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MONITORING ONLY PLAN FOR TRUCK FILL STAND REVISION 1 NAS KEY WEST FL

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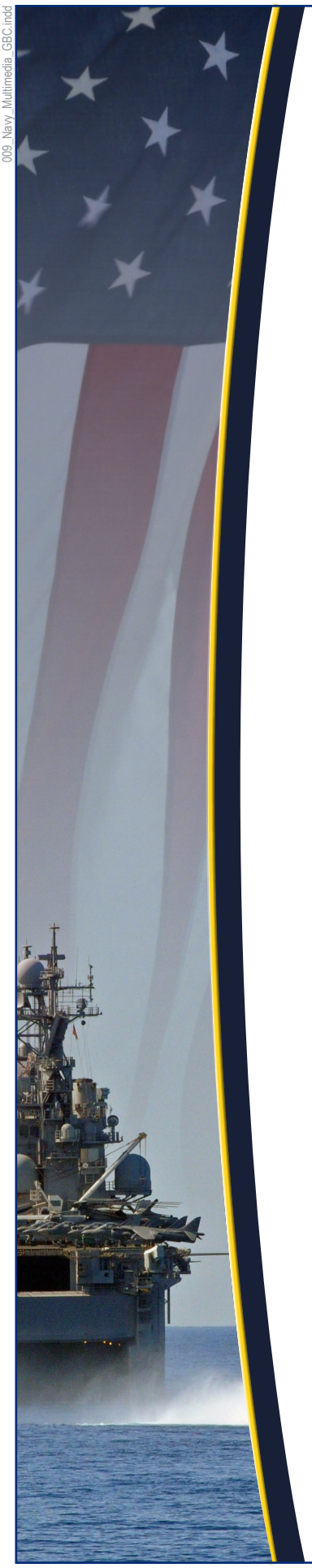

Revision 1

Monitoring Only Plan for the Truck Fill Stand

Naval Air Station Key West
Boca Chica Key, Florida

NAVFAC
Naval Facilities Engineering Command

Prepared for

Department of the Navy
Naval Facilities Engineering Command Southeast

Contract No.
N62470-10-D-3009
CTO-JM08

August 2013

Prepared by

CH2MHILL®

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Department of the Navy
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Under the

Navy Multimedia Contract
Contract N62470-10-D-3009

Prepared by

Atlanta, Georgia

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Acronyms and Abbreviations

^{o}C	degrees Celsius
µg/L	microgram per liter
AFVR	aggressive fluid vapor recovery
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
ASAP	as soon as possible
AST	aboveground storage tank
BBL	Blasland, Bouck, & Lee, Inc.
BCTF	Boca Chica Tank Farm
CFR	Code of Federal Regulations
COC	chain-of-custody
CTO	Contract Task Order
DLA	Defense Logistics Agency
DO	dissolved oxygen
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
ERA	ecological risk assessment
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FL-PRO	Florida Petroleum Residual Organic Method
FTL	Field Team Leader
GCTL	groundwater cleanup target level
HCl	hydrochloric acid
HDPE	high density polyethylene
Hg	mercury
HHRA	human health risk assessment
HNO_3	nitric acid
HSP	Health and Safety Plan
JP-5	jet propulsion fuel no.5
L	liter
L/min	liters per minute
LNAPL	light non-aqueous phase liquid
mg/L	milligrams per liter

mL	milliliters
MNA	monitored natural attenuation
MOP	Monitoring Only Plan
MS/MSD	matrix spike/matrix spike duplicate
NAS	Naval Air Station
NAVFAC SE	Naval Facilities Engineering Command Southeast
NFA	no further action
OES	Omega Environmental Services, Inc.
ORP	oxidation-reduction potential
OVA	organic vapor analyzer
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
POL	petroleum, oils, and lubricants
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
SAP	Sampling and Analysis Plan
SAR	Site Assessment Report
SRCR	site rehabilitation completion report
SSAR	Supplemental Site Assessment Report
SQAG	Sediment Quality Assessment Guidelines
SVOC	semi-volatile organic compound
SWCTL	surface water cleanup target level
T&D	transportation and disposal
TCL	Target Compound List
TCLP	Toxicity Compound Leaching Procedure
TDS	total dissolved solids
TFS	Truck Fill Stand
TPH	total petroleum hydrocarbon
TRPH	total recoverable petroleum hydrocarbon
TtNUS	Tetra Tech NUS, Inc.
UST	underground storage tank
VOC	volatile organic compound

SECTION 1

Introduction

CH2M HILL, Inc. has been contracted by Naval Facilities Engineering Command Southeast (NAVFAC SE) to prepare this Monitoring Only Plan (MOP) under Multimedia Contract No. N62470-10-D-3009, Contract Task Order (CTO) No. JM08. The purpose of this MOP is to outline the procedures to perform quarterly groundwater sampling at the Truck Fill Stand (TFS) site, Naval Air Station (NAS) Key West, Boca Chica Key, Florida.

This MOP is organized into the following sections and appendixes:

- **Section 1, Introduction** includes the site history and project objectives.
- **Section 2, Project Execution Plan** describes the scope of work to further evaluate and monitor petroleum hydrocarbon trends in groundwater. Project reporting requirements are also included in this section.
- **Section 3, Sampling and Analysis Plan (SAP)** details the sampling procedures that will be followed during execution of the work scope described in Section 2. Sampling methodology, sample collection frequency, laboratory analytical methods, and quality assurance (QA)/quality control (QC) sampling are discussed in this section. The test methodology presented in Section 3 conforms to the standards promulgated by the Florida Department of Environmental Protection (FDEP).
- **Section 4, Waste Management Plan** presents waste management practices that will be maintained during completion of the quarterly groundwater monitoring work including handling, transportation, and disposal of non-hazardous waste.
- **Section 5, Quality Control Plan** includes the testing requirements for work described in the MOP.
- **Section 6, References** lists the references used to prepare this document.
- **Appendix A** contains the Groundwater Monitoring Well Purge and Sampling Form.
- **Appendix B** contains an example chain-of-custody (COC) form.

1.1 Site Description

NAS Key West is located in southern Monroe County, Florida, approximately 150 miles southwest of Miami. The TFS is located on Boca Chica Key, Florida (Figure 1-1). The TFS is an active facility used to fill tanker trucks for refueling aircraft. Fuel from the Boca Chica Tank Farm (BCTF) located approximately 4,000 feet southwest of the TFS is pumped to the southwest portion of the TFS through twin 6-inch-diameter steel underground pipelines. Fuel is pumped and transferred at the fueling area to tanker trucks. Trucks routinely leave and return to the site for fueling missions and related airfield operations. The TFS is also referred to as Building A-902 in reference to the former operations building that stood on the southeast side of this facility (Tetra Tech NUS, Inc. [TtNUS], 2011).

The TFS, including former Building A-902, dates back to the 1940s and was part of the original NAS Key West infrastructure. Building A-902 was the original Administration Building for NAS Key West. The layout of the site has changed since it was first used as a fueling point in 1945. Documented environmental management activities began in the mid-1970s with the reporting of tank removals, implementation of numbering systems, and tank replacements. No other documented uses of the site exist (TtNUS, 2011).

Land surface at the TFS is generally flat and is mostly paved with asphalt and concrete. The site is not paved at the northern and western areas. Wetland areas are located immediately east and northeast of the site (TtNUS, 2011).

FIGURE 1-1
Site Location Map
NAS Key West
Boca Chica Key, Florida

1.2 Site History

Several spills and cleanup actions have been documented at the TFS. A 1,000-gallon underground storage tank (UST) designated Tank A-935 (also known as Tank A-902B), used for storing oily wastewater from the jet fuel filter system, was removed from the site in 1995. One 250-gallon aboveground storage tank (AST), Tank A-935-R, used for the same purpose, remains on site (Blasland, Bouck, & Lee, Inc. [BBL], 2001). The UST closure report for Tank A-935 indicated that the tank was in excellent condition; however, light non-aqueous phase liquid (LNAPL) was observed floating on groundwater during the tank excavation (Omega Environmental Services, Inc. [OES], 1995).

In April 1999, NAVFAC SE submitted a Site Assessment Report (SAR) for Building A-902 to FDEP (TtNUS, 1999). The SAR indicated that site soil and groundwater had been contaminated by petroleum hydrocarbons, presumably from past tanker truck spills. The SAR included recommendations for interim remedial action followed by a supplemental assessment. FDEP approved the SAR on May 10, 1999.

In late January 2000, less than 25 gallons of fuel were inadvertently released into a catch basin that was under repair, resulting in the contamination of soil. The Navy excavated the contaminated soil and screened soil samples using an organic vapor analyzer (OVA) to confirm that all affected soil had been removed. In late February/early March 2000, approximately 100 gallons of fuel were released in the same area. However, the catch basin had been repaired and all fuel was reportedly contained within the catch basin and later pumped out (BBL, 2001).

In March 2000, workers constructing the new Petroleum, Oils, and Lubricants (POL) Laboratory building adjacent to the TFS discovered discolored soil with a strong petroleum odor in trenches excavated for the building footers. Based on these findings, the Navy retained BBL to perform an investigation of the area. Two monitoring wells (TFS-MW-09 and TFS-MW-10) were installed on the north and south sides of the building and sampled for petroleum hydrocarbons. Benzene was detected in groundwater samples from both wells at concentrations that exceeded the Groundwater Cleanup Target Level (GCTL) of 1 microgram per liter (µg/L), as specified in Florida Administrative Code (F.A.C.) Chapter 62-777, Table I. BBL concluded that the plume was not adequately defined in the area of the new POL Laboratory building and additional assessment was necessary. In addition, on March 29, 2000, approximately 1.9 inches of LNAPL were measured in monitoring well TFS-MW-01 (BBL, 2001).

On April 27, 2000, approximately 3,200 gallons of jet propulsion fuel no. 5 (JP-5) were released at the TFS when a valve was left open for 3 hours. Upon discovery, LNAPL recovery commenced and soil excavation began on April 28, 2000. In some areas, excavation was limited by cement foundations. The entire footprint of the spill was excavated and stockpiled. Stockpiled soil was later removed from the site and disposed. During the excavation work, dark brown oil was visible near the water table (BBL, 2001).

Because these releases potentially affected the findings of the 1999 SAR, the Navy contracted BBL to conduct a supplemental site assessment to define the extent of petroleum hydrocarbon contamination. The Supplemental Site Assessment Report (SSAR) concluded that dissolved petroleum hydrocarbons above the GCTLs were present in groundwater in the vicinity of the new POL Laboratory building, the TFS, and AST A-935-R. Concentrations of petroleum hydrocarbons in sediments and surface water in the adjacent wetland also exceeded Sediment Quality Assessment Guidelines (SQAGs) and marine Surface Water Cleanup Target Levels (SWCTLs). LNAPL was also detected in several monitoring wells. The SSAR concluded that remedial measures should be initiated (BBL, 2001).

Subsequently, a treatability study was planned for the TFS site to include aggressive fluid vapor recovery (AFVR). TtNUS was tasked with performing the treatability study, and in May 2003 collected groundwater samples to establish baseline conditions at the TFS. The baseline data were compared with the 1999 SAR and test data showed that volatile organic compound (VOC) and polynuclear aromatic hydrocarbon (PAH) concentrations had decreased in the area west of the TFS, but remained above the GCTLs. In addition, gauging data showed LNAPL thickness had decreased from about 1 foot in monitoring well TFS-MW-04 (October 2000) to a sheen in May 2003. Due to the decrease in LNAPL thickness, TtNUS

determined that an AFVR was no longer an appropriate remedy for monitoring well TFS-MW-04. Instead, TtNUS recommended that quarterly monitoring be implemented to evaluate the extent to which natural attenuation was occurring (TtNUS, 2003). Monitored natural attenuation (MNA) sampling was conducted from May 2003 to June 2009. The results of the MNA sampling indicated that MNA was occurring, but concentrations of benzene, naphthalene, and total petroleum hydrocarbons (TPH) remained above the GCTLs in monitoring well TFS-MW-04, located in the southwest portion of the TFS.

Between June 2009 and March 2010, TtNUS performed an extensive site investigation in the TFS area. The sites investigated included: (1) the perimeter of the POL Laboratory building where LNAPL was observed in the building footing excavations; (2) the northern area adjacent to the POL Laboratory associated with the reported location of a former AST; (3) the area south of the POL Laboratory; (4) the area south of the current TFS fueling and tanker parking area/containment area extending to the edge of the taxiway; and (5) the area west of the pumping area where fuel lines have been known to leak, including the current MNA area and west beyond the edge of the taxiway. Surface water samples were also collected from the wetlands southwest of the POL Laboratory building during the site investigation (Navy, 2011).

Conclusions of the 2009/2010 Site Investigation in the JP-5 spill area were to: (1) revaluate this area since a distinct source area was not detected; and (2) collect sediment and additional surface water samples from the wetlands west of the site, as contamination has migrated to the wetlands (Navy, 2011).

Between April 9 and May 21, 2012, CH2M HILL performed additional site assessment activities at the TFS. The work included monitoring well installation, groundwater sampling, surface water and sediment sampling, aquifer slug testing, and a tidal influence evaluation. Findings from the additional site investigation activities showed petroleum compounds persist in groundwater, surface water, and sediment. Petroleum impacts to groundwater exceeded the FDEP GCTLs in one well while the FDEP SWCTLs were exceeded in the surface water samples. No FDEP regulatory standards were exceeded in the sediment samples.

Recommendations from the 2012 additional site investigation included quarterly groundwater monitoring to further evaluate the petroleum-contaminant trends over time. In addition, CH2M HILL also recommended conducting an ecological risk assessment to evaluate the potential risk to ecological receptors in the wetland area to the west of the TFS. Upon completion of an ecological risk assessment, recommendations for no further action (NFA), additional monitoring, or corrective actions for the surface water and sediment would be determined (CH2M HILL, 2012a).

Between July 17 and 19, 2012, CH2M HILL conducted a quarterly groundwater monitoring event at the TFS (CH2M HILL, 2012b). The work included a comprehensive round of well gauging and collecting groundwater samples from nine monitoring wells. Findings from the first quarter monitoring event showed petroleum compounds persist in groundwater. Petroleum impacts to groundwater exceeded the FDEP GCTLs in two monitoring wells. Recommendations from the first quarterly sampling event included continuation of the quarterly groundwater monitoring to further evaluate the petroleum-contaminant trends over time. In addition, CH2M HILL also recommended collection of water quality samples to determine the potability of the aquifer and to evaluate reclassification of the groundwater at the site as poor quality.

Between October 23 and 26, 2012, CH2M HILL conducted a quarterly groundwater monitoring event at the TFS (CH2M HILL, 2013a). The work included a comprehensive round of well gauging, and the collection of groundwater samples from nine monitoring wells and collection of three water quality samples to evaluate the potability and quality of the aquifer. Findings from the second quarter monitoring event showed groundwater beneath at the TFS site is saline, and that salinity increases with depth. Therefore, groundwater beneath the site is not of freshwater water quality and cannot be used as a potable water source without desalination. Although petroleum compounds persist in groundwater, the impacts are significantly below the “poor quality” GCTLs. Recommendations from the second quarterly sampling event included using “poor quality” GCTLs as the site groundwater protection criteria,

consideration of NFA for groundwater, discontinuing groundwater monitoring at the TFS site, completion of an ecological risk assessment to evaluate the potential risk to ecological receptors in the wetland area to the west of the TFS, preparation of a site rehabilitation completion report (SRCR) for groundwater documenting the rationale and formal request for NFA, and plugging and abandoning of the existing groundwater monitoring wells.

Between January 14 and 17, 2013, CH2M HILL conducted a quarterly groundwater monitoring event at the TFS (CH2M HILL, 2013b). The work included a comprehensive round of well gauging and collecting groundwater samples from nine monitoring wells. Findings from the third quarter monitoring event showed petroleum compounds persist in groundwater. Petroleum impacts to groundwater exceeded the FDEP GCTLs for poor quality in two monitoring wells and the marine SWCTLs in five monitoring wells. Recommendations from the third quarterly sampling event included continuation of the quarterly groundwater monitoring to further evaluate the PAHs and total recoverable petroleum hydrocarbon (TRPH) contaminant trends over time while discontinuing sampling for VOCs because the data demonstrate that the "poor quality" GCTLs and marine SWCTLs have been met for four consecutive groundwater sampling events.

On March 20, 2013, a teleconference was held between the Navy, FDEP, and CH2M HILL to discuss a path forward to address FDEP concerns at the NAS Key West TFS. Discussion topics included plume delineation, sentinel wells, risk assessment, and the use of poor water quality cleanup target limits. As a result of the discussion, FDEP stated the primary concern is associated with the ability to clearly delineate the vertical and horizontal extent to prove the Defense Logistics Agency (DLA) (western portion) and the Navy (eastern portion) plumes are not co-mingled and are separate plumes. FDEP suggested sampling monitoring well TFS-MW-03 to determine if contaminants are moving northward and to determine if the western and eastern portions of the plume site are separate. Additionally, FDEP recommended sampling monitoring well TFS-MW-02 because it was identified as a data gap along the edge of the wetland area. During the teleconference, all parties agreed that wells TFS-MW-02 and TFS-MW-03 would be sampled during the April 2013 monitoring event in lieu of source area wells TFS-MW-04 and TFS-MW-11.

FDEP clarified that SWCTLs should be used in addition to GCTLs as comparison criteria for sentinel wells along the wetland area. Furthermore, based on the detection of contaminant concentrations in sediment and groundwater above the GCTLs, FDEP concurred with the recommendation to complete an ecological risk assessment (ERA). The ERA will be performed to evaluate whether the contaminants detected pose a risk to wildlife. It was recommended that the first three steps of the U.S. Environmental Protection Agency's (EPA's) 8-Step Process should be performed for the ERA because many sites do not require evaluations beyond Step 3 of the 8-Step Process; however, the evaluation should be carried beyond Step 3 if required based on the results of the first three steps.

With regard to GCTLs, the FDEP stated that a determination of poor water quality can only be made using a minimum of three wells located outside the source area, and water quality parameters would have to be collected quarterly for a minimum of one year. It was agreed that wells TFS-MW-16 and TFS-MW-17, which were previously sampled for water quality parameters, are acceptable for use as non-source area wells. Well TFS-MW-8D was also determined to be acceptable for use because it was not impacted. Lastly, monitoring well TFS-MW-03 was agreed upon as a fourth viable non-source area well to be included for sampling for the poor water quality evaluation.

Between April 9 and 11, 2013, CH2M HILL conducted a quarterly groundwater monitoring event at the TFS (CH2M HILL, 2013c). The work included a comprehensive round of well gauging, collection of groundwater samples from nine monitoring wells, and collection of one water quality sample to evaluate the potability and quality of the aquifer. Findings from the fourth quarter monitoring event showed groundwater beneath at the TFS site is saline and that salinity increases with depth. Therefore, groundwater beneath the site is not of freshwater water quality and cannot be used as a potable water source without desalination. Although petroleum compounds persist in groundwater, the impacts are

significantly below the “poor quality” GCTLs. Petroleum impacts to groundwater exceeded the FDEP marine SWCTLs in two monitoring wells. A review of the quarterly historical groundwater data shows that health-based GCTLs and marine SWCTLs for VOCs have been met for the past three consecutive groundwater sampling events. However, the health-based GCTLs, “poor quality” GCTLs, and marine SWCTLs for semi-volatile organic compound (SVOCs) (specifically PAH compounds) have not been met; and health-based GCTLs and marine SWCTLs for TRPH have not been met. Recommendations from the fourth quarterly sampling event included the following:

- Continue quarterly groundwater monitoring for PAHs and TRPH at 11 monitoring well locations and discontinue sampling for VOCs because the data show that the health-based GCTLs and marine SWCTLs have been met for the past three consecutive groundwater sampling events (refer to F.A.C. Chapter 62-770.690[8][g]).
- Discontinue groundwater monitoring for SVOCs because the historical data indicate that with the exception of PAHs, SVOCs have not been detected.
- Continue quarterly groundwater monitoring for water quality parameters in four monitoring wells to evaluate and determine the applicability of “poor quality” GCTLs at the TFS for comparing site contaminants.
- Complete an ecological risk assessment to evaluate the potential risk to ecological receptors in the wetland area to the west of the TFS site.

On April 23, 2013, CH2M HILL participated in a partnering meeting at the TtNUS office located in Jacksonville, Florida. During the meeting, CH2M HILL presented a brief summary of the background and history of the TFS site, current status of the site, and proposed path forward. As a result of the discussions, FDEP indicated that GCTLs must be met at the site boundaries and also stated that the TFS cannot be split into “eastern” and “western” portions (Navy and DLA portions, respectively) and that the entire site will need to be evaluated as a whole because FDEP will not grant separate closures for the individual portions of the site. The FDEP also clarified that a human health risk assessment (HHRA) was not required because the GCTLs that are required to be met at the site boundaries are based on protection of human health.

The current analyte list (Appendix IX VOCs, Appendix IX SVOCs, and TRPH) was discussed and CH2M HILL recommended reducing the analyte list based historical and recent sample results. However, FDEP was uncertain about the request, and indicated that FDEP would need to review historical test results before agreeing to a reduced analyte list.

1.3 Project Objectives

The objectives of this MOP are to provide methods for data collection to continue the groundwater monitoring program as recommended in the April 2013 (Fourth) Quarterly Groundwater Monitoring Report (CH2M HILL, 2013c) and to evaluate the groundwater for water quality parameters and determine the applicability of “poor quality” GCTLs for comparing site contaminants.

SECTION 2

Project Execution Plan

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

2.1 Scope of Work

The activities associated with the scope of work outlined in this MOP are as follows:

- Mobilization and site preparation
- Quarterly groundwater sampling
- Characterization, containerization, and transportation and disposal (T&D) of contaminated media
- Decontamination and demobilization

The scope for each task is described below.

2.1.1 Mobilization and Site Preparation

This task consists of mobilizing personnel and equipment to the project site to perform the work. During this effort, CH2M HILL will establish areas for equipment storage and decontamination, and will locate connection points to potable water. Project management tasks will include coordination with Base personnel to obtain the necessary authorization, clearances, training, and badges so CH2M HILL can perform work within the TFS site.

2.1.2 Quarterly Groundwater Sampling

CH2M HILL will measure the depth to groundwater and total well depths prior to sampling. Gauging will be performed using a clean (decontaminated) oil/water interface probe. Measurements will be made relative to a survey mark on the top of the well casing. Gauging data will be used to calculate water-level elevations and prepare groundwater contour maps.

CH2M HILL will collect groundwater samples from 11 monitoring wells (TFS-MW-01, TFS-MW-02, TFS-MW-03, TFS-MW-04, TFS-MW-05, TFS-MW-8D, TFS-MW-11, TFS-MW-12, TFS-MW-15, TFS-MW-16, and TFS-MW-17) on a quarterly basis for 2 years. Monitoring wells will be sampled for PAHs (EPA Method 8270SIM) and TRPH (Florida Petroleum Residual Organic Method [FL-PRO]). In addition to the PAH and TRPH analyses, samples collected from monitoring wells TFS-MW-03, TFS-MW-8D, TFS-MW-16, and TFS-MW-17 will also be analyzed for water quality parameters that include chloride and sulfate (EPA Method 300.1), total dissolved solids (TDS) (A2540C), and salinity (A2520B). Well locations are shown on Figure 2-1. The monitoring wells will be purged and sampled following the EPA guidance entitled “Low-Flow Minimal Drawdown Ground-Water Sampling Procedures” (EPA, 1996). Wells containing LNAPL, if present, will not be sampled.

All groundwater samples will be collected in accordance with FDEP Bureau of Petroleum Storage Systems Petroleum Cleanup Program Standard Operating Procedures PCS-005 (FDEP, 2005) and FS2200 (FDEP, 2008). Groundwater samples will be collected after purging a minimum of one well volume, stabilization of field parameters, and the water level has stabilized (when the well recovery rate equals the purge rate). The following field parameters will be measured during well purging and recorded on the groundwater sampling log (Appendix A): purge volume, water level, temperature, pH, specific conductance, oxidation reduction potential (ORP), and dissolved oxygen (DO).

Decontamination procedures, as outlined below in Section 3.5, will be followed before moving to another sampling location. Samples will be placed on ice in coolers and shipped using standard COC procedures to the laboratory for chemical analysis. An example COC is presented in Appendix B.

LEGEND

- Proposed Quarterly Monitoring Well Sample Location
- Monitoring Well Location
- Abandoned Monitoring Well Location

FIGURE 2-1
Proposed Monitoring Well Sample Locations
NAS Key West
Boca Chica Key, Florida

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2.1.3 Characterization, Containerization, and T&D of Contaminated Media

Disposal characterization sampling and laboratory analyses will be completed to determine the necessary handling and T&D requirements. Water accumulated during well development and well purging activities will be containerized in 55-gallon drums. One composite sample will be collected semiannually in accordance with protocol outlined in Section 3 (SAP). The groundwater will be transported to a facility permitted to accept the petroleum-impacted material.

2.1.4 Demobilization and Decontamination

CH2M HILL and its T&D subcontractor personnel, equipment, and unused materials will be demobilized from the site at the completion of each groundwater sampling event.

Personnel and equipment will be cleaned to remove residual contamination. Waste fluids accumulated during cleaning will be containerized in 55-gallon drums, and will be sampled in accordance with the protocol outlined in Section 3 (SAP). Liquid waste will be managed, transported, and disposed in accordance with the protocol outlined in Section 4 (Waste Management Plan). Decontamination of personnel and equipment will be performed in accordance with the site Accident Prevention Plan (APP) that will be provided as a standalone document, and the applicable provisions of 29 Code of Federal Regulations (CFR) 1910.120.

2.2 Communications Plan

Table 2-1 provides a project personnel directory and contact information.

TABLE 2-1
Project Personnel Directory
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Contact	Company
Brian Syme, Remedial Project Manager	Department of the Navy NAVFAC SE Bldg. 903 Yorktown Ave Jacksonville, FL 32212-0030 904/542-6881
Jacquelyn Jackson, Contracting Officer	Department of the Navy NAVFAC SE Bldg. 903 Yorktown Ave Jacksonville, FL 32212-0030 904/542-6914
Kola Olowu	Defense Logistics Agency Installation Support For Energy 8725 John J. Kingman Road, Suite 2941 Fort Belvoir, VA 22060-6222 703/767-8316
Edward Barham, Environmental Director	Naval Air Station Key West Environmental Department Building 626, Room 104, Randolph Avenue NAS Key West. Florida 33040 305/293-2911
LTJG Taylor Burks, Site Director	Naval Air Station Key West Building 626, Room 109, Randolph Avenue NAS Key West. Florida 33040 305/293-2189
Tracie Bolanos, Project Manager	Florida Department of Environmental Protection 2600 Blairstone Road Tallahassee, Florida 32399 850/245-8998
Greg Rowell, Project Manager Tom Kessler, Senior Technical Consultant Michael Goldman, Health and Safety Manager Nikki Monroe, Field Team Leader Lisa Schwan, Waste Coordinator	CH2M HILL, Inc. Northpark 400 1000 Abernathy Road, Suite 1600 Atlanta, GA 30328 770/604-9095

2.3 Traffic Control Plan

Traffic control will be the responsibility of the onsite CH2M HILL representative. CH2M HILL will reduce disturbance to NAS Key West traffic patterns during project activities. CH2M HILL will consult with onsite personnel to evaluate site access and traffic flow to reduce the impact of this work to NAS Key West.

SECTION 3

Sampling and Analysis Plan

This section describes the sampling procedures that will be followed during execution of the work scope described in Section 2 (Project Execution Plan). Analytical methods, data quality objectives, procedures used for collection of samples, and protocol for equipment decontamination are discussed in this section. Any changes to the activities described in this SAP must be documented as an addendum or revision to this SAP and approved by the Project Manager and Project Chemist.

Samples will be collected in accordance with the procedures presented in this SAP and comply with the FDEP Bureau of Petroleum Storage Systems Petroleum Cleanup Program Standard Operating Procedures PCS-005 (FDEP, 2005) and FS2200 (FDEP, 2008).

3.1 Data Quality Levels for Measurement Data

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

TABLE 3-1
Data Quality Levels
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Sampling Activity	Data Quality Level Category
Groundwater Sampling (field parameter measurement)	Screening
Groundwater Sampling (offsite laboratory analyses)	Definitive
Waste Characterization of Liquid and Soil Waste (offsite laboratory analyses)	Definitive

3.2 Sampling Objectives

The sampling objectives for this project will be as follows:

- Collect 11 groundwater samples quarterly for 2 years for the analysis of PAHs and TRPH by EPA Method 8270SIM and FL-PRO, respectively.
- Collect four groundwater samples quarterly for 2 years for the analysis of chloride and sulfate (EPA Method 300.1), TDS (A2540C), and salinity (A2520B).
- Collect liquid samples for waste characterization of decontamination and well purge water.

3.3 Groundwater Sampling Methodology

1. Slowly lower the pump intake to the middle of the screened interval to minimize excessive mixing of the stagnant water in the casing above the screen with water within screened zone, and to minimize re-suspension of solids that may have accumulated at the bottom of the well.
2. Once the pump intake is positioned in the well, an airtight flow-through cell (equipped with a multi-function water quality meter) will be connected to the water discharge line.
3. A water level meter will then be lowered in to the well to monitor changes in water level during pumping. Once purging begins, water level measurements will be monitored, and pumping rates will be adjusted so the rate is between 0.1 to 0.3 liter per minute (L/min) to maintain minimal drawdown.

4. While purging, field parameters (DO, pH, temperature, conductivity, turbidity, and ORP) will be measured every 3 to 5 minutes using a multi-function water quality meter, and will be recorded until all parameters have stabilized for three consecutive readings. Once field parameter stabilization is achieved, sample bottles will be filled for laboratory analysis. Stabilization occurs when, for at least three consecutive readings, the pH remains within 0.1 standard units, specific conductance varies no more than 5 percent, and DO remains within 0.2 milligram per liter (mg/L) or 10 percent saturation, whoever is greater.

5. Water samples will be collected by directing the groundwater discharge stream from the pump so that it runs down the inside of the sample bottle with a minimum amount of splashing. Groundwater will be collected through the tubing for PAHs, TRPH, chloride, sulfate, TDS, and salinity. The sample bottles required for each analysis are provided in Table 3-2.

6. Cap each bottle and affix a label to the bottle. Label information will include laboratory, project name and number, sample identification, station identification, preservative, analysis, sampler's initials, sample date, and time. Place samples in appropriate containers and pack with ice in coolers.

Requirements for sample collection, preservation, and analysis are listed in Table 3-2. Samples will be delivered to the laboratory as soon as possible to allow the samples to be analyzed within the specified holding times. Requirements for QA/QC samples are listed in Table 3-2. All analytical data will be submitted by both hard copy and electronic files. All data will be reviewed and validated by CH2M HILL.

Residual purge water collected during sampling will be transferred to a 55-gallon drum and will be characterized in accordance with this SAP and disposed of in accordance with procedures outlined below in Section 4 (Waste Management Plan).

3.4 Waste Characterization Sampling and Analyses

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

Waste characterization samples will be collected to evaluate the T&D requirements of liquid accumulated during well development, purging, and decontamination activities. Liquid characterization samples will be collected from the drums prior to disposal. One composite sample (and one grab for VOC analysis) will be collected once per year. Liquid characterization samples will be collected as follows and analyzed for the parameters listed in Table 3-2.

1. Using a bailer or dip jar, collect a liquid sample from its containment.

2. Fill the sample containers for the volatile analyses first (grab sample). Fill the 40-mL vials so that there is no headspace in each vial.

3. Then fill the sample containers for the remaining analyses.

4. Label and package the samples on ice for shipment to the laboratory.

TABLE 3-2
Sampling and Analysis Summary
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No.	Sampling Method	Sampling Equipment	Turnaround Time	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
Groundwater Sampling												
Groundwater Sampling	TFS-MW-01, TFS-MW-02, TFS-MW-03, TFS-MW-04, TFS-MW-05, TFS-MW-08D, TFS-MW-11, TFS-MW-12, TFS-MW-15, TFS-MW-16, and TFS-MW-17	Water	Quarterly for 2 years	112 (11 + 1 DUP + 1 MS and MSD = 14 X 8 quarterly events)	Grab	Peristaltic Pump, Flow-Through Cell, Tubing	21 days	PAHs	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
								TRPH	FL-PRO	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
								Chloride	300.1	28 days	Cool to 4°C	(1) 250-mL HDPE
								Sulfate	300.1	28 days	Cool to 4°C	
								TDS	A2540C	7 days	Cool to 4°C	(1) 500-mL HDPE
								Salinity	A2520B	180 days	Cool to 4°C	(1) 250mL HDPE
	Equipment Blank	Water	1 per 10% of sampling	9	Prepared in Field	Analyte-free water	21 days	PAHs	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
								TRPH	FL-PRO	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
Waste Characterization Sampling												
Disposal of Liquid Waste from Well Purge Water	55-gallon drums containing liquid waste	Water	Semi-annually	4	Grab	Drum Thief or Dip Jar	7 days	TCL Volatiles	8260B	14 days	HCl pH< 2; Cool to 4°C	(3) 40-mL vial
								TCL Semi-volatiles	8270C	7 days ext; 40-days analysis	Cool to 4°C	(6) 1-L amber glass
								TCL Pesticides	8081B	7 days ext; 40-days analysis		
								TCL Herbicides	8151A	7 days ext; 40-days analysis		
								PCBs	8082A	7 days ext; 40-days analysis		
								TRPH	FL-PRO	7 days ext; 40-days analysis		
								TCL Metals	6010C/7470A	180 days; Hg = 28 days	HNO_3 pH< 2; Cool to 4°C	(1) 250-mL HDPE
								Ignitability	1010A	ASAP	Cool to 4°C	(1) 500-mL glass
								Corrosivity	9040C as pH	ASAP		

TABLE 3-2
Sampling and Analysis Summary
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Sample Task	Sample Point	Matrix	Sampling Frequency	Approx Sample No.	Sampling Method	Sampling Equipment	Turnaround Time	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
	Trip Blank	Water	1 per cooler containing volatile samples	2	Prepared by Lab	N/A	21 days	VOCs	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40-mL vials

°C – degrees Celsius
ASAP – as soon as possible
HCl – hydrochloric acid
HDPE – high-density polyethylene
Hg – mercury
HNO_3 – nitric acid
L – liter
mL – milliliter
MS/MSD – matrix spike/matrix spike duplicate
PCBs – polychlorinated biphenyls
TCL – Target Compound List
TCLP – Toxicity Compound Leaching Procedure

3.5 Equipment Decontamination

Sampling methods and equipment have been selected to minimize decontamination requirements and the possibility of cross-contamination. The following procedures will be used for all sampling equipment used to collect routine samples undergoing trace organic or inorganic analyses.

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

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

3.6 Sample Documentation

Sampling documentation will include the following:

- Numbered COC forms
- Sample logbook, which includes the following information:
  - Name of laboratories and contacts to which the samples were sent, turnaround time requested, and data results, when possible
  - Termination of a sample point or parameter and reasons
  - Unusual appearance or odor of a sample
  - Field parameter measurements, flow rates, and purge volumes
  - Additional samples and reasons for obtaining them
  - Levels of protection used (with justification)
  - Meetings and telephone conversations held with the NAVFAC SE, regulatory agencies, project manager, or supervisor
  - Details concerning any samples split with another party
  - Details of QC samples obtained
  - Sample collection equipment and containers, including their serial, property, or lot numbers
  - Field analytical equipment, and equipment utilized to make physical measurements will be identified
  - Calculations, results, and calibration data for field sampling, and field physical measurement equipment
  - Sampling station identification
  - Date and time of sample collection
  - Description of the sample location

  - Description of the sample
  - Sampler(s)' name(s) and company
  - How the sample was collected
  - Maps/sketches of sampling locations, if applicable
  - Weather conditions that may affect the sample (for example, rain, extreme heat or cold, wind, etc.)
- Sample labels
- Custody seals (minimum of two on each shipping container)

3.7 Field Quality Control

Field duplicate samples, equipment blanks, trip blanks, and MS/MSD will be collected at the frequency specified in Table 3-2. Field QC samples are not required for disposal sampling.

3.8 Analytical Methods

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

Preliminary and final analytical results will be faxed to Bethany Garvey in accordance with the turn-around times listed in Table 3-2. Final hardcopy data and electronic file will be delivered to Kama White within 21 days of sample receipt. Contact information for Bethany Garvey and Kama White is provided as follows:

Bethany Garvey
Laboratory Coordinator
CH2M HILL
Northpark 400
1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
(770) 604.9182 ext 54124
(678) 579.8176 (fax)
bethany.garvey@ch2m.com

Kama White
Database Coordinator
CH2M HILL
Northpark 400
1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
(770) 604.9182 ext 54385
kama.white@ch2m.com

SECTION 4

Waste Management Plan

The Waste Management Plan describes the waste management requirements and procedures for investigation activities at the TFS located at NAS Key West. The work to be performed at the site consists of groundwater sampling that includes use of an offsite fixed base laboratory for data analysis. Waste accumulated during the work will include decontamination and well purge water accumulated during groundwater sampling activities.

4.1 Waste Characterization and Profile

Waste characterization information typically will be included on a waste profile form provided by the offsite facility. It is assumed that wastes from this activity will be non-hazardous. CH2M HILL will provide analytical data from characterization sampling and analysis. However, in some cases, facilities that are permitted to accept a specific waste material may require specific or additional analyses to evaluate the waste stream before acceptance. Waste characterization sampling will be completed in accordance with Section 3 (SAP).

Waste characterization information for wastes will be documented on a waste profile form provided by the offsite treatment or disposal facility as part of the waste acceptance process. The profile will be reviewed and approved by the CH2M HILL Waste Coordinator prior to submission to the Navy for generator signature. Navy personnel will provide any required generator certification and/or signature. The signed profile will then be submitted to the disposal facility for acceptance approval.

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

- Generator (Navy) information including name, address, contact, and phone number
- Site name including street/mailing address
- Process generating waste
- Source of contamination
- Historical use for area
- Waste composition (that is, 95 percent soil, 5 percent debris)
- Physical state of waste (that is, solid, liquid, etc.)
- Hazardous waste codes, if applicable

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

Typically, uncontaminated wastes such as general construction debris will be characterized using process knowledge and generally will be classified as municipal solid waste.

4.2 Waste Management

4.2.1 Waste Storage Time Limit

Liquids from equipment decontamination and groundwater sampling activities will be contained in 55-gallon drums. The liquid is expected to be non-hazardous petroleum-contaminated water and will be removed from the site as soon as possible. CH2M HILL will coordinate transportation and disposal of the liquid waste contained in the 55-gallon drums. CH2M HILL will provide the waste characterization results to the Navy and coordinate waste characterization profile and manifest review and approval with NAS Key West personnel.

4.2.2 Labels

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

- "Analysis Pending" or "Waste Material" - Temporary or handwritten label until analytical results are received and reviewed. This label will include the accumulation start date.
- "Non-Hazardous Waste" - Preprinted labels with the following information:
  - Accumulation start date
  - Generator name
  - Waste-specific information (for example, contaminated water)

4.2.3 General Waste Management Requirements

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

Temporary waste accumulation areas will contain appropriate emergency response equipment. The APP will identify the specific emergency response procedures and equipment. Spill control equipment (such as sorbent pads) will be available in the waste accumulation areas, and where liquids are transferred from one vessel to another.

All drums will be inspected upon arrival at the site for equipment in disrepair and any contamination or contents. If a drum contains waste upon arrival or is in disrepair, it will be immediately rejected and documented.

The following guidelines relate to drums:

- Drums and small containers will be transported to the temporary accumulation areas on wood pallets and will be secured together with non-metallic banding.
- Drums will be inspected and inventoried upon arrival onsite for signs of contamination and/or deterioration.
- Adequate aisle space (for example, 30 inches) will be provided for containers such as 55-gallon drums to allow the unobstructed movement of personnel and equipment. A row of drums should be no more than two drums wide.
- Each drum will be provided with its own label and labels will be visible.
- Drums will remain covered except when removing or adding waste to the drum. Covers will be properly secured at the end of each workday.
- Drums will be disposed of with the contents. If the contents are removed from the drums for offsite transportation and treatment or disposal, the drums will be decontaminated prior to re-use or before leaving the site.
- Drums containing liquids waste will be provided with secondary containment.

4.3 Shipping Documentation

Prior to offsite disposal of any waste, a waste approval package will be provided to the Navy for each waste stream. This package shall include a waste profile naming the United States Navy as the generator of the waste, analytical summary table(s) applicable to the waste, a completed waste manifest, and any other applicable information necessary for the Navy to complete its review of the disposal package and signature as the generator.

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

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

- Generator information including name, address, contact, and phone number, EPA identification number
- Transporter information including name, address, contact and phone number, EPA identification number

- Facility information including name, address, phone number, EPA identification number
- Site name including street/mailing address
- U.S. Department of Transportation (DOT) Proper Shipping Name
- Type and number of drum
- Quantity of waste (volumetric estimate)
- CTO or job number
- Profile number
- 24-hour emergency phone number.

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

4.4 Disposal

Offsite treatment, recycling or disposal facilities will use the waste profile and supporting documentation, such as analytical results, to determine if the facility will accept a waste. Petroleum contaminated liquids will be sent to a qualified waste water treatment facility permitted to accept the waste.

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SECTION 5

Quality Control Plan

This QC Plan identifies the inspection requirements for the definable features of work.

5.1 Organization and Responsibilities

The project organization chart presented in Figure 5-1 depicts the chain-of-command for this CTO and individuals responsible for executing the work as indicated. Individual roles and responsibilities of CTO personnel are summarized in Table 5-1.

TABLE 5-1
Roles, Responsibilities, and Authorities of Key Project Personnel
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Role	Responsibility	Authority
Project Manager	• Manage and provide technical direction for work • Communicate with client • Provide overview of subcontractor performance • Organize project staff and assign responsibilities • Supervise preparation and approval of project-specific procedures, work plans, supporting plans, and reports • Meet project performance objectives • Prepare status reports	• Approve subcontractor selection • Review qualifications of subcontractors • Stop work at the site for any reason • Approve payment to vendors, suppliers, and subcontractors • Approve invoices to NAVFAC SE
Field Team Leader (FTL)	• Responsible for all site activities • Provide direction to subcontractors • Provide daily status reports • Conduct daily safety meetings • Stop work for unsafe conditions or practices • Monitor and report on subcontractor quality and quantities and health and safety performance • Initiate corrective actions for non-conf • Review the project MOP	• Stop work for unsafe conditions or practices • Notify the Project Manager if the project cannot be completed with regard to quality, schedule, or cost • Approve corrective actions • Approve materials and labor costs for site operations • Resolve subcontractor interface issues • Approve daily status reports • Stop work for unsafe practices or conditions
Waste Transportation and Disposal Coordinator	• Develop site-specific procedures for transport and disposal practices • Plan and coordinate the T&D of waste • Review subcontractor qualifications • Audit T&D subcontractors compliance with contract requirements	• Approve subcontractor's daily report of waste material removed from the site • Approve corrective action plans from T&D subcontractor

TABLE 5-1
Roles, Responsibilities, and Authorities of Key Project Personnel
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Role	Responsibility	Authority
Project QC Manager/ QC Inspector(s)	• Monitor and report on subcontractor quality and quantities • Audit subcontractors offsite fabrication • Maintain submittal register • Participate in Continuous Improvement Team • Stop work for noncompliant operations • Maintain lessons learned log	• Stop work for noncompliant operations • File daily quantities report • File lessons learned log sheet • Approve resumption of work for resolved quality issues
Site Health and Safety Specialist	• Monitor and report on subcontractor safety and health performance • Record and report safety statistics • Conduct needed site safety and health orientation • Maintain environmental log • Stop work for unsafe practices or conditions	• Stop work for unsafe practices or conditions • Approve subcontractor site-specific Health and Safety Plan (HSP) • Set weekly safety objectives • Approve resumption of work for resolved safety issues

5.2 Definable Features of Work

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

- Mobilization and site preparation
- Groundwater sampling
- Waste management
- Demobilization and decontamination

The field inspections associated with the definable features of the work items are described below.

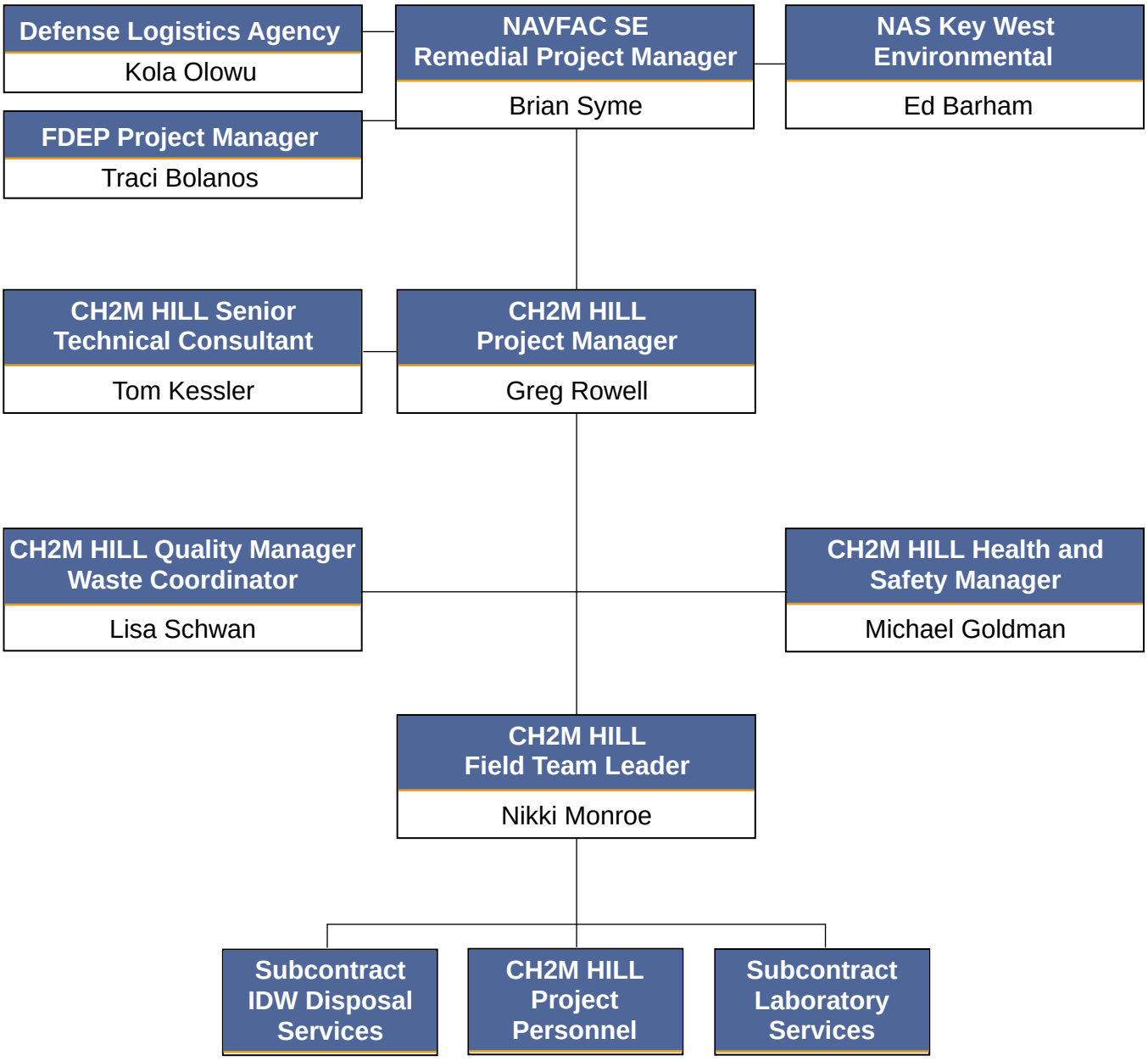

FIGURE 5-1
Project Organization
NAS Key West
Boca Chica Key, Florida

5.2.1 Mobilization and Site Preparation

As part of the mobilization activity, a pre-activity meeting will be held to review the preparedness to begin the project and the procedures and schedule to complete the project. The preparedness check will verify that site preparation provisions such as approvals, verification of subcontractor qualifications, and designation of equipment and material and waste staging areas are in place to begin the work activities. Additionally, equipment will be verified as being functional and in good working condition prior to the project start.

5.2.1.1 Preparatory Phase

The preparatory phase will include a review of the relevant activity hazard analyses (AHAs), the MOP including the communications matrix and project schedule, the APP, and confirming that appropriate equipment and materials are available to commence the work activities.

5.2.1.2 Initial Phase

The FTL will perform inspections as necessary to verify the sampling locations are identified, equipment and materials are staged in the designated areas, and that the equipment used to conduct investigation activities are in good working condition.

5.2.1.3 Follow-up Phase

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

Mobilization and site preparation inspections will include the procedures listed in Table 5-2.

TABLE 5-2
Mobilization and Site Preparation Inspection Procedures
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Task	Procedures
Mobilization/Site Preparation	Verify site access from NAS Key West.
	Verify designated locations for equipment and waste staging areas.
	Verify subcontractor personnel qualification and certification.
	Verify acceptance of the selected laboratory for offsite sample testing.
	Verify sampling locations.
	Verify that equipment is operating as designed.

5.2.2 Groundwater Sampling

5.2.2.1 Preparatory Phase

The preparatory phase will include a review of procedures presented in the SAP (Section 3) and confirming that the appropriate equipment and materials are available to perform the work.

5.2.2.2 Initial Phase

The FTL will perform inspections to confirm that the procedures presented in the SAP (Section 3) are being properly followed.

5.2.2.3 Follow-up Phase

The FTL will provide continuous oversight of the sampling to verify that the work is completed in accordance with the requirements provided in the SAP (Section 3).

Groundwater sampling inspections will include the procedures listed in Table 5-3.

TABLE 5-3
Groundwater Sampling Inspection Procedures
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Task	Procedures
Groundwater Sampling	Verify appropriate sampling equipment is being used.
	Verify field instruments are calibrated in accordance with manufacturer's recommendations.
	Verify appropriate sample bottles/containers are being used.
	Verify equipment is decontaminated between each sampling point.
	Verify that sampling activities are documented in the field logbook and are accurate and complete.
	Coordinate sample shipment with laboratory.
	Review the SAP for compliance with procedures.
	Review COC records for accuracy and completeness.
	Ensure QC samples are collected at the prescribed frequency.

5.2.3 Waste Management

5.2.3.1 Preparatory Phase

The preparatory phase will include a review of procedures presented in the SAP (Section 3) and Waste Management Plan (Section 4).

5.2.3.2 Initial Phase

The FTL will perform inspections to confirm that the procedures presented in the SAP (Section 3) and Waste Management Plan (Section 4) are being properly followed.

5.2.3.3 Follow-up Phase

The FTL will provide oversight of the waste characterization sampling to verify that the work is completed in accordance with the requirements provided in the SAP (Section 3) and of the waste management practices to verify that the work is completed in accordance with the Waste Management Plan (Section 4).

Waste management inspections will include the procedures listed in Table 5-4.

TABLE 5-4
Waste Management Inspection Procedures
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Task	Procedures
Waste Management	Verify the designated location of waste staging.
	Verify drum labels for waste are identified properly.
	Inspect waste staging areas weekly to ensure drum labels are legible, drums are stored on pallets, liquid drums are stored in secondary containment, and proper isle space.
Transportation and Disposal (T&D)	Verify the completion of the waste profile (obtain Navy signature).
	Obtain T&D facility certificates.

5.2.4 Decontamination and Demobilization

Equipment and personnel will be decontaminated and demobilized from the site following completion of the work activities identified in this MOP. Final equipment inspections will be performed by the FTL.

5.2.4.1 Preparatory Phase

The preparatory phase will include a review of decontamination procedures, the APP, and relevant AHA forms.

5.2.4.2 Initial Phase

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

5.2.4.3 Follow-up Phase

The FTL will provide continuous oversight of the demobilization to verify that the work is completed in accordance with the requirements provided in the MOP. Deficiencies will be noted and corrected.

Site restoration and demobilization inspections will include the procedures listed in Table 5-5.

TABLE 5-5
Site Restoration and Demobilization Procedures
Truck Fill Stand, NAS Key West, Boca Chica Key, Florida

Task	Procedures
Decontamination and Demobilization	Inspect work areas to verify all equipment and materials are safely removed from the site.
	Inspect work areas to verify project housekeeping and cleaning were completed.
	Verify that personnel and equipment have been contaminated.
	Complete final walkthrough inspection.
	Ensure an orderly site demobilization.
	Oversee collation of site records and documents.

SECTION 6

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Appendix A
Form FD 9000-24: Groundwater Sampling Log

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	SITE LOCATION:
WELL NO:	SAMPLE ID:	DATE:

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	ODOR (describe)

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE:	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: _____ µm
FIELD DECONTAMINATION: PUMP Y N	TUBING Y N (replaced)	DUPLICATE: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 ^{o}C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Appendix B
Chain-of-Custody Form

CH2MHILL Constructors, Inc.

1000 Abernathy Rd, Ste 1600
Atlanta, GA 30328
Tel No: (770) 604-9182
Fax No: (770) 604-9282

CHAIN-OF-CUSTODY RECORD

[1] COC NUMBER:

NAS Key West TFS	[2] PROJECT NUMBER: 426847	[8] LAB NAME AND CONTACT:	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	[14] RECIPIENT 1 (Address, Tel No. , and Fax No.):
				Northpark 400, 1000 Abernathy Road, Suite 1600, Atlanta GA 30328 678-579-8067 fax 770-604-9095 phone
[3] PROJECT PHASE/SITE/TASK:	[6] CTO OR DO NUMBER:	[9] LAB PO NUMBER:	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	[15] RECIPIENT 2 (Address, Tel No. , and Fax No.):
				Northpark 400, 1000 Abernathy Road, Suite 1600, Atlanta GA 30328 678-579-8067 fax 770-604-9095 phone
[4] PROJECT CONTACT:	[7] PROJECT TEL NO AND FAX NO:	[10] LAB TEL NO AND FAX NO:	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	[16] RECIPIENT 3 (Address, Tel No. , and Fax No.):

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	[25] ANALYSES REQUIRED (Include Method Numbers)											[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS	[28] LAB ID (for lab's use)
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

[29] SAMPLER(S) AND COMPANY: (please print)	[30] COURIER AND SHIPPING NUMBER:	[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
	FEDEX	

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature:			Printed Name and Signature:		
			FEDEX		
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		

Distribution: **[ ] Original** - Laboratory (To be returned with Analytical Report); **[ ] Copy 1** - Project File; **[ ] Copy 2** - PMO

Form CCI001, Rev 06/00