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CONTAMINATION ASSESSMENT PLAN FOR SITE BUILDING 18-A NS MAYPORT FL

2/1/2009

TETRA TECH NUS

Comprehensive **L**ong-term **E**nvironmental **A**ction **N**avy

CONTRACT NUMBER N62467-04-D-0055

Contamination Assessment Plan
for
Site Building 18-A

Naval Station Mayport
Jacksonville, Florida

Contract Task Order 0118

February 2009

NAVFAC Naval Facilities Engineering Command
Southeast
NAS Jacksonville
Jacksonville, Florida 32212-0030

TETRA TECH NUS, Inc.

CONTAMINATION ASSESSMENT PLAN
FOR
SITE BUILDING 18-A

NAVAL STATION MAYPORT
JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command
Southeast
NAS Jacksonville
Jacksonville, Florida 32212-0030

Submitted by:
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CONTRACT NUMBER N62467-04-D-0055
CONTRACT TASK ORDER 0118

FEBRUARY 2009

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ACRONYMS

bls	Below Land Surface
BPSS	Bureau of Petroleum Storage Systems
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
°C	Degrees Celsius
CAP	Contamination Assessment Plan
CLEAN	Comprehensive Long-term Environmental Action Navy
CTO	Contract Task Order
DPT	Direct Push Technology
EDB	1,2-Dibromoethane
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	Flame Ionization Detector
FL-PRO	Florida Petroleum Range Organics
FOL	Field Operations Leader
GAG	Gasoline Analytical Group
GCTL	Groundwater Cleanup Target Level
GPS	Global Positioning System
IDW	Investigation Derived Waste
KAG	Kerosene Analytical Group
mg/L	Milligrams per Liter
MTBE	Methyl tertiary-butyl ether
NAVFAC SE	Naval Facilities Engineering Command Southeast
NAVSTA	Naval Station
NTU	Nephelometric Turbidity Unit
OVA	Organic Vapor Analyzer
PAH	Polynuclear Aromatic Hydrocarbon
ppm	Parts per Million
PVC	Polyvinyl Chloride
QC	Quality Control
SAR	Site Assessment Report
SCTL	Soil Cleanup Target Level
SOP	Standard Operating Procedure
TOM	Task Order Manager
TRPH	Total Recoverable Petroleum Hydrocarbons
TtNUS	Tetra Tech NUS, Inc.

ACRONYMS (CONTINUED)

USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
VOH	Volatile Organic Halocarbon

1.0 INTRODUCTION

Tetra Tech NUS, Inc. (TtNUS) has prepared this Contamination Assessment Plan (CAP) for Site Building 18-A at Naval Station (NAVSTA) Mayport, Florida. This CAP was prepared for the United States Navy, Naval Facilities Engineering Command Southeast (NAVFAC SE) under Contract Task Order (CTO) 0118, for the Comprehensive Long-term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055.

This CAP provides the rationale and methodology for performing field activities to characterize soil and groundwater conditions at the Site Building 18-A. The objective of the proposed field investigations is to determine the extent of soil and/or groundwater impacts by previous operations at the site. The data collected during the Site Building 18-A investigation will be used to prepare a Site Assessment Report (SAR) and subsequent corrective action documents, if required, in accordance with Chapter 62-770.600, Florida Administrative Code (FAC). Investigations will characterize the site condition from which to base future courses of action.

1.1 SITE DESCRIPTION

NAVSTA Mayport is located within the corporate limits of the City of Jacksonville, Duval County, Florida, and is approximately 12 miles to the east-northeast of downtown Jacksonville and adjacent to the town of Mayport. The Station complex is located on the northern end of a peninsula bounded by the Atlantic Ocean to the east and the St. Johns River to the north and west. NAVSTA Mayport occupies the entire northern part of the peninsula except for the town of Mayport, which is located to the west between the Station and the St. Johns River.

The area of investigation at NAVSTA Mayport is associated with the Air Operations Fuel Lab, referred to as Site Building 18-A. Site Building 18-A, the Air Operations Fuel Lab, tests aviation fuel for NAVSTA Mayport. The investigation area is a relatively flat area of the Station located northwest of the intersection of Mayport Road and Mahan Street near Bravo Pier and adjacent to the airfield. Figure 1-1 shows the location of the site on the NAVSTA Mayport facility.

1.2 SITE HISTORY

Site Building 18-A is currently the Air Operations Fuel Lab located northwest of the intersection of New Maine road and Patrol Road (Figure 1-2). The Air Operations Fuel Lab tests aviation fuel for NAVSTA Mayport. The building is serviced by a septic system, which will be the focus of the proposed site investigation activities. Review of available documents revealed that strong petroleum odors were noted

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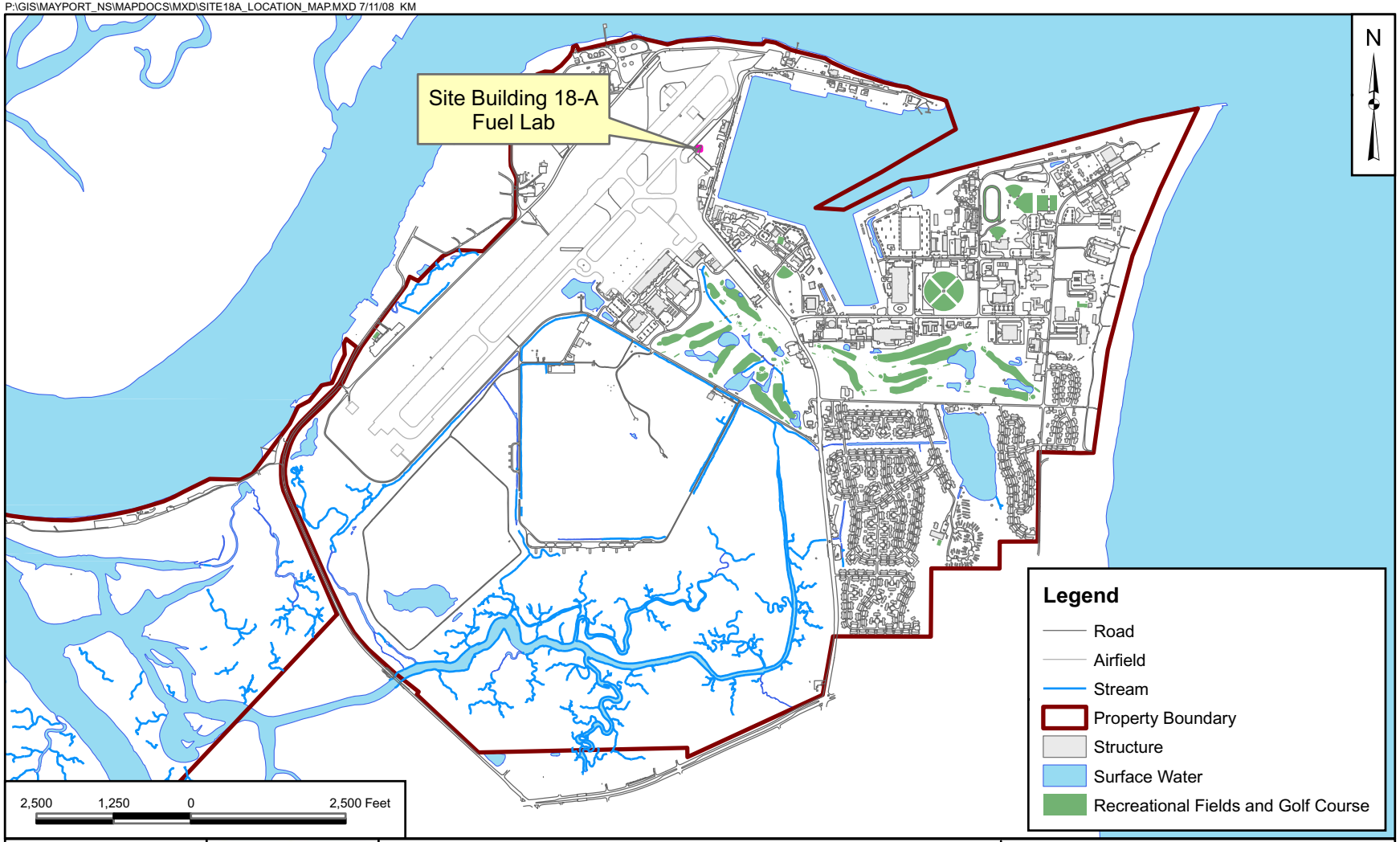

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CHECKED BY H. CAROLAN	DATE 7/14/08	
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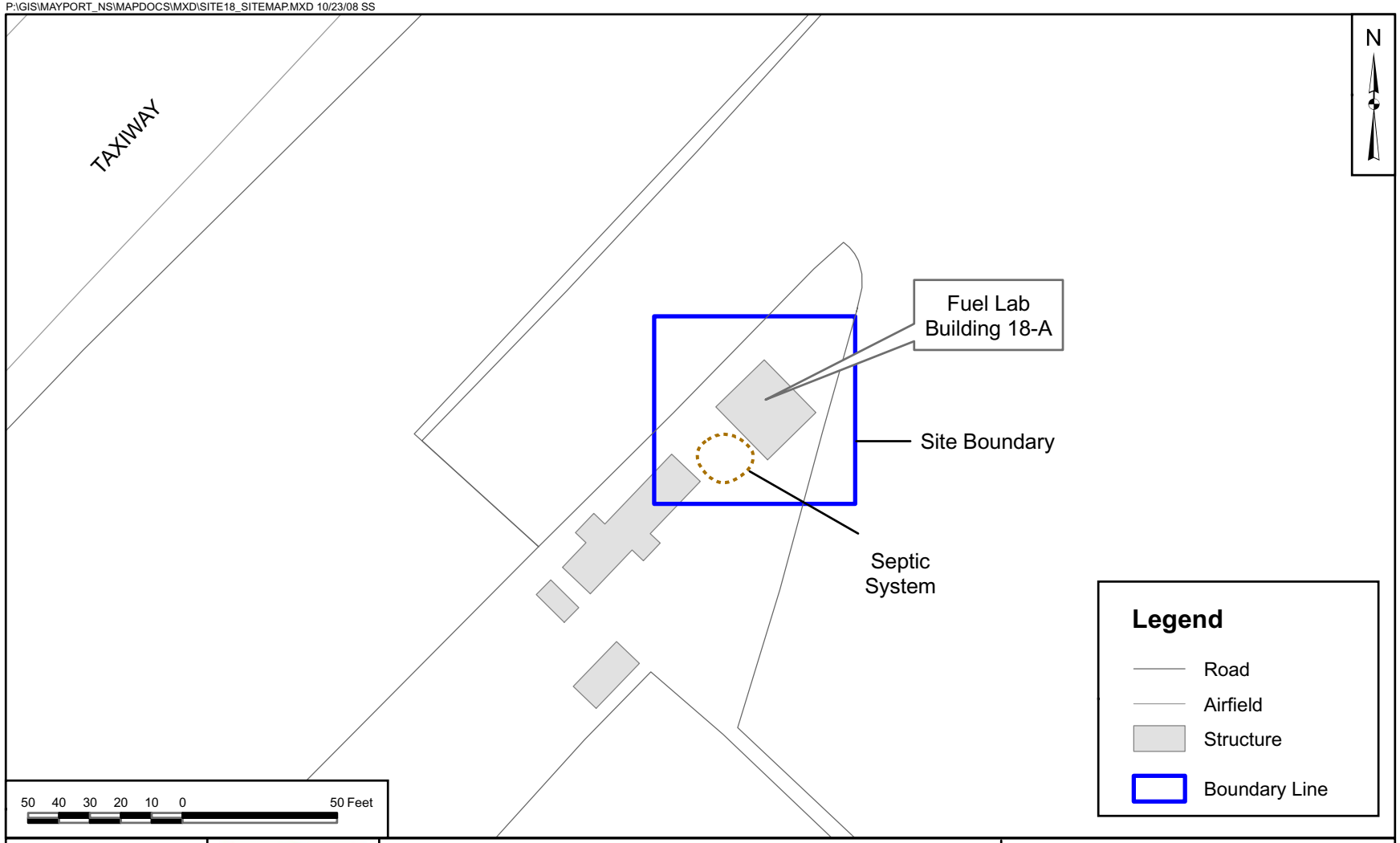

DRAWN BY: S. STROZ — DATE: 10/23/08	SITE MAP SITE BUILDING 18-A - FUEL LAB CONTAMINATION ASSESSMENT PLAN NAVAL STATION MAYPORT JACKSONVILLE, FLORIDA	CONTRACT NUMBER: CTO 0118
CHECKED BY: R. MCCANN — DATE: 10/23/08		APPROVED BY: — DATE: —
COST/SCHEDULE-AREA		APPROVED BY: — DATE: —
SCALE: AS NOTED		DRAWING NO.: FIGURE 1-2 — REV: 0

when the septic tank backed up and required pumping. Samples were collected from the service truck after the pump out was completed. Petroleum hydrocarbons were detected in the samples with a maximum concentration of 40,000 parts per million (ppm). Upon further investigation, it was determined that the pump truck contained waste from off-station grease traps, and this may have interfered with the sample results.

2.0 OBJECTIVE AND SCOPE OF PROPOSED ASSESSMENT

The objective of the proposed assessment described in this CAP is as follows:

- Determine the presence/absence and vertical and horizontal extent of any soil impacts.
- Determine the presence/absence and extent of groundwater impacts (horizontal and vertical) through the installation of temporary [direct-push technology (DPT)] and permanent monitoring wells.
- The results of the investigation will be compiled in a SAR in accordance with Chapter 62-770, FAC, complete with recommendations for future courses of action, if needed.

The investigations will meet the requirements of Chapter 62-770.600, FAC, for completion of a SAR. This shall include gathering information to support a "No Further Action" proposal, Natural Attenuation Monitoring Plan, or Remedial Action Plan, as required.

The work in the following sections will be completed in accordance with the Florida Department of Environmental Protection's (FDEP) Standard Operating Procedures (SOPs), revised March 31, 2008.

2.1 MOBILIZATION

Field mobilization activities will take place on the first day of each phase of work and will include travel and on-site preparatory activities. These activities will include the marking of sample locations; utility clearance; and receiving, storage, and testing and calibration of field equipment.

2.1.1 Utility Clearance

Base personnel will support utility clearance at all required locations, and associated activities will be performed in accordance with TtNUS SOP HS-1.0. Existing records will be reviewed for each intrusive sample location, and each location will be cleared with magnetic location devices. In addition, a hand auger will be used to advance each soil boring from the surface to approximately 4 feet below land surface (bls). Hand augering will allow clearance (this procedure may be modified if required for compliance with the dig permit) of utilities potentially buried within the upper 4 feet. Sunshine State One-Call of Florida (811 or 1-800-432-4770) will be contacted to mark all known utilities in the vicinity of sampling and drilling locations.

Prior to beginning work that penetrates land surface, a dig permit is required to be obtained from the Engineering Division of the Public Works Department. With assistance from TtNUS, the designated drilling subcontractor will be responsible for obtaining the dig permit. Contact personnel for obtaining a

dig permit is Wayne Purifoy at (904) 270-5207, extension 128. The field operations leader (FOL) may be requested to accompany Base utility clearance personnel to the site to review any restrictions to drilling and monitoring well installation activities. A copy of a dig permit is provided in Appendix A.

2.2 GROUNDWATER ELEVATION DETERMINATION

2.2.1 Groundwater Flow

In order to verify the direction of groundwater flow at this site, at least three of the temporary sampling points will be used as piezometers if these well points coincide with the placement of assessment sampling points. In the event the assessment points do not coincide with appropriate piezometer locations, at least three piezometers will be installed using DPT techniques and materials. The piezometers will be constructed with a screen length sufficient to intersect the water table surface and penetrate into the static water table at least 5 feet. The top-of-casing elevations will be surveyed using an on-site arbitrary bench mark. The vertical elevations of each piezometer casing will be surveyed to an accuracy of at least 0.01 foot. Prior to sampling, depth-to-water will be measured from the top-of-casing of the piezometer wells using an electronic water level indicator. The relative water table elevation at each location will be calculated by subtracting the depth-to-water measurement from the surveyed top-of-casing elevation. All data will recorded in the appropriate site-specific field logbook and on groundwater level measurement field forms. In addition, a groundwater flow direction (potentiometric) map will be generated from the water table elevation data.

To ensure the proper placement of additional sampling points and subsequent permanent monitoring wells, this information, along with groundwater flow data from adjacent sites (specifically, Site 1330), will be considered during the DPT investigation in the event groundwater impacts are detected. Historically, groundwater flow data obtained from monitoring wells located east of the subject site indicated a flow direction in the surficial aquifer to the east-southeast, toward the turning basin (TtNUS, 2003).

2.3 SOIL AND GROUNDWATER INVESTIGATION (PHASE I)

2.3.1 DPT Soil Investigation

The investigation at Site Building 18-A will be conducted in two phases. During the first phase, DPT will be used to advance soil borings and collect soil and groundwater samples for mobile laboratory analysis. A biased soil sampling approach has been designed to evaluate the magnitude and extent of any impacts to soil in the area of the septic system. It is estimated that 10 soil borings will be advanced initially; additional borings will be advanced as necessary to delineate identified soil impacts. The initially proposed soil sampling locations are shown on Figure 2-1. If additional sample locations are required for delineation, borings will be placed using a step-out distance of approximately 10 feet. Actual sampling

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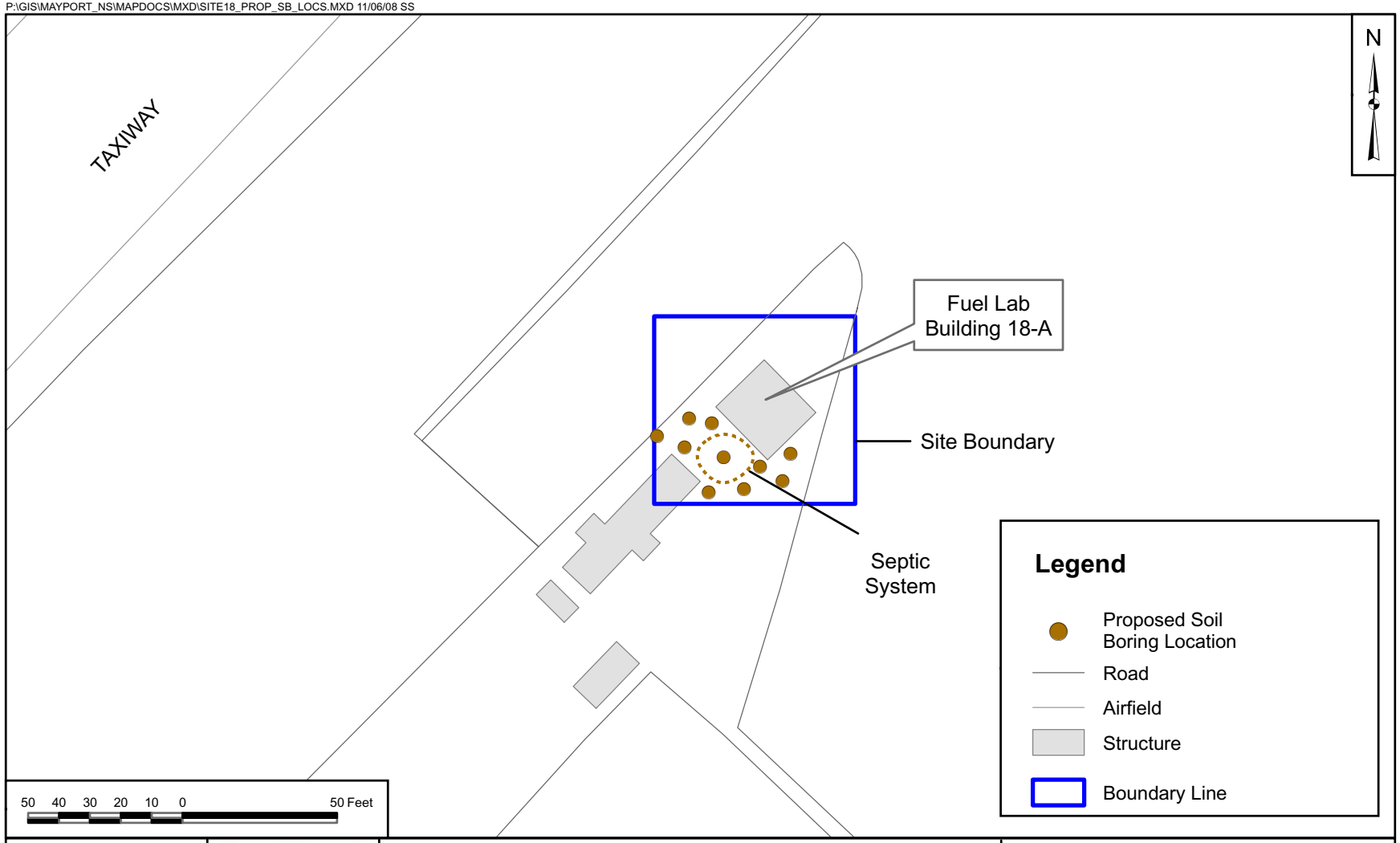

DRAWN BY: S. STROZ — DATE: 10/23/08 CHECKED BY: R. MCCANN — DATE: 11/06/08 COST/SCHEDULE-AREA SCALE: AS NOTED	NAVFAC	PROPOSED SOIL BORING LOCATIONS SITE BUILDING 18-A - FUEL LAB CONTAMINATION ASSESSMENT PLAN NAVAL STATION MAYPORT JACKSONVILLE, FLORIDA

CONTRACT NUMBER: CTO 0118

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locations will be determined in the field based on site constraints and results for samples submitted for analyses by the mobile laboratory. It is anticipated that proposed sampling locations placed closest to the septic system may be installed in the grassy areas; however, it is likely that some of the sampling locations will be in paved areas such as driveways and parking lots. Concrete coring, if necessary, will be performed by the drilling subcontractor using conventional coring attachments unless the surfaces encountered require additional cutting services. This will be determined in the field by the on-site TtNUS personnel.

At each location, a hand auger will be used to advance a soil boring from the surface to approximately 4 feet bls. Hand augering will allow depth-discrete sampling of the surface soils (less than 2 feet bls) and will provide clearance (this procedure may be modified if required for compliance with the dig permit) of utilities potentially buried within the upper 4 feet. Surface soil samples will be collected from depths of 0 to 6 inches bls and within an interval of 6 inches to 2 feet bls. Following hand augering to approximately 4 feet bls, soil borings will be advanced at 2-foot intervals to the water table using DPT. The water table is anticipated to be approximately 6 to 7 feet bls. Continuous soil cores will be collected from 4 feet bls to a final depth of each boring using a 2.125-inch outside diameter, 4-foot long stainless steel macrocore sampler containing an acetate liner. The cores will be visually screened and logged for lithologic description and samples collected above the water table will be field screened using an Organic Vapor Analyzer (OVA) equipped with a Flame Ionization Detector (FID). In the absence of OVA-FID responses, a soil sample will be collected from immediately above the water table for mobile laboratory screening. Sampling intervals and frequency may be adjusted in the field based on site conditions encountered during this investigation. Split samples from select locations will be submitted to the mobile laboratory for analysis of benzene, toluene, ethylbenzene, and xylene (BTEX), methyl tertiary-butyl ether (MTBE), naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. The quantity and type of soil samples to be analyzed by the mobile laboratory during this phase of the assessment are provided in Table 2-1. Soil displaced during the investigation will be containerized in 55-gallon steel drums, labeled, and properly disposed of after receipt of the analytical results. A soil sample log sheet will be maintained for each of these samples (Appendix A).

At the end of the first phase of activities, confirmatory soil samples will be collected and submitted to an FDEP approved, fixed-base laboratory as required in Chapter 62-770, FAC. For the purpose of this investigation, any impacts to the soil and groundwater from the Fuel Lab septic system will be considered a “sole source” requiring three soil samples [Chapter 62-770.600(3)(e), FAC] to be collected from locations representing low, medium, and high field screening responses. All soil sampling activities will be performed in accordance with FDEP SOP-001/01, FS 3000 Soil. These samples will be submitted to an FDEP-approved, fixed-based laboratory for analysis of the constituents listed in the Gasoline

Analytical Group (GAG) and Kerosene Analytical Group (KAG) per Table B in Chapter 62-770, FAC. The quantity and type of soil samples to be analyzed by the fixed-base laboratory are provided in Table 2-1.

To comply with Chapter 62-713, FAC, an FDEP approved, fixed-base laboratory will analyze additional soil investigation derived waste (IDW) samples for volatile organic halocarbons (VOHs) and total metals (arsenic, cadmium, chromium, and lead). This data, combined with the soil confirmatory data, will be used to characterize the soil IDW for proper disposal.

TABLE 2-1

DPT INVESTIGATION LABORATORY SAMPLE SUMMARY – PHASE I
SITE BUILDING 18-A
CONTAMINATION ASSESSMENT PLAN
NAVAL STATION MAYPORT
JACKSONVILLE, FLORIDA

Analyte	Proposed Method[1]	Assessment Samples	IDW Samples[2]	Equipment Blanks (Aqueous)	Trip Blanks (Aqueous)	Total Samples
SOIL & GROUNDWATER – VIA ON-SITE MOBILE LABORATORY						
BTEX/MTBE	SW-846 USEPA 8260B	Minimum of 10	0	0	0	Minimum of 10
Naph, 1-MN, 2-MN	SW-846 USEPA 8260B	Minimum of 10	0	0	0	Minimum of 10
SOIL - VIA FIXED-BASE LABORATORY						
BTEX/MTBE	SW-846 USEPA 8260B	3	1	1	1	6
VOHs	SW-846 USEPA 8260B	0	1	0	0	1
PAHs[3]	SW-846 USEPA 8310	3	1	1	0	5
Metals[4] (Disposal)	SW-846 USEPA 6010B	0	1	0	0	1
TRPH[5]	FL-PRO	3	0	1	0	4
GROUNDWATER - VIA FIXED-BASE LABORATORY						
BTEX/MTBE	SW-846 USEPA 8260B	2	1	1	1	5

TABLE 2-1

DPT INVESTIGATION LABORATORY SAMPLE SUMMARY – PHASE I
SITE BUILDING 18-A
CONTAMINATION ASSESSMENT PLAN
NAVAL STATION MAYPORT
JACKSONVILLE, FLORIDA

Analyte	Proposed Method[1]	Assessment Samples	IDW Samples[2]	Equipment Blanks (Aqueous)	Trip Blanks (Aqueous)	Total Samples
GROUNDWATER - VIA FIXED-BASE LABORATORY (CONTINUED)						
VOHs	SW-846 USEPA 8260B	2	1	0	0	3
PAHs[3]	SW-846 USEPA 8310	2	1	1	0	4
Lead, total	SW-846 USEPA 6010B	2	1	1	0	4
EDB	USEPA 504.1	2	1	1	0	4
TRPH[5]	FL-PRO	2	1	1	0	4

Notes:
(1) Method referenced reflects FDEP requirements.
(2) Investigation derived waste (IDW) sample numbers are based upon disposing of 55-gallon drums (one composite sample per site) of soil. Groundwater analyticals will be used to determine the appropriate disposal method of the development and purge water. Soil analytical for volatiles, PAHs, and TRPH (collected from environmental samples) will be used to characterize soil for proper disposal. In accordance with Chapter 62-713, FAC, an additional discrete and composite sample will be collected for VOHs and metals, respectively; from the soil IDW generated in order to complete the soil characterization for proper disposal.
(3) Includes 1-methylnaphthalene, 2-methylnaphthalene and 16 method-listed PAHs included in Table A of Chapter 62-770, FAC.
(4) Analyses for arsenic, cadmium, chromium, and lead.
(5) Only if contaminants are identified.

USEPA = United States Environmental Protection Agency
FL-PRO = Florida Petroleum Range Organics
VOHs = Volatile Organic Halocarbons
Naph, 1-MN, 2-MN = Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene
EDB = 1,2-dibromoethane
GAG/KAG (Soil) = BTEX/MTBE, PAHs, and TRPHs
GAG/KAG (Groundwater) = BTEX/MTBE/VOHs, PAHs, EDB, total lead, and TRPHs
TRPH = Total Recoverable Petroleum Hydrocarbons

The results of these analyses will be compared against the FDEP Soil Cleanup Target Levels (SCTLs) established in Chapter 62-777, FAC. All sample locations will be marked with a wooden stake or brightly colored pin flag indicating the sample location. Coordinates will be determined by Global Positioning System (GPS) at each individual sample location, which will allow for future repeatable investigations or for reference in any remedial action. All sample location markers will be removed prior to the final demobilization.

Prior to DPT sampling activities, one macrocore boring will be completed from the land surface to approximately 40 feet bls to verify that no confining layer is breached. The continuous core will be visually screened and logged on soil log forms for lithologic description. Based on lithologic information obtained during assessment activities across the facility (specifically, Site 1330), the surficial aquifer is comprised of undifferentiated deposits which extend from land surface to the top of the Hawthorn Group, approximately 50 feet bls (TtNUS, 2003). It is anticipated that fine-grained sands will be encountered near the surface interspersed with thin (less than 1 foot thick) clay lenses. These deposits generally grade to a mixture of sand and coarse shell fragments from 30 to 50 feet bls. The base of the surficial aquifer system is the intermediate confining unit, which is a sequence of marine clays and discontinuous limestone stringers.

2.3.2 DPT Groundwater Investigation

Approximately 10 temporary groundwater sampling points will be installed at the locations shown on Figure 2-2. These sampling points are located specifically to provide data in determining if the groundwater in the vicinity of the septic system is impacted with contaminants consistent with historical operations performed at the Fuel Lab. Groundwater samples will be collected from the suspected source area adjacent to the septic system, and up gradient, down gradient, and cross gradient from the source area to be verified during Phase I of this investigation. If additional sample locations are required for delineation of groundwater impacts, sampling points will be placed using a step-out distance of approximately 50 feet. An on-site mobile laboratory will be used to provide sample results within 3 hours of submission. Based on the groundwater analytical results from the initial locations, additional DPT borings will be installed to complete the vertical and horizontal delineation of the contaminants of concern.

Actual boring locations may need to be relocated based on field screening results, physical obstructions, or utilities. Information obtained from the DPT sampling and analyses will be used to develop a three-dimensional visualization of contamination in the shallow and intermediate zones of the surficial aquifer. Field methodologies for DPT groundwater sample collection are detailed below.

Groundwater samples will be collected using a DPT groundwater sampling system in conjunction with a peristaltic pump and sterile Teflon® and medical-grade silicon tubing. In general, the DPT groundwater sampling system consists of an enclosed 4-foot groundwater sampler attached to 2.125-inch outside diameter steel drive rods, which are hammer driven via DPT to the maximum desired sampling depth.

When the desired sampling depth is reached, the outer sleeve of the groundwater sampler is retracted to expose a 4-foot mill-slotted (0.02-inch) well point screen to the formation. Approved tubing will then be lowered through the inner core of the DPT drive rod to the bottom of the borehole and attached to a peristaltic pump using silicon tubing. Considering the contaminants of concern (BTEX and

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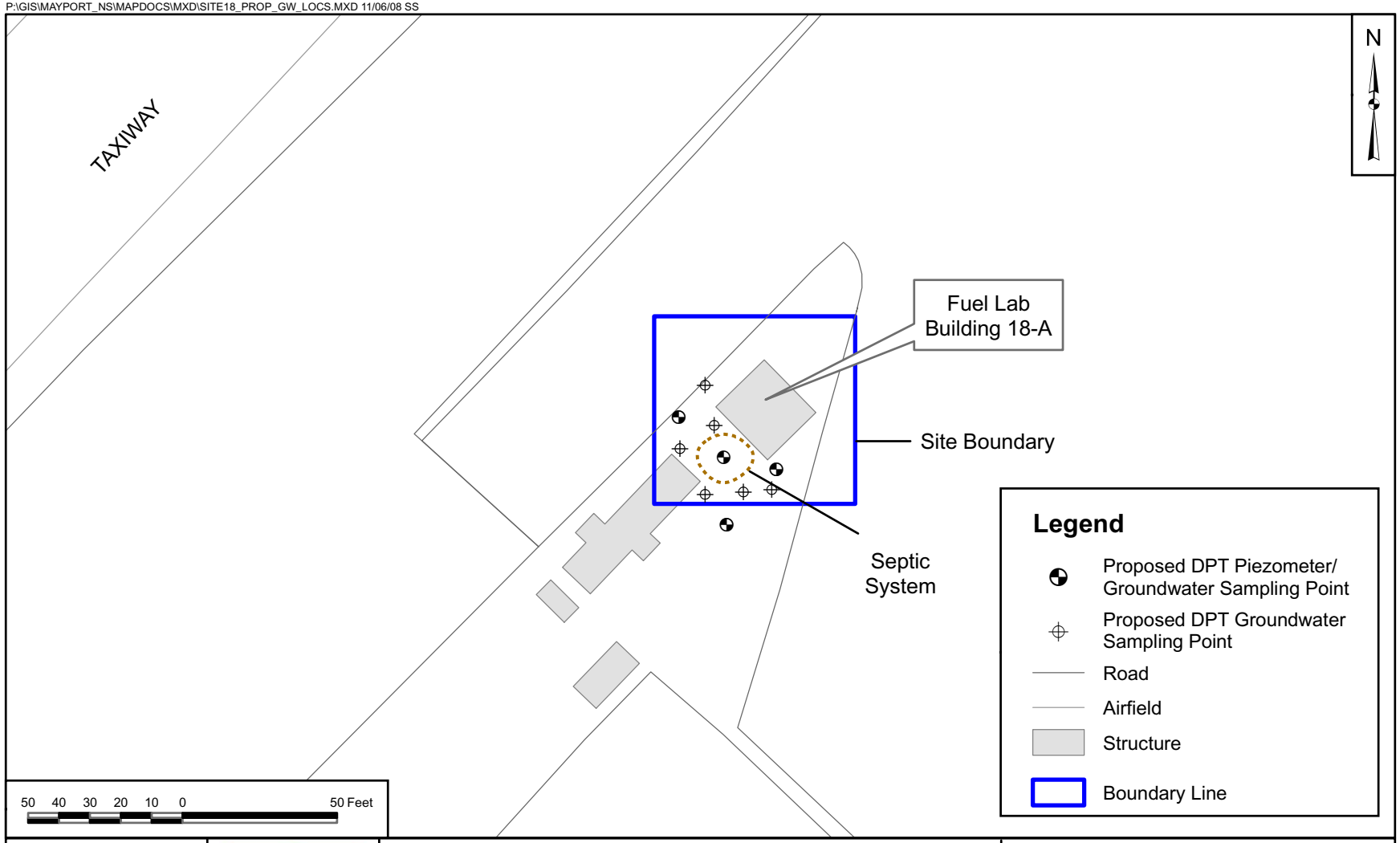


DRAWN BY: S. STROZ — DATE: 10/23/08	PROPOSED GROUNDWATER SAMPLING LOCATIONS SITE BUILDING 18-A - FUEL LAB CONTAMINATION ASSESSMENT PLAN NAVAL STATION MAYPORT JACKSONVILLE, FLORIDA	CONTRACT NUMBER: CTO 0118
CHECKED BY: R. MCCANN — DATE: 11/06/08		APPROVED BY: — DATE: —
COST/SCHEDULE-AREA		APPROVED BY: — DATE: —
SCALE: AS NOTED		DRAWING NO.: FIGURE 2-2 — REV: 0

naphthalenes), the screen interval will be placed to bracket the water table observed at the time of the investigation. Given use of a 4-foot mill-slotted well point screen, the sample tubing for each sample will be placed within the upper 2 feet of the saturated interval (BPSS, 2005). A sample will be collected once the purge water becomes visibly clear. It is likely that the purge water will not become visibly clear due to fine sediments in this area. In this case, purging will be conducted for a minimum of 5 minutes before a sample is collected to reduce turbidity. New tubing (FDEP-approved) will be used between each sampling location. The water table at the site is expected to be between 6 and 7 feet bls. The actual sampling depth at each boring location is subject to change based on field observations and groundwater analytical results obtained from the on-site mobile laboratory.

As necessary, groundwater samples will also be collected from intermediate and deeper intervals to vertically delineate impacted areas. The procedures for advancing the DPT groundwater sampling point to a maximum anticipated depth of approximately 50 feet bls are the same as described for shallow groundwater sampling procedures. The first groundwater sample will be collected from approximately 50 feet bls. Once that sample is collected, the sample tubing will be replaced and the sampling screened interval will be pulled up to the next desired sampling depth, thereafter, until the shallowest desirable sample has been collected. Depth to a low permeability unit, if present, is estimated to be approximately 40 feet below grade in the vicinity of the septic system. If a low permeability unit is not identified, the borehole will be advanced to a maximum depth of approximately 40 feet bls. Groundwater samples will be collected in 10-foot intervals from approximately 40 feet bls to approximately 10 feet bls.

Due to the small diameter well materials used as part of the sampling approach, geochemical parameters, and turbidity will not be measured during this sampling event. Groundwater samples collected for screening purposes will be submitted to an on-site mobile laboratory for analysis of select volatile organic compounds (VOCs) (BTEX and MTBE) and semivolatile organic compounds (naphthalene, and 1- and 2-methylnaphthalene) using USEPA Method 8260. The results will be compared against the FDEP Groundwater Cleanup Target Levels (GCTLs) established in Chapter 62-777, FAC. The results of the field screening activities will be the basis for determining which sample locations and intervals will be sent to the FDEP approved, fixed-base laboratory for analyses. Two groundwater assessment samples (approximately 20 percent of the total initial samples) will be submitted to an FDEP approved, fixed-base laboratory for analysis of the GAG/KAG per Table B in Chapter 62-770, FAC. The quantity and type of groundwater samples to be analyzed by the fixed-base laboratory during the DPT groundwater investigation are provided in Table 2-1. The placement of permanent monitoring wells will be based on results obtained during the DPT groundwater investigation.

Each DPT boring will be grouted with neat (i.e., no additives) Type I Portland cement. The DPT rig will be used to push hollow rods back down to the final depth at each sample location and fill the bore hole from

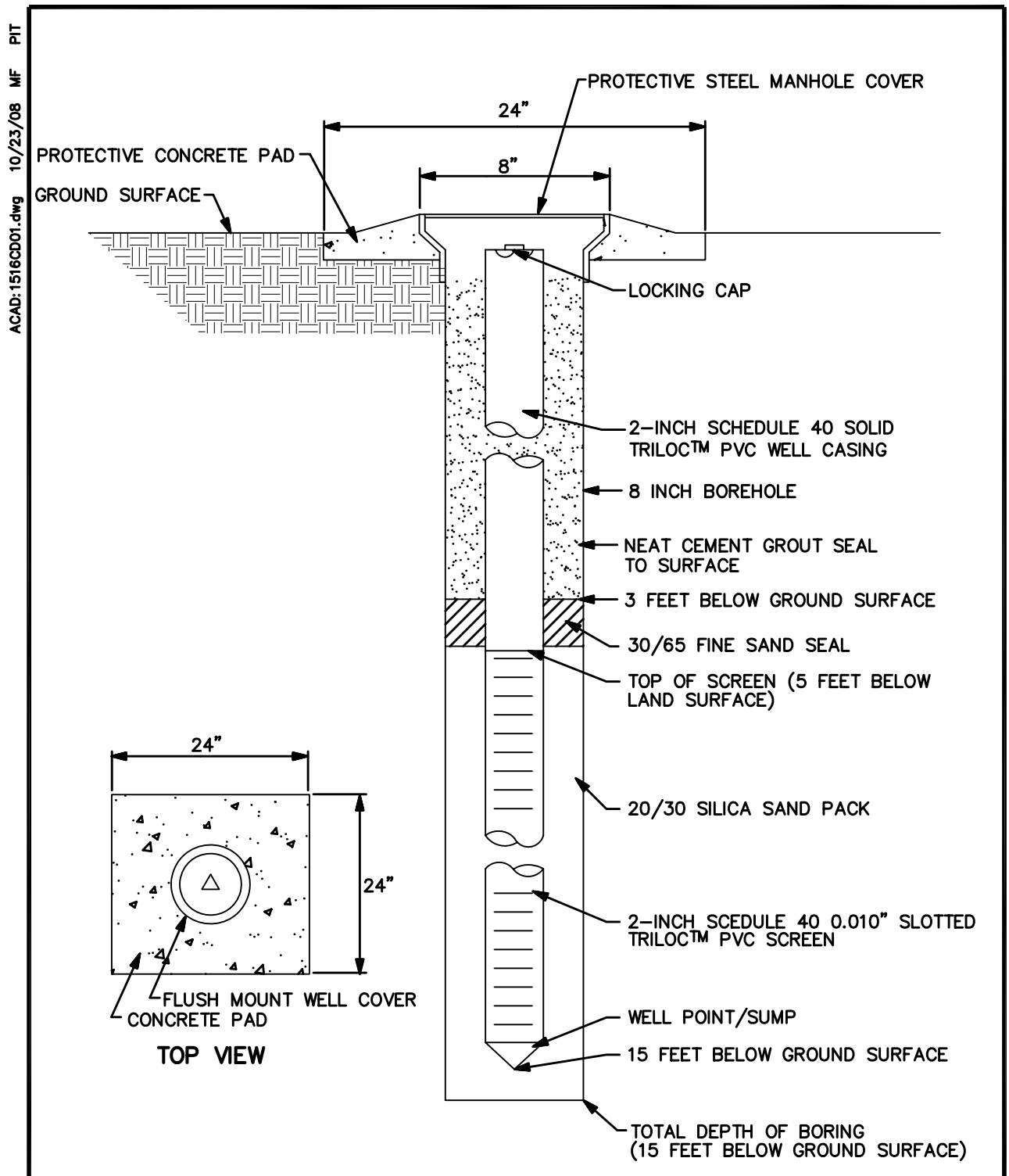
the bottom up with grout. At a minimum, borings will be grouted at the end of each work week (Friday). Orange safety cones will be placed on each boring until the grouting is complete. Grouting of borings may be performed sooner (possibly daily) to prevent safety issues in areas of high pedestrian, equipment, or vehicle traffic. Soil and groundwater displaced during this investigation will be placed into a steel 55-gallon drum(s) to remain at an on-site location predetermined by NAVSTA Mayport. All sample locations will be marked with a wooden stake, brightly colored pin flag, or spray marking paint indicating the sample location. Coordinates will be determined by GPS at each individual sample location, which will allow for future repeatable investigations or guide in any remedial action. All removable sample location markers will be removed prior to the final demobilization.

2.4 MONITORING WELL CONSTRUCTION, DEVELOPMENT, AND SAMPLING (PHASE II)

2.4.1 Monitoring Well Construction

The second phase of the investigation will be based on releases identified in the first phase. If no releases are identified then the groundwater investigation would be limited to one groundwater monitoring well. However, if releases are identified, the groundwater investigation will involve the installation of up to six shallow monitoring wells (maximum depth of 15 feet) and one deep monitoring well (maximum depth of approximately 30 feet) installed by DPT using a rotary drilling attachment and hollow stem augers. These monitoring wells will be installed in areas in which contaminated groundwater was observed, as well as, areas that will provide delineation in the estimated upgradient and downgradient locations. The actual depths and locations will be determined in the field by the TtNUS field geologist.

The proposed permanent monitoring wells will be constructed of 2-inch inside diameter, Schedule 40, flush-joint polyvinyl chloride (PVC) riser and flush-joint 0.010-inch factory-slotted well screen. Shallow monitoring well screen sections will be approximately 10 feet in length and positioned to intersect the water table surface. After the borings are drilled to the desired depth, wells will be installed through the augers. The wells will be installed such that approximately 3 feet of screen will be above the saturated zone and 7 feet of screen below to allow for seasonal water table fluctuations. Groundwater is expected to be encountered at a depth of 6 feet to 7 feet bls. One deep well will be installed based on DPT analysis and will be utilized for vertical delineation. The deep well will be installed to approximately 30 feet bls and will be constructed using 0.010-inch factory-slotted well screen approximately 5 feet in length. Diagrams showing typical shallow and deep well construction designs are presented on Figures 2-3 and 2-4, respectively.



DRAWN BY: MF DATE: 10/22/08	NAVFAC	TYPICAL SHALLOW MONITORING WELL DESIGN SITE BUILDING 18-A - FUEL LAB CONTAMINATION ASSESSMENT PLAN NAVAL STATION MAYPORT JACKSONVILLE, FLORIDA	CONTRACT NO. 1516
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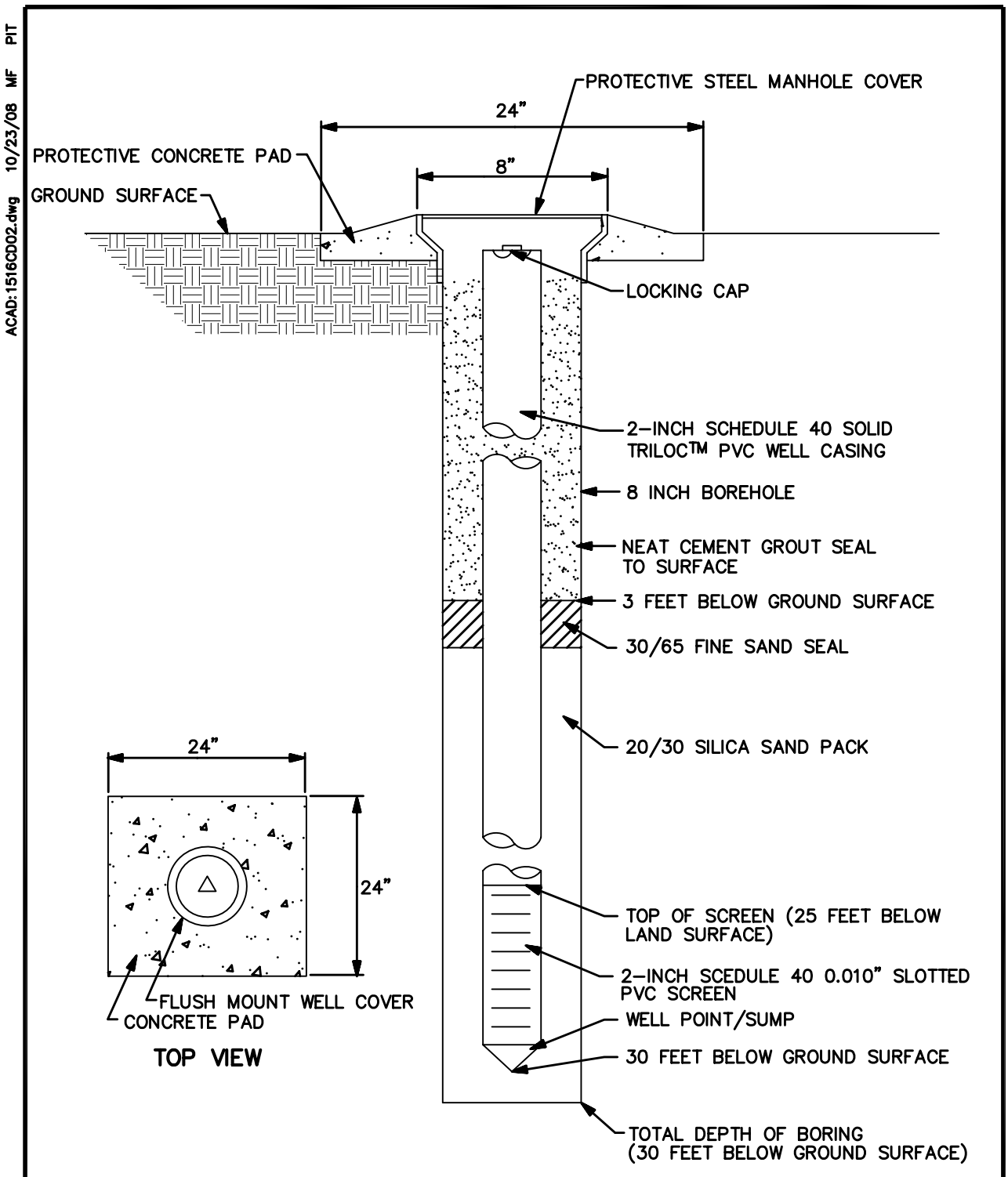
SCALE: AS NOTED			DRAWING NO. FIGURE 2-3 / REV. 0

FORM CADD NO. SDIV-AV.DWG - REV 1 - 9/10/98



DRAWN BY MF DATE 10/22/08	NAVFAC	TYPICAL DEEP MONITORING WELL DESIGN SITE BUILDING 18-A - FUEL LAB CONTAMINATION ASSESSMENT PLAN NAVAL STATION MAYPORT JACKSONVILLE, FLORIDA	CONTRACT NO. 1516
CHECKED BY DATE			OWNER NO. 0000
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-4 / REV. 0

FORM CADD NO. SDIV-AV.DWG - REV 1 - 9/10/98

2.4.2 Monitoring Well Development and Sampling

A boring log, monitoring well sheet, and certificate of conformance will be maintained for each permanent well installation (see Appendix A). Once installed, the wells will be developed per Navy specifications.

The permanent monitoring wells will be developed no sooner than 24 hours after placement of grout to remove fine sediment from around the screened interval of the well. Permanent monitoring wells will be developed by bailing and purging or by pumping as determined by the field geologist. Field parameters (pH, temperature, turbidity, and specific conductance) will be measured at equally-spaced timed intervals during well development. Wells will be developed for a maximum time period of one hour or until the field measurements become stable and the development water is visibly clear.

Water quality stabilization will be determined using the following criteria:

- Temperature $\pm$ 0.2 degrees Celsius (°C)
- pH $\pm$ 0.2 standard units
- Specific conductivity $\pm$ 5 percent of reading

Field development data will be maintained on a Monitoring Well Development Record (see Appendix A). No sooner than 24 hours after development, groundwater samples will be collected from monitoring wells in accordance with FDEP SOPs. Prior to obtaining samples, synoptic water levels and total well depths will be measured and recorded on a Groundwater Level Measurement Sheet (see Appendix A). A second round of water levels will be collected no sooner than one month later on the same data sheet.

The wells will be purged using a peristaltic pump using low flow quiescent purging techniques per FDEP SOPs. The data will be recorded on a Low Flow Purge Data Sheet (see Appendix A). In accordance with variances promulgated in FDEP Bureau of Petroleum Storage Systems (BPSS) guidance documents (BPSS, 2005), the sample tubing for samples collected from the shallow permanent monitoring wells will be placed within the upper 2 feet of the water column. Depending on the groundwater parameters, up to five well volumes may be purged. If wells are purged dry with less than three well volumes removed, the water level in the well will be allowed to recover enough to collect five field readings (pH, temperature, turbidity, dissolved oxygen, and specific conductance) prior to collecting a water sample. If the well does not purge dry using the low flow purging technique, groundwater characteristics will be taken after each well volume of water is purged or at 2- to 10-minute intervals, depending on the flow rate. Stabilization will be defined according to the following scenarios:

I. When purging a well that has a partially submerged well screen, a minimum of one well volume will be purged prior to collecting measurements of field parameters listed below. If the well screen is

fully submerged, then a minimum of one volume of the pump, associated tubing, and flow cell will be purged prior to collecting field parameters listed below. Purging will be considered complete when three consecutive measurements of the field parameters are within the desired limits as shown below.

- Temperature ± 0.2 °C
- pH ± 0.2 Standard Units
- Specific Conductivity ± 5 percent of reading
- Dissolved oxygen is not greater than 20 percent of saturation at the field measured temperature
- Turbidity is not greater that 20 Nephelometric Turbidity Units (NTUs)

II. When purging a well and Scenario I is impossible to achieve, three consecutive measurements of the following parameters are required:

- Dissolved oxygen ± 0.2 milligrams per liter (mg/L) or 10 percent, whichever is greater
- Temperature ± 0.2 °C
- pH ± 0.2 Standard Units
- Specific Conductivity ± 5 percent of reading
- Turbidity ± 5 NTUs or 10 percent, whichever is greater

If stabilization is not achieved, five screen volumes must be removed prior to samples being collected in the appropriate sample containers. Samples to be analyzed for volatile constituents will be collected first and immediately sealed in 40-milliliter vials so that no headspace exists. Samples will be analyzed for compounds listed in Table 2-2.

Groundwater samples for assessment purposes will then be collected from each new well utilizing low flow sampling techniques and sent to a fixed-base laboratory for analysis of the constituents listed in the GAG / KAG including: BTEX and MTBE, PAHs (includes 1-methylnaphthalene, 2-methylnaphthalene, and the 16 method-listed PAHs included in Table B of Chapter 62-770, FAC), VOHs, 1,2-dibromoethane (EDB), total lead, and TRPH. Table 2-2 shows the quantity and type of groundwater samples anticipated for fixed-base laboratory analyses associated with this phase of the assessment. The laboratory analyses selected are designed to identify impacts from suspected processes at the Fuel Lab. The data acquired during sampling will be recorded on a Groundwater Sample Log Sheet (Appendix A).

A registered surveyor will survey the monitoring wells installed during the site assessment. Horizontal positioning will be measured and plotted for each permanent monitoring well in accordance with the Florida State Plane Coordinate System and the North American Datum of 1983. The top-of-casing

elevation of each permanent monitoring well will be surveyed in accordance to the North American Vertical Datum of 1988 and referenced to site features (i.e., building corners, etc.).

TABLE 2-2

FIXED-BASE LABORATORY SAMPLE SUMMARY – PHASE II
GROUNDWATER –SITE BUILDING 18-A
CONTAMINATION ASSESSMENT PLAN
NAVAL STATION MAYPORT
JACKSONVILLE, FLORIDA

Analyte	Proposed Method[1]	Environmental Samples	IDW Samples[2]	Equipment Blanks (Aqueous)	Trip Blanks (Aqueous)	Total Samples
BTEX/MTBE	SW-846 USEPA 8260B	7	1	1	1	10
VOHs	SW-846 USEPA 8260B	7	1	1	0	9
PAHs[3]	SW-846 USEPA 8310	7	1	1	0	9
Lead, total	SW-846 USEPA 6010B	7	1	1	0	9
EDB	USEPA 504.1	7	1	1	0	9
TRPH	FL-PRO	7	1	1	0	9

Notes:
[1] Method referenced reflects FDEP requirements.
[2] Groundwater analytical results will be used to determine the appropriate disposal method of the development and purge water.
[3] Includes 1-methylnaphthalene, 2-methylnaphthalene and 16 method-listed PAHs included in Table A of Chapter 62-770, FAC.
GAG/KAG (Groundwater) = BTEX/MTBE/VOHs, PAHs, EDB, total lead, and TRPH.

2.5 EQUIPMENT DECONTAMINATION

The equipment involved in well installation and well sampling activities will be decontaminated prior to and during the respective field activities in accordance with the FDEP SOPs.

2.6 WASTE HANDLING

Drill cuttings from the DPT screening survey, well installations, and water from the well development, purging, and sampling will be collected and containerized in Department of Transportation approved (17-E or 17-H) steel 55-gallon drums. Each drum will be sealed, labeled, and transported to a drum staging area, pending the IDW analytical results. For this investigation, the confirmatory soil sample analytical data will be used to characterize the soil IDW for disposal. In addition, to satisfy the requirements of Chapter 62-713, FAC, one discrete and one composite soil sample will be collected from

the steel 55-gallon drums of soil IDW. Table 2-1 lists and describes the sample requirements for the soil IDW samples. Groundwater analytical results from the mobile and fixed-base laboratories will be used for aqueous IDW disposal. The proper method of off-site disposal will be determined by these analytical results. IDW will be transported to the IDW staging area at NAVSTA Mayport pending disposal arrangements. See Appendix A for a copy of the IDW management sheet.

A lined decontamination pad will be constructed and used to collect the water from cleaning of drilling equipment. Decontamination materials generated during the site investigation will be containerized for proper disposal.

2.7 SAMPLE HANDLING

Sample handling includes the selection of sample containers, preservatives, allowable holding times, and analytical methods. In addition, sample identification, packaging, and shipping will be addressed. Sample handling procedures will be in accordance with the FDEP SOPs.

2.8 SAMPLE PACKAGING, SHIPPING, AND NOMENCLATURE

Samples will be packaged and shipped in accordance with FDEP SOPs. The FOL will be responsible for completing the following forms when samples are collected for shipping.

- Sample labels
- Chain-of-Custody labels
- Appropriate labels applied to shipping coolers
- Chain-of Custody forms
- Federal Express Air Bills

Each sample will be assigned a unique sample identification number. The unique label system established for this sampling event is as follows:

1	**2**	**3**	**4**
General Site Name	**Facility Number**	**Sample Identifier**	**Sequence Number**

Where:

1	General Site Name	MPT
2	Facility Number	Building Number
3	Sample Identifier	DPT groundwater location number; monitoring well identification number and soil boring identification number
4	Sequence number	See below

TtNUS personnel will assign identification numbers to DPT locations, specifically for groundwater samples (e.g., DP01, etc.). They will also assign identification numbers to monitoring wells (e.g., 1S for first shallow well, 2S for second shallow well, etc.). Soil borings associated with this effort will begin at SB01 and continue numbering in a consecutive fashion (e.g., SB02, SB03, etc.).

For soil samples, the sequence number will be representative of the lower depth of the soil sample (e.g., a soil sample collected from the 1 to 3-foot interval of a soil boring will have a sequence number of 03, a sample from the 3 to 5-foot interval will have a sequence number of 05). For groundwater samples collected with the DPT equipment, the sequence number will be representative of the lower depth of the groundwater sample (e.g., a groundwater sample collected from the 6 to 10-foot interval would have a sequence number of 10). Groundwater samples collected from permanent monitoring wells will have a sequence number beginning at 01 and continuing consecutively, based on the sampling round. For example, a groundwater sample collected from shallow monitoring well MW4 at Site Building 18-A during the first groundwater sampling round would have the following nomenclature:

MPT-18A-MW4S-01

A soil sample collected at Site Building 18-A from the 3- to 5-foot interval at boring SB02 would have the following nomenclature:

MPT-18A-SB02-05

2.9 SAMPLE CUSTODY

The chain-of-custody begins with the release of the empty sample bottles from the laboratory and must be documented and maintained from that point forward. To maintain custody of the sample bottles or samples, they must be in someone's physical possession, in a locked room or vehicle, or sealed with an intact custody seal. When the possession of the bottles or samples is transferred from one person to another it will be documented in the field logbook and on the chain-of-custody.

2.10 QUALITY CONTROL SAMPLES

In addition to periodic calibration of field equipment and appropriate documentation on a field calibration sheet (see Appendix A), quality control (QC) samples will be collected or generated during environmental sampling activities. QC samples will be collected in accordance with the requirements established during the Plan of Action negotiations.

Trip Blanks – Trip blank(s) are required if the samples will be analyzed for VOCs. Trip blanks are prepared by the laboratory providing the VOC vials and are prepared by filling the preserved vials with analyte-free water.

Equipment/Field Blanks – Equipment/Field blanks are required for sampling equipment used during the investigation. Equipment blank frequency is 5 percent of samples taken (excluding QC samples).

2.11 FIELD DOCUMENTATION

Field documentation for this assessment will include field logbooks, field log forms, location and sample identification nomenclature, and sample labels.

In addition to chain-of-custody records associated with sample handling, packaging, and shipping, certain standard forms will be completed for sample description and documentation. Dedicated field logbooks will be used to record pertinent field activities. The Task Order Manager's (TOM) name, FOL name, project name and location, and project number will be recorded on the inside of the front cover of all logbooks. Entries will be recorded with waterproof, non-erasable ink. Each page of the logbook will be numbered and dated. All logbook entries must be legible and contain accurate and complete information about an individual's project activities. At the end of all entries for a particular day, or a particular event if appropriate, the investigator will draw a diagonal line across the page below the last entry and initial indicating the conclusion of entries. All entries will be objective, factual, and free of personal feelings. Corrections will be made by drawing a single line through the error and entering the correct data. All corrections will be initialed and dated.

2.12 DEMOBILIZATION

Demobilization will occur at the conclusion of all other field activities related to this investigation. Activities to occur during this phase include the installation of well tags on the new monitoring wells, return of all rental field equipment, verification of proper IDW documentation and staging by the FOL, and securing of the site.

2.13 SITE MANAGEMENT AND BASE SUPPORT

TtNUS will perform this project with support from the Navy. This section of the CAP describes the project contacts, support personnel, project milestones, and time frames of all major events.

Throughout the duration of the investigation activities, work at NAVSTA Mayport will be coordinated through NAVFAC SE, FDEP, and NAVSTA Mayport personnel. The primary contacts are as follows:

1. NAVFAC SE
   Ms. Beverly Washington
   (904) 542-6243

2. FDEP
   Mr. John Winters
   (850) 245-8999

3. NAVSTA Mayport Facilities
   Ms. Diane Racine
   (904) 270-6730, extension 208

NAVSTA Mayport personnel will provide the following support functions:

- Assist TtNUS in locating underground utilities and TtNUS' drilling subcontractor in obtaining a dig permit prior to the commencement of drilling operations.

- Provide existing engineering plans, drawings, diagrams, files, etc. to facilitate evaluation of the sites under investigation.

- Provide all historical data, background geological and hydrogeological information, and initial site investigation documents.

NAVSTA Mayport personnel will aid in arranging the following:

- Personnel identification badges, vehicle passes, and/or entry permits.

- A secure staging area (approximately 2,000 square feet) for storing equipment and supplies.

- A supply (e.g., fire hydrant, stand pipe, etc.) of large quantities of potable water for equipment cleaning, sampling, etc.

- As required, provide escorts for contract personnel working in secured areas.

The project will be staffed with personnel from the TtNUS' Jacksonville, Florida office. During field activities, TtNUS will provide an FOL who is familiar with the scope of work to be completed and requirements of working at NAVSTA Mayport. Additionally, TtNUS will supply one DPT rig with mobile

laboratory, one hollow stem auger drill rig, and a TtNUS field crew to supervise drilling activities and sample the groundwater monitoring wells.

Mr. Mark Peterson is the TOM for CTO 0118 and will be the primary point of contact for the Station and the FOL. He is responsible for cost and schedule control as well as technical performance. Mr. Peterson will provide senior level review and oversight during field activities.

2.13.1 Contingency Plan

In the event of problems that may be encountered during site activities, the NAVFAC SE point of contact will be notified immediately, followed by the TtNUS TOM, and the NAVSTA Mayport point of contact. The TOM will determine a course of action designed not to interfere with the schedule or budget. Contingency plans will be approved in writing through the NAVFAC SE point of contact before being enacted.

3.0 REPORTING REQUIREMENTS

Following the Phase I and Phase II site assessment activities, a SAR will be prepared in accordance with Chapter 62-770, FAC. The SAR will be submitted in draft final and final versions. Formal written responses will be not prepared for comments received on the draft final version of the report; comments will be resolved, as necessary, via conference call, and incorporated into the final version of the SAR.

4.0 PROPOSED SCHEDULE

Field activities, including DPT soil and groundwater screening, monitoring well installation and development, sampling, surveying, and IDW management at Site Building 18-A are proposed to begin in January 2009. The following are the anticipated number of days to complete each task:

FIELD INVESTIGATION

- Utility Clearances 4 days
- DPT and Mobile Lab Mobilization 1 day each
- DPT and Mobile Lab Investigation 5 days
- Drilling Coordination and Mobilization 2 days
- Monitoring Well Installation and Development 5 days
- Monitoring Well Sampling 2 days
- Off-site Laboratory Analyses/Validation 60 days
- Surveying and Coordination 2 days
- IDW Management/Disposal and Coordination 2 days

REPORT PREPARATION

- Prepare Draft- Final SAR 60 days
- Navy Review of Draft - Final SAR 30 days
- Prepare Final SAR 10 days
- Submit Final SAR 10 days

REFERENCES

BPSS (Bureau of Petroleum Storage Systems), 2005. Florida Department of Environmental Protection (FDEP) BPSS, Groundwater Sampling Standard Operating Procedures Variances and Clarifications for Bureau of Petroleum Storage Systems Sites. May.

FDEP (Florida Department of Environmental Protection), 2008. Standard Operating Procedures for Field Activities, DEP-SOP-001/01. March.

FDEP, 2005. Chapter 62-770, Florida Administrative Code (FAC). April.

TtNUS (Tetra Tech NUS, Inc.), 2003. Site Assessment Report Addendum for Site 1330, Naval Station Mayport, Mayport, Florida. Prepared for Southern Division, Naval Facilities Engineering Command, North Charleston, South Carolina. December.

APPENDIX A

FIELD FORMS

EXCAVATION PERMIT REQUEST
Naval Station Mayport

PERMIT REQUEST NO. MYPT-10/08-000

1a. Name of Company:	**Date Requested:**		**Date Required:**
1b. Requestor:	**Phone:**	**Cell Phone:**	**Fax:**
E- Mail Address:			
1c. Government Issuing Agency: NS Mayport Public Work Engineering Office Building 1966:		**POC:** C. Wayne Purifoy (904) 5184 x 134	
2a. Project Title:		**Sub Contractor:** *(if different than 1a,1b)*	
2b. Scope of Excavation (Specify Purpose, Method, Length and Depth of Area- Attached Site-Map)			
3. Permit Request Approval prior to locate: (PW Engineering) Name: C. Wayne Purifoy Signature_____ Date: 10/02/06 *Comments: Contractor shall mark area of locate with white paint*			

4. Utility Organization Phone	Ticket#	Name of Locator	Initial	Date	
4a. Primary Elec **JEA Bldg 12** (904) 270-5397 Water & Sewer					
4b. Secondary Elec **IAP Bldg 12** (904) 270-5347					
4c. Natural Gas **Sunshine State** 1-800-432-4770 Tel/Com **Sunshine State** 1-800-432-4770 CATV **Sunshine State** 1-800-432-4770					
4d. Gov Fiber-Optics NMCI Mayport **POC:** David Ludwig @ Bldg 12 (904) 270-5053 E-mail david.ludwig@nmci-isf.com					
4e.Gov Com-Cable GEMD Mayport POC Vern Benson Bldg 450 (904)270-6148 Vern.benson@navy.mil					
4f. PWO Environmental Div **POC** Cheryl Mitchell Bldg 2021 (904)270-6730 Cheryl.Mitchell@navy.mil					
4g. Navy owned –copper (phone cable: **POC** John Buettgen NAS JAX (904)542-4569					

5. Permit Request Approval after locate (PW Engineering)

Name: C. Wayne Purifoy Signature_____ Date:_____

Comments:

Is excavation within or near areas of contamination?

Contractor Supervisor / Representative:

Name:_____ Signature:_____ Date:_____

Note: Locators shall initial and date Excavation Permit Request when locates are complete: **Provide copy to PW Engineering, FAX (904) 270-5115, Attn : C. Wayne Purifoy or e-mail:** carey.purifoy@navy.mil

Note: Contractor shall mark areas with white paint identifying where locates are being requested, Provide Map of area where locates are to be performed.

Note: Locators shall call requestor (1b) to identify locations of excavation, drilling or boring when area is not clearly marked.

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: HESE
Project No.: 112G00369

[] Surface Soil (SS)
[] Subsurface Soil (SU)
[] Sediment (SD)
[] Other:
[] QA Sample Type:

Sample ID No.: HESA-SB00 -000.5-20060331
Sample Location:
Sampled By: DS
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/31/2006	**Depth**	**Color**	**Description (Sand, Silt, Clay, Moisture, etc.)**
Time:	0.5		
Method: grab			
Monitor Reading (ppm 0			

COMPOSITE SAMPLE DATA:

Date:	**Time**	**Depth**	**Color**	**Description (Sand, Silt, Clay, Moisture, etc.)**
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	**Container Requirements**		**Collected**	**LAB**
8270	glass	4 oz		Accutest

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	**Duplicate ID No.:**

Signature(s):

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: _____ BORING NUMBER: _____
PROJECT NUMBER: _____ DATE: _____
DRILLING COMPANY: _____ GEOLOGIST: _____
DRILLING RIG: _____ DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	PID/FID Reading (ppm): Sampler BZ	PID/FID Reading (ppm): Borehole**	PID/FID Reading (ppm): Driller BZ**
													0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area
Background (ppm): [ ]

Remarks: _____

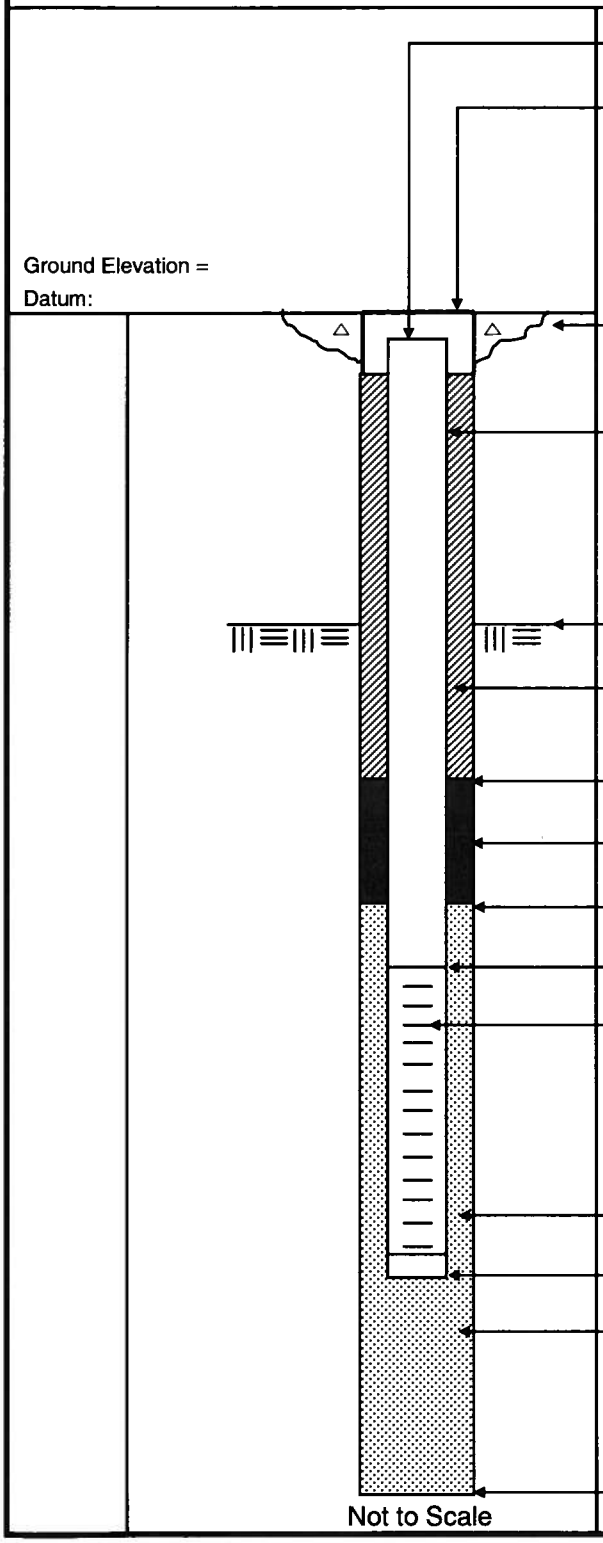
Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

WELL No.: _____

MONITORING WELL SHEET

PROJECT:		DRILLING Co.:		BORING No.:	
PROJECT No.:		DRILLER:		DATE COMPLETED:	
SITE:		DRILLING METHOD:		NORTHING:	
GEOLOGIST:		DEV. METHOD:		EASTING:	



Elevation / Depth of Top of Riser: ____ / ____

Elevation / Height of Top of Surface Casing: ____ / ____

I.D. of Surface Casing: _____

Type of Surface Casing: _____

Type of Surface Seal: _____

I.D. of Riser: _____

Type of Riser: _____

Borehole Diameter: _____

Elevation / Depth Top of Rock: ____ / ____

Type of Backfill: _____

Elevation / Depth of Seal: ____ / ____

Type of Seal: _____

Elevation / Depth of Top of Filter Pack: ____ / ____

Elevation / Depth of Top of Screen: ____ / ____

Type of Screen: _____

Slot Size x Length: _____

I.D. of Screen: _____

Type of Filter Pack: _____

Elevation / Depth of Bottom of Screen: ____ / ____

Elevation / Depth of Bottom of Filter Pack: ____ / ____

Type of Backfill Below Well: _____

Elevation / Total Depth of Borehole: ____ / ____

MONITORING WELL MATERIALS
CERTIFICATE OF CONFORMANCE

Well Designation:_____
Site Name: _____
Date Installed: _____
Project Name: _____

Site Geologist: _____
Drilling Company: _____
Driller:_____
Project Number: _____

Material	Brand/Description	Source/Supplier	Sample Collected ?
Well Casing			
Well Screen			
End Cap			
Drilling Fluid			
Drilling Fluid Additives			
Backfill Material			
Annular Filter Pack			
Bentonite Seal			
Annular Grout			
Surface Cement			
Protective Casing			
Paint			
Rod Lubricant			
Compressor Oil			

To the best of my knowledge, I certify that the above described materials were used during installation of this monitoring well.

Signature of Site Geologist:_____

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Site: _____ Depth to Bottom (ft.): _____ Project Name: _____
Well: _____ Static Water Level Before (ft.): _____ Project Number: _____
Date Installed: _____ Static Water Level After (ft.): _____ Site Geologist: _____
Date Developed: _____ Screen Length (ft.): _____ Drilling Co.: _____
Dev. Method: _____ Specific Capacity: _____
Pump Type: _____ Casing ID (in.): _____

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NAVSTA Mayport **Project No.:** 112G00538
Location: Building **Personnel:** T. Cottenoir
Weather Conditions: _____ **Measuring Device:** Heron
Tidally Influenced: Yes X No ___ **Remarks:** _____

Well or Piezometer Number MPT-	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	PID (ppm) BK/BH
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								
MW -								

ppm=parts per million; BK=background; and BH=borehole of the well.

* All measurements to the nearest 0.01 foot

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: _____ WELL ID.: _____

PROJECT NUMBER: _____ DATE: _____

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments

SIGNATURE(S): _____ PAGE___OF___

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: _____
Project No.: _____

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type: _____
[] QA Sample Type: _____

Sample ID No.: _____
Sample Location: _____
Sampled By: _____
C.O.C. No.: _____
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: / Time: / Method:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD **Duplicate ID No.:**

Signature(s):

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

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

PURGING DATA

WELL DIAMETER (in):	TOTAL WELL DEPTH (ft):	STATIC DEPTH TO WATER (ft):	WELL CAPACITY (gal/ft):

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

_____ Liters

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

_____ Liters

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 (Liters):

TIME	VOLUME PURGED (gal)	CUMUL. VOLUME PURGED (gal)	PURGE RATE (gpm)	DEPTH TO WATER (ft)	pH	TEMP. (^{O}C)	COND. (µmhos)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR	ODOR

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

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N	DUPLICATE: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (mL)	FINAL pH		
	3	CG	40 ml	HCL	40 ml		8260	SM
	2	AG	1L	--	1 L		8270	VT
	2	AG	1L	H2SO4	1L		TRPH	VT

REMARKS:

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

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

Naval Station Mayport Investigative Derived Waste Drum Log

Contractor Company Name: Tetra Tech NUS, Inc.

Individual Name:

Location Name:
(i.e. SWMU number, Bldg number)

Date of generation:

Expected date of results:

Drum Number: __various (See Table Below for additional info.)_____
(Use site # and unique drum number)

Drum No.	**Type of Waste** (i.e. drill cuttings, purge water)	**Hazardous Or Non-Haz**	**Quantity of Waste** (gals/lbs)	**Date**	**Group Generating Waste**	**Individual's Initials/ Name**

WEEKLY INVESTIGATIVE DERIVED WASTE INSPECTION CHECKLIST
NAVAL STATION MAYPORT

This form is to be completed legibly by the contractor when conducting weekly inspections of IDW drums.

All discrepancies shall be corrected immediately. Failure to correct discrepancy(s) shall result in contractual action.

Date: _____

Inspector: _____ _____

Company Name: _____TtNUS_____

		YES	NO
1.	Are all containers properly labeled/dated?		
2.	Are containers compatible with contents?		
3.	Are all containers in good condition?		
4.	Are containers closed?		
5.	Are lids/caps/bolts/rings tight?		
6.	Are any containers dated longer than 60 days?		
7.	Number of containers inspected.		
Comments:			
Date/nature of repairs or remedial actions:			
Copy to: NAVSTA Mayport N4E FAX: 270-7398 (EACH FRIDAY)			

Enclosure (2)

Revised 1/24/2006

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : _____ INSTRUMENT NAME/MODEL: _____

SITE NAME: MPT MANUFACTURER: _____

PROJECT No.: 112g00538 SERIAL NUMBER: _____

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
				Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		