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NAS WHITING FIELD
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CONTAMINATION ASSESSMENT REPORT FOR SITE 2894 NAS WHITING FIELD FL
10/1/1993
ABB ENVIRONMENTAL SERVICES, INC

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CONTAMINATION ASSESSMENT REPORT

SITE 2894

**NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA**

UNIT IDENTIFICATION CODE (UIC): N60508

Contract No. N62467-89-D-0317

Prepared by:

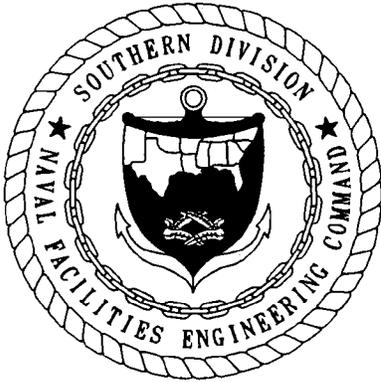
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October 1993



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, 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 on petroleum contamination in Florida's environment as a result of petroleum spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Environmental Coordinator, Naval Air Station (NAS) Whiting Field, Milton, Florida, at 904-623-7181, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 1843, at DSN 563-0613 or 803-743-0613.

EXECUTIVE SUMMARY

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) at Building 2894, Naval Air Station Whiting Field, Milton, Florida. The CA at Building 2894 site was initiated in response to a directive issued by the Florida Department of Environmental Protection (FDEP).

On April 5, 1991, JP-5 jet fuel was discovered leaking from an underground pipeline between Building 2894 and the truckstand used to offload fuel from trucks to aboveground storage tanks (ASTs) 2891 and 2892. Base personnel estimated that at least 25 gallons of JP-5 was released into the soil in the vicinity of the pumphouse.

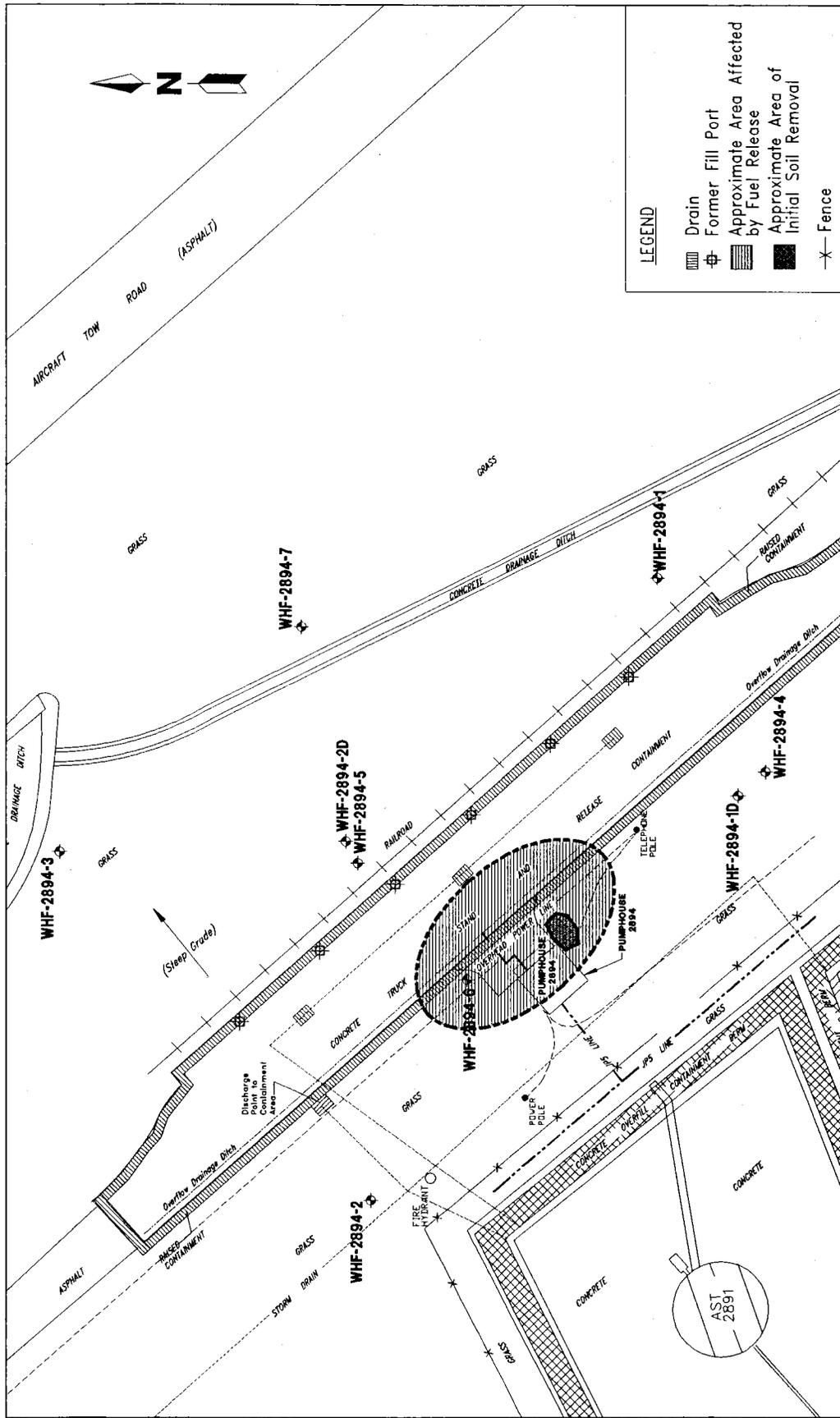
On the day the leak was discovered, approximately 2 cubic yards of fuel-saturated soil was excavated from the vicinity of the release by base personnel. The underground pipeline was flushed with water, abandoned in place, and replaced with a new aboveground pipeline that is currently in use. The contaminated water used to flush the pipeline was disposed in the base's water contaminated fuel system and the excavated soil was transported to the Santa Rosa County Landfill for disposal.

The Pensacola office of the FDEP, was notified by base personnel of the release on the afternoon of April 5, 1991. A Discharge Reporting Form officially notifying the FDEP of the release was submitted April 8, 1991. On June 13, 1991, FDEP notified SOUTHNAVFACENGCOM that it should proceed with a CA of the site as required in Chapter 17-770, Florida Administrative Code (FAC).

Soil borings and monitoring wells were placed at the site during the CA to assess the horizontal and vertical extent of soil and groundwater contamination. Soil and groundwater samples were collected and analyzed in accordance with Chapter 17-770, FAC. A map of the site showing approximately areas affected by the fuel release is presented as the Executive Summary Map. The findings, conclusions, and recommendations of the Contamination Assessment Report (CAR) are summarized below.

Findings

- Sediments encountered during drilling operations at the site consist of layers of very fine- to coarse-grained quartz sand, clayey sand, and sandy clay. An intermittent lens of clay causes perched water conditions about 15 to 20 feet below land surface (bls) and at 90 feet bls.
- There are two distinct water-bearing zones at the site separated by a clay layer approximately 15 feet thick. Groundwater in the upper water-bearing zone is encountered at depths ranging from 72.58 feet bls to 85.91 feet bls, or surface elevations from 80.39 feet to 83.31 feet above National Geodetic Vertical Datum (NGVD). Groundwater in the lower water-bearing zone is encountered from 94.58 feet bls to 96.90 feet bls. The clay layer forms an aquitard for the lower water-bearing zone, which is under pressure and has a potentiometric surface elevation ranging from 69.71 feet to 70.75 feet above NGVD.



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REPORT, SITE 2894**

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MILTON, FLORIDA**



EXECUTIVE SUMMARY MAP



- The net groundwater flow direction of the upper water-bearing zone at the site is toward the northeast.
- Organic vapor analyzer (OVA) headspace analysis of soil boring samples indicates the presence of excessively contaminated (≥ 50 ppm for Kerosene Analytical Group or mixed product analytical group) soil at the site. Excessively contaminated soil extends to a depth of 55 feet bls. The majority of excessively contaminated soil at the site is encountered from ground surface to depths ranging from approximately 25 to 30 feet bls.
- Laboratory results of groundwater samples indicate concentrations of kerosene analytical group compounds were either less than method detection limits, or detected in concentrations less than State target levels in all wells at the site except WHF-2894-3. In monitoring well WHF-2894-3, ethylene dibromide (EDB) was most recently detected at $0.06 \mu\text{g}/\ell$, which is above the State target level of $0.02 \mu\text{g}/\ell$.

Conclusions

- Past releases of petroleum products from fueling operations at Site 2894 have resulted in excessive soil contamination as defined in Chapter 17-770, FAC.
- There is no significant groundwater contamination associated with the petroleum release or the excessively contaminated soils.

Recommendations

Based on the findings and conclusions of this CA, a Remedial Action Plan (RAP) is recommended to clean up excessively contaminated soil at Site 2894. Before preparing a RAP, a study should be completed to assess the feasibility of different remedial technologies. This is recommended based on the extent and complexity of the soil contamination.

ACKNOWLEDGMENTS

In preparing this report, the Underground Storage Tank Section of the Comprehensive Long-Term Environmental Action, Navy group at ABB Environmental Services, Inc., commends the support, assistance, and cooperation provided by the personnel of the Naval Air Station Whiting Field, Milton, Florida, and Southern Division, Naval Facilities Engineering Command.

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
AST	aboveground storage tank
bls	below land surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CA	contamination assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CompQAP	Comprehensive Quality Assurance Plan
CTO	Contract Task Order
EDB	ethylene dibromide
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FID	flame ionization detector
ft/day	feet per day
ft/ft	feet per foot
ft/min	feet per minute
GC	gas chromatograph
gpm	gallons per minute
HRS	Hazard Ranking System
HSA	hollow-stem auger
HSWA	Hazardous and Solid Waste Amendments
ID	inside diameter
IR	Installation Restoration
IRA	Initial Remedial Action
K	hydraulic conductivity
mg/l	milligrams per liter
msl	mean sea level
MS/MSD	matrix spike/matrix spike duplicate
MTBE	methyl tert-butyl ether
µg/l	micrograms per liter
NAS	Naval Air Station
NEESA	Naval Energy and Environmental Support Activity
NFAP	No Further Action Proposal
NGVD	National Geodetic Vertical Datum
OVA	organic vapor analyzer

GLOSSARY (Continued)

PCE	tetrachloroethene
POA	Plan of Action
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SOUTHNAV-	
FACENCOM	Southern Division, Naval Facilities Engineering Command
SPCC	Spill Prevention Control and Countermeasure
SPT	standard penetration test
SWDA	Solid Waste Disposal Act
TCE	trichloroethene
TRAWING FIVE	Training Air Wing Five
TRPH	total recoverable petroleum hydrocarbon
USEPA	U.S. Environmental Protection Agency
USTs	underground storage tanks
V	velocity
VOCs	volatile organic compounds

1.0 INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) and submit a Contamination Assessment Report (CAR) for each of six petroleum contaminated sites at Naval Air Station (NAS) Whiting Field, Milton, Florida. This CAR is submitted for one of the sites, Site 2894.

On April 5, 1991, JP-5 jet fuel was discovered leaking from an underground pipeline between the pumphouse, Building 2894, and the truckstand used to offload fuel from tanker trucks to aboveground storage tanks (ASTs) 2891 and 2892. Base personnel estimated that approximately 25 gallons of JP-5 was released into the soil in the vicinity of the pumphouse.

The scope of services for the work at NAS Whiting Field is described in Contract Task Order (CTO) No. 009, the Plan of Action (POA), and the Contamination Assessment Plan (CAP) and includes the following:

- drilling soil borings and analyzing soil samples to assess the degree and the extent of soil contamination,
- installing and sampling groundwater monitoring wells to assess the degree and the extent of groundwater contamination,
- collecting water level data to estimate the groundwater flow direction and hydraulic gradient at the site,
- conducting a public potable well inventory within a 0.50-mile radius of the site,
- conducting slug tests in selected wells to estimate aquifer characteristics, and
- reducing and analyzing pertinent data gathered during the CA to complete this CAR.

The CA at Site 2894 was conducted from February through August 1992 and May through July 1993. The following sections of the report present the background information, data compilation, results, conclusions, and recommendations of the CAR.

2.0 SITE LOCATION AND BACKGROUND

2.1 SITE LOCATION AND AREA OF INVESTIGATION.

2.1.1 Relation of Site to Surrounding Area NAS Whiting Field is located in Florida's northwest coastal area approximately 7 miles north of Milton and 20 miles northeast of Pensacola (Figure 2-1). NAS Whiting Field occupies 3,490 acres in north-central Santa Rosa County with easement rights to an additional 457 acres.

2.1.2 Land Use The station is the home base of Training Air Wing Five (TRAWING FIVE), whose mission is to administer, coordinate, and supervise flight and academic training. The station is divided into a North Field, where fixed wing training takes place, and a South Field used for helicopter training. Support facilities are located between the two fields (Figure 2-2).

2.1.3 Site Layout Building 2894 is a pumphouse used to transfer jet fuel, JP-5, from tanker trucks to ASTs 2891 and 2892. Building 2894 is located in the northeast section of the industrial area at NAS Whiting Field east of ASTs 2891 and 2892. The site topography is generally flat in the area of the truckstand and Building 2894; however, there is a relatively steep hillside north and east of the truckstand area that is truncated by concrete drainage ditches at the base of the hill. West of Building 2894, the ground slopes gently toward the concrete spill containment area surrounding ASTs 2891 and 2892.

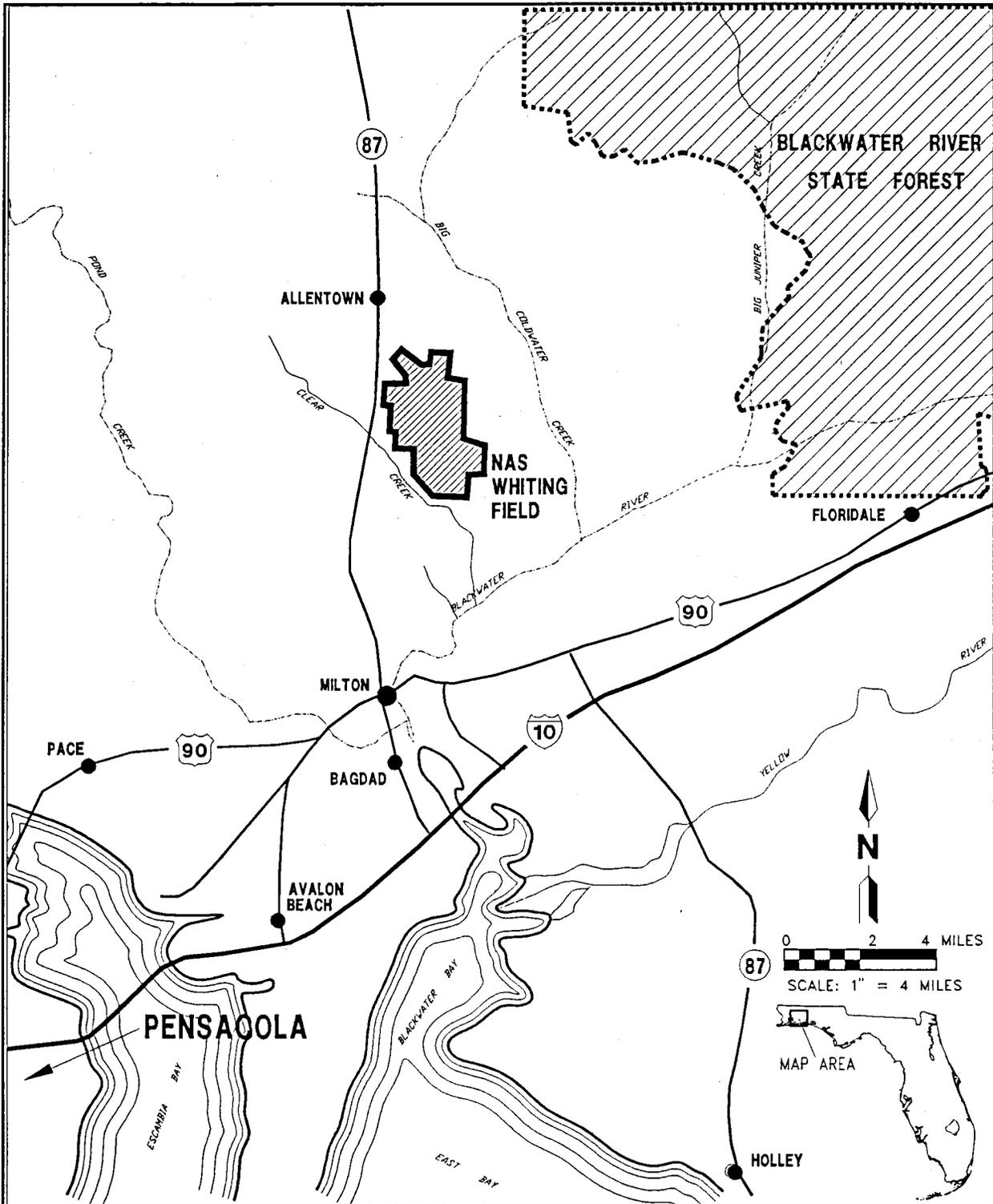
The site consists of Building 2894, which is a one-story, cement block structure on a concrete slab; a concrete truckstand with a spill containment system adjacent to the pumphouse; ASTs 2891 and 2892; and the associated piping.

A site plan of the Building 2894 pumphouse, truckstand, ASTs 2891 and 2892 (AST 2892 is not shown), and surrounding area is presented in Figure 2-3. Also shown in Figure 2-3 are known existing utilities, and the location of the former railroad service line.

2.2 SITE HISTORY AND OPERATIONS.

2.2.1 Past and Present Use of Site In the past, jet fuel was transported to the pumphouse by railcar on a railroad line, which ran along the east side of the truckstand. Jet fuel was offloaded from the railcars via a pipeline adjacent to the railroad line and pumped into ASTs 2891 and 2892. The railroad line was removed in the mid-1970's and the associated pipelines were abandoned in place. Today, JP-5 is transferred from tanker trucks to ASTs 2891 and 2892 through the Building 2894 pumping station. Jet fuel, JP-5, has been stored at this site since the 1960's.

Tanks 2891 and 2892 are two 230,000-gallon bare steel ASTs that were constructed in 1961. The tanks have secondary spill containment consisting of a concrete base and berm. The spill containment area is surrounded by chain-link fencing and locking gates to discourage unwarranted entry. The truckstand is also bermed and has drains that flow into the AST spill containment area in the event of a release.



**FIGURE 2-1
FACILITY LOCATION MAP**



**CONTAMINATION ASSESSMENT
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FIG-1/KGP/10/07/93

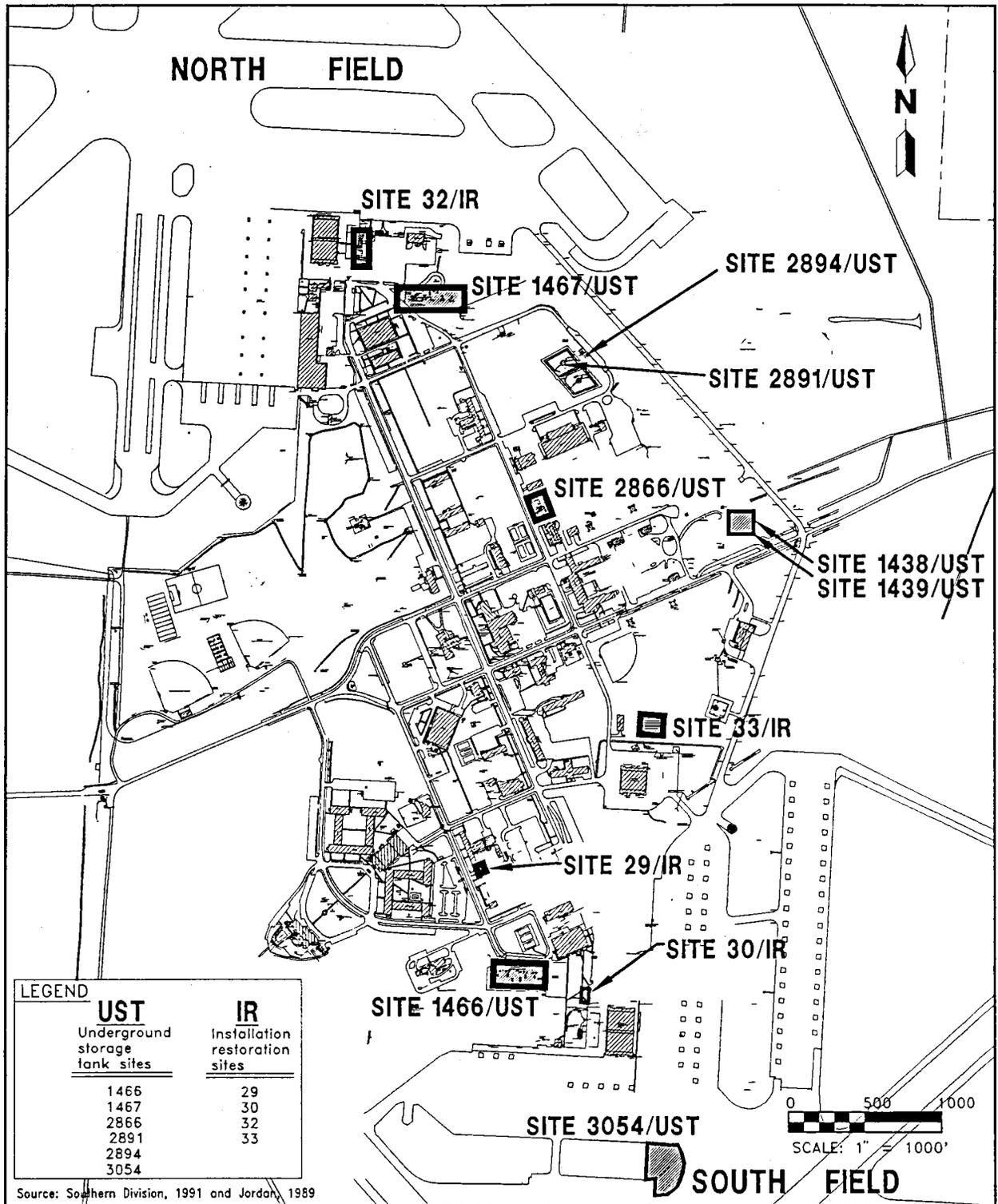


FIGURE 2-2
SITE LOCATION MAP



CONTAMINATION ASSESSMENT
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On the morning of April 5, 1991, base personnel working at the Building 2894 pumphouse reported the fuel release to the base Environmental Coordinator. The Pensacola office of the Florida Department of Environmental Protection (FDEP; formerly the Florida Department of Environmental Regulation [FDER]) was notified of the release on the afternoon of April 5, 1991, after initial remedial action was taken to clean up the fuel. A Discharge Reporting Form, officially notifying the FDEP of the release was submitted April 8, 1991. On June 13, 1991, FDEP notified SOUTHNAVFACENGCOM that it should proceed with a CA of the site as required in Chapter 17-770, Florida Administrative Code (FAC).

2.2.2 Structural Integrity

2.2.2.1 **Inventory Reconciliation** ASTs 2891 and 2892 are inventoried daily and are contained in the base Spill Prevention Control and Countermeasure (SPCC) plan.

2.2.2.2 **Repairs, Replacements, Removals, and Abandonments** In the mid-1970's when the railroad was taken out of service, the fuel fill ports located along the northeast side of the truckstand were abandoned by draining the lines and filling the ports with cement.

2.2.2.3 **Tightness Testing** The piping connecting the pumphouse to the dispensers located approximately 0.5 mile to the west is scheduled for tightness testing in 1994. No integrity testing of these components has previously been performed at this site.

2.2.3 Initial Remedial Action (IRA) On the day the leak was discovered, approximately 2 cubic yards of fuel-saturated soil was excavated from the vicinity of the release (Figure 2-3). The underground pipeline was flushed with water, abandoned in place, and replaced with a new aboveground pipeline, which is currently in use. The contaminated water used to flush the pipeline was disposed in an onsite system in accordance with base procedures for water-contaminated fuel disposal. The excavated soil was transported to the Santa Rosa County landfill for disposal.

The horizontal and vertical extent of petroleum-contaminated soil excavated at the site was based on visual inspection of the soil at the time of excavation. No organic vapor analysis of soil sample headspace was performed during the excavation to assess the level or extent of petroleum-contaminated soil at the site.

All available documentation associated with the JP-5 release and initial remedial action are attached as Appendix A, Release and Initial Remedial Action Documentation.

2.3 PREVIOUS INVESTIGATIONS AND OTHER POSSIBLE SOURCES OF CONTAMINATION. Other possible sources of petroleum contamination within the confines of NAS Whiting Field include the former underground storage tanks (USTs) at the North Fuel Farm, the abandoned pipeline associated with the fuel hydrant system for the North and South Field, and the AST 2891 (Figure 2-2). These sites are currently being investigated as part of the UST or Installation Restoration (IR) programs.

There have been no previous investigations conducted at the Building 2894 site; however, there are six UST sites at NAS Whiting Field currently under investigation in accordance with Chapter 17-770, FAC, with several others scheduled in the future. The sites in the vicinity of Site 2894 are shown in Figure 2-2. These sites are discussed below.

Sites 1466 and 1467, the South and North Fuel Farms, are currently under investigation as part of the UST program. Analytical results of groundwater samples collected at Site 1467 indicate the presence of compounds not regulated under Chapter 17-770, FAC. Groundwater sampling was conducted in late August 1993 to analyze samples for target compound list parameters and to determine if this site should continue to be assessed in accordance with Chapter 17-770, FAC, regulations or be transferred to the IR program.

Site 2866, the Navy Exchange Service Station, CA and CAR are complete. Approval by FDEP of the recommended No Further Action Proposal (NFAP) is pending the results of the tank removal scheduled for the upcoming year.

Site 2891 is the AST adjacent to Site 2894, which was investigated as part of the UST program in response to a release of JP-5 fuel that occurred on August 6, 1991. The CAR submitted for Site 2891 in January 1993 recommended a NFAP. Approval of the CAR is pending confirmatory soil sampling and subsequent FDEP review.

Site 3059, a spill release site, CA and CAR are complete. Additional field work was performed at this site at the request of FDEP. Approval of the NFAP is pending the completion of a CAR addendum.

The IR program at NAS Whiting Field has been designed to identify, prioritize, and abate or control contaminant migration resulting from past operations at Naval installations. There are currently 23 sites being investigated under this program at NAS Whiting Field. Where possible, data from the IR investigation pertinent to this site are referenced in this report.

3.0 SITE CONDITIONS

3.1 PHYSIOGRAPHY. NAS Whiting Field is located within the Western Highlands subdivision of the Northern Highlands. This zone is characterized by southward sloping hills and plateaus, which have been cut by numerous streams. Elevations generally range from 50 to 200 feet above mean sea level (msl). Site elevations range from 150 feet to 190 feet msl. Surface water runoff is conveyed to Clear Creek (west and south) and Big Cold Creek (east) by a system of ditches and storm drains. The drainage system was installed when the base was constructed in the early 1940's.

3.2 GEOLOGY.

3.2.1 Regional Geology NAS Whiting Field is underlain by a thick sequence of tertiary sedimentary formations. A generalized geologic column of these formations is presented in Figure 3-1. Information on the regional geologic characterization presented in this section was obtained from the NAS Whiting Field Remedial Investigation (RI) Workplan, Volume I (Jordan, 1990), the Verification Study (Geraghty & Miller, 1986), the Initial Assessment Study (Envirodyne Engineers, 1985), and Marsh, (1966).

The oldest formation studied in the western panhandle area (Escambia and Santa Rosa Counties) is the Hatchetigbee Formation of the early Eocene series. This formation is composed of silty clay with beds of glauconitic shale and shaly limestone. The average thickness of the Hatchetigbee Formation is 315 feet (Marsh, 1966).

Overlying the Hatchetigbee is the Tallahatta Formation of middle Eocene age, which consists of shale and siltstone deposits interbedded with gray limestone and well sorted sand.

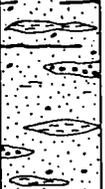
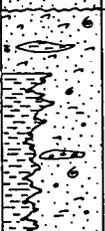
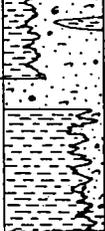
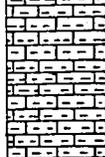
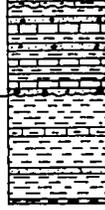
Above the Tallahatta is the Lisbon equivalent that has been correlated with the Lisbon Formation of Alabama. The Lisbon is approximately 500 feet thick and consists of a shaly limestone.

The upper Eocene series is represented by the Ocala group. The Ocala is a light-gray limestone and averages 165 feet in thickness. Fifty-seven species of foraminifera were identified in this group. Unconformably overlying the Ocala is the Bucatunna Clay Member of the Byram Formation. The Bucatunna is a dark gray soft clay averaging 125 feet in thickness throughout the western Florida Panhandle.

The Chickasawhay Limestone and Tampa Formation are so similar in the western Panhandle that they are presented as "undifferentiated" on the geologic column. The Chickasawhay is a gray dolomitic limestone and the Tampa is a light gray to white hard limestone (generally not dolomitic). These undifferentiated sediments range in thickness from 30 to 270 feet.

Above the Chickasawhay-Tampa Formation lies the Pensacola Clay, which consists of an upper and lower member of dark to light gray sandy clay. These two members are separated by the Escambia sand member of gray fine- to coarse-grained sand.

GENERALIZED GEOLOGIC COLUMN OF FORMATIONS IN THE WESTERN FLORIDA PANHANDLE

SERIES	GRAPHIC SECTION	FORMATION
PLEISTOCENE		MARINE TERRACE DEPOSITS: Sand, light tan, fine to coarse
PLEISTOCENE (?)		CITRONELLE FORMATION: Sand with lenses of clay and gravel. Sand, light-yellowish-brown to reddish-brown, very fine to very coarse and poorly sorted. Hardpan layers in upper part. Logs and carbonaceous zones present in places. Fossils extremely scarce except near the coast where shell beds may be the marine equivalent of the fluvial facies of the Citronelle.
UPPER MIOCENE		MIOCENE COARSE CLASTICS: Fossiliferous sand with lenses of clay and gravel. Sand is light-gray to light-brown, very fine to very coarse and poorly sorted. Fossils abundant, mostly minute mollusks. Contains a few zones of carbonaceous material. Lower part of coarse clastics present only in northern part of area, interfingering with Pensacola Clay in the central part. PENSACOLA CLAY: Formation consists of an Upper Member and Lower Member of dark-to-light-gray, tough, sandy clay; separated by the Escambia Sand Member of gray, fine to coarse, quartz sand. Contains carbonized plant fragments, and abundant mollusks and foraminifers. Pensacola Clay is present only in southern half of area, interfingering with the Miocene coarse clastics in the central part.
UPPER MIDDLE TO LOWER UPPER MIOCENE		
LOWER MIOCENE AND UPPER OLIGOCENE		CHICKASAWHAY LIMESTONE AND TAMPA FORMATION UNDIFFERENTIATED <u>Tampa</u> : Limestone, light-gray to grayish-white, hard, with several beds of clay; <u>Chickasawhay</u> : Dolomitic limestone, gray, vesicular.
MIDDLE OLIGOCENE		BUGATUNNA CLAY MEMBER OF BYRAM FORMATION: Clay, dark-gray soft, silty to sandy, foraminiferal, carbonaceous.
UPPER EOCENE		OCALA GROUP: Limestone, light-gray to chalky-white foraminifers extremely abundant, esp. <u>Lepidocyclina</u> ; corals, echinoids, mollusks, bryozoans.
MIDDLE EOCENE		LISBON EQUIVALENT: Shaly limestone, dark-gray to grayish-cream; hard, compact; glauconitic; with thick intervals of dense, light-gray shale. TALLAHATTA FORMATION: Shale and siltstone, light-gray, hard, with numerous interbeds of gray limestone and very fine to very coarse, pebbly sand. Foraminifers locally abundant.
LOWER EOCENE		HATCHETIGSEE FORMATION: Clay, gray to dark-gray, micaceous, silty, with beds of glauconitic shale, siltstone, and shaly limestone. Mollusks, foraminifers, corals, echinoids. Bashi Marl Member (about 10 feet thick) at base.

Source: Marsh

**FIGURE 3-1
GENERALIZED GEOLOGIC COLUMN OF
FORMATIONS IN THE WESTERN
FLORIDA PANHANDLE**

FIG3-1/KGP/10/10/93



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The upper member of the Pensacola Clay is not present in the immediate vicinity of NAS Whiting Field and the lower member pinches out east of Big Coldwater Creek.

Miocene age coarse clastics, however, are present throughout the western Florida Panhandle. These coarse clastics are described as brown to gray, poorly sorted sand and gravel with thick lenses of clay. These sediments overlie the Chickasawhay Limestone in the vicinity of NAS Whiting Field.

The Citronelle Formation of Pleistocene age overlies the Miocene clastics and is very similar in composition. The two units are differentiated by the abundance of shells in the Miocene clastics. The thickness of the Citronelle ranges from 40 to 800 feet in westernmost Florida. The Citronelle also contains layers of fossil wood, hardpan, shells, and kaolinitic burrows of aquatic animals (Marsh, 1966).

Three marine shorelines can be recognized from existing topographic profiles across Escambia and Santa Rosa Counties. The shoreline at 30 feet above National Geodetic Vertical Datum (NGVD) of 1929 is represented by the Pamlico terrace, the Penholoway terrace has a relic shoreline at 70 feet NGVD, and the third shoreline is a seaward-sloping upland surface ranging from 70 to 270 feet above NGVD.

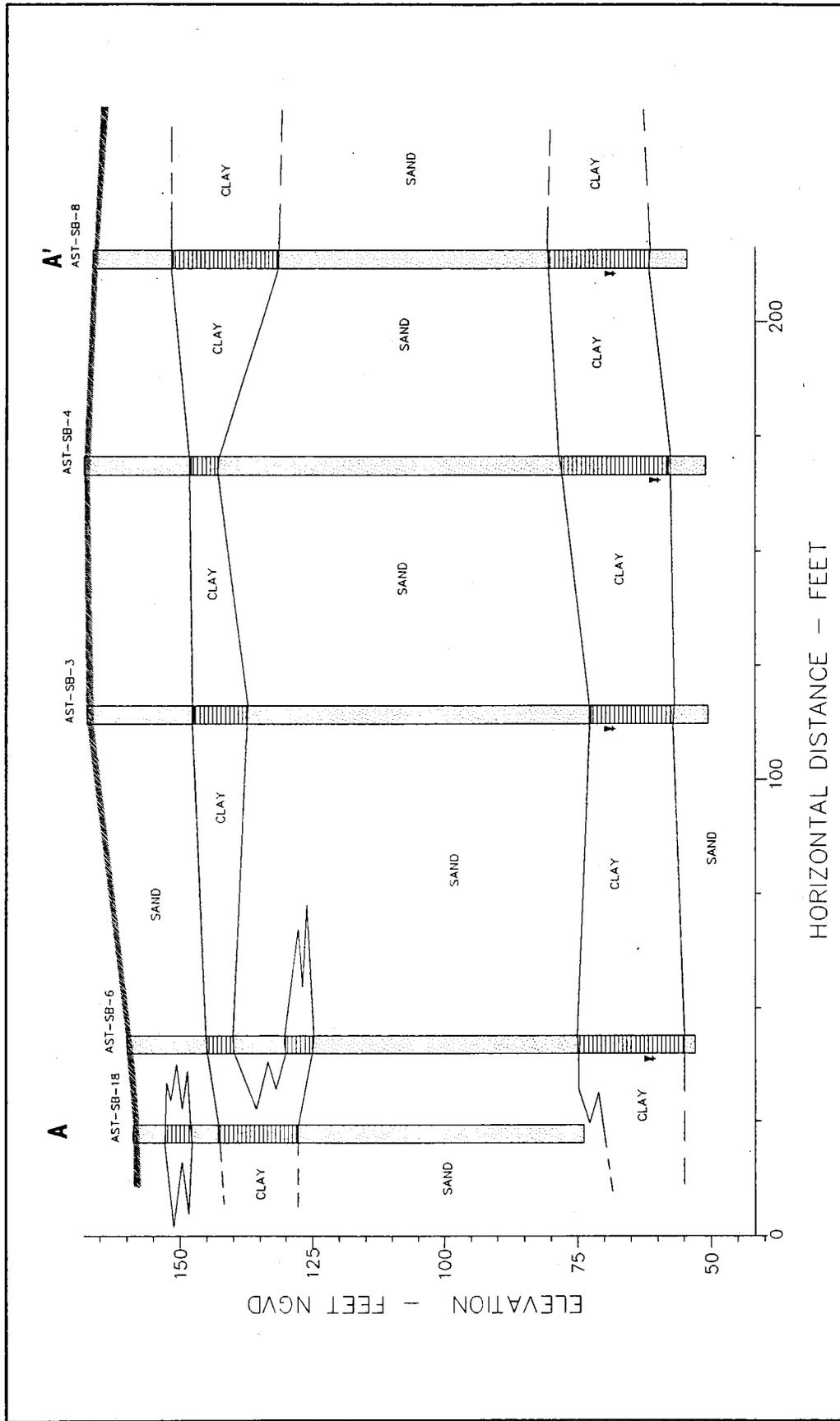
The geologic structure of the western Florida Panhandle is a simple homocline with a few faults and folds present in northern Santa Rosa County where the Pollard graben is located.

3.2.2 Site Geology The upper water-bearing zone and the main producing zone of the sand-and-gravel aquifer at NAS Whiting Field are classified and regulated as a Class G-II water source according to Chapter 17-3, FAC.

The uppermost surficial sediments at Site 2894 consist primarily of low-permeability sediments such as clayey sand and sandy clay. These sediments range in thickness from approximately 20 to 40 feet. Beneath the low permeability sediments, the lithology generally consists of very fine- to very coarse-grained sand with randomly interbedded lenses and layers of gravel and clay.

Sediments encountered during drilling operations at the site consist of layers of very fine- to coarse-grained quartz sand, clayey sand, and sandy clay. An intermittent lens of clay approximately 5 feet thick and approximately 15 to 20 feet below land surface (bls) causes perched water conditions at the site. Another clay layer, which is more locally extensive, is approximately 15 feet thick and encountered from approximately 90 feet to 105 feet bls.

Three cross sections representing the general lithology of the site are presented in Figures 3-2 through 3-5. Complete lithologic logs for all site soil borings and monitoring wells are presented in Appendix B.

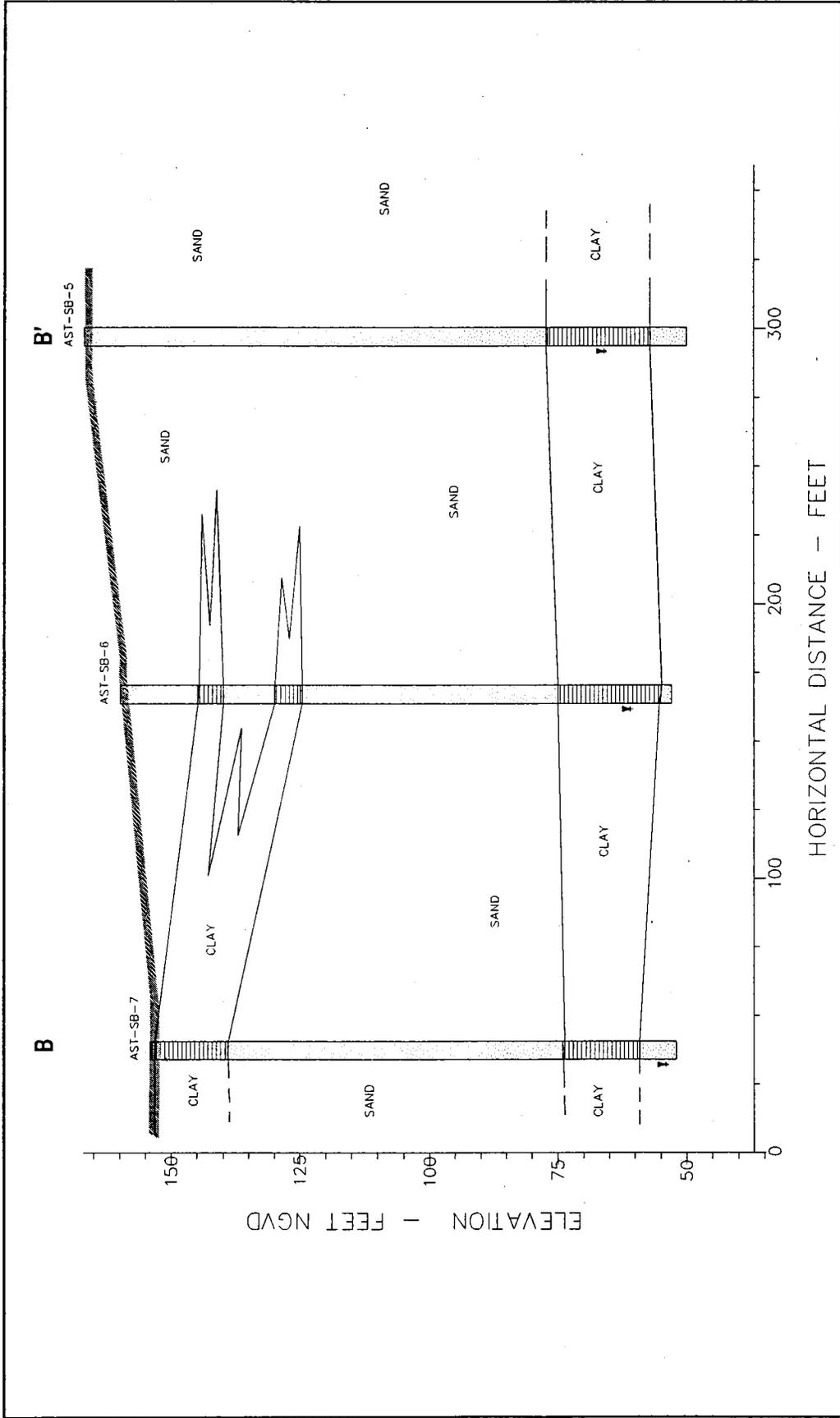


CONTAMINATION ASSESSMENT
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FIGURE 3-3
 CROSS SECTION A - A'

2894SECT/KGF/08/20/93

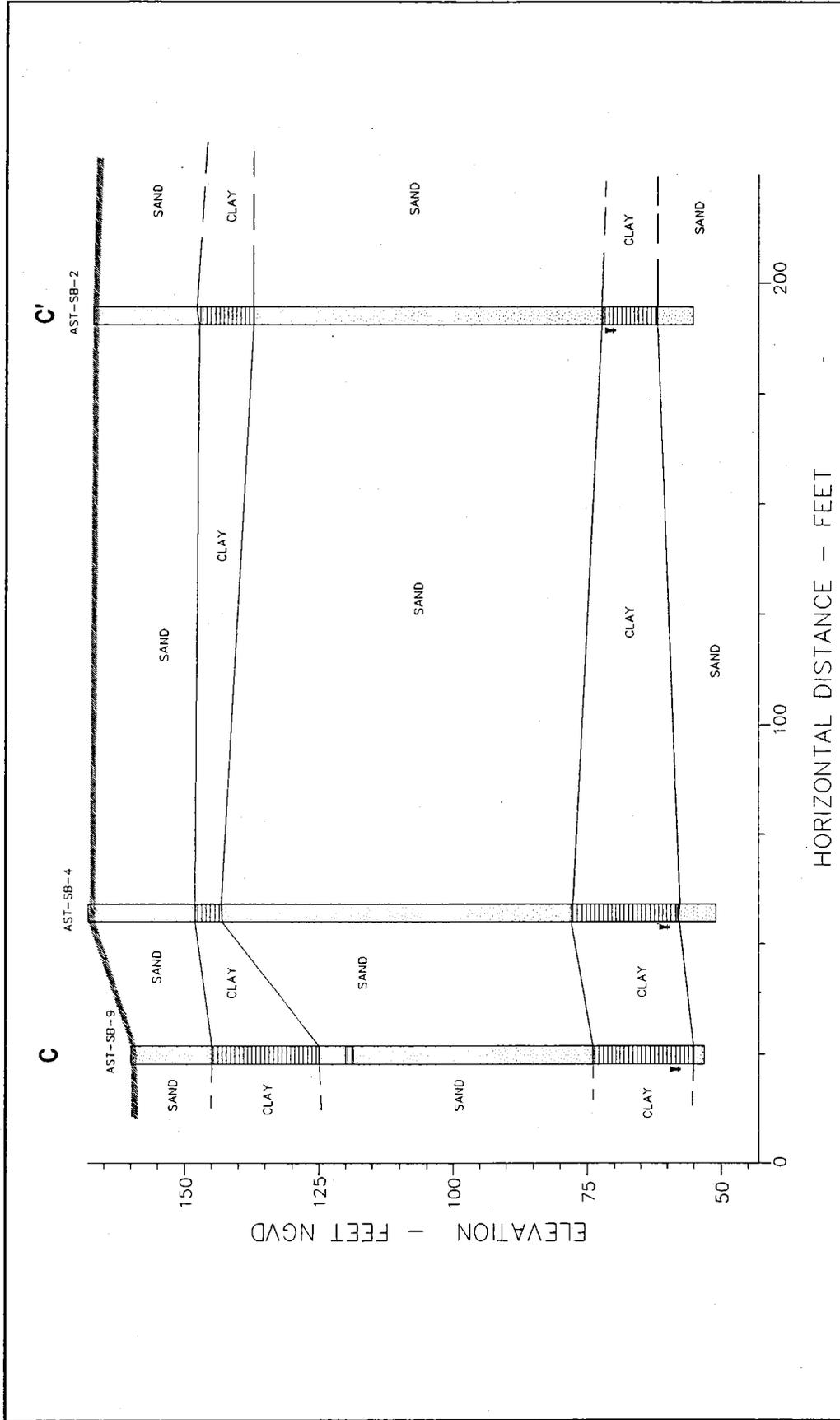


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NAS WHITING FIELD
 MILTON, FLORIDA

FIGURE 3-4
 CROSS SECTION B - B'



CONTAMINATION ASSESSMENT
REPORT, SITE 2894



NAS WHITING FIELD
MILTON, FLORIDA

FIGURE 3-5
CROSS SECTION C - C'

3.3 HYDROGEOLOGY.

3.3.1 Regional Hydrogeology

Sand-and-Gravel Aquifer. The uppermost sediments, extending to a depth of approximately 350 feet bls, comprise the sand-and-gravel aquifer, which is subdivided into two units. The water table or upper part of the sand-and-gravel aquifer does not constitute a source for large water supplies; however, its primary importance is to recharge the lower, more productive zone of the aquifer.

The sand-and-gravel aquifer includes the upper Miocene coarse clastics, the Citronelle Formation, and marine terrace deposits. These three units have similar hydraulic properties and are sometimes indistinguishable. The aquifer consists of poorly sorted, fine- to coarse-grained sand with gravel and lenses of clay. The clay may be as much as 60 feet thick. In some areas, the formation also contains wood fragments. The part of the formation that contains the wood fragments may be as much as 25 feet thick (Marsh, 1966).

The aquifer contains lensatic zones within the sand that are cemented by iron-oxide minerals. The lenses, known locally as hardpans, have lower permeabilities and, along with the clay lenses, are responsible for the occurrence of perched water tables and semi-artesian conditions in the aquifer.

Floridan Aquifer System. Underlying the sediments of the sand-and-gravel aquifer is the thick (approximately 300 feet), relatively impermeable Pensacola Clay. Below the Pensacola Clay are thick layers of limestone and shale to a depth of nearly 2,000 feet.

The limestone layers constitute the regionally extensive Floridan aquifer system. In the area of NAS Whiting Field, the Floridan aquifer is divided into an upper and lower part separated by the Bucatunna Clay. The Floridan aquifer system receives little or no recharge from the sand-and-gravel aquifer because of the Pensacola Clay confining unit. The potentiometric surface of the Upper Floridan aquifer in the NAS Whiting Field area is about 50 to 55 feet above msl.

3.3.2 Site Hydrogeology

3.3.2.1 Capacity and Continuity of Confining Layers There are three major aquifers in the NAS Whiting Field area. The uppermost aquifer, the sand-and-gravel aquifer, exists under both artesian and non-artesian conditions depending on the presence or absence of semi-confining clay lenses. The two other aquifers, the Upper Floridan and the Lower Floridan, are deep artesian aquifers of the Floridan aquifer system.

Sand-and-Gravel Aquifer. The sand-and-gravel aquifer is recharged by infiltration of rainwater at the surface. A clay layer of variable thickness and lateral extent at NAS Whiting Field creates locally perched water table conditions. This is the case at Site 2894 where the semi-confining clay layer, approximately 15 feet thick, is encountered at approximately 80 feet bls. This clay layer forms an aquitard and subsequently creates a locally perched water table, which will henceforth be referred to as the upper water-bearing zone of the sand-and-gravel aquifer. The water-bearing zone below the clay layer will be referred to as the lower water-bearing zone.

The results of an aquifer test in the Milton area indicate the clayey sand confining unit separating the upper and lower water-bearing zones is very leaky. In the NAS Whiting Field area, clay lenses occur in the uppermost 30 feet and in the depth interval of approximately 100 to 170 feet bls (elevation 10 to 70 feet above msl). Although the clays appear to be continuous, they may contain permeable zones or windows (Naval Energy and Environmental Support Activity [NEESA], 1985).

Groundwater in the upper water-bearing zone was encountered at depths ranging from 72.58 feet bls to 85.91 feet bls, or elevations from 80.39 feet to 83.31 feet above NGVD. Groundwater in the lower water-bearing zone was encountered from approximately 94.58 feet bls to 96.9 feet bls. The lower water-bearing zone is under pressure and has a potentiometric surface elevation ranging from 69.71 feet to 70.75 feet above NGVD. The direction of groundwater flow in the sand-and-gravel aquifer is generally to the southwest.

3.3.2.2 Aquifer Classification In Escambia County, which borders Santa Rosa County, 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. It is suspected that this condition may also occur in the NAS Whiting Field area due to the regionally discontinuous clay lenses. The upper water-bearing zone and the main producing zone of the sand-and-gravel aquifer at NAS Whiting Field are classified and regulated as a Class G-II water source according to Chapter 17-3, FAC.

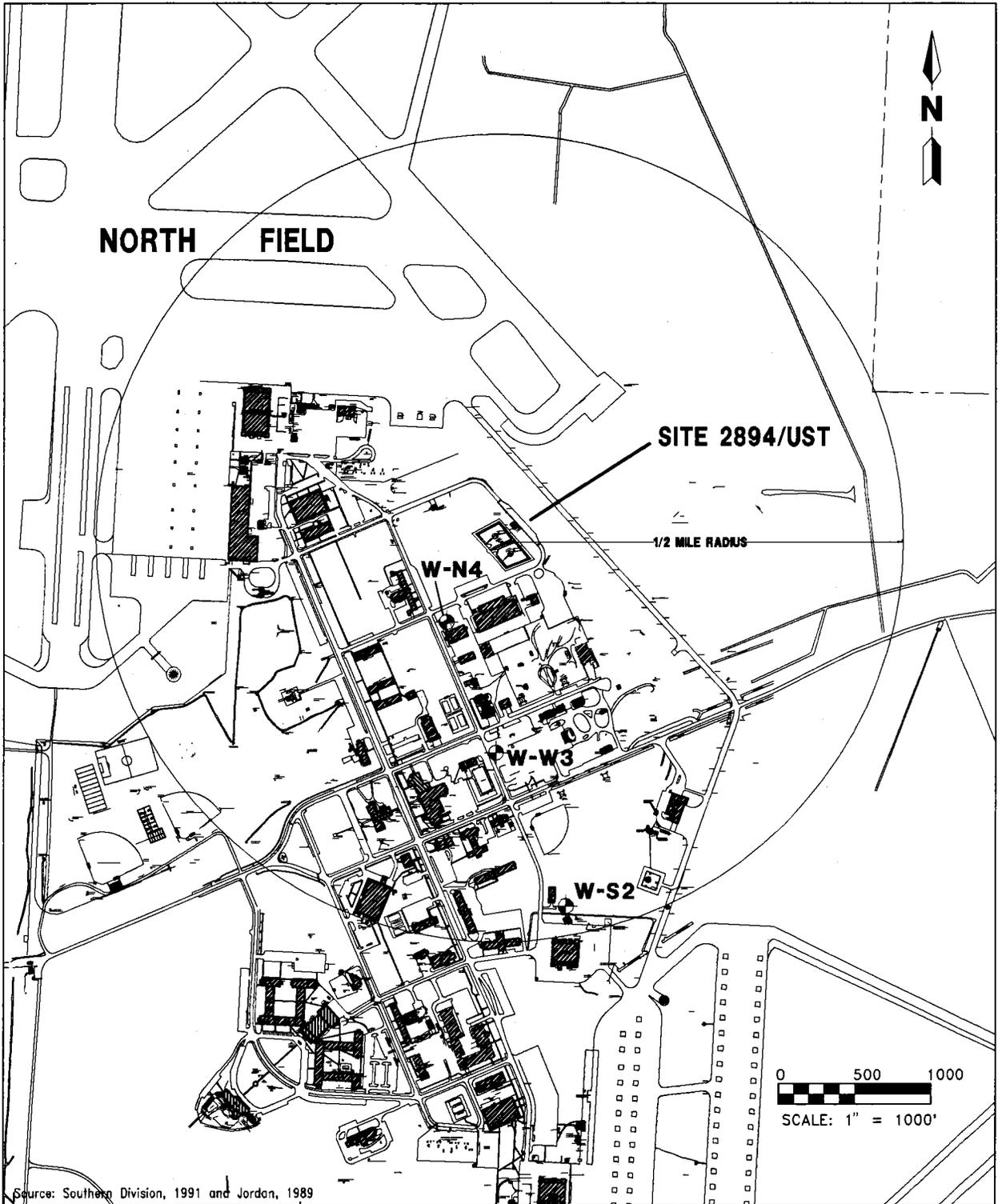
3.4 WELL SURVEY. An inventory of potable water wells near NAS Whiting Field was conducted as part of the Hazard Ranking System (HRS) II scoring performed by ABB-ES in May 1991.

All potable and industrial water supplies in the NAS Whiting Field vicinity are obtained from the sand-and-gravel aquifer. This aquifer extends from the surface to an approximate depth of 300 feet bls. Screened intervals of most production wells are at a depth of about 150 to 350 feet bls, depending on the surface elevation and the presence of clay lenses.

3.4.1 Private Wells No known privately controlled potable wells are located within a 0.25-mile radius of Site 2894.

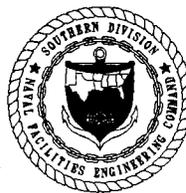
3.4.2 Public Wells Water for the City of Milton and for the Point Baker and Allentown area is supplied by nine wells, all of which are screened in the sand-and-gravel aquifer and are outside a 1-mile radius of NAS Whiting Field.

Potable water on the base is currently supplied by three production wells: the north (W-N4), south (W-S2), and west (W-W3) production wells (Figure 3-6). These three wells are within 0.50-mile radius of the site. These production wells replaced previously existing wells that were abandoned because of insufficient capacity or poor water quality. When the base was built in 1943, three production wells were drilled: the original north (W-N1), south (W-S1), and west (W-W1) wells. In 1951, these wells were abandoned and replaced by new wells (W-N2, W-S2, and W-W2) each within 75 feet of the original well. These new wells were constructed to deliver increased yields.



Source: Southern Division, 1991 and Jordan, 1989

**FIGURE 3-6
POTABLE WATER WELL LOCATIONS
AT NAS WHITING FIELD**



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The west and north wells, however, contained objectionable levels of iron and were replaced by, respectively, W-W3 in 1965 and W-N3 in 1975. The replacement north well, originally drilled as a test well, was also found to have unacceptable iron concentrations and was subsequently abandoned and replaced by the currently used north production well (W-N4).

Current average pumping capacities from the wells at NAS Whiting Field are: north well (W-N4), 600 gallons per minute (gpm); west well (W-W3), 700 gpm; and south well (W-S2), 500 gpm. At the request of the FDEP, supply well W-S2 was shut down on August 28, 1986, due to concentrations of benzene exceeding the Florida drinking water standard of 1.0 microgram per liter ($\mu\text{g}/\ell$) in the groundwater. Production well W-W3 was also shut down on September 25, 1986, due to concentrations of trichloroethene greater than the State standard of 3 $\mu\text{g}/\ell$. The wells were reactivated after installation of treatment systems. The treatment systems consist of granular activated carbon treatment at the wellhead followed by chlorination, pH adjustment, and addition of a sequestering agent to reduce iron precipitation. Production well W-W3 has a granular activated carbon filter unit installed to reduce the concentration of trichloroethene detected in the groundwater.

NAS Whiting Field operated with service from only the north production well throughout most of 1987. Testing of an activated carbon adsorption filtration system to treat water from the west well (W-W3) for trichloroethene removal began on November 3, 1987. Upon completion of the operational tests on December 1, 1987, the west well was returned to service. At the south production well (W-S2), an activated carbon filtration system was installed in early 1990. The north production well has been sampled and, pending the analytical results, an activated carbon filtration system will be installed. Pumping rates, well depths, and screen intervals for the three base production wells are shown in Table 3-1 (Locklear, 1983).

Table 3-1
Production Rates for NAS Whiting Field Supply Wells

Contamination Assessment Report
Site 2894, Naval Air Station Whiting Field
Milton, Florida

Well Designation	Pumping Rate (gpm)	Total Depth (feet)	Screen Interval (bls)
W-N4	600	230	156 - 230
W-W3	700	263	179 - 263
W-S2	500	234	160 - 234

Notes: gpm = gallons per minute.
bls = below land surface.

4.0 METHODOLOGIES AND EQUIPMENT

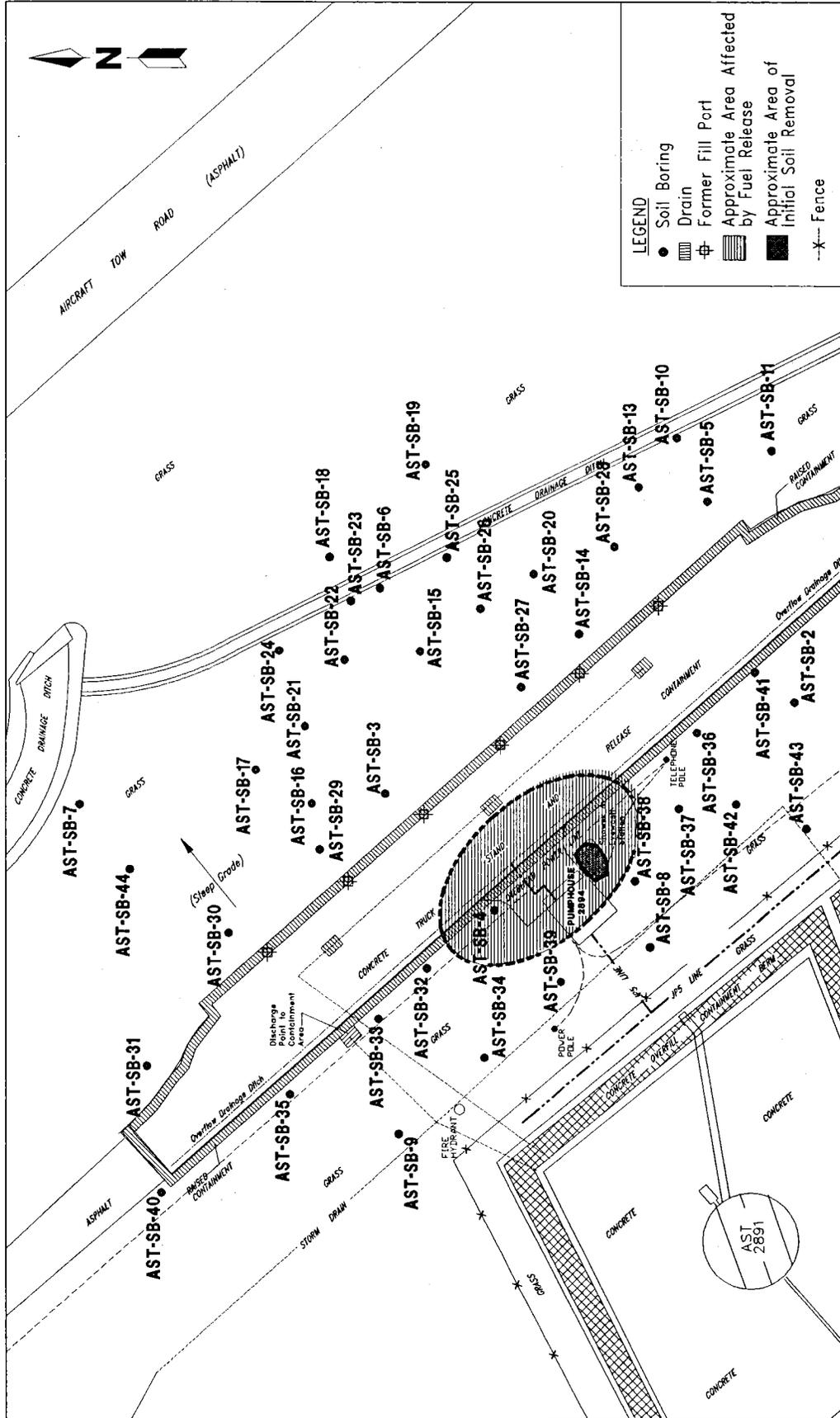
4.1 SOIL BORING PROGRAM. Forty-two soil borings, AST-SB-2 through AST-SB-11 and AST-SB-13 through AST-SB-44, were completed at Site 2894 (Figure 4-1). Soil borings AST-SB-1 and AST-SB-12 were installed as part of the CA for Site 2891. Initially, both Sites 2891 and 2894 were being investigated as part of the site assessment for AST 2891. SOUTHNAVFACENCOM decided to investigate the releases at Sites 2891 and 2894 as separate CAs. Therefore, borings AST-SB-1 and AST-SB-12, which were sampled when the sites were being investigated together, were not applicable to this site investigation. These borings were drilled at the site to:

- assess the vertical and horizontal extent of petroleum-contaminated soil at the site,
- assess areas where visual observations and historical information indicated possible sources of contamination,
- characterize the subsurface sediments, and
- aid in the placement of subsequent groundwater monitoring wells.

Boreholes were advanced using a drill rig equipped with hollow-stem augers (HSAs). Soil borings AST-SB-2 through AST-SB-11 were installed with 4½-inch inside diameter (ID) HSAs, and AST-SB-13 through AST-SB-44 were installed with 2½-inch ID HSAs. Soil borings were sampled at 5-foot intervals from ground surface to total depth to obtain lithologic and soil contamination information. Soil samples were screened by headspace analysis using an organic vapor analyzer (OVA). Upon completion of sampling, the borehole was filled with neat cement (Portland Type I) to approximately 6 feet bls and then backfilled with soil.

Soil borings AST-SB-2 through AST-SB-11 were installed from February to May 1992 to depths varying from 52 to 117 feet bls. In all of these borings, except AST-SB-4, OVA headspace readings of soil samples were less than 10 parts per million (ppm) below depths of 50 feet bls. OVA headspace data from these borings were presented to FDEP to show that additional proposed soil borings need not be drilled to the water table to adequately assess the vertical and horizontal extent of soil contamination at the site. FDEP agreed that proposed soil borings AST-SB-13 through AST-SB-44 could be terminated in the unsaturated zone providing OVA headspace readings of the two previous sample intervals, sampling at 5-foot intervals, were less than 10 ppm. Soil borings AST-SB-13 through AST-SB-44 were installed from May through June 1993. Lithologic logs for all soil borings are presented in Appendix B, Lithologic Logs.

4.2 MONITORING WELL PROGRAM. Nine monitoring wells were installed at Site 2894; seven, WHF-2894-1 through WHF-2894-7, screened in the upper water-bearing zone and two, WHF-2894-1D and WHF-2894-2D, screened in the lower water-bearing zone at the site. Monitoring well locations are shown in Figure 4-2. Monitoring well completion logs are presented in Appendix B. Monitoring wells WHF-2894-5, WHF-2894-6, and WHF-2894-2D were placed within the area of excessively contaminated soil to assess the vertical and horizontal extent of groundwater contamination. Monitoring well WHF-2894-7 was placed at the downgradient edge of the soil

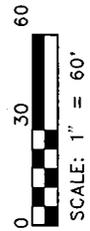


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**FIGURE 4-1
SOIL BORING LOCATION MAP**



contamination, and monitoring wells WHF-MW-1, WHF-MW-2, WHF-MW-3, and WHF-MW-4 were placed around the edge of the contaminated soil area.

Shallow monitoring wells were installed using a drill rig equipped with 6¼-inch ID HSAs. Double-cased wells were installed for all deep wells using a mud rotary drill rig. The 8-inch diameter surface casing was set approximately 2 feet below the top of the semi-confining clay layer.

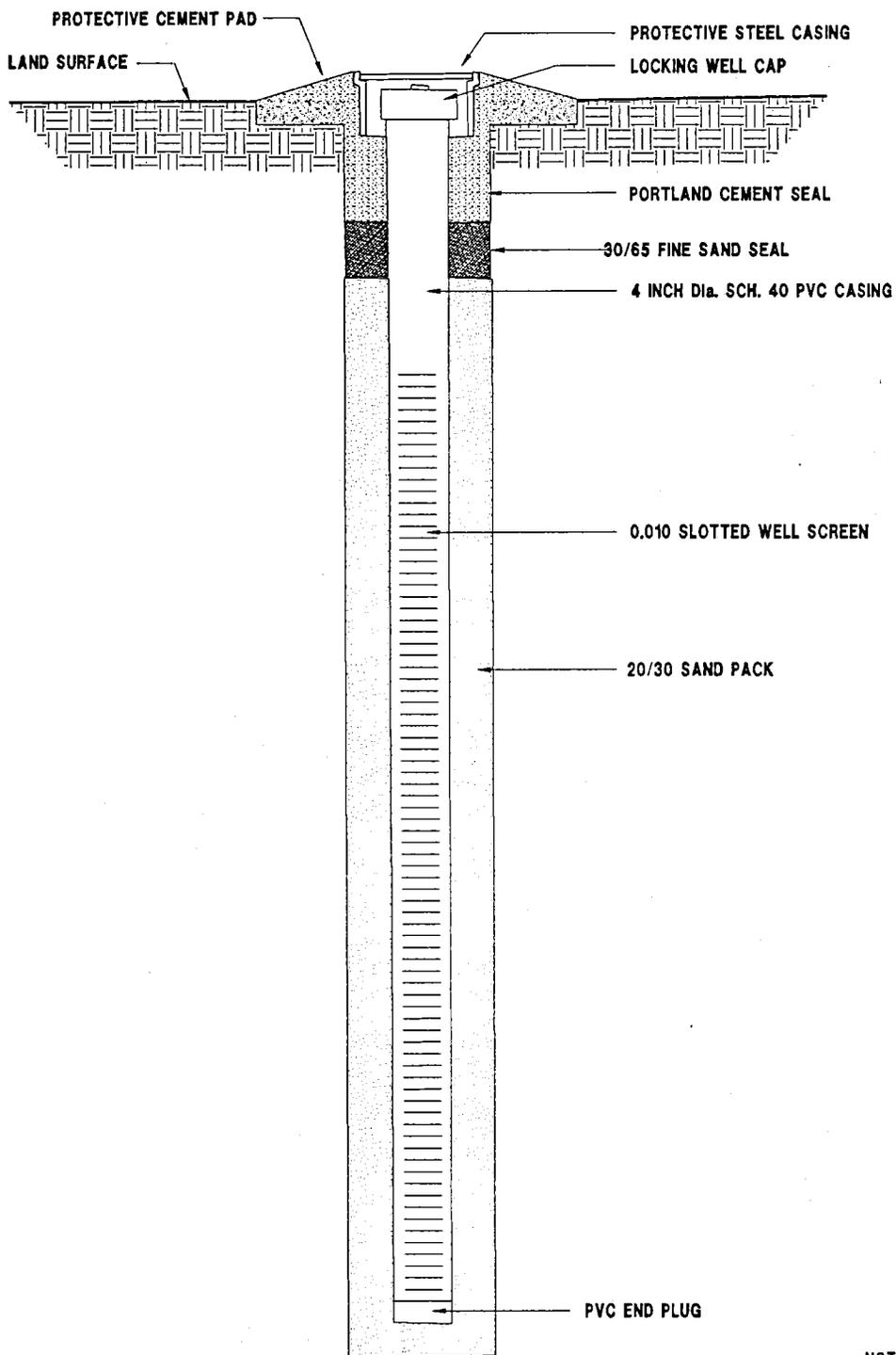
Soil samples were collected from the monitoring well borehole prior to well installation using a standard penetration test (SPT) split-spoon sampler. The soil samples were collected at 5-foot intervals to the vadose zone. A final sample was collected at approximately 1 to 3 feet above the groundwater table. The soil samples were screened using an OVA equipped with a flame ionization detector (FID) using procedures described in Chapter 17-770, FAC. Additional sample screening was performed using a portable gas chromatograph (GC) calibrated to detect benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tert-butyl ether (MTBE), trichloroethene (TCE), and tetrachloroethene (PCE) to the part per billion (ppb) range. The GC screening was performed on both groundwater and saturated soil samples. The purpose of the OVA and GC screening procedure was to optimize monitoring well placement during the investigation.

Monitoring wells installed during the investigation were constructed of schedule 40 polyvinyl chloride (PVC) casing with flush-threaded joints and 0.010-inch slotted screen. Surface casings, installed prior to well installation, were constructed of 8-inch ID schedule 40 PVC casing with slip couplings secured with stainless-steel screws and sealed at the bottom with a slip cap. The shallow monitoring wells were constructed of 4-inch PVC with a 15-foot screen section placed at a depth that allowed for seasonal water table fluctuations. The well casing extends from the top of the screen to land surface. A 20/30 grade silica sand filter pack was placed in the annular space around the well screen to approximately 2 feet above the top of the screen. A 2-foot fine sand seal, 30/65 grade, was placed on top of the filter pack. The remaining annular space was filled to the surface with a neat cement grout. A protective traffic-bearing subsurface vault was installed to complete well installation. Monitoring wells are equipped with a locking well cap and a padlock. Figures 4-3 and 4-4 depict typical shallow and deep monitoring well installations.

4.3 GROUNDWATER ELEVATIONS. The elevation and slope of both the upper and lower water-bearing zones were calculated by surveying the top of the well casing for each monitoring well to a common reference datum using a surveyor's level and stadia rod. A benchmark, stamped "C 113 1945," referencing the NGVD of 1929 was used as the common reference datum.

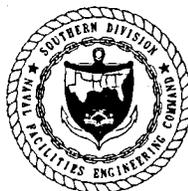
4.4 GROUNDWATER SAMPLING PROGRAM. Groundwater samples were collected from all existing site monitoring wells from August 15 through August 18, 1992. The samples were sent to Wadsworth/ALERT Laboratories in Tampa, Florida, for analysis. Two laboratory blanks, one field blank, one equipment blank, one duplicate, and two trip blanks were also analyzed.

On July 14, 1993, groundwater samples were again collected from all existing site monitoring wells. The samples were sent to CH2M Hill in Alachua, Florida, for



NOT TO SCALE

FIGURE 4-3
TYPICAL SHALLOW MONITORING WELL
INSTALLATION DETAIL



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TAWWELL/KCP/10/07/93

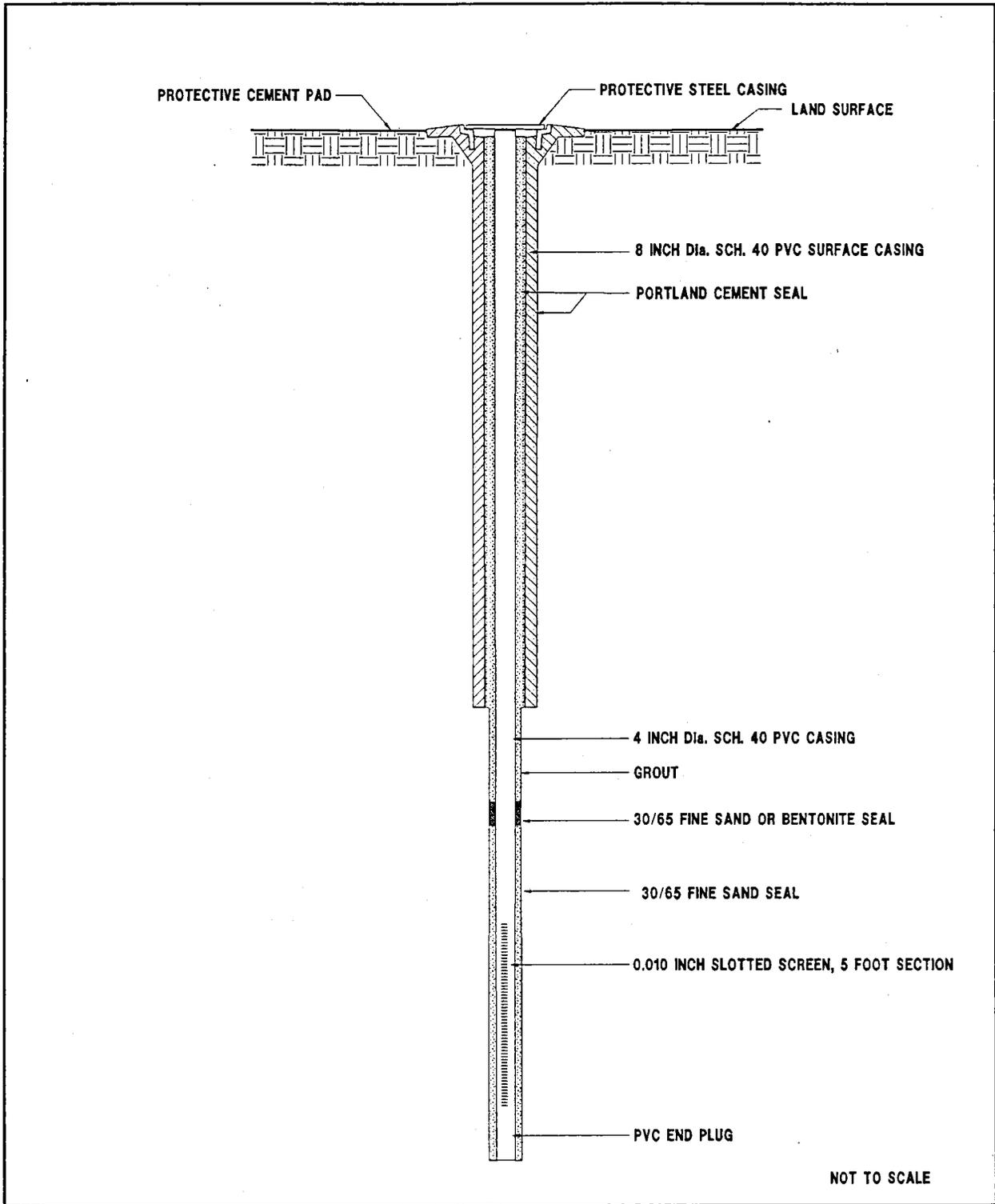
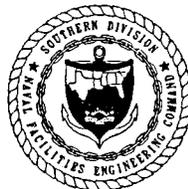


FIGURE 4-4
TYPICAL DEEP MONITORING WELL
INSTALLATION DETAIL



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NAS WHITING FIELD
MILTON, FLORIDA

TANKWELL/KCP/10/07/93

analysis. One field blank, one equipment blank, one duplicate, one matrix spike/matrix spike duplicate (MS/MSD) pair, and one trip blank were also analyzed.

The groundwater samples were collected in accordance with the ABB-ES FDEP-approved Comprehensive Quality Assurance Plan (ComQAP). Before sampling, all monitoring wells were purged with a submersible pump equipped with a ball check valve. Purging continued until either water quality parameters (specific conductance, temperature, and pH) had stabilized, five well volumes were removed, or the well was pumped dry. Groundwater samples were collected using an extruded Teflon™ bailer. The samples were placed into appropriate containers, properly preserved, and placed on ice. Samples were then shipped to the respective analytical laboratories for analysis within 24 hours after collection. All groundwater samples collected during the CA were analyzed for the kerosene analytical group compounds as described in Chapter 17-770, FAC.

5.0 CONTAMINATION ASSESSMENT RESULTS

5.1 AQUIFER CHARACTERISTICS. Three falling head and two rising head slug tests each were conducted in monitoring wells WHF-2894-6 and WHF-2894-7 to estimate the hydraulic conductivity of the sand-and-gravel aquifer during the CA. Monitoring wells WHF-2894-6 and WHF-2894-7 have screen intervals from 80.0 feet to 90.0 feet bls and from 69.0 feet to 84.0 feet bls, respectively. Both wells are screened in the upper water-bearing zone.

The water level in monitoring well WHF-2894-4, screened in the upper water-bearing zone, was 81.79 feet bls or an elevation of 83.07 feet. Well WHF-2894-1D, adjacent to WHF-2894-4, is screened below the semi-confining clay unit and has a water level of 94.58 feet bls, or an elevation of 70.33 feet. The difference in water level elevations in these wells indicates that the clay layer forms an effective aquitard between the upper and lower water-bearing zones.

5.1.1 Piezometric Surface (Upper Water-bearing Zone) Depth to groundwater was measured in all site wells on July 31, 1992; August 18, 1992; June 5, 1993; and July 12, 1993; using an electronic water level indicator with an accuracy to 0.01 foot. Water level elevations were calculated by subtracting the measured depth to groundwater from the elevation at the top of the well casing (Table 5-1). This information was plotted as contour maps with flow lines, indicating groundwater flow direction drawn perpendicular to the groundwater isopleths (Figures 5-1 through 5-4).

Figures 5-1 through 5-4 indicate a northeast flow direction in the upper water-bearing zone, which generally conforms with the north-northeast dip of the clay confining layer.

5.1.2 Piezometric Surface (Lower Water-bearing Zone) The groundwater flow direction in the lower water-bearing zone is generally toward the south-southwest (ABB-ES, 1992a). Groundwater elevations in deep monitoring wells WHF-2894-1D and WHF-2894-2D indicate the groundwater flow direction in the lower water-bearing zone at the site is toward the south.

5.1.3 Horizontal Groundwater Flow Velocity The average hydraulic conductivity for the site was estimated from slug test data from site monitoring wells WHF-2894-6 and WHF-2894-7. The slug test data were evaluated using Aqtesolv™ (Geraghty & Miller, 1989) to plot and estimate hydraulic conductivities. The results of the slug tests are shown in Table 5-2. Hydraulic conductivity values obtained for the site vary for the two monitoring wells tested and for type of test, rising head versus falling head. Differences in values at each monitoring well can be attributed to the differences in lithology. Six of the seven wells in the upper zone of the sand-and-gravel aquifer have lithologies similar to WHF-2894-7; therefore, the average hydraulic conductivity computed from slug tests performed on this well are most representative of the site. The falling head test is more appropriate for fine-grained soil with low permeability (Das, 1990); therefore, the average hydraulic conductivity computed from the falling head tests from WHF-2894-7 is used. The calculated average horizontal conductivity is 2.5×10^{-3} feet per min (ft/min).

The average hydraulic gradient across the site was estimated by dividing the difference in water level elevations by the distance between the two respective

**Table 5-1
Top of Casing and Groundwater Elevations**

Contamination Assessment Report
Site 2894, Naval Air Station Whiting Field
Milton, Florida

Well Number	July 31, 1992			August 18, 1992			June 5, 1993			July 12, 1993		
	TOC	DTW	Groundwater Elevation	TOC	DTW	Groundwater Elevation	TOC	DTW	Groundwater Elevation	TOC	DTW	Groundwater Elevation
WHF-2984-1	167.00	85.14	81.86	167.00	85.91	81.09	167.00	85.18	81.82	167.00	84.90	82.10
WHF-2984-2	159.00	76.31	82.69	159.00	76.56	82.44	159.00	76.44	82.56	159.00	75.99	83.01
WHF-2984-3	154.17	72.88	81.29	154.17	73.78	80.39	154.17	72.75	81.42	154.17	72.58	81.59
WHF-2984-4	164.86	81.79	83.07	164.86	82.00	82.86	164.86	81.82	83.04	164.86	81.55	83.31
WHF-2984-5	167.52	85.66	81.86	167.52	85.91	81.61	167.52	85.68	81.84	167.52	85.35	82.17
WHF-2984-6	166.86	84.33	82.53	166.86	84.58	82.28	166.86	84.32	82.54	166.86	84.09	82.77
WHF-2894-7	NI	NI	NI	NI	NI	NI	159.07	78.22	80.85	159.07	77.93	81.14
WHF-2984-1D ¹	164.91	94.58	70.33	164.91	94.71	70.20	164.91	95.02	69.89	164.91	95.20	69.71
WHF-2984-2D ¹	167.08	96.33	70.75	167.08	96.48	70.60	167.08	96.75	70.33	167.08	96.90	70.18

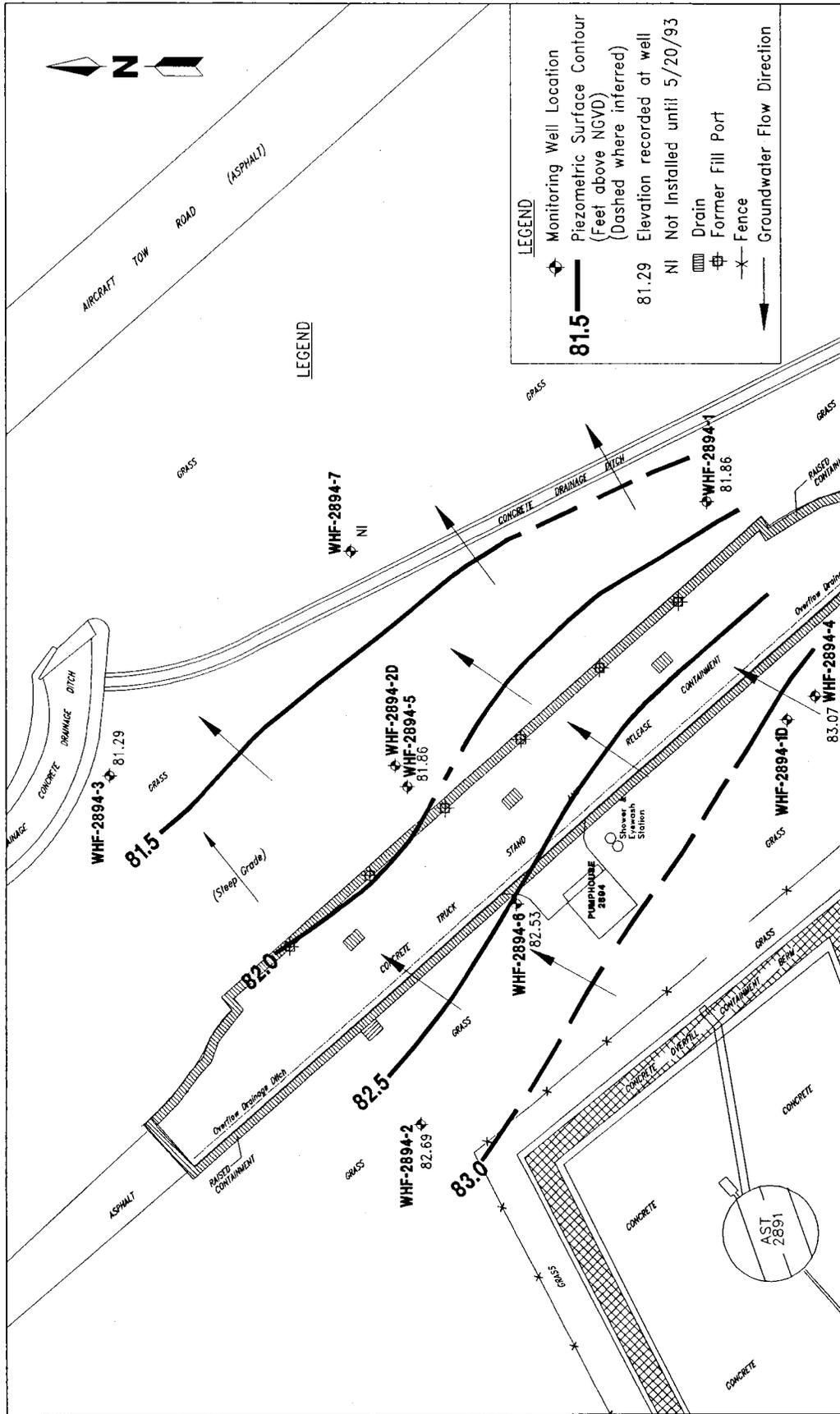
¹Double-cased well with screen interval in the lower water-bearing zone of sand-and-gravel aquifer.

Notes: Groundwater elevation expressed in feet above National Geodetic Vertical Datum (NGVD) of 1929.

TOC = top of casing elevation in feet above NGVD.

DTW = depth to water in feet below TOC.

NI = not installed until May 20, 1993.



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MILTON, FLORIDA**



**FIGURE 5-1
PIEZOMETRIC SURFACE MAP OF THE
UPPER WATER-BEARING ZONE OF THE
SAND-AND-GRAVEL AQUIFER,
JULY 31, 1992**



Table 5-2
Estimated Hydraulic Conductivities Evaluated Using
Aqtesolv™¹

Contamination Assessment Report
 Site 2894, Naval Air Station Whiting Field
 Milton, Florida

Test Type	Monitoring Well			
	WHF-2894-6		WHF-2894-7	
	ft/min	ft/day	ft/min	ft/day
Falling Head	0.002009	2.89296	0.002692	3.87648
Falling Head	0.000173	0.249552	0.002239	3.22416
Falling Head	0.000177	0.254448	0.002462	3.54528
Test Average	<u>0.000786</u>	<u>1.13232</u>	<u>0.002464</u>	<u>3.54864</u>
Rising Head	0.000205	0.2952	0.003417	4.92048
Rising Head	0.00032	0.460368	0.005069	7.29936
Test Average	<u>0.000262</u>	<u>0.377784</u>	<u>0.004243</u>	<u>6.10992</u>
Combined Average	0.000577	0.830506	0.003176	4.573152

¹Geraghty & Miller, Inc., 1989.

Notes: ft/min = foot per minute.
 ft/day = foot per day.

measurement locations. From the water elevation data collected July 7, 1993, the hydraulic gradient was computed to be 1.1×10^{-2} feet per foot (ft/ft).

The effective porosity for silty sand and well sorted sands ranges from 18 percent to 27 percent (Fetter, 1980). An average value for effective porosity of 23 percent or 0.23 was selected for the seepage velocity calculations. The calculated pore water velocity (V) is 1.2×10^{-4} ft/min or 0.17 foot per day (ft/day). The slug tests, equations, and calculations used to calculate these values are presented in Appendix C, Aquifer Parameter Calculations.

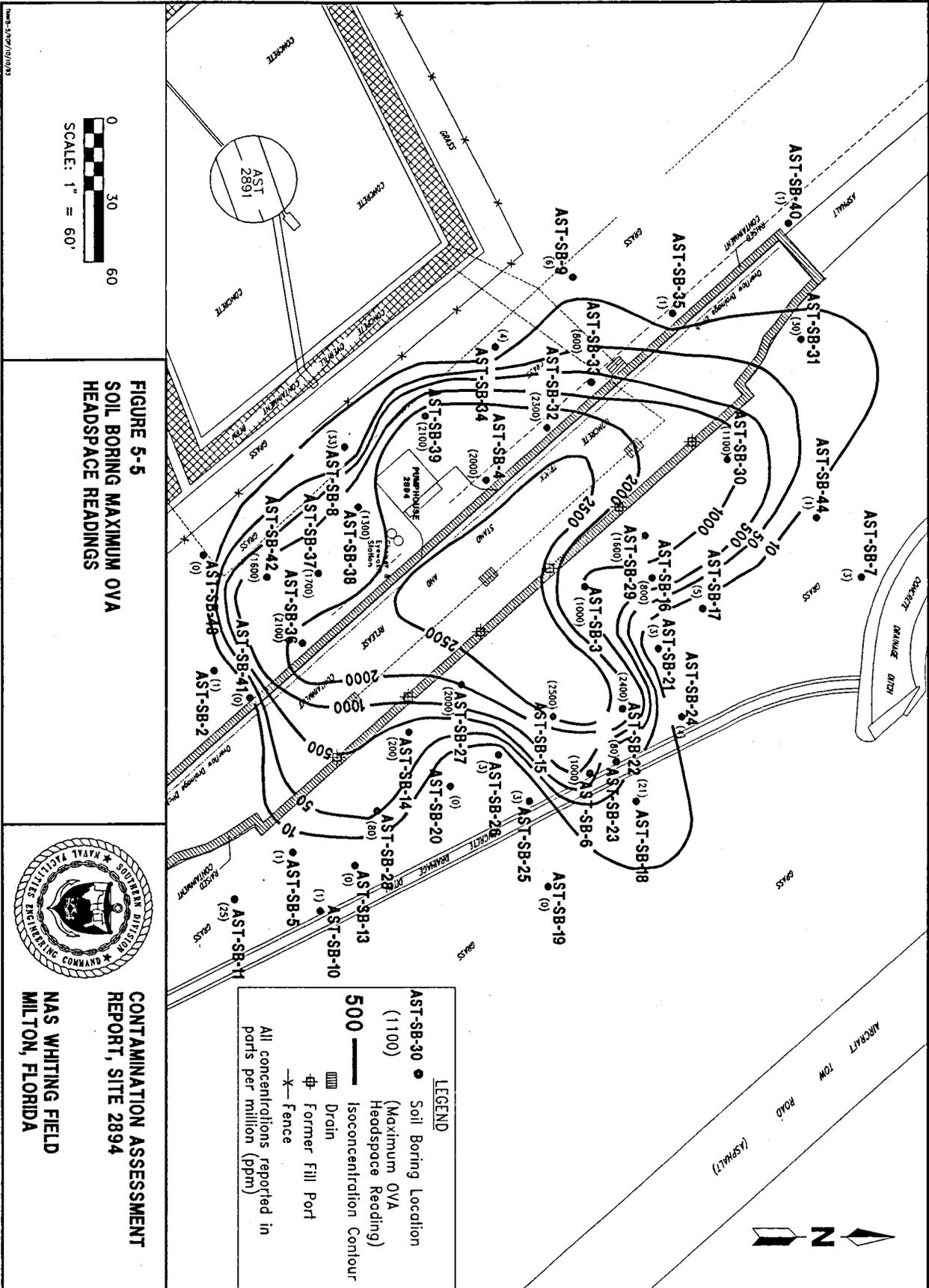
5.2 CONTAMINANT PLUME CHARACTERIZATION.

5.2.1 Soil Assessment Volatile organic compounds (VOCs) detected using OVA headspace methods exceeded State target levels of 50 ppm for kerosene analytical group constituents in 18 of the 42 soil borings at the site. Excessive soil contamination in 17 of these borings ranged from land surface to 35 feet bls. One boring, AST-SB-4, located in the center of a suspected release point, has excessively contaminated soil extending to a depth of 55 feet bls. Maximum headspace readings from each boring are plotted and contoured in Figure 5-5 and tabulated in Table 5-3. This figure shows the horizontal extent of petroleum contaminated soil. The northeast to southwest axis of this plume is approximately 340 feet in length, and the northwest to southeast axis is approximately 220 feet.

Cross sections showing the vertical and horizontal extent of contamination at the site are shown in Figures 5-6, 5-7, and 5-8. The soil contamination decreases in depth and concentration with distance from the pumphouse and pipeline.

5.2.2 Groundwater Assessment Laboratory analytical results of the August 1992 and July 1993 groundwater samples indicate there is no significant groundwater contamination in the site area. Analytical results of the groundwater samples collected August 1992 indicate only two monitoring wells had detectable concentrations of kerosene analytical group components (Figure 5-9). In monitoring well WHF-2894-1D, total recoverable petroleum hydrocarbon (TRPH) was detected at 2 milligrams per liter (mg/l), which is less than the State regulatory standard of 5 mg/l. In monitoring well WHF-2894-3, ethylene dibromide (EDB) was detected at 0.09 micrograms per liter ($\mu\text{g}/\text{l}$), which exceeds the State regulatory standard of 0.02 mg/l.

Results of laboratory analysis of groundwater samples collected in July 1993 from WHF-2894-1 indicate the TRPH concentration is 0.06 mg/l (Figure 5-10), which is less than the State regulatory standard of 5 mg/l. This shows a significant decrease in the concentration from the samples collected in August 1992. In unfiltered groundwater samples from monitoring wells WHF-2894-1, WHF-2894-3, and WHF-2894-4, lead was detected at 2 $\mu\text{g}/\text{l}$, 2 $\mu\text{g}/\text{l}$, and 20 $\mu\text{g}/\text{l}$, respectively. These concentrations are less than the State regulatory standard of 50 $\mu\text{g}/\text{l}$. In the sample from monitoring well WHF-2894-3, the concentration of EDB was 0.06 $\mu\text{g}/\text{l}$, which exceeds the State regulatory standard of 0.02 $\mu\text{g}/\text{l}$, but shows a decrease in the concentration when compared to the sample collected in August 1992.



**FIGURE 5-5
SOIL BORING MAXIMUM OVA
HEADSPACE READINGS**



**CONTAMINATION ASSESSMENT
REPORT, SITE 2894
NAS WHITING FIELD
MILTON, FLORIDA**

LEGEND

- Soil Boring Location
- (1100) (Maximum OVA Headspace Reading)
- 500 — Isoconcentration Contour
- ▭ Drain
- ⊕ Former Fill Port
- x- Fence

All concentrations reported in parts per million (ppm)

**Table 5-3
Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data,
February 1991 through July 1993**

Contamination Assessment Report
Site 2894, NAS Whiting Field
Milton, Florida

Depth (feet bis)	Headspace Readings at Boring Designation,											
	AST-SB-2	AST-SB-3	AST-SB-4	AST-SB-5	AST-SB-6	AST-SB-7	AST-SB-8	AST-SB-9	AST-SB-10	AST-SB-11	AST-SB-12	
0 to 5	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
5 to 7	0	200	0	0	0	0	0	0	0	0	0	25
10 to 12	0	150	100	0	0	0	0	0	0	0	0	0
15 to 17	0	1,000	350	0	0	0	6	1	0	0	0	0
20 to 22	0	280	500	0	700	0	0	2	0	0	0	0
25 to 27	0	1,000	2,000	0	1,000	NM	NM	2	0	0	0	0
30 to 32	0	450	2,000	0	1,000	NM	33	2	1	1	0	0
35 to 37	0	32	2,000	0	280	0	4	2	0	0	0	0
40 to 42	0	30	2,000	0	11	1	0	1	0	0	0	0
45 to 47	0	10	60	0	10	0	1	1	0	0	0	0
50 to 52	0	1	200	0	4	3	2	0	0	0	0	2
55 to 57	0	8	80	0	3	0	2	1	NS	NS	2	2
60 to 62	0	14	20	0	5	0	0	0	NS	NS	0	0
65 to 67	0	6	14	0	6	0	6	0	NS	NS	0	0
70 to 72	1	2	15	0	1	3	1	0	NS	NS	0	0
75 to 77	0	2	6	0	5	NM	2	0	NS	NS	0	0
80 to 82	0	7	0	1	NM	0	4	1	NS	NS	0	0
85 to 87	NM	0	NM	NM	0	NM	0	0	NS	NS	0	0
90 to 92	0	0	5	0	0	NM	0	0	NS	NS	0	0
95 to 97	NM	0	0	0	0	BGW	NM	6	NS	NS	NS	NS
100 to 102	BGW	BGW	3	BGW	BGW	BGW	BGW	3	NS	NS	NS	NS
105 to 107	BGW	BGW	NM	BGW	BGW	NS	BGW	BGW	NS	NS	NS	NS
110 to 112	BGW	BGW	BGW	BGW	BGW	NS	BGW	BGW	NS	NS	NS	NS
115 to 117	BGW	BGW	BGW	NS	NS	NS	BGW	BGW	NS	NS	NS	NS

See notes at end of table.

Table 5-3 (Continued)
Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data,
February 1991 through July 1993

Contamination Assessment Report
 Site 2894, NAS Whiting Field
 Milton, Florida

Depth (feet bls)	Headspace Readings at Boring Designation,															
	AST-SB-13	AST-SB-14	AST-SB-15	AST-SB-16	AST-SB-17	AST-SB-18	AST-SB-19	AST-SB-20	AST-SB-21	AST-SB-22	AST-SB-23					
0 to 5	0	NM	1,800	NM	0	3	0	0	0	0	0	0				
5 to 7	0	200	1,000	800	NM	0	0	0	0	0	0	0				
10 to 12	0	50	50	60	1	2	0	0	0	0	0	0				
15 to 17	0	25	80	9	1	0	0	0	3	0	0	0				
20 to 22	0	1	2,000	18	2	21	0	0	3	2,400	80	0				
25 to 27	0	0	2,500	45	2	15	0	0	2	1,400	3	0				
30 to 32	0	0	8	5	3	4	0	0	3	50	8	0				
35 to 37	0	0	28	5	2	4	0	0	1	100	3	0				
40 to 42	0	0	12	5	2	2	0	0	2	10	4	0				
45 to 47	0	0	4	2	5	2	NS	NS	0	7	11	0				
50 to 52	NS	NS	2	2	NS	8	NS	NS	NS	9	5	0				
55 to 57	NS	NS	NS	NS	NS	1	NS	NS	NS	15	0	0				
60 to 62	NS	NS	NS	NS	NS	1	NS	NS	NS	4	NS	0				
65 to 67	NS	NS	NS	NS	NS	4	NS	NS	NS	1	NS	0				
70 to 72	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS	0				
75 to 77	NS	NS	NS	NS	NS	1	NS	NS	NS	NS	NS	0				
80 to 82	NS	NS	NS	NS	NS	SAT	NS	NS	NS	NS	NS	0				
85 to 87	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0				
90 to 92	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0				
95 to 97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0				
100 to 102	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0				
105 to 107	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0				
110 to 112	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0				
115 to 117	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0				

See notes at end of table.

Table 5-3 (Continued)
Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data,
February 1991 through July 1993

Contamination Assessment Report
 Site 2894, NAS Whiting Field
 Milton, Florida

Depth (feet bls)	Headspace Readings at Boring Designation,													
	AST-SB-24	AST-SB-25	AST-SB-26	AST-SB-27	AST-SB-28	AST-SB-29	AST-SB-30	AST-SB-31	AST-SB-32	AST-SB-33	AST-SB-34	AST-SB-35	AST-SB-36	AST-SB-37
0 to 5	0	0	5	200	1	4	6	0	0	4	0	0	4	0
5 to 7	0	0	5	1,000	80	420	600	30	0	0	0	0	0	0
10 to 12	0	0	0	140	8	700	1,100	6	80	40	4	4	4	4
15 to 17	0	0	0	36	5	1,100	50	3	200	800	0	0	0	0
20 to 22	2	0	0	15	4	1,600	15	0	2,000	15	2	2	2	2
25 to 27	0	0	2	1,900	0	55	70	2	2,000	37	0	0	0	0
30 to 32	4	0	0	2,000	0	0	0	0	2,100	0	1	1	1	1
35 to 37	NM	1	0	SAT	SAT	22	0	0	2,300	0	2	2	2	2
40 to 42	3	1	3	70	SAT	10	0	0	2,300	4	2	2	2	2
45 to 47	2	3	1	6	0	1	0	0	50	4	0	0	0	0
50 to 52	3	NS	0	8	NS	14	NS	NS	90	NS	NS	NS	NS	NS
55 to 57	NS	NS	NS	5	NS	4	NS	NS	17	NS	NS	NS	NS	NS
60 to 62	NS	NS	NS	NS	NS	4	NS	NS	70	NS	NS	NS	NS	NS
65 to 67	NS	NS	NS	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS
70 to 72	NS	NS	NS	NS	NS	NS	NS	NS	4	NS	NS	NS	NS	NS
75 to 77	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
80 to 82	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
85 to 87	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
90 to 92	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
95 to 97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
100 to 102	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
105 to 107	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
110 to 112	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
115 to 117	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

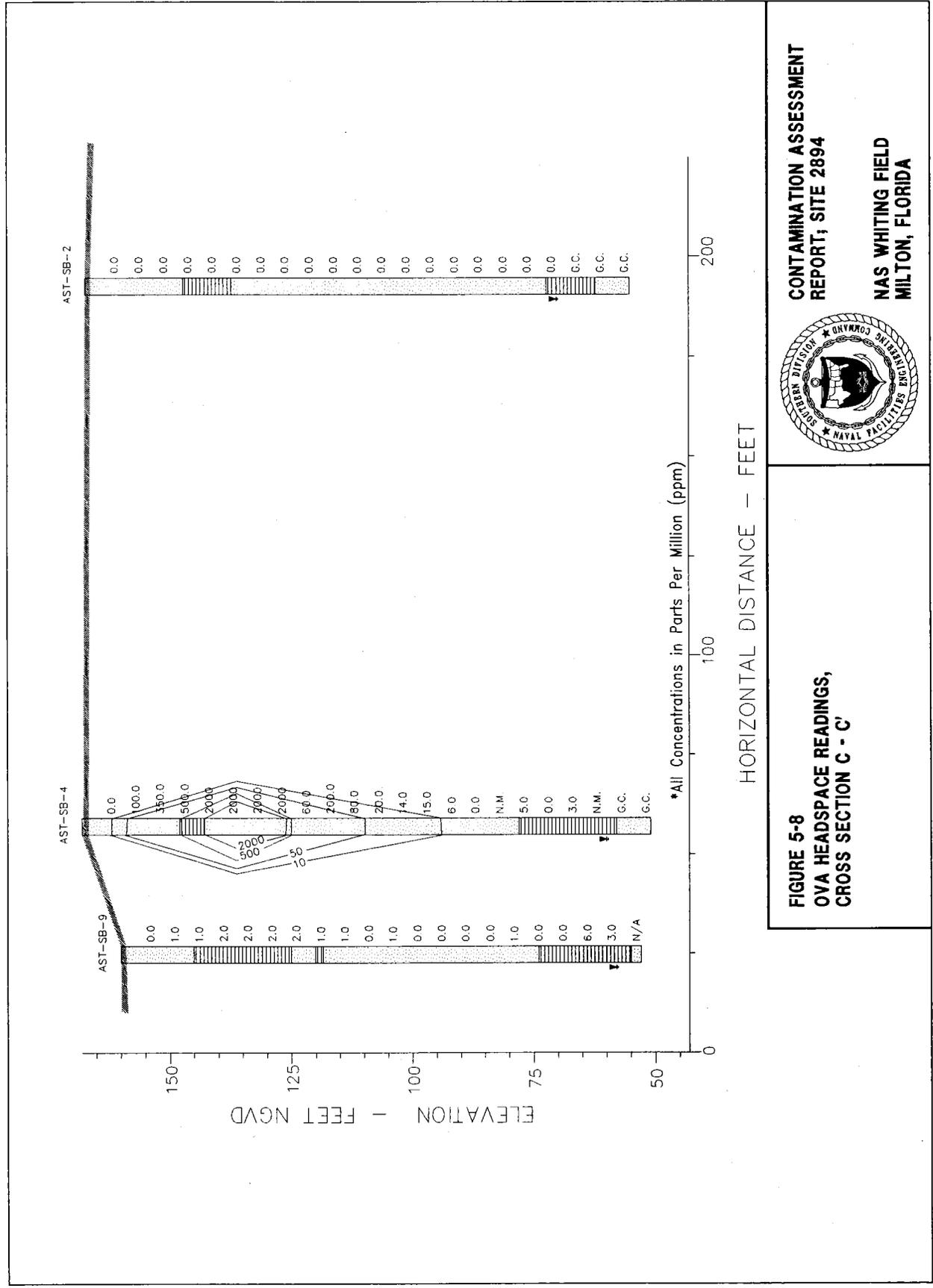
See notes at end of table.

Table 5-3 (Continued)
Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analytical Data,
February 1991 through July 1993

Contamination Assessment Report
 Site 2894, NAS Whiting Field
 Milton, Florida

Depth (feet bis)	Headspace Readings at Boring Designation,													
	AST-SB-35	AST-SB-36	AST-SB-37	AST-SB-38	AST-SB-39	AST-SB-40	AST-SB-41	AST-SB-42	AST-SB-43	AST-SB-44	AST-SB-45	AST-SB-46	AST-SB-47	AST-SB-48
0 to 5	0	0	NM	0	0	1	0	0	0	0	0	0	0	0
5 to 7	0	0	NM	600	600	0	0	0	NM	0	0	0	0	0
10 to 12	0	0	0	0	20	1	0	0	0	0	0	0	0	1
15 to 17	0	0	1,500	1,300	210	1	0	0	1,000	0	0	0	0	0
20 to 22	1	2,100	1,500	110	2	0	0	0	1,600	0	0	0	0	1
25 to 27	1	35	1,700	15	2,100	0	0	0	20	0	0	0	0	1
30 to 32	1	3	1,600	SAT	1,600	1	0	0	4	0	0	0	0	0
35 to 37	1	SAT	SAT	SAT	500	0	0	0	SAT	0	0	0	0	0
40 to 42	0	SAT	60	27	2,000	0	0	0	10	0	0	0	0	1
45 to 47	0	0	16	1	2,100	0	0	0	0	0	0	0	0	0
50 to 52	NS	0	2	4	SAT	NS	NS	NS	2	NS	NS	NS	NS	NS
55 to 57	NS	NS	5	NS	700	NS								
60 to 62	NS	NS	NS	NS	80	NS								
65 to 67	NS	NS	NS	NS	38	NS								
70 to 72	NS	NS	NS	NS	24	NS								
75 to 77	NS	NS	NS	NS	100	NS								
80 to 82	NS	NS	NS	NS	9	NS								
85 to 87	NS	NS	NS	NS	SAT	NS								
90 to 92	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
95 to 97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
100 to 102	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
105 to 107	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
110 to 112	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
115 to 117	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

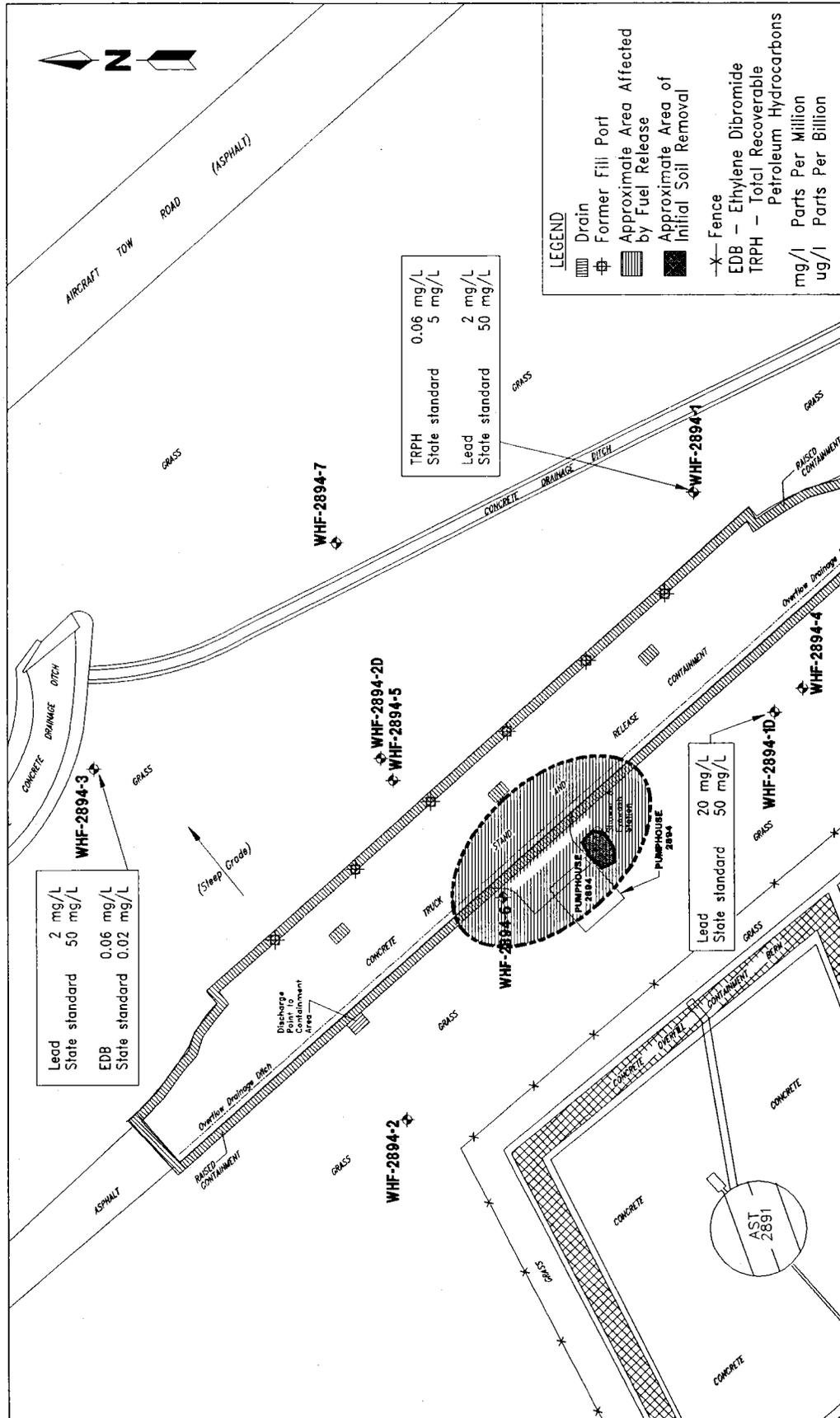
Notes: Concentrations are in parts per million (ppm).
 NM = not measured.
 BGW = below ground water.
 SAT = sample saturated (perched water).
 bis = below land surface.
 NS = not sampled.



**CONTAMINATION ASSESSMENT
REPORT, SITE 2894**

**NAS WHITING FIELD
MILTON, FLORIDA**

**FIGURE 5-8
OVA HEADSPACE READINGS,
CROSS SECTION C - C'**



**CONTAMINATION ASSESSMENT
REPORT, SITE 2894**

**NAS WHITING FIELD
MILTON, FLORIDA**



**FIGURE 5-10
GROUNDWATER ANALYTICAL RESULTS
DISTRIBUTION MAP,
JULY 14, 1993**

6.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

6.1 SUMMARY. The following conclusions are based on the site history, data collected during the CA at NAS Whiting Field, and published literature on regional and site conditions.

- Sediments encountered during drilling operations at the site consist of layers of very fine- to coarse-grained quartz sand, clayey sand, and sandy clay. An intermittent lens of clay approximately 5 feet thick creates perched water conditions at 15 to 20 feet bls. Another, more locally extensive clay layer, is encountered approximately 90 bls and forms an effective aquitard and semi-confining layer.
- There are two distinct water-bearing zones at the site separated by the 10- to 20-foot thick clay layer at a depth approximately 90 feet bls. Groundwater in the upper water-bearing zone is encountered at depths ranging from 72.58 feet bls to 85.91 feet bls, or surface elevations from 80.39 feet to 83.31 feet above NGVD. Groundwater in the lower water-bearing zone is encountered from approximately 94.58 feet bls to 96.9 feet bls. The clay layer forms an aquitard for the lower water-bearing zone, which is under pressure and has a potentiometric surface elevation ranging from 69.71 feet to 70.75 feet above NGVD.
- Groundwater in the upper and lower water-bearing zones at the site is classified G-II.
- The net groundwater flow direction of the upper water-bearing zone at the site is toward the northeast.
- The direction of groundwater flow in the deep water-bearing zone is to the south-southeast.
- Water level measurements in monitoring wells WHF-2894-1D and WHF-2894-2D indicate the potentiometric surface of the deep water-bearing zone at the site is approximately 97 feet bls.
- The calculated average hydraulic gradient across the site is 0.0016 ft/ft.
- The calculated average hydraulic conductivity at the site is 9.55 ft/day.
- The calculated average pore water velocity is 0.07 ft/day.
- OVA headspace analysis of soil boring samples indicate the presence of excessively contaminated soil at the site extending to a maximum depth of approximately 55 feet bls. The majority of excessively contaminated soil at the site is encountered from ground surface to depths ranging from 25 to 30 feet bls.
- Laboratory results of groundwater samples indicate concentrations of kerosene analytical group compounds were either less than method detection limits, or detected in concentrations less than State target

levels in all wells at the site except WHF-2894-3. In monitoring well WHF-2894-3, the concentration of EDB had decreased from 0.09 $\mu\text{g}/\ell$ in August 1992 to 0.06 $\mu\text{g}/\ell$ in July 1993. The State target cleanup level for EDB is 0.02 $\mu\text{g}/\ell$. In addition, the concentration of TRPH decreased from 2 $\mu\text{g}/\ell$ to 0.06 mg/ℓ in WHF-MW-1D. The State target cleanup level for TRPH is 5 mg/ℓ .

- Three public potable water wells are within the 0.50-mile radius of the site and are upgradient or outside the minimal contamination at the site.

6.2 CONCLUSIONS.

- Past releases of petroleum products from fueling operations at Site 2894 have resulted in excessive soil contamination as defined in Chapter 17-770, FAC.
- Excessively contaminated soils extend to a depth of 55 feet bls.

6.3 RECOMMENDATIONS. Based on the findings and conclusions of this CA, a Remedial Action Plan (RAP) is recommended to clean up excessively contaminated soil at Site 2894. Before preparing a RAP, a study should be completed to assess the feasibility of various remedial technologies.

7.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment described in this report was conducted using sound hydrogeologic principles and judgment. This assessment is based on the field investigation and associated information detailed in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the assessment described in this report. This Contamination Assessment Report was developed for Site 2894 at NAS Whiting Field in Milton, Florida, and should not be construed to apply to any other site.



Michael J. Williams
Professional Geologist
P.G. No. 000344

10/20/93

Date

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APPENDIX A

FUEL RELEASE AND INITIAL REMEDIAL ACTION DOCUMENTATION

4/5/91

0720 - Sadra Deonne reported discovery of release of fuel @ 62894

0730 - On site for assessment - PID & Tempore devices on scene - instructed TSP personnel to contain release & clean-up all free product
Leak appears to be in 8" fuel line leading from truck discharge to pumps. Location of leak under concrete. Remedial action initiated

(a) Product removal from pipe

(b) Pipe flushed twice w/water

(c) Moved specimens contaminated soil & placed in vesicles ± 2 CV

(d) ran new pipe above ground

1530 Notified FDEK by phone - Bob Barr

Soil disposed of at Santa Rosa Landfill

Site being evaluated by ABB under Florida Petroleum Contamination Agreement



DEPARTMENT OF THE NAVY

COMMUNICATIONS OFFICER
NAVAL AIR STATION
WHITING FIELD
MILTON, FLORIDA 32570-8000

V8
4/11/91

5090
Ser 18/00

4/12/91

Robert A. Barr, III
Storage Tanks Section Supervisor
Department of Environmental Regulation
160 Governmental Center
Pensacola, FL 32501-5794

Dear Mr. Barr:

As discussed in the telephone conversation between you and Jim Holland on April 9, 1991, please find the enclosed Discharge Reporting Form with an associated spill incident narrative. Following review of these enclosures, if there are any questions or concerns, please contact Jim Holland, P.E. at 623-7181.

Sincerely,

J. D. MACFARQUHAR
Lieutenant Commander, CEC, U.S. Navy
By direction of the
Commanding Officer

Encl: (1)
Discharge Reporting Form w/attachment



Discharge Reporting Form

Use this form to notify the Department of Environmental Regulation of:

- Results of tank tightness testing that exceed allowable tolerances within ten days of receipt of test result.
- Petroleum discharges exceeding 25 gallons on pervious surfaces as described in Section 17-761.460 F.A.C. within one working day of discovery.
- Hazardous substance (CERCLA regulated), discharges exceeding applicable reportable quantities established in 17-761.460(2) F.A.C., within one working day of the discovery.
- Within one working day of discovery of suspected releases confirmed by: (a) released regulated substances or pollutants discovered in the surrounding area, (b) unusual and unexplained storage system operating conditions, (c) monitoring results from a leak detection method or from a tank closure assessment that indicate a release may have occurred, or (d) manual tank gauging results for tanks of 550 gallons or less, exceeding ten gallons per weekly test or five gallons averaged over four consecutive weekly tests.

Mail to the DER District Office in your area listed on the reverse side of this form

PLEASE PRINT OR TYPE
Complete all applicable blanks

1. DER Facility ID Number: _____ 2. Tank Number: 2891/2892 3. Date: 4/8/91
4. Facility Name: NAS WHITING FIELD
Facility Owner or Operator: COMMANDING OFFICER
Facility Address: PUBLIC WORKS DEPARTMENT, NAS WHITING FIELD, MILTON, FL
Telephone Number: (904) 623-7181 County: SANTA ROSA
Mailing Address: SAME
5. Date of receipt of test results or discovery: 4/5/91 month/day/year
6. Method of initial discovery. (circle one only)
A. Liquid detector (automatic or manual) D. Emptying and Inspection. F. Vapor or visible signs of a discharge in the vicinity.
B. Vapor detector (automatic or manual) E. Inventory control. G. Closure: _____ (explain)
C. Tightness test (underground tanks only). H. Other: 1
7. Estimated number of gallons discharged: ± 25
8. What part of storage system has leaked? (circle all that apply) A. Dispenser B. Pipe C. Fitting D. Tank E. Unknown
9. Type of regulated substance discharged. (circle one)
A. leaded gasoline D. vehicular diesel L. used/waste oil V. hazardous substance includes pesticides, ammonia, chlorine and derivatives (write in name or Chemical Abstract Service CAS number) _____
B. unleaded gasoline F. aviation gas M. diesel Z. other (write in name) _____
C. gasohol G. jet fuel Q. new/lube oil
10. Cause of leak. (circle all that apply)
 A. Unknown C. Loose connection E. Puncture G. Spill _____ I. Other (specify) _____
B. Split D. Corrosion F. Installation failure H. Overfill _____
11. Type of financial responsibility. (circle one)
A. Third party insurance provided by the state insurance contractor C. Not applicable
B. Self-insurance pursuant to Chapter 17-769.500 F.A.C. D. None
12. To the best of my knowledge and belief all information submitted on this form is true, accurate, and complete.

Printed Name of Owner, Operator or Authorized Representative

Signature of Owner, Operator or Authorized Representative

FRANK ROWELL, Director
Road & Bridges Dept.
1095 Old Bagdad Hwy.
826-0191-994-5721

LARRY STANHOPE
Director of Public Works
1095 Old Bagdad Hwy.
626-0191-994-5721
FAX 994-6445

JAMES P. STEWART, Director
Building Maintenance/Parks/Animal Control
P. O. Box 854
623-1550-939-1877

TONY COMILLION, Director
Solid Waste/Mosquito Control/Environmental Control
1095 Old Bagdad Hwy.
626-0191-994-5721

DEVANN COOK, Director
Safety
1095 Old Bagdad Hwy.
626-0191-994-5721

June 3, 1991

Mr. Jim Holland
Public Works
NAS Whiting Field
Milton, FL 32570

Dear Jim:

As discussed during our phone conversation, we can accept the three cubic yards of fuel-contaminated soil for disposal at Central Landfill. Please have the hauler identify it as SPW #49. As discussed, the charge for disposal is \$50 per ton with a minimum charge of \$75. If you do not have an account with our landfill, you will need to pay by cash or check. Call the landfill two hours prior to delivery at phone number 623-9843.

Sincerely,

Tony M. Comillion (L.H.)

Tony M. Comillion, Director
Solid Waste & Mosquito Control

TMG/dd

SPECIAL WASTE LOG SHEET

Anticipated Delivery Date: _____

SPW #: 49

Responsible Company & Phone: Whiting Field Public Works Dept (623-7181) *Jim Holland*

Anticipated Volume: _____

Special Instructions: Fuel Contaminated Soil

Delivery Date	Quantity	Cummulative Quantity
6-11-91	2 yd.	2 yds

Total Cummulative Quantity _____

Date Office notified of final delivery _____

SANTA ROSA COUNTY PETROLEUM PROGRAM

Administered by:
ESCAMBIA COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH SERVICES

1190 West Leonard Street, Suite 2
Pensacola, Florida 32501



Telephone (904) 444-8990

June 13, 1991

Mr. John Albrecht, Code 11523
Department of the Navy
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
P.O. Box 10068
Charleston, SC 29411-0068

Re: NAS Whiting Field
FAC #578516386

Dear Mr. Albrecht:

On April 23, 1991, this department inspected the above named facility in response to a reported petroleum discharge. We confirmed that a discharge had occurred and we have the following comments to offer.

We feel that a contamination assessment is underway; however, we wish to notify you of our expectations. We expect the United States Navy to proceed to assess and clean up the contamination present at this facility pursuant to Chapter 17-770, Florida Administrative Code (FAC). Specifically, within thirty days you should have begun a Contamination Assessment (CA) as defined in Section 17-770.600(1), FAC (attached). A Contamination Assessment Report and remedial action plan should be prepared on the results of the CA within the time frames found in Chapter 17-770, FAC. Any interagency agreement the United States Navy may have with the Florida Department of Environmental Regulation will supersede the timetables set forth in Chapter 17-770, FAC.

If you have any questions, you may contact Eric Ericson at the letterhead address or telephone number (904)444-8990.

Sincerely,

E. P. Ericson, Supervisor
Petroleum Tank Section

cc: File

Mr. Bob Barr III
Mr. G. A. Richmond, P.E.

Post-It™ brand fax transmittal memo 7671		# of pages > 4
To: Nicole Pagano	From: Jim Holland	
Co: ABB Environ	Co: Public Works	
Dept:	Phone: 904-623-7181 x49	
Fax: 904-577-0142	Fax: 904-623-7490	

APPENDIX B

LITHOLOGIC AND MONITORING WELL COMPLETION LOGS

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-1
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/25/92	COMPLTD: 2/25/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 100 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2	0.0	SAND: Reddish brown to grayish orange, fine- to medium-grained.		SM		POSTHOLE
10		1.0/2	0.0	SANDY CLAY: Reddish brown to graysih orange, fine- to medium-grained.		CL		
15		1.0/2	0.0	SANDY CLAY: Light red to white to pale yellowish orange, fine- to medium-grained.				
20		1.9/2	0.0	CLAYEY SAND: Light red to white to pale yellowish orange, fine- to medium-grained.		SC		
25		1.2/2	0.0	SAND: White to light to pale yellowish orange, fine- to medium-grained.		SM		
30		1.2/2	0.0					
35		1.5/2	0.0	SAND: White to light red to pale yellowish orange to pinkish gray, fine- to medium-grained.				
40		1.0/2	0.0	SAND: White, fine- to medium-grained.				
45		1.0/2	0.0	SAND: Light red, fine- to medium-grained, trace clay.				
50		1.0/2	0.0	SAND: White, fine- to medium-grained.				
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-1
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/25/92	COMPLTD: 2/25/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 100 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				Continued from PAGE 1				
		1.0/2	0.0			SM		
60		1.2/2	0.0	SAND: White to pinkish gray, fine- to medium-grained.				
65		1.3/2	0.0	SAND: White, fine- to coarse-grained.		GM		
70		1.8/2	0.0	SAND: White, fine- to coarse-grained.				
75		1.6/2	0.0	SAND: Pale yellowish brown, light red, grayish orange, moderate pink, fine- to coarse-grained.				
80		1.5/2	0.0					
85		2.0/2	0.0	CLAYEY SAND: Gray to light red to brown, fine- to medium-grained.		SC		
90		2.0/2	0.0	SANDY CLAY: Light red to brown to pale yellowish brown to pinkish gray, fine- to coarse-grained, saturated.		CL		
95		2.0/2	0.0	SANDY CLAY: Light red to brown to pale yellowish brown to pinkish gray, fine- to coarse-grained, saturated.				
100		2.0/2	0.0					
105		2.0/2	G.C.	SANDY CLAY: Light red to brown to pale yellowish brown to pinkish gray, fine- to coarse-grained, saturated.				
110						SM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-1
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/25/92	COMPLTD: 2/25/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 100 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2								
		2.0/2	G.C.	SAND: Brown to grayish orange to pinkish gray, fine- to medium-grained, saturated.		SM		
115		2.0/2	G.C.	SAND: Pinkish gray to pinkish orange, fine- to coarse-grained, saturated.		GM		
120								
125								
130								
135								
140								
145								
150								
155								
160								
165								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-2
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/26/92	COMPLTD: 2/26/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 97 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	CLAYEY SAND: Reddish-brown to brown to pinkish gray, fine- to medium-grained.		SC		POSTHOLE
10		1.0/2	0.0					
15		0.8/2	0.0	CLAYEY SAND: Reddish-brown to brown to pinkish gray, fine- to medium-grained.				
20		1.3/2	0.0	SANDY CLAY: Light red to white to pale yellowish brown, fine- to medium-grained, very stiff.				
25		1.6/2	0.0					
30		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.		SM		
35		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.				
40		2.0/2	0.0	SAND: Grayish orange to pinkish gray to white, fine- to coarse-grained, trace clay, few gravels.		GM		
45		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		SM		
50		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		GM		
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-2
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/26/92	COMPLTD: 2/26/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 97 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60	1.2/2		0.0	SAND: Light red to reddish brown to grayish orange, fine- to coarse grained, little gravel.		GM		
65	1.0/2		0.0	SAND: Light red to grayish orange, fine- to coarse-grained, little gravel.				
70	1.0/2		1.0	SAND: Grayish orange to grayish orange to white, fine- to coarse-grained with moderate gravel.				
75	1.3/2		0.0	SAND: Light brown to reddish brown to pinkish orange, fine- to coarse-grained with some gravel.				
80	1.7/2		0.0	SAND: Light red to reddish brown, fine- to coarse-grained, with moderate gravel, moist throughout.				
85	1.8/2		0.0					
90	2.0/2		0.0	SAND: Light red to reddish brown, fine- to coarse-grained with moderate gravel, saturated.				
95	2.0/2		0.0	CLAY: Red to gray to white to brown, fine to medium grained, stiff.		CH		
100	2.0/2		G.C.					
105	2.0/2		G.C.	SAND: Pale yellowish brown to white to pinkish gray, fine- to coarse-grained, saturated.		GM		
110								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-2
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/26/92	COMPLTD: 2/26/92
METHOD: 4.25 in. HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 97 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
		2.0/2	G.C.	SAND: Pink red to light red to grayish orange to grayish orange, fine- to coarse-grained, saturated.	00	GM		
115								
120								
125								
130								
135								
140								
145								
150								
155								
160								
165								

Continued from PAGE 2

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-3
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 02/26/92	COMPLTD: 02/26/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 99 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2	200.0	SAND: Brown, fine grained, hard, odor.		SM	POSTHOLE	
10		1.8/2	150.0			SM	6,8,9,8	
15		1.8/2	1000	CLAYEY SAND: Red, dark yellowish orange, grayish orange, very fine-grained, mottled, strong odor.		SC	3,12,15,14	
20		1.8/2	280.0	CLAY: Red, Dark yellowish orange, very pale orange, mottled, some fine-grained, strong odor.		CL	7,9,13,16	
25		1.8/2	1000	SANDY CLAY: Brown, red, stiff, clay lenses, strong odor.		SC	5,6,11,13	
30		2.0/2	450.0	SAND: Red, brown, fine- to medium-grained, odor.		SM	6,9,6,8	
35		1.5/2	32.0	SAND: White, fine- to medium-grained, odor.		SM	11,9,9,9	
40		1.5/2	30.0	SAND: White, fine- to medium-grained, odor.		SM	6,6,7,7	
45		0.8/2	10.0	SAND: White, very fine-grained, silt, clay, less odor, damp.		SM	6,7,7,9	
50		1.0/2	1.0	SAND: White, fine- to medium-grained.		SM	5,6,8,8	
55						GM	-,-,8,10	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-3
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 02/26/92	COMPLTD: 02/26/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 99 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				Continued from PAGE 1				
		1.5/2	8.0	SAND: White, medium- to coarse-grained, quartz pebbles.		GM	-,-,12,16	
60		1.0/2	14.0	SAND: White, medium-grained.		SP	10,12,15,16	
65		1.2/2	6.0	SAND: Coarse- to very coarse-grained, quartz pebbles.		GP	12,16,18,18	
70		1.5/2	2.0	SAND: Light grayish orange, fine- to medium-grained.		SM	-,-,22,30	
75		1.6/2	2.0	SAND: Grayish orange and moderate pink, fine- to medium-grained, clayey sand lenses.		SM	-,12,13,22	
80		1.0/2	7.0	SAND: Grayish orange with dark yellowish orange stripes, fine-grained, well-sorted.		ML	50,R	
85		1.8/2	0.0	SAND: Brown, very dark red, grayish orange, very fine- to medium-grained, saturated.		ML	Wt. of Rod	
90		2.0/2	0.0	SAND: Fine grained (.5'), wet, stiff clay in remainder of spoon.		CL	5,6,8,7	
95		2.0/2	0.0	CLAY: Purple, stiff.		CL	-,10,12,12	
100		2.0/2	0.0	CLAY: Brown, white, very stiff.		CL	-,13,14,18	
105		2.0/2	1.0	CLAY: Brown, white, very stiff.		CL	-,28,34,35	
110						SC		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-3
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 02/26/92	COMPLTD: 02/26/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 99 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				Continued from PAGE 2				
		2.0/2	7.0	SAND: Brown, wet, 2" clay lens.		SC	-,28,34,35	
115		2.0/2	0.0				6,5,6,6	
120								
125								
130								
135								
140								
145								
150								
155				SAND: Fine grained, well-sorted, saturated.				
160								
165								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-4
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/01/92	COMPLTD: 3/01/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 168.00 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 108 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.3/2	0.0	SANDY CLAY: Reddish brown to moderate pink to white fine- to medium-grained.		CL		POSTHOLE
10		1.7/2	100.0	SAND: Olive gray to dark yellowish orange, fine- to medium-grained, trace clay.		SM		
15		1.5/2	350.0	SAND: Brown to red to dark yellowish orange, fine- to medium-grained, trace clay.		SM		
20		2.0/2	500.0	CLAY: Light red to white to brown to purple, stiff, slight odor detected.		CH		
25		2.0/2	2000	SAND: Light red to white to brown, fine- to medium-grained, trace clay, slight odor detected.		SM		
30		2.0/2	2000	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, slight odor detected.		GM		
35		2.0/2	2000	SAND: Pinkish gray to white fine- to medium-grained. Slight odor detected.		SM		
40		2.0/2	2000					
45		2.0/2	60.0	SAND: White to pinkish gray to grayish orange, fine-grained, some silt, odor detected.		ML		
50		2.0/2	200.0	CLAYEY SAND: Pinkish gray to grayish orange to gray, fine-grained, slight odor detected.		SC		
55						GM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-4
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/01/92	COMPLTD: 3/01/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 168.00 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 108 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
80.0		1.3/2	80.0	SAND: White to pinkish gray to grayish orange, fine- to coarse-grained with some gravel.		GM		
60		1.3/2	20.0			SM		
65		1.1/2	14.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained, some gravel.		SM		
70		1.1/2	15.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained, some gravel.		SM		
75		1.1/2	6.0	SAND: Brown to pinkish gray to white, fine- to medium-grained.		SM		
80		1.0/2	0.0	SAND: pale yellowish brown to pinkish gray to white, fine- to medium-grained.		SM		
85		1.5/2	N.M.	SAND: Purple to brown to dark yellowish orange, fine- to medium-grained, wet.		GM		
90		1.8/2	5.0	CLAY: Gray to brown to pinkish gray, fine- to medium-grained, stiff.		CH		
95		2.0/2	0.0			CH		
100		2.0/2	3.0	CLAY: Gray to brown to pinkish gray, fine- to medium-grained, stiff.		CH		
105		2.0/2	N.M.	CLAY: Gray to brown to pinkish gray, fine- to medium-grained, stiff.		CH		
110						SM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-4
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/01/92	COMPLTD: 3/01/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 168.00 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 108 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2								
		2.0/2	G.C.	SAND: Brown to pinkish gray to white, fine- to medium-grained, saturated.		SM		
115		2.0/2	G.C.	SAND: pinkish gray to grayish orange to brown, fine- to medium-grained, saturated.				
120								
125								
130								
135								
140								
145								
150								
155								
160								
165								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-5
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/02/92	COMPLTD: 3/02/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 101 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	SAND: Olive gray to gray, fine- to medium-grained, trace clay.		SM		POSTHOLE
10		2.0/2	0.0	SANDY CLAY: Reddish brown to grayish orange to pinkish gray, fine- to medium-grained, trace clay.		SC		
15		1.0/2	0.0	SANDY CLAY: Grayish orange to brown to pinkish gray, fine- to medium-grained.				
20		1.2/2	0.0	SAND: Light red to white to pale yellowish brown, fine- to medium-grained.		SM		
25		2.0/2	0.0	SAND: White to Light red to dark yellowish brown to pinkish gray, fine- to medium-grained.				
30		1.7/2	0.0	SAND: Grayish yellow to pinkish gray to white, fine- to medium-grained.				
35		1.3/2	0.0	SAND: Pinkish gray to white, fine- to medium-grained, trace silt.				
40		1.5/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to midium-grained, trace clay.				
45		1.5/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained.				
50		1.5/2	0.0					

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-5
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/02/92	COMPLTD: 3/02/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: 0
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 101 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.7/2	0.0	SAND: pinkish gray to grayish orange to gray, fine- to medium-grained.		SM		
60		1.6/2	0.0	SAND: white to grayish orange, fine- to medium-grained, some gravels.				
65		1.5/2	0.0					
70		1.5/2	0.0	SAND: white, fine- to medium-grained.				
75		1.8/2	0.0	SAND: pinkish gray to grayish orange to white, fine- to coarse-grained, trace clay.		GM		
80		1.1/2	1.0	SAND: Pinkish to pale yellowish brown to white, fine-grained.		ML		
85		1.1/2	N.M.	SAND: Pinkish red to pale yellowish brown to pinkish gray to grayish orange, fine- to coarse-grained, wet.		GM		
90		2.0/2	0.0	SANDY CLAY: Pinkish gray, to light brown to pale yellowish brown, fine- to medium-grained, moderate amount of clay.		CL		
95		2.0/2	0.0	CLAY: Light red to pale yellowish brown to brown to white, fine- to medium-grained, stiff.		CH		
100		2.0/2	0.0					
105		N/A	N.M.	SANDY CLAY: Brown to dark yellowish orange, to white to pinkish gray, fine- to medium-grained, moderate amount of clay.		CL		
110						GM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-6
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/03/92	COMPLTD: 3/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 107FT.	DPTH TO ∇ 99 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2	0.0	SANDY CLAY: Reddish-brown to grayish orange to pinkish gray, fine- to medium-grained.		CL		POSTHOLE
10		2.0/2	0.0	SAND: Reddish-brown to pinkish gray, fine- to medium-grained, trace clay.		SM		
15		1.8/2	0.0	CLAY: Light red to brown to pale yellowish brown to white, fine- to medium-grained, stiff.		CH		
20		2.0/2	700.0	SAND: Light red to brown to white, fine- to medium-grained, trace clay, few gravel, noticeable odor detected.		SM		
25		2.0/2	1000	SANDY CLAY: Brown to grayish orange to pinkish grey to white, fine- to medium-grained, noticeable odor detected.		SC		
30		0.8/2	1000	CLAY: Light red to brown to grayish orange to pale yellowish brown, fine- to medium-grained, noticeable odor detected.		CH		
35		1.0/2	280.0	SAND: Grayish orange to pinkish gray to white, fine- to medium-grained, noticeable odor.		SM		
40		1.5/2	11.0	SANDY CLAY: Pinkish gray to grayish orange to white, fine- to medium-grained.		SC		
45		1.0/2	10.0					
50		1.6/2	4.0	SAND: White to pinkish gray, fine- to coarse-grained with some gravel.		GM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-7
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/03/92	COMPLTD: 3/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 102FT.	DPTH TO ∇ 100 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.7/2	0.0	CLAY: Brown to pinkish gray to white, fine- to medium-grained, stiff.		CL		POSTHOLE
10		1.9/2	0.0	SANDY CLAY: Reddish brown to pinkish gray, fine- to medium-grained.				
15		1.8/2	0.0	SAND: Grayish orange to brown to pinkish gray, fine- to medium-grained, few gravel.		SM		
20		2/2	0.0	SAND: Very pale orange, white, fine- to medium-grained.				
25		N.R.	N.M.	NO RECOVERY				
30		1.9/2	N.M.	SAND: Very pale orange, white, grayish orange, fine- to medium-grained.				
35		1.1/2	0.0	SAND: Pinkish gray, white, fine- to medium-grained.				
40		1.1/2	1.0	SAND: Pinkish gray, white, fine- to medium-grained.				
45		1.5/2	0.0	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, few gravel.		GM		
50		1.6/2	3.0			SM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-7
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/03/92	COMPLTD: 3/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 102FT.	DPTH TO ∇ 100 FT.
LOGGED BY: C. Douse	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.7/2	0.0	SAND: White, pale yellowish brown, fine-grained, moist.		SM		
60		1.3/2	0.0	SAND: Brown, pale yellowish brown, fine- to coarse-grained.				
65		1.5/2	0.0					
70		1.3/2	3.0	SAND: White, brown, fine- to medium-grained.				
75		1.9/2	N.M.	SAND: Pinkish gray to moderate orange pink, fine- to coarse-grained.		GM		
80		2.0/2	0.0	CLAY: Red, gray, very pale orange, fine-grained, stiff.		CL		
85		2.0/2	N.M.	CLAY: Very pale orange, gray, grayish orange, white, fine- to medium-grained, stiff.				
90		2.0/2	N.M.	CLAY: Very pale orange, gray, grayish orange, white, fine- to medium-grained, stiff.				
95		2.0/2	G.C.	SAND: Grayish orange, white, very pale orange, fine- to medium-grained, saturated.		SM		
100		2.0/2	G.C.	SAND: Brown, fine- to medium-grained, saturated.				
105								
110								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-8
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/03/92	COMPLTD: 03/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 98 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2/2	0.0	CLAYEY SAND: Brown, fine-grained, well-sorted, moist.		SC	POSTHOLE 6,8,12,9	
10		2/2	0.0				7,7,9,8	
15		2/2	6.0	SANDY CLAY: Red to grayish orange to gray.		CL	4,4,4,7	
20		2/2	0.0	CLAY: Gray to grayish orange, stiff.		CH	4,4,5,4	
25		2/2	N/A	SILTY CLAY: Moderate pink to brown, moist.		CL	2,2,2,3	
30		2/2	33.0	SANDY CLAY: Grayish orange to red, very fine-grained, moist, odor detected.			5,5,7,9	
35		2/2	4.0	SAND: White to red, very fine- to coarse-grained.		GM	6,9,10,14	
40		2/2	0.0	SILTY CLAY: Grayish red, moist. SAND: White, medium-grained.		CL	8,9,10,10	
45		2/2	1.0	SILTY SAND: White, very fine-grained, trace clay, moist.		ML	7,8,9,9	
50		2/2	2.0	SAND: White, fine- to medium-grained, well-graded.		SM		Wt. of Rod
55						GM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-8
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/03/92	COMPLTD: 03/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 98 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		2/2	2.0	SAND: White, fine- to coarse-grained, well-sorted.		GM	15,18,18,18	
60		1.5/2	0.0				15,17,18,19	
65		1.6/2	6.0				Wt. of Rod	
70		1.5/2	1.0	SAND: White to dark yellowish orange, fine- to coarse-grained.			25,30,26,27	
75		1.2/2	2.0	SAND: White to red, medium- to coarse-grained.		SW	0,22,23,23	
				CLAYEY SAND: Red to white, medium-grained.		SC		
80		1.2/2	4.0	SAND: Red to grayish orange, medium to very coarse-grained.		GP	Wt. of Rod	
85		1.5/2	0.0	CLAYEY SAND: Brown, moist.		SC	15,18,18,20	
				CLAY: Gray, trace sand.		CH		
90		1.8/2	0.0	CLAY: Gray to red, trace silt.			Wt. of Rod	
95		1.8/2	N/A	CLAY: Purple to gray, stiff.			10,14,16,20	
100		2/2	N/A	CLAY: Grayish orange to red, very stiff.			0,0,24,24	
105		1/2	N/A	SAND: Brown, fine-grained, trace clay, saturated.		ML	Wt. of Rod	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-8
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/03/92	COMPLTD: 03/03/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 98 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				Continued from PAGE 2				
		2/2	N/A	SAND: Brown, fine-grained, saturated.		ML	10,10,10,10	
115								
120								
125								
130								
135								
140								
145								
150								
155								
160								
165								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-9
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/10/92	COMPLTD: 03/10/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 102 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2/2	0.0	SANDY CLAY : Brown, saturated.		CL		POSTHOLE
10		2/2	1.0	CLAYEY SAND : Mottled, red, grayish orange, dark yellowish orange, fine-grained.		SC	6,9,9,9	
15		2/2	1.0	SAND : Gray, Fine-grained, well-sorted, trace clay. SAND : red, medium-grained, well-sorted.		ML	6,9,9,10	
20		2/2	2.0	SAND : Red and grayish orange stripped, medium- to coarse-grained, gravelly.		SW	6,7,7,8	
25		2/2	2.0	SAND : White, medium-grained, well-graded.			6,6,7,8	
30		2/2	2.0	SAND : Very pale orange with red, fine- to medium-grained.		SM	8,15,21,22	
35		2/2	2.0	SAND : Grayish orange and red, medium- to coarse-grained, last 4 inches are gray silt with clay.		SP	11,11,9,10	
40		2/2	1.0	SANDY SILTY CLAY : Moderate pink, gravel < 5 mm., sand, medium-grained.		GM	0,0,7,14	
45		2/2	1.0	SAND : White, fine- to medium-grained, some gravel.			10,12,14,14	
50		2/2	0.0	SAND : White, fine- to medium-grained.		SM	14,19,25,23	
55						GM		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-9
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/10/92	COMPLTD: 03/10/92
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 102 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				Continued from PAGE 1				
		2/2	1.0	SAND: White, fine- to coarse-grained, poorly-graded.		GM	18,20,23,23	
60		1.5/2	0.0	SAND : Red, dark yellowish orange, very pale orange, stripped, medium- to very coarse-grained, clayey lenses.		SP	0,0,12,12	
65		1.6/2	0.0	SAND : Dark yellowish orange, very fine-grained, well-sorted, damp.		ML	10,12,12,12	
70		1.5/2	0.0	SAND : Very pale orange, dark yellowish orange, medium- to coarse-grained, damp.		SP	22,22,24,29	
75		1.2/2	0.0	SAND : Dark yellowish orange, grayish orange, fine- to coarse-grained, wet.		GM	26,33,33,35	
80		1.2/2	1.0	SAND : dark yslowish orange, grayish orange, medium- to very coarse-grained, saturated.		SP	10,12,14,14	
85		1.5/2	0.0	SAND : Brown, medium- to very coarse-grained, gravelly, saturated.			Wt. of Rod	
90		1.8/2	0.0	SAND : Brown, medium- to very coarse-grained, saturated. CLAY : Stiff.			7,12,14,15	
95		1.8/2	6.0	SAND : Brown, medium- to coarse-grained, saturated.			8,10,12,12	
100		2/2	3.0	SAND : Brwon, medium- to coarse-grained. Last 6 inches are brown and very pale orange fine sand, saturated.			12,25,35,37	
105		1/2	N/A				REF	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-10
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/17/92	COMPLTD: 03/17/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5							SM		
									POSTHOLE
			1/2	0.0	SAND: Red to dark yellowish orange to grayish orange, fine- to medium-grained, trace clay.			6,12,14,20	
10							ML		
			1.5/2	0.0	SAND: Reddish brown, fine-grained, trace clay.			5,6,9,9	
15							CL		
			2/2	0.0	SANDY CLAY: Red, fine-grained.			9,10,10,10	
							ML		
					SAND: Red to brown, fine-grained, trace clay.				
20									
			1.8/2	0.0	SAND: Brown to moderate pink, very fine-grained with silt and clay.			7,7,7,8	
25									
			2/2	0.0	SAND: Red to dark yellowish orange to pinkish gray, very fine-grained with silt and clay.			5,7,7,7	
30									
			1.8/2	1.0	SAND: White to red, very fine-grained, well-sorted, trace silt.			6,7,7,6	
35									
			1.8/2	0.0	SAND: White, very fine-grained, well-sorted, silty.			5,6,7,8	
40							GP		
			2/2	0.0	SAND: Fine- to medium-grained with <15mm gravel.			9,10,12,15	
45							ML		
			2/2	0.0	SAND: Moderate pink to white, very fine-grained, well-sorted, trace silt.			10,10,12,12	
50							SM		
			1.8/2	0.0	SAND: Gray, very fine- to medium-grained, well-graded.			12,15,18,18	
55									

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-11
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/17/92	COMPLTD: 03/17/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2		25.0	CLAYEY SAND: Brown to red, fine- to medium-grained.		SC		
								POSTHOLE	
								4,7,7,10	
10		2/2		0.0	CLAYEY SAND: Brpwn to grayish orange, fine- to medium-grained.				
								5,7,7,7	
15		2/2		0.0	SANDY CLAY: Red to grayish orange to dark yellowish orange, fine- to medium-grained.		CL		
								7,7,9,10	
20		1.8/2		0.0	SAND: White to red, fine-grained, well-sorted.		ML		
								10,12,15,18	
25		1.5/2		0.0	SAND: Moderate pink to white, fine- to medium-grained.		SM		
								12,15,18,19	
30		1.8/2		1.0	SAND: Gray, fine- to medium-grained.				
								17,19,25,27	
35		1.5/2		0.0	SAND: White, very fine-grained, silty.		ML		
								14,12,11,11	
40		1.5/2		0.0					
								10,12,12,14	
45		1.8/2		0.0	SAND: White, fine- to medium-grained, well-graded.		SM		
								14,16,17,18	
50		2/2		0.0	SILTY SAND: White, very fine-grained.		ML		
								14,12,12,11	
55									

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-12
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/19/92	COMPLTD: 03/19/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 97FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2/2	0	SAND: Medium-grained, trace clay, dry.		SC		POSTHOLE
10		2/2	0	SANDY CLAY: Mottled red / dark yellowish orange / off white, fine-grained.		CL		
15		2/2	0	SILTY CLAY : Mottled, red / dark yellowish orange, off white, fine-grained, some fine sand, stiff.				
20		2/2	0	SILTY CLAY : Very light gray with moderate pink mottling, damp.				
25		2/2	0	SILTY CLAY : Very light gray with moderate pink mottling, damp.				
30		1.8/2	0	SAND : Moderate pink, fine-grained, well-sorted, 2 inch clay zone, moist.		ML		
35		1.6/2	0	SAND : Moderate pink, fine-grained, well-sorted, damp.				
40		1.6/2	0	SAND : Moderate pink, very fine- to fine-grained, trace medium-grained, well-graded.				
45		1.6/2	0	SAND : White with moderate reddish brown stripes, very fine- to medium-grained, well-graded, last 4 inches dry.		SM		
50		2/2	2	SAND : White, very fine- to coarse-grained, well-graded.		GM		
55						ML		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-12
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 03/19/92	COMPLTD: 03/19/92
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 97FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.6/2	2	SAND : Very fine- to fine-grained, moderately graded, trace medium-grained.		ML		
60		1.8/2	0	SAND : White, Very fine- to fine-grained, well-graded.				
65		1.8/2	0	SAND : Very fine- to fine-grained, moderately graded, trace medium-grained sand and mica, damp.				
70		1.6/2	0	SAND : Gray with moderate yellow stripes, Very fine- to very coarse-grained, well-graded, predominately coarse and very coarse, small pebbles < 5 mm.		GP		
75		2/2	0	SAND : White with red and moderate orange pink stripes, very coarse- grading to very fine-grained.				
80		2/2	0	SAND : White with moderate orange and pale yellowish brown, medium- to coarse-grained, damp.		SP		
85		2/2	0	SILTY CLAY : Mottled moderate orange pink / yellowish gray, moist.		CL		
90		2/2	0	CLAY : Gray with grayish orange mottling, silty lenses, damp.				
95								
100								
105								
110								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-13
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/14/93	COMPLTD: 05/14/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 166.00 FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			0.0	SAND : Dark yellowish orange and olive gray, medium-grained, well-sorted, moist.		SP		POSTHOLE
5		0.9/2	0.0	SAND : Dark yellowish orange and olive gray, medium-grained, well-sorted, some clay, moist.				4,7,7,10
10		0.9/2	0.0	CLAYEY SAND : Moderate reddish brown, dark yellowish orange and olive gray, mottled, medium-grained, some fines, well-rounded, poorly sorted, dry.		SC		15,6,10,9
15		1/2	0.0	SILTY SAND : Moderate reddish brown at the top grading to grayish orange, fine- to medium-grained, well-graded, well-rounded, looser with depth.		SM		4,9,10,8
20		1.2/2	0.0	SAND : Dark yellowish orange and dark yellowish brown, medium-grained, subrounded, poorly sorted, damp.		SW		9,11,14,12
25		1.8/2	0.0	SILTY SAND : Pale yellowish orange, medium-grained at the top grading to very fine-grained with depth, well-rounded, dense, damp.		SM		10,12,18,16
30		1.8/2	0.0	SILTY SAND : Mottled moderate red, grayish orange pink, dark yellowish orange, very fine-grained, silty, tray clay, well-rounded, moist.		ML		4,3,7,9
35		1.8/2	0.0	SILTY SAND : Very pale orange, very fine-grained, well-rounded.				9,8,6,7
40		1.7/2	0.0	SILTY SAND : Grayish pink, very light gray, very fine-grained, well-sorted, mica, clay lense, moist.				5,6,6,10
45		1.8/2	0.0	SILTY SAND : Grayish orange pink, fine- to very fine-grained, well-sorted, trace mica, moist.				8,8,9,6
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-14
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/14/93	COMPLTD: 05/14/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			0.0	SAND : Medium-grained, large gravel, dense.		SP		POSTHOLE
5		1.9/2	220	SAND : Olive gray, medium-grained, well-sorted, damp.				10,15,18,6
10		1.8/2	50	CLAYEY SAND : Mottled dark yellow orange, very pale orange, moderate yellowish brown, medium-grained, dense, damp.		SC		2,9,6,13
15		2/2	25	SANDY CLAY : Mottled dark yellow orange, medium-to fine-grained, dense.		CL		3,8,18,6
20		2/2	1.0	SANDY SILTY CLAY : Light brown, very pale orange, trace sand and silt, tight, dry.				5,9,11,14
25		2/2	0.0	CLAYEY SAND : Mottled pale yellowish brown, dark yellowish orange, sand and silty clay, moist.		SC		6,4,6,6
30		1.9/2	0.0	SAND : Grayish orange, very fine- to medium-grained, well-rounded, well-graded, mica.		SW		5,7,8,8
35		1.8/2	0.0	SILTY SAND : (0 to 15 in) Dark yellow orange, medium-grained, subrounded, mica, saturated, (15 to 20 in) grayish pink, silty, soft, moist, perched water table.		SM		5,7,4,8
40		2/2	0.0	SILTY CLAYEY SAND : Grayish pink and moderate reddish brown, very fine-grained, soft, moist.		ML		1,2,6,6
45		1.8/2	0.0	SAND : Very pale orange, fine- to medium-grained, well-sorted, well-rounded, moist.		SM		12,14,12,14
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-15
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/14/93	COMPLTD: 05/14/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2	1800	SAND : Dark Yellowish brown, medium-grained, dry.		SW	POSTHOLE	
10		2/2	1000	SAND : Dark yellowish brown, fine- to medium-grained, rounded, trace clay, moist.		SC	3,5,6,7	
15		0.5/2	50	CLAYEY SAND : (0 to 12 in) Moderate reddish brown, fine-grained, dense, dry, (12 to 24 in), dark reddish brown, fine-grained, loose.			4,8,16,13	
20		1.9/2	80	CLAYEY SAND : (0 to 3 in) Moderate reddish brown, medium-grained, (3 to 6 in), mottled moderate reddish brown, very light gray, dark yellowish orange, clay, tight.			4,7,9,10	
25		1.9/2	2000	SANDY SILTY CLAY : Mottled dark yellowish orange, very pale orange, moderate red, very fine-grained, moist, strong petroleum odor.		CL	2,4,5,5	
30		2/2	2500	SANDY SILTY CLAY : Mottled dark yellowish orange, very pale orange, moderate red, very fine-grained, moist, strong petroleum odor.			2,3,2,3	
35		1.8/2	8	SILTY CLAY : Moderate reddish brown, grayish pink,			1,1,2,1	
40		1.8/2	28	SILTY SAND : Pinkish gray, fine- to medium-grained, well-graded, dry.		SM	9,11,12,15	
45		1.8/2	12	SILTY SAND : Pinkish gray, fine- to medium-grained, well-graded, dry.			10,10,11,9	
50		1.8/2	4	SILTY SAND : Very pale orange, very fine- to medium-grained, subangular pebbles, mica, damp.			7,10,10,12	
55		1.8/2	2	SILTY SAND : Very pale orange, very fine- to medium-grained, subangular, pebbles, mica, damp.			12,12,12,14	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-16
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/16/93	COMPLTD: 05/16/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.9/2	1700	SAND : Dark yellowish brown, fine-grained, well-sorted.		SM	3,6,4,5	
10		1.8/2	100	SAND : Dark yellowish brown, pale brown, fine-grained, well-sorted.			12,15,16,10	
15		2/2	18	CLAY : (0 to 12 in), Dark reddish brown, medium-grained, (12 to 24 in), dark yellowish orange, pale yellowish brown, very pale orange, medium- to fine-grained, very stiff, hard.		CH	11,13,11,13	
20		1.8/2	18	SANDY CLAY : Mottled dark yellowish orange, very pale orange, fine-grained, compact.		CL	7,7,9,17	
25		1.8/2	45	SAND : Very pale orange and light brown, very fine- to very coarse-grained, well-graded, angular, gravel 3/4 inch, subrounded, loose.		SW	4,6,10,11	
30		1.7/2	5	SAND : Very pale orange, very fine- to coarse-grained, well-graded, subangular, loose, dry.			7,8,10,13	
35		1.3/2	5	SAND : Very pale orange, very fine- to coarse-grained, well-graded, subangular, loose, dry.			5,7,14,17	
40		1.5/2	5	SILTY SAND : Very pale orange, very fine- to medium-grained, some silt, trace mica, loose, musty odor.		SM	7,11,12,15	
45		1.4/2	2	SILTY SAND : Very pale orange, very fine- to medium-grained, some silt, trace mica, loose, musty odor.			9,9,7,12	
50		1.8/2	2	SILTY SAND : Very pale orange, fine- to medium-grained, mica, loose.			12,12,16,21	
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-17
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/16/93	COMPLTD: 05/16/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Dark yellowish orange, fine- to medium-grained, trace clay.		SP		
5		0.2/2		SAND : Dark yellowish orange, fine- to medium-grained, trace clay.			3,10,17,16	
10		1.8/2		SANDY CLAY : Mottled, very pale orange, moderate reddish brown, dark yellowish orange, fine-grained, hard, dry.		CL	5,9,14,18	
15		1.9/2		SAND : Moderate reddish brown, very pale orange, fine-grained, well-sorted, well-rounded, mica, some clay.		SM	6,6,7,8	
20		1.3/2		SAND : Moderate reddish brown, very pale orange, fine- to coarse-grained, well-graded, angular, gravel < 5mm, dry.		GM	12,8,8,8	
25		1/2		SAND : Very pale orange, very fine- to medium-grained well-graded, rounded, dry.		SM	8,11,11,11	
30		1/2		SAND : Very pale orange, medium-grained, well-sorted, rounded, mica, clay lenses.		SP	7,7,9,13	
35		1.5/2		SAND : Very pale orange, fine-grained, well-rounded, well-sorted, trace clay lenses, mica, dry.		SM	5,6,11,11	
40		1.5/2		SAND : Very pale orange, very fine- to medium-grained, rounded, mica, trace clay, dry.			6,12,13,15	
45		1.5/2		SAND : Very pale orange, fine- to medium-grained, subrounded, mica, loose, dry.			9,8,8,8	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-18
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93	COMPLTD: 05/20/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 83FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
3				CLAYEY SAND : Moderate reddish brown, fine- to medium-grained, moist.		SC		
5		1.5/2	0	SANDY CLAY : Very pale orange, dark yellowish brown, mottled, moderate reddish brown, fine-grained, hard, dry.		CL	4,8,12,17	
10		1.4/2	2	CLAYEY SAND : Moderate to reddish brown, medium- to very coarse-grained, gravel, angular, loose.		SC	10,9,15,11	
15		1.9/2	0	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist.		CL	10,7,7,6	
20		1.6/2	21	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled; inelastic, soft, moist.			1,1,2,1	
25		2/2	15	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist, petroleum odor.			5,9,8,7	
30		2/2	4	SAND : Pale yellowish orange, fine-grained, poorly-sorted, rounded.		ML	4,8,10,12	
35		0.7/2	4	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, dry.			7,8,9,9	
40		1.6/2	2	SAND : Very pale orange, very fine-grained, well-sorted, well-rounded, dry.			7,8,11,9	
45		1.4/2	2	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, dry.			13,16,17,16	
50		1.5/2	8	SAND : Very pale orange, medium- to coarse-grained, poorly-graded, gravel, mica.		SP	9,12,16,16	
55						ML		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-18
CLIENT: SOUTHNAVFACENCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93	COMPLTD: 05/20/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 83FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60		1.7/2	1	SAND : Very pale orange, fine-grained, well-rounded, loose, mica, dry.		ML	11,15,18,15	
65		1.8/2	1	SAND : Very pale orange, fine- to medium-grained, well-graded, subrounded, damp.		SM	10,14,25,29	
70		1.7/2	4	SAND : Very pale orange, fine- to medium-grained, subrounded, well-graded, mica, damp.			14,34,29,32	
75		1.6/2	0	SAND : Very pale orange, pale yellowish orange, medium-grained, subrounded, well-sorted, mica, damp.			6,11,29,40	
80		1.5/2	1	SAND : Grayish orange, medium-grained, some fines, subrounded.		SP	11,23,32,35	
80		1.6/2	SAT	SAND : Dark yellowish orange, medium-grained, subrounded, moist.		SM	19,24,35,40	
80		2/2	SAT	SAND ; Medium-grained graded to very coarse-grained, angular, saturated.		GP	22,23,24,29	
85		2/2	SAT	SAND : Dusky red, coarse- to very coarse-grained, angular, saturated.			14,20,18,9	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-19
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93	COMPLTD: 05/17/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 42FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				0	SAND : Medium-grained, damp.		SP		
5			1/2	0	CLAYEY SAND : Very pale orange, moderate reddish brown, light brown, medium-grained, subrounded, moist.		SC	2,3,8,9	
10			1.6/2	0	CLAYEY SAND : Mottled very pale orange, moderate reddish brown pale yellowish orange, fine-grained, subrounded, densely compacted.			3,8,10,12	
15			1.8/2	0	CLAY : mottled moderate reddish brown, very pale orange, dark yellowish orange, fine-grained, hard, dry.		CL	3,10,11,10	
20			2/2	0	SILTY CLAY : Pale red, moderate reddish brown, soft.			2,4,3,4	
25			1.5/2	0	SAND : Very pale orange, moderate reddish brown, light brown, fine-grained, rounded, loose.		SP	5,10,9,7	
30			1.8/2	0	CLAYEY SAND : Moderate reddish brown, dark yellowish orange, fine-grained, rounded, saturated.		SC	3,2,2,4	
35			2/2	0	SANDY CLAY : Moderate reddish brown, very pale orange, fine-grained, moist.		CL	1	
40			1.8/2	0	SAND : Very pale orange, fine- to medium-grained, rounded, mica, loose.		SM	9,11,11,11	
45									
50									
55									

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-20
CLIENT: SOUTHNAVFACENCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93	COMPLTD: 05/17/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate brown, fine- to medium-grained, rounded, trace clay.		SM		
5		1.5/2		CLAYEY SAND : Grayish orange, light brown, fine- to medium-grained, well-rounded, gravel < 5mm.		SC	4,5,4,8	
10		1.9/2		CLAYEY SAND : Moderate red, grayish orange, fine-grained.		SC	6,8,10,8	
15		1.8/2		SAND : Dark yellowish orange, very pale orange, grayish orange pink, very fine-grained, silty, well-rounded.		ML	4,7,8,8	
20		1.8/2		SILTY CLAY : Pale reddish brown, very pale orange, soft.		CL	4,4,6,7	
25		2/2		SANDY CLAY : Dusty red, pale reddish brown, medium-grained, well-rounded, soft, sand lenses.		CL	2,4,6,5	
30		1.8/2		SILTY CLAY : Very pale orange, moderate reddish brown, dark yellowish orange, soft, moist.		CL	5,3,4,5	
35		2/2		SILTY CLAY : very pale orange, moderate orange pink, soft, moist.		CL	2,1,2,4	
40		2/2		SAND : (0 to 8 in) Sand, moderate red, medium grained, subrounded, saturated. (8 to 14 in) Silty clay, very pale orange, soft, moist. (14 to 24 in)		CL	7,9,10,9	
45		1.8/2		Sand, very pale orange, moderate reddish brown, medium-grained, gravel, damp.		SP		
45		1.8/2		SAND : very pale orange, fine- to medium-grained, dry.		SM	7,10,10,9	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-21
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93	COMPLTD: 05/17/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0						SC		
5		1/2		CLAYEY SAND : Mottled, moderate reddish brown, very pale orange, pale yellowish orange, fine-grained, hard, dry.			3,7,11,20	
10		1.2/2		SANDY CLAY : Mottled very pale orange, light brwon, fine-grained, inelastic.		CL	4,8,11,15	
15		1.5/2	3	SAND : Very pale orange, dusty red, fine-grained, poorly-sorted, subrounded, gravel, dry.		ML	4,8,7,9	
20		1.4/2	3	SAND : Very pale orange, light red, fine- to medium-grained, subangular, loose, dry.		SM	6,8,6,9	
25		1.5/2	2	SAND : Very pale orange, medium-grained, well-sorted, subrounded, mica, dry.		SP	5,7,8,12	
30		1.5/2	3	SAND : Very pale orange, medium-grained, well-sorted, subrounded, mica, dry.			7,12,8,12	
35		1.7/2	1	SILTY SAND : Very pale orange, very fine-grained, rounded, mica, clay lenses, dry.		ML	4,6,7,12	
40		1.6/2	2	SILTY SAND : Very pale orange, fine-grained, rounded, mica, dry.			6,6,12,13	
45		1/2	0	SAND : Very pale orange, medium-grained, rounded, mica, dry.		SP	9,14,16,20	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-22
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/18/93	COMPLTD: 05/18/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 67FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
15		1.5/2		SAND : Very pale orange, medium- to coarse-grained, poorly graded, subangular, loose.		SP	10,16,19,20	
60		1.5/2		SILTY SAND : Very pale orange, fine-grained, well-rounded, loose, mica.		SM	14,25,29,40	
65		1.5/2		SAND : Very pale orange, medium-grained, subrounded, mica, dry.			8,12,23,27	
70								
75								
80								
85								
90								
95								
100								
105								
110								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-22
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/18/93	COMPLTD: 05/18/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 67FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate yellowish brown, fine- to medium-grained, some clay, moist.		SC		
5		2/2		CLAYEY SAND : Mottled, moderate reddish brown, grayish orange pink, dark yellowish orange, fine- to medium-grained, densely compacted, dry.			8,9,10,20	
10		2/2		CLAY : Mottled moderate reddish brown, very pale orange, dark yellowish orange, some fine sand, hard, inelastic, dry.		CL	5,7,12,15	
15		2/2		SILTY CLAY : Pale yellowish orange, dark yellowish orange, light brown, soft inelastic, damp.			4,5,7,6	
20		2/2	2400	SILTY CLAY : Moderate reddish brown, very pale orange, soft, inelastic, soft, moist.			2,3,3,5	
25		2/2	1400	SAND : Coloring stratified, dusky red, very pale orange, dark, yellowish orange, fine- to medium-grained, sorted; subangular, loose, petroleum odor.		SM	5,8,9,14	
30		2/2	50	SAND : Very pale orange, medium- to coarse-grained, subangular, large gravel, rounded, 10 - 15 mm.		SP	6,12,14,15	
35		1.5/2	100	SILTY SAND : Very pale orange, very fine-grained, soft, rounded, clay lenses, mica.		ML	6,8,13,4	
40		1.5/2	10	SILTY CLAY : Grayish orange pink, soft, mica, moist.		CL	5,4,6,8	
45		1/2	7	SAND : Grayish orange pink, medium-grained, well-sorted, subrounded, mica, damp.		SP	9,17,20,20	
50		1.5/2	9	SAND : Grayish orange pink, medium-grained, well-sorted, subrounded, loose, gravel.			8,14,15,16	
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-23
CLIENT: SOUTHNAVFACENCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/18/93	COMPLTD: 05/18/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 57FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Light brown, medium-grained, trace clay, damp.		SC		
5		1.5/2		CLAYEY SAND : Moderate reddish brown, dark yellowish orange, very pale orange, fine-grained, hard.			5,11,13,18	
10		1.5/2		SAND : Dusky red, medium- to coarse-grained, loose, dry.		SP		
				CLAY : Dark brown, hardpan.		CL		8,14,9,11
15		1.5/2		SILTY CLAY : very pale orange, pale yellowish orange, hard, inelastic.				3,5,5,6
				SILTY CLAY : Very pale orange, moderate reddish brown, soft, inelastic.				
20		1.7/2	80	SILTY CLAY : Moderate reddish brown, very pale orange, soft, moist.				1,2,2,1
25		2/2	3	SILTY CLAY : Very pale orange, moderate red, soft, inelastic.				3,3,3,4
				CLAY : Light red, soft, elastic.				
30		1.6/2	8	SAND : Very pale orange, fine- to medium-grained, poorly-graded, mica, dry.		SM		7,7,12,10
35		1.5/2	3	SILTY SAND : Very light gray, very fine-grained, rounded, clay lenses, mica.		ML		5,6,7,7
40		1.5/2	4	SILTY SAND : Very light gray, very fine-grained, rounded, mica, clay lenses.				4,8,8,10
45		1.7/2	11	SAND : Very light gray, medium-grained, rounded, loose, mica.		SP		12,18,20,17
50		1.4/2	5	SAND : Very pale orange, medium-grained, subrounded, loose, mica.				8,14,22,20

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-23
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/18/93	COMPLTD: 05/18/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 57FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
		1.5/2	0	SAND : Moderate reddish brown, very pale orange, medium- to coarse-grained, rounded, poorly graded, loose.		SP	10,19,21,28	

Continued from PAGE 1

TITLE: NAS Whiting Field		LOG of WELL:		BORING NO. AST-SB-25	
CLIENT: SOUTHNAVFACENGCOM				PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.			DATE STARTED: 05/18/93		COMPLTD: 05/18/93
METHOD: 2.25" HSA		CASE SIZE:		SCREEN INT.:	
TOC ELEV.: FT.		MONITOR INST.: OVA		PROTECTION LEVEL: D	
LOGGED BY: N. Pagano		WELL DEVELOPMENT DATE:		DPTH TO ∇ FT.	
				SITE: 2894	

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Dark yellowish brown, fine- to medium-grained, trace clay, damp.		SM		
5		2/2		CLAYEY SAND : Mottled moderate reddish brown, very pale orange, dark yellowish brown, fine-grained, rounded, compact, dry.		SC	13,15,16,16	
10		2/2		SILTY SAND : Mottled very pale orange, pale yellowish orange, dark yellowish brown, fine-grained, rounded, compact, dry.		ML	7,13,15,12	
15		2/2		SANDY CLAY : Moderate red, fine-grained, inelastic. CLAY : Very pale orange, pale red, inelastic, hard.		CL	7,4,7,8	
20		2/2		SILTY CLAY : Very pale orange, moderate red, soft, moist.		CL	2,2,2,3	
25		2/2		SILTY SAND : Dark yellowish orange, moderate red, very pale orange, very fine grained, clay lense, soft, moist.		ML	4,5,4,7	
30		2/2		SILTY CLAY : Very pale orange, moderate reddish brown, trace very fine sand, soft, saturated.		CL	1,1,3,6	
35		1.5/2	1	SILTY CLAY : Very pale orange, moderate reddish brown, trace very fine sand, soft, saturated.		CL	5,14,16,14	
40		1.2/2	1	SAND : Light gray, medium- to coarse-grained, angular, dry.		ML	12,13,16,16	
45		1.5/2	3	SAND : Grayish pink, fine-grained, well-rounded, well-sorted, mica, clay lense.		ML	9,19,24,27	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-24
CLIENT: SOUTHNAVFACENCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/18/93	COMPLTD: 05/18/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Dark yellowish brown, fine- to medium-grained, trace clay, damp.		SM		
5		1.5/2		CLAYEY SAND : Moderate reddish brown, very pale orange, light brown, very fine-grained, rounded, compact.		CL	4,9,18,27	
10		2/2		SILTY CLAY : Mottled moderate reddish brown, light gray, inelastic, hard.		ML	6,10,12,12	
15		1.7/2		SILTY SAND : Moderate orange pink, fine-grained, poorly-sorted.		ML	5,7,6,8	
20		1.5/2	2	SILTY SAND : Light gray, fine-grained, rounded, poorly-sorted, gravel, < 5 mm.		SP	4,6,6,7	
25		0.7/2		SAND : Very pale orange, fine- to medium-grained, poorly-sorted, rounded, loose, gravel.		SM	4,7,9,10	
30		1.6/2	4	SAND : Very pale orange, fine-grained, subrounded, loose, mica.		ML	6,10,11,15	
35		1.5/2		SILTY SAND : Very pale orange, grayish pink, very fine-grained, clay lenses, mica, rounded.		ML	4,5,11,15	
40		2/2	3	SAND : Very pale orange, very fine- to coarse-grained, poorly-graded, gravel, mica.		GM	6,7,7,14	
45		1.7/2	2	SAND : Grayish orange pink, medium-grained, subrounded, loose, mica.		SM	10,10,12,16	
50		1.5/2	3	SAND : Dusky red, very pale orange, medium-grained, subangular, loose.		SM	7,15,14,15	
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-26
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/19/93	COMPLTD: 05/19/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			SAND : Grayish brown, fine- to medium-grained, trace clay moist.		SM		
5		2/2	CLAYEY SAND : light brown, fine-grained, well-rounded, damp.		SC	5,3,4,5	
10		2/2	CLAYEY SAND : Moderate reddish brown, very pale orange, fine-grained, well-rounded, hard.		SC	5,6,7,14	
15		1.7/2	SILTY SAND : Moderate reddish brown, very pale orange, very fine-grained, trace clay.		ML	9,9,6,7	
20		2/2	SILTY CLAY : Pale yellowish orange, soft, inelastic, damp.		CL	3,4,3,3	
25		2/2	SILTY SAND : Stratified color, dusky red, pale yellowish orange, very fine-grained, rounded, clay senses, mica, damp.		ML	8,7,5,8	
30		1.8/2	SILTY SAND : Very pale orange, fine-grained, rounded, nearly saturated.		ML	4,5,7,6	
35		2/2	SILTY CLAY : Moderate orange pink, moderate reddish brown, soft, inelastic, moist.		CL	1,2,4,18	
40		2/2	SILTY SAND : Grayish orange pink, very fine-grained, rounded, mica.		ML	10,10,14,14	
45		2/2	SILTY SAND : Very pale orange, very fine-grained, rounded, mica.		ML	9,8,8,12	
50		1.8/2	SAND : Very pale orange, medium-grained, well-sorted, subrounded, loose, mica.		SP	12,12,15,22	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-27
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/19/93	COMPLTD: 05/19/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 57FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.7/2	200	SAND : Dark yellowish brown, fine-grained, rounded, moist.		ML		
10		2/2	1000	SAND : Olive gray, fine-grained, rounded, wood fragments, possibly roots, moist.		ML	5,8,11,11	
15		1.7/2	140	CLAYEY SAND : Moderate yellowish brown, very pale orange, fine- to medium-grained, rounded.		SC	9,7,9,7	
20		1.7/2	36	CLAYEY SAND : Moderate reddish brown, very pale orange, fine-grained, compact dry.		SC	6,5,7,13	
25		1.7/2	15	CLAYEY SAND : Pale yellowish orange, moderate red, very pale orange, very fine-grained, soft, silt, moist.		SC	4,6,7,10	
30		1.7/2	1900	SILTY CLAY : Grayish pink, Grayish yellow, soft, moist.		CL	3,6,4,4	
35		1.7/2	2000	SILTY SAND : Moderate red, very pale orange, light brown, very fine-grained, clay lenses, soft, moist.		ML	5,4,7,7	
40		1.7/2	SAT	SILTY SAND : Very pale orange, moderate red, very fine-grained, well-rounded, mica, saturated.		ML	2,3,3,3	
45		1.9/2	70	SILTY CLAY : (0 to 18 in.) Moderate orange pink, soft, moist, (18 to 22 in.) coarse-grained, angular, gravel 5 mm, poorly sorted.		CL	9,13,15,18	
50		1.9/2	6	SILTY SAND : Very pale orange, very fine-grained, well-rounded, well-sorted, mica, dense.		ML	6,7,9,12	
55		2/2	8	SILTY SAND : Light gray, fine-grained, rounded, mica.		ML	8,14,13,15	
						SP		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-27
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/19/93	COMPLTD: 05/19/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: 0
TOC ELEV.: 167.50 FT.	MONITOR INST.: OVA	TOT DPTH: 57FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				5	SAND : Very pale orange, medium-grained, mica, loose, slough is saturated.		SP	7,23,26,23	
60									
65									
70									
75									
80									
85									
90									
95									
100									
105									
110									

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-28
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/19/93	COMPLTD: 05/19/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 167.20 FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
1				SAND : Dark yellowish brown, fine- To medium-grained, subrounded, loose, moist.		SM		
5		1.5/2	80	SAND : Dark yellowish brown, fine-grained, rounded, moist.		ML	9,5,4,4	
10		1.5/2	8	CLAYEY SAND : Moderate reddish brown, fine-grained, damp.		SC	4,4,6,8	
15		1.8/2	5	CLAYEY SAND : Moderate reddish brown, very pale orange, fine-grained, compact, dry.		SC	4,7,11,15	
20		1/2	4	SILTY CLAY : Pale yellowish orange, light brown, soft; damp.		CL	4,5,6,6	
25		1.5/2	0	SILTY CLAY : Dusky red, very pale orange, pale yellowish orange, soft, inelastic, damp.		CL	1,2,2,4	
30		2/2	0	SILTY SAND : Very pale orange, pale yellowish orange, very fine-grained, rounded, mica.		ML	2,5,6,6	
35		2/2	SAT	SILTY SAND : Grayish orange pink, rounded, mica, saturated, 4 inch clay lense, soft, saturated.		ML	1,3,3,4	
40		2/2	SAT	SILTY SAND : Grayish orange pink, rounded, mica, saturated, 4 inch clay lense, soft, saturated.		ML	4,5,3,4	
45		2/2	0	SILTY SAND : Grayish orange pink, rounded, well sorted, mica, damp.		ML	5,8,8,9	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-29
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/19/93	COMPLTD: 05/19/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 62FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
4				SAND : Light brown, fine- to medium-grained, poorly sorted, gravel, old railroad bed.		SM		
5		1.5/2	420	SAND : Dark yellowish brown, fine-grained, well-rounded, well-sorted.		ML	11,10,13,20	
10		1.5/2	700	SAND : Olive gray, fine-grained, rounded, well-sorted, compact, unidentifiable odor, possibly aged petroleum.			6,20,35,37	
15			1100	CLAYEY SAND : Light brown, fine- to medium-grained, poorly sorted, wood fragments, possibly old railroad ties, damp.		SC	5,2,4,8	
20		2/2	1600	SANDY CLAY : Very pale orange, moderate red, inelastic, stiff, petrodeum odor.		CL	4,7,13,15	
25		2/2	55	SAND : Very pale orange, moderate reddish brown, fine- to medium-grained, rounded, loose, dry.		SM	6,8,10,8	
30		1.7/2	0	SAND : Dusky red, very pale orange, very coarse with gravel 5mm fining downward to fine sand, rounded, well-sorted.		GM	4,4,8,8	
35		1.5/2	22	SAND : Very pale orange, fine- to coarse-grained, poorly-graded, some gravel, subangular, loose, dry.			13,10,8,10	
40		1.9/2	10	SAND : Very pale orange, medium- to coarse-grained, subrounded, loose, dry.		SP	19,8,8,9	
45		1.7/2	1	SILTY SAND : Very pale orange, very fine-grained, rounded, mica, damp.		ML	15,10,8,11	
50		1.7/2	14	SAND : Very pale orange, medium-grained, poorly-sorted, mica, loose.		SM	21,18,17,16	
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-29
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/19/93	COMPLTD: 05/19/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 62FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.9/2	4	SAND : Very pale orange, medium-grained, poorly-sorted, loose, mica.		SM	15,13,15,18	
60		1.7/2	4	SAND : Very pale orange, coarse-grained, angular, gravel.		SW	36,17,17,19	
65								
70								
75								
80								
85								
90								
95								
100								
105								
110								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-30
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/21/93	COMPLTD: 05/21/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
6				SAND : Dark yellowish brown, fine-grained, rounded, gravel.		ML		
5		1.6/2	600	SAND : Olive gray, fine-grained, rounded, petroleum odor.			12,10,10,13	
10		1.6/2	1100	SAND : Olive gray, fine-grained, rounded, petroleum odor.			12,6,9,6	
15		1.5/2	50	CLAYEY SAND : Olive gray, medium-grained, moist.		SC	8,5,5,5	
20		1/2	15	CLAYEY SAND : Very pale orange, fine-grained, hard.			5,4,16,16	
25		1.5/2	70	SAND : Very pale orange, moderate red, fine- to very coarse-grained, gravel, angular, loose, dry.		GP	7,11,10,9	
30		2/2	0	CLAYEY SAND : Moderate red, fine- to medium-grained, subrounded, damp.		SC	6,7,7,8	
35		2/2	0	SAND : Very pale orange, medium- to very coarse-grained, gravel, angular, damp.		GP	7,7,9,9	
40		2/2	0	SAND : medium-grained, subrounded, clayey lenses, moist.		SP	9,12,11,13	
45		2/2	0	SILTY SAND : Moderate reddish brown, very fine-graded to coarse-grained with depth, moist.		GM	13,12,13,12	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-31
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/01/93	COMPLTD: 06/01/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				CLAYEY SAND : Moderate yellowish brown, fine- to medium-grained, damp.		SC		
5		1.9/2		SAND : Dark yellowish brown, fine-grained, well-rounded, mica, trace clay, moist.		ML	16,10,13,14	
10		1.9/2	6100	SAND : Dark yellowish brown, fine-grained, well-rounded, mica, trace clay, moist.		ML	24,9,12,6	
15		1.9/2	3	CLAYEY SAND : Moderate reddish brown, medium-grained, damp.		SC	14,4,4,4	
20		1.5/2	0	SAND : Moderate reddish brown, medium-grained, rounded, some clay.		SC	6,9,11,10	
25		1.4/2	2	SAND : Very pale orange, coarse-grained, angular, poorly-sorted, clay lenses, dry.		SW	3,7,6,11	
30		1.4/2	0	SAND : Moderate reddish brown, very pale orange, fine-grained, rounded, stratified with medium sand and clayey lenses, dry.		ML	10,9,11,11	
35		1.7/2	0	SAND : Very pale orange, medium-grained, subrounded, mica, dry.		SP	12,10,7,8	
40		1.6/2	0	SAND : (0 to 11 in.) Moderate reddish brown, medium-grained, subrounded, mica. (11 to 20 in.) CLAY : (11 to 20 in.) Bluish white, silty, very stiff, overlain by large gravel, dry.		SP	10,11,9,17	
45		0.5/2	0	SAND : Very pale orange, medium- to coarse-grained, small gravel, loose, dry.		SP	10,10,7,12	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-32
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/01/93	COMPLTD: 06/01/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 168.00 FT.	MONITOR INST.: OVA	TOT DPTH: 72FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				CLAYEY SAND : Light brown, fine- to medium-grained, damp.		SC		
5		0.9/2		SAND : Moderate reddish brown, fine- to medium-grained, trace clay, damp.		SM	8,2,2,2	
10		2/2	8	SAND : Moderate reddish brown, fine- to medium-grained, trace clay, damp.		SM	4,7,4,4	
15		1.9/2	200	CLAYEY SAND : Mottled, moderate red, very pale orange, dark yellowish orange, fine-grained, rounded, damp.		SC	4,6,9,11	
20		2/2	2000	SANDY CLAY : Hard, inelastic, strong petroleum odor, almost a sheen on the clay.		CL	5,7,10,14	
25		2/2	2000	SAND : Moderate orange pink, fine- to coarse-grained, well-graded, well-rounded, strong petroleum odor, dry.		GM	5,7,7,8	
30		2/2	2100	SAND : Moderate orange pink, fine- to coarse-grained, well-graded, well-rounded, strong petroleum odor, dry.		GM	5,7,6,8	
35		1.6/2	2300	SAND : Very pale orange, fine- to medium-grained, rounded, mica, strong petroleum odor, dry.		SM	5,6,9,11	
40		1.6/2	2300	SAND : Very pale orange, Medium- to coarse-grained, angular, some gravel, loose, strong petroleum odor, dry.		ML	13,13,10,13	
45		2/2	50	SILTY SAND : Very light gray, very fine-grained, well-rounded, trace clay.		SM	6,6,7,7	
50		1.6/2	90	SILTY SAND : Very light gray, very fine-grained, rounded.		SM	10,8,10,9	
55						SP		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-32
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/01/93	COMPLTD: 06/01/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 168.00 FT.	MONITOR INST.: OVA	TOT DPTH: 72FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.6/2	17	SAND : Very pale orange, medium- to very coarse-grained, some gravel, subangular, loose, dry.		SP	9,12,15,15	
60		1.5/2	70	SAND : Medium-grained, subangular, loose, mica, dry.			12,12,12,13	
65		1.6/2	0	SAND : Very pale orange, medium-grained, subrounded, loose, mica, dry.			9,16,15,19	
70		1.5/2	4	SAND : Very pale orange, moderate red, Medium-grading to coarse-grained, loose, dry.			20,15,19,20	
75								
80								
85								
90								
95								
100								
105								
110								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-33
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/02/93	COMPLTD: 06/02/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 168.00 FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
4					SAND : Moderate brown, fine- to medium-grained, subrounded, compact, damp.		SM		
5			1/2	0	CLAYEY SAND : Moderate brown, fine-grained, rounded, mica, hard, damp.		SC	3,3,5,6	
10			1.6/2	40	CLAYEY SAND : Moderate brown, fine-grained, rounded, mica, damp.			5,6,6,5	
15			0.5/2	800	SAND : Dark yellowish orange, moderate, reddish brown, fine-grained, subrounded, trace clay, damp.		ML	5,12,16,14	
20			2/2	15	CLAYEY SAND : Pale reddish brown, grayish orange, medium-grained, subangular, some gravel, dry.		SC	5,9,13,14	
25			1.6/2	37	SAND : Moderate reddish brown, very pale orange, medium-grained with gravel grading to coarse-grained with gravel, subangular, dry.		SP	5,7,9,9	
30			1.6/2	0	SAND : Very pale orange, medium-grained, subrounded, mica, loose, dry.			5,7,9,9	
35			2/2	0	SAND : Very pale orange, medium-grained, subangular, loose, mica, dry.			6,7,9,12	
40			1.6/2	4	SAND : Very pale orange, medium-grained, subangular, loose, some rounded gravel, dry.			8,12,15,13	
45			1.6/2	4	SILTY SAND : Very pale orange, fine- to medium grained, subrounded, loose.		SM	7,12,14,15	
50									
55									

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-34
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/02/93	COMPLTD: 06/02/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 165.00 FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate brown, fine-grained, rounded, trace clay.		ML		
5		2/2		CLAYEY SAND : Moderate reddish brown, grayish orange, fine-grained, rounded, damp.		SC	9,4,9,5	
10		1.6/2	4	CLAYEY SAND : Moderate reddish brown, grayish orange, medium-grained, subrounded, compact, dry.			7,6,8,7	
15		1.6/2	0	SAND : Moderate orange pink, fine-grained, rounded, loose, damp.		ML	7,7,8,9	
20		1.6/2	2	SAND : Grayish orange, coarse- with gravel, subangular, graded, to medium-grained with gravel, subangular, loose, dry.		SP	8,8,9,10	
25		1.2/2	0	SAND : Very pale orange, fine- to medium-grained, well-graded, mica, dry.		SM	6,10,8,10	
30		1.5/2	1	SAND : Very pale orange, fine- to medium-grained, well-graded, some subrounded gravel, mica, loose, dry.			6,8,9,10	
35		2/2	2	SAND : Very pale orange, very fine- to medium-grained, rounded, mica, loose, dry.			10,13,8,8	
40		2/2	2	SAND : (0 to 20 in.) Silty sand, very pale orange, very fine-grained, well-rounded, well-sorted, damp. (20 to 22 in.) Clay, very pale orange, silty, soft, damp. (22 to 24 in.) Sand, grayish pink, medium-grained, well-rounded.			6,4,9,13	
45		2/2	0	SAND : Very pale orange, fine- to medium-grained, well-rounded, mica, slightly damp.			8,10,16,16	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-35
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/02/93	COMPLTD: 06/02/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: 168.00 FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate reddish brown, fine-grained, rounded, damp.		ML		
5		1/2		CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, damp.		SC	2,1,1,2	
10		2/2		CLAYEY SAND : Dark yellowish brown, fine-grained, rounded, moist.			5,5,1,2	
15		1.6/2		CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, mica, moist.			3,2,4,4	
20		1.6/2	1	SAND : (0 to 6 in.) Clay, sandy, very pale orange, hard, inelastic, dry. (6 to 20 in.) Sand, moderate reddish brown, very coarse-grained, angular, gravel, trace clay, dry.		GP	10,16,15,15	
25		2/2	1	SAND : Moderate reddish brown, very coarse-grained, gravel, angular, loose, dry.			9,9,12,13	
30		2/2	1	SAND : Very pale orange, moderate reddish brown, fine- to medium-grained, well-graded, rounded, loose, dry.		SM	6,10,12,11	
35		1.6/2	1	SAND : Moderate reddish brown, light brown, medium-grained, well-sorted, subangular, loose, slightly damp.		SP	7,9,12,11	
40		1.5/2	0	SAND : Moderate reddish brown, very pale orange, medium- to coarse-grained, angular, gravel, clayey lenses, loose, dry.			10,13,21,17	
45		1.9/2	0	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, trace silt and clay.		ML	8,10,9,10	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-36
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/02/93	COMPLTD: 06/02/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate brown, fine-grained, rounded, trace clay.		ML		
5		2/2		SAND : Light brown, fine-grained, well-rounded, well-sorted, damp.			5,5,4,4	
10		2/2		CLAYEY SAND : Moderate reddish brown, dark yellowish orange, fine-grained, rounded, dry.		SC	10,12,13,9	
15		2/2		CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, compact, damp.			4,5,4,10	
20		2/2	2100	SILTY CLAY : Moderate red, very pale orange, stiff, inelastic, dry.		CL	4,4,6,8	
25		2/2	35	CLAYEY SAND : Moderate red, very fine-grained, silt, soft, moist.		SC	3,3,3,7	
30		2/2	3	SAND : Moderate red, very fine-grained, sand and clay, moist.			4,4,5,5	
35		2/2	SAT	SAND : Moderate red, very fine-grained, sand and clay, moist.			1,3,3,5	
40		2/2	SAT	SAND : Moderate red, very pale orange, layers of sand, fine-grained, clay, sand, very coarse-grained, with gravel, saturated.		ML	3,5,9,10	
45		2/2	0	SAND : Very pale orange, very fine-grained, rounded, mica, damp.			8,12,10,10	
50		1.9/2	0	SAND : Very pale orange, very fine-grained, rounded, mica, damp.			13,20,21,28	
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-37
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/02/93	COMPLTD: 06/03/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 57FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				SAND : Fine-grained, rounded, hard, very dry.		ML		
10		1.6/2	0	CLAYEY SAND : Moderate reddish brown, fine- to medium-grained, rounded, damp.		SC	10,11,15,14	
15		1.5/2	1500	CLAYEY SAND : (0 to 10 in.) Very pale orange, fine-grained, compact, rounded. (10 to 18 in.) Moderate reddish brown, medium-grained, rounded, loose, saturated, strong petroleum odor.			4,5,12,7	
20		1.6/2	1500	CLAY : Dusky red, very pale orange, with sand, medium- to coarse-grained, stiff, inelastic.		CL	5,5,9,8	
25		1.9/2	1700	CLAYEY SAND : Very light gray, moderate orange pink, very fine-grained, well-rounded, trace silt, soft, damp, strong petroleum odor.		SC	2,1,1,1	
30		2/2	1600	SAND : Grayish orange yellow, moderate red, very fine-grained, rounded, clay lenses, soft.		ML	4,5,4,6	
35		2/2	SAT	SAND : Grayish orange yellow, moderate red, very fine-grained, rounded, clay lenses, soft, saturated.		ML	1,1,2,4	
40		2/2	60	SAND : Very pale orange, medium-grained, rounded, well-sorted, mica.		SP	4,10,12,13	
45		2/2	16	SAND : Very pale orange, medium-grained, rounded, well-sorted, mica.			7,10,13,13	
50		2/2	2	SAND : Very light gray, very fine-grained, with fines, compact, well-rounded, damp.		ML	7,8,9,11	
55		2/2	5	SAND : Very pale orange, coarse-grained, angular, gravel.		SP	9,12,19,18	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-38
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/03/93	COMPLTD: 06/03/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Light brown, fine-grained, rounded, compact, dry.		ML		
5		1.5/2	600	SAND : Dark yellowish brown, fine-grained, rounded, mica, damp.			3,4,12,12	
10		2/2	1300	SAND : Moderate reddish brown, medium-grained, rounded, some clay, mica, damp.		SP	6,5,10,14	
15		2/2	110	CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, mica, damp.		SC	6,5,6,7	
20		1/2	15	SILTY CLAY : Very pale orange, grayish orange, stiff, inelastic.		CL	2,3,6,8	
25		2/2	SAT	SAND : Very pale orange, very fine-grained, with fines, damp.		ML	1,2,2,1	
30		2/2	SAT	SILTY CLAY : Very pale orange, dusky red, soft, saturated.		SC	1,2,1,4	
35		2/2	SAT	SAND : Very pale orange, medium-grained, rounded, well-sorted, mica, saturated.		SP	2,5,3,6	
40		1.6/2	27	SAND : Very pale orange, medium-grained, rounded, poorly-sorted, mica, moist.		SM	6,8,10,14	
45		2/2	1	SAND : Light gray, very fine-grained, with silt, compact, rounded.			5,7,6,7	
50		1.6/2	4	SAND : Very pale orange, fine-grained, subrounded, mica.		ML	8,8,9,9	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-39
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/03/93	COMPLTD: 06/04/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 87FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Light brown, very fine-grained, dry.		ML		
5		1.6/2	600	CLAYEY SAND : Medium-grained.		SC	1,2,2,1	
10		2/2	20	CLAYEY SAND : Light brown, fine-grained, rounded, damp.			3,4,2,4	
15		2/2	210	CLAYEY SAND : Moderate reddish brown, very pale orange, medium-grained, rounded, mica, damp, petraoleum odor.			3,4,6,6	
20		2/2	2	CLAY : Grayish red, verystiff, inelastid, some silt and fines, dry.		CL	4,8,11,14	
25		1.6/2	2100	CLAYEY SAND : Moderte reddish brown, fine-grained, rounded.		SC	4,7,7,3	
30		2/2	1800	SAND : Very pale orange, moderate reddish brown, medium-grained, angular, with gravel, loose, dry.		SP	6,7,11,8	
35		2/2	500	SAND : Very pale orange, Moderate reddish brown, medium-grained, angular, with gravel, loose, dry.			5,3,11,10	
40		2/2	2000	SAND : Very pale orange, coarse-grained, angular, mica, loose, dry, petroleum odor.			6,11,10,10	
45		2/2	2100	SILTY SAND : Very pale orange, very fine-grained, well-rounded, well-sorted, compact, mica, petroleum odor.		ML	7,7,7,7	
50		2/2	SAT	SAND : Very pale orange, very fine-grained, silty, saturated.			1,1,3,7	
55						SP		

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-39
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/03/93	COMPLTD: 06/04/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 87FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
700		2/2		SAND : Very pale orange, coarse-grained, angular, loose, angular gravel, petroleum odor.		SP	9,11,13,15	
80		2/2		SAND : Very pale orange, coarse-grained, angular, loose, "sugar sand".			6,11,12,11	
38		1.6/2		SAND : Very pale orange, medium-grained, angular, loose, trace gravel, subangular.			11,16,15,15	
24		1.6/2		SAND : Moderate orange pink, medium-grained, subrounded, dry.			10,16,23,28	
100		2/2		SAND : Pale yellowish orange, medium-grained, angular, dry.			17,30,50,R	
9		1.5/2		SAND : Very pale orange, fine- to medium-grained, angular, loose, dry.		SM	10,21,28,25	
SAT		1.6/2		SAND : Dark yellowish orange, coarse-grained, gravel, angular, saturated.		SP	9,14,21,40	

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-40
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/03/93	COMPLTD: 06/03/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				1 SAND : Light brown, medium-grained, subrounded, hard.		SP		
5		1.5/2		0 CLAYEY SAND : Moderate reddish brown, fine-grained, rounded, damp.		SC	8,4,7,5	
10		1.5/2		1 SAND : Grayish brown, fine- to medium-grained, rounded, loose, dry.		SM	10,12,9,6	
15		1.5/2		1 SAND : Moderate reddish brown, medium-grained, subrounded, trace clay.		SP	8,5,3,4	
20		1.6/2		0 CLAYEY SAND : Moderate reddish brown, medium-grained, subrounded.		SC	5,5,9,11	
25		1.5/2		0 SAND : Moderate reddish orange, medium-grained, subangular, with gravel, loose, dry.			6,8,9,7	
30		1.4/2		1 SAND : Moderate reddish orange, fine- to coarse-grained, well-graded, subrounded, loose, dry.		GM	9,7,9,9	
35		1.5/2		0 SAND : Moderate reddish orange, fine- to medium-grained, subrounded, some gravel, loose, dry.		SM	4,7,10,12	
40		1.6/2		0 SAND : Moderate reddish orange, fine-grained, well-rounded, well-sorted, dry.			12,8,9,15	
45		1.6/2		0 SAND : Very pale orange, fine- to medium-grained, subrounded, loose, dry.			19,17,12,11	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-41
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/04/93	COMPLTD: 06/04/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: 0
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate brown, fine- to medium-grained, subrounded, damp.	[Diagonal Hatching]	SM		
5		1.6/2		SAND : Moderate brown, fine- to medium-grained, with clay, subrounded, moist.				9,7,6,7
10		2/2		CLAYEY SAND : Moderate reddish brown, fine-grained, subangular, damp.	[Horizontal Dashing]	SC		
15		1.9/2		CLAYEY SAND : Light brown, fine-grained, rounded, damp.				12,10,12,13
20		2/2		SILTY CLAY : Very pale orange, moderate reddish brown, trace fine sand, very stiff, inelastic.	[Horizontal Dashing]			
25		2/2		SAND : Moderate red, moderate reddish brown, very fine- to fine-grained, some silt and clay lenses, damp.			ML	
30		2/2		SAND : Very pale orange, very fine-grained, well-rounded, well-graded, trace silt, mica.	[Diagonal Hatching]			
35		1.9/2		SAND : Very pale orange, very fine-grained, well-rounded, well-graded, trace silt, mica, damp.				10,5,10,12
40		1.9/2		SILTY SAND : Very pale orange, very fine-grained, well-rounded, trace clay, mica, damp.	[Diagonal Hatching]			
45		1.6/2		SILTY SAND : Very pale orange, very fine-grained, well-rounded, well-sorted, mica.				4,5,9,6
50								7,6,8,7
55								8,10,10,10
								7,7,12,7
								9,10,12,11

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-42
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/04/93	COMPLTD: 06/04/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate brown, fine- to medium-grained, subrounded, damp.		SM		
5		1.6/2		CLAYEY SAND : Moderate brown, medium-grained, rounded, mica, damp.		SC	7,6,5,10	
10		2/2	0	CLAYEY SAND : Moderate reddish brown, fine- to medium-grained, subrounded, compact, dry.			8,8,11,10	
15		1.9/2	1000	SILTY CLAY : Dusky red, very pale orange, fine- to medium-grained, some sand and gravel, unidentified inclusions, crystalline, hard.		CL	4,5,8,10	
20		2/2	1600	SILTY CLAY : Moderate pink, very fine-grained, sand, soft, moist.			2,3,3,2	
25		2/2	20	SAND : Very pale orange, moderate orange pink, very fine-grained, well-sorted, well-rounded, mica, trace clay.		ML	5,4,4,5	
30		1.5/2	4	SAND : Very pale orange, moderate orange pink, very fine-grained, well-sorted, well-rounded, mica, trace clay.			5,4,6,7	
35		2/2	SAT	SAND : Moderate orange pink, very fine- to fine-grained, silty, some clay, saturated.			1,1,3,4	
40		1.6/2	10	SAND : Very pale orange, medium-grained, subrounded, mica, loose.		SP	6,12,15,14	
45		1.5/2	0	SAND : Very pale orange, medium-grained, subrounded, mica, loose.			7,12,14,16	
50		1.6/2	2	SAND : Very pale orange, medium-grained, subangular, loose, mica, dry.			7,14,14,15	
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-43
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/04/93	COMPLTD: 06/04/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Moderate brown, medium-grained, subrounded, hard.		SP		
5		1.6/2		SAND : Moderate reddish brown, very pale orange, dark yellowish orange, medium-grained, subrounded, with clay.			5,12,14,12	
10		1.6/2		CLAYEY SAND : Very pale orange, pale yellowish orange, very fine-grained, rounded, silty.		SC	3,6,10,4	
15		2/2		SILTY CLAY : Very pale orange, moderate red, some sand, medium-grained, inelastic.		CL	4,6,9,11	
20		1.6/2		SILTY CLAY : Moderate orange pink, soft, inelastic, moist.			3,4,5,6	
25		1.9/2		SAND : Moderate red, very fine-grained, well-rounded, well-sorted, mica.		ML	6,6,4,8	
30		1.6/2		SAND : Pale red, very fine-grained, with silt, clay lenses, moist.			3,2,6,6	
35		1.6/2		SILTY SAND : Pinkish gray, very fine-grained, rounded, well-sorted, mica.			4,8,8,7	
40		1.5/2		SAND : Very pale orange, fine-grained, subrounded, some silt, mica, damp.			4,7,8,9	
45		2/2		SAND : Very pale orange, fine-grained, subrounded, some silt, mica, damp.			14,8,10,15	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL:	BORING NO. AST-SB-44
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 06/04/93	COMPLTD: 06/04/93
METHOD: 2.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 47FT.	DPTH TO ∇ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND : Light brown, fine-grained, rounded, compact, dry.		ML		
5		1/2		CLAYEY SAND : Grayish orange, medium-grained, subrounded, damp.		SC	4,4,6,12	
10		1.5/2	1	SAND : Moderate reddish brown, coarse- to very coarse-grained, some clay and gravel, angular, poorly-sorted.		GP	12,10,13,11	
15		1.6/2	0	SAND : Moderate reddish brown, medium-grained, subangular, gravel, subangular, loose, dry.		SP	5,8,7,8	
20		1.9/2	1	SAND : Very pale orange, fine-grained, subrounded, loose, mica, dry.		ML	6,6,8,7	
25		1.5/2	1	SAND : Very pale orange, medium-grained, subangular, some gravel, loose, dry.		SP	7,10,12,13	
30		1.9/2	0	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, mica, dry.		ML	6,6,8,8	
35		1.6/2	0	SAND : Very pale orange, coarse-grained, angular with subangular gravel, loose, dry.		GP	11,9,12,12	
40		1.5/2	1	SAND : Very pale orange, Coarse-grained, subangular, loose, dry.			12,16,15,15	
45		1.6/2	0	SAND : Very pale orange, medium-grained, angular, well-sorted, loose, dry.		SP	12,9,15,14	
50								
55								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-1	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/08/92	COMPLTD: 4/08/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 80'-90'	PROTECTION LEVEL: D
TOC ELEV.: 167 FT.	MONITOR INST.: OVA	TOT DPTH: 96FT.	DPTH TO ∇ 85 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	SAND: Olive gray to gray, fine- to medium-grained, trace clay.		SM		
10		2.0/2	0.0	CLAYEY SAND: Reddish brown to grayish orange to pinkish gray. fine- to medium-grained.		SC		
15		1.0/2	0.0	CLAYEY SAND: Grayish orange to brown to Pinkish gray, fine- to medium-grained.				
20		1.2/2	0.0	SAND: Light red to white to pale yellowish brown, fine- to medium-grained.		SM		
25		2.0/2	0.0	SAND: White to light red to dark yellowish orange to pinkish gray, fine- to medium-grained.				
30		1.7/2	0.0	SAND: Pale yellowish brown to pinkish gray to white, fine- to medium-grained.				
35		1.3/2	0.0	SAND: Pinkish gray to white, fine- to medium-grained, trace silt.				
40		1.5/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained, trace clay.				
45		1.5/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained.				
50		1.5/2	0.0					
55								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-1	BORING NO.
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/08/92	COMPLTD: 4/08/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 80'-90'	PROTECTION LEVEL: D
TOC ELEV.: 167 FT.	MONITOR INST.: OVA	TOT DPTH: 96FT.	DPTH TO ∇ 85 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60		1.7/2	0.0	SAND: Pinkish gray to grayish orange to gray, fine- to medium-grained.		SM		
65		1.6/2	0.0	SAND: White to grayish orange, fine- to medium-grained, some gravels.		SM		
70		1.5/2	0.0	SAND: White, fine- to medium-grained.		SM		
75		1.5/2	0.0	SAND: White, fine- to medium-grained.		SM		
80		1.8/2	0.0	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, trace clay.		GM		
85		1.1/2	1.0	SAND: Moderate pink to pale yellowish brown to white, fine-grained.		ML		
90		1.1/2	N.M.	SAND: Moderate red to pale yellowish brown to pinkish gray to grayish orange, fine- to coarse-grained, wet.		GM		
95		2.0/2	0.0	SANDY CLAY: Pinkish gray to light brown to pale yellowish brown, fine- to medium-grained, moderate clay.		CL		
100		2.0/2	0.0	CLAY: Light red to pale yellowish brown to brown to white, fine- to medium-grained, stiff.		CH		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-2	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 04/09/92	COMPLTD: 04/09/92
METHOD: 6.25" HSA	CASE SIZE: 4 INCH	SCREEN INT.: 70'-85'	PROTECTION LEVEL: D
TOC ELEV.: 159 FT.	MONITOR INST.: OVA	TOT DPTH: 86FT.	DPTH TO ∇ 81 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2/2	0.0	SANDY CLAY : Brown, saturated.		CL	POSTHOLE 2,2,2,6	
10		2/2	1.0	CLAYEY SAND : Mottled, red, grayish orange, dark yellowish orange, fine-grained.		SC	6,9,9,9	
15		2/2	1.0	SAND : Gray, Fine-grained, well-sorted, trace clay. SAND : red, medium-grained, well-sorted.		ML	6,9,9,10	
20		2/2	2.0	SAND : Red and grayish orange stripped, medium- to coarse-grained, gravelly.		SW	6,7,7,8	
25		2/2	2.0	SAND : White, medium-grained, well-graded.		SW	6,6,7,8	
30		2/2	2.0	SAND : Very pale orange with red, fine- to medium-grained.		SM	8,15,21,22	
35		2/2	2.0	SAND : Grayish orange and red, medium- to coarse-grained, last 4 inches are gray silt with clay.		SP	11,11,9,10	
40		2/2	1.0	SANDY SILTY CLAY : Moderate pink, gravel < 5 mm., sand, medium-grained.		GM	0,0,7,14	
45		2/2	1.0	SAND : White, fine- to medium-grained, some gravel.		GM	10,12,14,14	
50		2/2	0.0	SAND : White, fine- to medium-grained.		SM	14,19,25,23	
55						SM		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-2	BORING NO.
CLIENT: SOUTHNAVFACENCOM			PROJECT NO: 7518-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 04/09/92	COMPLTD: 04/09/92
METHOD: 6.25" HSA	CASE SIZE: 4 INCH	SCREEN INT.: 70'-85'	PROTECTION LEVEL: D
TOC ELEV.: 159 FT.	MONITOR INST.: OVA	TOT DPTH: 86FT.	DPTH TO ∇ 81 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60		2/2	1.0	SAND: White, fine- to coarse-grained, poorly-graded.		GM	18,20,23,23	
65		1.5/2	0.0	SAND : Red, dark yellowish orange, very pale orange, stripped, medium- to very coarse-grained, clayey lenses.		SP	0,0,12,12	
70		1.6/2	0.0	SAND : Dark yellowish orange, very fine-grained, well-sorted, damp.		ML	10,12,12,12	
75		1.5/2	0.0	SAND : Very pale orange, dark yellowish orange, medium- to coarse-grained, damp.		SP	22,22,24,29	
80		1.2/2	0.0	SAND : Dark yellowish orange, grayish orange, fine- to coarse-grained, wet.		GM	26,33,33,35	
85		1.2/2	1.0	SAND : dark yslowish orange, grayish orange, medium- to very coarse-grained, saturated.		SP	10,12,14,14	
90		1.5/2	0.0	SAND : Brown, medium- to very coarse-grained, gravelly, saturated.			Wt. of Rod	
95								
100								
105								
110								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-3	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/09/92	COMPLTD: 4/09/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 70'-80'	PROTECTION LEVEL: D
TOC ELEV.: 154.17' FT.	MONITOR INST.: OVA	TOT DPTH: 86FT.	DPTH TO ∇ 73 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.7/2	0.0	CLAY: Brown to pinkish gray to white, fine- to medium-grained, stiff.		CL		POSTHOLE
10		1.9/2	0.0	SANDY CLAY: Reddish brown to pinkish gray, fine- to medium-grained.				
15		1.8/2	0.0	SAND: Grayish orange to brown to pinkish gray, fine- to medium-grained, few gravels.		SM		
20		2.0/2	0.0	SAND: Very pale orange, white, fine- to medium-grained.				
25		N.R.	N.M.	NO RECOVERY				
30		1.9/2	N.M.	SAND: Very pale orange, white, grayish orange, fine- to medium-grained.				
35		1.1/2	0.0	SAND: Pinkish gray to white, fine- to medium-grained.				
40		1.1/2	1.0	SAND: Pinkish gray to white, fine- to medium-grained.				
45		1.5/2	0.0	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, few gravel.		GM		
50		1.6/2	3.0			SM		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-3	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/09/92	COMPLTD: 4/09/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 70'-80'	PROTECTION LEVEL: D
TOC ELEV.: 154.17' FT.	MONITOR INST.: OVA	TOT DPTH: 86FT.	DPTH TO ∇ 73 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60	1.7/2		0.0	SAND: White, pale yellowish orange, fine-grained, moist.		SM		
65	1.3/2		0.0	SAND: Brown, pale yellowish orange, fine- to coarse-grained.		SM		
70	1.5/2		0.0					
75	1.3/2		3.0	SAND: White, brown, fine- to medium-grained.		SM		
80	1.9/2		N.M.	SAND: Pinkish gray to orange, fine- to coarse-grained.		GM		
85	2.0/2		0.0	CLAY: Red, gray, very pale orange, fine-grained, stiff.		CL		
90	2.0/2		N.M.	CLAY: Very pale orange, gray, grayish orange, white, fine- to medium-grained, stiff.		CL		
95								
100								
105								
110								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-4	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/11/92	COMPLTD: 4/11/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 75'-90'	PROTECTION LEVEL: D
TOC ELEV.: 164.86' FT.	MONITOR INST.: OVA	TOT DPTH: 91FT.	DPTH TO ∇ 83 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	CLAYEY SAND: Reddish brown to brown to pinkish gray, fine- to medium-grained.		SC	POSTHOLE	
10		1.0/2	0.0					
15		0.8/2	0.0	CLAYEY SAND: Reddish brown to brown to pinkish gray, fine- to medium-grained.				
20		1.3/2	0.0	SANDY CLAY: Light red to white to pale yellowish brown, fine- to medium-grained, very stiff.				
25		1.6/2	0.0					
30		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.		SM		
35		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.				
40		2.0/2	0.0	SAND: Grayish orange, pinkish gray, white, fine- to coarse-grained, trace clay, few gravel.		GM		
45		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		SM		
50		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		GM		
55								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-4	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/11/92	COMPLTD: 4/11/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 75'-90'	PROTECTION LEVEL: D
TOC ELEV.: 164.86' FT.	MONITOR INST.: OVA	TOT DPTH: 91FT.	DPTH TO ∇ 83 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60	1.2/2		0.0	SAND: Light red to reddish brown to grayish orange, fine- to coarse-grained, little gravel.		GM		
65	1.0/2		0.0	SAND: Light red to grayish orange, fine- to coarse-grained, little gravel.				
70	1.0/2		0.0	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained with moderate gravels.				
75	1.3/2		0.0	SAND: Light red to reddish brown to pinkish gray, fine- to coarse-grained with some gravels.				
80	1.7/2		0.0	SAND: Light red to reddish brown, fine- to coarse-grained, with moderate gravel, moist throughout.				
85	1.8/2		0.0					
90	2.0/2		0.0	SAND: Light red to reddish brown, fine- to coarse-grained, with moderate gravel, saturated.				
95								
100								
105								
110								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-5	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/12/92	COMPLTD: 4/12/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 77'-87'	PROTECTION LEVEL: D
TOC ELEV.: 167.52 FT.	MONITOR INST.: OVA	TOT DPTH: 96FT.	DPTH TO ∇ 81 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.3/2	0.0	CLAYEY SAND: Reddish brown to moderate pink to white, fine- to medium-grained.		SC		
10		1.7/2	100.0	SAND: Olive gray to dark yellowish orange, fine- to medium-grained, trace clay.		SM		
15		1.5/2	350.0	SAND: Brown to red to dark yellowish orange, fine- to medium-grained, trace clay.		CH		
20		2.0/2	500.0	CLAY: Light red to white to brown to purple, stiff, slight odor detected.		SM		
25		2.0/2	2000	SAND: Light red to white to brown, fine- to medium-grained, trace clay, slight odor detected.		GM		
30		2.0/2	2000	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained, slight odor detected.		SM		
35		2.0/2	2000	SAND: Pinkish gray to white, fine- to medium-grained, slight odor detected.		ML		
40		2.0/2	2000					
45		2.0/2	60.0	SAND: White to pinkish gray to grayish orange, fine-grained, some silt, odor detected.		SC		
50		2.0/2	200.0	SANDY CLAY: Pinkish gray to grayish orange, to gray, fine-grained, slight odor detected.		GM		
55								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-5	BORING NO.
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/12/92	COMPLTD: 4/12/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 77'-87'	PROTECTION LEVEL: D
TOC ELEV.: 167.52 FT.	MONITOR INST.: OVA	TOT DPTH: 96FT.	DPTH TO ∇ 81 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
80.0		1.3/2	80.0	SAND: White to pinkish gray to grayish orange, fine- to coarse-grained with some gravel.		GM		
60		1.3/2	20.0					
65		1.1/2	14.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained, few gravel.		SM		
70		1.1/2	15.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.				
75		1.1/2	6.0	SAND: Brown to pinkish gray to white, fine- to medium-grained.				
80		1.0/2	0.0	SAND: Pale yellowish brown to pinkish gray to white, fine- to medium-grained.				
85		1.5/2	N.M.	SAND: Purple to brown to dark yellowish orange, fine- to coarse-grained.		GM		
90		1.8/2	5.0	CLAY: Gray to brown to pinkish gray, fine- to medium-grained, stiff.		CH		
95		2.0/2	0.0					
100								
105								
110								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-6	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/13/92	COMPLTD: 4/13/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 80'-90'	PROTECTION LEVEL: D
TOC ELEV.: 166.86' FT.	MONITOR INST.: OVA	TOT DPTH: 96FT.	DPTH TO ∇ 82 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2	200.0	SAND: Brown, fine-grained, hard, odor.		SM	POSTHOLE 6,8,9,8	
10		1.8/2	150.0				3,12,15,14	
15		1.8/2	1000	CLAYEY SAND: Red, dark yellowish orange, grayish orange, very fine-grained, mottled, strong odor.		SC	7,9,13,16	
20		1.8/2	280.0	CLAY: Red, dark yellowish orange, very pale orange, mottled, some fine-grained, strong odor.		CL	5,6,11,13	
25		1.8/2	1000	SANDY CLAY: Brown, red, stiff, clay lenses, strong odor.		SC	6,9,6,8	
30		2.0/2	450.0	SAND: Red, brown, fine- to medium-grained, odor.		SM	11,9,9,9	
35		1.5/2	32.0	SAND: White, fine- to medium-grained, odor.			6,6,7,7	
40		1.5/2	30.0	SAND: White, fine- to medium-grained, odor.			6,7,7,9	
45		0.8/2	10.0	SAND: White, very fine-grained, silt, clay, less odor, damp.			5,6,8,8	
50		1.0/2	1.0	SAND: White, fine- to medium-grained.			-,-,8,10	
55						SW		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-6	BORING NO.
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 4/13/92	COMPLTD: 4/13/92
METHOD: 6.25" HSA	CASE SIZE: 4 inch	SCREEN INT.: 80'-90'	PROTECTION LEVEL: D
TOC ELEV.: 166.86' FT.	MONITOR INST.: OVA	TOT DPTH: 96FT.	DPTH TO ∇ 82 FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
		1.5/2	8.0	SAND: White, medium- to coarse-grained, quartz cobbles.		SW	-, -, 12, 16	
60		1.0/2	14.0	SAND: White, medium-grained.		SP	10, 12, 15, 16	
65		1.2/2	6.0	SAND: Coarse- to very coarse-grained, quartz cobbles.		SW	12, 16, 18, 18	
70		1.5/2	2.0	SAND: Light grayish orange, fine- to medium-grained.		SM	-, -, 22, 30	
75		1.6/2	2.0	SAND: Grayish orange, moderate pink, fine- to medium-grained, clayey sand lenses.		SM	-, 12, 13, 22	
80		1.0/2	7.0	SAND: Grayish orange with dark yellowish orange stripes, fine-grained, well-sorted.		ML	50, R	
85		1.8/2	0.0	SAND: Brown, very dark red, grayish orange, very fine- to medium-grained, saturated.		ML	Wt. of Rod	
90		2.0/2	0.0	SAND: Fine-grained (.5'), wet, stiff clay in remainder of spoon.		CL	5, 6, 8, 7	
95		2.0/2	0.0	CLAY: Purple, stiff.		CL	-, 10, 12, 12	

TITLE: NAS Whiting Field		LOG of WELL: WHF 2894-7	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93	COMPLTD: 05/20/93
METHOD: 6.25 in. HSA	CASE SIZE: 4 inch	SCREEN INT.: 69-84 ft	PROTECTION LEVEL: D
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 85FT.	DPTH TO ∇ 77.93 ft FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE: 7/13/93		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
3			CLAYEY SAND : Moderate reddish brown, fine- to medium-grained, moist.		SC		
5	1.5/2	0	SANDY CLAY : Very pale orange, dark yellowish brown, mottled, moderate reddish brown, fine-grained, hard, dry.		CL	4,8,12,17	
10	1.4/2	2	CLAYEY SAND : Moderate to reddish brown, medium- to very coarse-grained, gravel, angular, loose.		SC	10,9,15,11	
15	1.9/2	0	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist.		CL	10,7,7,6	
20	1.6/2	21	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist.			1,1,2,1	
25	2/2	15	SILTY CLAY : Pale reddish brown, very pale orange, pale yellowish orange, mottled, inelastic, soft, moist, petroleum odor.			5,9,8,7	
30	2/2	4	SAND : Pale yellowish orange, fine-grained, poorly-sorted, rounded.		ML	4,8,10,12	
35	0.7/2	4	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, dry.			7,8,9,9	
40	1.6/2	2	SAND : Very pale orange, very fine-grained, well-sorted, well-rounded, dry.			7,8,11,9	
45	1.4/2	2	SAND : Very pale orange, fine-grained, well-rounded, well-sorted, dry.			13,16,17,16	
50	1.5/2	8	SAND : Very pale orange, medium- to coarse-grained, poorly-graded, gravel, mica.		SP	9,12,16,16	
55					ML		

TITLE: NAS Whiting Field		LOG of WELL: WHF 2894-7	BORING NO.
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-30	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 05/17/93	COMPLTD: 05/20/93
METHOD: 6.25 in. HSA	CASE SIZE: 4 inch	SCREEN INT.: 69-84 ft	PROTECTION LEVEL: D
TOC ELEV.: 158.80 FT.	MONITOR INST.: OVA	TOT DPTH: 85FT.	DPTH TO ∇ 77.93 ft FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE: 7/13/93		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60		1.7/2	1	SAND : Very pale orange, fine-grained, well-rounded, loose, mica, dry.		ML	11,15,18,15	
		1.8/2	1	SAND : Very pale orange, fine- to medium-grained, well-graded, subrounded, damp.		SM	10,14,25,29	
65		1.7/2	4	SAND : Very pale orange, fine- to medium-grained, subrounded, well-graded, mica, damp.			14,34,29,32	
70		1.6/2	0	SAND : Very pale orange, pale yellowish orange, medium-grained, subrounded, well-sorted, mica, damp.			6,11,29,40	
75		1.5/2	1	SAND : Grayish orange, medium-grained, some fines, subrounded.		SP	11,23,32,35	
		1.6/2	SAT	SAND : Dark yellowish orange, medium-grained, subrounded, moist.		SM	19,24,35,40	
80		2/2	SAT	SAND : Medium-grained graded to very coarse-grained, angular, saturated.		GP	22,23,24,29	
		2/2	SAT	SAND : Dusky red, coarse- to very coarse-grained, angular, saturated.			14,20,18,9	

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-ID	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/30/92	COMPLTD: 3/30/92
METHOD: Mud Rotary	CASE SIZE: 4&8 inches	SCREEN INT.: 100'-114'	PROTECTION LEVEL: D
TOC ELEV.: 164.91 FT.	MONITOR INST.: OVA	TOT DPTH: 114FT.	DPTH TO ∇ 97 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		2.0/2	0.0	CLAYEY SAND: Reddish brown to brown to Pinkish gray, fine- to medium-grained.		SC		
10		1.0/2	0.0					
15		0.8/2	0.0	CLAYEY SAND: Reddish brown to brown to pinkish gray, fine- to medium-grained.				
20		1.3/2	0.0	SANDY CLAY: Light red to white to pale yellowish brown, fine- to medium-grained, very stiff.		CL		
25		1.6/2	0.0					
30		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained, trace clay.		SM		
35		1.8/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to medium-grained.				
40		2.0/2	0.0	SAND: Grayish-orange, to pinkish gray to white, fine- to coarse-grained, trace clay, few gravel.		GM		
45		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		SM		
50		1.2/2	0.0	SAND: White to pinkish gray to grayish orange, fine- to medium-grained.		GM		
55								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-ID	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/30/92	COMPLTD: 3/30/92
METHOD: Mud Rotary	CASE SIZE: 4&8 inches	SCREEN INT.: 100'-114'	PROTECTION LEVEL: D
TOC ELEV.: 164.91 FT.	MONITOR INST.: OVA	TOT DPTH: 114FT.	DPTH TO ∇ 97 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
60		1.2/2	0.0	SAND: Light red to reddish brown to grayish orange, fine- to coarse grained, little gravels.		GM		
65		1.0/2	0.0	SAND: Light red to grayish orange, fine- to coarse-grained, little gravels.				
70		1.0/2	1.0	SAND: Pinkish gray to grayish orange to white, fine- to coarse-grained with moderate gravel.				
75		1.3/2	0.0	SAND: Light red to reddish brown to pinkish gray, fine- to coarse grained with some gravel.				
80		1.7/2	0.0	SAND: Light red to reddish brown, fine- to coarse grained, with moderate gravel, moist throughout.				
85		1.8/2	0.0					
90		2.0/2	0.0	SAND: Light red to reddish brown, fine- to coarse-grained, with moderate gravel, saturated.				
95		2.0/2	0.0	CLAY: Red to gray to white to brown, fine- to medium-grained, stiff.		CH		
100		2.0/2	G.C.					
105		2.0/2	G.C.	SAND: Pale yellowish brown to white to pinkish gray to brown, fine- to coarse-grained, saturated.		GM		
110								

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-1D	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7518-40
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/30/92	COMPLTD: 3/30/92
METHOD: Mud Rotary	CASE SIZE: 4&8 inches	SCREEN INT.: 100'-114'	PROTECTION LEVEL: D
TOC ELEV.: 164.91 FT.	MONITOR INST.: OVA	TOT DPTH: 114FT.	DPTH TO ∇ 97 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
			2.0/2	G.C.	SAND: Moderate pink to light red to pinkish gray, fine- to coarse-grained, saturated.	0 0	GM		
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-2D	BORING NO.
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 5/22/92	COMPLTD: 5/22/92
METHOD: Mud Rotary	CASE SIZE: 4&8 inches	SCREEN INT.: 106'-116'	PROTECTION LEVEL: D
TOC ELEV.: 167.68 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 96.9 FT.
LOGGED BY: A. Stodghill	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2	200.0	SAND: Brown, fine-grained, hard, odor.		SM	POSTHOLE 6,8,9,8	
10		1.8/2	150.0				3,12,15,14	
15		1.8/2	1000	CLAYEY SAND: Red, dark yellowish orange, grayish orange, very fine-grained, mottled, strong odor.		SC	7,9,13,16	
20		1.8/2	280.0	CLAY: Red, dark yellowish orange, very pale orange, mottled, some fine-grained, strong odor.		CL	5,6,11,13	
25		1.8/2	1000	SANDY CLAY: Brown, red, stiff, clay lenses, strong odor.		SC	6,9,6,8	
30		2.0/2	450.0	SAND: Red, brown, fine- to medium-grained, odor.		SM	11,9,9,9	
35		1.5/2	32.0	SAND: White, fine- to medium-grained, odor.			6,6,7,7	
40		1.5/2	30.0	SAND: White, fine- to medium-grained, odor.			6,7,7,9	
45		0.8/2	10.0	SAND: White, very fine-grained, silt, clay, less odor, damp.			5,6,8,8	
50		1.0/2	1.0	SAND: White, fine- to medium-grained.			-,-,8,10	
55		1.5/2	8.0	SAND: White, medium- to coarse-grained, quartzitic cobbles.		SW	-,-,12,16	
						SP		

TITLE: NAS Whiting Field		LOG of WELL: WHF-2894-2D	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7518-40	
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 5/22/92	COMPLTD: 5/22/92
METHOD: Mud Rotary	CASE SIZE: 4&8 inches	SCREEN INT.: 106'-116'	PROTECTION LEVEL: D
TOC ELEV.: 167.68 FT.	MONITOR INST.: OVA	TOT DPTH: 117FT.	DPTH TO ∇ 96.9 FT.
LOGGED BY: A. Stodghill	WELL DEVELOPMENT DATE:		SITE: 2894

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 1								
63		1.0/2	14.0	SAND: White, medium-grained.		SP	10,12,15,16	
68		1.2/2	6.0	SAND: Coarse to very coarse-grained, quartzitic cobbles.		SW	12,16,18,18	
73		1.5/2	2.0	SAND: Light grayish orange, fine- to medium-grained.		SM	-, -,22,30	
78		1.6/2	2.0	SAND: Grayish orange and moderate pink, fine- to medium-grained, clayey sand lenses.		SM	-,12,13,22	
83		1.0/2	7.0	SAND: Grayish orange with dark yellowish orange stripes, fine-grained, well-sorted.		ML	50,R	
88		1.8/2	0.0	SAND: Brown, very dark red, grayish orange, very fine- to medium-grained, saturated.		ML	Wt. of Rod	
93		2.0/2	0.0	SAND: Fine-grained (.5'), wet, stiff clay in remainder of spoon.		ML	5,6,8,7	
98		2.0/2	0.0	CLAY: Purple, stiff.		CL	-,10,12,12	
103		2.0/2		CLAY: Light bluish gray and reddish brown, mottled, stiff.		CL	10,21,34,36	
108		1.0/2		CLAY: Light bluish gray and reddish brown, mottled, stiff.		CL	18,16,18,19	
113				SAND: Grayish orange, fine grained, trace clay, minerals, micaeous.		SP		



QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 02560007		Purchase Order #		LAB TEST CODES		SHADED AREA -- FOR LAB USE ONLY	
Project Name NAS WHF		Report Copy to: RAO ANJARA		Project #		Lab 1 # 30420	
Company Name/CH2M HILL Office ABB-ES/Redding		Mr. M RAO ANJARA		Project #		Lab 2 # 94015	
Ms. I 904-658-1293		Dr. I		Project #		Quote # Kit Request #	
Requested Completion Date: 30 Days		Sampling Requirements SDWA <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> <i>CFR 40</i>		Project #		No. of Samples	
Sample Disposal: Dispose <input checked="" type="checkbox"/> Return <input type="checkbox"/>		CLIENT SAMPLE ID (9 CHARACTERS)		Project #		Page of	
Type Matrix		C O M P W S O I L		Project #		LIMS Ver Ack Gen	
Date Time		Date/Time		Project #		LAB 1 ID	
7/20/03 0930		W HF-02-SB-AB-01		Project #		LAB 2 ID	
7/20/03 1015		W HF-02-SB-FB-01		Project #		Tested PH 8	
7/20/03 1030		W HF-02-SB-TB-01		Project #		Ca: PH > 12	
7/20/03 0838		W HF-02-SB-01 (5-7)		Project #		Metal: PH < 2	
7/20/03 0855		W HF-02-SB-01 (10-12)		Project #		4	
7/20/03 0105		W HF-02-SB-01 (15-17)		Project #		5	
7/20/03 0948		W HF-02-SB-01 (20-22)		Project #		6	
7/20/03 1027		W HF-02-SB-01 (50-52)		Project #		7	
7/20/03 1406		W HF-02-SB-01 (65-70)		Project #		8	
7/20/03 1406		W HF-WR-SB-01 (5-7)		Project #		9	
7/20/03 1406		W HF-WR-SB-01 (5-7) D		Project #		10	
7/20/03 1406		W HF-WR-SB-01 (5-7) D		Project #		11	
Sampled By & Title Sayer, Katherine, Senior, Petroleum Geology		Date/Time 7-30-93 1730		Relinquished By Sayer, Katherine		Date/Time 7-29-93 31750	
Received By		Date/Time		Relinquished By		Date/Time	
Received By		Date/Time		Relinquished By		Date/Time	
Received By		Date/Time		Relinquished By		Date/Time	
Work Authorized By		Date/Time		Relinquished By		Date/Time	
MICHAEL J. WELLS		1000		Relinquished By		Date/Time	
Remarks		Remarks		Relinquished By		Date/Time	
Require Level 2 protocol		Require Level 2 protocol		Relinquished By		Date/Time	
Shipping #		Shipping #		Relinquished By		Date/Time	
6800592945		6800592945		Relinquished By		Date/Time	
HAZWRAP/NESSA: Y N		HAZWRAP/NESSA: Y N		Relinquished By		Date/Time	
QC Level: 1 2 3 Other:		QC Level: 1 2 3 Other:		Relinquished By		Date/Time	
COC Rec Y ICE Y		COC Rec Y ICE Y		Relinquished By		Date/Time	
Ana Req Y TEMP 20C		Ana Req Y TEMP 20C		Relinquished By		Date/Time	
Cust Seal Y Ph		Cust Seal Y Ph		Relinquished By		Date/Time	
TCL VOC'S (COP)		TCL VOC'S (COP)		Relinquished By		Date/Time	
40 ml vial		40 ml vial		Relinquished By		Date/Time	
TCL COP VOC'S		TCL COP VOC'S		Relinquished By		Date/Time	
30 # jar		30 # jar		Relinquished By		Date/Time	
P&S2		P&S2		Relinquished By		Date/Time	
P&S2		P&S2		Relinquished By		Date/Time	
P&S2		P&S2		Relinquished By		Date/Time	



QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project #		Purchase Order #		LAB TEST CODES		SHADED AREA -- FOR LAB USE ONLY	
02590202						Lab 1 # 94015	
Project Name		Project #		Project #		Quote #	
MASWF						Kit Request #	
Company Name/CH2M HILL Office		Report Copy to:		ANALYSES REQUESTED		Project #	
ABB-ES/Redding		Mr. M Row Angers Ms. J Row Angers Dr. J Row Angers		TCL COP SVCS TCL COP SVCS TCL COP SVCS TCL COP SVCS TCL COP SVCS TCL COP SVCS		No. of Samples	
Requested Completion Date:		Sampling Requirements		Page		of	
7/24/93		SDWA <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> <i>CEC/6 weeks</i>		LIMS Ver		Ack Gen	
Type		CLIENT SAMPLE ID (9 CHARACTERS)		COC Rev		Login	
Matrix				LIMS Ver		Ack Gen	
C O M P		W H F		LAB 1 ID		LAB 2 ID	
G R A B		- 0 2 - 5 B - 0 1 (5 - 7)		4			
W A T E R		- 0 2 - 5 B - 0 1 (1 0 - 1 2)		5			
S O I L		- 0 2 - 5 B - 0 1 (1 5 - 1 7)		6			
M A T R I X		- 0 2 - 5 B - 0 1 (2 0 - 2 2)		7			
C O M P		- 0 2 - 5 B - 0 1 (5 0 - 5 2)		8			
M A T R I X		- 0 2 - 5 B - 0 1 (6 8 - 7 0)		9			
Date		Date/Time		REMARKS		REMARKS	
7/24/93 0130		7/30/93					
7/24/93 0838		7/30/93					
7/24/93 0955		7/30/93					
7/24/93 0905		7/30/93					
7/24/93 0948		7/30/93					
7/24/93 1027		7/30/93					
Date/Time		Date/Time		Date/Time		Date/Time	
7/24/93 0130		7/30/93		7/30/93 1800		7/30/93 1800	
Sampled By & Title		Date/Time		Relinquished By		Relinquished By	
Sherrill Walker (Gold Walker)		7/30/93		Sherrill Walker (Gold Walker)		Sherrill Walker (Gold Walker)	
Received By		Date/Time		Date/Time		Date/Time	
Received By		Date/Time		Date/Time		Date/Time	
Received By		Date/Time		Date/Time		Date/Time	
MICHAEL NEEDA (NEEDA)		7/31/93		MICHAEL NEEDA (NEEDA)		MICHAEL NEEDA (NEEDA)	
Work Authorized By		Remarks		Shipping #		Shipping #	
		Require NEEDA Level C' printed (Aero's)		6800592945		6800592945	
HAZWRAP/NESSA: Y N		OC Level: 2 3 Other:		COC Rec		COC Rec	
				Ana Req		Ana Req	
				Cust Seal		Cust Seal	
				ICE		ICE	
				TEMP		TEMP	
				Ph		Ph	



QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project #		Purchase Order #		LAB TEST CODES		SHADED AREA -- FOR LAB USE ONLY	
02560007						Lab 1 # 94015	
Project Name		LAB TEST CODES		LAB TEST CODES		Lab 2 #	
M/S Whiting Field / Soil Sampling							
Company Name/CH2M/HILL Office		ANALYSES REQUESTED		ANALYSES REQUESTED		Kit Request #	
APR-ES / Redding							
Project Manager & Phone #		Report Copy to:		Project #			
Mr. M. Anu Angata		Mr. Anu Angata					
Ms. J. Anu Angata		704 656 1293					
Dr. J. Anu Angata							
Requested Completion Date:		Sampling Requirements		No. of Samples		Page of	
		SDWA <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/> <i>cecl</i>					
		Sample Disposal: <input type="checkbox"/> Dispose <input type="checkbox"/> Return					
Type		CLIENT SAMPLE ID (9 CHARACTERS)		COC Rev		LIMS Ver	
C O M P				Login		Ack Gen	
G R A B							
W S O I L				REMARKS		LAB 1 ID	
M A T R I X				LAB 2 ID			
Date		Date/Time		Date/Time		Date/Time	
7/20/93		WHR-0258-RD-01		7/20/93 1650		7/20/93 1655	
7/20/93		WHR-02-50-RD-01		7/20/93 1650		7/20/93 1655	
7/20/93		WHR-02-50-RD-01		7/20/93 1650		7/20/93 1655	
Sampled By & Title		Date/Time		Relinquished By		HAZWRAP/NESSA: Y N	
Silva Jose Geologist		7/20/93 1650		Silva Jose Geologist		QC Level: 1 2 3 Other:	
Received By		Date/Time		Relinquished By		COC Rec ICE	
						Ana Reg TEMP/3C	
Received By		Date/Time		Relinquished By		Cust Seal Ph	
Michael Rivera		1000				Shipping # 6800542745	
Work Authorized By		Remarks		Require to get 1000's			

