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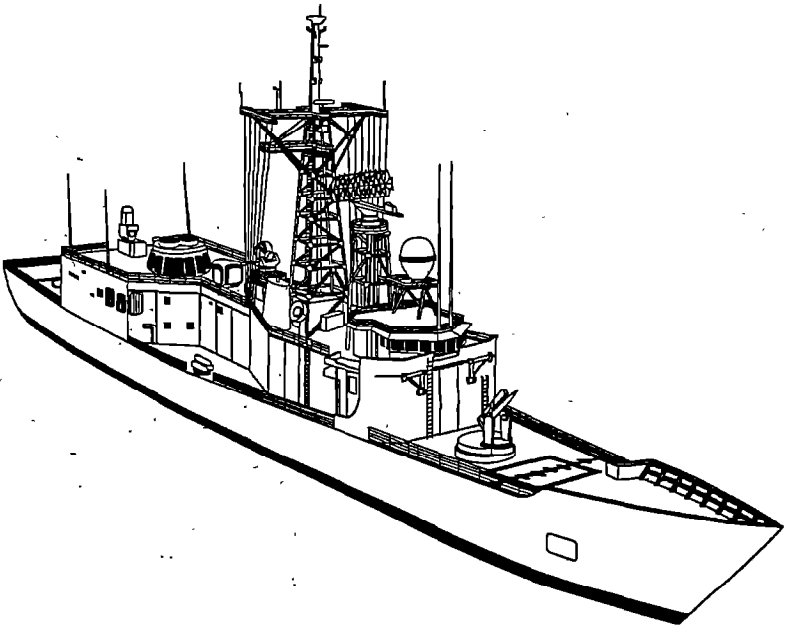
BASEWIDE WORK PLAN REVISION 1 NAS CECIL FIELD FL
11/1/1998
CH2MHILL CONSTRUCTORS INC

Southern Division
Naval Facilities Engineering Command

BASEWIDE WORK PLAN
REVISION NO. 1

NAS Cecil Field
Jacksonville, Florida

Contract Task Order No. 0002
Remedial Action Contract: N62467-98-D-0995



SUBMITTED BY

CH2MHILL Constructors, Inc.
November, 1998

Basewide Work Plan
Contract No. N62467-98-D-0995
Contract Task Order No. 0002

NAS Cecil Field
Jacksonville, Florida

Submitted to:

U.S. Naval Facilities Engineering Command Southern Division

Prepared by:

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Revision No.1

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Tables

Table 1-1 Submittals and Delivery Dates

Acronym List

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
APR	Air Purifying Respirator
AROICC	Assistant Resident Officer in Charge of Construction
ASTM	American Society for Testing and Materials
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CCI	CH2M HILL Constructors, Inc.
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CMP	Contract Management Plan
CMS	Contract Management System
ConRep	Construction Representative
COTR	Contracting Officer's Technical Representative
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
CTO	Contract Task Order
DRF	Discharge Reporting Form
EDB	Ethylene Dibromide
EMD	Environmental Management Division
EZ	Exclusion Zone
FID	Flame Ionization Detector
ft bls	Feet Below Land Surface
FOPS	Falling Object Protective Structures
gpm	gallons per minute
HAPS	Hazardous Air Pollutants
HASP	Health and Safety Plan
IDLH	Immediate Danger to Life or Health
LEL	Lower Explosive Limit
LEPC	Local Emergency Planning Committee
µg/l	micrograms per liter
mg/kg	milligrams per kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
msl	mean sea level
MSHA	Mine Safety Health Administration
MTBE	Methyl Tert-Butyl Ether
NAVFAC	Naval Facilities Engineering Command
NIOSH	National Institute of Occupational Safety and Health
NOSC	Navy On Scene Coordinator
NPDES	National Pollutant Discharge Elimination System
NTR	Navy Technical Representative
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
PM	Project Manager

Acronym List (Continued)

POL	Petroleum, Oils and Lubricants
PPE	Personal Protective Clothing and Equipment
PQCM	Program Quality Control Manager
ppm	parts per million
psi	pounds per square inch
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
ROICC	Resident Officer in Charge of Construction
ROPS	Rollover Project Structures
SHSS	Site Health and Safety Specialist
SZ	Support Zone
TCLP	Toxicity Characteristic Leaching Procedure
TOX	Total Organic Halogens
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
TWA	Time Weighted Average
USEPA	United States Environmental Protection Agency
USCG	United States Coast Guard
USGS	United States Geological Survey
USMC	United States Marine Corps
UST	Underground Storage Tank
USN	United States Navy
VOA	Volatile Organic Aromatics
VOC	Volatile Organic Compounds

1.0 Introduction

CH2M HILL Constructors, Inc. (CCI) has been contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command (Southern Division, NAVFAC), to prepare this Basewide Work Plan for work to be performed by CCI at NAS Cecil Field in Jacksonville, Florida. The work is being performed under Contract No. N62467-98-D-0995 and in accordance with the management approach outlined in the CCI Contract Management Plan (CMP) dated July 1998.

The purpose of this Basewide Work Plan is to describe the generic efforts necessary to perform environmental remediation services at NAS Cecil Field. Components of this work may include the following: underground storage tank (UST)/aboveground storage tank (AST) removal; soil and free product removal; sampling and analysis; installation of soil and groundwater remediation systems; and operation and maintenance of those systems. This document serves as the Basewide Work Plan that outlines the fundamental plans and requirements for completion of these activities at NAS Cecil Field. Necessary site-specific information for each Contract Task Order (CTO) or project will be provided in work plan addenda to supplement this Basewide Work Plan.

This work plan is organized into six sections of text including five appendices. A brief description of each section is presented below.

1.0 Introduction of this Basewide Work Plan contains a brief description of the reporting requirements. The site-specific work plan addenda will include the site history, the required scope of work, and individual project schedule.

2.0 Sampling and Analysis Plan provides the sample collection and analysis methodology including sample handling, labeling, and required collection of quality assurance and quality control samples. Each work plan addenda will provide the specific project sample locations, sample collection frequency, and the required laboratory analyses and turnaround times.

3.0 Waste Stream Management Plan discusses the characterization, disposal, handling, and transportation of wastes encountered or generated during the work completed at NAS Cecil Field. If hazardous waste is expected during site-specific project activities, the work plan addenda will address the characterization and management of those hazardous materials.

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

5.0 Site Health and Safety Plan addresses basewide health and safety requirements for the project construction activities completed at NAS Cecil Field. These requirements will be in accordance with Appendix A of the CMP.

6.0 Quality Control Plan details the quality administrators, the project organization, and the definable features of work for each project site. The work plan addenda will outline any additional site-specific features of work not addressed in this Basewide Work Plan. In addition, a Submittal Register that documents quality control for materials, inspections, and testing will be completed in accordance with Appendix B of the CMP.

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

- Appendix A Erosion and Sediment Control Plan
- Appendix B Transportation and Disposal Plan
- Appendix C Machinery and Mechanized Equipment
- Appendix D Quality Control Attachments
- Appendix E Health and Safety Plan

Each work plan addenda may also include Section 7.0 Technical Specifications containing site-specific additions and modifications to the project's technical specifications. The addenda may also include Section 8.0 Contractor Generated Construction Drawing containing the site-specific design drawings such as any site plan, piping and instrumentation diagrams, construction details, etc. applicable to the particular project. Further, Section 1.0 Introduction (provided in the addenda) will include the following site-specific information: Site History and Project Objectives and Scope of Work.

1.1 Project Schedule

The work plan addenda will provide a site-specific project schedule outlining the primary construction activities.

Similar on-site construction activities will be completed concurrently at the different project locations. All activities will be coordinated with base personnel to minimize operational conflicts.

1.2 Reporting

A list of deliverables and their anticipated submittal dates as part of the basewide requirement is provided in Table 1-1.

Once approved, one set of full size contract design drawings will be at the site and available to the Navy Technical Representative (NTR) for review during the execution of the project. At the completion of each project, the marked sets of drawings indicating changes to the design will be delivered to the NTR. Field survey notes will be submitted with the final as-built drawings. An electronic file of the as-built drawings will also be submitted to the NTR at this time.

CCI will prepare an Environmental Conditions Report for each project prior to the commencement of construction. Photographs of the pre-construction condition of the work site will be incorporated into the Report. Additional pictures of items such as roads, sidewalks, storage areas, and staging areas will also be included. Copies of the

Environmental Conditions Report will be submitted to the NTR within two weeks of the start of construction.

TABLE 1-1
Submittals and Delivery Dates

Deliverables	Submittal Date(s)
Design Drawings	Submitted with each work plan addendum. Marked sets of as-built construction drawings will be delivered to the NTR at each project's completion
Permits	Obtain where necessary
Environmental Conditions Report	2 weeks prior to construction
CPM Schedule	Within 30 days of work plan approval
Status Reports	Delivered 15th of following month
QC Meeting Minutes	2 calendar days after each QC meeting
Contractor Production Report	Daily
Contractor Quality Control Report	Daily
Rework Items List	Monthly during field operations
Contractor's Closeout Report	Project completion
Test Results Summary Reports	Within 30 days of laboratory receipt of samples

As part of the Contract Management System (CMS), the Network Analysis Diagram and the Monthly Status Report provide an ongoing tracking system designed to limit project pitfalls and to monitor project activities and upcoming events. The information required in the Monthly Status Report will be submitted in accordance with Section C, Part 2.4 of the basic contract.

Copies of the minutes from QC meetings will be delivered to the NTR within two calendar days after each meeting. Contractor Production Reports will be completed by the Site Superintendent for each day that work is performed on-site. These daily reports will document the specific work performed and key project events.

Contractor Quality Control Reports are required to be completed by the Project Quality Control Manager for each day that work is performed on-site. These daily reports identify the control phase, the definable feature of work, meetings held, approved submittals, compliance with material usage and storage, field testing completed, and work methods and schedule. Section 6.0 Quality Control Plan identifies the QC requirements for this work.

A Rework Items List will document the work that does not comply with the CTO. The list includes the items that need to be reworked, the discovery date of the reworked items, and the date that they were corrected. The Rework Items List will be maintained by the Project Quality Control Manager and will be submitted with the last daily Contractor Quality Control Report of each month.

Any permits identified in the scope of work will be obtained by CCI. Required well permits will be obtained by CCI or its subcontractor.

A summary report of all field tests and laboratory analytical results will be submitted to the NTR within 30 days after laboratory receipt of the samples and in accordance with Section C, Part 6.4 of the basic contract.

At the completion of each project, CCI will submit a Contractor's Closeout Report. This report will include an introduction, summary of project activities, final health and safety report, summary of record documents, field changes and contract modifications, complete set of data validation results, off-site transportation and disposal of materials, and Quality Control (QC) summary report. A table of contents for the Contractor's Closeout Report will be submitted and approved by the NTR prior to preparation of the report.

1.3 Government Furnished Property

CCI anticipates that government-furnished property will not be required during any of the projects completed at NAS Cecil Field. However, any equipment, materials, or other items purchased by the Navy for any of the projects will remain the property of the Navy following completion of the specific project. The items will either be turned over to the ROICC or will remain with CCI to be used on other CTOs issued under this contract. An inventory of these items will be maintained by CCI to track items that remain with CCI. Property management will be conducted in accordance with Section 3.10 of the CMP.

1.4 Communications Plan

The organizational structure and lines of communications for a participating CTO will be included in the Work Plan Addendum for each CTO.

2.0 Sampling and Analysis Plan

2.1 Purpose and Scope

This site-specific Sampling and Analysis Plan (SAP) outlines the required testing of environmental media, including construction materials, during the execution of each project at NAS Cecil Field. This SAP provides information on the sample collection frequency, required analyses, and methodology for waste characterization and incidental samples collected during the construction phase of each project; sample quality assurance/quality control procedures to be maintained during all sample collection activities; and decontamination procedures. The work plan addenda will outline the required sample locations, frequency, and analyses required for each particular project.

The various types of environmental samples collected during the execution of each project may include confirmation samples, waste characterization samples, remediation system samples, groundwater monitoring well samples, and incidental wastestream samples. Confirmation samples (aka verification samples) are collected and analyzed to evaluate the limits of a soil excavation. Waste characterization samples are collected and analyzed to evaluate the required management, transportation, and disposal requirements for any wastestream generated during a project. Remediation system samples are collected and analyzed to evaluate the effectiveness or efficiency of a treatment system. Groundwater monitoring well samples collected and analyzed during the operation of a groundwater treatment system are used to evaluate the treatment system performance and to characterize the movement and magnitude of the groundwater contaminant plume. Incidental wastestream samples are collected and analyzed to properly characterize management, transportation, and disposal requirements for any incidental wastestream, such as decontamination water, generated during project construction or operation and maintenance activities.

2.2 Chemical Sampling Methodologies and Analytical Requirements

2.2.1 Waste Characterization and Incidental Waste Samples

2.2.1.1 Soil

Waste characterization samples will be collected to evaluate handling, transportation, and disposal requirements in the event that petroleum-contaminated soil is encountered during excavation and well installation. Excavated soil will be screened in the field with a photoionization detector (PID) to segregate soil that is potentially contaminated. Screened soil that exhibits a PID reading of 10 ppm above ambient air levels will be segregated; and for every 200 cubic yards of soil, a composite sample, consisting of six grabs, will be collected, delivered to a Navy approved laboratory, and analyzed for total

petroleum hydrocarbons (TPH) using U. S. Environmental Protection Agency (USEPA) Methods 3550 and 5030. Screened soil that exhibits a PID reading of less than 10 ppm above ambient air levels can be used as fill material. Section 2.2.3 Air Monitoring Measurement Procedures outlines the procedures for direct air monitoring using a PID.

In an effort to reduce the amount of soil requiring treatment, soil exhibiting PID readings above 500 ppm will be further segregated and sampled as discussed above. Each stockpile whose analytical results reveal a TPH concentration greater than the limits outlined in the site-specific work plan addendum will require off-site transportation.

Composite samples will be collected at a frequency required by the Florida Department of Environmental Protection (FDEP) Chapter 62-770, Florida Administrative Code (F.A.C.). The following protocol outlines sample compositing procedures for soil stockpiles, soil contained in drums, and in-situ soil from an excavation wall or floor.

- *Soil Stockpiles* - for every 200 cubic yards of material, grab samples will be collected at six locations and composited into one sample. The six locations will be selected so that each location is representative of approximately 1/6 of the stockpile volume.
- *Drums or Other Containers* - for six or less 55-gallon drums, an equal number of grab samples will be collected from each drum and composited into one sample. A minimum of six grab samples will be collected and composited. If more than six drums of soil material are present, six representative drums of the same material and suspected source of hydrocarbon contamination will be selected and one sample from each of the selected drums will be collected and composited into one sample. Closed-top drums will be accessed using non-sparking techniques and tools.
- *In-Situ Soil* - for sampling in unshored excavations deeper than four feet, grab samples from six discrete locations will be collected from an excavation equipment bucket and composited into one sample. Using this method, personnel will not be required to enter the excavation. Each representative grab sample will be from a portion that has not contacted the equipment bucket.

If a sample is collected for purgeable organic compound analysis [i.e., volatile organic compounds (VOCs) and/or benzene, toluene, ethylbenzene, and xylenes (BTEX)], a portion of the sample will be directly placed into the sample container without mixing and compacted so that no head space remains in the sample container. The container rim will be cleaned of soil and material so the lid can be tightly sealed.

2.2.1.2 Water

Water generated from development and purging of wells, dewatering of excavations, and any accumulated decontamination water will be containerized, sampled, and delivered to a Navy approved laboratory for appropriate analysis. Analytical requirements are based on the source of the contamination. At NAS Cecil Field, petroleum, oils, and lubricants (POL) will be the primary contaminants. These contaminants will primarily be resultant from leaking USTs or underground pipelines.

Groundwater samples collected from well development or purge water will be analyzed for volatile aromatics (Gasoline Analytical Group per Chapter 62-770, F.A.C.) using

USEPA Method 602, if gasoline is the known source of petroleum contamination. If diesel fuel, heating oil, or jet fuel are the known contaminants of concern (COC)(Kerosene Analytical Group per Chapter 62-770, F.A.C.), groundwater samples will be collected and analyzed for volatile aromatics using USEPA Method 602 and polynuclear aromatic hydrocarbons (PAH) using USEPA Method 610.

The petroleum-contaminated groundwater will be contained and properly disposed or treated on-site/off-site. If petroleum-contaminated groundwater is intended to be hauled to a recycling or treatment facility permitted to accept the material, CCI will coordinate with the treatment facility concerning the required number of samples and analyses to be completed.

The following sample collection protocol will be observed when collecting water samples from a temporary containment vessel (i.e. frac tank) and groundwater monitoring wells for volatile organic analyses and, if required, non-volatile organic or inorganic analyses. The water sample will be collected using a decontaminated or dedicated Teflon bailer.

- *Volatile Organic Analyses* - The following steps must be followed when collecting water samples for volatile organic analyses:

    1. Slowly pour from the top of the decontaminated Teflon bailer and completely fill the preserved 40-ml vials. Cap each 40-ml vial. Dislodge all air bubbles from the cap before sealing the vial.
    2. Turn the capped vial upside-down and check for air bubbles. Tap the bottom of the vials to check for any bubbles that may have formed around the cap or sides. Discard and re-sample if bubbles are observed.
    3. Wipe the outside of sample vials with a Kimwipe or clean paper towel.
    4. Place sample vial(s) in a zip-top plastic bag and seal the bag.
    5. Immediately pack all samples into a cooler containing ice.

- *Non-volatile Organic or Inorganic Analyses* - It is assumed the sample containers, supplied by the Navy approved laboratory, contain the required preservative. The following steps must be followed when collecting water samples for non-volatile organic or inorganic analysis:

    1. Slowly pour from the top of the decontaminated Teflon bailer and fill the sample containers to approximately 90 percent capacity.
    2. Cap the sample containers and wipe the outer surfaces of the sample containers clean with a Kimwipe or clean paper towel.
    3. Place sample container(s) in individual zip-top plastic bags, if possible, and seal the bags.
    4. Water level/sample level may be marked on container to determine whether or not liquid is lost during storage and shipping.
       Note: Marking of 40-ml vials is not necessary.
    5. Immediately pack all samples into a cooler containing ice.

At a minimum, three water column well volumes will be purged prior to sample collection from a well. Measurements of pH, temperature, conductivity, and appearance (turbidity) will be collected and recorded in a field notebook for each well volume

removed. The representative sample will be collected once three well volumes have been removed and the pH and conductivity measurements have stabilized. If the pH and conductivity measurements have not stabilized after five well volumes have been purged, the required sample will be collected for analysis.

The sample collection protocol may be modified based on specific site conditions and project requirements. Each work plan addendum will identify the required sample collection locations and analyses for operation and maintenance activities.

2.2.1.3 Product Material and UST Contents

Product recovery systems will accumulate material in large product storage tanks. CCI will coordinate with NAS Cecil Field to evaluate if the base could use or recycle the material in any way. If NAS Cecil Field cannot use or recycle the material, the product will be hauled off-site to a permitted facility that will recycle the material. Prior to the off-site transportation of the material, CCI will coordinate with the recycling facility concerning the required laboratory analyses. The required laboratory analyses will be based on the COC and the requirements of the recycling facility.

Contents from USTs, including water accumulated in the UST decontamination, will be removed and temporarily placed in 55-gallon drums or other suitable tanks. Prior to the off-site transportation of the UST contents, CCI will coordinate with the facility permitted to accept the material concerning the required laboratory analyses. The required laboratory analyses will be based on the former contents of the UST and the requirements of the disposal facility.

2.2.2 Vapor Extraction System Effluent Sampling

Air quality effluent samples from any soil vapor extraction unit installed at NAS Cecil Field will be collected at start-up, monthly for the first quarter, and quarterly thereafter. The samples will be collected in a Tedler bag or by utilizing charcoal tubes and a personal sampling pump and analyzed for volatile aromatics using USEPA Method 18 to evaluate the contaminant discharges to the atmosphere.

2.2.3 Sample Equipment Decontamination

Decontamination of field equipment is necessary to support the quality of samples by preventing cross contamination. Further, decontamination reduces health hazards and prevents the spread of contaminants off-site. All reusable equipment (non-dedicated) used to collect, handle, or measure samples will be decontaminated before coming into contact with any sample. Decontamination of equipment will occur at the sampling location(s). The sample location will include a bucket in which sampling equipment can be cleaned. Decontamination water will be transferred into 55-gallon drums or a frac tank for storage. As indicated in Section 2.2.1.2 Water, it is anticipated that any decontamination water collected during projects at NAS Cecil Field will either be disposed off-site or taken to a treatment system on the base that can treat petroleum-contaminated water.

All items that contact contaminated media will be decontaminated before use and between sample locations if dedicated sampling equipment is not used. If decontaminated items are not immediately used, they will be covered either with plastic

or aluminum foil depending on the size of the item. General guidelines for all decontamination procedures for the equipment being used are as follows:

- Potable water will be of a known quality. Water from untested sources that may contain contaminants will not be used.
- Soap used in the soap and water rinse step will be a low phosphate detergent.
- Sampling equipment that has come into contact with oil and grease will be cleaned with methanol or other approved alternative to remove the oily material. This may be followed by a hexane rinse and another methanol rinse.
- Decontaminated equipment will be allowed to air dry before being used.
- All cleaning procedures will be documented in a bound field book.
- Gloves, boots, safety glasses, and any other personal protective clothing and equipment will be used as specified in the site-specific health and safety plan.

2.2.4 Air Monitoring Measurement Procedures

As outlined in Section 2.2.1.1 Soil, the direct measurement of organic vapors using a PID is a required step during any subsurface excavation or drilling activities. The following outlines the procedures for direct measurement of organic vapors using the PID:

- Connect the measurement probe to the instrument and make the necessary operational checks (e.g., battery check, etc.) as outlined in the manufacturer's manual.
- Calibrate the instrument according to the manufacturer's manual.
- Verify that the instrument is reading zero and that all function and range switches are set appropriately.
- Insert the end of the probe directly into the atmosphere to be measured (e.g., breathing zone, monitoring well casing, split spoon, mason jar, etc.), and read the organic vapor concentration in ppm from the instrument display. Record the highest instrument response.
- Immediately document the reading in the field logbook, or on the appropriate field form.

2.2.5 Sample Handling

Handling of sample containers upon completion of sample collection activities will be minimized. Sample containers will be placed in plastic bags prior to their placement in the shipping containers. Packing will be provided between containers to avoid breakage. A chain-of-custody, documenting the sample identifications, the number of samples, and the required analyses, will accompany the shipping containers. If shipped by common carrier, the chain of custody will be placed in a sealed plastic bag taped to the inside of the shipping containers. Shipping containers will be sealed with strapping tape to avoid tampering during transport to the laboratory.

Special handling procedures must be used for samples requiring an environment maintained at 4 degrees Celsius (i.e., samples to be analyzed for VOCs, semi-volatiles, BTEX, and/or TPH). Shipping containers will be insulated coolers and packed with wet ice. Wet ice substitutes such as dry ice, blue ice, or chemical cooling packs will not be used. Environmental samples collected from a POL source will be considered non-hazardous substances and will be delivered to an approved laboratory within 24-hours of packaging, by a commercial carrier such as Federal Express.

2.2.6 Analytical Methods

Analytical testing will be completed in accordance with the site-specific requirements provided in the project specifications. If required, analytical methods and sample collection frequency for confirmation samples, treatment system samples, and well samples will be provided in the site-specific work plan addenda. Analytical methods for waste characterization samples and incidental waste stream samples are provided in Section 2.2.1 Waste Characterization and Incidental Waste Samples. Modifications to the analytical methods for waste characterization samples and incidental wastestream samples will be provided in the site-specific work plan addenda. The addenda will provide, in tabular format, the required sample collection locations, frequency, and analytical methods.

2.2.7 Field Sampling Quality Control

Field quality control will include collection of QC samples. QC samples will be collected and analyzed for the identical parameters, using the same method, as the samples collected during the same sampling event. All QC samples will be collected, handled, and documented in the same manner as samples collected during the sampling event. QC samples will be collected for each sampling event including water sampling, solid sampling, and combined water/solid sampling. QC samples will include the following:

- *Trip Blanks* - Trip blanks will be required only for VOC samples. The trip blanks will be prepared in advance by the laboratory providing the sample containers. Each trip blank will include one set of VOC vials filled with analyte-free water. The trip blanks will be placed in the same transport container as empty VOC vials and be returned to the laboratory in the same shipping container as VOC samples. A trip blank will be submitted for each cooler that transports ten or more empty or full VOC vials. The trip blanks remain unopened for the entire sampling episode.

- *Pre-Cleaned Equipment Blanks* - Blanks will be collected on equipment that is brought to the site pre-cleaned and ready for use. Pre-cleaned equipment will include disposable sampling equipment (i.e., disposable Teflon bailers, etc.). These blanks will be collected from the sampling equipment immediately prior to sampling by rinsing the sampling equipment with analyte-free water and collecting rinsate in the appropriate sample containers.

- *Field-Cleaned Equipment Blanks* - In the event that field decontamination of sampling equipment is necessary, blanks will be collected on equipment that has been decontaminated in the field. These blanks will be collected after the equipment is decontaminated by rinsing the sampling equipment with analyte-free water and collecting rinsate in the appropriate sample containers.

- *Field Duplicates* - Duplicate samples will be collected and analyzed for the identical parameters, using the same method as the samples collected during the sampling event when five or more samples are taken (in accordance with established USEPA methods in their *Standard Operating Procedures and Quality Assurance Manual*, USEPA, Environmental Compliance Branch, Athens, Georgia, February 1, 1991). The duplicates will be collected using the same sample acquisition technique used to collect samples of the same environmental media (i.e., soil, water) for the same laboratory analysis (i.e., USEPA Method 602, USEPA Method 5030 and 3550, etc.).

QC samples for the site-specific projects at NAS Cecil Field will be provided in a tabular format in the work plan addenda.

Quality control of field measurements will include calibration of all field sampling equipment at the start of each sampling day in accordance with equipment manufacturers' recommendations.

2.2.8 Sample Identification

All sample containers will be labeled in advance of sampling activities. The sample label will include a specific sample identification. The sample label will also include the date and time the sample was collected, the name or initials of the sampler, and the sample location. The label will also identify the container preservative, if any, as prepared by the laboratory.

The sample identification procedure will be implemented for the following types of environmental samples collected at NAS Cecil Field.

- Waste Characterization Samples and Incidental Wastestream Samples

  CTO Number-Location-Environmental Media-Month and Date-Year
Environmental Media: S (Soil), SL (Sludge), SW (Surface Water), GW (Groundwater), WW (Wastewater), and A (Air)
Month and Date: Four digit number representing the month and date (e.g., 0402 is April 2)
Year: Last two digits of the calendar year (e.g., 98 is the calendar year 1998)

- Confirmation Samples

  CTO Number-Location-Environmental Media-Month and Date-Year

- Monitoring Well Samples

  CTO Number-Monitoring Well Location-Q #-Year-Number of Months of Treatment System Operation (if applicable)

  Q #: Represents the quarter number in the calendar year (e.g., fourth quarter is Q4)
  Number of Months of Treatment System Operation (if applicable): Represents the number of months the groundwater treatment system, soil treatment system, and/or product recovery system has been in operation since start-up.

  An example of the monitoring well sample identification protocol is a quarterly sampling event conducted at a site with an air sparge system that has been in

operation since November 1997. The sample event, conducted under CTO No. 0002, included a sample collected from groundwater monitoring well MW-1 in May 1998. This example has the following identification number: 002-MW1-Q2-98-06.

- Treatment System Samples

  CTO Number-Equipment Location-Influent or Effluent-Media-Month and Date-Year- Number of Months of Treatment System Operation (if applicable)

  Equipment Location: Air Stripper (ASl), Activated Carbon Adsorption Units (ACA), Oil/Water Separator (OWS), Soil Vapor Extraction Blower (SVE), Monitoring Well (MW), and Recovery Trench (RT). This list may be modified based on site-specific project locations. If required, the work plan addenda will document the site-specific treatment system sample locations.

  Influent or Effluent: Influent to the specific equipment or treatment system location where the sample is collected will be designated by the letter I. Effluent from the specific equipment or treatment system location where the sample is collected will be designated by the letter E.

An example of the treatment system sample identification protocol is an air quality sample collected under CTO No. 0002 from the soil vapor extraction blower effluent on June 2, 1998. The air sparge and soil vapor extraction system has been in operation since November 1997. This example would have the following identification number: 002-SVE-E-A-0602-98-07.

2.2.9 Sample Custody and Handling

A chain-of-custody record will be completed for each sampling event and will accompany the samples during shipment. The chain-of-custody record, typically completed on a carbon copy form provided by the laboratory, documents the site-specific sample information required by the laboratory. The record will, at a minimum, contain the following:

- Site name and address;
- Full name of sampler
- Sample identification number or label for each sample
- Collection date and time for each sample
- Sample matrix (liquid, solid, gas)
- Number of containers for each sample
- Sample location description for each sample
- Required analyses for each sample
- Preservation for each sample
- Confirmation indicating samples were shipped on ice
- Documentation if sample(s) is expected to be highly contaminated
- Signature of person(s) involved in chain of possession
- Transfer date(s) and time(s) in chain of possession

Personnel preparing the chain-of-custody form (i.e., sampler) will retain a copy of the form and attach it to the project's daily field logs.

If the samples are shipped by common carrier, the chain-of-custody form will be placed in a sealed plastic bag inside the shipping container. Prior to shipment, the shipping container will be secured with strapping tape and a custody seal. Thus, in the case of using a common carrier for shipment, two signatures will be required on the final chain-of-custody: one signature by the sample technician who prepared the form and one signature of the sample custodian assigned by the laboratory. The sample custodian assigned by the laboratory will open the shipping container and will document on the chain-of-custody form any shipping container custody seal breaks and/or shipping container or sample container(s) damage.

2.2.10 Field Documentation

A Field Activity Daily Log form will be completed for each day of sampling. This daily log form will be completed using waterproof ink and will be placed in a dedicated on-site binder at the completion of each sampling day. Individual sheets in the dedicated binder will be signed/initialed, dated, and sequentially numbered. The dedicated binder of daily logs will be placed in the project file at the completion of each sampling event. The daily log will index and will have attached all other paperwork generated during the sampling event including well purge logs, equipment calibration sheets, sampling analysis request forms, chain-of-custody forms, and shipping receipts.

A single responsible party will be designated for field documentation whenever feasible. For multi-person sampling teams, the party responsible for documentation will be focused on the field documentation effort such as the daily log and other related forms and will not be directly involved in the sample collection activities. The field documentation will include sufficient detailed information so that the history of each sample can be retained when necessary without the assistance of the sample collection personnel. Data will typically include a detailed description of equipment decontamination procedures, equipment calibration procedures, preparatory purging at each sample location, inventory of all generated wastes, and disposition of all generated wastes. A copy of the daily log, including all attachments, will be attached to the Daily Production Report.

2.2.11 Laboratory Requirements

2.2.11.1 Sample and Shipping Containers

Sample containers required to complete the analyses will be provided by the approved laboratory. The laboratory will be responsible for supplying the appropriate sample preservatives. The laboratory will also provide shipping containers and custody seals for each shipping container. By evaluating the size of the sample volume, the laboratory will supply the required shipping container(s).

2.2.11.2 Laboratory QA/QC

An acceptable substitute for Navy approval according to NEESA 20.2-047B will be current certification and participation in the USEPA Contract Laboratory Program (CLP) or certification by the U.S. Army Corps of Engineers for environmental work.

Evidence of the appropriate certification(s) will be provided by the laboratory prior to any analytical work.

The selected laboratory's data validation and quality analysis procedures will conform to USEPA and FDEP laboratory certification Quality Assurance/Quality Control (QA/QC) requirements. These stringent requirements provide written procedures for laboratory methodologies, equipment, and quality analyses. Each certified laboratory is inspected on an annual basis to verify laboratory operations are being conducted in conformance with certification requirements.

QC tests such as method blanks and matrix spikes will be completed at frequencies established by the test method or the laboratory QA/QC program, whichever is more stringent. The results of the QC tests, completed by the laboratory concurrent with the required sample analysis, will be reported with the sample results.

2.2.11.3 Laboratory Management of Samples

The laboratory will assign a sample custodian to receive samples. The sample custodian will open the shipping container(s) and denote any damage to the shipping container or sample containers on the chain-of-custody form for the samples. Upon receipt of a sample, the custodian will inspect the condition of each sample and document any discrepancies between information presented on the sample label and the chain-of-custody record. The custodian will assign a laboratory number to each sample, record the sample in the laboratory logbook, and store the sample in a secured storage room or cabinet until assigned to an analyst for analysis. Each sample will be stored in the appropriate conditions, such as four degrees Celsius, if required, and for maximum holding times identified by 40 Code of Federal Regulations (CFR) 136, USEPA "Guidelines Establishing Test Procedures For The Analysis Of Pollutants."

The custodian will immediately contact the person who completed the chain-of-custody in the event any shipping container seal is broken, any discrepancies between the chain-of-custody and sample labels are noted, or any sample container is damaged. Any problem(s) documented by the sample custodian will be resolved with the sample collection personnel before the sample is assigned for analysis.

2.2.11.4 Sample Disposal

The laboratory will dispose all samples in accordance with all applicable federal, state, and local environmental regulations. Prior to off-site transportation of samples, the laboratory will be responsible for evaluating the classification of each sample in accordance with the environmental regulations established in 40 CFR 260 and 261. If a sample is deemed a hazardous waste by the laboratory, the sample and sample container will be disposed or treated at a facility permitted in accordance with the requirements outlined 40 CFR 264. If a sample is deemed a non-hazardous waste by the laboratory, the sample and sample container will be disposed or treated at a facility permitted in accordance with 40 CFR 257.

2.2.11.5 Laboratory Equipment Decontamination

The selected laboratory will decontaminate equipment in accordance with the approved procedures established in their QA/QC program that served as the basis of their certification.

2.2.12 References and Miscellaneous Procedures

Procedures for chemical sampling and analyses have been developed to comply with standard industry practices. For issues or circumstances not covered in Section 2.0 Sampling and Analysis Plan, standard practices will be implemented based upon guidance provided in the following referenced documents used to develop the methodologies provided in the preceding sections.

- Guidance of USEPA as established in their *Standard Operating Procedures and Quality Assurance Manual* (USEPA, Environmental Compliance Branch, Athens, Georgia, February 1, 1991)
- FDEP Chapters 62-770 and 62-160, F.A.C.

2.3 Construction Materials Sampling Methodologies and Field Testing

2.3.1 Concrete

Sampling and testing of concrete will be in accordance with required procedures outlined in the project's technical specifications. The technical specifications will typically cross-reference procedures to specific American Society for Testing and Materials (ASTM) standards. Testing will be completed by a testing laboratory certified by Florida for concrete testing. Laboratory certification will be required prior to concrete placement. Field sampling and testing will be performed by technicians trained in concrete sampling and testing procedures.

If the placement of concrete is required the following guidelines for sampling and testing will be maintained:

- Concrete will have a 28-day compressive strength of 3000 pounds per square inch (psi) and will be sampled during placement. Slump will be between 2 and 4 inches in accordance with ASTM C 143. Air content will be tested using ASTM C 33 aggregate Size No. 57 to verify 4 to 6 percent air entrainment for concrete exposed to freeze-thaw conditions. Cylinders will be taken for compressive strength testing. They will be broken on days 7 and 28 to verify the concrete is 3000 psi. A copy of the test results for the mix design will be attached to the Daily Production Report for the initial day of use of each concrete supply.
- The time of arrival on-site for each load of concrete will be documented. Loads will be placed within 2 hours of arrival on-site. Any load, or portion of a load, on-site in excess of this allowed holding time will be rejected and not used on-site.

- Field tests for temperature, slump by cone method, using ASTM C 143, and entrained air by pressure method, using ASTM Method C231, will be completed for each load of concrete delivered to the site prior to placement of the load. Any load of concrete not meeting specified criteria will be rejected for use at the site. Material may be reworked on-site (e.g. additional water, mixing, etc.) to meet specified criteria subject to the limits of the previously identified holding time.
- Three concrete cylinders will be collected in accordance with ASTM C 172 for every 40 cubic yards of concrete placed with a minimum of one set of cylinders collected for each day of concrete placement. One cylinder will be tested for 7-day compressive strength and one cylinder will be tested for 28-day compressive strength. The third cylinder will be tested for 28-day compressive strength if the initial 28-day test indicates deficient strength.

2.3.2 Backfill and Fill Material Testing

All in-place density tests will be conducted in accordance with ASTM 1556, or ASTM D 2922 and ASTM D 3017. When ASTM D 2922 and ASTM D 3017 density tests are used, the results will be verified by performing an ASTM D 1556 density test at a location where ASTM D 2922 and ASTM D 3017 tests were completed. Under slabs or areas to be repaved, backfill will be compacted to 95 percent of ASTM D 698. All other areas will be compacted to 85 percent of ASTM D 698 but will not require a compaction test. Granular backfill materials including gravel and sand will be compacted to non-movement.

An independent subcontractor will perform the field density tests. Field tests will be performed by a qualified technician. Data collected by the technician will be reviewed by the Site Superintendent and Resident Officer in Charge of Construction (ROICC). If necessary any adjustments in placement and compaction of the fill will be made. Data will be recorded by the technician on a field log that will be presented as part of the field density test submittal.

3.0 Wastestream Management Plan

Soil from excavation activities will be placed on plastic sheeting near the excavation areas or directly loaded onto trucks. To evaluate the proper disposal requirements, a composite soil sample consisting of six grabs will be collected every 200 cubic yards. Excavated soil will be field screened and analyzed in accordance with requirements and methodology provided in Section 2.2.1 Waste Characterization and Incidental Waste Samples.

In addition, samples of water generated from development and purging of wells and any accumulated decontamination water will be collected, delivered to the Navy approved laboratory, and analyzed for the disposal parameters provided in Section 2.2.1 Waste Characterization and Incidental Waste Samples. The water accumulated during on-site project activities will be temporarily contained on-site in a frac tank or other approved container(s) until hauled to a Navy approved treatment facility.

All required transportation manifests will be prepared by CCI and signed by an NAS Cecil Field representative.

3.1 Wastestreams

Wastes will be handled and disposed of in accordance with regulations established by FDEP. Only materials impacted with petroleum constituents at non-hazardous levels are expected to be encountered at the project sites at the NAS Cecil Field. Petroleum-contaminated wastes under FDEP guidelines are designated non-hazardous wastes and will be managed accordingly. If analytical data from hazardous waste characterization methods [required to evaluate if a material is considered a characteristic hazardous waste] indicate a contaminant at a concentration exceeding the regulatory limits established in 40 CFR 261, the waste will be segregated into a separate wastestream and managed in accordance with regulations for generators of hazardous wastes outlined in 40 CFR 262.

3.2 Waste Characterization

Waste characterization information will be completed for specific wastestreams. This information will accompany the specific wastestream during off-site transportation of the material. Some wastestreams such as general construction refuse, general demolition debris, and metallic debris will be considered municipal solid waste and, as a result, will not require waste characterization.

Waste characterization will involve completion of written documentation describing the wastes. At a minimum, written documentation to characterize the waste stream will include the following:

- Generator information including name, address, contact, and phone number

- Site name including street/mailing address
- Activity generating waste (e.g., tank removal, excavation, treatment system operation, etc.
- Source of contamination (e.g., USTs, pipeline, etc.)
- Historical chemical use for area (e.g., gasoline, leaded gasoline, diesel, JP-4, etc.)
- Physical state of waste (e.g., solid, liquid, solid with free liquids, etc.)
- Copies of all analytical data for waste

Waste characterization data will typically be completed on a form provided by the disposal facility. At a minimum, supporting analytical data from the most recent sampling event will accompany the waste material. The most recent sampling event will be completed in accordance with FDEP requirements for non-hazardous wastes and in accordance with the requirements of the facility permitted to accept the material. In some cases, facilities permitted to accept a specific waste material require additional analyses to evaluate the waste stream prior to disposal, treatment, or recycling. Generator certification and signature, if required, will be provided by Navy personnel. An approved copy of the waste characterization form, signed by a representative of the facility approved to accept the waste material, will be received prior to off-site transportation of the material.

3.3 Disposal of Wastestreams

Wastestreams will be disposed of, recycled, or treated. The preferred disposal method, whenever feasible, will be recycling, treating, or recovering the waste material in lieu of landfilling. The appropriate documentation will be obtained prior to transportation of the material to the approval facility. This includes documentation from the following facilities:

- For off-site non-hazardous solids disposal facilities located in Florida, a copy of documentation indicating the facility as a FDEP-permitted facility for the disposal/recovery of petroleum-contaminated special waste.
- For off-site non-hazardous water treatment facilities located in Florida, a copy of documentation indicating the facility as a FDEP-permitted facility for the treatment/recovery of petroleum-contaminated water and, if applicable, a copy of the facility's National Pollutant Discharge Elimination System (NPDES) permit.
- For hazardous wastes, a copy of documentation indicating a permit to treat, dispose of, and/or store hazardous waste in accordance with USEPA regulations outlined 40 CFR 264.

The treatment, recycling, or disposal facility will be responsible for providing a copy of the final waste manifest and for providing a certificate of treatment or disposal for each load of waste received.

3.4 Handling and Transportation of Wastestreams

3.4.2 Temporary Storage

Wastes will be securely stored on-site prior to transportation and treatment or disposal. Storage containers and stockpiles will be clearly labeled prior to placement of any waste. Labels will indicate the material to be a "Non-Hazardous Waste," unless analytical results indicate a hazardous waste. The labels will include the date that waste was initially placed and a description of the waste material. Non-hazardous waste material will typically be stored in the following manner:

- Roll-offs for solids and debris will be provided with covers and disposable liners. Roll-offs will be inspected upon arrival on-site. Any roll-off arriving on-site with contents will be rejected. When not in use, securely fastened covers will be installed on all roll-offs. Liners will be disposed of as contaminated debris. Roll-offs will be inspected by the transporter after removal of the liner and decontaminated in the event of evidence of liner failure. Decontamination procedures will be completed by the transporter at the point of disposal or by returning the roll-off to the site for decontamination.

- Stockpiles for solids and debris will be provided with liner, cover, and perimeter berm. The liner will be a minimum of two 10-mil polyethylene sheets. Cover will be a minimum of one 10-mil polyethylene sheet. The perimeter berm, typically hay bales placed beneath the liner, will be constructed to allow for collection of any free liquids draining from the stockpile. Covers and perimeter berms will be secured in-place when not in use and at the end of each workday. Construction materials for the stockpiles that contact waste will be disposed of as contaminated debris. Vehicles transporting stockpiled material will be decontaminated following each vehicle's final load at the end of each workday. Decontamination procedures will be completed by the transporter at the point of disposal or by returning the roll-off to the site for decontamination.

- Drums containing solids and liquids will be neatly arranged and stored in a single on-site location. Each drum will be provided with its own label. Drums will remain covered until material is placed inside the container. 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 off-site transportation and disposal or treatment, the drums will be decontaminated prior to re-use or before leaving the site.

- Storage tanks for liquids will be provided with covers. Tanks will be inspected upon arrival on-site. Any tank arriving on-site with contents will be rejected. Tanks will be decontaminated prior to leaving the site. Typically, decontamination procedures will occur immediately following removal of the tank contents. The fluids used in the decontamination activities will be disposed of with the tank contents. Vehicles transporting bulk waste liquids will be decontaminated following each vehicle's final load at the end of each workday. Decontamination procedures will be completed by the transporter at the point of disposal or by returning the storage tank to the site for decontamination.

Containers will be inventoried the day of arrival on-site using the Transportation & Disposal Log. Containers and stockpiles will be visually inspected on a daily basis with prompt response taken in the event of any evidence of failure to contain the wastes. Decontamination of the containers and/or vehicles, completed at the point of disposal, will be documented by the transporter on the final manifest. Decontamination of the containers and/or vehicles, completed by returning to the site after disposal, will be documented on the Daily Production Report. In the event that hazardous waste material is generated during specific project activities, it will not be stored on-site for longer than 90 days as required by 40 CFR 262.

3.4.3 Transportation of Wastestreams

Each load of waste material will be manifested prior to leaving the site. The manifest form, with multiple carbon copies, will typically be provided by the waste transporter or selected treatment or disposal facility. The manifest will accompany the waste material to its final destination. The manifest form will typically identify the waste as non-hazardous. If the waste is hazardous, the manifest will be completed in accordance with 40 CFR 262. Manifesting of hazardous wastes will be completed by personnel certified with the United States Department of Transportation (USDOT) for manifesting hazardous materials. At a minimum, the non-hazardous or hazardous manifest form will include the following information:

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

Transportation of non-hazardous wastes will be completed by a transporter licensed with the Florida Department of Transportation (FDOT) for commercial transportation. In the event that wastes are hazardous, the transporter will be completed by a transporter licensed in accordance with 40 CFR 263 and 49 CFR 171-179. A copy of documentation indicating that the selected transporter has appropriate licenses will be received prior to transport of any waste material. The transporter will be responsible for weighing loads by a scale certified by the Florida Department of Commerce, Bureau of Weights and Measures. For each load of material, weight measurements will be obtained for each full and empty container, dump truck, or tanker truck. Disposal quantities will be based on the difference of weight measurements between the full and empty container, dump truck, or tanker truck. Weights will be recorded on the waste manifest. Copies of weight tickets will be provided by the transporter with the final manifest.

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

3.5 Documentation of Wastestreams

Documentation of wastestreams will be completed as discussed in the preceding sections.

4.0 Environmental Protection Plan

4.1 Introduction

The work to be performed at the project sites will incorporate features to protect the environment during excavation activities. All work will be performed in a manner that meets the intent of federal, state, and local regulations designed to protect the environment.

4.2 Erosion And Sediment Control

An Erosion and Sediment Control Plan is presented in **Appendix A.** Erosion and sediment control details required as part of the development of the Erosion and Sediment Control Plan are included in the construction drawings. Erosion and sediment control features are limited due to the nature and scope of work, and the relatively flat topography at the NAS Cecil Field. Soil removed during soil and pipe trenching activities will be screened using a PID and placed on plastic sheeting near the excavation areas. These excavation areas are shown on the site-specific construction drawings. The temporary containment of excavated soil detail shows a method for the temporary containment of excavated soil in the event soil material is left on-site overnight. The figure depicts the use of straw bails around the perimeter and plastic sheeting underneath and covering the stockpile.

Petroleum-contaminated soil from the installation of wells will be loaded directly into an on-site container, sampled to evaluate disposal requirements, and hauled to a treatment or recycling facility permitted to accept the material. If laboratory results for TPH analyses using USEPA Methods 3550 and 5030 are less than 10 milligrams per kilogram (mg/kg), the material can be used for fill material.

To prevent the migration of dust and debris from the excavation areas and to limit stormwater runoff from entering or eroding soil and/or pipe trench excavations, silt fences will be constructed around the sides of the excavation areas. A diagram of the staked silt fence detail is provided in construction drawings. Once the pipe trench excavations are completed, the areas will be filled with the appropriate material specified in the technical specifications and construction drawings; and the areas will be regraded, mulched, and seeded or compacted and repaved with asphalt or concrete as required.

4.3 Excess Soil Treatment and Disposal

Trenching activities will generate excess soil material. This excess soil will be segregated and stockpiled; and composite samples, consisting of six grabs, will be collected and analyzed for TPH using USEPA Methods 3550 and 5030. Soils, which by laboratory analyses contain TPH concentrations greater than the limits outlined in the site-specific

work plan addenda will require off-site transportation. Soil with TPH analytical results less than 10 mg/kg will be suitable for use as backfill material.

4.4 Construction Debris

Construction activities will generate a small quantity of debris including asphalt and packaging materials. These materials will be collected daily, segregated, containerized, and hauled to a facility licensed to accept construction debris.

4.5 Air Pollution Control

An individual site-specific air discharge permit for the operation of a soil vapor extraction system and/or groundwater treatment equipment such as an aerator or air stripper is not expected to be required. Effluent vapor concentrations of individual hazardous air pollutants (HAPS) are expected to be below 10 tons per year; and total HAPS is expected to be below 25 tons per year. Under Title V of the Clean Air Act Amendments, an air quality permit application will be required to be prepared if the individual or total HAPS limits are exceeded. Air effluent streams from the groundwater treatment equipment and/or the soil vapor extraction systems will be vented to the outside.

4.6 Water Pollution Control

Water generated from the development and purging of wells and any accumulated decontamination water and/or water accumulated during dewatering activities will be properly containerized, sampled, and delivered to a Navy approved laboratory for analyses. The petroleum-contaminated groundwater will be disposed off-site or treated at an approved facility.

Product material generated from recovery systems will be temporarily stored in product storage tanks. The material will be sampled, analyzed, and hauled to a location where the material can be used/recycled.

Contents from USTs, including the water accumulated in the decontamination of the UST, will be removed, temporarily placed in 55-gallon drums, sampled and analyzed, and hauled off-site to a permitted facility that will recycle or treat the material.

4.7 Dust Control

Excavation activities will be performed in a manner that limits blowing dust and tracking of mud onto site access roads. Potential dust control measures that will be employed when appropriate include water spray, sweeping, or covering with plastic sheeting. Access roads will be swept or washed periodically when construction activities track mud and dust material onto road surfaces.

4.8 Spill Containment

Due to the nature of site activities, the risk of accidental fuel or oil spills is minimal. Heavy machinery used at the project sites will be in good working condition and will be inspected periodically during site work. If significant oil or fuel leaks develop from machinery, CCI will arrange for the prompt repair or replacement of the equipment. Absorbent pads and/or a quick dry chemical absorbent will be available on-site should leaks occur. This material will be placed in 55-gallon drums, sampled in accordance with the disposal/treatment facility requirements, and delivered to a facility permitted to accept petroleum-contaminated material.

4.9 Environmental Conditions Report

CCI and the Resident Officer in Charge of Construction (ROICC) will conduct an environmental conditions survey for each project site prior to the commencement of construction. The pre-construction condition of the facilities, including grassy areas, trees, shrubs, paving, gutters, curbs, buildings, and facilities, will be photographed. A written report describing the pre-construction condition of the project site, including copies of the photographs and comments on the condition of existing paved areas, will be submitted to the ROICC within two weeks from the construction start date.

5.0 Health and Safety Plan

CCI is submitting this Basewide Health and Safety Plan (HASP) for all POL projects completed at NAS Cecil Field. This HASP contains procedures and protocols pertaining to personnel and public health and safety issues encountered during the environmental restoration projects. It is through the implementation of this plan (presented in Appendix E), along with CCI's overall Health and Safety Program, that site hazards and risks with regard to remediation activities will be controlled and minimized.

This Basewide Health and Safety Plan will be supplemented with CTO site-specific information presented in each CTO Work Plan Addendum.

6.0 Quality Control Plan

6.1 Purpose

Naval Air Station (NAS) Cecil Field remedial actions conducted as part of the CCI Southern Division RAC will be executed in accordance with a quality control plan developed and implemented in accordance with Part 6, Quality Control, of the contract and Appendix B of the Contract Management Plan. Contained within this document are direct and edited excerpts from existing manuals and documents, as well a number of standard forms that were incorporated to ensure existing standards of quality are met or exceeded during the conduct of operations required by the CCI Southern Division RAC. In addition to the excerpts, are references to manuals, documents, and procedures.

This Contract Task Order (CTO) Quality Control (QC) Plan has been developed using the Quality Control Program document as guidance. Individuals assigned to the CCI Southern Division RAC program, including CTO projects, will be able to refer to this document to familiarize themselves with the contract requirements and obtain direction on how to accomplish specific tasks within the CCI Southern Division RAC, including CTO projects.

The quality control program document, and this CTO QC Plan, will serve as the basis for identification and implementation of enhancements and/or improvements to the CTO QC Plan itself. This approach is in keeping with firmwide total quality processes and will be accomplished by the feedback process identified within the contract management plan (CMP).

As a matter of corporate policy, CCI is committed to fulfill or exceed our clients' needs and to meet necessary and sufficient regulations and standards of the engineering profession and construction industry. This quality commitment applies to all work conducted by CCI, inclusive of all engineering, scientific, economic, design, and construction activities.

Individuals performing work under the CCI Southern Division RAC, CTO projects inclusive, and under CCI's overall Quality Management Plan, and QC Plans, are responsible for the quality of their work and for the implementation and adherence to applicable quality procedures consistent with the principles of continuous quality improvement and total quality leadership (TQL).

6.2 Scope

Establish and maintain a basewide quality control (QC) plan comprised of:

- A QC organization
- A project (CTO) level plan incorporating the three phases of control
- Definition of contractually required meetings
- Development of submittal processing procedures
- Identification of testing standards and requirements

- Establishment of a complete inspection process
- Processes which address certifications and documentation necessary to provide contractually compliant materials, equipment, workmanship, fabrication, construction, and operations

The overall objective of the program level plan and the CTO QC Plan is to establish the guidance appropriate to direct individuals in the quality performance of their tasks, inclusive of preparation and implementation of all CTO level plans. To this end, the strategy of the quality management program is to eliminate major work product defects and to limit minor defects, thereby achieving client satisfaction, while minimizing professional liability exposure. Quality management is a continuous process underlying all aspects of project management, including project staffing, client liaison, project planning and execution, coordination, and the control of schedule, cost, and deliverables.

6.3 Acronyms and Definitions

Definitions of most of the unique terms used within the CTO QC Plan are presented within the body of the guidelines contained in this CTO QC Plan. A number of definitions along with frequent acronyms used within this CTO QC Plan and/or other CTO documents include:

6.3.1 Acronyms

ASTM – American Society for Testing and Materials
BRAC – Base Realignment and Closure
CAM – Contract Administration Manager
CCI – CH2M HILL Constructors, Inc.
CMP – Contract Management Plan
COE – Corps of Engineers
CTO – Contract Task Order
EFA – Engineering Field Activity
EFD – Engineering Field Division
EPA – Environmental Protection Agency
ER,N – Environmental Restoration, Navy
HSM – Health and Safety Manager
IRP – Installation Restoration Program
PM – CTO Project Manager
PMO – Program Management Office
QAO – Quality Assurance Officer
QC – Quality Control
QCPP – Quality Control Program Plan
QCM – Quality Control Manager
RAC – Remedial Action Contract
ROICC – Resident Officer in Charge of Construction
SHSS – Site Health and Safety Specialist
SPM – Program Senior Project Manager

6.3.2 Definitions

Shop Drawings – Drawings, schedules, diagrams, and other data prepared specifically for this contract by CCI, subcontractor, manufacturer, supplier, distributor, or lower tier provider, to illustrate a portion of the work.

Product Data – Preprinted material, such as illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature, catalog data, and other data used to illustrate a portion of the work, but not prepared exclusively for this contract.

Samples – Physical examples of products, materials, equipment, assemblies, or workmanship, physically identical to a portion of the work, illustrating a portion of the work or establishing standards for evaluating the appearance of the finished work, or both.

Administrative Submittals – Submittals of data for which reviews and approval will be required to ensure that the administrative requirements of the project are adequately met, but not to ensure directly that the work is in accordance with the design concept and in compliance with the contract documents.

Submittal Register – That specific document of a prescribed format which is used to establish and define required submittals, record their status, and monitor the submittal process.

Day – Generally construed as a work day unless stipulated as a calendar day.

Lead Engineer – Project Submittal Quality Administrator; that person on the project team assigned the task of managing the submittal process. They are also specifically charged with the responsibility for developing, maintaining, and monitoring the submittal register and coordinating project submittal requirements with the PM and QC Inspector.

QC Inspector – Person responsible for Quality Control on a specific CTO.

Resident Engineer – The on-site competent technical authority designated by the PM.

DOR – Designer of Record; that entity responsible for design of the remedial action implemented through the requirements of a CTO.

6.4 Responsibilities

The QCM is responsible for oversight of activities conducted under the guidance of the QCPP, which includes the CTO QC Plan. This responsibility includes periodic reviews of the processes implemented under this portion and the evaluation of any recommendations made by the project team over the course of the project regarding use of these processes.

The Project Submittal Quality Administrator is that person on the project team assigned the task of managing the submittal process. They are also specifically charged with the responsibility for developing, maintaining, and monitoring the submittal register and coordinating project submittal requirements with the PM and QC Inspector.

The QC Inspector is responsible to the QCM for managing CTO site specific QC requirements in accordance with the CTO QC Plan. The QC Inspector will develop the CTO QC Plan while reviewing and becoming familiar with CTO requirements. The QC Inspector will submit the CTO QC Plan to both the QCM and PM for review and approval. This position requires a thorough understanding of construction and chemical quality control, as well as a clear understanding of

the three phases of control and project documentation. Submittal reviews under the auspices of the program QC team will be conducted by the QC Inspector. The responsibility for oversight and coordination of all testing activities, certifying the appropriate aspects of QC activities, and attendance at and preparation of minutes for the QC Meetings and the Coordination and Mutual Understanding Meeting all befall the QC Inspector. The QC Inspector carries tremendous responsibilities and serves a critical role in the successful performance of the CCI Southern Division RAC and CTO requirements. Under certain circumstances, as defined in the contract documents, the QC Inspector may also serve as the Site Health and Safety Specialist (SHSS).

The Site Superintendent is responsible to the PM for executing the construction phase of a specific CTO and for efficiently applying the resources of the project team. The Site Superintendent is responsible for all technical, personnel, construction methodology, quality, safety, and local client interface details of the project and the project team while mobilized to the CTO site. Site Superintendents must manage, lead, and control their projects. They manage the site activities to be performed on behalf of the Navy, they lead the project team so the work is done efficiently and correctly, and they control the use of resources to meet project objectives within the authorized budgets. The Site Superintendent must also be actively involved in the oversight and guidance of subcontractor efforts. The Site Superintendent's objective is to produce a quality work product within the authorized schedule and budget. To accomplish this goal, the Site Superintendent does the following:

- Develops, with the PM, HSM, and QCM, the objectives, expectations, and scope of the work to be performed
- Plans the approach to the CTO and documents this approach in the project work plan for authorization by the PM and SPM
- Identifies staff and other resources needed to execute the CTO and establishes clear lines of communication within the organization
- Organizes, directs, and controls site personnel and resources
- Coordinates and communicates with the PM, QC Inspector, and SHSS as necessary to keep them fully informed of the work plans and progress
- Attends Coordination and Mutual Understanding meeting
- Attends Quality Control meetings
- Reviews the project work plan regularly
- Continuously monitors work progress, quality, safety, and adherence to authorized budgets and schedules

The Quality Control Administrator is that person responsible for supporting the daily quality control operations in the PMO. Reporting to the QCM, this individual supports the program and CTO projects by coordinating deliverables with the Lead Engineer and PA; assisting in the preparation and review of CTO QC plans; assisting in the preparation and review of CTO work plans; assisting in the preparation and review of site health and safety plans; confirming that documents are being properly stored within the electronic and printed document control protocols established for the program and CTO; supporting QC Inspectors and PMs with submittal review; assisting the QCM in conducting project audits; and performing other duties as assigned by the QCM or Program Manager.

6.5 Guidelines

6.5.1 QC Implementation

6.5.1.1 Project Quality Control (QC)

Various sections within Part 6.0 of the contract stipulate the requirements for quality control at the CTO level. Addressed within this section of the CTO QC Plan are specific activities associated with the CTO QC Plan, the three phases of control, project meetings, reporting, and testing. The QC Inspector will be responsible for development and implementation of the CTO QCP.

6.5.1.2 Project Quality Control Plan

Critical to the effective execution of the CTO is effective development and implementation of a CTO QC plan. The plan itself has a number of specific requirements that are satisfied before fieldwork commences. Because of the very nature of the work to be conducted under the CCI Southern Division RAC, the CTO QC plan is an integral part of the CTO work plan. And addresses both off-site and on-site activities.

The following items are addressed in the CTO QC Plan Addendum:

- Resume of the proposed CTO QC Inspector
  - The resume' shall clearly convey the qualifications of the proposed candidate.
  - The candidate for the QC Inspector position may be the same proposed as the Site Superintendent or Site Health and Safety Specialist (SHSS), provided that the scope of the CTO is such that will allow for part-time assignment to each task.
- Appointing letter for proposed QC Inspector
  - Signed by an officer of CCI
  - Clearly stated in the letter shall be the assignment of responsibility for development and implementation of the CTO QC Plan, appropriate references to be used in development and implementation of the plan, reporting hierarchy for the project, and the delegated authority to direct correction of non-conforming work
- Testing requirements associated with the CTO
  - Identification of the testing laboratory(ies) required to support the CTO
  - Testing plan that clearly identifies required tests, inclusive of chemical, confirmatory, construction quality, and materials
- List of outside organizations supporting CCI in delivery of the CTO

6.5.1.3 Three Phases of Control

The Navy has established a precise three-phase protocol involving project execution that must be implemented throughout delivery of the CCI Southern Division RAC. Intended through application of the protocol is enhanced quality and corresponding documentation of the quality process for each definable feature of work. The process formalizes specific actions that are prudent to delivery of any and every CTO, and establishes guidelines that allow CCI as the project delivery agents to better know and understand the Navy's expectations.

Preparatory Phase

The preparatory phase is that step in delivering the CTO that essentially culminates the planning and design process leading up to actual remediation of a specific site or sites. It also serves to

assure that the CTO delivery, QC, and safety plans have been completed and are ready to be implemented. The following events take place for each definable feature of work established by the PM:

1. Confirm that the appropriate technical specifications are incorporated into the project work plan and review specifications with the Site Superintendent and responsible foreman.
2. Confirm that the appropriate contract drawings are incorporated into the project work plan and review drawings with the Site Superintendent and responsible foreman.
3. Verify with the Site Superintendent and responsible foreman that all shop drawings and submittals have been approved by the proper approving authority (including factory test results, when required).
4. Confirm with the Site Superintendent and responsible foreman that the testing plan coincides with the work plan and that adequate testing is called for to assure quality delivery.
5. Confirm definition of preliminary work required at the CTO work site and examine the CTO work area with the Site Superintendent and responsible foreman to confirm required preliminary work has been properly completed.
6. Confirm availability of required materials and equipment. Examine materials and equipment with the Site Superintendent and responsible foreman to confirm compliance with approved submittals. Examine mock-ups and any sample work product to confirm compliance with approved submittals.
7. Review the site health and safety plan and activity hazard analysis with the Site Superintendent and responsible foreman to ensure that safety concerns are adequately addressed and applicable safety requirements have been incorporated into the plan. Confirm that the appropriate material safety data sheets (MSDS) have been identified and properly submitted.
8. Discuss with the Site Superintendent and responsible foreman construction methods to be employed during the remedial action. Identify checkpoints and areas of evaluation that will allow determination that the appropriate quality of construction is being achieved.

Execution of the preparatory phase must follow notification to the Contracting Officer, or designated representative, no less than two working days prior to conducting the confirmatory reviews. Additionally, results of the activity are to be documented in the daily Contractor Quality Control Report (see Section 6.5.2.2).

Initial Phase

The initial phase occurs at the startup of remedial activities, or construction, associated with a specific definable feature of work. Essentially, the initial phase confirms that the CTO QC Plan is being effectively implemented and the desired results are being achieved. As is the case with the preparatory phase, proper notification to the Contracting Officer is required before initiating site activity. With the initial phase, notification that the crews are ready to start a particular definable feature of work is required prior to their actual start. In the case of initial CTO activity, however, the coordination and mutual understanding meeting will be conducted prior to beginning work. The request to schedule the meeting may also serve as notice of the intent to start a particular CTO/definable feature of work.

Specific details associated with the initial phase are:

1. Establish the quality of workmanship required to properly deliver the CTO in accordance with contract requirements. The QC Inspector assures that the appropriate supervisors have made the work crews aware of expectations associated with the construction methods established under the preparatory phase. This assurance is to be achieved via observation of the initial work activities as well as interaction with the Site Superintendent and responsible foreman.

2. Resolve conflicts. The QC Inspector will serve to guide the Site Superintendent and responsible foreman in resolving conflicts. Should conflicts arise in establishing the baseline quality for the definable feature of work, the responsibility to resolve the conflict falls to the QC Inspector. Should the conflict not be resolved in a manner that satisfies the contract requirements, the QC Inspector must elevate the conflict to the program level (Program Quality Control Manager) and issue a non-compliance notice (see Section 3.7 of the CMP). Should the issue jeopardize the results of the definable feature of work, or put the CTO at risk of non-compliant performance, the QC Inspector may direct a cessation of work activity.

3. Evaluate the site health and safety plan and activity hazard analysis against actual work conditions with the Site Superintendent and responsible foreman to assure that the hazard analysis conducted to prepare the safety plan adequately addressed field conditions. Confirm applicable safety requirements are being implemented during construction activities.

4. Observe and evaluate the performance of testing technicians. Confirm with the Site Superintendent and/or responsible foreman that testing is being performed in accordance with the testing plan and that required protocols are being observed. Review reports and documentation associated with extraction, packaging, transporting, and testing of samples. Note discrepancies and direct correction accordingly.

Upon completion of the initial phase activities, results are to be documented in the daily Contractor Quality Control Report (see Section 6.5.2.2).

Follow-Up Phase

Completion of the initial phase of quality control activity then leads directly into the follow-up phase, which addresses the routine day-to-day activities on the project site. Inspection activities associated with each definable feature of work are to be addressed within the Daily Contractor Quality Control Report. (Procedures for use of the report are recorded in Section 5.2.2 of this document.) Specific concerns associated with the follow-up phase include:

1. Inspection of the work activity to assure work is in compliance with the contracted remedial action

2. Evaluation and confirmation that the quality of workmanship is being maintained at a level no less than that established during the initial phase

3. Evaluation and confirmation that required testing is being performed in accordance with procedures established during the preparatory phase and confirmed during the initial phase

4. Confirmation that non-conforming work is being corrected promptly and in accordance with the direction provided by the QC Inspector

Off-Site Activities

Initiation of activities in either the preparatory or initial phase that are conducted away from the CTO project site must be preceded by notification to the Contracting Officer. This notification is to

occur no less than two weeks prior to start of the work. The PM must include off-site activities in the project schedule to ensure that the QC Inspector may provide the correct notice to the Contracting Officer.

6.5.1.4 Definable Features of Work

A list of the definable work features for the hydrocarbon restoration projects is provided below:

- Site preparation
- Soil excavation in designated areas, screening, stockpiling, backfilling, and revegetation
- UST removal activities to include content removal, purging, excavation, removal, confirmation testing, transportation, disposal, and backfill
- Transport and treatment of petroleum impacted soil and water.
- Well installation to include air sparge, groundwater recovery, and free product recovery wells
- Waste characterization and incidental waste stream characterization
- Trenching to include all utility trenching and pipe trenching related to remedial activities such as horizontal vapor extraction systems and fluid transport piping, associated bedding, pipe/screen placement, backfill and compaction, and revegetation where required
- Foundation construction to include required footing excavation, forming, reinforcing and concrete placement
- Remediation system building construction
- Equipment installation to include free product, groundwater, and/or soil treatment equipment installation and associated appurtenances such as blowers, moisture separators, pumps, storage tanks, aerators, carbon treatment systems, air compressor, equalization tank(s) and utility hook up
- Paving to include grading and compaction, curb and gutter placement, as well as both asphalt and concrete paving activities.
- System start-up and operations and maintenance activities.

A definable feature of work not included in this list that is an integral element of the site-specific construction activities will be provided in the CTO work plan addenda.

Site Preparation

Site preparation activities includes clearing, grubbing, permitting as well as staging of equipment and material necessary to begin work.

Preparatory Phase

The preparatory phase will include a review of the construction drawings, work plan, specifications, submittal status, and confirmation of appropriate materials.

Initial Phase

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

Follow-up Phase

The QC Inspector will provide continuous oversight of the site preparation activities to verify that the work is completed in accordance with the construction drawings, specifications, and requirements provided in the work plan. Daily observation will verify compliance with the technical specifications and the requirements provided in this work plan. Deficiencies will be noted and corrected.

Soil Excavation, Screening, Stockpiling, and Backfilling Activities

Preparatory Phase

The preparatory phase will include a review of the construction drawings, requirements provided in the work plan, and specifications; review of the proposed excavation area including depth based on the analytical results from pre-excavation sampling activities; verifying acceptance and approval of the excavation permit from the ROICC office; verifying the submittal approval; confirming acceptability of the backfill and other required materials; and confirming that appropriate equipment and craftsmen are available to complete the work.

Prior to the commencement of excavation activity, site controls including construction barricades, roadway signs, and security fencing will be installed as necessary. The excavation area at the work site will be marked with paint and stakes, as appropriate, and an underground utility survey will be conducted by contacting the appropriate utility locating service. If necessary, CCI will coordinate with the ROICC to acquire utility layout plans of the area. Utilities which intersect the excavation area will be physically verified by the locating service. All marked utility lines in the excavation area will be uncovered with hand tools. In addition, the progress of excavation conducted with machinery will be continuously monitored for signs of buried obstructions.

Effected personnel at each facility where soil excavation is proposed will be contacted prior to mobilization to allow time to move vehicles which may interfere with access to the proposed excavation area or with the intended excavation and backfill flow patterns.

Initial Phase

Prior to excavation activities, the QC Inspector will complete the initial inspection to verify that the soil excavation follows the planned boundaries, including depth, based on the analytical results from the pre-excavation samples or as outlined in the technical specifications and/or construction drawings. Deficiencies will be documented and corrected as necessary.

Follow-up Phase

The QC Inspector will be responsible for daily surveillance of the excavation and backfilling activities. The daily surveillance will verify that the work is being completed according to the construction drawings and technical specifications and will be documented as necessary. Attention will be placed on area and depth of excavation and manifesting of petroleum-impacted soil. Backfill activities will be inspected to verify that proper placement, soil loading, and compaction methods are maintained as outlined in the technical specifications and the work plan.

The QC Inspector will verify that revegetation or pavement activities are completed in accordance with the construction drawings, the requirements in the work plan, and the technical specifications. Deficiencies will be documented and corrected as necessary.

UST Removal Activities

Preparatory Phase

The preparatory inspection for UST removal and purging activities will include review of the construction drawings and technical specifications. Additionally, a review of the American

Petroleum Institute (API) Recommended Practice 1604, *Removal and Disposal of Used Underground Petroleum Storage Tanks*, review of state regulations for UST removal and purging will also be made. Verification of the submittal approval and that appropriate, equipment, purging materials and health and safety equipment are present, and confirming that appropriate qualified field technicians are available to complete the work.

Initial Phase

Prior to the UST content removal, the QC Inspector or Site Superintendent will complete an initial inspection of the UST to evaluate the volume of contents within the UST. The volume of the material will be calculated by stick gauging the UST and evaluating the level of material contained within the UST. Multiple inspections will likely be required during content removal. The initial inspection of UST activities will be initiated when a representative portion of the contents have been removed from the UST. The QC Inspector will perform the inspections and note deviations from the construction drawings and specifications and any deficiencies in equipment.

The initial phase of the purging activities will be evaluation and selection of the purging material such as the inert gas carbon dioxide (either gaseous or solid form)or nitrogen. Evaluation and selection of the appropriate purging material will be made on a site-specific basis.

Prior to the UST excavation, the QC Inspector or Site Superintendent will locate the fill pipes. Once the fill pipes are located, excavation will continue until the top of the UST has been uncovered. Once the fill pipes are located and excavation to the top of the UST is complete, purging of the tank can commence. Multiple inspections will be required during excavation and removal activities. The initial inspection of UST excavation activities will be initiated when a representative portion of the soil has been removed exposing the UST and its associated piping. The QC Inspector will document the excavation activities and note deviations from the construction drawings and specifications and any deficiencies in equipment.

Follow-up Phase

Once the purging activities have been completed and the LEL and oxygen level have been evaluated as safe, the UST can be removed from the ground. The metal straps securing the UST to the underground pad will be cut. Nylon strap(s) will be attached to the trackhoe bucket and the other end of the strap will be hooked to the lifting rings of the tank. The UST will be slowly lifted from the excavation and placed on an impermeable liner. The QC Inspector or Site Superintendent will document the excavation and removal procedures.

Backfill activities of the excavation will be inspected to verify that proper placement, soil loading, and compaction methods are maintained as outlined in the technical specifications. The QC Inspector will verify that excavation, UST removal, backfilling, and revegetation or pavement activities have been completed in accordance with the construction drawings and technical specifications. Deficiencies will be documented and corrected as necessary.

Once the tank is removed, the remaining sludge in the bottom of the tank will be removed using a squeegee, absorbent material, and non-sparking shovels, and placed in 55-gallon drums. The remaining sludge will not be removed until the UST is checked to verify that it is still properly purged.

The tank atmosphere will be regularly tested for flammable or combustible vapor concentrations during purging activities. The LEL and the oxygen percentage in the tank will be monitored using a combustible gas indicator. The QC Inspector or Site Superintendent will document the results of the purging procedures.

The QC Inspector or Site Superintendent will verify that the tank content removal and purging activities have been completed and properly documented in accordance with the technical specifications and state regulations for UST abatement. Deficiencies will be documented and corrected as necessary. The QC Inspector or Site Superintendent will verify that the contents of the UST have been removed, the interior has been properly cleaned using a high pressure wash, and that the tank has been properly marked and secured prior to off-site transportation to a recycling facility.

Prior to any work performed on USTs, including the removal of the remaining sludge on the tank floor, the QC Inspector or Site Health and Safety Specialist will verify that the vapor concentration is lower than ten percent of the LEL and the oxygen concentration is at least 19.5 percent.

Transportation and Treatment of Petroleum Impacted Soil and Groundwater

Preparatory Phase

The preparatory stage for transportation of petroleum-impacted soil and groundwater includes a review of the disposal, recycling or treatment facility(s) qualifications, transportation schedule for hauling material off-site, and confirming that the appropriate equipment and materials, such as non-hazardous waste manifests, are available to complete the sampling activities.

Initial Phase

Verify that the information provided on the waste manifest is complete and accurate including, but not limited to, generator name, date, type of material being hauled, designated recycling or treatment facility, and volume and/or weight of material. Correct discrepancies in the non-hazardous waste manifest.

Follow-up Phase

Verify that the recycling or treatment facility has accepted and treated the waste material at their facility and has sent the required completed manifest to the generator or the generator's technical representative. Confirm receipt of the certificate of recycling or treatment from the designated facility and verify that the invoice is complete and accurate.

Well Installation Including Air Sparge, Groundwater Recovery, And Product Recovery Wells

Preparatory Phase

The preparatory inspection for air sparge well and/or recovery well installation activities will include review of the construction drawings, the site-specific work plan, and specifications, verifying the submittal approval, confirming qualifications and schedule of the well driller, verifying that appropriate materials are present, and confirming that the appropriate equipment and geologists and/or technicians are available to complete the work.

Initial Phase

Prior to the air sparge well and/or recovery well installation activities, the QC Inspector will complete an initial inspection of the augers to verify that they have been properly decontaminated. The locations of the air sparge wells, groundwater recovery wells, and product recovery wells will be shown on the site plan provided in the work plan. Deficiencies will be documented and corrected as necessary.

Follow-up Phase

A geologist or other approved technical representative and the QC Inspector will be responsible for oversight of well installation activities. Oversight activities will include verification that the work is being completed according to the technical specifications and the well details provided on the construction drawings. Attention will be placed on total well and screen depth, well materials,

and filter pack materials and depths. The QC Inspector will verify that the installation procedures are completed in accordance with the requirements provided in the work plan, technical specifications, and the well details provided on the construction drawings. Deficiencies will be documented and corrected as necessary.

Waste Characterization and Incidental Waste Stream Sampling

Preparatory Phase

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

Initial Phase

Waste characterization and incidental waste stream samples will be collected and analyzed at an approved laboratory in accordance with requirements outlined in the work plan or sampling and analysis plan. Sample collection activities including proper chain-of-custody documentation will follow the protocols outlined in the work plan or sampling and analysis plan. Procedures for the collection of pre-excavation, groundwater monitoring well, treatment system, and confirmation samples will be outlined in the work plan.

Follow-up Phase

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

Trenching Activities

Preparatory Phase

The preparatory phase for the installation of the pipe and utility trenches will include a review of the site plan, construction drawings, work plan, technical specifications, submittal status, confirmation of appropriate materials and construction equipment, worker qualifications and availability, and equipment availability.

Initial Phase

Initial inspections of the pipe trench will be completed when a representative portion of the trench has been excavated. The QC Inspector will verify that the depth and slope are being maintained according to the construction drawings and technical specifications.

Follow-up Phase

The QC Inspector will provide oversight during trench and piping installation activities. The QC Inspector or Site Superintendent will document the length, depth, and location of the trench, pipe placement, and bedding and cover material in the trench. Daily observation will verify compliance with the construction drawings and technical specifications. Fill activities will be inspected to verify proper placement, soil loading, and compaction, where necessary. The QC Inspector will conduct inspections to verify that the work, pipe materials, and associated equipment are in accordance with the construction drawings, the requirements provided in the work plan, and technical specifications. Deficiencies will be documented and corrected.

Foundation Construction

Concrete foundations will be formed and placed to facilitate construction of remediation system buildings. Free product, groundwater, and/or soil treatment equipment will be mounted at the appropriate locations on the concrete foundation inside the building.

Preparatory Phase

The preparatory phase will include a review of the construction drawings, work plan, specifications, submittal status, and confirmation of appropriate materials.

Initial Phase

Multiple inspections will be required during construction of the foundation to verify proper footing and form placement. Additional inspections will also be required to verify the proper placement of reinforcing steel or welded wire fabric that may be required. The QC Inspector will perform the inspections and note deviations from construction drawings, specifications, and work plan and any deficiencies in equipment.

Follow-up Phase

The QC Inspector will provide continuous oversight of the foundation placement to verify that the work is completed in accordance with the construction drawings, specifications, and requirements provided in the work plan. Compressive strength, slump, and air tests will be completed on the concrete to verify proper mix design. The QC Inspector will evaluate the compressive strength, slump, and air test data to verify that the results are acceptable. Daily observation will verify compliance with the technical specifications and the requirements provided in this work plan. Deficiencies will be noted and corrected.

Remediation System Building Construction

The remediation system building will be constructed following construction of the foundation. Free product, groundwater, and/or soil treatment equipment will be mounted at the appropriate locations on the concrete foundation inside the building.

Preparatory Phase

The preparatory phase will include a review of the plans and specifications, review of the work plan, submittal status, confirmation of appropriate materials and equipment, worker qualifications and availability, and equipment availability.

Initial Phase

Multiple inspections will be required during the construction of the building. The installation will include frame construction, steel panel placement, brick veneer installation (if required), louver placement, door placement, vent and fan placement, lighting, wiring, etc. The QC Inspector will perform the inspections and note deviations from the construction drawings, the site-specific work plan addendum, and specifications and any deficiencies in materials or equipment.

Follow-up Phase

The QC Inspector will provide continuous oversight of building construction to verify that the work is completed in accordance with the construction drawings, the requirements provided in the work plan, and specifications. Daily observation will verify compliance with the construction drawings and technical specifications. Deficiencies will be noted and corrected.

Equipment Installation

Installation of free product, groundwater, and/or soil treatment equipment will include the electrical and utility connection of the required treatment equipment and associate appurtenances. Depending on the project requirements this could include vapor extraction blower(s), moisture

separator, condensation storage tank, aerator, liquid-phase carbon vessels, oil/water separator, free-product storage tank, air compressor, sump pumps, equalization tank, horizontal air compressor storage tank, pneumatic pump installation, and controls. The environmental remediation treatment equipment will be mounted at the appropriate locations on the concrete foundation inside the building.

Preparatory Phase

The preparatory phase will include a review of the construction drawings and the work plan, technical specifications, submittal status, confirmation of appropriate materials and treatment equipment, worker qualifications and availability, and equipment availability.

Initial Phase

Multiple inspections will be required during installation of the equipment. The initial inspection of the treatment equipment installation activities will be initiated following construction of the remediation building and completed when a representative portion of the equipment has been placed on the slab and connected to the proper utilities. The installation will include the plumbing and electrical connections. The QC Inspector will perform the inspections and note deviations from the construction drawings, the work plan, and specifications and deficiencies in equipment.

Follow-up Phase

The QC Inspector will provide continuous oversight of the treatment equipment placement, piping, and utility connection activities to verify that the work is completed in accordance with the construction drawings, work plan requirements, and technical specifications. Deficiencies will be noted and corrected.

Paving Activities

Paving will be placed to facilitate all weather access to the remediation system buildings or as part of the site restoration. Paving activities will include grading, curb and gutter placement, as well as concrete and asphalt paving.

Preparatory Phase

The preparatory phase will include a review of the construction drawings, work plan, specifications, submittal status, and confirmation of appropriate materials.

Initial Phase

Multiple inspections will be required during construction of the subgrade to verify proper compaction. Additional inspections will also be required to verify the proper placement of curb and gutter that may be required. Actual paving operations will require continuous inspection to assure proper pavement placement. The QC Inspector will perform the inspections and note deviations from construction drawings, specifications, and work plan and deficiencies in equipment.

Follow-up Phase

The QC Inspector will provide continuous oversight of paving activities to verify that the work is completed in accordance with the construction drawings, specifications, and requirements provided in the work plan. Compressive strength, slump, and air tests will be completed on the concrete to verify proper mix design. Asphalt temperatures will be verified prior to placement. The QC Inspector will evaluate the compressive strength, slump, and air test data to verify that the results are acceptable. Daily observation will verify compliance with the technical specifications and the requirements provided in this work plan. Deficiencies will be noted and corrected.

System Start-Up and Operation and Maintenance

Each treatment system will be started, operated, and maintained for a period required in the CTO. Collection of treatment system and groundwater monitoring well samples from specified locations will be conducted as specified in the work plan. An operation and maintenance manual will be prepared that documents the required sample collection protocol, system start-up conditions, normal operating conditions, and troubleshooting guides.

Preparatory Phase

Prior to system start-up, the specifications, submittal status, and manufacturer's operating instructions will be reviewed by the QC Inspector and other site personnel. Start-up will not begin until equipment and piping tests have been completed.

Initial Phase

The initial phase will be completed by the QC Inspector once start-up has commenced. The QC Inspector will inspect for gauge and flow readings, leaks, equipment malfunctions, and other deficiencies. Deficiencies will be corrected during start-up activities.

Follow-up Phase

Technical personnel performing operation and maintenance activities will provide oversight of the system operation and collect any necessary treatment system and groundwater monitoring well samples from the groundwater and/or soil remediation system(s). Deficiencies will be documented and corrected. Technical personnel will abide by the operation and maintenance schedule and complete the required activities as specified in the Operation and Maintenance Manual. At the completion of operation and maintenance activities, the treatment system will be turned over to the owner for operation. An operation and maintenance manual, prepared by CCI will be provided. The QC Inspector and technical personnel will verify that the system is operating in accordance with the technical specifications.

6.5.1.5 Project Meetings

Coordination and Mutual Understanding Meeting

Prior to the start of on-site activities, the QC Inspector shall meet with the Contracting Officer (or designated representative) to discuss the CTO QC plan. The purpose of the meeting will be to confirm a clear understanding by both the QC Inspector and Contracting Officer exists regarding the specific QC points of concern on the features of work, forms to be used on the project and the correct protocol for use of each form, administration of both on-site and off-site work, and the duties and responsibilities of all CCI personnel on the site. The meeting shall be attended by the CTO Project Manager, Site Superintendent, and QC Inspector.

QC Meeting

After the start of site work activities, the QC Inspector shall conduct QC meetings at a frequency established as necessary by the pace of the work, or as required by the Contracting Officer. Typically, meetings are expected to occur at two-week intervals. Conducting the meetings and preparing the meeting minutes are responsibilities of the QC Inspector. The daily contractor quality control report will also document the meeting occurrence. The meeting agenda will include:

- Review of previous meeting minutes
- Review of the project schedule
  - Work or testing accomplished since the last meeting
  - Rework items identified since the last meeting

- Rework items completed since the last meeting

- Submittal status
  - Submittals reviewed since the last meeting
  - Submittals expected within the next two-week window

- Review of the work scheduled over the next two week window
  - Establish completion targets for any outstanding rework
  - Identify and schedule any definable features of work requiring preparatory phase activities
  - Identify and schedule any definable features of work requiring initial phase activities
  - Identify and schedule any definable features of work requiring follow-up phase activities,
  - Identify any testing required in support of or confirming remedial activities
  - Review status of any off-site activities
  - Identify any special documentation requirements for either production or QC
  - Address and resolve any production or QC problems

- Identify any activities or items that may require revising the CTO QC plan, and annotate any recommendations

- Identify any production or QC procedures that may be less effective than anticipated and may require revising the project delivery or QCPP, and annotate any recommendations

6.5.1.6 Reporting

Contractor Production Reports

The Contractor Production Report documents the daily construction activity at the project site. One is to be prepared for each CTO in progress. The document is prepared, signed, and dated by the Site Superintendent. The Site Superintendent will submit the report to the QC Inspector for attachment to the Daily Contractor Quality Control Report. Refer to Section 6.5.2.1 of this document for specific procedures; a sample form and an example of a completed report are provided in Attachment A (Appendix D).

Daily Contractor Quality Control Reports

The Daily Contractor Quality Control Report documents the quality control activity at the project site. A report will be prepared for each CTO in progress. The document is prepared, signed, and dated by the QC Inspector. The QC Inspector will submit the report to the Contracting Officer, with the Contractor Production Report attached, the day following the date of the report. Refer to Section 5.2.2 of this document for specific procedures; a sample form is provided in Attachment A (Appendix D).

Testing Plan and Log

The Testing Plan and Log is a document that defines and records the parameters associated with all on-site testing that occurs over the course of the CTO. This document will be maintained by the QC Inspector as tests are conducted and test results reported. Data is to be entered at the time of the testing and immediately upon receipt of the test results. The Testing Plan and Log will be submitted monthly for Contracting Officer review. Refer to Section 5.2.3 of this document for specific details regarding use of the Testing Plan and Log; a copy of the log is provided in Attachment A(Appendix D).

Monthly Summary Report of Field Tests

The QC Inspector will complete a report at the end of each month's activities. This report will provide a monthly summary of all testing activities conducted over the reporting period and their corresponding results (pass/fail). The report will be attached to the last Daily Contractor Quality Control Report submitted for the reporting period. Refer to Section 6.5.2.4 of this document for an specific details regarding use of the Monthly Summary Report of Field Tests; a copy of the report in provided in Attachment A(Appendix D).

QC Meeting Minutes

On the event of a CTO QC meeting, the QC Inspector will take minutes and release the documented proceedings within six calendar days of the meeting. Refer to Section 6.5.2.5 of this document for specific details. A copy of the meeting minutes form is provided in Attachment A (Appendix D).

Rework Items List

The Rework Items List is a list maintained by the QC Inspector to document those discrepancies that are not corrected within the same day of discovery. Should a non-compliant activity or result be observed during a work period and be corrected within the same work period, it does not need to be recorded on the Rework Items List. The list will include items identified by both the Contractor and the Contracting Officer. A copy of the updated list will be attached to last Daily Contractor Quality Control Report submitted for the reporting period (month). Refer to Section 6.5.2.6 of this document for specific details regarding use of the Rework Items List; an example is provided in Attachment A (Appendix D).

Nonconformance Notice

An NCN is issued by the QC Inspector to the subcontractor for subcontract non-conforming on-going work or work in place. Upon discovering nonconforming or unacceptable work, the QC Inspector will immediately notify the subcontractor. If the work cannot easily be corrected (i.e. within the current workday), the QC Inspector will then issue an NCN, which will be copied to the PM, Contract Administration Manager (CAM), and QCM. The subcontractor must respond with proposed corrective action within 24 hours. The QC Inspector and PM will review the proposed corrective action and respond to the subcontractor. The QC Inspector will document the actual corrective action taken and inform the PM, CAM, and QC Manager.

A copy of the NCN form is provided in Attachment A (Appendix D).

Sampling and Analysis Plan

When environmental sampling is required under performance of any CTO, a Sampling and Analysis Plan shall be prepared and maintained. The QC Inspector will monitor the plan for compliance with regards to sample collection and submission procedures. This plan shall be prepared to reflect the specifics discussed in Sections 6.5.3.2 through 6.5.3.8.

Submittal Register

Refer to Section 5.4 for specific direction regarding submittal processing and register maintenance.

As-Built Records

The QC Inspector and Site Superintendent shall be jointly responsible for maintaining as-built records. Verification of data, information, records, etc., have been incorporated into the project files shall be the sole responsibility of the QC Inspector.

As-built records will be maintained at the project site and will be available for inspection by the Contracting Officer at any time.

6.5.1.7 Surveying

Under the provisions of the Contract Documents, all lines and grades are to be established by CCI from existing baselines or benchmarks. CCI is charged with the responsibility of maintaining stakes, marks, or information establishing lines and grades. The Site Superintendent is responsible for verifying conformance of final lines and grades with the Contract Documents, and coordinating confirmation with the QC Inspector. Should the Site Superintendent and/or QC Inspector need assistance in confirming that the work is within acceptable tolerances and is properly located/oriented, they should advise the Resident Engineer and QCM of their concern. The Resident Engineer will review the specific situation with the Site Superintendent, and if necessary, will arrange for survey services to be provided to address the concern and confirm the nature and/or quality of the work. Once a clear conclusion has been established, the QC Inspector will respond accordingly that the work is acceptable, or with an advisory to the Site Superintendent via a non-compliance notice addressing the construction concern.

All survey data must conform to the Tri-Service Spatial Data Standards (TSSDS). These standards shall be applied on all deliverables involving site investigation, site assessment, site verification, remedial investigation, and confirmation sampling activities. Horizontal controls for graphic and non-graphic information are Mercator Projection, GRS 80, State Plane Coordinate System, North American Datum 1983, Lambert Zones 1 through 6 (or appropriate zone for region to be mapped), feet. Vertical controls are Mean Sea Level, North American Vertical Datum 1988.

6.5.1.8 Materials Testing

Materials testing to be performed during project construction will be contracted for by the Subcontract Administrator in concert with the PM and QCM. Scheduling of site services will be the responsibility of the QC Inspector. Materials testing may include, but not be limited to the following:

- Performance of gradation analysis on fill materials
- Perform laboratory Proctor compaction tests
- Perform relative density testing, moisture (critical for modified proctor)
- Perform pavement analyses, asphaltic concrete
- Molding, curing, and breaking of concrete cylinder specimens
- Slump test for cast-in-place concrete
- Checking air entrainment for cast-in-place concrete
- Checking and recording concrete temperature for cast-in-place concrete
- Sample testing of mortar and grout
- Subgrade evaluation (bearing capacity/penetrometer)
- Asphalt cores, Marshall samples, gradation, density, etc.
- Other tests and/or samples specific to the general services agreement

Results of the above testing will be reported to the QCM.

The Subcontract Administrator is also responsible for administering the materials testing contract(s). This activity will be done in close coordination with the QCM as well as the QC Inspector. Confirmation of laboratory invoices will be the responsibility of the QC Inspector. Maintenance of site testing records will also be the responsibility of the QC Inspector.
One provision of the contract is that the QC Inspector will make arrangements with the laboratory to take samples and specimens at least 24 hours in advance. A record of the laboratory's work will be recorded by each QC Inspector in the daily Contractor Quality Control Report and in the

materials testing log kept as part of the project files for verification purposes. Typical information kept in the daily Contractor Quality Control Report includes time on the project, name of technician, and tests or samples taken (with locations). The testing lab technician will provide an immediate copy of the field activity report to the QC Inspector prior to their departure. This report summarizes activities conducted and allows the inspector to verify that correct information and locations have been recorded.

6.5.1.9 Periodic Site Visits/Observation

Based on the project's need for services by specialized technical staff, the QC representative will secure permission from the PM, coordinate with the QCM, and subsequently arrange visits to the site in the following disciplines:

- Geotechnical Engineer
- Construction Engineer
- Civil Engineer
- Project Chemist
- Hazardous Waste Engineer
- Environmental Scientist
- Project Controls Specialist
- Others as required

The purpose of the site visits is to provide one or more of the following:

- Technical review of and assistance with ongoing construction
- Observation/evaluation of field performance tests
- Assistance in problem resolution
- Assistance in final inspection/project closeout
- Others as required

Each individual visiting the site will meet initially with the CTO Inspector and Site Superintendent to review procedures and goals of the visit. The individual visiting the site will prepare a report for each visit detailing activities, observations, requested actions, proposed solutions, etc. Before leaving the site, the visitor will debrief with the CTO Inspector and Site Superintendent.

6.5.1.10 ROICC Inspections

Periodically, the ROICC inspector assigned to the project will visit the project and review the work to check for contract compliance. These may or may not be scheduled or coordinated visits, but are likely to be periodic. The inspector will typically arrive on site to observe and evaluate project activities. In all cases, the on-site QC representative will accompany the inspector. In cases where the assigned QC representative is a part-time assignment, if the representative is not present at the time of the visit, the Site Superintendent will accompany the inspector on the site visit.

6.5.1.11 Punch Lists

The inspection staff will maintain a continuous list of deficient items for each CTO, organized by definable feature of work within the respective CTO. Upon receipt of notification from the Site Superintendent signifying substantial completion, the QC Inspector will execute a thorough assessment of the work in place with the Site Superintendent in order to generate a punch list. The QC Inspector will arrange for specialty inspections, as necessary. The punch list will consist of an accumulation of items from:

- Contractor Production Reports
- Log of rework items
- Review of specifications, submittals, and drawings
- Contracting Officer observations and comments
- Specialty inspection reports

The QC Inspector will prepare a draft copy of the punch list for review by the Site Superintendent, PM, and QCM. Upon approval and direction from the PM, the Site Superintendent will use the list to establish a completion schedule and target final inspection by the Contracting Officer. During the final inspection with the Contracting Officer or his representative, a final punch list will be developed and a punch list schedule will be established.

Upon notification by the Site Superintendent that specific work items have been completed, the QC Inspector will examine the completed work with the Site Superintendent. Should the item be correctly completed, the QC Inspector will initial and date the item on the confirmation copy of the punch list and notify the ROICC for verification. The official confirmation copy of the punch list will be maintained in the project files. Items disputed by the Site Superintendent will be noted to the QCM, who will review them with the QC Inspector and Site Superintendent, and if necessary, the PM. Updated punch lists will be issued weekly to the Site Superintendent, PM and QCM.

Due to the nature of the work and the maintenance of the rework items list, punch lists are to be very specific and brief. This will reduce the magnitude of an overall final inspection and will, in turn, facilitate substantial and final completion.

6.5.1.12 Laboratories

Acquisition of laboratory services will be necessary under most CTO-specific projects. In accordance with the requirements of the CCI Southern Division RAC, laboratory services will be obtained from independent testing laboratories qualified to perform the testing required by CTO projects. Two different types of laboratory services are anticipated: construction-related analyses and environmental analyses. The CTO QC Plan Addendum will specify the types of sampling and analysis required for the project and identify the type of laboratory service required.
Once the type of laboratory service required has been determined, the selection process will be conducted using, at a minimum, a demonstration by the laboratory that it is capable of meeting the relevant accreditation/certification criteria to complete the work in a manner which is both reliable and adequately documented to meet the following six indicators of data quality:

- Comparability
- Completeness
- Representativeness
- Accuracy
- Precision
- Acceptable detection limits (environmental media, only)

Laboratories must be actively participating in relevant accreditation/certification programs. The CTO QC Plan Addendum will specify the types of accreditation/certification which are relevant to each CTO-specific project. Some examples include the following:

- Construction-Related Activities
  - National Institute of Standards and Technology (NIST)

- National Voluntary Laboratory Accreditation Program (NVLAP)
- American Association of State Highway and Transportation Officials (AASHTO) Program
- American Association for Laboratory Accreditation (AALA) Program

- Environmental Investigations
  - Navy Laboratory Evaluation Program
  - EPA Contract Laboratories Performance (CLP) Program
  - Individual Certification/Accreditation programs or criteria

The CTO QC Plan Addendum will also specify data deliverable formats, both electronic and hard copy, data quality objectives, laboratory deliverable schedules, and performance criteria.

6.5.1.13 Documents, Reports, Minutes, Correspondence

Documents, reports, minutes, and correspondence are deliverables provided to the Navy. Quality in these deliverables is based on both technical and non-technical aspects of the work. To have acceptable quality, deliverables must meet at least the following requirements:

- Logical and technically correct assumptions, approach, and conclusions
- Appearance and format meeting firm and client style standards (e.g., cover, printing, figures, and tables)
- Logical organization and presentation
- Readable properly edited text (i.e., no typographical errors, misspelled words, or incorrect references)

Internal reviews, as well as client comments or feedback, and their resolution will be documented and maintained as permanent project records.

6.5.2 QC Documentation

6.5.2.1 Contractor Production Reports

The Site Superintendent will document site construction activities using the electronic Contractor Production Report, which is a template within the Microsoft Word application (see Attachment A). Reports are required for each day that work occurs at the CTO site. Every calendar day of the CTO is to be accounted for with a report, even if no activity occurs. An example is included in Attachment A. The following guidelines are to be followed:

- Each Site Superintendent will prepare and submit the reports to the QC Inspector within the next working day of the report.
- The Site Superintendent will assure report filenames are in accordance with document control protocols for standardization (refer to Section 3.7 of the CMP for specific guidance). The Site Superintendent will also verify the report has been electronically submitted to the PMO in the correct file location.
- Entries are to be accurately and thoroughly made, addressing factual information only and avoiding opinion, conjecture or speculation.
- Report every workday and account for every calendar date. If no work is done on a given date, the date should be entered and the reason for not working should be recorded (i.e.; "No

activities scheduled for this date, no onsite inspection services provided"). Should seven consecutive days of inactivity occur, a single report accounting for each day will be prepared on the last day of the seven day sequence.

- Document site activities. References to specific schedule activities shall be made regarding definable features of work. Problems or abnormal occurrences shall be clearly described, including the reason for the specific occurrences. Entries should include, but are certainly not limited to:
  - Date of the report, report number, contract number, title and location of CTO, and the name of the reporting Site Superintendent
  - Weather conditions in the morning and afternoon, typically 8:00 a.m. and 2:00 p.m.
  - Report the number of construction employees on the CTO site, sorted by employer. Annotate trade, work location, and description of work performed
  - Report job safety actions taken and safety inspections conducted. Specifically annotate if:
    - A job safety meeting was held (if so, attach a copy of the meeting minutes)
    - A lost time accident occurred (if so, attach a copy of the completed OSHA report)
    - Trenching, scaffold, high-voltage electrical, or high work was done (if so, attach inspection checklist used for corresponding aspect of work)
    - Hazardous material or waste was released into the environment (if so, attach a description of the event and proposed corrective action)
  - List of equipment and/or material received that is to be incorporated into the job
  - List of construction and plant equipment on site, indicate number of hours in use, hours idle, and/or hours down for repair
  - Identification of any delays that occurred over the course of the day and the corresponding cause. Cite if delay is recoverable and how recovery will be executed
  - Identification of any and all changes that occurred over the course of the day and how the change was precipitated
  - Site visitors log

6.5.2.2 Daily Contractor Quality Control Reports

The QC Inspector will document site activities using the electronic Daily Contractor Quality Control Report, which is a template within the Microsoft Word application Reports are required for each day that work occurs at the CTO site. Every calendar day of the CTO is to be accounted for with a report, even if no activity occurs. An example is included in Attachment A. These guidelines are to be followed:

- Each QC Inspector will prepare and submit the reports within the next working day of the report. Ensure that the Contractor Production Report is attached to the Daily QC report.

- The QC Inspector will ensure that report filenames are in accordance with document control protocols for standardization The QC Inspector will also ensure that the report has been electronically submitted to the PMO in the correct file location.
- Entries are to be accurately and thoroughly made, addressing factual information only and avoiding opinion, conjecture, or speculation.
- Report every workday and account for every calendar date. If no work is done on a given date, the date should be entered and the reason for not working should be recorded (i.e.; "No activities scheduled for this date, no onsite inspection services provided."). Should seven consecutive days of inactivity occur, a single report accounting for each day will be prepared on the last day of the seven day sequence.
- Include references to phone calls and on-site conversations. Record details of pertinent and relevant conversations on the standard telephone conversation form and reference the conversation record in the daily QC report.
- Document site activities. References to specific schedule activities shall be made regarding definable features of work. Each QC Inspector is responsible for coordinating activities with the Site Superintendent and ensuring knowledge of planned construction activities. Problems or abnormal occurrences shall be clearly described, and incorporated into the rework item list as required, including the reason for the specific occurrences. Entries shall include, but are certainly not limited to:
  - Identify the control phase and the definable feature of work.
  - Annotate results of any preparatory phase meetings and/or activities.
  - Annotate results of any initial phase meetings and/or activities.
  - Annotate results of any follow-up phase inspections and/or activities.
  - Report the number of construction employees on the CTO site, split among trades. Note CCI staff and individual subcontractors. This information should be obtained from the Site Superintendent, not by personnel count, although the information should be corroborated by visual count.
  - Report the work performed and reference scheduled activities, using common terminology, whenever possible.
  - Report tests conducted and corresponding results.
  - Report testing services utilized. If subcontracted, include the number of technicians, number of tests, and time spent on the project.
- When a specific scheduled activity or measured event is completed (e.g., a portion of a basin slab is cast, a length of pipeline is laid, a specific piece of equipment is set), clearly annotate so in the daily QC report and record the date on the as-built drawings.
- In the event paperwork is exchanged with the Contracting Officer, record the time, the name of Contracting Officer's representative to whom field paperwork was delivered or received, and the nature of the contents of the paperwork.

- Note questions on workmanship, to whom the question was raised, and what the disposition of the question was/is.
- In the event multiple CTOs are being overseen by one QC Inspector, each CTO shall be reported independently.
- Document photographs taken and any unusual activities observed.
- Update the rework item list as activities are completed.
- Ensure that proper documentation is prepared and filed for Technical Specialist site visits in compliance with QCPP and this CTO QC Plan protocols.
- Ensure the certification is completed and signed.
- File field pocket notebooks (Rite in the Rain) in the permanent project records.

6.5.2.3 Testing Plan and Log

The testing plan and log is intended to identify and track the status of those tests, both construction and environmental, required by the contract (CTO). The log will be developed by the QC administrator and PM, and maintained at the site by the QC Inspector. An example of the log format is provided in Attachment A. The specific items recorded in the log are self explanatory. One key purpose of the log is to alert the QC Inspector and Site Superintendent to the required tests, which in turn allows them to ensure proper protocols are incorporated into the project activities, QC plan, health and safety plan, and schedule. The log also serves as a basis to confirm availability of testing services prior to the onset of site activities.

In that the plan and log is in electronic format, the QC Inspector is responsible for ensuring the current version is properly filed within the PMO electronic file. Updates will be monitored by the QC administrator to ensure current status is available to program management and project management staff.

6.5.2.4 Monthly Summary Report of Field Tests

The monthly summary of field tests is exactly that, a synopsis of tests conducted over the reporting period and the corresponding results (pass or fail). The summary sheet will be submitted as a cover sheet to the monthly submission of the updated sampling plan and log. Format for the report is provided in Attachment A (Appendix D). The specific items recorded in the log are self-explanatory.

In that the plan and log is in electronic format, the QC Inspector is responsible for ensuring the current version is properly filed within the PMO electronic file. Updates will be monitored by the QC administrator to ensure current status is available to program management and project management staff.

6.5.2.5 QC Meeting Minutes

The critical concerns regarding QC meeting minutes are the timeliness of their issuance, the accuracy of the comments, and the thoroughness of the recorded proceedings. The QC Inspector will use the standard CCI Word template for meeting minutes, an example of which is included in Attachment A of Appendix D. Given the timing of submission of the minutes (no more than two calendar days following the meeting), the QC Inspector will review the minutes with the Site Superintendent to confirm thoroughness and quality of the content the day following the meeting. If there are areas of concern regarding quality of the delivered work product or procedures in use

at or off the site, the QC Inspector and Site Superintendent will contact the QCM and PM for a briefing and review of the minutes prior to their issuance. Should the Contracting Officer's representative have questions or comments on the minutes, the QC Inspector and Site Superintendent will respond to such via amended minutes or separate correspondence. In such an event, issuance of the response will be preceded by a review of the response by both QCM and PM.

In that the meeting minutes will be in an electronic format, the QC Inspector is responsible for ensuring the document is properly filed within the PMO electronic file.

6.5.2.6 Rework Items List

The rework items list is intended to identify and status those items of work within the contract (CTO) that have been identified as not satisfying contract requirements. The list will be developed and maintained at the site by the QC Inspector. An example of the list format is provided in Attachment A. The specific items recorded in the list are self-explanatory. Critical to understanding the list is recognizing that items are entered into the list only if corrective action of a deficiency cannot be completed within the workday it was identified. One key purpose of the list is to provide a tracking mechanism for the QC Inspector and Site Superintendent for discrepancies, required corrective action, the respective priority of resolution, and confirmation of resolution. The list in turn allows them to ensure PM and QCM awareness to site issues and potential lessons learned which could support future CTO project activities, QC plans, health and safety plans, and schedules.

Since the list is in electronic format, the QC Inspector is responsible for ensuring the current version is properly filed within the PMO electronic file. Updates will be monitored by the QC administrator to ensure current status is available to program management and project management staff.

6.5.2.7 Submittal Register

Refer to Section 6.5.4.2.

6.5.2.8 Photographs

The on site QC Inspector will maintain the construction photograph file. Photographs will be taken as required and periodically by the QC Inspector or designee. Standard progress, details of work, unusual occurrences, accidents, details of problems (poor work, non-complying work) and displays of good, quality work and craftsmanship are examples of photographs that are to be taken by each QC Inspector or designee. Photographs will be filed in 3-inch three ring binders and arranged chronologically, two photos per page. Each photograph will be labeled directly on the photo.

Photographs will also be provided on CD ROM for the permanent project record. Negatives and the CD will be filed at the Program Management Office. Prints will be maintained in the field office.

Vantage points for progress photos are to be consistent from set to set. If the location is not apparent, the viewers location should be defined. Care should be taken to ensure scale definition is evident so viewer can gauge size, depth, etc. Photographs are to be taken with a data-back camera with the date displayed (time will only be displayed in necessary situations).

Progress photograph protocol is as follows:

- Four-inch by 6-inch photographs will be used.
- The QC Inspector/photographer will document pertinent information to be typed onto adhesive-backed labels. Labels will be adhered to the backs of the photographs after typing. Information will include the perspective of the view, the project name and contract number, name of QC Inspector, time of photo, and a brief description of the view. If hand written in lieu of typed, all writing will be block printing - clear and very legible. If the date is not clearly visible via the data-back label on the print, the date shall be written in as information with the description.
- One print will be processed of each photograph, and labeled and filed. The film processor will provide, in addition to the uncut print, one set of negatives which will be used to generate the CD ROM stored set. The set of prints and the CD should be kept secure (i.e., fireproof) and separate from the set of negatives.
- Negatives will be filed promptly in sleeves. The sleeve containing the negatives will be labeled citing the project and dates covered by the negatives. The negative sleeve will then be forwarded to the PMO for retention.

6.5.3 Work Processes

6.5.3.1 General

Activities and processes affecting the quality of items and services conducted under the CCI Southern Division RAC Program, including CTO projects, are prescribed by and performed in accordance with documented instructions, procedures, drawings, and specifications associated with contract CTOs issued by the Southern Division. To the greatest extent practical, established, approved procedures will be used in execution of the work. The objective is to ensure efficiency, cost-effectiveness, coordination among study, design and construction objectives, reliability of data collected, safety and proper recording and reporting formats. In the event a modification to an approved procedure or development of a new procedure is required by virtue of delivery requirements or implementation of an innovative delivery approach, review and approval of the proposed procedure (revised or new) by appropriate technical specialists and management must be completed before implementation. Development of standard operating procedures (SOPs) for appropriate repetitive processes is encouraged. SOPs developed for specific CTOs will be standardized via incorporation into the Contract Management Plan (CMP). SOPs are made accessible to all CCI Southern Division RAC staff through the CMP.

6.5.3.2 Field Investigations

Field investigations and investigation processes shall be planned to meet data quality objectives (DQOs). The specific scope and procedures required by specific CTOs will be identified and documented in respective project work plans. The practices, techniques, and equipment for data collection and sampling will be reviewed periodically (at the time of preparation of a CTO, or no more than at six-month intervals) for technical soundness and validity. Project-specific procedures will be reviewed and approved by the PM.

Activities are to be identified such that investigations are performed in accordance with established CCI procedures. The CTO specific procedures provide details of:

- Instrumentation
- Calibration, maintenance, and repair
- Decontamination and waste management
- Methods
- Records

When a technical activity requires a deviation from a procedure, specification, or drawing, the QC Inspector must approve such deviation and document the occurrence accordingly. If the deviation is such that the QC Inspector must obtain approval from higher authority, the QC Inspector will document the deviation, forward the request for approval of the deviation to the PM and QCM, and follow-up daily with the QCM until disposition is provided. Data rendered questionable by deviations from procedures shall be annotated accordingly in the testing plan and log.

6.5.3.3 Data Management

Data Collection and Analysis

Data collection and analysis shall be performed in accordance with project plans and procedures. Documentation shall be sufficiently detailed to ensure that data collection is consistent and reproducible. For laboratory or other analytical data, quality control checks are performed using accepted methods such as blank, replicate, duplicate, spiked, and split samples. Data collection instructions are reviewed and approved.

Field logbooks are maintained to record samples collected, data measurements taken, and observations of events and conditions that could affect data quality. Original data collected in the field and field logbooks will be retained as permanent quality records. The field logbooks will be used by the QC Inspector to transcribe appropriate information into the testing plan and log. Original data may also be recorded and backed up on electronic media (e.g., tape or disk).

Data Tracing and Identification

Data recorded in field logbooks shall be done in adequate detail so data may be traced to the project and specific location from which the data was obtained. The date and time of data acquisition will be recorded. Type and serial number of all instruments used to obtain the data, and the names of sampling team members shall also be recorded.

Data Transfer and Reduction

When data are transferred from one medium to another, the transfer method is verified to be error free (or within a specified tolerance). Data transfer includes, but is not limited to transfer from:

- Field logbooks into testing plan and log
- Field logbooks or testing plans and logs into a computerized database
- Automatic data acquisition device outputs (e.g., strip chart recordings) to manually generated tables or computer databases
- Computer outputs to other computer inputs (e.g., magnetic tape to disk)

PMs are responsible for appropriately documenting and checking data reduction calculations. Data reduction calculations and associated checking are maintained as project records. Data validation is conducted in accordance with Section 3.0 of the CCI Quality Management Manual.

6.5.3.4 Sampling

Sampling and analysis procedures are prepared based on standard protocols established by CCI and include sampling techniques, frequency, and associated equipment. The following topics are included in sampling and analysis procedures:

- Required equipment
- Collection methods
- Special conditions for sample preparation to avoid contamination
- Decontamination and cleaning procedures
- Types and volumes of sample containers
- Holding times
- Preservation methods
- Sample shipment and chain-of-custody procedures
- Sample analysis methods

A CTO project-specific Sampling and Analysis Plan (SAP) will be prepared as a component of the CTO work plan when applicable. The SAP identifies the number and types of samples to be collected, sampling locations, analytical parameters, health and safety requirements, and unusual conditions. Data quality objective (DQO) planning will be implemented in accordance with EPA 540/G-87-003 and 004 or as required by the CTO.

6.5.3.5 Test Control

Site investigation field-testing will be performed in accordance with the CTO project work plan. The CTO QC Plan Addendum will include provisions to assure that all data collected is of known quality and meet project requirements. The PM and QCM will review this section of the CTO QC Plan Addendum.

Tests may be needed to verify conformance of an item to specified requirements and to demonstrate that the item will perform satisfactorily in service. Tests may also be required to verify techniques for waste minimization or disposal. Such tests will be planned and executed in accordance with the requirements and acceptance criteria of applicable design or other pertinent technical documents.

6.5.3.6 Control of Measuring and Test Equipment

Measuring and test equipment must be the proper type, range, accuracy, and tolerance to determine conformance to specified requirements. Project records will identify the measuring and test equipment used for an activity.

For each major piece of equipment, calibration frequency and standards are specified in appropriate CCI procedures. Normally, manufacturer's instructions are followed for calibration, calibration checks, and maintenance. The method and interval of calibration for each item is based on the type of equipment, stability characteristics, required accuracy, intended use, and other conditions affecting measurement control.

When measuring and test equipment is found to be out of calibration, an evaluation of the validity of previous inspection or test results and of the acceptability of items previously inspected or tested will be conducted and documented. Out-of-calibration devices are tagged or segregated and not used until they have been re-calibrated. If an item of measuring or test equipment is consistently found to be out of calibration, it will be repaired or replaced. Re-calibration will be performed whenever the accuracy of the equipment is suspect.

Reference calibration standards used are certified as traceable to National Institute of Standards and Testing (NIST) or other acceptable standards. Appropriate documentation is maintained to substantiate the validity of the standards used.

The PM is responsible for the control and calibration of tools, gauges, instruments, and other devices used for acceptance inspections and tests during site field activities. The Project Manager is also responsible for using appropriately calibrated and checked instruments during investigations and maintaining records to indicate calibration status. The QC Inspector is responsible for assuring that the appropriate equipment is used for inspections and tests.

6.5.3.7 Handling, Shipping, and Storage

When site activities require temporary or permanent installation of equipment, facilities, or structures, the PM is responsible for verifying that necessary special handling, cleaning, and storage requirements have been specified. Such requirements are identified and made available to field personnel through appropriate documents such as manufacturer's instructions, manuals, or field procedures.

Special tools and equipment are used and controlled as necessary for safe and adequate handling. Special handling tools and equipment are inspected and tested in accordance with applicable standards or procedures and at specified time intervals to verify that they are adequately maintained. Operators of special handling and lifting equipment are experienced or trained in using the equipment.

Sample shipment will be performed in accordance with requirements of the Department of Transportation (DOT). Sample chain-of-custody procedures provide for sample labeling and tracking reports, which contain the following information:

- Unique sample identification
- Analysis(es) to be performed
- Documentation of specific reagents or supplies that become an integral part of the sample (preservatives, absorbing reagents, filters, etc.)
- Sample preservation method
- Sample chain-of-custody logs
- Identification of personnel

Procurement documents require laboratories to document and maintain appropriate chain-of-custody procedures.

6.5.3.8 Inspection, Test, and Operating Status

The status of permanently installed equipment is identified by tagging or by documentation traceable to the equipment. Documentation includes the status of component installation, component installation testing, system functional testing, system or component turnover, and any deficiencies associated with the component or system.

When dynamic, operating, electrical, or other type equipment must be isolated or removed from service because of safety or environmental concerns, it is to be tagged and appropriate lockout procedures implemented. Tagging and lockout requirements will be developed on a CTO specific

basis to conform to facility, base, station, or process requirements. At a minimum, CCI standards defined in the Health and Safety procedures are to be observed when locking out and/or tagging out a piece of equipment.

6.5.4 Submittals

Submittals are a major performance element within the CCI Southern Division RAC. The effectiveness with which we manage the submittal process will be an influential parameter in the determination of how effective CCI has been in executing and delivering CTO work assignments. As such, the QCPP is dedicated to process definition and delineation of responsibilities within this area of performance and is available to CTO staff.

The QCPP will addresses the general standards associated with submittal processing. These include, but are not necessarily limited to, defining types of submittals involved with execution of the CCI Southern Division RAC, use of the submittal register, procedures for processing submittals, and the formats associated with the various types of submittals.

6.5.4.1 Submittal Types

Pre-Construction submittals typically include:

- Project Delivery Plans
- Quality Control Plans
- Site Health and Safety Plans
- Vendor Design Calculations, Shop Drawings, etc.
- Personnel Qualifications (Welding, NDE, etc.)
- Product Data
- Samples

Construction/Post Construction submittals typically include:

- Production, Inspection, and Test Reports.
- Material Certifications
- Progress Reports, Safety Reports, Manpower Reports, etc.
- As-Built or Certified Data
- Operation and Maintenance Manuals
- QC Records and Certifications

6.5.4.2 Submittal Register

At the onset of each CTO the Contracting Officer will provide to CCI the submittal register with specific review items identified and corresponding review authority. The form cited in the contract documents contains 15 columns and the process for using the register is clearly described in Part 7.8 of the contract. Recognizing the charter to move to an electronic process in the near future, identified herein is a slight revision to the register protocol, which involves the application of *Excel* (spreadsheet application) as the register platform in a standard format. This approach, described in the ensuing outline, involves a single register as opposed to multiple copies maintained by the separate entities to the contract. Employing an electronic version of the register may be of benefit to the program, and CCI will be responsible for its currency, accuracy, and maintenance. In either case, CCI will follow the direction of the Contracting Officer. Similarly, in either case, the

Contracting Officer provides the initial data for columns A through E of the register. An example of the printed form is included as Attachment B (Appendix D).

- Column A will identify the specification section requiring the submittal.
- Column B will be a submittal description (refer to part 7.7 of the contract for the schedule of submittal descriptions), including a list of materials or products addressed by the submittal.
- Column C identifies the principal paragraph in the specification section where the material or product is specified.
- Column D is used to cite the approving authority ("G" indicates Contracting Officer approval; blank indicates QCM approval).
- Column E is used in cases when the Contracting Officer will cite reviewers other than the QC organization (space may be blank).
- Column F identifies the submittal number, in consecutive format, assigned by CCI. Resubmittals will require addition of a suffix to the original submittal number. For example, the first resubmission of original submittal 16 could be labeled 16A. The second 16B, and so forth.
- Column G identifies the expected date the approving authority should receive the submittal.
- Columns H and I will document CCI PM review of the submittal prior to transmitting it to approving authority.
- Column J cites the date CCI transmittal of the submittal to the QC organization
- Column K entry will be that date the submittal is received by the QC organization.
- Column L entry is the QC disposition of the submittal. In cases where the Contracting Officer is the approving authority, the disposition must be no less than "Approved as Noted" before forwarding to Contracting Officer for review.
- Column M entry will be that date the submittal is transmitted by the QC organization to either the Contracting Officer as approving authority, or back to the subcontractor for further action (e.g., purchase, installation, revisions, etc.).
- Column N entry will be that date the submittal is received by the Contracting Officer.
- Column O entry is the QC disposition of the submittal
- Column P entry will be that date the submittal is transmitted by the Contracting Officer back to the QC organization within CCI for further action (e.g., purchase, installation, revisions, etc.).
- Column Q used for any remarks that annotate special concerns or situations with the submittal (e.g., expedite, administrative only).

6.5.4.3 Technical Submittal Process

The following subsection discusses the process for reviewing submittals. The Process Flow Diagram for submittal review is provided in Attachment C (Appendix D). Specific details regarding transmittal requirements, numbers of copies, certification statements, submittal

disposition, and reviewing authority are addressed in Part 7.0 of the Contract. Several forms (e.g., transmittal form) and procedures will be identified and incorporated into the plan upon definition of those requirements by the Contracting Officer.

Submittals will be received by the Resident Engineer who will log them directly into ***Expedition*** under the Submittal log (NOTE: Use of ***Expedition*** as a submittal document control tool does not supercede nor preclude the use of the Submittal Register as required by the contract documents -- *Expedition* is a tool used by CCI to optimize document control and process management). After logging, the submittal will be forwarded to the PM, with a copy filed and the submittal entered onto a tickler tracking list. Permanent project filing will be by CTO, and very simply by submittal number. The document control number (DCN) generated in ***Expedition*** will identify where the submittal is filed, which will be the corresponding submittal number. Should resubmittals be required under any submittal, the DCN will have a corresponding suffix appended to the initial submittal number (e.g., the second resubmittal for submittal 23 will be annotated "23B"). The Resident Engineer will status the submittal in the submittal register at each step of the process.

Once received, the PM will review the submittal for general contract conformity and determine its worthiness to proceed through the review process. If ...

- ...in the opinion of the PM the submittal is in general conformity with the contract, the submittal will be forwarded to the QC Inspector for review.
- ...in the opinion of the PM the submittal does not conform to the contract documents, the submittal will be returned to the Subcontractor or vendor/supplier annotated with the disposition *"Not Reviewed."*

The QC Inspector will review the submittal to confirm the conclusion and disposition recommended by the PM. If...

- ...in the opinion of the QC Inspector the submittal is in general conformity with the contract, the submittal will be forwarded to the QCM for review.
- ...in the opinion of the QC Inspector the submittal does not conform to the contract documents, the submittal will be returned to the Subcontractor or vendor/supplier annotated with the disposition *"Not Reviewed"* and a brief explanation of the deficiencies.

If the QCM is the approving authority for the submittal, the QC Inspector will establish the disposition accordingly, and if...

- ...after technical review there are no comments, the submittal will be returned to the Subcontractor or vendor/supplier with the disposition *"Approved,"* which will permit the Subcontractor to release the product for delivery, install the product (or store it) and bill for the product and its installation. Subcontract specifications will typically allow 45 calendar days of review time, inclusive of CCI and Contracting Officer time. The review time will be as follows: Log-in - 1 day; PM review – 2 days; forward to QC Inspector - 2 days; QC Inspector review – as approving authority, 15 days / as QC confirmation of PM disposition, 2 days; forward to Contracting Officer, 1 day; Contracting Officer review, 20 days; and return to Subcontractor/Vendor – 2 to 5 days, dependent upon Contracting Officer disposition.
- ...after technical review there are minor comments, such as those that alert the Subcontractor to special coordination needs among other products or for those that change or correct the submittal data in an insignificant manner, the submittal will be returned to the Contractor with

the disposition *"Approval as Noted"*, which will permit the Contractor to proceed as indicated under the *"Approved"* disposition, but only after consideration and incorporation of the review comments.

- ...after technical review there are comments significant enough to require a resubmittal, the submittal will be returned to the Subcontractor with the disposition *"Revise and Resubmit."* The Subcontractor should not order, deliver or install any product or material item without special permission from the QC Inspector when the corresponding submittal has an *"R&R"* status. The Subcontractor must resubmit the submittal. The Resident Engineer will forward the resubmittal to the PM after log-in. The PM will review the resubmittal to ensure the submittal comments were addressed. The resubmittal will then be forwarded to the QC Inspector, or returned to the Contractor as may be appropriate.

- ...after technical review it is the position of the QC Inspector that the submittal is completely unacceptable, it will be returned to the Subcontractor with the disposition *"Disapproved"* and a meeting will be convened with the Subcontractor to go over the problems with the submittal in an effort to assure general conformity of the next submittal and keep the resubmittal process to a minimum. Similar coordination with the subcontractor will occur should the Contracting Officer's disposition be *"Disapproved."*

If the Contracting Officer is the approving authority, the submittal is to be transmitted to the Contracting Officer following QC Inspector review (with no less than a *"Approved as Noted"* disposition) with the appropriate certification. The Resident Engineer will then tickle the submittal for return within the 20 day Contracting Officer review window.

The Resident Engineer will continuously monitor the submittal process and evaluate its flow, advising the PM and QC Inspector weekly of the process status. If, in the opinion of the PM, the Subcontractor is not providing generally conforming submittals, or is not adequately addressing the review comments, he will notify the Subcontractor and meet with the appropriate representatives to correct the problem.

Once the overall review process is complete for a specific submittal, regardless of the disposition, the Resident Engineer will file the permanent file copy, return the submittal to the Subcontractor or Vendor/Supplier and route a copy of the submittal to the QC Inspector. The QC Inspector will retain copies of the submittals as working copies for field activities, and will file their set by specification section as opposed to submittal number.

6.5.4.4 Invoice Submittals

Quality assurance of invoices will be a coordinated effort among the PM, Subcontracts Administrator, and Program Accountant. The Subcontract Administrator reviews invoices from subcontractors for conformance with subcontract requirements. If the subcontractor invoice meets the requirements/conditions of the subcontract the Subcontract Administrator obtains final written approval from the PM. The Program Accountant prepares the client consolidated invoice and gives to the PM for review of compliance with contract requirements and coordinates preparation of appropriate transmittals and certifications for submittal to the Contracting Officer. The CAM will perform final review on all invoices submitted to the Contracting Officer.

6.5.5 Data Management

6.5.5.1 General

Part 8.0 of the contract addresses the environmental data management and required electronic delivery standards. In accordance with the contract requirements, a data management plan will be developed for CTOs performed under the Navy RAC program. The data management plan describes the identification, collection, organization, storage, reporting, and archival of information related to the CTO project. The data management plan can be a stand-alone document or it can be a section in the project plan. At a minimum, the data management plan addresses the issues, as detailed below.

6.5.5.2 Overview

The overview gives a brief description of the data collection and reporting aspects of the CTO project. A data flow chart (or set of charts) that illustrates the paths of information is provided, along with text describing each step in the flow chart.

6.5.5.3 Staffing and Responsibilities

The staff positions involved with data collection, management, and reporting are identified. The responsibilities of the positions should be clearly described. Finally, names should be assigned to each position. On smaller projects, it is not uncommon to have the same person assigned to multiple positions. At a minimum, each project has the following positions (and responsibilities) identified:

- Project data manager to oversee the management of project data
- Database specialist to oversee the database operations, load data into the database, check the integrity of information in the database, generate reports from the database
- Data clerk to enter data into the database, data filing, report formatting

6.5.5.4 Data Management System

The electronic data management and reporting system(s) used in the CTO will be identified and described. In the description of the each data system, include the name and platform of the database (e.g., Access, SQL Server, Oracle) and the name (e.g., EDMS, ArcInfo, MGE) and platform (e.g., Access, Visual Basic, proprietary) of all client applications that are used to process data.

6.5.5.5 Field Data Collection

The data to be captured in the field in support of data analysis and reporting is identified and described in this section. Also included are location and sample identification protocols, bearing in mind that the location and sample identifiers are to be unique among all CTO projects within each DOD installation. The sources of the information (i.e., soil boring logs, well completion logs, sampling logs) are identified and examples of them are provided. If information is manually transcribed from a hard copy source into an application, the process(es) by which the transcribed information will be verified is described.

6.5.5.6 Analytical Laboratory Data Collection

The data that will be captured from the analytical and geotechnical laboratories is identified and described in this section. The format and content of both the hard copy and electronic data deliverables is addressed in this section of the data management plan. The processes by which

data is imported from the electronic data deliverable into the database is described, as is the method of verification of the data transfer.

6.5.5.7 Analytical Data Quality Evaluation and Validation

The processes by which validation flags for analytical results are entered into the database and then verified are described in this section of the data management plan. Since not all projects will require data validation, this section may be marked as "Not applicable to this project".

6.5.5.8 Generation of Navy Environmental Data Transfer Standard (NEDTS) Deliverables

The tools and processes required to generate and review the NEDTS, version 2.01, deliverables is identified and described in this section of the data management plan. Only those projects that collect and report non-spatial information are required to generate a NEDTS data deliverable. The NEDTS deliverable will be provided to the information management division of the military facility or the reporting agency designated by the facility in the project CTO.

The NEDTS deliverable consists of up to 34 data files containing information related to the project. The tables that will actually be populated and reported for a particular project will be identified in the CTO. If not specified by the client in the CTO, the PM will identify in the data management plan which tables will be delivered. Valid values for the tables in the database will be maintained by the project data manager.

6.5.5.9 Adherence to the Tri-Service Spatial Data Standard (TSSDS)

The TSSDS, version 1.75, will be followed in all geographical information system (GIS) or computer-aided drafting and design (CADD) deliverables. The TSSDS specifies valid values to be used for the attributes of maps and other drawings. TSSDS-compliance on existing GIS platforms, such as Environmental System Research Institute's Arc/Info and Integraph's MGE/ERMA, have been worked out by CCI and are currently used in other DOD projects.

6.6 References

Southern Division Navy RAC Contract N62467-98-D-0995

Naval Facilities Engineering Command *RAC Contract Manual (NAVFAC P-1092)*
Southern Division, Naval Facilities Engineering Command *Response Action Contract Guide (May 19, 1995)*

Tri-Service Spatial Data Standards (TSSDS)

Navy Environmental Data Transfer Standards (NEDTS 2.01)

Executive Order 12906 "Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure"

OMB Circular No. A-16 ("Coordination of Surveying, Mapping, and Related Spatial Data Activities")

ASTM A 880, 1989 Criteria for use in Evaluation of Testing Laboratories and Organizations for Examination and Inspection of Steel, Stainless Steel, and Related Alloys

ASTM C 1077, 1990 Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation

ASTM D 3666, 1990 (Rev. A) Evaluating and Qualifying Agencies Testing and Inspecting Bituminous Paving Materials

ASTM D 3740, 1988 Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E 319, 1990 Applicable for Evaluation of Testing and Inspection Agencies as Used in Construction

ASTM E 543, 1989 (Rev. A) Determining the Qualifications of Nondestructive Testing Agencies

ASTM Designation D 3951-88, Standard Practice for Commercial Packaging

Military Standard 129, Marking for Shipment and Storage

CCI *Quality Management Program*

CCI *Quality Assurance Program Plan, Woolfolk Chemical Works Site*

Requirements for Quality Control of Analytical Data, HAZWRAP Support Contractor Office

CCI *Construction Inspection Manual*

Appendix A

Erosion and Sediment Control Plan

Erosion and Sediment Control Plan
Contract No. N62467-98-D-0995

NAS Cecil Field
Jacksonville, Florida

Submitted to:

U.S. Naval Facilities Engineering Command Southern Division

Prepared by:

CH2MHILL
Constructors, Inc.

115 Perimeter Center Place, N.E.
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September 1998

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1.0 Introduction

1.1 Scope of Work

The scope of work services at NAS Cecil Field includes, but is not limited to, the construction of product recovery systems, groundwater and soil recovery and treatment systems, operation and maintenance of the recovery and treatment systems, underground storage tank abatement activities, if required, and soil excavation activities.

1.2 Existing Site Conditions

Topography at NAS Cecil Field is mainly flat. Conditions range from operational fuel facilities with asphalt parking lots and fuel dispensing stations to abandoned facilities with grass, vegetation, and trees. Site drainage features include stormwater catch basins, drainage ditches, concrete culverts and spillways, and retention ponds. Asphalt roads, concrete curbs and sidewalks, and vegetation areas may be traversed to construct the remediation facilities.

1.3 Adjacent Areas

Since the project sites are located within the boundaries of an operational military base, the adjacent areas are generally well developed with large paved areas consisting of access roads, buildings, parking areas, and military support facilities.

1.4 Off-Site Areas

The construction activities associated with the environmental restoration products will generate excess excavated soil and some asphalt and concrete debris. The soil will be sampled and analyzed for hydrocarbon constituents and subsequently recycled, treated, or disposed of in accordance with applicable federal, state, and local regulations.

1.5 Soils

Soil borings have been performed at each of the work sites as part of the site characterization studies. Based on these logs and from other site activities conducted at NAS Cecil Field, the lithology varies from a fine sand to a medium sand.

1.6 Critical Areas

The sites have many drainage ditches and culverts that could ultimately allow for erosion and sediment migration. Therefore, silt fencing will be used to control erosion and to prevent soil material from reaching the protected surface water body. Because of different site conditions associated with projects at NAS Cecil Field, consideration as to the most appropriate location of silt fences on each site during the phases of construction will be continually evaluated.

1.7 Erosion and Sediment Control Measures

Unless otherwise indicated, all vegetative and structural erosion control measures will be constructed and maintained in a manner which meets the intent of the minimum standards defined under Florida Erosion and Sediment Control Regulations.

2.0 Structural Practices

2.1 Silt Fence Barrier

Silt fences will be erected in the appropriate locations surrounding each construction site. Weather conditions will be considered in areas that may be affected by open trenches and soil stockpiles. Silt fence will be installed when rain or wind indicate possible off-site migration of soil material. Silt fence barriers and straw hay bales will be available at each of the work sites in the event that unforeseen circumstances warrant the use of sediment control measures. If the silt fence is intended to be utilized during a project, a detail of the fence installation will be provided as part of the construction drawings presented in the work plan addenda.

2.2 Storm Drain Inlet Protection

Storm drains located within the drainage areas of the construction sites will be protected from sediment laden waters by use of filter fabric in grassy areas and stone filter covers along paved access road gutters.

3.0 Revegetation Procedures

Straw or hay mulch will be applied to reseeded areas to reduce gully erosion and promote seed germination.

4.0 Management Strategies

The following erosion and sediment control management strategies will be maintained during on-site project activities:

- The Project Superintendent will be responsible for installation and maintenance of the erosion and sediment control features.
- Erosion and sediment control features will be installed as the first step of construction operations.
- Seeding and stabilization will follow immediately after final grading is completed. After achieving adequate stabilization, erosion and sediment control features will be removed.
- Asphalt and concrete will be restored once the installation and testing of all the pipes has been completed. Soil stockpiles will be covered to reduce the potential of blowing soil.

Appendix B

Transportation and Disposal Plan

Transportation and Disposal Plan
Contract No. N62467-98-D-0995

NAS Cecil Field
Jacksonville, Florida

Submitted to:

U.S. Naval Facilities Engineering Command Southern Division

Prepared by:

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September 1998

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1.0 Waste Identification and Documentation

CCI will review waste analyses and any historical information for each waste type to facilitate the preparation of manifest packages for submittal to the EMD representative. The Navy will be responsible for signing manifests associated with any petroleum-contaminated material generated at the project sites.

Contaminants identified at each site are attributable to hydrocarbon material. As a result, CCI anticipates that no hazardous waste will be generated during project activities since it is unlikely that any hydrocarbon-impacted material removed from any project site will met the definition of a characteristic hazardous waste in accordance with 40 CFR Part 261. However, the NTR will be notified under the unlikely event hazardous waste is generated during project activities.

If hazardous waste is generated at any of the sites, CCI will then use the specific provisions outlined in 40 CFR Parts 261, 262, 268, 302, and 49 CFR Part 172, to evaluate waste streams for characteristic and listed wastes, proper shipping codes, and appropriate disposal methods. The complete manifest package, including waste manifests, waste profile sheets, analytical results, and other shipping information, will be certified by the on-site regulatory specialist before wastes are transported off government property. CCI will submit the completed manifest package for generator designation, review, and approval. No hazardous wastes will be transported without approval and manifest signature from the Navr representative.

2.0 Selection of Off-Site Transporter and Treatment and Disposal Facilities

Waste material will not be transported off-site until written approval to receive the waste has been provided by the selected treatment or disposal facility. Selection of the transporter and treatment or recycling facility will be based on the review of the received bid submittals.

2.1 Transporter

The selected transporter will haul any petroleum-contaminated soil or water waste stream generated during the project to the selected treatment or recycling facility. If the waste is non-hazardous, a non-hazardous waste hauler will be selected. A non-hazardous waste hauler is not required to have a USEPA transportation identification number. USEPA identification numbers are required only for hazardous waste transportation companies.

2.2 Treatment Facility

Petroleum contaminated soil will be transported to a licensed offsite disposal facility. Petroleum contaminated water generated during any of the onsite project activities will be transported to another licensed offsite disposal facility.

Waste shipping documents signed by the appropriate Navy and transporter personnel must accompany all petroleum-contaminated groundwater and soil that is treated offsite.

3.0 Packaging, Labeling, and Transportation of Contaminated Waste

3.1 Packaging and Labeling

All non-hazardous and RCRA hazardous waste being prepared for transportation will be classified, containerized, and labeled according to applicable USEPA and U.S. Department of Transportation regulations (40 CFR Parts 262 and 263, 49 CFR Parts 172, 173, and 178). If necessary, CCI will require hazardous waste transportation personnel to be trained in accordance with DOT regulations (49 CFR Part 172, Subpart H).

3.2 Transportation

CCI will verify that only waste types and quantities specified by the completed manifest package are loaded in vehicles identified for off-site transportation. If necessary, CCI will also verify that materials are properly containerized, labeled, and loaded, and that the proper placards are placed on the transport vehicle prior to departure.

Appendix C

Machinery and Mechanized Equipment

Machinery and Mechanized Equipment
Contract No. N62467-98-D-0995

NAS Cecil Field
Jacksonville, Florida

Submitted to:

U.S. Naval Facilities Engineering Command Southern Division

Prepared by:

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September 1998

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1.0 General

Before any machinery or mechanized equipment is placed in use, it shall be inspected and tested by a competent person and certified to be in safe operating condition. Inspections and tests shall be in accordance with manufacturers' recommendations and shall be documented. Records of tests and inspections shall be maintained at the site by the contractor, and shall be made available upon request of the designated authority, and shall become part of the official project file. Results of the inspections will be provided on the Contractor Quality Control Report and attached to the Contractor Production Report (see Appendix D). The Contractor Quality Control Report and the Contractor Production Report will be submitted to the ROICC on a daily basis.

1.1 Daily/Shift Inspections and Tests

All machinery and equipment shall be inspected daily (when in use) to verify safe operating conditions: The employer shall designate competent persons to conduct the daily inspections and tests.

Tests shall be made at the beginning of each shift during which the equipment is to be used to evaluate that the brakes and operating systems are in proper working condition and that all required safety devices are in place and functional.

Whenever any machinery or equipment is found to be unsafe, or whenever a deficiency which affects the safe operations of equipment is observed, the equipment shall be immediately taken out of service and its use prohibited until unsafe conditions have been corrected. A tag indicating that the equipment shall not be operated, and that the tag shall not be removed, shall be placed in a conspicuous location on the equipment. Where required, lockout procedures shall be used. The tag shall remain in its attached location until it is demonstrated to the individual deadlining the equipment that it is safe to operate. When corrections are complete, the machinery or equipment shall be retested and reinspected prior to being returned to service.

1.2 Equipment Operation, Maintenance and Repair

Machinery and mechanized equipment shall be operated only by designated qualified personnel. Machinery or equipment shall not be operated in a manner that will endanger persons or property nor shall the safe operating speeds or loads be exceeded. Getting on or off any equipment while it is in motion is prohibited. Machinery and equipment shall be operated in accordance with the manufacturers' instructions and recommendations. When the manufacturers' instructions or recommendations are more stringent than the requirements of this manual, the

manufacturers' instructions or recommendations shall apply.

Inspections or determinations of road conditions and structures shall be made in advance to verify that clearances and load capacities are safe for the passage or placing of any machinery or equipment. Equipment operations requirements are as follows:

- Seats or equal protection must be provided for each person required to ride on equipment.
- Equipment operated on the highway shall be equipped with headlights, taillights, brake lights, backup light, and turn signals visible from the front and rear.
- All equipment with windshields shall be equipped with powerful wipers. Vehicles that operate under conditions that cause fogging or frosting of windshields shall be equipped with operable defogging or defrosting devices.
- Mobile equipment, operating within an off-highway job site not open to public traffic, shall have a service brake system and a parking brake system capable of stopping and holding the equipment while fully loaded on the grade of operation. In addition, it is recommended that all heavy duty hauling equipment have an emergency brake system which will automatically stop the equipment upon failure of the service brake system; this emergency brake system should be manually operable from the driver's position.
- Stationary machinery and equipment shall be placed on a firm foundation and secured before being operated.
- All mobile equipment and the areas in which they are operated shall be adequately illuminated while work is in progress.
- All vehicles which will be parked or moving slower than normal traffic on haul roads shall have a yellow flashing light or four-way flashers visible from all directions.
- No one shall be permitted in the truck cab during loading operations except the driver and then only if the truck has a cab protector.
- Mechanized equipment shall be shut down prior to and during fueling operations. Closed systems, with automatic shut-off that will prevent spillage if connections are broken, may be used to fuel diesel powered equipment left running.
- All machinery or equipment operating on rails, tracks, or trolleys (except railroad equipment) shall be provided with substantial track scrapers or track cleaners - effective in both directions - on each wheel or set of wheels.
- Parking
  - Whenever equipment is parked, the parking brake shall be set.

- Equipment parked on an incline shall have the wheels chocked or track mechanisms blocked and the parking brake set.
- All equipment left unattended at night, adjacent to a highway in normal use or adjacent to construction areas where work is in progress, shall have lights or reflectors, or barricades equipped with lights or reflectors, to identify the location of the equipment.

- Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism prevents road reactions from causing the steering handwheel to spin; when permitted, the steering knob shall be mounted within the periphery of the wheel.
- Safeguards shall be provided to prevent machinery and equipment operating on floating plane from going into the water.
- All industrial trucks shall meet the requirements of design, construction, stability, inspection, testing, maintenance, and operation, as defined in ANSI/ASME B56.1, Safety Standards and Low Lift and High Lift Trucks.
- Lift trucks, stackers, and similar equipment shall have the rated capacity posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities shall also be clearly shown on the vehicle. The ratings shall not be exceeded.
- The controls of loaders, excavators, or similar equipment with folding booms or lift arms shall not be operated from a ground position unless so designed.
- Personnel shall not work or pass under or ride in the buckets or booms of loaders in operation.
- Tire service vehicles shall be operated so that the operator will be clear of tires and rims when hoisting operations are being performed. Tires large enough to require hoisting equipment will be secured from movement by continued support of the hoisting equipment unless bolted to the vehicle hub or otherwise restrained.
- Each bulldozer, scraper, dragline, crane, motor grader, front-end loader, mechanical shovel, backhoe, and other similar equipment shall be equipped with at least one dry chemical or carbon-dioxide fire extinguisher with a minimum rating of 5-B:C.
- Fill hatches on water haul vehicles shall be secured or the opening reduced to a maximum of 8 inches.

Equipment maintenance and repairs procedures are as follows:

- Preventive maintenance procedures recommended by the manufacturer shall be followed.

- All machinery or equipment shall be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being completed. Equipment designed to be serviced while running is exempt from this requirement.
- All repairs on machinery or equipment shall be made at a location that will protect repair personnel from traffic.
- Heavy machinery, equipment, or parts thereof which are suspended or held apart by slings, hoist, or jacks also shall be substantially blocked or cribbed before personnel are permitted to work underneath or between them.
- Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the engines stopped and brakes set, unless work being performed on the machine requires otherwise.
- Towing
  - All towing devices used on any combination of equipment shall be structurally adequate for the weight drawn and shall be securely mounted.
  - Persons shall not be permitted to get between a towing vehicle and the piece of towed equipment until both have been completely stopped with all brakes set and wheels chocked on both vehicle and equipment.
- No modification or additions that affect the capacity or safe operation of machinery or equipment shall be made without the manufacturers' written approval.
  - If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.
  - In no case shall the original safety factor of the equipment be reduced.

2.0 Guarding and Safety Devices

The following rules and procedures apply to guarding and safety devices:

- Reverse signal [back-up] alarm
  - All self-propelled construction and industrial equipment, whether moving alone or in combination, shall be equipped with a reverse signal alarm. Equipment designed and operated so that the operator is always facing the direction of motion does not require a reverse signal alarm.
  - Reverse signal alarms shall be audible and sufficiently distinct to be heard under prevailing conditions.
  - Alarms shall operate automatically upon commencement of backward motion. Alarms may be continuous or intermittent (not to exceed 3-second intervals) and shall operate during the entire backward movement.
  - Reverse signal alarms shall be in addition to requirements for signal persons.
- A warning device or signal person shall be provided where there is danger to persons from moving equipment, swinging loads, buckets, booms, etc.
- Guarding
  - All belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment shall be guarded when exposed to contact by persons or when they otherwise create a hazard.
  - All hot surfaces of equipment, including exhaust pipes or other lines, shall be guarded or insulated to prevent injury and fire.
  - All equipment having a charging skip shall be provided with guards on both sides and open end of the skip area to prevent persons from walking under the skip while it is elevated.
  - Platforms, footwalks, steps, handholds, guardrails, and toe boards shall be designed, constructed, and installed on machinery and equipment to provide safe footing and access ways.
  - Equipment shall be provided with suitable working surfaces of platforms, guard rails, and hand grabs when attendants or other employees are required to ride for operating purposes outside the operator's cab or compartment; platforms and steps shall be of nonskid material.
  - Substantial overhead protection shall be provided for the operators of fork lifts and similar material handling equipment.

- Fuel tanks shall be located in a manner which will not allow spills or overflows to run onto engine, exhaust, or electrical equipment.
- Exhaust or discharges from equipment shall be so directed that they do not endanger persons or obstruct views of operator.
- A safety tire rack, cage, or equivalent protection shall be provided and used when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices.
- No guard, safety appliance, or device shall be removed from machinery or equipment, or made ineffective except for making immediate repairs, lubrications, or adjustments, and then only after the power has been shut off. All guards and devices shall be replaced immediately after completion of repairs and adjustments and before power is turned on.
- Seat belts and anchorages meeting the requirements of 49 CFR 571 shall be installed and worn in all motor vehicles (installation and usage on buses are optional); two-piece seat belts and anchorages for construction equipment shall comply with applicable federal specification or SAE J 386a.
- All high rider industrial trucks shall be equipped with overhead guards which meet the structural requirements defined in paragraph 4.21 of ANSI/ASME B51 1, Safety Standards for Low Lift and High Lift Trucks.
- Suitable protection against the elements, falling or flying objects, swinging loads, and similar hazards shall be provided for operators of all machinery or equipment; glass used in windshields or cabs shall be safety glass.
- Falling object protective structures (FOPS)
  - All bulldozers, tractors, or similar equipment used in clearing operations shall be provided with guards, canopies, or grills to protect the operator from falling and flying objects as appropriate to the nature of the clearing operations.
  - FOPS for other construction, industrial, and grounds-keeping equipment will be furnished when the operator is exposed to falling objects hazards.
  - FOPS will be certified by either the manufacturer or a licensed engineer as complying with the following applicable SAE recommended practices:
    - J 231 - Minimum Performances Criteria for FOPS
    - J 1043 - Minimum Performance Criteria for Falling Object Protective Structure (FOPS) for Industrial Equipment
- Rollover Protective Structures (ROPS)
  - In addition to the requirements of 1.8 and 1.11, seat belts and rollover protective structures (ROPS) shall be installed on:
    - Crawler and rubber-tire tractors including dozers, push and pull tractors, winch tractors, and mowers

- Off-the-highway self-propelled pneumatic-tire earth movers such as trucks, pans, scrapers, bottom dumps, and end dumps
- Motor graders
- Water tank trucks having a tank height less than the cab; and
- Other self-propelled construction equipment such as front-end loaders, backhoes, rollers, and compactors.

– ROPS are *not* required on:

  - Trucks designed for hauling on public highways
  - Crane-mounted dragline backhoes
  - Sections of rollers and compactors of the tandem steel-wheeled and self-propelled pneumatic tired type that do not have an operator's station
  - Self-propelled rubber-tired lawn and garden tractors and side boom pipe-laying tractors operated solely on flat terrain, not exposed to rollover hazards
  - Cranes, draglines, or equipment on which the operator's cab and boom rotate as a unit

– ROPS may be removed from certain types of equipment when the work cannot be performed with the ROPS in place and when ROPS removal is approved in writing by the Designated Authority.

– The operating authority shall furnish proof from the manufacturer or certification from a licensed engineer that the ROPS complies with the following SAE standards, as applicable:

  - J167a - Overhead Protection for Agricultural Tractors - Test Procedures and Performance Requirements;
  - J 1040c - Performance Criteria for ROPS for Construction, Earthmoving, Forestry, and Mining Machines;
  - J 1042 - Operator Protection for Industrial Equipment;
  - J 1084a - Operator Protective Structure Performance Criteria for certain Forestry Equipment;
  - J 1194 - Roll-Over Protective Structures (RROPS) for Wheeled Agricultural Tractors.

– ROPS shall also be acceptable if they meet the criteria of any state which has a DOL approved OSHA program or meet Water and Power Resources Service requirements.

– The following information permanently affixed to the ROPS is acceptable in lieu of a written certification:

  - Manufacturer's or fabricator's name and address
  - ROPS model number, if any
  - Machine make, model, or series number that the structure is designed to fit

- Field welding on ROPS shall be performed by welders who are certified by the contractor as being qualified in accordance with American Welding Society Standards D1.1, Military Standard MIL-STD 248, or the equivalent.

- All points requiring lubrication during operation shall have fittings so located or guarded to be accessible without hazardous exposure.
- All machinery or equipment and material hoists operating on rails, tracks, or trolleys shall have positive stops or limiting devices either on the equipment, rails, tracks, or trolleys to prevent overrunning safe limits.
- Whenever long-bed end-dump trailers are used in off-road hauling, they should be equipped with a roll-over warning device: the device should have a continuous monitoring display at the operator station to provide the operator with a quick and easily-read indicator and audible warning of an unsafe condition.

3.0 Cranes and Derricks

Procedures regarding cranes and derricks are listed below.

- Every crane shall have the following documents with them at all times they are to be operated:
  - Operating manual developed by the manufacturer for the specific make and model of crane; a copy of the operating manual for any crane operator aids with which the crane is equipped
  - Load rating chart for the crane, which shall include:
    - Crane make and model, serial number, and year of manufacturer
    - Load ratings for all crane operating configurations, including optional equipment
    - Wire rope type, size, and reeving; line pull, line speed, and drum capacity
    - Operating limits in windy or cold weather conditions
  - The crane's log book which shall be used to record operating hours and all crane inspections, tests, maintenance and repair. (The log shall be updated daily as the crane is used and shall be signed by the operator and supervisor: service mechanics shall sign the log after conducting maintenance or repairs on the crane.)
- Responsibilities in crane operations
  - The operator shall not engage in any activity that will divert his attention while operating the crane.
  - The operator shall respond to signals from the person who is directing the lift or an appointed signal person: when a signal person is not used as part of the crane operation, the operator is responsible for the lifts.
  - Each operator is responsible for those operations under his direct control, including those items under (d), below: whenever there is any doubt as to safety, the operator shall consult with his supervisor before commencing the operation.
  - Prior to a lift, the rigger (except during a critical lift, when these shall be done by the lift supervisor) shall ensure that:
    - the crane is level and, where necessary, blocked.
    - the load is well secured and balanced in the sling or lifting device before it is lifted more than a few inches.
    - the lift and swing path is clear of obstructions and adequate clearance is maintained from electrical sources.
    - all persons are clear of the swing radius of the counterweight.

- When two or more cranes are used to lift one load, one designated person shall be responsible for the operation.
    - The designated person shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.
    - The designated person shall make such determinations as the necessity to reduce crane ratings, load position, boom location, ground support, and speed of movement, which are required to safely make the lift.
    - The designated person shall ensure that all prescribed communication (including signaling) personnel and/or equipment are on hand and properly functioning, and that all personnel involved with the crane operation understand the communication systems and their responsibilities associated with communications.

- Operator designation
    - Cranes and derricks may only be operated by qualified operators.
    - Only those operators qualified to operate a particular type of crane or derricks may operate that type of machinery: the USACE Command shall designate a qualified individual to administer examinations and to qualify operators.

- Operator qualifications and training
    - Proficiency qualifications
        - Each operator shall be instructed in and qualified for each type of crane or derrick he is to operate.
        - Qualification shall be by written and practical operating examination unless the operator is licensed by a state or city licensing agency for the particular type of crane or derrick. (Qualification for operation of a particular type of crane or derrick on the project shall be valid for a period of three years.)
        - The qualifying examination procedures in the Health and Safety Plan shall be followed. When the crane manufacturer recommends operator qualifying examination procedures, those procedures shall be in addition to the requirements of the Health and Safety Plan.
    - Operators shall meet the physical qualifications listed in Section 1.C: at the minimum, examinations are required annually.
    - Crane and derrick operators (not contractor) shall complete a 24-hour crane operators course every three years: the course shall cover general crane operation and safety and shall be at least 24 hours in length.

- Cranes and derricks shall be designed and constructed in accordance with the applicable standards.

- Cranes and derricks shall be operated, inspected, tested and maintained in accordance with the manufacturer's operating manual for the crane.
- A hazard analysis shall be developed for crane set-up and set-down procedures (mobilization, assembly or erection, dismantling, and demobilization).
- Clearances
  - Adequate clearance shall be maintained from electrical sources.
  - Adequate clearance shall be maintained between moving and rotating structures of the crane and fixed objects to allow the passage of employees without harm: the minimum adequate clearance is 16 inches.
  - Accessible areas within the swing radius of the rear of the rotating superstructure of a crane, either permanently or temporarily mounted, shall be barricaded to prevent an employee from being struck or crushed by the crane.
- Hoisting ropes shall be installed in accordance with the equipment manufacturer's recommendations.
  - There shall be at least three full wraps (not layers) of cable on the drums of hoisting equipment at all times.
  - The drum end of the rope shall be anchored to the drum by an arrangement specified by the crane of rope manufacturer.
- Communications
  - A standard signal system shall be used on all cranes and derricks.
  - In situations where the operator cannot see the load, audio (radio) communications shall be used: in all other operations, audio communications should be used.
- Inspection of cranes and derricks shall be in accordance with the manufacturer's recommendations:
  - Prior to initial use all new and altered cranes shall be inspected by a qualified person to ensure compliance with the applicable standards listed in 16.C.05.
  - Prior to initial use and periodically thereafter (one to twelve months or as recommended by the manufacturer) a periodic inspection shall be conducted by a qualified person.
    - A copy of the checklist used for the inspection shall be maintained at the project site.
    - A USN representative shall be notified at least 24 hours prior to the inspection and may wish to accompany the contractor's inspection during the inspection of the crane or derrick.

- Pre-operational inspections (start-up procedures) shall be conducted by the operator prior to every operation (shift) of the crane. If checklists are used for pre-operational inspections, a copy of the checklist shall be maintained at the project site; if checklists are not used, the operator shall indicate the successful completion of the inspection - in accordance with the manufacturer's recommendations - in the operator's log.

- Cranes not in use on a regular basis shall be inspected in accordance with the following:

  - A crane which has been idle for a period of 1 month or longer, but less than six months, shall be given an inspection, conforming to the requirements for frequent crane inspections and frequent wire rope inspections, by a qualified person before being placed in service.
  - A crane which has been idle for a period of over six months shall be given a complete inspection, conforming to the requirements for frequent and periodic crane inspections and frequent and periodic wire rope inspections, by a qualified person before being placed in service.
  - Standby cranes shall be inspected by a qualified person at least semiannually and before being placed in service. Inspection requirements depend on the length of time since the previous inspection, in accordance with paragraphs (1) and (2) above; standby cranes which are exposed to adverse environmental conditions shall be inspected more frequently, as evaluated by the designated authority.

- Performance load tests

  - Under the following circumstances cranes shall be load tested by a qualified person:

    - Prior to initial use of cranes in which load sustaining parts have been altered, replaced, or repaired (excluding replacement of the rope)
    - Every time it is reconfigured or reassembled after disassembly
    - Every four years

  - Performance load tests shall be conducted in accordance with the manufacturer's recommendations. Test loads shall not exceed 100% of the manufacturer's load rating capacity chart at the configuration of the test.

  - Written reports of the rated load test, showing test procedures and confirming the adequacy of repairs or alterations, shall be maintained with the crane or derrick or at the on-site project office.

- The manufacturer's specifications and limitations applicable to the operation of any crane or derrick shall be followed: at no time shall a crane or derrick be loaded in excess of the manufacturer's rating.

  - Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified

engineer competent in this field and such determinations will be documented and recorded.

  - Attachments used with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

- Riding on loads, hooks, hammers, buckets, material hoists, or other hoisting equipment not meant for personnel handling is prohibited.

- When practical and when their use does not create a hazard, tag lines shall be used to control loads.

- Whenever a slack line condition occurs, prior to further operations, the proper seating of the rope in the sheaves and on the drum shall be checked.

- Critical lift plans. Prior to making a critical lift, a critical lift plan shall be prepared by the crane operator, lift supervisor, and rigger. The plan shall be documented and a copy provided to the designated authority: the plan shall be reviewed and signed by all personnel involved with the lift.

  - The plan shall specify the exact size and weight of the load to be lifted as well as all crane and rigging components which add to the weight.

  - The plan shall specify the lift geometry and procedures, including the crane position, height of the lift, the load radius, and the boom length and angle, for the entire range of the lift.

  - The plan shall designate the crane operator, lift supervisor, and rigger and state their qualification.

  - The plan will include a rigging plan which shows the lift points and describes rigging procedures and hardware requirements.

  - The plan will describe the ground conditions, outrigger or crawler track requirements, and, if necessary, the design of mats, necessary to achieve a level, stable foundation of sufficient bearing capacity for the lift. For floating cranes or derricks, the plan shall describe the operating base (platform) condition.

  - The plan will list environmental conditions under which lift operations are to be stopped.

  - The plan will specify coordination and communication requirements for the lift operation.

  - For tandem or tailing crane lifts, the plan will specify the make and model of the cranes, the line, boom, and swing speeds, and requirements for an equalizer beam.

- Environmental considerations

  - Cranes shall not be operated when wind speeds at the top of the crane approach the maximum wind velocity recommendations of the manufacturer.

- Operations undertaken during weather conditions that produce icing of the crane structure or reduced visibility should be performed at reduced functional speeds and with signaling means appropriate to the situation.
- When conditions are such that lightning could occur, all crane operations shall cease.
- For night operations, lighting shall be adequate to illuminate the working areas while not interfering with the operators vision.

- Maintenance and repairs
  - Maintenance and repairs shall be conducted in accordance with the manufacturer's procedures and precautions.
  - Replacement parts or repairs shall have at least the original design factor; replacement parts for load bearing and other critical parts shall be either obtained from or certified by the original equipment manufacturer (OEM).

4.0 Crawler-, Truck-, and Wheel-Mounted Cranes

- All lattice boom and hydraulic mobile cranes shall be equipped with the following:
  - A boom angle indicator and aloud indicating device, or a load moment indicator (rated capacity indicator): calibration and testing of indicators will be performed in accordance with the manufacturer's recommendations. This requirement is effective January 1, 1994. When cranes are used in duty cycle operations, they are exempt from the requirements for load indicating devices and load moment indicators.
  - A means for the crane operator to visually evaluate the levelness of the crane.
  - Drum rotation indicators shall be provided on cranes and derricks and located to afford sensing by the operator. Equipment manufactured prior to 1990 is exempt from this requirement but retrofit is highly recommended.
  - A boom angle or radius indicator shall be provided within the operator's view.
  - Anti-two block (upper limit) devices
    - Lattice boom cranes shall be equipped with an anti-two block device to stop the load hoisting function before the load block or load contacts the boom tip. Cranes that are used exclusively for duty cycle operations (such as clamshell, dragline, grapple, or pile driving) are exempt from anti-two block equipment requirements.
    - Telescopic boom cranes shall be equipped with an anti-two block device to stop the load hoisting function before the load block or load contacts the boom tip and to prevent damage to the hoist rope or other machine components when extending the boom.
    - Telescopic boom cranes which are used exclusively for duty cycle operations (such as clamshell, dragline, grapple, or pile driving) shall be equipped with a two-blocking damage prevention feature or warning device to prevent damage to the hoist rope or other machine components when extending the boom.
- All mobile cranes with cable-supported booms shall be equipped with:
  - Boom stops which, at the angle specified by the crane manufacturer, limit the movement of that portion of the boom below the point at which the boom stop acts on the boom.

- The boom stop manufacturer shall certify that the boom stop has been designed, manufactured, and functionally tested such that it will fulfill the requirement of SAE J220, Crane Boom Stops - May 1971. (Pre 1971 cranes will essentially meet the requirements of SAE J220 except for paragraph 4.1.)
  - A crane boom stop field test will be conducted to verify the proper setup of the boom stops and functioning of the boom hoist disengaging device. This test will be conducted prior to initiating the load performance test required by paragraphs 16.C.12. Deficiencies noted shall be corrected prior to the load performance test.
- All jibs shall have positive stops to prevent their movement of more than 5^0 above the straight line of the jib and boom on conventional crane booms.
- A properly functioning boom hoist disengaging device which shall automatically and completely disengage the boom hoisting power from the boom hoist drum when the boom has reached its highest rated angle. When power is thus disengaged, the boom hoist drum shall automatically be restrained from motion in the lowering direction under any rated condition.

- The crane's foundation shall be evaluated for stability. The evaluation shall consider ground conditions, static and dynamic load, and operating quadrants. Cribbing shall be provided in accordance with the manufacturer's recommendations.
- Boom assembly and disassembly
  - The manufacturer's boom assembly and disassembly procedures shall be followed. The manufacturer's boom assembly and disassembly procedures shall be reviewed by all members of the assembly/disassembly team prior to assembly and disassembly.
  - When removing pins or bolts from a boom, workers shall stay out from under the boom.
- Outriggers
  - When the load to be handled and/or the operating radius require the use of outriggers, or at any time when outriggers are used, outriggers shall be fully extended and set to remove the machine weight from wheels (except locomotive cranes).
  - When outrigger floats are used, they shall be securely attached to the outriggers.
  - Blocking under outriggers floats shall meet the following requirements:
    - Sufficient strength to prevent crushing, bending, or shear failure
    - Such thickness, width, and length as to completely support the float, transmit the load to the supporting surface, and prevent shifting, toppling, or excessive settlement under load

    - Use of blocking only under the outer bearing surface of the extended outrigger beam floats

- Unless the manufacturer has specified an on-rubber rating, mobile cranes shall not pick or swing loads over the side of the crane unless the outriggers (if so equipped) are down and fully extended.

- Unless recommended against by the manufacturer, crane booms shall be lowered to ground level or secured against displacement by wind loads or other outside forces when not in use: if the manufacturer recommends against this practice, the manufacturer's recommended practice shall be followed.

5.0 Portal, Tower, and Pillar Cranes

- All load bearing foundations, supports, and rail tracks shall be constructed or installed in accordance with the crane manufacturer's recommendation and the applicable ANSI/ASME standard.
- Cranes shall be erected in accordance with the crane manufacturer's recommendations and the applicable ANSI/ASME standard.
  - The manufacturer's written erection instructions and a list of the weights of each component to be erected shall be kept at the site.
  - Erection shall be performed under the supervision of a qualified person.
  - An activity hazard analysis shall be developed for the erection procedures. The analysis will include a plan that shows:
    - Location of the crane and adjacent buildings or towers, overhead power and communication lines, underground utilities
    - Foundation design and construction requirements
    - When the tower is erected within a structure, the plan shall show clearances between the tower and the structure and bracing and wedging requirements
  - Wind velocity at the site at the time of erection shall be a consideration and may be a limiting factor that could require suspending the erection operation.
  - Before crane components are erected, they shall be a consideration and may be a limiting factor that could require suspending the erection operation.
- After erection, and before placing the crane in service, the following shall be tested in accordance with the manufacturer's recommended procedures and ANSI/ASME B30.3 or B30.4, as applicable:
  - Crane supports
  - Brakes and clutches, limit and overload switches, and locking and safety devices
  - Load hoisting and lowering, boom hoisting and lowering, and swing motion mechanisms and procedures.
- A boom angle or radius indicator shall be provided within the operator's view.
- Luffing jib cranes shall be equipped with jib stops of a shock absorbing type, a jib hoist limit switch, and a jib angle indicator visible to the operator.

- Rail clamps, if used, shall have slack between the point of attachment to the rail and the end fastened to the crane: rail clamps shall not be used as a means of restraining tipping of a crane.
- Raising (climbing or telescoping) hammerhead tower cranes.
  - The operator of a hammerhead tower crane shall be present during climbing or telescoping operations.
  - Hammerhead cranes shall not be climbed or telescoped when wind speeds at the top of the crane exceed 20 mph or as recommended by the manufacturer.
  - Climbing operations shall not be commercial until all support provisions required at the new support level are in place and as specified by a qualified person.
- Tower cranes shall weathervane when left unattended; luffing jib cranes shall have the boom elevated to 15^0 when left unattended.

6.0 Material Hoists

Guidelines for material hoists are listed below.

- Material hoists shall be designed and constructed or installed in accordance with the requirements of ANSI A10.5.
- Material hoist towers, masts, guys or braces, counterweights, drive machinery supports, sheave supports, platforms, supporting structures, and accessories shall be designed by a licensed engineer.
- Hoist towers shall be erected and dismantled only under the direct supervision of a qualified individual.
- A copy of the hoist operating manual shall be available at all times it is operated.
- Material hoists and hoist tower systems shall be inspected in accordance with the manufacturer's recommendations.
  - Prior to initial use and each time after the tower is extended, all parts of the tower or mast, cage, bucket, boom, platform, hoisting machine, guys, and other equipment shall be inspected by a qualified person to verify compliance with the manufacturer's inspection guidelines and ANSI A10.5.
  - Prior to initial use and periodically thereafter (one to twelve months or as recommended by the manufacturer) a periodic inspection shall be conducted by a qualified person. Periodic inspections shall cover those items specified by the manufacturer: at the minimum, periodic inspections shall cover all sheaves, racks and pinions, guy ties, bolt connections, miscellaneous clamps, braces, and similar parts.
  - A USN representative shall be notified at least 24 hours prior to any of the above inspections and may wish to accompany the contractor's inspector.
  - Pre-operational inspections (start-up procedures) shall be conducted by the operator prior to every operation (shift) of the hoist.
- Before a hoist is placed in service and every 4 months thereafter, a car-arresting-device test shall be performed.
  - For rope-supported cars, the test shall be conducted in the following manner:
    - Pull a loop in the lifting rope and attach the test rope to each side of the loop above the bucket or platform
    - Raise the platform or bucket to allow the load to be supported by the test rope
    - Cut the test rope to allow the load to fall and activate the car-arresting device

- For car suspension other than rope supported, the test shall be conducted by creating an overspeed condition of the car.
- Structural components shall be inspected for damage after the test and before the hoist is placed in operation again.

- Maintenance and repairs
  - Replacement parts for load bearing or critical components shall be either obtained from or certified by the equipment manufacturer.
  - Maintenance and repairs shall be conducted in accordance with the manufacturer's precautions and procedures.

- Landings and runways
  - Landing platforms and runways that connect the hoist way or tower to a structure shall be designed and constructed to sustain the maximum intended load without failure.
  - Floors or platforms which may become slippery shall have slip-resistant surfaces.
  - When workers may be exposed to falling objects, overhead protection, composed of 2-inch planking or the equivalent, shall be provided.
  - A barricade shall be provided at the open ends of each landing: The barricade shall extend from the floor a distance of at least 36 inches and shall be of #19 US gage wire or the equivalent, with openings not exceeding ½ inch.
  - Material shall not be stored on landing platforms or runways.
- Whenever a slack line condition occurs, prior to further operations, the proper seating of the rope in the sheaves and on the drum shall be checked.
- Hoisting ropes shall be installed in accordance with the equipment manufacturer's recommendations.
  - There shall be at least three full wraps of cable on the drums of hoisting equipment at all times.
  - The drum end of the rope shall be anchored to the drum by an arrangement specified by the crane of rope manufacturer.
  - Riding on material hoists or other hoisting equipment not meant for personnel handling is prohibited.
  - While hoisting equipment is in operation, the operator shall not perform any other work and he shall not leave his position at the controls until the load has been safely landed or returned to ground level.

- Not more than one cage or bucket shall be operated at the same time by any one hoisting machine or operator.

- Operating rules shall be established and posted at the operator's station of the hoist: such rules shall include signal system and allowable line speed for various loads. Rules and notices shall be posted on the car frame or cross head in a conspicuous location, including the statement **NO RIDERS ALLOWED.**
- Air powered hoists shall be connected to an air supply of sufficient capacity and pressure to safely operate the hoist: pneumatic hoses shall be secured by some positive means to prevent accidental disconnection.

7.0 Earth Drilling Equipment

Guidelines for earth drilling equipment are listed below.

- Earth drilling equipment shall be operated, inspected, and maintained as specified in the manufacturers' operating manual; a copy of the manual will be available at the job site.
- Prior to bringing earth drilling equipment on the job site, a survey shall be conducted to identify overhead electrical hazards and potential ground hazards, such as contact with unexploded ordnance, hazardous agents in the soil, or underground utilities.
  - The location of any overhead or ground hazards shall be identified on a site layout plan.
  - The findings of this survey and the controls for all potential hazards shall become a part of the hazard analysis for the activity.
- The hazard analysis for an earth drilling activity will not be accepted unless:
  - It contains a copy of the material safety data sheet for the drilling fluids, if required;
  - It meets the requirements of 01.A.09; and
  - It indicates that the site layout plan specified in 16.M.02 will become a part of the analysis, and will be covered at the preparatory inspection (pre-activity safety briefing), when the plan has been completed.
- Training
  - All members of drilling crews shall be trained in:
    - Operation, inspection, and maintenance of the equipment
    - Safety features and procedures to be utilized during operation, inspection, and maintenance of the equipment
    - Overhead electrical line and underground hazards
  - Training will be based on the equipment operating manual and the hazard analysis for the activity.
- Earth drilling equipment shall be equipped with two easily-accessible emergency shutdown devices, one for the operator and one for the helper.
- Clearance from electrical sources shall be as specified in 11.E.05.
  - Drilling equipment shall be posted with signs warning the operator of electrical hazards.

- The equipment operator shall ascertain proper clearance prior to moving equipment. Clearance shall be monitored by a spotter or by the use of an electrical proximity warning device.

- Moving equipment
  - Before earth drilling equipment is moved, the travel route shall be surveyed for overhead and terrain hazards, particularly overhead electrical hazards.
  - Earth drilling equipment shall not be transported with the mast up. The exception is movement of the equipment required in drilling a series of holes, such as in blasting, if the following conditions are satisfied:
    - Movement is over level, smooth terrain
    - The path of travel has been inspected for stability and the absence of holes, other ground hazards, and electrical hazards
    - The travel distance is limited to short, safe distances

- Equipment set-up
  - Equipment shall be set-up on stable ground and maintained level; cribbing shall be used when necessary.
  - Outriggers shall be extended per the manufacturers' specifications.
  - When drilling equipment is operated in areas with the potential for classification as a confined space, the health and safety requirements outlined in Section 5.0 Health and Safety Plan shall be followed.

- Equipment operation
  - Weather conditions shall be monitored; operations shall cease during electrical storms or when electrical storms are imminent.
  - Drill crew members shall not wear loose clothing or equipment.
  - Auger guides shall be used on hard surfaces.
  - The operator shall verbally alert employees and visually verify that employees are clear from dangerous parts of equipment prior to starting or engaging equipment.
  - The discharge of drilling fluids shall be channeled away from the work area to prevent the ponding of water.
  - Hoists shall be used only for their designed intent and shall not be loaded beyond their rated capacity. Steps shall be taken to prevent two-blocking of hoists.
  - The equipment manufacturers' procedures shall be followed if rope becomes caught in, or objects pulled into, a cathead.

- Drill rods shall be neither run nor rotated through rod slipping devices; no more than one foot of drill rod column shall be hoisted above the top of the drill mast. Drill rod tool joints shall not be made up, tightened, or loosened while the rod column is supported by the rod slipping device.
- Dust shall be controlled.
- Augers shall be cleaned only when the rotating mechanism is in neutral and the auger stopped; long-handled shovels shall be used to move cuttings from the auger.
- Open boreholes shall be capped and flagged; open excavations shall be barricaded.

Appendix D

Quality Control Attachments

Attachment A

Quality Control Forms

- Contractor Production Report
- Example of Completed Contractor Production Report
- Daily Contractor Quality Control Report
- Testing Plan and Log
- Monthly Summary Report of Field Tests
- Example of QC Meeting Minutes Form
- Rework Items List
- Nonconformance Notice

CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

CONTRACT NO.	D.O. #	TITLE AND LOCATION	DATE / REPORT NO.
CONTRACTOR: CH2M HILL CONSTRUCTION INC.		SUPERINTENDENT	
AM WEATHER / PM WEATHER		MAX TEMP F / MIN TEMP F	

WORK PERFORMED TODAY

WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

JOB SAFETY

WAS A JOB SAFETY MEETING HELD THIS DATE? ☐ YES ☐ NO
(If YES, attach copy of the meeting minutes)

WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? ☐ YES ☐ NO
(IF YES, attach copy of completed OSHA report)

WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE? ☐ YES ☐ NO
(If YES, attach statement or checklist showing inspection performed)

WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? ☐ YES ☐ NO
(If YES, attach description of incident and proposed action)

TOTAL WORKED HOURS ON JOB SITE THIS DATE	
CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	
TOTAL WOARK HOURS FROM START OF CONSTRUCTION	

LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED

SAFETY REQUIREMENTS HAVE BEEN MET

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB

CONSTRUCTION AND PLANT EQUIPMENT OF JOB SITE TODAY. INCLUDE NUMBER OF HOURS USED TODAY.

REMARKS

CONTRACTORS SUPERINTENDENT DATE

CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE: July 2, 1998

CONTRACT NO.	D.O. #	TITLE AND LOCATION	REPORT NO.
N62467-98-D-0995		Example NAS	6

CONTRACTOR: CH2M HILL CONSTRUCTION INC. SUPERINTENDENT: John Doe, CCI

AM WEATHER 10:00 am / PM WEATHER 14:00 pm / MAX TEMP 96 F / MIN TEMP 74 F

Sunny; clear; Temp. 81° F / Partly cloudy; clear; Temp. 94° F

WORK PERFORMED TODAY

WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS
Geotechnical Drilling at Basin	XYZ Drillers		Drill	
Lead Driller		1		9
Helpers (1)		2		18
Staging Site Preparation	ABC General Contractors		Const	
Foreman		1		8
Heavy Equip. Operator		1		8
Laborer		2		16

JOB SAFETY

WAS A JOB SAFETY MEETING HELD THIS DATE? ☐ YES ☐ NO
(If YES, attach copy of the meeting minutes)

WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? ☐ YES ☐ NO
(If YES, attach copy of completed OSHA report)

TOTAL WORKED HOURS ON JOB SITE THIS DATE: 59

CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT: 288

WAS TRENCHING/SCAFFOLD/HV ELECTRICAL/HIGH WORK DONE? ☐ YES ☐ NO
(If YES, attach statement or checklist showing inspection performed)

WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? ☐ YES ☐ NO
(If YES, attach description of incident and proposed action)

TOTAL WORK HOURS FROM START OF CONSTRUCTION: 347

LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED

1) Reviewed drill rig set-up and observed safety practices during drilling and sample collection
2) Reviewed equipment operations and observed safety practices during heavy equipment operation
3) Checked site for proper equipment storage at end of day

X SAFETY REQUIREMENTS HAVE BEEN MET

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB

1) 100 tons No. 57 stone for planned road bed to staging area
2) 1 Motor grader

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INCLUDE NUMBER OF HOURS USED, IDLE AND DOWN FOR REPAIR TODAY.

1 Motor Grader – 6 hours used; 2 hour idle
1 HSA Drill Rig – 7 hours; 2 hours down for repair of water supply hose line
1 Water tank – 7 hours; 2 hours idle

REMARKS

Completed work at 4 geotecnical sampling points. Boreholes backfilled with grout to land surface and marked for future surveying. Completed grading in staging area and began placement of No. 57 stone. Approximately ½ acre complete.

CONTRACTORS SUPERINTENDENT _____ DATE _____

CONTRACTOR QUALITY CONTROL REPORT

DATE

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

PHASE	Y - YES, N - NO, SEE REMARKS; BLANK - NOT APPLICABLE	IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION, AND LIST PERSONNEL PRESENT
PREPARATORY	THE PLANS AND SPECS HAVE BEEN REVIEWED	
	THE SUBMITTALS HAVE BEEN APPROVED	
	MATERIALS COMPLY WITH APPROVED SUBMITTALS AND ARE STORED PROPERLY	
	PRELIMINARY WORK WAS DONE CORRECTLY	
	TESTING PLAN HAS BEEN REVIEWED	
	WORK METHOD AND SCHEDULE DISCUSSED	
INITIAL	PRELIMINARY WORK WAS DONE CORRECTLY	TESTING PERFORMED AND WHO PERFORMED TEST
	SAMPLE HAS BEEN PREPARED/APPROVED	
	WORKMANSHIP IS SATISFACTORY	
	TEST RESULTS ARE ACCEPTABLE	
	WORK IS IN COMPLIANCE WITH THE CONTRACT	
FOLLOW-UP	WORK COMPLIES WITH CONTRACT AS APPROVED IN INITIAL PHASE	TESTING PERFORMED AND WHO PERFORMED THE TEST

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)	REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)

REMARKS

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.

QC Inspector DATE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT

GOVERNMENT QUALITY CONTROL MANAGER DATE

Testing Plan and Log

CH2M HILL Constructors, Inc.

Contract Number: N62467-98-D-0995		CTO No.:		CTO Title:				Location:		
A	B	CTO No.:	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

Rev 0: 26JUN98

Monthly Summary Report of Field Tests

CH2M HILL Constructors, Inc.

Contract Number: N62467-98-D-0995	CTO No.:	CTO Title:	Location:

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

Rev 0: 26JUN98

Monthly Summary Report of Field Tests

CH2M HILL Constructors, Inc.

Contract Number: N62467-98-D-0995		CTO No.:	CTO Title:			Location:		
A	B	C	D		A	B	C	D
Type of Test Required	Date of Test	Reporting Laboratory	Test Results		Type of Test Required	Date of Test	Reporting Laboratory	Test Results

Rev 0: 26JUN98

MEETING SUMMARY

CH2MHILL Constructors, Inc.

Quality Control Meeting 3

CTO 008

ATTENDEES: Site Superintendent
ROICC Inspector

COPIES: PM
QCPM

FROM: Carl Simpson

DATE: July 1, 1998

1. Meeting date June 30, 1998.
2. Reviewed meeting 2 minutes. No corections or amendments required.
3. Reviewed progress schedule.
   a. Completed excavation of contaminated soil under removed tank 001.
   b. No rework identified since meeting 2.
   c. No rework required or in progress.
4. Submittal status:
   a. Reviewed submittal 007, air sparging unit. Approved as noted.
   b. Expect submittal on control valves next week.
5. .....

.

.

.

8. Next meeting in 2 weeks, July 14, 1998.

Rework Items List

Contract Number: N62467-98-D-0995

Contractor: CH2M HILL Constructors, Inc.

CTO Number	Date Identified	Description	Referenced Spec or Drawing	PQCM Action	Resolution	Date Completed

Rev 0: 26JUN98

CH2MHILL
Constructors, Inc.

115 PERIMETER CENTER PLACE.NE
SUITE 700
ATLANTA, GA 30346-1278
PHONE: (770) 604-9095
FAX: (770) 604-9183

NON-CONFORMANCE NOTICE

CTO: _____ NCN NO: _____

NCN DATE: _____

TO: _____

SUBCONTRACTOR: _____

You are hereby notified that tests and/or inspection indicates that work performed does not conform to the contract document requirements.

Non-conforming work may be required to be removed and replaced at no cost to the Owner. It shall be your responsibility to determine the corrective action necessary and advise the Engineer. You may wish to continue operations until additional investigations by the Owner or Engineer confirm or refute the initial findings.

_____ _____

Project Quality Control Manager — Date

ITEM DESCRIPTION: _____

TEST / INSPECTION: _____

CONTRACT SPECIFICATION/DRAWING: _____

NON-CONFORMANCE DESCRIPTION:

CONTRACT REQUIREMENT DESCRIPTION:

SUBCONTRACTOR'S PROPOSED CORRECTIVE ACTION (Attach additional pages if necessary):

_____ _____ _____

Subcontractor's Representative — Title — Date

PROJECT MANAGER'S RESPONSE: ☐ CONCUR - NET ☐ CONCUR - SEE REQUIREMENTS ☐ DON'T CONCUR - SEE COMMENTS

_____ _____

Project Manager — Date

SUBCONTRACTOR'S FINAL CORRECTIVE ACTION (Attach additional pages if necessary):

_____ _____ _____

Subcontractor's Representative — Title — Date

Final return of Non-Conformance Notice returned to Project Manager and PQCM on:

_____ _____

Project Quality Control Manager — Date

Attachment B

Submittal Register

Contract Number: N62467-98-D-0995		CTO No.: 002			CTO Title: NAS Cecil Field					Location: Jacksonville, 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

Attachment C

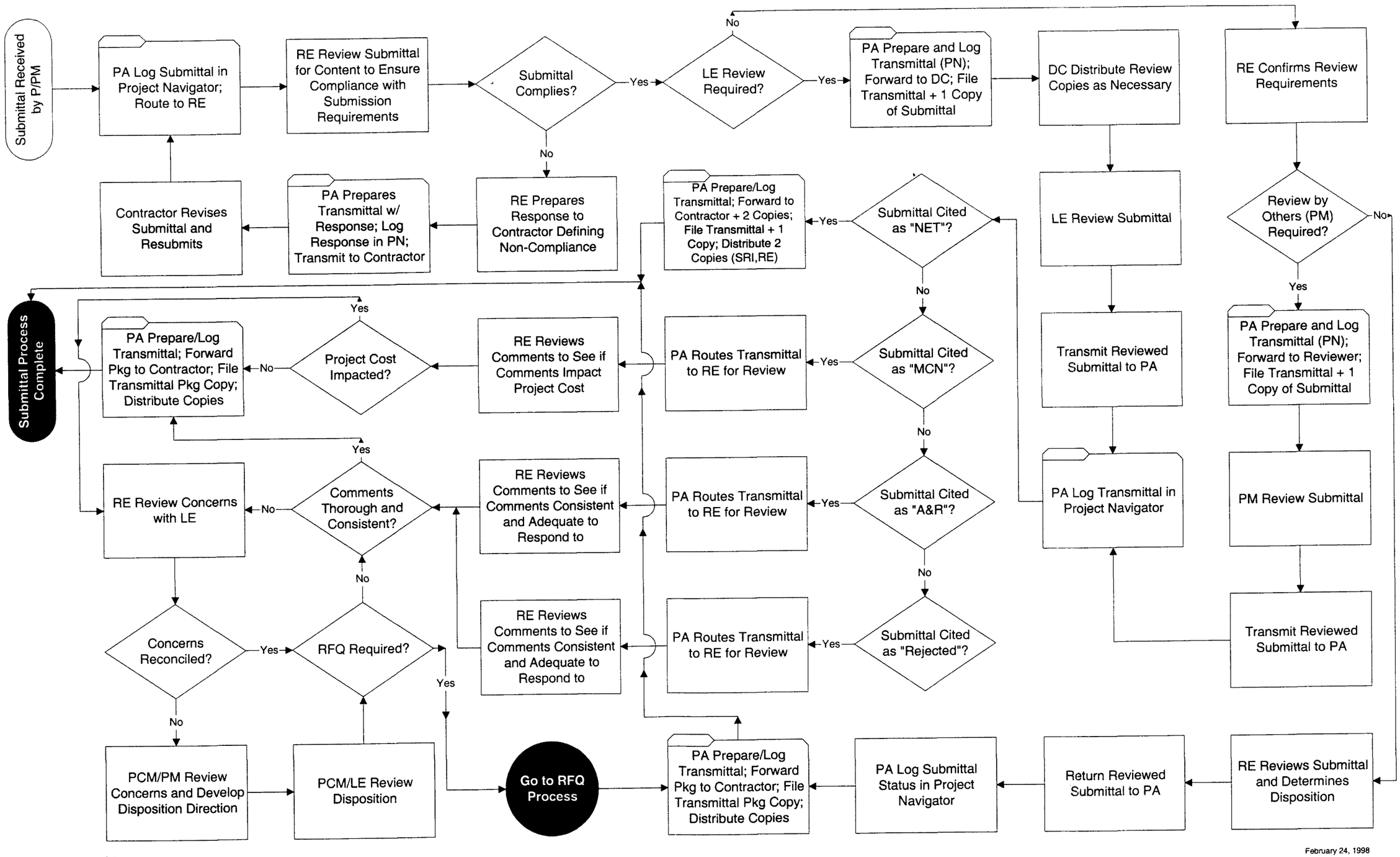
Submittal Review Process Flow Diagram

Submittal Review

Process Flow Diagram

Process Owner = Resident Engineer

Process Oversight = Project Manager



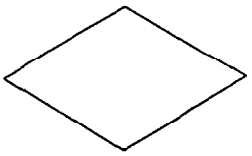
F/Administration/Workplan/CM Manual/Submittals.vsd

February 24, 1998

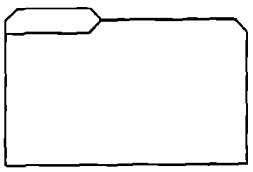
CCI Southern Division RAC
Process Flow Chart Legend

Process Start Point

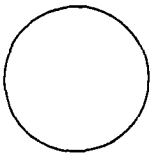
Process/Action Task



Decision Task



File/Forward/Distribute Task



External Transfer Point

Internal Transfer Point

Process Completion Point

LE - Lead Engineer

CO - Contracting Officer

COTR - Contracting Officer's Technical Representative

RE - Resident Engineer

PM - Project Manager

PA - Program Assistant

SPM - Senior Program Manager

Program Manager

PN - Project Navigator

RFP - Request for Proposal

RFC - Request for Clarification

RFI - Request for Information

COR - Change Order Request

WDC - Work Change Directive

Appendix E

Health and Safety Plan

Heath and Safety Plan
Contract No. N62467-98-D-0995

NAS Cecil Field

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

November 1998

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Attachment 1 Employee Signoff
Attachment 2 Material Safety Data Sheets

CCI HEALTH AND SAFETY PLAN for CECIL FIELD NAVAL AIR STATION

(Reference CH2M HILL SOP 19, *Health and Safety Plans*)

This health and safety plan will be kept on the site during field activities and will be reviewed and updated as necessary. The plan adopts, by reference, the standards of practice (SOP) in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual*, and CH2M HILL's *Site safety Notebook* as appropriate. The site safety coordinator (SHSS) is to be familiar with these SOPs and the content of this plan. Site personnel must sign Attachment 1. In addition, this plan adopts procedures in the work plan for the project.

1 PROJECT INFORMATION AND DESCRIPTION

CLIENT OR OWNER: Navy RAC **PROJECT NO:** 149152

CCI PROJECT MANAGER: Norm Hatch **OFFICE: Jacksonville, FL**

SITE NAME: Cecil Field Naval Air Station, Jacksonville, FL

SITE ADDRESS: Jacksonville, FL

DATE HEALTH AND SAFETY PLAN PREPARED: September 1998

DATE(S) OF INITIAL VISIT: August, 1998

DATE(S) OF SITE WORK: Determined by task order

SITE ACCESS: The Base is located at the merger of 103rd Street and Normandy Blvd., about nine miles west of Interstate 295 and five miles south of Interstate 10. A base pass must be obtained from base security to enter the base. The Pass and Tag office is located in Bldg. 327, directly inside the main gate and is open from 0730 to 1400.

SITE SIZE: Cecil Field became operational in December 1941, covering 2,600 acres. The facility was expanded till today it covers nearly 30,000 acres

SITE TOPOGRAPHY: The area is flat land with native trees and vegetation.

PREVAILING WEATHER: NE Florida with hot and humid summers, hurricanes in fall and mild winters and spring.

SITE DESCRIPTION AND HISTORY The base is the home of three squadrons of F-18 Fighters and other Naval support aircraft. As such a base, fuels and POLs were used in various areas of the facility. Numerous underground storage tanks were used during the operations on base.

2 PROJECT ORGANIZATION AND TASKS TO BE PERFORMED UNDER THIS PLAN

2.1 PROJECT ORGANIZATION

CLIENT: Southern Division, Naval Facilities Engineering Command

CH2M HILL:
Project Manager: Norm Hatch/JAX
Site Superintendent: Jeff Winnette
Refer to Section 4 for field staff. TBD

CONTRACTORS and SUBCONTRACTORS: Refer to Section 4.2.

2.2 DESCRIPTION OF TASKS (Reference Section 1, "Field Activity Start-up Form," of *Site Safety Notebook*

Refer to project documents (i.e., work plan) for detailed task information. A health and safety risk analysis has been performed for each task and is incorporated in this plan through task-specific hazard controls and requirements for monitoring and protection. Tasks in addition to those listed below require an approved amendment to this plan before additional work begins. Refer to Section 10.2 for procedures related to tasks that do not involve hazardous waste operations and emergency response (Hazwoper).

2.2.1 HAZWOPER-REGULATED TASKS

- Excavation of UST Areas
- Drilling for ground water extraction system
- Oversight of remediation and construction
- Groundwater monitoring
- Installation of air sparge/soil vapor extraction treatment system
- Surface soil sampling at UST areas
- Hand augering for sampling
- Surveying of sites
- Investigation-derived waste (drum) sampling and disposal
- Installation of groundwater recirculation system

2.2.2 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 HSM is required before these tasks are conducted on regulated hazardous waste sites.**

TASK	RESTRICTIVE CONDITIONS
• Electrical installation	
• Masonry work	
• General heavy equipment work (excavation, grading, etc.)	
• Mechanical installations (equipment, pumps, etc.)	
• Engineering testing/evaluation	

3 HAZARD EVALUATION AND CONTROL

3.1 HEAT AND COLD STRESS (Reference CH2M HILL SOP HS-09, *Heat and Cold Stress*)

3.1.1 PREVENTING HEAT STRESS

- Drink 16 ounces of water before beginning work, such as in the morning or after lunch. Disposable (e.g., 4-ounce) cups and water maintained at 50° to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons per day. Take regular breaks in a cool, preferably air-conditioned, area. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours. Monitor for signs of heat stress.
- Acclimate to site work conditions by slowly increasing workloads; e.g., do not begin site work with extremely demanding activities.
- Use cooling devices, such as cooling vests, to aid natural body ventilation. The 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.
- During hot weather, conduct field activities in the early morning or evening if possible.
- Provide adequate shelter to protect personnel against radiant heat (sun, flames, hot metal), which can decrease physical efficiency and increase the probability of heat stress.
- In hot weather, rotate shifts of workers.
- Maintain good hygiene standards by frequently changing clothing and by showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should consult medical personnel.

3.1.2 SYMPTOMS AND TREATMENT OF HEAT STRESS

	Heat Syncope	Heat Rash (*miliaria rubra*, "prickly heat")	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!

3.1.3 HEAT-STRESS MONITORING

For field activities part of ongoing site work activities in hot weather, the following procedures should be used to monitor the body's physiological response to heat and to estimate the work-cycle/rest-cycle when workers are performing moderate levels of work. These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high(>50%), or when the workers exhibit symptoms of heat stress.

The heart rate should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 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 110 beats/minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 110 beats/minute, or 20 beats/minute above resting pulse.

3.1.4 PREVENTING COLD STRESS

- Be aware of the symptoms of cold-related disorders, and ***wear proper clothing for the anticipated fieldwork.***
- Consider monitoring the work conditions and adjusting the work schedule, using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- ***Wind-Chill Index.*** This measure relates the dry bulb temperature and the wind velocity. It is used only to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index sometimes is limited in its usefulness because the index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it is used only as a guideline to warn workers when they are in a situation that can cause cold-related illnesses. Used in conjunction with the NSC guidelines, the wind-chill index provides a starting point for adjusting work and warm-up schedules.
- ***NSC Guidelines for Work and Warm-Up Schedules.*** The cold-exposure limits recommended by the NSC can be used in conjunction with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; ***workers should be monitored for symptoms of cold-related illness.*** If symptoms are not observed, the work duration can be increased.
- The wind-chill index and the NSC guidelines are in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual,* SOP HS-09.

3.1.5 SYMPTOMS AND TREATMENT OF COLD STRESS

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

3.2 PROCEDURES FOR LOCATING BURIED UTILITIES

Local Utility Mark-Out Service
Name: Dave Kruzicki, Chief of Base Environmental
Phone: 904-778-5620 Ext. 114

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

3.3 GENERAL PHYSICAL (SAFETY) HAZARDS AND CONTROLS

Engineering and administrative controls are to be implemented by the party in control of the site or the hazard (i.e., CH2M HILL, subcontractor, or contractor). CH2M HILL employees and subcontractors must, at a minimum, remain aware of hazards affecting them regardless of who is responsible for controlling the hazards. Specialty subcontractors are responsible for the safe operation of their equipment (e.g., drill rig, heavy equipment). CH2M HILL employees are not to operate, or assist in the operation of, any subcontractor or contractor equipment.

		Tasks									
Hazard (Refer to SOP, or HSP Section)	**Engineering Controls, Administrative Controls, and Work Practices**	**Excavation**	**Drilling, Installation, Well Installation and Abandonment**	**Groundwater Monitoring , s**	**Surface Water and Sediment Sampling Using a Boat**	**Surface Water and Sediment Sampling from the Shore or Water**	**Hand Augering**	**Surveying**	**IDW Drum Sampling and Disposal[a]**	**Observation of Loading of Material for Offsite Disposal**	**Remediation and Construction Oversight**
Flying debris/objects (HS-07)	Provide shielding and PPE; maintain distance.	X	X		X	X	X		X	X	X
Noise > 85 dBA	Noise protection and monitoring required.	X	X		X					X	X
Gas cylinders (HS-21)	Instruct employees in the safe use of compressed gases. Make certain gas cylinders are properly anchored and chained. Keep cylinders away from ignition sources. Cap cylinders when not in use.	X	X								
Electrical	Make certain third wire is properly grounded. Do not tamper with electrical wiring unless qualified to do so. Ground as appropriate. Project field sites should have ground fault circuit interrupters (GFCIs) installed for all wiring, including extension cords. Heavy equipment (e.g., drill rig) should remain at least 15 feet from overhead power line for power lines of 50 kV or less. For each 10 kV > 50, increase distance by ½ foot. Operate and maintain equipment according to manufacturer's instructions. Use only extension cords that are three-wire grounded. Cords passing through work areas must be covered or elevated to protect from damage. Use only electrical tools and equipment that are either effectively grounded or double-insulated UL approved. Properly label switches, fuses, and circuit breakers. Remove cord from an outlet by grasping the plug, not pulling the cord. Protect all electrical equipment, tools, switches, etc., from elements. Avoid physical contact with power circuit. Only qualified electricians are to install and work on electrical circuits and equipment.	X	X	X	X						X
Suspended loads	Work not permitted under suspended loads.	X	X		X					X	X
Buried utilities, drums, tanks, etc. (Section 3.3)	Locate buried utilities, drums, tanks, etc., before digging or drilling and mark location.	X	X				X				X
Slip, trip, fall hazards (e.g., wet/muddy surface, inadequate railing, unstable surface)	Provide slip-resistant surfaces, ropes, and/or other devices to be used. Brace and shore equipment	X	X	X	X	X	X	X	X	X	X
Back injury (HS-29)	Use proper lifting techniques, or provide mechanical lifting aids.	X	X	X	X	X	X		X		X
Confined space entry (Section 9.0)	Space must be evaluated by qualified person. Additional controls and monitoring, training, and an approved entry permit are generally required.	NOT				APPROVED					
Trenches/excavations (HS-32)	Make certain trench meets OSHA standard before entering. All excavations > 4 feet deep must be sloped or shored, and have a ladder every 25 feet. Personnel and equipment must remain at least 2 feet from edge of trench at all times.	X									X
Protruding objects	Flag visible objects.	X	X	X	X	X	X	X	X	X	X
Visible lightning	Stop work.	X	X	X	X	X	X	X	X	X	X
Vehicle traffic (HS-24)	Provide temporary traffic controls, including trained flaggers and lookouts. Implement traffic control program when required.									X	X
Stairways, ladders, and scaffolds (HS-25)	Stairways and ladders are generally required when there is a break in elevation of 19 inches or more. Keep access ways clear. Equipment must meet OSHA specifications. Document employee training.		X								X
Elevated work area/falls (HS-31)	Provide guardrail, safety net, floor covers, body harness, and monitoring system, where applicable. Document employee training.	X				X					X
Fire prevention and control (HS-22)	No spark sources are allowed within exclusion or decontamination zones. Appropriate firefighting equipment must be available on the site. Extinguishers are to be inspected visually every month and undergo an annual maintenance check. Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations. Keep areas near exits and extinguishers clear. Open flames are prohibited in the vicinity of flammable materials. Combustible materials stored outside should be at least 10 feet from the	X	X			X			X		X

3.3 GENERAL PHYSICAL (SAFETY) HAZARDS AND CONTROLS

Engineering and administrative controls are to be implemented by the party in control of the site or the hazard (i.e., CH2M HILL, subcontractor, or contractor). CH2M HILL employees and subcontractors must, at a minimum, remain aware of hazards affecting them regardless of who is responsible for controlling the hazards. Specialty subcontractors are responsible for the safe operation of their equipment (e.g., drill rig, heavy equipment). CH2M HILL employees are not to operate, or assist in the operation of, any subcontractor or contractor equipment.

		Tasks									
Hazard (Refer to SOP, or HSP Section)	**Engineering Controls, Administrative Controls, and Work Practices**	**Excavation**	**Drilling, Installation, Well Installation and Abandonment**	**Groundwater Monitoring , s**	**Surface Water and Sediment Sampling Using a Boat**	**Surface Water and Sediment Sampling from the Shore or Water**	**Hand Augering**	**Surveying**	**IDW Drum Sampling and Disposal[a]**	**Observation of Loading of Material for Offsite Disposal**	**Remediation and Construction Oversight**
	building. Unnecessary combustible materials and flammable or combustible liquids must not be allowed to accumulate. Flammable or combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.										
Inadequate illumination	Site work will be performed during daylight hours whenever possible. Work conducted during hours of darkness will require enough illumination intensity "to read a newspaper without difficulty."	X	X	X	X	X	X	X	X	X	X
Entanglement in rotating equipment	• Prohibit loose clothing and hair • Prohibit wearing jewelry		X				X				
Drilling	• The drill rig is not to be operated in inclement weather. • The driller is to verify that the rig is properly leveled and stabilized before raising the mast. • Personnel should be cleared from the sides and rear of the rig before the mast is raised. • The driller is not to drive the rig with the mast in the raised position. • The driller must check for overhead power lines before raising the mast. A minimum distance of 15 feet between mast and overhead lines (<50 kV) is recommended. Increased separation may be required for lines greater than 50 kV. • Personnel should stand clear before rig startup. • The driller is to verify that the rig is in neutral when the operator is not at the controls. • Become familiar with the hazards associated with the drilling method used (cable tool, air rotary, hollow-stem auger, etc.). • Do not wear loose-fitting clothing, watches, etc., that could get caught in moving parts. • Do not smoke or permit other spark-producing equipment around the drill rig. • The drill rig must be equipped with a kill wire or switch, and personnel are to be informed of its location. • Be aware and stand clear of heavy objects that are hoisted overhead. • The driller is to verify that the rig is properly maintained in accordance with the drilling company's maintenance program. • The driller is to verify that all machine guards are in place while the rig is in operation. • The driller is responsible for housekeeping (maintaining a clean work area). • The drill rig should be equipped with at least one fire extinguisher. • If the drill rig comes into contact with electrical wires and becomes electrically energized, do not touch any part of the rig or any person in contact with the rig, and stay as far away as possible. Notify emergency personnel immediately.		X								
Heavy equipment	• Become familiar with hazards specific to the equipment being used. • *Always confirm that the operator is aware of your location, particularly when you* approach or pass by equipment. • Backup alarm is required for heavy equipment. Do not count on backup alarms always functioning. Look around when alarm sounds. • Do not ride equipment not designed for passengers. • Do not climb on operating equipment. • Do not place yourself between fixed and moving parts or objects. • Do not stand adjacent to the equipment. • Stay clear of equipment on cross slopes and unstable terrain. • Stay clear of pile-driving operations. • Stay outside the turning radius of the equipment. • Operators using all-terrain vehicles (ATV) must be trained; other ATV requirements may apply. • Observer must remain in contact with operator and signal safe backup. • Personnel must remain outside the turning radius.	X	X		X					X	X
Working near water	• U.S. Coast Guard-approved personal flotation devices (PFDs–e.g., life jacket) provided for each employee will be worn. • PFDs will be inspected before and after each use. Defective equipment will not be used.					X					

3.3 GENERAL PHYSICAL (SAFETY) HAZARDS AND CONTROLS

Engineering and administrative controls are to be implemented by the party in control of the site or the hazard (i.e., CH2M HILL, subcontractor, or contractor). CH2M HILL employees and subcontractors must, at a minimum, remain aware of hazards affecting them regardless of who is responsible for controlling the hazards. Specialty subcontractors are responsible for the safe operation of their equipment (e.g., drill rig, heavy equipment). CH2M HILL employees are not to operate, or assist in the operation of, any subcontractor or contractor equipment.

		Tasks									
Hazard (Refer to SOP, or HSP Section)	**Engineering Controls, Administrative Controls, and Work Practices**	**Excavation**	**Drilling, Installation, Well Installation and Abandonment**	**Groundwater Monitoring , s**	**Surface Water and Sediment Sampling Using a Boat**	**Surface Water and Sediment Sampling from the Shore or Water**	**Hand Augering**	**Surveying**	**IDW Drum Sampling and Disposal[a]**	**Observation of Loading of Material for Offsite Disposal**	**Remediation and Construction Oversight**
	• Sampling and other equipment will be used according to the manufacturer's instructions. • A minimum of one life-saving skiff will be provided for emergency rescue. • A minimum of one ring buoy with 90 feet of 3/8-inch solid-braid polypropylene (or equal) rope will be provided for emergency rescue. • Keep nonessential personnel 3 feet from edge of water										
Working on water	• Safe means of boarding or leaving a boat or a platform will be provided to prevent slipping and falling. Boat/barge must be equipped with adequate railing. instructions/warnings (e.g., protect from pinch points, sharp objects, rope burns/entanglement). • Work requiring the use of a boat will take place only during daylight hours. • Work requiring the use of a boat will not take place during inclement weather. • The boat/barge must be operated according to U.S. Coast Guard regulations (speed, lightning, right-of-way, etc.). Shut off engine before refueling; do not smoke while refueling.				X						
IDW Drum sampling	Personnel are allowed to handle and/or sample drums containing investigation-derived waste (IDW) only; handling or sampling other drums requires a plan revision or amendment approved by the CH2M HILL HSM. The following control measures will be taken when sampling drums containing IDW: • Minimize transportation of drums. • Minimize number of people involved in the actual sampling. • Sample only labeled drums or drums known to contain IDW. • Use caution when sampling bulging or swollen drums. Relieve pressure slowly. • If drums contain, or potentially contain, flammable materials, use nonsparking tools to open. • Picks, chisels, and firearms may not be used to open drums. • Reseal bung holes or plugs whenever possible. • Avoid mixing incompatible drum contents. • Sample drums without leaning over the drum opening. • If there is evidence of contamination on the lid of the drum, cover the lid with plastic sheeting. • Transfer the content of drums using a method that minimizes contact with material. • Air monitoring and PPE requirements specified in sections 5 and 6 must address drum sampling. • *Spill-containment procedures specified in Section 8 must be appropriate for the* material to be handled.								X		

3.4 BIOLOGICAL HAZARDS AND CONTROLS

Hazard and Location	Control Measures
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. Carry the victim or have him/her walk slowly if the victim must be moved. Try to identify the type of snake: note color, size, patterns, and markings.
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.
Exposure to **bloodborne pathogens** may occur when rendering first aid or CPR, or when coming into contact with medical or other potentially infectious material, or when coming into contact with landfill waste or waste streams containing such infectious material.	Training is required before a task involving potential exposure is performed. 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.
Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic.	Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SHSS and/or the 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.

Other Potential Biological Hazards:

3.5 TICK BITES (Reference CH2M HILL HS-03, *Tick Bites*)

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.

Prevention against tick bites includes avoiding tick areas; wearing tightly woven light-colored clothing with long sleeves and wearing pant legs tucked into boots or socks; spraying **only outside** of clothing with insect repellent containing permethrin or permanone, and spraying skin with DEET; and checking yourself frequently for ticks and showering as soon as possible. To prevent chemical repellents from interfering with sample analyses, exercise care while using repellents during the collection and handling of environmental samples.

If bitten by a tick, carefully remove the tick with tweezers, grasping the tick as close as possible to the point of attachment while being careful not to crush the tick. After removing the tick, wash your hands and disinfect and press the bite area. The removed tick should be saved. Report the bite to human resources personnel.

Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, bone pain may develop. If symptoms appear, seek medical attention.

3.6 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 for operating in contaminated areas.

Hazards	Controls
None Known	None Required

3.7 HAZARDS POSED BY CHEMICALS BROUGHT ON THE SITE

3.7.1 HAZARD COMMUNICATION

(Reference CH2M HILL *Hazard Communication Manual* and Section 5 of the *Site Safety Notebook*)

CH2M HILL's *Hazard Communication Program Manual*, which is available from area or regional offices and from the Corporate Human Resources Department in Denver. The project manager is to request Material Safety Data Sheets (MSDSs) from the client or from the contractors and the subcontractors for chemicals to which CH2M HILL employees potentially are exposed. The SHSS is to do the following:

- Give employees required site-specific HAZCOM training.
- Confirm that the inventory of chemicals brought on the site by subcontractors is available.
- Before or as the chemicals arrive on the site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, if any.

The chemical products listed below will be used on the site. Refer to Attachment 2 for MSDSs.

Chemical	Quantity	Location
Methane (calibration gas)	1 liter, compressed gas	Support Zone
Isobutylene (calibration gas)	1 liter, compressed gas	Support Zone
Pentane (calibration gas)	1 liter, compressed gas	Support Zone
Hydrochloric Acid (sample preservative)	< 500 ml	Support/Exclusion Zone
Nitric Acid (sample preservative)	< 500 ml	Support/Exclusion Zone
Sulfuric Acid (sample preservative)	< 500 ml	Support/Exclusion Zone
Sodium Hydroxide (sample preservative)	< 500 ml	Support/Exclusion Zone
Methanol (decontamination solvent)	< 1 gallon	Support/Decontamination Zone
Hexane (decontamination solvent)	< 1 gallon	Support/Decontamination Zone
Isopropanol (decontamination solvent)	< 1 gallon	Support/Decontamination Zone
pH Buffers (calibration standard)	< 500 ml	Support Zone
MSA Sanitizer (respirator cleaner)	< 1 liter, powder	Support/Decontamination Zone
Alconox/Liquinox (detergent)	< 1 liter, powder/liquid	Support/Decontamination Zone

3.7.2 SHIPPING AND TRANSPORTATION OF CHEMICAL PRODUCTS

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

Nearly all chemicals brought to the site are considered hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive the 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.

3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)

Contaminant	Location and Highest[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Arsenic	GW: SB: SS:	0.01 mg/m³	5 Ca	Ulceration of nasal septum, respiratory irritation; dermatitis; gastrointestinal disturbances; peripheral neuropathy, hyperpigmentation	NA
Benzene	GW: SB: SS:	1 ppm	500 Ca	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	9.24
2-Butanone (Methyl Ethyl Ketone, MEK)	GW: SB: SS:	200 ppm	3,000	Eye, skin, and nose irritation: headache, dizziness; vomiting, dermatitis	9.54
Cadmium	GW: SB: SS:	0.005 mg/m³	9 Ca	Pulmonary edema, coughing, chest tightness/pain, headache; chills, muscle aches, nausea, vomiting, diarrhea; difficulty breathing; loss of sense of smell; emphysema; mild anemia	NA
Carbon Tetrachloride	GW: SB: SS:	2 ppm	200 Ca	Central nervous system (CNS) depression; nausea; vomiting; eye and skin irritation; liver and kidney injury; drowsiness; dizziness	11.47
Chlordane	GW: SB: SS:	0.5 mg/m³	100 Ca	Blurred vision, confusion, ataxia, delirium, coughing, abdominal pain, nausea, vomiting, diarrhea, irritability, tremors, anuria	UK
Chlorobenzene	GW: SB: SS:	10 ppm	1,000	Skin, eye, and nose irritation; drowsiness; uncoordination; CNS depression	9.07
Chloroform	GW: SB: SS:	2 ppm	500 Ca	Dizziness, mental dullness, nausea, confusion, disorientation, headache, fatigue, eye and skin irritation, anesthesia, enlarged liver	11.42
Chromium (as Cr(II) & Cr (III))	GW: SB: SS:	0.5 mg/m³	25	Irritated eyes, sensitization dermatitis, histologic fibrosis of lungs	NA
Chromium (hexavalent)	GW: SB: SS:	0.05 mg/m³	15 Ca	Irritated respiratory system; nasal septum perforation; liver and kidney damage; leucytosis; leupen; monocytosis; eosinophilla; eye injury, conjunctivitis; skin ulcer; sensitization dermatitis	NA

3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)					
Contaminant	**Location and Highest[a] Concentration (ppm)**	**Exposure Limit[b]**	**IDLH[c]**	**Symptoms and Effects of Exposure**	**PIP[d] (eV)**
Cobalt (Metal, Dusts, and Fumes)	GW: SB: SS:	0.05 mg/m³	20	Coughing; difficulty breathing; wheezing; decreased pulmonary function; diffuse nodule fibrosous; dermatitis; respiratory hypersensitivity; asthma	NA
DDT	GW: SB: SS:	0.5 mg/m³	500 Ca	Paresthesia of tongue, lips, hand, and face; tremors; dizziness; confusion; headache; fatigue; convulsions; eye and skin irritation; vomiting	UK
o-Dichlorobenzene (1,2-Dichlorobenzene)	GW: SB: SS:	25 ppm	200 Ca	Nose and eye irritation; liver and kidney damage; skin blisters	9.06
p-Dichlorobenzene (1,4-Dichlorobenzene)	GW: SB: SS:	10 ppm	150 Ca	Headache, eye irritation, nausea, vomiting; swelling periorbital; profuse rhinitis; jaundice; cirrhosis	8.98
1,1-Dichloroethane	GW: SB: SS:	100 ppm	3,000	CNS depression, skin irritation; liver, kidney, and lung damage	11.06
1,2-Dichloroethane (Ethylene Dichloride)	GW: SB: SS:	1 ppm	50 Ca	CNS depression; nausea; vomiting; dermatitis; eye irritation; liver, kidney, and CNS damage; corneal opacity	11.05
Endosulfan	GW: SB: SS:	0.1 mg/m³	NL	Irritated skin, nausea, confusion, agitation, flushing, dry mouth, tremor, convulsion, headache	UK
Ethyl Benzene	GW: SB: SS:	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
Lead	GW: SB: SS:	0.05 mg/m³	100	Weakness, lassitude; facial pallor; pal eye; weight loss, malnutrition; abdominal pain, constipation; anemia; gingival lead line; tremors; paralysis of wrist and ankles; encephalopathy; kidney disease; irritated eyes; hypotension	NA
Mercury	GW: SB: SS:	0.05 mg/m³	10	Skin and eye irritation, cough, chest pain, difficult breathing, bronchitis, pneumontitis, tremors, insomnia, irritability, indecision, headache, fatigue, weakness, GI disturbance	NA

3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)

Contaminant	Location and Highest[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Naphthalene	GW: SB: SS:	10 ppm	250	Eye irritation, headache, confusion, excitement, nausea, vomiting, abdominal pain, bladder irritation, profuse sweating, dermatitis, corneal damage, optical neuritis	8.12
PCBs	GW: SB: SS:	0.5 mg/m^3	5 Ca	Eye and skin irritation, acne-form dermatitis, liver damage, reproductive effects	UK
PNAs (Limits as Coal Tar Pitch)	GW: SB: SS:	0.2 mg/m^3	80 Ca	Dermatitis, bronchitis	UK
1,1,2,2-Tetrachloroethane (Tetrachloroethane)	GW: SB: SS:	1 ppm	100 Ca	Nausea, vomiting, abdominal pain, finger tremors, jaundice, hepatitis, liver tenderness, monocytosis, kidney damage, dermatitis	11.10
Tetrachloroethene	GW: SB: SS:	25 ppm	150 Ca	Eye, nose, and throat irritation; nausea; flushed face and neck; vertigo; dizziness; sleepiness; skin redness; headache; liver damage	9.32
1,1,2-Trichloroethane	GW: SB: SS:	10 ppm	100 Ca	Eye and nose irritation, CNS depression, liver damage, dermatitis	11.00
Trichloroethylene	GW: SB: SS:	25 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
Toluene	GW: SB: SS:	50 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82
Xylenes	GW: SB: SS:	100 ppm	900	Irritated eyes, skin, nose, throat; dizziness; excitement; drowsiness; incoherence; staggering gait; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis	8.56
Vinyl Chloride	GW: SB: SS:	1 ppm	NL Ca	Weakness, abdominal pain, gastrointestinal bleeding, enlarged liver, pallor or cyanosis of extremities	9.99

3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)

Contaminant	Location and Highest[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Vinylidene Chloride (1,1-dichloroethylene)	GW: SB: SS:	1 ppm	NL Ca	Eye, skin, and throat irritation; dizziness; headache; nausea; difficult breathing; liver and kidney dysfunction; pneumonitis	UK

Footnotes:

a: Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), SS (Surface Soil), SL (Sludge), SW (Surface Water),

b: Appropriate value of 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

3.9 POTENTIAL ROUTES OF EXPOSURE

DERMAL: Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 5.	**INHALATION:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in sections 5 and 6, respectively.	**OTHER:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before eating, drinking, or smoking).

4 PERSONNEL

4.1 CH2M HILL EMPLOYEE MEDICAL SURVEILLANCE AND TRAINING

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

The employees listed below are enrolled in the CH2M HILL Comprehensive Health and Safety Program and 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 received 8 hours of supervisor and instrument training and can serve as site safety coordinator (SHSS) for the level of protection indicated. 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 that involve the potential for exposure to health and safety hazards. 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 that involve the potential for exposure to health and safety hazards. 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's 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
Craig Haas	ATL	Site Health and Safety Specialist	Level D SHSS
Norm Hatch	JAX	Project Manager	
Robert Nash	ATL	Health and Safety Manager	Level B SHSS. FA-CPR

4.2 FIELD TEAM CHAIN OF COMMAND AND COMMUNICATION PROCEDURES

4.2.1 CLIENT

Contact Name: Ken Lott/NavFacEng Com, Charleston, S.C.
Facility Contact Name: Dave Kruziciki/CFNAS
Phone: 904/778-5620, ext.114

4.2.2 CH2M HILL

Project Manager: Norm Hatch/JAX
Health and Safety Manager: Robert Nash/ATL
Site Superintendent: Jeff Winnette/ATL
Site Health and Safety Specialist: Craig Haas/ATL

The SHSS is responsible for contacting the field team leader and the project manager. In general, the project manager either will contact or will identify the client contact. The Health and Safety Manager (HSM) should be contacted as appropriate. The SHSS or the project manager must notify the client and the HSM when a serious injury or a death occurs or when health and safety inspections by OSHA or other agencies are conducted. Refer to sections 10 through 12 for emergency procedures and phone numbers.

4.2.3 SUBCONTRACTORS

(Reference Section 3, *Corporate Health and Safety Program Manual*)

When specified in the project documents (e.g., contract), this plan may cover CH2M HILL subcontractors. However, this plan does not address hazards associated with tasks and equipment that the subcontractor has expertise in (e.g., operation of drill rig). Specialty subcontractors are responsible for health and safety procedures and plans specific to their work. Specialty subcontractors are to submit plans to CH2M HILL for review and approval before the start of fieldwork. Subcontractors must comply with the established health and safety plan(s). CH2M HILL must monitor and enforce compliance with the established plan(s).

Subcontractor:
Subcontractor Contact:
Telephone:

General health and safety communication with subcontractors contracted with CH2M HILL and covered by this plan is to be conducted as follows:

- Request that the subcontractor, if a specialty subcontractor, submit a safety or health plan applicable to their expertise (e.g., drill-rig safety plan or nuclear density gauge [NDG] health plan); attach the reviewed plan.
- Supply subcontractors with a copy of this plan, and brief them on its provisions.
- Direct health and safety communication to the subcontractor-designated safety representative.
- Notify the subcontractor-designated representative if a violation of the plan(s) is observed. Specialty subcontractors are responsible for mitigating hazards in which they have expertise.
- If a hazard condition persists, inform the subcontractor. If the hazard is not mitigated, stop affected work as a last resort and notify the project manager.
- When an apparent imminent danger exists, promptly remove all affected personnel. Notify the project manager.
- Make clear that consistent violations of the health and safety plan by a subcontractor may result in termination of the subcontract.

5 PERSONAL PROTECTIVE EQUIPMENT (PPE) (Reference CH2M HILL SOP HS-07, *Personal Protective Equipment*, HS-08, *Respiratory Protection*, Section 2 of the *Site Safety Notebook*)

5.1 PPE SPECIFICATIONS[a]

Task	Level	Body	Head	Respirator[b]
General work uniform when no chemical exposure is anticipated	D	Work clothes; steel-toe, steel-shank leather work boots; work gloves	Hardhat[c] Safety glasses Ear protection[d]	None required
Field Activities	Modified D	**COVERALLS:** Uncoated Tyvek® **BOOTS:** Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers **GLOVES:** Inner surgical-style nitrile glove AND outer chemical-resistant nitrile glove.	Hardhat[c] Splash shield[c] Safety glasses Ear protection[d]	None required
Field Activities	C	**COVERALLS:** Polycoated Tyvek® **BOOTS:** Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers **GLOVES:** Inner surgical-style nitrile glove AND outer chemical-resistant nitrile glove.	Hardhat[c] Splash shield[c] Ear protection[d] Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H[e] cartridges or equivalent
Not Approved for this Plan	B	**COVERALLS:** Polycoated Tyvek® **BOOTS:** Steel toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers **GLOVES:** Inner surgical-style nitrile glove AND outer chemical-resistant nitrile glove.	Hardhat[c] Splash shield[c] Ear protection[d] Spectacle inserts	Positive-pressure demand self-contained breathing apparatus (SCBA): MSA Ultralite, or equivalent

[a] Modifications are as indicated. CH2M HILL will provide PPE to only CH2M HILL employees.
[b] No facial hair that would interfere with respirator fit is permitted.
[c] Hardhat and splash-shield areas are to determined by the SHSS.
[d] Ear protection should be worn while working around drill rigs or other noise-producing equipment or when conversations cannot be held at distances of 3 feet or less without shouting. Refer to Section 6 for other requirements.
[e] The GME-H cartridge is the new standard-issue cartridge. Available stock of the previously standard GMC-H cartridges may be used for tasks covered by this plan.

5.2 REASONS FOR UPGRADING OR DOWNGRADING LEVEL OF PROTECTION

Upgrade*	Downgrade
• Request from individual performing task. • Change in work task that will increase contact or potential contact with hazardous materials. • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazards. • Instrument action levels (Section 6) exceeded.	• New information indicating that situation is less hazardous than originally thought. • Change in site conditions that decreases the hazard. • Change in work task that will reduce contact with hazardous materials.

*Performing a task that requires an upgrade to a higher level of protection (e.g., level D to level C) is permitted only when the PPE requirements have been specified in Section 5 and an SHSS who meets the requirements specified in subsection 4.1 is present.

6 AIR MONITORING SPECIFICATIONS (Reference CH2M HILL SOP HS-06, *Air Monitoring*, and Section 2 of the *Site Safety Notebook*)

Instrument	Tasks	Action Levels[a]		Frequency[b]	Calibration
FID: OVA model 128 or equivalent	Where Benzene is present	0 to 1 ppm 1 to 10 ppm >10 ppm	Level D Level C Stop Work	Initially and periodically during task	Daily
	Non-Benzene	0 to 10 ppm 10 to 100 ppm >100 ppm	Level D Level C Stop work		
PID: MiniRae with 10.6eV lamp or equivalent	Where Benzene is present	0 to 1 ppm 1 to 10 ppm >10 ppm	Level D Level C Stop Work	Initially and periodically during task	Daily
	Non-Benzene	0 to 10 ppm 10 to 100 ppm >100 ppm	Level D Level C Stop work		
CGI: MSA model 260 or 261 or equivalent		0-10%[c] LEL: 10-25%[c] LEL: >25%[c] LEL:	No explosion hazard Potential explosion hazard Explosion hazard; evacuate or vent	Continuous during advancement of boring or trench	Daily
O_2 Meter: MSA model 260 or 261 or equivalent		>25.0%[c] O_2: 20.9%[c] O_2: <19.5%[c] O_2:	Explosion hazard; evacuate or vent Normal O_2 O_2 deficient; vent or use SCBA	Continuous during advancement of boring or trench	Daily
Detector Tube: Drager benzene specific 0.5/c (0.5 to 10 ppm range) with pretube, or equivalent		<0.5ppm 0.5-1ppm >1ppm	Level D Level C Level B	Initially and periodically when PID/FID >1ppm	Not Applicable
Noise-Level Monitor[d]:		< 85 dB(A) 85 - 120 dB(A) 120 dB(A)	No action required Hearing protection required[e] Stop; re-evaluate	Initially and periodically during task	Daily

Note a: Action levels apply to sustained breathing-zone measurements above background.

Note b: The exact frequency of monitoring depends on field conditions and is to be determined by the SHSS; generally, every 5 to 15 minutes is acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time and measurement result, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3," "at surface/SB-2," etc.).

Note 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 to only ambient working atmospheres, and do not apply to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry; refer to Section 9.

Note d: Contact HSM. Noise monitoring, training, and audiometric testing also are required.

6.1 CALIBRATION SPECIFICATIONS

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

Instrument	Gas	Span	Reading	Method
PID: HNU, 10.2 eV probe	100 ppm isobutylene	9.8 ± 2.0	55 ppm	1.5 lpm reg T-tubing OR 0.25 lpm reg direct tubing
HNU, 11.7 eV probe		5.0 ± 2.0	68 ppm	
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF=53	53 ppm ±5 ppm	1.5 lpm REG T-Tubing
PID: TVA 1000	100 ppm isobutylene	CF=0.55	55 ppm ± 5 ppm	1.5 lpm REG T-Tubing
FID: OVA-128	100 ppm methane	3.0 ± 1.5	100 ppm	1.5 lpm reg T-tubing
FID: TVA 1000	100 ppm methane	CF=1.00	100 ppm ± 10	1.5 lpm reg T-tubing
Dust Monitor: Miniram-PDM3	Dust-free air	Not applicable	0.00 mg/m^3 in "Measure" mode	Dust-free area OR Z-bag with HEPA filter
CGI: MSA 260, 261, 360, or 361	0.75% pentane	N/A	50% LEL ± 5 % LEL	1.5 lpm reg direct tubing

6.2 AIR SAMPLING

Sampling 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.

Method Description:

Personnel and Areas

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

HSM:
Other:

7 DECONTAMINATION (REFERENCE CH2M HILL SOP HS-13, *DECONTAMINATION*)

The SHSS must monitor the effectiveness of the decontamination procedures. Decontamination procedures found to be ineffective will be modified by the SHSS.

7.1 DECONTAMINATION SPECIFICATIONS

Personnel	Sample Equipment	Heavy Equipment
• Boot wash/rinse	• Wash/rinse equipment	• Power wash
• Glove wash/rinse	• Solvent-rinse equipment	• Steam clean
• Outer-glove removal	• **Solvent-disposal method:**	• **Water-disposal method:**
• Body-suit removal		
• Inner-glove removal		
• Respirator removal		
• Hand wash/rinse		
• Face wash/rinse		
• Shower ASAP		
• **PPE-disposal method:**		
• **Water-disposal method:**		

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 typical establishment of work zones, including the decontamination line. Work zones are to be modified by the SHSS to accommodate task-specific requirements.

8 SPILL-CONTAINMENT PROCEDURES

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

9 CONFINED-SPACE ENTRY

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

No confined-space entry will be permitted. Confined-space entry requires additional health and safety procedures, training, and a permit. If conditions change such that confined-space entry is necessary, contact the HSM to develop the required entry permit.

When planned activities will not include confined-space entry, permit-required confined spaces accessible to CH2M HILL personnel are to be identified before the task begins. The SHSS is to confirm that permit spaces are properly posted or that employees are informed of their locations and informed of their hazards.

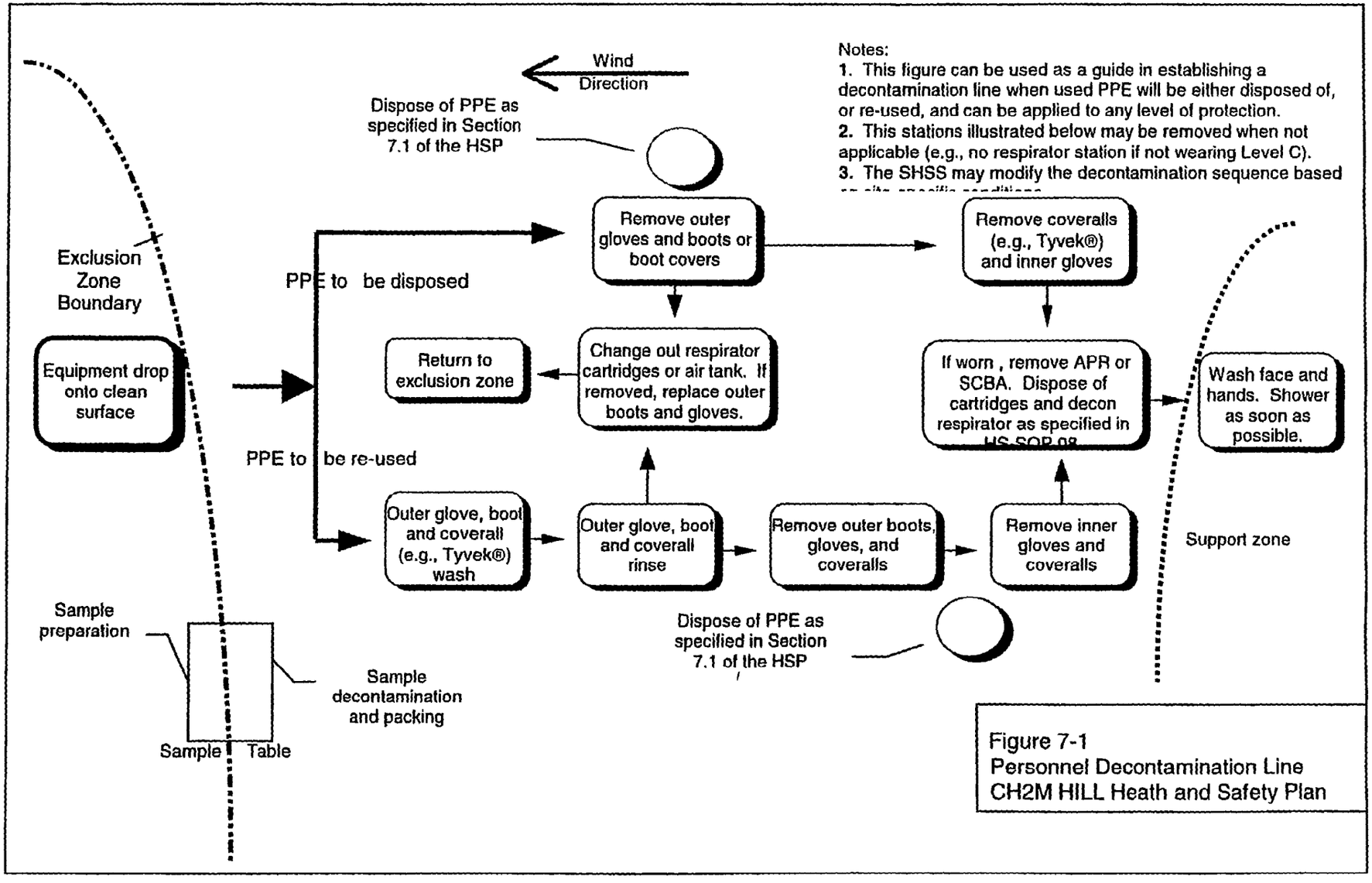

Figure 7-1
Personnel Decontamination Line
CH2M HILL Heath and Safety Plan

10 SITE-CONTROL PLAN

10.1 SITE-CONTROL PROCEDURES

- The site safety coordinator (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. Refer to Section 8 of *Site Safety Notebook*.
- 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 at sites where project field offices, trailers, or equipment storage boxes are established. Posters can be obtained by calling either 800/548-4776 or 800/999-9111.
- Field Trailers: Post "Exit" signs above exit doors, and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Determine wind direction.
- Establish work zones: support, decontamination, and exclusion zones. Delineate work zones with flags or cones as appropriate. Support zone should be upwind of the site.
- Establish decontamination procedures, including respirator-decontamination procedures, and test the procedures.
- Use access control at the entry and exit from each work zone.
- Store chemicals in appropriate containers.
- Make MSDSs available for onsite chemicals to which employees are exposed.
- 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."
- Establish procedures for disposing of material generated on the site.
- 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 CH2M HILL SOP 18, *Health and Safety* Checklist, or Section 4 of *Site Safety Notebook*. Deficiencies are to be noted, reported to the HSM, and corrected.

10.2 HAZWOPER COMPLIANCE PLAN (Reference CH2M HILL SOP HS-17, *Health and Safety Plans*)

This section outlines procedures to be followed when certain activities do not require 24- or 40-hour training. ***Note, prior approval from the HSM is required before these tasks are conducted on regulated hazardous waste sites.***

- Certain parts of the site work may be covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated tasks must be included in subsection 2.2.1.
- Air sampling must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to subsections 3.8 and 6.2 for contaminant data and air sampling requirements, respectively.
- Non-Hazwoper-trained personnel must be informed of the nature of the existing contamination and its locations, the limits of their access, and the emergency action plan for the site. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements, including 29 CFR 1910.1200 (HAZCOM). Refer to subsection 3.7.1 for hazard communication requirements.
- 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 volatile contaminants. Non-Hazwoper-trained personnel should be monitored whenever the belief is that there may be a possibility of exposure (e.g., change in site conditions), or at some reasonable frequency to confirm that there is no exposure. Refer to Section 6.1 for air monitoring requirements.
- 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 leave the site.

If Hazwoper-regulated tasks are conducted concurrently with nonregulated tasks, non-Hazwoper-trained subcontractors must be removed from areas of exposure. If non-Hazwoper-trained personnel remain on the site while a Hazwoper-regulated task is conducted, the contaminant/exposure area (exclusion zone) must be posted, non-Hazwoper-trained personnel must be reminded of the locations of restricted areas and the limits of their access, and real-time monitoring must be conducted. Non-Hazwoper-trained personnel at risk of exposure 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.

11 EMERGENCY RESPONSE PLAN (REFERENCE CH2M HILL SOP HS-12, *EMERGENCY RESPONSE*)

11.1 PRE-EMERGENCY PLANNING

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

- Review the facility emergency and contingency plans where applicable.
- Locate the nearest telephone; determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Identify and communicate chemical, safety, radiological, and biological hazards.
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Post site map marked with locations of emergency equipment and supplies, and post OSHA job-site poster. The OSHA job-site poster is required at sites where project field offices, trailers, or equipment-storage boxes are established. Posters can be obtained by calling either 800/548-4776 or 800/999-9111.
- 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.
- Evaluate capabilities of local response teams where applicable.
- 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, chemical and vapor releases.
- Review notification procedures for contacting CH2M HILL's medical consultant and team member's occupational physician.
- Rehearse the emergency response plan once before site activities begin, including driving the route to the hospital.
- Brief new workers on the emergency response plan.
- The SHSS will evaluate emergency response actions and initiate appropriate follow-up actions.

11.2 EMERGENCY EQUIPMENT AND SUPPLIES

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

Emergency Equipment and Supplies	Location
20 lb (or two 10-lb) fire extinguisher (A, B, and C classes)	
First aid kit	
Eye wash	
Potable water	
Bloodborne-pathogen kit	
Additional equipment (specify)	

11.3 EMERGENCY MEDICAL TREATMENT

- Notify appropriate emergency response authorities listed in sections 12 and 13 (e.g., 911).
- During a time of no emergency, contact CH2M HILL's medical consultant for advice and guidance on medical treatment.
- 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.
- Notify the field team leader and the project manager of the injury.
- Make certain that the injured person is accompanied to the emergency room.
- Notify the health and safety manager.
- Notify the injured person's human resources department within 24 hours.
- Prepare an incident report -- refer to CH2M HILL SOP 12, *Emergency Response and First Aid*, and Section 6 of *Site Safety Notebook*. Submit the report to the corporate director of health and safety and the corporate human resources department (COR) within 48 hours.
- When contacting the medical consultant, state that you are calling about a CH2M HILL matter, and give your name, your 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.

11.4 NONEMERGENCY PROCEDURES

The procedures listed above may be applied to nonemergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to Human Resources. 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.

- When contacting the medical consultant, state that the situation is a CH2M HILL matter, and give your name, your 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.
- Follow these procedures as appropriate.

11.5 INCIDENT RESPONSE

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

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

11.6 EVACUATION

- Evacuation routes will be designated by the SHSS before work begins.
- Onsite and offsite assembly points will be designated before work begins.
- Personnel will leave the exclusion zone and assemble at the onsite assembly point upon hearing the emergency signal for evacuation.
- Personnel will assemble at the offsite point upon hearing the emergency signal for a site evacuation.
- The SHSS and a "buddy" will remain on the site after the site has been evacuated (if possible) to assist local responders and advise them of the nature and location of the incident.
- The SHSS accounts for all personnel in the onsite assembly zone.
- A person designated by the SHSS before work begins will account for personnel at the offsite assembly area.
- The SHSS will write up the incident as soon as possible after it occurs and will submit a report to the corporate director of health and safety.

11.7 EVACUATION ROUTES AND ASSEMBLY POINTS

Refer to the site map in Section 1. Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.

11.8 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.
Client/Facility:	

12 EMERGENCY RESPONSE

12.1 EMERGENCY RESPONSE TELEPHONE NUMBERS

SITE ADDRESS: NAS Cecil Field (Attn: CCI)
13200 Normandy Boulevard
1st Street, Building 884
Jacksonville, FL 32215

Phone: 904-777-4812
Cellular Phone:

Police: Base Police — **Phone:** 904-778-5380

Fire: Base Fire Department — **Phone:** 911

Medical Clinic: Base Clinic — **Phone:** 904-778-5717

Ambulance: Cecil Field Fire Department — **Phone:** 911

*When using a cellular phone outside the telephone's normal calling area, exercise caution in relying on the cellular phone to activate 911. When the caller is outside the normal calling area, the cellular service carrier should connect the caller with emergency services in the area where the call originated, but this may not occur. Telephone numbers of backup emergency services should be provided if a cellular phone is relied on to activate 911.

Hospital: St. Vincent's Hospital
Address: 1800 Barrs St.
Jacksonville, FL

Phone: (904) 387-7300

Route to Hospital: (Refer to Figure 12-1)

From Cecil Field: Take SR 134 (Jacksonville Heights) approximately 10 miles to US 17. Turn left and go north on US 17 approximately 2.5 miles to SR 128 (San Juan Avenue). Turn right on San Juan. Go east approximately ¼ mile to Herschell. Turn left on Herschell. Herschell will then turn into St. Johns Avenue. Follow St. Johns Avenue, which will turn into Riverside, approximately 1 mile to King Street. Turn right. Hospital will be on the corner of King Street and Barrs.

Figure 12-1 (Hospital Route Map)

13 EMERGENCY CONTACTS

If an injury occurs, notify the injured person's personnel office as soon as possible after obtaining medical attention for the injured person. Notification MUST be made within 24 hours of the injury.

CH2M HILL Medical Consultant

Dr. Peter P. Greaney, M.D.
Work Care, Inc.
333 S Anita Drive
Orange, CA 928868
(After-hours calls will be returned within 20 minutes.)

Occupational Physician (Regional or Local)

Lakeshore Medical
4616 San Juan Avenue
Jacksonville, FL 32210
Phone (904) 384-5385
Fax (904) 388-5838

Health and Safety Manager (HSM)

Name: Robert Nash/ATL
Phone: 770/604-9095

Project Manager

Name: Norm Hatch/JAX
Phone: 904/733-9119

Radiation Health Manager (RHM)

Name: Dave McCormack/SEA
Phone: 206/453-5000

Regional Human Resources Department

Name: Mary Jo Jordon/GNV
Phone: 352/335-5877

Client

Name: Ken Lott/ NavFacEngCo
Phone: 843/820-5916

Corporate Human Resources Department

Name: Julie Zimmerman/COR
Phone: 303/771-0900

Federal Express Dangerous Goods Shipping

Phone: 800/238-5355

CH2M HILL Emergency Number for Shipping Dangerous Goods

Phone: 800/255-3924

Worker's Compensation and Auto Claims

GAB Business Services, Inc.
Phone: 800/747-7222 After hours 800/621-5410

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

14 APPROVAL

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

14.1 ORIGINAL PLAN

APPROVED BY: Robert Nash **DATE: September 1998**

14.2 REVISIONS

REVISIONS MADE BY: **DATE:**

REVISIONS TO PLAN:

REVISIONS APPROVED BY: **DATE:**

15 DISTRIBUTION

Name	Office	Responsibility	Number of Copies
Robert Nash	ATL	Health and Safety Manager/Approver	1
Norm Hatch	JAX	Project Manager	1
Jeff Winnette	ATL	Site Superintendent	1
Craig Haas	ATL	Site Health and Safety Specialist	1
Client	NA	Client Project manager	

16 ATTACHMENTS

Attachment 1: Employee Signoff
Attachment 2: Applicable Material Safety Data Sheets

Attachment 1
Employee Signoff

EMPLOYEE SIGNOFF

The employees listed below have been given a copy of this health and safety plan, have read and understood it, and agree to abide by its provisions.

EMPLOYEE NAME	EMPLOYEE SIGNATURE AND DATE

Attachment 2
Material Safety Data Sheets