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CONTAMINATION ASSESSMENT REPORT JET TEST CELL FACILITY 811 NAS JACKSONVILLE FL

11/1/1991

ABB ENVIRONMENTAL

CONTAMINATION ASSESSMENT REPORT

NAVAL AIR STATION
JET TEST CELL
FACILITY 811
JACKSONVILLE, FLORIDA

UIC: N65928

Contract No. N62467-89-D-0317

Prepared by:

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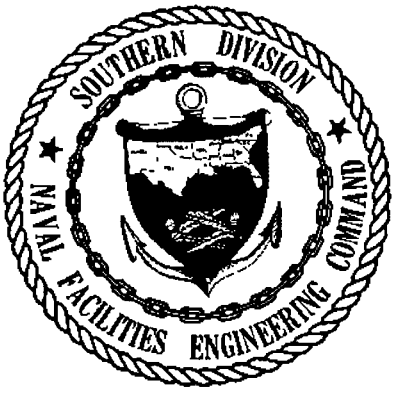

FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments (HSWA) of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, 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 (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 23 September 1988 and became effective 22 December 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 the Florida Department of Environmental Regulation (FDER) Chapter 17-770, Florida Administrative Code (FAC) (State Underground Petroleum Environmental Response) regulations on petroleum contamination in Florida's environment as a result of spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Commanding Officer, Naval Air Station (NAS), Cecil Field, Jacksonville, Florida, or to Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 1823, at AUTOVON 563-0528 or 803-743-0528.

EXECUTIVE SUMMARY

The groundwater and soil contamination at NAS Cecil Field, Jet Test Cell is in violation of Florida Department of Environmental Regulation (FDER) Chapter 17-770, Florida Administrative Code (FAC). regulations for underground petroleum contamination.

For example, select monitoring wells had benzene contamination at 490 $\mu g/\ell$, 4000 $\mu g/\ell$, and 4300 $\mu g/\ell$. The regulatory standard for benzene is 1 $\mu g/\ell$. Also the total volatile organic aromatic (total volatile organic aromatics [VOA]) concentrations at the same locations are 737 $\mu g/\ell$, 4614 $\mu g/\ell$, and 21600 $\mu g/\ell$. The regulatory standard for Total VOA is 50 $\mu g/\ell$. Based on these and other findings, it is recommended that a Remedial Action Plan (RAP) be prepared to address the clean up of the contamination.

The contaminant plume based on laboratory analytical results for Total VOA is shown on the executive summary map on the following page and remains entirely on Navy property. The vertical extent of the contamination does not exceed 30 feet below land surface (bls). The contaminant plume is migratory downgradient (southward) of the source.

The ungrouted fill ports of the four northern fiberglass USTs, installed in 1986, are believed to be the source of groundwater and soil contamination. These fill ports were not properly grouted from 1986 until 1989. During this time excess product contained in the tanker truck hose was allowed to drain into the fill port vault and percolate downward to the groundwater. This problem has been corrected.

Executive Figure

ACKNOWLEDGEMENTS

In preparing this report, The Underground Storage Tank Section of the Navy Comprehensive Long-Term Environmental Action Navy (CLEAN) Group at ABB Environmental Services Inc. (ABB-ES) commends the support, assistance, and cooperation provided by the personnel at Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, and Southern Division, Naval Facilities Engineering Command. In particular, we acknowledge the effort, dedication, and professionalism provided by the following people during the investigation and preparation of this report.

Name	Title	Position	Location
Carl Loop	Env. Engineer	Engineer-in-Charge	SOUTHNAVFACENGCOM
David Pipkin	Env. Coordinator	Env. Coordinator	NAS Cecil Field

ACRONYMS, INITIALISMS, AND ABBREVIATIONS

The following list contains many of the acronyms, initialisms, abbreviations, and units of measure used in this report.

ABB-ES	ABB Environmental Services Inc.
BDL	below detection limits
BETX	benzene, ethyl benzene, toluene, and xylenes
bls	below land surface
CA	Contamination Assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CFR	Code of Federal Regulations
CompQAP	Comprehensive Quality Assurance Plan
CTO	Contract Task Order
EDB	ethylene dibromide
FAC	Florida Administrative Code
FDER	Florida Department of Environmental Regulation
ft/day	feet per day
GC	gas chromatograph
gpd/ft	gallons per day per foot
HSWA	Hazardous and Solid Waste Amendments of 1984
msl	mean sea level
MTBE	methyl tert butyl ether
NGVD	National Geodetic Vertical Datum
NTC	Naval Training Center
OVA	Organic Vapor Analyzer
PAH	polynuclear aromatic hydrocarbons
PCA	Preliminary Contamination Assessment
PCAR	Preliminary Contamination Assessment Report
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
SJRWMD	St. Johns River Water Management District
SOUTHNAVFACENGCOM	Southern Division Naval Facilities Engineering Command
SPT	standard penetration test
SWDA	Solid Waste Disposal Act of 1965
TRPH	total recoverable petroleum hydrocarbons
$\mu g/\ell$	micrograms per liter
UIC	uniform identification code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	underground storage tank
VOA	volatile organic aromatic
1,2 DCA	1,2-dichloroethane

1.0 INTRODUCTION

ABB Environmental Services (ABB-ES) was authorized on September 21, 1990, by Southern Division (SouthDIV) Naval Facilities Engineering Command (NAVFACENGCOM) to conduct a Contamination Assessment (CA) and to develop a Contamination Assessment Report (CAR) for the Jet Test Cell, Facility 811, at Naval Air Station (NAS) Cecil Field in Jacksonville, Duval County, Florida. The scope of services for the work is contained in CTO No. 23, the Plan of Action (POA), and the Contamination Assessment Plan (CAP).

1.1 PURPOSE The purpose of the CA was to assess the vertical and horizontal extent of the petroleum contamination in the soil and groundwater beneath the site. The purpose of the CAR is to present the findings and conclusions of the CA and recommend appropriate further action for this site. Information developed from the CA will be used to assess the need for site remediation and to develop a Remedial Action Plan (RAP), if deemed necessary.

1.2 SCOPE The scope of services developed to perform a CA include:

- review Navy files and other pertinent information,
- installing soil borings and collecting soil samples for head space analysis using an Organic Vapor Analyzer (OVA) to determine the extent of soil contamination at the site,
- collecting saturated soil samples for field gas chromatograph (GC) screening to determine optimal well placement,
- collecting groundwater and soil samples for petroleum related contamination as outlined in the Florida Department of Environmental Regulation (FDER) Chapter 17-770, Florida Administrative Code (FAC),
- conducting a topographic survey of monitoring well elevations to determine the direction of groundwater flow,
- conducting slug testing on select wells to determine aquifer characteristics,
- conducting a well inventory for potable wells within a 1/4-mile radius of the site, and
- reducing and analyzing all data gathered during the CA to complete a CAR.

The following sections of the report present the background information, data compilation, results, conclusions, and recommendations of the CAR. Investigative methodologies and procedures are contained in Appendix B.

2.0 SITE BACKGROUND

The Jet Test Cell is located at NAS Cecil Field, Jacksonville, Florida. The base is situated in southwestern Duval County, off the junction of highway 228 and 103rd Street on the main base (see Figure 1). The fuel farm is in a fenced and secured area.

2.1 SITE DESCRIPTION The Jet Test Cell is located near the corner of Jet Avenue and 9th Street, just west of Hangar 1845 (see Figure 2). A site layout map of the facility is presented on Figure 3. The test cell consists of two 20,000 gallon, asphalt coated steel, underground tanks (339-TC1 and 339-TC2) installed in 1953 that contain JP-5. The facility also contains a third storage tank. Tank 339-TC3 is a 5,000 gallon above ground tank constructed of stainless steel. Tank 339-TC3 was installed in 1970 and rests on a gravel base with impervious dikes. The associated piping for tank 339-TC3 has no parts in contact with the soil. Tanks 339-TC1 and 339-TC2 have corrosion resistant coated metal piping with cathodic protection. All tanks are reported to be gauged daily.

2.2 SITE HISTORY In October, 1989, an attempt was made to precision test tanks 339-TC1 and 339-TC2 as part of the base Release Detection Program, however, leaks occurring because of inadequate seals between manway covers and the tank walls precluded the test. Several other spills from these tanks have occurred in the past due to overfilling the tanks. The facility currently has a work order request to repair the seals between the manway covers and the tank walls. As a result of the Release Detection Program, a Preliminary Contamination Assessment (CA) was started in December 1990. Six shallow soil borings were conducted. At that time it was determined that the a full Contamination Assessement would be needed. In June through December, 1991, 13 shallow monitoring wells and 3 deep wells were installed. All wells were sampled during the week of December 2, 1991.

Figure 1 Facility Location Map

Figure 2 Site Location Map

Figure 3 Site Plan

3.0 SITE CONDITIONS

3.1 PHYSIOGRAPHY

3.2.1 Regional The general physiography of the Duval County area is discussed in Appendix A.

3.2.2 Site Specific NAS Cecil Field lies within the Duval Uplands, an irregular flat plain from 70 to 100 feet above mean sea level (msl) that consists of a clayey sand lithology (Scott, 1978; Leve, 1966). Elevations at the Jet Test Cell range from approximately __ to __ feet above msl. General surface drainage in the area of the Test Cell is to the _____.

3.2 HYDROGEOLOGY

3.2.1 Regional The general hydrogeology in the Duval county area is discussed in Appendix A.

3.2.2 Site Specific The site specific hydrogeology of the Jet Test Cell is as follows.

Figure 4 Geological Cross section

4.0 METHODOLOGIES AND EQUIPMENT

All methodologies and equipment that were used during the course of this CA are listed in ABB-ES's Standard Operating Procedures. Methodologies will be in accordance with ABB-ES' FDER approved CompQAP.

Appendix B describes all the different investigative methodologies and equipment that were used during this Contamination Assessment Investigation.

4.1 SOIL BORING PROGRAM Six shallow soil borings were conducted in the vicinity of the Jet Engine Test Cell (Figure 3). The borings were drilled to assess the approximate horizontal and vertical extent of subsurface soil contamination, to determine the most appropriate locations for the monitoring wells, and to determine shallow lithology at the site. Appendix B contains methodologies for conducting soil borings. The results of the soil boring program are discussed in Section 5.2 of this report.

4.2 MONITORING WELL INSTALLATION PROGRAM ABB field personnel supervised the drilling and installation of monitoring wells around the Jet Engine Test Cell. 13 shallow wells (CEF-811-1 through CEF-811-11, CEF-811-14, and CEF-811-15) and 3 deep wells (CEF-811-12, CEF-811-13, and CEF-811-16) were installed at the site in June through November 1991 to assess the horizontal and vertical extent of petroleum contamination beneath the site. Monitoring well construction methodologies and materials are discussed in Appendix B.

4.3 GROUNDWATER ELEVATION SURVEY The elevation and slope of the water table were determined by surveying the top of the well casing for each monitoring well to a common datum using a surveyor's level and stadia rod. No benchmark referencing an elevation to the National Geodetic Vertical Datum (NGVD) of 1929 was located in the area; therefore, an arbitrary benchmark (BM) elevation of 80.00 feet was established on _____(see Figure 3). The elevations and water level data for all monitoring wells were measured from the north side of the PVC well casing.

Groundwater level measurements were collected during the week of December 2, 1991 from all the monitoring wells at the site except for those containing free product. Procedures for ground water level measurements are contained in Appendix B.

Table 1 Water Table and Construction Elevation Data

Figure 5 Water table elevations

4.4 SAMPLING PROGRAM The horizontal and vertical contamination distribution in subsurface soils and groundwater was assessed using laboratory analyses of groundwater samples collected from monitoring wells and by analysis of soil samples using an OVA and portable GC.

4.4.1 Soil Samples Soil samples collected during the investigation in December, 1990 were analyzed using an Organic Vapor Analyzer (OVA). Procedures for OVA analysis are described in Appendix B. In addition, soil samples were also collected at monitoring well locations and screened for benzene, ethylbenzene, toluene, and xylenes (BETX) using a portable GC and parameter standards.

Four of the most contaminated soil samples were sent to Savannah Laboratory in Tallahassee, Florida and analyzed for kerosene constituents as described in FDER Chapter 17-770, FAC. QA/QC samples were collected along with the soil samples. These samples included a trip blank, a field blank, an equipment blank, and 1 duplicate sample (1 duplicate sample for every increment of 10 samples collected).

4.4.2 Groundwater Samples Groundwater samples were collected in December, 1991 from the monitoring wells at the site and shipped to Wadsworth/Alert Laboratory in Tampa for analysis. The groundwater samples were collected in accordance with ABB-ES' FDER approved Generic Quality Assurance Plan. Samples were delivered to Wadsworth Laboratory, Tampa and analyzed for the FDER Chapter 17-770, FAC kerosene analytical group which includes EPA Methods 601, 602, 610, 418.1 (Total Recoverable Petroleum Hydrocarbons), ethylene dibromide (EDB), and dissolved lead. Procedures for collection of groundwater samples are presented in Appendix B.

4.5 AQUIFER SLUG TESTS A series of slug tests were performed on monitoring wells CEF-811-03, CEF-811-04, CEF-811-07 and CEF-811-08 to determine the hydraulic conductivity of the aquifer response zone. Procedures for conducting slug tests are discussed in Appendix B.

5.0 CONTAMINATION ASSESSMENT RESULTS

5.1 AQUIFER CHARACTERISTICS AND HYDROGEOLOGIC PARAMETERS The results of the slug tests analyses indicate an average horizontal hydraulic conductivity of between 0.38 feet per day (ft/day) and 1.39 ft/day. The pore water velocity (V) ranges from _.___ ft/day to _.___ ft/day and the transmissivity (T) ranges from 20.9 ft^2/day to 76.5 ft^2/day. Equations and calculations used to determine these values as well as slug test data are presented in Appendix D.

5.3 CONTAMINANT PLUME DEFINITION AND CHARACTERIZATION

Free product was measured in monitoring well CEF372-02 at a thickness of 0.18 feet. No there monitoring wells contained free product.

Water quality field parameters were collected from all sampled monitoring wells during the sampling phase of the contamination assessment. In general, the pH ranged from 5.44 to 12.07, the specific conductance ranged from 93 to 570 micromhos per centimeter (μmhos/cm), and the temperature ranged from 66.8 to 86.2 degrees centigrade (°C).

Table 2 and Figure 6 present a summary of the OVA results collected during the CA. Neither of the samples were excessively contaminated.

Table 3 presents a summary of the labrotory results for the sampling of groundwater and should be refered to during the following discussion. Included in this table are the nine truckstand wells as well as four wells from the southern edge of the North Fuel Farm. The only well found out of compliance besides CEF372-02, which contained free product, was CEF372-03. Well 3 containes 73 $\mu g/\ell$ xylene and 75 $\mu g/\ell$ Total VOAs. It is also contaminated with 158 $\mu g/\ell$ Total Naphthalenes and 10 mg/ℓ TRPH (Total Recoverable Petroleum Hydrocarbons).

Horizontal groundwater contaminant distribution is presented in Figure 7. The vertical extant of contamination, as defined by CEF372-10D and CEF 76-27D, does not appear to have penetrated the confining unit between the unconfined surficial aquifer and the underlying confined aquifer.

Based on the contaminant distribution, there does not appear to be a single source of contamination, but rather two separate spill events that were large enouth to impact the aquifer.

Table 2 OVA Results

Table 3 Soil Sample Results

Table 4 GW Sample Results

Figure 6 Contaminant Distribution

5.4 POTABLE WELL SURVEY A potable well survey is conducted to determine the risk of contamination to potable water sources due to the petroleum release being investigated. NAS Cecil Field currently uses five on site wells for all potable water. These wells are numbered PS-1 through PS-5. The following is construction and operation information concerning these wells:

TABLE 5
POTABLE WELL DATA

WELL	DATE INSTALLED	DEPTH (ft)	STATIC LEVEL (ft)	DRAWDOWN ft	YIELD gpm
PS-1	1941	887	30	8	450
PS-2	1945	907	33	13	525
PS-3	1950	950	33	11	500
PS-4	1956	1303	34	15	1000
PS-5	1956	1350	35	15	1000

Currently, no well has encountered interrupted operation due to water quality, although they have been taken out of service due to mechanical failures and routine maintenance.

No surface water bodies are used as potable sources.

No private potable wells are within 1 mile of this site.

Figure 7 Potable well survey

6.0 SUMMARY CONCLUSIONS AND RECOMMENDATIONS

6.1 SUMMARY Based on the results of the field investigations and the laboratory analytical results collected during the CA, the following is a summary of conditions at the site.

- **Only the shallow water table aquifer was encountered during drilling operations.**
- Generally, the sediments encountered were comprised predominamtly of fine grained sands and clayey sands.
- Groundwater beneath the site was encountered at a depth of between __ and __ feet.
- **Overall direction of groundwater at the site is to the south.**
- **Groundwater contaminants identified during the CA investigation include ethyl benzene, toluene, xylenes, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.**
- **The vertical extent of petroleum contamination, as defined by the deep well, does not appear to exceed __ feet bls.**
- There are two potable wells on the base within a 1/4 mile radius of the site. PS3 and PS5 both supply potable water to the site from a depth of 950 and 1350 feet respectively. PS5 is within 500 feet of the site.
- Hydraulic Conductivity K=0.38 to 1.39 ft/day
- Hydraulic Gradient I=_.___

6.2 CONCLUSIONS

6.3 RECOMMENDATIONS Because the groundwater and soils beneath the site exceeds the Chapter 17-770, FAC, target levels for Class G-II groundwater and kerosene contaminated soils, ABB-ES recommends that a Remedial Action Plan (RAP) be prepared as a follow-up report to address the contamination.

7.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment contained in this report was prepared using sound hydrogeologic principles and judgement. This assessment is based on the geologic 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 the Jet Test Cell at Naval Air Station Cecil Field, Jacksonville, Florida and should not be construed to apply to any other site.

Allan M. Stodghill
Professional Geologist
P.G. No. 0000508

Date

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APPENDIX A

SITE CONDITIONS

Physiography
Duval county lies within the northern, or proximal zone, geomorphic province characterized by continuous high ground forming a broad upland that extends eastward to the Eastern Valley and westward continuously into the Western Highland of Florida (Scott, 1978).

Hydrogeology
NAS Cecil Field is underlain by three water-bearing units. These include the surficial aquifer, the shallow rock aquifer, and the Floridan aquifer.

The surficial aquifer extends to a depth of approximately 45 feet below land surface (bls) (Geraghty and Miller, 1983). It is comprised of unconsolidated deposits of sands and clay with a hardpan layer of iron oxide (Fairchild, 1972). The surficial aquifer is recharged by local rainfall and discharges to area streams. The depth to the surficial aquifer water table at NAS Cecil Field is approximately 5 feet bls.

The shallow rock aquifer consists of shell, limestone, and sand deposits and is situated between the surficial aquifer and the underlying Hawthorn Formation (Fairchild, 1972). In the NAS Cecil Field area, the limestone layer is approximately 20 to 25 feet thick and occurs at a depth of 60 to 120 feet bls (Geraghty and Miller, 1983). Groundwater flow in the shallow rock aquifer is to the east (Fairchild, 1972). Most small domestic supplies are obtained from this aquifer.

The Floridan aquifer system is the principal source of freshwater in northeast Florida. It is comprised of the Oldsmar, Lake City, and Avon Park Limestones, the Ocala Group, and a few discontinuous thin water-bearing zones in the lower part of the Hawthorn Formation, some of which are not present in all areas.

The Ocala Group is a homogeneous sequence of permeable, hydraulically connected, marine limestones containing a few hard, less transmissive dolomite or limestone beds that restrict the vertical movement of water. The Avon Park Limestone consists almost entirely of hard, relatively impermeable, dolomite confining beds and soft permeable limestone and dolomite water-bearing zones.

The top of the Floridan aquifer occurs at a depth of about 500 feet bls at NAS Cecil Field. Geraghty and Miller (1983) report that the transmissivity of the Floridan aquifer a few miles east of the base is 190,000 gallons per day per foot (gpd/ft.).

Leve (1966) and Geraghty and Miller (1983) report that groundwater within the Floridan aquifer flows east-northeast in the vicinity of NAS Cecil Field. There is a downward gradient between the shallow rock aquifer and the Floridan aquifer in the area of NAS Cecil Field (Leve, 1966).

APPENDIX B

FIELD METHODOLOGIES

Soil Boring

The soil borings were conducted using a 3-inch diameter hand auger. The boreholes were advanced to the top of the water table. A soil sample, immediately above the water table from each borehole, was retrieved and placed in 16-ounce soil jars for headspace analysis using an OVA following FDER procedures as outlined in Chapter 17-770, FAC.

Monitoring Well Construction

Monitoring wells were installed using a drill rig with hollow-stem augering capabilities. Soil samples were collected from each monitoring well borehole prior to well installation using a Standard Penetration Test (SPT) split-spoon sampler. The soil samples were collected immediately above the water table and from there at 5-foot intervals to the bottom of the borehole. These samples were analyzed using an a portable gas chromatograph (GC) calibrated to detect benzene, ethyl benzene, toluene, and xylene (BETX) to the part per billion (ppb) level. The purpose of the screening procedure was to optimize monitoring well placement during the investigation.

All 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. Each shallow well was constructed of 2-inch PVC with a 10-foot screen section placed at a depth that should encompass seasonal water table fluctuations. The deep monitoring well was constructed of 4-inch PVC with 5 feet of 0.010-inch slotted screen. The well casings extend from the top of the screen to land surface. A 20/30 grade silica filter pack was placed in the annular space around each well to approximately 2 to 3 feet above the top of the screens. A 1 to 2 foot bentonite seal was then placed on top of the filter pack. The remaining annular space was grouted to the surface with a neat cement grout. A protective traffic-bearing vault was installed to complete each well location. Each monitoring well is equipped with a locking well cap and a padlock. Figure 10 depicts a typical monitoring well installation for the site.

Subsequent to installation, the shallow monitoring wells were developed using a centrifugal pump and the deep wells were developed by air surging until the purged water was relatively sand free or as clear as the aquifer allowed in a reasonable amount of time.

Water Level Measurements

The groundwater levels were measured using an electric water level indicator (M-Scope) and an engineering tape accurate to 0.01 foot. The wells were checked for the presence of free product by visual inspection of a groundwater sample taken from each well and the thickness of the free product was determined by the use of an oil/water interface probe. Water level elevations were calculated by subtracting the measured depth to groundwater from the surveyed elevation at the top of the well casing. This information was plotted on a scaled water table contour map where flow lines (depicting groundwater flow direction) can be drawn perpendicular to the groundwater elevation contours. The groundwater hydraulic gradient was calculated by subtracting the differences in groundwater elevation (in feet) between two wells or two points on the map and dividing the elevation difference by the distance between the two points to obtain a resulting hydraulic gradient in feet per foot.

Figure 8 Typical Monitoring Well Detail

Soil Sampling

Soil Samples were placed in 16-ounce glass jars using a stainless steel spoon and placed in a 20 degree Celsius (°C) water bath for 5 minutes. Samples were analyzed using a OVA with a flame ionization detector (FID) using the headspace technique described in FDER Chapter 17-770, FAC.

Groundwater Sampling

The groundwater samples were collected in accordance with ABB-ES's FDER approved Comprehensive Quality Assurance Plan (CompQAP). The monitoring wells were purged with a Teflon™ bailer. Purging continued until water quality parameters (specific conductance, temperature, and Ph) had stabilized. 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 or delivered to the above referenced laboratory for analyses within a 24-hour period. All groundwater samples collected during the CA were analyzed for the kerosene analytical group outlined in FDER Chapter 17-770, FAC.

Slug Tests

The slug was constructed of 1-inch outside diameter PVC pipe, 5 feet in length, filled with sand, and capped watertight at both ends. The water level changes in the monitoring wells were recorded on an In-Situ Inc. Hermit 1000C Data Logger with a model PXD-260 Pressure Transducer.

The pressure transducer was suspended just above the bottom of the well and an initial water level was recorded prior to beginning the test. The slug was then lowered into the well until it was totally submerged beneath the water table. Water levels were then observed until recovery to the original level. Following stabilization, the slug was quickly removed with water level measurements recorded over time until the water level returned to the original level. A minimum of two rising head tests were conducted for each well in order to obtain an average recovery response.

Aquifer characteristics were calculated from slug test data using the computer program AQTESOLV™ (Geraghty & Miller, Inc., 1989) based on the analytical method presented by Bouwer and Rice for partially penetrating wells screened in an unconfined aquifer. The program derives a hydraulic conductivity (K) value based on linear regression of the data gathered during the slug test. The slope of the resulting line represents the K value for each analytical run.

APPENDIX C

LITHOLOGIC LOGS

TITLE. NAS CECIL FIELD		LOG of WELL.	BORING NO 90SB-1
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED. 12/21/90	COMPLTD. 12/21/90
METHOD. Hand Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.: Porta FID	TOT DPTH. 11 0FT	DPTH TO ▽ 10 29* FT
LOGGED BY: A Stodghill & K. Busen	WELL DEVELOPMENT DATE:		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND Dark gray, fine grained, mixed with silt		SM		
					SAND Gray, fine grained				
					SILTY SAND Light brown, fine grained				
5					SILTY SAND Light brown to moderate orange, fine grained				
10									
15					*Abnormally low due to pumping for nearby construction activities				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE NAS CECIL FIELD	LOG of WELL.	BORING NO. 90SB-2
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR.	DATE STARTED 12/21/90	COMPLTD. 12/21/90
METHOD. Hand Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.: FT.	MONITOR INST.: Porta FID	TOT DPTH. 11 0FT	DPTH TO ▽ * FT
LOGGED BY. A Stodghill & K. Busen	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND Dark gray, fine grained, mixed with silt		SM		
					SAND Gray, fine grained				
					SILTY SAND Light brown, fine grained				
5					SILTY SAND Light brown to moderate orange, fine grained				
10									
15					*Not recorded				
20									

TITLE. NAS CECIL FIELD	LOG of WELL:	BORING NO. 90SB-3
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR:	DATE STARTED. 12/21/90	COMPLTD: 12/21/90
METHOD. Hand Auger	CASE SIZE:	SCREEN INT..
PROTECTION LEVEL. D		
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH: 11 0FT
DPTH TO ▽ * FT		
LOGGED BY: A Stodghill & K Busen	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND Dark gray, fine grained, mixed with silt		SM		
					SAND Gray, fine grained				
					SILTY SAND Light brown, fine grained				
5					SILTY SAND Light brown to moderate orange, fine grained				
10									
15					*Not recorded				
20									

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO. 90SB-4
CLIENT. SOUTHDIVNAVFACENGCOM			PROJECT NO 08514-30
CONTRACTOR.		DATE STARTED. 12/21/90	COMPLTD 12/21/90
METHOD. Hand Auger	CASE SIZE.	SCREEN INT	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH. 11 0FT	DPTH TO ▽ 10 26* FT
LOGGED BY. A Stodghill & K Busen	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND Dark gray, fine grained, mixed with silt		SM		
					SAND. Gray, fine grained				
					SILTY SAND Light brown, fine grained				
5					SILTY SAND Light brown to moderate orange, fine grained				
10									
15					*Abnormally low due to pumping for nearby construction activities				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD		LOG of WELL.	BORING NO. 90SB-5
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO: 08514-30
CONTRACTOR:		DATE STARTED. 12/21/90	COMPLTD 12/21/90
METHOD: Hand Auger	CASE SIZE:	SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 11 0FT	DPTH TO ▽ * FT
LOGGED BY: A Stodghill & K Busen	WELL DEVELOPMENT DATE:		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND Dark gray, fine grained, mixed with silt		SM		
					SAND Gray, fine grained				
					SILTY SAND Light brown, fine grained				
5					SILTY SAND Light brown to moderate orange, fine grained				
10									
15					*Not recorded				
20									

TITLE. NAS CECIL FIELD	LOG of WELL	BORING NO. 90SB-6
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR.	DATE STARTED. 12/21/90	COMPLTD. 12/21/90
METHOD: Hand Auger	CASE SIZE:	SCREEN INT :	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 11 0FT	DPTH TO ▽ * FT
LOGGED BY: A Stodghill & K Busen	WELL DEVELOPMENT DATE:	SITE: Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND Dark gray, fine grained, mixed with silt		SM		
					SAND Gray, fine grained				
					SILTY SAND Light brown, fine grained				
5					SILTY SAND Light brown to moderate orange, fine grained				
10									
15					*Not recorded				
20									

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-1
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED. 09/15/93	COMPLTD. 09/15/93
METHOD. Hydraulic Auger	CASE SIZE:	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST . Porta FID	TOT DPTH 9 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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 brown-black, very fine grained		SM		
				0	SAND Light tan-brown, very fine grained		SC		
5				0	SILTY SAND Tan-orange, hard clay				
				0	SILTY SAND Tan-orange, less clay than above at 7 ft bls		SM		
				0	SAND Tan, very fine grained				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-2
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO: 08514-30
CONTRACTOR.		DATE STARTED. 09/15/93	COMPLTD. 09/15/93
METHOD: Hydraulic Auger	CASE SIZE:	SCREEN INT :	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J. Tarr & D Wilkie	WELL DEVELOPMENT DATE:		SITE Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SILTY SAND Light brown, very fine grained		SM		
				0	SAND Light brown, very fine grained, damp				
5				1	SAND Light tan-brown, very fine grained, damp				
				0	SILTY SAND Light brown, very fine grained with some clay matrix				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-3
CLIENT. SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED: 09/15/93	COMPLTD. 09/15/93
METHOD. Hydraulic Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH: 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SILTY SAND Black, very fine grained		SM		
				0	SILTY SAND Light brown, very fine grained				
5				0	SILTY SAND White, very fine grained, clean, well rounded				
				0	SILTY SAND Tan-orange, very fine grained with clay matrix, damp, and stiff				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO 93SB-4
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED. 09/15/93	COMPLTD. 09/15/93
METHOD: Hydraulic Auger	CASE SIZE:	SCREEN INT :	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST.: Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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 brown-tan, very fine grained		SM		
				0	SAND Dark brown-tan, very fine grained				
				0	SILTY SAND Tan-orange, very fine grained with clay matrix, stiff		SC		
5				0			SM		
				3	SILTY SAND Orange, very fine grained, stiff				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-5
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR:	DATE STARTED. 09/15/93	COMPLTD. 09/15/93
METHOD. Hydraulic Auger	CASE SIZE: SCREEN INT.	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.. Porta FID TOT DPTH 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J. Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				400	SAND. Black, very fine grained, sub-rounded		SM		
				600	SAND Black, very fine grained, sub-rounded, odor				
5				400	SILTY SAND Gray, very fine grained, damp, odor				
				750	SILTY SAND Orange, very fine grained with clay matrix, odor *Approximate				
10									
15									
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD		LOG of WELL.	BORING NO. 93SB-6
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED. 09/15/93	COMPLTD. 09/15/93
METHOD. Hydraulic Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH: 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D. Wilkie	WELL DEVELOPMENT DATE:		SITE. Jet Engine Test Cell

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 brown, very fine grained		SM		
				0	SAND Dark brown, very fine grained				
5				2	SILTY SAND Tan, very fine grained with clay matrix				
				20	SILTY SAND Tan-orange, very fine grained				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD		LOG of WELL:	BORING NO. 93SB-7
CLIENT. SOUTHDIVNAVFACENGCOM			PROJECT NO: 08514-30
CONTRACTOR:		DATE STARTED: 09/16/93	COMPLTD: 09/16/93
METHOD: Hydraulic Auger	CASE SIZE:	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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 brown, fine grained, poorly graded		SM		
				0	SAND Dark brown, fine grained, poorly graded				
5				0	SILTY SAND Tan, clay sub-matrix, damp				
				0	SILTY SAND Tan, poorly graded				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL		BORING NO. 93SB-8
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR.		DATE STARTED 09/16/93	COMPLTD 09/16/93
METHOD: Hydraulic Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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-tan, fine to medium grained, poorly graded		SM		
				0	SAND Light tan-white, fine grained, clean, poorly graded				
5				0	SAND Tan, fine grained, poorly graded				
				0	SAND Tan, fine grained, poorly graded				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-9
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR:	DATE STARTED. 09/16/93	COMPLTD. 09/16/93
METHOD: Hydraulic Auger	CASE SIZE. SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.: FT	MONITOR INST.: Porta FID TOT DPTH: 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE:	SITE: Jet Engine Test Cell

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 brown, fine grained, poorly graded		SM		
				96	SAND Dark brown, fine grained, poorly graded				
5				98	SILTY SAND. Tan, very fine grained, damp				
				229	SILTY SAND Light tan-brownish purple, very fine grained, damp				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL:	BORING NO 93SB-10
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR:	DATE STARTED. 09/16/93	COMPLTD. 09/16/93
METHOD: Hydraulic Auger	CASE SIZE. SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.: Porta FID TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

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 brown, fine to medium grained, poorly graded with trace organics		SM		
				0	SAND Dark brown, fine to medium grained, poorly graded				
5				40	SILTY SAND Tan, very fine grained, with submatrix clay				
				1720	SILTY SAND Tan, very fine grained, damp, submatrix clay, slight odor				
10									
15									
					*Approximate				
20									

TITLE: NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-11
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED: 09/16/93	COMPLTD. 09/16/93
METHOD: Hydraulic Auger	CASE SIZE:	SCREEN INT .	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D. Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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 Brown, fine to medium grained, trace quartz grains, wet, strong odor		SM		
				2455	SAND Brown, fine to medium grained, wet, very strong odor				
5				1790	SILTY SAND Tan, very fine grained, clay submatrix, strong odor				
				1830	SILTY SAND Tan, very fine grained, clay submatrix, strong odor				
10									
15					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL	BORING NO. 93SB-12
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR:	DATE STARTED. 09/16/93	COMPLTD. 09/16/93
METHOD. Hydraulic Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL: D
TOC ELEV.: FT	MONITOR INST.: Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

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 brown, fine to medium grained, occasional quartz grains.		SP		
							SM		
				1	SAND. Dark brown, fine to medium grained				
5				150	SAND Dark brown, fine grained, poorly graded, slight odor				
				100	SAND Light tan-light purple, fine grained, slight odor				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.	BORING NO. SB-13
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR.	DATE STARTED 09/16/93	COMPLTD. 09/16/93
METHOD: Hydraulic Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell	

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				13	SAND Dark brown, fine to medium grained, poorly graded		SM		
				70	SAND Dark brown, fine to medium grained, poorly graded				
5				0	SAND Light brown-light purple, fine grained				
				6	SAND Dark brown-black, fine grained				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-14
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED. 09/16/93	COMPLTD. 09/16/93
METHOD: Hydraulic Auger	CASE SIZE:	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.. FT.	MONITOR INST.: Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D. Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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 Dark brown, fine to medium grained		SM		
				1	SAND Light tan-brown, fine to medium grained				
5				0	SAND Light brown-light purple, fine grained.				
				0	SAND. Light brown-light purple, fine grained				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-15
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR.	DATE STARTED 09/16/93	COMPLTD. 09/16/93
METHOD: Hydraulic Auger	CASE SIZE. SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.. Porta FID TOT DPTH 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE Jet Engine Test Cell

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 tan, fine to medium grained		SM		
				0	SAND Tan, fine to medium grained, poorly graded				
5				0	SAND. Light brown, fine grained				
				0	SILTY SAND Light brown-light purple, very fine grained, trace of clay matrix				
10									
15									
					*Approximate				
20									

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-16
CLIENT. SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED: 09/16/93	COMPLTD. 09/16/93
METHOD. Hydraulic Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.: Porta FID	TOT DPTH: 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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 Tan, fine to medium grained, poorly graded		SM		
				0	SAND Light brown-tan, fine to medium grained, poorly graded				
5				0	SAND Light brown, fine grained				
				310	SILTY SAND Light brown, very fine grained, odor				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-17
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO: 08514-30
CONTRACTOR:	DATE STARTED. 09/16/93	COMPLTD: 09/16/93
METHOD: Hydraulic Auger	CASE SIZE: / SCREEN INT.:	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST.. Porta FID / TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J. Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

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 brown, fine to medium grained		SM		
					SAND Tan, fine to medium grained, poorly graded				
				0	SAND Tan, fine grained, poorly graded				
5				0	SILTY SAND Light brown-light purple, very fine grained				
				3	SAND Brown, fine grained, poorly graded				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-18
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR:	DATE STARTED. 09/16/93	COMPLTD. 09/16/93
METHOD. Hydraulic Auger	CASE SIZE:	SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.: Porta FID	TOT DPTH 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

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-tan, fine to medium grained, poorly graded		SM		
				140	SAND Light brown-tan, fine to medium grained, poorly graded, odor				
5				850	SILTY SAND Tan, very fine grained, very strong odor				
				1100	SILTY SAND Tan, very fine grained, clay submatrix, very strong odor				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.	BORING NO 93SB-19
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR:	DATE STARTED. 09/17/93	COMPLTD. 09/17/93
METHOD. Hydraulic Auger	CASE SIZE: / SCREEN INT.:	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.: Porta FID / TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				1500	SAND Dark brown, fine to medium grained, poorly graded, strong odor		SM		
				1700	SAND Tan, fine to medium grained, poorly graded, strong odor				
5				2000	SILTY SAND Tan, very fine grained, strong odor				
				1300	SILTY SAND Tan, very fine grained, strong odor				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL.	BORING NO 93SB-20
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR.	DATE STARTED. 09/17/93	COMPLTD. 09/17/93
METHOD: Hydraulic Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				530	SAND Dark brown, fine to medium grained, poorly graded.		SM		
				1460	SAND Tan, fine grained, poorly graded, very strong odor				
5				1260	SAND Tan, fine grained, poorly graded, very strong odor.				
				1510	SILTY SAND Tan-orange, fine grained				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL:	BORING NO. 93SB-21
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO: 08514-30
CONTRACTOR:	DATE STARTED. 09/17/93	COMPLTD. 09/17/93
METHOD. Hydraulic Auger	CASE SIZE. SCREEN INT .	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID TOT DPTH. 7 OFT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				2	SAND Dark brown, fine to medium grained		SM		
				0	SAND Dark brown, fine to medium grained				
5				0	SAND Brown-tan, fine to medium grained				
				0	SAND Brown-tan, fine to medium grained				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-22
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR:	DATE STARTED. 09/17/93	COMPLTD. 09/17/93
METHOD. Hydraulic Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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-tan, fine to medium grained, poorly graded		SM		
				0	SAND Light brown-tan, fine to medium grained, poorly graded				
5				0	SILTY SAND Light brown, very fine to fine grained				
				1	SILTY SAND Light tan-light purple, very fine grained				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-23
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED. 09/17/93	COMPLTD. 09/17/93
METHOD: Hydraulic Auger	CASE SIZE.	SCREEN INT .	PROTECTION LEVEL. D
TOC ELEV . FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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-tan, fine to medium grained, poorly graded		SM		
				2	SAND Light brown-tan, fine to medium grained, poorly graded				
5				>500	SILTY SAND Tan, very fine grained, poorly graded, stiff, slight hydrocarbon odor				
				150	SILTY SAND Light tan-orange, very fine grained, hydrocarbon stains, strong odor				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-24
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR:	DATE STARTED. 09/17/93	COMPLTD. 09/17/93
METHOD: Hydraulic Auger	CASE SIZE: / SCREEN INT.:	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.: Porta FID / TOT DPTH: 7.0FT	DPTH TO ▽ 7* FT.
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE:	SITE: Jet Engine Test Cell

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-tan, fine to medium grained		SM		
				0	SAND Light brown-tan, fine to medium grained				
5				0	SILTY SAND Light tan-orange, very fine grained				
				0	SILTY SAND. Light tan, fine grained				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-25
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED. 09/17/93	COMPLTD. 09/17/93
METHOD: Hydraulic Auger	CASE SIZE.	SCREEN INT .	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST.: Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J. Tarr & D. Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				2	SAND Light brown, fine grained, poorly graded		SM		
				0	SAND Light tan, fine grained, poorly graded				
5				0	SILTY SAND Light brown-purple, fine grained				
				2	SILTY SAND Light brown-purple, fine grained, stiff				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL·	BORING NO. 93SB-26
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR.	DATE STARTED. 12/13/93	COMPLTD 12/13/93
METHOD: Hand Auger	CASE SIZE.	SCREEN INT.	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 7 OFT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D. Wilkie	WELL DEVELOPMENT DATE:		SITE. Jet Engine Test Cell

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 Brown, fine grained, trace of silt, poorly graded		SM		
				18	SAND Brown, fine grained, trace of silt, poorly graded				
5				0	SAND Brown, fine grained, trace of silt, poorly graded				
				0	SAND Dark brown, fine grained, trace of silt, poorly graded				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-27
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO: 08514-30
CONTRACTOR:	DATE STARTED: 12/13/93	COMPLTD. 12/13/93
METHOD: Hand Auger	CASE SIZE:	SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.: Porta FID	TOT DPTH: 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D. Wilkie	WELL DEVELOPMENT DATE.	SITE: Jet Engine Test Cell

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 Brown, fine grained, trace of silt, poorly graded		SM		
				0	SAND Brown, fine grained, trace of silt, poorly graded				
5				0	SILTY SAND Brown, trace of clay				
				0	SAND Brown, fine grained, trace of silt, poorly graded				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-28
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR:		DATE STARTED. 12/13/93	COMPLTD. 12/13/93
METHOD: Hand Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY. J Tarr & D Wilkie	WELL DEVELOPMENT DATE.		SITE. Jet Engine Test Cell

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 Brown, fine grained, trace of silt, poorly graded		SM		
				0	SAND. Brown, fine grained, trace of silt, poorly graded				
5				0	SAND Brown, fine grained, trace of silt, poorly graded				
				0	SAND Brown, fine grained, trace of silt, poorly graded				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL	BORING NO 93SB-29
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR:	DATE STARTED. 12/13/93	COMPLTD. 12/13/93
METHOD: Hand Auger	CASE SIZE:	SCREEN INT..
PROTECTION LEVEL. D		
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT
DPTH TO ▽ 7* FT		
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

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 Brown, fine grained, trace of silt, poorly graded		SM		
				0	SAND Brown, fine grained, trace of silt, poorly graded.				
5				0	SAND Light brown, fine grained, trace of silt, poorly graded				
				0	SAND Light brown, fine grained, trace of silt, poorly graded				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.		BORING NO. 93SB-30
CLIENT: SOUTHDIVNAVFACENGCOM			PROJECT NO 08514-30
CONTRACTOR:		DATE STARTED 12/13/93	COMPLTD 12/13/93
METHOD: Hand Auger	CASE SIZE.	SCREEN INT..	PROTECTION LEVEL D
TOC ELEV.: FT.	MONITOR INST.. Porta FID	TOT DPTH. 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D. Wilkie	WELL DEVELOPMENT DATE:		SITE. Jet Engine Test Cell

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 Brown, fine grained, trace of silt, poorly graded		SM		
				0	SAND Brown, fine grained, trace of silt, poorly graded				
5				0	SAND Brown, fine grained, trace of silt, poorly graded				
				0	SAND Brown, fine grained, trace of silt, poorly graded				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL.	BORING NO. 93SB-31
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO: 08514-30
CONTRACTOR:	DATE STARTED: 12/13/93	COMPLTD. 12/13/93
METHOD: Hand Auger	CASE SIZE: / SCREEN INT..	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID / TOT DPTH: 7 0FT	DPTH TO ▽ 7* FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE.	SITE. Jet Engine Test Cell

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 Brown, fine grained, poorly graded		SM		
				0	SILTY SAND Brown, fine grained, trace of clay				
5				0	SILTY SAND. Brown, fine grained, trace of clay				
				0	SILTY SAND Brown, fine grained, trace of clay				
10									
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD		**LOG of WELL:** CEF 811-01	**BORING NO.**
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO.** 7525-20
CONTRACTOR: National Petroleum Testing Consultants, Inc		**DATE STARTED.** 6/28/91	**COMPLTD.** 6/28/91
METHOD. HSA	**CASE SIZE:** 2 inch	**SCREEN INT..** 5' to 15'	**PROTECTION LEVEL.** D
TOC ELEV.. FT.	**MONITOR INST.:**	**TOT DPTH.** 15FT	**DPTH TO ▽** 5* FT
LOGGED BY. J Bell	**WELL DEVELOPMENT DATE.** 6/28/91		**SITE.** Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND gray - brown, fine-grained, with fill material		SP		
					SAND gray - brown, fine-grained				
					SAND pale gray to orange, fine-grained, mottled				
5			100%	G.C					
10					SAND pale gray to orange, fine-grained, mottled, poorly graded				
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD		LOG of WELL. CEF 811-02	BORING NO
CLIENT. SOUTHNAVFACENGCOM			PROJECT NO 7525-20
CONTRACTOR: National Petroleum Testing Consultants, Inc		DATE STARTED. 6/28/91	COMPLTD 6/28/91
METHOD. HSA	CASE SIZE. 2 inch	SCREEN INT.. 5' to 15'	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST..	TOT DPTH. 15FT	DPTH TO ▽ 6 5* FT
LOGGED BY: J Bell	WELL DEVELOPMENT DATE. 6/28/91		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			90%	G C	SAND gray to brown, very fine-grained		SP		
10									
15									
					*Approximate				
20									

TITLE. NAS CECIL FIELD	LOG of WELL. CEF 811-03	BORING NO
CLIENT. SOUTHNAVFACENGCOM		PROJECT NO. 7525-20
CONTRACTOR. National Petroleum Testing Consultants, Inc	DATE STARTED. 7/09/91	COMPLTD. 7/09/91
METHOD. HSA	CASE SIZE 2 inch	SCREEN INT 4' to 14'	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST..	TOT DPTH 14FT	DPTH TO ▽ 5* FT
LOGGED BY: J Koch	WELL DEVELOPMENT DATE. 7/09/91	SITE Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				G.C	SAND olive brown, fine-grained, poorly graded		SP		
10					SAND olive gray, very fine-grained, poorly graded				
15					*Approximate				
20									

TITLE. NAS CECIL FIELD	LOG of WELL. CEF 811-04	BORING NO
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO. 7525-20
CONTRACTOR: National Petroleum Testing Consultants, Inc	DATE STARTED. 7/09/91	COMPLTD. 7/09/91
METHOD: HSA	CASE SIZE: 2 inch	SCREEN INT.. 4' to 14'	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST..	TOT DPTH: 14FT	DPTH TO ▽ 5* FT
LOGGED BY: A Stodghill	WELL DEVELOPMENT DATE. 7/09/91	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND brownish gray, fine-grained, poorly graded		SP		
5			80%	G C.	CLAYEY SAND pale gray to brown, very fine to medium-grained, poorly graded		SC		
10					CLAYEY SAND orange, fine-grained				
					CLAYEY SAND pink - gray, fine-grained				
					CLAYEY SAND dark brown, very fine-grained				
15					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL. CEF 811-05	BORING NO
CLIENT. SOUTHNAVFACENGCOM		PROJECT NO. 7525-20
CONTRACTOR. National Petroleum Testing Consultants, Inc	DATE STARTED 7/09/91	COMPLTD 7/09/91
METHOD. HSA / CASE SIZE. 2 inch	SCREEN INT 4' to 14'	PROTECTION LEVEL D
TOC ELEV.: FT / MONITOR INST.:	TOT DPTH. 14FT	DPTH TO ▽ 5-6* FT
LOGGED BY: A Stodghill	WELL DEVELOPMENT DATE 7/09/91	SITE Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Fill material with silt and sand				
					SAND gray - brown, very fine-grained, with silt		SM		
					SAND gray and yellow - brown, laminated, fine-grained, poorly graded		SP		
5			100%	G C	SAND dark gray to brown, fine-grained				
					SAND dark gray, fine-grained, poorly graded				
10					SAND light gray to light brown, laminated, fine-grained, poorly graded				
					SAND light gray, fine-grained, poorly graded				
					SAND. dark brown - gray, fine-grained, poorly graded				
15					*Approximate				
20									

TITLE: NAS CECIL FIELD	LOG of WELL. CEF 811-06	BORING NO
CLIENT. SOUTHNAVFACENGCOM		PROJECT NO· 7525-20
CONTRACTOR: National Petroleum Testing Consultants, Inc	DATE STARTED. 7/09/91	COMPLTD. 7/09/91
METHOD: HSA	CASE SIZE: 2 inch	SCREEN INT.. 4' to 14'	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST..	TOT DPTH· 14FT	DPTH TO ▽ 4* FT
LOGGED BY: J Koch	WELL DEVELOPMENT DATE: 7/09/91	SITE: Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			100%	G C.	Fill material with silt and sand		SP		
10					SAND light olive brown, fine-grained, poorly graded				
15					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL. CEF 811-07	BORING NO.
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO. 7525-20
CONTRACTOR: National Petroleum Testing Consultants, Inc	DATE STARTED. 7/10/91	COMPLTD. 7/10/91
METHOD. HSA / CASE SIZE. 2 inch	SCREEN INT . 4' to 14'	PROTECTION LEVEL. D
TOC ELEV.. FT / MONITOR INST :	TOT DPTH: 14FT	DPTH TO ▽ 5 5* FT
LOGGED BY. A Stodghill	WELL DEVELOPMENT DATE. 7/10/91	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Fill material with silt and sand Sand is brown, very fine-grained		SP		
5			100%	G.C	CLAYEY SAND pale gray yellow to dark brown, fine-grained		SC		
					CLAYEY SAND pink - gray, fine-grained				
10									
					CLAYEY SAND light brown, very fine-grained, poorly graded				
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL. CEF 811-08	BORING NO
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO 7525-20
CONTRACTOR. National Petroleum Testing Consultants, Inc	DATE STARTED 7/10/91	COMPLTD 7/10/91
METHOD. HSA	CASE SIZE: 2 inch	SCREEN INT 4' to 14'	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST..	TOT DPTH 14FT	DPTH TO ▽ 5-7* FT
LOGGED BY: A Stodghill	WELL DEVELOPMENT DATE. 7/10/91	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND brown to gray, very fine-grained, some silt and organics		SP		
					SAND medium gray, fine-grained, silty				
					SAND pink gray to light gray, fine-grained, clayey				
5			100%	G C	CLAYEY SAND light gray to orange, fine-grained		SC		
10					CLAYEY SAND pink gray to light brown, fine-grained				
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS CECIL FIELD	LOG of WELL: CEF 811-09		BORING NO
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO 7525-20
CONTRACTOR: National Petroleum Testing Consultants, Inc		DATE STARTED. 7/10/91	COMPLTD. 7/10/91
METHOD. HSA	CASE SIZE. 2 inch	SCREEN INT.. 4' to 14'	PROTECTION LEVEL D
TOC ELEV.: FT	MONITOR INST.:	TOT DPTH. 14FT	DPTH TO ▽ 5* FT
LOGGED BY: J Koch	WELL DEVELOPMENT DATE: 7/10/91		SITE Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND brownish gray, fine-grained, with fill material		SP		
5									
10					SAND light gray, very fine-grained, poorly graded				
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD		LOG of WELL. CEF 811-10	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO. 7525-20
CONTRACTOR: National Petroleum Testing Consultants, Inc		DATE STARTED: 7/10/91	COMPLTD. 7/10/91
METHOD. HSA	CASE SIZE. 2 inch	SCREEN INT.. 4' to 14'	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.	TOT DPTH. 14FT	DPTH TO ▽ 6* FT
LOGGED BY. J Koch	WELL DEVELOPMENT DATE. 7/10/91		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND brownish gray, fine-grained, with fill material		SP		
5									
					SAND gray, very fine-grained				
10									
15					*Approximate				
20									

TITLE. NAS CECIL FIELD		LOG of WELL. CEF 811-11	BORING NO.
CLIENT. SOUTHNAVFACENGCOM			PROJECT NO 7525-20
CONTRACTOR. National Petroleum Testing Consultants, Inc		DATE STARTED 7/11/91	COMPLTD 7/11/91
METHOD. HSA	CASE SIZE. 2 inch	SCREEN INT 4' to 14'	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST..	TOT DPTH 14FT	DPTH TO ▽ 5* FT
LOGGED BY. J Koch	WELL DEVELOPMENT DATE. 7/11/91		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND brownish gray, fine-grained, with fill material		SP		
5			60%	G C					
10					SAND gray, fine-grained				
15					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL. CEF 811-12D	BORING NO
CLIENT. SOUTHNAVFACENGCOM		PROJECT NO 7525-20
CONTRACTOR: National Petroleum Testing Consultants, Inc	DATE STARTED 8/22/91	COMPLTD. 8/22/91
METHOD. HSA	CASE SIZE. 2 inch	SCREEN INT.. 25' to 35'	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST.:	TOT DPTH. 35FT	DPTH TO ▽ 65* FT
LOGGED BY. A Stodghill	WELL DEVELOPMENT DATE: 8/22/91	SITE: Jet Engine Test Cell

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 brown to gray, very fine-grained		SP		
10									
15			30%	G C	SAND light brown to white, fine-grained, poorly graded				
20									
25			40%	G C	SAND light brown to white, fine-grained				
30							SC		
35			50%	G C	CLAYEY SAND. olive gray to white, fine-grained				
40									
45					*Approximate				
50									

TITLE. NAS CECIL FIELD		LOG of WELL. CEF 811-13D	BORING NO
CLIENT. SOUTHNAVFACENGCOM			PROJECT NO. 7525-20
CONTRACTOR. National Petroleum Testing Consultants, Inc		DATE STARTED 8/23/91	COMPLTD 8/23/91
METHOD: HSA	CASE SIZE. 2 inch	SCREEN INT 32' to 37'	PROTECTION LEVEL. D
TOC ELEV.. FT	MONITOR INST..	TOT DPTH 37FT	DPTH TO ▽ * FT
LOGGED BY. A Stodghill	WELL DEVELOPMENT DATE 8/23/91		SITE Jet Engine Test Cell

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 light brown to gray, with fill material		SP		
10					SAND light brown to white, fine-grained				
15			30%	G C	SAND light brown to white, fine-grained, poorly graded				
20									
25			30%	G C	SAND light brown to orange, layered, very fine-grained				
30					Hard pan				
35			50%	G C	SAND. light gray, laminated with orange, very fine-grained		SC		
40			100%	G C	CLAYEY SAND gray - green, very fine-grained				
45									
50					*Not recorded				

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD		**LOG of WELL.** CEF-811-14D	**BORING NO.** N/A
CLIENT. SOUTHDIVNAVFACENGCOM			**PROJECT NO.** 7525-30
CONTRACTOR. Groundwater Protection, Inc		**DATE STARTED.** 11/20/91	**COMPLTD.** 11/20/91
METHOD: Mud Rotary	**CASE SIZE:** 4"	**SCREEN INT..** 40' to 45'	**PROTECTION LEVEL.** D
TOC ELEV.. FT	**MONITOR INST.:** Porta FID	**TOT DPTH.** 42FT	**DPTH TO ▽** * FT
LOGGED BY: A Stodghill	**WELL DEVELOPMENT DATE:** 11/20/91		**SITE:** Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN
10			14/2	G C	SAND. light brown to gray, very fine to fine-grained		SP	
15			14/2	G C	SAND yellow brown to medium brown, very fine-grained.			
20			10/2	G C	SAND white, grading downward to medium brown, very fine-grained			
25			10/2	G C	SAND white to light brown, fine-grained			
30					SAND gray to yellow gray, medium-grained, grading downward to very fine-grained			
					CLAY. olive gray		CL	
35			20/2	G.C.	35 - 35.5. CLAY green to gray green. 35 5 - 40 SAND green to gray, medium-grained, clayey 40 - 41 SAND. olive green to gray, very fine to fine-grained, clayey		SC	
40								
45					*Not recorded			
50								

WELL DATA

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL. CEF 811-15	BORING NO N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO. 7525-30
CONTRACTOR. Groundwater Protection, Inc	DATE STARTED. 11/19/91	COMPLTD. 11/19/91
METHOD. HSA	CASE SIZE. 2 inch	SCREEN INT.. 3' to 13'	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH. 13FT	DPTH TO ▽ * FT
LOGGED BY: A Stodghill	WELL DEVELOPMENT DATE. 11/19/91	SITE. Jet Engine Test Cell	

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			90%	G C	SAND gray-yellow to pink-gray, very fine-grained, clayey		SC		
10							SP		
15			70%	G C	SAND light brown to black, very fine-grained, mottled				
20					*Not recorded				

TITLE. NAS CECIL FIELD	LOG of WELL. CEF-811-16	BORING NO
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR: Layne Environmental Services	DATE STARTED. 09/28/93	COMPLTD. 09/28/93
METHOD: Hollow Stem Auger	CASE SIZE. 2" / SCREEN INT.: 5' to 15'	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.: Porta FID / TOT DPTH: 16 0FT	DPTH TO ▽ 6 89 FT
LOGGED BY: J Tarr & D. Wilkie	WELL DEVELOPMENT DATE: 09/29/93	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				1500	SAND Dark brown, fine-grained, poorly graded		SM	Posthole	
				2400	SAND Tan, fine-grained, poorly graded, strong odor			Posthole	
5			1 4/2	1400	SILTY SAND Light gray, stiff, trace of clay			2,2,3,2	
10			1 4/2	450	SAND Tan, fine-grained, poorly graded			2,3,3,4	
15			1 4/2	400	SAND Dark brown, medium-grained, moderately to well graded, strong odor		SP	3,2,4,5	
					TOTAL DEPTH = 16 0' bls				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL. CEF-811-17	BORING NO
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR: Layne Environmental Services	DATE STARTED. 09/28/93	COMPLTD. 09/28/93
METHOD. Hollow Stem Auger	CASE SIZE: 2"	SCREEN INT . 5' to 15'	PROTECTION LEVEL D
TOC ELEV.: FT	MONITOR INST.: Porta FID	TOT DPTH: 15 0FT	DPTH TO ▽ 7 06 FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE: 09/30/93	SITE. Jet Engine Test Cell

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 brown, fine grained, poorly graded		SM	Posthole	
				0	SAND Dark brown, fine grained, poorly graded			Posthole	
5			1 6/2	1300	SILTY SAND Yellow-orange, fine grained, trace of clay			2,2,3,2	
10			1 6/2	40	SAND Light brown, fine grained, poorly graded, well washed			2,1,3,3	
15			1 4/2	32	SAND. Dark brown, fine grained, poorly graded			2,3,5,6	
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD		LOG of WELL. CEF-811-18	BORING NO.
CLIENT. SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR: Layne Environmental Services		DATE STARTED. 09/28/93	COMPLTD: 09/28/93
METHOD: Hollow Stem Auger	CASE SIZE. 2"	SCREEN INT.. 5' to 15'	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 15 0FT	DPTH TO ▽ 7 03 FT
LOGGED BY: J Tarr & D. Wilkie	WELL DEVELOPMENT DATE. 09/29/93		SITE. Jet Engine Test Cell

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 Gray, fine-grained, poorly graded		SM	Posthole	
				0	SAND Tan-gray, fine-grained, poorly graded, strong odor			Posthole	
5			1 4/2	2300	SILTY SAND Greenish-gray, fine-grained, clay matrix, odor			3,4,5,5	
10			1 4/2	1400	SAND Tan-light brown, fine-grained, poorly graded, odor			2,3,2,2	
15			1 6/2	1500	SAND. Tan, fine-grained, poorly graded to 14 5 ft bls Dark brown, fine-grained, poorly graded to 16 0 ft bls.			6,9,8,11	
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL CEF-811-19	BORING NO.
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR: Layne Environmental Services	DATE STARTED. 09/28/93	COMPLTD 09/28/93
METHOD: Hollow Stem Auger	CASE SIZE: 2"	SCREEN INT 5' to 15'	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH: 15 0FT	DPTH TO ▽ 6 89 FT
LOGGED BY: J Tarr & D Wilkie	WELL DEVELOPMENT DATE. 09/29/93	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				80	SAND Dark brown, fine to medium-grained, moderately graded		SM	Posthole	
				3700	SAND Light-gray, fine-grained, poorly graded, odor			Posthole	
5			1 4/2	5000	SAND Light-gray, fine-grained, poorly graded, odor to 5 ft bls Dark brown, fine-grained, poorly graded, possible hydrocarbon staining to 6 ft bls			2,3,2,4	▽
10			1 6/2	1050	SAND Dark brown, fine-grained, poorly graded, possible hydrocarbon staining to 10 ft bls Tan, fine-grained, poorly graded, strong odor to 11 ft bls.			5,6,8,9	
15			2 0/2	1500	SAND Tan-light brown, fine-grained, poorly graded			8,4,3,5	
					DEPTH TO PRODUCT = 6 75' bls.				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL. CEF-811-20		BORING NO.
CLIENT. SOUTHDIVNAVFACENGCOM			PROJECT NO. 08514-30
CONTRACTOR. Layne Environmental Services		DATE STARTED: 09/29/93	COMPLTD. 09/29/93
METHOD: Hollow Stem Auger	CASE SIZE: 2"	SCREEN INT.. 5' to 15'	PROTECTION LEVEL. D
TOC ELEV.: FT	MONITOR INST.. Porta FID	TOT DPTH. 15 0FT	DPTH TO ▽ 6 94 FT
LOGGED BY: J. Tarr & D Wilkie	WELL DEVELOPMENT DATE. 09/30/93		SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				1200	SAND Brown, fine-grained, poorly graded, strong odor		SM	Posthole	
				3700	SAND Brown, fine-grained, poorly graded, strong odor			Posthole	
5			1 4/2	5000	SAND Tan, fine-grained, poorly graded, odor			2,3,3,4	
10			1 4/2	1900	SAND Tan, fine-grained, poorly graded, strong odor			3,4,5,5	
15			1 8/2	150	SAND. Tan-light brown, fine-grained, poorly graded			3,3,2,2	
20									

TITLE. NAS CECIL FIELD		**LOG of WELL:** CEF-811-21	**BORING NO.**
CLIENT: SOUTHDIVNAVFACENGCOM			**PROJECT NO.** 08514-30
CONTRACTOR: Layne Environmental Services		**DATE STARTED.** 09/29/93	**COMPLTD** 09/29/93
METHOD: Hollow Stem Auger	**CASE SIZE.** 2"	**SCREEN INT.:** 5' to 15'	**PROTECTION LEVEL** D
TOC ELEV.. FT	**MONITOR INST.:** Porta FID	**TOT DPTH.** 15 0FT	**DPTH TO ▽** 7 03 FT
LOGGED BY: J. Tarr & D Wilkie	**WELL DEVELOPMENT DATE.** 09/30/93		**SITE.** Jet Engine Test Cell

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 Brown, fine to medium-grained, moderate to poorly graded		SP	Posthole	
				140	SAND Dark gray, fine-grained, moderate to poorly graded, odor		SM	Posthole	
5			18/2	40	SAND. Dark gray, fine-grained, poorly graded			2,3,2,4	
10			18/2	20	SAND Dark gray, fine-grained, poorly graded to 9 5 ft bls Tan, fine-grained, poorly graded to 11 ft bls			2,2,2,3	
15			20/2	3	SAND Light tan, fine-grained, poorly graded			3,2,2,3	
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL. CEF-811-22D	BORING NO.
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO. 08514-30
CONTRACTOR: Layne Environmental Services	DATE STARTED. 09/29/93	COMPLTD 09/30/93
METHOD: Hollow Stem Aug /Mud Rotary	CASE SIZE. 2" Well/6" Surface	SCREEN INT 35' to 40'	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.. Porta FID	TOT DPTH 40 0FT	DPTH TO ▽ 6 71 FT
LOGGED BY: J. Tarr & D. Wilkie	WELL DEVELOPMENT DATE. 09/30/93	SITE. Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				700	SAND Dark brown, fine-grained, poorly graded		SM	Posthole	
				3000	SAND Tan, fine-grained, poorly graded, very strong odor			Posthole	
5			1 8/2	3900	SILTY SAND Light gray-yellowish orange, clay matrix, stiff, strong odor			2,2,3,11	
10			1 8/2	3000	SAND Light-dark brown, fine-grained, 4" thick light gray layer, very strong hydrocarbon odor			3,4,8,9	
15			2 0/2	1800	SAND Dark gray, fine to medium-grained, poorly graded to 16 ft bls Light brown-tan, fine to medium-grained, poorly graded to 17 ft bls			2,11,5,5	
20			2 0/2	180	SAND Light brown-tan, fine to medium-grained, poorly graded			3,4,5,8	
25			2 0/2	1000	SAND Light brown, fine to medium-grained, poorly graded, possible dried product stains White, quartz, strong odor from 26 5-27 0 ft			4,5,9,13	
							CH		
30			0 8/2	5	CLAY Dark gray, highly plastic, very fat, possible 1 foot thick confining layer.				
							SP		
35			0 8/2	3	SAND Light gray, medium-grained, moderate to well graded				
40			0 4/2		SAND. Tan, medium to coarse-grained quartz, moderate to well graded				
45					SAND. Tan, medium to coarse-grained quartz, moderate to well graded				
50									
55									
60									

TITLE: NAS CECIL FIELD	LOG of WELL: CEF-811-23	BORING NO.
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR. Layne Environmental Services	DATE STARTED. 01/11/94	COMPLTD. 01/11/94
METHOD: Hollow Stem Auger	CASE SIZE: 2" / SCREEN INT 5' to 15'	PROTECTION LEVEL D
TOC ELEV.: FT.	MONITOR INST.. Porta FID / TOT DPTH. 15 0FT	DPTH TO ▽ 6 50* FT
LOGGED BY: J Tarr	WELL DEVELOPMENT DATE. 01/25/94	SITE Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0			SM	Posthole	
				0	SAND. Brown, fine grained, trace of silt, no hydrocarbon odor			Posthole	
5									
10				460	SAND Gray, fine grained, with silt, trace of clay, strong hydrocarbon odor				
15									
					*Approximate				
20									

TITLE: NAS CECIL FIELD	**LOG of WELL.** CEF-811-24	**BORING NO**
CLIENT: SOUTHDIVNAVFACENGCOM		**PROJECT NO.** 08514-30
CONTRACTOR: Layne Environmental Services	**DATE STARTED** 01/11/94	**COMPLTD.** 01/11/94
METHOD: Hollow Stem Auger	**CASE SIZE.** 2"	**SCREEN INT .** 5' to 15'	**PROTECTION LEVEL.** D
TOC ELEV.: FT	**MONITOR INST .** Porta FID	**TOT DPTH.** 15 0FT	**DPTH TO ▽** 6 50* FT
LOGGED BY: J Tarr	**WELL DEVELOPMENT DATE.** 01/25/94	**SITE.** Jet Engine Test Cell

DEPTH FT	LABORATORY SAMPLE ID	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				280	SAND Light gray, fine grained, with silt, trace of clay, hydrocarbon odor		SM	Posthole	
5									
10				290	SAND Light brown, fine grained, with silt, hydrocarbon odor, wet				
15									
					*Approximate				
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE. NAS CECIL FIELD	LOG of WELL. CEF-811-25	BORING NO
CLIENT. SOUTHDIVNAVFACENGCOM		PROJECT NO 08514-30
CONTRACTOR: Layne Environmental Services	DATE STARTED. 01/11/94	COMPLTD. 01/11/94
METHOD: Hollow Stem Auger	CASE SIZE. 2"	SCREEN INT . 5' to 15'	PROTECTION LEVEL D
TOC ELEV.. FT	MONITOR INST.: Porta FID	TOT DPTH. 15 0FT	DPTH TO ▽ 6 50* FT
LOGGED BY: J Tarr	WELL DEVELOPMENT DATE: 01/25/94	SITE. Jet Engine Test Cell

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 Brown, fine grained, trace of silt		SM	Posthole	
				0	SAND Brown, fine grained			Posthole	
5									
10				0	SAND Brown, fine grained, with silt, wet				
15									
					*Approximate				
20									

APPENDIX D

AQUIFER TEST DATA

Estimates of average pore water velocity were obtained using the following formula:

$$V = (k*I)/n$$

where
- V = discharge (velocity) (ft/day)
- K = hydraulic conductivity (ft/day)
- I = hydraulic gradient
- n = estimated porosity

Assuming a high hydraulic conductivity of 1.39 ft/day and a low conductivity of 0.38 ft/day, an estimated porosity of 25 percent and a hydraulic gradient of -_.___, the calculated average linear pore water velocity would be as follows:

$$V = (0.38 * \_.\_\_\_) / 0.25$$
$$V = \_.\_\_\_ \text{ ft/day to } \_.\_\_\_ \text{ ft/day}$$

In order to calculate a transmissivity value from the slug test results, the following formula was used:

$$T = K * b$$

where
- T = transmissivity (ft^2/day)
- K = hydraulic conductivity (ft/day)
- b = aquifer test interval (thickness) (ft)

based on the formula, the calculation for T would be as follows:

$$T = 0.38 * 55$$
$$T = 20.9 \text{ ft}^2\text{/day to } 76.5 \text{ ft}^2\text{/day}$$

APPENDIX E

LABORATORY DATA SHEETS