemented during subsurface piping investigation activities.

TABLE 6-3
QC Procedures for Subsurface Piping Investigation Activities

Task	Procedures/Construction Details
Excavation	• Verify vertical control, width and depth of excavation • Staging of excavated soils in approved staging areas
Subsurface Piping Inspections	• Verification of air monitoring instrument calibration, conduct work area air monitoring • Verify piping identified for draining, estimate quantity of fluid, identify fuel type, segregate • Ensure spill equipment present • Coordinate waste transportation or temporary onsite storage
Backfill	• Verify material analytical results to ensure it is "clean" • Lifts of 1-foot or less • Verify grading to transition to surrounding grades
Site Restoration	• Verify limerock placement and compaction • Perform Surface preparation • Select locations for performing in-place soil density tests • Verify data obtained in the field and that recording forms are accurate and complete • Provide Seeding, Mulching and Fertilizing • Perform Damage (washout) Repair • Ensure Defective Material Rejection • Ensure unused material is properly stored

6.6 Surveying

6.6.1 Preparatory Phase

The preparatory phase will include the following: a review of the relevant AHAs, a review of the requirements provided in the Work Plan Addendum and the site specific Health and Safety Plan, and verify acceptance and approval of surveyor qualifications/license (Florida-registered professional land surveyor). The competent person will be identified and the logistical approach for conducting the activity will be discussed.

6.6.2 Initial Phase

As the activities proceed, the Project QC Manager will conduct initial inspections, verify existing monuments and structures, verify instrument calibration and accuracy, and monitor the work completed to verify conformity with this Work Plan Addendum. Deficiencies will be documented and corrected as necessary.

6.6.3 Follow-up Phase

The Project QC Manager will be responsible for the ongoing inspection of the site activities, verification of instrument calibration and accuracy, and surveillance will verify that the work is being completed according to the Work Plan Addendum provisions. Deficiencies will be documented and corrected as necessary.

Table 6-4 lists the quality controls that will be implemented during surveying activities.

TABLE 6-4
QC Procedures for Surveying

Task	Procedures/Construction Details
Post investigation Site Surveying	• Surveyor qualifications / license (Florida -registered professional land surveyor) • Verification of existing monuments and structures • Instrument calibration and accuracy • Surveying tolerances (horizontal, vertical, contours) (Horizontal controls Mercator Projection , GRS 80, State Plane Coordinate System, North American Datum 1983, Lambert Zones 1-6 (or appropriate zone for region to be mapped)(Vertical controls mean Sea Level, North American Vertical Datum, 1988) • Reference to applicable plane coordinates and vertical datum, information collected in English units (Tri-Service Spatial Data Standards) • Survey documents surface/subsurface structure locations, locations and limits of subsurface piping investigation excavations, locations of discovered subsurface piping, locations of buried utilities, monitoring well locations, and any deviations. • Electronic and hard copy data deliverables

6.7 Field Sampling

Groundwater, representative samples of borrow soil, and solid/liquid waste characterization samples will be collected. Environmental samples will be collected in accordance with EPA and FDEP SOPs. Other controls will include, but are not limited to,

maintaining a chain of custody; proper handling, packing, and shipping; sampling performed by qualified persons; and the use of certified laboratories.

6.7.1 Preparatory Phase

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

6.7.2 Initial Phase

Groundwater, backfill certification, and waste characterization samples will be collected and subsequently analyzed at an approved laboratory in accordance with methods outlined in the project specific SAP. Sample collection activities, including proper chain-of-custody documentation, will follow the protocols outlined in the project-specific SAP.

6.7.3 Follow-up Phase

The Project QC Manager will observe sample collection activities and the associated documentation records throughout each sampling event. Analytical reports from the approved laboratory will be reviewed for accuracy and quality. If required, data validation information from the laboratory will be reviewed to resolve discrepancies in the analytical data. CH2M HILL QA personnel will validate laboratory data and field sampling results.

Table 6-5 lists the quality controls that will be implemented during field sampling activities.

TABLE 6-5
QC Procedures for Field Sampling

Task	Procedures/Construction Details
Field Sampling	• Verify laboratory and credentials • Verify appropriate sampling equipment • Verify equipment decontamination • Verify appropriate facilities and testing equipment are available and comply with testing standards • Verify the field instruments are calibrated in accordance with manufacturers' recommendations • Verify recording forms, including all of the test documentation requirements, have been prepared and are accurate and complete

6.8 Waste Management

6.8.1 Preparatory Phase

The preparatory phase for transportation and disposal of waste streams includes a review of the waste management plan included in this Work Plan Addendum; disposal, recycling or treatment facility qualifications; transportation schedule for hauling material offsite; and confirming that the appropriate equipment and materials, such as waste manifests, are available to commence the work activity. Review and acceptance of the waste disposal

package by the CH2M HILL waste coordinator is required prior to submitting the package to the Navy for approval. Prior to any work, the relevant AHAs will be reviewed and discussed. All temporary storage containers will be inspected prior to acceptance onto the project and labeled.

6.8.2 Initial Phase

This phase includes inspecting the waste transport vehicles (roll-off containers, end-dumps, transports, etc.) prior to accepting on the job. Containers used for soil transport will be lined prior to loading. Containers used for transporting liquids will be free of liquids or other foreign materials prior to filling. Information provided on the waste manifest must be verified as complete and accurate including, but not limited to, generator name, address and signature, date, type of material being hauled, designated recycling or treatment facility, and volume and/or weight of material. Any discrepancies on waste manifest documents will be corrected.

6.8.3 Follow-up Phase

This phase includes verifying that the designated recycling or treatment facility has accepted and treated the waste material at the facility and has sent the required completed manifest to the generator or the generator's technical representative. Receipt of the certificate of recycling or disposal from the designated facility must be verified, as well as that the invoice is complete and accurate. A field logbook and an electronic log of all transportation and disposal shipments will be maintained. Containers, tanks, and roll-off containers will be routinely inspected for integrity and inventoried. Waste storage areas (including areas with stockpiles, containers, tanks, roll-off containers) will be visually inspected on a daily basis for releases or signs of corrosion, deterioration, or other conditions that could result in a release. These results of all inspections will be recorded.

Table 6-6 lists the quality controls that will be implemented during waste management activities.

TABLE 6-6
QC Procedures for Waste Management

Task	Procedures/Construction Details
Waste Management	• Verification of designated locations of equipment layout, material and waste staging, and decontamination • Update waste tracking log and label waste containers • Inspect segregated wastes, label containers with content • Inspect waste containers for cleanliness, acceptable materials of construction, adequate storage volume
Transportation and Disposal	• Verify waste profile completion (obtain Navy Signature) • Transporter and Disposal facility certificates • Verify stockpile and waste storage area inspection

6.9 Decontamination and Demobilization

Personnel and equipment utilized to perform intrusive work will be decontaminated in accordance with the provisions of the site-specific Health and Safety Plan. Pre-final

inspection of cleanliness will be performed by the Site Superintendent and the Site Health and Safety Specialist. Final equipment inspections will be performed and documented by the Project QC Manager, or his/her designee.

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

6.9.1 Preparatory Phase

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

6.9.2 Initial Phase

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

6.9.3 Follow-up Phase

The Project QC Manager will provide continuous oversight of the decontamination and demobilization to verify that the work is completed in accordance with the requirements provided in this Work Plan Addendum. Deficiencies will be noted and corrected.

Table 6-7 lists the quality controls that will be implemented during decontamination and demobilization activities.

TABLE 6-7
QC Procedures for Decontamination and Demobilization

Task	Procedures/Construction Details
Decontamination and Demobilization	• Pre-final site inspection and develop punch-list items • Work areas to ensure all temporary facilities, equipment and materials are safely removed from the site • Work areas to ensure project housekeeping and cleaning • Decontamination of personnel and equipment • Completion inspection when work is substantially complete • Punch lists on outstanding items • Project housekeeping and final project cleaning • Final Inspections • Orderly Site Demobilization • Collation of Site Records & Documents • Final Reports and Deliverables • Complete Resolution of Punch-list items • Final Site Inspection • Orderly Site Demobilization

6.10 CTO Support Organizations

The supporting organizations for this project are yet to be determined.

7.0 References

CH2M HILL Constructors, Inc. 1999. Basewide Work Plan, Naval Station Mayport, Mayport, Florida. May.

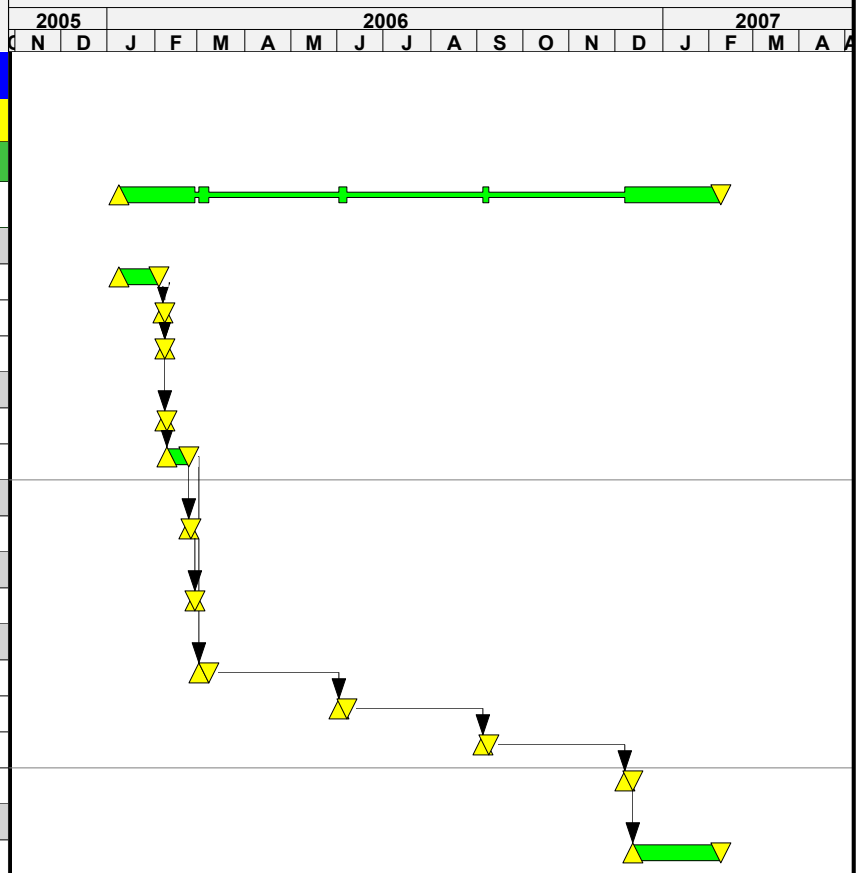
Florida Department of Environmental Protection. 2004. *Department of Environmental Protection Standard Operating Procedures for Field Activities*, DEP-SOP-001/01. February 1.

Tetra Tech NUS, Inc. 2003. *Site Assessment Report Addendum for Site 1330, Naval Station Mayport, Mayport Florida*. December.

Appendix A

Project Schedule

Activity ID	WBS	% Comp	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish
CTO #0012 - NAVSTA - Mayport, FL							
PHASE 3							
ADDITIONAL INVESTIGATION @ BLDG 46, SITE 1330							
Subtotal		0		277	277	09JAN06	08FEB07
MOBILIZATION & PREPARATORY WORK							
AL34010394		0	Pre-Construction Submittals	20	20	09JAN06*	03FEB06
AL99010292		0	Pre- Construction Meeting	1	1	06FEB06	06FEB06
AL34010292		0	Mobilization	1	1	07FEB06	07FEB06
SUBSURFACE INVESTIGATION							
AL34020590		0	Underground Utility Location	2	2	07FEB06	08FEB06
AL34020591		0	Subsurface Piping System Investigation	10	10	09FEB06	22FEB06
SITE RESTORATION							
AL34200401		0	Site Restoration	2	2	23FEB06	24FEB06
SURVEY							
AL34210606		0	Post-Investigation Site Survey	1	1	27FEB06	27FEB06
GROUNDWATER SAMPLING AND ANALYSIS							
AL34020502		0	Quarterly GW Sampling and Analysis	4	4	02MAR06	07MAR06
AL34020503		0	Quarterly GW Sampling and Analysis	4	4	02JUN06	07JUN06
AL34020504		0	Quarterly GW Sampling and Analysis	4	4	05SEP06	08SEP06
AL34020505		0	Quarterly GW Sampling and Analysis	4	4	07DEC06	12DEC06
REPORTING							
AL34020403		0	Annual Site Status Report	40	40	13DEC06	08FEB07



Start Date 28MAY03
Finish Date 23OCT07
Data Date 28OCT05
Run Date 08DEC05 11:20

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Early Bar
Progress Bar
Critical Activity

RAC4 - CO12 **Sheet 1 of 1**

CTO #0012 - NAVSTA - Mayport, FL
CTO COMPLETION SCHEDULE
NAVY RAC SOUTHERN DIVISION

CH2MHILL

Appendix B

Site Specific Health and Safety Plan

Health and Safety Plan
Additional Investigation at
Building 46, Site 1330

Naval Station Mayport
Mayport, Florida

Revision No. 00

Contract No. N62467-01-D-0331
Contract Task Order No. 0012

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

December 2005

Contents

Tables

Figures

Attachments

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
BEI	Bechtel Environmental Inc.
bls	below land surface
CAR	Contamination Assessment Report
CH2M HILL	CH2M HILL Constructors, Inc.
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CTO	Contract Task Order
dBA	decibel A-rated
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
FA	first aid
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
CGTLs	groundwater cleanup target levels
GFCI	ground fault circuit interrupter
GPR	ground penetrating radar
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
IRA	Initial Remedial Action
IRF	Incident Report Form
lb	pound
LEL	lower explosive limit
LPO	Loss Prevention Observations
mg/m^3	milligrams per cubic meter
MOP	Monitoring Only Plan
MSDS	Material Safety Data Sheet
MTBE	methyl tert butyl ether
mW/cm^2	milliwatt per square centimeter
NAVFAC EFD SOUTH	U.S. Navy Facilities Engineering Command, Southern Division
NDG	nuclear density gauge
NLI	Near Loss Investigation
NS	Naval Station
NSC	National Safety Council

NTR	Navy Technical Representative
Omega	Omega Environmental Services, Inc.
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
PCBs	polychlorinated biphenyls
PDF	personal flotation device
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
PTSP	Pre-Task Safety Plan
RF	radio frequency
RMSF	Rocky Mountain Spotted Fever
SAR	supplied-air respirator
SCBA	self-contained breathing apparatus
SCTL	Soil Cleanup Target Level
SHSS	Site Health and Safety Specialist
SOP	standard of practice
STEL	short-term exposure limit
SVOC	semi-volatile organic compound
SZ	support zone
T&D	Transportation and disposal
TBD	to be determined
TMCC	truck-mounted crash cushion
TtNUS	Tetra Tech NUS, Inc.
TSDF	treatment, storage, and disposal facility
USACE	U.S. Army Corps of Engineers
UST	underground storage tank
VOCs	volatile organic compounds

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

1.0 Project Information and Description

CONTRACT TASK ORDER (CTO) No: 0012

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

PROJECT/SITE NAME: Naval Station (NS) Mayport**,** Building 191 Contaminated Soil Delineation

SITE ADDRESS: Southwest corner of Massey Avenue and Supply Street, NS Mayport

CH2M HILL PROJECT MANAGER: Michael Halil

CH2M HILL OFFICE: Atlanta, Georgia (ATL)

DATE HEALTH AND SAFETY PLAN PREPARED: December 6, 2005

DATE(S) OF SITE WORK: December 2005 – December 2006

SITE BACKGROUND AND SETTING: Site 1330 includes Building 46 and extends approximately 200 feet north of the building, west of Building 46 to the taxiway, and east of Building 46 to include Bravo Pier. Site 1330 is a large, mostly asphalt covered area with Building 46 located near the center of the investigation area. Building 46 is a recreation hall and a laundromat for Navy personnel and Bravo Pier is an operational pier.

Utilities are present in the pier area and include active pressurized steam lines, fuel oil product lines, and oily wastewater oil lines. Cement structures fitted with utility access points or "igloos" dot the pier providing utility service hook-ups such as electricity, petroleum fuel, steam, oily wastewater return, and water to the docked ships. No overhead utilities are present.

Site 1330 is the location of a former fuel depot that reportedly began operations in 1944. This facility distributed "high octane" and "low octane" fuels to ships and seaplanes docked at the turning basin. The facility consisted of a series of four 25,000-gallon, circular concrete USTs (numbered 39, 39A, 39B, and 40) connected by 3- and 4-inch underground piping that ran to the turning basin. The 25,000-gallon tanks were located approximately 200 to 300 feet west of the ship basin near the airport taxiway. A large soil mound that measured 400 feet long by 240 feet wide by 4 feet high apparently covered the 25,000-gallon tanks. According to design drawings, the main portion of these tanks were about 10 feet below land surface (bls).

These tanks and associated piping were allegedly removed sometime in the early 1950s. In 1969, aboveground storage tanks (numbered 1330 and 1331) holding lubrication oils for the ships were installed along the taxiway in the area between the footprints of the former cement USTs. Although the history of these tanks is not well documented, they reportedly were removed in December 1986 or 1988.

A Contamination Assessment Report (CAR) detailing the fuel distribution area located along the taxiway for Site 1330 was prepared by the U.S. Army Corps of Engineers (USACE)

and submitted to the FDEP in May 1992. The FDEP submitted comments in June 1992 requesting additional assessment work due to the presence of impacted soil and groundwater from the fuel distribution system, which included the Bravo Pier. The requested supplemental work was performed in October 1992, and a CAR Addendum was submitted in December 1992. The FDEP submitted comments to the CAR addendum in February 1993 requesting removal of petroleum-contaminated soils and additional information about the Bravo Pier soil contamination discovered during the original CAR. Responses to these comments were addressed in March 1993, stating that a soil removal contract would be initiated for Site 1330, and further investigations would be conducted at the Bravo Pier site. At this time, it was not known that concrete USTs were still in place along the airport taxiway. Two areas of investigation emerged as potential sites for additional investigation, the former USTs near the taxiway and the release at Bravo Pier.

During November 1993, the Navy contracted Omega Environmental Services, Inc. (Omega) to remove the contaminated soil at the former UST site. It was discovered during the soil removal process that at least one of the tanks (Tank 39) was still in place. This tank was subsequently abandoned in place by Omega. In December 1993, NS Mayport sent an Interim Report to FDEP detailing this discovery of three additional USTs (39A, 39B, and 40) and proposed a plan of action. The tanks were abandoned in place by Bechtel Environmental, Inc. (BEI) and closure reports were submitted in July 1995 to the FDEP representing two separate tank closure activities at Site 1330 one for Tank 39 in December 1993 by Omega and one for Tanks 39A, 39B, and 40 by BEI in 1995.

Between August and September 1995, BEI also performed an Initial Remedial Action (IRA) at Bravo Pier. These activities were completed in response to recommendations made during the CAR for Site 1330. During the assessment of Site 1330, pressure tests were performed on fuel lines that were located in the area of contamination. At this time, a small leak was detected from the JP-5 lateral line valve connection. BEI removed approximately 23 tons of impacted soil, an area of 12 feet by 9 feet by 7.5 feet deep. As a result of the work plan limitations, the area of "excessively contaminated "soils was not delineated.

In January 1999, Tetra Tech NUS, Inc. (TtNUS) completed a Site Assessment Report at Bravo Pier (the location of the JP-5 line leak), identifying petroleum-impacted groundwater, but no petroleum impacted soils. Isopropylbenzene was the only contaminant detected that exceeded FDEP Groundwater Cleanup Target Levels (GCTLs). As a result, no recommendations of additional measures to assess or remediate the Bravo Pier JP-5 fuel leak were instituted since the release was not determined to be related to the leaking product line. The source of the isopropylbenzene release was considered a separate release.

Between the time of the Bravo Pier SA in 1999 and the tank closures in 1995, FDEP gave final approval of a Monitoring Only Plan (MOP) for Site 1330 that was granted in a letter to the Navy dated 17 February 1997 and was carried out by the USACE. Subsequent sampling and analysis for U.S. Environmental Protection Agency (EPA) Method 602 (including MTBE) performed during monitoring indicated a continuation and worsening trend of matrix interferences to the target analyses. Isopropylbenzene was later learned to be the laboratory matrix interference, but this was not understood during the initial monitoring of Site 1330. The full VOC parameter, which includes isopropylbenzene, was not analyzed until it became apparent during the TtNUS January 1999 SA that isopropylbenzene was also impacting Site 1330, which was located across Maine Street to the west.

An isopropylbenzene plume delineation map is provided as Figure 1-1of the work plan. Isopropylbenzene concentrations have remained mostly consistent since monitoring of the compound began in 1998.

DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED:

Additional investigation activities at Site 1330 will include:

- Mobilization and site preparation
- Underground utility location
- Subsurface piping system investigation
- Site restoration
- Post-investigation site survey
- Quarterly groundwater sampling and analysis
- Containerization, characterization, and transportation and disposal (T&D) of generated or accumulated contaminated materials
- Decontamination and demobilization
- Preparation and submittal of an Annual Site Status Report

2.0 Tasks to be Performed Under this Plan

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

2.1 Hazwoper-Regulated Tasks

- Mobilization and site preparation
- Underground utility location
- Subsurface piping system investigation
- Site restoration
- Post-investigation site survey
- Quarterly groundwater sampling and analysis
- Containerization, characterization, and T&D of generated or accumulated contaminated materials
- Decontamination and demobilization

2.2 Non-Hazwoper-Regulated Tasks

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

Tasks	Controls
• Sampling location survey • Preparation and submittal of an Annual Site Status Report	• Brief on hazards, limits of access, and emergency procedures

TABLE 2-1
Hazard Analysis
(Refer to Section 3 for hazard controls)

Potential Hazards	Project Activities									
	Mobilization	Underground utility location	Subsurface piping system investigation	Site restoration	Post-investigation site survey	Quarterly groundwater sampling and analysis	Containerizatn, characterization, and T&D of generated or accumulated contaminated materials	Decontamination and demobilization		
Manual Lifting (HS-29)	x	x	x	X	X	X	X	X		
Fire Prevention (HS-22)	x					X				
Electrical Safety (HS-23)						X				
Lockout /Tagout (HS-33)										
Ladders & Stairs(HS-25)										
Compressed Gas Cylinders (HS-63)						X				
Buried Utilities		X								
Excavations (HS-32)		X	X							
Fall Protection (HS-31)		X								
Heavy Equipment (HS-27)			X	X			X	X		
Confined Space Entry (HS-17)										
Concrete & Masonry Work (HS-43)										
Cranes and Hoisting (HS-44)										
Demolition (HS-45)										
Scaffolding(HS-73)										
Steel erection (HS-62)										
Welding and cutting (HS-22)										
Aerial Lifts (HS-41)										
Hand & Power Tools (HS-50)	x	X	X	X	X	X	X	X		
Forklifts (HS-48)										
Drilling (HS_35)										
Noise (HS-39)	X	X	X	X	X	X	X	X		
Pressurized Lines/Equipment		X	X							
Pressure Washing/Equip Decon								X		
Vacuum Truck/Pumping Operations										
Suspended Loads							X			
Vehicle Traffic	X	x	X	X	X	X				
Haul Truck Operations										
Visible Lighting	X	X	X	X	X	X	X	X		
Mechanical Guarding Hazards							X			
Asbestos Hazard										
Lead Hazard										
Chemical Hazard-Dermal/Inhalation	x	X	X	X	X	X	X	X		
Dust Hazard (Silica/Metals)										
Fire/Explosion Hazards		X	X							

3.0 Hazard Controls

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

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

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

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

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

3.1 Project-Specific Hazards

3.1.1 Underground Utility Locate Requirements

- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.

- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.

Instrumented locates are to be used to field verify utility locations and identify utilities not previously identified. An independent utility survey company will be hired to locate and verify all subsurface utilities present in the work area Technologies such as:

  - Ground Penetrating Radar (GPR)
  - Radio Frequency (RF)
  - Dual RF
  - Ferromagnetic Detectors
  - Electronic markers
  - Combination of one or more of the above technologies

This survey will be conducted within 10 calendar days of initiating work at the site.

- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually
- Underground utility locations must be physically verified by hand digging using wood or fiberglass-handled tools when any adjacent construction work is expected to come within three feet of the underground system. If construction is parallel to an existing utility the utility will be exposed by hand digging every 30 m (100 feet) if parallel within 1.5 m (5 feet) of the excavation.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change n 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.

3.1.2 Excavation Activities

- CH2M HILL personnel must notify and be granted authorization from the excavation competent person prior to entering any excavation. CH2M HILL 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.
- CH2M HILL 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.

3.1.3 Operating Heavy Equipment

- CH2M HILL 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 will 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 will 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' from the powerlines < 50 kV. Provide an additional 4' 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 2.2.8 "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 will 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.

3.1.4 Exposure to Public Vehicular Traffic

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

- Exercise caution when exiting traveled way or parking along street – avoid sudden stops, use flashers, etc.
- Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.
- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.
- Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.
- Always remain aware of an escape route—behind an established barrier, parked vehicle, guardrail, etc.
- Always pay attention to moving traffic; never assume drivers are looking out for you
- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from traffic, a "buddy system" should be used, where one worker is looking towards traffic.
- When working on highway projects, obtain a copy of the contractor's traffic control plan.
- Work area should be protected by a physical barrier such as a K-rail or Jersey barrier.
- Review traffic control devices to ensure that they are adequate to protect your work area. Traffic control devices should: 1) convey a clear meaning, 2) command respect of road users, and 3) give adequate time for proper traffic response. The adequacy of these devices are dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.
- Either a barrier or shadow vehicle should be positioned a considerable distance ahead of the work area. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion (TMCC). All vehicles within 40 feet of traffic should have an orange flashing hazard light atop the vehicle.
- Except on highways, flaggers should be used when 1) two-way traffic is reduced to using one common lane, 2) driver visibility is impaired or limited, 3) project vehicles enter or exit traffic in an unexpected manner, or 4) the use of a flagger enhances established traffic warning systems.
- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and

warns workers. Vehicles should be parked at least 40 feet away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.

3.1.5 Uneven Walking Surfaces

- Employees walking in ditches, swales and other drainage structures adjacent to roads or across undeveloped land must use caution to prevent slips and falls which can result in twisted or sprained ankles, knees, and backs.
- Whenever possible operate from a flat surface and do not enter a steep ditch or hillside.
- If steep terrain must be negotiated, sturdy leather safety shoes or boots with that provide a high degree of traction and ankle support should be used. The need for ladders or ropes to provide stability should be evaluated.
- Avoid extremely tall grass/vegetation areas where the ground surface level can not readily be anticipated or directly observed.
- Clear and grub heavily covered areas where possible prior to conducting regular activities in the work area.

3.1.6 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.

3.2 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 will 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 will be removed at regular intervals.
- All spills will be quickly cleaned up. Oil and grease will be cleaned from walking and working surfaces.

3.2.2 Hazard Communication

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

The SHSS is to perform the following:

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

- Give employees required chemical-specific HAZCOM training using Attachment 3.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

3.2.3 Shipping and Transportation of Chemical Products

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

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

3.2.4 Lifting

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

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

3.2.5 Fire Prevention

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

- Fire extinguishers will 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 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.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool– but not cold– water. Call ambulance, and get medical attention immediately!

3.2.6.1 Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70ºF, 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.

3.3 Biological Hazards and Controls

3.3.1 Snakes

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

3.3.2 Poison Ivy and Poison Sumac

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

3.3.3 Ticks

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

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

3.3.4 Bees and Other Stinging Insects

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

3.3.5 Bloodborne Pathogens

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

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

3.3.6 Mosquito Bites

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

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

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

Symptoms of Exposure to the West Nile Virus

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

- The West Nile Virus incubation period is from 3-15 days.
- If you have any questions or to report any suspicious symptoms, contact the project Health and Safety Manager.

3.4 Radiological Hazards and Controls

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

3.5 Contaminants of Concern

Contaminants of Concern are listed in Table 3-1.

TABLE 3-1
Contaminants of Concern

Contaminant	Location and Maximum[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Isopropylbenzene	GW: SB: SS:	50 ppm	900 ppm	Irritation to eyes, skin, mucous membrane, dermatitis; headaches; narcolepsy, coma	8.75
Trichloroethylene (TCE)	GW: SB: SS:	50 ppm	1,000 Ca	Headache, vertigo, visual disturbance, eye and skin irritation, fatigue, giddiness, tremors, sleepiness, nausea, vomiting, dermatitis, cardiac arrhythmia, paresthesia, liver injury	9.45
Vinyl Chloride	GW: SB: SS:	1 ppm	NL Ca	Weakness, abdominal pain, gastrointestinal bleeding, enlarged liver, pallor or cyanosis of extremities	9.99

Footnotes:
[a] Specify sample-designation and media: SB (Soil Boring).
[b] Appropriate value of PEL, REL, or TLV listed.
[c] IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.
[d] PIP = photoionization potential; NA = Not applicable; UK = Unknown.

3.6 Potential Routes of Exposure

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

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

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

4.0 Project Organization and Personnel

4.1 CH2M HILL Employee Medical Surveillance and Training

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

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

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

Employee Name	Office	Responsibility	SHSS/FA-CPR
Mike Halil	JAX	Project Manager	FA/CPR
Richard Rathnow	ORO	Health and Safety Manager	SHSS/FA-CPR

4.2 Field Team Chain of Command and Communication Procedures

4.2.1 NAVFAC EFD SOUTH

Eva Clement, CO	Southern Division NAVFAC P.O. Box 190010 North Charleston, SC 29419-9010 843/820-5518
Richard Stanley, ACO	As above 843/820-5939
Jimmy Jones, COTR	As above 843/820-5544
Beverly Washington, RPM	As above 843/820-5581

Larry Blackburn, NTR/ROICC	Southern Division NAVFAC Resident Officer in Charge of Construction P. O. Box 139, Building 13 NAS Jacksonville, FL 32212-0139 904/542-5571, ext. 260
Cheryl Mitchell, NS Mayport Environmental Manager	Staff Civil Engineer Environmental Division Building 1538 NS Mayport, FL 32227 904/270-6730

4.2.2 CH2M HILL

R. Scott Newman, Program Manager Scott Smith, Senior Project Manager Richard Rathnow, Health and Safety Manager	CH2M HILL Constructors, Inc 115 Perimeter Center Place, N.E. Suite 700 Atlanta, GA 30346-1278 770/604-9095 CH2M HILL Constructors, Inc Oak Ridge, TN 865/483-9005
Michael Halil, Project Manager Tracey Bennett, Project Engineer Garnet McCurdy, Project Superintendent Bruce Johnson, Site Health and Safety Specialist	CH2M HILL Constructors, Inc. 6219 Authority Avenue Jacksonville, FL 32221 904/777-4812

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

- Include standard terms and conditions, and contract-specific HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors)
- Select safe and competent subcontractors by:

  - obtaining, reviewing and accepting or rejecting subcontractor pre-qualification questionnaires

  - ensuring that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award

  - including HS&E submittals checklist in subcontract agreements, and ensuring that appropriate site-specific safety procedures, training and medical monitoring records are reviewed and accepted prior to the start of subcontractor's field operations

- Maintain copies of subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures in the project file accessible to site personnel.
- Provide oversight of subcontractor HS&E practices per the site-specific safety plan.

- Manage the site and interfacing with 3rd parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care.
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented.

The CH2M HILL HSM is responsible for:

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

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

- Verify this HSP remains current and amended when project activities or conditions change
- Verify CH2M HILL site personnel and subcontractor personnel read this HSP and sign Attachment 1 "Employee Signoff Form" prior to commencing field activities
- Verify CH2M HILL site personnel and subcontractor personnel have completed any required specialty training (e.g., fall protection, confined space entry) and medical surveillance as identified in Section 2.
- Verify compliance with the requirements of this HSP and applicable subcontractor health and safety plan(s)
- Act as the project "Hazard Communication Coordinator."
- Act as the project "Emergency Response Coordinator" and perform the responsibilities outlined in Section 4.
- Post OSHA job-site poster; the poster is required at sites where project field offices, trailers, or equipment-storage boxes are established; posters can be obtained by calling 800/548-4776 or 800/999-9111.
- Verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (e.g., as tasks or hazards change).
- Verify that project H&S forms and permits, found in Attachment 5, are being used as outlined in Section 2.
- Perform oversight and/or assessments of subcontractor HS&E practices per the site-specific safety plan and verify that project activity self-assessment checklists, found in Attachment 5, are being used as outlined in Section 2.

- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor's field operations.
- Manage the site and interfacing with 3rd parties in a manner consistent with our contract/subcontract agreements and the applicable standard of reasonable care.
- Coordinate with the HS&E manager regarding CH2M HILL and subcontractor operational performance, and 3rd party interfaces.
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented.

The training required for the SHSS is as follows:

- SHSS 10-hour course
- 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 Subcontractors

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

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

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

Subcontractors must comply with the established health and safety plan(s). The CH2M HILL SHSS should verify that subcontractor employee training, medical clearance,

and fit test records are current and must monitor and enforce compliance with the established plan(s). CH2M HILL oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

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

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

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

5.0 Personal Protective Equipment

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

PPE Specifications are listed in Table 5-1.

TABLE 5-1
PPE Specifications[a]

Level			Head	Respirator [b]
General site entry Oversight of remediation and construction Demobilization	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat [c] Safety glasses Ear protection [d]	None required
Utility Locates Subsurface piping system investigation Site restoration Post-investigation site survey Quarterly groundwater sampling and analysis Containerization, characterization, and T&D of generated or accumulated contaminated materials Decontamination and demobilization	Modified D	Work clothes or cotton coveralls **Boots:** Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers **Gloves:** Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Safety glasses Ear protection [d]	None required
Source Area if contaminated materials encountered	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.

Reasons for Upgrading or Downgrading Level of Protection

Upgrade[f]	Downgrade
• Request from individual performing tasks. • Change in work tasks that will increase contact or potential contact with hazardous materials. • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazards. • Instrument action levels (Section 5) exceeded.	• 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.

TABLE 5-1
PPE Specifications[a]

Level	Head	Respirator [b]

[a] Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.
[b] No facial hair that would interfere with respirator fit is permitted.
[c] Hardhat and splash-shield areas are to be determined by the SHSS.
[d] Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.
[e] Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range (refer to Section 5)--then at least every 4 hours. If encountered conditions are different than those anticipated in this HSP, contact the HSM.
[f] Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SHSS qualified at that level is present.

6.0 Air Monitoring/Sampling

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

6.1 Air Monitoring Specifications

Air Monitoring Specifications are listed in Table 6-1.

TABLE 6-1
Air Monitoring Specifications

Instrument	Tasks	Action Levels[a]		Frequency [b]	Calibration
Dust Monitor Visual Assessment	All activities	No Visible Dust Visible Dust	Level D Use dust suppression methods	Initially and periodically during tasks	Zero Daily

[a] Action levels apply to sustained breathing-zone measurements above background.
[b] The exact frequency of monitoring depends on field conditions and is to be determined by the 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 Calibration Specifications

Instrument	Gas	Span	Reading	Method
PID: OVM, 10.6 or 11.8 eV bulb	100 ppm isobutylene	RF = 1.0	100 ppm	1.5 lpm reg T-tubing
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF = 100	100 ppm	1.5 lpm reg T-tubing
PID: TVA 1000	100 ppm isobutylene	CF = 1.0	100 ppm	1.5 lpm reg T-tubing
FID: OVA	100 ppm methane	3.0 $\pm$ 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 $\pm$ 5% LEL	1.5 lpm reg direct tubing

6.3 Air Sampling

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

7.0 Decontamination

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

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

7.1 Decontamination Specifications

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

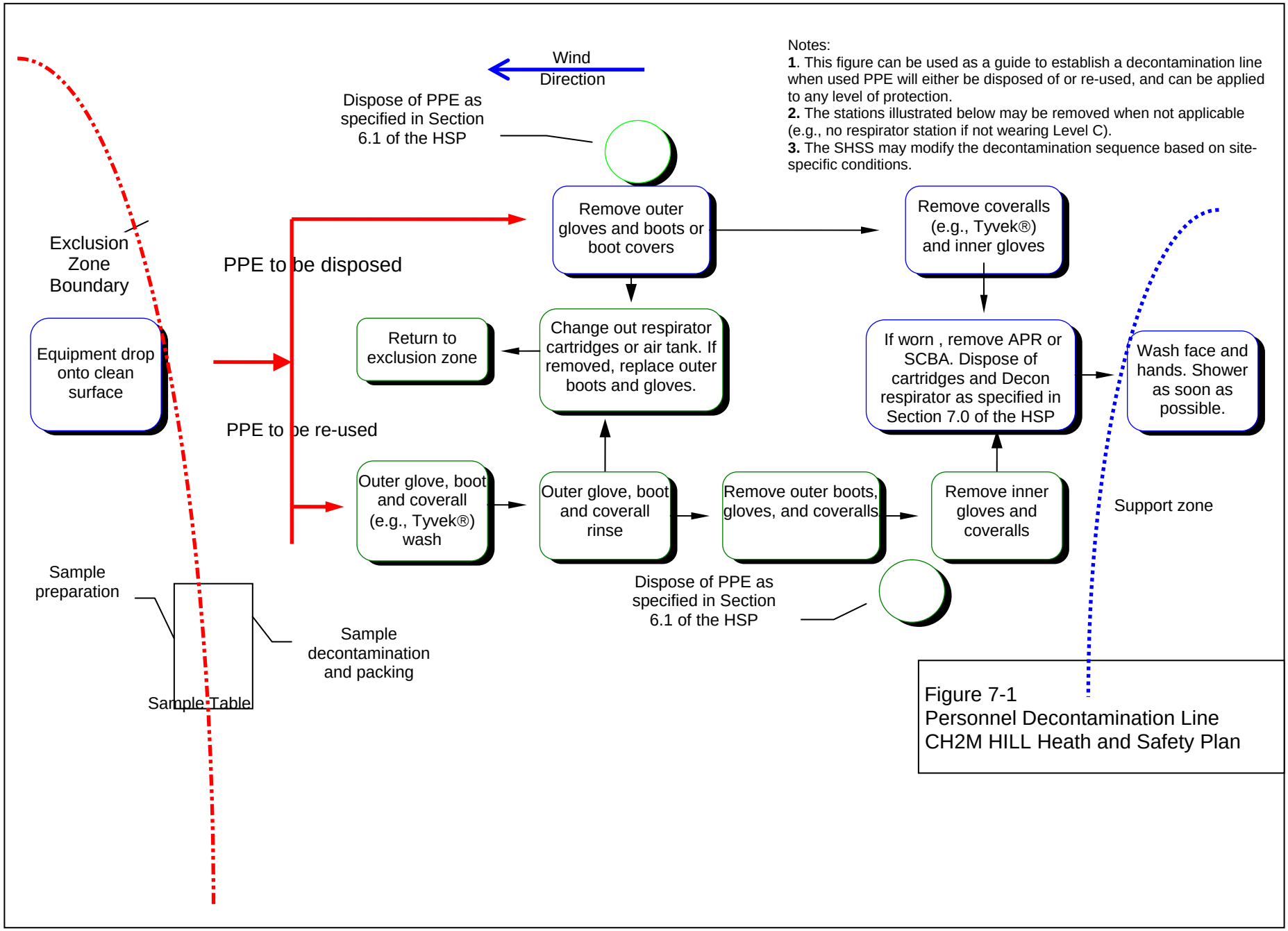


Figure 7-1
Personnel Decontamination Line
CH2M HILL Heath and Safety Plan

8.0 Spill-Containment Procedures

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

9.0 Site Control Plan

9.1 Site Control Procedures

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

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

9.2 Hazwoper Compliance Plan

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

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

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

10.0 Emergency Response Plan

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

10.1 Pre-Emergency Planning

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

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

10.2 Emergency Equipment and Supplies

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

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

10.3 Incident Reporting, Investigation and Response

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

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

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

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

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

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

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

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

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

10.4 Emergency Medical Treatment

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

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

10.5 Evacuation

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

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

10.6 Evacuation Signals

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

10.7 Incident Notification and Reporting

- Upon any project incident (fire, spill, injury, near miss, death, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- For CH2M HILL work-related injuries or illnesses, contact the respective Human Resources contact listed in Attachment 4. For CH2M HILL incidents the HR administrator completes an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.
- For CH2M HILL subcontractor incidents, complete the Subcontractor Accident/Illness Report Form (Attachment 6)and submit to the HSM.
- Notify and submit reports to client as required in contract.

11.0 Behavior Based Loss Prevention System

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

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

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

The Site Supervisor serves as the Site Health and Safety Specialist (SHSS) and is responsible for implementing the BBLPS on the project site. When a separate individual is assigned as the SHSS, the SHSS is delegated authority from the Site Supervisor to implement the BBLPS on the project site, but the Site Supervisor remains accountable for it's implementation. The Site Supervisor/Safety Coordinator will 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 will 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 will be prepared for all field activities performed by CH2M HILL and subcontractor during the course of the project by the Site Supervisor/SHSS. The Project-Specific and General Hazards of the HSP, the Hazard Analysis Table (Table 2-1), and applicable CH2M HILL Standards of Practice (SOPs) should be used as a basis for preparing CH2M HILL AHAs.

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

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

11.2 Pre-Task Safety Plans

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

11.3 Loss Prevention Observations

Loss Prevention Observations (LPOs) will 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 will perform at least one LPO each week for a tasks/operations addressed in the project-specific HSP or AHA. The Site Supervisor/SHSS will complete the LPO form in Attachment 6 for the task/operation being observed.

11.4 Loss/Near Loss Investigations

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

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

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

- Gather all relevant facts, focusing on fact-finding, not fault-finding, while answering the who, what, when, where and how questions.

- Draw conclusions, pitting facts together into a probable scenario.

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

Site Supervisors/SHSS will 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 will 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 will 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 will be submitted to the Project Manager and HSM within 24 hours of incident occurs. The final Incident Investigation and Root Cause Analysis will be submitted after completing a comprehensive investigation of the incident.

12.0 Approval

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

12.1 Original Plan

Written By: Rich Rathnow **Date: 12-7-2005**

Approved By: **Rich Rathnow** **Date: 12-7-2005**

12.2 Revisions

Revisions Made By: **Date:**

Revisions to Plan:

Revisions Approved By: **Date:**

Attachment 1

Employee Signoff Form

EMPLOYEE SIGNOFF FORM

Health and Safety Plan

The CH2M HILL 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 will 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 # :
SHSS:	Trainer:

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

The HCC will 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 will 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 will be made available for employee review in the facility/project hazard communication file.

Attachment 4

Emergency Contacts

Emergency Contacts-

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

Medical Emergency – 911
Facility Medical Response #:
Local Ambulance #:

CH2M HILL- Medical Consultant
Dr. Jerry H. Berke, M.D., M.P.H.
Health Resources
600 West Cummings Park, Suite 3400
Woburn, MA 01801-6350
781/938-4653
800/350-4511
(After hours calls will be returned within 20 minutes)

Fire/Spill Emergency -- 911
Facility Fire Response #:
Local Fire Dept #:

Local Occupational Physician

Security & Police – 911
Facility Security #:
Local Police #:

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

Utilities Emergency
Water:
Gas:
Electric:

Navy RAC Health and Safety Manager (HSM)
Name: Rich Rathnow/ORO
Phone: 865/483-9005 (Office); 865/607-6734 (Cell)
865/531-2933 (Home)

Site Health and Safety Specialist (SHSS)
Name: TBD
Phone:

CH2M HILL Human Resources Department
Name: Nancy Orr/COR
Phone: 303/771-0952

Project Manager
Name: Michael Halil
Phone: (770)604-9095

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 Medical Center - Beaches

Hospital Phone #: Hospital Phone #: 904/247-2900

Directions to Hospital

Route to Hospital:

Leave Base and proceed SOUTH on Mayport Road	3.7 miles
Mayport Road becomes SR A1A	0.5 Miles
Turn LEFT at intersection of Atlantic Blvd (stay with SR-A1A)	0.1 miles
Exit SR-10/Atlantic Blvd Ramp	0.1 miles
Merge onto Atlantic Blvd and proceed	1.1 miles
Turn RIGHT on North 3rd Street and proceed	3.4 miles
Turn RIGHT on South 13th Ave and proceed	0.6 miles
Baptist Medical Center is on LEFT	
Total Distance 9.5 miles	Travel time: ≈25 minutes

Attachment 5

Project Activity Self-Assessment Checklists/Permits

Traffic Control

Hand and Power Tools

CH2MHILL

H&S Self-Assessment Checklist – TRAFFIC CONTROL

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

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

SSC or DSC may consult with subcontractors when completing this checklist, but will not direct the means and methods of traffic control operations nor direct the details of corrective actions. Subcontractors will 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) will be corrected immediately or all exposed personnel will be removed from the hazard until corrected.

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

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate CH2M HILL employee exposure to traffic hazards.
☐ Evaluate a CH2M HILL subcontractor's compliance with traffic control requirements.
Subcontractors Name: _____

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

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

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

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

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-24.

SECTION 1

SAFE WORK PRACTICES (3.1)

		Yes	No	N/A	N/O
1.	Personnel working on/adjacent to active roadways or in control zones are wearing safety vests.	☐	☐	☐	☐
2.	Traffic control plan (TCP) is consistent with roadway, traffic, and working conditions.	☐	☐	☐	☐
3.	TCP has been approved by regulatory or contractual authority prior to work.	☐	☐	☐	☐
4.	TCP considers all factors that may influence traffic related hazards and controls.	☐	☐	☐	☐
5.	Work areas are protected by rigid barriers.	☐	☐	☐	☐
6.	Lookouts are used when applicable.	☐	☐	☐	☐
7.	Vehicles are parked 40 feet away from work zone or are equipped with hazard beacon/strobe.	☐	☐	☐	☐
8.	TMCC or TMA vehicle is used where appropriate.	☐	☐	☐	☐
9.	All CH2M HILL traffic control devices conform to MUTCD standards.	☐	☐	☐	☐
10.	Traffic control devices are inspected continuously.	☐	☐	☐	☐
11.	Flagging is only used when other means of traffic control are inadequate.	☐	☐	☐	☐
12.	Additional traffic control zone controls have been implemented.	☐	☐	☐	☐
13.	Cranes do not swing loads/booms over nor do workers enter/cross live roadways (as defined).	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
GENERAL (3.2.1)				
14. Lane closings are performed when required by this SOP.	☐	☐	☐	☐
15. Traffic control configurations are based on an engineering study of the location.	☐	☐	☐	☐
16. If no study, traffic control is performed with approval of the authority having jurisdiction.	☐	☐	☐	☐
17. TCP has been prepared and understood by all responsible parties prior to work.	☐	☐	☐	☐
18. Special preparation/coordination with external parties has been conducted where applicable.	☐	☐	☐	☐
19. All contractor traffic control devices conform to MUTCD standards.	☐	☐	☐	☐
20. Traffic movement and flow are inhibited or disrupted as little as possible.	☐	☐	☐	☐
21. Supplemental equipment and activities do not interfere with traffic.	☐	☐	☐	☐
22. Drivers and pedestrians are considered when entering and traversing traffic control zone.	☐	☐	☐	☐
TRAFFIC CONTROL ZONES (3.2.2)				
23. Traffic control zones are divided into the necessary five areas.	☐	☐	☐	☐
24. Advances warning area is designed based on conditions of speed, roadways, and driver needs.	☐	☐	☐	☐
25. Advanced warning signage is spaced according to roadway type and conditions.	☐	☐	☐	☐
26. Transition areas are used to channelize traffic around the work area.	☐	☐	☐	☐
27. Buffer areas are used to provide a margin of safety for traffic and workers.	☐	☐	☐	☐
28. The buffer area is free of equipment, workers, materials, and worker vehicles.	☐	☐	☐	☐
29. The length of the buffer area is two times the posted speed limit in feet.	☐	☐	☐	☐
30. All work is contained in the work area and is closed to all traffic.	☐	☐	☐	☐
31. A termination area is used to provide traffic to return to normal lanes.	☐	☐	☐	☐
32. A downstream taper is installed in the termination area.	☐	☐	☐	☐
DEVICE INSTALLATION AND REMOVAL (3.2.3)				
33. All vehicles involved with device installation/removal have hazard beacons/strobes.	☐	☐	☐	☐
34. Devices are installed according to the order established by this SOP.	☐	☐	☐	☐
35. Devices are removed in the opposite order of installation.	☐	☐	☐	☐
36. Tapers are used to move traffic out of its normal path.	☐	☐	☐	☐
37. Tapers are created using channelizing devices.	☐	☐	☐	☐
38. The length of taper is determined by posted speed and width of lane to be closed (see formula).	☐	☐	☐	☐
39. Local police or highway patrol assist during taper installation and removal.	☐	☐	☐	☐
40. TMCC/ TMA vehicles are used to protect personnel during installation and removal of devices.	☐	☐	☐	☐
41. Cone trucks are equipped with platforms and railings.	☐	☐	☐	☐
42. Cones are the appropriate height for the specific roadway and are reflectorized.	☐	☐	☐	☐
43. Temporary sign supports are secured using sandbags to prevent movement.	☐	☐	☐	☐
44. Arrow panels are used on lane closures where required.	☐	☐	☐	☐
45. Concrete barriers are used where required.	☐	☐	☐	☐
46. Barrels, crash cushions, or energy absorbing terminals are used to protect traffic as required.	☐	☐	☐	☐
47. Changeable message signs (CMS) are used as required.	☐	☐	☐	☐
48. CMS are not used to replace required signage.	☐	☐	☐	☐
49. No more than two message panels are used in any message cycle on CMS.	☐	☐	☐	☐
FLAGGING (3.2.4)				
50. Flagging is used only when other traffic control methods are inadequate.	☐	☐	☐	☐
51. Only approved personnel with current certification are allowed to be used as flaggers.	☐	☐	☐	☐
52. Flaggers are located off the traveled portion of the roadway.	☐	☐	☐	☐
53. A communication system is established when more than one flagger is used.	☐	☐	☐	☐
54. Hand signaling by flaggers is by means of red flags, sign paddles, or red lights.	☐	☐	☐	☐
55. Flaggers are alert, positioned close enough to warn work crews, and easily identified from crew.	☐	☐	☐	☐
56. An escape plan is established by crew and flaggers prior to traffic control set up.	☐	☐	☐	☐
57. Signs indicating a flagger is present are used and removed as required.	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
INSPECTION AND MAINTENANCE (3.2.5)				
Traffic control zones are monitored to determine their effectiveness under varying conditions.	☐	☐	☐	☐
Traffic control devices are inspected at the beginning and continuously during work shift.	☐	☐	☐	☐
Traffic control devices are restored to their proper position immediately and continuously.	☐	☐	☐	☐
Damaged, old, or ineffective devices are removed and replace immediately and continuously.	☐	☐	☐	☐
Devices using reflected light for illumination are cleaned and monitored continuously.	☐	☐	☐	☐

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

Auditor: _____ Project Manager: _____

CH2MHILL

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

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

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

SSC or DSC may consult with subcontractors when completing this checklist, but will not direct the means and methods of hand and power tool use nor direct the details of corrective actions. Subcontractors will 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) will be corrected immediately or all exposed personnel will be removed from the hazard until corrected.

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

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

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

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

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

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

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

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-50.

SECTION 1

	Yes	No	N/A	N/O
SAFE WORK PRACTICES (3.1)				
1. All tools operated according to manufacturer's instructions and design limitations.	☐	☐	☐	☐
2. All hand and power tools maintained in a safe condition and inspected and tested before use.	☐	☐	☐	☐
3. Defective tools are tagged and removed from service until repaired.	☐	☐	☐	☐
4. PPE is selected and used according to tool-specific hazards anticipated.	☐	☐	☐	☐
5. Power tools are not carried or lowered by their cord or hose.	☐	☐	☐	☐
6. Tools are disconnected from energy sources when not in use, servicing, cleaning, etc.	☐	☐	☐	☐
7. Safety guards remain installed or are promptly replaced after repair.	☐	☐	☐	☐
8. Tools are stored properly.	☐	☐	☐	☐
Cordless tools and recharging units both conform to electrical standards and specifications.	☐	☐	☐	☐
10. Tools used in explosive environments are rated for such use.	☐	☐	☐	☐
11. Knife or blade hand tools are used with the proper precautions.	☐	☐	☐	☐
12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stressors.	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
GENERAL (3.2.1)				
13. PPE is selected and used according to tool-specific hazards anticipated.	☐	☐	☐	☐
14. Tools are tested daily to assure safety devices are operating properly.	☐	☐	☐	☐
15. Damaged tools are removed from service until repaired.	☐	☐	☐	☐
16. Power operated tools designed to accommodate guards have guards installed.	☐	☐	☐	☐
17. Rotating or moving parts on tools are properly guarded.	☐	☐	☐	☐
18. Machines designed for fixed locations are secured or anchored.	☐	☐	☐	☐
19. Floor and bench-mounted grinders are provided with properly positioned work rests.	☐	☐	☐	☐
20. Guards are provided at point of operation, nip points, rotating parts, etc.	☐	☐	☐	☐
21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid.	☐	☐	☐	☐
ELECTRIC-POWERED TOOLS (3.2.2)				
22. Electric tools are approved double insulated or grounded and used according to SOP HS-23.	☐	☐	☐	☐
23. Electric cords are not used for hoisting or lowering tools.	☐	☐	☐	☐
24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed.	☐	☐	☐	☐
25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool.	☐	☐	☐	☐
26. Portable, power-driven circular saws are equipped with proper guards.	☐	☐	☐	☐
ABRASIVE WHEEL TOOLS (3.2.3)				
27. All employees using abrasive wheel tools are wearing eye protection.	☐	☐	☐	☐
28. All grinding machines are supplied with sufficient power to maintain spindle speed.	☐	☐	☐	☐
29. Abrasive wheels are closely inspected and ring-tested before use.	☐	☐	☐	☐
30. Grinding wheels are properly installed.	☐	☐	☐	☐
31. Cup-type wheels for external grinding are protected by the proper guard or flanges.	☐	☐	☐	☐
32. Portable abrasive wheels used for internal grinding are protected by safety flanges.	☐	☐	☐	☐
33. Safety flanges are used only with wheels designed to fit the flanges.	☐	☐	☐	☐
34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength.	☐	☐	☐	☐
PNEUMATIC-POWERED TOOLS (3.2.4)				
35. Tools are secured to hoses or whip by positive means to prevent disconnection.	☐	☐	☐	☐
36. Safety clips or retainers are installed to prevent attachments being expelled.	☐	☐	☐	☐ 37.
Safety devices are installed on automatic fastener feed tools as required.	☐	☐	☐	☐
38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded.	☐	☐	☐	☐
39. Manufacturer's safe operating pressure for hoses, pipes, valves, etc. are not exceeded.	☐	☐	☐	☐
40. Hoses are not used for hoisting or lowering tools.	☐	☐	☐	☐
41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure.	☐	☐	☐	☐
42. Airless spray guns have required safety devices installed.	☐	☐	☐	☐
43. Blast cleaning nozzles are equipped with operating valves, which are held open manually.	☐	☐	☐	☐
44. Supports are provided for mounting nozzles when not in use.	☐	☐	☐	☐
45. Air receiver drains, handholes, and manholes are easily accessible.	☐	☐	☐	☐
46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water.	☐	☐	☐	☐
47. Air receivers are completely drained at required intervals.	☐	☐	☐	☐
48. Air receivers are equipped with indicating pressure gauges.	☐	☐	☐	☐
49. Safety, indicating, and controlling devices are installed as required.	☐	☐	☐	☐
50. Safety valves are tested frequently and at regular intervals to assure good operating condition.	☐	☐	☐	☐

SECTION 2 (continued)

	Yes	No	N/A	N/O
LIQUID FUEL-POWERED TOOLS (3.2.5)				
51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining.	☐	☐	☐	☐
Liquid fuels are stored, handled, and transported in accordance with SOP HS-21	☐	☐	☐	☐
Liquid fuel-powered tools are used in confined spaces in accordance with SOP HS-17.	☐	☐	☐	☐
Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded.	☐	☐	☐	☐
POWDER-ACTUATED TOOLS (3.2.6)				
Only trained employee operates powder-actuated tools.	☐	☐	☐	☐
Powder-actuated tools are not loaded until just prior to intended firing time.	☐	☐	☐	☐
Tools are not pointed at any employee at any time.	☐	☐	☐	☐
Hands are kept clear of open barrel end.	☐	☐	☐	☐
Loaded tools are not left unattended.	☐	☐	☐	☐
Fasteners are not driven into very hard or brittle materials.	☐	☐	☐	☐
Fasteners are not driven into easily penetrated materials unless suitable backing is provided.	☐	☐	☐	☐
Fasteners are not driven into spalled areas.	☐	☐	☐	☐
Powder-actuated tools are not used in an explosive or flammable atmosphere.	☐	☐	☐	☐
All tools are used with correct shields, guards, or attachments recommended by manufacturer.	☐	☐	☐	☐
JACKING TOOLS (3.2.7)				
Rated capacities are legibly marked on jacks and not exceeded.	☐	☐	☐	☐
Jacks have a positive stop to prevent over-travel.	☐	☐	☐	☐
The base of jacks are blocked or cribbed to provide a firm foundation, when required.	☐	☐	☐	☐
Wood blocks are place between the cap and load to prevent slippage, when required.	☐	☐	☐	☐
After load is raised, it is cribbed, blocked, or otherwise secured immediately.	☐	☐	☐	☐
Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.	☐	☐	☐	☐
All jacks are properly lubricated.	☐	☐	☐	☐
Jacks are inspected as required.	☐	☐	☐	☐
Repair or replacement parts are examined for possible defects.	☐	☐	☐	☐
Jacks not working properly are removed from service and repaired or replaced.	☐	☐	☐	☐
HAND TOOLS (3.2.8)				
Wrenches are not used when jaws are sprung to the point of slippage.	☐	☐	☐	☐
Impact tools are kept free of mushroomed heads.	☐	☐	☐	☐
Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool.	☐	☐	☐	☐

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

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

Auditor: _____ Project Manager: _____

Attachment 6

Behavior Based Loss Prevention System Forms

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

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:

CH2MHILL PRE-TASK SAFETY PLAN

Project: _____ Location: _____Date:_____

Supervisor: _____Emergency Number(s):_____

Brief Job Descriptions:

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

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

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

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

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

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

__ Chemical burns/contact	__ Trench, excavations, cave-ins	__Ergonomics
__ Pressurized lines/ equipment	__ Overexertion	__ Chemical splash
__ Thermal burns	__ Pinch points	__ Poisonous plants/insects
__ Electrical	__ Cuts/abrasions	___Eye hazards/flying projectile
__ Weather conditions	__ Spills	__ Inhalation hazard
__Heights/fall> 6’	__ Overhead Electrical hazards	__ Heat/cold stress
__ Noise	__ Elevated loads	__ Water/drowning hazard
__ Explosion/fire	__ Slips, trip and falls	__ Heavy equipment
__Radiation	__ Manual lifting	__ Aerial lifts/platforms
__ Confined space entry	__Welding/cutting	__ Demolition

Other Potential Hazards (Describe):

_____

CH2MHILL PRE-TASK SAFETY PLAN

Hazard Control Measures (Check all that apply):			
PPE __ Thermal/lined __ Eye __ Dermal/hand __ Hearing __ Respiratory __ Reflective vests __ Flotation device	Protective Systems __ Sloping __ Shoring __ Trench box __ Barricades __ Competent person __ Locate buried utilities __ Daily inspections	Fire Protection __ Fire extinguishers __ Fire watch __ Non-spark tools __ Grounding/bonding __ Intrinsically safe equipment	Electrical __ Lockout/tagout __ Grounded __ Panels covered __ GFCI/extension cords __ Power tools/cord inspected
Fall Protection __ Harness/lanyards __ Adequate anchorage __ Guardrail system __ Covered opening __ Fixed barricades __ Warning system	Air Monitoring __ PID/FID __ Detector tubes __ Radiation __ Personnel sampling __ LEL/O2 __ Other	Proper Equipment __ Aerial lift/ladders/scaffolds __ Forklift/ Heavy equipment __ Backup alarms __ Hand/power tools __ Crane w/current inspection __ Proper rigging __ Operator qualified	Welding & Cutting __ Cylinders secured/capped __ Cylinders separated/upright __ Flash-back arrestors __ No cylinders in CSE __ Flame retardant clothing __ Appropriate goggles
Confined Space Entry __ Isolation __ Air monitoring __ Trained personnel __ Permit completed __ Rescue	Medical/ER __ First-aid kit __ Eye wash __ FA-CPR trained personnel __ Route to hospital	Heat/Cold Stress __ Work/rest regime __ Rest area __ Liquids available __ Monitoring __ Training	Vehicle/Traffic __ Traffic control __ Barricades __ Flags __ Signs
Permits __ Hot work __ Confined space __ Lockout/tagout __ Excavation __ Demolition __ Energized work	Demolition __ Pre-demolition survey __ Structure condition __ Isolate area/utilities __ Competent person __ Hazmat present	Inspections: __ Ladders/aerial lifts __ Lanyards/harness __ Scaffolds __ Heavy equipment __Cranes and rigging	Training: __ Hazwaste __ Construction __ Competent person __ Task-specific (THA) __ Hazcom
FieldNotes:_____ _____			

Supervisor signature:_____ Date:_____

List employees who reviewed hazards identified per the checklist.

Print Name	Badge No.	Signature	SS# (Unbadged Personnel)

CH2MHILL

LOSS PREVENTION OBSERVATION

Project:	Supervisor:	Date:
_____	_____	_____

Task/Operation Observed:	Job Title of Worker Observed:
_____ _____ _____	_____ _____

Background Information/comments:	Task Hazard Analysis completed for task (Y/N):
_____ _____ _____	_____

Positive Observations/Safe Work Procedures

1._____

2._____

3._____

4._____

Questionable Activity/Unsafe Condition Observed

1._____

2._____

3._____

Observed Worker's Comment(s)

1._____

2._____

3._____

4._____

Supervisor's Corrective Actions Taken:

1._____

2._____

3._____

4._____

CH2MHILL

Loss Investigation Report Form

Employer Information

Company Name:
_____

Project Name: _____ Project Number: _____

Project Location:
_____

CHIL Project? Yes ☐ No ☐

Task Location: _____

Job Assignment: _____ Business Group: _____

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

Near Loss Incident Specific Information

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

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

Address where the incident occurred:
_____
Equipment Malfunction : Yes ☐ No ☐
Activity was a Routine Task: Yes ☐ No ☐

Describe any property damage:
_____

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

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

Describe the specific incident and how it occurred:

_____
_____
_____
_____

Describe how this incident may have been prevented:

_____
_____
_____

Contributing Factors (Describe in detail why incident occurred):

_____
_____
_____

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

Witness Information (First Witness)

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

Witness Information (Second Witness)

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

COMPLETE ROOT CAUSE ANALYSIS FORM

Root Cause Analysis Form

Root Cause Analysis (RCA)

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

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

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

Investigation Team Members

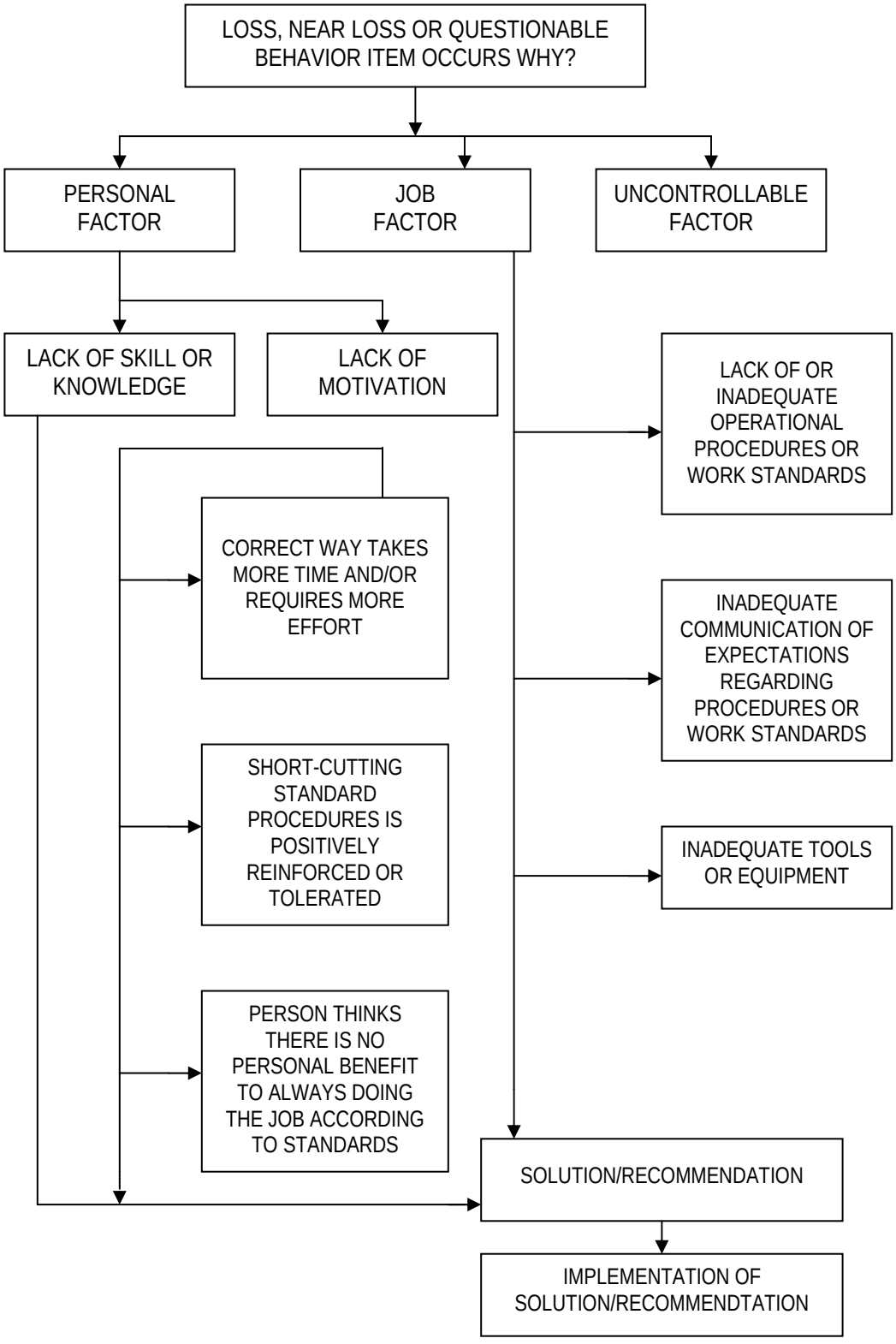
Name	Job Title	Date

Results of Solution Verification and Validation

Reviewed By

Name	Job Title	Date

Root Cause Analysis Flow Chart



Determination of Root Cause(s)

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

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

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

<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.

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 ☐ Property Damage ☐ Spill/Release
☐ Environmental/Permit Issue ☐ Near Miss ☐ 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 ☐ Southwest ☐ Asia Pacific
☐ Southeast ☐ Corporate ☐ Europe Middle East
☐ Northwest ☐ Canadian ☐ 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:_____
_____

Attachment 7

Applicable Material Safety Data Sheets
(available onsite)

Attachment 8

Subcontractor H&S Plans/Procedures

Appendix C

Technical Memorandum
Historical Review of Site 1330 Fuel Distribution System
Naval Station Mayport, Mayport, Florida

Historical Review of Site 1330 Fuel Distribution System, Naval Station Mayport-Mayport, Florida

PREPARED FOR: File

PREPARED BY: Jason Cole/ORO

DATE: June 6, 2005

Introduction

From 1942 to the early 1950s high and low octane fuels were dispensed from selected locations along Bravo pier at Naval Station Mayport. The fuel depot was composed of underground pipes, storage tanks and above ground loading and unloading stations. Over time, components of the fuel depot were demolished and removed from service; system abandonment procedures however, were poorly documented. Subsurface petroleum contamination has been identified at the former depot location now referred to as Site 1330. In an effort to better understand the observed contaminant distribution, a historical review of facility operations and layout was performed. This memorandum provides a summary of historical depot configuration, operation and demolition.

Fuel Depot

The fuel depot operated at Site 1330 was composed of four underground tanks, underground transfer piping and loading/unloading stations on land and water. System tanks appear to be identical and were constructed of concrete with a rated capacity of 25,000 gallons. Tanks were approximately 25' in diameter and 10 feet high; all tanks were located approximately 6 below ground surface. In general the tanks were filled by a network of three and four inch diameter piping. Fuel was dispensed through two inch diameter lines. Although pumps were not explicitly shown or referenced on drawings available for review, the location of the tanks relative to product discharge points confirms the system operated under positive pressure. Tank locations and subsurface piping alignments are depicted in Figure 1.

Historical drawings obtained from Naval Station Mayport indicate that the tanks stored at least 3 different products while in operation: diesel oil, low octane gasoline, and high octane gasoline. Drawing revision notes indicate diesel was handled less than two years before the tank was converted to high octane gasoline. A historical drawing of the fuel depot is included in Attachment A. Table 1 summarizes fuel depot tank names, historical contents and inferred operational characteristics.

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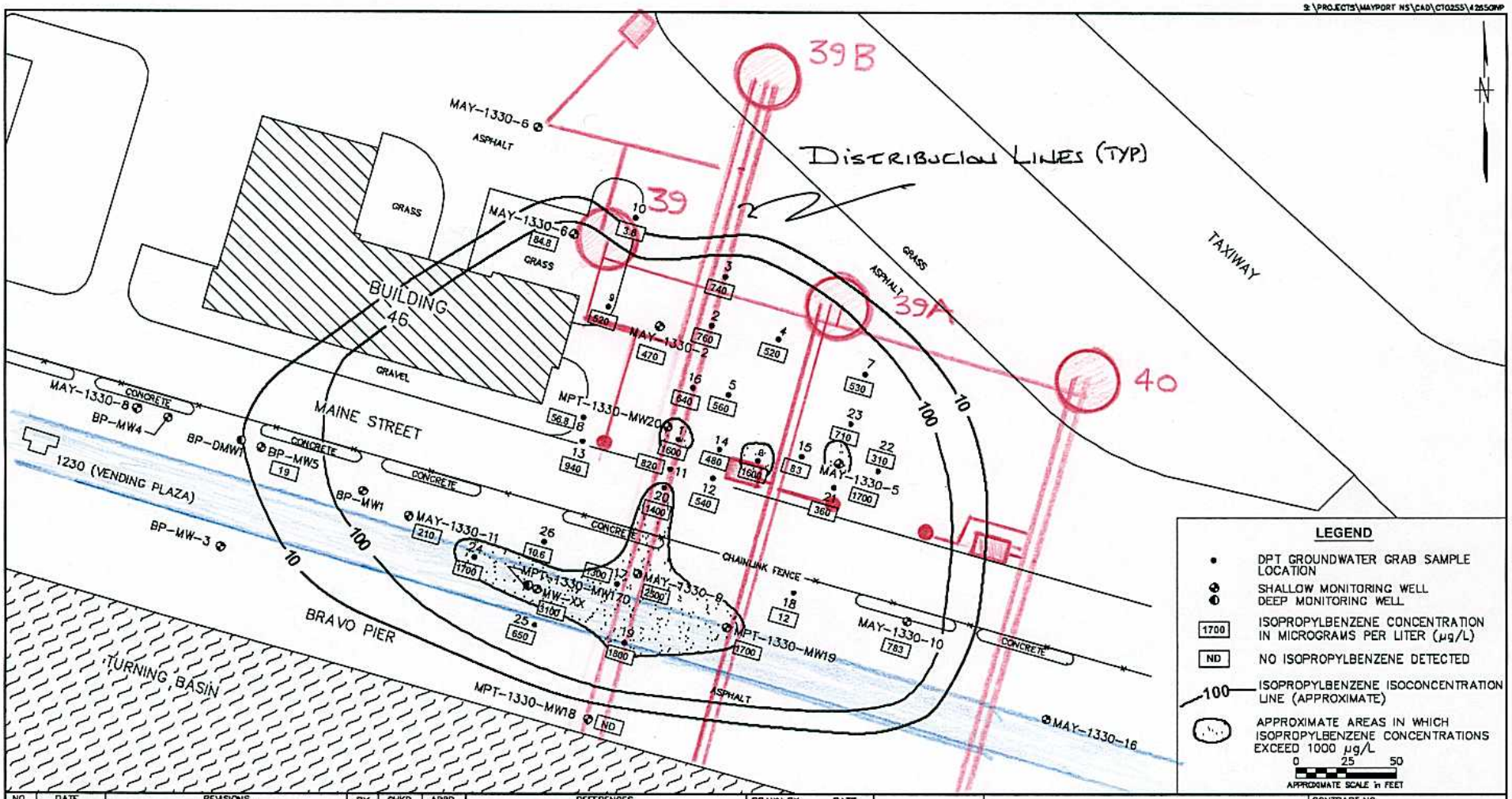


NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY LLK DATE 5/28/03
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

FIGURE 1

SITE 1330
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

CONTRACT NO. 4265
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 3-3
REV. 0

FORM CADD NO. SDIV_BHLDWG - REV 0 - 1/20/98

● – TANK FILL STATION
– TRUCK LOADING STATION
– UTILITY CORRIDOR

TABLE 1
Site 1330 - Summary of Fuel Depot Tanks
Naval Station Mayport- Mayport, Florida

Site 1330 Reference	Design Drawing	Contents	Function
Tank 39	Tank No.1	High Octane Gasoline	Fill from barge, truck and transfer from No.4 Dispense to pier Dispense to truck
Tank 39A	Tank No.3	Low Octane Gasoline	Fill from barge and truck Dispense to pier Dispense to truck
Tank 39B	Tank No.2	High Octane Gasoline	Fill from barge, truck and transfer from No.4 Dispense to pier Dispense to truck
Tank 40	Tank No.4	Diesel (< 2years) High Octane Gasoline	Fill from barge and truck Dispense to pier Dispense to truck Transfer to Tank No.1 and No.2

Underground Tank Abandonment

Environmental investigation of site 1330 in the early 1990s reveled that subsurface media was impacted by petroleum products. Subsequent investigation and remediation activities at the site ultimately led to the discovery of Tank 39 and later Tanks 39A, 39B and 40. Up until the discovery of the tanks, it was generally believed that the four tanks in the fuel depot had been previously abandoned. Following discovery of the underground tanks, abandonment procedures were initiated. In 1993, Omega Environmental excavated contaminated soil from the top and sides of Tank 39. During excavation, the tank man way was exposed and free product was reportedly observed within the tank. To aid abandonment, the tank roof was removed to allow excavation of petroleum contaminated solids from the vessel. Management of liquids present in the tank following solids removal was not specified. It is assumed that liquids were pumped from the tank and discharged to an oily water treatment plant operated by the facility. Following steam cleaning of the interior tank surfaces, the concrete structure was backfilled with soil to match surrounding surface grade.

Early in 1995, Bechtel Environmental commenced abandonment of the remaining underground tanks at Site 1330. Procedures employed duplicated efforts of the previous abandonment performed by Omega Environmental. Abandonment activities are summarized below.

- Soil covering the tanks was removed to expose the vessel manways and roofs. Soil was not removed from the sides of the tank below the roof elevation.

- The roof structure of Tank 39A was completely collapsed and concrete and supporting steel were present in the tank with petroleum contaminated water and soil. Solid materials were removed from the tank and disposed off site as non-hazardous waste. Concrete debris were removed, cleaned, and recycled locally.
- Tank 39B and 40 were filled with petroleum contaminated water and soil (50/50). Water present was evacuated and discharged to the oily water treatment plant. Following roof demolition, solids were excavated and disposed off site as non-hazardous waste. Concrete debris were cleaned and recycled locally.
- Piping and valves present in the tank and access pits was removed, cleaned and disposed.
- Once solid and liquids were removed, each of the vessel walls was steamed cleaned. Rinsate was collected and discharged to Naval Station's oily water treatment plant.
- Clean tanks were filled to match existing grade and covered with grass seed and asphalt (Tank 39A only).

Subsurface Contamination

Contamination of site soil and groundwater by gasoline range petroleum products has historically declined at Site 1330. Benzene and isopropylbenzene are currently the only contaminants found in excess of Groundwater cleanup target levels (GCTL); no other contaminants of concern (COC) have been identified at the site. Isopropylbenzene was discovered in groundwater during a sampling event in 1999. Subsequent investigation activities delineated contamination to a foot print of approximately 400' x 240'.

The dissolved plume is triangular and points toward former tank farm location. Figure 1 provides an overview of the isopropyl benzene plume relative to fuel depot component locations. Groundwater gradients at 1330 are flat but generally flow toward the turning basin. The shape of the isopropylbenzene plume and the historical piping locations from the former fuel depot strongly suggest that petroleum products were released to the subsurface during depot operations or at some unknown time after the facility ceased operations. Bravo Pier contains several active utility corridors, running parallel with Maine Street. Historical facility review indicates fuel pipes were not located in the areas were lateral spreading of isopropyl benzene is observed indicating that preferential contaminant migration has occurred in the active utility corridors.

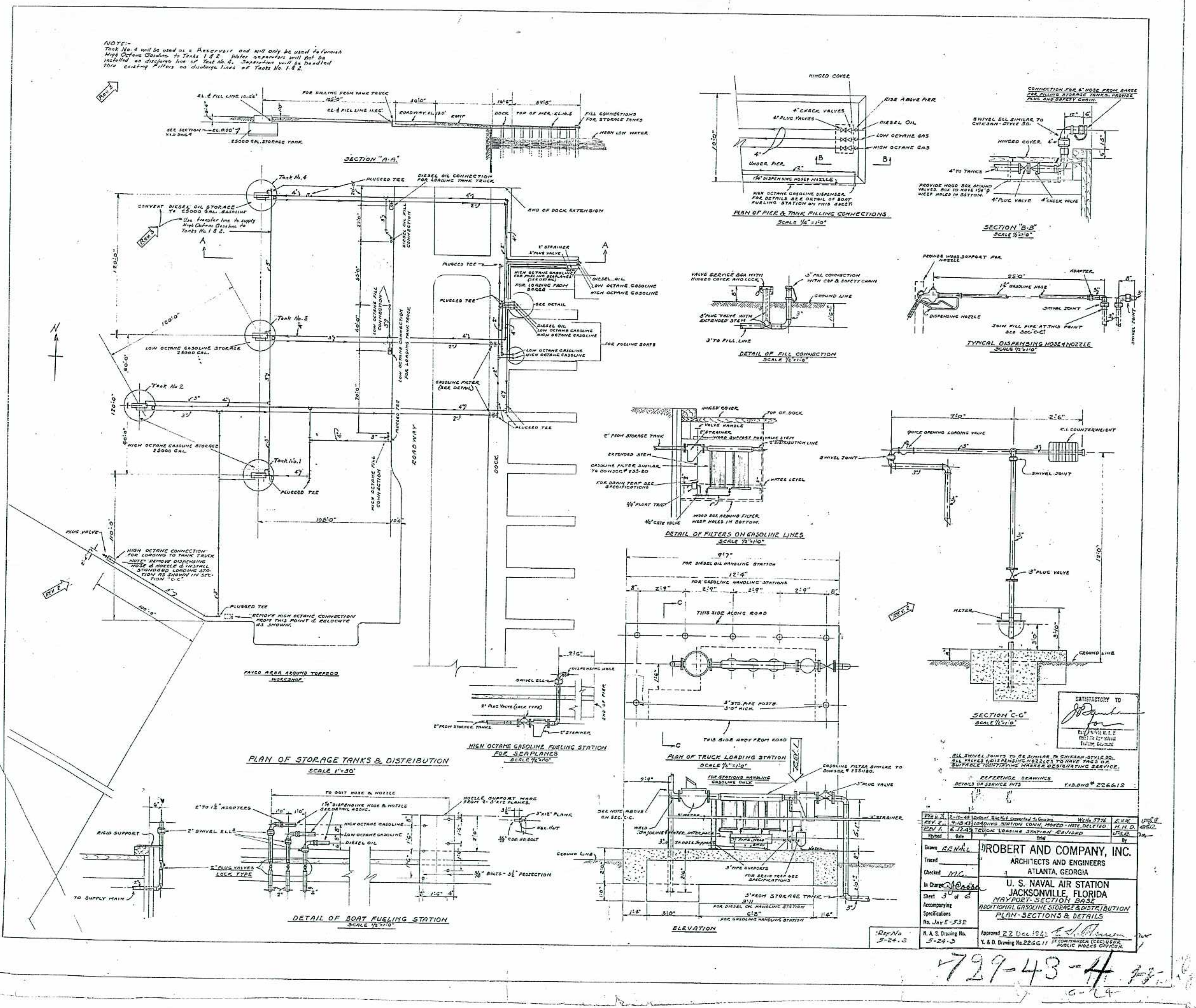
Conclusions

Concentrations of isopropylbenzene at Site 1330 have remained stable since monitoring for the contaminant began in 1999. Chemical properties of isopropyl benzene indicate that degradation is possible under both anaerobic and aerobic conditions. Despite this potential, there is inconclusive proof to support natural degradation process are actually occurring at the site. Stable concentrations of isopropylbenzene could be attributed to several factors: microbial conditions, inhibitory chemical concentrations, or the presence of residual source material.

Historical evaluation of the fuel depot infrastructure and operation relative to contamination at the site suggests isopropylbenzene was released to the subsurface as a component of high octane gasoline. The mechanism of release is unknown however the location of the plume relative to piping alignment suggests a leak may have occurred in high octane gasoline piping used to fill the bulk tank or piping used to distribute product to end users. Likewise, the time of release is also unknown and may have occurred over many years of facility operation or as a discrete point release.

Closure reports indicate the former storage tanks were properly abandoned and therefore are no longer considered a potential source of contamination. The status of existing piping used to convey fuels however, is largely unknown as closure reports made no reference to abandonment of the distribution system. Recent field investigation activities have confirmed the presence of a steel pipeline trending northeasterly from the pier toward the location of Tank 39B. Furthermore, the pipeline location matches the observed contaminant distribution remarkably well. While it is unlikely that product is present in the pipeline, the potential should be investigated to confirm that residual petroleum products are not impacting groundwater at Site 1330.

Attachment A


NOTE:-
Tank No. 4 will be used as a Reservoir and will only be used to furnish High Octane Gasoline to Tanks 1 & 2. Water separators will not be installed on discharge line of Tank No. 4. Separation will be handled thru existing Filters on discharge lines of Tanks No. 1 & 2.
SECTION "A-A"
PLAN OF PIER & TANK FILLING CONNECTIONS
SCALE 1/8"=1'0"
SECTION "B-B"
DETAIL OF FILL CONNECTION
TYPICAL DISPENSING HOSE & NOZZLE
DETAIL OF FILTERS ON GASOLINE LINES
SECTION "C-C"
PLAN OF STORAGE TANKS & DISTRIBUTION
SCALE 1"=30'
HIGH OCTANE GASOLINE FUELING STATION FOR SEAPLANES
PLAN OF TRUCK LOADING STATION
ELEVATION
DETAIL OF BOAT FUELING STATION
ALL SWIVEL JOINTS TO BE SIMILAR TO CHIKSAN STYLE 50. ALL VALVES & DISPENSING NOZZLES TO HAVE TAGS OR SUITABLE IDENTIFYING MARKER DESIGNATING SERVICE.
REFERENCE DRAWINGS
DETAILS OF SERVICE PITS Y.&D. DWG # 226612
SATISFACTORY TO
REV. 3. 2-10-44 Diesel Tank No. 4 converted to Gasoline W.K. No 5776 E.V.W.
REV. 2. 9-18-43 LOADING STATION CONN. MOVED - NOTE DELETED H.H.D.
REV. 1. 6-12-43 TRUCK LOADING STATION REVISED J.S.R.
Revised Date Brief By
Drawn E.E. HALL
Traced
Checked M.C.
In Charge
Sheet 3 of 6
Accompanying Specifications No. Jax E-532
ROBERT AND COMPANY, INC.
ARCHITECTS AND ENGINEERS
ATLANTA, GEORGIA
U. S. NAVAL AIR STATION
JACKSONVILLE, FLORIDA
MAYPORT-SECTION BASE
ADDITIONAL GASOLINE STORAGE & DISTRIBUTION
PLAN-SECTIONS & DETAILS
N. A. S. Drawing No. 5-24-3
Approved 22 Dec 1942
Y. & D. Drawing No. 226611
LT. COMMANDER (CEC) USNR PUBLIC WORKS OFFICER
Ref No 5-24-3
729-43-4

Appendix D

Quality Control Attachments

- Transportation and Disposal Log
- Submittal Register
- Testing Plan and Log
- Summary of Field Tests Log
- Quality Control Manager Appointing Letter
- Alternate Quality Control Manager Appointing Letter
- Contractor Daily Production Report
- Contractor Daily Quality Control Report
- Preparatory Phase Report

Transportation and Disposal Log

CTO No	Project No	Project Name	Site Description	Container Type	Container Design	Waste Profile Sample No	Contractor	Transporter	Date Transported	Transporter EPA ID	Load ID	Disposal Facility	Disp Fac EPA ID	Media	Waste Type (Haz, Nonhaz, TSCA)	Waste Code/ Haz Waste No	Disposal Date	Manifest Number	Disposal Treatment Method (Enter disposal quantity under appropriate method)					Certif of Disp/ Destruc Date	Comments/ Notes	File Status (see note)
																			Incineration	Recycle	Landfill	Other	Unit			

Contract Number: N62467-01-D-0331			CTO No.: 0012			CTO Title: NS Mayport Additional Investigation at Bldg 46					Location: Mayport, 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-04	**Drawings**															
		As-builts															
	SD-07	**Schedules**															
		Project Schedule															
	SD-09	**Reports**															
		Project Completion Report															
		Annual Site Status Report															
		Environmental Conditions Report															
		Laboratory Analytical Reports															
		Soil Density Reports															
	SD-13	**Certificates**															
		Analytical Laboratory Certification															
		Construction Laboratory Certification															
		Disposal Facility Permit															
		Transport Permit															
		Land Surveyor Certification															
		Utility Excavation Permit															
		Well Driller Permit															
	SD-18	**Records**															
		Contaminated Soil Disposal Profile															
		Contaminated Soil DisposalManifests															
		Contaminated Water Disposal Manifests															
		Contaminated Water Disposal Profile															
		List of Contractor Personnel															
		Contractor Production Reports															
		Contractor QC Reports															
		Backfill log															
		Transportation and Disposal Log															
		Testing Plan and Log															
		Compaction Test Records - Field															
		Well Purge Records															

Testing Plan and Log

CH2M HILL Constructors, Inc.

Contract Number: N62467-01-D-0331		CTO No.: 0012		CTO Title: NS Mayport Additional Investigation at Bldg 46				Location: Mayport, FL		
A	B	C	D	E	F	G	H	I	J	K
Spec Section and Paragraph	Test Required	Proposed Lab	Sampled By	Tested By	Test Location	Frequency	Date Test Made	Test Results	Date Results Forwarded	Remarks
Maximum Density and Optimum Moisture	Proctor				Field Determined	Per Backfill Material				
Compaction	Nuclear Density				Field Determined	Per Backfill Site, per Material				
Groundwater Elevation Measurements	Liquid Elevation				Monitoring Wells: MAY-1330-2, BP-MW5, MAY-1330-5, MAY-1330-6, MAY-1330-9 , MAY-1330-10, MAY-1330-11, MPT-1330-MW19, MPT-1330-MW20 , MW-XX, BP-MW-3, MAY-1330-3, MAY-1330-8, MAY-1330-13, MAY-1330-14, MAY-1330-16, and MAY-1330-18	quarterly				
Groundwater Field Parameters	temperature, pH, turbidity, specific conductance, DO, and ORP				Monitoring Wells: MAY-1330-2, BP-MW5, MAY-1330-5, MAY-1330-6, MAY-1330-9 , MAY-1330-10, MAY-1330-11, MPT-1330-MW19, MPT-1330-MW20 , MW-XX, BP-MW-3, MAY-1330-3, MAY-1330-8, MAY-1330-13, MAY-1330-14, MAY-1330-16, and MAY-1330-18	quarterly				
Groundwater Monitoring	TCL (volatiles, semi-volatiles, herbicides), PCBs, TAL metals, ignitability, and corrosivity				Monitoring Wells: MAY-1330-2, BP-MW5, MAY-1330-5, MAY-1330-6, MAY-1330-9 , MAY-1330-10, MAY-1330-11, MPT-1330-MW19, MPT-1330-MW20 , MW-XX, BP-MW-3, MAY-1330-3, MAY-1330-8, MAY-1330-13, MAY-1330-14, MAY-1330-16, and MAY-1330-18	quarterly				
Characterization of Backfill Material	TCL Volatiles TCL Semi-Volatiles PAHs (including 1-and 2-Methylnaphthalene) TCL Pesticides,TCL Herbicides PCBs,TRPH,TAL Metals, and pH				Once per Off-Site Source	one composite per 5 grabs				
Characterization of Liquid Wastes	TCL Volatiles TCL Semi-Volatiles PAHs (including 1-and 2-Methylnaphthalene) TCL Pesticides,TCL Herbicides PCBs,TRPH,TAL Metals,Corrosivity,Ignitability				Aqueous material disposal	1 (or as needed for disposal)				

Monthly Summary Report of Field Tests

Start Date:	End Date:	Submitted Date:	
Contract Number: Navy Contract # N62467-01-D-0331	CTO No.: CTO 0012	CTO Title: Remedial Actions at Site 1330	Location: NAS Mayport, Mayport, FL

A	B	C	D
Type of Test Required	Date of Test	Reporting Laboratory	Test Results

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

December 7, 2005

Mr. Jeff Marks
CH2M HILL Constructors, Inc.
6219 Authority Avenue
Jacksonville, Florida 32221

RE: Contract No. N62467-01-D-0331
Contract Task Order No. 0012
Naval Station (NS) Mayport – Mayport, Florida
Project Quality Control Manager Letter of Appointment

Dear Mr. Marks:

Herein describes the responsibilities and authority delegated to you in your capacity as the Project QC Manager at the NS Mayport site, Contract Task Order (CTO) 0012 under RAC Contract No. N62467-01-D-0331.

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.

Scott Smith
Program Manager

cc: Mike Halil/JAX
Theresa Rojas/ATL
Project File No. 281913

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

December 7, 2005

Mr. Greg Ramey
CH2M HILL Constructors, Inc.
115 Perimeter Center Place, N.E., Suite 700
Atlanta, GA 30346

RE: Contract No. N62467-01-D-0331
Contract Task Order No. 0012
Naval Station (NS) Mayport – Mayport, Florida
Alternate Project Quality Control Manager Letter of Appointment

Dear Mr. Ramey:

Herein describes the responsibilities and authority delegated to you in your capacity as the alternate Project QC Manager on the NS Mayport, Contract Task Order (CTO) 0012 under the Navy RAC Contract # N62467-01-D-0331.

In this position, you assist and represent the Project QC Manager in the event that he is not on the project site and 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 and 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.

Scott Smith
Program Manager

cc: Mike Halil/ATL
Theresa Rojas/ATL
Project File No. 281913

CH2M HILL **SOUTHDIV RAC** **N62467-01-D-0331**	**CONTRACTOR PRODUCTION REPORT** (ATTACH ADDITIONAL SHEETS IF NECESSARY)	DATE OF REPORT: REVISION NO: REVISION DATE:

CTO NO:	PROJECT NAME/LOCATION:		REPORT NO:
PROJECT NO:	SUPERINTENDENT:	SITE H&S SPECIALIST:	
AM WEATHER:	PM WEATHER:	MAX TEMP: F	MIN TEMP: F

SUMMARY OF WORK PERFORMED TODAY

JOB SAFETY

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

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

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB

DESCRIPTION OF EQUIPMENT/MATERIAL RECEIVED	MAKE/ MODEL/ MANUFACTURER	EQUIPMENT/ LOT NUMBER	INSPECTION PERFORMED BY	NUMBER/ VOLUME/ WEIGHT

EQUIPMENT USED ON JOB SITE TODAY.

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

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

VISITORS TO THE SITE:

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

SAFETY REQUIREMENTS HAVE BEEN MET ☐

SUPERINTENDENT'S SIGNATURE _____ DATE _____

CH2M HILL **SOUTHDIV RAC** **N62467-01-D-0331**	**CONTRACTOR PRODUCTION REPORT** (CONTINUATION SHEET)	DATE OF REPORT: REVISION NO: REVISION DATE:
CTO NO:	PROJECT NAME/LOCATION:	REPORT NO:

WORK PERFORMED TODAY

EMPLOYEE	WORK PERFORMED	EMPLOYER	EMPLOYEE NUMBER	TITLE/TRADE	HRS

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

SAFETY REQUIREMENTS HAVE BEEN MET ☐

SUPERINTENDENT'S SIGNATURE _____ DATE _____

CH2M HILL **SOUTHDIV RAC** **N62467-01-D-0331**	**CONTRACTOR QUALITY CONTROL REPORT** (ATTACH ADDITIONAL SHEETS IF NECESSARY)	REPORT DATE: REVISION NO: REVISION DATE:

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

SAFETY MEETINGS AND INSPECTIONS

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

DEFINABLE FEATURES OF WORK STATUS

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

PREPARATORY

WAS PREPARATORY PHASE WORK PERFORMED TODAY? ☐ YES ☐ NO

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

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

INITIAL AND FOLLOW-UP FEATURE OF WORK COMMENTS

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

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

CH2M HILL **SOUTHDIV RAC** **N62467-01-D-0331**	**CONTRACTOR QUALITY CONTROL REPORT** (ATTACH ADDITIONAL SHEETS IF NECESSARY)	REPORT DATE: REVISION NO: REVISION DATE:

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

SAMPLING/TESTING PERFORMED

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

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

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

SUBMITTALS INSPECTION / REVIEW

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

OFF-SITE SURVEILLANCE ACTIVITIES, INCLUDING ACTIONS TAKEN:

ACCUMULATION/STOCKPILE AREA INSPECTION

INSPECTION PERFORMED BY:		SIGNATURE OF INSPECTOR:	
ACCUMULATION/ STOCKPILE AREA LOCATION			

NO OF CONTAINERS:		NO OF TANKS:		NO OF ROLL-OFF BOXES:		NO OF DRUMS:	

INSPECTION RESULTS:

TRANSPORTATION AND DISPOSAL ACTIVITIES/SUMMARY/QUANTITIES:

GENERAL COMMENTS (rework, directives, etc.):

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

On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

PROJECT QC MANAGER'S SIGNATURE DATE

On behalf of the contractor, I attest that the work for which payment is requested, including stored material, is in compliance with contract requirements.

PROJECT QC MANAGER'S SIGNATURE DATE

CH2M HILL **SOUTHDIV RAC** **N62467-01-D-0331**	**PREPARATORY PHASE REPORT**	REPORT NO:	REPORT DATE: REVISION NO: REVISION DATE:	CTO NO:
PROJECT NO:	DEFINABLE FEATURE OF WORK:	SITE/ACTIVITY:		

PERSONNEL PRESENT

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

NAME	POSITION	COMPANY/GOVERNMENT

SUBMITTALS

REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER.

HAVE ALL SUBMITTALS BEEN APPROVED? YES ☐ NO ☐

IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED?

ARE ALL MATERIALS ON HAND? YES ☐ NO ☐

IF NO, WHAT ITEMS ARE MISSING?

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

COMMENTS:

MATERIAL STORAGE

ARE MATERIALS STORED PROPERLY? YES ☐ NO ☐

IF NO, WHAT ACTION IS TAKEN?

SPECIFICATIONS

REVIEW EACH PARAGRAPH OF SPECIFICATIONS.

DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK.

CLARIFY ANY DIFFERENCES.

PRELIMINARY WORK & PERMITS

ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.

IF NO, WHAT ACTION IS TAKEN?

CH2M HILL **SOUTHDIV RAC** **N62467-01-D-0331**	**PREPARATORY PHASE REPORT**	REPORT NO:	REPORT DATE: REVISION NO: REVISION DATE:	CTO NO:
PROJECT NO:	DEFINABLE FEATURE OF WORK:	SITE/ACTIVITY:		

TESTING

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

TEST	FREQUENCY	PERFORMER

WHEN REQUIRED?

WHERE REQUIRED?

REVIEW TESTING PLAN.

HAVE TEST FACILITIES BEEN APPROVED?

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

SAFETY

ACTIVITY HAZARD ANALYSIS APPROVED? YES ☐ NO ☐

REVIEW APPLICABLE PORTION OF EM 385-1-1.

MEETING COMMENTS

NAVY/ROICC COMMENTS DURING MEETING.

OTHER ITEMS OR REMARKS

OTHER ITEMS OR REMARKS:

PROJECT QC MANAGER NAME	PROJECT QC MANAGER'S SIGNATURE		DATE	