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PRELIMINARY CONTAMINATION ASSESSMENT PLAN AND SITE SPECIFIC HEALTH AND SAFETY PLAN FOR SITE 119 NAS JACKSONVILLE FL

8/1/1994

ABB ENVIRONMENTAL

PRELIMINARY CONTAMINATION ASSESSMENT PLAN AND SITE-SPECIFIC HEALTH AND SAFETY PLAN

SITE 119
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

Contract Task Order No. 108

Contract No. N62467-89-D-0317

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FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments (HSWA) of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, primarily petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act (RCRA) of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations, Title 40, Part 280 (Title 40 CFR 280), *Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks*, and Title 40 CFR 281, *Approval of State Underground Storage Tank Programs*. Title 40 CFR 280 was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This report was prepared to satisfy the requirements of Chapter 17-770, Florida Administrative Code (FAC), *State Underground Petroleum Environmental Response*, regulations pertaining to petroleum contamination in Florida's environment as a result of spills or leaking tanks or piping.

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
AST	aboveground storage tank
AVGAS	aviation gasoline
bls	below land surface
CFR	Code of Federal Regulations
CompQAP	Comprehensive Quality Assurance Plan
EDB	ethylene dibromide
ERC	Environmental Restoration Company
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
FOL	Field Operations Leader
GC	gas chromatograph
HSWA	Hazardous and Solid Waste Amendments of 1984
ID	inside diameter
IDW	investigative derived waste
IR	Installation Restoration
MOGAS	motor vehicle fuel
msl	mean sea level
NADEP	Naval Aviation Depot
NAS	Naval Air Station
OVA	organic vapor analyzer
PCA	Preliminary Contamination Assessment
PCAP	Preliminary Contamination Assessment Plan
PCAR	preliminary contamination assessment report
PCE	perchloroethene
PID	photoionization detector
ppm	parts per million
PVC	polyvinyl chloride
PWC	Public Works Command
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RESD	Regulatory and Environmental Services Department
RI/FS	Remedial Investigation and Feasibility Study
SOUTHNAVFACENGCOM	Southern Division, Naval Facilities Engineering Command
SSFP	Scoping Study Field Program
SWDA	Solid Waste Disposal Act of 1965

GLOSSARY (Continued)

TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TOC	top of casing
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
VOAs	volatile organic aromatics
WWTP	wastewater treatment plant

1.0 INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), has been contracted by the Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to prepare a Preliminary Contamination Assessment Plan (PCAP) for the Site 119 aboveground and underground storage tanks (UST) at the U.S. Naval Air Station (NAS), Jacksonville, Florida. The PCAP outlines a strategy for the field investigation and sampling program that will provide preliminary screening data to characterize and estimate the extent of soil and groundwater contamination at the site. Because non-petroleum contamination may be present in the soil and groundwater, these data will also be used to determine if the site will remain in the UST program or will be transferred to the Installation Restoration (IR) program. The PCAP includes a site description and background information, and a schedule for implementing the Preliminary Contamination Assessment (PCA).

2.0 BACKGROUND

2.1 SITE DESCRIPTION. NAS Jacksonville is located along the west bank of the St. Johns River east of Highway 17 and north of Interstate 295 (Figure 2-1). The Site 119 tanks are located in the northeast area of NAS Jacksonville, immediately south of the east end of the 9/27 taxiway and east of Bravo taxiway (see Figure 2-2). The area between Site 119 and the St. Johns River to the east includes a grass covered field in the northern half and an asphalt-paved parking lot for fuel trucks in the southern half. South of Site 119 and the fuel truck parking lot is the remaining part of the aircraft refueling complex, which operates under the Fuels Branch, Logistics Division, of NAS Supply Department. The southern section of the site is bounded on the east by Bravo taxiway, on the south by Albemarle Avenue, and on the west by Catapult Road (the access road to Facility 159, the bulk fuel farm located north of the airstrip).

Within the complex are two 10,000-barrel-capacity aboveground storage tanks (ASTs, Facility 120 and 1982), each with bermed concrete secondary containment. Both ASTs are used to store No. 6 heating oil and are owned by Public Works Command (PWC). The supply lines originate southeast of the ASTs at Pier 139, and the distribution lines extend from the ASTs to the pump station (Facility 1937) and then to the steam plants. There are also two waste oil ASTs, Tank 120A and 120B, which have 11,400- and 10,000-gallon capacities, respectively. Both tanks are within one concrete secondary containment area. Other noteworthy facilities in the complex include a JP-5 truck loading station (Facility 1963) and Building 24, which houses an office, a fuel testing laboratory, and a fuel truck repair shop.

Site 119 originally consisted of 16 27,000-gallon USTs (from south to north, labeled 119-A, 119-B, 119-C, 119-D, 119-I, 119-J, 119-K, 119-L, 119-Q, 119-R, 119-S, 119-T, 119-Y, 119-Z, 119-AA, and 119-AB). Eleven of the tanks (119-I, 119-J, 119-L, 119-Q, 119-R, 119-S, 119-T, 119-Y, 119-Z, 119-AA, and 119-AB) have been abandoned in place (filled with sand or water), and the other four tanks (119-A, 119-B, 119-C, and 119-D) were taken out of service in 1991. Tank 119-K was removed in 1987 and had been used to store paint wastes generated at the Naval Aviation Depot (NADEP). Historically, the tanks have been used to store a variety of petroleum products, including leaded and unleaded gasoline, JP-4, aviation gasoline (AVGAS) 115/145, No. 2 heating fuel oil, kerosene, lubricant, and waste oil. All 16 USTs were constructed of painted or asphalt-coated steel and were installed along a north to south line with their long axes oriented east to west. The 15 USTs remaining at the site are grouped into three sets of four tanks (two pairs of two), and one set of three tanks (originally there were four before Tank 119-K was removed). The southernmost set of USTs (119-A, 119-B, 119-C, and 119-D) has an associated fill-port pad and dispenser island. The other USTs received fuel from Facility 159, Pier 139, and the railroad unloading point directly south of the tanks. These 11 USTs were connected to a truck-loading stand (Facility 1963) to the southeast, where the fuel was distributed. All pipe lines associated with the Site 119 USTs are now out of service; Facility 1963 receives JP-5 directly from Facility 159 via a supply line installed in 1983.

Fuel was originally pumped from the Site 119 USTs using a water lift system. Water was pumped into the bottom of the UST to push the fuel out and into a holding tank (trap), where it was pumped to the truck loading stand. At one time

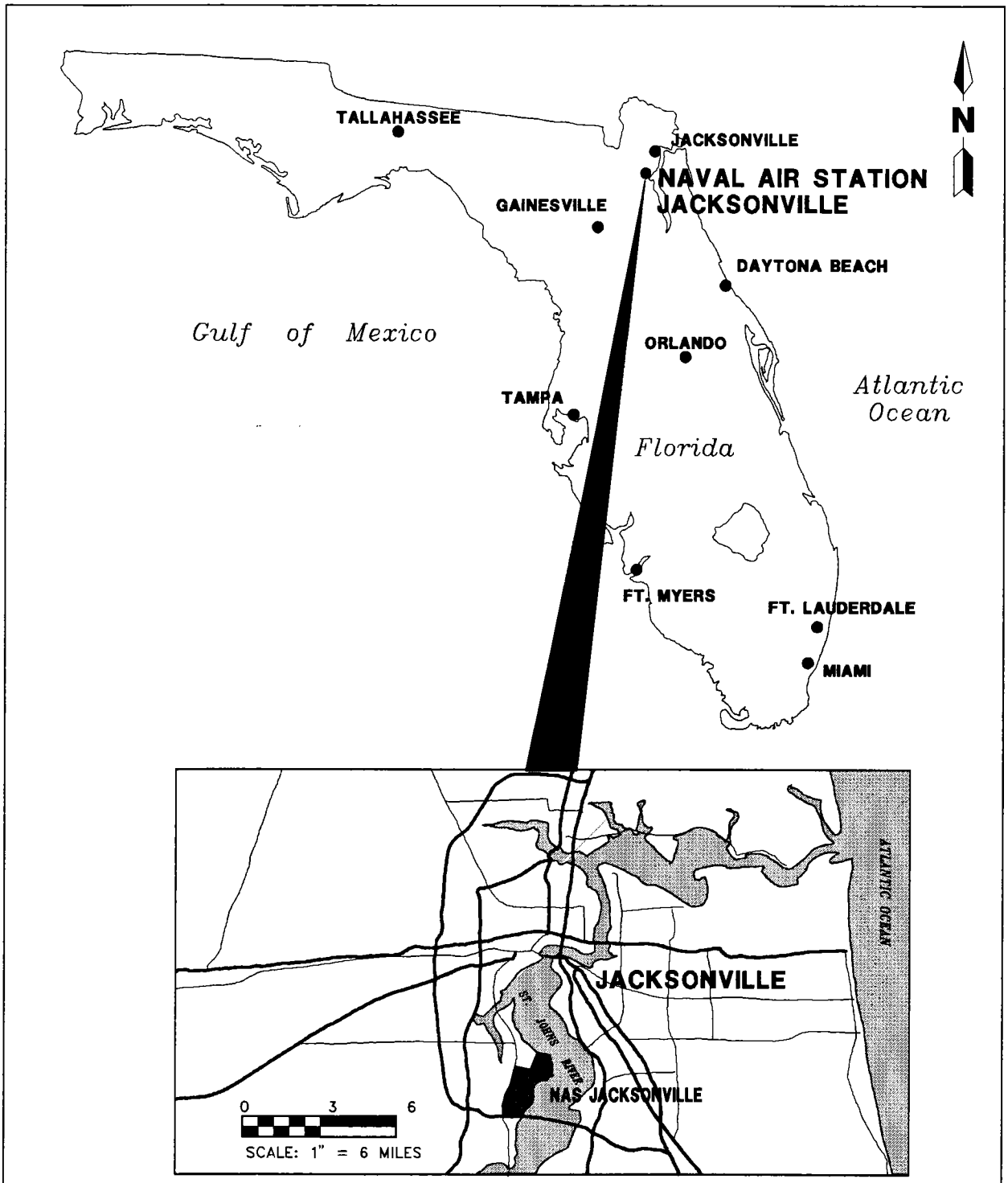

FIGURE 2-1
FACILITY LOCATION MAP

JAX/JAXSITE/DRM-WDW/0811-94

PRELIMINARY CONTAMINATION ASSESSMENT PLAN
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there were concrete fuel trap and control pits with slatted wood covers located on the west side of each pair of USTs. The trap and control pits housed the water lift control valves and a 300-gallon holding tank. Only four of these trap and control pits remain. When the USTs were refilled with fuel, the water was drained to a sewer line that discharged the water to the St. Johns River after passing through an oil-water separator. There are numerous other concrete pits along product and water lines, and one above each UST, that provide access to valves.

2.2 SITE HISTORY. All of the Site 119 USTs, except two, were installed in 1941. Tanks 119-Y and 119-Z were installed in 1953. Tank 119-K, which was last used to store paint waste generated at NADEP, was removed in 1987. The Resource Conservation and Recovery Act (RCRA) closure of Tank 119-K was supervised by G.A.I. Soil from the bottom of the excavation was sampled and analyzed by Enviropact, Inc. The organic vapor analyzer (OVA) and laboratory (U.S. Environmental Protection Agency [USEPA] Method 8020) data indicated that aromatic hydrocarbons were not detected in the soil. Groundwater samples were not collected. Tanks 119-Y, 119-Z, 119-AA, and 119-AB, the northernmost set that is now under the 9/27 taxiway, were abandoned in place in 1989. Tanks 119-I, 119-J, 119-L, 119-Q, 119-R, 119-S, and 119-T were abandoned in place (filled with sand) in March and April 1993 by Environmental Restoration Company (ERC) and their subcontractor, Barrington Petroleum Contractors. The tank closure report indicates that petroleum contamination was detected in the soil and groundwater associated with Tanks 119-J and 119-T (Tables 2-1 and 2-2). Tanks 119-A, 119-B, 119-C, and 119-D were emptied and cleaned in 1991 and have been out of service since that time, though not formally closed. Tanks 119-Q, 119-R, 119-S, and 119-T were taken out of service before 1970.

From 1941 to 1943, fuel was supplied to the Site 119 tanks from Pier 139 and railroad tank cars. In 1943, the bulk fuel farm (Facility 159, Tanks 159-A through 159-I) was constructed and also supplied fuel via four supply lines. In 1953, the new fueling pier (Facility 142) and four new tanks at Facility 159 (159-L through 159-O) were completed, which replaced Pier 139 for fuel supply. The year before 1952), the truck-loading stand (Facility 1963) was built where Tank 1982 is now located and was connected directly to Facility 159 by three new supply lines. Facility 1963 was relocated in late 1961 to its present location. A new JP-5 supply line replaced the three older lines in 1983. It is not known where the dispenser(s) for the Site 119 tanks were located before 1952. The fuel-port pad and dispenser island (Facility 1988 and 1987, respectively) for Tanks 119-A through 119-D were constructed in 1957, replacing the original supply line and water-lift dispensing system. Another dispenser island (Facility 239) was located west of Tank 119-K, which is estimated to have been in operation from about 1957 to about 1970. It is not known whether the dispenser(s) pumped from Tanks 119-K or 119-L, or both. Today, fuel trucks that refuel aircraft with JP-5 are loaded solely at Facility 1963. Two dedicated fuel trucks receive fuel from a vender supply truck; one truck dispenses AVGAS 115/145, and the other dispenses motor vehicle fuel (MOGAS). The two dedicated fuel trucks are parked in the paved area east of Site 119 when not in use.

The area east of Tanks 119-A through 119-J, which is now an asphalt-paved parking lot for fuel trucks, was the site of the "east side" trickling filter wastewater treatment plant (WWTP) for the base. The east side plant operated from 1940 to 1972, when it was taken out of service and the flow directed to the west side

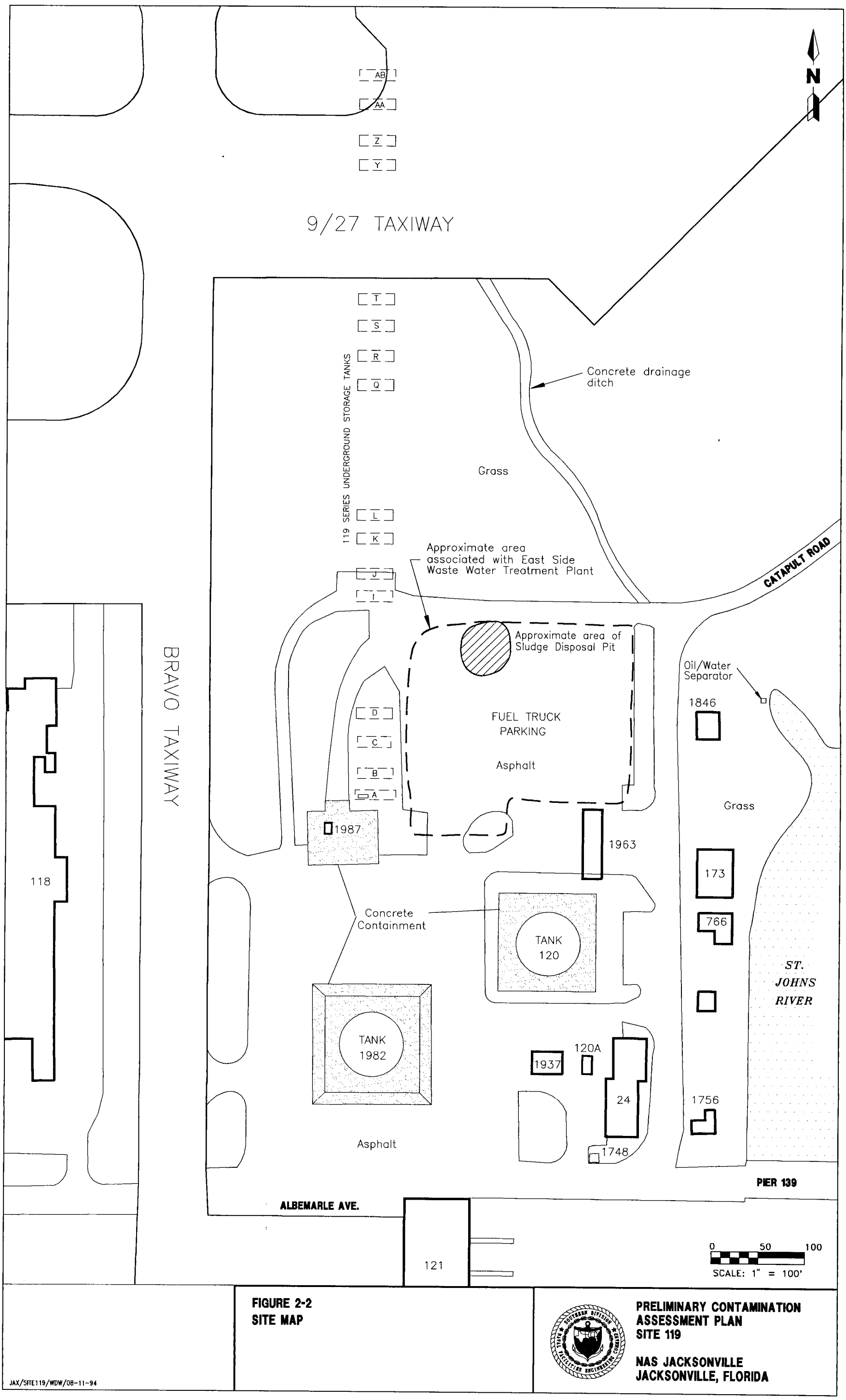

FIGURE 2-2
SITE MAP

PRELIMINARY CONTAMINATION ASSESSMENT PLAN
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JAX/SITE119/WDW/08-11-94

Table 2-1
Soil Sample Organic Vapor Analyzer (OVA) Results, March 15, 1993

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Sample No.	Sample Location	Depth (feet bls)	OVA Results[1] (ppm)
17	North side, east end, 119-T	2	3,700
		4	4,870
		5	4,870
22	South side, east end, 119-S	4	46
		6	110
23	West end, 119-J	4	34
		6	3,070
		8	4,870
24	West end, 119-I	6	1,400
		8	4,870
25	South side, west end, 119-I	6	1,800

[1] Calculated OVA results after subtracting methane concentrations.

Source: Environmental Restoration Company (ERC), 1993, Tank Closure Report.

Notes: bls = below land surface.
ppm = parts per million.

Table 2-2
Select Analytical Results of Groundwater Samples, March 16, 1993

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Contaminant	Sample Point Identifier				Regulatory[1] Standards for Class G-II Groundwater
	MW-1	MW-2	MW-3	MW-4	
Volatile Organic Aromatics (VOAs) (USEPA Method 624 modified), ppb					
Benzene	4.9	ND	ND	ND	1
Ethylbenzene	6.9	ND	ND	ND	
Toluene	22.2	ND	ND	ND	
m + p-Xylenes	18.7	ND	ND	ND	
o-Xylene	4.9	ND	ND	ND	
Total VOA	57.6	ND	ND	ND	50
Naphthalenes (USEPA Method 610), ppb					
1-Methylnaphthalene	52	ND	ND	ND	
2-Methylnaphthalene	45	ND	ND	ND	
Naphthalene	18	66	ND	ND	
Total naphthalenes	115	66	ND	ND	100

[1] Chapter 17-770.730(5a), Florida Administrative Code (FAC).

Source: Environmental Restoration Company (ERC) 1993, Tank Closure Report.

Notes: USEPA = U.S. Environmental Protection Agency.
ppb = parts per billion.
Total VOA = the sum of the concentrations of benzene, ethylbenzene, toluene, and xylenes.
Total Naphthalenes = the sum of the concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene.

plant. Both WWTPs treated domestic wastewater; however, the east side plant had also treated industrial wastewater since 1961. Therefore, in 1972 the west side plant was not only expanded to handle the additional flow, but was also upgraded to treat the industrial wastewater by aerobic sludge digestion. From 1961 to 1972, industrial wastewater was treated at the east side plant where a primary clarifier removed paint chips by settling and oils and solvents by skimming. The sludges were collected in the hopper, then periodically pumped into a truck and transported to the base landfill. When this practice was prohibited, the sludges were taken to an offsite disposal facility. Effluent from the primary clarifier was chlorinated before being discharged into the St. Johns River. Sludges from the domestic digesters and the sludge drying beds were disposed in a pit on the site. The east side plant was demolished in 1974. The approximate location of the sludge disposal pit is shown on Figure 2-2.

3.0 SITE CONDITIONS

3.1 REGIONAL PHYSIOGRAPHY NAS Jacksonville is located in the Atlantic Coastal Lowlands physiographic province, which in northeast Florida encompasses a series of ancient marine terraces. These terraces mark the ocean bottom during the Pleistocene Epoch when the sea, having transgressed beyond the present shoreline, remained stationary for long periods as it regressed episodically. With each episode of sea regression, the former sea floor became exposed as a flat plain, and a low scarp and sand dune ridge along the landward edge marked the abandoned shoreline. Seven terraces are recognized in Duval County, but the flat plains and abandoned shorelines have been dissected and eroded by streams, leaving only remnants of the original terraces. NAS Jacksonville lies mostly on the Pamlico Terrace (10 to 25 feet above mean sea level [msl]), but traces of the lower Silver Bluff Terrace (0 to 10 feet above msl) exist along the St. Johns River.

NAS Jacksonville is situated on a peninsular plateau between the St. Johns River and the Ortega River. Surface water drainage is directed by topographic features to either river.

3.2 SITE-SPECIFIC PHYSIOGRAPHY. Site 119 lies on a remnant of the Silver Bluff Terrace, near the west bank of the St. Johns River. The topography in the area is fairly even, sloping slightly to the St. Johns River. The elevation is approximately 3 to 4 feet above msl. Site 119 is located near the southern edge of a point called Piney Point, which was formed by a bend in the St. Johns River to the west. Surface drainage is directed by ditches or grading to stormwater drains that discharge into the St. Johns River. Within the aircraft refueling complex, stormwater lines have gate valves to control the discharge in case of a petroleum spill.

3.3 REGIONAL HYDROGEOLOGY. In northeastern Florida, the distribution of sediments is controlled by the Peninsular Arch and the Southeast Georgia Embayment. More than 1,500 feet of Eocene Age and younger sediments were deposited in the region.

The underlying unconsolidated geologic sequence consists of flat-lying deposits of sand, silt, and clay overlying a thick sequence of marine carbonates. The three discernible underlying geologic units in the region are: (1) the surficial deposits, which form a unit approximately 40 to 100 feet thick and are of Late Miocene to Recent Age; (2) the Hawthorn Group, which is approximately 300 feet thick and of middle Miocene Age; and (3) the marine carbonate sequences of the Floridan aquifer system, which are of Eocene Age and comprise a unit greater than 1,000-feet thick.

The Ocala Group is composed of Eocene Age limestone formations, which are the principal consolidated formations near NAS Jacksonville. The Eocene Age limestone formations in Duval County slope northeastward and form an irregular trough or basin, which extends from south-central Duval County northeastward into northeastern Nassau County.

3.3.1 Shallow Aquifer The surficial deposits consist of sediments of upper Miocene Age and younger, and comprise the shallow aquifer. Surficial deposits

can be divided into undifferentiated sediments of Pleistocene and Recent Age and sediments of upper Miocene and Pliocene Age. These sediments were deposited in lagoon and estuarine environments. The Pleistocene and Recent Age sediments extend from the surface to about 40 feet below land surface (bls). These highly variable sediments include quartz sand, shelly sand, coquina, silt, clay, and shell beds. Iron oxide-cemented (rusty red color hardpan) fine-grained sand sediments are common in the upper part of the surficial deposits. Upper Miocene and Pliocene sediments consist of interbedded silty clay and clayey sand; sand; shell; and soft friable limestone prevalent at the base of these deposits. The contact between the upper Miocene and Pliocene deposits and the underlying Hawthorn Group is an unconformity identified by a coarse phosphatic sand and gravel bed (Leve, 1968). When coarse-grained phosphatic sand and gravel are not present, the contact is phosphatic sandy clay or clayey sand, dolostone, or a magnesium-rich clay.

The shallow aquifer beneath central and eastern Duval County is composed of a series of permeable zones separated by confining or semi-confining beds. The groundwater flow direction in the water table zone tends to reflect the surface topography of the area. Groundwater in this zone generally flows from higher to lower topographic areas or discharge areas (e.g., springs or streams that intersect the water table). Throughout much of NAS Jacksonville, the water table zone flows generally east toward the St. Johns River, west toward the Ortega River, or to smaller tributaries of these two principal drainage basins.

The shallow aquifer is recharged by local precipitation. The average annual precipitation for Duval County is 52 to 54 inches. Water level hydrography indicates that 10 to 16 inches of rainfall recharges the shallow aquifer annually (Fairchild, 1972). Recharge was estimated by Hendry using a porosity of 20 percent. Discharge of the shallow aquifer occurs by evapotranspiration, seepage into surface water bodies, downward leakage into the underlying Hawthorn Group (intermediate artesian aquifer), and well pumpage.

3.3.2 **Intermediate Artesian Aquifer** The Hawthorn Group lies unconformably above the Crystal River Formation within the Ocala Group. Lithologically, the Hawthorn Group is quite variable and consists of calcareous, phosphatic sandy clay, and clayey sand interbedded with thin discontinuous lenses of phosphatic sand, phosphatic sandy limestone, limestone, and dolostone. The limestone and dolostone lenses are thicker and more prevalent near the base of the Hawthorn.

Phosphate is present throughout Hawthorn Group sediments, comprising one of the primary lithologic constituents. The most common carbonate components of the Hawthorn Group are dolomite and dolosilt. Clay minerals associated with the Hawthorn Group sediments are smectite, illite, palygorskite, and kaolinite.

The Hawthorn Group serves as a confining layer that separates the shallow aquifer from the underlying Floridan aquifer system; however, in Duval County, permeable sand and limestone layers within the Hawthorn's confining clay layers form the secondary or intermediate artesian aquifer. Water levels indicate that groundwater flow in the intermediate artesian aquifer in the NAS Jacksonville area is towards the east (Fairchild, 1972).

3.3.3 **Floridan Aquifer System** The marine carbonate sequences that make up the Floridan aquifer system beneath NAS Jacksonville consist of the following formations in descending order:

- the Ocala Group, which consists of the Crystal River Formation, the Williston Formation, and the Inglis Formation;
- the Avon Park Limestone;
- the Lake City Limestone; and
- the Oldsmar Limestone.

These formations range in age from the Late Eocene Crystal River Formation to the Early Eocene Oldsmar Limestone.

The Crystal River Formation is a white to cream, chalky, massive fossiliferous limestone and is the youngest Eocene formation underlying NAS Jacksonville. The Williston Formation, which lies conformably between the overlying Crystal River Formation and the underlying Inglis Formation, is a tan to buff granular limestone. The Inglis Formation, of late Eocene Age, is a tan to buff calcitic limestone very similar in appearance and composition to the Williston Formation (Leve, 1968).

The Avon Park Limestone, of middle Eocene Age, unconformably underlies the Ocala Group. It consists of alternating beds of tan, hard, massive dolomite, and brown to cream, granular, calcitic limestone. The Lake City Limestone unconformably underlies the Avon Park Limestone and is also Eocene in age. Lithologically, it consists of alternating beds of white to brown, chalky to granular limestone with lignite bands, and gray to tan dolomite. Below the Lake City Limestone is the Oldsmar Limestone of early Eocene Age. It consists of a cream to brown, soft, granular limestone and cherty, glauconitic, massive to finely crystalline dolomite (Leve, 1968).

The Floridan aquifer system is the principal source of freshwater in northeast Florida. Recharge to the Floridan aquifer system is predominantly by direct rainfall along the Ocala Uplift where the limestone of the aquifer outcrops at land surface. In northeast Florida, there is an area of recharge that encompasses western Clay and Putnam Counties and eastern Bradford and Alachua Counties, as close as 30 miles southwest of NAS Jacksonville. Permeable sand and gravel facies of the Hawthorn Group outcrop in this area, which appears to be hydraulically connected to the Floridan aquifer system. The top of the Floridan aquifer system in the vicinity of NAS Jacksonville occurs at a depth ranging from 275 to 400 feet bls (Causey, 1978). The groundwater in the Floridan aquifer system in this vicinity is moving northeastward toward the cone of depression in Jacksonville caused by heavy pumpage (Leve, 1968).

3.4 SITE-SPECIFIC HYDROGEOLOGY. The hydrogeology in the vicinity of Site 119 can be inferred from information obtained during a Remedial Investigation and Feasibility Study (RI/FS) Scoping Study Field Program (SSFP) conducted in the NADEP area by ABB-ES in 1993. Cone penetrometer tests and a deep monitoring well installation were performed within a few hundred feet of Tank 1982. The tank closure assessment for Tanks 119-I through 119-T did not investigate the subsurface below 8 feet bls.

A light gray to very light brown, fine- to very fine-grained, poorly graded quartz sand was encountered from land surface to 25 feet bls. Underlying the

sand deposit is a laterally extensive, light to dark greenish-gray, silty, damp, plastic clay that is 9 feet thick closest to the site. This clay layer is lenticular in profile, with the thickest part oriented northeast to southwest from the seawall in front of Hanger 123 to the corner of Wasp Street and Enterprise Avenue. This line traces the mouth of an old tributary that emptied into the St. Johns River and is now buried by fill material. The clay also extends from the mouth of this tributary to the northwest beyond Albemarle Avenue, which was a marsh before it was buried. Poorly graded, fine-grained, quartz sand was encountered below the clay to at least 80 feet bls. It is unknown how far northward toward Site 119 these lithologic units extend.

The groundwater flow direction in the water table zone appears to be toward the east, southeast, and south and is influenced by the St. Johns River and the old marsh that was to the south and southwest of the site.

4.0 POTABLE WELL SURVEY

A potable well survey was conducted by ABB-ES to locate potable water sources that might be affected by petroleum constituents in soil and groundwater at the site. The only potable water well within a ½-mile radius of the site, according to the Verification Study (Geraghty & Miller, 1985), is near the steam plant (Building 104), which is upgradient of the site (Figure 4-1). The well (not shown on Figure 4-1) is reported to be 160 feet deep with 115 feet of casing. The Verification Study listed this well as a former cooling water well that was no longer in use.

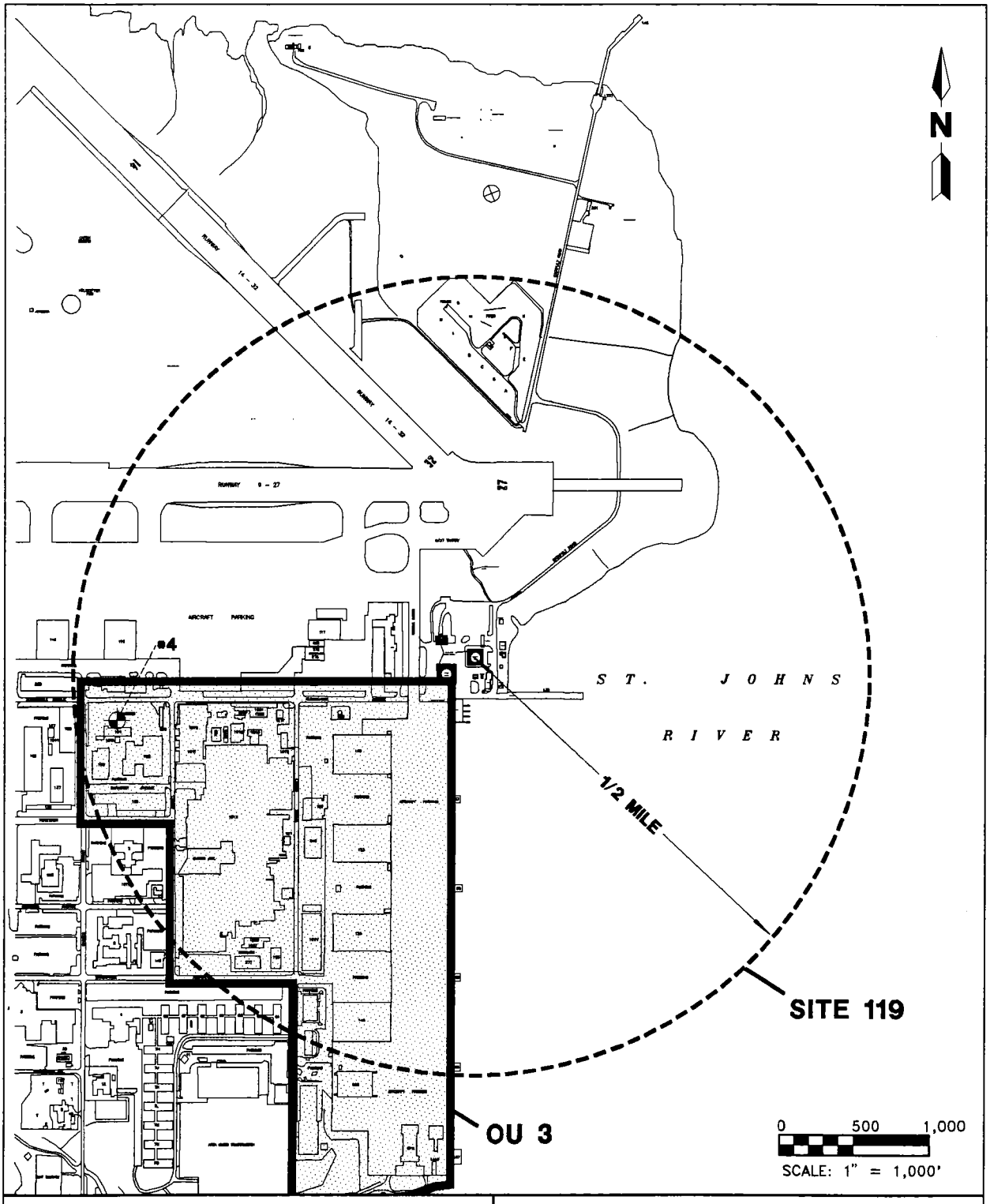

FIGURE 4-1
POTABLE WELL LOCATION MAP

JAX/SITE119/DRM-WDW/08-11-94

PRELIMINARY CONTAMINATION ASSESSMENT PLAN
SITE 119

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5.0 PROPOSED ASSESSMENT PLAN

5.1 FIELD INVESTIGATION. To assess the horizontal and vertical extent of soil contamination, the preliminary investigation will include advancing approximately 80 soil borings, using the TerraProbe[SM] system. A soil probe is placed on the end of 1-inch-diameter threaded rods and pushed or hammered to the desired sampling depth. The closed probe point is then released with internal rods, and the soil probe is driven an additional 10 to 12 inches to collect a sample inside the tube. The whole assembly is then retracted to the surface and the sample extracted from the tube. Soil samples will be collected at 1 foot bls and every 2 feet vertically thereafter until total depth is reached. The maximum depth for the boring will depend on the depth of the water table. Based on information gathered during the SSFP, the estimated depth to groundwater is 5 to 6 feet bls. OVA headspace analyses will be performed using a flame ionization detector (FID) for each sample in accordance with Chapter 17-770, Florida Administrative Code (FAC).

To assess the horizontal extent of groundwater contamination, samples from the water table will also be collected by the TerraProbe[SM]. A retractable water sample point is installed on the threaded drive rods, and the probe is driven into the water table. The point is then retracted and opened to the groundwater. The samples are collected using a small-diameter stainless-steel bailer that fits down inside the drive rods. At the discretion of the Field Operations Leader (FOL), groundwater samples will be collected from either a soil boring hole or from a new probe location. The samples will be analyzed in the field, using a portable HNU GC-311 gas chromatograph (GC) equipped with a photoionization detector (PID), for petroleum-related compounds and trichloroethene (TCE) and tetrachloroethene (PCE).

Three shallow permanent monitoring wells will be installed in excessively contaminated areas based on GC results from the TerraProbe[SM] groundwater sampling. One well is planned to be installed in the sludge burial pit area. Two wells will be installed in other areas of excessive petroleum contamination (if found). To obtain a geologic profile of the site, soil samples will be collected vertically at 2-foot intervals for lithologic description until total depth is reached. Soil will be classified in accordance with the Unified Soil Classification System. The shallow monitoring wells will be installed to a total depth of approximately 13 to 14 feet bls and will be constructed of 2-inch inside diameter (ID), schedule 40, flush-threaded, polyvinyl chloride (PVC) screen and casing. Screen length will be 10 feet with 0.010 inch slots. Approximately 2 feet of screen will extend above the water table to accommodate seasonal water level fluctuations. The screen will be surrounded with a quartz sand filter pack of 20/30 size (or an acceptable equivalent) to at least 1 foot above the top of the screen. A 0.5-foot bentonite seal will be placed above the filter pack. The remaining annulus will be grouted to land surface with neat cement, but not less than 18 inches to meet the requirements of the city of Jacksonville Regulatory and Environmental Services Department (RESD).

A locking, watertight cap will be installed on each well. The wellheads will be protected by an 8-inch diameter subsurface traffic-bearing vault with a metal cover. Upon completion, all newly installed monitoring wells will be developed by pumping until the purged water is clear and relatively free of sediment to assure a good hydraulic connection with the surrounding aquifer. The

construction details of a typical shallow monitoring well are illustrated in Figure 5-1.

Investigative derived waste (IDW), which will include excessively contaminated soil and groundwater from the installation, development, and purging of the monitoring wells and rinsate from the decontamination of equipment, will be containerized in 55-gallon drums and stored onsite. One composite sample will be collected from the drums containing soil and one from the drums containing water, and both samples will be sent to an approved laboratory for full Toxicity Characteristic Leaching Procedure (TCLP) analyses minus pesticides. Should the analytical results of the IDW water sample be within acceptable limits for base sewage disposal, then the water will be pumped from the drums into the sewage lift station beside Building 24. The drummed IDW soil will be disposed by the Navy upon receiving the analytical results.

The strategy for estimating the vertical and horizontal extent of contaminated soil and groundwater simultaneously by TerraProbe^{SM} will be to initially probe all known or suspected potential contaminant sources, and then work outward from areas where contamination is found. One potential source area to be investigated will be the reported sludge burial pit associated with the east side WWTP. In addition to the Site 119 USTs, there have been four known fuel dispenser islands in the history of the site, as well as many control valve pits that may be sources of petroleum contamination. Figure 5-2 shows the locations of suspected contamination sources and the proposed TerraProbe^{SM} boring and monitoring well locations.

At least 24 hours after development of the monitoring wells, groundwater samples will be collected from each monitoring well. Because of possible non-petroleum contamination from the old east side WWTP and Tank 119-K, the groundwater samples will be analyzed for the following compounds: purgeable aromatics (USEPA Method 624/8240), base-neutral and acid extractables (USEPA Method 625/8250/8270); ethylene dibromide (EDB) (USEPA Method 504), total recoverable petroleum hydrocarbon (TRPH) (USEPA Method 418.1), and lead (USEPA Method 239.2). This list includes the kerosene and mixed product group as defined in Chapter 17-770, FAC, which is the required analytical parameters given the variety of petroleum products stored onsite. If non-petroleum contaminants are detected in TerraProbe^{SM} soil or groundwater samples in the area of the sludge burial pit, a monitoring well will be installed and groundwater and soil samples will be collected from the borehole and well. The groundwater and soil samples will also be analyzed for total RCRA metals. Quality assurance and quality control (QA/QC) samples will be collected and analyzed as prescribed in ABB-ES' Florida Department of Environmental Protection (FDEP)-approved Comprehensive Quality Assurance Plan (CompQAP) (No. 870515G).

After monitoring well installation and concurrent with groundwater sample collection, water levels will be measured in all wells. Water level measurements will be used to establish the direction of groundwater flow and provide data on fluctuations in the water table. The monitoring well locations and the elevations of the tops of casing (TOC) will be surveyed by the ABB-ES field crew, relative to the location and elevation of an existing structure, if known. If no known elevation is available at the site, an arbitrary elevation datum will be established for reference. To assess the hydraulic properties of the surficial aquifer, a minimum of two slug tests will be conducted in the three proposed monitoring wells.

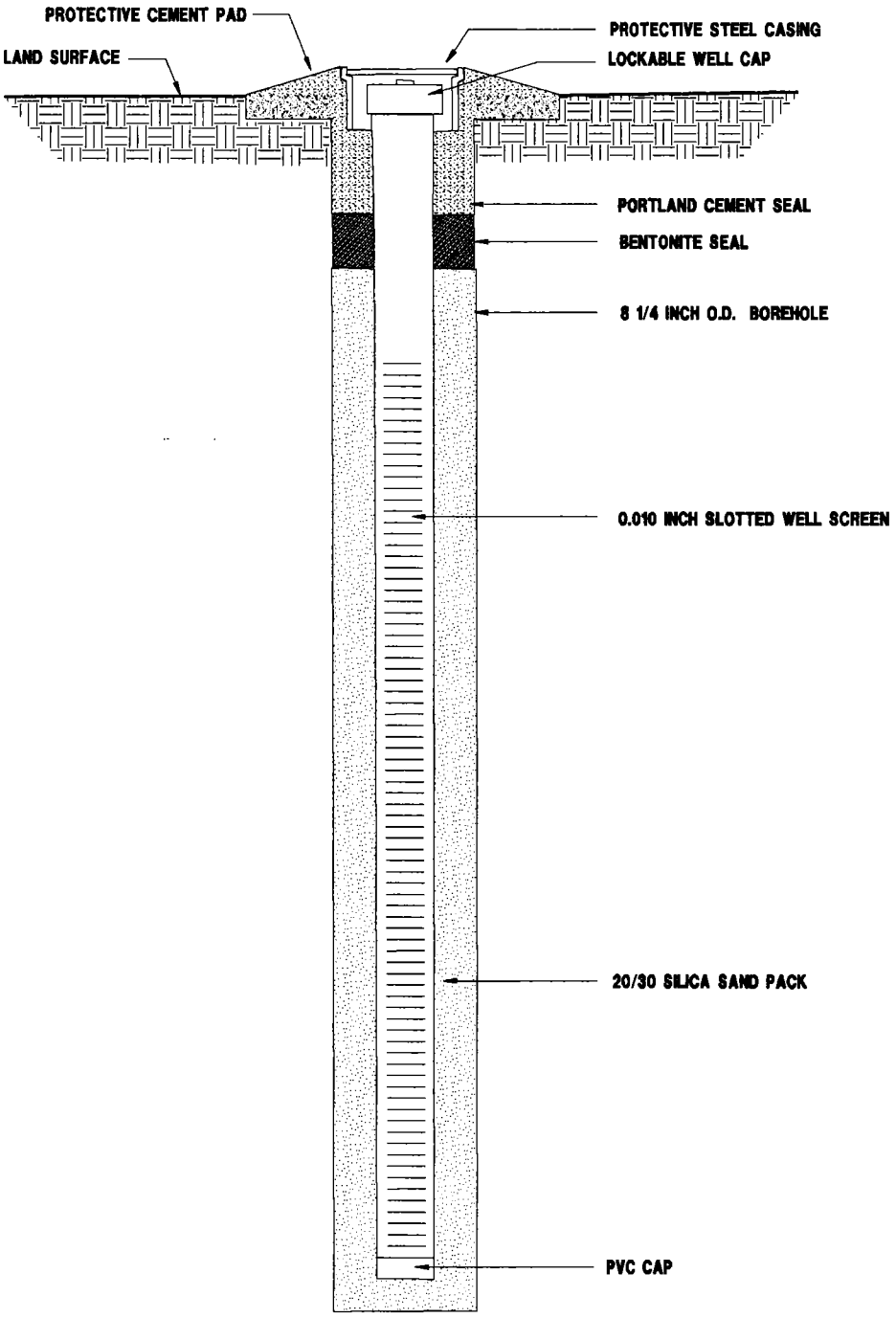
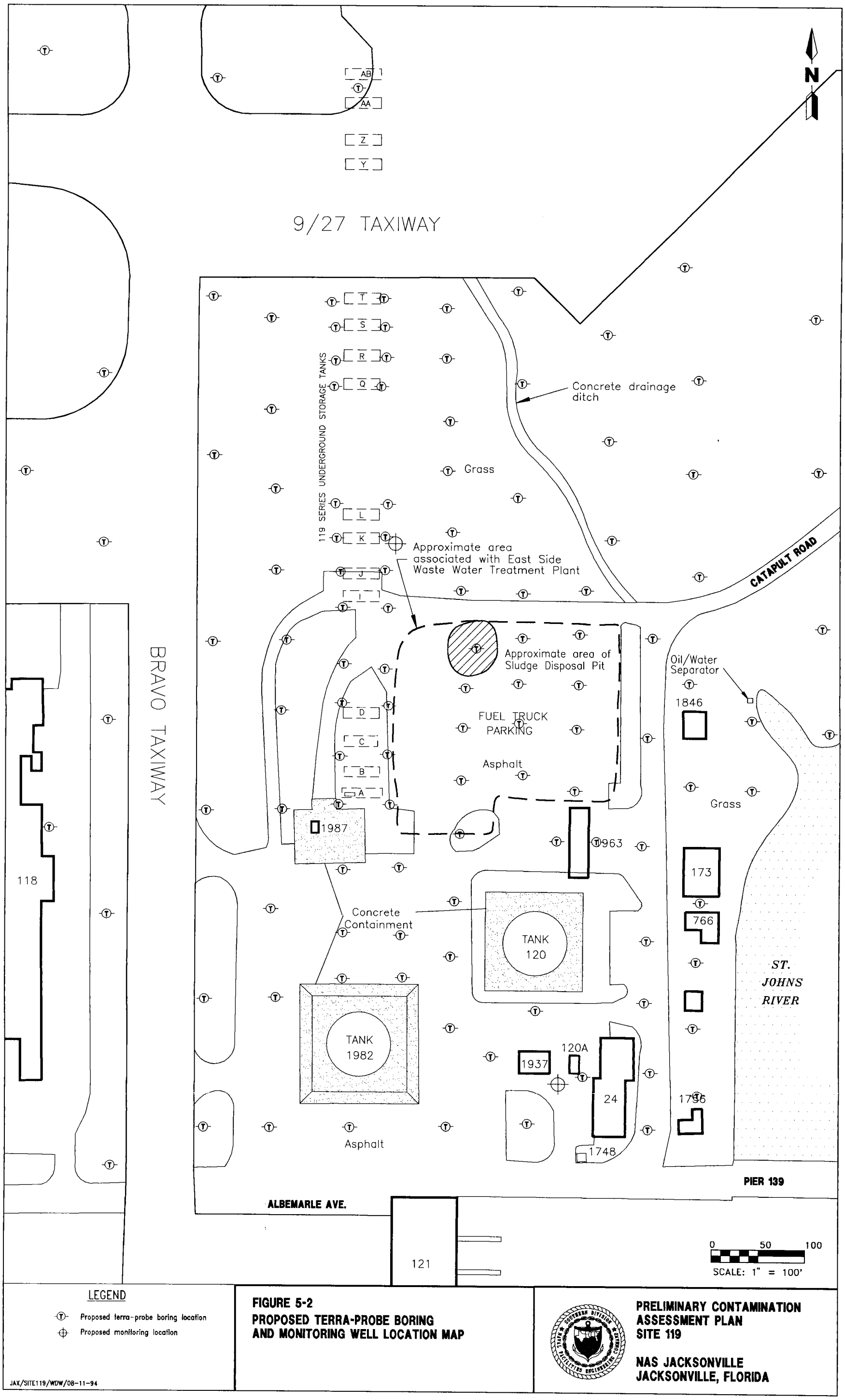


FIGURE 5-1
TYPICAL SHALLOW MONITORING WELL CONSTRUCTION DETAIL

JAX/MONWELL/WDW/08-11-94

PRELIMINARY CONTAMINATION ASSESSMENT PLAN
SITE 119

NAS JACKSONVILLE
JACKSONVILLE, FLORIDA



LEGEND

- Proposed terra-probe boring location
- Proposed monitoring location

FIGURE 5-2
PROPOSED TERRA-PROBE BORING AND MONITORING WELL LOCATION MAP

PRELIMINARY CONTAMINATION ASSESSMENT PLAN
SITE 119

NAS JACKSONVILLE
JACKSONVILLE, FLORIDA

JAX/SITE119/WDW/08-11-94

5.2 PRELIMINARY CONTAMINATION ASSESSMENT REPORT (PCAR) PREPARATION. Upon completion of the field investigation and receipt of the laboratory analytical results of the groundwater and soil samples, a PCAR in the form of a Technical Memorandum will be prepared and submitted to SOUTHNAVFACENGCOM for review and approval. The report will discuss site background information, site conditions, investigative methodologies, findings, and recommendations for Site 119. A site location map, maps of soil boring and monitoring well locations, tables summarizing analytical results, and investigative summaries and conclusions will be included with the report. If contamination is found at the site, the report will support a decision to either continue the assessment under the UST program to fulfill the requirements of Chapter 17-770, FAC, or turn the site over to the IR program. If the site remains in the UST program, ABB-ES will recommend that SOUTHNAVFACENGCOM issue a statement of work for ABB-ES to prepare a plan of action and cost estimate to perform a contamination assessment and prepare a contamination assessment report and remedial action plan, if required, for Site 119.

6.0 SCHEDULE

A projected schedule to complete the PCA field investigative program at NAS Jacksonville Site 119 is approximately 2½ weeks. This includes mobilization, drilling, sampling, surveying, and demobilization. The field investigative work is scheduled to begin the week of August 15, 1994. Upon completion of the field investigation, approximately 2 weeks will be required for receipt of the laboratory analyses of the groundwater and soil samples collected during the investigation. A Gantt Chart outlining the project schedule is attached as Appendix A, Project Schedule.

7.0 REFERENCES

Causey, L.V., and Phelps, G.G., 1978, Availability and Quality of Water from Shallow Aquifers in Duval County, Florida: U.S. Geological Survey Water Resources Investigations 78-92, 36 p.

Fairchild, R.W., 1972, The Shallow Aquifer System in Duval County, Florida: Florida Bureau of Geology Report of Investigations No. 59, 50 p.

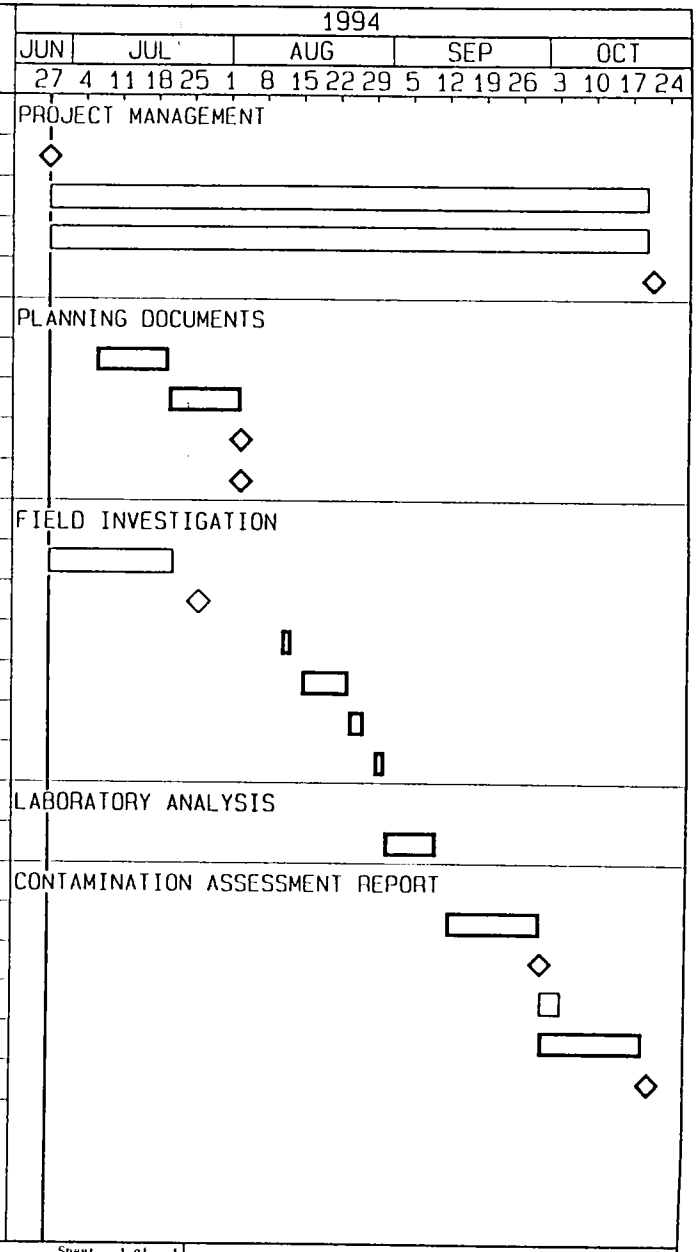
Geraghty & Miller, Inc., 1985, Verification Study, Assessment of Potential Ground-Water Pollutants at Naval Air Station-Jacksonville, Jacksonville, Florida: prepared for Southern Division, Naval Facilities Engineering Command.

Leve, G.W., 1968, The Floridan Aquifer in Northeast Florida: Groundwater, vol. 6, no. 2, p. 19-29.

APPENDIX A

PROJECT SCHEDULE

ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	ORIG DUR
PROJECT MANAGEMENT			
NOTICE TO PROCEED - SOW 93	27JUN94		0
DAY-TO-DAY MANAGEMENT	27JUN94	19OCT94	81
TEMR REVIEW & PREPARATION	27JUN94	19OCT94	81
SOW NO. 093 COMPLETE		20OCT94	0
PLANNING DOCUMENTS			
CAP PREPARATION	6JUL94	19JUL94	10
HASP PREPARATION	20JUL94	2AUG94	10
SUBMIT CAP TO NAVY		2AUG94	0
SUBMIT HASP TO NAVY		2AUG94	0
FIELD INVESTIGATION			
SUBCONTRACT PREP	27JUN94	20JUL94	17
SUBCONTRACT AWARD		25JUL94	0
FIELD MOBILIZATION & PREPARATION	11AUG94	12AUG94	2
SOIL INVESTIGATION (TERRA PROBE)	15AUG94	23AUG94	7
WELL INSTALLATION	24AUG94	26AUG94	3
GROUNDWATER SAMPLING	29AUG94	30AUG94	2
LABORATORY ANALYSIS			
LABORATORY ANALYSIS (SUBCONTRACT)	31AUG94	9SEP94	7
CONTAMINATION ASSESSMENT REPORT			
NARRATIVE PCAR PREPARATION	12SEP94	29SEP94	14
SUBMIT NARRATIVE PCAR TO NAVY		29SEP94	0
NAVY REVIEW OF NARRATIVE CAR	30SEP94	30OCT94	2
ABB SUPPORT PHASE II POA DEVELOPMENT	30SEP94	19OCT94	14
SUBMIT PHASE II POA TO NAVY		20OCT94	0



Plot Date 8JUN94
Data Date 27JUN94
Project Start 27JUN94
Project Finish 20OCT94

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

B017 S093

Sheet 1 of 1

NAVYCLEAN
SOW NO. 093 NAS JAX PH I CA SITE 119
BASELINE PROJECT SCHEDULE

ABB ENVIRONMENTAL SERVICES, INC.

Date	Revision	Checked	Approved