

FFTF & MORS  
WORK PLAN



**Brown & Root**

Services

0009

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May 28, 1998

Project Number 7849

Navy Public Works Center  
ATTN: Diane Lancaster  
P.O. Box 5  
Code 184DL  
NAS Jacksonville  
Jacksonville, Florida 32212-5000

Reference: Clean contract No. N62467-94-D0888  
Contract Task Order No. 0061

Subject: Work Plan for the  
Former Fire Fighting Training Facility  
Gas Hill, and Hawkins/103<sup>rd</sup> Street Sites  
Naval Air Station Jacksonville  
Jacksonville, Florida

Dear Ms. Lancaster:

Brown & Root Environmental is pleased to submit for your review and approval the Work Plan for the Former Fire Fighting Training Facility, Gas Hill and Hawkins/103<sup>rd</sup> Street Sites at NAS Jacksonville in Jacksonville, Florida.

Subcontracts to initiate Phase I field activities are currently being prepared. Disposal of industrial derived wastes associated with this project will be coordinated through PWC JAX. It is anticipated that field investigation activities will be initiated in June 1998.

If you have any questions regarding this plan or require further information, please contact me at (904) 281-0400.

Very truly yours,

Samuel P. Pratt, P.G.  
Task Order Manager

SS/sp

Enclosures (1)

cc: Bryan Kizer (w/o enclosure)

Brown & Root International, Inc.



A Halliburton Company

**Work Plan**  
for  
**Former Fire Fighting Training  
Facility and Gas Hill and  
Hawkins/103<sup>rd</sup> Street**  
at

Naval Air Station Jacksonville  
Jacksonville, Florida



**Southern Division**  
**Naval Facilities Engineering Command**  
Contract Number N62467-94-D-0888  
Contract Task Order 0061

May 1998

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## 1.0 INTRODUCTION

Brown & Root Environmental (B&R Environmental) has prepared this Work Plan for the submittal of the Site Assessment Report (SAR) and a Remedial Action Plan (RAP) for the former Fire Fighting Training Facility (FFTF) and for implementing Monitoring Only Plans (MOPs) at the Gas Hill and 103<sup>rd</sup> Street Hawkins Properties at the Naval Air Station, Jacksonville, Florida. This Work Plan was prepared for the U.S. Navy (Navy) Southern Division (SouthDiv) Naval Facilities Engineering Command (NAVFACENGCOM) under Contract Task Order (CTO) 0061, for the Comprehensive Long-term Environmental Action Navy (CLEAN III) Contract Number N62467-94-D-0888.

The Work Plan provides the rationale for performing field activities associated with collecting data to evaluate petroleum hydrocarbons in the subsurface at the FFTF. Data collected during the investigations will be used to prepare a SAR. In addition, the Work Plan provides the general requirements for implementing the MOPs at the Gas Hill and Hawkins 103<sup>rd</sup> Street Sites. These MOPs will be performed in accordance with the monitoring plans developed by ABB Environmental.

### 1.1 GENERAL SITE LOCATION

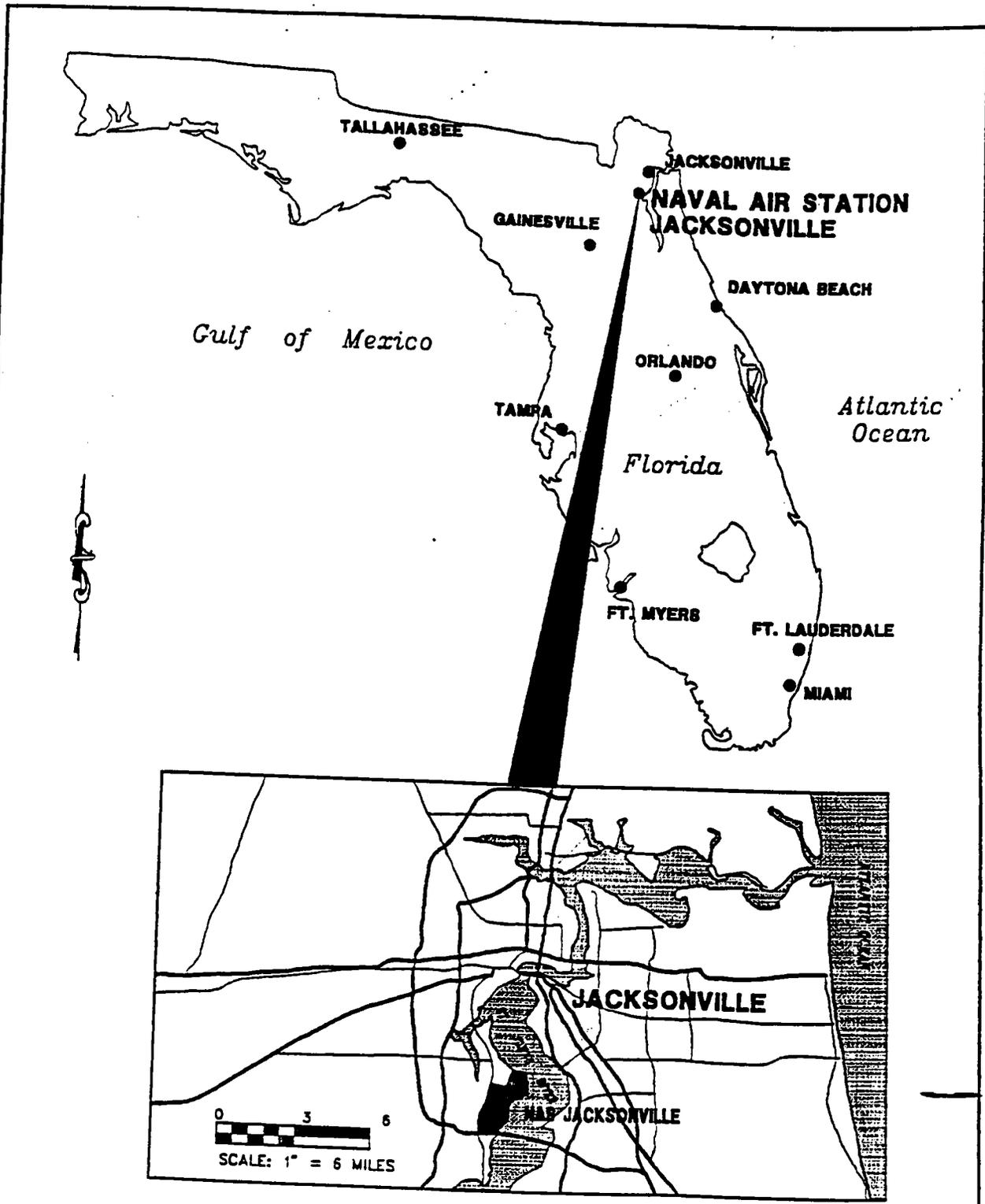
The FFTF is located at Naval Air Station Jacksonville (NAS JAX), within Operational Unit 2 (OU 2). A facility location map and a facility map are provided as Figures 1-1 and 1-2. The FFTF is depicted on Figure 1-3.

### 1.2 OBJECTIVE

The objective of the proposed field investigation at the FFTF is to evaluate the extent of petroleum hydrocarbons in subsurface soils and groundwater. The data collected during the investigations will be used to prepare a SAR as required by Chapter 62-770.630, FAC, and to evaluate the need for future remediation or monitoring at the FFTF. In addition, B&R Environmental will implement two MOPs for a period of one year. Activities associated with these MOPs will include quarterly groundwater sampling and report preparation.

## 2.0 SITE DESCRIPTION

The land incorporated into NAS JAX has been used for U.S. Navy operations since 1940. The FFTF is located within OU 2, which is located on the northern part of NAS JAX. Historically, OU 2 has primarily been used for domestic and industrial wastewater treatment. Sites within the operable unit have also been used for fire fighting training. The FFTF (Potential Source of Contamination [PSC] 2) is a shallow, unlined, circular pit, that is approximately 120 feet in diameter. No vegetation grows on the pit although the immediate surrounding areas are vegetated with grass.

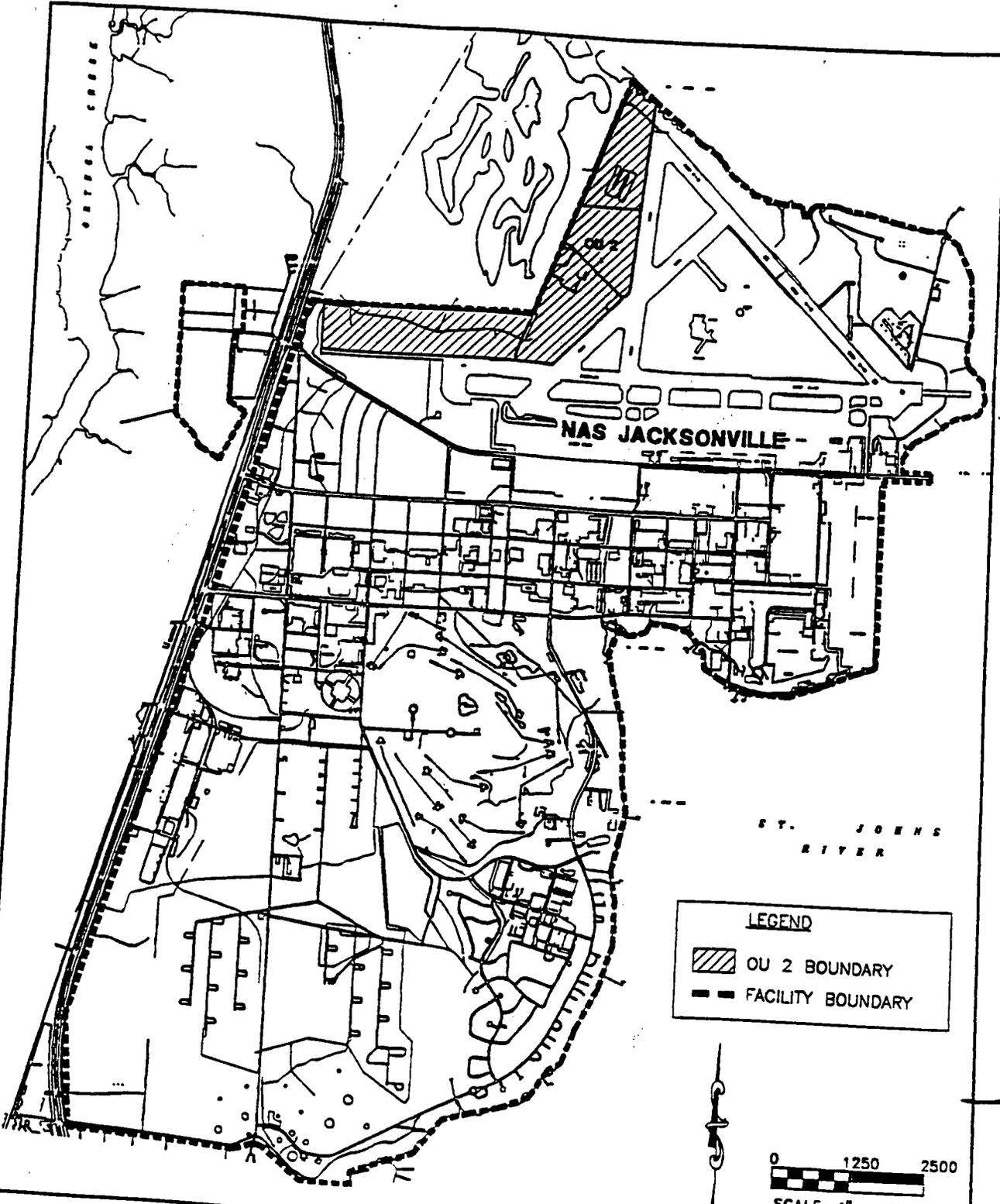


**FIGURE 1-1**  
**FACILITY LOCATION MAP**



**FOCUSED RI/FS**  
**REPORT**  
**FOR OU2**

**NAS JACKSONVILLE**  
**JACKSONVILLE, FLORIDA**

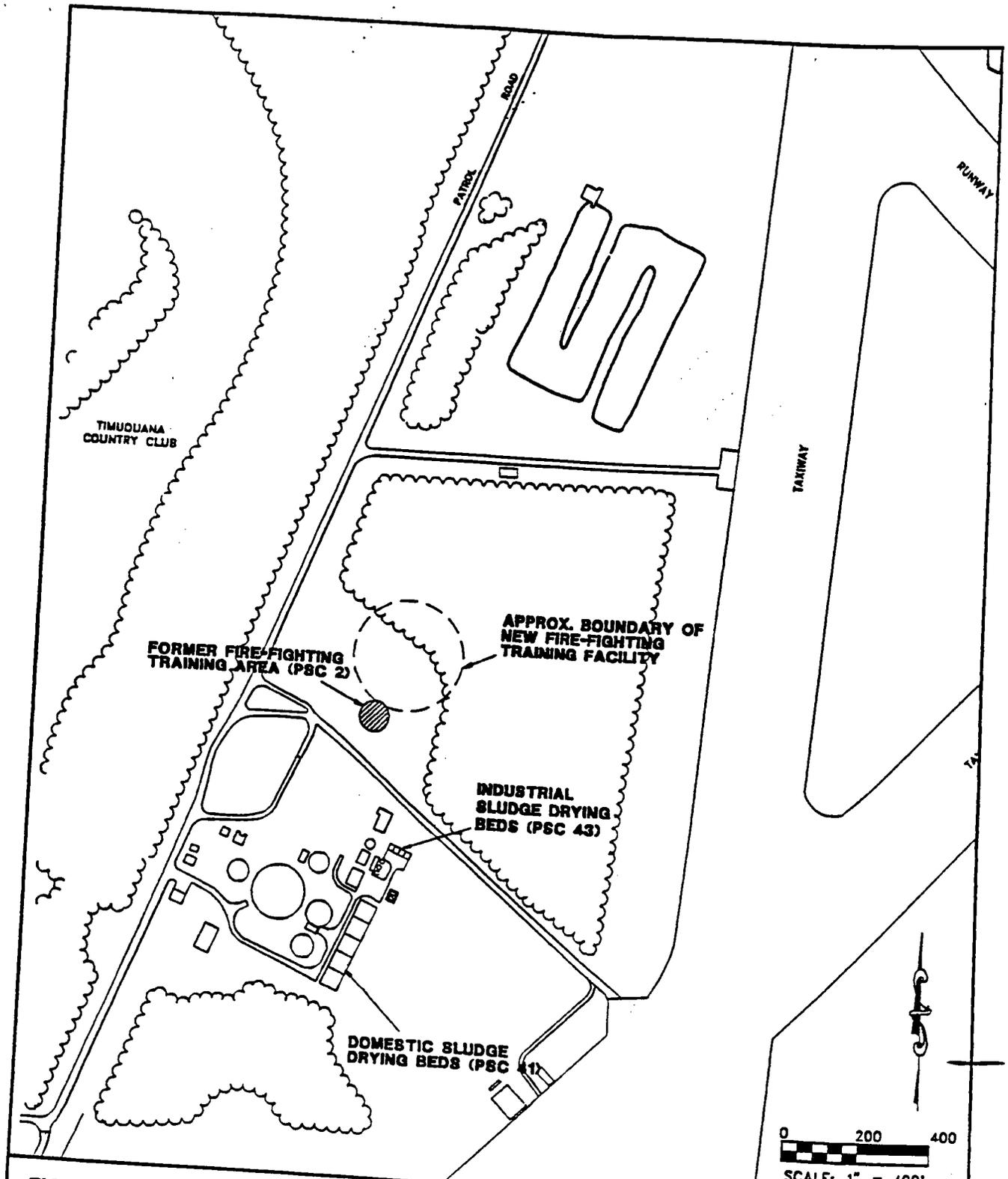


**FIGURE 1-2  
FACILITY MAP AND LOCATION  
OF OU2**



**FOCUSED RI/FS  
REPORT  
FOR OU2**

**NAS JACKSONVILLE  
JACKSONVILLE, FLORIDA**



**FIGURE 1-3  
SITE LOCATION MAP**



**FOCUSED RI/FS  
REPORT  
FOR OU 2**

**NAS JACKSONVILLE  
JACKSONVILLE, FLORIDA**

### 3.0 SITE HISTORY

The FFTF was previously investigated under the Installation Restoration (IR) Program as PSC 2. The PSC occupies a circular area with a diameter of approximately 120 feet. From 1966 to 1991, obsolete vehicle parts were periodically staged on the pit. The parts were covered with JP-4, JP-5 and aviation gasoline and then ignited to simulated aircraft crashes, which were extinguished during fire fighting training exercises. An estimated 6,000 gallons of fuel per year were disposed of on the PSC in this manner. Data gathered during a Focused Remedial Investigation and a Remedial Investigation prepared by ABB Environmental documented the presence of liquid phase product in wells installed in PSC-2. During a excavation project performed by Bechtel Environmental all of the petroleum impacted soil in PSC-2 was excavated from the site. The excavated soil was transported off site for thermal treatment, and the dig pit was back filled with clean soil. However, samples collected by ABB Environmental in December 1997 indicate the continued presence of free product and groundwater contamination at the site. Furthermore, based upon the presence of free product in at least two of the piezometers installed by ABB, the back filled soil in the FFTF is suspected have been re-contaminated due to fluctuations of groundwater elevations in the "smear" zone.

### 4.0 SCOPE OF PROPOSED ASSESSMENTS

The proposed scope of work for assessment activities will take place in two phases. Phase 1 will consist of performing a soil contamination assessment using direct push technology (DPT), such as a geoprobe, to collect soil and groundwater samples. These samples will be analyzed to delineate the horizontal and vertical extent of vadose zone soil contamination. In conjunction with the direct push soil boring installation, a mobile laboratory will be used to analyze the soil and groundwater samples for benzene, toluene, ethyl benzene, xylenes (BTEX) and Diesel Range Organics (DRO), to determine the optimum location and number of permanent monitoring wells. Following completion of Phase 1, a letter report will be submitted to the Navy and FDEP to propose locations of permanent monitoring wells to determine the aquifer's characteristics.

Phase 2 will involve the mobilization of a drill rig to install approximately six shallow monitoring wells and one deep monitoring well. The placement and construction of these wells will be based on ground water flow gradients, site lithology, and water quality data collected during the Phase 1 field investigation. Following well installation and development, groundwater samples will be collected from the newly installed wells. Slug tests will be performed on three shallow monitoring wells.

The relative top of casing elevation and horizontal location of all permanent monitoring wells installed during the contamination assessment will be surveyed with respect to horizontal and vertical datum of the USGS NAD'27 coordinate system.

#### 4.1 SOIL INVESTIGATION (Former Fire Fighting Training Facility)

The hydrocarbon soil contamination assessment will be conducted using DPT. This method of drilling is preferred due to the subsurface lithology, the presence of a shallow water table, and to minimize the volume of soil cuttings generated during boring activities.

Approximately 20 soil borings will be installed during the Phase 1 field investigation. Soil samples will be collected continuously to the water table in each of the borings. Vadose zone soils will be

screened for hydrocarbon vapors following procedures for headspace analysis as required by Chapter 62-770.200 FAC.

If soil contamination is identified above State Target Levels at any proposed boring location additional soil borings will be advanced to assess the areal extent of soil contamination. It is assumed 20 soil borings will provide sufficient areal coverage to delineate the soil contamination. Vadose zone soils will be collected from the zone of highest contamination, intermediate contamination, and low contamination (based on OVA and mobile laboratory data) in three of the DPT soil borings. These soil samples will be sent to a fixed-based laboratory for analysis for constituents of the Kerosene Analytical Group, as defined in Chapter 62-770, FAC. In addition, one soil sample will be collected and analyzed for total organic carbon (TOC) to evaluate the site's potential for natural attenuation.

A completed log of each boring will be maintained by the on-site geologist. At a minimum, the boring log will contain the following information:

- Sample Numbers and Types
- Sample Depths
- Sample Recovery/Sample Interval
- Soil Density or Cohesiveness
- Soil Color
- Unified Soil Classification System (USCS) Material Description
- Presence of Free Product (if applicable)
- Filtered / Unfiltered OVA Readings
- Mobile Laboratory Results

The site's lithology and soil quality will be assessed from soil samples collected during the soil screening survey. During drilling of the permanent monitoring wells (see Section 4.2), split-spoon samples will be collected from the boring positioned where the deep well will be installed. Grab samples from the auger flights will be collected during boring advancement from the shallow monitoring wells and logged.

#### **4.2 GROUNDWATER INVESTIGATION (Former Fire Fighting Training Facility)**

During the DPT investigation, groundwater samples will be collected at each boring location for on-site analysis. The samples will be collected using tygon tubing and a peristaltic pump. The samples will be placed into appropriate sample bottles and analyzed for BTEX and DRO constituents using a mobile lab equipped with a gas chromatograph (GC).

Three borings installed during the soil hydrocarbon vapor survey will be converted into temporary piezometer wells completed with well screen to intersect the water table. Relative groundwater elevations will be determined from static water level measurements collected from the piezometer wells and used to determine the groundwater flow direction across the site. The locations for the piezometer wells will be determined in the field based upon the judgement of the geologist on site.

The preliminary groundwater results from the DPT investigation, and the groundwater flow gradient across the site, will be used to evaluate the location of permanent monitoring wells. The sample results from the groundwater field screening investigation will be plotted on a map and permanent monitoring well locations will be selected based on the spatial distribution of identified constituents and the local groundwater flow pattern. It is anticipated that six shallow and one deep monitoring wells will be required to assess the horizontal and vertical extent of dissolved hydrocarbons. The installation of the monitoring wells will be completed during the Phase 2 field investigation.

Well installation permits will be obtained from the St. John's River Water Management District prior to drilling activities. Permanent monitoring wells will be installed using hollow stem auger drilling techniques. Monitoring wells will be constructed of 2-inch ID Schedule 40, flush-joint PVC riser and flush-joint 0.01 inch factory slotted well screen. Screen sections will be 10 feet in length and will be positioned to intersect the water table. After the borings are drilled to the desired depth, the well will be installed through the augers. A monitor well construction diagram will be completed for each well installed.

The monitoring wells will be developed no sooner than 24 hours after installation to remove fine sediment material from around the monitored interval of the well. Wells will be developed by bailing and surging, or by pumping, as determined by the field geologist. The pH, temperature, and specific conductance measurements will be collected from the purge water. Wells will be developed up to a maximum of one hour or until these measurements become stable and the purge water is visibly clear. Water quality stabilization will be determined using the following criteria: temperature  $\pm 0.5^{\circ}\text{C}$ , pH  $\pm 0.1$  unit, and specific conductivity  $\pm 10$   $\mu\text{mhos/cm}$ .

Groundwater samples will be obtained from monitoring wells used in the assessment investigations in accordance with B&R Environmental Comprehensive Quality Assurance Plan (FDEP Comp QA Plan No. 870055). Prior to obtaining samples, water levels and total well depths will be measured and the wells will be purged using a peristaltic pump and a low flow quiescent purging technique. Three to five well volumes will 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 at least 80 percent, then a sample will be collected. Field measurements of pH, temperature, and specific conductance will be taken after each volume of water is purged. Stabilization of the above parameters is defined in the previous paragraphs. If these parameters do not stabilize after three volumes, up to five volumes will be removed. Before purging, a clear bailer or an oil water interface probe will be used to check for free product. No samples will be collected from a well that exhibits measurable free product. The thickness of the free product will be measured and recorded. Samples will be obtained using a peristaltic pump using a low flow quiescent sampling technique. The samples will be transferred directly into the appropriate (pre-preserved) sample bottles for analysis. Samples to be analyzed for volatile constituents shall be taken first and immediately sealed in the vial so that no headspace exists. The sample constituents analyzed for each of the Sites are summarized in Table 4-1. All pertinent field and sampling data will be recorded using a groundwater sample form.

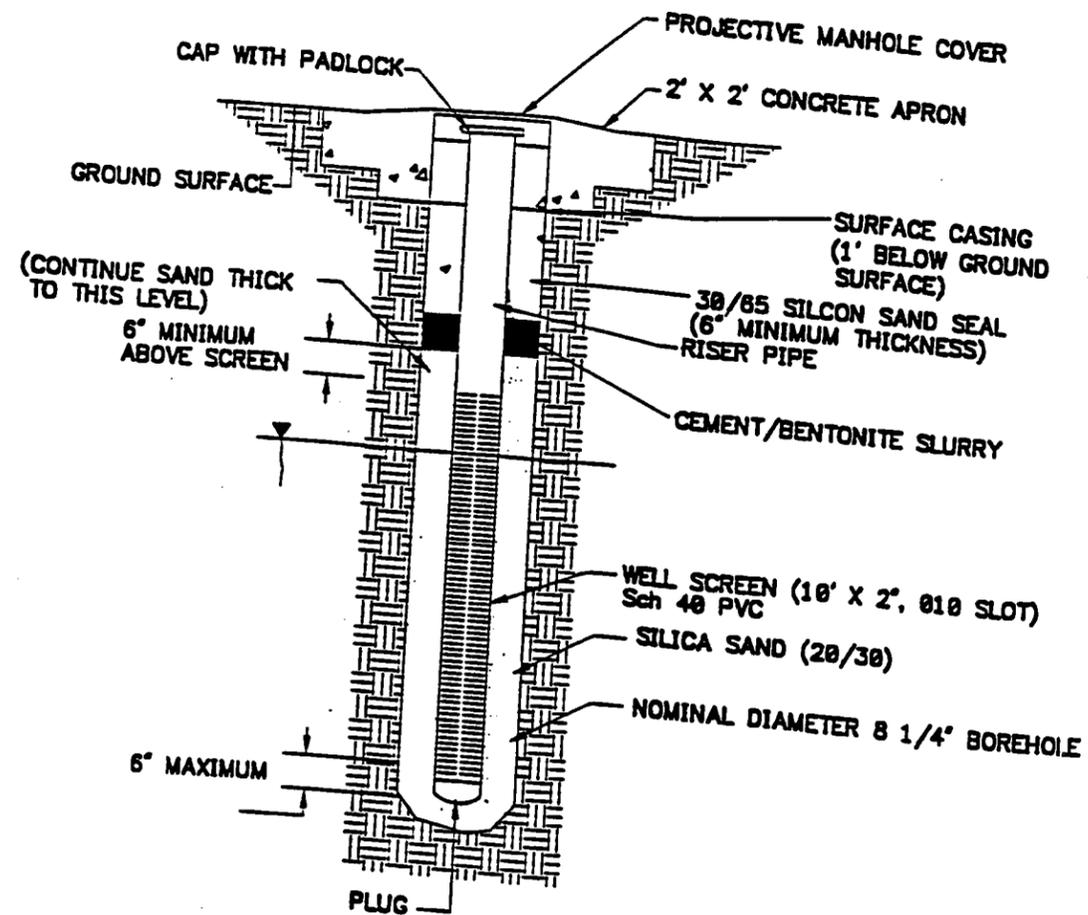
B&R Environmental will perform a series of duplicate aquifer slug tests on three selected shallow monitoring wells at the site. Each of these tests will be performed by removing a volume ("slug") of water from the well and measuring the recharge of the well back to equilibrium. The Bouwer and Rice methodology for partial penetrating wells in unconfined aquifers will be utilized to calculate the hydraulic conductivity values for the three monitoring wells as described by Bouwer, 1989, and Rice, 1976. Calculations will be performed using Aqtesolve™ aquifer characterizations program as described in Duffield and Rumbaugh, 1991.

#### 4.3 GAS HILL and HAWKINS MONITORING ONLY WORK PLAN SCOPE

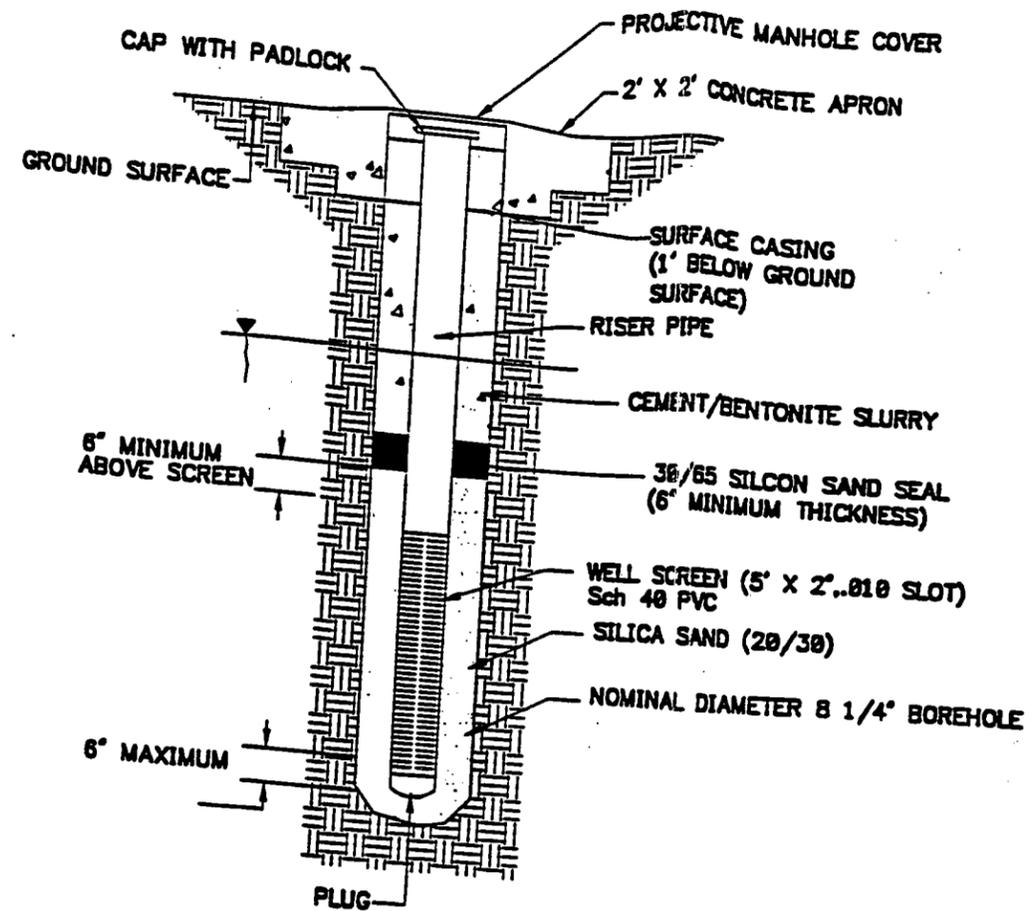
At the Gas Hill & Hawkins 103<sup>rd</sup> Street site locations, monitoring only work shall be performed which includes quarterly site visits to sample the designated groundwater monitoring wells, followed by the preparation of quarterly status reports. The monitoring at these sites shall continue for a period of one year. Work will be performed in accordance with the monitoring programs developed by ABB Environmental and approved by FDEP.

#### 4.4 GAS HILL & HAWKINS GROUNDWATER MONITORING

During quarterly groundwater sampling events, B&R Environmental will collect groundwater samples from the wells specified in FDEP approved monitoring plans.



TYPICAL FLUSHMOUNT CONSTRUCTION  
SHALLOW AQUIFER MONITORING WELL  
N.T.S.



TYPICAL FLUSHMOUNT CONSTRUCTION  
DEEP AQUIFER MONITORING WELL  
N.T.S.

SITE MANAGER:	CHECKED BY: -
DRAWN BY: HJP	DRAWING DATE: 3/4/98
SURVEYED BY:	SURVEY DATE:
SCALE: N.T.S.	
CAD DWG. NO.: 7586CD03	PROJ. NO.: 7586

**Tetra Tech** NUS, Inc.

FIGURE 4-1  
TYPICAL WELL CONSTRUCTION  
CONSTRUCTION DETAILS

At the Gas Hill site, B&R Environmental will collect samples from 17 monitoring wells (GH-6, GH-7, GH-8, GH-9, GH-13, GH-14, GH-15, GH-16, GH-17, GH-19, GH-20, GH-22, GH-23, GH-24, plus three additional wells which are to be installed by ABB-ES as described in a January 28, 1998 letter from FDEP to the Navy). Groundwater samples will be analyzed for EPA Method 602 and 610 constituents as defined by Chapter 62-770, FAC. Groundwater sampling will be performed in accordance with the methods described in Section 4.2.

At the Hawkins 103<sup>rd</sup> Street site, B&R Environmental will collect samples from 9 monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5R, MW-6R, KM-0, TM-2, TM-3). The groundwater samples will be analyzed for EPA Method 601, 602, 610, 418.1, 504, and 207 constituents, as defined by Chapter 62-770, FAC. **Table 4-2** is a summary of the sampling required for the Monitoring Plans at Gas Hill & Hawkins 103<sup>rd</sup> Street. Groundwater sampling will be performed in accordance with the methods described in Section 4.2.

**TABLE 4-1**  
**FIELD INVESTIGATION**  
**ENVIRONMENTAL SAMPLE SUMMARY**  
**Former Fire Fighting Training Facility**  
**NAS, Jacksonville, Florida**

Analyte	Proposed Method (1)	Env. Samples	IDW Samples (2)	Duplicate Samples	Rinsate Blanks (Aqueous)	Field Blank (Aqueous)	Trip Blanks (Aqueous)	Total Sample
<b>GROUNDWATER</b>								
VOH	EPA 601	76	1	1	1	1		11
VOA	EPA 602	76	1	1	1	1		11
PAH	EPA 610	76	1	1	1	1	2	13
LEAD	EPA 239.2	76	1	1	1	1		11
TRPH	FL-PRO	76	1	1	1	1		11
EDB	EPA 504.1	76	1	1	1	1		11
Nitrate	EPA 300	3						3
Sulfate	EPA 300	3						3
Methane	RSK SOPs 147 and 175	3						3
<b>SOIL</b>								
VOH	EPA 8010	3	1					4
VOA	EPA 8020	3	1				1	5
PAH	EPA 8100	3	1					4
LEAD	EPA 239.2	3						3
TRPH	EPA 9073	3	1					4
8 RCRA Metals	8 RCRA Metals		1					1
Total Halides	EPA 5050/9056		1					1
TOC		1						1
<b>TOTAL (Groundwater and Soil)</b>		<b>67</b>	<b>12</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>100</b>

- (1) Method referenced reflects FDEP requirements.  
 (2) IDW sample numbers based upon collection of one composite soil sample and one composite liquid sample.

All analyses are analyzed using standard 21-day laboratory turn around time.

**TABLE 4-2**  
**FIELD INVESTIGATION**  
**ENVIRONMENTAL SAMPLE SUMMARY**  
**Gas Hill, and Hawkins 103<sup>rd</sup> Street**  
**NAS, Jacksonville, Florida**

Analyte	Proposed Method (1)	Env. Samples	IDW Samples (2)	Duplicate Samples	Rinsate Blanks (Aqueous)	Field Blank (Aqueous)	Trip Blanks (Aqueous)	Total Samples
<b>GROUNDWATER</b>								
VOH	EPA 601	36/9		4/1	4/1	4/1		48
VOA	EPA 602	104/26		11/3	11/3	11/3	11/3	148
PAH	EPA 610	104/26		11/3	11/3	11/3		137
TRPH	FL-PRO	36/9		4/1	4/1	4/1		48
EDB	EPA 504.1	36/9		4/1	4/1	4/1		48
Metals	EPA 200.7	36/9		4/1	4/1	4/1		48
<b>TOTAL</b>		352		38	38	38	11	477

- (1) Method referenced reflects FDEP requirements.
- (2) IDW sample numbers based upon collection of one composite soil sample and one composite liquid sample.

All analyses are analyzed using standard 21-day laboratory turn around time.

Handwritten notes and numbers:

- 12 11 8 8
- 6 8 8
- 9 9
- 7 7
- VOA 4 12
- metals 2 3 3 4
- SOI 8 4

81  
BRE/JAX-05-98-001

#### 4.5 EQUIPMENT DECONTAMINATION

The equipment involved in field sampling activities will be decontaminated prior to and during drilling and sampling activities in accordance with B&R Environmental's SOP and CompQAP.

#### 4.6 WASTE HANDLING

Drill cuttings from well installations, well development water, and purge water will be collected and containerized in DOT approved (Specification 17C) 55-gallon drums. Each drum will be sealed, labeled and left at a drum staging area pending groundwater analytical results and/or composite waste sample results for disposal. A waste staging area will be established at the site to store investigative derived waste generated during the site assessment investigation. A lined decontamination pad will be constructed and used to collect the water from steam cleaning of drilling equipment. All decontamination materials generated during the site investigation will be containerized for proper disposal. Wastes disposal will be coordinated through the NAS JAX Public Works Center.

#### 4.7 SAMPLE HANDLING

Sample handling includes the field-related consideration concerning the selection of sample containers, preservatives, allowable holding times and analysis requested. In addition, sample identification, packaging, and shipping will be addressed. All sample handling procedures will be in accordance with B&R Environmental's FDEP approved CompQAP No. 870055.

#### 4.8 SAMPLE PACKAGING AND SHIPPING

Samples will be packaged and shipped in accordance with B&R Environmental's CompQAP. The field operations leader will be responsible for completion of 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

#### 4.9 SAMPLE CUSTODY

The chain-of-custody begins with the release of the 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 on the field logbook and on the chain-of-custody.

#### 4.10 QUALITY CONTROL (QC) SAMPLES

In addition to periodic calibration of field equipment and appropriate documentation, quality control samples will be collected or generated during environmental sampling activities. Quality control samples include field blanks, field duplicates, field replicates, and trip blanks. Each type of field quality control sample is defined as follows:

Rinsate Blank - Rinsate blanks are obtained under representative field conditions by running organic free water through sample collection equipment (bailer, split-spoon, etc.) after

decontamination and placing it in the appropriate containers for analysis. Rinsate blanks will be used to assess the effectiveness of decontamination procedures. Rinsate blanks will be collected for each type of non-dedicated sampling equipment used and will be submitted as shown in Table 4-1.

Field Duplicate - Field duplicate(s) are two water samples collected independently at a sample location during a single act of sampling under representative field conditions. Field duplicates sample frequencies are provided in Table 4-3. The duplicates shall be analyzed for the same parameters in the laboratory as indicated in Table 4-1.

Trip Blanks - Trip blank(s) will be prepared at the laboratory facility and will accompany the VOA vials to the sampling site and back to the laboratory. Trip blanks are not required by the FDEP unless 10 or more volatiles samples are collected during a given sampling event. Trip blank sample frequency are provided in Table 4-3.

TABLE 4-3

QUALITY CONTROL SAMPLE FREQUENCY  
COASTAL SYSTEMS STATION, PANAMA CITY, FLORIDA

# of Samples	Precleaned Equipment BLK	Field cleaned Equipment BLK	Trip BLK (VOCs)	Duplicate
10+	minimum of one then 5%	minimum of one then 5%	one per cooler	minimum one then 10%
5-9	one*	one*	NR	one
< 5	one*	one*	NR	NR

NR = Not required  
BLK = Blank

\* Note: For 9 or fewer samples, a precleaned equipment blank or a field cleaned equipment blank is required. A field cleaned equipment blank must be collected if equipment is cleaned in the field.

4.11 **SITE MANAGEMENT AND BASE SUPPORT**

B&R Environmental will perform this project with support from the Navy. This section of the Work Plan describes the project contacts, support personnel, project milestones and time frames of all major events.

Throughout the duration of the investigation activities, work at NAS JAX be coordinated through SouthDiv and NAS JAX personnel. The primary contacts are as follows:

1. SouthDiv Engineer in Charge  
Mr. Brian Kizer  
(803) 820-5596
2. NAS JAX Engineering Officer  
Ms. Diane Lancaster  
(904) 542-2717\*119

The following support functions will be provided by NAS JAX personnel:

- Assist B&R Environmental in locating underground utilities prior to the commencement of drilling operations.
- Provide existing engineering plans, drawings, diagram, files, etc., to facilitate evaluation of the Site under investigation.
- Provide all historical data, background geological and hydrogeological information, and initial site investigation documents.

NAS JAX personnel will aid in arranging the following:

- Personnel identification badges, vehicle passes, and/or entry permits.
- A secure staging area (approximately 1,000 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 etc.
- As required, provide escorts for contract personnel working in secured areas.
- Establish a decontamination area and waste staging area located adjacent to or near the study area.

The project will be staffed with personnel from the B&R Environmental's Jacksonville, Florida offices. During field activities, B&R Environmental will provide a senior level geologist and/or staff geologist, and equipment technician(s).

Mr. Sam Pratt, P.G., is the Task Order Manager (TOM) for CTO 0061 and will be the primary point of contact. He is responsible for cost and schedule control as well as technical performance. Mr. Pratt is a Florida Licensed Professional Geologist and will serve as the TOM and will provide senior level review and oversight during field activities. Mr. Pratt will be the primary point of contact for the Field Operations Leader.

#### **4.11.1 Contingency Plan**

In the event of problems which may be encountered during site activities, the SouthDiv point of contact will be notified immediately, followed by the B&R Environmental project manager and the NAS JAX point of contact. The project manager will determine a course of action so as to not interfere with the schedule or budget. All contingency plans will be approved through the SouthDiv point of contact before being enacted.

## **5.0 PROPOSED LABORATORY ANALYSIS**

Groundwater samples (collected from the monitoring wells) and soil samples collected for laboratory analyses will be analyzed in accordance with parameters as identified in Chapter 62-770.800 (see Sections 5.1 and Section 5.2 below for specific sampling requirements regarding soil and groundwater).

## 5.1 SOIL INVESTIGATION

Three soil samples will be collected and analyzed for constituents in the Kerosene Analytical Group as defined by Chapter 62-770.800, FAC Parameters within these groups are identified on Table 4-1. The soil samples will be collected from three borings (one sample per boring) advanced during the soil hydrocarbon vapor assessment. One sample will be collected from each boring located in the area of highest, lowest and intermediate contaminant zones (respectively) as indicated in the Phase 1 screening.

## 5.2 GROUNDWATER INVESTIGATION

Groundwater samples at the former fire fighting facility will be collected from each newly installed permanent monitoring wells and analyzed for parameters in the Kerosene Analytical Group in accordance with Chapter 62-770.800, FAC A groundwater environmental sampling summary and a summary of Investigative Derived Waste sample parameters are summarized in Table 4-1. Twenty-six wells will be sampled at the Gas Hill and Hawkins 103<sup>rd</sup> Street sites per the sampling summary shown in Table 4-2.

## 6.0 PROPOSED SCHEDULE

Phase 1 of the field work is proposed to begin in June 1998 and take approximately 5 days to complete. Phase 2 of the field work will begin following review and approval of the proposed permanent monitoring well locations by the FDEP and Navy. The SAR developed with the completion of Phase 2 field activities will be completed and submitted to the Navy for review approximately 60 days after Phase 2 sampling activities are completed.

Depending on the recommendations of the approved SAR, either a RAP, MOP, or a No Further Action Proposal (NFA) will be developed and submitted to the FDEP. It is anticipated the MOP or RAP will be submitted to the Navy for review approximately 60 days after field activities for the RAP or MOP are completed. The remedial technology considered for site remediation will be determined based on the findings presented in the SAR.

The MOPs at Gas Hill & Hawkins 103<sup>rd</sup> Street are scheduled from June of 1998 through May of 1999. During this year duration, quarterly site visits shall be made to sample the designated groundwater monitoring wells.

## 7.0 REPORTS

Upon completion of all field work and laboratory analysis, a SAR summarizing the results of the investigation will be submitted to the FDEP. Basic site information including site Facility Identification Number, facility name and address, date closed, area, type of system and capacity will be provided. Also included in these reports will be graphical presentations of the groundwater screening results, and complete summaries of the soil and groundwater analytical results. The locations of the soil samples and monitoring wells will be presented on scaled figures. Boring logs, chain-of-custody forms, field forms, field screening results, and analytical reports will be included in Appendices of the report.

The report will include a determination if remediation is required in accordance with Chapter 62.770 F.A.C action levels for soil and groundwater remediation. If remediation is deemed appropriate, a recommended remediation technique will be presented with an implementation schedule. A Responsibility Assignment Matrix, and meeting with Remedial Action Contractors (RACs) to discuss the results of the contamination assessment will be developed, scheduled, and implemented.

The Monitoring only reports for Gas Hill and Hawkins 103<sup>rd</sup> Street are to be submitted within 60 days of quarterly sampling events. The MOP reports will include a summary of the quarterly groundwater analytical results and tables and figures depicting the events of the current quarterly monitoring.

## 8.0 REFERENCES

Bouwer, H., 1989. The Bouwer and Rice Slug Test - an Update. *Groundwater*, v. 27, pp. 304-309.

Bouwer, H. and R. C. Rice, 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells. *Water Resources Research*, V. 12, pp. 423-428.

Brown & Root Environmental, 1995 Revision. Comprehensive Quality Assurance Plan, FDEP COMP QA PLAN # 870055.