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CONTAMINATION ASSESSMENT PLAN AVIATION GASOLINE PIPELINE AREA NAS PENSACOLA FL
9/1/1994
ABB ENVIRONMENTAL SERVICES, INC

CONTAMINATION ASSESSMENT PLAN

AVIATION GASOLINE PIPELINE AREA
NAVAL AVIATION DEPOT
PENSACOLA, FLORIDA

Contract Task Order (CTO) No. 008

Contract No. N62467-89-D-0317

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September 1994

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, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act (RCRA) of 1976. 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 (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 regulations on 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.
AVGAS	aviation gasoline
bls	below land surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CA	Contamination Assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CompQAP	Comprehensive Quality Assurance Plan
CTO	Contract Task Order
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
GC	gas chromatograph
HASP	Health and Safety Plan
HSWA	Hazardous and Solid Waste Amendments of 1984
ID	inside diameter
IRA	initial remedial action
NADEP	Naval Aviation Depot
NAS	Naval Air Station
OVA	organic vapor analyzer
ppm	parts per million
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
RAC	Remedial Action Contract
RCRA	Resource Conservation and Recovery Act
SOUTHNAVFACENGCOM	Southern Division, Naval Facilities Engineering Command
SWDA	Solid Waste Disposal Act of 1965
USEPA	U.S. Environmental Protection Agency
USTs	underground storage tanks

1.0 INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), has been contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to prepare a Contamination Assessment Plan (CAP) for the aviation gasoline (AVGAS) pipeline around Chevalier Field at Naval Aviation Depot (NADEP) Pensacola, Florida. The CAP outlines field investigations and sampling programs that will assess the source(s) of petroleum contamination in the vicinity of the AVGAS pipeline and evaluate the horizontal and vertical extent of petroleum contamination detected. The following report presents the site locations and develops a rationale for the proposed field investigations to be implemented at each site under the contamination assessment (CA).

2.0 BACKGROUND

2.1 SITE DESCRIPTION. NADEP Pensacola is based at Naval Air Station (NAS) Pensacola. NAS Pensacola is located on the west edge of Pensacola Bay, 2 miles south of Pensacola, Florida, on Navy Boulevard.

2.2 SITE HISTORY. The Aviation Gas (AVGAS) Pipeline Area is located around the north, west, and south edges of Chevalier Field, NADEP Pensacola. The 8,000-foot long pipeline was installed during the 1940's and supplied aviation fuel to aircraft stationed in Chevalier Field until the 1970's. The pipeline was constructed of unprotected steel and buried to a depth of approximately 5 feet below land surface (bls). Thirteen oil pits and 12 500-gallon underground storage tanks (USTs) are also associated with the AVGAS pipeline (Former Tank/Pit Sites). The USTs reportedly contained AVGAS and were used to distribute fuel along the pipeline. The purpose and contents of the oil pits is uncertain, although they are suspected to have contained lube oil. Recently, plans have been made to close the AVGAS pipeline, remove the USTs and oil pits, and demolish Chevalier Field. Approximately 4,000 feet of the pipeline will be abandoned in place (Pipeline Abandonment Sites), while the remaining sections will be removed by the Remedial Action Contract (RAC) contractor (Pipeline Removal Sites). The USTs and associated oil pits will be removed and closed by another Navy subcontractor.

Pipeline Abandonment Sites. The northern and northwestern portions of the AVGAS pipeline will be abandoned in place. Several assumptions about the pipeline abandonment area were made in order to estimate the cost and level of effort associated with these sites (see Figure 2-1). The assumptions that affect this CAP are as follows.

- One soil boring for every 20 feet of pipeline will be required by the Florida Department of Environmental Protection (FDEP) in order to complete the closure assessment.
- Eight areas of soil and groundwater contamination will be identified during the closure assessment.
- Any initial remedial actions (IRA) for contaminated soil will be handled by the RAC contractor.
- AVGAS is the only type of petroleum contamination.

Pipeline Removal Sites. The southern and southwestern portions of the AVGAS pipeline will be removed (see Figure 2-2). The assumptions made for these sites that affect this CAP are as follows.

- Excessively contaminated soil will be excavated by the RAC contractor during pipeline removal.
- Eight areas of groundwater contamination will be identified during pipeline removal.
- AVGAS is the only type of petroleum contamination.

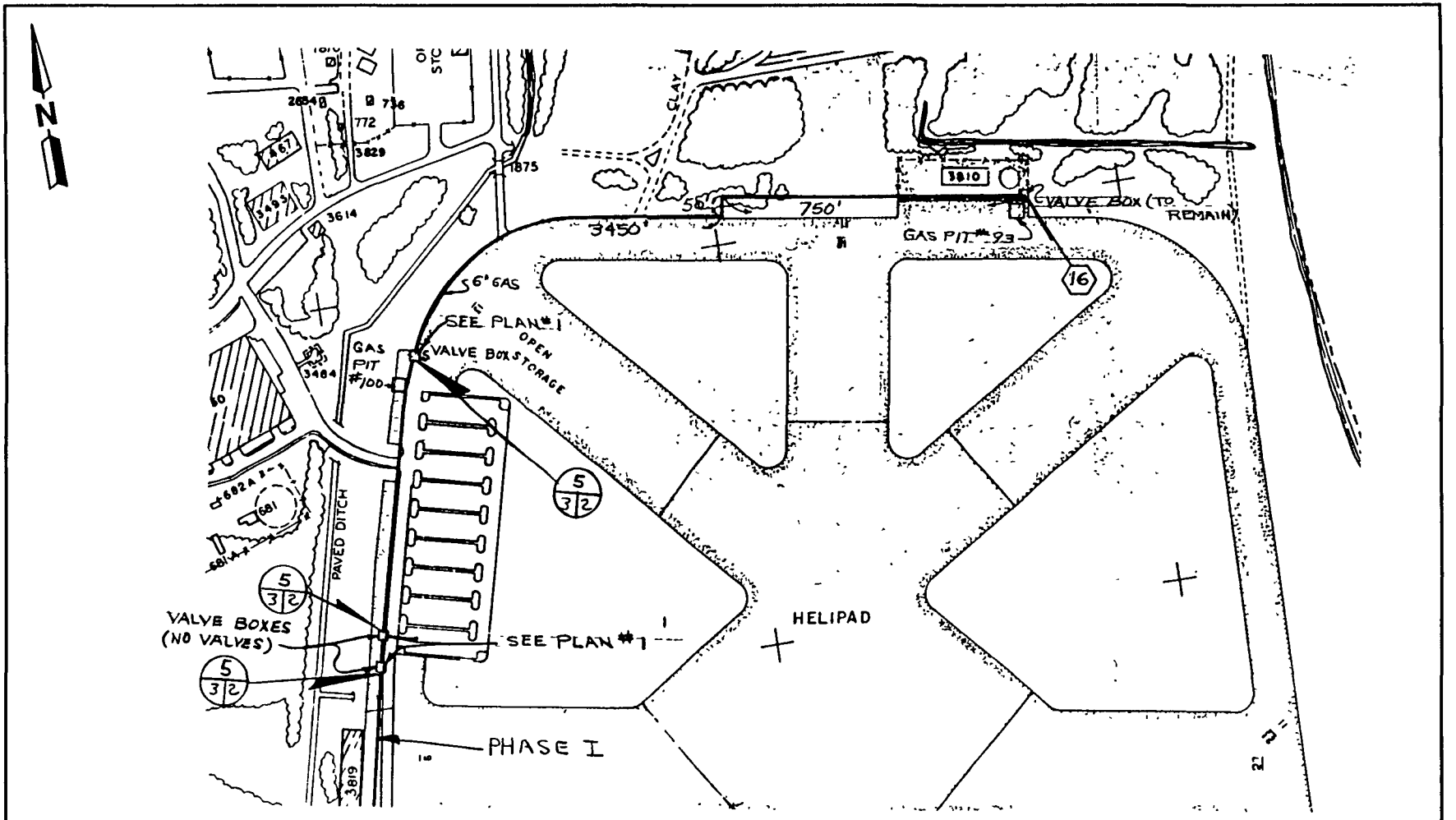

FIGURE 2-1

SITE MAP,
PIPELINE ABANDONMENT AREA

CONTAMINATION ASSESSMENT PLAN, AVGAS PIPELINE

NADEP PENSACOLA
PENSACOLA, FLORIDA

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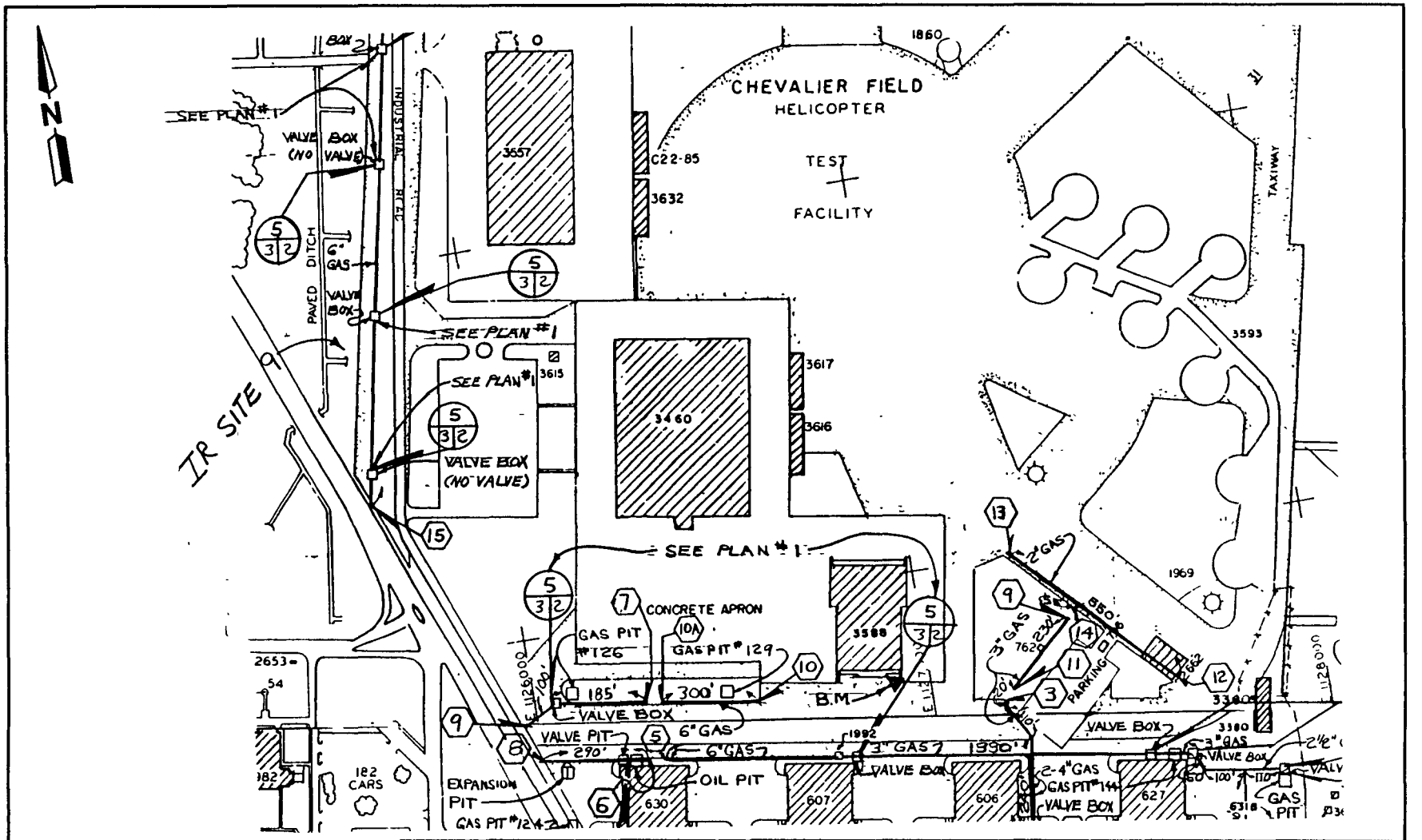

FIGURE 2-2

SITE MAP,
PIPELINE REMOVAL AREA

CONTAMINATION ASSESSMENT PLAN, AVGAS PIPELINE

NADEP PENSACOLA
PENSACOLA, FLORIDA

7527-22 940902WEM

Former Tank/Pit Sites. Each of the USTs and pits associated with the AVGAS pipeline will be removed (see Figures 2-1 and 2-2). The assumptions made for these sites are as follows.

- Five areas of soil and groundwater contamination will be identified during the removal action.
- The five areas of soil contamination will be removed by the RAC contractor during an IRA.
- AVGAS is the only type of petroleum contamination anticipated.

Site 23. Site 23 is the location of a fuel oil/diesel release in the vicinity of the AVGAS Pipeline (site maps will not be available until field work begins). Because construction of new utilities is scheduled to cross a portion of Site 23, ABB-ES will perform soil screening at Site 23 to determine if any excessive soil contamination may exist in the construction area. ABB-ES will not be conducting a soil screening of the entire site, nor will any contamination assessment or formal report be initiated for Site 23 at this time.

2.3 PHYSIOGRAPHY. Florida is divided into four physiographic zones: the Coastal Lowlands, the Central Highlands, the Northern Highlands, and the Marianna Lowlands (Puri and Vernon, 1964). The Pensacola area lies entirely within the Coastal Lowlands zone, which closely parallels the Florida coastline. The Coastal Lowlands are further divided into the Atlantic, Distal, and Gulf Coastal Lowlands (Puri and Vernon, 1964). The NADEP Pensacola is located within the Gulf Coastal Lowlands. The lowlands are characterized by poor drainage and elevations less than 100 feet above mean sea level. Landforms include barrier islands, estuaries, coastal ridges, dunes, and valleys (Puri and Vernon, 1964).

Land surface elevations at NADEP Pensacola range from sea level at the coast to greater than 30 feet above mean sea level. Surface drainage is variable, but is generally toward the nearest body of water.

2.4 HYDROGEOLOGY. The general hydrogeology in the NADEP area is discussed in the regional hydrogeology section. The hydrogeologic conditions that exist beneath the NADEP sites are presented in the site-specific hydrogeology section.

2.4.1 Regional The Pensacola area is underlain by three water-bearing zones. These zones, in order of increasing depth, are: the sand-and-gravel aquifer, the Upper Floridan aquifer, and the Lower Floridan aquifer.

The sand-and-gravel aquifer is comprised of Pleistocene terrace deposits, the Pliocene Citronelle Formation (Marsh, 1966), and Miocene coarse clastics. These deposits extend from the surface to a depth of approximately 400 feet bls and are predominantly poorly sorted, fine-grained to coarse-grained sand interbedded with numerous layers of clay and gravel (up to 60 feet thick). There is great lithologic variability in these deposits. Clay lenses and the presence of hardpan layers within the sand-and-gravel aquifer result in the occurrence of perched water tables and artesian conditions in some areas (Musgrove and others, 1965). Groundwater flow is generally topographically controlled. Recharge to the aquifer is derived almost entirely from local rainfall. The sand-and-gravel

aquifer is the sole source of potable groundwater in the Pensacola area (Roaza and others, 1991).

The sand-and-gravel aquifer is divided into three major zones: the surficial zone, the low permeability zone, and the main producing zone (Roaza and others, 1991). These designations are based on changes in permeability of the sediments comprising each zone. The surficial zone is the uppermost layer of the aquifer. It consists primarily of sand and gravel with occasional silt and clay deposits. This zone ranges in thickness from 0 to 150 feet (Roaza and others, 1991). The low permeability zone, which underlies the surficial zone, consists of various mixtures of clay, silt, sand, and gravel. Locally, this zone contains poorly sorted sand, with gravel and some clay (Roaza and others, 1991). The thickness of the zone varies from 50 to 100 feet. Individual beds of the low permeability zone are highly discontinuous, and in some areas there may be hydraulic connection between the surficial zone and the main producing zone. The main producing zone is composed of moderate to well sorted sand-and-gravel beds that are typically interbedded with beds of fine-grained sand and clay. Locally, this zone typically contains medium-grained sand and sandy clays (Roaza and others, 1991). The thickness of the main producing zone ranges from 200 to 300 feet.

The Upper Floridan aquifer is comprised of deposits correlative to the lower Miocene Tampa Formation and the upper Oligocene Chickasawhay Formation. These two formations are undifferentiated in the Pensacola area. Locally, these deposits are approximately 380 feet thick (Marsh, 1966) and are typically brown to light gray, hard, fossiliferous dolomitic limestone or dolomite with a distinctive spongy-looking texture. Locally, the overlying Pensacola Clay is approximately 1,000 feet thick and forms an effective confining unit between the sand-and-gravel aquifer and the Upper Floridan aquifer (Marsh, 1966). This confining unit has also been designated as part of the Intermediate System (Roaza and others, 1991). The Upper Floridan aquifer is recharged by local rainfall in Conecuh, Escambia, and Monroe Counties, Alabama (Healy, 1980). General groundwater flow in the Upper Floridan aquifer is to the southeast toward the Gulf of Mexico (Barr, 1987). The groundwater in the Upper Floridan aquifer is mineralized in the Pensacola area and is not used as a water supply.

The Lower Floridan aquifer is comprised of upper to middle Eocene limestones. The aquifer is approximately 500 feet thick in the vicinity (Marsh, 1966). The limestones are typically white to grayish cream, soft, and chalky. The Lower Floridan aquifer is confined from above by the Bucatunna Clay Member of the middle Oligocene Byram Formation and from below by gray shales and clays of middle Eocene age. The Bucatunna Clay, also called the Intermediate Zone, is approximately 170 feet thick in the Pensacola area (Musgrove and others, 1965). Groundwater flow in the aquifer is to the southeast toward the Gulf of Mexico (Healy, 1980). The water quality is poor because of high mineralization.

2.4.2 Site Specific The principal water-bearing zone of concern at Chevalier Field is the surficial zone of the sand-and-gravel aquifer. The surficial zone is unconfined, and the water table has been encountered at depths ranging from 1 to 3 feet bls during other investigations. Groundwater flow varies over the length of the pipeline, but is believed to be flowing to the southeast near the southern section of the pipeline, to the north near the northern section of the pipeline, and to the west near the western section of the pipeline.

In some areas near NAS Pensacola, the surficial zone of the sand-and-gravel aquifer has been demonstrated to be hydraulically connected with the main producing zone of the sand-and-gravel aquifer, making potable water supplies susceptible to contamination in these areas (Roaza and others, 1991). For this reason, the surficial zone at NAS Pensacola will be treated as a Class G-II groundwater source, and Class G-II FDEP regulatory standards will be applied during this investigation.

3.0 INVENTORY OF PROXIMATE POTABLE WATER WELLS

A potable well survey was conducted to assess the risk of contamination to potable water sources during investigations of nearby sites (Sites 2662W, 3810N, 3450S, 604). Two potable supply wells (designated as Well No. 1 and Well No 2 on Figure 5-16) exist at NAS Pensacola (Wilkins and others, 1985). The NAS Pensacola water supply system is used in conjunction with the Corry Field water supply system, which is located approximately 2 miles north of NAS Pensacola. According to NADEP personnel, these wells are not currently used for potable water supplies at NAS Pensacola, but are available as reserve potable water supplies should the need arise.

Potable well inventory data are presented in Table 3-1. Both wells at NAS Pensacola are screened in the main producing zone of the sand-and-gravel aquifer at depths ranging from 105 to 160 feet bls. Neither of the potable wells is located within a 0.25-mile radius of the AVGAS pipeline area.

Table 3-1
Potable Well Inventory Data

Contamination Assessment Plan
AVGAS Pipeline Area
NADEP Pensacola, Florida

Well Identification Number/Local Name	Location	Total Depth (feet bls)	Screened Interval (feet bls)	Diameter Casing/Screen (inches)
302116087170201/No. 1	Sec. 1,T3S,R30W Duncan and Taylor Roads	174	105-160	24/12
302124087163601/No. 2	Sec. 1,T3S,R30W Murray and Farrar Roads	178	110-160	24/12

Note bls = below land surface

4.0 PROPOSED ASSESSMENT PLAN

4.1 CLOSURE FIELD INVESTIGATIONS. The pipeline closure field investigation will include a startup meeting to be held at each site. All personnel associated with the investigation will review the scope of work presented in the CAP and the Health and Safety Plan (HASP). During this same time, ABB-ES will secure the necessary utility clearance for boring and monitoring well installation at each site. The purpose of the closure assessment is to identify the vertical and horizontal extent of any soil contamination associated with the AVGAS pipeline and identify areas of petroleum contamination requiring further investigation. The closure field investigation will involve the following activities.

4.1.1 Pipeline Abandonment Area Approximately 200 soil borings will be advanced to the water table (~5 feet bls) along the 4,000-foot length of the pipeline located to the north and northwest of Chevalier Field. An additional 100 soil borings will be advanced to roughly delineate areas of soil contamination discovered along the pipeline. Soil borings will be advance using either the TerraProbe™ or a manually operated auger. Soil samples will be collected at 2-foot intervals until the water table is reached and screened using an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID) in accordance with Chapter 17-770, Florida Administrative Code (FAC) requirements. For the purposes of the AVGAS Pipeline investigation, OVA readings of >50 parts per million (ppm) will be used as the cleanup standard.

Additionally, groundwater samples will be collected from each borehole. These groundwater samples will be screened for benzene, toluene, ethylbenzene, and xylenes (BTEX) using a portable gas chromatograph (GC). This groundwater data will be used to evaluate areas of possible groundwater contamination requiring further investigation.

4.1.2 Pipeline Removal Area The purpose of the pipeline removal field investigation is to support the RAC contractors efforts to remove the pipeline and any associated excessively contaminated soil. ABB-ES will assist the RAC contractor by screening the soils being removed with an OVA equipped with a FID to verify that all the contaminated soils (OVA readings of >50 ppm) have been removed. Upon completion of the soil removal operations, ABB-ES will install temporary groundwater monitoring wells in the areas where soil contamination was the highest to assess any impact on the site groundwater. After these wells have been developed, groundwater samples will be collected and submitted to an approved contract laboratory for analysis of gasoline analytical group parameters as described in Chapter 17-770, FAC.

4.1.3 Former Tank/Pit Sites Closure investigations for these sites will be conducted by another Navy contractor.

4.1.4 Site 23 Approximately 40 soil borings will be advanced to the water table at Site 23. These soil borings will be used to assess the approximate extent and degree of petroleum soil contamination in areas where utilities are projected to cross the pipeline. ABB-ES will limit the soil assessment efforts to areas of concern depicted in the Figure 2-3. No further field work will be conducted at this site under this CAP.

4.2 INITIAL REMEDIAL ACTIONS. Initial remedial actions will be taken at those sites where appropriate. IRAs will consist of the removal of petroleum-contaminated soil (OVA readings >50 ppm) and replacing it with clean fill. IRAs conducted for groundwater remediation are not anticipated for any of the sites.

4.2.1 Pipeline Abandonment Area It has been assumed that eight areas of excessive soil contamination associated with the abandoned pipeline will be identified during the closure investigation. During the IRA or contaminated soil removal operations at these eight sites, ABB-ES will assist the RAC contractor by screening the soils being removed with an OVA/FID to verify that the contaminated soils have been removed.

4.2.2 Pipeline Removal Area Excessively contaminated soil will be excavated and disposed as the pipeline is removed. No separate IRA field event will occur at these sites.

4.2.3 Former Tank/Pit Sites It has been assumed that five areas of excessive soil contamination associated with the former tank/pits will be identified during the Phase I (see Section 4.3.3) soil investigation. During the IRA or contaminated soil removal operations at these five sites, ABB-ES will assist the RAC contractor by screening the soil being removed with an OVA/FID to verify that the contaminated soils (OVA reading >50 ppm) have been removed.

4.3 CONTAMINATION ASSESSMENT FIELD INVESTIGATIONS. The purpose of the CA field investigations is to assess the vertical and horizontal extent of petroleum contamination and to assess the source(s) of contamination. The CA will require the advancement of soil borings, the installation of permanent groundwater monitoring wells, the collection and screening of soil samples (Tank/Pit Sites, only), and the collection and laboratory analyses of groundwater samples from the monitoring wells at each site.

Prior to the beginning of each CA field investigation, a start-up meeting will be held onsite at NADEP Pensacola. All personnel associated with the investigation will review the scope of work in the CAP and HASP. Scheduling, logistics, and special precautions will be discussed. ABB-ES will secure the necessary excavation permits that are required prior to the installation of monitoring wells for each site at this time.

Permanent monitoring wells will be installed in selected soil borings at each site to characterize the groundwater contaminant plume and assess its horizontal extent. The shallow monitoring wells 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 a slotted screen opening of 0.010-inch. At least 2 feet of screen will be placed above the water table to accommodate seasonal and tidal fluctuations of the water table. The screen will be surrounded with a 20/30 quartz sand filter pack to a minimum of 0.5 foot above the top of the screen as determined by the depth to water in each well. A minimum of 0.5-foot bentonite seal will be placed above the filter pack. The remaining annulus will be grouted to land surface with neat cement.

A deep monitoring well will be installed at each site to assess the vertical extent of the groundwater contaminant plume. The deep monitoring well will be constructed of 2-inch ID, schedule 40, flush-threaded, PVC screen and casing.

Screen length will be 5 feet with a slotted screen opening of 0.010 inch. The monitoring well will be placed within a 6-inch PVC surface casing, installed to prevent vertical migration of contaminants. The depth of the surface casing will be determined by the vertical extent of contaminants being measured on the OVA. The screen will be surrounded with a 20/30 quartz sand filter pack to at least 2 feet above the top of the screen. A 2-foot fine-grained sand (30/65 grade) seal will be placed immediately above the filter pack. The remaining annulus will be grouted to land surface with neat cement. The annular space surrounding the surface casing will also be grouted to land surface with neat cement.

A locking, watertight cap will be installed on each well. All monitoring wells will be finished below grade in a subsurface traffic-bearing vault and protected with a metal manhole assembly. Upon completion, all newly installed monitoring wells will be developed by pumping until the purged water is clear and relatively free of sediment to provide a good hydraulic connection with the surrounding aquifer.

Diagrams of typical shallow and deep monitoring well construction are illustrated in Figures 4-1 and 4-2, respectively. Detailed information of monitoring well construction, lithologic descriptions, split-spoon samples, and other pertinent data will be graphically displayed in boring logs in the Contamination Assessment Reports (CARs). Soil will be classified in accordance with the Unified Soil Classification System.

Groundwater samples will be collected from all monitoring wells at each site that do not contain free product and analyzed for gasoline analytical group parameters as defined in Chapter 17-770, FAC. Appropriate quality assurance/quality control (QA/QC) samples, including a decontamination water source blank, will also be collected and analyzed. Groundwater samples will be collected with Teflon™ bailers and shipped via overnight carrier to a U.S. Environmental Protection Agency (USEPA) approved analytical laboratory. The analytical sampling program will comply with the ABB-ES Comprehensive Quality Assurance Plan (CompQAP).

Aquifer tests will be conducted to estimate the hydraulic properties of the water-table aquifer. Rising-head slug tests will be performed on a maximum of one monitoring well from each site to collect data for calculating hydraulic conductivity. Hydraulic conductivity will be calculated using the computer program AQTESOLV™ (Geraghty & Miller, Inc. 1989). The AQTESOLV™ program calculates hydraulic conductivity from slug test data following the methods of Bouwer and Rice (1976) for partially penetrating wells screened in unconfined aquifers.

During this field investigation, ABB-ES personnel and their subcontractors will stockpile contaminated drilling cuttings (sustained OVA readings of >50 ppm) on plastic sheeting for aeration. The drilling cuttings will be screened with an OVA at the completion of the field investigation. If OVA readings have dropped below 50 ppm, the cuttings will be spread in an area designated by the NADEP Pensacola Environmental Coordinator. If OVA readings from the drilling cuttings remain in excess of 50 ppm, ABB-ES' subcontractor will drum the cuttings. Disposal of the drummed cuttings will be the responsibility of the Navy.

4.3.1 Pipeline Abandonment Area CA investigations will be conducted at up to eight locations to characterize the groundwater contaminant plumes and assess their vertical and horizontal extent.

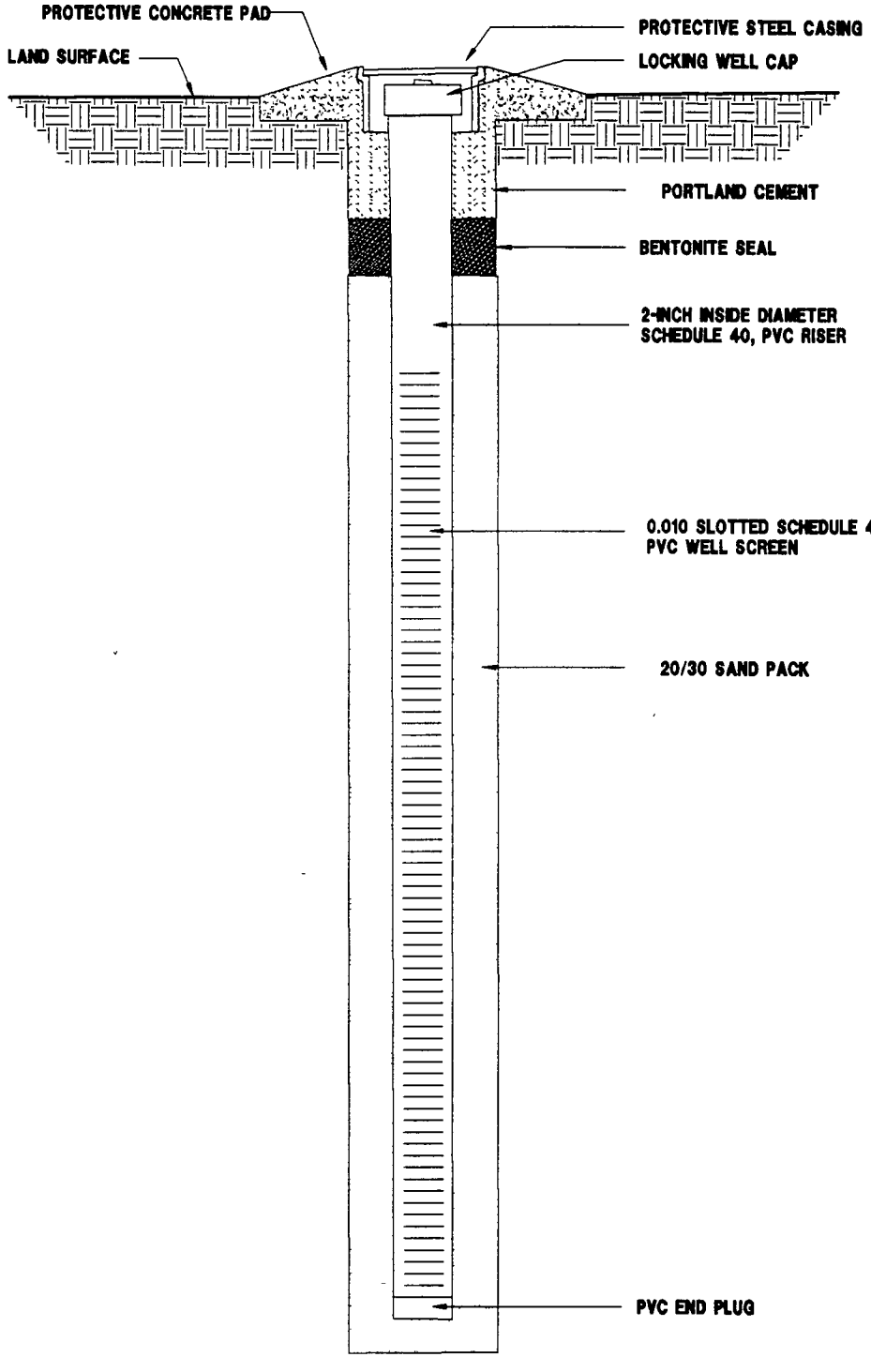

FIGURE 4-1
TYPICAL SHALLOW MONITORING WELL CONSTRUCTION DIAGRAM

CONTAMINATION ASSESMENT PLAN, AVGAS PIPELINE

NADEP PENSACOLA
PENSACOLA, FLORIDA

PENSACOLA/WELLTYP/GLC/9-02-94

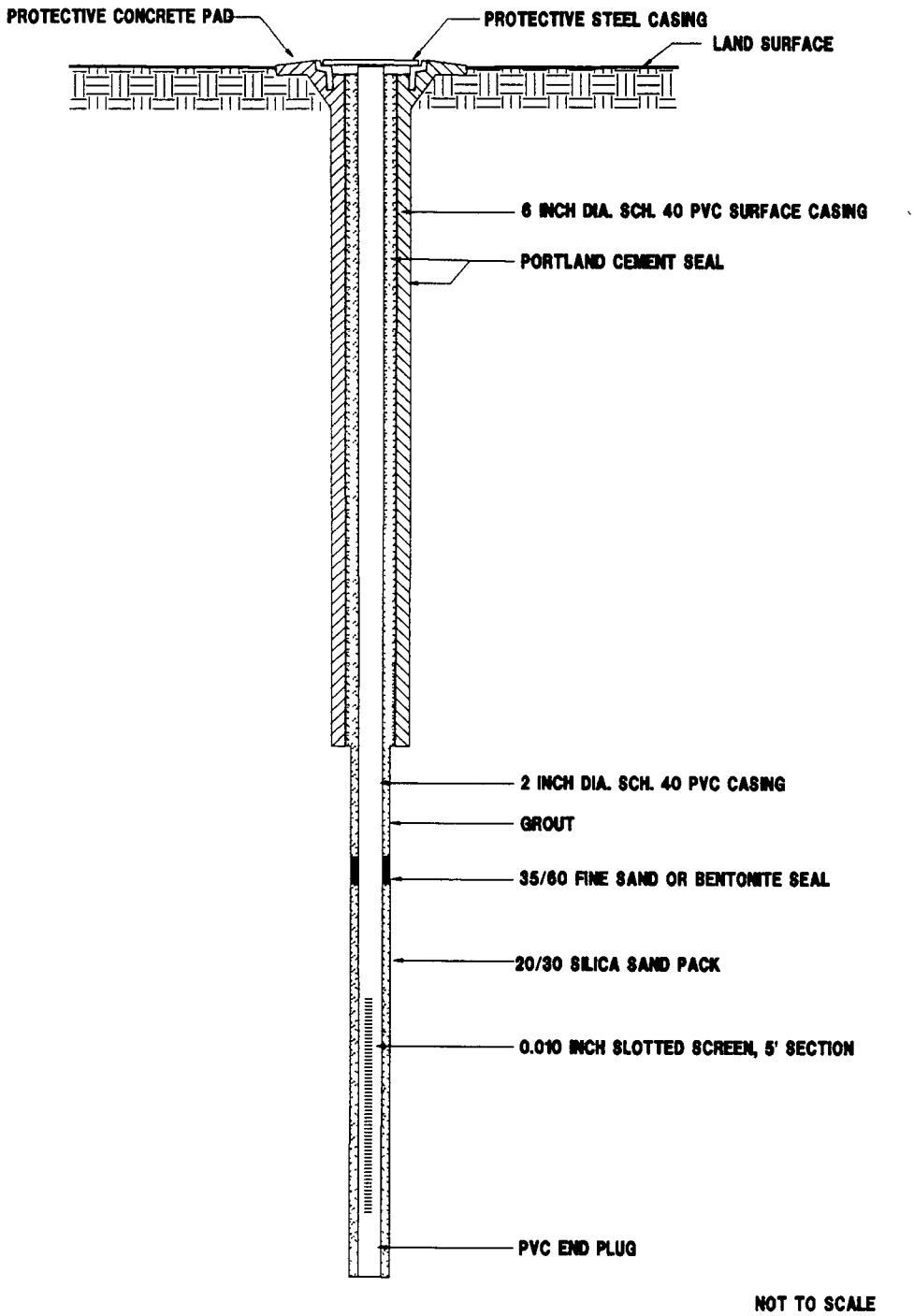

FIGURE 4-2
TYPICAL DEEP MONITORING WELL CONSTRUCTION DIAGRAM

PENSACOLA/WELLTYP/GLC/9-02-94

CONTAMINATION ASSESMENT PLAN, AVGAS PIPELINE

NADEP PENSACOLA
PENSACOLA, FLORIDA

Groundwater samples will be collected from each proposed well location after the advancement of a pilot boring. The groundwater sample will be collected inside the hollow-stem augers with a disposable polyethylene bailer. These groundwater samples will be screened for BTEX using a portable GC. This groundwater data will be used to verify that the proposed location will effectively serve to assess the extent of groundwater contamination.

Approximately 10 permanent shallow monitoring wells (15 feet in depth) and 1 deep well (30 feet in depth) will be installed at the each site. Proposed monitoring well locations will be determined after the closure field investigation. After the monitoring wells have been installed and developed, groundwater samples will be collected and submitted to an approved contract laboratory for analysis of gasoline analytical group parameters.

Slug tests will be performed in one monitoring well from each of the eight sites to assess the hydraulic conductivity of the aquifer. The test will be repeated a minimum of three times in each well.

4.3.2 Pipeline Removal Area CA investigations will be conducted at up to eight locations to characterize the groundwater contaminant plumes and assess their vertical and horizontal extent.

Groundwater samples will be collected from each proposed well location after the advancement of a pilot boring. These groundwater samples will be screened for BTEX using a portable GC. This groundwater data will be used to verify that the proposed location will effectively serve to assess the extent of groundwater contamination.

Approximately 10 permanent shallow monitoring wells (15 feet in depth) and 1 deep well (30 feet in depth) will be installed at the each site. Proposed monitoring well locations will be determined after the closure field investigation. After the monitoring wells have been installed and developed, groundwater samples will be collected and submitted to an approved contract laboratory for analysis of the gasoline analytical group.

Slug tests will be performed in one monitoring well from each of the eight sites to assess the hydraulic conductivity of the aquifer. The test will be repeated a minimum of three times in each well.

4.3.3 Former Tank/Pit Sites

Phase I - Soil Investigation. A phase I soil investigation will be conducted at up to five former tank/pit locations to characterize the soil contaminant plumes and assess their vertical and horizontal extent.

Approximately 75 soil borings (15 per site) will be advanced to the water table (~5 feet bls) around the former tank locations. Soil samples will be collected at 2-foot intervals in the borings and screened using an OVA/FID in accordance with Chapter 17-770, FAC, requirements. See Figure 4-3 for proposed soil boring locations at a typical tank/pit site.

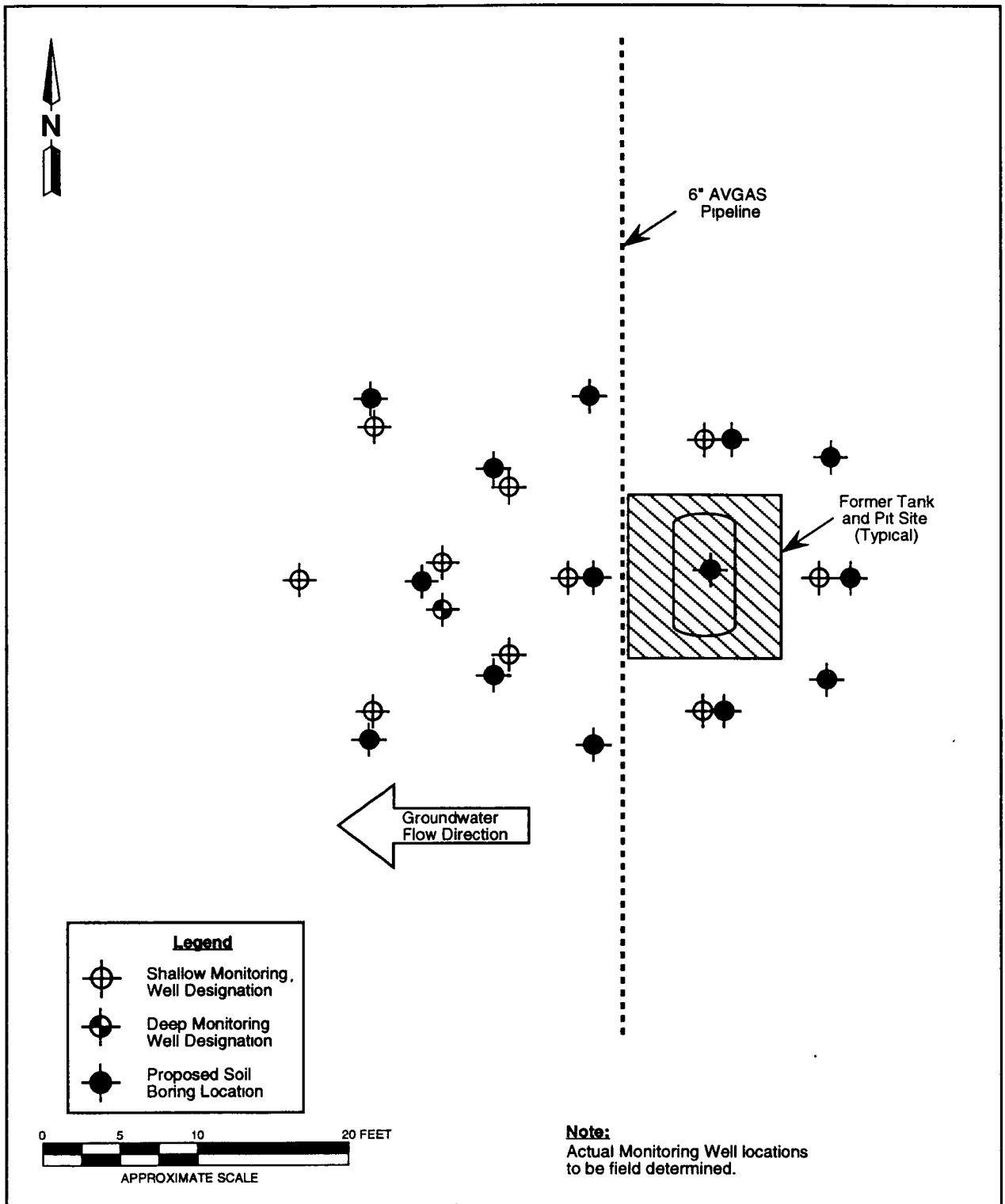

FIGURE 4-3

PROPOSED SOIL BORING AND MONITORING WELL LOCATIONS, TYPICAL TANK AND PIT SITE

CONTAMINATION ASSESSMENT PLAN, AVGAS PIPELINE

NADEP PENSACOLA
PENSACOLA, FLORIDA

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Additionally, groundwater samples will be collected from each borehole. These groundwater samples will be screened for BTEX using a portable GC. The groundwater data will be used to verify that proposed well locations will effectively serve to assess the extent of groundwater contamination.

Once the soil boring program is completed, a IRA report will be prepared to present the soil assessment findings, conclusions, and recommendations.

Phase II - Groundwater Investigation. The phase II groundwater investigations will take place after the IRAs (see Section 4.2.3) have been completed. The phase II investigations will be conducted at up to five locations to characterize the groundwater contaminant plumes and assess their vertical and horizontal extent.

Groundwater samples will be collected from each proposed well location where a groundwater sample was not collected during phase I. These groundwater samples will be screened for BTEX using a portable GC. This groundwater data will be used to verify that the proposed location will effectively serve to assess the extent of groundwater contamination.

Approximately 10 permanent shallow monitoring wells (15 feet in depth) and 1 deep well (30 feet in depth) will be installed at the each site (see Figure 4-3). After the monitoring wells have been installed and developed, groundwater samples will be collected and submitted to an approved contract laboratory for analysis. All groundwater samples will be analyzed for the gasoline analytical group parameters.

Slug tests will be performed in one monitoring well from each of the five sites to assess the hydraulic conductivity of the aquifer. The test will be repeated a minimum of three times in each well.

4.4 PREPARATION OF REPORTS.

4.4.1 Closure Report Once the removal or abandonment of a section of pipeline is completed, a pipeline closure report will be prepared for that section of the pipeline. The reports will present the findings and conclusions of the closure field investigations. The reports will include the soil sample screening data and maps outlining the extent of the excessive soil contamination identified for removal and other areas where additional assessment activities are required.

4.4.2 Technical Memoranda A technical memorandum will be prepared and submitted after the soil investigation at the Pipeline Abandonment Area and the Former Tank/Pit Sites. The memoranda will present the soil assessment findings, conclusions, and recommendations. The memoranda will include soil sample screening data, maps outlining the extent of soil contamination, and information on the vertical and horizontal extent of contamination to allow a contaminated soil removal operation (IRA) to be conducted.

Additionally, a technical memorandum will be prepared subsequent to the Site 23 soil screening. The result of the screening will be presented along with a map showing the extent of soil contamination.

4.4.3 Contamination Assessment Reports (CARs)

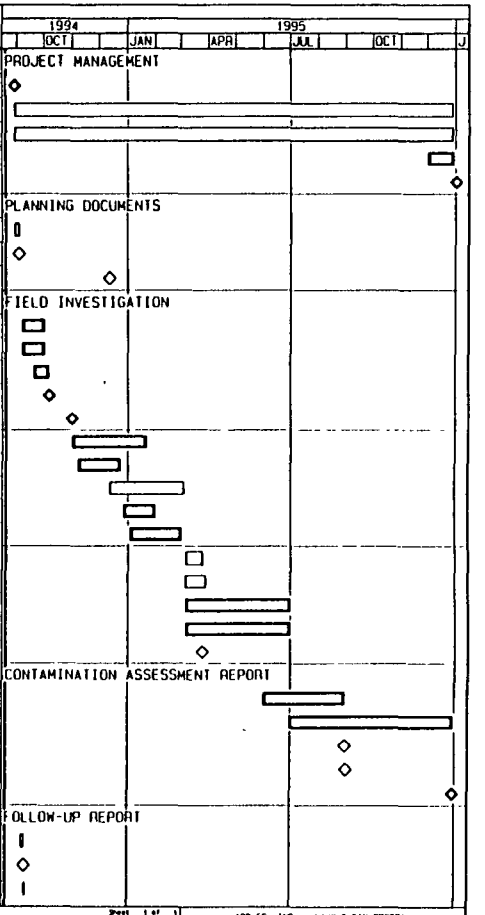
Preparation of a Master CAR. A master CAR will be prepared and submitted to SOUTHNAVFACENGCOM and the NAS Pensacola upon completion of the 21 field investigations (all sites combined). The master CAR will discuss site background information, hydrogeology, geology, and other site conditions which apply to all 21 sites. Facility and site location maps will be included in this report.

Preparation of Master CAR Data Addenda. Master CAR addenda for each of the 21 sites will be prepared and submitted to SOUTHNAVFACENGCOM and NAS Pensacola upon completion of the field investigations and master CAR. These addenda will present site-specific information, findings, and recommendations for each site. Recommendations shall be made as to the need for any follow-up reports. If recommended, a No Further Action Proposal (NFAP) will be incorporated into the addenda. Soil borings and monitoring well location maps as well as contamination delineation maps will be included in each addenda.

5.0 SCHEDULE

Figure 5-1 depicts a Gantt Schedule, indicating the estimated duration and initiation/completion dates of individual tasks for the Contamination Assessment Program at the AVGAS Pipeline Area sites.

ACTIVITY ID	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	ORIG DUR
A801400	AVGAS PIPELINE NOTICE TO PROCEED	29AUG94		0
A801405	AVGAS DAY-TO-DAY MANAGEMENT	29AUG94	28DEC95	338
A801420	AVGAS TFMR REVIEW & PREPARATION	29AUG94	28DEC95	338
A801410	AVGAS JOB CLOSEOUT	1DEC95	29DEC95	20
A801415	AVGAS JOB COMPLETE	2JAN96	29DEC95	0
A804425	AVGAS CAP & HASP PREPARATION	29AUG94	2SEP94	5
A804430	AVGAS SUBMIT CAP & HASP TO NAVY		2SEP94	0
A804435	AVGAS NAVY REVIEW CAP & HASP COMPLETE	12DEC94		0
A805500	AVGAS PIPELINE ABANDONMENT FLD WRK	6SEP94	30SEP94	19
A805505	AVGAS SITE 23 SOIL INVEST (ABANDMT)	6SEP94	30SEP94	19
A805510	AVGAS PIPELINE CLOSURE REPORT (ABANDMT)	19SEP94	5OCT94	13
A805515	AVGAS SUBMIT PIPELINE CLOSURE RPT (ABANDMT)		5OCT94	0
A805520	AVGAS NAVY REVIEW P/L CLOSURE RPT (ABANDMT)	31OCT94		0
A805525	AVGAS INITIAL REMEDIAL ACTIONS (ABANDMT)	31OCT94	20JAN95	56
A805550	AVGAS SOIL ASSESSMT (FORMER TANK)	7NOV94	23DEC94	33
A805440	AVGAS PIPELINE CLOSURE FLD WORK (RMVL ASSES)	12DEC94	3MAR95	58
A805553	AVGAS SUBMIT IRA REPORT (FORMER TANK)	27DEC94	30JAN95	24
A805555	AVGAS INITIAL REMEDIAL ACTION (FORMER TANK)	3JAN95	28FEB95	41
A805445	AVGAS PIPELINE CLOSURE REPORT (RMVL ASSES)	6MAR95	24MAR95	15
A805450	AVGAS PERFORM CONTAM ASSESSMENTS (RMVL ASSES)	6MAR95	28MAR95	17
A805530	AVGAS CONTAMINATION ASSESSMENT (ABANDMT)	6MAR95	30JUN95	84
A805560	AVGAS GROUNDWATER ASSES (FORMER TANK)	6MAR95	30JUN95	84
A805447	SUBMIT PIPELINE CLOSURE RPT (RMVL ASSES)		24MAR95	0
A815600	AVGAS PREP MASTER CAR	1JUN95	30AUG95	64
A815610	AVGAS PREP 21 CAR DATA ADDENDUM	30JUN95	29DEC95	126
A815605	AVGAS SUBMIT MASTER CAR		30AUG95	0
A815615	AVGAS SUBMIT INTERIM 21 CAR ADDEND RPT	1SEP95		0
A815620	AVGAS SUBMIT FINAL 21 CAR ADDENDUM		29DEC95	0
A816570	AVGAS PREP ALT PROC FOR P/L CLOSURE	6SEP94	8SEP94	3
A816575	AVGAS SUBMIT ALT PROC P/L CLOSURE RPT		8SEP94	0
A816580	AVGAS MEETING WITH FDEP	9SEP94	9SEP94	1



Plot Date 2SEP94
Data Date 19AUG94
Project Start 7OCT93
Project Finish 29DEC95

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Date | Revision | Checked | Approved

FIGURE 5-1
CTO 008 NADEP PENSACOLA CAR
AVGAS PIPELINE ASSESSMENT
BASELINE PROJECT SCHEDULE

FIGURE 5-1

BASELINE PROJECT SCHEDULE

CONTAMINATION ASSESSMENT PLAN, AVGAS PIPELINE

NADEP PENSACOLA
PENSACOLA, FLORIDA

REFERENCES

ABB Environmental Services, Inc. (ABB-ES), 1994. Contamination Assessment Report for Site 2662W, NADEP, NAS Pensacola, Florida. Contract No. N62467-89-D-0317.

Bouwer, H., and Rice, R.C., 1976, A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells: Water Resources Research, vol. 12, p. 423-428.

Geraghty & Miller, Inc., 1989, AQTESOLV™, aquifer test design and analysis: computer version 1.0.