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NAS WHITING FIELD
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REMEDIAL INVESTIGATION SITE 11 SOUTH EAST OPEN DISPOSAL ARE NAS WHITING FIELD FL

3/1/2000

HARDING LAWSON ASSOCIATES

REMEDIAL INVESTIGATION

SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B) (LANDFILL)

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

UNIT IDENTIFICATION CODE: N60508
CONTRACT NO.: N62467-89-D-0317/116

MARCH 2000

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA 29418

Harding Lawson Associates
Engineering and Environmental Services
2590 Executive Center Circle East
Tallahassee, Florida 32301 - (850) 656-1293

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REMEDIAL INVESTIGATION REPORT

SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B) (LANDFILL)

NAVAL AIR STATION WHITING FIELD MILTON, FLORIDA

Unit Identification Code: N60508

Contract No.: N62467-89-D-0317/116

Prepared by:

Harding Lawson Associates
2590 Executive Center Circle, East
Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29418

Linda Martin, Code 1859, Engineer-in-Charge

February 2000

CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, Harding Lawson Associates, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/116 are complete and accurate and comply with all requirements of this contract.

DATE: February 14, 2000

NAME AND TITLE OF CERTIFYING OFFICIAL: Rao Angara
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Eric Blomberg, P.G.
Project Technical Lead

(DFAR 252.227-7036)

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FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense (DOD) initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Installation Restoration (IR) program. This program complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), the Resource Conservation and Recovery Act (RCRA), and the Hazardous and Solid Waste Amendments of 1984. These acts establish the means to assess and clean up hazardous waste sites for both private-sector and Federal facilities. The CERCLA and SARA acts form the basis for what is commonly known as the Superfund program.

Originally, the Navy's part of this program was called the Naval Assessment and Control of Installation Pollutants (NACIP) program. Early reports reflect the NACIP process and terminology. The Navy eventually adopted the program structure and terminology of the standard IR program.

The IR program is conducted in several stages as follows:

- preliminary assessment (PA),
- site inspection (SI) (formerly the PA and SI steps were called the initial assessment study under the NACIP program),
- remedial investigation and feasibility study (RI/FS), and
- remedial design and remedial action (RD/RA).

The Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) manages and the U.S. Environmental Protection Agency (USEPA) and the Florida Department of Environmental Protection (formerly Florida Department of Environmental Regulation) oversee the Navy environmental program at Naval Air Station (NAS) Whiting Field. All aspects of the program are conducted in compliance with State and Federal regulations, as ensured by the participation of these regulatory agencies.

Questions regarding the CERCLA program at NAS Whiting Field should be addressed to Ms. Linda Martin, Code 1859, at (803) 820-7341.

EXECUTIVE SUMMARY

A remedial investigation and feasibility study (RI/FS) is being conducted at Naval Air Station (NAS) Whiting Field in Milton, Florida, by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), as part of the Department of Defense Installation Restoration (IR) program. The IR program was designed to identify and abate or control contaminant migration resulting from past operations at naval installations.

A phased approach was implemented to conduct the RI. Phase I was completed in May 1992. The subsequent phases of the RI were designated as Phase IIA and Phase IIB. Fieldwork for Phase IIA was completed in March 1994. Phase IIB was completed in November 1996. A source removal action was conducted by CH2M Hill in June 1999 to address exceedances of residential and industrial cleanup criteria by benzo(a)pyrene.

This RI report contains the results of assessment activities used to characterize site-specific chemicals detected in environmental media (soil gas, soil, and groundwater) at Site 11, Southeast Open Disposal Area (B) (Landfill) at NAS Whiting Field. Data obtained from these activities were used to evaluate the nature and extent of contamination at the site and support feasibility studies (if required) and baseline risk assessments. Human health and ecological baseline risk assessments are included with the RI report.

The fieldwork conducted during the RI included the following tasks:

- soil gas survey,
- geophysical survey,
- test pit investigations,
- subsurface soil sampling,
- surface soil sampling,
- monitoring well installation,
- groundwater sampling, and
- hydrogeologic investigations.

Soil gas samples were analyzed for methane and other volatile organic compounds (VOCs). Soil and groundwater samples were analyzed for target compound list organic analytes, and target analyte list inorganic analytes.

The following conclusions are based on results of the RI investigation activities at Site 11, Southeast Open Disposal Area, NAS Whiting Field.

- Interpretation of the geophysical survey suggested the presence of a single well-defined landfill boundary and three additional smaller anomalies likely caused by surface ferromagnetic metal lying on or near the ground surface.

- Methane and total volatile organic compounds (TVOCs) were detected at 2 of the 46 soil gas locations investigated. At these locations, methane accounted for 58 percent and 100 percent of the total gas measurement. However, the occurrence of soil gas appears to be limited in areal extent and there is no evidence of off-site migration.

- Surface soil samples were reported to contain one VOC, fourteen semivolatile organic compounds (SVOCs), and nine pesticide compounds. However, only concentrations of two SVOCs (benzo(a)pyrene and benzo(a)anthracene) and one pesticide compound (dieldrin) were detected at concentrations exceeding either the USEPA Region III RBCs or their Florida soil cleanup target levels. The location of the benzo(a)pyrene and benzo(a)anthracene exceedances was excavated in June 1999 as part of a source removal action.

- Twenty-three inorganic analytes were detected in the surface soil. Aluminum, arsenic, iron, manganese, and lead were detected in one or more samples in excess of either or both the applicable USEPA Region III risk-based concentrations (RBCs) or the Florida soil cleanup target levels for residential soil.

- Subsurface soil samples were reported to contain three VOCs, one SVOC, five pesticides, and two PCB compounds. However, none of the organic compounds were detected at concentrations exceeding the USEPA Region III RBCs or Florida soil cleanup target levels.

- Nineteen inorganic analytes were detected in the subsurface soil samples. Concentrations of aluminum, beryllium, iron, and manganese in samples exceeded one or more of the USEPA Region III residential or industrial RBCs, or the Florida soil cleanup target levels.

- All of the pH values except one reported for groundwater samples collected at Site 11 were outside the range of Florida Secondary Drinking Water Standards. However, all of the values except two were within the range observed in background samples collected at NAS Whiting Field.

- Four VOCs and two SVOCs were detected in groundwater samples from monitoring wells at Site 11. The detected concentrations of two of the VOCs (vinyl chloride and benzene) exceeded the Florida groundwater cleanup target levels for these compounds. No SVOCs, pesticides, or PCBs were detected in groundwater samples at concentrations exceeding the Florida groundwater cleanup target levels or Federal MCLs. Seventeen inorganic analytes were detected in the Phase IIB groundwater samples. Three inorganic analytes (aluminum, iron, and manganese) were detected at levels that exceeded their respective Florida groundwater cleanup target levels and Federal MCLs.

- At Site 11, the groundwater flow direction is toward the southeast across the site and likely discharges to Big Coldwater Creek. Big Coldwater Creek is located approximately 9,000 feet downgradient of the site. The average horizontal hydraulic gradient for the site area is 0.0029 ft/ft. The geometric mean for the hydraulic conductivity data of monitoring wells in the site area was 8.38 ft/day, and the average seepage velocity value was 0.074 ft/day.

- The Human Health Risk Assessment identified six polynuclear aromatic hydrocarbons (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene),

one pesticide compound (dieldrin), and three inorganic analytes (arsenic, iron, and lead) as the HHCPCs for surface soil at Site 11. No analytes were selected as HHCPCs for subsurface soil. In groundwater samples, three VOCs (1,2-dichloroethene, benzene, vinyl chloride), one SVOC (bis(2-ethylhexyl)phthalate),y and five inorganic analytes (aluminum, arsenic, iron, manganese, and thallium) were identified as HHCPCs.

- The HHCPCs detected in surface soil, subsurface soil, and groundwater do not pose unacceptable carcinogenic risks to the evaluated receptors based on USEPA target risk range of 1×10^{-4} to 1×10^{-6}.

- The total ELCR at Site 11 associated with ingestion of soil by a hypothetical future resident (7×10^{-5}) exceeds Florida's target risk level of concern (1×10^{-6}) due to benzo(a)pyrene and arsenic. The total ELCR at Site 11 associated with ingestion of groundwater by hypothetical future resident (9×10^{-5} exceeds Florida's target level of concern due to vinyl chloride and arsenic.

- The surface soil, subsurface soil, and groundwater noncancer risks are at or below USEPA and FDEP target levels for all potential current and hypothetical future receptors.

- Risks associated with exposures to ECPCs in Site 11 surface soil were evaluated for terrestrial wildlife. Based on the results of the food-web model, lethal risks to terrestrial wildlife at Site 11 are not predicted.

- Sublethal risks to terrestrial wildlife associated with ingestion of pesticides and lead in surface soil and food items were identified; however, elevated concentrations of 4,4'-DDD and lead are localized in the immediate area surrounding sampling location 11-SL-02. Sublethal risks to small mammals and birds appear to be localized to location 11-SL-02 while impacts to top predator populations are predicted over the entire area of Site 11.

- The ERA concluded that growth and reproduction of small mammal and bird populations may be impacted in the area near sample location 11-SL-02, while sublethal impacts to top predator populations are likely over the entire area of Site 11. In addition, the survival of terrestrial invertebrates and consequent abundance for foraging mammals and birds may be impacted from contaminants detected at surface soil location 11S00201 due to TPH and 4,4'-DDT.

RECOMMENDATIONS. Based upon the interpretation of findings from the remedial investigation activities, a feasibility study is recommended for Site 11 to evaluate potential strategies for the reduction in human health and ecological risks associated with surface soil at the site. In addition, the presence of vinyl chloride in Site 11 groundwater samples at concentration exceeding Florida's target risk level indicates that additional sampling and remedial measures may be required. However, all groundwater contamination issues, including soil leaching, will be addressed as part of the current remedial investigation for the facilitywide groundwater study (Site 40).

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
ARAR	applicable or relevant and appropriate requirement
BAF	bioaccumulation factor
BAT	Bengt-Arne-Torstensson
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
cm/sec	centimeters per second
CO_2	carbon dioxide
CPC	chemical of potential concern
CRDL	contract-required detection limit
CT	central tendency
%D	percent Difference
DCE	dichloroethene
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethene
DDT	dichlorodiphenyltrichloroethane
DQO	data quality objective
ECPC	ecological chemical of potential concern
Eh	redox potential
ELCR	excess lifetime cancer risk
EM	electromagnetic
EPC	exposure point concentration
ERA	ecological risk assessment
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FS	feasibility study
ft/day	feet per day
ft/ft	feet per foot
ft/yr	feet per year
GIR	General Information Report
HHCPC	human health chemical of potential concern
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
HRS	Hazard Ranking System
IAS	initial assessment study
IDL	instrument detection limit
IR	Installation Restoration
IRIS	Integrated Risk Information System

GLOSSARY (Continued)

K	hydraulic conductivity
LOAEL	lowest observed adverse effects level
MAG	magnetometry
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
MS/MSD	matrix spike and matrix spike duplicate
μg/kg	micrograms per kilogram
μg/ℓ	micrograms per liter
n	effective porosity
NAS	Naval Air Station
NACIP	Navy Assessment and Control of Installation Pollutants
NCP	National Oil and Hazardous Substances Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
NOAEL	no observable adverse effects level
NPL	National Priority List
NTU	nephelometric turbidity unit
O_2	carbon dioxide
OVA	organic vapor analyzer
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCB	polychlorinated biphenyl
PCE	perchloroethylene
PCPT	piezocone penetrometer test
PDE	potential dietary exposure
PCSCC	Petroleum Contamination Site Cleanup Criteria
PVC	polyvinyl chloride
QAPP	Quality Assurance Program Plan
RBC	risk-based concentration
RGO	remedial goal option
%RSD	percent Relative Standard Deviation
RI	remedial investigation
RI/FS	remedial investigation and feasibility study
RME	reasonable maximum exposure
RPD	relative percent difference
RTV	reference toxicity value
SARA	Superfund Amendments and Reauthorization Act
SDG	sample delivery group
SFF	site foraging frequency
SI	site inspection
SOUTHNAV-FACENGCOM	Southern Division, Naval Facilities Engineering Command
SQL	sample quantitation limit
SCTL	Soil Cleanup Target Level

GLOSSARY (Continued)

SU	standard unit
SVOC	semivolatile organic compound
TAL	target analyte list
TCE	trichloroethene
TCL	target compound list
TM	trademark
TPH	total petroleum hydrocarbons
TVOC	total volatile organic compound
UCL	upper confidence limit
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1.0 INTRODUCTION

Harding Lawson Associates (HLA), under contract to the Department of Navy, Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), is submitting the Remedial Investigation (RI) Report for Site 11, Southeast Open Disposal Area, at Naval Air Station (NAS) Whiting Field located in Milton, Florida. The RI Report for Site 11 is one in a series of site-specific reports being completed in conjunction with the NAS Whiting Field General Information Report (GIR) (ABB-ES, 1998) to summarize the previous investigations and to present the results of the RI.

The Remedial Investigation and Feasibility Study (RI/FS) is being conducted on behalf of the Navy at NAS Whiting Field under contract No. N62467-89-D-0317. The RI was conducted in three phases. The Phase I RI field program was completed in May 1992. The Phase IIA RI field program was conducted between May 1992 and March 1994. The Phase IIB RI field program was completed in November 1996.

A source removal action was conducted by CH2M Hill in June 1999 to address exceedances of residential and industrial cleanup criteria by benzo(a)pyrene. Details of the source removal are presented in Appendix J.

Installation Location and Description. NAS Whiting Field is located in Santa Rosa County, in Florida's northwest coastal area, approximately 7 miles north of Milton and 20 miles northeast of Pensacola (Figure 1-1). NAS Whiting Field presently consists of two air fields separated by an industrial area. The installation is approximately 2,560 acres. Figure 1-2 presents the installation layout and locations of RI/FS sites at NAS Whiting Field. A complete description of historic operations at the facility is presented in Section 1.3 and Appendix A of the NAS Whiting Field GIR (ABB-ES, 1998).

1.1 PURPOSE OF THE RI/FS. The purpose of the NAS Whiting Field RI is to identify and characterize the nature and extent of chemicals in environmental media and potential risks to human and ecological receptors that might be posed by toxic or hazardous chemicals present onsite. The chemicals were potentially released to the environment during past waste disposal practices or spills. The data collected during the RI field program will also be used in an FS (if necessary) to screen, evaluate, and select remedial alternatives to provide permanent, feasible solutions to environmental impacts that may be a result of past waste disposal practices or spills.

1.2 SITE DESCRIPTION. Site 11 is located along the eastern facility property boundary near the South Air Field (Figure 1-2). The site was originally identified as an approximately 3-acre area encompassing an old borrow pit that was used as an open disposal area from 1943 until approximately 1970. The site had uncontrolled access and received a wide variety of wastes, including general refuse, construction debris, tree clippings, furniture, waste solvents, paint, transformer oils, hydraulic fluid, and various other oils. Background information was gathered from the Initial Assessment Study (IAS) (Envirodyne Engineers, Inc., 1985).

When disposal operations were discontinued in 1970, a final covering was placed over the site and pine trees were planted (Geraghty & Miller, December 1986).

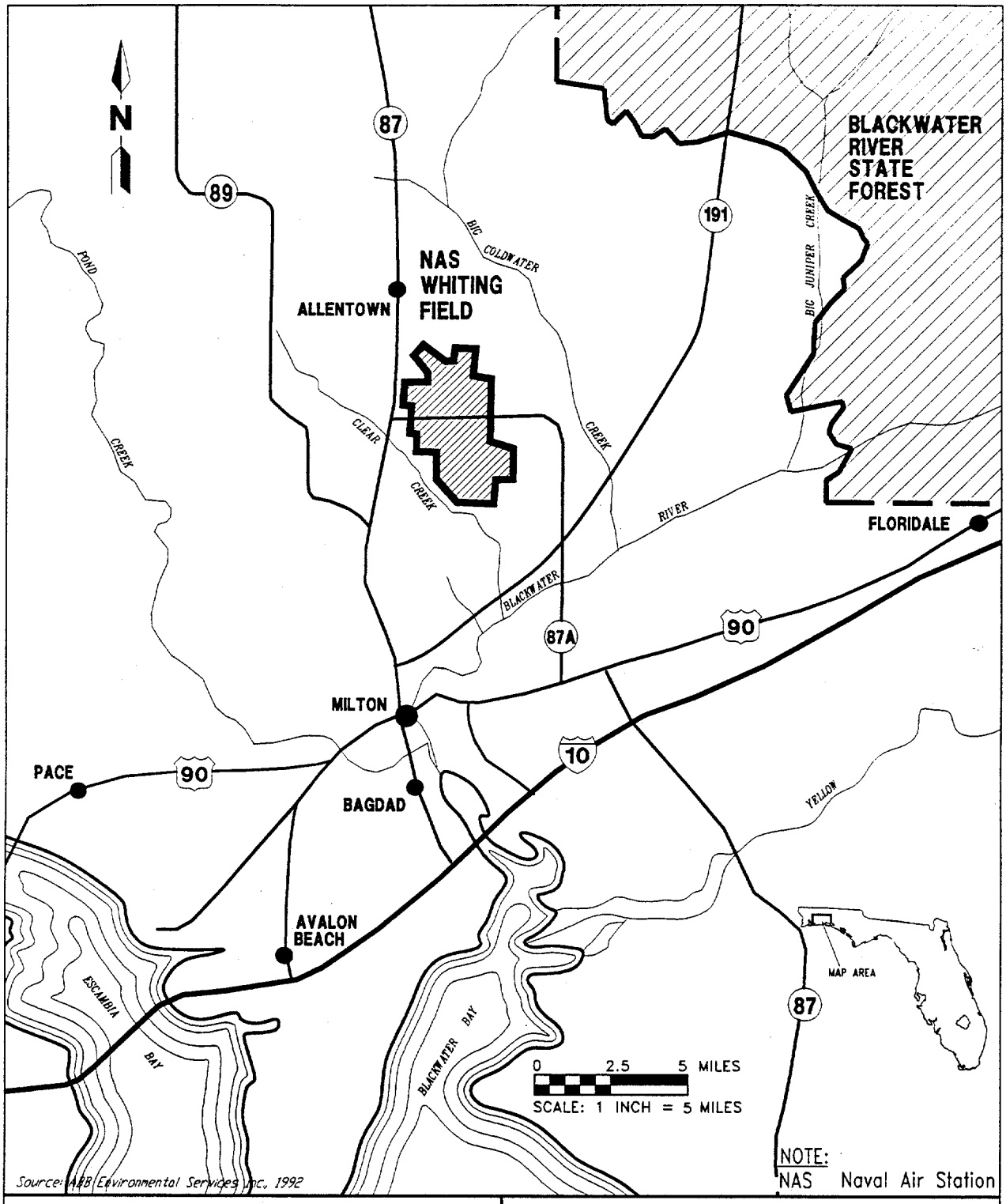

FIGURE 1-1
FACILITY LOCATION MAP

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REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

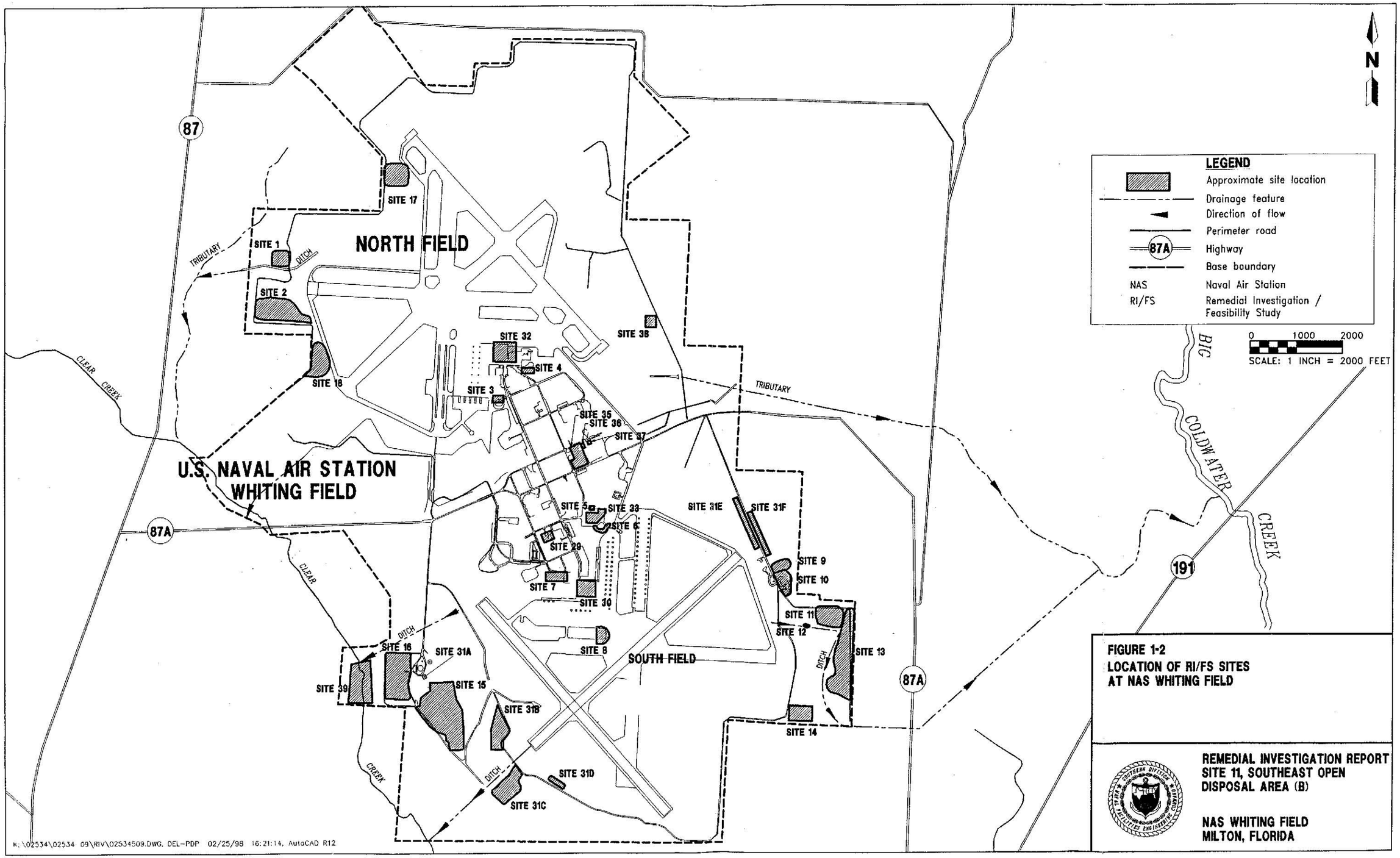

FIGURE 1-2
LOCATION OF RI/FS SITES
AT NAS WHITING FIELD

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN
DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

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1.3 REGULATORY SETTING. The Navy Installation Restoration (IR) program was designed to identify and abate or control contaminant migration resulting from past operations at naval installations. The IR program is the Navy response authority under Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and Executive Order 12580. CERCLA requires that Federal facilities comply with the act, both procedurally and substantively. SOUTHNAVFACENGCOM is the agency responsible for the Navy IR program in the southeastern United States. Therefore, SOUTHNAVFACENGCOM has the responsibility to process NAS Whiting Field through preliminary assessment, site inspection, RI/FS, and remedial response selection in compliance with the guidelines of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300).

Section 105(a)(8)(A) of SARA requires the U.S. Environmental Protection Agency (USEPA) to develop criteria to set priorities for remedial action for chemicals detected in environmental media based on relative risk to human health and the environment. To meet this requirement, USEPA has established the Hazard Ranking System (HRS) as Appendix A to the NCP. First promulgated in 1982, the HRS was amended in December 1990, effective March 14, 1991 (55 Federal Register No. 241:51532-51667), to comply with requirements of Section 105(c)(1) of SARA to increase the accuracy of the assessment of relative risk. The HRS has been substantially revised and is designed to prioritize sites after the site inspection (SI) phase of the CERCLA process. The HRS score for NAS Whiting Field was generated in 1993. The score was sufficient to place NAS Whiting Field on the National Priority List (NPL).

In January 1994, the USEPA placed NAS Whiting Field on a proposed list of sites to be included on the NPL (40 CFR 300, Federal Register, 18 January 1994), and on May 31, 1994, NAS Whiting Field was placed on the NPL effective June 30, 1994 (40 CFR 300, Federal Register, May 31, 1994). As a result, the RI/FS for NAS Whiting Field must follow the requirements of the NCP, as amended by SARA, and regulatory guidance for conducting RI/FS programs under CERCLA.

1.4 REPORT ORGANIZATION. The RI Report is organized into nine chapters (Chapters 1.0 to 9.0). Chapter 1.0 presents the purpose, site description, and regulatory setting for the RI at NAS Whiting Field. Chapter 2.0 summarizes previous investigations. Chapter 3.0 presents the investigative methodology for Phase IIA and Phase IIB of the RI. Chapter 4.0 presents the site-specific data quality assessment. Chapter 5.0 discusses the investigative results of the assessment. Chapter 6.0 presents the Human Health Risk Assessment (HHRA), and Chapter 7.0 presents the Ecological Risk Assessment (ERA). Chapter 8.0 discusses the fate and transport of chemicals determined to be human and/or ecological chemicals of potential concern. Chapter 9.0 provides a summary of the conclusions and recommendations. Chapter 10.0 presents professional review certification.

2.0 PREVIOUS INVESTIGATIONS

This chapter summarizes the previous investigations at Site 11, Southeast Open Disposal Area, at NAS Whiting Field. Previous investigations include an IAS, Verification Study, and the Phase I of the RI.

2.1 INITIAL ASSESSMENT STUDY. Background information was gathered for the IAS (Envirodyne Engineers, Inc., 1985) by conducting a record search, performing an onsite survey, and conducting interviews with long-time employees and retired personnel familiar with the site. Interviews with facility personnel and record reviews indicated that prior to the 1970s most of the hazardous waste was disposed of at various onbase disposal pits.

Site 11 was originally identified as an approximately 3-acre area encompassing an old borrow pit that was used as an open disposal area from 1943 until approximately 1970. The site had uncontrolled access and received a wide variety of wastes, including general refuse, construction debris, tree clippings, furniture, waste solvents, paint, transformer oils, hydraulic fluid, and various other oils (Envirodyne Engineers, Inc., 1985).

Envirodyne Engineers, Inc., recommended in the IAS that a confirmation study be completed based on the types of wastes possibly disposed of at the site, the potential for off-site migration, and the presence of human and ecological receptors. The confirmation study would typically consist of two parts: verification and characterization; however, only the verification phase was conducted.

2.2 VERIFICATION STUDY. The Verification Study (Geraghty & Miller, 1986) at Site 11 consisted of the installation of one monitoring well (WHF-11-1) along the eastern side of the site. Monitoring well WHF-11-1 was installed to a depth of 127 feet below land surface (bls) and later water-level measurements (ABB-ES, 1995a) indicate the well to be hydraulically crossgradient to the site.

One groundwater sample was collected from monitoring well WHF-11-1 and analyzed for USEPA priority pollutants and additional herbicide compounds. Bis-(2-ethylhexyl)phthalate was detected at 23 micrograms per liter ($\mu g/\ell$), and mercury and zinc were detected at concentrations below the State and Federal maximum contaminant levels (MCLs) in effect at that time.

2.3 RI PHASE I INVESTIGATION, 1990-1992. In December 1990, HLA, under contract to the Department of the Navy, and SOUTHNAVFACENGCOM initiated an RI at NAS Whiting Field. The objective of Phase I of the RI was to characterize the nature and extent of contamination at sites identified during the IAS. The Phase I RI program addressed 14 of 18 previously identified sites at the installation.

The RI Phase I investigation at Site 11 consisted of collecting two groundwater samples using a piezocone penetrometer test (PCPT) and Bengt-Arne-Torstensson (BAT) sampler and installing one monitoring well. On April 11, 1991, PCPT exploration WHF-11-CPT-1 was advanced at the southeastern corner of Site 11. A shallow and a deep BAT groundwater sample were collected from WHF-11-CPT-1 at

depths of 92 and 132 feet bls. The two samples were analyzed for volatile organic compound (VOCs) and target analyte list (TAL) inorganic analytes at an off-site laboratory. Acetone and carbon disulfide were detected in the samples, but were interpreted to be artifacts resulting from decontamination procedures (ABB-ES, 1992a). Seven inorganic analytes (aluminum, barium, calcium, iron, manganese, sodium, and zinc) were detected. Detailed results are summarized in the RI Phase I Technical Memorandum No. 5 (ABB-ES, 1992a).

An additional monitoring well (WHF-11-2) was installed at an intermediate depth of 125 feet bls southwest and based on later water-level measurements, the well was determined to hydraulically crossgradient of the site (ABB-ES, 1995a). An *in situ* permeability test (slug test) was conducted to assess hydraulic properties. No groundwater sample from this well was collected for laboratory analysis during the Phase I.

3.0 FIELD INVESTIGATIVE METHODS

Field investigative techniques used during the RI to collect the data are described in the RI/FS Workplan, Volume II (E.C. Jordan, 1990), which provides descriptions of sampling methods, field personnel responsibilities, sample management, chain of custody, project documentation, change in field methods, protocols on corrective actions, decontamination procedures, waste management handling, and other general project standards and procedures in Section 3.1, General Site Operations.

Field and laboratory quality assurance and quality control requirements for the RI activities comply with the RI/FS Quality Assurance Project Plan (QAPP) located in Appendix A of the RI/FS Workplan, Volume II (E.C. Jordan, 1990). Health and safety requirements were in accordance with the general Health and Safety Plan located in Volume III of the RI/FS Workplan (E.C. Jordan, 1990).

Field investigative methods not covered in the documents identified above are described in Technical Memorandum No. 7, RI Phase IIB Workplan (ABB-ES, 1995b) and in the NAS Whiting Field GIR (ABB-ES, 1998).

These field and laboratory investigation techniques are in general conformance with USEPA standard operating procedure (USEPA, 1991a and 1996a) and were followed during the RI sampling and analysis program.

Following the RI Phase I, two additional phases of RI activities were conducted at Site 11. Phase IIA investigations were conducted at NAS Whiting Field from 1992 to 1994. At Site 11 these investigations consisted of a geophysical survey, surface soil sampling, test pitting and subsurface soil sampling, monitoring well installations, and groundwater sampling. A detailed summary of the Phase IIA work is presented in RI/FS Technical Memorandums No. 1 through No.6 released in 1994 and 1995. Based upon additional data needs, the RI Phase IIB was carried out during 1995 and 1996. The proposed Phase IIB work was presented in the RI/FS Technical Memorandum No. 7, Phase IIB Workplan (ABB-ES, 1995b). At Site 11, RI Phase IIB activities included a soil gas survey, surface soil sampling, monitoring well installations, and groundwater sampling.

The following sections provide a brief description of the Phase IIA and Phase IIB field investigation and sampling methodologies at Site 11.

3.1 GEOPHYSICAL SURVEY. Geophysical surveys at Site 11 were conducted in May through June 1992 as part of the Phase IIA investigation. The purpose of the geophysical surveys was to assess the lateral and vertical extent of the waste disposal area and locate buried metallic or nonmetallic objects that may indicate a potential waste disposal area.

Geophysical methods used at the site include electromagnetic (EM) induction and magnetometry (MAG). Blackhawk Geosciences, Inc., Golden, Colorado, was subcontracted by HLA to conduct the geophysical tasks. A technical report describing the methodology, results, and conclusions of the geophysical survey was prepared in February 1993 (ABB-ES, 1993).

Data from the EM and MAG surveys were collected along east to west grid lines that were spaced 40 feet apart. The grid lines were oriented with a magnetic compass and measuring tape. Data were collected at stations located at 10-foot intervals along each grid line. These grid lines were later surveyed by a Florida-licensed surveyor. The location of the grid and the plotted geophysical data are presented on Figures A-1 through A-4 in Appendix A. The results of the geophysical survey are presented in Section 5.3.

3.2 SOIL GAS SURVEY FOR METHANE. During the Phase IIB investigation, a soil gas survey was conducted in June 1995 at Site 11 to assess the presence of methane gas or other VOCs potentially emanating from the site. A total of 31 soil gas samples was collected across the site and up to 100 feet beyond the site boundary. Sample locations were determined based on a 100- by 100-foot grid. Figure 3-1 presents the locations of the active soil gas survey points. The 31 soil gas samples were collected from grid locations 9 through 20, 23 through 34, 37 through 41, and 43 through 48 (Figure 3-1).

At each location, an open-ended stainless-steel tube was pushed or manually driven to the proposed sampling depths of 1.5 feet and 3.0 feet bls. Organic vapor measurements were made at the two sampling depths. The air within the stainless-steel tube was purged with a vacuum pump to obtain a representative sample of soil gas. Organic vapor concentrations were measured in the field with either a Portafid II™ or a Foxboro OVA-128™ organic vapor analyzer (OVA). If total VOCs were detected in a soil gas sample, a granulated charcoal filter was attached to the OVA intake probe. Organic vapor measurements were recorded with and without the charcoal filter. A comparison of the two measurements allowed a qualitative analysis of the presence of methane gas. Soil gas samples were not submitted for laboratory analysis.

A common problem associated with the use of the OVAs was probe flame-out due to either high humidity or high carbon dioxide (CO_2)/low oxygen (O_2) levels in the soil-gas samples. If an OVA flame-out occurred, a landfill gas analyzer (LFG-10™) was used to measure methane and CO_2 levels. The results of the soil gas survey are presented in Section 5.4.

3.3 SURFACE SOIL ASSESSMENT. Five surface soil samples were collected at Site 11 in August 1992 as part of Phase IIA RI. An additional 13 surface soil samples were collected in January 1996 during Phase IIB RI.

The five Phase IIA surface soil sampling locations (11-SL-01 through 11-SL-05, and duplicate sample 11-SL-01A) were identified based upon visual inspection and geophysical anomalies (Figure 3-2). Surface soil samples were collected from the land surface to a maximum depth of 12 inches bls using a decontaminated stainless-steel auger. To minimize volatilization, samples for VOC analyses were directly transferred from the stainless-steel auger bucket with a stainless-steel spoon into standard soil sample jars. The remaining sample was emptied into a glass bowl using a stainless-steel spoon. Soil samples for all other analyses were thoroughly mixed in a glass bowl prior to transferring into standard sample containers. Surface soil samples were analyzed for target compound list (TCL), VOCs, semivolatile organic compound (SVOCs), pesticides and polychlorinated biphenyls (PCBs), and TAL inorganic analytes.

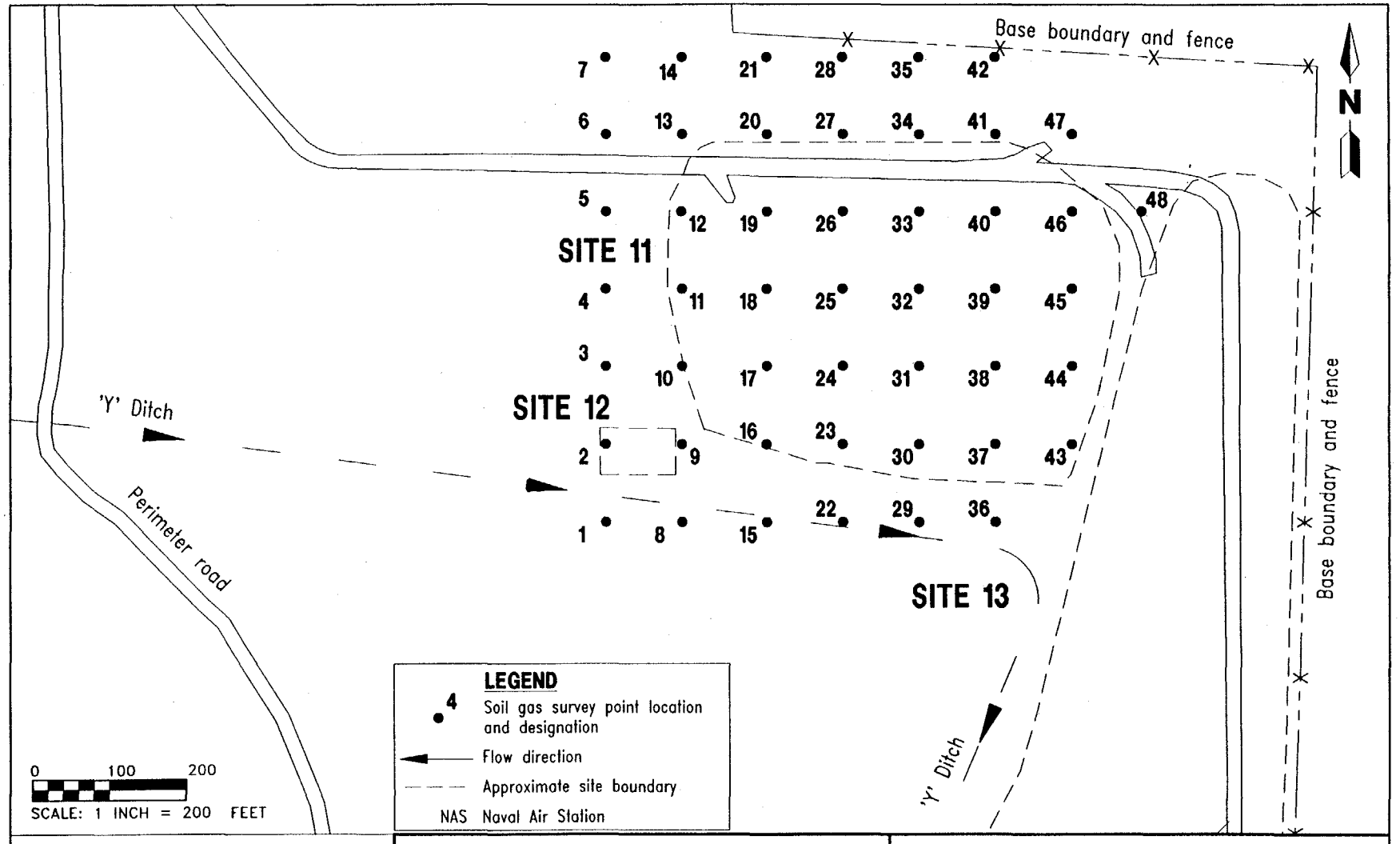

FIGURE 3-1
LOCATION OF ACTIVE SOIL GAS SURVEY POINTS

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

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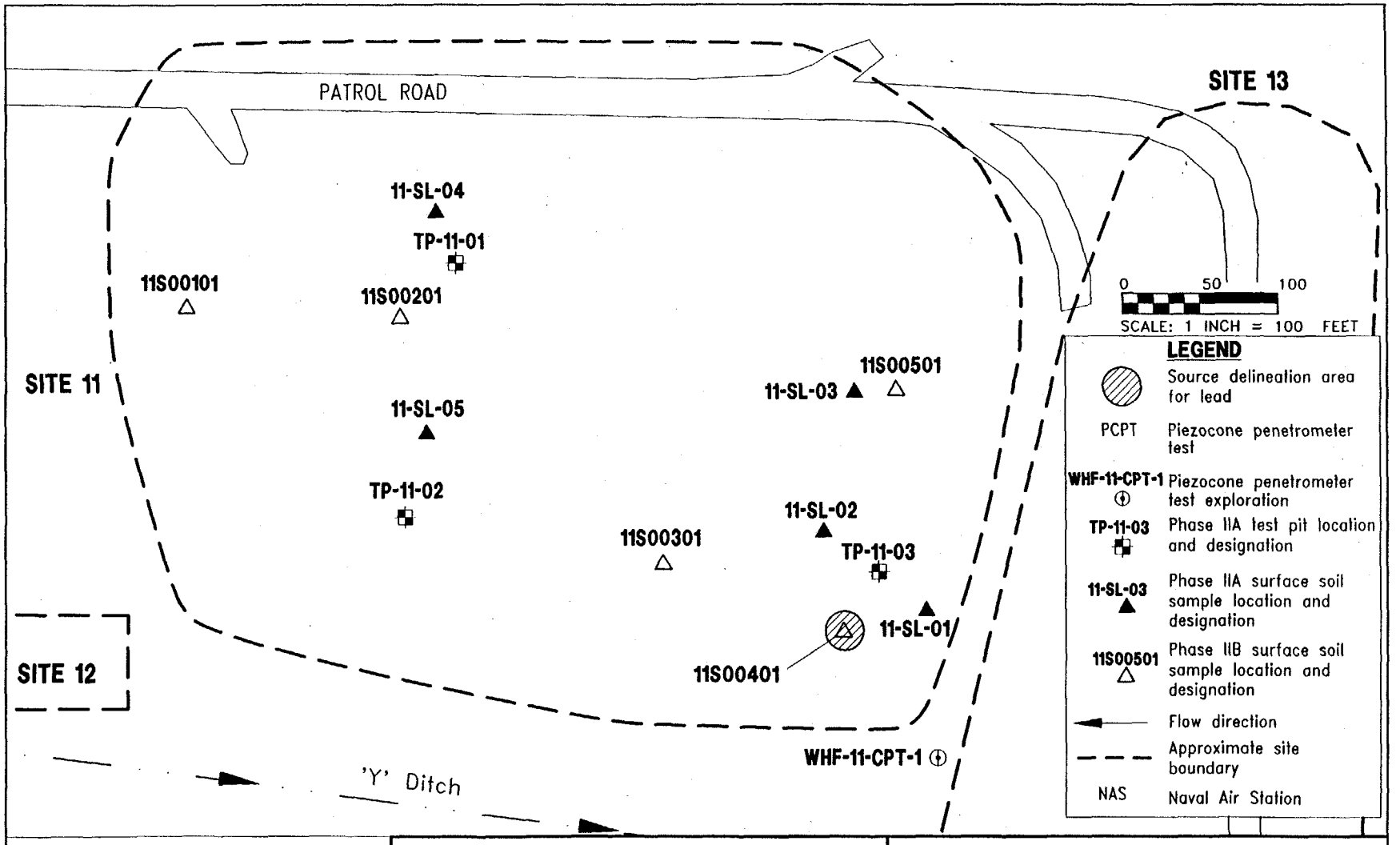

FIGURE 3-2
LOCATION OF SURFACE SOIL SAMPLES, TEST PITS, AND PCPT EXPLORATION

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REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

Five of the thirteen surface soil sample locations (11S00101 through 11S00501) chosen during the Phase IIB RI were selected to obtain an unbiased characterization of on-site surface soil and support both the ERA and the HHRA. Sampling locations were determined using the systematic sampling method where a point is chosen at random along a transect, and then samples are collected at equidistant intervals thereafter (Gilbert, 1987; USEPA, 1989a). Samples (11S00101 through 11S00501) were analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganic analytes, and total petroleum hydrocarbons (TPH).

The remaining eight Phase IIB surface soil samples (11S00601 through 11S01301) were collected on a ten-foot-radius around Phase IIA soil sample 11S00401. These samples were collected for source delineation of lead at this location and the samples were analyzed for lead only. After review of the draft RI report, it was noted that the delineation of lead should have been ground surface soil sample 11-SL-02. CH2M Hill conducted additional soil sampling in April 1999 to delineate lead around soil sample 11-SL-02. Results of this sampling event are presented in Appendix J.

All Phase IIB surface soil samples were collected from the land surface to a maximum depth of 12 inches bls using a decontaminated stainless-steel auger. Soil samples were described using the Unified Soil Classification System and recorded in a bound field logbook by HLA personnel.

Background screening criteria were established by collecting background samples across the installation from each U.S. Department of Agriculture (USDA) soil type identified at NAS Whiting Field. These data are presented in Subsection 3.3.1 of the GIR (ABB-ES, 1998). The arithmetic mean of analytes detected in the background soil samples was calculated by summing individual analyte concentrations and then dividing the sum by the number of samples from which the analytes were detected. Samples were then compared to twice the arithmetic mean of analyte concentrations detected in background surface soil samples associated with the Troup loamy sand and Dothan fine sandy loam soil types. The surface soil sampling results are discussed in Section 5.5 of this report.

3.4 SUBSURFACE SOIL ASSESSMENT. Subsurface soil assessment at Site 11 consisted of split-spoon sampling collected during the installation of monitoring wells for both Phase IIA and Phase IIB, and the collection of three soil samples during Phase IIA test pit excavations. The following subsections provide a description of the soil sampling activities associated with both monitoring well installations and the excavation of test pits.

Detailed lithologic descriptions for all monitoring wells and PCPT soundings are presented in Phase I Technical Memorandum No. 1, Geological Assessment (ABB-ES, 1992b) and in Phase IIA Technical Memorandum No. 2, Geological Assessment (ABB-ES, 1995c). A summary of the Site 11 lithology is also presented in Section 5.1 of this report.

3.4.1 Split-Spoon Sampling Lithologic data were recorded during monitoring well installation. Monitoring wells WHF-11-1S and WHF-11-3 were installed during Phase IIA and monitoring well pair WHF-11-4S/WHF-11-4D was installed during Phase IIB. Soil samples were collected using a 2-foot split spoon and visually inspected by an HLA geologist. All data were entered into a bound logbook. Detailed soil descriptions and other pertinent data are presented in the boring logs for the soil boring investigation located in Phase IIA Technical Memorandum No. 2, Geological Assessment (ABB-ES, 1995c). Split-spoon samples were generally

collected at 5-foot intervals during drilling of the monitoring wells. Monitoring well installations were conducted in conjunction with the hydrogeologic and groundwater investigations (summarized in Phase IIA Technical Memoranda Nos. 4 [ABB-ES, 1995a] and 5 [ABB-ES, 1995d], respectively).

3.4.2 Test Pitting Three test pits (TP-11-01, TP-11-02, and TP-11-03) were excavated on October 8, 1992, at Site 11 following the completion of the geophysical survey. UXB International, Inc., from Chantilly, Virginia, was subcontracted by HLA to conduct the test pit excavations.

The test pits were excavated at a location where a geophysical anomaly potentially defined buried materials. The purpose of the test pits was to characterize waste materials, if present, by the description, collection, and chemical analysis of a subsurface soil sample.

Prior to excavating the test pits, the proposed areal dimensions and orientations of the test pits were surveyed by UXB with a hand-held magnetometer, a terrain conductivity meter (FEREX™ 4.021), and a metal detector. Site-specific field activities also included clearing of vegetation.

After each test pit location and orientation had been determined, the four corners of the test pits were staked. The staked locations were referenced to the grid coordinates defined for the geophysical survey. A backhoe was used to excavate rectangular pits. The physical description of each soil layer and waste type was recorded in the field logbook during test pit excavation. A subsurface soil sample was collected directly from the backhoe bucket during the excavation. Following sample collection, the test pit was backfilled with excavated soil.

Three subsurface soil samples (11-SS-01-01, 11-SS-02-02, and 11-SS-03-03) were collected from a depth of 5 to 6 feet bls in the test pits. Soil samples for VOC analyses were collected with a decontaminated stainless-steel spoon directly from the backhoe bucket and placed into a sample jar. Additional sample portions were scooped from the backhoe bucket with a stainless-steel spoon, mixed thoroughly in a glass bowl, and then transferred to the appropriate standard sample containers. The subsurface soil samples were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL inorganic analytes. The location of the test pits are presented on Figure 3-2. Sampling results are discussed in Section 5.6 of this report.

3.5 HYDROGEOLOGIC ASSESSMENT. The hydrogeologic assessment of Site 11 included Site 11 and five adjacent sties, including Site 9 (Waste Fuel Disposal Pit), Site 10 (Southeast Open Disposal Area A), Site 12 (Tetraethyl Lead Disposal Area), Site 13 (Sanitary Landfill), and Site 14 (Short-Term Sanitary Landfill). Data from all six sites were combined to provide a larger data set and better understanding of the hydrogeologic conditions.

The hydrogeologic field investigation activities included the collection of water-level data from 15 monitoring wells and conducting slug test analyses on five monitoring wells. Results of the Phase IIA hydrological assessment are presented in Phase IIA Technical Memorandum No. 4, Hydrogeologic Assessment (ABB-ES, 1995a). Monitoring well construction details are presented in Table 3-1. Results of the hydrogeologic assessment are also presented in Section 5.2 of this report.

Table 3-1
Summary of Monitoring Well Construction Details

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	RI Phase of Well Completion	Well Size (inches)	Land Surface Elevation (feet msl)	TOC Elevation (feet msl)	Total Well Depth (feet BTOC)	Approximate Screen Interval (feet BTOC)	Surface Casing Length (feet bls)
Southeast Disposal Area							
Site 9, Waste Fuel Disposal Pit							
WHF-9-1	VS	4	144.66	146.55	118.40	108 to 118	NA
WHF-9-2	I	4	158.11	161.07	124.35	114 to 124	NA
WHF-9-3S	IIA	2	147.92	150.85	108.24	93 to 108	0 to 77
Site 10, Southeast Open Disposal Area (A)							
WHF-10-1	VS	4	144.19	146.73	118.20	108 to 118	NA
WHF-10-2	IIA	2	147.78	150.75	113.14	98 to 113	NA
Site 11, Southeast Open Disposal Area (B)							
WHF-11-1	VS	4	122.48	124.86	128.40	118 to 128	NA
WHF-11-1S	IIA	2	114.91	116.65	54.40	39 to 54	NA
WHF-11-2	I	4	145.19	148.12	125.84	120 to 125	NA
WHF-11-3	IIA	2	114.29	117.19	73.16	58 to 73	0 to 46
WHF-11-4S	IIB	2	126.13	129.43	79.0	64 to 79	NA
WHF-11-4D	IIB	2	125.79	128.94	109	99 to 109	NA
Site 12, Tetraethyl Lead Disposal Area							
WHF-12-1	VS	4	134.20	136.40	113.4	03 to 113	NA
WHF-12-2	IIB	2	132.45	135.56	85	70 to 85	NA
Site 13, Sanitary Landfill							
WHF-13-1	VS	4	100.40	102.66	122.90	112 to 122	NA
WHF-13-1S	IIA	2	104.61	108.97	61.30	46 to 61	NA
WHF-13-1I	IIB	2	NR	109.17	93	83 to 93	NA
WHF-13-2S	IIA	2	99.94	102.86	72.41	57 to 72	0 to 42
WHF-13-3	IIB	2	81.38	81.44	41	26 to 41	NA
WHF-13-4	IIB	2	80.41	80.37	40	25 to 40	NA
Site 14, Short-Term Sanitary Landfill							
WHF-14-1	VS	4	137.83	139.69	153.20	143 to 153	NA
WHF-14-2	IIA	2	142.86	145.80	118.30	103 to 118	0 to 94

Notes: RI = remedial investigation.
msl = mean sea level.
TOC = top of casing.
BTOC = below top of casing.
bls = below land surface.
VS = verification study.
NA = not applicable.
I = remedial investigation Phase I.
IIA = remedial investigation Phase IIA.
IIB = remedial investigation Phase IIB.
NR = not recorded.

3.6 GROUNDWATER ASSESSMENT. Groundwater assessment activities at Site 11 for Phase IIA and Phase IIB RI activities consisted of monitoring well installations and groundwater sampling.During the Phase IIA investigation, two monitoring wells, WHF-11-1S and WHF-11-3, were installed at the site. Both monitoring wells were installed with 15-foot screened sections intersecting the observed water table. WHF-11-1S and WHF-11-3 were completed to depths of 54.42 feet bls and 73.16 feet bls, respectively.

Two additional monitoring wells, WHF-11-4S and WHF-11-4D, were installed at Site 11 during the Phase IIB. The deep monitoring well (WHF-11-4D) was installed with a 10-foot-long screen to a depth of approximately 109 feet bls. The shallow monitoring well (WHF-11-4S) was installed with a 15-foot screen that intersected the water table.

During Phase IIA groundwater samples were collected from monitoring wells WHF-11-1, WHF-11-1S, WHF-11-2, and WHF-11-3 in October 1993. The groundwater samples were collected using a Teflon™ bailer after purging the monitoring wells with either a submersible or bladder pump. The groundwater samples were analyzed for Contract Laboratory Program (CLP) (Naval Energy and Environmental Support Activity [NEESA] Level C) TCL VOCs, SVOCs, pesticides and PCBs, and TAL inorganics.

During Phase IIB of the RI, groundwater samples were collected from all six monitoring wells installed at Site 11 using low-flow sampling techniques. Purging and sampling methodology was followed as presented in Paragraph 2.1.7.2 of the GIR (ABB-ES, 1998). The groundwater samples were analyzed for CLP (NEESA Level D) TCL VOCs, SVOCs, pesticides and PCBs, and TAL inorganic analytes. Samples for TAL inorganic analytes were unfiltered (total analysis) if turbidity was below 10 nephelometric turbidity units (NTUs). If turbidity was greater than 10 NTUs, an additional groundwater sample was collected and filtered (dissolved-phase inorganics) using a 45-micron filter. The purpose of the additional groundwater sample was to assess uncertainty associated with a turbid unfiltered groundwater sample.

Analyses were also conducted to assess secondary water quality parameters and provide data for assessing remedial alternatives in the FS. The analyses included alkalinity, chloride, sulfates, hardness, ammonia nitrates, total Kjeldahl nitrogen, nitrate and nitrite, pH, phosphorous, total dissolved solids, and total organic carbon. Water quality parameter data are presented in Section 5.7 of this report.

4.0 SITE-SPECIFIC DATA QUALITY ASSESSMENT

This chapter describes how the data generated during Phase IIB of the RI at Site 11 were managed and evaluated. Section 4.1 describes the analytical program and data management for the RI at Site 11. Section 4.2 summarizes the precision, accuracy, representativeness, completeness, and comparability (PARCCs) report on the data. Section 4.3 presents a summary of the Data Quality Assessment.

The soil and groundwater samples collected during Phase IIA of the RI were qualified according to USEPA functional guidelines for evaluation of organic (USEPA, 1991e) and inorganic analytes (USEPA, 1988) data analyzed using USEPA CLP protocol. The data quality objective (DQO) assessment for the Phase IIA soil samples is presented in detail in RI Phase IIA Technical Memorandum No. 3 (ABB-ES, 1994). The DQO assessment for the Phase IIA groundwater samples is presented in detail in RI Phase IIA Technical Memorandum No. 5 (ABB-ES, 1995d).

4.1 ANALYTICAL PROGRAM. Samples collected during the Phase IIB of the RI at Site 11 were analyzed using off-site laboratory analytical methods. Sampling locations are presented in Chapter 3.0 of this report and sample results are presented in Chapter 5.0 and Appendix C (soil data) and Appendix D (groundwater data).

Environmental samples (surface soil and groundwater) were collected and analyzed by an off-site laboratory using CLP methodology (USEPA, 1986a) for analysis of VOCs, SVOCs, pesticides, PCBs, metals, and cyanide. Some groundwater samples were also analyzed for wet chemistry analyses. The laboratory analytical program is described in more detail in Section 2.2 of the NAS Whiting Field GIR (ABB-ES, 1998).

Analytical results obtained for all environmental samples during the RI sampling events were submitted as NEESA Level D (USEPA Level IV) analytical packages for VOCs, SVOCs, pesticides, PCBs, metals, cyanide, and wet chemistry.

4.2 DATA REVIEW. Data validation is the technical review of individual analytical results relative to the following criteria:

- DQOs and the QAPP in the NAS Whiting Field Workplan (E.C. Jordan Co. Inc., 1990, and ABB-ES, 1995b).
- NEESA guidance document 20.2-047B, Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Program (NEESA, 1988).
- USEPA, CLP National Functional Guidelines for Organic Data Review, February 1994 (USEPA, 1994a).
- USEPA, CLP National Functional Guidelines for Inorganic Data Review, February 1994 (USEPA, 1994b).

The data validation process is described in Section 2.3 of the NAS Whiting Field GIR (ABB-ES, 1998).

The data were reviewed, validated, and evaluated using the PARCC specified in the DQOs. PARCC criteria are described in Section 2.3 of the NAS Whiting Field GIR (ABB-ES, 1998). The Site 11 Phase IIB soil and groundwater analytical data were validated by Laboratory Data Consultants, Inc., of Carlsbad, California, in 1996. The Site 11 Phase IIB data include sample delivery group (SDG) WF11B and WF012 for soil samples and SDG WF028 for groundwater samples. The subsections below summarize the PARCC criteria evaluation of the analytical data.

4.2.1 **Precision** Precision is a measure of the agreement or repeatability of a set of replicate results (relative percent difference [RPD]) obtained from duplicate laboratory analyses of samples collected from the same location and depth interval. Precision for analytical data collected during the RI sampling events was evaluated using results of field duplicate samples, laboratory duplicate samples, matrix spike and matrix spike duplicate (MS/MSD) samples, and/or consecutive laboratory control samples. The evaluation of precision for the RI sampling event is presented in Table 4-1 and summarized below.

The only exceedance of RPD limits for MS/MSD samples was the semivolatile compound pyrene in SDG WF11B. All other parameters were within MS/MSD RPD limits for the two SDGs.

Soil field duplicate samples from SDG WF11B and SDG WF012 each had a sample with RPD control limit exceedances (RPD greater than 50 percent). Soil field duplicate sample 10S00201 from SDG WF11B had seven organic compounds, (phenanthrene [128 RPD], fluoranthene [90 RPD], pyrene [52 RPD], benzo(a)anthracene [74 RPD], chrysene [59 RPD], bis(2-ethylhexyl)phthalate [183 RPD], benzo(k)fluoranthene [62 RPD]) and two inorganic compounds (calcium [51 RPD] and magnesium [66 RPD]) exceeding the control limits. Field duplicate sample 31S00501 from SDG WF012 had one exceedance of the RPD control limit (magnesium [53 RPD]).

All groundwater MS/MSDs are within the RPD control limits.

Two groundwater field duplicate samples from SDG WF028 had RPD control limit exceedances (RPD greater than 30 percent). Field duplicate sample 12G00101 had a control limit exceedance for the organic compound acetone(67 RPD). Field duplicate sample 11G002201 had five inorganic compounds in exceedance (copper [43 RPD], iron [37 RPD], magnesium [32 RPD], manganese [74 RPD], and zinc [151 RPD]).

Possible causes for RPD exceedances include poor sample heterogeneity, improper sample collection, inconsistent sample preparation, and poor instrument stability. During the validation process, the precision results associated with the exceedances listed above for both soil and groundwater media were considered moderately imprecise. The MS/MSD and field duplicate results indicate an acceptable level of precision was obtained (Appendix B).

4.2.2 **Accuracy** Accuracy is a measure of the agreement between the true value and the value measured using an analytical method (percent recovery). Accuracy also is evaluated during data validation by assessing initial and continuing calibration data for the analytical instrument. Accuracy for analytical data collected during the RI sampling events was assessed by evaluating percentage recoveries for MS/MSD samples, surrogate recoveries, laboratory control samples, and initial and continuing calibration standard results. The evaluation of recoveries for MS/MSD samples is presented in Table 4-2 and summarized below.

Table 4-1
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
Soil						
WF11B						
Organics (μg/kg)	10S00201	Acetone	29	20	37	50
		2-Hexanone	11 U	4	NC	50
		Phenanthrene	68	310	128	50
		Di-*n*-butylphthalate	46	380 U	NC	50
		Fluoranthene	160	420	90	50
		Pyrene	170	290	52	50
		Butylbenzylphthalate	57	380 U	NC	50
		Benzo(a)anthracene	87	190	74	50
		Chrysene	120	220	59	50
		bis(2-Ethylhexyl)phthalate	3,200	140	183	50
		Benzo(a)fluoranthene	150	200	28	50
		Benzo(k)fluoranthene	110	210	62	50
		Benzo(a)pyrene	95	150	45	50
		Indeno(1,2,3-cd)pyrene	58	56	4	50
		Acenaphthene	380 U	40	NC	50
		Anthracene	380 U	54	NC	50
		Carbazole	380 U	84	NC	50
Pesticides and PCB		4,4'-DDT	7.0	8.9	24	50
TAL Metals (mg/kg)		Aroclor-1254	340	390	14	50
		Aluminum	8,960	5,890	41	50
		Arsenic	3.6	2.4	40	50
		Barium	9.2	8.1	13	50
		Beryllium	0.10	0.06	50	50
		Cadmium	1.4	1.3	7	50
		Calcium	1,320	779	51	50
		Chromium	16.0	12.2	27	50
		Cobalt	0.79	0.82	4	50
		Copper	10.8	11.5	6	50
		Iron	9,660	8,650	11	50
		Lead	32.5	29.0	11	50

See notes at end of table.

Table 4-1 (Continued)
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
TAL Metals (mg/kg) (Continued)						
		Magnesium	200	100	66	50
		Manganese	39.3	36.4	8	50
		Nickel	2.0	ND	NC	50
		Potassium	69.4	ND	NC	50
		Sodium	181	192	6	50
		Vanadium	24.5	20.8	16	50
		Zinc	50.0	42.9	15	50
		Cyanide	0.20	0.13	42	50
		TRPH	105	66.1	46	50
WF012						
Organics (µg/kg)	31S00501	Acetone	9	8	12	50
TAL Metals (mg/kg)		Aluminum	4,500	6,050	29	50
		Arsenic	1.3	1.2	8	50
		Barium	6.6	8.6	26	50
		Calcium	143	146	2	50
		Chromium	2.8	3.8	30	50
		Cobalt	ND	1.2	NC	50
		Copper	2.2	3.0	31	50
		Iron	2,470	2,840	14	50
		Lead	3.2	2.9	10	50
		Magnesium	80.1	138	53	50
		Manganese	87.0	95.3	9	50
		Nickel	1.9	2.2	15	50
		Potassium	81.9	115	34	50
		Selenium	0.18	ND	NC	50
		Sodium	192	175	9	50
		Vanadium	5.9	7.2	20	50
		Zinc	3.9	5.2	28	50
		Barium,TCLP	0.393	0.574	37	50
		Chromium,TCLP	0.0017 U	0.0018	NC	50
		Selenium,TCLP	0.0217 U	0.2351	NC	50
		Cyanide	0.09	ND	NC	50

See notes at end of table.

Table 4-1 (Continued)
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
TAL Metals (µg/ℓ)	11S00601	Lead	19.3	25.0	26	50
Groundwater						
WF028						
Organics (µg/ℓ)	12G00101	Acetone	3	6	67	30
		bis(2-Ethylhexyl)phthalate	2	2	0	30
TAL Metals (µg/ℓ)		Aluminum	14.0	15.1	8	30
		Barium	14.5	14.5	0	30
		Calcium	1,840	1,870	2	30
		Lead	0.60	0.50 U	NC	30
		Magnesium	320	327	2	30
		Manganese	1.0 U	1.4	NC	30
		Potassium	2,220	2,290	3	30
		Sodium	2,310	2,360	2	30
		Thallium	0.70	0.60 U	NC	30
		Zinc	6.7	5.5	20	30
		Cyanide	1.8 U	2.1	NC	30
TAL Metals (µg/ℓ)	11G00201					
		Aluminum	2,770	2,320	18	30
		Arsenic	1.7	2.0	16	30
		Barium	50.3	51.6	3	30
		Beryllium	0.40	0.30 U	NC	30
		Calcium	35,400	41,800	17	30
		Chromium	20.4	19.2	6	30
		Copper	2.0	3.1	43	30
		Iron	232	337	37	30

See notes at end of table.

Table 4-1 (Continued)
Precision Summary for Soil and Groundwater Field Duplicate Samples

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Compound	Sample Concentration	Duplicate Concentration	RPD	Control Limits
TAL Metals (μg/ℓ) (Continued)						
		Lead	0.50 U	0.90	NC	30
		Magnesium	388	538	32	30
		Manganese	2.2	4.8	74	30
		Potassium	12,900	9,610	29	30
		Sodium	3,420	2,950	15	30
		Vanadium	11.0	11.0	0	30
		Zinc	3.4	24.3	151	30
		Cyanide	1.5 U	3.3	NC	30

Notes: SDG = sample delivery group.
ID = identification.
RPD = relative percent difference.
μg/kg = micrograms per kilogram.
U = compound not detected above detection limit, detection limit is reported.
NC = not calculable.
PCB = polychlorinated biphenyl.
DDT = dichlorodiphenyltrichloroethane.
TAL = target analyte list.
mg/kg = milligrams per kilogram.
ND = nondetect.
TRPH = total recoverable petroleum hydrocarbons.
TCLP = toxicity characteristic leaching procedure.
μg/ℓ = micrograms per liter.
D_1 = sample concentration.
D_2 = duplicate concentration.

$$RPD = 100 \times \frac{|D_1 - D_2|}{0.5(D_1 + D_2)} \quad (1)$$

Table 4-2
Accuracy Summary for MS/MSD Samples

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

SDG Number	MS/MSD Sample	Analyte	% Recovery MS/MSD	Control Limits
WF11B	**Soil**			
	10S00201			
Semivolatile Organic Compounds		Pyrene	39	<36
WF012	31S00501			
Semivolatile Organic Compounds		4-Nitrophenol	120/115	11-114
WF028	**Groundwater**			
	12G00101			
Semivolatile Organic Compounds		4-Nitrophenol	83/-	10-80

Notes: MS/MSD = matrix spike and matrix spike duplicate.
SDG = sample delivery group.
% = percent.
< = less than.

The percent recovery for some of the soil and groundwater samples was above the target range; therefore, some analytical results may be biased low. Some of the analytical results for SVOCs and inorganic analytes were qualified based on the evaluation of percent recovery. The validation process indicates an acceptable level of accuracy was attained (Laboratory Data Consultants, 1996).

A summary of the surrogate spike samples and the surrogate compounds that were outside control limits for the Phase IIB samples collected at Site 11 is presented in Table 4-3. The required control limits were also identified for each surrogate compound. All the samples associated with these surrogates were qualified in accordance with the USEPA functional guidelines as presented in Subsection 3.3.4 of the GIR (ABB-ES, 1998). All data, based on surrogate recoveries, are acceptable for use in conducting the site characterization, risk assessment, and FS.

Table 4-3
Accuracy Summary for Surrogate Recoveries Outside QC Criteria

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Spiked Analyte	Surrogate Recovery (%R)[1]	QC Limits (percent)
WF11B	12R00101	Decachlorobiphenyl	32/29	60-150
	10S00201	Decachlorobiphenyl	56/55	60-150
	10S00301	Decachlorobiphenyl	45/42	60-150
	11S00201	Decachlorobiphenyl	50/-	60-150
WF012	31R00201	Decachlorobiphenyl	54/43	60-150
	31S00901	Decachlorobiphenyl	45/40	60-150
	31S01201	Decachlorobiphenyl	48/50	60-150
	31S01301	Decachlorobiphenyl	46/-	60-150
WF028	10G00101	Decachlorobiphenyl	50/48	60-150
	11G00101	Decachlorobiphenyl	47/47	60-150
	11G00301	Decachlorobiphenyl	25/24	60-150
	11G00401	Decachlorobiphenyl	29/29	60-150
	11G0020D	Decachlorobiphenyl	59/-	60-150

[1] Reported as value for first column/second column.

Notes: QC = quality control.
SDG = sample delivery group.
ID = identification.
%R = percent recovery.

Initial calibrations are performed to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the volatile TCL. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. Continuing calibrations are performed to ensure that the instrument is capable of producing acceptable qualitative and quantitative data.

Continuing calibration establishes the 12-hour Relative Response Factor on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. Initial and continuing calibrations for organic analysis are measured by the percent Relative Standard Deviation (%RSD) for initial calibrations and the percent Difference (%D) for continuing calibrations. For inorganic analysis, the initial calibration verification and continuing calibration verification are measured.

Table 4-4 summarizes the initial and continuing calibration details for the soil and groundwater samples collected at Site 11.

The evaluations of the %RSD for the initial calibrations and the %D for the continuing calibrations indicate that the response factors for the system performance check compounds generally met the required criteria for VOCs, SVOCs, pesticides, and PCBs. Samples associated with those SDGs in which certain VOCs, SVOCs, pesticides, and PCBs exhibiting an RRF that does not meet the minimum requirements were qualified as UJ/J.

4.2.3 Representativeness Representativeness is the degree to which the data obtained from an environmental sample accurately reflect the presence or absence of contamination at a site. Field quality control samples (including source water blanks, equipment rinse blanks, and trip blanks) and laboratory quality control samples (including method [organic analyses] and preparation blanks [inorganic analysis]) were used to assess representativeness. Representativeness also is assessed by review of the adherence to extraction and analysis holding times. The evaluation of representativeness in field quality control samples for the RI sampling event is presented in Table 4-5 and summarized below.

Trip Blanks. There were no detections of VOCs above the quantitation limit in the soil trip blanks associated with Site 11. Two groundwater trip blanks (11T02201 and 10T02101) both had methylene chloride detected at a concentration of 2 $\mu g/\ell$. Trip blank 11T02201 also had acetone detected at a concentration of 10 $\mu g/\ell$.

Rinsate Blanks. VOCs, if present, were not detected at concentrations exceeding their detection limits in the rinsate blanks. One SVOC, di-*n*-butylphthalate, was detected in the rinsate blank sample 12R00101 from SDG WF011B at a concentration of 4 $\mu g/\ell$.

Iron, sodium and zinc were detected in both rinse blanks from SDGs WF11B (12R00101) and WF012 (31R00201). SDG WF11B also had barium (0.30 $\mu g/\ell$) and calcium (42.3 $\mu g/\ell$) detected. SDG WF012 had a detection of copper (1.3 $\mu g/\ell$) in the rinse blank 31R00201. SDG WF028 groundwater rinse blank 11R01601 had a detection of acetone (10 $\mu g/\ell$) and di-*n*-butylphthalate (5 $\mu g/\ell$). Groundwater rinse blank11R01601 had calcium, sodium, and cyanide detected at concentrations 62.7, 30.8, and 1.5 $\mu g/\ell$, respectively.

Laboratory Method and Preparation Blanks. Concentrations of styrene (1 $\mu g/\ell$) and xylenes (total)(2 $\mu g/\ell$) were detected in the water method blanks for SDGs WF11B and WF012. Acetone was detected in the soil method blanks for SDGs WF11B and WF012 with concentrations between 4 and 7 $\mu g/\ell$. Di-*n*-butylphthalate was detected in the method blanks for SDG WF11B at a concentration between 69 and 100 $\mu g/\ell$. Bis(2-ethylhexyl)phthalate was

Table 4-4
Summary of Initial and Continuing Calibration for Site 11 Samples

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

SDG[1]	Compound	Initial Calibration	Continuing Calibration	Qualifier
WF11B	Acetone	--	40.0	UJ/J
1/10/96	2-Butanone	--	37.3	UJ
	4-Methyl-2-pentanone	--	37.7	UJ
	2-Hexanone	--	41.0	UJ/J
1/11/96	Trichloroethene	--	27.7	UJ
	2-Hexanone	--	50.9	UJ/J
	1,1,2,2-Tetrachloroethane	--	34.2	UJ
1/12/96	2-Hexanone	--	48.4	UJ/J
1/10/96	Endosulfan	22	--	UJ
WF012	Trichloroethene	--	27.7	UJ
1/11/96	2-Hexanone	--	50.9	UJ
	1,1,2,2-Tetrachloroethane	--	34.2	UJ
1/12/96	2-Hexanone	--	48.4	UJ
1/13/96	Chloromethane	--	27.2	UJ
	Vinyl chloride	--	27.2	UJ
	Acetone	--	68.1	UJ/J
	2-Butanone	--	69.9	UJ
	1,2-Dichloroethane	--	29.6	UJ
	4-Methyl-2-pentanone	--	31.4	UJ
1/15/96	Chloroethane	--	26.3	UJ
	Acetone	--	51.7	UJ/J
	2-Butanone	--	40.8	UJ
	1,2-Dichloroethane	--	35.4	UJ
1/17/96	Endosulfan sulfate	24.0	--	UJ
WF028	Acetone	33.8	--	J
9/2/96	Chloromethane	--	32.4	J
	Chloroethane	--	28.4	J
	Acetone	--	49.2	J
	2-Butanone	--	38.7	J
	4-Methyl-2-pentanone	--	35.7	J
	2-Hexanone	--	38.9	J

See notes at end of table

Table 4-4 (Continued)
Summary of Initial and Continuing Calibration for Site 11 Samples

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

SDG	Compound	Initial Calibration	Continuing Calibration	Qualifier
WF028 (Continued)				
9/3/96	Chloromethane	--	27.4	J
	Acetone	--	34.7	J
	2-Butanone	--	32.6	J
	4-Methyl-2-pentanone	--	32.9	J
	2-Hexanone	--	38.9	J
9/6/96	Chloromethane	--	35.4	J
	Acetone	--	41.0	J
	2-Butanone	--	41.8	J
	1,2-Dichloropropane	--	27.6	J
	4-Methyl-2-pentanone	--	40.5	J
	2-Hexanone	--	43.3	J
	Bromoform	--	26.2	J
	1,1,2,2-Tetrachloroethane	--	26.5	J
9/20/96	3,3-Dichlorobenzidine	--	30.4	J
9/26/96	Benzo(k)fluoranthene	--	28.5	J

Notes: Calibration values expressed as percent recovery.

SDG = sample delivery group.
-- = not detected.
UJ = The analyte was not detected above the reported sample IDL; however, the reported concentration is approximate and may not reliably be presumed to be less than the IDL value.
J = The analyte was positively identified and is reported as an approximate concentration.

Table 4-5
Representativeness Summary for Site 11 Field Quality Control Samples

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	12R00101	31R00201	11R01601	10TO02101	11TO2201
Collect Date:	05-JAN-96	08-JAN-96	28-AUG-96	26-AUG-96	28-AUG-96
Laboratory Sample No.:	RA847012	RA855021	RC044016	RC044001	RC044008
Volatile Organic Compounds (μg/ℓ)					
Acetone	--	--	10 U	--	10 U
Methylene chloride	--	--	--	2	2
Semivolatile Organic Compounds (μg/ℓ)					
Di-*n*-butylphthalate	4	--	5	NA	NA
Pesticides and PCBs (μg/ℓ)					
None detected					
Inorganic Analytes (μg/ℓ)					
Barium	0.30 J	--	--	NA	NA
Calcium	42.3 J	--	67.2 U	NA	NA
Copper	--	1.3 UJ	--	NA	NA
Iron	11.6 UJ	21.2 UJ	--	NA	NA
Sodium	24.6 UJ	40.3 UJ	30.8 U	NA	NA
Zinc	2.2 UJ	3.0 UJ	--	NA	NA
Cyanide	--	--	1.5	NA	NA

Notes: μg/ℓ = micrograms per kilogram.
-- = analyte not detected.
U = compound not detected above detection limit, detection limit is reported.
NA = not analyzed.
PCB = polychlorinated biphenyl.
J = estimated value.

detected in the method blanks associated with SDG WF11B at a concentration of 3 $\mu g/\ell$ for waters and a concentration of 69 $\mu g/\ell$ for soils.

Environmental samples associated with method blanks that contained methylene chloride and acetone with results greater than the instrument detection limit (IDL) but less than 10 times the amount detected in the laboratory preparation blanks were annotated with UJ qualifier (Laboratory Data Consultants, 1996).

Both SDGs WF11B and WF012 had detections of iron, nickel, sodium, zinc, and calcium. SDG WF11B also had a detection of aluminum (2.922 milligrams per kilogram [mg/kg]). SDG WF012 had a detection of barium (0.081 mg/kg). Sample results greater than the IDL but less than 5 times the amount detected in the laboratory preparation blanks were appropriately annotated with a J or UJ qualifier (Laboratory Data Consultants, 1996).

Sampling and analysis holding times for each analytical fraction were met in all samples.

Qualification of the environmental samples was required because of the detection of target analytes in laboratory and field blanks. Qualification of the RI data, based on blank contamination, was performed according to USEPA data validation guidelines (USEPA, 1994a and 1994b).

4.2.4 Comparability Comparability is the confidence with which one data set can be compared with another and the degree to which the environmental data from each sampling event are considered equivalent. Comparability of the analytical data was ensured by using standard operating procedures for sample collection, by using standard chemical analytical methods, and by reporting the analytical results in standard units (SU). The sampling, shipment, and analytical protocols were consistent with USEPA standard operation procedures and methodologies described in workplans for NAS Whiting Field throughout the period of the RI.

4.2.5 Completeness Completeness is the percentage of useable data reported and validated compared with the total number of measurements made. Useable data are those measurements that were not rejected (qualified with an "R") during the validation process. None of the analytical data were rejected. The goal for analytical completeness for the RI sampling event was 85 percent useable data. The completeness goal of 85 percent was met for all matrices and all parameters.

4.3 SUMMARY. Based on the results of the QC sample analyses, the established precision and accuracy goals of the project were achieved (Table 4-6). Some field- and/or laboratory-derived contamination was present in some of the QC samples, which required the results from some of the environmental samples to be amended. QC sample results and data validation criteria indicate a 100 percent completeness was achieved, thus satisfying the 85 percent completeness goal. Standard methods of analyses and units of measure were used throughout the project, thus meeting the QC criteria and the DQOs presented in the workplan.

Overall, the data generated during the sampling event meet established DQOs and are acceptable for use in site characterization, risk assessment, and evaluation of corrective measures.

Table 4-6
Summary of DQO Assessment - PARCC Parameters

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
Soil and Groundwater Samples					
TCL VOC	Acceptable	Acceptable	Acceptable	100	Acceptable
TCL SVOCs	Acceptable	Acceptable	Acceptable	100	Acceptable
Pesticides and PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
TAL metals and total cyanides	Acceptable	Acceptable	Acceptable	100	Acceptable

[1] Cumulative of sampling and analytical components.
[2] Analytical component.

Notes: All the units are expressed as the ratio of number of analytes meeting the quality control criteria to the total number of analytes.

DQO = data quality objective.
PARCC = precision, accuracy, reproducibility, completeness, and comparability.
% = percent.
TCL VOCs = target compound list volatile organic compounds.
TCL SVOCs = target compound list semivolatile organic compounds.
PCB = polychlorinated biphenyl.
TAL = target analyte list.

5.0 INVESTIGATIVE RESULTS

The Phase IIA RI, at Site 11, consisted of a geophysical survey, surface soil sampling, test pitting and subsurface soil sampling, monitoring well installations, and groundwater sampling. The Phase IIB RI included a soil gas survey, surface soil sampling, monitoring well installations, and groundwater sampling.

The following sections present the results of the geologic, hydrogeologic and geophysical assessment and the analytical results from the soil gas, surface soil, subsurface soil, and groundwater sampling events.

5.1 GEOLOGIC ASSESSMENT. Surface soils encountered during Phase IIA explorations were described as tan to dark brown fine to very fine sand and tan clayey sand. Shallow subsurface soils (two to seven feet bls) were yellow, red, olive, and brown interlayered sand, silt, and clay (ABB-ES, 1994). Test pit excavations encountered crushed and burned debris, bricks, asphalt, concrete, metal cans, and assorted interlayered rubble within the upper 12 feet of soil. At test pit location TP-11-03, in the southeast corner of Site 11, burned debris and a 55-gallon drum were uncovered in the bottom of the excavation at a depth of 12 feet bls (ABB-ES, 1994).

The generalized lithologic sequence of subsurface soils at Site 11 consists of interlayered silty sand, sand, and clay. Throughout most of the site a layer of silty sand was encountered from approximately 10 to 25 feet bls, which was underlain by up to 30 feet of sand. A clay layer (15 to 25 feet thick) was encountered in several soil borings at sites in the southeast area of the facility. In soil borings completed at Site 11 this clay unit was encountered at approximately 60 feet bls. In deeper soil borings, completed below the clay layer, well and poorly graded sand layers were interlayered with clay stringers (ABB-ES, 1995c).

Detailed descriptions can be found in the boring and monitoring well logs presented in the RI Phase IIA Technical Memorandum No. 2 (ABB-ES, 1995c). A general discussion of the geology at NAS Whiting Field is presented in Subsection 1.4.5 of the GIR (ABB-ES, 1998). Site 11 monitoring well boring logs are presented in Appendix G of this report.

5.2 HYDROGEOLOGIC ASSESSMENT. The hydrogeologic assessment included determination of horizontal and vertical hydraulic gradients, hydraulic conductivities, and seepage velocities. The hydrogeologic assessment results are used to characterize the transport of chemicals of potential concern (CPCs) from the site by groundwater flow. Contaminant fate and transport for ecological CPCs at Site 11 is presented in Chapter 8.0 of this report.

Groundwater Flow Direction. Table 5-1 summarizes the results of the water-level measurements for the six RI sites in the southeast disposal area during the RI field program. Facilitywide water table elevation data is provided in Appendix D of the GIR (ABB-ES, 1998). Groundwater flow patterns for the measurement events are similar, and the potentiometric surface maps for depicting the February 8 and 9, 1994, event (Figure 5-1) and the November 7 to 9, 1996, event

Table 5-1
Summary of Water-Level Elevations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (ft BTOC)	September 30 and October 1, 1993		February 8 and 9, 1994	
			Water Level (ft BTOC)	Water Level (ft msl)	Water Level (ft BTOC)	Water Level (ft msl)
Southeast Disposal Area						
Site 9, Waste Fuel Disposal Pit						
WHF-9-1	146.55	118.40	86.72	59.83	89.34	57.21
WHF-9-2	161.07	124.35	100.03	61.04	102.69	58.38
WHF-9-3S	150.85	108.24	90.78	60.07	93.35	57.50
Site 10, Southeast Open Disposal Area (A)						
WHF-10-1	146.73	118.20	88.12	58.61	90.62	56.11
WHF-10-2	150.75	113.14	92.04	58.71	94.58	56.17
Site 11, Southeast Open Disposal Area (B)						
WHF-11-1	124.86	128.40	51.08	73.78	63.42	61.44
WHF-11-1S	116.65	54.40	45.50	71.15	45.99	70.66
WHF-11-2	148.12	125.84	93.50	54.62	95.93	52.19
WHF-11-3	117.19	73.16	61.91	55.28	64.22	52.97
WHF-11-4S	129.43	79	--	--	--	--
WHF-11-4I	125.79	109	--	--	--	--
Site 12, Tetraethyl Lead Disposal Area						
WHF-12-1	136.40	113.40	80.20	56.20	82.68	53.72
WHF-12-2	135.56	85	--	--	--	--
Site 13, Sanitary Landfill						
WHF-13-1	102.66	122.90	50.62	52.04	52.90	49.76
WHF-13-1S	108.97	61.30	55.25	53.72	57.59	51.38
WHF-13-1I	109.17	93	--	--	--	--
WHF-13-2S	102.86	72.41	51.61	51.25	53.85	49.01
WHF-13-3S	81.81	41	--	--	--	--
WHF-13-4S	80.68	40	--	--	--	--
Site 14, Short-Term Sanitary Landfill						
WHF-14-1	139.69	153.20	88.49	51.20	90.79	48.90
WHF-14-2	145.80	118.30	95.15	50.65	97.45	48.35

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (ft BTOC)	June 22 to 24, 1994		October 10 to 13, 1994	
			Water Level (ft BTOC)	Water Level (ft msl)	Water Level (ft BTOC)	Water Level (ft msl)
Southeast Disposal Area						
Site 9, Waste Fuel Disposal Pit						
WHF-9-1	146.55	118.40	88.19	58.36	82.20	64.35
WHF-9-2	161.07	124.35	101.95	59.12	95.49	65.58
WHF-9-3S	150.85	108.24	92.28	58.57	86.16	64.69
Site 10, Southeast Open Disposal Area (A)						
WHF-10-1	146.73	118.20	89.60	57.13	83.45	63.28
WHF-10-2	150.75	113.14	93.62	57.13	113.02	37.73
Site 11, Southeast Open Disposal Area (B)						
WHF-11-1	124.86	128.40	62.23	62.63	56.37	68.49
WHF-11-1S	116.65	54.40	44.63	72.02	43.56	73.09
WHF-11-2	148.12	125.84	94.97	53.15	88.79	59.33
WHF-11-3	117.19	73.16	63.08	54.11	57.16	60.03
WHF-11-4S	129.43	79	--	--	--	--
WHF-11-4I	125.79	109	--	--	--	--
Site 12, Tetraethyl Lead Disposal Area						
WHF-12-1	136.40	113.40	81.67	54.73	75.41	60.99
WHF-12-2	135.56	85	--	--	--	--
Site 13, Sanitary Landfill						
WHF-13-1	102.66	122.90	51.89	50.77	46.00	56.66
WHF-13-1S	108.97	61.30	56.45	52.52	50.29	58.68
WHF-13-1I	109.17	93	--	--	--	--
WHF-13-2S	102.86	72.41	52.93	49.93	47.00	55.86
WHF-13-3S	81.44	41	--	--	--	--
WHF-13-4S	80.37	40	--	--	--	--
Site 14, Short-Term Sanitary Landfill						
WHF-14-1	139.69	153.20	90.12	49.57	83.88	55.81
WHF-14-2	145.80	118.30	96.86	48.94	90.56	55.24

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (ft BTOC)	January 10 to 13, 1995		April 19 and 20, 1995	
			Water Level (ft BTOC)	Water Level (ft msl)	Water Level (ft BTOC)	Water Level (ft msl)
Southeast Disposal Area						
Site 9, Waste Fuel Disposal Pit						
WHF-9-1	146.55	118.40	82.82	63.73	82.73	63.82
WHF-9-2	161.07	124.35	95.99	65.08	96.14	64.93
WHF-9-3S	150.85	108.24	86.73	64.12	86.80	64.05
Site 10, Southeast Open Disposal Area (A)						
WHF-10-1	146.73	118.20	83.97	62.76	84.12	62.61
WHF-10-2	150.75	113.14	88.00	62.75	88.10	62.65
Site 11, Southeast Open Disposal Area (B)						
WHF-11-1	124.86	128.40	57.17	67.69	56.92	67.94
WHF-11-1S	116.65	54.40	44.57	72.08	44.03	72.62
WHF-11-2	148.12	125.84	89.22	58.90	89.56	58.56
WHF-11-3	117.19	73.16	57.97	59.22	57.74	59.45
WHF-11-4S	129.43	79	--	--	--	--
WHF-11-4I	125.79	109	--	--	--	--
Site 12, Tetraethyl Lead Disposal Area						
WHF-12-1	136.40	113.40	76.06	60.34	76.22	60.18
WHF-12-2	135.56	85	--	--	--	--
Site 13, Sanitary Landfill						
WHF-13-1	102.66	122.90	46.73	55.93	46.61	56.05
WHF-13-1S	108.97	61.30	51.18	57.79	51.02	57.95
WHF-13-1I	--	--	--	--	--	--
WHF-13-2S	102.86	72.41	47.66	55.20	47.64	55.22
WHF-13-3S	81.81	41	--	--	--	--
WHF-13-4S	80.68	40	--	--	--	--
Site 14, Short-Term Sanitary Landfill						
WHF-14-1	139.69	153.20	84.30	55.39	84.67	55.02
WHF-14-2	145.80	118.30	90.93	54.87	91.41	54.39

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (ft BTOC)	July 28 and 29, 1995		October 12 to 14, 1995	
			Water Level (ft BTOC)	Water Level (ft msl)	Water Level (ft BTOC)	Water Level (ft msl)
Southeast Disposal Area						
Site 9, Waste Fuel Disposal Pit						
WHF-9-1	146.55	118.40	82.01	64.54	82.27	64.28
WHF-9-2	161.07	124.35	95.15	65.92	95.35	65.72
WHF-9-3S	150.85	108.24	85.90	64.95	86.14	64.71
Site 10, Southeast Open Disposal Area (A)						
WHF-10-1	146.73	118.20	83.22	63.51	83.62	63.11
WHF-10-2	150.75	113.14	87.15	63.60	87.55	63.20
Site 11, Southeast Open Disposal Area (B)						
WHF-11-1	124.86	128.40	56.49	68.37	56.96	67.90
WHF-11-1S	116.65	54.40	44.41	72.24	44.18	72.47
WHF-11-2	148.12	125.84	88.73	59.39	89.45	58.67
WHF-11-3	117.19	73.16	57.31	59.88	57.81	59.38
WHF-11-4S	129.43	79	--	--	--	--
WHF-11-4I	125.79	109	--	--	--	--
Site 12, Tetraethyl Lead Disposal Area						
WHF-12-1	136.40	113.40	75.38	61.02	75.99	60.41
WHF-12-2	135.56	85	--	--	--	--
Site 13, Sanitary Landfill						
WHF-13-1	102.66	122.90	46.19	56.47	46.93	55.73
WHF-13-1S	108.97	61.30	50.62	58.35	51.34	57.63
WHF-13-1I	--	--	--	--	--	57.72
WHF-13-2S	102.86	72.41	46.09	56.77	47.98	54.88
WHF-13-3S	81.81	41	--	--	--	--
WHF-13-4S	80.68	40	--	--	--	--
Site 14, Short-Term Sanitary Landfill						
WHF-14-1	139.69	153.20	83.90	55.79	84.84	54.85
WHF-14-2	145.80	118.30	90.55	55.25	91.55	54.25

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (ft BTOC)	January 19 and 20, 1996		April 25 to 27, 1996	
			Water Level (ft BTOC)	Water Level (ft msl)	Water Level (ft BTOC)	Water Level (ft msl)
Southeast Disposal Area						
Site 9, Waste Fuel Disposal Pit						
WHF-9-1	146.55	118.40	76.91	69.64	75.99	70.56
WHF-9-2	161.07	124.35	90.03	71.04	89.13	71.94
WHF-9-3S	150.85	108.24	80.78	70.07	79.96	70.89
Site 10, Southeast Open Disposal Area (A)						
WHF-10-1	146.73	118.20	78.33	68.40	77.49	69.24
WHF-10-2	150.75	113.14	82.25	68.50	81.44	69.31
Site 11, Southeast Open Disposal Area (B)						
WHF-11-1	124.86	128.40	51.85	73.01	50.82	74.04
WHF-11-1S	116.65	54.40	43.26	73.39	43.35	73.30
WHF-11-2	148.12	125.84	84.03	64.09	83.53	64.59
WHF-11-3	117.19	73.16	52.69	64.50	51.68	65.51
WHF-11-4S	129.43	79	--	--	--	61.62
WHF-11-4I	125.79	109	--	61.59	--	57.75
Site 12, Tetraethyl Lead Disposal Area						
WHF-12-1	136.40	113.40	70.61	65.79	69.90	66.50
WHF-12-2	135.56	85	--	--	--	--
Site 13, Sanitary Landfill						
WHF-13-1	102.66	122.90	41.87	60.79	41.14	57.48
WHF-13-1S	108.97	61.30	45.92	63.05	45.18	63.79
WHF-13-1I	--	--	--	--	--	--
WHF-13-2S	102.86	72.41	42.91	59.95	42.26	60.60
WHF-13-3S	81.81	41	--	--	--	--
WHF-13-4S	80.68	40	--	--	--	--
Site 14, Short-Term Sanitary Landfill						
WHF-14-1	139.69	153.20	79.60	60.09	79.14	60.55
WHF-14-2	145.80	118.30	86.30	59.50	85.90	59.90

See notes at end of table.

Table 5-1 (Continued)
Summary of Water-Level Elevations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (ft BTOC)	July 25 to 27, 1996		November 7 to 9, 1996	
			Water Level (ft BTOC)	Water Level (ft msl)	Water Level (ft BTOC)	Water Level (ft msl)
Southeast Disposal Area						
Site 9, Waste Fuel Disposal Pit						
WHF-9-1	146.55	118.40	77.40	69.11	80.95	65.70
WHF-9-2	161.07	124.35	90.27	70.80	93.61	67.46
WHF-9-3S	150.85	108.24	81.30	69.55	84.67	66.18
Site 10, Southeast Open Disposal Area (A)						
WHF-10-1	146.73	118.20	78.82	67.91	82.18	64.55
WHF-10-2	150.75	113.14	82.66	68.09	86.02	64.73
Site 11, Southeast Open Disposal Area (B)						
WHF-11-1	124.86	128.40	52.98	71.88	56.17	68.69
WHF-11-1S	116.65	54.40	44.43	72.22	45.25	71.40
WHF-11-2	148.12	125.84	84.58	63.54	88.01	60.11
WHF-11-3	117.19	73.16	53.78	63.41	57.03	60.16
WHF-11-4S	129.43	79	--	--	67.81	61.62
WHF-11-4I	125.79	109	64.20	61.59	68.04	57.75
Site 12, Tetraethyl Lead Disposal Area						
WHF-12-1	136.40	113.40	71.37	65.03	74.75	61.65
WHF-12-2	135.56	85	--	--	51.45	57.72
Site 13, Sanitary Landfill						
WHF-13-1	102.66	122.90	42.84	55.55	46.17	52.18
WHF-13-1S	108.97	61.30	47.11	61.86	50.48	58.49
WHF-13-1I	109.17	93	--	--	51.45	57.72
WHF-13-2S	102.86	72.41	43.88	58.98	47.13	55.73
WHF-13-3S	81.44	41	--	--	--	--
WHF-13-4S	80.37	40	--	--	--	--
Site 14, Short-Term Sanitary Landfill						
WHF-14-1	139.69	153.20	80.19	59.50	63.65	76.04
WHF-14-2	145.80	118.30	86.83	58.97	90.33	55.47

Notes: TOC = top of casing.
msl = mean sea level.
ft BTOC = feet below top of casing.
ft msl = feet above mean sea level.
-- = no water level was recorded for this round of sampling.

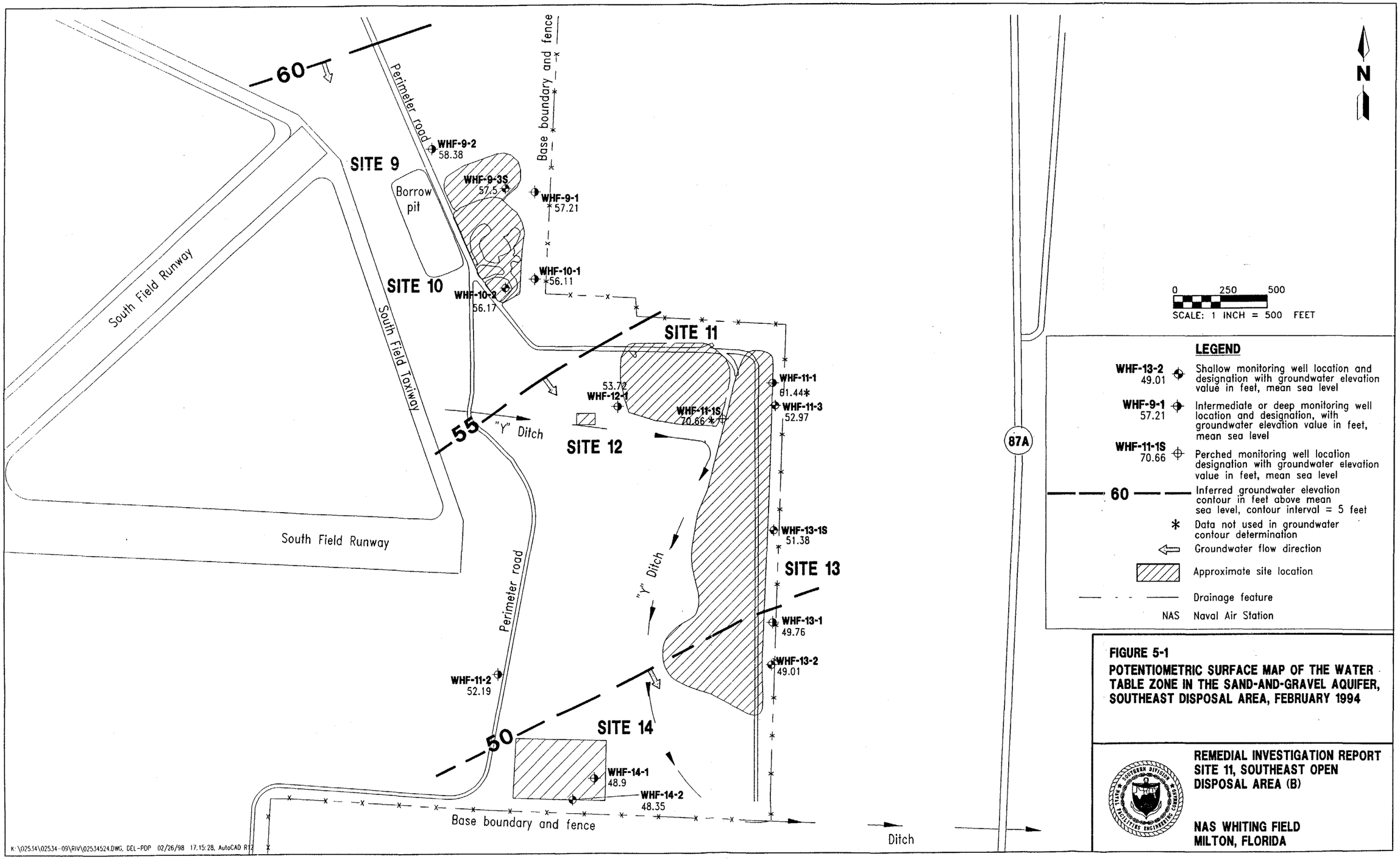


FIGURE 5-1
POTENTIOMETRIC SURFACE MAP OF THE WATER TABLE ZONE IN THE SAND-AND-GRAVEL AQUIFER, SOUTHEAST DISPOSAL AREA, FEBRUARY 1994

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

00779JB2Z

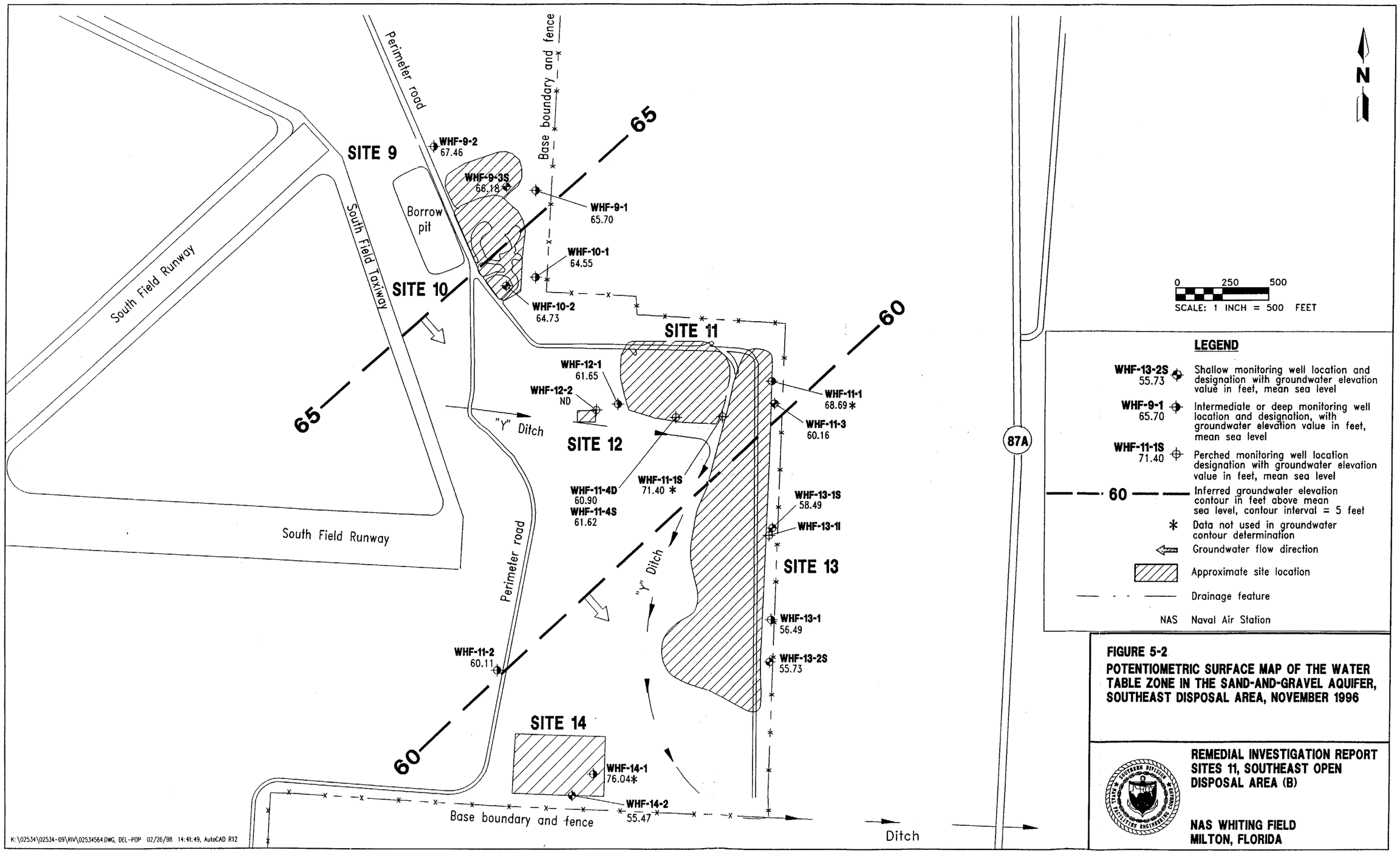


FIGURE 5-2
POTENTIOMETRIC SURFACE MAP OF THE WATER TABLE ZONE IN THE SAND-AND-GRAVEL AQUIFER, SOUTHEAST DISPOSAL AREA, NOVEMBER 1996

REMEDIAL INVESTIGATION REPORT SITES 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD MILTON, FLORIDA

(Figure 5-2) are included in the body of this report. Groundwater elevations for monitoring wells WHF-11-1 and WHF-11-1S were not used in the potentiometric surface maps. Monitoring well WHF-11-1S is screened in a perched groundwater layer and anomalous groundwater elevations were recorded for well WHF-11-1. The data from the measurement events indicate a groundwater flow direction to the southeast.

Three intermediate depth wells (WHF-11-1, WHF-13-1, and WHF-14-1) were completed at depths generally 10 to 30 feet deeper than the shallow zone monitoring wells (Table 3-1). Data from these three wells suggests a groundwater flow pattern to the southeast, similar to the flow pattern for the shallow water table zone.

Horizontal Hydraulic Gradients. Table 5-2 provides a summary of the horizontal hydraulic gradients calculated for sites in the Southeast Disposal Area from October 1993 to November 1996. The horizontal hydraulic gradients for all sites in the southeast disposal area ranged from a low of 0.0021 feet per foot (ft/ft) to a maximum of 0.0036 ft/ft. The average horizontal hydraulic gradient for all sites in the southeast disposal area ranged from 0.0026 ft/ft for February 1994 to 0.0033 ft/ft for April 1996. The overall average horizontal hydraulic gradient for all measurement events from 1993 through 1996 was 0.0029 ft/ft.

Vertical Hydraulic Gradients. Table 5-3 presents a summary of the vertical hydraulic gradients calculated for the Site 11 sites in the southeast disposal area. The vertical hydraulic gradients have been calculated for the site since 1993 using wells WHF-14-1 and WHF-14-2. With installation of two additional well clusters during the Phase IIB at Site 11 (WHF-11-4S/WHF-11-4D) and Site 13 (WHF-13-1S/WHF-13-1I), vertical gradients were also calculated at these sites using November 1996 data.

A downward vertical gradient was measured at both Site 11 and Site 13 during the November 1996 measurement period. The downward gradient is in contrast to the consistently upward gradient measured at Site 14. Typically, the upward gradient at well cluster WHF-14-1/WHF-14-2 ranged from 0.013 ft/ft to 0.015 ft/ft. The November 1996 measurements in the Site 14 well cluster indicate a 20-foot difference in water levels between the two wells. The average water-level difference between these wells previously was approximately 0.6 feet. This variation in the reading suggest a potential measurement error rather than a dramatic change in the site hydrogeology.

Hydraulic Conductivity. Slug tests were conducted at five shallow monitoring wells in the southeast disposal area during the RI. Table 5-4 summarizes the hydraulic conductivity values and geometric mean calculated for monitoring wells in the southeast disposal area. As shown in Table 5-4, all slug test trials on monitoring well WHF-11-2 were rejected because data were extremely varied. In addition, hydraulic conductivity data from monitoring well WHF-10-2 was rejected because it exceeded a 20 percent variance. A discussion of hydraulic conductivity data is presented in Section 2.3 and Table 2-2 of Technical Memorandum No. 4, Hydrogeologic Assessment, January 1995 (ABB-ES, 1995d).

Average hydraulic conductivity values for individual monitoring wells in the southeast disposal area ranged from 4.73 feet per day (ft/day) (1.67×10^{-3} centimeters per second [cm/sec]) for WHF-11-3 to 14.55 ft/day (5.13×10^{-3} cm/sec) for WHF-13-2S. Monitoring wells selected from the area were screened within well-graded to poorly-graded sand between 27 to 59 feet above msl. The geometric mean for the hydraulic conductivity data of monitoring wells in the area was 8.38 ft/day (2.96×10^{-3} cm/sec).

Table 5-2
Summary of Horizontal Hydraulic Gradients

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	September 30 to October 1, 1993		February 8 and 9, 1994	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area					
WHF-9-3S	526	60.07	0.0026	57.50	0.0025
WHF-10-2		58.71		56.17	
WHF-9-1	460	59.83	0.0027	57.21	0.0024
WHF-10-1		58.61		56.11	
WHF-9-2	842	61.04	0.0028	58.38	0.0026
WHF-10-2		58.71		56.17	
WHF-11-3	1,381	55.28	0.0029	52.97	0.0029
WHF-13-2		51.25		49.01	
WHF-11-2	1,123	54.62	0.0031	52.19	0.0029
WHF-14-1		51.20		48.90	
WHF-9-2	3,547	61.04	0.0029	58.38	0.0028
WHF-14-2		50.65		48.35	
		Average Gradient	0.0028		0.0026

See notes at end of table.

Table 5-2 (Continued)
Summary of Horizontal Hydraulic Gradients

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	June 22 to 24, 1994		October 10 to 13, 1994	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area					
WHF-9-3S	526	58.57	0.0027	64.69	**
WHF-10-2		57.13		37.73	
WHF-9-1	460	58.36	0.0027	64.35	0.0023
WHF-10-1		57.13		63.28	
WHF-9-2	842	59.12	0.0024	65.58	**
WHF-10-2		57.13		37.73	
WHF-11-3	1,381	54.11	0.0030	60.03	0.0030
WHF-13-2		49.93		55.86	
WHF-11-2	1,123	53.15	0.0032	59.33	0.0031
WHF-14-1		49.57		55.81	
WHF-9-2	3,547	59.12	0.0029	65.58	0.0029
WHF-14-2		48.94		55.24	
	Average Gradient		0.0028		0.0028

See notes at end of table.

Table 5-2 (Continued)
Summary of Horizontal Hydraulic Gradients

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	January 10 to 13, 1995		April 19 and 20, 1995	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area					
WHF-9-3S	526	64.12	0.0026	64.05	0.0027
WHF-10-2		62.75		62.65	
WHF-9-1	460	63.73	0.0021	63.82	0.0026
WHF-10-1		62.76		62.61	
WHF-9-2	842	65.08	0.0028	64.93	0.0027
WHF-10-2		62.75		62.65	
WHF-11-3	1,381	59.22	0.0029	59.45	0.0031
WHF-13-2		55.20		55.22	
WHF-11-2	1,123	58.90	0.0031	58.56	0.0032
WHF-14-1		55.39		55.02	
WHF-9-2	3,547	65.08	0.0029	64.93	0.0030
WHF-14-2		54.87		54.39	
	Average Gradient		0.0027		0.0029

See notes at end of table.

Table 5-2 (Continued)
Summary of Horizontal Hydraulic Gradients

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	July 28 and 29, 1995		October 12 to 14, 1995	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area					
WHF-9-3S	526	64.95	0.0026	64.71	0.0029
WHF-10-2		63.60		63.20	
WHF-9-1	460	64.54	0.0022	64.28	0.0025
WHF-10-1		63.51		63.11	
WHF-9-2	842	65.92	0.0028	65.72	0.0030
WHF-10-2		63.60		63.20	
WHF-11-3	1,381	59.88	0.0023	59.38	0.0033
WHF-13-2		56.77		54.88	
WHF-11-2	1,123	59.39	0.0032	58.67	0.0034
WHF-14-1		55.79		54.85	
WHF-9-2	3,547	65.92	0.0030	65.72	0.0032
WHF-14-2		55.25		54.25	
	Average Gradient		0.0027		0.0031

See notes at end of table.

Table 5-2 (Continued)
Summary of Horizontal Hydraulic Gradients

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	January 19 and 20, 1996		April 25 to 27, 1996	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area					
WHF-9-3S	526	70.07	0.0030	70.89	0.0030
WHF-10-2		68.50		69.31	
WHF-9-1	460	69.64	0.0027	70.56	0.0029
WHF-10-1		68.40		69.24	
WHF-9-2	842	71.04	0.0030	71.94	0.0031
WHF-10-2		68.50		69.31	
WHF-11-3	1,381	64,50	0.0033	65.51	0.0036
WHF-13-2		59.95		60.60	
WHF-11-2	1,123	64.09	0.0036	64.59	0.0036
WHF-14-1		60.09		60.55	
WHF-9-2	3,547	71.04	0.0033	71.94	0.0034
WHF-14-2		59.50		59.90	
	Average Gradient		0.0032		0.0033

See notes at end of table.

Table 5-2 (Continued)
Summary of Horizontal Hydraulic Gradients

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	July 25 to 27, 1996		November 7 to 9, 1996	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Southeast Disposal Area					
WHF-9-3S	526	69.55	0.0028	66.18	0.0028
WHF-10-2		68.09		64.73	
WHF-9-1	460	69.11	0.0026	65.70	0.0025
WHF-10-1		67.91		64.55	
WHF-9-2	842	70.80	0.0032	67.46	0.0032
WHF-10-2		68.09		64.73	
WHF-11-3	1,381	63.41	0.0032	60.16	0.0032
WHF-13-2		58.98		55.73	
WHF-11-2	1,123	63.54	0.0036	60.11	0.014*
WHF-14-1		59.50		76.04	
WHF-9-2	3,547	70.80	0.0033	67.46	0.0034
WHF-14-2		58.97		55.47	
	Average Gradient		0.0031		0.0031

Notes: msl = mean sea level.
ft/ft = feet per foot.
* = anomalous horizontal gradient, not included in average hydraulic gradient calculation.

Table 5-3
Summary of Vertical Hydraulic Gradients, Southeast Disposal Area

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Well Screens (feet)	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
September 30 and October 1, 1993					
WHF-14-2	27.5	41.01	50.65	0.0134	Upward
WHF-14-1	-13.51		51.20		
February 8 and 9, 1994					
WHF-14-2	27.5	41.01	48.35	0.0134	Upward
WHF-14-1	-13.51		48.90		
June 22 to 24, 1994					
WHF-14-2	27.5	41.01	48.94	0.0154	Upward
WHF-14-1	-13.51		49.57		
October 10 to 13, 1994					
WHF-14-2	27.5	41.01	55.24	0.0139	Upward
WHF-14-1	-13.51		55.81		
January 10 to 13, 1995					
WHF-14-2	27.5	41.01	54.87	0.0127	Upward
WHF-14-1	-13.51		55.39		
April 19 and 20, 1995					
WHF-14-2	27.5	41.01	54.39	0.0154	Upward
WHF-14-1	-13.51		55.02		
July 28 and 29, 1995					
WHF-14-2	27.5	41.01	55.25	0.0132	Upward
WHF-14-1	-13.51		55.79		
October 12 and 14, 1995					
WHF-14-2	27.5	41.01	54.25	0.0146	Upward
WHF-14-1	-13.51		54.85		
January 19 and 20, 1995					
WHF-14-2	27.5	41.01	59.50	0.0144	Upward
WHF-14-1	-13.51		60.09		
April 25 to 27, 1996					
WHF-14-2	27.5	41.01	59.90	0.0158	Upward
WHF-14-1	-13.51		60.55		

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients, Southeast Disposal Area

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Well Screens (feet)	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
July 25 to 27, 1996					
WHF-14-2	27.5	41.01	58.97	0.0129	Upward
WHF-14-1	-13.51		59.50		
November 7 to 9, 1996					
WHF-14-2	27.5	41.01	55.47	*	*
WHF-14-1	-13.51		76.04		
WHF-13-1S	47.67	31.5	58.49	0.0244	Downward
WHF-13-1I	16.17		57.72		
WHF-11-4S	50.43	30.49	61.62	0.0236	Downward
WHF-11-4D	19.94		60.90		

Notes: msl = mean sea level.
ft/ft = feet per foot.
* = vertical gradient not calculated due to anomaly in water-level data.

Table 5-4
Summary of Hydraulic Conductivity (K) Data from Slug Tests

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Well Number	Range of K (ft/day)	Number of Usable Runs	Average K (ft/min)	Average K (ft/day)	Average K (cm/sec)
Southeast Disposal Area					
Site 10, Southeast Open Disposal Area (A)					
WHF-10-2	R	R	R	R	R
Site 11, Southeast Open Disposal Area (B)					
WHF-11-2	R	R	R	R	R
WHF-11-3	4.41 to 5.23	3	0.0033	4.73	1.67×10^{-3}
Site 13, Sanitary Landfill					
WHF-13-2S	13.23 to 15.51	6	0.0101	14.55	5.13×10^{-3}
Site 14, Short-Term Sanitary Landfill					
WHF-14-2	8.53 to 8.57	2	0.0059	8.55	3.02×10^{-3}
			Geometric Mean	8.38	2.96×10^{-3}

Notes: Average is the arithmetic mean.

ft/day = feet per day.
ft/min = feet per minute.
cm/sec = centimeters per second.
R = data rejected.

Seepage Velocity. The seepage velocity was calculated by multiplying the hydraulic conductivity (K) by the hydraulic gradient and dividing by the effective porosity (n). Table 5-5 summarizes the average linear pore water velocity (i.e., seepage velocity) for the water table zone of the sand and gravel aquifer for sites in the southeast disposal area. The calculations are based on an assumed effective porosity (n) of 0.35 for the site soil. The effective porosity (n) value represents silty through poorly graded sands (Fetter, 1988). Seepage velocities ranged from 0.069 ft/day at Sites 9, 10, 11, 13, and 14 to 0.079 ft/day at Sites 11 and 13. The average of the seepage velocity values for the sites in the southeast disposal area was 0.074 ft/day (27 feet per year [ft/yr]).

Table 5-5
Summary of Phase II Seepage Velocities

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Investigation Area	Sites	Monitoring Well Pair	Horizontal[1] Gradient (ft/ft)	K (ft/day)	Effective Porosity (n)	Seepage Velocity (ft/day)
Southeast Disposal Area	11 and 13	WHF-11-3 and WHF-13-2	0.0029	[2]9.65	0.35	0.079
	9, 10, 11, 13, and 14	WHF-9-2 and WHF-14-2	0.0029	[3]8.37	0.35	0.069
					Arithmetic average	0.074

[1] Horizontal gradients based on groundwater measurements from September 1993 through November 1996.
[2] The K is averaged where values are available for both wells in the well pair.
[3] Geometric mean for the area.

Notes: ft/ft = feet per foot.
K is hydraulic conductivity (ft/day).
ft/day = feet per day.

5.3 GEOPHYSICAL SURVEY Interpretation of the geophysical data including total magnetic, EM-31 conductivity, and EM-31 inphase data sets indicated a single well-defined landfill boundary and three smaller total magnetic anomalies located outside the interpreted landfill area. The three anomalies located outside the interpreted landfill boundary are believed to be caused by ferromagnetic metal lying at or near the ground surface.

5.4 SOIL GAS ASSESSMENT Thirty-one of the 48 proposed soil gas sample locations were sampled at Site 11. The sample locations are shown on Figure 3-1. The soil gas locations not sampled were several grid spacings beyond locations with positive detections.

The analytical results from the soil gas survey are presented in Table 5-6. Total VOCs (TVOCs) and methane were detected in two samples (sample locations 45 and 46) along the northeast corner of the site. At both locations the detections were in the sample from 3 feet bls. TVOC concentrations were 600 ppm and 1,100 ppm for locations 45 and 46, respectively. Methane concentrations were 350 ppm and 1,100 ppm, accounting for 58 percent and 100 percent of the TVOC concentrations in the two samples. Based upon the soil gas survey, it was concluded that off-site migration of soil gas was unlikely (ABB-ES, 1995e).

Table 5-6
Summary of Active Soil Gas Survey, July 15, 16, and 17, 1995

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet bls)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
9	1.5	0	0	NA	1
	3.0	0	0	NA	1
10	1.5	0	0	NA	1
	3.0	0	0	NA	1
11	1.5	NR	NR	NA	1
	3.0	0	0	NA	1
12	1.5	0	0	NA	1
	3.0	0	0	NA	1
13	1.5	0	0	NA	0
	3.0	0	0	NA	0
16	1.5	0	0	NA	2
	3.0	0	0	NA	2
17	1.5	0	0	NA	1
	3.0	0	0	NA	1
18	1.5	0	0	NA	1
	3.0	0	0	NA	1
19	1.5	0	0	NA	0
	3.0	0	0	NA	0
20	1.5	0	0	NA	0
	3.0	0	0	NA	0
23	1.5	0	0	NA	0
	3.0	0	0	NA	0
24	1.5	0	0	NA	0
	3.0	0	0	NA	0
25	1.5	0	0	NA	0
	3.0	0	0	NA	0
26	1.5	0	0	NA	0
	3.0	0	0	NA	0
27	1.5	0	0	NA	0
	3.0	0	0	NA	0
30	1.5	0	0	NA	1
	3.0	0	0	NA	1
31	1.5	0	0	NA	0
	3.0	0	0	NA	0
32	1.5	0	0	NA	0
	3.0	0	0	NA	0

See notes at end of table.

Table 5-6 (Continued)
Summary of Active Soil Gas Survey, July 15, 16, and 17, 1995

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Sample ID	Depth (feet bls)	Total VOC (ppm)	Methane (ppm)	Methane/VOC (percent)	Rinsate Blank (ppm)
32D	1.5	0	0	NA	0
	3.0	0	0	NA	0
33	1.5	0	0	NA	0
	3.0	0	0	NA	0
34	1.5	0	0	NA	0
	3.0	0	0	NA	0
37	1.5	0	0	NA	0
	3.0	0	0	NA	0
38	1.5	0	0	NA	0
	3.0	0	0	NA	0
39	1.5	0	0	NA	0
	3.0	0	0	NA	0
40	1.5	0	0	NA	0
	3.0	0	0	NA	0
41	1.5	0	0	NA	0
	3.0	0	0	NA	0
43	1.5	0	0	NA	0
	3.0	0	0	NA	0
44	1.5	0	0	NA	0
	3.0	0	0	NA	0
45	1.5	0	0	NA	1
	3.0	600	350	58	1
46	1.5	0	0	NA	0
	3.0	1,100	1,100	100	0
47	1.5	0	0	NA	0
	3.0	0	0	NA	0
48	1.5	0	0	NA	0
	3.0	0	0	NA	0

Notes: ID = identification.
bls = below land surface.
VOC = volatile organic compounds.
ppm = parts per million.
NA = not applicable.
NR = sample was not recovered.
D = duplicate.

5.5 SURFACE SOIL ASSESSMENT. Table 5-7 summarizes the analytical results for organic compounds detected in surface soil samples at Site 11. Table 5-8 summarizes the analytical results for the inorganic analytes detected in the surface soil samples and Table 5-9 summarizes the results of the additional sampling for lead at the site. The sample locations are shown on Figure 3-2 and analytical results are summarized on Figure 5-3. Table 5-10 summarizes the frequency of detection, range of detection limits, range of detection concentrations, mean of detected concentrations, and background screening values for the combined background samples of the Troup loamy sand and Dothan fine sandy loam found at Site 11. This table also presents the USEPA Region III Risk-Based Concentrations (RBCs) for soils and the Soil Cleanup Target Levels for Florida (FDEP, 1999).

TCL VOCs. One VOC (acetone) was detected at an estimated concentration of 100 micrograms per kilogram (μg/kg) in surface soil sample (11-SL-02). The detected concentration was below the Florida residential soil cleanup target level of 260,000 μg/kg.

TPH. TPH analysis was performed on five surface soil samples (11S00101 through 11S00501) at Site 11. All five samples contained TPH at concentrations ranging from 7 to 53.1 μg/kg which are below the Florida cleanup target level of 350 mg/kg.

TCL SVOCs. Fourteen SVOCs were detected in the surface soil samples from Site 11. Thirteen of the compounds were only detected in surface soil sample 11-SL-04. Benzo(a)pyrene, detected at a concentration of 910 μg/kg, exceeded the FDEP residential and industrial cleanup target levels and the USEPA Region III RBCs for residential and industrial soil. Benzo(a)anthracene (1,800 μg/kg) also exceeded the FDEP residential soil cleanup target level (1,400 μg/kg) and the USEPA Region III RBC for residential soil.

The location of surface soil sample 11-SL-04 was excavated in June 1999 as part of a source removal conducted by CH2M Hill. Confirmation samples collected from the bottom of the excavation indicated contaminant concentrations were below State and Federal screening criteria (Appendix J).

Pesticides and PCBs. Nine pesticide compounds were detected in the soil samples collected at the site. At least one pesticide was detected in 8 of the 10 samples collected at Site 11. However, only one of the pesticide compounds (dieldrin) was detected at concentrations exceeding the Florida soil cleanup target levels and USEPA Region III RBCs. Dieldrin was detected in sample 11-SL-02 (estimated concentration of 210 μg/kg) at a concentration exceeding the Florida residential soil cleanup target level and USEPA Region III RBC of 70 μg/kg and 40 μg/kg, respectively. The Florida leachability cleanup target level of 4 μg/kg was also exceeded by all eight of the dieldrin detections at Site 11.

TAL Inorganic Analytes. Twenty-three inorganic analytes were detected in the surface soil samples at Site 11. Twelve of the analytes (aluminum, arsenic, barium, calcium, chromium, iron, lead, magnesium, manganese, sodium, vanadium,

Table 5-7
Summary of Analytical Results for Organic Compounds Detected in Surface Soil at Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	11-SL-01	11-SL-01A Duplicate Sample	11-SL-02	11-SL-03	11-SL-04	11-SL-05
Collect Date:	08/18/92	08/18/92	08/18/92	08/18/92	08/18/92	08/18/92
Volatile Organic Compounds (µg/kg)						
Acetone	--	--	100 J	--	--	--
Total Petroleum Hydrocarbons (mg/kg)	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (µg/kg)						
2-Methylnaphthalene	--	--	--	--	49 J	--
Acenaphthylene	--	--	--	--	110 J	--
Anthracene	--	--	--	--	280 J	--
Benzo(a)anthracene	--	--	--	--	1,800	--
Benzo(a)pyrene	--	--	--	--	910	--
Benzo(b)fluoranthene	--	--	--	--	710	--
Benzo(g,h,i)perylene	--	--	--	--	310 J	--
Benzo(k)fluoranthene	--	--	--	--	870	--
Chrysene	--	--	--	--	2,500	--
Fluoranthene	--	--	--	--	1,300	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	230 J	--
Phenanthrene	--	--	--	--	2,100	--
Pyrene	--	--	--	--	3,400	--
bis(2-Ethylhexyl)phthalate	--	--	--	--	540	--
Pesticides and PCBs (µg/kg)						
4,4'-DDD	--	--	140 J	--	--	--
4,4'-DDE	--	--	88 J	2.5 J	4.9 J	64 J
4,4'-DDT	--	--	530 J	30 J	6.7 J	45 J
Aldrin	--	--	--	--	--	--
Dieldrin	--	--	210 J	5.1 J	4.9 J	44 J
Heptachlor	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--
alpha-Chlordane	--	--	62 J	--	39 J	310 J
gamma-Chlordane	--	--	54 J	--	29 J	260 J

See notes at end of table.

Table 5-7 (Continued)
Summary of Analytical Results for Organic Compounds Detected in Surface Soil at Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	11S00101	11S00201	11S00301	11S00401	11S00501
Collect Date:	01/06/96	01/06/96	01/07/96	01/07/96	01/06/96
Volatile Organic Compounds (μg/kg)					
Acetone	--	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)	7	53.1	9.3	8.6	11.6
Semivolatile Organic Compounds (μg/kg)					
2-Methylnaphthalene	--	--	--	--	--
Acenaphthylene	--	--	--	--	--
Anthracene	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--
Chrysene	--	--	--	--	--
Fluoranthene	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--
Phenanthrene	--	--	--	--	--
Pyrene	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	--	130 J	71 J	52 J	81 J
Pesticides and PCBs (μg/kg)					
4,4-DDD	--	--	--	--	--
4,4-DDE	--	19 J	5.3	--	2.1
4,4-DDT	--	27 J	6.8	6.8	2.3
Aldrin	--	0.96 J	--	--	--
Dieldrin	--	20 J	23	23	13
Heptachlor	--	4.8 J	--	--	--
Heptachlor epoxide	--	8.8 J	--	--	--
alpha-Chlordane	--	--	--	--	--
gamma-Chlordane	--	100 J	--	--	--

Notes: μg/kg = micrograms per kilogram.
-- = compound if present was not detected above instrument detection limits
J = estimated value.
mg/kg = milligrams per kilogram.
NA = not analyzed.
PCBs = polychlorinated biphenyls.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.

Table 5-8
Summary of Analytical Results for Inorganic Analytes Detected in Surface Soil at Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	11-SL-01	11-SL-01A	11-SL-02	11-SL-03	11-SL-04	11-SL-05
Collect Date:	08/18/92	08/18/92	08/18/92	08/18/92	08/18/92	08/18/92
Inorganic Analytes (mg/kg)						
Aluminum	9,790	10,800	10,800	9,380	6,100	2,110
Antimony	--	--	3.5 J	--	--	--
Arsenic	2 J	1.6 J	3.8	2.1 J	1.5 J	0.93 J
Barium	16.4 J	17.8 J	96	13.1 J	6.3 J	6.2 J
Beryllium	0.13 J	0.1 J	0.14 J	--	--	--
Cadmium	--	--	--	--	--	--
Calcium	183 J	186 J	1,790	375 J	248 J	331 J
Chromium	6.9	7.4	19.6	--	7.7	4.5
Cobalt	1.2 J	1.6 J	3.4 J	--	1.2 J	0.35 J
Copper	5.2 J	5.1 J	19.4	--	5.3 J	4 J
Cyanide	--	--	--	--	--	--
Iron	5,810	5,860	11,700	--	5,500	3,540
Lead	5.7	5.5	2,230	--	22.3	7.8
Magnesium	108 J	142 J	1,260	--	99.7 J	82.7 J
Manganese	275	285	230	--	182	39.4
Mercury	0.05 J	0.05 J	0.06 J	--	0.04 J	0.04 J
Nickel	--	--	10	--	--	--
Potassium	--	139 J	166 J	--	--	--
Selenium	--	--	--	--	--	--
Silver	1.2 J	0.67 J	1.9 J	--	0.55 J	0.93 J
Sodium	177 J	169 J	307 J	--	184 J	189 J
Vanadium	14.9	15.7	20.3	--	14.6	9.5 J
Zinc	8.8 J	9.9 J	260	--	47.8	9.4 J

See notes at end of table..

Table 5-8 (Continued)
Summary of Analytical Results for Inorganic Analytes Detected in Surface Soil at Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	11S00101	11S00201	11S00301	11S00401	11S00501
Collect Date:	01/06/96	01/06/96	01/07/96	01/07/96	01/06/96
Inorganic Analytes (mg/kg)					
Aluminum	9,660	5,670	5,070	5,070	10,700
Antimony	--	--	--	--	--
Arsenic	2.1 J	1.6 J	2.2 J	2.2 J	2.7
Barium	15.3 J	8.6 J	4.6 J	12.8 J	11.7 J
Beryllium	0.1 J	0.08 J	0.05 J	0.05 J	0.09 J
Cadmium	--	0.28 J	--	--	0.24 J
Calcium	206 J	332 J	249 J	249 J	483 J
Chromium	2.7	5	6	7.8	11.8
Cobalt	--	0.94 J	--	--	--
Copper	8.1	5.5	--	--	6.3
Cyanide	--	0.19 J	0.13 J	0.09 J	0.09 J
Iron	1,500	3,480	4,310	4,310	6,690
Lead	8.6	25.2	40.3	40.3	16.5
Magnesium	65.1 J	122 J	54.2 J	54.2 J	139 J
Manganese	31.4	46.7	34.2	97.3	122
Mercury	0.05 J	--	--	--	0.08
Nickel	--	1.8 J	--	--	2 J
Potassium	133 J	109 J	108 J	62.1 J	90.3 J
Selenium	--	--	--	--	--
Silver	0.79 J	--	--	--	--
Sodium	177 J	173 J	168 J	168 J	160 J
Vanadium	4.4 J	9.3 J	11.9	11.9	17.8
Zinc	21.5	23.8	8	8	11.2

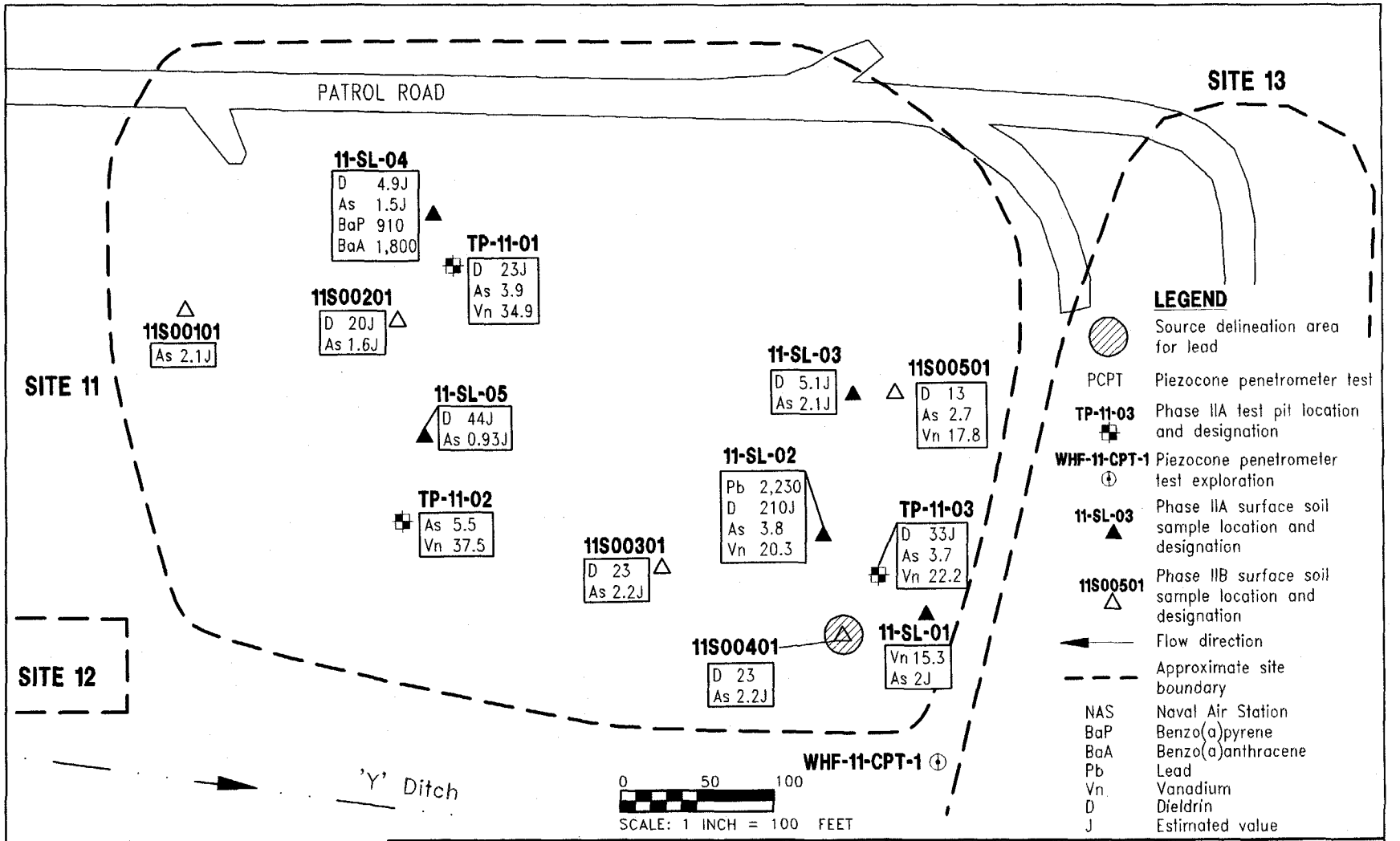
Notes: mg/kg = milligrams per kilogram.
-- compound, if present, was not detected above instrument detection limits.
J = estimated value.

Table 5-9
Summary of Analytical Results for Additional Lead Analysis of Surface Soils at Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	11S00601	11S00601D	11S00701	11S00801	11S00901	11S01001	11S01101	11S01201	11S01301
Collect Date:	01/07/96	01/07/96	01/07/96	01/07/96	01/07/96	01/07/96	01/07/96	01/07/96	01/07/96
Inorganic Analytes (mg/kg)									
Lead	19.3 J	25	18.7 J	16.5 J	16.8 J	23.3 J	16.2 J	74.8	43.5

Notes: mg/kg = milligrams per kilogram.
J = estimated value.



NOTES:
1. Only compounds with detections above Florida cleanup target levels are shown.
2. Organic concentration are in micrograms per kilogram.
3. Inorganic concentrations are in milligrams per kilograms.

K:\02534\02534-09\Riv\02534709.DWG, VC-BB 03/20/00 13:48:52, ACAD14

FIGURE 5-3
SURFACE AND SUBSURFACE SOIL ANALYTICAL RESULTS

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

Table 5-10
Summary of Surface Soil Analytical Results

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limits	Range of Detected Concentrations[2]	Background Screening Concentration[3]	USEPA Region III RBCs Residential/ Industrial[4]	Soil Cleanup Target Levels for Florida Residential/Industrial/ Leachability[5]
Volatile Organic Compounds (µg/kg)						
Acetone	1/10	11 to 13	53.3*	NA	[7]780,000/20,000,000	780,000/5,500,000/2,800
Semivolatile Organic Compounds (µg/kg)						
2-Methylnaphthalene	1/10	350 to 4,000	49	NA	[7]160,000/4,100,000	80,000/560,000/6,100
Acenaphthylene	1/10	350 to 4,000	110	NA	[7]470,000/12,000,000	1,100,000/11,000,000/27,000
Anthracene	1/10	350 to 4,000	280	NA	[7]2,300,000/61,000,000	18,000,000/260,000,000/2,500,000
Benzo(a)anthracene	1/10	350 to 4,000	1,800	NA	[6]870/7,800	1,400/5,000/3,200
Benzo(a)pyrene	1/10	350 to 4,000	910	NA	[6]87/780	100/500/8,000
Benzo(b)fluoranthene	1/10	350 to 4,000	710	NA	[6]870/7,800	1,400/4,800/10,000
Benzo(g,h,i)perylene	1/10	350 to 4,000	310	NA	--/--	2,300,000/41,000,000/32,000,000
Benzo(k)fluoranthene	1/10	350 to 4,000	870	NA	[6]8,700/78,000	15,000/52,000/25,000
bis(2-Ethylhexyl)phthalate	5/10	350 to 4,000	52 to 540	NA	[6]46,000/410,000	76,000/280,000/3,600,000
Chrysene	1/10	350 to 4,000	2,500	NA	[6]87,000/780,000	140,000/450,000/77,000
Fluoranthene	1/10	350 to 4,000	1,300	NA	[7]310,000/8,200,000	2,900,000/48,000/1,200,000
Indeno(1,2,3-cd)pyrene	1/10	350 to 4,000	230	NA	[6]870/7,800	1,500/5,300/28,000
Phenanthrene	1/10	350 to 4,000	2,100	NA	--/--	2,000,000/30,000,000/250,000
Pyrene	1/10	350 to 4,000	3,400	NA	[7]230,000/6,100,000	2,200,000/37,000,000/880,000
Pesticides and PCBs (µg/kg)						
4,4'-DDD	1/10	3.6 to 980	140	NA	[6]2,700/24,000	4,600/18,000/4,000
4,4'-DDE	7/10	3.7 to 980	2.1 to 88	NA	[6]1,900/17,000	3,300/13,000/18,000

See notes at end of table.

Table 5-10 (Continued)
Summary of Surface Soil Analytical Results

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limits	Range of Detected Concentrations[2]	Background Screening Concentration[3]	USEPA Region III RBCs Residential/ Industrial[4]	Soil Cleanup Target Levels for Florida Residential/Industrial/ Leachability[5]
Pesticides and PCBs (μg/kg) (Continued)						
4,4'-DDT	8/10	3.7 to 980	2.3 to 530	NA	[6]1,900/17,000	3,300/13,000/11,000
Aldrin	1/10	1.9 to 490	0.96	NA	[6]38/340	70/300/500
Dieldrin	8/10	3.7 to 980	4.9 to 210	NA	[6]40/360	70/300/4
Heptachlor	1/10	1.9 to 490	4.8	NA	[6]140/1,300	200/900/23,000
Heptachlor epoxide	1/10	1.9 to 490	8.8	NA	[6]70/630	100/400/600
alpha-Chlordane	4/10	1.9 to 4,900	39 to 310	NA	[6]1,800/16,000	3,100/12,000/9,600
gamma-Chlordane	4/10	1.9 to 4,900	29 to 260	NA	[6]1,800/16,000	3,100/12,000/9,600
Inorganic Analytes (mg/kg)						
Aluminum	10/10	40	2,110 to 10,800	15,314	[7]7,800/200,000	72,000/--/SPLP[11]
Antimony	1/10	2.6 to 12	3.5	8	[7]3.1/82	26/240/5
Arsenic	10/10	2	0.93 to 3.8	3.0	[6]0.43/3.8	0.8/[12]4.62/29
Barium	10/10	40	4.6 to 96	23.8	[7]550/14,000	110/87,000/1,600
Beryllium	7/10	0.05 to 1	0.05 to 0.14	0.36	[7]16/410	120/800/63
Cadmium	2/10	0.58 to 1	0.24 to 0.28	0.58	[7]3.9/100	75/1,300/8
Calcium	10/10	1,000	185 to 1,790	402	--/--	--/--/--
Chromium[9]	10/10	2	2.7 to 19.6	10.8	[7]23/610	210/420/38
Cobalt	6/10	0.33 to 10	0.35 to 3.4	3	[7]470/12,000	4,700/110,000/SPLP[11]

See notes at end of table.

Table 5-10 (Continued)
Summary of Surface Soil Analytical Results

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limits	Range of Detected Concentrations[2]	Background Screening Concentration[3]	USEPA Region III RBCs Residential/ Industrial[4]	Soil Cleanup Target Levels for Florida Residential/Industrial/ Leachability[5]
Inorganic Analytes (mg/kg) (Continued)						
Copper	8/10	5	3.7 to 19.4	9.4	[7]310/8,200	110/76,000/SPLP[11]
Cyanide	5/10	0.23 to 0.5	0.09 to 0.19	0.26	[7,10]160/4,100	30/28,000/40
Iron	10/10	20	1,500 to 11,700	8,588	[7]2,300/61,000	23,000/480,000/SPLP[11]
Lead	18/18	0.60 to 1	5.2 to 2,230	11.4	[8]400	400/920/SPLP[11]
Magnesium	10/10	1,000	54.2 to 1,260	258	--/--	--/--/--
Manganese	10/10	3	31.4 to 280*	404	160/4,100	1,600/22,000/SPLP[11]
Mercury	6/10	0.1	0.04 to 0.08	0.12	[7]2.3/61	3.4/26/2.1
Nickel	4/10	2.3 to 8	1.6 to 10	7.2	[7]160/4,100	110/28,000/130
Potassium	8/10	128 to 1,000	62.1 to 166	177	--/--	--/--/--
Selenium	1/10	0.44 to 1	0.16	0.44	[7]39/1,000	390/10,000/5
Silver	5/10	2	0.55 to 1.9	0.7	[7]39/1,000	390/9,100/17
Sodium	10/10	1,000	160 to 307	388	--/--	--/--/--
Vanadium	10/10	10	4.4 to 20.3	21.2	[7]55/1,400	15/7,400/980
Zinc	10/10	4	5.7 to 260	15.4	[7]2,300/61,000	23,000/560,000/6,000
Others (mg/kg)						
Total petroleum hydrocarbon	5/5	1.8 to 1.9	7 to 53.1	ND	--/--	340/2,500/340

See notes at end of table.

Table 5-10 (Continued)
Summary of Surface Soil Analytical Results

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the nondetect.
[3] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[4] U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) Table (October 1998).
[5] Chapter 62-777, Florida Administrative Code, June 1999.
[6] The values correspond to a human cancer risk level of 1 in 1,000,000.
[7] The calculated values correspond to a noncancer hazard quotient of 0.1.
[8] Lead value is from the Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (Office of Solid Waste and Emergency Response Directive 9355.4-12).
[9] Values are for hexavalent chromium.
[10] Values are for hydrogen cyanide.
[11] Leachability values may be derived using SPLP test to calculate site-specific target levels or may be determined using toxicity characteristic leaching procedure in the event oily wastes are present.
[12] Value is a Florida Department of Environmental Protection approved site-specific soil cleanup goal for arsenic at covered landfill sites, Naval Air Station, Whiting Field (Appendix H).

Notes: *The average of a sample and its duplicate is used for all table calculations.*
Samples: 11-SL-01 through 11-SL-05, 11S00101 through 11S00501, and 11SS0101 through 11SS303.
Background samples: BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-04, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501.
Background duplicate sample: BKS00201D.

* = average of a sample and its duplicate.
μg/kg = micrograms per kilogram.
Bold indicates analyte exceeded screening criteria.
NA = not applicable.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.
mg/kg = milligrams per kilogram.
NSC = *no screening criteria available.*

and zinc) were detected in every sample. Nine soil samples contained one or more detected metals at concentrations exceeding the FDEP soil cleanup target levels and/or the USEPA RBCs. In five samples (11-SL-01, 11-SL-02, 11-SL-03, 11S00101, and 11S00501), concentrations of aluminum exceeded the Region III residential RBC of 7,800 mg/kg; however, all detections of aluminum (maximum of 10,800 mg/kg) were below the established background concentration of 15,450 mg/kg. In sample 11-SL-02, the detected concentration of arsenic (3.8 mg/kg) exceeded both the background concentration of 3.2 mg/kg and the Florida residential and industrial soil cleanup target levels of 0.8 mg/kg and 3.7 mg/kg, respectively. Detected concentrations of iron exceeded the USEPA residential RBC of 2,300 mg/kg in nine of the ten samples in which it was analyzed. However, sample 11-SL-02, with an iron concentration of 11,700 mg/kg, was the only sample that exceeded the background iron concentration of 8,830 mg/kg.

Lead was analyzed for and detected at all 18 surface soil sampling locations. The only exceedance of the OSWER Federal value of 400 mg/kg and the Florida residential and industrial soil cleanup goals of 400 mg/kg and 920 mg/kg, respectively, was in sample 11-SL-02, in which lead was detected at 2,230 mg/kg. Thirteen of the eighteen surface soil samples contained lead at concentrations exceeding the background screening concentration of 11.4 mg/kg. All eight samples (11S00601 through 11S01301), collected around location 11S00401 for source delineation, contained lead concentrations in excess of the background screening concentration. After review of the draft RI report, it was noted that the delineation of lead should have been around surface soil sample 11-SL-02. CH2M Hill conducted additional soil sampling in April 1999 to delineate lead around soil sample 11-SL-02. Only one of the 25 samples collected had a lead concentration (666 mg/kg in sample 11S03801) greater than the Florida residential cleanup target level and the Federal OSWER level of 400 mg/kg. Results of this sampling event are presented in Appendix J.

In one sample, 11-SL-01, the detected concentration of manganese (275 and 285 mg/kg for duplicate sample) exceeded the USEPA Region III residential RBC of 160 mg/kg, but not the USEPA industrial RBC, the Florida soil cleanup target levels, or the background screening concentration.

Vanadium was detected above the FDEP residential cleanup target level of 15 mg/kg but all detections were below the background screening concentration of 21.2 mg/kg.

5.6 SUBSURFACE SOIL ASSESSMENT. Table 5-11 summarizes the analytical results for organic and inorganic analytes detected in the three subsurface soil samples collected from the Phase IIA test pit excavations at Site 11. The sample locations are shown on Figure 3-1.

Table 5-12 summarizes the frequency of detection, range of detection limits, range of detection concentrations, mean of detected concentrations, and background screening values for Site 11 subsurface soil samples.

TCL VOCs. Three VOCs were detected in the three subsurface soil samples collected at Site 11. Acetone was detected in samples 11SS0101 and 11SS0303 at estimated concentrations of 100 μg/kg and 80 μg/kg, respectively. Toluene was detected in sample 11SS0101 at an estimated concentration of 4 μg/kg, and total xylenes were detected in all samples at estimated concentrations of 4 μg/kg (11SS0101 and 11SS0202) and 8 μg/kg (11SS0303). All detections of acetone, toluene, and xylene were below USEPA Region III RBCs and Florida cleanup target levels.

Table 5-11
Summary of Analytical Results, Site 11
Subsurface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Test Pit Identifier:	TP-11-01	TP-11-02	TP-11-03
Sample Identifier:	11SS0101	11SS0202	11SS0303
Collect Date:	10/08/92	10/08/92	10/08/92
Volatile Organic Compounds (µg/kg)			
Acetone	100 J	--	80 J
Toluene	4 J	--	--
Xylenes (total)	4 J	4 J	8 J
Semivolatile Organic Compounds (µg/kg)			
bis(2-Ethylhexyl)phthalate	100 J	--	--
Pesticides and PCBs (µg/kg)			
4,4'-DDD	22 J	--	120
4,4'-DDE	5 J	27	22 J
4,4'-DDT	--	8.4	28 J
Aldrin	7 J	--	--
Aroclor-1254	260 J	--	--
Aroclor-1260	62 J	--	--
Dieldrin	23 J	2 J	33 J
Inorganic Analytes (mg/kg)			
Aluminum	17,100	19,400	11,300
Arsenic	3.9	5.5	3.7
Barium	14.6 J	10.7 J	28.5 J
Beryllium	0.18 J	0.21 J	0.12 J
Cadmium	5	--	6.5
Calcium	601 J	766 J	12,100
Chromium	19.5	17.2	11.4
Cobalt	1.2 J	1.1 J	1.7 J
Copper	17.2	5.9	6.7
Iron	16,800	15,600	7,780
Lead	64.4	7.4	109
Magnesium	85.2 J	97 J	311 J
Manganese	20.6	41	188
Mercury	0.11	0.08 J	0.2 J
Nickel	3.7 J	3.5 J	3.9 J
Selenium	--	0.56 J	--
Sodium	176 J	167 J	189 J
Vanadium	34.9	37.5	22.2
Zinc	298	12.8 J	100

Notes: µg/kg = micrograms per kilogram.
J = estimated value.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.
mg/kg = milligrams per kilogram.

Table 5-12
Comparison of Analytes Detected in Site 11 Subsurface Soil Samples to Background Screening Values and Benchmark Concentrations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentrations	Background Screening Concentration[2]	USEPA Region III RBC Industrial[3]	Florida Soil Cleanup Target Levels Residential/Industrial/Leachability[4]
Volatile Organic Compounds (µg/kg)						
Acetone	2/3	11 to 19	80 to 100	NA	[6]20,000,000	780,000/5,500,000/2,800
Toluene	1/3	11 to 12	4	NA	[6]41,000,000	380,000/2,600,000/500
Xylenes (total)	3/3	11 to 12	4 to 8	NA	[6]410,000,000	5,900,000/40,00,000/200
Semivolatile Organic Compounds (µg/kg)						
bis(2-Ethylhexyl)phthalate	1/3	370 to 4,000	100	NA	[5]410,000	76,000/280,000/3,600,000
Pesticides and PCBs (µg/kg)						
4,4'-DDD	2/3	3.7 to 40	22 to 120	NA	[5]24,000	4,600/18,000/4,000
4,4'-DDE	2/3	4 to 40	5 to 27	NA	[5]17,000	3,300/13,000/18,000
4,4'-DDT	1/3	4 to 40	8.4 to 28	NA	[5]17,000	3,300/13,000/11,000
Aldrin	1/3	1.9 to 21	7	NA	[5]340	70/300/500
Aroclor-1254	1/3	37 to 400	260	NA	[5]2,900	500/2,100/17,000
Aroclor-1260	1/3	37 to 400	62	NA	[5]2,900	500/2,100/17,000
Dieldrin	1/3	4 to 40	2 to 33	NA	[5]360	70/300/4
Inorganic Analytes (mg/kg)						
Aluminum	3/3	40	11,300 to 19,400	27,800	[6]200,000	72,000/--/SPLP[9]
Arsenic	3/3	2	3.7 to 5.5	6.2	[5]3.8	0.8/[10]4.62/29
Barium	3/3	40	10.7 to 28.5	15.8	[6]14,000	110/87,000/1,600
Beryllium	3/3	1	0.12 to 0.21	0.26	[5]410	120/800/63
Cadmium	1/3	0.67 to 1	5 to 6.5	0.92	[8]100	75/1,300/8

See notes at end of table.

Table 5-12 (Continued)
Comparison of Analytes Detected in Site 11 Subsurface Soil Samples to Background Screening Values and Benchmark Concentrations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentrations	Background Screening Concentration[2]	USEPA Region III RBC Industrial[3]	Florida Soil Cleanup Target Levels Residential/Industrial/Leachability[4]
Inorganic Analytes (mg/kg) (Continued)						
Calcium	2/3	1,000	601 to 12,100	444	--	--/--/--
Chromium[8]	3/3	2	11.4 to 19.5	22.8	[6]610	210/420/38
Cobalt	1/3	10	1.1 to 1.7	1.48	[6]12,000	4,700/110,000/SPLP[9]
Copper	3/3	5	5.9 to 17.2	8.8	[6]8,200	110/76,000/SPLP[9]
Iron	3/3	20	7,780 to 16,800	18,100	[6]61,000	23,000/480,000/SPLP[9]
Lead	3/3	1	7.4 to 109	8.4	[7]400	400/920/SPLP[9]
Magnesium	3/3	1,000	85.2 to 311	270	--	--/--/--
Manganese	3/3	3	20.6 to 188	42.6	[6]4,100	1,600/22,000/SPLP[9]
Mercury	2/3	0.1	0.08 to 0.12	ND	[6]61	3.4/26/2.1
Nickel	2/3	8	0.08 to 0.2	5	[6]4,100	110/28,000/130
Selenium	1/3	0.48 to 1	3.5 to 3.9	0.3	[6]1,000	390/10,000/5
Sodium	2/3	1,000	167 to 189	ND	--	--/--/--
Vanadium	3/3	10	22.2 to 37.5	45	[6]1,400	15/7,400/980
Zinc	3/3	4	12.8 to 298	15.6	[6]61,000	23,000/560,000/6,000

See notes at end of table.

Table 5-12 (Continued)
Comparison of Analytes Detected in Site 11 Subsurface Soil Samples to Background Screening Values and Benchmark Concentrations

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[3] U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) Table (October 1998).
[4] Soil Cleanup Target Levels, Chapter 62-777, Florida Administrative Code (FDEP, 1999).
[5] The values correspond to a human cancer risk level of 1 in 1,000,000.
[6] The calculated values correspond to a noncancer hazard quotient of 0.1.
[7] Lead value is from the Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (Office of Solid Waste and Emergency Response Directive 9355.4-12).
[8] Values based on hexavalent form of chromium.
[9] Leachability values may be derived using SPLP test to calculate site-specific target levels or may be determined using toxicity characteristic leaching procedure in the event oily wastes are present.
[10] Value is a Florida Department of Environmental Protection approved site-specific soil cleanup goal for arsenic at covered landfill sites, Naval Air Station, Whiting Field (Appendix H).

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: 10SS0101, 10SS0202, 10SS0303.
Background samples: BKB00101, BKB00102, BKB201, BKB00202, BKB00301, BKB00302, BKB00401, BKB00402, BKB00501, BKB00502, BKB00601, BKB00602, BKB00701, BKB00702.
Background duplicate samples: BKB00401D and BKB00602D.

μg/kg = micrograms per kilogram.
NA = not applicable.
NSC = no screening criteria available.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
DDT = dichlorodiphenyltrichloroethane.
DDE = dichlorodiphenyldichloroethene.
mg/kg = milligrams per kilogram.
Bold indicates analyte exceeded screening criteria.

TCL SVOCs. Bis(2-ethylhexyl) phthalate was detected in subsurface soil sample 11SS0101 at an estimated concentration of 100 μg/kg. The detected concentration did not exceed Federal or Florida soil screening criteria.

Pesticides and PCBs. Five pesticides (4,4'-dichlorodiphenyldichloroethane [DDD], 4,4'-dichlorodiphenyldichloroethene [DDE], 4,4'-dichlorodiphenyltrichloroethane [DDT], aldrin, and dieldrin) and two PCBs (Aroclor-1254 and Aroclor-1260) were detected in subsurface soil samples collected at Site 11. Dieldrin and 4,4'-DDE were detected in all three samples. The PCBs were only detected in sample 11SS0101 from test pit TP-11-01. None of the detected pesticides or PCBs exceeded the respective screening values with the exception of dieldrin. Dieldrin was detected in sample 11SS0101 at a concentration of 33 μg/kg which exceeded the Florida leachability cleanup target level of 4 μg/kg.

TAL Metals and (Total) Cyanide. Nineteen inorganic analytes were detected in the subsurface soil samples at Site 11. Seventeen of the analytes (aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, sodium, vanadium, and zinc) were detected in every sample.

The detected arsenic concentrations, ranging from 3.7 mg/kg to 5.5 mg/kg, exceeded the Florida and Federal Screening Criteria for residential and industrial use soils but did not exceed the background screening concentration of 6.2 mg/kg. The detected concentrations of iron exceeded the background screening criteria, but were less than the USEPA and Florida screening criteria. In one sample (11SS0303) the concentration of manganese exceeded the background screening concentration. Manganese was not detected in any of the subsurface samples at concentrations in excess of the USEPA industrial RBC, or the Florida industrial soil cleanup target level. Vanadium was detected above the Florida residential cleanup target level in all three samples but was below the background screening concentration of 45 mg/kg.

5.7 GROUNDWATER ASSESSMENT. The groundwater assessment at Site 11 consisted of the collection of groundwater samples from four onsite wells during Phase IIA and six onsite wells during Phase IIB. The results of groundwater sampling events are discussed separately because of differences in sampling methodology.

5.7.1 Phase II Groundwater Samples Table 5-13 presents field parameter data collected during the Phase IIB sampling and Table 5-14 presents the analytical results for groundwater samples collected at Site 11 during the Phase IIA and IIB sampling events.

Field Parameters. Representative measurements of the field parameters obtained during the purging of the monitoring wells at Site 11 are presented in Table 5-11. The pH values for groundwater samples collected at Site 11 ranged from 5.21 to 11.9 SUs. All of the pH values, with the exception of one sample (monitoring well WHF-11-3, October 28, 1993) were outside the range for the Florida secondary drinking water requirements of 6.5 to 8.5 SUs. Monitoring well WHF-11-2 was sampled on two occasions (October 28, 1993 and August 28, 1996). During each sampling event, pH was measured to be 11.9 SU and 11.63 SU, respectively. The pH of monitoring well WHF-11-2 is considerably higher than the other monitoring wells at Site 11 and is the only well not within the range of values observed in background groundwater samples collected for NAS Whiting Field.

Table 5-13
Summary of Groundwater Field Parameters

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Date Sampled	pH (SU)	Temperature (°C)	Specific Conductance (μmhos/cm)	Turbidity (NTU)
Phase IIA					
WHF-11-1	10-29-93	6.04	19.9	111	2.77
WHF-11-1S	10-28-93	5.70	--	--	607
WHF-11-2	10-28-93	11.9	20.8	2,060	168
WHF-11-3	10-28-93	7.12	19	37	799
Phase IIB					
WHF-11-1	8-27-96	5.39	21.9	12	1
WHF-11-1S	8-28-96	6.36	31	520	3.2
WHF-11-2	8-28-96	11.63	26.9	1,270	1
WHF-11-3	8-28-96	5.21	26.7	14	1
WHF-11-4S	8-27-96	6.20	25.5	445	1.5
WHF-11-4D	8-26-96	6.08	23.4	75	1

Notes: SU = standard unit.
°C = degrees Celsius.
μmhos/cm = micromhos per centimeter.
NTU = nephelometric turbidity unit.
-- = not recorded.

Table 5-14
Summary of Analytical Results for Organic Parameters Detected in Groundwater Samples, Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

	Phase II A Sampling Event					Phase II B Sampling Event
Well Identifier:	WHF-11-1	WHF-11-1S	WHF-11-2	WHF-11-3	WHF-11-3	WHF-11-1
Sample Identifier:	WHF-11-1	WHF-11-1B	WHF11-2	WHF-11-3	WHF11-3A Duplicate	11G00102
Collect Date:	10/29/93	10/28/93	10/28/93	10/28/93	10/28/93	8/27/96
Volatile Organic Compounds (µg/ℓ)						
1,2-Dichloroethene (total)	--	9 J	--	--	--	--
Acetone	--	--	94 J	--	--	--
Benzene	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	--	--
Vinyl chloride	--	--	--	--	--	--
Semivolatile Organic Compounds (µg/ℓ)						
Di-n-octylphthalate	17 J*	--	5 J*	--	--	--
Phenol	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	--	--	--	--	--	--
Pesticides and PCBs (µg/ℓ)						
None detected						

See notes at end of table.

Table 5-14 (Continued)
Summary of Analytical Results for Organic Parameters Detected in Groundwater Samples, Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

	Phase II B Sampling Event					
Well Identifier:	WHF-11-1S	WHF-11-2	WHF-11-2	WHF-11-3	WHF-11-4S	WHF-11-4D
Sample Identifier:	11G00101	11G00201	11G00201 Duplicate	11G00301	11G00401	11G00401
Collect Date:	8/28/96	8/28/96	8/28/96	8/28/96	8/27/96	8/267/96
Volatile Organic Compounds (μg/ℓ)						
1,2-Dichloroethene (total)	6 J	--	--	2 J	--	--
Acetone	--	--	--	--	--	--
Benzene	2 J	--	--	--	--	--
Carbon disulfide	--	--	--	--	1 J	2 J
Vinyl chloride	2 J	--	--	--	--	--
Semivolatile Organic Compounds (μg/ℓ)						
Di-n-octylphthalate	--	--	--	--	--	--
Phenol	--	4 J	6 J	--	--	--
bis(2-Ethylhexyl)phthalate	--	5 J	4 J	6 J	--	--
Pesticides and PCBs (μg/ℓ)						
None detected						

Notes: μg/ℓ = micrograms per liter.
-- = not analyzed or not detected.
* = concentration is a result of sample reanalysis.
J = estimated value.
PCB = polychlorinated biphenyl.

Temperature measurements ranged from 19 to 31 degrees Celsius, and the specific conductance ranged from 12 to 2,060 micromhos per centimeter. Turbidity measurements for Phase IIA groundwater samples ranged from 2.77 to 799 NTUs. Turbidity measurements for Phase IIB groundwater samples, collected using low-flow sampling methods, ranged from 1 to 3.2 NTUs. All of the Phase IIB groundwater samples had turbidity measurements below the Florida public water supply treatment technique criteria of 5 NTUs.

Phase IIA Sampling Event. Tables 5-14 and 5-15 summarize the analytical results for organic and inorganic analytes, respectively, detected in four groundwater samples at Site 11. The sample locations are shown on Figure 3-1. No VOCs were detected in groundwater samples collected from the shallow monitoring wells at concentrations exceeding Federal or State MCLs. In samples from well WHF-11-1S, 1,2-dichloroethene (DCE) was detected at an estimated concentration of 9 $\mu g/\ell$, which is below the Federal and State MCL of 70 $\mu g/\ell$. Acetone was detected in one groundwater sample from an intermediate depth monitoring well (WHF-11-2) at an estimated concentration of 94 $\mu g/\ell$. The reported concentration did not exceed the Florida groundwater cleanup target level of 700 $\mu g/\ell$.

Di-*n*-octylphthalate was detected in groundwater samples collected from monitoring wells WHF-11-1 and WHF-11-2 at Site 11. Currently, no Federal or State standards exist for di-*n*-octylphthalate.

Seventeen inorganic analytes were detected in the groundwater samples collected from monitoring wells at Site 11. Thirteen inorganic analytes (aluminum, barium, beryllium, calcium, chromium, copper, iron, magnesium, manganese, potassium, sodium, vanadium, and zinc) were detected at concentrations exceeding the background screening criteria. Five of the analytes, including aluminum, iron, lead, manganese, and vanadium, were detected at concentrations exceeding either the Federal or State regulatory limits.

Phase IIB Sampling Event. Tables 5-14 and 5-15 summarize the analytical results for organic and inorganic analytes detected in six groundwater samples at Site 11 during Phase IIB of the RI investigation. The sample locations are shown on Figure 3-1 and analytical results are summarized on Figure 5-4. Table 5-16 shows statistical summary information for the Phase IIB groundwater sampling event.

Four VOCs (benzene, 1,2-DCE, carbon disulfide, and vinyl chloride) were detected in groundwater samples from monitoring wells at Site 11. Vinyl chloride (estimated concentration of 2 $\mu g/\ell$), benzene (estimated concentration of 2 $\mu g/\ell$), and 1,2-DCE (estimated concentration of 6 $\mu g/\ell$) were detected in monitoring well WHF-11-1S, which is located directly downgradient of the site. The detected concentrations of both vinyl chloride and benzene in this well exceed the Florida groundwater cleanup target level of 1 $\mu g/\ell$ for these two compounds. Carbon disulfide was detected in monitoring wells WHF-11-4S and WHF-11-4D at estimated concentrations of 1 $\mu g/\ell$ and 2 $\mu g/\ell$, respectively. 1,2-DCE was also detected in monitoring well WHF-11-3 at an estimated concentration of 2 $\mu g/\ell$.

One SVOC, bis(2-ethylhexyl)phthalate, was detected in monitoring well WHF-11-3 at a concentration that exceeded the Federal MCL and Florida groundwater cleanup target level. Phenol, detected in the groundwater sample (and duplicate)

Table 5-15
Summary of Analytical Results for Inorganic Analytes Detected in Groundwater Samples, Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

	Phase IIA Sampling Event					Phase IIB Sampling Event	
Well Identifier:	WHF-11-1	WHF-11-1S	WHF-11-2	WHF-11-3	WHF-11-3	WHF-11-1	WHF-11-1S
Sample Identifier:	WHF-11-1	WHF-11-1B	WHF11-2	WHF-11-3	WHF11-3A Duplicate	11G00102	11G00101
Collect Date:	10/29/93	10/28/93	10/28/93	10/28/93	10/28/93	8/27/96	8/28/96
Inorganic Analytes (µg/ℓ)							
Aluminum	69.8 J	16,400	5,860	24,000	22,300	--	--
Arsenic	--	--	--	--	--	--	0.6 J
Barium	33.8 J	97.1 J	63.6 J	153 J	150 J	34.1 J	102 J
Beryllium	--	0.2	--	--	1.2 J	--	--
Cadmium	--	--	--	--	--	--	--
Calcium	6,830	49,800	67,700	9,570	9,520	3,520 J	80,800
Chromium	--	20.3	44.4	54.3	55.2	--	--
Cobalt	--	--	--	6.1 J	5.9 J	--	--
Copper	5.4 J	8.4 J	6.4 J	34	27.5	--	--
Cyanide	--	--	--	--	--	--	--
Iron	142	23,000	2,280	37,800	36,700	--	6,690
Lead	6	5.4	2.1 J	21.9	19 J	--	9.8
Magnesium	304 J	5,220	567 J	3,570 J	3,450	238 J	7,660
Manganese	2.5 J	272	14.5 J	374	369	--	385
Mercury	--	--	--	--	0.22 J	--	--
Nickel	--	13.3	--	16.7 J	13.9 J	--	--
Potassium	747 J	1,980 J	9,960	3,060 J	2,940 J	9,760	3,100 J
Sodium	1,800 J	25,300 J	2,940 J	12,800	12,800	4,790 J	2,870 J
Thallium	--	--	--	--	--	0.7 J	--
Vanadium	--	49.8 J	--	61.8	60.6	--	--
Zinc	37.5	32.5 J	15.8 J	80.8	81.5	--	6.4 J
Secondary Water Quality Parameters							
Alkalinity as CaCO3	NA	NA	NA	NA	NA	30	178
Ammonia-N	NA	NA	NA	NA	NA	--	0.8

See notes at end of table.

Table 5-15 (Continued)
Summary of Analytical Results for Inorganic Analytes Detected in Groundwater Samples, Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

	Phase IIA Sampling Event					Phase IIB Sampling Event	
Well Identifier:	WHF-11-1	WHF-11-1S	WHF-11-2	WHF-11-3	WHF-11-3	WHF-11-1	WHF-11-1S
Sample Identifier:	WHF-11-1	WHF-11-1B	WHF11-2	WHF-11-3	WHF11-3A Duplicate	11G00102	11G00101
Collect Date:	10/29/93	10/28/93	10/28/93	10/28/93	10/28/93	8/27/96	8/28/96
Secondary Water Quality Parameters (Continued)							
Hardness as CaCO3	NA	NA	NA	NA	NA	14	211
Nitrate-Nitrite	NA	NA	NA	NA	NA	0.34	--
Phosphorous-P, (total)	NA	NA	NA	NA	NA	--	--
Sulfate	NA	NA	NA	NA	NA	0.57	43.4
Total dissolved solids	NA	NA	NA	NA	NA	30	245
Total Kjeldahl Nitrogen	NA	NA	NA	NA	NA	--	1
Total organic carbon	NA	NA	NA	NA	NA	--	--

See notes at end of table.

Table 5-15 (Continued)
Summary of Analytical Results for Inorganic Analytes Detected in Groundwater Samples, Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

	Phase IIB Sampling Event						
Well Identifier:	WHF-11-2	WHF-11-2	WHF-11-2(F)	WHF-11-3	WHF-11-3(F)	WHF-11-4S	WHF-11-4D
Sample Identifier:	11G00201	11G00201D	11G00201F	11G00301	11G00301F	11G00401	11G00402
Collect Date:	8/28/96	8/28/96	8/28/96	8/28/96	8/28/96	8/27/96	8/26/96
Inorganic Analytes $\mu g/\ell$							
Aluminum	2,770	2,320	1,930	913	--	--	270
Arsenic	1.7 J	2 J	1.1 J	--	--	3.3 J	--
Barium	50.3 J	51.6 J	26.4 J	35 J	15.6 J	96.2 J	18 J
Beryllium	0.4 J	--	--	--	--	--	--
Cadmium	--	--	--	1.2 J	--	--	--
Calcium	35,400	41,800	17,800	2,640 J	1,840 J	69,900	8,900
Chromium	20.4	19.2	14.1	10	--	--	--
Cobalt	--	--	--	--	--	--	--
Copper	2 J	3.1 J	--	4.5 J	--	--	1.6 J
Cyanide	--	--	0	--	0	--	--
Iron	232	337	7.4 J	4,560	--	8,810	271
Lead	--	0.9 J	1.1 J	1.8 J	--	3.1	1.5 J
Magnesium	388 J	538 J	378 J	485 J	379 J	4,290 J	963 J
Manganese	2.2 J	4.8 J	--	33.6	18.9	193	193
Mercury	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--
Potassium	12,900	9,610	9,970	2,540 J	--	--	--
Sodium	3,420 J	2,950 J	2,950 J	4,840 J	4,230 J	1,780 J	12,900
Thallium	--	--	--	--	--	--	--
Vanadium	11 J	11 J	8.4 J	4.5 J	--	--	--
Zinc	--	24.3	--	60.6	74.1	--	144
Secondary Water Quality Parameters							
Alkalinity as CaCO3	84	NA	NA	--	NA	168	35
Ammonia-N	--	NA	NA	--	NA	0.3	--

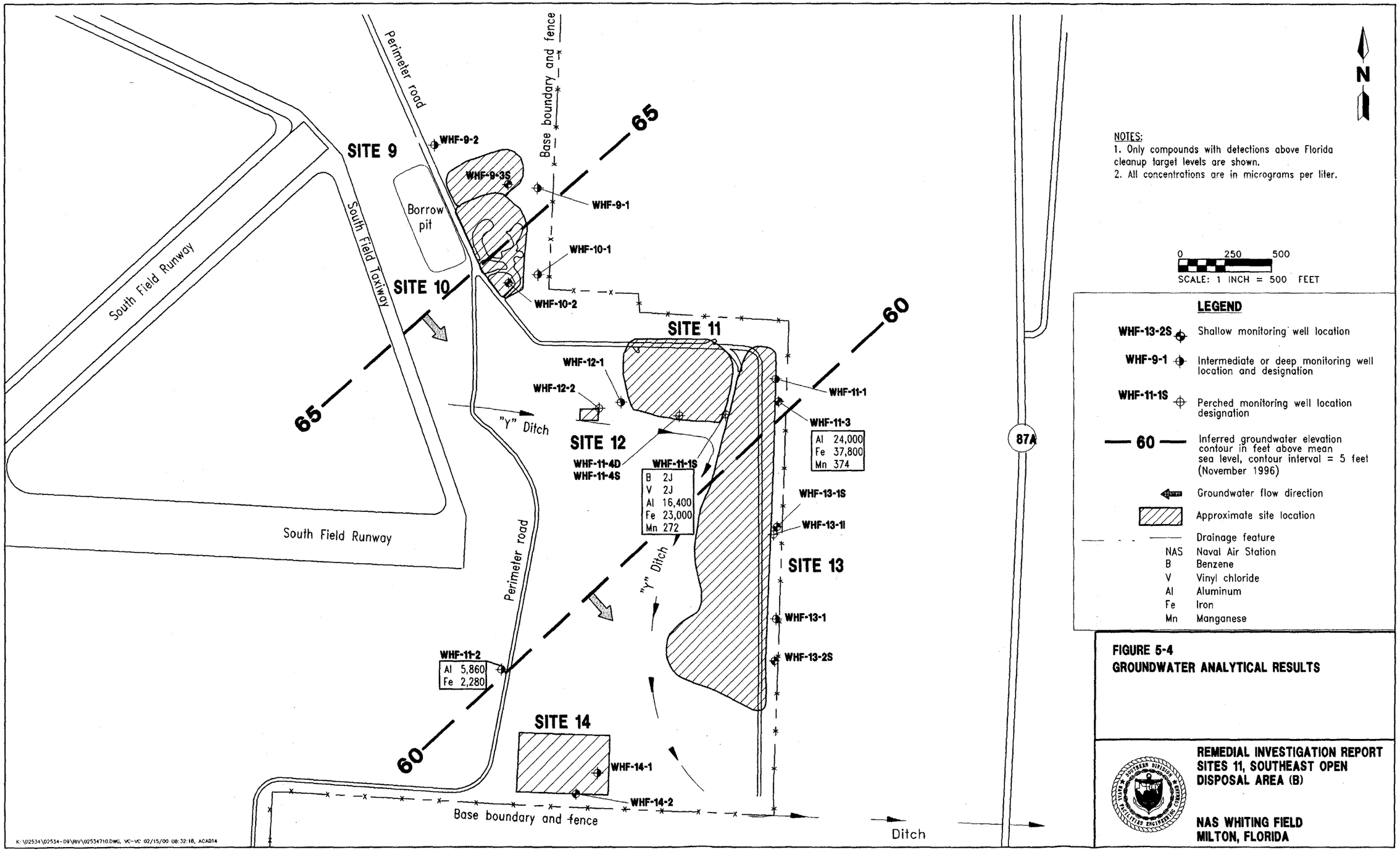
See notes at end of table.

Table 5-15 (Continued)
Summary of Analytical Results for Inorganic Analytes Detected in Groundwater Samples, Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

	Phase IIB Sampling Event						
Well Identifier:	WHF-11-2	WHF-11-2	WHF-11-2(F)	WHF-11-3	WHF-11-3(F)	WHF-11-4S	WHF-11-4D
Sample Identifier:	11G00201	11G00201D	11G00201F	11G00301	11G00301F	11G00401	11G00402 Duplicate
Collect Date:	8/28/96	8/28/96	8/28/96	8/28/96	8/28/96	8/27/96	8/26/96
Secondary Water Quality Parameters							
Hardness as CaCO3	113	NA	NA	NA	NA	196	22
Nitrate-Nitrite	0.9	NA	NA	NA	NA	--	--
Phosphorous-P (total)	--	NA	NA	0.11	NA	--	--
Sulfate	10.6	NA	NA	0.53	NA	44	9.12
Total dissolved solids	52	NA	NA	33	NA	215	33
Total Kjeldahl Nitrogen	--	NA	NA	--	NA	0.5	--
Total organic carbon	--	NA	NA	--	NA	2.7	--

Notes: $CaCo_3$ = calcium carbonate.
-- = compound, if present, was not detected above instrument detection limits.
$\mu g/\ell$ = micrograms per liter.
J = estimated value.
NA = compound was not analyzed.


SITE 9
SITE 10
SITE 11
SITE 12
SITE 13
SITE 14
Perimeter road
Base boundary and fence
South Field Runway
South Field Taxiway
Borrow pit
"Y" Ditch
Ditch
87A
65
60
WHF-9-2
WHF-9-3S
WHF-9-1
WHF-10-1
WHF-10-2
WHF-12-1
WHF-12-2
WHF-11-1
WHF-11-3
Al 24,000
Fe 37,800
Mn 374
WHF-11-4D
WHF-11-4S
WHF-11-1S
B 2J
V 2J
Al 16,400
Fe 23,000
Mn 272
WHF-13-1S
WHF-13-1I
WHF-13-1
WHF-13-2S
WHF-11-2
Al 5,860
Fe 2,280
WHF-14-1
WHF-14-2
N
NOTES:
1. Only compounds with detections above Florida cleanup target levels are shown.
2. All concentrations are in micrograms per liter.
0 250 500
SCALE: 1 INCH = 500 FEET
LEGEND
WHF-13-2S Shallow monitoring well location
WHF-9-1 Intermediate or deep monitoring well location and designation
WHF-11-1S Perched monitoring well location designation
60 Inferred groundwater elevation contour in feet above mean sea level, contour interval = 5 feet (November 1996)
Groundwater flow direction
Approximate site location
Drainage feature
NAS Naval Air Station
B Benzene
V Vinyl chloride
Al Aluminum
Fe Iron
Mn Manganese
FIGURE 5-4
GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
SITES 11, SOUTHEAST OPEN DISPOSAL AREA (B)
NAS WHITING FIELD
MILTON, FLORIDA

00779J032

Table 5-16
Summary of Analytes Detected in Site 11 Groundwater Samples Collected During the Phase IIB Remedial Investigation

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentrations Range[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Federal MCLs[5]	Florida Groundwater Cleanup Target Level[6]
Volatile Organic Compounds (µg/ℓ)							
1,2-Dichloroethene (total)	2/6	10	2 to 6	4	ND	70	70
Benzene	1/6	10	2	2	ND	5	1
Carbon disulfide	2/6	10	1 to 2	1.5	ND	NA	700
Vinyl chloride	1/6	10	2	2	ND	2	1
Semivolatile Organic Compounds (µg/ℓ)							
bis(2-Ethylhexyl)phthalate	2/6	10	4.5* to 6	5.3	ND	6	6
Phenol	1/6	10	5*	5	ND	NA	10
Inorganic Analytes (µg/ℓ)							
Aluminum	3/6	14.6 to 50	270 to 2,550	1,240	654	[8]200	200
Arsenic	3/6	0.5	0.6 to 3.3	1.9	ND	50	50
Barium	6/6	NR	18 to 102	56	72.6	2,000	2,000
Beryllium	1/6	0.15 to 0.3	0.28*	0.28	0.58	4	4
Cadmium	1/6	1.2	1.2	1.2	4.4	5	5
Calcium	6/6	NR	2,640 to 80,800	34,100	3,320	NA	NA
Chromium	2/6	2	10 to 19.8*	14.9	30	100	100
Copper	3/6	1.1	1.6 to 4.5	2.9	10.7	1,000	1,000
Iron	5/6	5	271 to 8,810	4,123	964	300	300
Lead	5/6	0.25 to 0.5	0.575* to 9.8	3.4	ND	[7]15	15
Magnesium	6/6	NR	238 to 7,660	2,350	2,430	NA	NA
Manganese	5/6	1	3.5* to 385	162	42.8	50	50
Potassium	4/6	1,100 to 1,580	2,540 to 11,300*	6,660	1,530	NA	NA

See notes at end of table.

Table 5-16 (Continued)
Summary of Analytes Detected in Site 11 Groundwater Samples Collected During the Phase IIB Remedial Investigation

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentrations Range[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Federal MCLs[5]	Florida Groundwater Cleanup Target Level[6]
Inorganic Analytes (μg/ℓ) (Continued)							
Sodium	6/6	NR	1,780 to 12,900	5,060	4,770	NA	160,000
Thallium	1/6	0.6	0.7	0.7	ND	2	2
Vanadium	2/6	1.2	4.5 to 11*	7.8	3.8	NA	49
Zinc	4/6	1.6 to 2.6	6.4 to 144	56	200	5,000	5,000

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed (excluding rejected values).
[2] A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the nondetect.
[3] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[5] Federal MCLs are maximum permissible concentrations of contaminants in the water that are delivered to a user by a public water system. USEPA Drinking Water Regulations and Health Advisories, February 1996.
[6] Florida Groundwater Cleanup Target Levels, Chapter 62-777, Florida Administrative Code (FDEP, 1999).
[7] Value is a treatment technique.
[8] Value is a secondary MCL.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: 11G00101, 11G00102,11G00201, 11G00301, 11G00401, 11G00402.
Duplicate sample: 11G00201D.
Background samples: BKG00101 through BKG00103, BKG00201 through BKG00203, BKG00301 through BKG00303.
Background duplicate sample: BKG00101D.

ARARs = applicable or relevant and appropriate requirement.
MCL = maximum contaminant level.
μg/ℓ = micrograms per liter.
* = average of sample and duplicate.
ND = not detected in any background samples.
NA = not applicable.
NR = not reported.
Bold indicates analyte exceeded screening criteria.

collected from monitoring well WHF-11-2, was the only other SVOC detected in the Site 11 groundwater.

Seventeen inorganic analytes were detected in the Phase IIB groundwater samples. Twelve of the analytes (aluminum, arsenic, barium, calcium, iron, lead, magnesium, manganese, potassium, sodium, thallium, and vanadium) were detected at concentrations exceeding the background screening concentration. Only three inorganic analytes (aluminum, iron, and manganese) were detected at levels that exceeded their respective Florida groundwater cleanup target level and Federal MCLs. Aluminum was detected above the Florida and Federal standard of 200 $\mu g/\ell$ in three monitoring wells: WHF-11-2, WHF-11-3, and WHF-11-4D. Groundwater samples from monitoring wells WHF-11-1S, WHF-11-3, and WHF-11-4S each contained concentrations of iron that exceeded the Florida and Federal standard of 300 $\mu g/\ell$. Manganese was detected in groundwater samples from monitoring wells WHF-11-1S, WHF-11-4S, and WHF-11-4D at concentrations exceeding the Federal and Florida regulatory limit of 50 $\mu g/\ell$.

6.0 HUMAN HEALTH RISK ASSESSMENT

An HHRA has been conducted as part of the RI for Site 11 at NAS Whiting Field. The purpose of the HHRA is to characterize the risks associated with the hypothetical exposures to site-related chemicals. This HHRA is conducted in accordance with the following guidance documents:

- USEPA's Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A) (USEPA, 1989b),
- Guidance for Data Useability in Risk Assessment (Part A), Final (USEPA, 1992a), and
- Region IV Risk Assessment Guidance (USEPA, 1995a).

Additionally the HHRA will consider FDEP regulations:

- Soil and Groundwater Cleanup Target Levels for Florida (FDEP, 1999)

The methodology for the HHRA is described in Chapter 2.0 of the GIR (ABB-ES, 1998). The HHRA methodology presented in the GIR (ABB-ES, 1998) consists of the following steps:

- data evaluation,
- selection of chemicals of potential concern,
- exposure assessment,
- toxicity assessment, and
- risk characterization.

Site 11 is located in the southeast area of the facility. The location, physical description, and history associated with Site 11 are described in Chapter 1.0 of this report. During the RI, surface soil, subsurface soil, and groundwater were collected from Site 11. Sampling locations and the sampling rationale are presented in Chapters 3.0 and 5.0 of this report.

6.1 DATA EVALUATION. The data evaluation involves numerous activities, including sorting data by medium, evaluating quantitation limits, and evaluating quality of data with respect to qualifiers.

The data for Site 11 were categorized into surface soil, subsurface soil, groundwater, and background for each medium.

Sample Quantitation Limits (SQLs) are compared to USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, 1998), and Florida Cleanup Target Levels (FDEP 1999). Surface soil and subsurface soil SQLs were compared to Region III RBCs for residential and industrial, respectively (USEPA, 1997a) and Soil Cleanup Target Levels for Florida (FDEP, 1999). Groundwater SQLs were compared to Florida Groundwater Cleanup Target Levels (FDEP, 1999) and Region III Tap Water RBCs (USEPA, 1998). Analyte-specific SQLs that are above RBCs and Federal and State screening values are identified and discussed in the uncertainty analysis.

The quality of the data was evaluated with respect to the data qualifiers. Only data of sufficient quality were retained for evaluation in the HHRA. The HHRA considers data with "J", "U", and "UJ" qualifiers, as well as data with no qualifier.

6.2 SELECTION OF HUMAN HEALTH CHEMICALS OF POTENTIAL CONCERN (HHCPCs). The HHCPCs were selected per the methodology described in Section 2.5 of the GIR (ABB-ES, 1998). This HHCPC selection methodology considers 1) frequency of detection, 2) consistency with background conditions, 3) comparison with regulatory and risk-based screening values (screening values are presented in Appendix E, Tables E-1 through E-3), and 4) comparison with essential nutrient levels.

In selecting HHCPCs, USEPA Region IV criteria will be used (USEPA, 1995a). For each medium, the following criteria will be employed to exclude detected analytes from the list of HHCPCs. Each criterion by itself is justification for excluding the analyte.

Less than 5 Percent Frequency of Detection. If an analyte has a frequency of detection (number of samples in which the analyte is detected divided by the number of samples analyzed for that analyte) less than 5 percent (USEPA, 1995a) and is not selected as a HHCPC in another medium, it is not selected as a HHCPC. This criterion is not used if there are less than 20 environmental samples for a specific medium, and was not applicable in this HHRA.

Less than Background Screening Concentrations. If the maximum detected concentration of an analyte is less than twice the arithmetic mean of the background concentration (inorganics only), the analyte is not selected as a HHCPC (USEPA, 1995a). Development of background screening values for surface soil, groundwater, and subsurface soil are discussed below.

- A representative surface soil background data set consisting of Troup loamy sand and Dothan fine sandy loam soil types is used for background screening of Site 11 surface soil samples. Sample locations are identified on Figure 3-10 and are discussed in Subsection 3.3.1 of the GIR (ABB-ES, 1998). The background surface soil data used for screening Site 11 surface soils are presented in Tables 3-8 and 3-14 of the GIR (ABB-ES, 1998).

- Subsurface soil locations are identified on Figure 3-11 and are discussed in Subsection 3.3.2 of the GIR (ABB-ES, 1998). Tables 3-15 through 3-17 in the GIR report present background sample data for various types of subsurface soil. Table 3-18 of the GIR (ABB-ES, 1998) presents summary statistics and background screening data value used in the Site 11 HHRA subsurface soil evaluation.

- Background groundwater sample locations are identified on Figure 3-12 and discussed in Subsection 3.3.3 of the GIR (ABB-ES, 1998). Tables 3-21 through 3-23 of the GIR (ABB-ES, 1998) presents background screening data for groundwater. Table 3-24 of the GIR (ABB-ES, 1998) presents the summary statistics used for screening the groundwater at Site 11.

Less than Risk-Based Screening Concentrations, Standards, and Guidelines. If the maximum detected concentration of the analyte in a medium is less than its corresponding adjusted USEPA Region III RBC (USEPA, 1998), and less than USEPA and Florida standards, the analyte is not selected as a HHCPC (USEPA, 1995a). The target hazard quotient (HQ) in the USEPA Region III RBC table is 1 and the target cancer risk is 1×10^{-6}. All RBCs based on noncarcinogenic effects are adjusted for a target HQ of 0.1 per Region IV guidance (USEPA, 1995a).

The residential soil RBCs are used for surface soil. The industrial soil RBCs are used for subsurface soil. No RBC is available for lead in soil due to a lack of toxicity data. Based on an USEPA recommendation, a screening level of 400 mg/kg for lead under residential land use is used as the RBC for lead in soil (USEPA, 1994c). No RBC is available for TPH. Therefore, the FDEP Cleanup Target Level was used for screening (FDEP, 1999). The maximum detected concentrations of analytes in surface soil and subsurface soil are also compared to residential and industrial Florida soil cleanup target levels, respectively. The maximum detected concentration of any organic analyte in surface soil that was also detected in groundwater (above a standard or guideline) is compared to the Florida Leaching Cleanup Target Level for that analyte.

Tap water RBCs (USEPA, 1997a), Federal MCLs (USEPA, 1996b) and Florida Groundwater Cleanup Target Levels (FDEP, 1999) are used for screening HHCPCs in groundwater.

Less than Essential Nutrient Screening Values. If the maximum detected concentration of an essential nutrient (i.e., sodium, potassium, magnesium, and calcium) in a medium is below a toxic level and consistent with or only slightly above its background concentration, the essential nutrient is not selected as an HHCPC. The derivation of essential nutrient screening values is presented in the GIR (ABB-ES, 1998).

HHCPCs were not screened using the essential nutrient value for iron; the RBC for iron was used instead. However, if iron is determined to be a risk driver, a comparison of the exposure point concentrations (EPCs) against the essential nutrient level for iron will be presented in the uncertainty analysis section for that medium.

If the analyte meets any of the above criteria, is not a member of the same chemical class as other HHCPCs in the medium, and is not a breakdown product of other HHCPCs in the medium, then the analyte is not selected as an HHCPC. In situations where multiple screening values are available, a chemical is excluded only if its maximum screening concentration is less than all of the corresponding screening values. Appendix E presents the RBCs, regulatory guidance values, and applicable or relevant and appropriate requirements that are used in HHCPC selection. After applying these criteria with professional judgment, HHCPCs are identified for each medium. HHCPC selection for each media is presented below in Subsections 6.2.1 through 6.2.3.

6.2.1 Surface Soil

6.2.1.1 Site 11 Surface Soil Ten samples including 11-SL-01 through 11-SL-05, 11S00101, 11S00201, 11S00301, 11-SL-02RE, 11S00201DL, and two duplicates 11-SL-01A and 11S00601D were considered in the Site 11 HHRA. Sample 11-SL-02RE only had data for VOCs, which were averaged with the original sample 11-SL-02. Sample 11S00201DL only had data for pesticides. However, all of the data were rejected, except for alpha chlordane. Sample 11S002001 had data for every class of constituents except alpha chlordane. Therefore, the alpha-chlordane data for sample 11S00201DL were combined into sample 11SS00201. Samples 11S00601 through 11S01301 and duplicate 11S00601D were analyzed only for lead. TPH was analyzed only in samples 11S00101 through 11S00501. VOCs, SVOCs, pesticides, PCBs, inorganic analytes, and TPH data from all of these samples are evaluated in this HHRA. Table 5-7 presents the analytes detected and the concentrations in surface soil. Table 6-1 presents summary statistics for the HHRA and identifies six polynuclear aromatic hydrocarbons (PAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene), one pesticide compound (dieldrin), and three inorganic analytes (arsenic, iron, and lead) as the HHCPCs for surface soil at Site 11.

6.2.1.2 Site 11 Subsurface Soil Three samples (11SS0101, 11SS0202, and 11SS0303) were collected from Site 11 (Figure 3-2). VOCs, SVOCs, pesticides, PCBs and inorganic analyte data from all of these samples are evaluated in this HHRA (Table 5-11). Table 6-2 presents the HHCPCs selection for subsurface soil at Site 11. No analytes were selected as HHCPCs in the subsurface soil.

6.2.1.3 Groundwater Six groundwater samples (11G00101, 11G00102, 11G00201, 11G00301, 11G00401, 11G00402) and the duplicate sample for 11G00201D) were collected from Site 11 (Figure 3-3). VOCs, SVOCs, pesticides, PCBs, and inorganic analyte data from these samples are evaluated in this HHRA (Table 5-14 and 5-15). Table 6-3 presents the summary statistics for the detected concentrations and identifies 1,2-dichloroethene, benzene, vinyl chloride, bis(2-ethylhexyl)phthalate, and five inorganics (aluminum, arsenic, iron, manganese, and thallium) as HHCPCs for groundwater at Site 11.

6.3 EXPOSURE ASSESSMENT. The exposure assessment methodology is described in Section 2.5.3 of the GIR (ABB-ES, 1998). This process involves the following several steps:

- characterization of the exposure setting in terms of physical characteristics and the populations that may hypothetically be exposed to site-related chemicals;
- identification of potential exposure pathways and receptors; and
- quantification of exposure for each population in terms of the amount of chemical either ingested, inhaled, or absorbed through the skin from all complete or hypothetically complete (potential future) exposure pathways.

Summaries of hypothetical exposure pathways to chemicals detected at Site 11 are presented on Figure 6-1.

Table 6-1
Selection of Human Health Chemicals of Potential Concern for Surface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limits	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Volatile Organic Compounds (µg/kg)								
Acetone	1/10	11 to 13	53.3*	53.3	ND	780,000	No	S
Semivolatile Organic Compounds (µg/kg)								
2-Methylnaphthalene	1/10	350 to 4,000	49	49	ND	80,000	No	S
Acenaphthylene	1/10	350 to 4,000	110	110	ND	470,000	No	S
Anthracene	1/10	350 to 4,000	280	280	ND	2,300,000	No	S
Benzo(a)anthracene	1/10	350 to 4,000	1,800	1,800	ND	870	Yes	
Benzo(a)pyrene	1/10	350 to 4,000	910	910	ND	87	Yes	
Benzo(b)fluoranthene	1/10	350 to 4,000	710	710	ND	870	Yes	C
Benzo(g,h,i)perylene	1/10	350 to 4,000	310	310	ND	230,000	No	S
Benzo(k)fluoranthene	1/10	350 to 4,000	870	870	ND	8,700	Yes	C
bis(2-Ethylhexyl)phthalate	5/10	350 to 4,000	52 to 540	175	ND	46,000	No	S
Chrysene	1/10	350 to 4,000	2,500	2,500	ND	87,000	Yes	C
Fluoranthene	1/10	350 to 4,000	1,300	1,300	ND	310,000	No	S
Indeno(1,2,3-cd)pyrene	1/10	350 to 4,000	230	230	ND	870	Yes	C
Phenanthrene	1/10	350 to 4,000	2,100	2,100	ND	230,000	No	S
Pyrene	1/10	350 to 4,000	3,400	3,400	ND	230,000	No	S

See notes at end of table.

Table 6-1 (Continued)
Selection of Human Health Chemicals of Potential Concern for Surface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limits	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Pesticides and PCBs (μg/kg)								
4,4'-DDD	1/10	3.6 to 980	140	140	ND	2,700	No	S
4,4'-DDE	7/10	3.7 to 980	2.1 to 88	26.5	ND	1,900	No	S
4,4'-DDT	8/10	3.7 to 980	2.3 to 530	81.8	ND	1,900	No	S
Aldrin	1/10	1.9 to 490	0.96	0.96	ND	38	No	S
Dieldrin	8/10	3.7 to 980	4.9 to 210	42.9	ND	40	Yes	
Heptachlor	1/10	1.9 to 490	4.8	4.8	ND	140	No	S
Heptachlor epoxide	1/10	1.9 to 490	8.8	8.8	ND	70	No	S
alpha-Chlordane	4/10	1.9 to 4,900	39 to 310	140	ND	1,800	No	S
gamma-Chlordane	4/10	1.9 to 4,900	29 to 260	111	ND	1,800	No	S
Inorganic Analytes (mg/kg)								
Aluminum	10/10	40	2,110 to 10,800	7,490	15,314	7,800	No	B
Antimony	1/10	2.6 to 12	3.5	3.5	8	3.1	No	B
Arsenic	10/10	2	0.93 to 3.8	2.1	3.0	0.43	Yes	
Barium	10/10	40	4.6 to 96	19.2	23.8	110	No	S
Beryllium	7/10	0.05 to 1	0.05 to 0.14	0.09	0.36	16	No	B, S

See notes at end of table.

Table 6-1 (Continued)
Selection of Human Health Chemicals of Potential Concern for Surface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limits	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Inorganic Analytes (mg/kg) (Continued)								
Cadmium	2/10	0.58 to 1	0.24 to 0.28	0.26	0.58	3.9	No	B, S
Calcium	10/10	1,000	185 * to 1,790	445	402	1,000,000	No	S
Chromium	10/10	2	2.7 to 19.6	7.9	10.8	23	No	S
Cobalt	6/10	0.33 to 10	0.35 to 3.4	1.5	3	470	No	S
Copper	8/10	5	3.7 to 19.4	7.2	9.4	110	No	S
Cyanide	5/10	0.23 to 0.5	0.09 to 0.19	0.12	0.26	30	No	B, S
Iron	10/1	20	1,500 to 11,700	5,250	8,588	2,300	Yes	
Lead	18/18	0.6 to 1	5.2 to 2,230	146	11.4	400	Yes	
Magnesium	10/10	6,000	54.2 to 1,260	214	258	460,468	No	S
Manganese	10/10	3	31.4 to 280*	126	404	160	No	B
Mercury	6/10	0.1	0.04 to 0.08	0.05	0.12	2.3	No	B, S
Nickel	4/10	2.3 to 8	1.6 to 10	3.9	7.2	110	No	S
Potassium	8/10	128 to 1,000	62.1 to 166	111	177	1,000,000	No	B, S
Selenium	1/10	0.44 to 1	0.16	0.16	0.44	39	No	B, S
Silver	5/10	2	0.55 to 1.9	1	0.7	39	No	S
Sodium	10/10	1,000	160 to 307	188	388	1,000,000	No	B, S
Vanadium	10/10	10	4.4 to 20.3	12.9	21.2	15	No	B, S
Zinc	10/10	4	5.7 to 260	40.5	15.4	2,300	No	S

See notes at end of table.

Table 6-1 (Continued)
Selection of Human Health Chemicals of Potential Concern for Surface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limits	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Others (mg/kg)								
Total petroleum hydrocarbons	5/5	1.8 to 1.9	7 to 53.1	17.9	NA	380	No	S

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the nondetect.
[3] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[5] For all chemicals except the essential nutrients (calcium, magnesium, potassium, and sodium), the lesser of the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for residential soil exposure per January 1993 guidance ("Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening, "EPA/903/R-93-001 [USEPA, 1993a]) or the Florida Soil Cleanup Target Levels (FDEP, 1999) was used for screening. Values from the USEPA Region III RBC Tables, dated October 1998, are based on an excess lifetime cancer risk of 6×10^{-6} or an adjusted hazard quotient of 0.1. For the essential nutrients, screening values were derived based on recommended daily allowances. Lead value is from the Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (Office of Solid Waste and Emergency Response Directive 9355.4-12).
[6] Analyte was included or excluded from the risk assessment for the following reasons:
B = the maximum detected concentration did not exceed the background screening concentration; therefore, the analyte will not be considered further.
S = the maximum detected concentration did not exceed the screening concentration; therefore, the analyte will not be considered further.
C = the analyte is a carcinogenic PAH and was selected as an HHCPC because one or more other carcinogenic PAHs were selected.

The average of a sample and its duplicate is used for all table calculations.
Samples: 11-SL-01 through 11-SL-05, 11S00101 through 11S01501, 11S00101 through 11S01301 (for lead only), 11S00101 through 11SS0501 (only analyzed TPH data).
Sample Duplicates: 11-SL-01A and 11S00601D.
Background samples: BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BK50301, BKS00401, and BKS00501.
Background duplicate sample: BKS00201D.

Notes: HHCPC = human health chemical of potential concern.
μg/kg = micrograms per kilogram.
* = average of sample and duplicate.
ND = not detected in any background sample.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.
mg/kg = milligrams per kilogram.
NA = not applicable.

Table 6-2
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentrations	Mean of Detected Concentrations[2]	Background Screening Concentration[3]	Selected Screening Concentration[4]	Analyte HHCPC? (Yes/No)	Reason[5]
Volatile Organic Compounds (µg/kg)								
Acetone	2/3	11 to 19	80 to 100	90	NA	5,500,000	No	S
Toluene	1/3	11 to 12	4	4	NA	2,600,000	No	S
Xylenes (total)	3/3	NA	4 to 8	5.3	NA	40,000,000	No	S
Semivolatile Organic Compounds (µg/kg)								
bis(2-Ethylhexyl)phthalate	1/3	370 to 4,000	100	100	NA	280,000	No	S
Pesticides and PCBs (µg/kg)								
4,4'-DDD	2/3	3.7 to 40	22 to 120	71	NA	18,000	No	S
4,4'-DDE	3/3	NA	5 to 27	18	NA	13,000	No	S
4,4'-DDT	2/3	4 to 40	8.4 to 28	18.2	NA	13,000	No	S
Aldrin	1/3	1.9 to 21	7	7	NA	300	No	S
Aroclor-1254	1/3	37 to 400	260	260	NA	2,100	No	S
Aroclor-1260	1/3	37 to 400	62	62	NA	2,100	No	S
Dieldrin	3/3	NA	2 to 33	19.3	NA	300	No	S
Inorganic Analytes (mg/kg)								
Aluminum	3/3	NA	11,300 to 19,400	15,900	27,800	200,000	No	B, S
Arsenic	3/3	NA	3.7 to 5.5	4.4	6.2	3.7	No	B
Barium	3/3	NA	10.7 to 28.5	17.9	15.8	14,000	No	S

See notes at end of table.

Table 6-2 (Continued)
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentrations	Mean of Detected Concentrations[2]	Background Screening Concentration[3]	Selected Screening Concentration[4]	Analyte HHCPC? (Yes/No)	Reason[5]
Inorganic Analytes (mg/kg) (Continued)								
Beryllium	3/3	NA	0.12 to 0.21	0.17	0.26	410	No	B, S
Cadmium	2/3	0.67 to 1	5 to 6.5	5.8	0.92	100	No	S
Calcium	3/3	NA	601 to 12,100	4,490	444	1,000,000	No	S
Chromium	3/3	NA	11.4 to 19.5	16	22.8	420	No	B, S
Cobalt	3/3	NA	1.1 to 1.7	1.3	1.5	12,000	No	S
Copper	3/3	NA	5.9 to 17.2	9.9	8.8	8,200	No	S
Iron	3/3	NA	7,780 to 16,800	13,400	18,100	61,000	No	B, S
Lead	3/3	NA	7.4 to 109	60.3	8.4	400	No	S
Magnesium	3/3	NA	85.2 to 311	164	272	460,468	No	S
Manganese	3/3	NA	20.6 to 188	83.2	42.6	4,100	No	S
Mercury	3/3	NA	0.08 to 0.2	0.13	ND	26	No	S
Nickel	3/3	NA	3.5 to 3.9	3.7	5	4,100	No	B, S
Selenium	1/3	0.48 to 1	0.56	0.56	0.3	1,000	No	S
Sodium	3/3	NA	167 to 189	177	ND	1,000,000	No	S
Vanadium	3/3	NA	22.2 to 37.5	31.5	45	1,400	No	B, S
Zinc	3/3	NA	12.8 to 298	137	15.6	61,000	No	S

See notes at end of table.

Table 6-2 (Continued)
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[3] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[4] The lesser of the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for industrial soil exposure per January 1993 guidance ("Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening," EPA/903/R-93-001 [USEPA, 1993a]) or Florida Soil Cleanup Target Levels (Florida Department of Environmental Protection, 1999) were used for screening. Actual values are taken from the USEPA Region III RBC Tables dated October 1998, and are based on an excess lifetime cancer risk of 1×10^{-6} or an adjusted hazard quotient of 0.1.
[5] Analyte was included or excluded from the risk assessment for the following reasons:
B = the maximum detected concentration did not exceed the background; therefore, the analyte will not be considered further.
S = the maximum detected concentration did not exceed the screening concentration; therefore, the analyte will not be considered further.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: 11SS0101, 11SS0202, 11SS0303.
Background samples: BKB00101, BKB00102, BKB00201, BKB00202, BKB00301, BKB00302, BKB00401, BKB00402, BKB00501, BKB00502, BKB00601, BKB00602, BKB00701, BKB00702.
Background duplicate samples: BKB00401D and BKB00602D.

HHCPC = human health chemical of potential concern.
μg/kg = micrograms per kilogram.
NA = not applicable.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.
mg/kg = milligrams per kilogram.

Table 6-3
Selection of Human Health Chemicals of Potential Concern for Unfiltered Groundwater

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florid

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentrations Range[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Volatile Organic Compounds (µg/ℓ)								
1,2-Dichloroethene (total)	2/6	10	2 to 6	4	NA	5.5	Yes	
Benzene	1/6	10	2	2	NA	0.36	Yes	
Carbon disulfide	2/6	10	1 to 2	1.5	NA	100	No	S
Vinyl chloride	1/6	10	2	2	NA	0.019	Yes	
Semivolatile Organic Compounds (µg/ℓ)								
bis(2-Ethylhexyl)phthalate	2/6	10	4.5* to 6	5.3	NA	4.8	Yes	
Phenol	1/6	10	5 *	5	NA	10	No	S
Inorganic Analytes (µg/ℓ)								
Aluminum	3/6	14.6 to 50	270 to 2,550 *	1,240	654	50	Yes	
Arsenic	3/6	0.5	0.6 to 3.3	1.9	ND	0.045	Yes	
Barium	6/6	NA	18 to 102	56	72.6	260	No	S
Beryllium	1/6	0.15 to 0.3	0.28 *	0.28	0.58	4	No	B
Cadmium	1/6	1.2	1.2	1.2	4.4	1.8	No	B, S
Calcium	6/6	NA	2,640 to 80,800	34,100	3,320	1,060,000	No	S
Chromium	2/6	2	10 to 19.8 *	14.9	30	11	No	B
Copper	3/6	1.1	1.6 to 4.5	2.9	10.7	150	No	B, S
Iron	5/6	5	271 to 8,810	4,120	964	300	Yes	
Lead	5/6	0.25 to 0.5	0.58* to 9.8	3.4	ND	15	No	S
Magnesium	6/6	NA	238 to 7,660	2,350	2,430	118,807	No	S
Manganese	5/6	1	3.5 * to 385	162	42.8	50	Yes	

See notes at end of table.

Table 6-3 (Continued)
Selection of Human Health Chemicals of Potential Concern for Unfiltered Groundwater

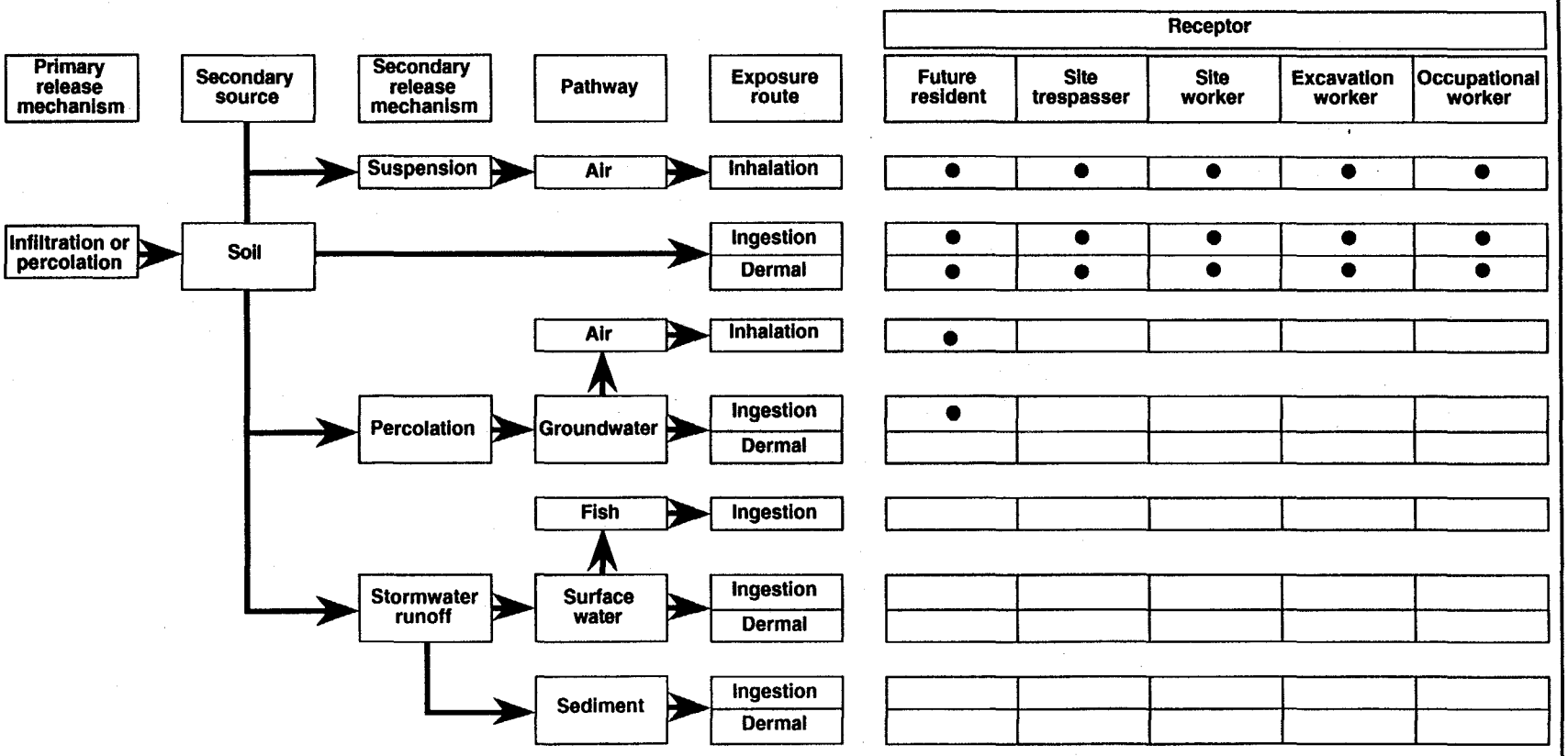
Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentrations Range[2]	Mean of Detected Concentrations[3]	Background Screening Concentration[4]	Selected Screening Concentration[5]	Analyte HHCPC? (Yes/No)	Reason[6]
Inorganic Analytes (μg/ℓ) (Continued)								
Potassium	4/6	1,100 to 1,580	2,540 to 11,300 *	6,660	1,530	297,016	No	S
Sodium	6/6	NA	1,780 to 12,900	5,060	4,770	160,000	No	S
Thallium	1/6	0.6	0.7	0.7	ND	0.29	Yes	
Vanadium	2/6	1.2	4.5 to 11 *	7.8	3.8	26	No	S
Zinc	4/6	1.6 to 2.6	6.4 to 144	56	200	1,100	No	B, S

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for the nondetect.
[3] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples.
[5] For all chemicals except the essential nutrients (calcium, magnesium, potassium, and sodium), the lesser of the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for tap water exposure per January 1993 guidance ("Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening," EPA/903/R-93-001 [USEPA, 1993a]) or the Florida Groundwater Cleanup Target Levels (Florida Department of Environmental Protection, 1999) was used for screening. Actual values are taken from the USEPA Region III RBC Tables dated October 1998, and are based on a excess lifetime cancer risk of 1×10^{-6} or an adjusted hazard quotient of 0.1. For the essential nutrients, screening values were derived based on recommended daily allowances.
[6] Analyte was included or excluded from the risk assessment for the following reasons:
B = the maximum detected concentration did not exceed the background screening concentration; therefore, the analyte will not be considered further.
S = the maximum detected concentration did not exceed the screening concentration; therefore, the analyte will not be considered further.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: 11G00101, 11G00102,11G00201, 11G00301, 11G00401, 11G00402.
Duplicate sample: 11G00201D
Background samples: BKG00101 through BKG00103, BKG00201 through BKG00203, and BKG00301
Background duplicate sample: BKG00101D

HHCPC = human health chemical of potential concern.
μg/ℓ = micrograms per liter.
NA = not applicable.
* = average of sample and duplicate.
ND = not detected in any background samples.



NOTE:
NAS = Naval Air Station

FIGURE 6-1
SITE 11, COMPLETE EXPOSURE PATHWAYS FOR HUMAN RECEPTORS

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

2534-09 WHITING SITE 11 FIG 6-1 FINAL 040198HAS

The hypothetical pathways including medium and route of exposure, the hypothetical exposed population, and the rationale for pathway selection or exclusion are provided in Table 6-4, and are described in more detail in Subsections 6.3.1through 6.3.3. Receptor-specific exposure parameters for each exposure scenario are presented in Appendix C to the GIR (ABB-ES, 1998). Risk calculation spreadsheets in Appendix E of this RI report also contain the assumed exposure parameters and quantitation of exposures.

6.3.1 Surface Soil No humans currently reside or work at Site 11. Site 11 may be developed eventually for residential land use; therefore, the residential receptor will be evaluated as part of the hypothetical future land-use scenario.

Currently there are no buildings present at the site; therefore, exposure of occupational workers will be only considered as part of the future land-use scenario. Other possible future exposure scenarios include excavation activities, such as installation of utility lines, and site maintenance, such as mowing the grass. Exposures of hypothetical future residents (adult and child), hypothetical future occupational workers, current and future site maintenance workers, future excavation workers, and current and future trespassers (adult and child) to surface soil contaminants through ingestion, dermal contact, and inhalation of particulates are evaluated in this HHRA.

6.3.2 Subsurface Soil There are no current exposures to subsurface soil because no excavation or construction activities are ongoing at Site 11. Therefore, subsurface soil exposure pathways are not evaluated in this HHRA. Also, there were no HHCPCs identified.

6.3.3 Groundwater Currently, groundwater at Site 11 is not used for any potable or nonpotable purpose. There are no plans to use the water resource in the foreseeable future. However, in the event that Site 11 or areas hydraulically downgradient of Site 11 are developed for residential use, the exposure pathway to chemicals in groundwater could become complete. Therefore, hypothetical future domestic use of the surficial aquifer is evaluated in this HHRA as a worst-case estimate of future potential exposures to groundwater. Exposure routes evaluated include ingestion of groundwater as tap water, and inhalation of volatiles during bathing (showering). The tap water ingestion and volatile inhalation exposure pathways are considered to be the most significant exposure pathways associated with potable use of water. Dermal exposure to groundwater during potable use is considered to be insignificant relative to tap water ingestion and volatile inhalation exposure pathways, and separate quantitative evaluation is not required by USEPA Region IV (USEPA, 1995).

6.3.4 Exposure Point Concentrations EPCs for all HHCPCs in surface soil and groundwater were calculated according to Subsection 2.5.3.3 of the GIR (ABB-ES, 1998). This quantification process involves developing assumptions regarding exposure conditions and exposure scenarios for each receptor to estimate the total amount of contaminants that a hypothetical receptor may ingest, dermally absorb, or inhale from each exposure pathway. The ultimate goal of this step, as defined in the USEPA guidance, is to identify the combination of these exposure variables or parameters that result in the most intense level of exposure that may "reasonably" be expected to occur under current and future site conditions (USEPA, 1989b). The EPCs for HHCPCs in surface soil for Site 11 are presented in Table 6-5. The EPCs for HHCPCs in groundwater for Site 11 are

Table 6-4
Summary of Potential Exposure Pathways

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Medium of Exposure	Route of Exposure	Potentially Exposed Population	Selected for Evaluation ?	Reason for Selection or Evaluation
Current Land Use				
Surface soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Resident (adult and child) Trespasser (adult and adolescent) Occupational worker (adult) Site maintenance worker (adult) Excavation worker (adult)	No Yes No Yes No	No humans currently reside at Site 11. Adolescents and adults may be exposed to contaminants in the surface soil while trespassing. The site maintenance workers may be exposed to contaminants in surface soil while performing routine site activities.
Subsurface soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Excavation worker (adult)	No	An excavation worker could be exposed to soil during excavation activities, but no excavation activities are ongoing. Additionally, there were no HHCPCs selected for subsurface soil at Site 11.
Groundwater	Ingestion of groundwater as drinking water	Resident (adult)	No	There are no current exposures to groundwater.
Future Land Use				
Surface soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Resident (child and adult) Trespasser (adolescent and adult) Occupational worker (adult) Site maintenance worker (adult) Excavation worker (adult)	Yes Yes Yes Yes Yes	If Site 11 is developed for residential use, residents could be exposed to chemicals in surface soil. Exposure of trespassers, occupational workers, site maintenance workers and excavation workers to chemicals in surface soil is possible.
Subsurface soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Excavation worker (adult)	No	An excavation worker could be exposed to subsurface soil during utility work or construction activities; however, there were no human health chemical of potential concerns selected for subsurface soil at Site 11.
Groundwater	Ingestion of groundwater as drinking water and inhalation of volatiles while showering	Resident (adult and child)	No	If Site 11 is developed for residential use, drinking water wells in the surficial aquifer could be influenced by contaminants in the groundwater associated with Site 11.

Table 6-5
Exposure Point Concentrations for Human Health Chemicals of Potential Concern for Surface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Maximum Detected Concentration	95% UCL[2]	Exposure Point Concentration[3]
Semivolatile Organic Compounds (μg/kg)				
Benzo(a)anthracene	1/10	1,800	976	976
Benzo(a)pyrene	1/10	910	806	806
Benzo(b)fluoranthene	1/10	710	777	710
Benzo(k)fluoranthene	1/10	870	800	800
Chrysene	1/10	2,500	1,140	1,140
Indeno(1,2,3-cd)pyrene	1/10	230	608	203
Pesticides and PCBs (μg/kg)				
Dieldrin	8/10	210	74	74
Inorganic Analytes (mg/kg)				
Arsenic	10/10	3.8	2.7	2.7
Iron	10/10	11,700	6,930	6,930
Lead	18/18	2,230	166	166

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] 95% UCL of the arithmetic mean is calculated using all samples. One-half the contract-required quantitation limit/contract-required detection limit is used as a surrogate for nondetects. The UCL is not calculated when there are less than 10 total samples.
[3] Exposure point concentration is the lower of either the 95% UCL concentration or maximum detected concentration.

Notes: % = percent.
mg/kg = milligrams per kilogram.
UCL = upper confidence limit
μg/kg = micrograms per kilogram.
PCB = polychlorinated biphenyl.

presented in Table 6-6. The EPCs were used with receptor-specific exposure parameters to quantify exposures to the HHCPCs, as shown in the risk calculation spreadsheets in Appendix E of this report.

6.4 TOXICITY ASSESSMENT. The toxicity assessment methodology is described in Subsection 2.5.4 of the GIR (ABB-ES, 1998). The toxicity assessment evaluates the available evidence on the hypothetical adverse effects associated with exposure to each HHCPC. This information is used to develop a relationship between the extent of exposure and the likelihood or severity of adverse human health effects. Two steps are typically associated with toxicity assessment: hazard identification and dose-response assessment.

- Hazard identification is the process of determining if exposure to an agent can cause a particular adverse health effect and, more importantly, if that effect will occur in humans. The objectives of the hazard identification in the HHRA are to (1) identify which of the contaminants detected at the site are hypothetical hazards, and (2) summarize their potential toxicity in brief nontechnical language.

- A dose-response assessment is conducted to characterize and quantify the relationship between intake, or dose, of a HHCPC and the likelihood of a toxic effect or response. There are two categories of toxic effects evaluated in this HHRA: carcinogenic and noncarcinogenic. Following USEPA guidance for HHRAs (USEPA, 1989b), these two endpoints (cancer and noncancer) are evaluated separately. As a result of the dose-response assessment, identified toxicity values are used to estimate the incidence of adverse effects as a function of human exposure to a chemical.

Appendix C to this report contains brief toxicity profiles for HHCPCs identified in surface soil and groundwater at Site 11. Appendix E of this report also contains toxicity information for the HHCPCs (Tables E-4 through E-9). Toxicity values used in this HHRA were current as of November 1997 for Integrated Risk Information System (IRIS) (USEPA, 1997b) and July 1997 for Health Effects Assessment Summary Tables (USEPA, 1997c).

6.5 RISK CHARACTERIZATION. Risk characterization is the final step in the risk assessment process. This step involves the integration of the exposure and toxicity assessments into a qualitative or quantitative expression of potential human health risks associated with contaminant exposure. Quantitative estimates of both carcinogenic and noncarcinogenic risks are made for each HHCPC and each complete exposure pathway identified in the exposure assessment. The risk characterization methodology is described in Subsection 2.5.5 of the GIR (ABB-ES, 1998).

Risk estimates for hypothetical exposures to surface soil and groundwater under current and hypothetical future land use scenarios are discussed below. These risk estimates are then compared to USEPA and FDEP carcinogenic and noncarcinogenic target levels.

The USEPA guidelines, established in the NCP, indicate that the total excess lifetime cancer risk (ELCR) due to exposure to the HHCPCs at a site should not

Table 6-6
Exposure Point Concentrations for Human Health Chemicals of Potential Concern, Groundwater

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Maximum Detected Concentration	Arithmetic Mean[2]	Exposure Point Concentration[3]
Volatile Organics (μg/ℓ)				
1,2-Dichloroethene (total)	2/6	6	4.7	4.7
Benzene	1/6	2	4.5	2
Vinyl chloride	1/6	2	4.5	2
Semivolatile Organics (μg/ℓ)				
bis(2-Ethylhexyl)phthalate	2/6	6	5.1	5.1
Inorganic Analytes (μg/ℓ)				
Aluminum	3/6	2,550	628	628
Arsenic	3/6	3.3	1.1	1.1
Iron	5/6	8,810	3,440	3,440
Manganese	5/6	385	135	135
Thallium	1/6	0.7	0.37	0.37

[1] Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
[2] Arithmetic mean of all samples calculated using one-half the contract-required quantitation limit and contract-required detection limit for nondetects.
[3] Exposure point concentration is the lower of either the mean concentration or maximum detected concentration.

Note: μg/ℓ = micrograms per liter.

exceed a range of 1 in 1,000,000 ($1x10^{-6}$) to 1 in 10,000 ($1x10^{-4}$) (USEPA, 1990). FDEP has indicated that chemical-specific risks greater than one in one million ($1x10^{-6}$) warrant further consideration.

A HQ less than 1 indicates that noncarcinogenic toxic effects are not expected to occur due to HHCPC exposure. Hazard indices (HIs) greater than 1 may be indicative of possible noncarcinogenic toxic effects, but the circumstances must be evaluated on a case-by-case basis (USEPA, 1989a). As the HI increases, so does the likelihood that adverse effects might be associated with exposure. Both USEPA and FDEP consider that chemicals with HIs greater than 1 warrant further evaluation and require an evaluation of the noncarcinogenic effects.

Table 6-7 summarizes the cancer and noncancer risk under a current land-use scenario for Site 11. Table 6-8 summarizes the cancer and noncancer risk under a hypothetical future land-use scenario for Site 11.

6.5.1 Surface Soil The risk calculations for surface soil exposure are shown in Tables E-10 through E-23 in Appendix E of this report. For the current land-use scenario, the cancer risks associated with exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 3×10^{-6} for an aggregate (combined adult and adolescent) trespasser, and 1×10^{-6} for a site maintenance worker. Both receptors cancer risk values are below the USEPA acceptable cancer risk range of 1 in 10,000 to 1 in 1,000,000. The noncancer risks associated with surface soil ingestion, dermal contact, and fugitive dust inhalation under current land use (adolescent trespasser, adult trespasser, and site worker) are below USEPA's and FDEP's target HI of 1. Figures 6-2 and 6-3 present summaries of cancer risks and HIs, respectively, associated with exposure scenarios under potential current land-use exposure scenario.

The cancer risks associated with exposure to surface soil ingestion, dermal contact, and fugitive dust inhalation under hypothetical future land use are 7×10^{-5} for an aggregate resident (combined adult and child), 3×10^{-6} for an aggregate trespasser (combined adult and adolescent), 2×10^{-6} for an occupational worker, 1×10^{-6} for a site maintenance worker, and 5×10^{-8} for an excavation worker under hypothetical future land use.

Figure 6-4 presents a summary of cancer risk associated with exposure scenarios under future land use. All of these hypothetical future receptor risks are within or below the USEPA acceptable cancer risk range; however, the hypothetical future residential risk exceeds the FDEP level of concern of 1×10^{-6} (mainly to benzo(a)pyrene and arsenic).

The noncancer risks associated with surface soil ingestion, dermal contact, and fugitive dust inhalation under future land use for all receptors are below USEPA's target HI of 1. Figure 6-5 presents a summary of HIs associated with exposure scenarios under future land use.

6.5.2 Groundwater The risk calculations for groundwater exposure are shown in Tables E-24 through E-27 in Appendix E of this report. Currently, there are no potable supply wells at the site; thus, there is no human exposure to groundwater. Therefore, risk was not evaluated for the current land-use scenario.

The cancer risks associated with exposure to groundwater via ingestion of tap water, and inhalation of volatiles while showering, under hypothetical future

Table 6-7
Risk Summary Current Land Use

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Land Use		Exposure Route	HI	ELCR
Current Land Use				
Surface Soil:				
	Adult Trespasser:	Incidental ingestion	0.006	4×10^{-7}
		Dermal contact	0.01	3×10^{-7}
		Inhalation of particulates	ND	6×10^{-11}
		Total Adult Trespasser:	0.02	7×10^{-7}
	Adolescent Trespasser:	Incidental ingestion	0.009	2×10^{-6}
		Dermal contact	0.01	2×10^{-7}
		Inhalation of particulates	ND	4×10^{-11}
		Total Adolescent Trespasser:	0.02	2×10^{-6}
		Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:	NC	3×10^{-6}
	Site Maintenance Worker:	Incidental ingestion	0.002	1×10^{-6}
		Dermal contact	0.008	3×10^{-7}
		Inhalation of particulates	ND	3×10^{-10}
		Total Site Maintenance Worker:	0.01	1×10^{-6}

Notes: HI = hazard index.
ELCR = excess lifetime cancer risk.
ND = not detected.
NC = not calculated because child and adult HIs are not additive.

Table 6-8
Risk Summary Future Land Use

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Land Use		Exposure Route	HI *	ELCR *
Future Land Use				
Surface Soil:				
	Adult Trespasser:	Incidental ingestion	0.006	4×10^{-7}
		Dermal contact	0.01	3×10^{-7}
		Inhalation of particulates	ND	6×10^{-11}
		Total Adult Trespasser:	0.02	7×10^{-7}
	Adolescent Trespasser:	Incidental ingestion	0.009	2×10^{-6}
		Dermal contact	0.01	2×10^{-7}
		Inhalation of particulates	ND	4×10^{-11}
		Total Adolescent Trespasser:	0.02	2×10^{-6}
		Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:	NC	3×10^{-6}
	Adult Resident:	Incidental ingestion	0.05	4×10^{-6}
		Dermal contact	0.09	3×10^{-6}
		Inhalation of particulates	ND	2×10^{-9}
		Total Adult Resident:	0.1	7×10^{-6}
	Child Resident:	Incidental ingestion	0.4	6×10^{-5}
		Dermal contact	0.1	1×10^{-6}
		Inhalation of particulates	ND	3×10^{-9}
		Total Child Resident:	0.5	6×10^{-5}
		Total Risk to Resident (Adult and Child) Exposed to Surface Soil:	NC	7×10^{-5}
	Occupational Worker:	Incidental ingestion	0.09	1×10^{-6}
		Dermal contact	0.005	6×10^{-7}
		Inhalation of particulates	ND	8×10^{-10}
		Total Occupational Worker:	0.09	2×10^{-6}

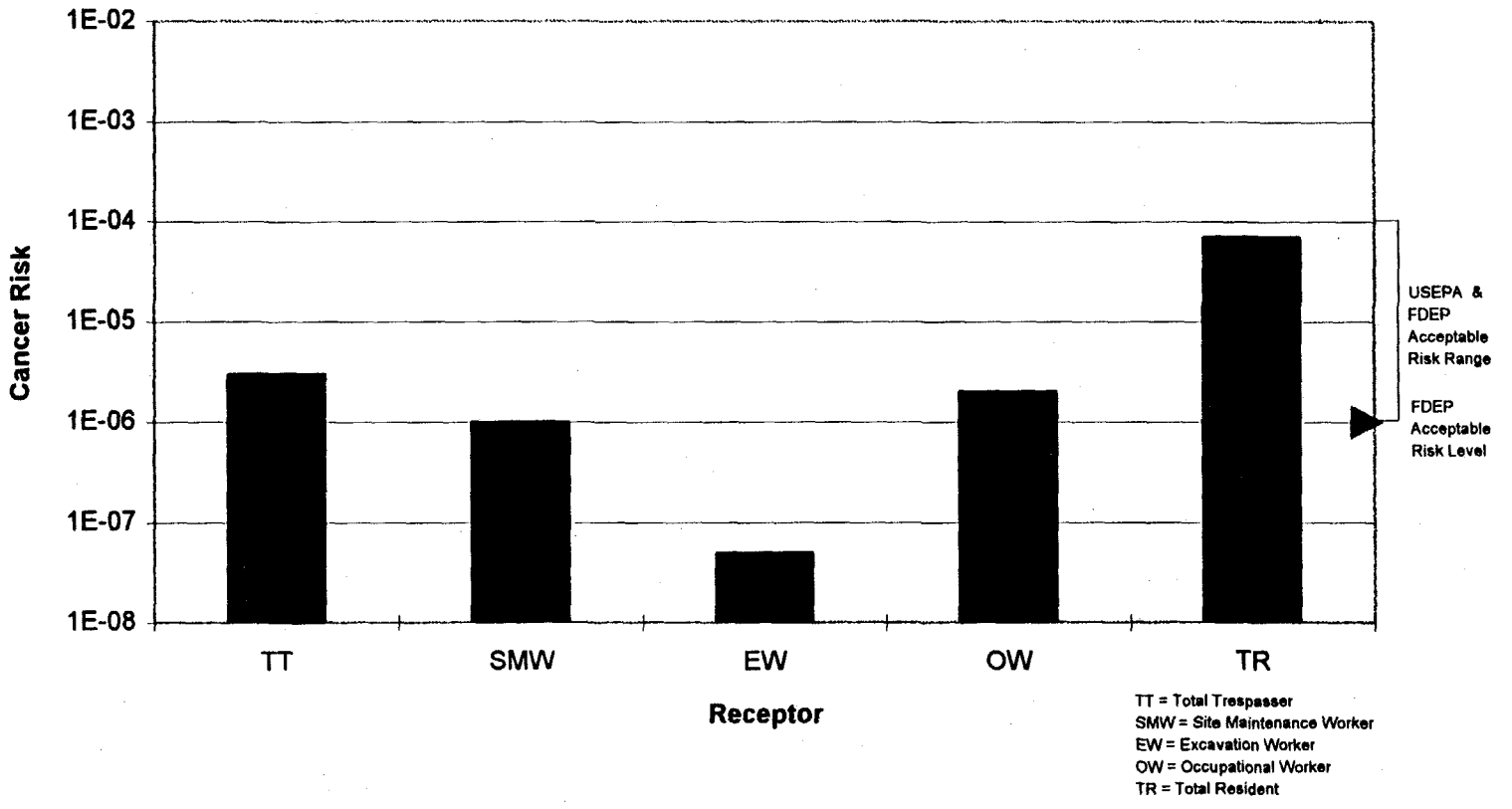
See notes at end of table.

Table 6-8 (Continued)
Risk Summary Future Land Use

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Land Use		Exposure Route	HI *	ELCR *
Future Land Use (Continued)				
	Site Maintenance Worker:	Incidental ingestion	0.002	1×10^{-6}
		Dermal contact	0.008	3×10^{-7}
		Inhalation of particulates	ND	3×10^{-10}
		Total Site Maintenance Worker:	0.01	1×10^{-6}
	Excavation Worker:	Incidental ingestion	0.02	5×10^{-8}
		Dermal contact	0.008	6×10^{-10}
		Inhalation of particulates	ND	1×10^{-11}
		Total Excavation Worker:	0.03	5×10^{-8}
Groundwater				
	Adult Resident			
		Ingestion of groundwater as drinking water	1	5×10^{-5}
		Inhalation of volatiles while showering	ND	3×10^{-6}
		Total Adult Resident:	1	5×10^{-5}
	Child Resident			
		Ingestion of groundwater as drinking water	1	3×10^{-5}
		Total Child Resident:	1	3×10^{-5}
		Total Risk to Resident (Adult and Child) Exposed to Groundwater:	NC	8×10^{-5}
		Total Risk to Resident (Adult and Child) Exposed to Surface Soil and Groundwater:	NC	1×10^{-4}

Notes: HI = hazard index.
* = receptor totals may vary for spreadsheets due to rounding algorithm.
ELCR = excess lifetime cancer risk
ND = No dose-response data for this exposure route were available for human health chemicals of potential concern in this medium.
NC = Not calculated because child and adult HIs are not additive.



NOTES:
NAS = Naval Air Station
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

FIGURE 6-2
CANCER RISK SUMMARY
CURRENT LAND USE FOR SURFACE SOIL AT SITE 11

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

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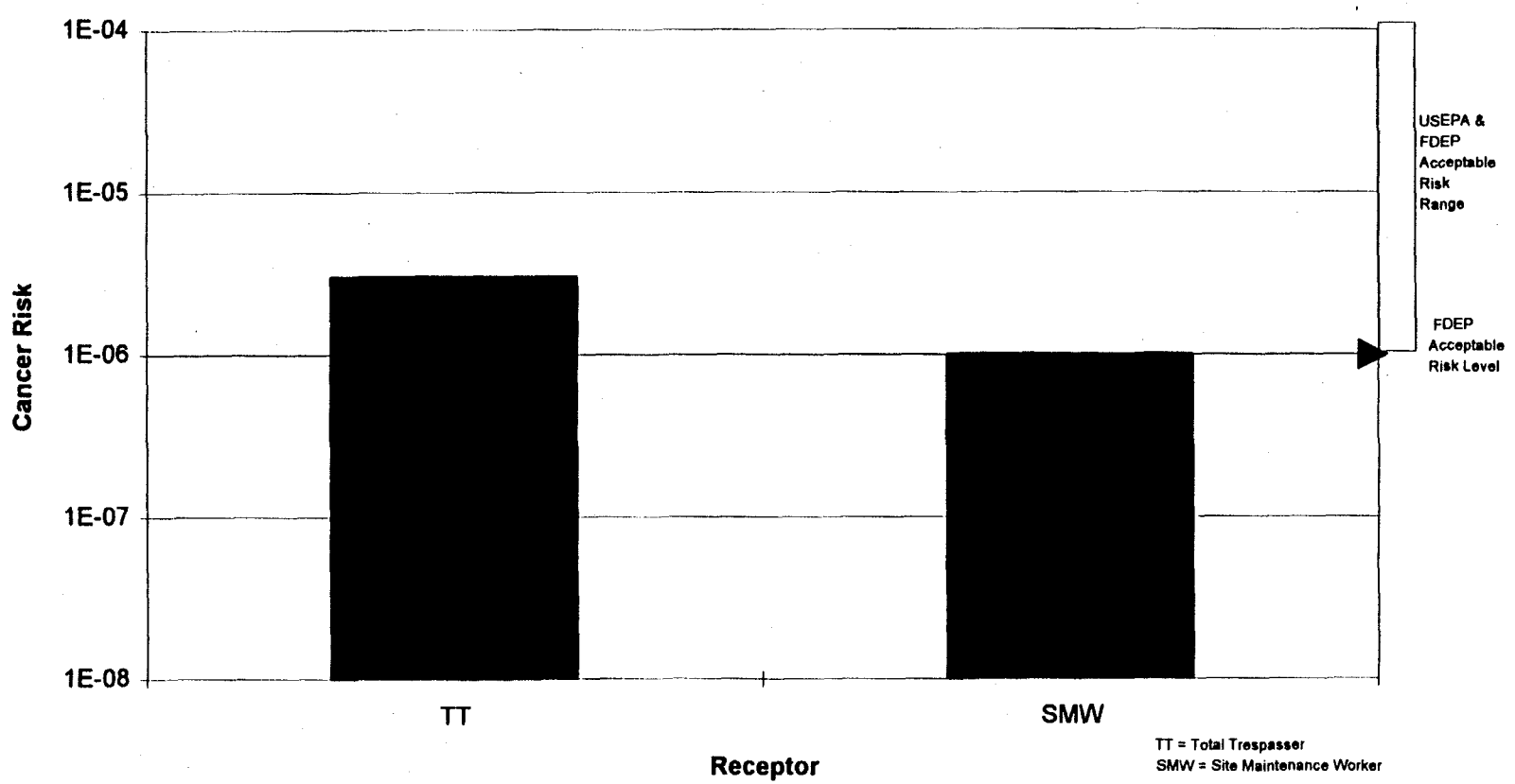

NOTES:
NAS = Naval Air Station
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

FIGURE 6-3
NONCANCER RISK SUMMARY
CURRENT LAND USE FOR SURFACE SOIL AT SITE 11

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

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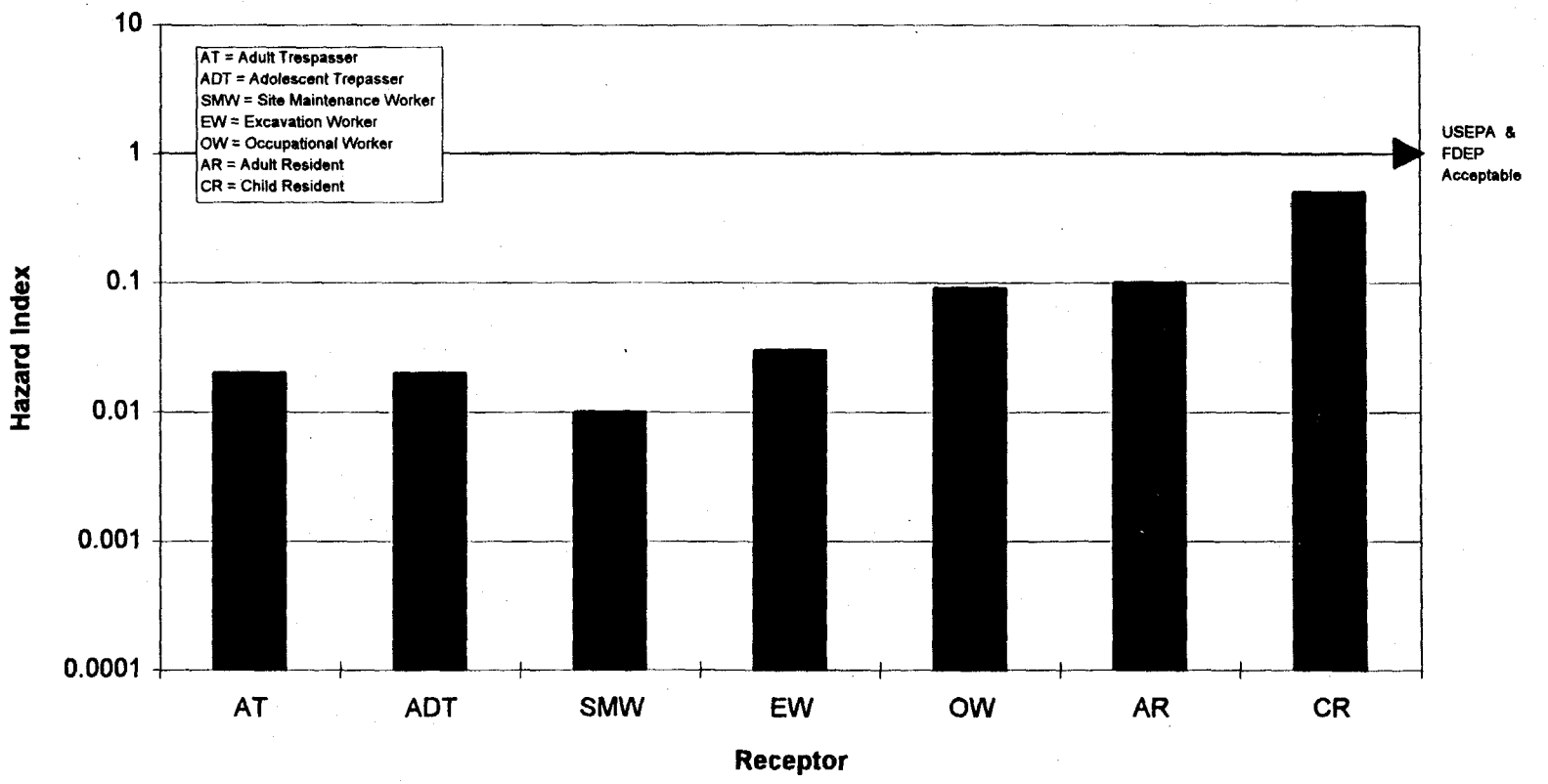


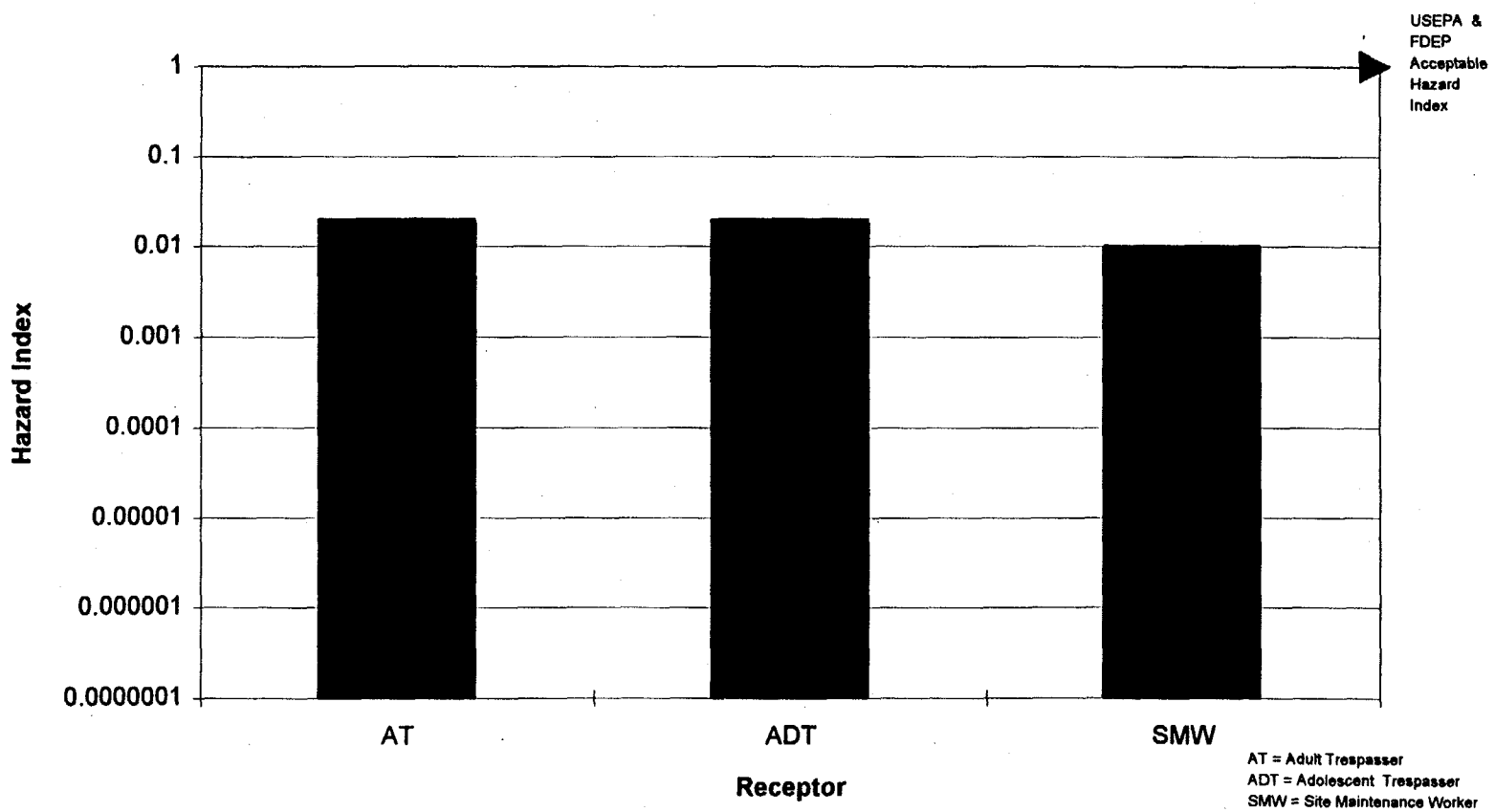
NOTES:
NAS = Naval Air Station
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

FIGURE 6-4
CANCER RISK SUMMARY
FUTURE LAND USE FOR SURFACE
SOIL AT SITE 11

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN
DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

H:\HEID\WHITING\SITE11\FIG6-4.PM5, FIGS11B.XLS 040198HAS



NOTES:
NAS = Naval Air Station
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

FIGURE 6-5
NONCANCER RISK SUMMARY
FUTURE LAND USE FOR SURFACE
SOIL AT SITE 11

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN
DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

H:\HEID\WHITING\SITE11\FIG6-5.PM5, FIGS11B.XLS 040198HAS

land use are 8×10^{-5} for an aggregate resident (combined adult and child). Figure 6-6 presents a summary of cancer risk associated with exposure scenarios under future land use. The hypothetical future receptor risk is within the USEPA acceptable cancer risk range but exceeds the FDEP level of concern of 1×10^{-6} due to vinyl chloride and arsenic.

Under hypothetical future land use, the noncancer risks associated with groundwater ingestion are 1 for both the adult resident and child resident. Both of these HIs do not exceed USEPA's target HI of 1. Figure 6-7 present a summary of the noncancer risk to potential future residents.

6.6 UNCERTAINTY ANALYSIS. General uncertainties associated with the collection, analysis, and evaluation of data; exposure assessment; toxicity assessment; and the risk estimation process are discussed in Subsection 2.5.5.1 of the GIR (ABB-ES, 1998). Site-specific uncertainties that are important for the interpretation of the calculated risk estimates for surface soil and groundwater at Site 11 are discussed below.

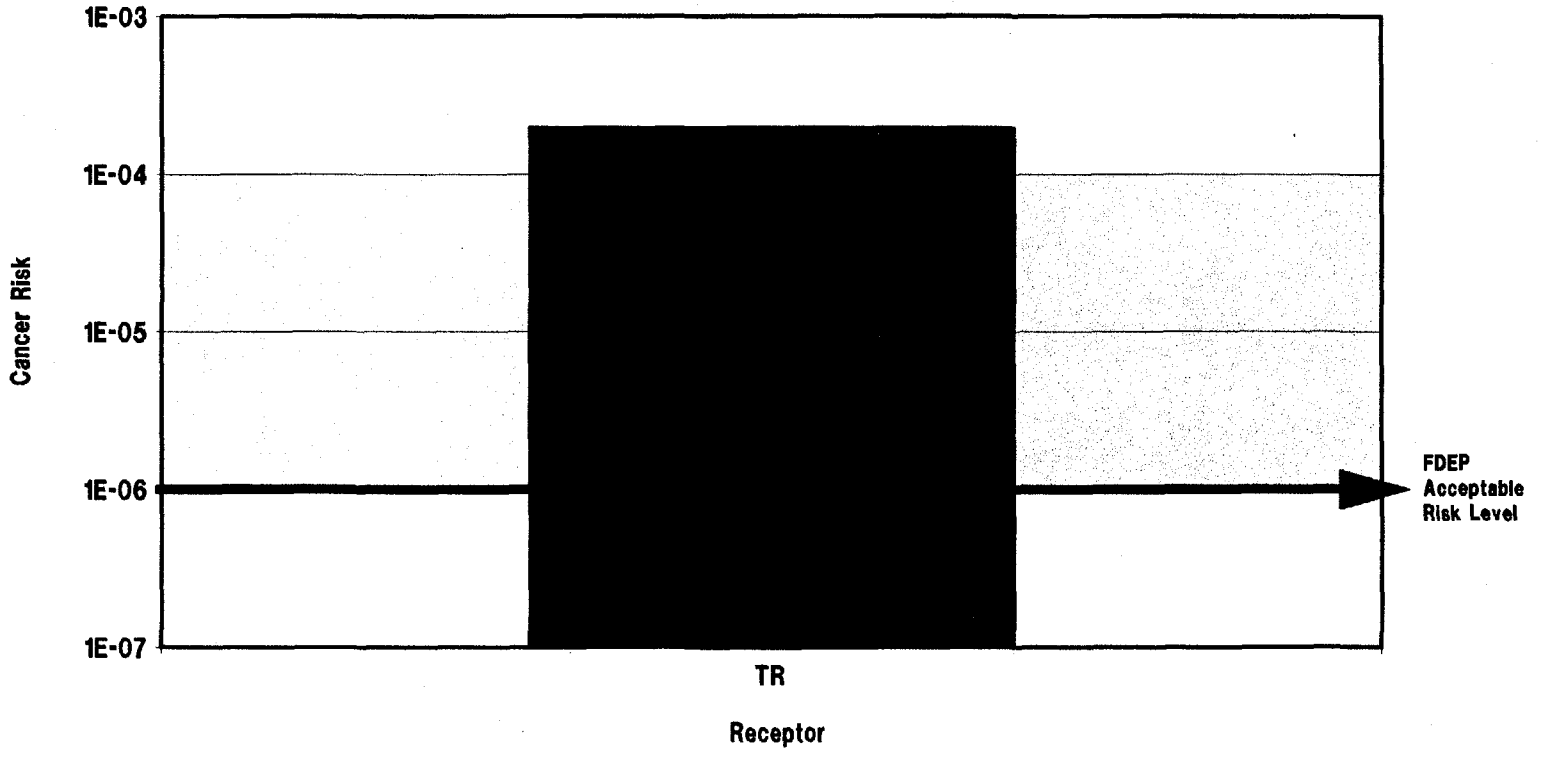
- The lack of inhalation reference doses for the HHCPCs in surface soil may have resulted in underestimates of the HIs associated with exposure to surface soil at Site 11; however, these noncancer risks are not likely to be significant when compared to oral and dermal risks that are fully characterized.

- One of the main contributors to surface soil carcinogenic risk at Site 11 is arsenic, a naturally occurring metal. It is uncertain whether or not this risk to hypothetical future residents is actually due to past site operations. Detected arsenic concentrations may actually be at naturally occurring levels or due to other anthropogenic activities such as pesticides application. This is especially noteworthy because the risk from arsenic at background conditions is 7×10^{-6}. Therefore, the risks from arsenic at Site 11 are likely to be overestimates.

- The SQLs were compared to the risk-based screening criteria and FDEP guidelines for all analytes not selected as HHCPCs to assess whether or not the detection limits were adequate to detect analytes at levels of concern (SQLs of analytes with 100 percent frequency of detection were not evaluated). These analytes with SQLs that exceed their screening criteria are aldrin, heptachlor, heptachlor epoxide, and chlordane in surface soil.

  Although these analyte SQLs exceeded the screening criteria, the detected concentrations were less than the SQLs. Since the laboratory equipment was able to detect the SQL, it was assumed that the SQL for aldrin, heptachlor, heptachlor epoxide, and chlordane was adequate for this HHRA.

- According to the methodology described in the GIR (ABB-ES, 1998) (Subsection 2.5.3.3), central tendency carcinogenic risk was evaluated for receptors that have an ELCR exceeding FDEP or USEPA levels of concern. The central tendency evaluation is designed to provide a probable risk level (USEPA, 1992a).



LEGEND

USEPA acceptable risk range

USEPA U.S. Environmental Protection Agency
FDEP Florida Department of Environmental Protection
TR Total resident

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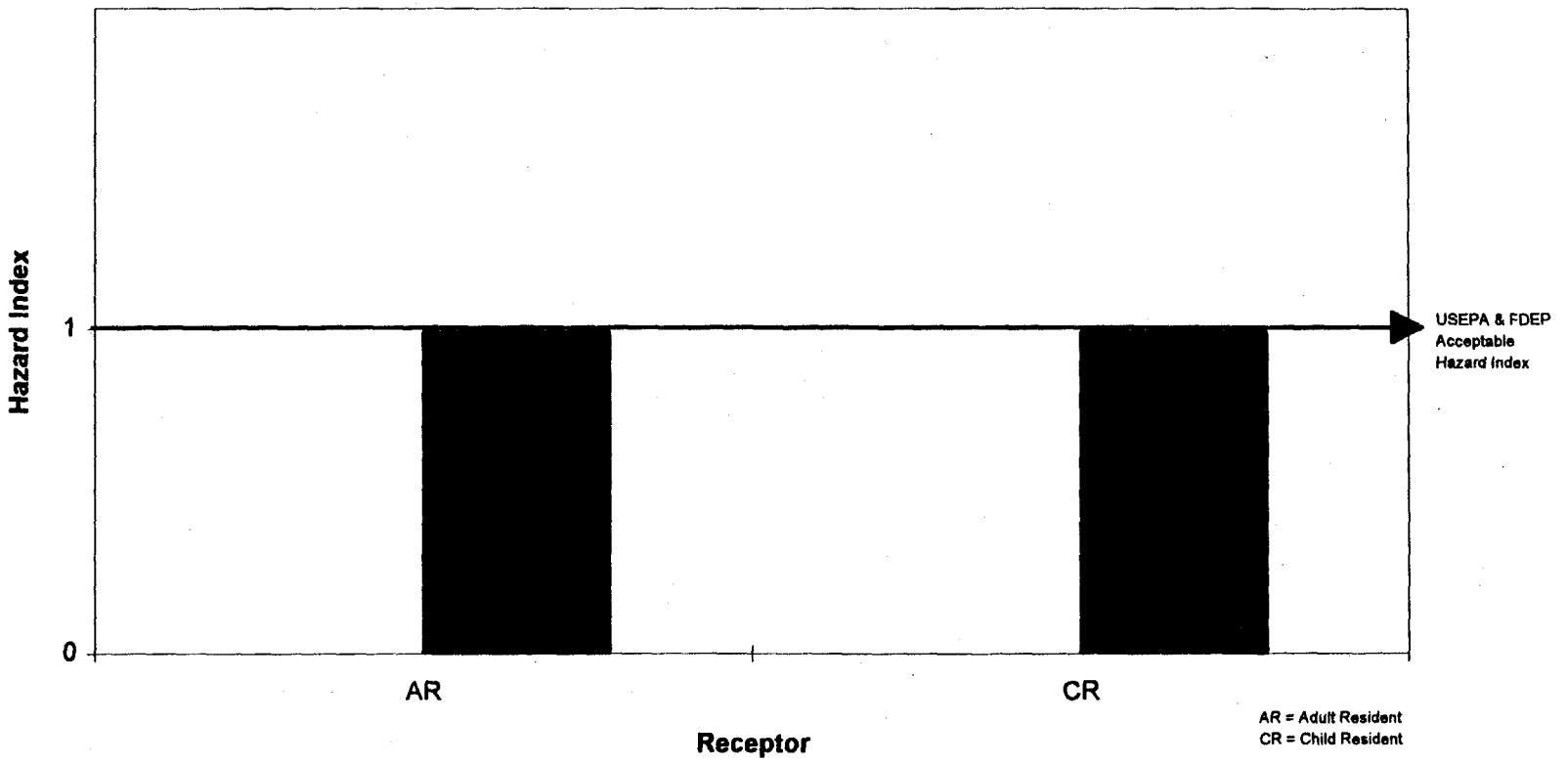
FIGURE 6-6
CANCER RISK SUMMARY
FUTURE LAND USE FOR GROUNDWATER
AT SITE 11

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN
DISPOSAL AREA

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA



NOTES:
NAS = Naval Air Station
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

FIGURE 6-7
NONCANCER RISK SUMMARY
FUTURE LAND USE FOR GROUNDWATER
AT SITE 11

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN
DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

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The hypothetical reasonable maximum exposure (RME) carcinogenic risk for the future resident exceeded target risk level of 1×10^{-6}. The central tendency carcinogenic risk for hypothetical trespasser, future residential, and occupational worker are presented in Table E-28 through E-34 in Appendix E of this report. Calculated central tendency risk was characterized only for ingestion and dermal exposures because the contribution from inhalation was insignificant compared to other risk pathways. The central tendency risk from exposure to surface soil is 1×10^{-5} for the future resident, 3×10^{-7} for the aggregate trespasser, and 5×10^{-7} for the occupational worker.

The central tendency risk aggregate residential exposed to groundwater is 2×10^{-5}, which exceeds the Florida target level.

The risk range 7×10^{-5} to 1×10^{-5} presented by the RME and central tendency risk exposure scenarios for the hypothetical future aggregate resident to surface soil are useful information to provide perspective for the risk manager and compliance with Agency guidance (USEPA, 1995b).

6.7 REMEDIAL GOAL OPTIONS. Remedial goal option (RGO) tables are presented for each medium with a total ELCR greater than 1×10^{-6} or an HI greater than 1 per USEPA guidance, and for media with chemicals whose EPCs exceed Florida standards. The RGO concentrations are calculated using the scenario representing the highest estimated risk for a given medium. Based on the above criteria, RGOs are developed for each chemical with a total ELCR greater than 1×10^{-6} or an HQ greater than 0.1. Because the HI for all receptors is at or below 1, RGOs were not calculated based on noncancer risk. Analytes whose EPCs exceed Florida standards are also presented in the RGO tables.

RGOs and available Federal regulatory and FDEP risk-based criteria are intended to provide the basis for the development of remedial alternatives in the FS. The RGO values are not actual or proposed cleanup levels, but are provided to assist risk-management decision making in the FS.

Table 6-9 presents the RGOs for surface soil for four analytes. RGOs are presented for benzo(a)pyrene, dieldrin, and arsenic based on cancer risks for the adult and child resident at Site 11. Benzo(a)anthracene is presented in the RGO table because the EPC exceeds the FDEP Cleanup Target Level.

Table 6-10 presents the RGOs for groundwater for four analytes. RGOs are presented for benzene, vinyl chloride, and arsenic. Iron is presented in the RGO table because the EPC exceeded the FDEP Groundwater Target Level.

6.8 SUMMARY OF HHRA FOR SITE 11. HHCPCs were identified and risks were estimated for surface soil and groundwater associated with Site 11. No HHCPCs were identified for subsurface soil; therefore, no additional evaluations were performed. The conclusions below were drawn based on this HHRA.

- The HHCPCs detected in surface soil, subsurface soil, and groundwater do not pose unacceptable carcinogenic risks to the evaluated receptors based on USEPA target risk range of 1×10^{-4} to 1×10^{-6}.

Table 6-9
Summary of Remedial Goal Options for Surface Soil

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Range of Detected Concentrations	Exposure Point Concentration	Total Excess Lifetime Cancer Risk (Based on risk to resident [adult and child])			Total Hazard Index (Based on risk to child resident)			Florida Soil Cleanup Target Level (Residential)[1]	Florida Soil Cleanup Target Level (Leaching)[1]	Background Screening Concentration
			10^{-4}	10^{-5}	10^{-6}	3	1	0.1			
Semivolatile Organic Compounds (µg/kg)											
Benzo(a)anthracene	1,800	976	NA	NA	NA	NA	NA	NA	1,400	3,200	NA
Benzo(a)pyrene	910	806	NR	700	70	NA	NA	NA	100	8,000	NA
Pesticides and PCBs (µg/kg)											
Dieldrin	4.9 to 210	74	NR	NR	30	NA	NA	NA	70	4	NA
Inorganic Analytes (mg/kg)											
Arsenic	0.93 to 3.8	2.7	NR	NR	0.4	NA	NA	NA	0.8	29	3.2

[1] Values are from Florida Department of Environmental Protection Chapter 62-777, Florida Administrative Code, Soil Cleanup Target Levels (FDEP, 1999).

Notes: µg/kg = micrograms per kilogram.
NA = not applicable.
NR = not reported because the calculated remedial goal option exceeds the exposure point concentration.
mg/kg = milligrams per kilogram.

Table 6-10
Summary of Remedial Goal Options for Groundwater

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Range of Detected Concentrations	Exposure Point Concentration	Total Excess Lifetime Cancer Risk (Based on risk to resident [adult and child])			Total Hazard Index (Based on risk to child resident)			Florida Groundwater Cleanup Target Level[1]	Federal MCL[2]	Background Screening Concentration
			10^{-4}	10^{-5}	10^{-6}	3	1	0.1			
Volatile Organic Compounds (μg/ℓ)											
Benzene	2	6	NR	NR	2.3	NA	NA	NA	1	5	NA
Vinyl chloride	2	2	NR	0.4	0.04	NA	NA	NA	1	2	NA
Inorganic Analytes (μg/ℓ)											
Arsenic	0.6 to 3.3	1.1	NR	0.5	0.05	NA	NA	NA	50	50	ND
Iron	271 to 8,810	8,810	NR	NR	0.3	NA	NA	NA	300	300	964

[1] Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777, Florida Administrative Code (FDEP, 1999).
[2] Federal MCLs are taken from USEPA Drinking Water Regulations and Health Advisories from October 1996.

Notes: MCL = maximum contaminant level.
μg/ℓ = micrograms per liter.
NR = not reported because the calculated RGO exceeds the EPC.
NA = not applicable.
ND = not detected in any background sample.

- The total ELCR at Site 11 associated with ingestion of soil by a hypothetical future resident (7×10^{-5}) exceeds Florida's target risk level of concern (1×10^{-6}) due to benzo(a)pyrene and arsenic. The total ELCR at Site 11 associated with ingestion of groundwater by hypothetical future resident (9×10^{-5}) exceeds Florida's target risk level of concern due to vinyl chloride and arsenic.

- The background levels of arsenic at Site 11 exceed Florida residential soil cleanup target levels and may result in an unacceptable carcinogenic risk. It is likely that naturally occurring arsenic contributes to the exceedance of the FDEP target risk level.

- The surface soil, subsurface soil, and groundwater noncancer risks are at or below USEPA and FDEP target levels for all potential current and hypothetical future receptors.

7.0 ECOLOGICAL RISK ASSESSMENT

The ERA evaluates actual and potential adverse effects to ecological receptors associated with exposure to chemicals from Site 11, the Southeast Open Disposal Area (B) (Landfill), at NAS Whiting Field. The ERA for Site 11 follows the methodologies described in the NAS Whiting Field GIR (ABB-ES, 1998), and current guidance materials for ERAs at Superfund sites including the following:

- *Risk Assessment Guidance for Superfund Volume 2: Environmental Evaluation Manual* (USEPA, 1989c)
- *Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference* (USEPA, 1989d)
- *Framework for Ecological Risk Assessment* (USEPA, 1992b)
- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997d)
- *Supplemental Guidance to RAGS: Region 4 Bulletins on Ecological Risk Assessment* (USEPA, 1995a)
- *Proposed Guidelines for Ecological Risk Assessment* (USEPA, 1996c)

Risk assessment guidance included in the USEPA "Eco Update" bulletins (1991c, 1992c, and 1992d) and recent publications (e.g., Maughan, 1993; Suter, 1993) were also consulted.

This ERA was conducted to determine if ecological receptors are potentially exposed to contaminants from Site 11 at concentrations that could cause adverse ecological effects. The Site 11 ERA consists of eight sections.

- Site Characterization (Section 7.1) describes current ecological conditions at the site.
- Problem Formulation (Section 7.2) establishes the goals and focus of the assessment and identifies major factors to be considered.
- Hazard Assessment and Selection of Ecological Chemicals of Potential Concern (ECPCs) (Section 7.3) reviews the analytical data and identifies chemicals present at the site that may pose ecological risks.
- Exposure Assessment (Section 7.4) identifies complete exposure pathways and quantifies the magnitude and frequency of exposure.
- Ecological Effects Assessment (Section 7.5) identifies potential adverse effects to ecological receptors associated with the chemicals of concern identified in Section 7.3.
- Risk Characterization (Section 7.6) integrates exposure and concentration-toxicity response information to derive a likely estimate of adverse effects.

- Uncertainties (Section 7.7) identifies assumptions of the ERA process that may influence the risk assessment conclusions.

- Summary of Ecological Risk (Section 7.8).

7.1 SITE CHARACTERIZATION. NAS Whiting Field Site 11 is approximately 3 acres in size and is located along the eastern facility property boundary near the South Air Field (see Figure 1-2). The site is an old borrow pit that was used as an open disposal area from 1943 until approximately 1970. During its active period, Site 11 received a wide variety of wastes, including general refuse, construction debris, tree clippings, furniture, waste solvents, paint, transformer oils, hydraulic fluid, and various other oils. When disposal activities were discontinued in 1970, a final covering of soil from NAS Whiting Field was placed over the site and pine trees were planted (Geraghty & Miller, 1986).

As shown in the Site 11 vegetative cover map (Figure 7-1), planted pine trees border the northern, western, and southern perimeter of the site. The eastern boundary of Site 11 is characterized as an old field, while the center of the site is dominated by shrubs.

Saplings and shrubs commonly found in the planted pine area of Site 11 include various oaks (*Quercus* sp.), long-leaf pine (*Pinus palustris*), slash pine (*Pinus elliotii*), yaupon holly (*Ilex vomitoria*), blueberry (*Vaccinium* sp.), gallberry (*Ilex coriacea*), Chinese privet (*Ligustrum sinense*), cherry (*Prunus* sp.), red maple (*Acer rubrum*), hickory (*Carya* sp.), red cedar (*Juniperus virginiana*), winged sumac (*Rhus copallina*), groundsel tree (*Baccharis halimifolia*), and willow (*Salix* sp.). Species commonly found in the herbaceous strata of the planted pine habitat include several members of the aster, madder, and pea families; morning glories; grapes; yucca; Japanese honeysuckle, and several grasses. A complete list of the vegetative species occurring at Site 11 is provided in Appendix G of the GIR (ABB-ES, 1998).

NAS Whiting Field maintains a program for planting and harvesting of pine trees, primarily long-leaf and slash pines. The planted pine area of Site 11 is subject to controlled burns and timber harvesting activities. As part of the ecosystem management plan, planted pine forests undergo periodic burning, usually once every four years, and selective thinning of long-leaf and slash pines every eight to ten years. These forestry management activities provide a variety of habitats and food sources. The planted pine area of Site 11 is reaching a mature status with a well-developed canopy and an open understory typical of uplands pine forests of the southeastern United States.

Southeastern pine forests provide habitats for a diverse array of birds, including insectivorous gleaners of pine needles and bark, flycatchers, seed-eaters, and nocturnal and diurnal aerial predators (Wolfe et. al., 1988). The pine flatwoods at Site 11 are likely to host such an assemblage of species. Birds of prey, such as owls and hawks, may also nest in these wooded areas.

It is likely that the terrestrial invertebrate biomass at Site 11 serves as a forage base for a variety of wildlife species, including adult amphibians, reptiles, small birds, and small mammals. Small reptiles, mammals, and birds may use the open portions of Site 11 for foraging, while returning to the forested

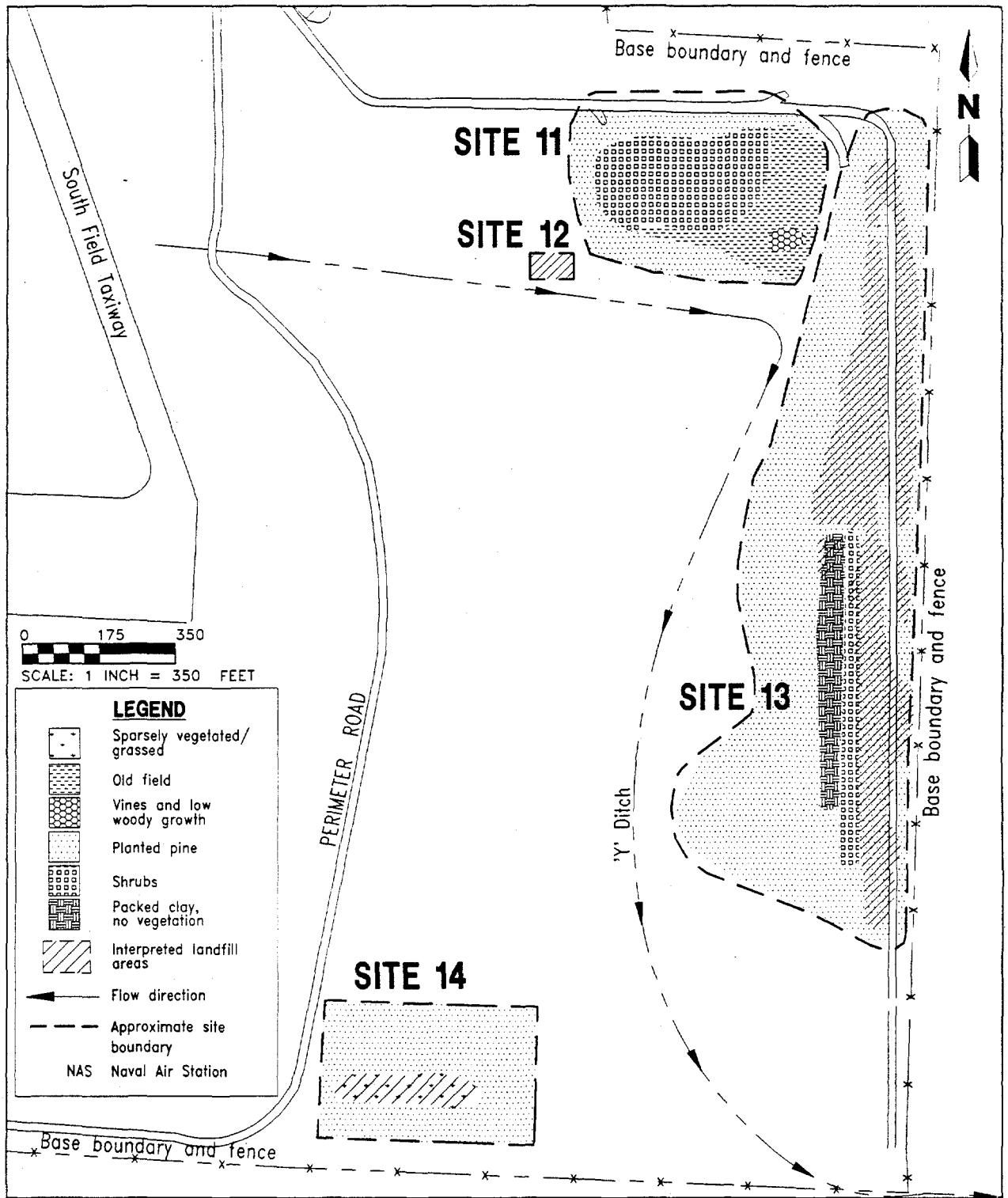

FIGURE 7-1
VEGETATIVE COVER MAP

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REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

pine area for protection. Predatory birds and mammals inhabiting the pine flatwood areas may also be attracted to the site.

Mammals and birds that may occur in the planted pine area of Site 11 include the Eastern cottontail rabbit (*Sylvilagus floridanus*), the hispid cotton rat (*Sigmodon hispidus*), cotton mouse (*Peromyscus gossypinus*), short-tailed shrew (*Blarina brevicauda*), American robin (*Turdus migratorius*), and Eastern meadowlark (*Sturnella magna*). Predatory mammals and birds such as the red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), great horned owl (*Bubo virginianus*), and the red-tailed hawk (*Buteo jamaicensis*) may also forage in the area of Site 11.

The "Y" drainage ditch is located approximately 80 feet south of site; however, off-site migration of site-related surface soil constituents to the ditch is unlikely because the topography of Site 11 gently slopes toward the east-northeast. During the 1986 verification study, a low point was observed in the northeastern corner where surface drainage ponds (Geraghty & Miller, 1986). Although ponding was not observed during the 1995 site characterization survey, it is expected that any runoff from the site would migrate in a northeasterly direction toward Big Coldwater Creek, which is located approximately 1.7 miles from Site 11.

Although no aquatic habitat is present at Site 11, groundwater from Site 11 may discharge to Big Coldwater Creek. Groundwater discharge to surface water is not evaluated as part of the ERA for Site 11 because Big Coldwater Creek receives groundwater discharge and stormwater runoff from multiple sources of potential contamination at NAS Whiting Field. In addition, Big Coldwater Creek is located more than 9,000 feet from Site 11 and concentrations of contaminants in Site 11 groundwater are low enough that they are not a concern for current and future discharges to surface water.

7.2 PROBLEM FORMULATION. The problem formulation is the initial step of the ERA process. Problem formulation is composed of identification of receptors, identification of exposure pathways for those receptors, and selection of assessment and measurement endpoints based on information gathered from the site characterization.

7.2.1 Identification of Receptors Ecological receptors that may potentially utilize the available planted pine and overgrown field habitat at Site 11 include terrestrial wildlife (i.e., mammals, birds, reptiles, and adult amphibians), terrestrial plants, and soil invertebrates. Terrestrial flora and fauna potentially using NAS Whiting Field are identified in the GIR (ABB-ES, 1998). Aquatic receptors are not evaluated in the ERA because no aquatic habitats exist at Site 11.

Certain species that potentially reside at NAS Whiting Field are protected by Federal and/or State laws. A list of State and federally protected species is provided in the GIR (ABB-ES, 1998). Observations made during an ecological survey of NAS Whiting field indicate that no State or federally listed rare, threatened, or endangered species or species of concern are known or likely to inhabit Site 11 (Nature Conservancy, 1997).

7.2.2 Identification of Exposure Pathways Exposure pathways are identified for three groups of receptors (terrestrial wildlife, terrestrial plants, and soil invertebrates). A complete exposure pathway includes a source of contamination, an exposure route, and a receptor. A conceptual model of the exposure pathways from source to ecological receptors is depicted in the contaminant pathway model on Figure 7-2.

All potential routes of exposure are considered in the ERA and are presented in the contaminant pathway model. The model differentiates between those exposure routes that are quantitatively evaluated and those that are qualitatively discussed. This limitation is necessary to focus the risk evaluation on those pathways for which contaminant exposures are the highest and most likely to occur. Those pathways that cannot be quantitatively evaluated, due to a lack of toxicological information, are qualitatively discussed and addressed as uncertainties. The general approach used to identify exposure pathways for the three groups of receptors is explained below.

Terrestrial Wildlife. Terrestrial wildlife may be exposed to contaminants in surface soil, surface water, and food items that are contaminated as a result of ingestion, dermal adsorption, and inhalation of fugitive dust and volatile emissions. Because no surface water is present at Site 11, only exposures to surface soil and potentially contaminated food are evaluated in the Site 11 ERA.

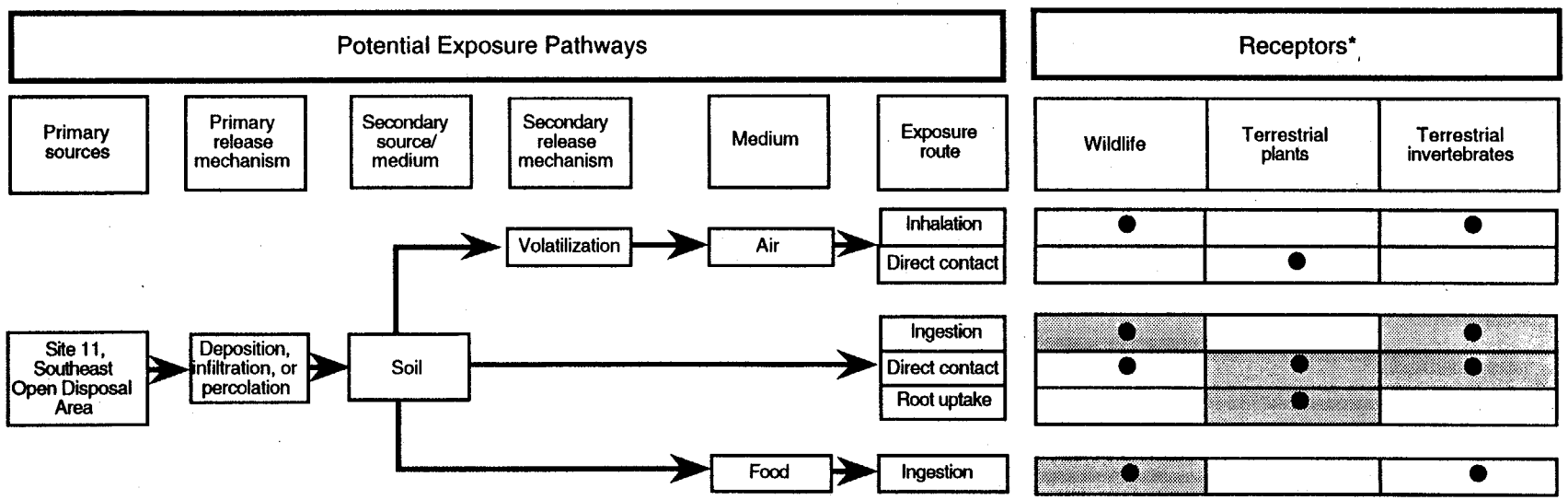
Dermal adsorption is considered to be a negligible exposure pathway because the presence of fur, feathers, or a chitinous exoskeleton is likely to prevent contamination from coming in direct contact with the skin (personal communication with Ted Simon, USEPA Region 4, September 1997). In addition, soil trapped in the fur or feathers is likely to be ingested during grooming or preening activities, which are evaluated as part of the indirect ingestion exposure pathway.

Exposure via inhalation of fugitive dust is also not likely to be a significant exposure pathway because the vegetation at Site 11 would limit the release of fugitive dust. Only one volatile constituent, acetone, was detected in the surface soil at Site 11. Exposures associated with VOCs are not evaluated in the ERA because of the low frequency and detection of VOCs in the surface soil. In addition, no evidence of burrowing animals and/or burrows was noted during the site characterization.

Potential contaminant exposures for reptiles and adult amphibians exist at NAS Whiting Field; however, ingestion toxicity data and bioaccumulation factors (BAF) are generally not available for these receptors. Therefore, potential risks associated with ingestion of affected media and food to these reptiles and amphibians will be qualitatively addressed in the Uncertainties Section of the ERA.

Terrestrial Plants and Invertebrates. Terrestrial plants and soil invertebrates may be exposed to contamination in surface soil by direct contact with and root uptake (plants) or ingestion (invertebrates) of soil. The ingestion exposure routes include the ingestion of soil and food items containing chemicals accumulated from Site 11 surface soil. Because the depth to groundwater is between 44 and 90 feet bls, far below the root zone of Site 11 plants, it is not expected that terrestrial plants are exposed to contamination in groundwater.

7.2.3 Identification of Endpoints The assessment and measurement endpoints selected for the Site 11 ERA are listed in Table 7-1. Assessment endpoints



NOTES:
NAS = Naval Air Station
ERA = ecological risk assessment

* Shading indicates the exposure pathways that are quantitatively evaluated for receptors in the Site 11 ERA. Nonshaded pathways are not evaluated because they are not considered significant pathways.

FIGURE 7-2
SITE 11, CONTAMINANT PATHWAY MODEL FOR ECOLOGICAL RECEPTORS

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA

NAS WHITING FIELD
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2534-09 FIG 7-2 (site 11) FINAL 010798MAW

Table 7-1
Endpoints Selected for
Ecological Risk Assessment

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Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Assessment Endpoint [a]	Receptor	Measurement Endpoint	Decision Point
Survival and growth of plant communities used as forage material.	Terrestrial plants	Germination of lettuce seeds exposed to surface soil samples in laboratory toxicity tests.	Significant differences ($P \leq 0.05$) in germination of lettuce seeds exposed to surface soil from Site 11 as compared to laboratory control and reference soil.
Survival and growth of terrestrial invertebrate communities used as forage material.	Terrestrial invertebrates	Survival and growth of earthworms exposed to surface soil samples in toxicity tests.	Significant differences ($P \leq 0.05$) in survival and/or growth of earthworms exposed to surface soil from Site 11 as compared to earthworms exposed to laboratory control and reference soil.
Survival and maintenance of wildlife populations.	Wildlife species	Oral chemical doses (mg/kg BW/day) based on measured adverse effects on growth, reproduction, or survival (i.e., NOAEL, LOAEL, and LD_{50} studies) of mammalian and avian laboratory test populations.	Comparison of potential dietary exposures in mammalian and avian wildlife with literature-derived RTVs. HQs >1 indicate potential risk.

[a] The assessment endpoints are discussed in further detail in Subsection 7.2.3.

Notes: P = probability.
≤ = less than or equal to.
mg/kg = milligrams per kilogram.
BW/day = body weight per day.
NOAEL = no observed adverse effect level.
LOAEL = lowest observed adverse effect level.
LD_{50} = lethal dose to 50 percent of a test population.
RTV = reference toxicity value.
HQ = hazard quotient.
> = greater than.

represent the ecological component to be protected, whereas the measurement endpoints approximate or provide a measure of the achievement of the assessment endpoint. The assessment endpoint selected for the Site 11 ERA is the survival and maintenance of receptor populations and communities at Site 11. The measurement endpoints used to gauge the likelihood of population- and community-level effects for terrestrial wildlife are chemical-specific toxicological benchmark values derived from the literature that are based on laboratory-measured survival, growth, and reproductive effects. For terrestrial plants and soil invertebrates at Site 11, the assessment endpoint is measured by the survival and growth of the earthworm (*Eisenia foetida*) in toxicity testing and response of the lettuce seed (*Lactuca sativa*) in germination tests with Site 11 surface soil samples. Table 7-1 presents the assessment endpoint, endpoint species, measurement endpoint, and decision point (i.e., the level at which additional evaluation may be warranted).

Four hypotheses were developed to gauge potential risks associated with exposure to Site 11 surface soil. These hypotheses are designed for multiple species and trophic levels and represent both individual and community dynamics. Hypotheses for the Site 11 ERA listed below.

1. Are ECPCs present in the surface soil at concentrations sufficiently high to reduce plant or soil invertebrate biomass or plant cover availability such that small mammal and bird populations could be affected?

2. Are ECPCs present in the surface soil at concentrations sufficiently high to reduce the survivability and growth of terrestrial plants and soil invertebrates?

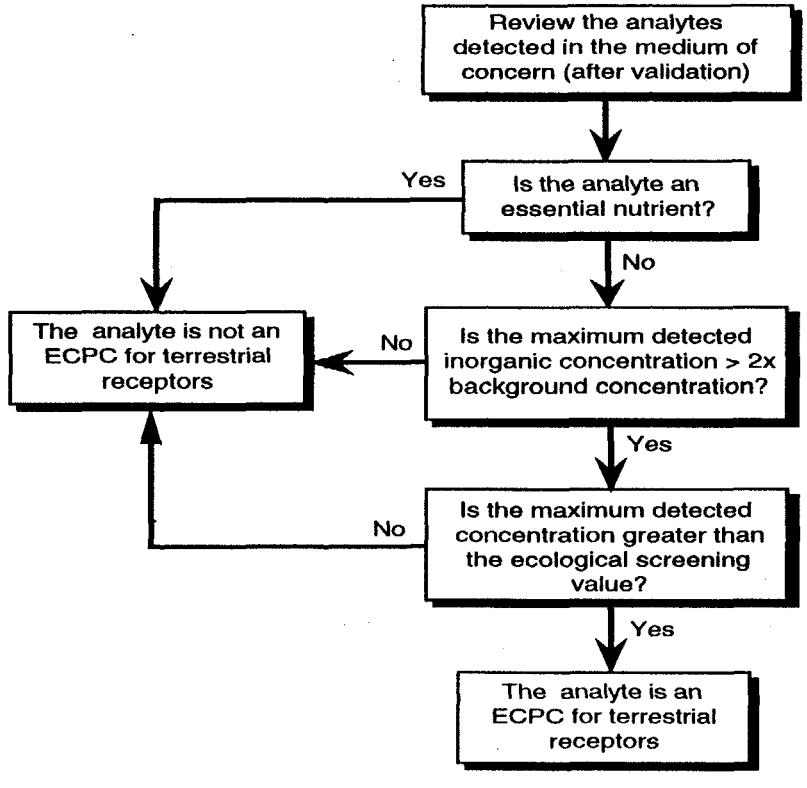
3. Are ECPC concentrations in plants and invertebrates sufficiently high as to adversely affect foraging small mammal or bird populations following consumption of contaminated prey?

4. Are bioaccumulating chemicals sufficiently high to reduce survivability, growth, or reproduction in top predators (i.e., foxes and owls)?

7.3 HAZARD ASSESSMENT AND SELECTION OF ECPCs. The hazard assessment includes a review of analytical data and selection of ECPCs. ECPCs represent analytes detected in environmental media (i.e., surface soil) that are considered in the ERA and could present a potential risk for ecological receptors. The process for selecting ECPCs is depicted on Figure 7-3. Additional details regarding the ECPC selection process are provided in Subsection 2.4.2 of the GIR (ABB-ES, 1998). Analytical data for Site 11 were evaluated for use in risk assessment pursuant to national guidance, *Guidance for Data Useability in Risk Assessment (Parts A and B)* (USEPA, 1992e).

Following the data validation step, calcium, iron, magnesium, potassium, and sodium are excluded as ECPCs because they are considered to be essential nutrients and not toxic. The rationale for eliminating essential nutrients as ECPCs is provided in the GIR (ABB-ES, 1998).

Inorganic chemicals representative of background conditions are not selected as ECPCs. In accordance with USEPA Region IV guidance (USEPA, 1991b), an inorganic



NOTES:
NAS = Naval Air Station
ECPC = ecological chemical of potential concern
> = greater than
x = times
Terrestrial receptors include terrestrial wildlife, plants, and invertebrates

FIGURE 7-3
ECOLOGICAL CHEMICAL OF POTENTIAL CONCERN SELECTION PROCESS

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

2534-09 FIG 7-3 (site 11) FINAL 021798MAW

analyte is not selected as an ECPC if the maximum detected concentration is less than 2 times the average detected inorganic concentration in background samples. The maximum detected concentrations are compared against representative site-specific background soil screening concentrations to eliminate chemicals that are unlikely to be site related.

A site-specific background investigation was conducted at NAS Whiting Field, and the findings are presented in Section 3.3.1.1 of the GIR (ABB-ES, 1998). The site-specific background study used to establish background screening values for Site 11 consists of nine surface soil samples (BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501) and one duplicate sample (BKS00201D) collected from Troup loamy sand and Dothan fine sandy loam soil types, which are similar to the soil types at Site 11.

Analytes that are not essential nutrients and exceed the background screening concentration are also screened against ecological screening values for surface soil. The surface soil ecological screening values are the Dutch Soil Criteria "A", which refer to background concentrations in surface soil issued by the U.S. Fish and Wildlife Service (Beyer, 1990). If the maximum detected concentration of an analyte exceeds the ecological screening value, the analyte is retained as an ECPC for terrestrial wildlife, which also includes terrestrial plants and soil invertebrates.

During the August 1992 Phase IIA investigation, five surface soil samples (11-SL-01 through 11-SL-05) and one duplicate (11-SL-01A) were collected at Site 11 (Figure 3-2). These samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL inorganic analytes. In January 1996, 13 additional surface soil samples were collected from Site 11 as part of the Phase IIB investigation. Five of the thirteen sampling locations were determined using the random and unbiased systematic sampling method described in Section 3.3. These five samples (11S00101 through 11S00501) were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganic analytes and TPH. The remaining eight samples (11S00601 through 11S01301) were collected within a 10-foot-radius surrounding the Phase IIA sample 11-SL-2, where an elevated lead concentration of 2,230 mg/kg was detected. These eight samples were analyzed for lead only for source delineation.

Table 7-2 presents a summary of the analytical data and the following information: frequency of detection, range of detection limits, range of detected concentrations, average of detected concentrations, background screening concentrations, ecological screening values, and selected ECPCs. ECPCs selected for the surface soil samples collected at Site 11 include one VOC (acetone), 14 semivolatiles (2-methylnaphthalene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)-fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and bis(2-ethylhexyl)phthalate), five pesticides (4,4'-DDD, 4,4'-DDT, dieldrin, alpha-chlordane, and gamma-chlordane), three inorganic analytes (lead, silver, and zinc), and TPH.

7.4 EXPOSURE ASSESSMENT. The purpose of the ecological exposure assessment is to estimate or measure the amount of an ECPC to which an ecological receptor may be exposed. The following sections briefly describe how contaminant exposures are estimated or measured for wildlife, terrestrial plants, and invertebrates at Site 11. The contaminant pathway model (Figure 7-2) provides a summary of the

Table 7-2
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 11

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Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentration[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Volatiles Organic Compounds (µg/kg)											
Acetone	1/10	11 to 13	53.25*	53.3	ND	NA	Yes	16.8	10.3	16.8	10.3
Semivolatile Organic Compounds (µg/kg)											
2-Methylnaphthalene	1/10	350 to 4,000	49	49	ND	NA	Yes	757	352	49	49
Acenaphthylene	1/10	350 to 4,000	110	110	ND	NA	Yes	614	358	110	110
Anthracene	1/10	350 to 4,000	280	280	ND	100	Yes	620	375	280	280
Benzo(a)anthracene	1/10	350 to 4,000	1,800	1,800	ND	NA	Yes	976	527	976	527
Benzo(a)pyrene	1/10	350 to 4,000	910	910	ND	100	Yes	806	438	806	438
Benzo(b)fluoranthene	1/10	350 to 4,000	710	710	ND	NA	Yes	777	418	710	418
Benzo(g,h,i)perylene	1/10	350 to 4,000	310	310	ND	NA	Yes	626	378	310	310
Benzo(k)fluoranthene	1/10	350 to 4,000	870	870	ND	NA	Yes	800	434	800	434
Chrysene	1/10	350 to 4,000	2,500	2,500	ND	NA	Yes	1,142	597	1,142	597
Fluoranthene	1/10	350 to 4,000	1,300	1,300	ND	100	Yes	873	477	873	477
Indeno(1,2,3-cd)-pyrene	1/10	350 to 4,000	230	230	ND	NA	Yes	608	370	230	230
Phenanthrene	1/10	350 to 4,000	2,100	2,100	ND	100	Yes	1,045	557	1,045	557
Pyrene	1/10	350 to 4,000	3,400	3,400	ND	100	Yes	1,375	687	1,375	687
bis(2-Ethylhexyl)-phthalate	5/10	350 to 4,000	52 to 540	175	80.3	NA	Yes	727	360	540	360

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentration[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Pesticides and PCBs (µg/kg)											
4,4'-DDD	1/10	3.6 to 980	140	140	ND	100	Yes	123	55.9	123	55.9
4,4'-DDE	7/10	3.7 to 980	2.1 to 88	26.5	ND	100	No[11]				
4,4'-DDT	8/10	3.7 to 980	2.3 to 530	81.8	ND	100	Yes	168	66.5	168	66.5
Aldrin	1/10	1.9 to 490	0.96 to 0.96	0.96	ND	100	No[11]				
Dieldrin	8/10	3.7 to 980	4.9 to 210	42.9	ND	100	Yes	74	35.4	74	35.4
Heptachlor	1/10	1.9 to 490	4.8	4.8	ND	100	No[11]				
Heptachlor epoxide	1/10	1.9 to 490	8.8	8.8	ND	100	No[11]				
alpha-Chlordane	4/10	1.9 to 4,900	39 to 310	140	ND	100	Yes	130	69.9	130	69.9
gamma-Chlordane	4/10	1.9 to 4,900	29 to 260	111	ND	100	Yes	108	58.1	108	58.1
Inorganic Analytes (mg/kg)											
Aluminum	10/10	40	2,110 to 10,800	7,486	15,314	NA	No[12]				
Antimony	1/10	2.6 to 12	3.5	3.5	8	NA	No[12]				
Arsenic	10/10	2	0.93 to 3.8	2.1	3.0	20	No[11]				
Barium	10/10	40	4.6 to 96	19.2	23.8	200	No[11]				
Beryllium	7/10	0.05 to 1	0.05 to 0.14	0.09	0.36	NA	No[12]				
Cadmium	2/10	0.58 to 1	0.24 to 0.28	0.26	0.58	1	No[12]				
Calcium	10/10	1,000	184.5* to 1,790	445	402	NA	No[13]				
Chromium	10/10	2	2.7 to 19.6	7.9	10.8	100	No[11]				
Cobalt	6/10	0.33 to 10	0.35 to 3.4	1.5	3	20	No[11]				

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 11

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Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentration[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Inorganic Analytes (mg/kg)											
Copper	8/10	5	3.7 to 19.4	7.2	9.4	50	No[11]				
Cyanide	5/10	0.23 to 0.5	0.09 to 0.19	0.12	0.26	NA	No[12]				
Iron	10/10	20	1,500 to 11,700	5,250	8,588	NA	No[13]				
Lead	18/18	0.6 to 1	5.2 to 2,230	146	11.4	50	Yes	166	146	166	146
Magnesium	10/10	1,000	54.2 to 1,260	214	258	NA	No[13]				
Manganese	10/10	3	31.4 to 280*	126	404	NA	No[12]				
Mercury	6/10	0.1	0.04 to 0.08	0.05	0.12	0.5	No[11,12]				
Nickel	4/10	2.3 to 8	1.6 to 10	3.9	7.2	50	No[11]				
Potassium	8/10	128 to 1,000	62.1 to 166	111	177	NA	No[12,13]				
Selenium	1/10	0.44 to 1	0.16 to 0.16	0.16	0.44	NA	No[12]				
Silver	5/10	2	0.55 to 1.9	1	0.7	NA	Yes	1.3	1	1.3	1
Sodium	10/10	1,000	160 to 307	188	388	NA	No[12,13]				
Vanadium	10/10	10	4.4 to 20.3	12.9	21.2	NA	No[12]				
Zinc	10/10	4	5.7 to 260	40.5	15.4	200	Yes	124	40.5	124	40.5
Other (mg/kg)											
Total petroleum hydrocarbons	5/5	1.8 to 1.9	7 to 53.1	17.9	ND	NA	Yes	NC	17.9	53.1	17.9

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 11

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[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed (excluding rejected values).
[2] The value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, one-half of the detection limit is used as a surrogate for the nondetect value.
[3] The average of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples. Background screening values for organic analyte values are one times the average of detected concentrations. Organic values are included for comparison purposes only (i.e., not used to select ecological contaminant of potential concerns).
[5] The ecological screening values are the Dutch Soil Criteria as reported in the U.S. Fish and Wildlife Service Biological Report 1990(2), "Evaluating Soil Contamination," (Beyer, 1990).
[6] These chemicals are retained for further evaluation in the ecological risk assessment.
[7] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA *Supplemental Guidance to RAGS: Calculating the Concentration Term*. The 95 percent UCL is not calculated when there are less than 10 total samples. (USEPA,1992f)
[8] The average of all samples assigns a value of one-half of the detection limit as a surrogate concentration for nondetect values.
[9] The reasonable maximum exposure point concentration (EPC) is equal to the lesser of the maximum detected concentration or the 95th percent UCL.
[10] The central tendency (CT) EPC is equal to the lesser of the average of all samples or the maximum exposure point concentration.
[11] The maximum detected concentration is less than the ecological screening value.
[12] The maximum detected concentration is less than the background screening concentration.
[13] The analyte is an essential nutrient and not considered toxic.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: Samples 11-SL-01, 11-SL-02, 11-SL-03, 11-SL-04, 11-SL-05, 11S00101, 11S00201, 11S00301, 11S00401, and 11S00501 were analyzed for VOCs, SVOCs, pesticides and PCBs, and inorganics. Samples 11S00601, 11S00701, 11S00801, 11S00901, 11S01010, 11S01101, 11S01201, and 11S01301 were analyzed for lead only. Samples 11S00101, 11S00201, 11S00301, 11S00401, and 11S00501 were analyzed for TPH only.
Duplicate samples: 11-SL-01A and 11S00601D.
Background samples: BKG-SL-02, BKG-SL-06, and BKG-SL-07.
Background duplicate samples: BKSS00201D.

* = average of sample and duplicate.
µg/kg = micrograms per kilogram.
NA = not available.
DDT = dichlorodiphenyltrichloroethane.
DDE = dichlorodiphenyldichloroethene.
% = percent.
SVOC = semivolatile organic compound.
NC = not calculated
ND = not detected in any background sample.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
mg/kg = milligrams per kilogram.
RME = reasonable maximum exposure.
VOC = volatile organic compounds.
TPH = total petroleum hydrocarbon.

potential exposure pathways that exist at Site 11 for each group of receptors. Additional details regarding the exposure assessment is provided in the GIR (ABB-ES, 1998).

7.4.1 Calculation of EPCs The EPC is a representative concentration used for evaluating risks throughout this ERA. RME and Central Tendency (CT) concentrations are derived for each ECPC. If the sample size is greater than or equal to ten, the RME value is equal to the lesser of the maximum detected concentration and the 95th percent upper confidence limit (UCL) calculated on the log-transformed arithmetic mean (USEPA, 1992f). One-half of the detection limit is used to calculate the 95th percent UCL. If the sample size is less than or equal to nine, the RME concentration is equal to the maximum detected concentration. If potential risks are predicted based on the RME scenario, then the CT exposure scenario is also evaluated. The CT exposure concentration is represented by the arithmetic mean of all samples. One-half of the detection limit is also used as a surrogate value for sample results that are below the detection limit.

With the exception of TPH, 10 or more surface soil samples were collected for all constituents at Site 11. For all constituents except TPH, the lesser of the maximum detected concentration and the 95th percent UCL is used as the RME concentration (USEPA, 1992f). Because TPH was analyzed in only five samples, the RME concentration for TPH is equal to the maximum detected concentration. Table 7-2 presents the RME and CT EPCs for the selected ECPCs.

7.4.2 Terrestrial Wildlife Exposure routes for wildlife receptors include direct and indirect ingestion of soil and ingestion of food containing site-related chemicals. The actual amount of an ECPC taken in by wildlife species (i.e., ingestion dose in milligrams per kilogram per day depends on a number of factors. A potential dietary exposure (PDE) model is used to estimate exposure to representative wildlife species. The PDE (or body dose) is calculated for each ECPC in surface soil using the equations presented in Table 7-3 and the methodologies described in the GIR (ABB-ES, 1998). The PPE is calculated based on the estimated concentrations of the ECPCs in food items that the species would consume; the amount of surface soil that it would ingest; the relative amount of different food items in its diet, body weight, and the food ingestion rate.

Wildlife species from different trophic guilds that may be present at the site were selected for the PDE model. The model uses species-specific feeding and habitat characteristics to estimate chemical exposures to wildlife species relative to their position in the food chain. Terrestrial receptors were chosen to represent the trophic levels typically found in the southeastern pine flatwoods and disturbed upland communities present at Site 11. The representative wildlife species considered in the ERA are summarized in Table 7-4 and discussed below.

- **Cotton mouse** (*Peromyscus gossypinus*). The cotton mouse represents a small mammalian herbivore that could potentially be exposed to contamination in soil and in plant tissue (accumulated from the soil). The cotton mouse home range is estimated at 0.147 acre and could reside entirely on the site. The cotton mouse represents the small mammal herbivore community at Site 11.

Table 7-3
Estimation of Potential Chemical Exposures for Representative Wildlife Species

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Estimation of Chemical Exposures Related to Surface Soil

Scope: Estimates the amount (dose) of a chemical ingested and accumulated by a species via incidental ingestion of surface soil and food items containing site-related chemicals.

Soil Chemical Concentration: The maximum detected concentration of the ecological chemicals of potential concern when the sample size is ≤ 9, and the lesser of the maximum detected concentration or the 95th percent upper confidence limit when the sample size is ≥ 10.

Soil Exposure Concentration:

$$\underset{(mg/kg)}{\text{Soil Exposure}} = \left(\underset{\text{as Soil}}{\text{\% of Diet}} \times \underset{(mg/kg)}{\text{Soil Concentration}} \right)$$

Primary Prey Item Concentration (TN_1)

$$\underset{(mg/kg)}{\text{Primary Prey Item Concentration}} = \left(BAF_{inv\ or\ plant} \times \underset{(mg/kg)}{\text{Soil Concentration}} \right)$$

Secondary Prey Item Concentration (TN_2):

$$\underset{(mg/kg)}{\text{Secondary Prey Item Concentration}} = \left(BAF_{mam\ or\ bird} \times \underset{(mg/kg)}{\text{Tissue Concentration of Primary Prey Items}^{*}} \right)$$

where BAF = bioaccumulation factor or mg/kg fresh weight tissue over mg/kg dry weight soil for invertebrates and plants, and mg/kg fresh weight tissue over mg/kg fresh weight food for small mammals and small birds.

* For a discussion of the weighted chemical concentration in prey items, see explanation of the PDE term below, and the General Information Report (ABB-ES, 1998)

Total Exposure Related to Surface Soil:

$$\underset{(mg/kgBW\text{-}day)}{PDE} = \frac{[P_1 \times T_1 + \ldots + P_N \times T_N + \text{soil exposure}] \times IR_{Diet} \times SFF \times ED}{BW}$$

where
- PDE = potential dietary exposure (mg/kgBW-day),
- P_N = percent of diet composed of food item N,
- T_N = tissue concentration in either the primary or secondary prey item N_1 and N_2, respectively (mg/kg),
- IR_{Diet} = food ingestion rate of receptor (kg of food or dietary item per day),
- BW = body weight (kg) of receptor,
- SFF = site foraging frequency (site area [acres] divided by home range [acres]), assumed to be equal to 1 for lethal exposure scenario, and
- ED = exposure duration (fraction of year species is expected to occur on site)

Notes:
- ≤ = less than or equal to.
- ≥ = greater than or equal to.
- mg/kg = milligrams per kilogram.
- % = percent.
- BAF = bioaccumulation factors.
- inv = invertebrate species
- mam = mammal species.
- mg/kg BW-day = milligrams per kilogram of body weight per day.
- kg = kilograms.

Table 7-4
Ecological Receptors Evaluated
For Surface Soil

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Receptor Evaluated		Method of Evaluation
Common Name	Scientific Name	
Terrestrial Plants	Lettuce seed (*Lactuca sativa*)	Toxicity testing of surface soil
Terrestrial Invertebrate	Earthworms (*Eisenia foetida*)	Toxicity testing of surface soil
Cotton mouse	*Peromyscus gossypinus*	Food-web model
Short-tailed shrew	*Blarina brevicauda*	Food-web model
Eastern meadowlark	*Sturnella magna*	Food-web model
Red fox	*Vulpes vulpes*	Food-web model
Great horned owl	*Bubo virginianus*	Food-web model

- **Short-tailed shrew** (*Blarina brevicauda*). The short-tailed shrew finds suitable habitat in forests, fields, marshes, and brush. It primarily feeds on earthworms, snails, centipedes, insects, small vertebrates, and slugs (DeGraaf and Rudis, 1986). Insectivorous species may receive relatively high chemical doses of bioaccumulating compounds as a result of their voracious appetites. The shrew has an estimated home range of 0.96 acres and represents small omnivorous mammals that may be found in the old field portion of Site 11.

- **Eastern meadowlark** (*Sturnella magna*). The eastern meadowlark is most commonly found in open pastures, prairies, farms, and meadows and has a home range of approximately 5 acres. The meadowlark feeds primarily on invertebrates, although its diet is supplemented with plants. The meadowlark represents insectivorous avian receptors found in open areas of Site 11 (DeGraaf and Rudis, 1986).

- **Red Fox** (*Vulpes vulpes*). This omnivorous mammal prefers open woodlands and grassy fields and is most active at night and twilight. It is an opportunistic forager, feeding on small mammals, birds, amphibians, reptiles, invertebrates, berries, and other fruits (Burt and Grossenheider, 1976). The red fox has an estimated home range of approximately 250 acres and represents the large predatory mammal guild at Site 11.

- **Great Horned Owl** (*Bubo virginianus*). The great horned owl is primarily a nocturnal hunter of small mammals. Its habitat includes deep woods and heavily wooded swamps often near open country where it may hunt for primary prey items consisting of small mammals and birds (DeGraaf and Rudis, 1986). The great horned owl home range is approximately 15 acres. The owl represents the predatory avian carnivores of both the open and forested areas of Site 11.

Parameters for quantitatively evaluating exposures to wildlife include body weight, food ingestion rate, home range, and relative consumption of food items. Exposure assumptions for each of the representative wildlife species for Site 11 are provided in Table 7-5 and Table F-4 of Appendix F. In addition to these parameters, the species foraging habits and bioaccumulation in food items are also considered.The Site Foraging Frequency (SFF) considers the frequency a receptor feeds within the site area by estimating the acreage of the site relative to the receptor's home range, and by considering the fraction of the year the receptor would be exposed to site-related chemicals (i.e., the exposure duration). By definition the SFF cannot exceed 1. The area of Site 11 (approximately 3 acres) is larger than the home range for the cotton mouse and short-tailed shrew and smaller than the home range for the Eastern meadowlark, red fox, and great horned owl. Because all representative wildlife species are expected to actively forage at the site year round, it is assumed that the exposure durations for these organisms are 1.

Wildlife species may be exposed to ECPCs in surface soil via incidental ingestion of soil or by ingesting prey items that have bioaccumulated these ECPCs. To estimate this exposure, a PDE is estimated for all representative wildlife species for each ECPC according to the equations in Table 7-3.

Prey items for wildlife species in the food-web exposure models include invertebrates and plants as well as small mammals and birds. BAFs are used in the wildlife exposure model to estimate the transfer of chemicals between soil and plants or soil invertebrates and between these organisms and primary consumer species. To estimate the PDE, tissue concentrations of ECPCs in prey items are estimated using BAFs for surface soil. BAFs for most receptors are extrapolated from literature values or estimated using regression equations from scientific literature. Based on the evidence provided in several reference materials (Suter, 1993; Maughan, 1993), an assumption is made that VOCs do not bioaccumulate in prey tissue. The general approach used to select BAFs for Site 11 is summarized in Table 7-6.

BAFs for invertebrate and plant food items are defined as the ratio of the ECPC concentration in plant or invertebrate tissue (mg chemical/kg tissue wet-weight) to the ECPC concentration in surface soil (mg chemical/kg dry-weight soil). BAFs reported in the scientific literature for avian and mammalian receptors are the reported ratios of ECPC concentrations in the tissues of these receptors (mg chemical/kg tissue wet-weight) to the concentrations of ECPCs in their food items (mg chemical/kg tissue wet-weight). BAFs for each of the ECPCs evaluated at Site 11 are included in Table F-1 of Appendix F.

For each representative wildlife species, the estimated percentage of soil in the overall diet is multiplied by the concentration of each ECPC in the soil and the food ingestion rate (kilograms per day [kg/d]) to determine the soil exposure concentration.

<u>7.4.3 Terrestrial Plants and Invertebrates</u> Terrestrial plants and invertebrates may be exposed to ECPCs via direct contact with and root uptake (plants) or ingestion (invertebrates) of ECPCs measured in Site 11 surface soil. For the purposes of the Site 11 ERA, exposures to terrestrial plants and invertebrates are assumed to occur within the top one-foot-interval of surface soil. Exposure of terrestrial plants to groundwater is not evaluated because the depth to the water table is approximately 44 to 90 feet bls (see hydrogeological discussion in Chapter 5.0 of this report).

Table 7-5
Exposure Parameters for Representative Wildlife Species

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Representative Wildlife Species	Body Weight (kg)	Reported Diet	Assumed Diet for Terrestrial Exposure Assessment (% of diet)	Food Ingestion Rate (kg/day)	Home Range (acres)
Cotton mouse [a] (*Peromyscus gossypinus*)	0.021 [b]	Seeds and some insects. [c]	88% Plants 10% Invertebrates 2% Soil [d]	0.0029 [e]	0.147 [f]
Short-tailed shrew (*Blarina brevicauda*)	0.017 [g]	Earthworms, slugs, snails, fungi, insects, and vegetation. [c]	78% Invertebrates 12% Plants 10% Soil [c]	0.0024 [e]	0.96 ± 0.09 [c]
Eastern meadowlark (*Sturnella magna*)	0.087 [h]	Insects, seeds, and invertebrates (beetles, grubs, bugs, grasshoppers, crickets, ants, and spiders) [h]	75% Invertebrates 20% Plants 5% Soil [h]	0.0119 [j]	5 [h]
Red fox (*Vulpes vulpes*)	4.69 [c]	Small mammals, birds, and invertebrates, as well as berries and other fruits. [c]	57% Small mammals 20% Invertebrates 10% Small birds 10% Plants 3% Soil [c]	0.24 [e]	250 [c]
Great horned owl (*Bubo virginianus*)	1.5 [i]	Mostly rabbits, mice, rats, squirrels, birds, bats, snakes, frogs, crayfish, and grasshoppers [i]	80% Small mammals 19% Small birds 1% Soil [c]	0.078 [j]	15 [k]

References:

[a] Values for the deer mouse were used for the cotton mouse (U.S. Environmental Protection Agency [USEPA], 1993b).
[b] Average of adult male and female deer mice in North America (USEPA, 1993b).
[c] Based on average exposure parameters cited in *Wildlife Exposure Factors Handbook* (USEPA, 1993b).
[d] Average of the deer mouse value is used for cotton mouse based on similarities in diet. Other values were based on diet composition (USEPA 1993b).
[e] Calculated using the mammal equation based on body weight (Wt) in kg. Food ingestion (kg/day) = $0.0687 \times Wt^{0.822}$ (kg) (USEPA, 1993b).
[f] Average for male and female deer mice, Virginia/mixed deciduous forest (USEPA, 1993b).
[g] Mean of means reported for male and female shrews in summer and fall (USEPA, 1993b).
[h] Terres (1980).
[i] DeGraaf & Rudis (1986).
[j] Calculated using the bird equation based on body weight (Wt) in kg. Food ingestion (kg/day) = $0.0582 \times Wt^{0.651}$ (kg) (USEPA, 1993b).
[k] Great horned owl home range taken from low end of range in southeast Madison County, N.Y. (Hager, 1957).

Notes: kg = kilograms.
% = percent.
kg/day = kilograms per day.
± = plus or minus.

Table 7-6
Estimation of Bioaccumulation Factors

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Receptor Group	Nature of Approach	General Approach
Terrestrial Plants		
Unit: mg/kg wet tissue per mg/kg dry soil	Literature Values	When available, literature values were used to estimate plant BAFs.
	Extrapolation and Empirical Data	When literature values were not available, plant BAFs for inorganic compounds were obtained from Baes et al. (1984).[1]
	Assumption	Although evidence suggests that plants may transport organic analytes with log K_{ow}s < 5 (i.e., volatile organic compounds [VOCs]) from the roots into leafy portions (Briggs et al., 1982; Briggs et al., 1983), bioaccumulation data for VOCs are generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it is assumed that transfer of VOCs from plant tissue to animal tissue does not occur.
Terrestrial Invertebrates		
Unit : mg/kg wet tissue per mg/kg dry soil	Literature Values	When no specific values were available, literature values were used to estimate BAFs for invertebrates.
	Assumption	Bioaccumulation data for VOCs is generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it is assumed that soil invertebrates do not bioaccumulate VOCs.
Small Mammals		
Unit : mg/kg wet tissue per mg/kg wet food	Literature Values	When available, literature values were used to estimate BAFs for small mammals.
	Extrapolation and Empirical Data	When literature values were not available, BAFs for small mammals for inorganics were derived from ingestion-to-beef biotransfer factors (BTFs) presented in Baes et al. (1984)[2].
	Assumption	Bioaccumulation data for VOCs are generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it is assumed that small mammals do not bioaccumulate VOCs.
Small Birds		
Unit: mg/kg wet tissue per mg/kg wet food	Literature Values	When available, literature values were used to estimate BAFs for small birds.
	No Information	BAFs were not obtained for SVOCs or for inorganic compounds as there is little bioaccumulation data available for birds. It is assumed that small birds do not accumulate VOCs.

[1] BAFs derived from Baes et al. (1984). Values are based on analysis of literature references, correlations with other chemical and physical parameters, or comparisons of observed and predicted elemental concentrations in vegetative and reproductive plant material and soil. Data are based on dry weight and were converted to a fresh weight basis assuming that plants are 80 percent water. This is generally consistent with the water content of berries (82 to 87 percent water) and leafy vegetables (87 to 95 percent water), presented in Suter (1993). Grains contain a much lower percentage of water (approximately 10 percent); therefore, this assumption likely underestimates exposure to graminivores.
[2] BTFs were converted to a BAF (mg/kg tissue divided by mg/kg food) by multiplying by a food ingestion rate of 12 kg (dry weight) per day (average intake for lactating and nonlactating cattle reported in Travis and Arms, 1988).

Notes: mg/kg = milligrams per kilogram.
BAFs = bioaccumulation factors.
kg = kilogram.
Log K_{ow} = Logarithmic expression of the octanol-water partition coefficient.
< = less than.
BTF = biotransfer factor.

7.5 ECOLOGICAL EFFECTS ASSESSMENT. The ecological effects assessment discusses what measurement endpoints were used to evaluate potential adverse impacts to the assessment endpoints (i.e., the survival and maintenance of receptor populations). The methods used for identifying and characterizing ecological effects for ECPCs in surface soil are described in the following subsections and in greater detail in Subsection 2.4.4 of the GIR (ABB-ES, 1998).

Wildlife receptors, terrestrial plants, and terrestrial invertebrates are potentially exposed to ECPCs in surface soil at Site 11. The measures of adverse ecological effects for these receptors are discussed separately.

7.5.1 Terrestrial Wildlife As identified in the problem formulation, the assessment endpoint selected for terrestrial wildlife is the survival and maintenance of wildlife populations and communities within the habitats present at Site 11. Because no long-term wildlife population data are available at NAS Whiting Field, a direct measurement of this assessment endpoint is not possible. The literature-derived results of laboratory toxicity studies that relate the dose of a chemical in an oral exposure with an adverse response to growth, reproduction, or survival of a test population (avian or mammalian species) are used as a measure of the assessment endpoint. Wildlife ingestion toxicity data are presented in Appendix F, Table F-2.

Reference toxicity values (RTVs) are derived for each ECPC and representative wildlife species according to the data hierarchy presented in *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*, Interim Final (USEPA, 1997d). The RTV represents the lowest exposure level (e.g., concentration in the diet) shown to produce adverse effects (e.g., reduced growth, impaired reproduction, increased mortality). For each ECPC, two RTVs representing lethal and sublethal effects are selected for each representative wildlife species. Lethal effects are those that result in mortality while sublethal effects are those that impair or prevent reproduction or growth. The RTVs are assumed to be a measure of the assessment endpoints for the protection of the survival, growth, and reproduction of terrestrial wildlife populations. Lethal RTVs are developed using the data hierarchy below and discussed in items 1, 2, and 3, while sublethal RTVs are derived using the methodology discussed in items 1 and 2.

1) For contaminants with well-documented adverse effects, the highest exposure level that is a no observed adverse effect level (NOAEL) is selected as the RTV.

2) If NOAEL values are not available, one-tenth of the lowest observed adverse effect level (LOAEL) is selected as the RTV.

3) If NOAEL or LOAEL values are not available, the lowest reported oral LD_{50} (oral dose [in mg/kg body weight-day] lethal to 50 percent of a test population) is used to derive the lethal RTV. The lethal RTV is one-fifth of the lowest reported LD_{50} value for the species most closely related to the representative wildlife receptor. One-fifth of an oral LD_{50} value is considered to be protective against lethal effects for 99.9 percent of individuals in a test population (USEPA, 1986b). An assumption is made that the value represented by one-fifth of an oral LD_{50} would be protective of 99.9 percent of the individuals within the

terrestrial wildlife populations and represents a level of acceptable risk.

A summary of lethal and sublethal RTVs selected from the ingestion toxicity data is provided in Table F-3 of Appendix F.

If neither lethal nor sublethal toxicity information is available for a taxonomic group, no RTVs are identified and risks associated with the respective ECPC are not quantitatively evaluated. However, the absence of specific data for a taxonomic group does not imply that there is no toxicological effect associated with contaminant exposure by these receptors; therefore, potential risks to these taxonomic groups are qualitatively discussed in the Uncertainties Section (Section 7.7).

7.5.2 Terrestrial Plants and Invertebrates The assessment endpoints selected for terrestrial plants and soil invertebrates are survivability and growth of terrestrial plant and soil invertebrate communities as well as reduction in the biomass of terrestrial plants and abundance of soil invertebrates used as forage material. The toxicity of surface soil at Site 11 was measured using two soil laboratory toxicity tests including a 30-day survival and growth test with earthworms (*Eisenia foetida*) and a 120-hour lettuce seed (*Lactuca sativa*) germination test.

Surface soil samples (samples 11N00201, 11N00301, 11N00401, and 10N00501) for toxicity testing were collected from four locations at Site 11 and two reference soil samples (sample BKN00301 and its duplicate sample BKN00301D and sample BKN00101) from uncontaminated sites at NAS Whiting Field . The Site 11 and reference soil samples were collected concurrently with surface soil samples (11S00201, 11S00301, 11S00401, 11S00501, BKNS00301, and BKNS00101) for chemical analyses and represent split samples. Therefore, the results of the chemical analyses can be used to establish contaminant exposure concentrations and provide the means to interpret responses in the bioassays. If adverse effects were observed in either of the bioassays, simple linear regressions were completed to determine if a correlation(s) exists between the concentration of an analyte and the adverse response measured in the bioassay.

The results of the earthworm and lettuce seed toxicity testing of surface soil samples from Site 11 are presented in Table 7-7. Additional information on the toxicity testing of Site 11 surface soil with *E. foetida* and *L. sativa* is included in Appendix F of the GIR (ABB-ES, 1998).

Because the earthworm survival and lettuce seed germination data in the reference sample, BKN00101, were significantly different ($P \leq 0.05$) than the reference location, BKN00301, and data from sample BKN00301 were not significantly different from the laboratory control, toxicity data from BKN00101 were not included in the statistical comparison of site-related data and control/reference data. Site-related toxicity data were evaluated by a statistical comparison of mean survival, growth (as wet weight), or germination with the reference sample (BKN00301 and BKN00301D) and the laboratory control.

With the exception of one soil sample (11N00201), the soil samples collected at Site 11 were not toxic to earthworms. Earthworms exposed to soil collected at 11N00201 for 30 days experienced 77 percent mortality. There were no significant differences ($P \leq 0.05$) in the growth of earthworms between the reference and

laboratory control samples and the Site 11 samples after 30 days of exposure. There were also no significant differences ($P \leq 0.05$) in germination of lettuce seeds between the reference and laboratory control samples and the Site 11 samples following 120 hours of exposure.

Table 7-7
Results of Site 11 Surface Soil Toxicity Testing

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Sample Location	Earthworm (*Eisenia foetida*)		Lettuce Seed (*Lactuca sativa*)
	Survival After 14 days (30 days) (%)	Weight Change (%)[1]	Germination After 120 Hours (%)
11N00201	100 (23)*	11.8	94
11N00301	100 (100)	4.6	91
11N00401	100 (100)	5.2	91
11N00501	100 (100)	7.2	86
Laboratory Control	100 (81)	13	91
BKN00301 (Reference)	100 (100)	10.9	97
BKN00301D (Reference)	100 (100)	5.0	90
BKN00101 (Reference)	100 (63)*	29.1	43*

[1] Growth of *E. foetida* is expressed as mean individual wet weight.

Notes: * = significantly different from the laboratory control and reference BKN00301.
% = percent.

7.6 RISK CHARACTERIZATION. This section presents the risk characterization for ecological receptors exposed to affected surface soil at Site 11. Potential risks associated with exposures to ECPCs in surface soil at Site 11 are discussed separately for wildlife, terrestrial plants, and soil invertebrates. Risks to wildlife are characterized by comparing the PDE concentrations (based on RME and CT exposure concentrations) for each surface soil ECPC with its respective RTV (estimated threshold dose for toxicity). Risks for terrestrial plants and soil invertebrates are evaluated by comparing toxicity benchmarks to RME and CT exposure concentrations.

7.6.1 Terrestrial Wildlife Risks for the representative wildlife species associated with ingestion and bioaccumulation of ECPCs in surface soil and prey items are quantitatively evaluated using HQs. HQs are calculated for each ECPC by dividing the PDE concentration by the selected lethal and sublethal RTV. HIs are determined for each receptor by summing the HQs for all ECPCs. When the estimated PDE is less than the RTV (i.e., the HQ < 1), it is assumed that chemical exposures are not associated with adverse effects to receptors and no risks to wildlife populations exist. For instance, if the PDE calculated using the RME concentration is less than the lethal RTV, then it is assumed that adverse effects to the survival of wildlife populations are unlikely to occur. Similarly, if the reasonable maximum PDE is less than the sublethal RTV, then it is assumed that adverse effects to wildlife populations related to growth and reproduction are unlikely to occur. When an HI is greater than or equal to 1,

a discussion of the ecological significance of the HQs comprising the HI is completed and risks from exposure to CT concentrations of ECPCs are evaluated.

This hazard ranking scheme evaluates potential ecological effects to individual organisms and does not evaluate potential populationwide effects. Contaminants may cause population reductions by affecting birth and mortality rates, immigration, and emigration (USEPA, 1989c). In many circumstances, lethal or sublethal effects may occur to individual organisms with little population- or community-level impacts; however, as the number of individual organisms experiencing toxic effects increases, the probability that population effects will occur also increases. The number of affected individuals in a population presumably increases with increasing HQ or HI values; therefore, the likelihood of population-level effects occurring is generally expected to increase with higher HQ or HI values.

The lethal and sublethal HQs and HIs are calculated for each ECPC and each representative wildlife species. Tables F-5 through F-9 of Appendix F present the HQ and HI calculations. A summary of risks to representative wildlife receptors is provided in Table 7-8.

Table 7-8
Summary of HIs for Terrestrial Wildlife[1]

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Ecological Receptors	Lethal Effects from Exposure to Reasonable Maximum EPCs	Sublethal Effects from Exposure to Reasonable Maximum EPCs	Sublethal Effects from Exposure to Central Tendency EPCs
Cotton mouse	0.071	1.5	0.55
Short-tailed shrew	0.15	4.5	2.2
Eastern meadowlark	0.07	3.5	1.8
Red fox	0.66	6.3	2.7
Great horned owl	0.43	20	9.5

[1] The information is a summary of the HIs presented in Tables E-4 through E-9 of Appendix E.

Notes: EPC = exposure point concentration.
HI = hazard index.

Summary HIs for representative wildlife species exposed to RME concentrations of ECPCs for lethal effects were less than 1; therefore, lethal risks are not predicted for these receptors (i.e., bioaccumulating chemicals are not sufficiently high to reduce survivability in small mammals and birds and in top predators).

Based on exposure to RME concentrations of ECPCs in the surface soil, sublethal risks are predicted for all representative wildlife species. The sublethal HIs for the short-tailed shrew (RME HI = 4.5 and CT HI = 2.2), Eastern meadowlark (RME HI = 3.5 and CT HI = 1.8), red fox (RME HI = 6.3 and CT HI = 2.7), and great horned owl (RME HI = 20 and CT HI = 9.5) are all above 1 based on RME and CT

exposure concentrations. The primary contributor to the sublethal HIs for the short-tailed shrew and the meadowlark is 4,4'-DDD.

Dieldrin and lead are primary contributors to sublethal risks for the red fox, while 4,4'-DDD, 4,4'-DDT and alpha- and gamma-chlordane are the primary risk drivers for the great horned owl.

Based on the results of the 1992 Phase IIA and 1996 Phase IIB surface soil investigations at Site 11, it appears that elevated concentrations of 4,4'-DDD, 4,4'-DDT, dieldrin, and lead in the surface soil may be localized at sampling location 11-SL-02. 4,4'-DDD was detected only at location 11-SL-02 and maximum concentrations of 4,4'-DDT, dieldrin, and lead were also detected at location 11-SL-02 as compared to the other sampling locations.

In order to evaluate whether or not potential risks to wildlife receptors exist outside the immediate area of sampling location 11-SL-02, the RME exposure concentrations for 4,4'-DDD, 4,4'-DDT, dieldrin, and lead were recalculated by excluding the concentrations of these analytes detected at 11-SL-02. The RME concentration for lead is equal to the 95th percent UCL because lead was analyzed in 17 additional samples, and the UCL is less than the maximum detected concentration. The RME concentration for 4,4'-DDD is not calculated because this pesticide was only detected at location 11-SL-02. The RME concentrations for 4,4'-DDT and dieldrin are equal to their maximum detected concentrations because these analytes were analyzed in only nine additional samples. The recalculated RME concentrations for the aforementioned analytes are as follows: 4,4'-DDD (not detected), 4,4'-DDT (0.045 mg/kg), dieldrin (0.044 mg/kg), and lead (37 mg/kg). The recalculated RME concentrations, excluding the data from location 11-SL-02, were then used to derive HIs via the food-web model. The sublethal HQs and HIs calculated using the revised RME exposure concentrations for each of the representative wildlife species are presented in Tables F-10 and F-11 of Appendix F.

Sublethal risks to small mammal and bird populations are not predicted based on the revised RMEs for 4,4'-DDD, 4,4'-DDT, dieldrin, and lead. Although sublethal HI for the Eastern meadowlark was 1.0, all HQ values for individual constituents were less than 1. Although adverse effects to individual small bids are possible at HI values of one, the likelihood of population-level effects are considered negligible. Sublethal HIs for the red fox (HI = 3.9) and the great horned owl (HI = 4.5) still exceed 1. The primary risk contributor for the fox is dieldrin; for the owl, the primary risk contributors are 4,4'-DDT, alpha-chlordane, and gamma-chlordane.

The results of the food-web modeling suggest that lethal risks to terrestrial wildlife at Site 11 are not expected. Sublethal risks to small mammals and birds and top predators associated with ingestion of pesticides (including 4,4'-DDD, 4,4'-DDT, dieldrin, alpha-chlordane, and gamma-chlordane) and lead in surface soil and related food items may occur. However, it appears that elevated concentrations of 4,4'-DDD and lead are localized in the immediate area surrounding sampling location 11-SL-02. Because sublethal risks to small mammals and birds appear to be localized to one discrete location or "hot-spot," it is unlikely that the reproduction or growth of these wildlife populations would be impacted outside the immediate area of 11-SL-02. However, sublethal impacts to growth and reproduction of top predator populations are possible over the entire area of Site 11.

7.6.2 Terrestrial Plants After 120 hours of exposure to Site 11 surface soil, lettuce seed germination was not inhibited. As shown in Table 7-7, lettuce seed germination ranged from 86 to 94 percent in soil collected from Site 11 as compared to 91 percent in the laboratory control and 94 percent in the reference sample, BKN00301, and its duplicate BKN00301D. The results of the toxicity testing show that surface soil samples collected at Site 11 are not expected to impact the survival and growth of terrestrial plants. Consequently, reduction of plant biomass and/or plant cover at Site 11 and subsequent impacts to small mammal and bird populations are not expected to occur.

7.6.3 Terrestrial Invertebrates With the exception of one sample (11S00201), the soil samples collected at Site 11 were not toxic to *E. foetida*. Following 30 days of exposure, survival and growth of earthworms in samples 11S00301, 11S00401, and 11S00501 were not significantly different ($P \leq 0.05$) from the laboratory control or reference sample. Worms exposed to soil from station 11S00201 experienced 77 percent mortality. Based on the results of the toxicity testing, it is assumed that with the exception of soil at location 11S00201, the contamination present in surface soil at Site 11 does not present an unacceptable risk for terrestrial soil invertebrates.

Of the soil samples collected during the 1996 Phase IIB investigation (11S00101 through 11S00501), sample location 11S00201 is characterized by concentrations of TPH and 4,4'-DDT greater than any other surface soil sampling location. TPH was detected at 53.1 mg/kg and 4,4'-DDT was detected at 0.027 mg/kg at this location. Appendix F presents a series of simple linear regression analyses that evaluate statistical relationships between biological effects observed in the surface soil bioassays and concentrations of selected analytes in Site 11 surface soil. Selected analytes include TPH, bis(2-ethylhexyl)phthalate, 4,4'-DDT, dieldrin, lead, and zinc. These analyses suggest that concentrations of TPH and 4,4'-DDT are both positively correlated with earthworm mortality with the square of the product moment correlation coefficient through data points in known "y"s and known "x"s) (R^2) values of 0.99 (TPH) and 0.95 (4,4'-DDT). As concentrations of either TPH or 4,4'-DDT increase (at location 11S00201), earthworm survival rates decrease.

7.7 UNCERTAINTY ANALYSIS. The objective of the uncertainty analysis is to discuss the assumptions of the ERA process that may influence the risk assessment results and conclusions. Table 2.5 of the GIR presents several general uncertainties inherent in the risk assessment process (ABB-ES, 1998).

Specific uncertainties associated with exposure to surface soil at Site 11 include the following:

- Although selected as an ECPC for surface soil, TPH was not evaluated in the ERA for terrestrial wildlife (i.e., mammals and birds) because toxicological benchmarks were not available. TPH was detected in five samples collected during the Phase IIB investigation at concentrations ranging from 7 to 53.1 mg/kg. It is believed that detected concentrations of TPH are likely the result of past disposal activities at Site 11. Based on the detected concentrations of volatile and semivolatile constituents, and the finding of no risk associated with these constituents, it is unlikely that detected concentrations of TPH in the surface soil of Site 11 pose a risk to terrestrial wildlife receptors.

- Risks to avian species may have been underestimated because bioaccumulation and toxicity data for this taxonomic group are generally lacking in the literature. As a result, potential risks associated with several ECPCs were not evaluated for avian species. If the toxicological and contaminant transport data obtained from studies conducted on mammals were used to estimate risks to avian species, then risk estimates for birds would be higher. However, there is also uncertainty in assuming that the metabolic functions of mammals and birds are similar enough to use intertaxonomic surrogates.

- Risks to adult amphibian and reptile species were not estimated because bioaccumulation and toxicity data for this taxonomic group are generally lacking in the literature. As a result, potential risks associated with ECPCs are uncertain for these species. Intertaxonomic surrogates were not used to calculate dietary risks to reptiles because of the uncertainty associated with extrapolation of data from endothermic to essentially ectothermic species.

- An assumption has been made that organisms evaluated in the toxicity tests are representative of species at the site. Depending on the sensitivities of terrestrial plants and invertebrates occurring at Site 11, risks may be over or underestimated.

- Inclusion of the lead confirmatory samples in the EPC calculation may result in overestimation of risk.

7.8 SUMMARY OF ECOLOGICAL ASSESSMENT FOR SITE 11. Potential risks for ecological receptors including terrestrial wildlife, terrestrial plants, and soil invertebrates were evaluated for ECPCs in surface soil at Site 11.

Risks associated with exposures to ECPCs in Site 11 surface soil were evaluated for terrestrial wildlife based on a model that estimates the amount of contaminant exposure obtained via the diet and incidental ingestion of surface soil. Comparison of estimated doses for wildlife species with reference toxicity doses representing thresholds for lethal and sublethal effects is the basis of wildlife risk evaluation. Based on the results of the food-web model, lethal risks to terrestrial wildlife at Site 11 are not predicted. Sublethal risks to terrestrial wildlife associated with ingestion of pesticides and lead in surface soil and food items were identified; however, elevated concentrations of 4,4'-DDD and lead are localized in the immediate area surrounding sampling location 11-SL-02. Sublethal risks to small mammal and bird populations appear to be localized to location 11-SL-02 while impacts to top predator populations are predicted over the entire area of Site 11.

Risks to terrestrial plants and soil invertebrates at Site 11 were evaluated based on the results of laboratory toxicity testing of surface soil samples from Site 11 with earthworms (*Eisenia foetida*) and lettuce seeds (*Lactuca sativa*). With the exception of soil from sampling location 11S00201, soil collected from Site 11 was not toxic to the test species and risks associated with exposure to ECPCs in surface soil were not identified for soil invertebrates, terrestrial plants, or foraging mammal and bird populations. At location 11S00201, significant earthworm mortality (77 percent) was observed. It is likely that elevated TPH and 4,4'-DDT concentrations (53.1 and 0.27 mg/kg, respectively) may

be at least partially responsible for the observed mortality in the laboratory toxicity tests.

In summary, the results of the ERA suggest that the growth and reproduction of small mammal and bird populations may be impacted in the area near sampling location 11-SL-02, while sublethal impacts to top predator populations are likely over the entire area of Site 11. Reductions in the biomass of terrestrial plants used as forage material at Site 11 are not expected. However, the survival of terrestrial invertebrates and consequent abundance for foraging mammals and birds may impacted at sampling location 11S00201.

8.0 CONTAMINANT FATE AND TRANSPORT

This chapter discusses the fate and transport of human health and ecological CPCs detected in soil and groundwater samples at Site 11. Fate, in the context of this chapter, refers to the ultimate disposition of a given CPC following its release into the environment. Transport refers to the mechanism(s) by which a given chemical released into the environment will arrive at its fate. Explanation of the fate and transport of chemicals in the environment can be very complicated or very simple, depending on the physical, chemical, and biological characteristics of the compound or metal considered and the environment into which that compound is released.

Several organic compounds and inorganics were detected in soil and groundwater sampled at Site 11. Because of the number of potential chemicals detected and the myriad fate and transport scenarios possible for those chemicals in the media, this discussion will focus only on those chemicals that may pose adverse risk to human or ecological receptors, as identified by the HHRA (Chapter 6.0) and the ERA (Chapter 7.0) in this report.

The following discussion of contaminant fate and transport is divided into two sections. Section 8.1 discusses potential migration routes of a chemical(s) in the media evaluated and does not focus specifically on media found to be of concern at Site 11. The site-specific persistence, fate, and transport of those compounds and elements found to pose a potential risk to human health or the environment are discussed in Section 8.2.

8.1 POTENTIAL ROUTES OF MIGRATION. Several routes of migration are possible for a contaminant in the various media: air, soil, surface water, groundwater, and biota. These routes are summarized below.

Air. Gases and particulate material can be transported in the atmosphere. Organic compounds, metals, and metal complexes that exist as gases at surface temperature and pressure may disperse or diffuse into the air and particulates may become entrained in air and thereby migrate. The extent to which gaseous constituents and particulate material remain airborne is a function of the level of excitation of the air (wind and temperature) and fate processes acting on the constituent and, for particulates, their density. Particulate material as discussed herein consists of organic compounds and inorganic material that would otherwise not be present in a gaseous medium under atmospheric conditions.

Soil. The primary agents of migration acting on soil include wind, rainwater, running water, biological activity, and human activity. Wind commonly transports soil in the form of particulate material. Rainwater may cause soil to migrate either by washing soil particles downward into the subsurface or by carrying soil particles overland to surface water bodies or other areas of deposition. The amount and type of vegetative cover and surface disturbance affects the degree to which wind and water cause soil to migrate.

Surface Water. The mechanisms for migration of constituents in surface water are dissolution and suspension. Several organic compounds and metals are soluble in water and can be transported in the aqueous phase. Other organic compounds and elements are not soluble in water, but may be transported by surface water via

suspension. The amount of suspended particulate material in surface water is largely a function of the water's energy; as that energy decreases, suspended material will settle and become part of the soil or sediment. Colloidal material may remain in suspension (by electrochemical forces) in water of very low energy (e.g., standing water).

Sediment. Saltation, traction, suspension, biological action, and human action are the primary mechanisms of migration for sediment. Physical, chemical, and biological processes affecting a constituent will determine where and how migration from sediment will occur.

Groundwater. Groundwater is a liquid medium capable of transporting constituents as colloidal forms, as complexes, as pure phase liquids, or as dissolved-phase liquids. Organic compounds and elements generally reach groundwater either by being placed directly into the water table (e.g., disposal pits) or by being leached from soil or solid waste to the water table by physical or chemical processes. Groundwater may discharge to the land surface, surface water bodies, other aquifers, or pumping wells. The migration of constituents from groundwater upon discharge depends on the chemical and/or physical processes acting upon that individual constituent in the medium to which it is discharged.

Biota. Biota may be considered a medium for migration of certain organic compounds and inorganics. Several compounds and elements are known to accumulate in the tissues of organisms at various levels in the food chain. As these organisms are consumed by other organisms, compounds and elements are accumulated in their tissue and passed on to organisms higher in the food chain. In this manner, contaminants may be transported by biota. Additionally, some organisms disturb bed sediments in streams and rivers. This disturbance can cause organic compounds and elements to be transported downstream as suspended material in surface water.

8.2 CONTAMINANT PERSISTENCE AND FATE. The discussion of contaminant persistence and fate in the environment is divided into three subsections. Subsection 8.2.1 discusses the processes that control the persistence and fate of organic compounds and inorganics in the environment. Subsection 8.2.2 discusses the primary persistence and fate characteristics of the constituents detected at Site 11. Subsection 8.2.3 discusses contaminant transport for Site 11.

8.2.1 Processes The persistence and fate of chemical constituents in the environment depends on various chemical, physical, and biological processes. The predominant processes affecting the environmental persistence and fate of chemical constituents include solubility, photolysis, volatilization, hydrolysis, oxidation, chemical speciation, complexion, precipitation or coprecipitation, cationic exchange, sorption, biodegradation or biotransformation, and bioaccumulation. These processes are briefly summarized below.

Solubility. The solubility of chemical constituents in water is important in assessing their mobility in the environment. This is particularly important for the transport and ultimate fate of chemicals from soil and sediment to water (i.e., groundwater and/or surface water). Generally for organic compounds, aqueous solubility is a function of molecular size, molecular polarity, temperature, and the presence of other dissolved organic cosolvents. For metals and other inorganic parameters, solubility is generally controlled by chemical

speciation, pH, redox potential (Eh), oxygen content, and the presence of dissolved and/or colloidal organic compounds (e.g., humic and fulvic acids) or other inorganic ion species (e.g., hydroxides and sulfates) (USEPA, 1979). Increased solubility is usually directly related to increased environmental mobility with groundwater and/or surface water being the principal transport medium. Therefore, solubility is a significant factor affecting the fate of a compound or element in the water environment.

Photolysis. Many chemical constituents, particularly organic compounds, are susceptible to photolytic degradation either directly or indirectly. Direct photolysis involves a splitting of the chemical compound by light, whereas indirect photolysis occurs when another compound is transformed by light into a reactive species (i.e., usually a hydroxyl radical) that reacts with and modifies the original compound. In general, photolysis primarily occurs within the atmosphere, although it may also occur to a limited extent in surface water and/or soil under certain environmental conditions (USEPA, 1979).

Volatilization. Volatilization of organic chemicals from soil or water to the atmosphere is an important pathway for chemicals with high vapor pressures. For organic compounds, volatilization is a function of partial pressure gradients, temperature, and molecular size and is more likely to occur for compounds with low molecular weights. In addition, certain metals such as mercury, arsenic, and lead are capable of undergoing biologically mediated transformation (i.e., alkylation) that form volatile end products. Volatilization is important for the transport of certain chemical constituents from surface soil (i.e., vadose zone), sediment, and surface water and is evaluated using Henry's law and other associated chemical-specific rate constants.

Hydrolysis. Hydrolysis involves the decomposition of a chemical compound by its reaction with water. The rate of reaction may be promoted by acid (hydronium ion, $[H_3O^+]$) and/or base (hydroxyl ion, $[OH^-]$) compounds. In general, most organic compounds are resistant to hydrolytic reactions unless they contain a functional group (or groups) capable of reacting with water. Metallic compounds, however, generally dissociate readily in water depending upon the aqueous environmental conditions (e.g., pH and ionic strength). For metals, hydrolytic dissociation is an indirect process that affects the primary fate and transport mechanism of aqueous solubility.

Oxidation. The direct oxidation of organic compounds in natural environmental matrices may occur but this is generally a slow, insignificant transformation mechanism of minimal importance (USEPA, 1979). However, some inorganic compounds may be rapidly oxidized under naturally occurring environmental conditions when the surrounding environment changes from anaerobic to aerobic conditions.

Chemical Speciation. Chemical speciation is important primarily for metals that may exist in multiple forms in the environment, particularly within aqueous matrices. In general, the aqueous speciation of metals depends primarily upon the relative stabilities of individual valence states (which are element specific), oxygen content, pH and Eh condition, and the presence of available complexating agents and/or other cations and anions (USEPA, 1979). Because various metallic species exhibit differential aqueous solubilities and differential mobilities within soils and/or sediments (USEPA, 1979), the particular speciation of an individual metal will greatly affect its environmental mobility.

Complexation. For metals, complexation with various ligands is an important process because these complexes may be highly soluble in water. Complexation may, therefore, greatly enhance mobility within environmental matrices, particularly in groundwater and surface water, depending upon the aqueous solubility of the resulting complex. Complexation depends upon numerous factors such as pH, Eh, type and concentration of complexing ligands, and other ions present (USEPA, 1979).

Most metals are capable of forming numerous organic and/or inorganic complexes in the natural environment (USEPA, 1979). Metals may form organo-metallic complexes, especially with naturally occurring organic acids (i.e., humic and fulvic acids). In some cases, these metallic species may exhibit varying affinities for different organic ligands (i.e., mercury and arsenic for amino acids and their derivatives) (USEPA, 1979). Metals may also form metallo-inorganic complexes with inorganic ligands such as carbonate, halogens (usually chlorine), hydroxyl, and sulfate (USEPA, 1979). However, organo-metallic complex formation is usually favored over metallo-inorganic complexes.

Precipitation and Coprecipitation. Both chemical precipitation and co-precipitation are important removal mechanisms, particularly for metals and metallo-cyanides in the environment. Precipitation and/or coprecipitation reactions depend on numerous aqueous environmental conditions such as pH, Eh, organic ligands present, oxygen content, and cationic and anionic species present (USEPA, 1979). Depending on the specific conditions, the removal of aqueous metallic species and metallo-cyanides from groundwater and/or surface water can greatly affect a metal's environmental mobility and, hence, its ultimate fate and transport.

Cation Exchange. Cation exchange is important primarily for metals and other ions that may substitute with other cations of similar charge and size within the lattice structure of clay minerals in soil and/or sediment (USEPA, 1979). This process, therefore, can significantly affect the mobility of an aqueous metal cation by removing it from solution under certain environmental conditions.

Sorption. The sorption of chemical constituents by inorganic particulate matter (i.e., soil or sediment) and organic compounds is an important process that affects mobility in the environment. This process is particularly important for the fate and transport of chemicals from soil or sediment to water (i.e., groundwater and surface water). In general, most metals exhibit a potential for adsorption to inorganic particulate matter and organic compounds (USEPA, 1979). Organic compounds also exhibit sorptive capability, but show greater variability in their ability to sorb to particulate or organic matter. The tendency for organic compounds to sorb to soils or sediment is reflected in their organic carbon partitioning coefficients (K_{oc}). K_{oc} is a measure of relative adsorption potential. The normal range of K_{oc} values is from 1 to 10^7 with higher values indicating greater sorption potential. Actual adsorption is chemical specific and is largely dependent on the organic content of the soil. The fraction of organic carbon, f_{oc}, in soil times the K_{oc} is defined as the distribution coefficient, K_d. The K_d is a ratio of the concentration adsorbed to the concentration partitioned to water.

Regardless of chemical class, sorption is a reversible process whereby desorption can be favored over sorption under certain environmental conditions (e.g., low pH for metals). For organic compounds in general, as the molecular weight

increases and the aqueous solubility decreases (i.e., low polarity and high hydrophobicity), the sorptive binding affinity increases (i.e., K_{oc} increases). The tendency for chemical constituents to adsorb to inorganic particulate and/or organic compounds is a particularly important process because sorption to soils and/or sediments can effectively reduce a chemical constituent's mobility.

Biodegradation or Biotransformation. Biodegradation is a result of the enzyme-catalyzed transformation of chemicals. Organisms require energy, carbon, and essential nutrients from the environment for their growth and maintenance. In the process, chemicals from the environment will be transformed by enzymes into a form that can be used by the organism. The biodegradation rate is the rate by which contaminants will be degraded. The rate is a function of microbial biomass and a chemical's concentration under given environmental conditions. When a pollutant is introduced into the environment, there is often a lag time before biodegradation begins while the organism generates an enzyme capable of digesting the chemical. Co-metabolism occurs when a pollutant can be biotransformed only in the presence of another compound that serves as a carbon and energy source (USEPA, 1979).

Bioaccumulation. Bioconcentration and bioaccumulation data are important when evaluating the impact of chemicals in the aquatic environment. The process is characterized by hydrophobic chemicals that can be partitioned into fat and lipid tissues and inorganic chemicals that can be partitioned into bone marrow. The bioconcentration factor is a measure of the concentration of a chemical in tissue (on a dry-weight basis) divided by the concentration in water, and is a commonly used parameter to quantify bioconcentration (USEPA, 1979). The process is significant because bioaccumulation magnifies up through the food chain.

8.2.2 Persistence and Fate of Site 11 CPCs This section discusses the persistence and fate characteristics for CPCs detected at Site 11. To focus the discussion of persistence and fate characteristics, only those constituents that were (1) identified by the human health or ERAs (presented in Chapters 6.0 and 7.0, respectively) as CPCs and (2) those constituents that were present above relevant standards will be addressed. These constituents are summarized below by medium for Site 11.

Human Health Assessment Constituents

- Surface soil: Six PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo-(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene), one pesticide compound (dieldrin) and three inorganic analytes (arsenic iron, and lead).

- Groundwater: Three VOCs (1,2-dichloroethene, benzene, vinyl chloride), one SVOC (bis(2-ethylhexyl)phthalate), and five inorganic analytes (aluminum, arsenic, iron, manganese, and thallium).

Ecological Assessment Constituents

- Surface soil: One VOC (acetone); fourteen SVOCs (bis(2-ethylhexyl-phthalate, 2-methylnaphthalene, acenaphthylene, anthracene, benzo(a)-anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene), five pesticides (4,4'-DDD, 4,4'-DDT,

dieldrin, alpha-chlordane, and gamma-chlordane), three inorganic analytes (lead, silver, and zinc), and TPH.

The fate and persistence characteristics of these constituents are summarized below by analytical fraction.

VOCs

Acetone. Acetone (C_3H_6O) is both a naturally occurring and manmade compound. It has been identified as a naturally occurring volatile metabolite of both plants and insects; forest fires have also been identified as a natural source of the compound. Acetone is commonly used as a solvent and is a by-product of several manufacturing processes (Howard, 1990).

The majority of acetone released to the environment is by emissions to the atmosphere; in the atmosphere it will break down by photolysis or be removed by rain. If released to the soil it will both volatilize and leach into the ground. In soil and groundwater, acetone will readily biodegrade and is not likely to significantly adsorb to either soil or sediment (Howard, 1990).

Acetone is a commonly recognized field- or laboratory-derived contaminant according to the USEPA CLP Functional Guidelines for Organic Data Review (USEPA, 1994a). As such, the detected concentrations of acetone at Site 11 may not be related to past disposal activities at the site. Furthermore, given the fact that acetone readily volatilizes, it is unlikely that surface soil would retain detectable quantities of acetone for 25 years (waste disposal at Site 11 ended in approximately 1970).

1,2-DCE. 1,2-DCE ($C_2H_2CL_2$) exists as two isomers, *cis* and *trans*. The *trans* isomer is twice as toxic as the *cis* isomer. Both may enter the environment in emissions and wastewater and as a solvent and extractant in the production of perfumes, lacquers, and thermoplastics. In addition, 1,2-DCE is a breakdown product in the reductive dehalogenation of trichloroethene (TCE) and tetrachloroethene (PCE) (Howard, 1990).

When released to soil, 1,2-DCE will either evaporate or leach to the groundwater. Adsorption to soil and sediment particles is low and biodegradation in soil and groundwater is slow. The greatest removal mechanism of 1,2-DCE from soils and waters is through volatilization (Howard, 1990).

Benzene. Benzene (C_6H_6) may enter the environment as result of the production, storage, transport, venting, and combustion of gasoline, as well as, the production, transport and storage of benzene as a pure product. Benzene is also natural by-product of forest fires (Howard, 1990).

Benzene is highly volatile, and is highly mobile in soil. If released to the soil, benzene will evaporate or leach from the soil to the groundwater. Biodegradation of benzene is likely in shallow aerobic waters, though not under anaerobic conditions. Abiotic degradation is largely limited to benzene present in the atmosphere. Hydrolysis is an insignificant mechanism for the breakdown of benzene (Howard, 1990).

Vinyl chloride. The predominant use of vinyl chloride (C_2H_3CL) is in the plastics industry for the production of polyvinyl chloride (PVC). Vinyl chloride

is also a breakdown product resulting from the biodegradation of other chlorinated solvents such as TCE, PCE, and 1,2-DCE.

Vinyl chloride has a relatively high vapor pressure and should readily volatilize from dry soil. However, vinyl chloride is also readily soluble and may be leached through the soil by atmospheric waters and enter the groundwater water (ATSDR, 1991a). Vinyl chloride will biodegrade within groundwater but the rate is highly dependant upon microbial communities and general water chemistry (eg. aerobic versus anaerobic conditions).

SVOCs

Bis(2-ethylhexyl)phthalate. Bis(2-ethylhexyl)phthalate (also known as di(2-ethylhexyl)phthalate) ($C_{24}H_{38}O_4$) is principally used as a plasticizer in the production of PVC and vinyl chloride resins. PVC is used in many common household items such as toys, vinyl upholstery, shower curtains, adhesives, and as a component of paper and paperboard. Bis(2-ethylhexyl)phthalate has also been used as a solvent, an acaracide in orchards, and as an inert ingredient in pesticide products (ATSDR, 1993).

Bis(2-ethylhexyl)phthalate is a widely used chemical that enters the environment primarily through the disposal of industrial and municipal wastes in landfills. Bis(2-ethylhexyl)phthalate tends to adsorb strongly to soil and sediments and to bioconcentrate in aquatic organisms. Sorption, bioaccumulation, and biodegradation are likely to be competing processes, with the dominant fate being determined by local environmental conditions (ATSDR, 1993).

Bis(2-ethylhexyl)phthalate has a strong tendency to be adsorbed to atmospheric particulate matter, soils, and sediments. Bis(2-ethylhexyl)phthalate biodegradation in soil is slow since strong adsorption reduces the availability for degradation. Biodegradation is expected to occur under aerobic conditions. Bis(2-ethylhexyl)phthalate may slowly volatilize into air. In air, direct photolysis and photooxidation are not likely (ATSDR, 1993).

Bis(2-ethylhexyl)phthalate is relatively insoluble; however, it may leach to the groundwater in the presence of common organic solvents such as alcohols and ketones. Bis(2-ethylhexyl)phthalate in the water will undergo biodegradation under aerobic conditions. Chemical hydrolysis occurs too slowly to be important (ATSDR, 1993).

PAHs. A total of thirteen PAHs was identified as CPCs (2-methylnaphthalene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene) at Site 11. PAHs are a group of chemicals that are formed during the incomplete burning of coal, oil, gas, wood, garbage, or other organic substances. PAHs can either be manmade or occur naturally. A few of the PAHs are used in medicines and to make dyes, plastics, and pesticides, while others are contained in asphalt used in road construction. There are more than 100 different PAH compounds (ATSDR, 1993).

In air, PAHs are found sorbed to particulates and as gases. Particle-bound PAHs can be transported long distances and are removed from the atmosphere through precipitation and dry deposition. PAHs are transported in surface waters by volatilization and sorption to settling particles. The compounds are transformed

in surface waters by photooxidation, chemical oxidation, and microbial metabolism. Sorption of PAHs to soil and sediment increases with increasing organic content and is also directly dependant upon particle size. Microbial metabolism is the major process for degradation of PAHs in soil environments. PAHs have relatively low solubilities, but if transported through soils by either leaching or colloidal movement, PAHs can enter groundwater and be transported within an aquifer (ATSDR, 1993).

Pesticides

4,4'-DDT and 4,4'-DDD. 4,4'-DDT (DDT) and its primary metabolites, 4,4'-DDE (DDE) and 4,4'-DDD (DDD), are manmade chemicals and are not known to occur naturally in the environment. Most releases of the chemicals are related to their manufacture and use as insecticides in agriculture and vector control. Pesticidal use of DDT, except in public health emergency, was banned in the United States in 1972. Due to the extensive past use of DDT worldwide and the persistence of DDT and its metabolites, these materials are virtually ubiquitous and are continually being transformed and redistributed in the environment (ATSDR, 1992).

DDT, DDE, and DDD are only slightly soluble in water. Therefore they are not easily displaced from their site of application, nor do they tend to leach to groundwater. Appreciable amounts of the compounds may remain in the soil for extended periods of time and are only readily moved by physical erosion of soil particles (ATSDR, 1992).

Four mechanisms have been identified as accounting for the most losses of DDT residues from soils: volatilization, removal by harvest of organic matter, water runoff, and chemical transformation. Photooxidation of DDT is known to occur on soil surfaces; however, it is not known to hydrolyze. Biodegradation may occur under both aerobic and anaerobic conditions in the presence of certain soil microorganisms (ASTDR, 1992).

Dieldrin. The pesticides aldrin and dieldrin were used, from the 1950s until the early 1970s, as insecticides on crops such as corn and cotton. The USDA canceled all uses of aldrin and dieldrin in 1970. However, aldrin and dieldrin were approved for killing termites by the USEPA in 1972. Use of aldrin and dieldrin to control termites continued until 1987. Aldrin is readily converted to dieldrin which is ubiquitous in the environment (ASTDR, 1991b).

Dieldrin is persistent in the environment because it is more resistant to biotransformation and abiotic degradation than aldrin; as a result, dieldrin is found in low levels in all media, even at a distance from the site of concentration. Transport of dieldrin in soils is minimal because it tends to bind tightly to soil; however, it can volatilize from soil. Most dieldrin found in surface water is the result of runoff from contaminated soil. The resistance of dieldrin to soil leaching generally precludes its migration into groundwater (ASTDR, 1991b).

Chlordane. Chlordane is a manmade chemical that was registered for use as a pesticide in the United States from 1948 to 1988. It was used mainly to stop termites in houses and was used on corn and other crops. In soil, chlordane will adsorb to the organic matter and volatilize slowly over time. It will not leach significantly, in general staying in the surface soil and potentially remain for

up to 20 years. Volatilization from soil is a major loss mechanism for chlordane; the rate will depend on such parameters as the soil organic content, water content, temperature, and relative humidity (ASTDR, 1988a).

Inorganic Analytes

Aluminum. Aluminum is the third most common element in the environment, though it is not generally found in elevated concentrations in groundwater. Aluminum is known to complex readily, however, and high concentrations present in groundwater are generally due to silt-sized particles of aluminum-containing compounds often present as clays or aluminum hydroxides. Complexing and polymerization of the most common valence state of aluminum, Al^{+3}, represents the predominant transport mechanism for aluminum in the environment.

Arsenic. Arsenic has two stable forms in solution in groundwater, arsenate (As^{5+}) and arsenite (As^{3+}). In groundwater, with pH ranging from 3 to 7, the monovalent arsenate anion $H_2AsO_4^-$ is the dominant form. Upon entering surface water, via groundwater discharge, arsenic may partition to sediment from solution by hydrous iron oxide adsorption and/or coprecipitation (or a combination of both) with sulfides in the sediment. The Eh and pH conditions of the surface water and sediment govern the effectiveness of these mechanisms (adsorption and coprecipitation) as a sink for arsenic. These mechanisms appear to be the major inorganic factors controlling arsenic concentrations in surface water (Hem, 1992).

Arsenic may be very mobile in the aquatic environment, cycling through the water column, sediment, biota, and air. Most arsenic released into the environment (on the earth's surface) eventually ends up either in sediments (in stream beds or lakes) or in the oceans. Eh and pH conditions largely govern the fate of arsenic (USEPA, 1979).

Iron. Iron is the second most abundant element in the environment. though dissolved concentrations present in groundwater are generally low. The chemical behavior of iron and its solubility depend upon the oxidation intensity and pH of the environmental system in which it is found. Iron exists in two valence states, Fe^{2+} and Fe^{3+}, with the Fe^{2+} or ferrous form the most common form of iron found in solution in the reducing conditions within the groundwater environment. Dissolved iron generally sorbs to sediment and may precipitate as iron hydroxide or may oxidize to form iron oxides and iron oxyhydroxides (USEPA, 1979). Iron also may complex with organic molecules, especially fluvic and humic acids. Aerated or flowing water with a pH in the range of 6.5 to 8.5 should contain little dissolved iron.

Lead. The accumulation of lead in most soils is primarily a function of the rate of deposition from the atmosphere. Most lead is retained strongly in soil, and very little is transported into surface water or groundwater. The fate of lead in soil is affected by the specific or exchange adsorption at mineral interfaces, the precipitation of sparingly soluble solid phases, and the formation of relatively stable organic-metal complexes or chelates with soil organic matter. These processes are dependant on such factors as soil pH, organic content of soil, the presence of inorganic colloids and iron oxides, ion-exchange characteristics, and the amount of lead in soil (ASTDR, 1988b).

The chemistry of lead in aqueous solutions is highly complex because this element can be found in a many forms. Lead has a tendency to form compounds of low solubility with major anions of natural water. In the natural environment, the divalent form (Pb^{2+}) is the stable ionic species of lead. Hydroxide, carbonate, sulfide, and, more rarely, sulfate may act as solubility controls in precipitating lead from water. The amount of lead that remains in the solution depends upon the pH of the water and the dissolved salt content (ASTDR, 1988b).

Manganese. Manganese is a naturally occurring element found in soil, lakes, streams, and food. Manganese does not occur in the environment as a pure metal, but is found combined with other chemicals like oxygen, sulfur, and chlorine. Elemental manganese and inorganic manganese compounds have negligible vapor pressures, but exist in air as suspended particulate matter derived from industrial emissions or the erosion of soils. Manganese is often transported in rivers as suspended sediment. The metal may exist in any of four oxidation states (2+, 3+, 4+, or 7+). Mn+2 is the most common form found in water with a pH between 4 and 7, but manganese may oxidize at a pH greater than 8. The transportation of manganese in water is controlled by the solubility of the specific chemical form present and the characteristics of available anions (ATSDR, 1990).

Silver. The major source of elevated silver levels in cultivated soils is from the application of sewage sludge and sludge effluents as agricultural amendments. Additional anthropogenic sources of silver in soil include atmospheric deposition and landfilling of household refuse or industrial wastes (ASTDR, 1989).

The mobility of silver in soils is affected by drainage (silver tends to be removed from well-drained soils), oxidation-reduction potential and pH conditions, and the presence of organic matter (which complexes with silver and reduces its mobility). Silver tends to form complexes with inorganic chemicals and humic substances in soils. Silver is toxic to soil microorganisms and inhibits bacterial biodegrative enzymes; therefore, biotransformation is not expected to be a significant process in the transformation and degradation of silver (ASTDR, 1989).

Thallium. Thallium is soluble over a wide range of oxidizing conditions but in reducing conditions, it precipitates to the metal form, and in the presence of sulfur, to an insoluble sulfide. Under high oxidizing conditions, thallium precipitates in the oxide or hydroxide form and settles into bed sediments.

The most common fate processes affecting thallium are adsorption and bioaccumulation. The ionic radius of thallium is similar to that of lead; thus, the fate of thallium in the environment is believed to be similar to that of lead (USEPA, 1979). Thallium may be strongly adsorbed by montmorillonite clay; thus, sediment is an active sink for thallium in the environment. The adsorption of thallium to clay particles is pH demandant. Adsorption is more effective under alkaline conditions rather than acidic conditions.

Thallium also may remain in solution in aerobic environments and is known to bioaccumulate.

Zinc. Zinc is a natural element found in soil. Zinc is also deposited in soils by atmospheric deposition. It is released to the atmosphere as dust and fumes from zinc production facilities, lead smelters, brass works, automobile

emissions, fuel combustion, incineration, and soil erosion. Zinc occurs in the environment in the +2 oxidation state. The relative mobility of zinc in soil is determined by the solubility of the compound, soil type, and pH and salinity of the soil (ASTDR, 1988c).

8.2.3 Transport of Contaminants This section discusses the transport of chemicals in various media at Site 11. All media, surface soil, subsurface soil, surface water, sediment, and groundwater will be discussed.

Surface Soil. Transport of the CPCs in soil is dependent on several factors, as discussed in Section 8.1. The primary agents of migration acting on soil include wind, water, and human activity. Soil can also act as a source medium from which the CPCs are transported to other media. Transport of the CPCs from soil via wind is not expected to be a major transport mechanism because of the vegetation present at Site 11. Vegetative cover is an effective means of limiting wind erosion of soil. Humans are effective at moving soil and can greatly affect the transport of soil-bound chemicals at hazardous waste sites. Under the current use of Site 11, human activity is not a major transport mechanism for the CPCs in soils. This condition may change based on the future use of Site 11.

Water can cause the transport of soil and, therefore, the CPCs in soil, via the mechanisms of physical transport of soil or the leaching of constituents from the soil to groundwater. Soil erosion, the physical transport of soil via surface water runoff, is currently not considered a major mechanism for the transport of the CPCs in soil at Site 11 because of (1) the low grade (slope) of the land surface at the site, (2) the vegetation at the site, and (3) the nature of the constituents remaining in the soil at the site.

The majority of the analytes detected in the soil at Site 11 are likely to remain attached to the soil because most metal analytes adsorb readily to or are natural constituents of clays and other minerals.

Surface Water. There are no permanent surface water bodies associated with Site 11. The "Y" drainage ditch is located approximately 80 feet south of site; however, off-site migration of site-related surface soil constituents to the ditch is unlikely because the topography of Site 11 gently slopes toward the east-northeast. During the 1986 verification study, a low point was observed in the northeastern corner where surface drainage ponds (Geraghty & Miller, 1986). Although ponding was not observed during the 1995 site characterization survey, it is expected that any runoff from the site would migrate in a northeasterly direction toward Big Coldwater Creek, which is located approximately 1.7 miles from Site 11.

Currently, transport of the CPCs at Site 11 via runoff is not considered an important transport mechanism because of (1) the low slope of the land surface at the site, (2) high infiltration capacity of soil at the site, (3) the heavy vegetation at Site 11, and (4) the tendency of the surface soil contaminants at the sites to remain attached to clays in the soil.

Sediment. The transport of sediment at Site 11 by the action of humans is not currently a significant transport mechanism. Little or no surficial erosion is likely due to vegetative cover and low topographic slope. Surficial drainage from the site is away from the "Y" ditch; therefore, the site is unlikely to impact the sediment within the ditch.

Groundwater. Both VOCs (vinyl chloride and 1,2-DCE) and inorganics were identified as CPC at Site 11. Given the low concentrations of the detected VOCs, it is likely that they are present as a dissolved phase. As such the transport and distribution of these compounds will be determined by groundwater flow and affected by dispersion, diffusion, retardation, and degradation. However, as discussed in Section 5.5, the observed concentrations of the inorganics in unfiltered groundwater at Site 11 were affected by turbidity in the groundwater samples at the time of collection. The groundwater samples collected in 1996 (during Phase IIB) are thought to be more representative of groundwater conditions at the site. It is probable that particulate material of larger than colloidal sizes does not easily move through the matrix of the aquifer. Colloid-sized material may be transported through the aquifer matrix at flow rates present in the surficial aquifer system at Site 11.

Hydrogeology at Site 11 is discussed in Section 5.6 of this report. The aquifer present at the site is the surficial (sand and gravel) aquifer. The CPCs identified for groundwater are associated with the surficial aquifer system. Recharge of the surficial aquifer at Site 11 occurs primarily by rainfall on the site and in the area north of the site. Groundwater flow direction in the surficial aquifer at Site 11 is primarily to the southeast. Big Coldwater Creek acts as a point of discharge approximately 9,000 feet east-southeast of the site.

Hydraulic data from the well clusters (WHF-11-4S/WHF-11-4D and WHF-13-1S/WHF-13-1I) completed at and downgradient of the site indicate that vertical gradient in this area is downward. The upper 100 to 150 feet of soils at Site 11 consist of sand and interlayered sand and clay. At least two significant (greater than 5 feet in thickness) clay layers have been encountered across the site. One or both clay layers may not be laterally continuous and may or may not represent a significant confining layer across the Southeast Disposal Area.

Horizontal hydraulic gradient estimates have been developed for the Site 11 area. The gradient was calculated for the period between September 1993 and November 1996 and averaged (Table 5-2). The average hydraulic gradient in the surficial aquifer is 0.0029 ft/ft in a southeasterly direction.

Hydraulic conductivity testing was successfully completed on monitoring wells WHF-11-3, WHF-13-2S, and WHF-14-2 across the Southeast Disposal Area. The average hydraulic conductivity value for the site is 0.0067 feet per minute or 9.65 ft/day (Table 5-4).

Horizontal groundwater seepage velocity calculations have been completed for the surficial aquifer system at Site 11 using available hydraulic information (Section 5.6). An average seepage velocity of 27 ft/yr was calculated using the seepage velocities for wells at sites across the Southeast Disposal Area. Disposal activities at Site 11 may have begun releasing contaminants to the aquifer approximately 50 years ago. Using the seepage velocity calculated above and a 50-year timeframe, the total distance of potential contaminant migration is estimated to be approximately 1,350 feet. It should be noted that slug tests provide an approximate estimate of hydraulic conductivity that can be more accurately measured using pumping tests. Slug test data may differ by up to a factor of 10 (Bouwer and Rice, 1989). Therefore, the value of 1,350 feet should be viewed as an estimate. In addition to potential variations in hydraulic conductivities along potential migration pathways, the physical processes of dispersion and diffusion, as wells as chemical degradation, dilution, and retardation, may greatly influence fate and transport contaminants released into the groundwater at Site 11.

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS. The following is a summary based on the RI investigations at Site 11, Open Disposal Area (B), NAS Whiting Field.

- Interpretation of the geophysical survey suggested the presence of a single well-defined landfill boundary and three additional smaller anomalies likely caused by surface ferromagnetic metal lying on or near the ground surface.

- Methane and TVOCs were detected at 2 of the 46 soil gas locations investigated. At these locations, methane accounted for 58 percent and 100 percent of the total gas measurement. However, the occurrence of soil gas appears to be limited in areal extent and there is no evidence of off-site migration.

- Surface soil samples were reported to contain one VOC, fourteen semivolatile organic compounds (SVOCs), and nine pesticide compounds. However, only concentrations of two SVOCs (benzo(a)pyrene and benzo(a)-anthracene) and one pesticide compound (dieldrin) were detected at concentrations exceeding either the USEPA Region III RBCs or their Florida soil cleanup goals. The location of the benzo(a)pyrene and benzo(a)anthracene exceedances was excavated in June 1999 as part of a source removal action.

- Twenty-three inorganic analytes were detected in the surface soil. Aluminum, arsenic, iron, manganese, and lead were detected in one or more samples in excess of either or both the applicable USEPA Region III risk-based concentrations (RBCs) or the Florida soil cleanup goals for residential soil.

- Subsurface soil samples were reported to contain three VOCs, one SVOC, five pesticides, and two PCB compounds. However, none of the organic compounds were detected at concentrations exceeding the USEPA Region III RBCs or Florida soil cleanup goals.

- Nineteen inorganic analytes were detected in the subsurface soil samples. Concentrations of aluminum, beryllium, iron, and manganese in samples exceeded one or more of the USEPA Region III residential or industrial RBCs, or the Florida soil cleanup goals.

- All of the pH values except one reported for groundwater samples collected at Site 11 were outside the range of Florida Secondary Drinking Water Standards. However, all of the values except two were within the range observed in background samples collected at NAS Whiting Field.

- Four VOCs and two SVOCs were detected in groundwater samples from monitoring wells at Site 11. The detected concentrations of two of the VOCs (vinyl chloride and benzene) exceeded the Florida groundwater guidance concentrations for these compounds. No SVOCs, pesticides, or PCBs were detected in groundwater samples at concentrations exceeding the Florida groundwater guidance concentrations or Federal MCLs.

Seventeen inorganic analytes were detected in the Phase IIB groundwater samples. Three inorganic analytes (aluminum, iron, and manganese) were detected at levels that exceeded their respective Florida groundwater guidance concentrations and Federal MCLs.

- At Site 11, the groundwater flow direction is toward the southeast across the site and likely discharges to Big Coldwater Creek. Big Coldwater Creek is located approximately 9,000 feet downgradient of the site. The average horizontal hydraulic gradient for the site area is 0.0029 ft/ft. The geometric mean for the hydraulic conductivity data of monitoring wells in the site area was 8.38 ft/day, and the average seepage velocity value was 0.074 ft/day.

- The Human Health Risk Assessment for Site 11 identified six polynuclear aromatic hydrocarbons (benzo(a)anthracene, benzo(a)pyrene, benzo(b)-fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene), one pesticide compound (dieldrin), and three inorganic analytes (arsenic, iron, and lead) as the HHCPCs for surface soil at Site 11. No analytes were selected as HHCPCs for subsurface soil. In groundwater samples, three VOCs (1,2-dichloroethene, benzene, vinyl chloride), one SVOC (bis(2-ethylhexyl)phthalate), and five inorganic analytes (aluminum, arsenic, iron, manganese, and thallium) were identified as HHCPCs.

- The HHCPCs detected in surface soil, subsurface soil, and groundwater do not pose unacceptable carcinogenic risks to the evaluated receptors based on USEPA target risk range of 1×10^{-4} to 1×10^{-6}.

- The total ELCR at Site 11 associated with ingestion of soil by a hypothetical future resident (7×10^{-5}) exceeds Florida's target risk level of concern (1×10^{-6}) due to benzo(a)pyrene and arsenic. The total ELCR at Site 11 associated with ingestion of groundwater by hypothetical future resident (9×10^{-5} exceeds Florida's target level of concern due to vinyl chloride and arsenic.

- The surface soil, subsurface soil, and groundwater noncancer risks are at or below USEPA and FDEP target levels for all potential current and hypothetical future receptors.

- Risks associated with exposures to ECPCs in Site 11 surface soil were evaluated for terrestrial wildlife. Based on the results of the food-web model, lethal risks to terrestrial wildlife at Site 11 are not predicted.

- Sublethal risks to terrestrial wildlife associated with ingestion of pesticides and lead in surface soil and food items were identified; however, elevated concentrations of 4,4'-DDD and lead are localized in the immediate area surrounding sampling location 11-SL-02. Sublethal risks to small mammals and birds appear to be localized to location 11-SL-02 while impacts to top predator populations are predicted over the entire area of Site 11.

- The ERA concluded that growth and reproduction of small mammal and bird populations may be impacted in the area near sample location 11-SL-02,

while sublethal impacts to top predator populations are likely over the entire area of Site 11. In addition, the survival of terrestrial invertebrates and consequent abundance for foraging mammals and birds may be impacted from contaminants detected at surface soil location 11S00201 due to TPH and 4,4'-DDT.

9.2 RECOMMENDATIONS. Based upon the interpretation of findings from the remedial investigation activities, a FS is recommended for Site 11 to evaluate potential strategies for the reduction in human health and ecological risks associated with surface soil at the site. In addition, the presence of vinyl chloride in Site 11 groundwater samples at concentration exceeding Florida's target risk level indicates that additional sampling and remedial measures may be required. However, all groundwater contamination issues, including soil leaching, will be addressed as part of the current remedial investigation for the facilitywide groundwater study (Site 40).

10.0 PROFESSIONAL REVIEW CERTIFICATION

The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures and protocols consistent with applied standards of practice. This report is based on the geologic investigation and associated information detailed in the text and appended to this report. If conditions are discovered or 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. The remedial investigation for Site 11, Southeast Open Disposal Area (B) (Landfill) was developed for NAS Whiting Field in Milton, Florida, and should not be construed to apply for any other purpose to any other site.

Eric A. Blomberg
Professional Geologist
P.G. No. 1695

3-2-00
Date

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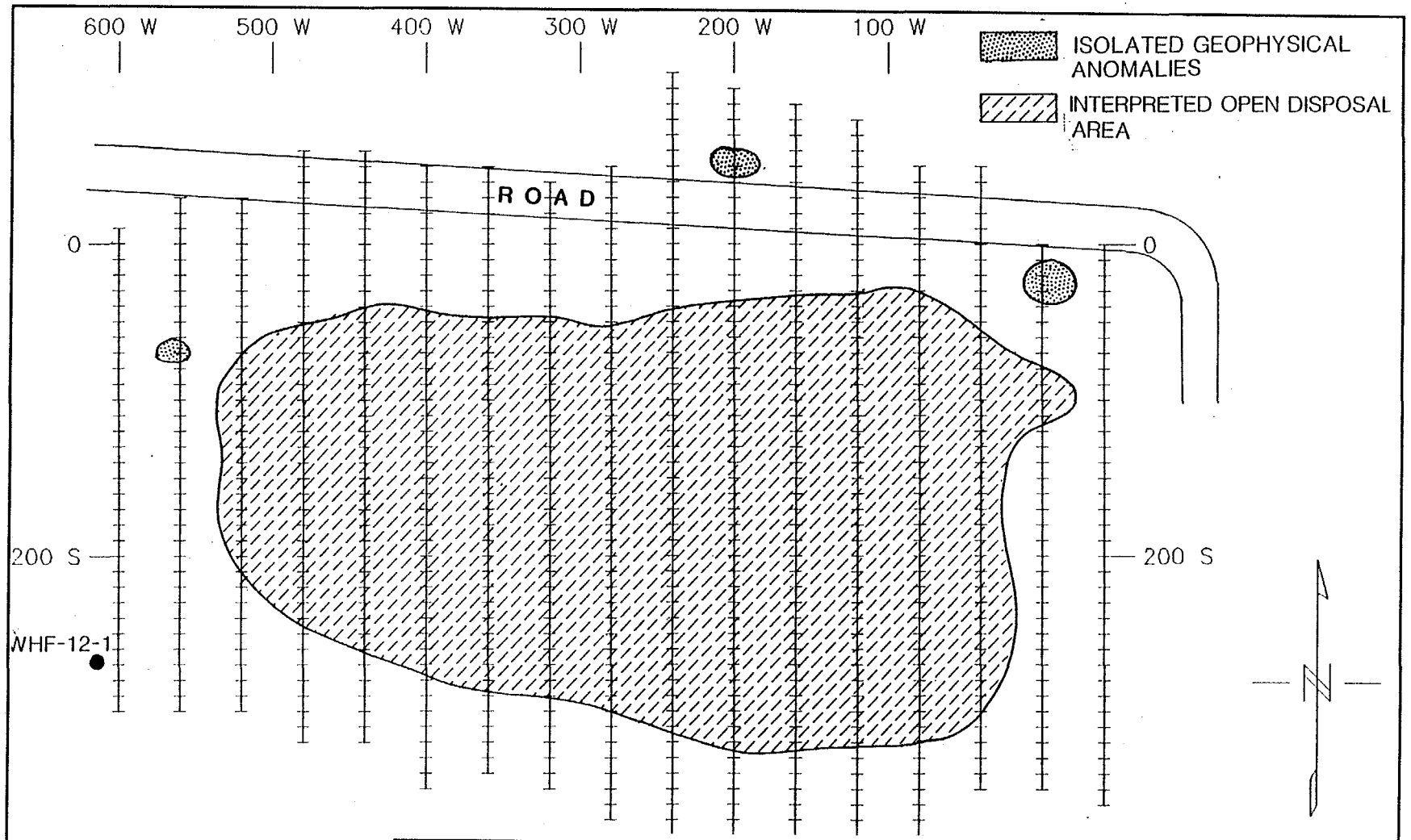
APPENDIX A

GEOPHYSICAL DATA



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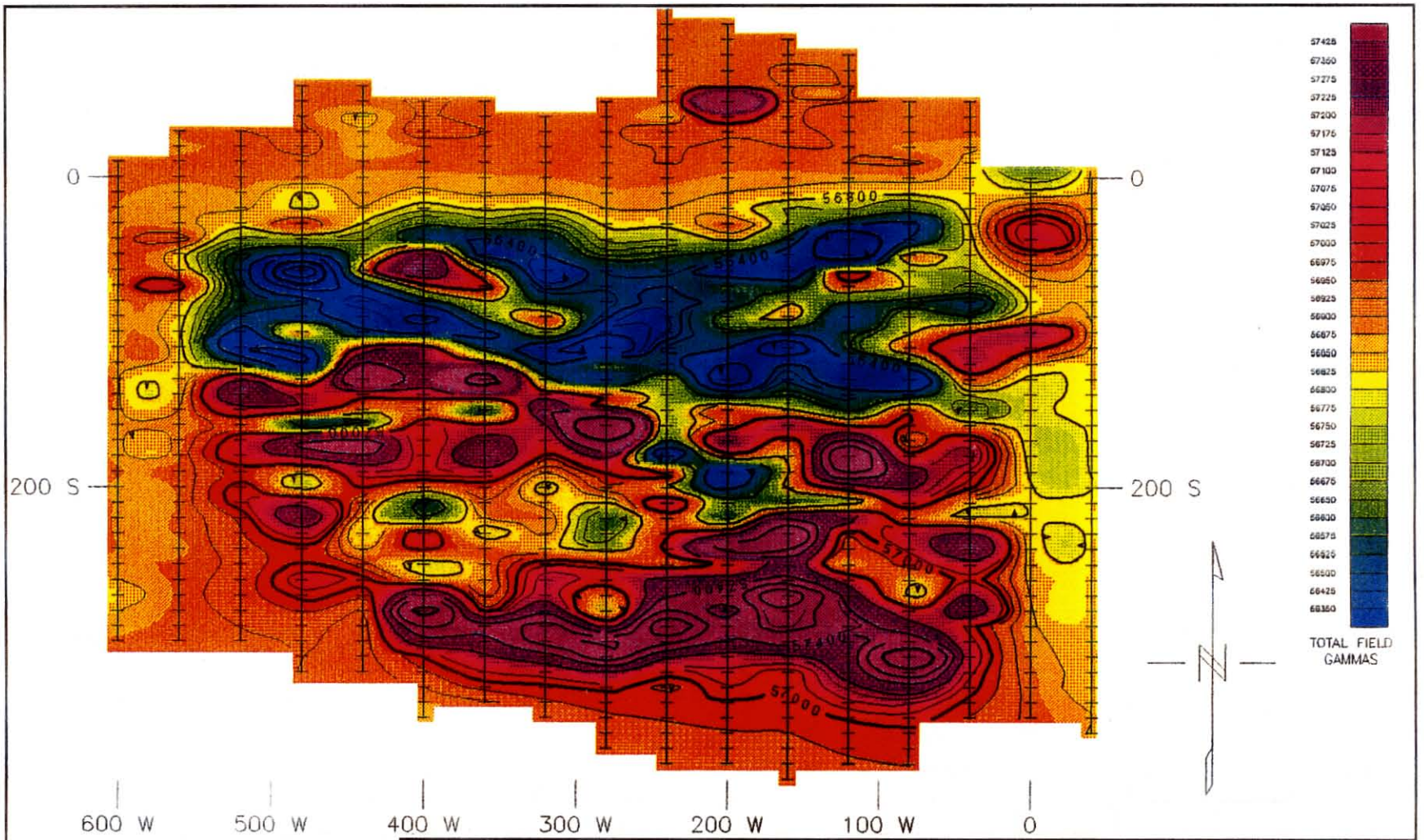
(feet)

FIGURE A-1
SITE 11
GEOPHYSICAL SURVEY GRID LINES AND INTERPRETED ANOMALY LOCATIONS

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

2534-09 FIGA-1 SITE 11 111097MAW



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(feet)

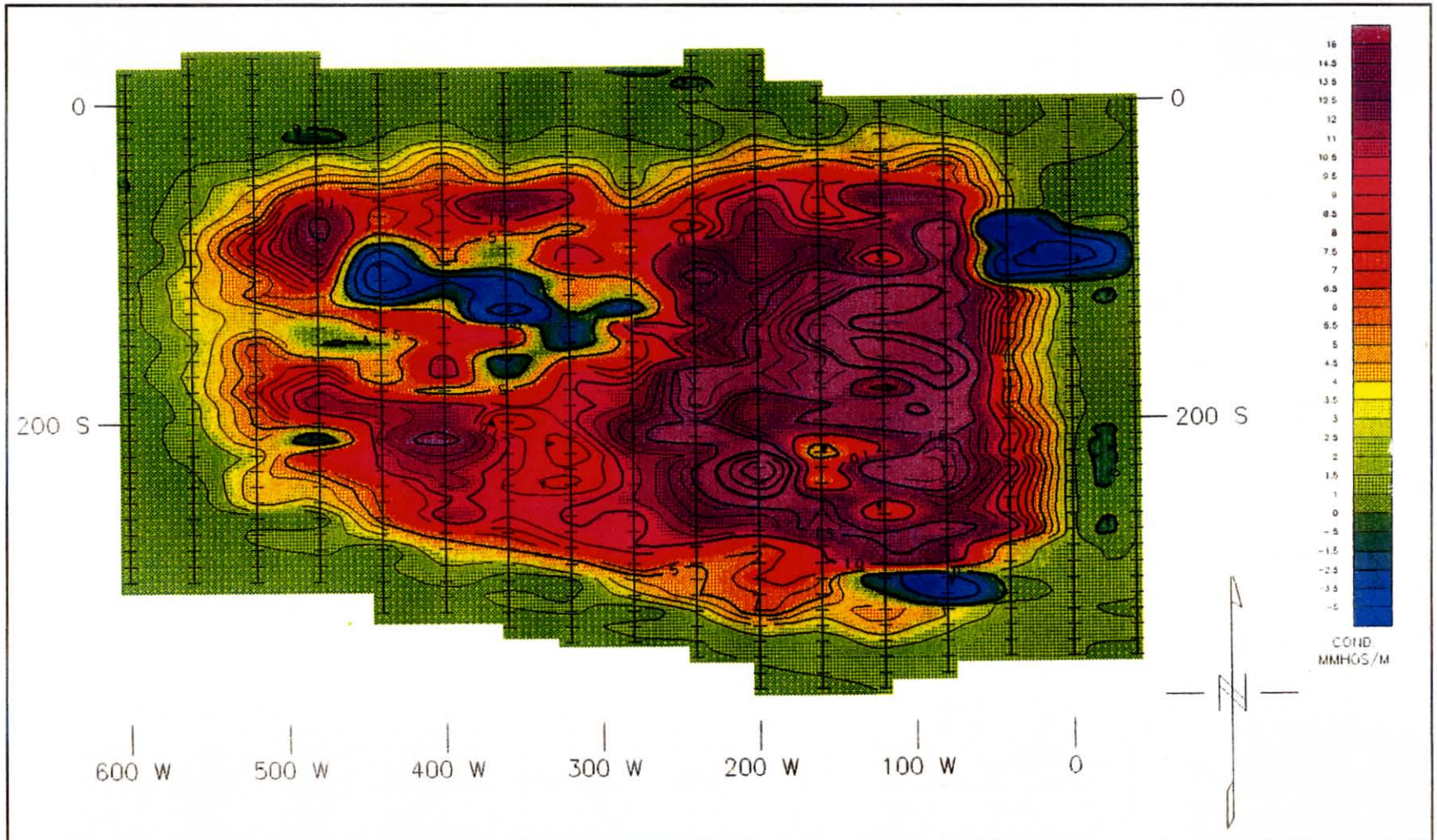
FIGURE A-2
SITE 11
TOTAL MAGNETIC FIELD
ISOPLETH MAP

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

2534-09 FIGA-2 SITE 11 111097MAW

00779JB4Y



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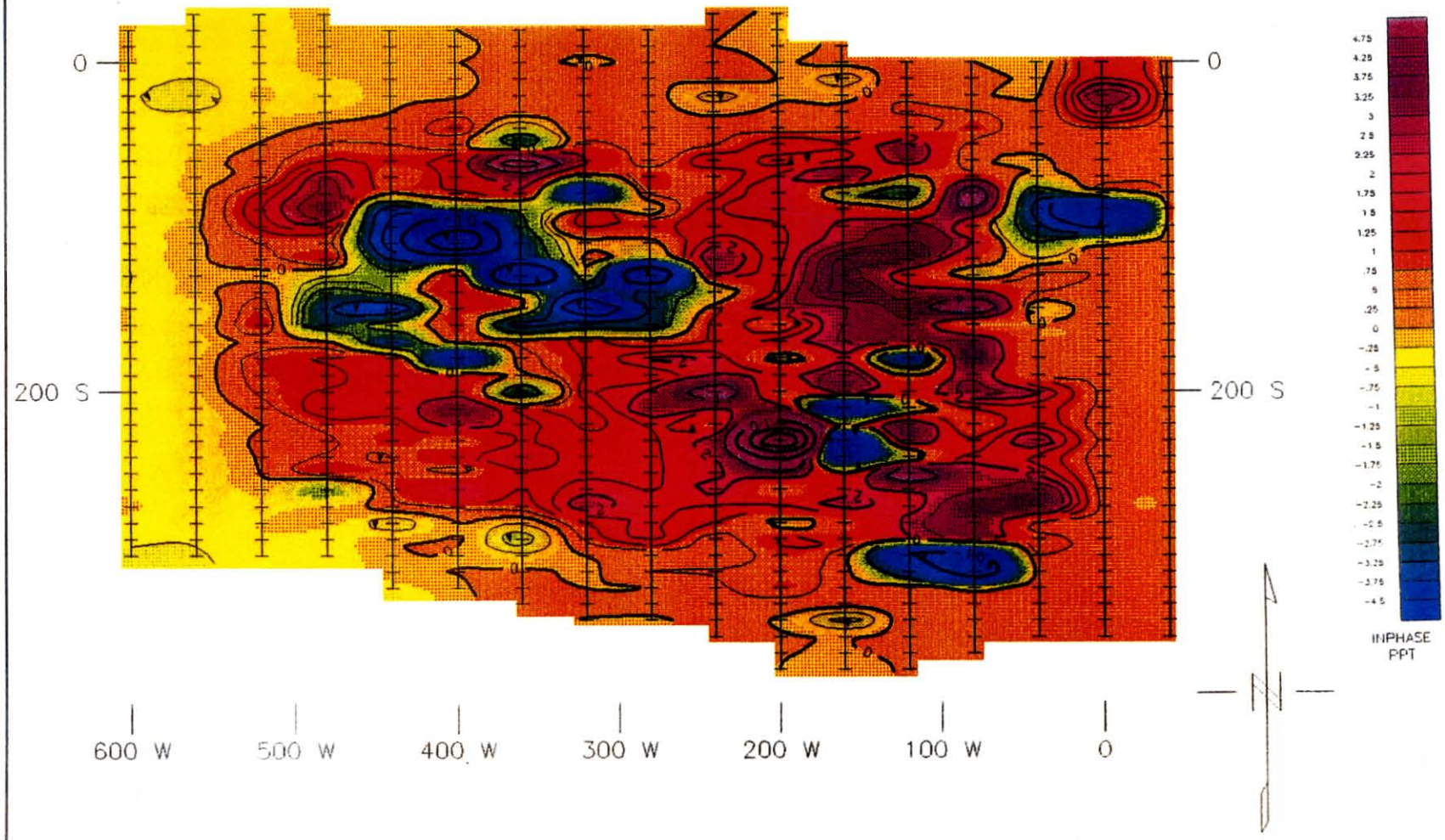
(feet)

FIGURE A-3
SITE 11
EM-31 CONDUCTIVITY
ISOPLETH MAP

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN
DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

2534-09 FIGA-3 SITE 11 111097MAW



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(feet)

FIGURE A-4
SITE 11
EM-31 INPHASE
ISOPLETH MAP

REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

2534-09 FIGA-4 SITE 11 111097MAW

APPENDIX B

QUALITY CONTROL DATA

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2C, Carlsbad, CA 92009 Phone: 619 634-0437 Fax: 619 634-0439

APPENDIX A

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida
PARCC Summary Tables

Final Version

5/1/96

APPENDIX A

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Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

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SDG#: WF006 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1779A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
01T00101	G8864001	TB	water	12-5-95	X					
01S00101	G8864002		soil	12-5-95	X	X	X	X	X	
01S00201	G8864003		soil	12-5-95	X	X	X	X	X	
01S00301	G8864004		soil	12-5-95	X	X	X	X	X	
01S00401	G8864005		soil	12-5-95	X	X	X	X	X	
01S00501	G8864006		soil	12-5-95	X	X	X	X	X	
02S00401	G8864007	FD	soil	12-5-95	X	X	X	X	X	
02S00401D	G8864008	FD	soil	12-5-95	X	X	X	X	X	
02S00401DDL	G8864008DL		soil	12-5-95		X				
02T00101	G8876001	TB	water	12-6-95	X					
02S00101	G8876002		soil	12-6-95	X	X	X	X	X	
02S00201	G8876003		soil	12-6-95	X	X	X	X	X	
02S00301	G8876004		soil	12-6-95	X	X	X	X	X	
02S00501	G8876005		soil	12-6-95	X	X	X	X	X	
09S00101	G8876006		soil	12-6-95	X	X	X	X	X	X
09S00201	G8876007		soil	12-6-95	X	X	X	X	X	X
09S00401	G8876008		soil	12-6-95	X	X	X	X	X	X
09S00501	G8876009		soil	12-6-95	X	X	X	X	X	X
09S00301	G8876010	FD	soil	12-6-95	X	X	X	X	X	X
09S00301D	G8876011	FD	soil	12-6-95	X	X	X	X	X	X
01R00101	G8876012	R	water	12-6-95	X	X	X	X	X	X
01F00101	G8876013	SB	water	12-6-95	X	X	X	X	X	X
02S00401MS	G8864007MS	MS	soil	12-5-95	X	X	X	X	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF006 **Sample Delivery Group Versus Sample Identification** **LDC#:** 1779A

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
02S00401MSD	G8864007MSD	MSD	soil	12-5-95	X	X	X	X	X	
09S00101MS	G8876006MS	MS	soil	12-6-95						X
09S00101DUP	G8876006MSD	DUP	soil	12-6-95						X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: WF007 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1779B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
10T00101	G8889001	TB	water	12-7-95	X					
10S00101	G8889002	FD	soil	12-7-95	X	X	X	X	X	X
10S00101R	G8889002R		soil	12-7-95		X				
10S00101D	G8889003	FD	soil	12-7-95	X	X	X	X	X	X
10S00401	G8889004		soil	12-7-95	X	X	X	X	X	X
10S00601	G8889005		soil	12-7-95	X	X	X	X	X	X
12S00301	G8889006		soil	12-7-95	X	X	X	X	X	X
12S00101	G8889007		soil	12-7-95	X	X	X	X	X	X
12S00601	G8889008		soil	12-7-95	X	X	X	X	X	X
10R00101	G8889009	R	water	12-7-95	X	X	X	X	X	X
13T00101	G8895001	TB	water	12-8-95	X					
13S00101	G8895002		soil	12-8-95	X	X	X	X	X	
13S00201	G8895003		soil	12-8-95	X	X	X	X	X	
13S00301	G8895004		soil	12-8-95	X	X	X	X	X	
13S00401	G8895005		soil	12-8-95	X	X	X	X	X	
13S00501	G8895006		soil	12-8-95	X	X	X	X	X	
14S00101	G8895007	FD	soil	12-8-95	X	X	X	X	X	
14S00101D	G8895008	FD	soil	12-8-95	X	X	X	X	X	
14S00201	G8895009		soil	12-8-95	X	X	X	X	X	
14S00301	G8895010		soil	12-8-95	X	X	X	X	X	
10S00101MS	G8889002MS	MS	soil	12-7-95	X		X	X	X	X
10S00101MSD	G8889002MSD	MSD	soil	12-7-95	X		X	X	X	X
10S00101RMS	G8889002RMS	MS	soil	12-7-95		X				

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF007 **Sample Delivery Group Versus Sample Identification** **LDC#:** 1779B

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
10S00101RMSD	G8889002RMSD	MSD	soil	12-7-95		X				

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: WF008 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1779C

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
15T00101	G8913001	TB	water	12-9-95	X				
15S02001	G8913002	FD	soil	12-9-95	X	X	X	X	X
15S02001D	G8913003	FD	soil	12-9-95	X	X	X	X	X
15S02101	G8913004		soil	12-9-95	X	X	X	X	X
15S02201	G8913005		soil	12-9-95	X	X	X	X	X
15S02301	G8913006		soil	12-9-95	X	X	X	X	X
15S02401	G8913007		soil	12-9-95	X	X	X	X	X
15S02501	G8913008		soil	12-9-95	X	X	X	X	X
15S01501	G8913009		soil	12-9-95	X	X	X	X	X
15S01401	G8913010		soil	12-9-95	X	X	X	X	X
15S01301	G8913011		soil	12-9-95	X	X	X	X	X
15S01601	G8913012		soil	12-10-95	X	X	X	X	X
15S01701	G8913013	FD	soil	12-10-95	X	X	X	X	X
15S01701D	G8913014	FD	soil	12-10-95	X	X	X	X	X
15S01801	G8913015		soil	12-10-95	X	X	X	X	X
15S01901	G8913016		soil	12-10-95	X	X	X	X	X
15S00901	G8913017		soil	12-11-95	X	X	X	X	X
15S00901RE	G8913017RE		soil	12-11-95		X			
15R00101	G8913020	R	water	12-11-95	X	X	X	X	X
15S02001MS	G8913002MS	MS	soil	12-9-95	X	X	X	X	X
15S02001MSD	G8913002MSD	MSD	soil	12-9-95	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF009 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1779D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
15T00201	G8914001	TB	water	12-11-95	X				
15S00101	G8914002	FD	soil	12-11-95	X	X	X	X	X
15S00101R	G8914002R		soil	12-11-95		X			
15S00101D	G8914003	FD	soil	12-11-95	X	X	X	X	X
15S00201	G8914004		soil	12-11-95	X	X	X	X	X
15S00301	G8914005		soil	12-11-95	X	X	X	X	X
15S00501	G8914006		soil	12-11-95	X	X	X	X	X
15S00401	G8914007		soil	12-11-95	X	X	X	X	X
15S00601	G8914008		soil	12-11-95	X	X	X	X	X
15S00701	G8914009		soil	12-11-95	X	X	X	X	X
15S00801	G8914010		soil	12-11-95	X	X	X	X	X
15S01201	G8914011		soil	12-11-95	X	X	X	X	X
15R00201	G8914012	R	water	12-11-95	X	X	X	X	X
15S01101	G8914013		soil	12-10-95	X	X	X	X	X
15S01001	G8914014		soil	12-10-95	X	X	X	X	X
15S00101MS	G8914002MS	MS	soil	12-11-95	X	X	X	X	X
15S00101MSD	G8914002MSD	MSD	soil	12-11-95	X	X	X	X	X
15S00101RMS	G8914002RMS	MS	soil	12-11-95		X			
15S00101RMSD	G8914002RMSD	MSD	soil	12-11-95		X			

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: WF010 **Sample Delivery Group Versus Sample Identification** **LDC#:** 1779E

Project Name: NAS Whiting Field Parameters/Analytical Method **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
31S00101	G8924001		soil	12-12-95	X	X	X	X	X
31S00201	G8924002		soil	12-12-95	X	X	X	X	X
31S00301	G8924003		soil	12-12-95	X	X	X	X	X
31S00401	G8924004		soil	12-12-95	X	X	X	X	X
31T00101	G8924005	TB	water	12-12-95	X				
31R00101	G8924006	R	water	12-12-95	X	X	X	X	X
31T00201	G8938001	TB	water	12-13-95	X				
31S01501	G8938002	FD	soil	12-13-95	X	X	X	X	X
31S01501D	G8938003	FD	soil	12-13-95	X	X	X	X	X
31S01601	G8938004		soil	12-13-95	X	X	X	X	X
31S01701	G8938005		soil	12-13-95	X	X	X	X	X
31S01801	G8938006		soil	12-13-95	X	X	X	X	X
31S01901	G8938007		soil	12-13-95	X	X	X	X	X
31S01501MS	G8938002MS	MS	soil	12-13-95	X	X	X	X	X
31S01501MSD	G8938002MSD	MSD	soil	12-13-95	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF11A | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
09W00101	RA903001	FD	water	1-5-96	X	X	X	X	X	X
09W00101D	RA903002	FD	water	1-5-96	X	X	X	X	X	X
16W00101	RA903003		water	1-5-96	X	X	X	X	X	
09W00101MS	RA903001MS	MS	water	1-5-96	X	X	X	X	X	X
09W00101MSD	RA903001MSD	MSD	water	1-5-96	X	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: WF11B

Sample Delivery Group Versus Sample Identification

LDC#: 1777B

Project Name: NAS Whiting Field

Parameters/Analytical Method

Job#: 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide	TRPH
12T00101	RA847001	TB	water	1-5-96	X					
10S00201	RA847002	FD	soil	1-5-96	X	X	X	X	X	X
10S00201DL	RA847002DL		soil	1-5-96		X				
10S00201D	RA847003	FD	soil	1-5-96	X	X	X	X	X	X
10S00301	RA847004		soil	1-5-96	X	X	X	X	X	X
10S00301R	RA847004R		soil	1-5-96		X				
10S00501	RA847005		soil	1-5-96	X	X	X	X	X	X
12S00201	RA847006		soil	1-5-96	X	X	X	X	X	X
12S00401	RA847007		soil	1-5-96	X	X	X	X	X	X
12S00501	RA847008		soil	1-5-96	X	X	X	X	X	X
12R00101	RA847012	R	water	1-5-96	X	X	X	X	X	X
11T00101	RA847013	TB	water	1-6-96	X					
11S00101	RA847014		soil	1-6-96	X	X	X	X	X	X
11S00201	RA847015		soil	1-6-96	X	X	X	X	X	X
11S00201DL	RA847015DL		soil	1-6-96			X			
11S00201R	RA847015R		soil	1-6-96	X					
11S00501	RA847016		soil	1-6-96	X	X	X	X	X	X
11S00401	RA847017		soil	1-7-96	X	X	X	X	X	X
11S00301	RA847018		soil	1-7-96	X	X	X	X	X	X
10S00201MS	RA847002MS	MS	soil	1-5-96	X	X	X	X	X	X
10S00201MSD	RA847002MSD	MSD	soil	1-5-96	X	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF012 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777C

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/ PCBs	Metals	Cyanide	Lead	TCLP Metals
11S00601	RA855001	FD	soil	1-7-96						X	
11S00601D	RA855002	FD	soil	1-7-96						X	
11S00701	RA855003		soil	1-7-96						X	
11S00801	RA855004		soil	1-7-96						X	
11S00901	RA855005		soil	1-7-96						X	
11S01001	RA855006		soil	1-7-96						X	
11S01101	RA855007		soil	1-7-96						X	
11S01201	RA855008		soil	1-7-96						X	
11S01301	RA855009		soil	1-7-96						X	
31S00401	RA855010		soil	1-7-96	X	X	X	X	X		
31S00501	RA855011	FD	soil	1-7-96	X	X	X	X	X		
31S00501D	RA855012	FD	soil	1-7-96	X	X	X	X	X		
31S00601	RA855013		soil	1-7-96	X	X	X	X	X		
31S00701	RA855014		soil	1-7-96	X	X	X	X	X		
31S01001	RA855015		soil	1-7-96	X	X	X	X	X		
31S01101	RA855016		soil	1-7-96	X	X	X	X	X		
31S00901	RA855017		soil	1-7-96	X	X	X	X	X		
31S00801	RA855018		soil	1-7-96	X	X	X	X	X		
31S01201	RA855019		soil	1-8-96	X	X	X	X	X		
31S01201R	RA855019R		soil	1-8-96	X						
31S01301	RA855020		soil	1-8-96	X	X	X	X	X		
31R00201	RA855021	R	water	1-8-96	X	X	X	X	X		
31S00401	RA857001		soil	1-7-96							X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

SDG#: WF012 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777C

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/ PCBs	Metals	Cyanide	Lead	TCLP Metals
31S00501	RA857002	FD	soil	1-7-96							X
31S00501D	RA857003	FD	soil	1-7-96							X
31S00601	RA857004		soil	1-7-96							X
31S00701	RA847005		soil	1-7-96							X
31S01001	RA857006		soil	1-7-96							X
31S01101	RA857007		soil	1-7-96							X
31S00901	RA857008		soil	1-7-96							X
31S00801	RA857009		soil	1-7-96							X
31S01201	RA857010		soil	1-8-96							X
31S01301	RA857011		soil	1-8-96							X
31S00501MS	RA855011MS	MS	soil	1-7-96	X	X	X	X	X		
31S00501MSD	RA855011MSD	MSD	soil	1-7-96	X	X	X	X	X		
31S00501MS	RA857002MS	MS	soil	1-7-96							X
31S00501MSD	RA857002MSD	MSD	soil	1-7-96							X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF013 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/ PCBs	Metals	Cyanide
16S00101	RA856001	FD	soil	1-8-96	X	X	X	X	X
16S00501	RA856002		soil	1-8-96	X	X	X	X	X
16S00401	RA856003		soil	1-8-96	X	X	X	X	X
16S00901	RA856004		soil	1-8-96	X	X	X	X	X
16S00901R	RA856004R		soil	1-8-96		X			
16S01501	RA856005		soil	1-8-96	X	X	X	X	X
16S00201	RA856006		soil	1-9-96	X	X	X	X	X
16S00301	RA856007		soil	1-9-96	X	X	X	X	X
16S00801	RA856008		soil	1-9-96	X	X	X	X	X
16S00801RE	RA856008RE		soil	1-9-96		X			
16S00601	RA856009		soil	1-9-96	X	X	X	X	X
16S00601DL	RA856009DL		soil	1-9-96		X			
16S01201	RA856010		soil	1-9-96	X	X	X	X	X
16S01301	RA856011		soil	1-9-96	X	X	X	X	X
BKS00301	RA856012		soil	1-9-96	X	X	X	X	X
BKS00101	RA856013		soil	1-9-96	X	X	X	X	X
16S01001	RA856014	FD	soil	1-9-96	X	X	X	X	X
16S01001D	RA856015	FD	soil	1-9-96	X	X	X	X	X
16T00101	RA856016	TB	water	1-9-96	X				
16R00101	RA856017	R	water	1-9-96	X	X	X	X	X
16S00101D	RA856018	FD	soil	1-9-96	X	X	X	X	X
24T00101	RA871001	TB	water	1-10-96	X				
24S00101	RA871002		soil	1-10-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

e I

SDG#: WF013 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/ PCBs	Metals	Cyanide
16S01001MS	RA856014MS	MS	soil	1-9-96	X	X	X	X	X
16S01001MSD	RA856014MSD	MSD	soil	1-9-96	X	X	X	X	X
24S00101MS	RA871002MS	MS	soil	1-10-96					X
24S00101MSD	RA871002MSD	MSD	soil	1-10-96					X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table I

SDG#: WF014 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777E

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
BKR00101	RA870001	R	water	1-10-96	X	X	X	X	X
BKT00101	RA870002	TB	water	1-10-96	X				
16S01401	RA870003		soil	1-10-96	X	X	X	X	X
16S00701	RA870004		soil	1-10-96	X	X	X	X	X
16S01101	RA870005		soil	1-10-96	X	X	X	X	X
16S01701	RA870006		soil	1-10-96	X	X	X	X	X
16S01601	RA870007		soil	1-10-96	X	X	X	X	X
BKS00201	RA870008	FD	soil	1-10-96	X	X	X	X	X
BKS00201D	RA870009	FD	soil	1-10-96	X	X	X	X	X
BKS00501	RA870010		soil	1-10-96	X	X	X	X	X
BKS00401	RA870011		soil	1-10-96	X	X	X	X	X
31B00401	RA870012		soil	1-11-96	X	X	X	X	X
31B00301	RA870013		soil	1-11-96	X	X	X	X	X
31B00201	RA870014	FD	soil	1-11-96	X	X	X	X	X
31B00201D	RA870015	FD	soil	1-11-96	X	X	X	X	X
31B00101	RA870016		soil	1-11-96	X	X	X	X	X
31B00501	RA870017		soil	1-11-96	X	X	X	X	X
31T00201	RA870018	TB	water	1-11-96	X				
BKS00201MS	RA870008MS	MS	soil	1-10-96	X	X	X	X	X
BKS00201MSD	RA870008MSD	MSD	soil	1-10-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

e I

SDG#: WF015 | **Sample Delivery Group Versus Sample Identification** | **LDC#:** 1777F

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
COR00101	RA908001	R	water	1-18-96	X	X	X	X	X
COF00101	RA908002	SB	water	1-18-96	X	X	X	X	X
COT00101	RA908003	TB	water	1-18-96	X				
COS00101	RA908004	FD	soil	1-18-96	X	X	X	X	X
COS00101D	RA908005	FD	soil	1-18-96	X	X	X	X	X
EOS00101	RA908006		soil	1-18-96	X	X	X	X	X
POS00101	RA908007		soil	1-18-96	X	X	X	X	X
YOS00101	RA908008		soil	1-18-96	X	X	X	X	X
SOS00101	RA908009		soil	1-18-96	X	X	X	X	X
WOS00101	RA908010		soil	1-18-96	X	X	X	X	X
AOS00101	RA908011		soil	1-18-96	X	X	X	X	X
COS00101MS	RA908004MS	MS	soil	1-18-96	X	X	X	X	X
COS00101MSD	RA908004MSD	MSD	soil	1-18-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate

Table II
Summary of Rejected Data (Organics)
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Fraction	Sample	Compound	Reason
WF006	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBS	All samples	No rejected results	-
WF007	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF008	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF009	Volatiles	All samples	No rejected results	-
	Semivolatiles	15S00201	1,4-Dichlorobenzene	Low MS/MSD recoveries
			1,2,4-Trichlorobenzene	Low MS/MSD recoveries
			Acenaphthene	Low MS/MSD recoveries
			Pyrene	MS/MSD recoveries
	Pesticides & PCBs	All samples	No rejected results	-
WF010	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF11A	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF11B	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF012	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF013	Volatiles	All samples	No rejected results	-
	Semivolatiles	16S00801	All compounds	Low Surrogate recoveries
	Pesticides & PCBs	All samples	No rejected results	-
WF014	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF015	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	COS00101	All compounds	Low Surrogate recoveries
		SOS00101	All compounds	Low Surrogate recoveries

Table III
Summary of Rejected Data (Inorganics)
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes				
SDG	**Fraction**	**Sample**	**Analyte**	**Reason**
WF006	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
	TRPH	All samples	No rejected results	-
WF007	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
	TRPH	All samples	No rejected results	-
WF008	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF009	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF010	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF11A	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
	TRPH	All samples	No rejected results	-
WF11B	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
	TRPH	All samples	No rejected results	-
WF012	All metals	All samples	No rejected results	-
	All TCLP metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	
WF013	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF014	Mercury	31B00301	Mercury	Low LCS % Recovery
	Cyanide	All samples	No rejected results	-
WF015	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF006	02S00401	Volatiles	-	-	-	-	-	None
		Phenol	26-90	-	-	92	-	None
		4-Chloro-3-methylphenol	26-103	-	-	104	-	None
		2,4-Dinitrotoluene	28-89	-	-	100	-	None
		Pyrene	35-142	-	29	30	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF007	10S00101	Volatiles	-	-	-	-	-	None
		4-Chloro-3-methylphenol	26-103	-	111	-	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF008	15S02001	Volatiles	-	-	-	-	-	None
		1,4-Dichlorobenzene	28-104	≤27	-	14	142	None
		1,2,4-Trichlorobenzene	38-107	≤23	-	12	149	None
		Acenaphthene	-	≤19	-	-	96	None
		2,4-Dinitrotoluene	28-89	-	100	94	-	None
		Pyrene	35-142	≤36	-	6	67	None
		Pesticides & PCBs	-	-	-	-	-	None
WF009	15S00101	Volatiles	-	-	-	-	-	None
		2-Chlorophenol	25-102	≤50	16	-	110	None
		1,4-Dichlorobenzene	28-104	-	0	0	-	R
		1,2,4-Trichlorobenzene	38-107	≤23	0	3	200	R
		Acenaphthene	31-137	≤19	0	9	200	R
		Pentachlorophenol	17-109	≤47	10	-	127	None
		Pyrene	35-142	-	0	0	-	R
		Pesticides & PCBs	-	-	-	-	-	None
WF009	15S00101R	2,4-Dinitrotoluene	28-89	-	-	95	-	UJ

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF010	31S01501	Volatiles	-	-	-	-	-	-
		4-Chloro-3-methylphenol	26-103	-	104	-	-	None
		2,4-Dinitrotoluene	28-89	-	94	-	-	None
		Pesticides & PCBs	-	-	-	-	-	-
WF11A	09W00101	Volatiles	-	-	-	-	-	None
		4-Chloro-3-methylphenol	23-97	-	104	107	-	None
		4-Nitrophenol	10-80	-	117	119	-	None
		2,4-Dinitrophenol	24-96	-	106	107	-	None
		Pentachlorophenol	96-103	-	120	119	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF11B	10S00201	Volatiles	-	-	-	-	-	None
		Pyrene	-	≤36	-	-	39	None
		Pesticides & PCBs	-	-	-	-	-	None
WF012	31S00501	Volatiles	-	-	-	-	-	None
		4-Nitrophenol	11-114	-	120	115	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF013	16S01001	Volatiles	-	-	-	-	-	None
		Phenol	26-90	-	-	96	-	U
		2-Chlorophenol	25-102	-	-	103	-	U
		Pentachlorophenol	17-109	-	-	110	-	U
		Pesticides & PCBs	-	-	-	-	-	None
WF014	BKS00201	Volatiles	-	-	-	-	-	None
		Pentachlorophenol	17-109	-	133	136	-	None
		4-Nitrophenol	11-114	-	-	132	-	None
		Pesticides & PCBs	-	-	-	-	-	None

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds								
			Criteria		% Recovery			
SDG	Client ID	Compound	% Recovery	RPD	MS	MSD	RPD	Qualifier
WF015	COS00101	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides & PCBs	-	-	-	-	-	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF006	**Client ID**	**02S00401**	**02S00401D**	
	Laboratory ID	**G8864007**	**G8864008**	
	Collection Date	**12/5/95**	**12/5/95**	
	Volatiles	ND	ND	-
	Semivolatiles	ND	ND	-
	Dieldrin	8.3	8.0	4
	Alpha-chlordane	5.6	5.1	9
	Gamma-chlordane	3.5	2.9	19
WF006	**Client ID**	**09S00301**	**09S00301D**	
	Laboratory ID	**G8876010**	**G8876011**	
	Collection Date	**12/6/96**	**12/6/96**	
	Acetone	ND	5 ug/Kg	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF007	**Client ID**	**10S00101**	**10S00101D**	
	Laboratory ID	**G8889002**	**G8889003**	
	Collection Date	**12/7/95**	**12/7/95**	
	Volatiles	ND	ND	-
	Phenanthrene	280 ug/Kg	1200 ug/Kg	124
	Fluoranthene	660 ug/Kg	2300 ug/Kg	111
	Pyrene	580 ug/Kg	1600 ug/Kg	94
	Benzo(a)anthracene	340 ug/Kg	1200 ug/Kg	112
	Chrysene	500 ug/Kg	1400 ug/Kg	120
	Bis(2-ethylhexyl)phthalate	200 ug/Kg	360U ug/Kg	Not calculable
	Benzo(b)fluoranthene	480 ug/Kg	1300 ug/Kg	92
	Benzo(k)fluoranthene	360 ug/Kg	900 ug/Kg	86
	Benzo(a)pyrene	400 ug/Kg	1000 ug/Kg	86
	Indeno(1,2,3-cd)pyrene	180 ug/Kg	360 ug/Kg	67
	Benzo(g,h,i)perylene	180 ug/Kg	340 ug/Kg	62
	Anthracene	370U ug/Kg	270 ug/Kg	Not calculable
	Carbazole	370U ug/Kg	100 ug/Kg	Not calculable
	Dibenz(a,h)anthracene	370U ug/Kg	170 ug/Kg	Not calculable
	Pesticides & PCBs	ND	ND	-
WF007	**Client ID**	**14S00101**	**14S00101D**	
	Laboratory ID	**G8895007**	**G8895008**	
	Collection Date	**12/8/95**	**12/8/95**	
	Acetone	8 ug/Kg	ND	Not calculable
	Methylene chloride	6 ug/Kg	ND	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF008	**Client ID**	**15S02001**	**15S02001D**	
	Laboratory ID	**G8913002**	**G8913003**	
	Collection Date	**12/9/95**	**12/9/95**	
	Acetone	5 ug/Kg	ND	Not calculable
	Methylene chloride	ND	5 ug/Kg	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF008	**Client ID**	**15S01701**	**15S01701D**	
	Laboratory ID	**G8913013**	**G8913014**	
	Collection Date	**12/10/95**	**12/10/95**	
	Acetone	6 ug/Kg	4 ug/Kg	40
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF009	**Client ID**	**15S00101**	**15S00101D**	
	Laboratory ID	**G8914002**	**G8914003**	
	Collection Date	**12/11/95**	**12/11/95**	
	Acetone	6 ug/Kg	7 ug/Kg	15
	Bis(2-ethylhexyl)phthalate	ND	1700 ug/Kg	Not calculable
	Pesticides & PCBs	ND	ND	-
WF010	**Client ID**	**31S01501**	**31S01501D**	
	Laboratory ID	**G8938002**	**G8938003**	
	Collection Date	**12/13/95**	**12/13/95**	
	Acetone	ND	5 ug/Kg	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF11A	**Client ID**	**09W00101**	**09W00101D**	
	Laboratory ID	**RA903001**	**RA903002**	
	Collection Date	**1/5/96**	**1/5/96**	
	Toluene	10U ug/L	1 ug/L	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF11B	**Client ID**	**10S00201**	**10S00201D**	
	Laboratory ID	**RA847002**	**RA847003**	
	Collection Date	**1/5/96**	**1/5/96**	
	Acetone	29 ug/Kg	20 ug/Kg	37
	2-Hexanone	11U ug/Kg	4 ug/Kg	Not calculable
	Phenanthrene	68 ug/Kg	310 ug/Kg	128
	Di-n-butylphthalate	46 ug/Kg	380U ug/Kg	Not calculable
	Fluoranthene	160 ug/Kg	420 ug/Kg	90
	Pyrene	170 ug/Kg	290 ug/Kg	52
	Butylbenzylphthalate	57 ug/Kg	380U ug/Kg	Not calculable
	Benzo(a)anthracene	87 ug/Kg	190 ug/Kg	74
	Chrysene	120 ug/Kg	220 ug/Kg	59
	Bis(2-ethylhexyl)phthalate	3200 ug/Kg	140 ug/Kg	183
	Benzo(a)fluoranthene	150 ug/Kg	200 ug/Kg	28
	Benzo(k)fluoranthene	110 ug/Kg	210 ug/Kg	62
	Benzo(a)pyrene	95 ug/Kg	150 ug/Kg	45
	Indeno(1,2,3-cd)pyrene	58 ug/Kg	56 ug/Kg	4
	Acenaphthene	380U ug/Kg	40 ug/Kg	Not calculable
	Anthracene	380U ug/Kg	54 ug/Kg	Not calculable
	Carbazole	380U ug/Kg	84 ug/Kg	Not calculable
	4,4'-DDT	7.0 ug/Kg	8.9 ug/Kg	24
	Aroclor 1254	340 ug/Kg	390 ug/Kg	14
WF012	**Client ID**	**31S00501**	**31S00501D**	
	Laboratory ID	**RA855011**	**RA855012**	
	Collection Date	**1/7/96**	**1/7/96**	
	Acetone	9 ug/Kg	8 ug/Kg	12
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF013	**Client ID**	**16S00101**	**16S00101D**	
	Laboratory ID	**RA856001**	**RA856018**	
	Collection Date	**1/8/96**	**1/8/96**	
	Acetone	4 ug/Kg	9 ug/Kg	77
	Bis(2-ethylhexyl)phthalate	45 ug/Kg	380U ug/Kg	Not calculable
	4,4'-DDE	3.2 ug/Kg	2.0 ug/Kg	46
	4,4'-DDT	3.8 ug/Kg	2.7 ug/Kg	34
WF013	**Client ID**	**16S01001**	**16S01001D**	
	Laboratory ID	**RA856014**	**RA856015**	
	Collection Date	**1/9/96**	**1/9/96**	
	Acetone	14 ug/Kg	4 ug/Kg	111
	Bis(2-ethylhexyl)phthalate	60 ug/Kg	58 ug/Kg	3
	Dieldrin	33 ug/Kg	60 ug/Kg	58
	4,4'-DDE	13 ug/Kg	22 ug/Kg	51
	4,4'-DDT	6.4 ug/Kg	9.0 ug/Kg	34
	Alpha-chlordane	6.8 ug/Kg	12 ug/Kg	55
	Gamma-chlordane	4.0 ug/Kg	7.9 ug/Kg	66
	Aroclor 1260	48 ug/Kg	110 ug/Kg	78

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF014	**Client ID**	**BKS00201**	**BKS00201D**	
	Laboratory ID	**RA870008**	**RA870009**	
	Collection Date	**1/10/96**	**1/10/96**	
	Acetone	8 ug/Kg	4 ug/Kg	67
	Bis(2-ethylhexyl)phthalate	370U ug/Kg	45 ug/Kg	Not calculable
	Pesticides & PCBs	ND	ND	-
WF014	**Client ID**	**31B00201**	**31B00201D**	
	Laboratory ID	**RA870014**	**RA870015**	
	Collection Date	**1/11/96**	**1/11/96**	
	Acetone	3 ug/Kg	11U ug/Kg	Not calculable
	Bis(2-ethylhexyl)phthalate	370U ug/Kg	48 ug/Kg	Not calculable
	Pesticides & PCBs	ND	ND	-
WF015	**Client ID**	**COS00101**	**COS00101D**	
	Laboratory ID	**RA908004**	**RA908005**	
	Collection Date	**1/18/96**	**1/18/96**	
	Acetone	22 ug/Kg	12U ug/Kg	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-

Table VI
Summary of Surrogate Recoveries
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF006	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
	All samples	Pesticides & PCBs	All within QC limits	-	-	None
WF007	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	10R00101	Decachlorobiphenyl	54	60-150	1	UJ (all compounds)
WF008	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	15S02501	Decachlorobiphenyl	54	60-150	1	UJ (all compounds)
WF009	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
	All samples	Pesticides & PCBs	All within QC limits	-	-	None
WF010	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	31S00101	Tetrachloro-m-xylene	57	60-150	1	UJ/J (all compounds)
		Tetrachloro-m-xylene	56	60-150		

Table VI
Summary of Surrogate Recoveries
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF11A	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	09W00101	Decachlorobiphenyl	56	60-150	3	UJ (all compounds)
		Decachlorobiphenyl	50	60-150		
	09W00101D	Decachlorobiphenyl	58	60-150		UJ (all compounds)
		Decachlorobiphenyl	51	60-150		
	16W00101	Decachlorobiphenyl	45	60-150		UJ (all compounds)
		Decachlorobiphenyl	40	60-150		
WF11B	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	12R00101	Decachlorobiphenyl	33	60-150	4	UJ (all compounds)
		Decachlorobiphenyl	29	60-150		
	10S00201	Decachlorobiphenyl	56	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	55	60-150		
	10S00301	Decachlorobiphenyl	45	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	42	60-150		
	11S00201	Decachlorobiphenyl	50	60-150		UJ/J (all compounds)
WF012	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs	54	60-150	4	UJ (all compounds)
	31R00201	Decachlorobiphenyl	43	60-150		
	31S00901	Decachlorobiphenyl	45	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	40	60-150		
	31S01201	Decachlorobiphenyl	48	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	50	60-150		
	31S01301	Decachlorobiphenyl	46	60-150		UJ (all compounds)

Table VI
Summary of Surrogate Recoveries
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF013	All samples	Volatiles	All within QC limits	-	-	None
		Semivolatiles				
	16S00801	Nitrobenzene-d5	3	23-120	1	R
		2-Fluorobiphenyl	3	30-115		
		Terphenyl-d14	4	18-137		
		Phenol-d5	2	24-113		
		2-Fluorophenol	2	25-121		
		2,4,6-Tribromophenol	3	19-122		
		2-Chlorophenol-d4	3	20-130		
		1,2-Dichlorobenzene-d4	2	20-130		
		Pesticides & PCBs				
	16R00101	Decachlorobiphenyl	58	60-150	8	UJ (all compounds)
	16S00101D	Tetrachloro-m-xylene	22	60-150		UJ/J (all compounds)
		Tetrachloro-m-xylene	21	60-150		
	16S00301	Tetrachloro-m-xylene	57	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	57	60-150		
		Decachlorobiphenyl	54	60-150		
	16S01001	Decachlorobiphenyl	44	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	41	60-150		
	16S01201	Tetrachloro-m-xylene	55	60-150		UJ/J (all compounds)
	16S01301	Decachlorobiphenyl	55	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	55	60-150		
	24S00101	Tetrachloro-m-xylene	48	60-150		UJ (all compounds)
		Tetrachloro-m-xylene	46	60-150		
		Decachlorobiphenyl	41	60-150		
		Decachlorobiphenyl	43	60-150		
	BKS00101	Tetrachloro-m-xylene	56	60-150		UJ (all compounds)
WF014	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	BKR00101	Decachlorobiphenyl	43	60-150	1	UJ (all compounds)
		Decachlorobiphenyl	39	60-150		

Table VI
Summary of Surrogate Recoveries
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF015	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs				
	COR00101	Decachlorobiphenyl	55	60-150	5	UJ (all compounds)
	AOS00101	Tetrachloro-m-xylene	55	60-150		UJ/J (all compounds)
		Decachlorobiphenyl	51	60-150		
		Decachlorobiphenyl	48	60-150		UJ (all compounds
	COS00101D	Tetrachloro-m-xylene	26	60-150		
		Tetrachloro-m-xylene	24	60-150		UJ/J (all compounds)
	WOS00101	Tetrachloro-m-xylene	39	60-150		
		Tetrachloro-m-xylene	37	60-150		
		Decachlorobiphenyl	41	60-150		
		Decachlorobiphenyl	43	60-150		
	YOS00101	Tetrachloro-m-xylene	37	60-150		UJ (all compounds)
		Tetrachloro-m-xylene	36	60-150		
	COS00101	Tetrachloro-m-xylene	7	60-150	2	R (ND compounds)
		Tetrachloro-m-xylene	7	60-150		
	SOS00101	Tetrachloro-m-xylene	2	60-150		R (ND compounds)
		Tetrachloro-m-xylene	1	60-150		
		Decachlorobiphenyl	15	60-150		
		Decachlorobiphenyl	16	60-150		

Notes: J = estimated value
UJ = undetected, but number that is reported as the quantification limit is an estimated value.

Table VII
Summary of Compounds Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF006	All	Volatiles	-	-	None
	12/7/96	2,4-Dinitrophenol	-	33.1	UJ
	12/8/96	2,4-Dinitrophenol	-	27.0	UJ
	12/11/96	Diethylphthalate	-	30.1	UJ
	12/12/96	Diethylphthalate	-	27.1	UJ
	11/30/95	Alpha-BHC	21.7	-	UJ
	11/30/95	Alpha-BHC	20.3	-	UJ
WF007	All	Volatiles	-	-	None
	12/12/96	Dimethylphthalate	-	27.1	UJ
	12/15/96	Nitrobenzene	-	25.6	UJ
		Pentachlorophenol	-	29.6	UJ
	12/15/96	Nitrobenzene	-	30.8	UJ
		2,4-Dinitrophenol	-	41.8	UJ
		4,6-Dinitro-2-methylphenol	-	30.1	UJ
		Pentachlorophenol	-	29.8	UJ
		Benzo(k)fluoranthene	-	26.5	UJ/J
	All	Pesticides & PCBs	-	-	None
WF008	All	Volatiles	-	-	None
	12/15/95	Nitrobenzene	-	25.6	UJ
		Pentachlorophenol	-	29.6	UJ
	12/31/95	2,4-Dinitrophenol	-	42.0	UJ
		4-Nitrophenol	-	27.3	UJ
		Pentachlorophenol	-	34.8	UJ
		3,3'-Dichlorobenzidine	-	25.9	UJ
		Benzo(b)fluoranthene	-	27.7	UJ
	11/30/95	Alpha-BHC	21.7	-	UJ
	11/30/95	Alpha-BHC	20.3	-	UJ
WF009	All	Volatiles	-	-	None
	12/15/95	Nitrobenzene	-	25.6	UJ
		Pentachlorophenol	-	29.6	UJ
	12/31/95	2,4-Dinitrophenol	-	42.0	UJ
		4-Nitrophenol	-	27.3	UJ
		Pentachlorophenol	-	34.8	UJ
		3,3'-Dichlorobenzidine	-	25.9	UJ
		Benzo(b)fluoranthene	-	27.7	UJ
	All	Pesticides & PCBs	-	-	None

Table VII
Summary of Compounds Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF010	All	Volatiles	-	-	None
	12/27/95	4-Nitrophenol	-	28.1	UJ
		Benzo(b)fluoranthene	-	31.4	UJ
		Indeno(1,2,3-cd)pyrene	-	32.8	UJ
	11/30/95	Alpha-BHC	21.7	-	UJ
	11/30/95	Alpha-BHC	20.3	-	UJ
WF11A	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
	1/10/96	Endosulfan I	22	-	UJ
WF11B	1/10/96	Acetone	-	40.0	UJ/J
		2-Butanone	-	37.3	UJ
		4-Methyl-2-pentanone	-	37.7	UJ
		2-Hexanone	-	41.0	UJ/J
	1/11/96	Trichloroethene	-	27.7	UJ
		2-Hexanone	-	50.9	UJ/J
		1,1,2,2-Tetrachloroethane	-	34.2	UJ
	1/12/96	2-Hexanone	-	48.4	UJ/J
	1/10/96	Endosulfan I	22	-	UJ
WF012	1/11/96	Trichloroethene	-	27.7	UJ
		2-Hexanone	-	50.9	UJ
		1,1,2,2-Tetrachloroethane	-	34.2	UJ
	1/12/96	2-Hexanone	-	48.4	UJ
	1/13/96	Chloromethane	-	27.2	UJ
		Vinyl chloride	-	27.2	UJ
		Acetone	-	68.1	UJ/J
		2-Butanone	-	69.9	UJ
		1,2-Dichloroethane	-	29.6	UJ
		4-Methyl-2-pentanone	-	31.4	UJ
	1/15/96	Chloroethane	-	26.3	UJ
		Acetone	-	51.7	UJ/J
		2-Butanone	-	40.8	UJ
		1,2-Dichloroethane	-	35.4	UJ
	All	Semivolatiles	-	-	None
	1/17/96	Endosulfan sulfate	24.0	-	UJ

Table VII
Summary of Compounds Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF013	1/15/96	1,1-Dichloroethene	33.9	-	UJ
		Carbon disulfide	32.8	-	UJ
	1/17/96	2-Hexanone	41.7	-	UJ
	1/13/96	Chloromethane	-	27.2	UJ
		Vinyl chloride	-	27.2	UJ
		Acetone	-	68.1	UJ/J
		2-Butanone	-	69.9	UJ
		1,2-Dichloroethane	-	29.6	UJ
		4-Methyl-2-pentanone	-	31.4	UJ
	1/15/96	Chloroethane	-	26.3	UJ
		Acetone	-	51.7	UJ/J
		2-Butanone	-	40.8	UJ
		1,2-Dichloroethane	-	35.4	UJ
	1/18/96	2-Hexanone	-	27.5	UJ
	1/22/96	Chloromethane	-	41.8	UJ
		Vinyl chloride	-	37.1	UJ
		Chloroethane	-	41.7	UJ
		Acetone	-	31.7	UJ/J
		Carbon disulfide	-	25.8	UJ
		2-Hexanone	-	38.4	UJ
	1/19/96	Benzo(g,h,i)perylene	-	29.0	UJ/J
	1/17/96	Endosulfan sulfate	24.0	-	UJ
WF014	1/15/96	1,1-Dichloroethene	33.9	-	UJ
		Carbon disulfide	32.8	-	UJ
	1/14/96	Acetone	31.3	-	UJ/J
	1/16/96	Acetone	-	46.7	UJ/J
		Methylene chloride	-	32.3	UJ
		2-Butanone	-	54.2	UJ
		4-Methyl-2-pentanone	-	31.9	UJ
		2-Hexanone	-	60.0	UJ
	1/12/96	Acetone	-	36.7	UJ/J
	1/20/96	Benzo(k)fluoranthene	-	30.7	UJ/J
	1/31/96	4-Nitrophenol	-	38.2	UJ
		4-Nitroaniline	-	27.9	UJ
		Pentachlorophenol	-	29.4	UJ
		Benzo(g,h,i)perylene	-	35.3	UJ/J
	1/17/96	Endosulfan sulfate	24.0	-	UJ

Table VII
Summary of Compounds Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF015	1/17/96	2-Hexanone	41.7	-	UJ
	1/19/96	Chloromethane	-	47.1	UJ
		Vinyl chloride	-	39.0	UJ
		Chloroethane	-	54.7	UJ
		Acetone	-	25.8	UJ/J
		Carbon disulfide	-	45.5	UJ
	1/31/96	4-Nitroaniline	-	27.9	UJ
		Pentachlorophenol	-	29.4	UJ
		Benzo(g,h,i)perylene	-	35.3	UJ
	2/2/96	2-Chlorophenol	-	26.6	UJ
		2-Nitroaniline	-	25.1	UJ
		2,4-Dinitrophenol	-	25.7	UJ
		4-Bromophenyl-phenylether	-	27.2	UJ
		Hexachlorobenzene	-	35.4	UJ
	2/1/96	4-Bromophenyl-phenylether	-	28.4	UJ
		Hexachlorobenzene	-	35.0	UJ
	1/30/96	Endosulfan sulfate	21.0	-	UJ

Notes: %RSD = percent Relative Standard Deviation for initial calibrations

%D = percent Difference for continuing calibrations

J = the compound was positively identified; the associated numerical value is the approximate concentration of the compound in the sample, either because its concentration was lower than the QL (laboratory "J" flag), or because QC criteria were not met (validation "J").

UJ = the compound was not detected above the reported sample QL. However, the reported sample QL is approximate; the compound concentration may not reliably be presumed to be less than the QL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the compound cannot be verified.

Table VIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF006	Volatiles	ND	All samples in SDG WF006
	Pesticides & PCBs	ND	All samples in SDG WF006
	Diethylphthalate	4 ug/L	01R00101 01F00101
	Diethylphthalate	150 ug/Kg	02S00101 02S00201 02S00301 02S00501 09S00101 09S00201 09S00401 09S00501
WF007	Volatiles	ND	All samples in SDG WF007
	Pesticides & PCBs	ND	All samples in SDG WF007
	Diethylphthalate	2 ug/L	10R00101
	Di-n-octylphthalate	230 ug/Kg	13S00101 13S00301 13S00401 13S00501 14S00101D 14S00301
	Di-n-octylphthalate	180 ug/Kg	13S00201 14S00101
WF008	Volatiles	ND	All samples in SDG WF008
	Pesticides & PCBs	ND	All samples in SDG WF008
	Di-n-butylphthalate	280 ug/Kg	15S02001D 15S02101 15S02201 15S01701 15S01701D
WF009	Volatiles	ND	All samples in SDG WF009
	Semivolatiles	ND	All samples in SDG WF009
	Pesticides & PCBs	ND	All samples in SDG WF009
WF010	Volatiles	ND	All samples in SDG WF010
	Di-n-butylphthalate	320 ug/Kg	31S00101 31S00201 31S00301 31S01401 31S01501 31S01501D 31S01601 31S01701 31S01801 31S01901
	Pesticides & PCBs	ND	All samples in SDG WF010

Table VIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF11A	Volatiles	ND	All samples in SDG WF11A
	Bis(2-ethylhexyl)phthalate	3 ug/L	09W00101 09W00101D 16W00101
	Pesticides & PCBs	ND	All samples in SDG WF11A
WF11B	Styrene	1 ug/L	11T00101
	Xylenes (total)	2 ug/L	
	Acetone	7 ug/Kg	10S00301 10S00501 11S00101 11S00201 12S00201 12S00401 12S00501
	Acetone	4 ug/Kg	11S00201R 11S00301 11S00401 11S00501
	Bis(2-ethylhexyl)phthalate	3 ug/L	12R00101
	Di-n-butylphthalate	69 ug/Kg	10S00301
	Bis(2-ethylhexyl)phthalate	37 ug/Kg	10S00501 12S00201
	Di-n-butylphthalate	100 ug/Kg	10S00201 10S00201DL 10S00201D 10S00301R 12S00401 12S00501 11S00101
	Pesticides & PCBs	ND	All samples in SDG WF11B
WF012	Xylenes (total)	2 ug/L	31R00201
	Styrene	1 ug/L	
	Acetone	7 ug/Kg	31S00801 31S01201
	Acetone	4 ug/Kg	31S00401 31S00501 31S00501D 31S01201R
	Semivolatiles	ND	All samples in SDG WF12
	Pesticides & PCBs	ND	All samples in SDG WF12
WF013	Xylenes (total)	2 ug/L	16T00101
	Styrene	1 ug/L	16R00101 24T00101

Table VIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF013	Bis(2-ethylhexyl)phthalate	34 ug/Kg	16S00101 16S00501 16S00401 16S00901
	Bis(2-ethylhexyl)phthalate	46 ug/Kg	16S00901R 16S00201
	Bis(2-ethylhexyl)phthalate	76 ug/Kg	16S00301 16S00801 16S00601 16S00601DL 16S01201 16S01301 BKS00301 16S01001
	Pesticides & PCBs	ND	All samples in SDG WF13
WF014	Toluene	1 ug/Kg	31B00301
	Bis(2-ethylhexyl)phthalate	38 ug/Kg	31B00501
	Pesticides & PCBs	ND	All samples in SDG WF14
WF015	Volatiles	ND	All samples in SDG WF15
	Pesticides & PCBs	ND	All samples in SDG WF15
	Bis(2-ethylhexyl)phthalate	1 ug/L	COR00101 COF00101

Table IX
Summary of Field Blank Contamination

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF006	**Client ID:** 01T00101 **Laboratory ID:** G8864001 **Collection Date:** 12/5/95 **Type:** Trip Blank		
	Acetone	9 ug/L	None
WF006	**Client ID:** 02T00101 **Laboratory ID:** G8876001 **Collection Date:** 12/6/95 **Type:** Trip Blank		
	Acetone	7 ug/L	None
WF006	**Client ID:** 01R00101 **Laboratory ID:** G8876012 **Collection Date:** 12/6/95 **Type:** Rinsate		
	Acetone	11 ug/L	None
	Di-n-butylphthalate	8 ug/L	None
	Bis(2-ethyhexyl)phthalate	2 ug/L	None
	Pesticides & PCBs	ND	None
WF006	**Client ID:** 01F00101 **Laboratory ID:** G8776013 **Collection Date:** 12/6/95 **Type:** Source Blank		
	Acetone	12 ug/L	None
	2-Butanone	2 ug/L	None
	Di-n-butylphthalate	15 ug/L	None
	Pesticides & PCBs	ND	None
WF007	**Client ID:** 10T00101 **Laboratory ID:** G8889001 **Collection Date:** 12/7/95 **Type:** Trip Blank		
	Acetone	8 ug/L	None
WF007	**Client ID:** 13T00101 **Laboratory ID:** G8895001 **Collection Date:** 12/8/95 **Type:** Trip Blank		
	Acetone	4 ug/L	None
WF007	**Client ID:** 10R00101 **Laboratory ID:** G8889009 **Collection Date:** 12/7/95 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	15 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None

Table IX
Summary of Field Blank Contamination

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF008	**Client ID:** 15T00101 **Laboratory ID:** G8913001 **Collection Date:** 12/9/95 **Type:** Trip Blank		
	Acetone	8 ug/L	None
WF008	**Client ID:** 15R00101 **Laboratory ID:** G8913020 **Collection Date:** 12/11/95 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	3 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF009	**Client ID:** 15T00201 **Laboratory ID:** G8914001 **Collection Date:** 12/11/95 **Trip Blank:** Trip Blank		
	Acetone	19 ug/L	None
WF009	**Client ID:** 15R00201 **Laboratory ID:** G8914012 **Collection Date:** 12/11/95 **Type:** Rinsate		
	Acetone	12 ug/L	None
	Di-n-butylphthalate	4 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF010	**Client ID:** 31T00101 **Laboratory ID:** G8924005 **Collection Date:** 12/12/95 **Type:** Trip Blank		
	Acetone	10 ug/L	None
WF010	**Client ID:** 31T00201 **Laboratory ID:** G8938001 **Collection Date:** 12/13/95 **Type:** Trip Blank		
	Acetone	12 ug/L	None
WF010	**Client ID:** 31R00101 **Laboratory ID:** G8924006 **Collection Date:** 12/12/965 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	7 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None

Table IX
Summary of Field Blank Contamination

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF11B	**Client ID:** 12R00101 **Laboratory ID:** RA847012 **Collection Date:** 1/5/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	4 ug/L	None
	Pesticides &PCBs	ND	None
WF11B	**Client ID:** 12T00101 **Laboratory ID:** RA847001 **Collection Date:** 1/5/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF11B	**Client ID:** 11T00101 **Laboratory ID:** RA847013 **Collection Date:** 1/6/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF012	**Client ID:** 31R00201 **Laboratory ID:** RA855021 **Collection Date:** 1/8/96 **Type:** Rinsate		
	Volatiles	ND	None
	Semivolatiles	ND	None
	Pesticides & PCBs	ND	None
WF013	**Client ID:** 16T00101 **Laboratory ID:** RA856016 **Collection Date:** 1/9/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF013	**Client ID:** 24T00101 **Laboratory ID:** RA871001 **Collection Date:** 1/10/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF013	**Client ID:** 16R00101 **Laboratory ID:** RA856017 **Collection Date:** 1/9/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	5 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None

Table IX
Summary of Field Blank Contamination

Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF014	**Client ID:** BKT00101 **Laboratory ID:** RA870002 **Collection Date:** 1/10/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF014	**Client ID:** 31T00201 **Laboratory ID:** RA870018 **Collection Date:** 1/11/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF014	**Client ID:** BKR00101 **Laboratory ID:** RA870001 **Collection Date:** 1/10/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	5 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF015	**Client ID:** COT00101 **Laboratory ID:** RA908003 **Collection Date:** 1/18/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF015	**Client ID:** COR00101 **Laboratory ID:** RA908001 **Collection Date:** 1/18/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	5 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF015	**Client ID:** COF00101 **Laboratory ID:** RA908002 **Collection Date:** 1/18/96 **Type:** Source Blank		
	Volatiles	ND	None
	Di-n-butylphthalate	7 ug/L	None
	Pesticides & PCBs	ND	None

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table X
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF006	02S00401	Calcium	-	±2205 mg/Kg	-	-	9780 mg/Kg	J
		Nickel	-	±17.6 mg/Kg	-	-	40.8 mg/Kg	J
		Antimony	75-125	-	73.8	-	-	J
		Manganese	75-125	-	73.8	-	-	J
		Cyanide	-	-	-	-	-	None
		TRPH	-	-	-	-	-	None
WF007	10S00101	Antimony	75-125	-	65.6	-	-	J
		Barium	75-125	±88.10 mg/Kg	171.0	-	1221 mg/Kg	J
		Manganese	75-125	±6.6 mg/Kg	130.0	-	34.30 mg/Kg	J
		Lead	75-125	-	128.7	-	-	J
		Selenium	75-125	-	56.1	-	-	J
		Cyanide	-	-	-	-	-	None
		TRPH	-	-	-	-	-	None
WF008	15S02001	Antimony	75-125	-	68.2	-	-	J
		Mercury	75-125	-	125.3	-	-	J
		Cyanide	-	-	-	-	-	None
WF009	15S00101	Antimony	75-125	-	53.5	-	-	J
WF010	31S01501	Antimony	75-125	-	73.8	-	-	None
		Cyanide	-	-	-	-	-	None
WF11A	09W00101	All metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
		TRPH	-	-	-	-	-	None
WF11B	10S00201	All metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
		TRPH	-	-	-	-	-	None

Table X
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF012	31S00501	All metals	-	-	-	-	-	None
		All TCLP metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF013	16S01001	Aluminum	-	≤35	-	-	71.0	J
		Iron	-	≤35	-	-	42.3	J
		Lead	75-125	-	127	-	-	J
		Cyanide	-	-	-	-	-	None
WF014	BKS00201	Aluminum	-	≤35	-	-	35.6	J
		Cyanide	-	-	-	-	-	None
WF015	COS00101	Lead	75-125	-	-46.5	-	-	J
		Cyanide	-	-	-	-	-	None

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF006	**Client ID**	**02S00401**	**02S00401D**	
	Laboratory ID	**G8864007**	**G8864008**	
	Collection Date	**12/5/95**	**12/5/95**	
	Aluminum	9580 mg/Kg	7580 mg/Kg	23
	Arsenic	3.9 mg/Kg	4.0 mg/Kg	3
	Barium	27.7 mg/Kg	15.9 mg/Kg	54
	Beryllium	0.31 mg/Kg	0.13 mg/Kg	81
	Calcium	14900 mg/Kg	9900 mg/Kg	40
	Chromium	13.6 mg/Kg	14.0 mg/Kg	3
	Cobalt	0.53 mg/Kg	ND	Not calculable
	Copper	4.3 mg/Kg	3.8 mg/Kg	12
	Iron	4010 mg/Kg	3880 mg/Kg	3
	Lead	10.9 mg/Kg	11.6 mg/Kg	6
	Magnesium	926 mg/Kg	403 mg/Kg	79
	Manganese	188 mg/Kg	164 mg/Kg	14
	Mercury	0.03 mg/Kg	0.05 mg/Kg	50
	Nickel	3.9 mg/Kg	3.8 mg/Kg	1
	Potassium	377 mg/Kg	142 mg/Kg	91
	Sodium	104 mg/Kg	70.2 mg/Kg	38
	Vanadium	12.9 mg/Kg	11.7 mg/Kg	10
	Zinc	13.1 mg/Kg	12.5 mg/Kg	5
	Cyanide	0.15 mg/Kg	ND	Not calculable
WF006	**Client ID**	**09S00301**	**09S00301D**	
	Laboratory ID	**G8876010**	**G8876011**	
	Collection Date	**12/6/96**	**12/6/96**	
	Aluminum	25200 mg/Kg	33100 mg/Kg	27
	Arsenic	8.5 mg/Kg	7.1 mg/Kg	18
	Barium	8.9 mg/Kg	21.7 mg/Kg	83
	Beryllium	0.12 mg/Kg	0.22 mg/Kg	59
	Calcium	176 mg/Kg	384 mg/Kg	74
	Chromium	21.7 mg/Kg	29.5 mg/Kg	30
	Cobalt	0.52 mg/Kg	0.55 mg/Kg	6
	Copper	6.8 mg/Kg	9.0 mg/Kg	28
	Iron	17800 mg/Kg	26500 mg/Kg	40
	Lead	11.2 mg/Kg	6.6 mg/Kg	52
	Magnesium	143 mg/Kg	227 mg/Kg	45
	Manganese	28.2 mg/Kg	52.9 mg/Kg	61
	Mercury	0.01 mg/Kg	0.01 mg/Kg	0
	Nickel	ND	6.1 mg/Kg	Not calculable
	Potassium	ND	212 mg/Kg	Not calculable
	Selenium	0.33 mg/Kg	ND	Not calculable
	Sodium	8.4 mg/Kg	10.4 mg/Kg	21
	Vanadium	43.5 mg/Kg	65.1 mg/Kg	40
	Zinc	6.3 mg/Kg	14.4 mg/Kg	78
	Cyanide	ND	ND	-
	TRPH	ND	ND	-

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF007	**Client ID**	**10S00101**	**10S00101D**	
	Laboratory ID	**G8889002**	**G8889003**	
	Collection Date	**12/7/95**	**12/7/95**	
	Aluminum	8760 mg/Kg	8920 mg/Kg	2
	Arsenic	2.5 mg/Kg	2.6 mg/Kg	4
	Barium	361 mg/Kg	1320 mg/Kg	114
	Beryllium	0.13 mg/Kg	0.13 mg/Kg	0
	Cadmium	0.91 mg/Kg	ND	Not calculable
	Calcium	23200 mg/Kg	17800 mg/Kg	26
	Chromium	18.2 mg/Kg	16.8 mg/Kg	8
	Cobalt	0.83 mg/Kg	2.0 mg/Kg	82
	Copper	7.9 mg/Kg	7.9 mg/Kg	0
	Iron	6520 mg/Kg	6780 mg/Kg	4
	Lead	38.0 mg/Kg	33.1 mg/Kg	14
	Magnesium	5910 mg/Kg	5600 mg/Kg	5
	Manganese	56.6 mg/Kg	66.0 mg/Kg	15
	Mercury	0.07 mg/Kg	0.07 mg/Kg	0
	Nickel	6.8 mg/Kg	3.0 mg/Kg	77
	Potassium	219 mg/Kg	ND	Not calculable
	Sodium	35.6 mg/Kg	46.2 mg/Kg	26
	Vanadium	18.9 mg/Kg	18.7 mg/Kg	1
	Zinc	37.7 mg/Kg	34.1 mg/Kg	5
	Cyanide	0.10 mg/Kg	0.20 mg/Kg	67
	TRPH	240 mg/Kg	180 mg/Kg	29
WF007	**Client ID**	**14S00101**	**14S00101D**	
	Laboratory ID	**G8895007**	**G8895008**	
	Collection Date	**12/8/95**	**12/8/95**	
	Aluminum	11600 mg/Kg	11500 mg/Kg	1
	Arsenic	1.5 mg/Kg	1.9 mg/Kg	23
	Barium	23.3 mg/Kg	26.6 mg/Kg	13
	Beryllium	0.15 mg/Kg	0.16 mg/Kg	6
	Calcium	120 mg/Kg	183 mg/Kg	6
	Chromium	7.8 mg/Kg	7.8 mg/Kg	0
	Cobalt	1.8 mg/Kg	1.6 mg/Kg	12
	Copper	3.8 mg/Kg	4.3 mg/Kg	12
	Iron	6310 mg/Kg	6630 mg/Kg	5
	Lead	7.7 mg/Kg	11.9 mg/Kg	42
	Magnesium	177 mg/Kg	162 mg/Kg	9
	Manganese	521 mg/Kg	597 mg/Kg	14
	Mercury	0.04 mg/Kg	0.04 mg/Kg	0
	Nickel	4.1 mg/Kg	4.6 mg/Kg	12
	Potassium	144 mg/Kg	ND	Not calculable
	Sodium	16.4 mg/Kg	14.0 mg/Kg	16
	Vanadium	16.8 mg/Kg	17.4 mg/Kg	6
	Zinc	6.0 mg/Kg	6.6 mg/Kg	10
	Cyanide	0.07 mg/Kg	ND	Not calculable

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF008	**Client ID**	**15S02001**	**15S02001D**	
	Laboratory ID	**G8913002**	**G8913003**	
	Collection Date	**12/9/95**	**12/9/95**	
	Aluminum	4630 mg/Kg	5470 mg/Kg	17
	Arsenic	1.2 mg/Kg	1.1 mg/Kg	9
	Barium	5.6 mg/Kg	6.6 mg/Kg	16
	Beryllium	0.13 mg/Kg	0.13 mg/Kg	0
	Calcium	22.2 mg/Kg	25.2 mg/Kg	13
	Chromium	3.0 mg/Kg	3.7 mg/Kg	21
	Copper	1.9 mg/Kg	2.4 mg/Kg	23
	Iron	2500 mg/Kg	2950 mg/Kg	17
	Lead	5.9 mg/Kg	5.9 mg/Kg	0
	Magnesium	85.0 mg/Kg	107 mg/Kg	23
	Manganese	75.2 mg/Kg	87.1 mg/Kg	15
	Mercury	0.02 mg/Kg	0.02 mg/Kg	0
	Nickel	2.4 mg/Kg	9.1 mg/Kg	117
	Selenium	0.26 mg/Kg	ND	Not calculable
	Vanadium	5.7 mg/Kg	7.1 mg/Kg	22
	Zinc	3.0 mg/Kg	4.1 mg/Kg	31
	Cyanide	ND	ND	-
WF008	**Client ID**	**15S01701**	**15S01701D**	
	Laboratory ID	**G8913013**	**G8913014**	
	Collection Date	**12/10/95**	**12/10/95**	
	Aluminum	13700 mg/Kg	9290 mg/Kg	38
	Arsenic	3.7 mg/Kg	4.3 mg/Kg	15
	Barium	4.4 mg/Kg	3.8 mg/Kg	15
	Beryllium	0.11 mg/Kg	0.11 mg/Kg	0
	Calcium	23.7 mg/Kg	20.4 mg/Kg	15
	Chromium	14.8 mg/Kg	14.0 mg/Kg	6
	Copper	2.6 mg/Kg	2.5 mg/Kg	4
	Iron	11900 mg/Kg	10400 mg/Kg	13
	Lead	4.7 mg/Kg	4.1 mg/Kg	14
	Magnesium	51.2 mg/Kg	41.8 mg/Kg	20
	Manganese	10.8 mg/Kg	6.8 mg/Kg	45
	Nickel	ND	3.0 mg/Kg	Not calculable
	Selenium	ND	0.25 mg/Kg	Not calculable
	Vanadium	35.9 mg/Kg	31.8 mg/Kg	12
	Zinc	1.5 mg/Kg	1.1 mg/Kg	31
	Cyanide	ND	ND	-

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF009	**Client ID**	**15S00101**	**15S00101D**	
	Laboratory ID	**G8914002**	**G8914003**	
	Collection Date	**12/11/95**	**12/11/95**	
	Aluminum	9280 mg/Kg	10800 mg/Kg	15
	Arsenic	2.0 mg/Kg	1.9 mg/Kg	5
	Barium	6.6 mg/Kg	7.8 mg/Kg	17
	Beryllium	0.12 mg/Kg	0.13 mg/Kg	8
	Calcium	21.6 mg/Kg	23.9 mg/Kg	10
	Chromium	8.4 mg/Kg	8.0 mg/Kg	5
	Copper	3.4 mg/Kg	3.9 mg/Kg	14
	Iron	5120 mg/Kg	5700 mg/Kg	11
	Lead	4.7 mg/Kg	3.6 mg/Kg	26
	Magnesium	109 mg/Kg	132 mg/Kg	19
	Manganese	36.4 mg/Kg	39.9 mg/Kg	9
	Mercury	0.02 mg/Kg	0.02 mg/Kg	0
	Nickel	5.0 mg/Kg	2.4 mg/Kg	70
	Potassium	169 mg/Kg	ND	Not calculable
	Vanadium	13.3 mg/Kg	15.1 mg/Kg	13
	Zinc	4.1 mg/Kg	5.0 mg/Kg	22
	Cyanide	ND	ND	-
WF010	**Client ID**	**31S01501**	**31S01501D**	
	Laboratory ID	**G8938002**	**G8938003**	
	Collection Date	**12/13/95**	**12/13/95**	
	Aluminum	9620 mg/Kg	8270 mg/Kg	15
	Arsenic	1.4 mg/Kg	1.9 mg/Kg	30
	Barium	14.6 mg/Kg	12.2 mg/Kg	18
	Beryllium	0.17 mg/Kg	0.15 mg/Kg	13
	Calcium	112 mg/Kg	103 mg/Kg	8
	Chromium	6.7 mg/Kg	6.0 mg/Kg	11
	Cobalt	0.80 mg/Kg	1.2 mg/Kg	40
	Copper	5.5 mg/Kg	4.2 mg/Kg	27
	Iron	4730 mg/Kg	4380 mg/Kg	8
	Lead	5.3 mg/Kg	5.4 mg/Kg	2
	Magnesium	154 mg/Kg	114 mg/Kg	30
	Manganese	183 mg/Kg	172 mg/Kg	6
	Mercury	0.01 mg/Kg	0.01 mg/Kg	0
	Nickel	3.9 mg/Kg	3.4 mg/Kg	13
	Potassium	ND	197 mg/Kg	Not calculable
	Vanadium	12.8 mg/Kg	11.3 mg/Kg	12
	Zinc	6.8 mg/Kg	5.0 mg/Kg	30
	Cyanide	ND	ND	-
WF11A	**Client ID**	**09W00101**	**09W00101D**	
	Laboratory ID	**RA903001**	**RA903002**	
	Collection Date	**1/5/96**	**1/5/96**	
	Aluminum	123 mg/L	129 mg/L	5
	Arsenic	0.60 mg/L	ND	Not calculable
	Barium	1.1 mg/L	1.3 mg/L	17
	Calcium	760 mg/L	726 mg/L	5
	Iron	118 mg/L	105 mg/L	12
	Magnesium	234 mg/L	236 mg/L	1
	Manganese	12.2 mg/L	12.0 mg/L	2
	Potassium	313 mg/L	298 mg/L	2
	Sodium	904 mg/L	893 mg/L	1
	Zinc	5.4 mg/L	3.8 mg/L	34
	Cyanide	ND	ND	-
	TRPH	ND	ND	-

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF11B	**Client ID**	**10S00201**	**10S00201D**	
	Laboratory ID	**RA847002**	**RA847003**	
	Collection Date	**1/5/96**	**1/5/96**	
	Aluminum	8960 mg/Kg	5890 mg/Kg	41
	Arsenic	3.6 mg/Kg	2.4 mg/Kg	40
	Barium	9.2 mg/Kg	8.1 mg/Kg	13
	Beryllium	0.10 mg/Kg	0.06 mg/Kg	50
	Cadmium	1.4 mg/Kg	1.3 mg/Kg	7
	Calcium	1320 mg/Kg	779 mg/Kg	51
	Chromium	16.0 mg/Kg	12.2 mg/Kg	27
	Cobalt	0.79 mg/Kg	0.82 mg/Kg	4
	Copper	10.8 mg/Kg	11.5 mg/Kg	6
	Iron	9660 mg/Kg	8650 mg/Kg	11
	Lead	32.5 mg/Kg	29.0 mg/Kg	11
	Magnesium	200 mg/Kg	100 mg/Kg	66
	Manganese	39.3 mg/Kg	36.4 mg/Kg	8
	Nickel	2.0 mg/Kg	ND	Not calculable
	Potassium	69.4 mg/Kg	ND	Not calculable
	Sodium	181 mg/Kg	192 mg/Kg	6
	Vanadium	24.5 mg/Kg	20.8 mg/Kg	16
	Zinc	50.0 mg/Kg	42.9 mg/Kg	15
	Cyanide	0.20 mg/Kg	0.13 mg/Kg	42
	TRPH	105 mg/Kg	66.1 mg/Kg	46
WF012	**Client ID**	**31S00501**	**31S00501D**	
	Laboratory ID	**RA855011**	**RA855012**	
	Collection Date	**1/7/96**	**1/7/96**	
	Aluminum	4500 mg/Kg	6050 mg/Kg	29
	Arsenic	1.3 mg/Kg	1.2 mg/Kg	8
	Barium	6.6 mg/Kg	8.6 mg/Kg	26
	Calcium	143 mg/Kg	146 mg/Kg	2
	Chromium	2.8 mg/Kg	3.8 mg/Kg	30
	Cobalt	ND	1.2 mg/Kg	Not calculable
	Copper	2.2 mg/Kg	3.0 mg/Kg	31
	Iron	2470 mg/Kg	2840 mg/Kg	14
	Lead	3.2 mg/Kg	2.9 mg/Kg	10
	Magnesium	80.1 mg/Kg	138 mg/Kg	53
	Manganese	87.0 mg/Kg	95.3 mg/Kg	9
	Nickel	1.9 mg/Kg	2.2 mg/Kg	15
	Potassium	81.9 mg/Kg	115 mg/Kg	34
	Selenium	0.18 mg/Kg	ND	Not calculable
	Sodium	192 mg/Kg	175 mg/Kg	9
	Vanadium	5.9 mg/Kg	7.2 mg/Kg	20
	Zinc	3.9 mg/Kg	5.2 mg/Kg	28
	Barium, TCLP	0.393 mg/L	0.574 mg/L	37
	Chromium, TCLP	0.0017U mg/L	0.0018 mg/L	Not calculable
	Selenium, TCLP	0.0217U mg/L	0.2351 mg/L	Not calculable
	Cyanide	0.09 mg/Kg	ND	Not calculable
WF012	**Client ID**	**11S00601**	**11S00601D**	
	Laboratory ID	**RA855001**	**RA855002**	
	Collection Date	**1/7/96**	**11/7/96**	
	Lead	19.3 mg/Kg	25.0 mg/Kg	26

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF013	**Client ID**	**16S00101**	**16S00101D**	
	Laboratory ID	**RA856001**	**RA856018**	
	Collection Date	**1/8/96**	**1/8/96**	
	Aluminum	4250 mg/Kg	5480 mg/Kg	25
	Arsenic	0.94 mg/Kg	1.2 mg/Kg	24
	Barium	13.2 mg/Kg	13.6 mg/Kg	3
	Beryllium	0.09 mg/Kg	ND	Not calculable
	Cadmium	0.28 mg/Kg	0.30 mg/Kg	7
	Calcium	210 mg/Kg	173 mg/Kg	19
	Chromium	4.0 mg/Kg	5.8 mg/Kg	37
	Copper	4.8 mg/Kg	3.0 mg/Kg	46
	Iron	2340 mg/Kg	2910 mg/Kg	22
	Lead	7.8 mg/Kg	7.5 mg/Kg	4
	Magnesium	103 mg/Kg	150 mg/Kg	37
	Manganese	185 mg/Kg	151 mg/Kg	20
	Nickel	ND	1.9 mg/Kg	Not calculable
	Potassium	99.6 mg/Kg	141 mg/Kg	34
	Selenium	0.19 mg/Kg	ND	Not calculable
	Sodium	129 mg/Kg	108 mg/Kg	18
	Vanadium	6.8 mg/Kg	8.6 mg/Kg	23
	Zinc	6.4 mg/Kg	6.9 mg/Kg	8
	Cyanide	0.12 mg/Kg	0.12 mg/Kg	0
WF013	**Client ID**	**16S01001**	**16S01001D**	
	Laboratory ID	**RA856014**	**RA856015**	
	Collection Date	**1/9/96**	**1/9/96**	
	Aluminum	2000 mg/Kg	1780 mg/Kg	12
	Arsenic	0.76 mg/Kg	0.64 mg/Kg	17
	Barium	4.9 mg/Kg	4.0 mg/Kg	20
	Cadmium	ND	0.23 mg/Kg	Not calculable
	Calcium	101 mg/Kg	99.8 mg/Kg	1
	Chromium	3.9 mg/Kg	3.3 mg/Kg	16
	Copper	10.2 mg/Kg	8.6 mg/Kg	17
	Iron	1470 mg/Kg	1310 mg/Kg	12
	Lead	13.5 mg/Kg	12.4 mg/Kg	9
	Magnesium	38.5 mg/Kg	29.9 mg/Kg	25
	Manganese	5.6 mg/Kg	4.9 mg/Kg	13
	Mercury	0.20 mg/Kg	0.17 mg/Kg	16
	Potassium	ND	77.6 mg/Kg	Not calculable
	Selenium	0.13 mg/Kg	ND	Not calculable
	Silver	4.1 mg/Kg	3.6 mg/Kg	13
	Sodium	139 mg/Kg	118 mg/Kg	16
	Vanadium	3.4 mg/Kg	3.2 mg/Kg	6
	Zinc	4.1 mg/Kg	3.4 mg/Kg	19
	Cyanide	0.10 mg/Kg	0.17 mg/Kg	52

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF014	**Client ID**	**BKS00201**	**BKS00201D**	
	Laboratory ID	**RA870008**	**RA870009**	
	Collection Date	**1/10/96**	**1/10/96**	
	Aluminum	6640 mg/Kg	4230 mg/Kg	44
	Arsenic	1.6 mg/Kg	0.99 mg/Kg	47
	Barium	11.4 mg/Kg	8.9 mg/Kg	34
	Beryllium	0.05 mg/Kg	ND	Not calculable
	Cadmium	0.21 mg/Kg	ND	Not calculable
	Calcium	132 mg/Kg	215 mg/Kg	48
	Chromium	3.4 mg/Kg	2.0 mg/Kg	52
	Cobalt	1.0 mg/Kg	ND	Not calculable
	Copper	3.4 mg/Kg	2.3 mg/Kg	39
	Iron	3340 mg/Kg	2220 mg/Kg	40
	Lead	5.9 mg/Kg	5.1 mg/Kg	15
	Magnesium	124 mg/Kg	72.5 mg/Kg	52
	Manganese	249 mg/Kg	217 mg/Kg	14
	Mercury	0.04 mg/Kg	0.05 mg/Kg	1
	Nickel	2.6 mg/Kg	ND	Not calculable
	Potassium	96.8 mg/Kg	65.8 mg/Kg	38
	Selenium	0.16 mg/Kg	0.14 mg/Kg	13
	Sodium	184 mg/Kg	346 mg/Kg	61
	Thallium	0.16 mg/Kg	ND	Not calculable
	Vanadium	8.1 mg/Kg	5.0 mg/Kg	47
	Zinc	5.6 mg/Kg	3.2 mg/Kg	55
	Cyanide	0.11 mg/Kg	ND	Not calculable
WF014	**Client ID**	**31B00201**	**31B00201D**	
	Laboratory ID	**RA870014**	**RA870015**	
	Collection Date	**1/11/96**	**1/11/96**	
	Aluminum	4360 mg/Kg	4050 mg/Kg	7
	Arsenic	1.0 mg/Kg	1.2 mg/Kg	18
	Barium	4.7 mg/Kg	4.3 mg/Kg	9
	Beryllium	0.05 mg/Kg	ND	Not calculable
	Cadmium	0.21 mg/Kg	0.34 mg/Kg	47
	Calcium	107 mg/Kg	121 mg/Kg	12
	Chromium	2.6 mg/Kg	2.1 mg/Kg	21
	Cobalt	0.76 mg/Kg	ND	Not calculable
	Copper	8.5 mg/Kg	8.4 mg/Kg	1
	Iron	2960 mg/Kg	2750 mg/Kg	7
	Lead	2.9 mg/Kg	2.9 mg/Kg	0
	Magnesium	81.1 mg/Kg	72.0 mg/Kg	12
	Manganese	8.0 mg/Kg	7.5 mg/Kg	7
	Mercury	0.04 mg/Kg	0.04 mg/Kg	0
	Nickel	1.8 mg/Kg	1.6 mg/Kg	12
	Potassium	88.8 mg/Kg	114 mg/Kg	25
	Sodium	175 mg/Kg	183 mg/Kg	5
	Vanadium	6.0 mg/Kg	5.3 mg/Kg	12
	Zinc	7.1 mg/Kg	6.4 mg/Kg	10

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF015	**Client ID**	**COS00101**	**COS00101D**	
	Laboratory ID	**RA908004**	**RA908005**	
	Collection Date	**1/18/96**	**1/18/96**	
	Aluminum	1770 mg/Kg	1620 mg/Kg	9
	Arsenic	0.57 mg/Kg	0.29 mg/Kg	65
	Barium	17.3 mg/Kg	11.6 mg/Kg	39
	Beryllium	0.07 mg/Kg	0.10 mg/Kg	35
	Calcium	521 mg/Kg	200 mg/Kg	89
	Chromium	2.0 mg/Kg	1.5 mg/Kg	29
	Copper	5.1 mg/Kg	5.0 mg/Kg	2
	Iron	906 mg/Kg	919 mg/Kg	1.4
	Lead	19.4 mg/Kg	8.9 mg/Kg	74
	Magnesium	142 mg/Kg	51.4 mg/Kg	94
	Manganese	4.9 mg/Kg	5.6 mg/Kg	13
	Sodium	120 mg/Kg	95.6 mg/Kg	23
	Vanadium	2.6 mg/Kg	2.8 mg/Kg	7
	Zinc	11.5 mg/Kg	3.3 mg/Kg	111
	Cyanide	0.12 mg/Kg	0.20 mg/Kg	50

Table XII
Summary of Analytes Exceeding Instrument Calibration
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Date	Analyte	Criteria		Qualifier
			Initial Calibration r	Continuing Calibration %R	
WF006	All	All metals	-	-	None
	All	Cyanide	-	-	None
	All	TRPH	-	-	None
WF007	All	All metals	-	-	None
	All	Cyanide	-	-	None
	All	TRPH	-	-	None
WF008	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF009	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF010	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF11A	All	All metals	-	-	None
	All	Cyanide	-	-	None
	All	TRPH	-	-	None
WF11B	All	All metals	-	-	None
	All	Cyanide	-	-	None
	All	TRPH	-	-	None
WF012	All	All metals	-	-	None
	All	All TCLP metals	-	-	None
	All	Cyanide	-	-	None
WF013	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF014	All	All metals	-	-	None
	All	Cyanide	-	-	None
WF015	All	All metals	-	-	None
	All	Cyanide	-	-	None

Notes: *r = correlation coefficient for initial calibrations*

%R = percent recovery for continuing calibrations

J = the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample because QC criteria were not met (validation "J").

UJ = the analyte was not detected above the reported sample IDL. However, the reported sample is approximate; the analyte concentration may not reliably be presumed to be less than the IDL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table XIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes			
SDG	**Analyte**	**Concentration**	**Associated Samples**
WF006	Aluminum	-5.056 mg/Kg	All soil samples in SDG WF006
	Calcium	-5.002 mg/Kg	
	Copper	0.482 mg/Kg	
	Iron	-1.408 mg/Kg	
	Magnesium	-5.504 mg/Kg	
	Selenium	0.660 mg/Kg	
	Sodium	2.840 mg/Kg	
	Zinc	0.344 mg/Kg	
	Aluminum	-7.772 mg/Kg	All soil samples in SDG WF006
	Cobalt	-0.518 mg/Kg	
	Iron	-1.702 mg/Kg	
	Magnesium	-5.232 mg/Kg	
	Copper	2.690 ug/L	All water samples in SDG WF006
	Iron	-5.220 ug/L	
	Magnesium	-37.720 ug/L	
	Mercury	-0.029 ug/L	
	Selenium	2.300 ug/L	
	Sodium	51.840 ug/L	
	Cyanide	ND	All samples in SDG WF006
	TRPH	ND	All samples in SDG WF006
WF007	Barium	0.174 mg/Kg	All soil samples in SDG WF007
	Calcium	6.280 mg/Kg	
	Iron	1.776 mg/Kg	
	Sodium	6.856 mg/Kg	
	Aluminum	47.800 ug/L	All water samples in SDG WF007
	Beryllium	0.250 ug/L	
	Calcium	38.580 ug/L	
	Cobalt	-2.750 ug/L	
	Copper	6.560 ug/L	
	Iron	15.910 ug/L	
	Nickel	12.410 ug/L	
	Sodium	-320.390 ug/L	
	Zinc	2.210 ug/L	
	Cyanide	ND	All samples in SDG WF007
	TRPH	ND	All samples in SDG WF007
WF008	Aluminum	10.014 mg/Kg	All soil samples in SDG WF008
	Beryllium	0.068 mg/Kg	
	Copper	0.454 mg/Kg	
	Iron	3.440 mg/Kg	
	Sodium	-72.604 mg/Kg	
	Aluminum	5.768 mg/Kg	All soil samples in SDG WF008
	Beryllium	0.060 mg/Kg	
	Cobalt	-0.428 mg/Kg	
	Copper	0.728 mg/Kg	
	Iron	1.184 mg/Kg	
	Nickel	2.284 mg/Kg	
	Sodium	-74.238 mg/Kg	
	Thallium	-0.470 mg/Kg	

Table XIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF008	Aluminum	47.800 ug/L	All water samples in SDG WF008
	Beryllium	0.250 ug/L	
	Calcium	38.580 ug/L	
	Cobalt	-2.750 ug/L	
	Copper	6.560 ug/L	
	Iron	15.910 ug/L	
	Nickel	12.410 ug/L	
	Sodium	-320.390 ug/L	
	Zinc	2.210 ug/L	
	Cyanide	ND	All samples in SDG WF008
WF009	Aluminum	10.014 mg/Kg	All soil samples in SDG WF009
	Beryllium	0.068 mg/Kg	
	Copper	0.454 mg/Kg	
	Iron	3.440 mg/Kg	
	Sodium	-72.604 mg/Kg	
	Aluminum	5.768 mg/Kg	All soil samples in SDG WF009
	Beryllium	0.068 mg/Kg	
	Cobalt	-0.428 mg/Kg	
	Copper	0.728 mg/Kg	
	Iron	1.184 mg/Kg	
	Nickel	2.284 mg/Kg	
	Sodium	-74.238 mg/Kg	
	Thallium	-0.470 mg/Kg	
	Aluminum	47.800 ug/L	All water samples in SDG WF009
	Beryllium	0.250 ug/L	
	Calcium	38.580 ug/L	
	Cobalt	-2.750 ug/L	
	Copper	6.560 ug/L	
	Iron	15.910 ug/L	
	Nickel	12.410 ug/L	
	Sodium	-320.390 ug/L	
	Zinc	2.210 ug/L	
	Cyanide	ND	All samples in SDG WF009
WF010	Aluminum	6.602 mg/Kg	All soil samples in SDG WF010
	Beryllium	0.066 mg/Kg	
	Copper	0.482 mg/Kg	
	Iron	1.828 mg/Kg	
	Mercury	-0.008 mg/Kg	
	Sodium	-74.902 mg/Kg	
	Aluminum	47.800 ug/L	All water samples in SDG WF010
	Beryllium	0.250 ug/L	
	Calcium	38.580 ug/L	
	Cobalt	-2.750 ug/L	
	Copper	6.560 ug/L	
	Iron	15.910 ug/L	
	Nickel	12.410 ug/L	
	Sodium	-320.390 ug/L	
	Zinc	2.210 ug/L	
	Cyanide	ND	All samples in SDG WF010

Table XIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF11A	Iron	14.610 ug/L	All samples in SDG WF11A
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Cyanide	ND	All samples in SDG WF11A
	TRPH	ND	All samples in SDG WF11A
WF11B	Iron	14.610 ug/L	All water samples in SDG WF11B
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Aluminum	2.922 mg/Kg	All soil samples in SDG WF11B
	Calcium	10.253 mg/Kg	
	Iron	1.620 mg/Kg	
	Sodium	11.866 mg/Kg	
	Zinc	0.512 mg/Kg	
	Cyanide	ND	All samples in SDG WF11B
	TRPH	ND	All samples in SDG WF11B
WF012	Iron	14.610 ug/L	All water samples in SDG WF12
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Barium	0.081 mg/Kg	All soil samples in SDG WF12
	Calcium	6.408 mg/Kg	
	Iron	0.684 mg/Kg	
	Sodium	9.938 mg/Kg	
	Zinc	0.321 mg/Kg	
	Arsenic, TCLP	-0.01539 mg/L	All samples in SDG WF12
	Barium, TCLP	0.00054 mg/L	
	Lead, TCLP	-0.02157 mg/L	
	Silver, TCLP	-0.00215 mg/L	
WF013	Iron	14.610 ug/L	All water samples in SDG WF13
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Barium	0.082 mg/Kg	All soil samples in SDG WF13
	Calcium	9.329 mg/Kg	
	Iron	0.799 mg/Kg	
	Lead	0.120 mg/Kg	
	Magnesium	4.111 mg/Kg	
	Potassium	56.814 mg/Kg	
	Sodium	8.614 mg/Kg	
	Zinc	0.240 mg/Kg	

Table XIII
Summary of Method Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF014	Iron	14.610 ug/L	All water samples in SDG WF14
	Nickel	11.200 ug/L	
	Sodium	22.840 ug/L	
	Zinc	2.170 ug/L	
	Cyanide	2.034 ug/L	All water samples in SDG WF14
	Beryllium	-0.049 mg/Kg	All soil samples in SDG WF14
	Calcium	15.945 mg/Kg	
	Iron	0.701 mg/Kg	
	Manganese	0.103 mg/Kg	
	Sodium	14.786 mg/Kg	
	Zinc	0.601 mg/Kg	
WF015	Iron	4.210 ug/L	All water samples in SDG WF15
	Sodium	30.690 ug/L	
	Thallium	0.700 ug/L	
	Zinc	1.400 ug/L	
	Cyanide	2.034 ug/L	
	Aluminum	2.553 mg/Kg	All soil samples in SDG WF15
	Barium	0.093 mg/Kg	
	Beryllium	0.043 mg/Kg	
	Calcium	6.248 mg/Kg	
	Iron	0.759 mg/Kg	
	Sodium	4.452 mg/Kg	
	Zinc	0.365 mg/Kg	

Table XIV
Summary of Field Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter		Concentration	Qualifier
WF006	**Client ID:**	**01R00101**		
	Laboratory ID:	**G8876012**		
	Collection Date:	**12/6/95**		
	Type:	**Rinsate**		
	Calcium		178 ug/L	J
	Sodium		60.6 ug/L	UJ
	Zinc		2.9 ug/L	J
	Cyanide		ND	None
	TRPH		ND	None
WF006	**Client ID:**	**01F00101**		
	Laboratory ID:	**G8776013**		
	Collection Date:	**12/6/95**		
	Type:	**Source Blank**		
	Copper		3.3 ug/L	UJ
	Sodium		113 ug/L	UJ
	Cyanide		ND	None
	TRPH		ND	None
WF007	**Client ID:**	**10R00101**		
	Laboratory ID:	**G8889009**		
	Collection Date:	**12/7/95**		
	Type:	**Rinsate**		
	Aluminum		52.3 ug/L	UJ
	Barium		0.70 ug/L	J
	Beryllium		0.25 ug/L	UJ
	Calcium		23.0 ug/L	UJ
	Copper		7.1 ug/L	UJ
	Iron		67.3 ug/L	UJ
	Zinc		17.6 ug/L	J
	Cyanide		ND	None
	TRPH		ND	None
WF008	**Client ID:**	**15R00101**		
	Laboratory ID:	**G8913020**		
	Collection Date:	**12/11/95**		
	Type:	**Rinsate**		
	Aluminum		54.6 ug/L	UJ
	Barium		1.0 ug/L	J
	Beryllium		0.21 ug/L	UJ
	Calcium		22.6 ug/L	UJ
	Copper		5.0 ug/L	UJ
	Iron		45.4 ug/L	UJ
	Zinc		1.5 ug/L	UJ
	Cyanide		ND	None

Table XIV
Summary of Field Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter		Concentration	Qualifier
WF009	**Client ID:**	**15R00201**		
	Laboratory ID:	**G8914012**		
	Collection Date:	**12/11/95**		
	Type:	**Rinsate**		
	Aluminum		69.8 ug/L	UJ
	Barium		1.0 ug/L	J
	Beryllium		0.29 ug/L	UJ
	Calcium		58.5 ug/L	UJ
	Copper		6.5 ug/L	UJ
	Iron		29.2 ug/L	UJ
	Nickel		48.7 ug/L	U
	Zinc		2.7 ug/L	J
	Cyanide		ND	None
WF010	**Client ID:**	**31R00101**		
	Laboratory ID:	**G8924006**		
	Collection Date:	**12/12/965**		
	Type:	**Rinsate**		
	Aluminum		56.5 ug/L	UJ
	Barium		0.86 ug/L	J
	Beryllium		0.42 ug/L	UJ
	Calcium		18.7 ug/L	UJ
	Copper		5.2 ug/L	UJ
	Iron		35.6 ug/L	UJ
	Zinc		3.2 ug/L	UJ
WF11B	**Client ID:**	**12R00101**		
	Laboratory ID:	**RA847012**		
	Collection Date:	**1/5/96**		
	Type:	**Rinsate**		
	Barium		0.30 ug/L	J
	Calcium		42.3 ug/L	J
	Iron		11.6 ug/L	UJ
	Sodium		24.6 ug/L	UJ
	Zinc		2.2 ug/L	UJ
	Cyanide		ND	None
	TRPH		ND	None
WF012	**Client ID:**	**31R00201**		
	Laboratory ID:	**RA855021**		
	Collection Date:	**1/8/96**		
	Type:	**Rinsate**		
	Copper		1.3 ug/L	UJ
	Iron		21.2 ug/L	UJ
	Sodium		40.3 ug/L	UJ
	Zinc		3.0 ug/L	UJ
WF013	**Client ID:**	**16R00101**		
	Laboratory ID:	**RA856017**		
	Collection Date:	**1/9/96**		
	Type:	**Rinsate**		
	Iron		7.0 ug/L	UJ
	Sodium		30.0 ug/L	UJ
	Zinc		3.4ug/L	UJ

Table XIV
Summary of Field Blank Contamination
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter		Concentration	Qualifier
WF014	**Client ID:**	**BKR00101**		
	Laboratory ID:	**RA870001**		
	Collection Date:	**1/10/96**		
	Type:	**Rinsate**		
	Calcium		42.3 ug/L	J
	Iron		7.8 ug/L	UJ
	Sodium		31.9 ug/L	UJ
	Zinc		1.8 ug/L	UJ
	Cyanide		2.0 ug/L	UJ
WF015	**Client ID:**	**COR00101**		
	Laboratory ID:	**RA908001**		
	Collection Date:	**1/18/96**		
	Type:	**Rinsate**		
	Iron		9.1 ug/L	UJ
	Lead		0.60 ug/L	J
	Sodium		58.6 ug/L	UJ
	Thallium		0.70 ug/L	UJ
	Zinc		2.2 ug/L	UJ
	Cyanide		2.0 ug/L	UJ
WF015	**Client ID:**	**COF00101**		
	Laboratory ID:	**RA908002**		
	Collection Date:	**1/18/96**		
	Type:	**Source Blank**		
	Iron		8.9 ug/L	UJ
	Sodium		55.0 ug/L	UJ
	Zinc		2.0 ug/L	UJ

Table XV
Sample Event PARCC Summary
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF006	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
	TRPH	Acceptable	Acceptable	Acceptable	100	Acceptable
WF007	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
	TRPH	Acceptable	Acceptable	Acceptable	100	Acceptable
WF008	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF009	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	99.5[3]	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF010	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF11A	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
	TRPH	Acceptable	Acceptable	Acceptable	100	Acceptable
WF11B	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
	TRPH	Acceptable	Acceptable	Acceptable	100	Acceptable
WF012	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF013	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	94.4[3]	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF014	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	99.7[3]	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable

Table XV
Sample Event PARCC Summary
Surface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF015	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	80.0[3]	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable

[1]Cumulative of sampling and analytical components.
[2]Analytical component.
[3]A few samples have results whose concentrations were rejected.

Notes: All completeness is expressed as the ratio of number of sample results considered usable (i.e., not qualified as rejected) to the total number of sample results.

% = percent
TRPH = Total Recoverable Petroleum Hydrocarbons

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2C, Carlsbad, CA 92009 Phone: 619 634-0437 Fax: 619 634-0439

APPENDIX A

Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida
PARCC Summary Tables

Draft Version

08/30/96

APPENDIX A

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Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

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SDG#: WF016 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
BKB00101	RB583001		soil	5-20-96	X	X	X	X	X
BKB00102	RB583002		soil	5-20-96	X	X	X	X	X
BKB00401	RB583003	FD	soil	5-20-96	X	X	X	X	X
BKB00401D	RB583004	FD	soil	5-20-96	X	X	X	X	X
BKB00402	RB583005		soil	5-20-96	X	X	X	X	X
BKB00201	RB583006		soil	5-20-96	X	X	X	X	X
BKB00202	RB583007		soil	5-20-96	X	X	X	X	X
BKR00201	RB583008	R	water	5-20-96	X	X	X	X	X
BKF00101	RB583009	SB	water	5-20-96	X	X	X	X	X
BKT00201	RB583010	TB	water	5-20-96	X				
BKB00301	RB583011		soil	5-21-96	X	X	X	X	X
BKB00302	RB583012		soil	5-21-96	X	X	X	X	X
BKB00501	RB583013		soil	5-21-96	X	X	X	X	X
BKB00502	RB583014		soil	5-21-96	X	X	X	X	X
BKB00601	RB583015		soil	5-21-96	X	X	X	X	X
BKB00602	RB583016	FD	soil	5-21-96	X	X	X	X	X
BKB00602D	RB583017	FD	soil	5-21-96	X	X	X	X	X
BKB00701	RB583018		soil	5-21-96	X	X	X	X	X
BKB00702	RB583019		soil	5-21-96	X	X	X	X	X
BKB00401MS	RB583003MS	MS	soil	5-20-96	X	X	X	X	X
BKB00401MSD	RB583003MSD	MSD	soil	5-20-96	X	X	X	X	X
BKR00201MS	RB583008MS	MS	water	5-20-96				X	
BKR00201MSD	RB583008MSD	MSD	water	5-20-96				X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF016 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
BKF00101MS	RB583009MS	MS	water	5-20-96					X
BKF00101MSD	RB583009MSD	MSD	water	5-20-96					X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF017 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
31B00601	RB592001	FD	soil	5-21-96	X	X	X	X	X
31B00602	RB592002		soil	5-21-96	X	X	X	X	X
31B00603	RB592003		soil	5-21-96	X	X	X	X	X
31B00604	RB592004		soil	5-21-96	X	X	X	X	X
31B00605	RB592005		soil	5-21-96	X	X	X	X	X
31B00601D	RB592006	FD	soil	5-21-96	X	X	X	X	X
12B00101	RB592007	FD	soil	5-21-96	X	X	X	X	X
12B00101D	RB592008	FD	soil	5-21-96	X	X	X	X	X
12B00102	RB592009		soil	5-21-96	X	X	X	X	X
31B00701	RB592010		soil	5-22-96	X	X	X	X	X
31B00702	RB592011		soil	5-22-96	X	X	X	X	X
31B00703	RB592012		soil	5-22-96	X	X	X	X	X
31B00704	RB592013		soil	5-22-96	X	X	X	X	X
31B00705	RB592014		soil	5-22-96	X	X	X	X	X
31B00801	RB592015		soil	5-22-96	X	X	X	X	X
31B00801DL	RB592015DL		soil	5-22-96	X				
31B00802	RB592016		soil	5-22-96	X	X	X	X	X
31B00803	RB592017		soil	5-22-96	X	X	X	X	X
31B00803DL	RB592017DL		soil	5-22-96	X				
31B00804	RB592018		soil	5-22-96	X	X	X	X	X
31B00804DL	RB592018DL		soil	5-22-96	X				
31B00805	RB592019		soil	5-22-96	X	X	X	X	X
31R00101	RB592020	R	water	5-22-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF017 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides/PCBs	Metals	Cyanide
31T00301	RB592021	TB	water	5-22-96	X				
12R00101	RB592022	R	water	5-21-96	X	X	X	X	X
BKT00301	RB592023	TB	water	5-21-96	X				
31B00601MS	RB592001MS	MS	soil	5-21-96	X	X	X	X	X
31B00601MSD	RB592001MSD	MSD	soil	5-21-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF018 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876C

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
30B00201	RB602001		soil	5-23-96	X	X	X
30B00202	RB602002	FD	soil	5-23-96	X	X	X
30B00203	RB602003		soil	5-23-96	X	X	X
30B00202D	RB602005	FD	soil	5-23-96	X	X	X
30B00101	RB602006		soil	5-23-96	X	X	X
30B00102	RB602007		soil	5-23-96	X	X	X
30B00103	RB602008		soil	5-23-96	X	X	X
30R00101	RB602010	R	water	5-23-96	X	X	X
30T00101	RB602011	TB	water	5-23-96	X		
30B00202MS	RB602002MS	MS	soil	5-23-96	X	X	X
30B00202MSD	RB602002MSD	MSD	soil	5-23-96	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF019 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
30B00501	MB047001		soil	6-4-96	X	X	X
30B00502	MB047002	FD	soil	6-4-96	X	X	X
30B00503	MB047003		soil	6-4-96	X	X	X
30B00502D	MB047005	FD	soil	6-4-96	X	X	X
30B00401	MB047006		soil	6-4-96	X	X	X
30B00402	MB047007		soil	6-4-96	X	X	X
30B00403	MB047008		soil	6-4-96	X	X	X
30R00201	MB047010	R	water	6-4-96	X	X	X
30T00201	MB047011	TB	water	6-4-96	X		
30R00301	MB068001	R	water	6-5-96	X	X	X
30T00301	MB068002	TB	water	6-5-96	X		
30F00101	MB068003	SB	water	6-5-96	X	X	X
30B00601	MB068004		water	6-5-96	X	X	X
30B00602	MB068005	FD	soil	6-5-96	X	X	X
30B00603	MB068006		soil	6-5-96	X	X	X
30B00602D	MB068009	FD	soil	6-5-96	X	X	X
30B00301	MB068010		soil	6-5-96	X	X	X
30B00302	MB068011		soil	6-5-96	X	X	X
30B00303	MB068012		soil	6-5-96	X	X	X
30B00303DL	MB068012DL		soil	6-5-96		X	
30B00305	MB068015		soil	6-5-96	X	X	X
30B00502MS	MB047002MS	MS	soil	6-4-96	X	X	X
30B00502MSD	MB047002MSD	MSD	soil	6-4-96	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF019 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1876D

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
30F00101MS	MB068003MS	MS	soil	6-4-96			X
30F00101MSD	MB068003MSD	MSD	soil	6-4-96			X
30B00601MS	MB068004MS	MS	water	6-5-96			X
30B00601MSD	MB068004MSD	MSD	water	6-5-96			X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF020 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1883A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
33B00301	MB080001		soil	6-6-96	X	X	X
33B00302	MB080002	FD	soil	6-6-96	X	X	X
33B00303	MB080003		soil	6-6-96	X	X	X
33B00304	MB080004		soil	6-6-96	X	X	X
33B00305	MB080005		soil	6-6-96	X	X	X
33B00305RE	MB080005RE		soil	6-6-96		X	
33B00306	MB080006		soil	6-6-96			X
33B00302D	MB080007	FD	soil	6-6-96	X	X	X
33B00201	MB080008		soil	6-6-96	X	X	X
33B00202	MB080009		soil	6-6-96	X	X	X
33B00203	MB080010		soil	6-6-96	X	X	X
33B00205	MB080011		soil	6-6-96			X
33B00101	MB080012		soil	6-6-96	X	X	X
33B00102	MB080013	FD	soil	6-6-96	X	X	X
33B00103	MB080014		soil	6-6-96	X	X	X
33B00102D	MB080015	FD	soil	6-6-96	X	X	X
33R00101	MB080016	R	water	6-6-96	X	X	X
33T00101	MB080017	TB	water	6-6-96	X		
33B00302MS	MB080002MS	MS	soil	6-6-96	X	X	
33B00302MSD	MB080002MSD	MSD	soil	6-6-96	X	X	
33B00302MSRE	MB080002MSRE	MS	soil	6-6-96		X	
33B00302MSDRE	MB080002MSDRE	MSD	soil	6-6-96		X	
33B00302S	MB080002S	MS	soil	6-6-96			X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF020	VALIDATION SAMPLE TABLE	LDC#: 1883A
Project Name: NAS Whiting Field	Parameters/Analytical Method	**Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Lead only
33B00302D	MB080002D	DUP	soil	6-6-96			X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WHF021 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1883B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	TCLP Metals
30U00101	MB107001		soil	6-11-96	X
30U00201	MB107002		soil	6-11-96	X
30U00301	MB107003		soil	6-11-96	X
30U00401	MB107004		soil	6-11-96	X
33U00101	MB107005		soil	6-11-96	X
33U00201	MB107006		soil	6-11-96	X
33U00301	MB107007		soil	6-11-96	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table II
Summary of Rejected Data (Organics)
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Fraction	Sample	Compound	Reason
WF016	Volatiles Semivolatiles Pesticides & PCBS	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF017	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF018	Volatiles Semivolatiles	All samples All samples	No rejected results No rejected results	- -
WF019	Volatiles Semivolatiles	All samples All samples	No rejected results No rejected results	- -
WF020	Volatiles Semivolatiles	All samples All samples	No rejected results No rejected results	- -

Table III
Summary of Rejected Data (Inorganics)
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes				
SDG	**Fraction**	**Sample**	**Analyte**	**Reason**
WF016	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF017	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF018	Lead	All samples	No rejected results	-
WF019	Lead	All samples	No rejected results	-

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF016	BKB00401	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides/PCBs	-	-	-	-	-	None
WF017	31B00601	Volatiles	-	-	-	-	-	None
		N-Nitroso-di-n-propylamine	41-126	≤38	33	-	45	None
		1,2,4-Trichlorobenzene	38-107	≤23	33	-	43	None
		Phenol	-	≤35	-	-	40	None
		1,4-Dichlorobenzene	-	≤27	-	-	44	None
		4-Chloro-3-methylphenol	-	≤33	-	-	38	None
		Acenaphthene	-	≤19	-	-	30	None
		Pesticides/PCBs	-	-	-	-	-	None
WF018	30B00203	Volatiles	-	-	-	-	-	None
		N-Nitroso-di-n-propylamine	41-126	-	33	34	-	UJ
		1,2,4-Trichlorobenzene	38-107	-	35	35	-	UJ
		Pyrene	35-142	-	33	-	-	UJ
WF019	30B00502	Volatiles	-	-	-	-	-	None
		1,4-Dichlorobenzene	-	≤27	-	-	40	UJ
		1,2,4-Trichlorobenzene	-	≤23	-	-	34	UJ
		Acenaphthene	-	≤19	-	-	25	UJ
WF020	33B00302	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF016	**Client ID**	**BKB00401**	**BKB00401D**	
	Laboratory ID	**RB583003**	**RB583004**	
	Collection Date	**5/20/96**	**5/20/96**	
	Acetone	6 ug/Kg	17 ug/Kg	96
	Di-n-butylphthalate	1000 ug/Kg	970 ug/Kg	3
	Pesticides/PBs	ND	ND	-
WF016	**Client ID**	**BKB00602**	**BKB00602D**	
	Laboratory ID	**RB583016**	**RB583017**	
	Collection Date	**5/21/96**	**5/21/96**	
	Acetone	47 ug/Kg	6 ug/Kg	155
	Di-n-butylphthalate	580 ug/Kg	310 ug/Kg	61
	Pesticides/PCBs	ND	ND	-
WF017	**Client ID**	**31B00601**	**31B00601D**	
	Laboratory ID	**RB592001**	**RB592006**	
	Collection Date	**5/21/96**	**5/21/96**	
	Acetone	3 ug/Kg	11 ug/Kg	114
	Di-n-butylphthalate	39 ug/Kg	350U ug/Kg	Not calculable
	Bis(2-ethylhexyl)phthalate	110 ug/Kg	79 ug/Kg	33
	Gamma-chlordane	1.5 ug/Kg	1.1 ug/Kg	31
WF017	**Client ID**	**12B00101**	**12B00101D**	
	Laboratory ID	**RB592007**	**RB592008**	
	Collection Date	**5/21/96**	**5/21/96**	
	Acetone	8 ug/Kg	3 ug/Kg	91
	Diethylphthalate	830 ug/Kg	370U ug/Kg	Not calculable
	Pesticides/PCBs	ND	ND	-
WF018	**Client ID**	**30B00202**	**30B00202D**	
	Laboratory ID	**RB602002**	**RB602005**	
	Collection Date	**5/23/96**	**5/23/96**	
	Acetone	7 ug/Kg	9 ug/Kg	25
	Methylene chloride	1 ug/Kg	2 ug/Kg	67
	Di-n-butylphthalate	380U ug/Kg	360 ug/Kg	Not calculable
WF019	**Client ID**	**30B00502**	**30B00502D**	
	Laboratory ID	**MB047002**	**MB047005**	
	Collection Date	**6/4/96**	**6/4/96**	
	Acetone	16 ug/Kg	14 ug/Kg	13
	Methylene chloride	2 ug/Kg	2 ug/Kg	0
	Trichloroethene	ND	1 ug/Kg	Not calculable
	Bis(2-ethylhexyl)phthalate	1000 ug/Kg	970 ug/Kg	3
	2-Methylnaphthalene	1900U ug/Kg	210 ug/Kg	Not calculable

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF019	**Client ID**	**30B00602**	**30B00602D**	
	Laboratory ID	**MB068005**	**MB068009**	
	Collection Date	**6/5/96**	**6/5/96**	
	Acetone	23 ug/Kg	31 ug/Kg	30
	Methylene chloride	5 ug/Kg	4 ug/Kg	22
	Trichloroethene	ND	1	Not calculable
	Di-n-butylphthalate	51 ug/Kg	43 ug/Kg	17
	Bis(2-ethylhexyl)phthalate	99 ug/Kg	42 ug/Kg	81
WF020	**Client ID**	**33B00302**	**33B00302D**	
	Laboratory ID	**MB080002**	**MB08007**	
	Collection Date	**6/6/96**	**6/6/96**	
	Acetone	7 ug/Kg	8 ug/Kg	13
	Methylene chloride	ND	2 ug/Kg	Not calculable
	1,2-Dichloroethene (total)	ND	4 ug/Kg	Not calculable
	Trichloroethene	ND	13 ug/Kg	Not calculable
	Bis(2-ethylhexyl)phthalate	48 ug/Kg	380U ug/Kg	Not calculable
WF020	**Client ID**	**33B00102**	**33B00102D**	
	Laboratory ID	**MB080013**	**MB080015**	
	Collection Date	**6/6/96**	**6/6/96**	
	Acetone	5 ug/Kg	5 ug/Kg	0
	Methylene chloride	ND	1 ug/Kg	Not calculable
	Di-n-butylphthalate	66 ug/Kg	45 ug/Kg	21
	Bis(2-ethylhexyl)phthalate	760 ug/Kg	370U ug/Kg	Not calculable

Table VI
Summary of Surrogate Recoveries
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF016	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
	All samples	Pesticides/PCBs	All within QC limits	-	-	None
WF017	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			6	
	12R00101	Decachlorobiphenyl	57	60-150		UJ (all detects)
		Decachlorobiphenyl	56	60-150		UJ (all detects)
	31R00101	Decachlorobiphenyl	27	60-150		UJ (all detects)
		Decachlorobiphenyl	27	60-150		UJ (all detects)
	12B00101D	Tetrachloro-m-xylene	58	60-150		UJ (all detects)
	12B00102	Tetrachloro-m-xylene	55	60-150		UJ (all detects)
		Tetrachloro-m-xylene	56	60-150		UJ (all detects)
	31B00603	Tetrachloro-m-xylene	46	60-150		UJ (all detects)
		Decachlorobiphenyl	54	60-150		UJ (all detects)
		Tetrachloro-m-xylene	49	60-150		UJ (all detects)
		Decachlorobiphenyl	53	60-150		UJ (all detects)
	31B00604	Tetrachloro-m-xylene	52	60-150		UJ (all detects)
		Decachlorobiphenyl	58	60-150		UJ (all detects)
		Tetrachloro-m-xylene	54	60-150		UJ (all detects)
WF018	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
WF019	All samples	Volatiles	All within QC limits	-	-	None
	All samples	Semivolatiles	All within QC limits	-	-	None
WF020	All samples	Volatiles	All within QC limits	-	-	None
	33B00305	Semivolatiles			1	
		2-Fluorophenol	0	25-121		R (all compounds)
		Phenol-d5	0	24-113		R (all compounds)
		2-Chlorophenol-d4	0	20-130		R (all compounds)
		1,2-Dichlorobenzene-d4	0	20-130		R (all compounds)
		Nitrobenzene-d5	0	23-120		R (all compounds)
		2-Fluorobiphenyl	0	30-115		R (all compounds)
		2,4,6-Tribromophenol	0	19-122		R (all compounds)
		Terphenyl-d14	0	18-137		R (all compounds)

Notes: J = estimated value
UJ = undetected, but number that is reported as the quantification limit is an estimated value.

Table VII
Summary of Compounds Exceeding Instrument Calibration
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF016	5/31/96	Chloromethane	48.8	26.5	UJ
	6/1/96	Chloromethane	42.0	-	UJ
	6/2/96	Chloromethane	-	37.6	UJ
	6/3/96	Chloromethane	-	33.4	UJ
	6/6/96	4-Nitroaniline	-	29.2	UJ
		Di-n-octylphthalate	-	25.2	UJ
	6/12/96	Endrin aldehyde	21.4	-	J
WF017	5/31/96	Chloromethane	48.8	26.5	UJ
	6/1/96	Chloromethane	42.0	-	UJ
	6/2/96	Chloromethane	-	37.6	UJ
	6/3/96	Chloromethane	-	33.4	UJ
	6/4/96	Chloromethane	-	64.3	UJ
		Chloroethane	-	37.9	UJ
	6/4/96	Chloromethane	-	62.2	UJ
	6/6/96	4-Nitroaniline	-	29.2	UJ
		Di-n-octylphthalate	-	25.2	UJ
	6/7/96	Butylbenzylphthalate	-	26.8	UJ
		3,3'-Dichlorobenzidine	-	32.9	UJ
		Bis(2-ethylhexyl)phthalate	-	27.4	UJ
	6/12/96	Endrin aldehyde	21.4	-	J
WF018	5/31/96	Chloromethane	48.8	26.5	UJ
	6/1/96	Chloromethane	42.0	-	UJ
	6/4/96	Chloromethane	-	64.3	UJ
		Chloroethane	-	37.9	UJ
	6/6/96	4-Nitroaniline	-	29.2	UJ
		Di-n-octylphthalate	-	25.2	UJ
WF019	All	Volatiles	-	-	None
	6/11/96	Hexachlorobenzene	-	30.8	UJ

Table VII
Summary of Compounds Exceeding Instrument Calibration
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Criteria		Qualifier
			Initial Calibration %RSD	Continuing Calibration %D	
WF020	All	Volatiles	-	-	None
	6/26/96	Bis(2-ethylhexyl)phthalate	-	28.6	UJ
		Di-n-octylphthalate	-	33.8	UJ

Notes: %RSD = percent Relative Standard Deviation for initial calibrations

%D = percent Difference for continuing calibrations

J = the compound was positively identified; the associated numerical value is the approximate concentration of the compound in the sample, either because its concentration was lower than the QL (laboratory "J" flag), or because QC criteria were not met (validation "J").

UJ = the compound was not detected above the reported sample QL. However, the reported sample QL is approximate; the compound concentration may not reliably be presumed to be less than the QL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the compound cannot be verified.

Table VIII
Summary of Method Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF016	Acetone	2 ug/Kg	BKB00101 BKB00401 BKB00401D BKB00402 BKB00201 BKB00202 BKB00301 BKB00302 BKB00501 BKB00502 BKB00601 BKB00602
	Acetone	1 ug/Kg	BKB00602D
	Bis(2-ethylhexyl)phthalate	12 ug/L	BKR00201 BKF00101
	Pestcides/PCBs	ND	-
WF017	Acetone	1 ug/Kg	31B00601 31B00605 12B00101 12B00101D 12B00102 31B00702 31B00703 31B00704 31B00705 31B00801 31B00802 31B00803
	Acetone	2 ug/Kg	31B00701 31B00804 31B00805
	Acetone	2 ug/Kg	31B00803DL 31B00804DL
	Bis(2-ethylhexylphthalate	2 ug/L	31R00101
	Bis(2-ethylhexylphthalate	2 ug/L	12R00101
	Pesticides/PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds			
SDG	**Compound**	**Concentration**	**Associated Samples**
WF018	Acetone	2 ug/Kg	30B00201 30B00203
	Acetone	2 ug/Kg	30B00202 30B00202D 30B00101 30B00102 30B00103
	Bis(2-ethylhexyl)phthalate	43 ug/Kg	30B00201 30B00202 30B00203 30B00202D 30B00101 30B00102 30B00103
WF019	Methylene chloride Acetone	5 ug/Kg 5 ug/Kg	30B00501 30B00502 30B00503 30B00502D 30B00401 30B00402 30B00403
	Acetone	5 ug/Kg	30B00601 30B00602 30B00603 30B00602D 30B00301 30B00302 30B00303 30B00305
	Bis(2-ethylhexyl)phthalate	1 ug/L	30R00201
	Bis(2-ethylhexyl)phthalate	59 ug/Kg	30B00601 30B00602 30B00603 30B00602D 30B00301 30B00302 30B00303 30B00303DL 30B00305

Table VIII
Summary of Method Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds			
SDG	**Compound**	**Concentration**	**Associated Samples**
WF020	Acetone	5 ug/Kg	33B00301 33B00302 33B00303 33B00304 33B00305 33B00302D 33B00201 33B00202 33B00203 33B00101 33B00102 33B00103 33B00102D
	Bis(2-ethylhexyl)phthalate	6 ug/L	33R00101
	Bis(2-ethylhexyl)phthalate	43 ug/Kg	33B00301 33B00302 33B00303 33B00304 33B00302D 33B00201 33B00202 33B00203 33B00101 33B00102 33B00103 33B00102D
	Bis(2-ethylhexylphthalate	300 ug/Kg	33B00305RE

Table IX
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF016	**Client ID:** BKR00201 **Laboratory ID:** RB583008 **Collection Date:** 5/20/96 **Type:** ***Equipment Rinsate***		
	Acetone	2 ug/L	None
	Di-n-butylphthalate	8 ug/L	None
	Bis(2-ethylhexyl)phthalate	3 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF016	**Client ID:** BKT00201 **Laboratory ID:** RB583010 **Collection Date:** 5/20/96 **Type:** **Trip Blank**		
	Methylene chloride	1 ug/L	None
	Acetone	13 ug/L	None
WF016	**Client ID:** BKF00101 **Laboratory ID:** RB583009 **Collection Date:** 5/20/96 **Type:** **Source Blank**		
	Acetone	23 ug/L	None
	Di-n-butylphthalate	9 ug/L	None
	Bis(2-ethylhexyl)phthalate	3 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF017	**Client ID:** 12R00101 **Laboratory ID:** RB592022 **Collection Date:** 5/21/96 **Type:** **Rinsate**		
	Acetone	8 ug/L	None
	Di-n-butylphthalate	9 ug/L	None
	Bis(2-ethylhexyl)phthalate	15 ug/L	15U ug/L[1]
	Butylbenzylphthalate	2 ug/L	None
	Pesticides/PCBs	ND	None
WF017	**Client ID:** 31R00101 **Laboratory ID:** RB592020 **Collection Date:** 5/22/96 **Type:**		
	Acetone	17 ug/L	None
	Di-n-butylphthalate	6 ug/L	None
	Bis(2-ethylhexyl)phthalate	6 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None

Table IX
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF017	**Client ID:** 31T00301 **Laboratory ID:** RB592021 **Collection Date:** 5/22/96 **Type:** Trip Blank		
	Acetone	4 ug/L	None
WF017	**Client ID:** BKT00301 **Laboratory ID:** RB592023 **Collection Date:** 5/21/96 **Type:** Trip Blank		
	Acetone	3 ug/L	None
WF018	**Client ID:** 30T00101 **Laboratory ID:** RB602011 **Collection Date:** 5/23/96 **Type:** Trip Blank		
	Methylene chloride	3 ug/L	None
	Acetone	10 ug/L	None
WF018	**Client ID:** 30R00101 **Laboratory ID:** RB602010 **Collection Date:** 5/23/96 **Type:** Rinsate		
	Acetone	6 ug/L	None
	Di-n-butylphthalate	9 ug/L	None
WF019	**Client ID:** 30T00201 **Laboratory ID:** MB047011 **Collection Date:** 6/4/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF019	**Client ID:** 30T00301 **Laboratory ID:** MB068002 **Collection Date:** 6/5/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF019	**Client ID:** 30R00201 **Laboratory ID:** MB047010 **Collection Date:** 6/4/96 **Type:** Rinsate		
	Volatiles	ND	None
	Di-n-butylphthalate	3 ug/L	None
	Bis(2-ethylhexyl)phthalate	4 ug/L	10U ug/L[1]

Table IX
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF019	**Client ID:** 30R00301 **Laboratory ID:** MB068001 **Collection Date:** 6/5/96 **Type:** Rinsate		
	Methylene chloride	3 ug/L	None
	Di-n-butylphthalate	7 ug/L	None
	Bis(2-ethylhexyl)phthalate	4 ug./L	None
WF019	**Client ID:** 30F00101 **Laboratory ID:** MB068003 **Collection Date:** 6/5/96 **Type:** Source Blank		
	Acetone	29 ug/L	None
	Di-n-butylphthalate	13 ug/L	None
WF020	**Client ID:** 33T00101 **Laboratory ID:** MB080017 **Collection Date:** 6/6/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF020	**Client ID:** 33R00101 **Laboratory ID:** MB080016 **Collection Date:** 6/6/96 **Type:** Rinsate		
	Acetone	15 ug/L	None
	Di-n-butylphthalate	13 ug/L	None
	Bis(2-ethylhexyl)phthalate	3 ug/L	10U ug/L[1]

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table X
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes								
			Criteria		% Recovery			
SDG	Client ID	Analyte	% Recovery	RPD	MS	MSD	RPD	Qualifier
WF016	BKB00401	All metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF016	BKR00201	Metals	-	-	-	-	-	None
WF016	BKF00101	Cyanide	-	-	-	-	-	None
WF017	31B00601	Lead	75-125	≤35	179.2	-	49.3	J
		Cyanide	-	-	-	-	-	None
WF018	30B00202	Lead	-	-	-	-	-	None
WF019	30B00502	Lead	-	-	-	-	-	None
WF019	30F00101	Lead	-	-	-	-	-	None
WF019	30B00601	Lead	75-125	-	66.4	-	-	J
WF020	33B00302	Lead	-	-	-	-	-	None

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF016	**Client ID**	**BKB00401**	**BKB00401D**	
	Laboratory ID	**RB583003**	**RB583004**	
	Collection Date	**5/20/96**	**5/20/96**	
	Aluminum	3600 mg/Kg	2290 mg/Kg	44
	Arsenic	0.54 mg/Kg	0.79 mg/Kg	38
	Barium	7.2 mg/Kg	6.4 mg/Kg	12
	Beryllium	ND	0.07 mg/Kg	Not calculable
	Calcium	194 mg/Kg	203 mg/Kg	5
	Chromium	3.2 mg/Kg	2.4 mg/Kg	29
	Cobalt	0.77 mg/Kg	0.58 mg/Kg	28
	Copper	1.8 mg/Kg	1.7 mg/Kg	6
	Iron	2220 mg/Kg	1660 mg/Kg	29
	Lead	1.4 mg/Kg	2.4 mg/Kg	53
	Magnesium	114 mg/Kg	93.0 mg/Kg	20
	Manganese	19.5 mg/Kg	14.5 mg/Kg	29
	Nickel	1.5 mg/Kg	ND	Not calculable
	Potassium	84.5 mg/Kg	ND	Not calculable
	Sodium	27.6 mg/Kg	22.5 mg/Kg	20
	Vavadium	4.9 mg/Kg	3.4 mg/Kg	36
	Zinc	3.9 mg/Kg	2.7 mg/Kg	36
	Cyanide	0.10 mg/Kg	0.13 mg/Kg	26
WF016	**Client ID**	**BKB00602**	**BKB00602D**	
	Laboratory ID	**RB583016**	**RB583017**	
	Collection Date	**5/21/96**	**5/21/96**	
	Aluminum	5040 mg/Kg	6050 mg/Kg	18
	Arsenic	1.4 mg/Kg	0.95 mg/Kg	38
	Barium	5.2 mg/Kg	5.9 mg/Kg	13
	Calcium	210 mg/Kg	195 mg/Kg	7
	Chromium	4.5 mg/Kg	4.7 mg/Kg	4
	Copper	2.0 mg/Kg	2.3 mg/Kg	14
	Iron	3430 mg/Kg	3820 mg/Kg	11
	Lead	1.8 mg/Kg	1.7 mg/Kg	6
	Magnesium	97.6 mg/Kg	111 mg/Kg	13
	Manganese	9.5 mg/Kg	11.1 mg/Kg	16
	Nickel	1.6 mg/Kg	ND	Not calculable
	Sodium	28.6 mg/Kg	26.2 mg/Kg	9
	Vanadium	10.3 mg/Kg	11.3 mg/Kg	9
	Zinc	3.2 mg/Kg	3.1 mg/Kg	3
	Cyanide	0.13 mg/Kg	0.16 mg/Kg	21

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF017	**Client ID**	**31B00601**	**31B00601D**	
	Laboratory ID	**RB295001**	**RB592006**	
	Collection Date	**5/21/96**	**5/21/96**	
	Aluminum	1580 mg/Kg	1760 mg/Kg	11
	Arsenic	0.44 mg/Kg	0.29 mg/Kg	41
	Barium	7.4 mg/Kg	9.6 mg/Kg	26
	Beryllium	0.07 mg/Kg	0.07 mg/Kg	0
	Cadmium	0.52 mg/Kg	0.68 mg/Kg	27
	Calcium	237 mg/Kg	297 mg/Kg	22
	Chromium	3.9 mg/Kg	5.4 mg/Kg	32
	Copper	11.4 mg/Kg	13.6 mg/Kg	18
	Iron	1120 mg/Kg	1310 mg/Kg	16
	Lead	6.3 mg/Kg	7.0 mg/Kg	11
	Magnesium	83.5 mg/Kg	98.7 mg/Kg	17
	Manganese	9.2 mg/Kg	11.3 mg/Kg	20
	Mercury	0.07 mg/Kg	0.08 mg/Kg	13
	Selenium	0.14 mg/Kg	ND mg/Kg	Not calculable
	Silver	1.1 mg/Kg	1.7 mg/Kg	43
	Sodium	23.5 mg/Kg	26.3 mg/Kg	11
	Vanadium	2.2 mg/Kg	2.4 mg/Kg	9
	Zinc	11.0 mg/Kg	15.9 mg/Kg	36
	Cyanide	0.10 mg/Kg	ND	Not calculable
WF017	**Client ID**	**12B00101**	**12B00101D**	
	Laboratory ID	**RB592007**	**RB592008**	
	Collection Date	**5/21/96**	**5/21/96**	
	Aluminum	25400 mg/Kg	8890 mg/Kg	96
	Arsenic	5.3 mg/Kg	1.2 mg/Kg	126
	Barium	18.0 mg/Kg	14.5 mg/Kg	22
	Beryllium	0.20 mg/Kg	ND	Not calculable
	Cadmium	0.57 mg/Kg	ND	Not calculable
	Calcium	495 mg/Kg	552 mg/Kg	11
	Chromium	19.9 mg/Kg	9.1 mg/Kg	74
	Copper	6.3 mg/Kg	2.9 mg/Kg	74
	Iron	16100 mg/Kg	8620 mg/Kg	61
	Lead	4.7 mg/Kg	3.4 mg/Kg	32
	Magnesium	170 mg/Kg	96.7 mg/Kg	55
	Manganese	7.7 mg/Kg	4.9 mg/Kg	44
	Mercury	0.04 mg/Kg	0.04 mg/Kg	0
	Nickel	2.5 mg/Kg	ND	Not calculable
	Potassium	81.2 mg/Kg	ND	Not calculable
	Sodium	49.8 mg/Kg	33.4 mg/Kg	39
	Vanadium	41.7 mg/Kg	26.5 mg/Kg	45
	Zinc	3.6 mg/Kg	3.7 mg/Kg	3
	Cyanide	ND	ND	None
WF018	**Client ID**	**30B00202**	**30B00202D**	
	Laboratory ID	**RB602002**	**RB602005**	
	Collection Date	**5/23/96**	**5/23/96**	
	Lead	1.8 mg/Kg	1.9 mg/Kg	5
WF019	**Client ID**	**30B00502**	**30B00502D**	
	Laboratory ID	**MB047002**	**MB047005**	
	Collection Date	**6/4/96**	**6/4/96**	
	Lead	4.3 mg/Kg	3.9 mg/Kg	10
WF019	**Client ID**	**30B00602**	**30B00602D**	
	Laboratory ID	**MB068005**	**MB068009**	
	Collection Date	**6/5/96**	**6/5/96**	
	Lead	4.5 mg/Kg	5.0 mg/Kg	11

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF020	**Client ID** **Laboratory ID** **Collection Date** Lead	**33B00302** **MB080002** **6/6/96** 7.8 mg/Kg	**33B00302D** **MB080007** **6/6/96** 7.1 mg/Kg	9
WF020	**Client ID** **Laboratory ID** **Collection Date** Lead	**33B00102** **MB080013** **6/6/96** 7.2 mg/Kg	**33B00102D** **MB080015** **6/6/96** 8.0 mg/Kg	11

Table XII
Summary of Analytes Exceeding Instrument Calibration
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Date	Analyte	Criteria		Qualifier
			Initial Calibration r	Continuing Calibration %R	
WF016	All	All metals Cyanide	- -	- -	None None
WF017	All	All metals Cyanide	- -	- -	None None
WF018	All	Lead	-	-	None
WF019	All	Lead	-	-	None
WF020	All	Lead	-	-	None

Notes: r = correlation coefficient for initial calibrations

%R = percent recovery for continuing calibrations

J = the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample because QC criteria were not met (validation "J").

UJ = the analyte was not detected above the reported sample IDL. However, the reported sample is approximate; the analyte concentration may not reliably be presumed to be less than the IDL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table XIII
Summary of Method Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes			
SDG	**Analyte**	**Concentration**	**Associated Samples**
WF016	Barium	1.760 ug/L	All water samples in SDG WF016
	Iron	31.120 ug/L	
	Sodium	88.880 ug/L	
	Zinc	16.920 ug/L	
	Aluminum	3.309 mg/Kg	All soil samples in SDG WF016
	Calcium	11.435 mg/Kg	
	Copper	0.249 mg/Kg	
	Iron	1.650 mg/Kg	
	Sodium	5.214 mg/Kg	
	Thallium	0.001 mg/Kg	
	Zinc	1.342 mg/Kg	
	Cyanide	ND	All samples in SDG WF016
WF017	Barium	1.760 ug/L	All water samples in SDG WF017
	Iron	31.120 ug/L	
	Sodium	88.880 ug/L	
	Zinc	16.920 ug/L	
	Aluminum	3.309 mg/Kg	All soil samples in SDG WF017
	Calcium	11.435 mg/Kg	
	Cobalt	0.249 mg/Kg	
	Copper	1.650 mg/Kg	
	Sodium	5.214 mg/Kg	
	Zinc	1.342 mg/Kg	
	Cyanide	ND	All samples in SDG WF017
WF018	Lead	ND	All samples in SDG WF018
WF019	Lead	2.260 ug/L	All water samples in SDG WF019
WF020	Lead	ND	All samples in SDG WF020

Table XIV
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF016	**Client ID:** BKR00201		
	Laboratory ID: RB583008		
	Collection Date: 5/20/96		
	Type: Rinsate		
	Barium	1.8 ug/L	1.7U ug/L[1]
	Iron	5.6 ug/L	5.6U ug/L[1]
	Lead	2.3 ug/L	None
	Sodium	57.5 ug/L	57.5U ug/L[1]
	Zinc	3.0 ug/L	3.0U ug/L[1]
	Cyanide	1.8 ug/L	None
WF016	**Client ID:** BKF00101		
	Laboratory ID: RB583009		
	Collection Date: 5/20/96		
	Type: Source Blank		
	Iron	6.4 ug/L	6.4U ug/L[1]
	Sodium	52.9 ug/L	52.9U ug/L[1]
	Zinc	3.8 ug/L	3.8U ug/L[1]
	Cyanide	ND	None
WF017	**Client ID:** 31R00101		
	Laboratory ID: RB592020		
	Collection Date: 5/22/96		
	Type: Rinsate		
	Aluminum	86.5 ug/L	None
	Barium	2.3 ug/L	2.3U ug/L[1]
	Calcium	503 ug/L	None
	Chromium	11.3 ug/L	None
	Copper	1.4 ug/L	None
	Iron	132 ug/L	132U ug/L[1]
	Lead	0.60 ug/L	None
	Magnesium	66.2 ug/L	None
	Manganese	3.8 ug/L	None
	Sodium	264 ug/L	None
	Zinc	7.8 ug/L	7.8U ug/L[1]
	Cyanide	ND	None
WF017	**Client ID:** 12R00101		
	Laboratory ID: RB592022		
	Collection Date: 5/21/96		
	Type: Rinsate		
	Aluminum	19.1 ug/L	None
	Barium	1.8 ug/L	1.8U ug/L[1]
	Calcium	86.5 ug/L	None
	Iron	15.6 ug/L	15.6U ug/L[1]
	Lead	0.60 ug/L	None
	Magnesium	30.5 ug/L	None
	Sodium	59.8 ug/L	None
	Zinc	3.8 ug/L	3.8U ug/L[1]
	Cyanide	ND	None

Table XIV
Summary of Field Blank Contamination
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF018	**Client ID:** 30R00101 **Laboratory ID:** RB602010 **Collection Date:** 5/23/96 **Type:** Rinsate		
	Lead	ND	None
WF019	**Client ID:** 30R00201 **Laboratory ID:** MB047010 **Collection Date:** 6/4/96 **Type:** Rinsate		
	Lead	ND	None
WF019	**Client ID:** 30R00301 **Laboratory ID:** MB068001 **Collection Date:** 6/5/96 **Type:** Rinsate		
	Lead	ND	None
WF019	**Client ID:** 30F00101 **Laboratory ID:** MB068003 **Collection Date:** 6/5/96 **Type:** Source Blank		
	Lead	2.1 ug/L	2.1U ug/L[1]
WF020	**Client ID:** 33R00101 **Laboratory ID:** MB080016 **Collection Date:** 6/6/96 **Type:** Rinsate		
	Lead	1.6 ug/L	None

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table XV
Sample Event PARCC Summary
Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF016	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF017	Volatiles	Acceptable	Acceptable	Acceptable	100[3]	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF018	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Lead	Acceptable	Acceptable	Acceptable	100	Acceptable
WF019	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100[3]	Acceptable
	Lead	Acceptable	Acceptable	Acceptable	100	Acceptable
WF020	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Lead	Acceptable	Acceptable	Acceptable	100	Acceptable

[1]Cumulative of sampling and analytical components.
[2]Analytical component.
[3]Samples results rejected for database purposes were not used in the completeness calculation.

Notes: All completeness is expressed as the ratio of number of sample results considered usable (i.e., not qualified as rejected) to the total number of sample results.

% = percent

APPENDIX A

Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida
PARCC Summary Tables

Draft Version

12/12/97

APPENDIX A

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NAS Whiting Field, Milton, Florida

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Table 1

SDG#: WF022 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1932A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
BKT01001	RB858001	TB	water	7-16-96	X				
BKR01001	RB858002	R	water	7-16-96	X	X	X	X	X
BKG00101	RB858003		water	7-16-96	X	X	X	X	X
BKG00101D	RB858004	FD	water	7-16-96	X	X	X	X	X
BKG00102	RB858005		water	7-16-96	X	X	X	X	X
BKG00102F	RB858006		water	7-16-96				X	
BKG00103	RB858007		water	7-16-96	X	X	X	X	X
BKG00202	RB858008		water	7-17-96	X	X	X	X	X
BKG00201	RB858009		water	7-17-96	X	X	X	X	X
BKF01001	RB858010	SB	water	7-17-96	X	X	X	X	X
17T01101	RB873001	TB	water	7-18-96	X				
17G00102	RB873002		water	7-18-96	X	X	X	X	X
17G00101	RB873003		water	7-18-96	X	X	X	X	X
17G00201	RB873004		water	7-18-96	X	X	X	X	X
17G00301	RB873005		water	7-18-96	X	X	X	X	X
17G00201F	RB873006		water	7-18-96				X	
01G00101	RB873007		water	7-19-96	X	X	X	X	X
01G00102	RB873008		water	7-19-96	X	X	X	X	X
01G00102D	RB873009		water	7-19-96	X	X	X	X	X
BKG00101MS	RB858003MS	MS	water	7-16-96	X	X	X	X	X
BKG00101MSD	RB858003MSD	MSD	water	7-16-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF023 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1942A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
01T01201	RB887001	TB	water	7-22-96	X				
01G00401	RB887002		water	7-22-96	X	X	X	X	X
01G00201	RB887003		water	7-22-96	X	X	X	X	X
01G00201F	RB887004		water	7-22-96				X	
01R01101	RB887005	R	water	7-23-96	X	X	X	X	X
01G00301	RB887006		water	7-23-96	X	X	X	X	X
BKG00301	RB887007		water	7-23-96	X	X	X	X	X
02G00201	RB887008		water	7-23-96	X	X	X	X	X
02G00101	RB887009		water	7-23-96	X	X	X	X	X
02G00101F	RB887010		water	7-23-96				X	
18G00301	RB887011		water	7-24-96	X	X	X	X	X
02G00301	RB887012		water	7-24-96	X	X	X	X	X
02G00301D	RB887013	FD	water	7-24-96	X	X	X	X	X
16T01301	RB887014		water	7-25-96	X				
16G00701	RB887015		water	7-25-96	X	X	X	X	X
16G00702	RB887016		water	7-25-96	X	X	X	X	X
16G00702DL	RB887016DL		water	7-25-96	X				
16G00703	RB887017		water	7-25-96	X	X	X	X	X
16G00703DL	RB887017DL		water	7-25-96	X				
18G00201	RB887018		water	7-26-96	X	X	X	X	X
02G00301MS	RB887012MS	MS	water	7-24-96	X	X	X	X	X
02G00301MSD	RB887012MSD	MSD	water	7-24-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF024 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1943A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
18T01401	RB920001	TB	water	7-29-96	X				
18G00101	RB920002		water	7-29-96	X	X	X	X	X
15G00401	RB920003		water	7-30-96	X	X	X	X	X
BKG00203	RB920004		water	7-30-96	X	X	X	X	X
15R01201	RB920005	R	water	7-31-96	X	X	X	X	X
BKG00203F	RB920006		water	7-30-96				X	
15G00702	RB920007		water	7-31-96	X	X	X	X	X
15G00702F	RB920008		water	7-31-96				X	
15G00701	RB920009		water	7-31-96	X	X	X	X	X
15G00701D	RB920010	FD	water	7-31-96	X	X	X	X	X
15G00701MS	RB920009MS	MS	water	7-31-96	X	X	X	X	X
15G00701MSD	RB920009MSD	MSD	water	7-31-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF025 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1956A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
15T01501	RB956001	TB	water	8-5-96	X				
15G00703	RB956002		water	8-5-96	X	X	X	X	X
15G00503	RB956003		water	8-6-96	X	X	X	X	X
15G00503DL	RB956003DL		water	8-6-96	X				
15G00502	RB956004		water	8-6-96	X	X	X	X	X
15G00501	RB956005		water	8-6-96	X	X	X	X	X
15G00601	RB956006		water	8-7-96	X	X	X	X	X
15G00603	RB956007		water	8-7-96	X	X	X	X	X
15G00601D	RB956008	FD	water	8-7-96	X	X	X	X	X
15G00503F	RB956009		water	8-6-96				X	
15G00501F	RB956010		water	8-6-96				X	
15R01301	RB956011	R	water	8-7-96	X	X	X	X	X
15T01601	RB956012	TB	water	8-8-96	X				
15G00301	RB956013		water	8-8-96	X	X	X	X	X
15G00302	RB956014		water	8-8-96	X	X	X	X	X
15G00303	RB956015		water	8-9-96	X	X	X	X	X
15G00101	RB956016		water	8-8-96	X	X	X	X	X
15G00203	RB956017		water	8-9-96	X	X	X	X	X
15G00301F	RB956018		water	8-8-96				X	
15G00203F	RB956019		water	8-9-96				X	
15G00601MS	RB956006MS	MS	water	8-7-96	X	X	X	X	X
15G00601MSD	RB956006MSD	MSD	water	8-7-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF026 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1957A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
15T01701	RB980001	TB	water	8-12-96	X				
15G00202	RB980002		water	8-12-96	X	X	X	X	X
15G00201	RB980003		water	8-13-96	X	X	X	X	X
15G00802	RB980004		water	8-13-96	X	X	X	X	X
15G00802R	RB980004R		water	8-13-96		X			
15G00801	RB980005		water	8-13-96	X	X	X	X	X
16G00201	RB980006		water	8-14-96	X	X	X	X	X
15G00803	RB980007		water	8-14-96	X	X	X	X	X
16G00803D	RB980008	FD	water	8-14-96	X	X	X	X	X
15G00202F	RB980009		water	8-12-96				X	
15G00201F	RB980010		water	8-13-96				X	
15G00802F	RB980011		water	8-13-96				X	
15R01401	RB980012	R	water	8-14-96	X	X	X	X	X
15G00803F	RB980013		water	8-14-96				X	
16G00201F	RB980014		water	8-14-96				X	
16T01801	RB980015	TB	water	8-15-96	X				
16G00202	RB980016		water	8-15-96	X	X	X	X	X
16G00202DL	RB980016DL		water	8-15-96	X				
16G00203	RB980017		water	8-15-96	X	X	X	X	X
16G00602	RB980018		water	8-15-96	X	X	X	X	X
16G00601	RB980019		water	8-16-96	X	X	X	X	X
16G00403	RB980020		water	8-16-96	X	X	X	X	X
16G00403DL	RB980020DL		water	8-16-96	X				
16G00403D	RB980021		water	8-16-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF026 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1957A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
16G00403DDL	RB980021DL		water	8-16-96	X				
16G00601F	RB980022		water	8-16-96				X	
16G00403F	RB980023		water	8-16-96				X	
15G00803MS	RB980007MS	MS	water	8-14-96	X	X	X	X	X
15G00803MSD	RB980007MSD	MSD	water	8-14-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF025					VALIDATION SAMPLE TABLE	LDC#: 1970A
Project Name: NAS Whiting Field					Parameters/Analytical Method	Job#: 8532-20
Client ID #	Lab ID #	QC Type	Matrix	Date Collected	Pesticides/PCBs	
15G00502RE	RB956004RE		water	8-6-96	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF027 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1970B

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
16T01901	RC016001	TB	water	8-19-96	X				
16G00401	RC016002		water	8-19-96	X	X	X	X	X
16G00402	RC016003		water	8-19-96	X	X	X	X	X
16G00101	RC016004		water	8-19-96	X	X	X	X	X
16G00301	RC016005		water	8-20-96	X	X	X	X	X
16G00302	RC016006		water	8-20-96	X	X	X	X	X
16G00304	RC016007		water	8-20-96	X	X	X	X	X
16G00303	RC016008		water	8-21-96	X	X	X	X	X
16G00501	RC016009		water	8-21-96	X	X	X	X	X
16G00303F	RC016010		water	8-21-96				X	
16G00501F	RC016011		water	8-21-96				X	
16R01501	RC016012	R	water	8-21-96	X	X	X	X	X
16G00501D	RC016013	FD	water	8-21-96	X	X	X	X	X
66T02001	RC016014	TB	water	8-22-96	X				
66G02101	RC016015		water	8-22-96	X	X	X	X	X
66G02103	RC016016		water	8-22-96	X	X	X	X	X
66G02102	RC016017		water	8-22-96	X	X	X	X	X
09G00101	RC016018		water	8-23-96	X	X	X	X	X
09G00301	RC016019		water	8-23-96	X	X	X	X	X
09G00301D	RC016020	FD	water	8-23-96	X	X	X	X	X
66G02102F	RC016021		water	8-23-96				X	
09G00301F	RC016022		water	8-23-96				X	
16G00501MS	RC016009MS	MS	water	8-21-96	X	X	X	X	X
16G00501MSD	RC016009MSD	MSD	water	8-21-96	X	X	X	X	X

TR = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF028 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1974A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
10T02101	RC044001	TB	water	8-26-96	X				
09G00201	RC044002		water	8-26-96	X	X	X	X	X
10G00101	RC044003		water	8-26-96	X	X	X	X	X
10G00201	RC044004		water	8-26-96	X	X	X	X	X
11G00402	RC044005		water	8-26-96	X	X	X	X	X
11G00102	RC044006		water	8-27-96	X	X	X	X	X
11G00401	RC044007		water	8-27-96	X	X	X	X	X
11T02201	RC044008	TB	water	8-28-96	X				
11G00301	RC044009		water	8-28-96	X	X	X	X	X
11G00101	RC044010		water	8-28-96	X	X	X	X	X
11G00201	RC044011		water	8-28-96	X	X	X	X	X
12G00101	RC044012		water	8-27-96	X	X	X	X	X
12G00201	RC044013		water	8-27-96	X	X	X	X	X
11G00201F	RC044014		water	8-28-96				X	
11G00301F	RC044015		water	8-28-96				X	
11R01601	RC044016		water	8-28-96	X	X	X	X	X
12G00101D	RC044017	FD	water	8-27-96	X	X	X	X	X
11G00201D	RC044018	FD	water	8-28-96	X	X	X	X	X
12G00101MS	RC044012MS	MS	water	8-27-96	X	X	X	X	X
12G00101MSD	RC044012MSD	MSD	water	8-27-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF029 | **VALIDATION SAMPLE TABLE** | **LDC#:** 1989A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
13T02301	RC092001	TB	water	9-9-96	X				
13G00101	RC092002		water	9-9-96	X	X	X	X	X
13G00102	RC092003		water	9-9-96	X	X	X	X	X
13G00201	RC092004		water	9-10-96	X	X	X	X	X
13G00103	RC092005		water	9-10-96	X	X	X	X	X
14G00201	RC092006		water	9-10-96	X	X	X	X	X
14G00101	RC092007		water	9-11-96	X	X	X	X	X
13R01701	RC092008	R	water	9-11-96	X	X	X	X	X
14G00101D	RC092009	FD	water	9-11-96	X	X	X	X	X
13G00103F	RC092010		water	9-10-96				X	
66T02401	RC092011	TB	water	9-12-96	X				
66G00901	RC092012		water	9-12-96	X	X	X	X	X
66G00904	RC092013		water	9-12-96	X	X	X	X	X
66G00902	RC092014		water	9-13-96	X	X	X	X	X
66G00903	RC092015		water	9-13-96	X	X	X	X	X
66G00903F	RC092016		water	9-13-96				X	
14G00101MS	RC092007MS	MS	water	9-11-96	X	X	X	X	X
14G00101MSD	RC092007MSD	MSD	water	9-11-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF030 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2000A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
66T02501	RC121001	TB	water	9-16-96	X				
66G00801	RC121002		water	9-16-96	X	X	X	X	X
66G00802	RC121003		water	9-16-96	X	X	X	X	X
66G00803	RC121004		water	9-17-96	X	X	X	X	X
66G00804	RC121005		water	9-17-96	X	X	X	X	X
66G00602	RC121006		water	9-17-96	X	X	X	X	X
66G00601	RC121007		water	9-18-96	X	X	X	X	X
66G00603	RC121008		water	9-18-96	X	X	X	X	X
66G00804F	RC121009		water	9-17-96				X	
66R01801	RC121010		water	9-18-96	X	X	X	X	X
66G00601D	RC121011	FD	water	9-18-96	X	X	X	X	X
66T02601	RC121012	TB	water	9-19-96	X				
66G00604	RC121013		water	9-19-96	X	X	X	X	X
66G02201	RC121014		water	9-19-96	X	X	X	X	X
66G02202	RC121015		water	9-19-96	X	X	X	X	X
66G02203	RC121016		water	9-20-96	X	X	X	X	X
66G02203D	RC121017	FD	water	9-20-96	X	X	X	X	X
66G00601MS	RC121007MS	MS	water	9-18-96	X	X	X	X	X
66G00601MSD	RC121007MSD	MSD	water	9-18-96	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF031 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2031A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA	SVOA	Pesticides /PCBs	Metals	Cyanide
05T02701	MB928001	TB	water	9-23-96	X				
05G00801	MB928002		water	9-23-96	X	X	X	X	X
05G00802	MB928003		water	9-23-96	X	X	X	X	X
05G00901	MB928004		water	9-24-96	X	X	X	X	X
05G00902	MB928005		water	9-24-96	X	X	X	X	X
05G01002	MB928006		water	9-24-96	X	X	X	X	X
05G01001	MB928007		water	9-25-96	X	X	X	X	X
05G00301	MB928008		water	9-25-96	X	X	X	X	X
05G00301RE	MB928008RE		water	9-25-96		X			
05G00801F	MB928009		water	9-23-96				X	
05G00902F	MB928010		water	9-24-96				X	
05R01901	MB928011	R	water	9-25-96	X	X	X	X	X
05G01001D	MB928012	FD	water	9-25-96	X	X	X	X	X
33T02801	MB958001	TB	water	9-26-96	X				
05G00101	MB958002		water	9-26-96	X	X	X	X	X
33G00501	MB958003		water	9-26-96	X	X	X	X	X
33G00201	MB958004		water	9-26-96	X	X	X	X	X
33G00101	MB958005		water	9-27-96	X	X	X	X	X
33G00301	MB958006		water	9-27-96	X	X	X	X	X
33G00301D	MB958007	FD	water	9-27-96	X	X	X	X	X
05G01001MS	MB928007MS	MS	water	9-25-96	X	X	X	X	X
05G01001MSD	MB928007MSD	MSD	water	9-25-96	X	X	X		
05G01001DUP	MB928007DUP	DUP	water	9-25-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF031B | **VALIDATION SAMPLE TABLE** | **LDC#:** 2121A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 7560-32

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals (CLP-2.1)	Cyanide
05G01002	MC447001		water	11-21-96	X	X	X	X	X
16T04001	MC447002	TB	water	11-21-96	X				

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF032 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2046A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
06T02901	MC011001	TB	water	9-30-96	X				
33G00401	MC011002		water	9-30-96	X	X	X	X	X
06G00102	MC011003		water	10-1-96	X	X	X	X	X
06G00101	MC011004		water	10-1-96	X	X	X	X	X
06G00301	MC011005		water	10-2-96	X	X	X	X	X
06R02001	MC011006	R	water	10-2-96	X	X	X	X	X
29G00501	MC011007		water	10-2-96	X	X	X	X	X
29G00501D	MC011008	FD	water	10-2-96	X	X	X	X	X
29T03001	MC037001	TB	water	10-3-96	X				
29G00101	MC037002		water	10-3-96	X	X	X	X	X
66G01201	MC037003		water	10-3-96	X	X	X	X	X
66G00102	MC037004		water	10-4-96	X	X	X	X	X
29G00501MS	MC011007MS	MS	water	10-2-96	X	X	X	X	X
29G00501MSD	MC011007MSD	MSD	water	10-2-96	X	X	X		
29G00501DUP	MC011007DUP	DUP	water	10-2-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF033 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2069A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
29T03101	MC085001	TB	water	10-7-96	X				
26G00401	MC085002		water	10-7-96	X	X	X	X	X
26G00301	MC085003		water	10-8-96	X	X	X	X	X
66G00202	MC085004		water	10-8-96	X	X	X	X	X
29G00201	MC085005		water	10-8-96	X	X	X	X	X
66G01901	MC085006		water	10-9-96	X	X	X	X	X
66R02101	MC085007	R	water	10-9-96	X	X	X	X	X
66T03201	MC118001	TB	water	10-10-96	X				
66G00201	MC118002		water	10-9-96	X	X	X	X	X
66G00201D	MC118003	FD	water	10-9-96	X	X	X	X	X
07G00101	MC118004		water	10-10-96	X	X	X	X	X
30G00501	MC118005		water	10-10-96	X	X	X	X	X
66G00301	MC118006		water	10-11-96	X	X	X	X	X
66G00201MS	MC118002MS	MS	water	10-9-96	X	X	X	X	X
66G00201MSD	MC118002MSD	MSD	water	10-9-96	X	X	X		
66G00201DUP	MC118002DUP	DUP	water	10-9-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF034 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2070A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
66T03301	MC153001	TB	water	10-14-96	X				
66G02001	MC153002		water	10-14-96	X	X	X	X	X
66G00302	MC153003		water	10-15-96	X	X	X	X	X
66G01801	MC153004		water	10-16-96	X	X	X	X	X
30G00301	MC153005		water	10-16-96	X	X	X	X	X
30G00401	MC153006		water	10-16-96	X	X	X	X	X
66R02201	MC153007	R	water	10-16-96	X	X	X	X	X
30G00301D	MC153008	FD	water	10-16-96	X	X	X	X	X
66T03401	MC176001	TB	water	10-17-96	X				
66G01101	MC176002		water	10-17-96	X	X	X	X	X
66G01301	MC176003		water	10-17-96	X	X	X	X	X
66G00501	MC176004		water	10-18-96	X	X	X	X	X
66G00501F	MC176005		water	10-18-96				X	
30G00301MS	MC153005MS	MS	water	10-16-96	X	X	X	X	X
30G00301MSD	MC153005MSD	MSD	water	10-16-96	X	X	X		
30G00301DUP	MC153005DUP	DUP	water	10-16-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

ble 1

SDG#: WF035 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2076A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
66T03501	MC214001	TB	water	10-21-96	X				
66G00401	MC214002		water	10-21-96	X	X	X	X	X
66G01601	MC214003		water	10-22-96	X	X	X	X	X
66G01501	MC214004		water	10-22-96	X	X	X	X	X
66G01701	MC214005		water	10-23-96	X	X	X	X	X
66R02301	MC214006	R	water	10-23-96	X	X	X	X	X
66G01701D	MC214007	FD	water	10-23-96	X	X	X	X	X
66T03601	MC231001	TB	water	10-24-96	X				
66G00101	MC231002		water	10-24-96	X	X	X	X	X
08G00101	MC231003		water	10-24-96	X	X	X	X	X
66G01001	MC231004		water	10-25-96	X	X	X	X	X
66G01701MS	MC214005MS	MS	water	10-23-96	X	X	X	X	X
66G01701MSD	MC214005MSD	MSD	water	10-23-96	X	X	X		
66G01701DUP	MC214005DUP	DUP	water	10-23-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF036 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2077A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
66T03701	MC262001	TB	water	10-28-96	X				
66G00701	MC262002		water	10-29-96	X	X	X	X	X
54G00201	MC262003		water	10-29-96	X	X	X	X	X
54G00101	MC262004		water	10-30-96	X	X	X	X	X
31G00201	MC262005		water	10-30-96	X	X	X	X	X
31G00201F	MC262006		water	10-30-96				X	
54R02401	MC262007	R	water	10-30-96	X	X	X	X	X
54G00101D	MC262008	FD	water	10-30-96	X	X	X	X	X
31T03801	MC284001	TB	water	10-31-96	X				
31G00301	MC284002		water	10-31-96	X	X	X	X	X
31G00402	MC284003		water	10-31-96	X	X	X	X	X
31G00403	MC284004		water	11-1-96	X	X	X	X	X
54G00101MS	MC262004MS	MS	water	10-30-96	X	X	X	X	X
54G00101MSD	MC262004MSD	MSD	water	10-30-96	X	X	X		
54G00101DUP	MC262004DUP	DUP	water	10-30-96				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF037 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2071A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 8532-20

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)	SVOA (CLP-1.9)	Pesticides /PCBs (CLP-1.9)	Metals	Cyanide
15T03901	MC424001	TB	water	11-18-96	X				
15G00502	MC424002		water	11-18-96	X				
15G00503	MC424003		water	11-18-96	X				
16G00202	MC424004		water	11-19-96	X				
16G00203	MC424005		water	11-19-96	X				
15G00802	MC424006		water	11-20-96	X				
15G00803	MC424007		water	11-20-96	X				
15G00803D	MC424008	FD	water	11-20-96	X				
15R02501	MC424009	R	water	11-20-96	X				
15F00201	MC424010		water	11-20-96	X	X	X	X	X
16G00702	MC448001		water	11-21-96	X				
16G00703	MC448002		water	11-21-96	X				
16G00403	MC448003		water	11-22-96	X				
16T04001	MC448004	TB	water	11-21-96	X				
15G00803MS	MC424007MS	MS	water	11-20-96	X				
15G00803MSD	MC424007MSD	MSD	water	11-20-96	X				

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF038 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2099A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 7560-32

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)
36T04101	MC687001	TB	water	12-17-96	X
36BO0101	MC687002		soil	12-17-96	X
36BO0102	MC687003		soil	12-17-96	X
36BO0103	MC687004		soil	12-17-96	X
36BO0201	MC687005		soil	12-17-96	X
36BO0202	MC687006		soil	12-17-96	X
36BO0203	MC687007		soil	12-17-96	X
36BO0301	MC687008		soil	12-17-96	X
36BO0302	MC687009		soil	12-17-96	X
36BO0303	MC687010		soil	12-17-96	X
36BO0303D	MC687011	FD	soil	12-17-96	X
36BO0401	MC687012		soil	12-18-96	X
36BO0401DL	MC687012DL		soil	12-18-96	X
36BO0402	MC687013		soil	12-18-96	X
36BO0403	MC687014		soil	12-18-96	X
36BO0403D	MC687015	FD	soil	12-18-96	X
36RO2601	MC687016	R	water	12-18-96	X
36BO0303MS	MC687011MS	MS	soil	12-17-96	X
36BO0303MSD	MC687011MSD	MSD	soil	12-17-96	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF039 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2102A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 7560-32

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)
35TO4201	MC698001	TB	water	12-19-96	X
35BO0101	MC698002		soil	12-20-96	X
35BO0102	MC698003		soil	12-20-96	X
35BO0102DL	MC698003DL		soil	12-20-96	X
35BO0103	MC698004		soil	12-20-96	X
35BO0104	MC698005		soil	12-20-96	X
35BO0105	MC698006		soil	12-20-96	X
35BO0106	MC698007		soil	12-21-96	X
35BO0201	MC698008		soil	12-21-96	X
35BO0202	MC698009		soil	12-21-96	X
35BO0203	MC698010		soil	12-21-96	X
35RO2701	MC698011	R	water	12-21-96	X
35BO0301	MC698012		soil	12-21-96	X
35BO0302	MC698013		soil	12-21-96	X
35BO0303	MC698014		soil	12-21-96	X
35BO0302D	MC698015	FD	soil	12-21-96	X
35BO0203D	MC698016	FD	soil	12-21-96	X
35BO0203MS	MC698010MS	MS	soil	12-21-96	X
35BO0203MSD	MC698010MSD	MSD	soil	12-21-96	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF040 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2120A

Project Name: NAS Whiting Field | Parameters/Analytical Method | **Job#:** 7560-32

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (CLP-1.9)
35TO4301	MC783001	TB	water	1-7-97	X
35BO0401	MC783002		soil	1-7-97	X
35BO0402	MC783003		soil	1-7-97	X
35BO0403	MC783004		soil	1-7-97	X
35BO0501	MC783005		soil	1-7-97	X
35BO0501DL	MC783005DL		soil	1-7-97	X
35BO0502	MC783006		soil	1-7-97	X
35BO0503	MC783007		soil	1-7-97	X
35BO0201	MC783008		soil	1-8-97	X
35BO0202	MC783009		soil	1-8-97	X
35BO0203	MC783010		soil	1-8-97	X
35BO0101	MC783011		soil	1-8-97	X
35BO0102	MC783012		soil	1-8-97	X
35BO0103	MC783013		soil	1-8-97	X
35BO0301	MC783014		soil	1-9-97	X
35BO0302	MC783015		soil	1-9-97	X
35BO0303	MC783016		soil	1-9-97	X
35R02801	MC783017	R	water	1-9-97	X
35BO0203D	MC783018	FD	soil	1-8-97	X
35BO0103D	MC783019	FD	soil	1-8-97	X
35BO0203MS	MC783010MS	MS	soil	1-8-97	X
35BO0203MSD	MC783010MSD	MSD	soil	1-8-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF041 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2323A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)	Pesticides /PCBs (1.9)	Metals (2.1)
35T04501	MD908001	TB	water	6-11-97	X			
35F00301	MD908002		water	6-11-97	X	X	X	X
35R03001	MD908003	R	water	6-11-97	X	X	X	X
35G00101	MD908004		water	6-11-97	X	X	X	X
35G00101D	MD908005	FD	water	6-11-97	X	X	X	X
35G00101DRE	MD908005RE	FD	water	6-11-97		X		
35G00103	MD908006		water	6-11-97	X	X	X	X
35G00103F	MD908007		water	6-11-97				X
35G00102	MD908008		water	6-12-97	X	X	X	X
37G00102	MD908009		water	6-12-97	X	X	X	X
37T04601	MD926001	TB	water	6-12-97	X			
36G00101	MD926002		water	6-12-97	X	X	X	X
36G00101F	MD926003		water	6-12-97				X
37G00101	MD926004		water	6-12-97	X	X	X	X
36G00102	MD926005		water	6-13-97	X	X	X	X
36G00102RE	MD926005RE		water	6-13-97		X		
36G00103	MD926006		water	6-13-97	X	X	X	X
36G00103RE	MD926006RE		water	6-13-97		X		
35T04701	MD950001	TB	water	6-15-97	X			
35G00202	MD950002		water	6-15-97	X	X	X	X
35G00202D	MD950003	FD	water	6-15-97	X	X	X	X
35G00203	MD950004		water	6-15-97	X	X	X	X
35G00201	MD950005		water	6-16-97	X	X	X	X
35G00201F	MD950006		water	6-16-97				X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF041 **VALIDATION SAMPLE TABLE** **LDC#:** 2323A

Project Name: NAS Whiting Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)	Pesticides /PCBs (1.9)	Metals (2.1)
13T04801	MD985001	TB	water	6-16-97	X			
13G00301	MD985002		water	6-16-97	X	X	X	X
13G00301F	MD985003		water	6-16-97				X
13G00401	MD985004		water	6-16-97	X	X	X	X
35G00101MS	MD908004MS	MS	water	6-11-97	X	X	X	X
35G00101MSD	MD908004MSD	MSD	water	6-11-97	X	X	X	
35G00101DUP	MD908004DUP	DUP	water	6-11-97				X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

ble 1

SDG#: WF042 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2311A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
05T04901	ME007001	TB	water	6-18-97	X
05G00301	ME007002		water	6-17-97	X
05G00901	ME007003		water	6-18-97	X
05G00902	ME007004		water	6-19-97	X
05G00902D	ME007005	FD	water	6-19-97	X
05R03101	ME007006	R	water	6-17-97	X
05T05001	ME021001		water	6-20-97	X
05G01001	ME021002		water	6-20-97	X
05G01002	ME021003		water	6-20-97	X
05G00902MS	ME007004MS	MS	water	6-19-97	X
05G00902MSD	ME007004MSD	MSD	water	6-19-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF043 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2315A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
05T05101	ME042001	TB	water	6-23-97	X
05R03201	ME042002	R	water	6-23-97	X
05G00801	ME042003		water	6-24-97	X
05G00802	ME042004		water	6-24-97	X
05G00802D	ME042005	FD	water	6-24-97	X
33T05201	ME053001	TB	water	6-24-97	X
33G00501	ME053002		water	6-24-97	X
33G00101	ME053003		water	6-24-97	X
33G00201	ME053004		water	6-25-97	X
33G00301	ME053005		water	6-25-97	X
33G00301DL	ME053005DL		water	6-25-97	X
33T05301	ME073001	TB	water	6-25-97	X
06G00102	ME073002		water	6-26-97	X
06G00301	ME073003		water	6-26-97	X
33G00401	ME073004		water	6-26-97	X
30T05401	ME087001	TB	water	6-26-97	X
07G00101	ME087002		water	6-26-97	X
07G00101D	ME087003	FD	water	6-26-97	X
30G00501	ME087004		water	6-26-97	X
30G00301	ME087005		water	6-27-97	X
30G00401	ME087006		water	6-27-97	X
05G00802MS	ME042004MS	MS	water	6-24-97	X
05G00802MSD	ME042004MSD	MSD	water	6-24-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF044 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2322A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
06T05501	ME100001	TB	water	6-29-97	X
06R03301	ME100002	R	water	6-29-97	X
66G00201	ME100003		water	6-29-97	X
06G00101	ME100004		water	6-29-97	X
66G00202	ME100005		water	6-30-97	X
66T05601	ME110001	TB	water	6-30-97	X
66G01201	ME110002		water	6-30-97	X
66G01201D	ME110003	FD	water	6-30-97	X
66G00102	ME110004		water	7-1-97	X
66G01301	ME110005		water	7-1-97	X
66T05701	ME133001	TB	water	7-2-97	X
66G00401	ME133002		water	7-2-97	X
66G02001	ME133003		water	7-2-97	X
66T05801	ME135001	TB	water	7-2-97	X
66G00603	ME135002		water	7-2-97	X
66G00603D	ME135003	FD	water	7-2-97	X
66G00604	ME135004		water	7-2-97	X
66G00601	ME135005		water	7-3-97	X
66G00602	ME135006		water	7-3-97	X
66G01201MS	ME110002MS	MS	water	6-30-97	X
66G01201MSD	ME110002MSD	MSD	water	6-30-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF045 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2345A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)	Pesticides /PCBs (1.9)	Metals (2.1)	Cyanide
OWT05901	ME149001	TB	water	7-7-97	X				
OWR03401	ME149002	R	water	7-7-97	X	X	X	X	X
OWG00501	ME149003		water	7-8-97	X	X	X	X	X
OWG00502	ME149004		water	7-8-97	X	X	X	X	X
OWG00502D	ME149005	FD	water	7-8-97	X	X	X	X	X
OWG00503	ME149006		water	7-8-97	X	X	X	X	X
OWG00503F	ME149007		water	7-8-97				X	
OWT06001	ME159001	TB	water	7-8-97	X				
OWG00101	ME159002		water	7-9-97	X	X	X	X	X
OWG00101RE	ME159002RE		water	7-9-97		X			
OWG00102	ME159003		water	7-9-97	X	X	X	X	X
OWG00102RE	ME159003RE		water	7-9-97		X			
OWG00103	ME159004		water	7-9-97	X	X	X	X	X
OWG00103RE	ME159004RE		water	7-9-97		X			
66T06101	ME175001	TB	water	7-9-97	X				
66G02301	ME175002		water	7-9-97	X	X	X	X	X
66G02301RE	ME175002RE		water	7-9-97		X			
66G02302	ME175003		water	7-9-97	X	X	X	X	X
66G02303	ME175004		water	7-10-97	X	X	X	X	X
OWT06201	ME190001	TB	water	7-10-97	X				
OWG00302	ME190002		water	7-10-97	X	X	X	X	X
OWG00302D	ME190003	FD	water	7-10-97	X	X	X	X	X
OWG00303	ME190004		water	7-10-97	X	X	X	X	X
OWG00301	ME190005		water	7-11-97	X	X	X	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF045 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2345A

Project Name: NAS Whiting

					Parameters/Analytical Method				
Client ID #	**Lab ID #**	**QC Type**	**Matrix**	**Date Collected**	**VOA (1.9)**	**SVOA (1.9)**	**Pesticides /PCBs (1.9)**	**Metals (2.1)**	**Cyanide**
OWG00301F	ME190006		water	7-11-97				X	
OWT06401	ME226001	TB	water	7-14-97	X				
OWT06401DL	ME226001DL		water	7-14-97	X				
OWG00401	ME226002		water	7-14-97	X	X	X	X	X
OWG00201	ME226003		water	7-15-97	X	X	X	X	X
OWG00502MS	ME149004MS	MS	water	7-8-97	X	X	X	X	X
OWG00502MSD	ME149004MSD	MSD	water	7-8-97	X	X	X		
OWG00502DUP	ME149004DUP	DUP	water	7-8-97				X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF046 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2377A

Project Name: NAS Whiting

					Parameters/Analytical Method				
Client ID #	**Lab ID #**	**QC Type**	**Matrix**	**Date Collected**	**VOA (1.9)**	**SVOA (1.9)**	**Pesticides /PCBs (1.9)**	**Metals (4.0)**	**Cyanide**
OWT06501	ME241001	TB	water	7-15-97	X				
31R03301	ME241002	R	water	7-15-97	X	X	X	X	X
31G00101	ME241003		water	7-15-97	X	X	X	X	X
31G00101D	ME241004	FD	water	7-15-97	X	X	X	X	X
OWT06601	ME261001	TB	water	7-16-97	X				
31G00401	ME261002		water	7-16-97	X	X	X	X	X
31G00402	ME261003		water	7-16-97	X				
31G00403	ME261004		water	7-16-97	X				
31G00301	ME261005		water	7-16-97	X				
31T06701	ME305001	TB	water	7-21-97	X				
31G00201	ME305002		water	7-21-97	X				
31G00101MS	ME241003MS	MS	water	7-15-97	X	X	X	X	
31G00101MSD	ME241003MSD	MSD	water	7-15-97	X	X	X		
31G00101DUP	ME241003DUP	DUP	water	7-15-97				X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF047 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2346A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA OLV01.0	Metals (2.1)
39W028	ME243001		water	7-15-97	X	
39W027	ME243002		water	7-15-97	X	
39W024	ME243003		water	7-15-97	X	
39W032	ME243004		water	7-15-97	X	X
39W034	ME243005		water	7-15-97	X	X
39W034D	ME243006		water	7-15-97	X	X
39W031	ME243007		water	7-15-97	X	
STOR_BLK	ME243008		water	7-17-97	X	
39T10001	ME244001	TB	water	7-15-97	X	
39W001	ME244002		water	7-15-97	X	
39W002	ME244003		water	7-15-97	X	X
39W003	ME244004		water	7-15-97	X	
39W004	ME244005		water	7-15-97	X	
39W005	ME244006		water	7-15-97	X	
39W006	ME244007		water	7-15-97	X	
39W007	ME244008		water	7-15-97	X	
39W008	ME244009		water	7-15-97	X	
39W014	ME267001		water	7-16-97	X	
39W015	ME267002		water	7-16-97	X	
39W016	ME267003		water	7-16-97	X	X
39W012	ME267004		water	7-16-97	X	
39W012D	ME267005	FD	water	7-16-97	X	
39W013	ME267006		water	7-16-97	X	
39W017	ME267007		water	7-16-97	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF047 **VALIDATION SAMPLE TABLE** **LDC#:** 2346A

Project Name: NAS Whiting Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA OLV01.0	Metals (2.1)
STOR_BLK2	ME267008		water	7-18-97	X	
39W034MS	ME243005MS	MS	water	7-15-97	X	X
39W034MSD	ME243005MSD	MSD	water	7-15-97	X	
39W034DUP	ME243005DUP	DUP	water	7-15-97		X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF048 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2338A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
39D002	ME245001		soil	7-15-97	X
39D001	ME245002		soil	7-15-97	X
39D007	ME245003		soil	7-15-97	X
39D023	ME264001		soil	7-16-97	X
39D026	ME264002		soil	7-16-97	X
39D016	ME264003		soil	7-16-97	X
39D013	ME264004		soil	7-16-97	X
39D019	ME264005		soil	7-17-97	X
39D018	ME264006		soil	7-17-97	X
39D018D	ME264007	FD	soil	7-17-97	X
39D022	ME264008		soil	7-17-97	X
39R03401	ME264009	R	water	7-16-97	X
39D018MS	ME264006MS	MS	soil	7-17-97	X
39D018MSD	ME264006MSD	MSD	soil	7-17-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF049 **VALIDATION SAMPLE TABLE** **LDC#:** 2347A

Project Name: NAS Whiting Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	SVOA (1.9)
39T10201	ME262001	TB	water	7-15-97	X	
39W023	ME262002		water	7-16-97	X	
39W026	ME262003		water	7-16-97	X	
39W025	ME262004		water	7-16-97	X	
39W029	ME262005		water	7-16-97	X	
39W030	ME262006		water	7-16-97	X	
39U001	ME262007		water	7-16-97	X	X
39W018	ME263001		water	7-17-97	X	
39W019	ME263002		water	7-17-97	X	
39W020	ME263003		water	7-17-97	X	
39W021	ME263004		water	7-17-97	X	
39W021D	ME263005	FD	water	7-17-97	X	
39W022	ME263006		water	7-17-97	X	
39T10401	ME263007	TB	water	7-17-97	X	
39W021MS	ME263004MS	MS	water	7-17-97	X	
39W021MSD	ME263004MSD	MSD	water	7-17-97	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF051 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2360A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	Metals (CLP)
16T06801	ME306001	TB	water	7-21-97	X	
16R03501	ME306002	R	water	7-21-97	X	
16G00401	ME306003		water	7-22-97	X	
16G00401D	ME306004	FD	water	7-22-97	X	
16G00402	ME306005		water	7-22-97	X	
16G00403	ME306006		water	7-22-97	X	
16T06901	ME322001	TB	water	7-22-97	X	
16G00302	ME322002		water	7-22-97	X	X
16G00303	ME322003		water	7-22-97	X	X
16G00202	ME322004		water	7-23-97	X	X
16G00203	ME322005		water	7-23-97	X	X
16T07001	ME340001	TB	water	7-23-97	X	
16G00601	ME340002		water	7-23-97	X	X
16G00601F	ME340003		water	7-23-97		X
16G00602	ME340004		water	7-23-97	X	X
16R03601	MW340005	R	water	7-23-97		X
16G00304	ME340006		water	7-24-97	X	X
16G00304F	ME340007		water	7-24-97		X
16G00301	ME340008		water	7-24-97	X	X
16G00101	ME340009		water	7-24-97	X	X
16G00101D	ME340010	FD	water	7-24-97	X	X
16T07101	ME348001	TB	water	7-25-97	X	
16G00702	ME348002		water	7-25-97	X	X
16G00702DL	ME348002DL		water	7-25-97	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF051 **VALIDATION SAMPLE TABLE** **LDC#:** 2360A

Project Name: NAS Whiting Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	Metals (CLP)
16G00703	ME348003		water	7-25-97	X	X
16G00703DL	ME348003DL		water	7-25-97	X	
16G00701	ME348004		water	7-25-97	X	X
16G00401MS	ME306003MS	MS	water	7-22-97	X	
16G00401MSD	ME306003MSD	MSD	water	7-22-97	X	

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

SDG#: WF052 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2354A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (OLV01.0)
39018	ME346001		water	7-25-97	X
39019	ME346002		water	7-25-97	X
39020	ME346003		water	7-25-97	X
39021	ME346004		water	7-25-97	X
39020D	ME346005	FD	water	7-25-97	X
39029	ME346006		water	7-25-97	X
39T10501	ME346007	TB	water	7-25-97	X
STORAGEBLK	ME346008		water	7-26-97	X
39020MS	ME346003MS	MS	water	7-25-97	X
39020MSD	ME346003MSD	MSD	water	7-25-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF053 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2384A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	Metals (2.1)
15T07201	ME367001	TB	water	7-27-97	X	
15R03701	ME367002	R	water	7-27-97	X	X
15G00601	ME367003		water	7-27-97	X	X
15G00602	ME367004		water	7-27-97	X	X
15G00602D	ME367005	FD	water	7-27-97	X	X
15T07301	ME377001	TB	water	7-28-97	X	
15G00201	ME377002		water	7-28-97	X	X
15G00101	ME377003		water	7-28-97	X	X
15G00202	ME377004		water	7-29-97	X	X
15G00203	ME377005		water	7-29-97	X	X
15T07401	ME390001	TB	water	7-29-97	X	
15G00301	ME390002		water	7-29-97	X	X
15G00302	ME390003		water	7-29-97	X	X
15G00701	ME390004		water	7-30-97	X	X
15G00702	ME390005		water	7-30-97	X	X
15T07501	ME404001	TB	water	7-30-97	X	
15G00401	ME404002		water	7-30-97	X	X
15G00703	ME404003		water	7-30-97	X	X
15G00703D	ME404004	FD	water	7-30-97	X	X
15G00501	ME404005		water	7-31-97	X	X
15G00501F	ME404006		water	7-31-97		X
15G00502	ME404007		water	7-31-97	X	X
15G00503	ME404008		water	7-31-97	X	X
15G00602MS	ME367004MS	MS	water	7-27-97	X	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF053 **VALIDATION SAMPLE TABLE** **LDC#:** 2384A

Project Name: NAS Whiting Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	Metals (2.1)
15G00602MSD	ME367004MSD	MSD	water	7-27-97	X	
15G00602DUP	ME367004DUP	DUP	water	7-27-97		X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table 1

SDG#: WF054 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2399A

Project Name: NAS Whiting | Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)	Metals (2.1)
15T07601	ME441001	TB	water	8-4-97	X	
15G00801	ME441002		water	8-4-97	X	X
15G00801D	ME441003	FD	water	8-4-97	X	X
15G00802	ME441004		water	8-4-97	X	X
15R03801	ME441005	R	water	8-5-97	X	X
15G00803	ME441006		water	8-5-97	X	X
15G00303	ME441007		water	8-5-97	X	X
30T07701	ME450001	TB	water	8-5-97	X	
30R03901	ME450002	R	water	8-6-97	X	X
30G00302	ME450003		water	8-6-97	X	X
15G00801MS	ME441002MS	MS	water	8-4-97	X	X
15G00801MSD	ME441002MSD	MSD	water	8-4-97	X	
15G00801DUP	ME441002DUP	DUP	water	8-4-97		X

Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

ble 1

SDG#: WF055 | **VALIDATION SAMPLE TABLE** | **LDC#:** 2511A

Project Name: NAS Whiting

Parameters/Analytical Method

Client ID #	Lab ID #	QC Type	Matrix	Date Collected	VOA (1.9)
OWT08001	MF004001	TB	water	10-27-97	X
OWR04101	MF004002	R	water	10-27-97	X
OWG00401	MF004003		water	10-27-97	X
OWG00401D	MF004004		water	10-27-97	X
13R04201	MF004005	R	water	10-28-97	X
13G00401	MF004006		water	10-28-97	X
OWG00401MS	MF004003MS	MS	water	10-27-97	X
OWG00401MSD	MF004003MSD	MSD	water	10-27-97	X

TB = Trip Blank, R = Rinsate, SB = Source Blank, FD = Field Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, DUP = Duplicate

Table II
Summary of Rejected Data (Organics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Fraction	Sample	Compound	Reason
WF022	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBS	All samples	No rejected results	-
WF023	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF024	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF025	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF026	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF027	Volatiles	16G00501	2-Butanone	Initial & Continuing Calibration (RRF)
		16G00501D	2-Butanone	
		16R01501	2-Butanone	
		66G02101	2-Butanone	
		66G02103	2-Butanone	
		66T02001	2-Butanone	
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF028	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF029	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF030	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF031	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF031B	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF032	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	29G00501	Heptachlor epoxide	Target compound identification (RT)
		29G00501D	Heptachlor epoxide	
WF033	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF034	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF035	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-

Table II
Summary of Rejected Data (Organics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds				
SDG	**Fraction**	**Sample**	**Compound**	**Reason**
WF036	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF037	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF038	Volatiles	All samples	No rejected results	-
WF039	Volatiles	All samples	No rejected results	-
WF040	Volatiles	All samples	No rejected results	-
WF041	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF042	Volatiles	All samples	No rejected results	-
WF043	Volatiles	All samples	No rejected results	-
WF044	Volatiles	All samples	No rejected results	-
WF045	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF046	Volatiles Semivolatiles Pesticides & PCBs	All samples All samples All samples	No rejected results No rejected results No rejected results	- - -
WF047	Volatiles	39T10001 39W001 39W002 39W003 39W004 39W005 39W006 39W007 39W008 39W012 39W012D 39W013 39W014 39W015 39W016 39W017 39W024 39W027 39W028 39W031 39W032 39W034 39W034D STOR_BLK STOR_BLK2	Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone 2-Butanone 2-Butanone 2-Butanone 2-Butanone Acetone & 2-Butanone 2-Butanone Acetone & 2-Butanone 2-Butanone 2-Butanone	Initial & Continuing Calibration (RRF)
WF048	Volatiles	All samples	No rejected results	-

Table II
Summary of Rejected Data (Organics)
Groundwater and Subsurface Soil Investigation. Phase IIB
NAS Whiting Field. Milton Florida

Organic Compounds				
SDG	**Fraction**	**Sample**	**Compound**	**Reason**
WF049	Volatiles	39T10201 39T10401 39W016 39W019 39W020 39W021 39W021D 39W022 39W023 39W025 39W026 39W029 39W030	Acetone & 2-Butanone Acetone & 2-Butanone Acetone 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone 2-Butanone 2-Butanone	Initial & Continuing calibration (RRF)
WF049	Semivolatiles	All samples	No rejected results	-
WF051	Volatiles	All samples	No rejected results	-
WF052	Volatiles	39G018 39G019 39G020 39G020D 39G021 39G029 39R10501 STORAGE BLK	Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone & 2-Butanone Acetone	Initial & Continuing Calibration (RRF)
WF053	Volatiles	All samples	No rejected results	-
WF054	Volatiles	All samples	No rejected results	-
WF055	Volatiles	All samples	No rejected results	-

Table III
Summary of Rejected Data (Inorganics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes				
SDG	**Fraction**	**Sample**	**Analyte**	**Reason**
WF022	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF023	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF024	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF025	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF026	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF027	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF028	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF029	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF030	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF031	All metals	All samples	No rejected results	-
	Cyanide	05G00101	Cyanide	Matrix spike (%R)
		05G00301	Cyanide	
		05G00801	Cyanide	
		05G00802	Cyanide	
		05G00901	Cyanide	
		05G00902	Cyanide	
		05G01001	Cyanide	
		05G01001D	Cyanide	
		05G01002	Cyanide	
		05R01901	Cyanide	
		33G00101	Cyanide	
		33G00201	Cyanide	
		33G00301	Cyanide	
		33G00301D	Cyanide	
		33G00501	Cyanide	
WF031B	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF032	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF033	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF034	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF035	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF036	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-
WF037	All metals	All samples	No rejected results	-
	Cyanide	15F00201	Cyanide	Matrix spike (%R)
WF041	All metals	All samples	No rejected results	-
	Cyanide	All samples	No rejected results	-

Table III
Summary of Rejected Data (Inorganics)
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes				
SDG	**Fraction**	**Sample**	**Analyte**	**Reason**
WF045	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF046	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF047	All metals	All samples	No rejected results	-
WF051	All metals	All samples	No rejected results	-
WF053	All metals	All samples	No rejected results	-
WF054	All metals	All samples	No rejected results	-

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF022	BKG00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Chloro-3-methylphenol	23-97	-	108	115	-	J (all detects)
		4-Nitrophenol	10-80	-	88	93	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	100	108	-	J (all detects)
		Pentachlorophenol	9-103	-	106	118	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF023	02G00301	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	88	82	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	97	-	-	J (all detects)
		Pentachlorophenol	9-103	-	139	122	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF024	15G00701	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	100	102	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	102	106	-	J (all detects)
		Pentachlorophenol	9-103	-	147	148	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF025	15G00601	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	99	102	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	101	103	-	J (all detects)
		Pentachlorophenol	9-103	-	124	130	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF026	15G00803	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Chloro-3-methylphenol	23-97	-	99	-	-	J (all detects)
		4-Nitrophenol	10-80	-	108	114	-	J (all detects)
		Pentachlorophenol	9-103	-	140	144	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	-	100	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF027	16G00501	Volatiles						
		Benzene	-	≤11	-	-	12	J
		Semivolatiles						
		4-Nitrophenol	10-80	-	91	91	-	J (all detects)
		Pentachlorophenol	9-103	-	104	104	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF028	12G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	83	-	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF029	14G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	88	91	-	J (all detects)
		Pentachlorophenol	9-103	-	-	106	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None
WF030	66G00601	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	85	89	-	J (all detects)
		Pesticides/PCBs	-	-	-	-	-	None

Table IV

Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF031	05G01001	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		Phenol	-	≤42	-	-	50	None
		2-Chlorophenol	-	≤40	-	-	50	None
		4-Chloro-3-methylphenol	-	≤42	-	-	51	None
		4-Nitrophenol	10-80	≤50	-	95	58	None
		Pentachlorophenol	-	≤50	-	-	52	None
		1,4-Dichlorobenzene	-	≤28	-	-	45	J
		N-Nitroso-di-n-propylamine	-	≤38	-	-	56	J
		1,2,4-Trichlorobenzene	-	≤28	-	-	41	J
		Acenaphthene	-	≤31	-	-	84	J
		2,4-Dinitrotoluene	-	≤38	-	-	52	J
		Pyrene	-	≤31	-	-	54	J
		Pesticides/PCBs	-	-	-	-	-	None
WF031B	None	Volatiles	-	-	-	-	-	-
		Semivolatiles	-	-	-	-	-	-
		Pesticides/PCBs	-	-	-	-	-	-
WF032	29G00501	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides/PCBs	-	-	-	-	-	None
WF033	66G00201	Volatiles						
		1,1-Dichloroethene	-	≤14	-	-	16	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	-	83	-	None
		Pesticides & PCBs	-	-	-	-	-	None
WF034	30G00301	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		Acenaphthene	46-118	≤31	44	-	37	None
		1,4-Dichlorobenzene	-	≤28	-	-	33	None
		1,2,4-Trichlorobenzene	-	≤28	-	-	34	None
		2,4-Dinitrotoluene	-	≤38	-	-	40	None
		Pyrene	-	≤31	-	-	36	None

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF034 cont.	30G00301	Pesticides/PCBs	-	-	-	-	-	None
WF035	66G01701	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides/PCBs	-	-	-	-	-	None
WF036	54G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	101	81	-	None
		1,4-Dichlorobenzene	-	≤28	-	-	30	J
		1,2,4-Trichlorobenzene	-	≤28	-	-	36	J
		Pesticides/PCBs	-	-	-	-	-	None
WF037	15G00803	Volatiles	-	-	-	-	-	None
WF038	36BO0303	Volatiles	-	-	-	-	-	None
WF039	35BO0203	Volatiles	-	-	-	-	-	None
WF040	37BO0203	Volatiles	-	-	-	-	-	None
WF041	35G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles	-	-	-	-	-	None
		Pesticides & PCBs						
		Aldrin	40-120	-	124	121	-	J (all detects)
WF042	05G00902	Volatiles	-	-	-	-	-	None
WF043	05G00802	Volatiles	-	-	-	-	-	None
WF044	66G01201	Volatiles						
		Trichloroethene	-	≤14	-	-	40	None
WF045	OWG00502	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	96	109	-	J (all detects)
		2,4-Dinitrotoluene	24-96	-	-	100	-	J (all detects)

Table IV
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike/Matrix Spike Duplicates
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Criteria		% Recovery		RPD	Qualifier
			% Recovery	RPD	MS	MSD		
WF045 cont.	OWG00502	Pesticides & PCBs						
		gamma-BHC	-	≤15	-	-	28	J
		Heptachlor	-	≤20	-	-	24	J
		Aldrin	40-120	≤22	-	128	29	J
		Dieldrin	52-126	≤18	-	134	22	J
		Endrin	56-121	≤21	-	144	22	J
WF046	31G00101	Volatiles	-	-	-	-	-	None
		Semivolatiles						
		4-Nitrophenol	10-80	-	88	96	-	J (all detects)
		Pesticides & PCBs						
		Endrin	56-121	-	127	-	-	J (all detects)
WF047	39W034	Volatiles	-	-	-	-	-	None
WF048	39D018	Volatiles	-	-	-	-	-	None
WF049	39W021	Volatiles	-	-	-	-	-	None
	None	Semivolatiles	-	-	-	-	-	None
WF051	16G00401	Volatiles	-	-	-	-	-	None
WF052	39020	Volatiles	-	-	-	-	-	None
WF053	15G00602	Volatiles	-	-	-	-	-	None
WF054	15G00801	Volatiles	-	-	-	-	-	None
WF055	13G00401	Volatiles	-	-	-	-	-	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF022	**Client ID**	**BKG00101**	**BKG00101D**	
	Laboratory ID	**RB858003**	**RB858004**	
	Collection Date	**7/16/96**	**7/16/96**	
	Acetone	ND	8 ug/L	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides/PCBs	ND	ND	-
WF022	**Client ID**	**01G00102**	**01G00102D**	
	Laboratory ID	**RB873008**	**RB873009**	
	Collection Date	**7/19/96**	**7/19/96**	
	Acetone	4 ug/L	2 ug/L	67
	Semivolatiles	ND	ND	-
	Pesticides/PCBs	ND	ND	-
WF023	**Client ID**	**02G00301**	**02G00301D**	
	Laboratory ID	**RB887012**	**RB887013**	
	Collection Date	**7/24/96**	**7/24/96**	
	Acetone	ND	10 ug/L	Not calculable
	Carbon disulfide	1 ug/L	ND	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides/PCBs	ND	ND	-
WF024	**Client ID**	**15G00701**	**15G00701D**	
	Laboratory ID	**RB920009**	**RB920010**	
	Collection Date	**7/31/96**	**7/31/96**	
	Acetone	2	ND	Not calculable
	Semivolatiles	ND	ND	-
	Pesticides/PCBs	ND	ND	-
WF025	**Client ID**	**15G00601**	**15G00601D**	
	Laboratory ID	**RB956006**	**RB956008**	
	Collection Date	**8/7/96**	**8/7/96**	
	Acetone	5 ug/L	8 ug/L	46
	1,2-Dichloroethene (total)	1 ug/L	1 ug/L	0
	Chlorobenzene	5 ug/L	5 ug/L	0
	Ethylbenzene	10U ug/L	1 ug/L	Not calculable
	1,4-Dichlorobenzene	12 ug/L	12 ug/L	0
	Naphthalene	4 ug/L	4 ug/L	0
	Diethylphthalate	1 ug/L	1 ug/L	0
	Pesticides/PCBs	ND	ND	-
WF026	**Client ID**	**15G00803**	**15G00803D**	
	Laboratory ID	**RB980007**	**RB980008**	
	Collection Date	**8/14/96**	**8/14/96**	
	Acetone	25 ug/L	5 ug/L	133
	2-Butanone	7 ug/L	10U ug/L	Not calculable
	Trichloroethene	4 ug/L	4 ug/L	0
	Bis(2-ethylhexyl)phthalate	2 ug/L	1 ug/L	67
	4,4'-DDT	0.16 ug/L	0.079 ug/L	68

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF026	**Client ID**	**16G00403**	**16G00403D**	
	Laboratory ID	**RB980020**	**RB980021**	
	Collection Date	**8/16/96**	**8/16/96**	
	Acetone	3 ug/L	2 ug/L	40
	1,2-Dichloroethene (total)	1 ug/L	2 ug/L	67
	Benzene	600 ug/L	600 ug/L	0
	Phenol	8 ug/L	8 ug/L	0
	Naphthalene	1 ug/L	2 ug/L	67
	Bis(2-ethylhexyl)phthalate	1 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF026	**Client ID**	**16G00403DL**	**16G00403DDL**	
	Laboratory ID	**RB980020DL**	**RB9890021DL**	
	Collection Date	**8/16/96**	**8/16/96**	
	Acetone	18 ug/L	24 ug/L	29
	Benzene	700 ug/L	740 ug/L	6
WF027	**Client ID**	**16G00501**	**16G00501D**	
	Laboratory ID	**RC016009**	**RC016013**	
	Collection Date	**8/21/96**	**8/21/96**	
	Volatiles	ND	ND	None
	Bis(2-ethylhexyl)phthalate	2 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF027	**Client ID**	**09G00301**	**09G00301D**	
	Laboratory ID	**RC016019**	**RC016020**	
	Collection Date	**8/23/96**	**8/23/96**	
	Acetone	46 ug/L	18 ug/L	88
	2-Butanone	2 ug/L	10U ug/L	Not calculable
	Semivolatiles	ND	ND	None
	Pesticides/PCBs	ND	ND	None
WF028	**Client ID**	**11G00201**	**11G00201D**	
	Laboratory ID	**RC044011**	**RC044018**	
	Collection Date	**8/28/96**	**8/28/96**	
	Acetone	5 ug/L	11 ug/L	75
	Phenol	4 ug/L	6 ug/L	40
	Bis(2-ethylhexyl)phthalate	5 ug/L	4 ug/L	22
	Pesticides/PCBs	ND	ND	None
WF028	**Client ID**	**12G00101**	**12G00101D**	
	Laboratory ID	**RC044012**	**RC044017**	
	Collection Date	**8/27/96**	**8/27/96**	
	Acetone	3 ug/L	6 ug/L	67
	Bis(2-ethylhexyl)phthalate	2 ug/L	2 ug/L	0
	Pesticides/PCBs	ND	ND	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF029	**Client ID**	**14G00101**	**14G00101D**	
	Laboratory ID	**RC092007**	**RC092009**	
	Collection Date	**9/11/96**	**9/11/96**	
	Acetone	8 ug/L	4 ug/L	67
	Carbon disulfide	3 ug/L	10U ug/L	Not calculable
	Methylene chloride	1 ug/L	10U ug/L	Not calculable
	Bis(2-ethylhexyl)phthalate	4 ug/L	4 ug/L	0
	Pesticides/PCBs	ND	ND	None
WF030	**Client ID**	**66G00601**	**66G00601D**	
	Laboratory ID	**RC121007**	**RC121011**	
	Collection Date	**9/18/96**	**9/18/96**	
	Acetone	2 ug/L	8 ug/L	120
	Methylene chloride	2 ug/L	10U ug/L	Not calculable
	Bis(2-ethylhexyl)phthalate	2 ug/L	3 ug/L	40
	Pesticides/PCBs	ND	ND	None
WF030	**Client ID**	**66G02203**	**66G02203D**	
	Laboratory ID	**RC121016**	**RC121017**	
	Collection Date	**9/20/96**	**9/20/96**	
	Acetone	4 ug/L	10U ug/L	Not calculable
	Bis(2-ethylhexyl)phthalate	2 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF031	**Client ID**	**05G01001**	**05G01001D**	
	Laboratory ID	**MB928007**	**MB928012**	
	Collection Date	**9/25/96**	**9/25/96**	
	Volatiles	ND	ND	None
	Semivolatiles	ND	ND	None
	Pesticides/PCBs	ND	ND	None
WF031	**Client ID**	**33G00301**	**33G00301D**	
	Laboratory ID	**MB958006**	**MB958007**	
	Collection Date	**9/27/96**	**9/27/96**	
	1,1-Dichloroethene	5 ug/L	6 ug/L	18
	1,2-Dichloroethene (total)	4 ug/L	3 ug/L	29
	Trichloroethene	300 ug/L	300 ug/L	0
	Di-n-butylphthalate	1 ug/L	1 ug/L	0
	Pesticides/PCBs	ND	ND	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF032	**Client ID**	**29G00501**	**29G00501D**	
	Laboratory ID	**MC011007**	**MC011008**	
	Collection Date	**10/2/96**	**10/2/96**	
	Volatiles	ND	ND	None
	Semivolatiles	ND	ND	None
	Pesticides/PCBs	ND	ND	None
WF033	**Client ID**	**66G00201**	**66G00201D**	
	Laboratory ID	**MC118002**	**MC118003**	
	Collection Date	**10/9/96**	**10/9/96**	
	Trichloroethene	1 ug/L	1 ug/L	0
	Toluene	1 ug/L	1 ug/L	0
	Semivolatiles	ND	ND	None
	Pesticides/PCBs	ND	ND	None
WF034	**Client ID**	**30G00301**	**30G00301D**	
	Laboratory ID	**MC153005**	**MC153008**	
	Collection Date	**10/16/96**	**10/16/96**	
	1,2-Dichloroethene (total)	31 ug/L	31 ug/L	0
	Trichloroethene	340 ug/L	340 ug/L	0
	Di-n-butylphthalate	2 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF035	**Client ID**	**66G01701**	**66G01701D**	
	Laboratory ID	**MC214005**	**MC214007**	
	Collection Date	**10/23/96**	**10/23/96**	
	Volatiles	ND	ND	None
	Di-n-butylphthalate	3 ug/L	2 ug/L	40
	Pesticides/PCBs	ND	ND	None
WF036	**Client ID**	**54G00101**	**54G00101D**	
	Laboratory ID	**MC262004**	**MC262008**	
	Collection Date	**10/30/96**	**10/30/96**	
	Volatiles	ND	ND	None
	Diethylphthalate	1 ug/L	10U ug/L	Not calculable
	Di-n-butylphthalate	1 ug/L	10U ug/L	Not calculable
	Pesticides/PCBs	ND	ND	None
WF037	**Client ID**	**15G00803**	**15G00803D**	
	Laboratory ID	**MC424007**	**MC424008**	
	Collection Date	**11/20/96**	**11/20/96**	
	Trichloroethene	5 ug/L	5 ug/L	0
WF038	**Client ID**	**36BO0303**	**36BO0303D**	
	Laboratory ID	**MC687010**	**MC687011**	
	Collection Date	**12/17/96**	**12/17/96**	
	Volatiles	ND	ND	None

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF038	**Client ID**	**36BO0403**	**36BO0403D**	
	Laboratory ID	**MC687014**	**MC687015**	
	Collection Date	**12/18/96**	**12/18/96**	
	Volatiles	ND	ND	None
WF039	**Client ID**	**35BO0302**	**35BO0302D**	
	Laboratory ID	**MC698013**	**MC698015**	
	Collection Date	**12/21/96**	**12/21/96**	
	Volatiles	ND	ND	None
WF039	**Client ID**	**35BO0203**	**35BO0203D**	
	Laboratory ID	**MC698010**	**MC698016**	
	Collection Date	**12/21/96**	**12/21/96**	
	Volatiles	ND	ND	None
WF040	**Client ID**	**37BO0203**	**37BO0203D**	
	Laboratory ID	**MC783010**	**MC783018**	
	Collection Date	**1/8/97**	**1/8/97**	
	Acetone	14 ug/Kg	12 ug/Kg	15
	Methylene chloride	2 ug/Kg	10 ug/Kg	133
WF040	**Client ID**	**37BO0103**	**37BO0103D**	
	Laboratory ID	**MC783013**	**MC783019**	
	Collection Date	**1/8/97**	**1/8/97**	
	Acetone	18 ug/Kg	22 ug/Kg	20
	Methylene chloride	3 ug/Kg	11 ug/Kg	114
WF041	**Client ID**	**35G00101**	**35G00101D**	
	Laboratory ID	**MD908004**	**MD908005**	
	Collection Date	**6/11/97**	**6/11/97**	
	Volatiles			
	1,1-Dichlcroethene	6 ug/L	7 ug/L	15
	1,1,1-Trichloroethane	2 ug/L	2 ug/L	0
	Xylene (total)	2 ug/L	1 ug/L	67
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF041	**Client ID**	**35G00202**	**35G00202D**	
	Laboratory ID	**MD950002**	**MD950003**	
	Collection Date	**6/15/97**	**6/15/97**	
	Volatiles			
	Chloroform	3 ug/L	3 ug/L	0
	Semivolatiles			
	Bis(2-ethylhexyl)phthalate	10U ug/L	5 ug/L	Not calculable
	Pesticides & PCBs	ND	ND	-
WF042	**Client ID**	**05G00902**	**05G00902D**	
	Laboratory ID	**ME007004**	**ME007005**	
	Collection Date	**6/19/97**	**6/19/97**	
	Volatiles	ND	ND	-

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF043	**Client ID**	**05G00802**	**05G00802D**	
	Laboratory ID	**ME042004**	**ME042005**	
	Collection Date	**6/24/97**	**6/24/97**	
	Volatiles			
	Benzene	1 ug/L	10U ug/L	Not calculable
	Trichloroethene	4 ug/L	10U ug/L	Not calculable
	Xylenes (total)	1 ug/L	10U ug/L	Not calculable
WF043	**Client ID**	**07G00101**	**07G00101D**	
	Laboratory ID	**ME087002**	**ME087003**	
	Collection Date	**6/26/97**	**6/26/97**	
	Acetone	540 ug/L	490 ug/L	10
	Benzene	3900 ug/L	4400 ug/L	12
	Toluene	14000 ug/L	16000 ug/L	13
	Ethylbenzene	1800 ug/L	2000 ug/L	10
	Xylenes, total	3200 ug/L	3600 ug/L	12
WF044	**Client ID**	**66G01201**	**66G01201D**	
	Laboratory ID	**ME110002**	**ME110003**	
	Collection Date	**6/30/97**	**6/30/97**	
	Volatiles			
	1,1-Dichloroethene	3 ug/L	2 ug/L	40
	1,2-Dichloroethene (total)	3 ug/L	3 ug/L	0
	Trichloroethene	120 ug/L	96 ug/L	22
WF044	**Client ID**	**66G00603**	**66G00603D**	
	Laboratory ID	**ME135002**	**ME135003**	
	Collection Date	**7/2/97**	**7/2/97**	
	Volatiles			
	Trichloroethene	1 ug/L	1 ug/L	0
WF045	**Client ID**	**OWG00502**	**OWG00502D**	
	Laboratory ID	**ME149004**	**ME149005**	
	Collection Date	**7/8/97**	**7/8/97**	
	Volatiles			
	Acetone	3 ug/Kg	2 ug/Kg	40
	Semivolatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
WF045	**Client ID**	**OWG00302**	**OWG00302D**	
	Laboratory ID	**ME190002**	**ME190003**	
	Collection Date	**7/10/97**	**7/10/97**	
	Volatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
	Semivolatiles			
	Di-n-butylphthalate	4 ug/L	6 ug/L	40
WF046	**Client ID**	**31G00101**	**31G00101D**	
	Laboratory ID	**ME241003**	**ME241004**	
	Collection Date	**7/15/97**	**7/15/97**	
	Volatiles	ND	ND	-
	Pesticides & PCBs	ND	ND	-
	Semivolatiles			
	Di-n-butylphthalate	6 ug/L	3 ug/L	67

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF047	**Client ID**	**39W034**	**39W034D**	
	Laboratory ID	**ME243005**	**ME243006**	
	Collection Date	**7/15/97**	**7/15/97**	
	Volatiles			
	Acetone	4 ug/L	5U ug/L	Not calculable
	Carbon disulfide	1U ug/L	1 ug/L	Not calculable
WF047	**Client ID**	**39W012**	**39W012D**	
	Laboratory ID	**ME267004**	**ME267005**	
	Collection Date	**7/16/97**	**7/16/97**	
	Volatiles			
	Methylene chloride	2U ug/L	1 ug/L	Not calculable
	Benzene	2 ug/L	2 ug/L	0
WF048	**Client ID**	**39D018**	**39D018D**	
	Laboratory ID	**ME264006**	**ME264007**	
	Collection Date	**7/17/97**	**7/17/97**	
	Volatiles			
	Acetone	27 ug/Kg	27 ug/Kg	0
	Trichloroethene	2 ug/Kg	2 ug/Kg	0
WF049	**Client ID**	**39W021**	**39W021D**	
	Laboratory ID	**ME263004**	**ME263005**	
	Collection Date	**7/17/97**	**7/17/97**	
	Volatiles	ND	ND	-
WF051	**Client ID**	**16G00401**	**16G00401D**	
	Laboratory ID	**ME306003**	**ME306003**	
	Collection Date	**7/22/97**	**7/22/97**	
	Volatiles			
	Acetone	18 ug/L	14 ug/L	25
WF051	**Client ID**	**16G00101**	**16G00101D**	
	Laboratory ID	**ME340009**	**ME340010**	
	Collection Date	**7/24/97**	**7/24/97**	
	Volatiles	ND	ND	-
WF052	**Client ID**	**39020**	**39020D**	
	Laboratory ID	**ME346004**	**ME346005**	
	Collection Date	**7/25/97**	**7/25/97**	
	Volatiles	ND	ND	-
WF053	**Client ID**	**15G00602**	**15G00602D**	
	Laboratory ID	**ME367004**	**ME367005**	
	Collection Date	**7/27/97**	**7/27/97**	
	Volatiles			
	Trichloroethene	2 ug/L	2 ug/L	0
WF053	**Client ID**	**15G00703**	**15G00703D**	
	Laboratory ID	**ME404003**	**ME404004**	
	Collection Date	**7/30/97**	**7/30/97**	
	Volatiles			
	1,2-Trichloroethene (total)	1 ug/L	2 ug/L	67
	Trichloroethene	36 ug/L	38 ug/L	5
	1,1-Dichloroethene	2 ug/L	10U ug/L	Not calculable

Table V
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Organic Compounds			RPD
WF054	**Client ID**	**15G00801**	**15G00801D**	
	Laboratory ID	**ME441002**	**ME441003**	
	Collection Date	**8/4/97**	**8/4/97**	
	Volatiles			
	Chlorobenzene	4 ug/L	4 ug/L	0
WF055	**Client ID**	**OWG00401**	**OWG00401D**	
	Laboratory ID	**MF004003**	**MF004004**	
	Collection Date	**10/27/97**	**10/27/97**	
	Volatiles	ND	ND	-

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF022	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			10	
	BKR01001	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	58	60-150		J
	BKG00101	Tetrachloro-m-xylene	59	60-150		J
		Tetrachloro-m-xylene	57	60-150		J
	BKG00102	Decachlorobiphenyl	37	60-150		J
		Decachlorobiphenyl	37	60-150		J
	BKG00103	Decachlorobiphenyl	40	60-150		J
		Decachlorobiphenyl	41	60-150		J
	BKG00202	Decachlorobiphenyl	47	60-150		J
		Decachlorobiphenyl	47	60-150		J
	BKG00201	Decachlorobiphenyl	43	60-150		J
		Decachlorobiphenyl	43	60-150		J
	BKF01001	Tetrachloro-m-xylene	59	60-150		J
		Tetrachloro-m-xylene	59	60-150		J
		Decachlorobiphenyl	51	60-150		J
		Decachlorobiphenyl	47	60-150		J
	17G00101	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	56	60-150		J
	17G00201	Decachlorobiphenyl	22	60-150		J
		Decachlorobiphenyl	21	60-150		J
	01G00102D	Decachlorobiphenyl	59	60-150		J
		Decachlorobiphenyl	56	60-150		J
WF023	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			5	
	01G00201	Decachlorobiphenyl	32	60-150		J
		Decachlorobiphenyl	28	60-150		J
	01G00301	Decachlorobiphenyl	49	60-150		J
		Decachlorobiphenyl	47	60-150		J
	02G00101	Decachlorobiphenyl	41	60-150		J
		Decachlorobiphenyl	42	60-150		J
	16G00703	Decachlorobiphenyl	59	60-150		J
		Decachlorobiphenyl	55	60-150		J
	18G00301	Decachlorobiphenyl	48	60-150		J
		Decachlorobiphenyl	46	60-150		J

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF024	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	BKG00203	Decachlorobiphenyl	52	60-150	-	J
		Decachlorobiphenyl	48	60-150	-	J
WF025	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			5	
	15G00101	Decachlorobiphenyl	21	60-150		J
		Decachlorobiphenyl	20	60-150		J
	15G00303	Tetrachloro-m-xylene	57	60-150		J
		Tetrachloro-m-xylene	58	60-150		J
	15G00502	Tetrachloro-m-xylene	155	60-150		J (all detects)
		Tetrachloro-m-xylene	162	60-150		J (all detects)
	15R01301	Decachlorobiphenyl	59	60-150		J
	15G00502RE	Decachlorobiphenyl	53	60-150		J
		Decachlorobiphenyl	54	60-150		J
WF026	All	Volatiles	All within QC limits	-	-	None
		Semivolatiles			2	
	15G00802	2-Fluorobiphenyl	161	43-116		J (all detects) all B/N
		Terphenyl-d14	163	33-141		J (all detects) all B/N
	15G00802R	2-Fluorobiphenyl	182	43-116		J (all detects) all B/N
		Terphenyl-d14	153	33-141		J (all detects) all B/N

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF026 cont.		Pesticides/PCBs			9	
	15G00201	Decachlorobiphenyl	52	60-150		J
		Decachlorobiphenyl	50	60-150		J
	15G00202	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	58	60-150		J
	15G00801	Decachlorobiphenyl	43	60-150		J
		Decachlorobiphenyl	38	60-150		J
	15G00803	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	58	60-150		J
	16G00201	Decachlorobiphenyl	43	60-150		J
		Decachlorobiphenyl	37	60-150		J
	16G00203	Decachlorobiphenyl	44	60-150		J
		Decachlorobiphenyl	43	60-150		J
	16G00403	Decachlorobiphenyl	40	60-150		J
		Decachlorobiphenyl	39	60-150		J
	16G00403D	Decachlorobiphenyl	47	60-150		J
		Decachlorobiphenyl	46	60-150		J
	16G00601	Decachlorobiphenyl	25	60-150		J
		Decachlorobiphenyl	25	60-150		J
WF027	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			2	
	16G00304	Decachlorobiphenyl	46	60-150		J
		Decachlorobiphenyl	43	60-150		J
	66G02103	Decachlorobiphenyl	58	60-150		J
		Decachlorobiphenyl	58	60-150		J
WF028	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			5	
	10G00101	Decachlorobiphenyl	50	60-150		J
		Decachlorobiphenyl	48	60-150		J
	11G00101	Decachlorobiphenyl	47	60-150		J
		Decachlorobiphenyl	47	60-150		J
	11G00301	Decachlorobiphenyl	25	60-150		J
		Decachlorobiphenyl	24	60-150		J
	11G00401	Decachlorobiphenyl	29	60-150		J
		Decachlorobiphenyl	29	60-150		J
	11G00201D	Decachlorobiphenyl	59	60-150		J

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF029	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			3	
	13G00101	Decachlorobiphenyl	23	60-150		J
		Decachlorobiphenyl	23	60-150		J
	66G00901	Decachlorobiphenyl	43	60-150		J
		Decachlorobiphenyl	42	60-150		J
	66G00903	Decachlorobiphenyl	52	60-150		J
		Decachlorobiphenyl	52	60-150		J
WF030	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	66G00804	Decachlorobiphenyl	31	60-150		J
		Decachlorobiphenyl	31	60-150		J
WF031	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			3	
	05G00301	Tetrachloro-m-xylene	56	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
	05G00101	Decachlorobiphenyl	164	60-150		J (all detects)
	05G01002	Tetrachloro-m-xylene	57	60-150		J
WF031B	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
	All	Pesticides/PCBs	All within QC limits	-	-	None
WF032	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
	29G00101	Pesticides/PCBs			1	
		Tetrachloro-m-xylene	54	60-150		J
		Tetrachloro-m-xylene	56	60-150		J

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF033	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			3	
	07G00101	Tetrachloro-m-xylene	174	60-150		J (all detects)
	30G00501	Tetrachloro-m-xylene	59	60-150		J
	66G00201D	Tetrachloro-m-xylene	25	60-150		J
		Tetrachloro-m-xylene	36	60-150		J
WF034	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	66G01801	Tetrachloro-m-xylene	164	60-150		J (all detects)
WF035	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	08G00101	Tetrachloro-m-xylene	59	60-150		J
WF036	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides/PCBs			1	
	54G00101	Tetrachloro-m-xylene	57	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
WF037	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
	All	Pesticides/PCBs	All within QC limits	-	-	None
WF038	All	Volatiles	All within QC limits	-	-	None
WF039	All	Volatiles	All within QC limits	-	-	None
WF040	All	Volatiles	All within QC limits	-	-	None

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF041	All	Volatiles	All within QC limits	-	-	None
	All	Semivolatiles	All within QC limits	-	-	None
		Pesticides & PCBs			2	
	35G00201	Decachlorobiphenyl	58	60-150		J
	36G00103	Tetrachloro-m-xylene	57	60-150		J
		Tetrachloro-m-xylene	58	60-150		J
WF042	All	Volatiles	-	-	-	None
WF043	All	Volatiles	-	-	-	None
WF044	All	Volatiles	-	-	-	None
WF045	All	Volatiles	-	-	-	None
		Semivolatiles			3	
	OWG00101	2-Fluorophenol	0	21-110		J (all detects)
		Phenol-d5	0	10-110		R (all non-detects)
		2-Chlorophenol-d4	0	33-110		
		1,2-Dichlorobenzene-d4	0	16-110		
		Nitrobenzene-d5	0	35-114		
		2-Fluorobiphenyl	0	43-116		
		2,4,6-Tribromophenol	0	10-123		
		Terphenyl-d14	0	33-141		
	OWG00102	2-Fluorophenol	0	21-110		J (all detects)
		Phenol-d5	0	10-110		R (all non-detects)
		2-Chlorophenol-d4	0	33-110		
		1,2-Dichlorobenzene-d4	0	16-110		
		Nitrobenzene-d5	0	35-114		
		2-Fluorobiphenyl	0	43-116		
		2,4,6-Tribromophenol	0	10-123		
		Terphenyl-d14	0	33-141		

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF045 cont.	OWG00103	2-Fluorophenol	0	21-110		J (all detects)
		Phenol-d5	0	10-110		R (all non-detects)
		2-Chlorophenol-d4	0	33-110		
		1,2-Dichlorobenzene-d4	0	16-110		
		Nitrobenzene-d5	0	35-114		
		2-Fluorobiphenyl	0	43-116		
		2,4,6-Tribromophenol	0	10-123		
		Terphenyl-d14	0	33-141		
		Pesticides & PCBs			4	
	OWG00101	Tetrachloro-m-xylene	45	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
	OWG00103	Tetrachloro-m-xylene	59	60-150		J
	OWG00302	Tetrachloro-m-xylene	54	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
	OWG00302D	Tetrachloro-m-xylene	53	60-150		J
		Tetrachloro-m-xylene	52	60-150		J
WF046	All	Volatiles	-	-	-	None
	All	Semivolatiles	-	-	-	None
		Pesticides & PCBs			2	
	31G00101	Tetrachloro-m-xylene	48	60-150		J
		Tetrachloro-m-xylene	55	60-150		J
	31R03301	Tetrachloro-m-xylene	59	60-150		J
WF047	All	Volatiles	-	-	-	None
WF048	All	Volatiles	-	-	-	None
WF049	All	Volatiles	-	-	-	None
	All	Semivolatiles	-	-	-	None
WF051	All	Volatiles	-	-	-	None
WF052	All	Volatiles	-	-	-	None
WF053	All	Volatiles	-	-	-	None
WF054	All	Volatiles	-	-	-	None

Table VI
Summary of Surrogate Recoveries
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Client ID	Compound	Percent Recovery	QC Limits	# of Samples	Qualifier
WF055	All	Volatiles	-	-	-	None

Notes: J = estimated value
UJ = undetected, but number that is reported as the quantification limit is an estimated value.

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF022		Volatiles			
	6/25/96	Acetone	30.2	-	J
	7/19/96	Chloromethane	-	28.8	J
		Chloroethane	-	48.7	J
	7/22/96	Chloroethane	-	30.6	J
		Semivolatiles			
	8/13/96	4,6-Dinitro-2-methylphenol	-	27.2	J
		Pentachlorophenol	-	25.4	J
	8/14/96	4-Chloroaniline	-	31.6	J
		2,4-Dinitrophenol	-	27.6	J
		4,6-Dinitro-2-methylphenol	-	33.8	J
	All	Pesticides/PCBs	-	-	None
WF023		Volatiles			
	6/25/96	Acetone	30.2	-	J
	7/25/96	Acetone	-	33.2	J
	7/31/96	Acetone	-	30.4	J
		Methylene chloride	-	31.7	J
		Carbon disulfide	-	27.2	J
	8/1/96	Chloroethane	-	27.5	J
		Carbon disulfide	-	27.5	J
		Methylene chloride	-	37.8	J
		Semivolatiles			
	8/20/96	4-Nitroaniline	-	37.8	J
		Chrysene	-	27.8	J
	8/21/96	4-Nitroaniline	-	31.5	J
		Chrysene	-	28.5	J
		Benzo(g,h,i)perylene	-	32.7	J
	8/25/96	4,4'-DDT	23.6	-	J
WF024		Volatiles			
	6/25/96	Acetone	30.2	-	J
	8/5/96	Acetone	33.8	-	J
	8/2/96	Chloroethane	-	29.5	J
		Carbon disulfide	-	30.8	J
		Methylene chloride	-	41.0	J
		Semivolatiles			
	8/21/96	4-Nitroaniline	-	28.7	J
		Chrysene	-	29.5	J
		Indeno(1,2,3-cd)pyrene	-	28.1	J
		Dibenz(a,h)anthracene	-	34.0	J
		Benzo(g,h,i)perylene	-	37.6	J
	All	Pesticides/PCBs	-	-	None

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF025		Volatiles			
	8/5/96	Acetone	33.8	-	J
	8/14/96	Chloromethane	26.7	-	J
		Chloroethane	28.5	-	J
		Acetone	29.7	-	J
		Semivolatiles			
	9/9/96	2,4-Dinitrophenol	-	29.9	J
		4-Nitroaniline	-	27.6	J
		4,6-Dinitro-2-methylphenol	-	30.7	J
		Pyrene	-	30.0	J
		3,3'-Dichlorobenzidine	-	37.0	J
		2,4-Dinitrophenol	-	35.6	J
		4-Nitroaniline	-	29.4	J
		4,6-Dinitro-2-methylphenol	-	32.0	J
		Pentachlorophenol	-	27.8	J
		3,3'-Dichlorobenzidine	-	27.8	J
	8/25/96	4,4'-DDT	23.6	-	J
WF026		Volatiles			
	8/5/96	Acetone	33.8	-	J
	8/19/96	Chloromethane	-	46.5	J
		Chloroethane	-	77.1	J
		1,1-Dichloroethane	-	28.6	J
		2-Butanone	-	30.3	J
	8/20/96	Chloromethane	-	32.5	J
		Chloroethane	-	32.4	J
	8/22/96	Acetone	-	37.9	J
		Carbon disulfide	-	28.0	J
		2-Butanone	-	27.8	J
		Semivolatiles			
	9/10/96	2,4-Dinitrophenol	-	35.6	J
		4-Nitroaniline	-	29.4	J
		4,6-Dinitro-2-methylphenol	-	32.0	J
		Pentachlorophenol	-	27.8	J
		3,3'-Dichlorobenzidine	-	27.8	J
	9/10/96	4-Chloroaniline	-	36.8	J
		3-Nitroaniline	-	37.9	J
		2,4-Dinitrophenol	-	29.3	J
		4-Nitroaniline	-	49.5	J
		4,6-Dinitro-2-methylphenol	-	29.4	J
		Pentachlorophenol	-	29.6	J
		3,3'-Dichlorobenzidine	-	54.1	J
		Pesticides & PCBs			
	9/14/96	alpha-BHC	22.2	-	J
		delta-BHC	22.1	-	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF027		Volatiles			
	9/1/96	2-Butanone	39.1	-	J
		2-Butanone	0.014 (RRF)	-	J(detects) / R(ND)
	8/5/96	Acetone	33.8	-	J
	9/2/96	Acetone	-	102.4	J
		2-Butanone	-	36.3	J
	8/22/96	Acetone	-	37.9	J
		Carbon disulfide	-	28.0	J
		2-Butanone	-	27.8	J
	8/29/96	Bromomethane	-	31.0	J
		Chloroethane	-	63.9	J
		Acetone	-	37.2	J
	9/2/96	Chloromethane	-	32.4	J
		Chloroethane	-	28.4	J
		Acetone	-	49.2	J
		2-Butanone	-	38.7	J
		4-Methyl-2-pentanone	-	35.7	J
		2-Hexanone	-	38.9	J
		2-Butanone	-	0.019 (RRF)	J (detects) / R (ND)
	9/3/96	Chloromethane	-	27.4	J
		Acetone	-	34.7	J
		2-Butanone	-	32.6	J
		4-Methyl-2-pentanone	-	32.9	J
		2-Hexanone	-	38.9	J
		Semivolatiles			
	9/10/96	4-Chloroaniline	-	36.8	J
		3-Nitroaniline	-	37.9	J
		2,4-Dinitrophenol	-	29.3	J
		4-Nitroaniline	-	49.5	J
		4,6-Dinitro-2-methylphenol	-	29.4	J
		Pentachlorophenol	-	29.6	J
		3,3'-Dichlorobenzidine	-	54.1	J
	9/20/96	3,3'-Dichlorobenzidine	-	30.4	J
	All	Pesticides/PCBs	-	-	None
WF028		Volatiles			
	8/5/96	Acetone	33.8	-	J
	9/2/96	Chloromethane	-	32.4	J
		Chloroethane	-	28.4	J
		Acetone	-	49.2	J
		2-Butanone	-	38.7	J
		4-Methyl-2-pentanone	-	35.7	J
		2-Hexanone	-	38.9	J
	9/3/96	Chloromethane	-	27.4	J
		Acetone	-	34.7	J
		2-Butanone	-	32.6	J
		4-Methyl-2-pentanone	-	32.9	J
		2-Hexanone	-	38.9	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF028 cont.	9/6/96	Chloromethane	-	35.4	J
		Acetone	-	41.0	J
		2-Butanone	-	41.8	J
		1,2-Dichloropropane	-	27.6	J
		4-Methyl-2-pentanone	-	40.5	J
		2-Hexanone	-	43.3	J
		Bromoform	-	26.2	J
		1,1,2,2-Tetrachloroethane	-	26.5	J
		Semivolatiles			
	9/20/96	3,3'-Dichlorobenzidine	-	30.4	J
	9/26/96	Benzo(k)fluoroanthene	-	28.5	J
	All	Pesticides/PCBs	-	-	None
WF029		Volatiles			
	9/17/96	Chloromethane	-	38.1	J
		Methylene chloride	-	33.6	J
	9/18/96	2-Hexanone	-	26.5	J
		Semivolatiles			
	9/26/96	Benzo(k)fluoranthene	-	28.5	J
	9/26/96	Benzo(k)fluoranthene	-	25.6	J
	All	Pesticides/PCBs	-	-	None
WF030		Volatiles			
	9/20/96	Methylene chloride	-	35.2	J
	9/23/96	Methylene chloride	-	30.2	J
		Semivolatiles			
	10/16/96	2,4-Dinitrophenol	-	25.8	J
		4-Nitrophenol	-	28.0	J
	All	Pesticides/PCBs	-	-	None
WF031	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
		Pesticides & PCBs			
	11/5/96	delta-BHC	21.2	-	J
WF031B	All	Volatiles	-	-	None
		Semivolatiles			
	11/28/96	Di-n-octylphthalate	-	25.3	J
		Pesticides & PCBs			
	12/9-10/97	Alpha-BHC	23.9	-	J
WF032		Volatiles			
	10/10/96	1,1,2,2-Tetrachloroethane	-	27.8	J
		Semivolatiles			
	11/3/96	Hexachlorobutadiene	-	33.5	J
		Hexachlorocyclopentadiene	-	31.5	J
		Di-n-octylphthalate	-	27.0	J
		Pesticides & PCBs			
	11/5/96	delta-BHC	21.2	-	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF033		Volatiles			
	10/16/96	Acetone	-	25.3	J
		Semivolatiles			
	11/4/96	Hexachlorobutadiene	-	31.2	J
		Hexachlorocyclopentadiene	-	27.9	J
	All	Pesticides/PCBs	-	-	None
WF034	All	Volatiles	-	-	None
		Semivolatiles			
	11/26/96	Di-n-octylpthalate	-	33.9	J
	All	Pesticides/PCBs	-	-	None
WF035	All	Volatiles	-	-	None
		Semivolatiles			
	11/26/96	Bis(2-ethylhexyl)phthalate	-	25.6	J
		Di-n-octylphthalate	-	32.1	J
	11/27/96	Di-n-octylphthalate	-	30.0	J
		Pesticides & PCBs			
	11/5/96	delta-BHC	21.2	-	J
WF036	All	Volatiles	-	-	None
		Semivolatiles			
		Di-n-octylphthalate	-	30.0	J
		Di-n-octylphthalate	-	25.3	J
		Pesticides & PCBs			
		alpha-BHC	23.9	-	J
WF037	All	Volatiles	-	-	None
		Semivolatiles			
	11/28/96	Di-n-octylphthalate	-	25.3	J
		Pesticides & PCBs			
	12/9-10/96	alpha-BHC	23.9	-	J
WF038		Volatiles			
	12/26/96	Acetone	-	30.6	J
WF039		Volatiles			
	12/26/96	Acetone	-	30.6	J
WF040	All	Volatiles	-	-	None
WF041	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
		Pesticides & PCBs			
	6/11-12/97	Methoxychlor	24.2	-	J
		delta-BHC	21.5	-	J
WF042	All	Volatiles	-	-	None
WF043	All	Volatiles	-	-	None

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Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF044		Volatiles			
	7/7/97	Bromomethane	-	33.5	J
WF045	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
		Pesticides & PCBs			
	7/31/97	alpha-BHC	20.3	-	J
		alpha-BHC	24.2	-	J
		gamma-BHC	21.9	-	J
WF046	All	Volatiles	-	-	None
	All	Semivolatiles	-	-	None
		Pesticides & PCBs			
	7/31/97	alpha-BHC	20.3	-	J
		alpha-BHC	24.2	-	J
		gamma-BHC	21.9	-	J
WF047		Volatiles			
	7/21/97	Acetone	35.4	-	J
	7/21/97	Acetone	0.023 RRF	-	J (all detects) R (all non-detects)
		2-Butanone	0.030 RRF	-	J (all detects) R (all non-detects)
	7/28/97	Bromomethane	-	34.6	J
		Acetone	-	35.1	J
	7/29/97	Bromomethane	-	30.5	J
		Acetone	-	30.9	J
	7/21/97	Acetone	-	0.020 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.030 (RRF)	J (all detects) R (all non-detects)
	7/22/97	Acetone	-	0.020 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.030 (RRF)	J (all detects) R (all non-detects)
	7/28/97	Acetone	-	0.015 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.026 (RRF)	J (all detects) R (all non-detects)
	7/29/97	Acetone	-	0.015 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.026 (RRF)	J (all detects) R (all non-detects)
WF048		Volatiles			
	7/25/97	Bromomethane	36.5	-	J
	7/26/97	Bromomethane	-	28.7	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Date	Compound	Initial Calibration %RSD	Continuing Calibration %D	Qualifier
WF049	7/21/97	Volatiles Acetone	35.4	-	J
	7/21/97	Acetone	0.023 (RRF)	-	J (all detects) R (all non-detects)
		2-Butanone	0.030 (RRF)	-	J (all detects) R (all non-detects)
	7/28/97	Bromomethane	-	34.6	J
		Acetone	-	35.1	J
	7/22/97	Acetone	-	0.020 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.030 (RRF)	J (all detects) R (all non-detects)
	7/28/97	Acetone	-	0.015 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.026 (RRF)	J (all detects) R (all non-detects)
	All	Semivolatiles	-	-	None
WF051	All	Volatiles	-	-	None
WF052		Volatiles			
	7/21/97	Acetone	35.4	-	J
	7/21/97	Acetone	0.023 (RRF)	-	J (all detects) R (all non-detects)
		2-Butanone	0.030 (RRF)	-	J (all detects) R (all non-detects)
	7/29/97	Bromomethane	-	30.5	J
		Acetone	-	30.9	J
	7/29/97	Acetone	-	0.016 (RRF)	J (all detects) R (all non-detects)
		2-Butanone	-	0.026 (RRF)	J (all detects) R (all non-detects)
WF053		Volatiles			
	8/8/97	Acetone	-	36.4	J
WF054		Volatiles			
	8/19/97	Acetone	39.1	-	J
	8/8/97	Acetone	-	36.4	J
	8/19/97	Acetone	-	30.3	J

Table VII
Summary of Compounds Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds					
SDG	**Date**	**Compound**	**Initial Calibration %RSD**	**Continuing Calibration %D**	**Qualifier**
WF055	All	Volatiles	-	-	None

Notes: %RSD = percent Relative Standard Deviation for initial calibrations

%D = percent Difference for continuing calibrations

J = the compound was positively identified; the associated numerical value is the approximate concentration of the compound in the sample, either because its concentration was lower than the QL (laboratory "J" flag), or because QC criteria were not met (validation "J").

UJ = the compound was not detected above the reported sample QL. However, the reported sample QL is approximate; the compound concentration may not reliably be presumed to be less than the QL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the compound cannot be verified.

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds			
SDG	**Compound**	**Concentration**	**Associated Samples**
WF022	Volatiles		BKT01001
	Acetone	8 ug/L	BKR01001
			BKG00101
			BKG00101D
			BKG00102
			BKG00103
	Methylene chloride	1 ug/L	BKG00202
	Acetone	16 ug/L	BKG00201
			BKF01001
	Acetone	14 ug/L	17T01101
			17G00102
			17G00101
			17G00201
			17G00301
			01G00101
			01G00102
			01G00102D
		ND	
	Semivolatiles	ND	-
	Pesticides/PCBs		-
WF023	Volatiles		01T01201
	Methylene chloride	2 ug/L	01G00401
	Acetone	15 ug/L	01G00201
			01G00301
			BKG00301
			02G00201
			02G00101
			18G00301
			02G00301
			02G00301D
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF024	Volatiles		18T01401
	Acetone	2 ug/L	18G00101
			15G00401
			BKG00203
			15R01201
	-		15G00701
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF025	Volatiles		15G00503DL
	Acetone	3 ug/L	15R01301
			15T01601
			15G00301
			15G00302
			15G00303
			15G00101
			15G00203
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF026	Volatiles		15T01701
	Acetone	11 ug/L	15G00202
			15G00201
			15G00802
			15G00801
			16G00201
			15G00803D
			15R01401
	Acetone	4 ug/L	15G00803
			16T01801
			16G00202
			16G00203
	Acetone	5 ug/L	16G00202DL
			16G00602
			16G00601
			16G00403
			16G00403DL
			16G00403D
			16G00403DDL
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF027	Volatiles		16G00401
	Acetone	5 ug/L	16G00402
			16G00101
			16G00301
	Acetone	5 ug/L	09G00301
	Acetone	6 ug/L	16G00501
	Trichloroethene	1 ug/L	16R01501
	Xylenes (total)	2 ug/L	16G00501D
			66T02001
			66G02101
			66G02103
	Acetone	11 ug/L	16G00303
			66G02102
			09G00101
			09G00301D
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF028	Volatiles		10T02101
	Acetone	5 ug/L	09G00201
			10G00201
			11G00102
			11G00401
			11T02201
			11G00301
	Acetone	11 ug/L	10G00101
			11G00402
			11G00201
			12G00201

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF028 cont.	Acetone	5 ug/L	11G00101
	Carbon disulfide	6 ug/L	12G00101
			11R01601
			12G00101D
			11G00201D
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF029	Volatiles		13T02301
	Acetone	3 ug/L	13G00101
			13R01701
	Acetone	3 ug/L	13G00102
			13G00201
			13G00103
			14G00201
			14G00101
			14G00101D
			66T02401
			66G00901
			66G00904
			66G00902
			66G00903
	Semivolatiles		
	Bis(2-ethylhexyl)phthalate	1 ug/L	All samples in SDG WF029
	Pesticides/PCBs	ND	-
WF030	Volatiles		66T02501
	Acetone	3 ug/L	66G00801
			66G00802
			66G00803
			66G00804
	Semivolatiles		
	Bis(2-ethylhexyl)phthalate	2 ug/L	All samples in SDG WF030
	Pesticides/PCBs	ND	-
WF031	Volatiles	ND	-
	Semivolatiles		
	Di-n-butylphthalate	3 ug/L	05G00801
	Bis(2-ethylhexyl)phthalate	3 ug/L	05G00802
			05G00901
			05G00902
	Di-n-butylphthalate	2 ug/L	05G01001
	Bis(2-ethylhexyl)phthalate	2 ug/L	05G00301
			05R01901
			05G01001D
	Di-n-butylphthalate	2 ug/L	05G00101
			33G00501
			33G00201
			33G00101
			33G00301
			33G00301D
	Pesticides/PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF031B	Volatiles	ND	-
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF032	Volatiles	ND	-
	Semivolatiles		
	Di-n-butylphthalate	1 ug/L	33G00401 06G00102 06G00101 06G00301 06R02001 29G00501 29G00501D
	Di-n-butylphthalate	3 ug/L	29G00101 66G01201 66G00102
	Pesticides/PCBS	ND	-
WF033	Volatiles	ND	-
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF034	Volatiles	ND	-
	Semivolatiles		
	Bis(2-ethylhexyl)phthalate	2 ug/L	66G01101 66G01301 66G00501
	Pesticides/PCBs	ND	-
WF035	Volatiles	ND	-
	Semivolatiles	ND	-
	Pesticides/PCBs	ND	-
WF036	Volatiles	ND	-
	Semivolatiles		
	Di-n-butylphthalate	2 ug/L	66G00701 54G00201 54G00101 31G00201 54R02401 54G00101D
	Pesticides/PCBs	ND	-
WF037	Volatiles	ND	-
	Semivolatiles		
	Di-n-butylphthalate	4 ug/L	All samples in SDG WF037
	Pesticides/PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF038	Volatiles Acetone	 7 ug/Kg	36BO0101 36BO0102 36BO0103 36BO0201 36BO0202 36BO0203 36BO0301 36BO0302 36BO0303 36BO0303D 36BO0401 36BO0402 36BO0403 36BO0403D
WF039	Volatiles Acetone Methylene chloride	 7 ug/Kg 4 ug/Kg	35BO0203D 35BO0102DL 35BO0105 35BO0201
WF040	Volatiles Acetone Bromomethane Acetone	 3 ug/L 2 ug/L 3 ug/Kg	All water samples in SDG WF040 35BO0402 35BO0501 35BO0501DL 35BO0502 37BO0201 37BO0202 37BO0101 37BO0102 37BO0103 37BO0301 37BO0302 37BO0303 37BO0203D 37BO0103D
WF041	Volatiles Pesticides & PCBs Semivolatiles Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	ND ND 1 ug/L 2 ug/L	- - 13G00301 13G00401
WF042	Volatiles	ND	-
WF043	Volatiles Acetone	 6 ug/L	 33T05301 06G00102 06G00301 33G00401
WF044	Volatiles Acetone	 3 ug/L	66T05601 66G01201 66G01201D 66G00102 66G01301

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds			
SDG	**Compound**	**Concentration**	**Associated Samples**
WF044 cont.	Acetone	11 ug/L	66T05701 66G00401 66G02001 66T05801 66G00603 66G00603D 66G00604 66G00601 66G00602
WF045	Volatiles Acetone	5ug/L	OWT05901 OWR03401 OWG00501 OWG00502 OWG00502D OWG00503 OWT06001 OWG00101 OWG00102 OWG00103 66T06101 66G02301 66G02302 66G02303
	Acetone	5 ug/L	OWT06201 OWG00302 OWG00302D OWG00303 OWG00301 OWT06401 OWT06401DL OWG00401 OWG00201
	Semivolatiles Di-n-butylphthalate	2 ug/L	OWR03401 OWG00501 OWG00502 OWG00502D OWG00503
	Phenol	72 ug/L	OWG00101
	2-Chlorophenol	67 ug/L	OWG00102
	1,4-Dichlorobenzene	33 ug/L	OWG00103
	N-Nitroso-di-n-propylamine	49 ug/L	
	1,2,4-Trichlorobenzene	36 ug/L	
	4-Chloro-3-methylphenol	62 ug/L	
	Acenaphthylene	12 ug/L	
	Acenaphthene	39 ug/L	
	4-Nitrophenol	69 ug/L	
	2,4-Dinitrotoluene	43 ug/L	
	Pentachlorophenol	65 ug/L	
	Pyrene	42 ug/L	
	Di-n-butylphthalate	5 ug/L	66G02301 66G02302 66G02303
	Di-n-butylphthalate	4 ug/L	OWG00401 OWG00201
	Pesticides & PCBs	ND	-

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Compound	Concentration	Associated Samples
WF046	Volatiles 2-Butanone	4 ug/L	All samples in SDG WF046
	Semivolatiles Di-n-butylphthalate	3 ug/L	31R03301 31G00101 31G00101D
	Pesticides & PCBs	ND	-
WF047	Volatiles Acetone	4 ug/L	39W028 39W027 39W024 39W032 39W034D 39W031 39T10001 39W001 39W002 39W003 39W004 39W005
WF048	Volatiles 2-Butanone	4 ug/L	39R03401
	Acetone 2-Butanone	3 ug/Kg 4 ug/Kg	39D002 39D001 39D007 39D023 39D026 39D016 39D013 39D019 39D018 39D018D 39D022
WF049	Volatiles 2-Butanone	4 ug/L	39U001
	Semivolatiles	ND	-
WF051	Volatiles 2-Butanone	4 ug/L	16T06801 16R03501
WF052	Volatiles	ND	-
WF053	Volatiles Methylene chloride	8 ug/L	15G00602D 15T07501 15G00401 15G00703 15G00703D 15G00501 15G00502 15G00503
WF054	Volatiles Acetone	4 ug/L	30T07701 30R03901 30G00302

Table VIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds			
SDG	**Compound**	**Concentration**	**Associated Samples**
WF054 cont.	Methylene chloride	8 ug/L	15T07601 15G00801 15G00801D 15G00802 15R03801 15G00803 15G00303
WF055	Volatiles	ND	-

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF022	**Client ID:** BKF01001		
	Laboratory ID: RB858010		
	Collection Date: 7/17/96		
	Type: Source blank		
	Volatiles		
	Acetone	4 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBs	ND	None
WF022	**Client ID:** BKR01001		
	Laboratory ID: RB858002		
	Collection Date: 7/16/96		
	Type: Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	None
	Bis(2-ethylhexyl)phthalate	2 ug/L	None
	Pesticides/PCBs	ND	None
WF022	**Client ID:** BKT01001		
	Laboratory ID: RB858001		
	Collection Date: 7/16/96		
	Type: Trip blank		
	Volatiles		
	Acetone	3 ug/L	10U ug/L[1]
WF022	**Client ID:** 17T01101		
	Laboratory ID: RB873001		
	Collection Date: 7/18/96		
	Type: Trip blank		
	Volatiles		
	Acetone	8 ug/L	10U ug/L[1]
WF023	**Client ID:** 01R01101		
	Laboratory ID: RB887005		
	Collection Date: 7/23/96		
	Type: Equipment rinsate		
	Volatiles		
	Acetone	4 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBS	ND	None
WF023	**Client ID:** 01T01201		
	Laboratory ID: RB887001		
	Collection Date: 7/22/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	10U ug/L[1]
	Acetone	3 ug/L	10U ug/L[1]

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter		Concentration	Qualifier
WF023	**Client ID:**	16T01301		
	Laboratory ID:	RB887014		
	Collection Date:	7/25/96		
	Type:	**Trip blank**		
	Volatiles			
	Acetone		2 ug/L	None
WF024	**Client ID:**	18T01401		
	Laboratory ID:	RB92001		
	Collection Date:	7/29/96		
	Type:	**Trip blank**		
	Volatiles			
	Methylene chloride		2 ug/L	None
	Acetone		4 ug/L	10U ug/L[1]
	Chloroform		1 ug/L	None
WF024	**Client ID:**	15R01201		
	Laboratory ID:	RB920005		
	Collection Date:	7/31/96		
	Type:	**Equipment rinsate**		
	Volatiles			
	Acetone		6 ug/L	10U ug/L[1]
	Semivolatiles			
	Di-n-butylphthalate		6 ug/L	None
	Pesticides/PCBs		ND	None
WF025	**Client ID:**	15R01301		
	Laboratory ID:	RB956011		
	Collection Date:	8/7/96		
	Type:	**Equipment rinsate**		
	Volatiles		ND	None
	Semivolatiles			
	Di-n-butylphthalate		6 ug/L	None
	Pesticides/PCBs		ND	None
WF025	**Client ID:**	15T01501		
	Laboratory ID:	RB956001		
	Collection Date:	8/5/96		
	Type:	**Trip blank**		
	Volatiles			
	Methylene chloride		2 ug/L	None
	Acetone		4 ug/L	None
WF025	**Client ID:**	15T01601		
	Laboratory ID:	RB956012		
	Collection Date:	8/8/96		
	Type:	**Trip blank**		
	Volatiles			
	Methylene chloride		1 ug/L	None
	Acetone		2 ug/L	10U ug/L

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF026	**Client ID:** 15T01701 **Laboratory ID:** RB980001 **Collection Date:** 8/12/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
WF026	**Client ID:** 16T01801 **Laboratory ID:** RB980015 **Collection Date:** 8/15/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Acetone	3 ug/L	10U ug/L[1]
WF026	**Client ID:** 15R01401 **Laboratory ID:** RB980012 **Collection Date:** 8/14/96 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	6 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBS	ND	None
WF027	**Client ID:** 16T01901 **Laboratory ID:** RC016001 **Collection Date:** 8/19/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	5 ug/L	None
	Acetone	6 ug/L	None
WF027	**Client ID:** 66T02001 **Laboratory ID:** RC016014 **Collection Date:** 8/22/96 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
WF027	**Client ID:** 16R01501 **Laboratory ID:** RC016012 **Collection Date:** 8/21/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	None
	Pesticides/PCBs	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF028	**Client ID:** 11T02201		
	Laboratory ID: RC044008		
	Collection Date: 8/28/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
	Acetone	8 ug/L	10U ug/L[1]
WF028	**Client ID:** 10T02101		
	Laboratory ID: RC044001		
	Collection Date: 8/26/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
WF028	**Client ID:** 11R01601		
	Laboratory ID: RC044016		
	Collection Date: 8/28/96		
	Type: Equipment rinsate		
	Volatiles		
	Acetone	9 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	None
	Pesticides/PCBs	ND	None
WF029	**Client ID:** 13R01701		
	Laboratory ID: RC092008		
	Collection Date: 9/11/96		
	Type: Equipment rinsate		
	Volatiles		
	Acetone	3 ug/L	10U ug/L[1]
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	None
	Bis(2-ethylhexyl)phthalate	1 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF029	**Client ID:** 13T02301		
	Laboratory ID: RC092001		
	Collection Date: 9/9/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Acetone	2 ug/L	10U ug/L[1]
WF029	**Client ID:** 66T02401		
	Laboratory ID: RC092011		
	Collection Date: 9/12/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
	Acetone	3 ug/L	10U ug/L[1]

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF030	**Client ID:** 66R01801		
	Laboratory ID: RC121010		
	Collection Date: 9/18/96		
	Type: Equipment rinsate		
	Volatiles		
	Acetone	4 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	3 ug/L	None
	Bis(2-ethylhexyl)phthalate	1 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF030	**Client ID:** 66T02501		
	Laboratory ID: RC121001		
	Collection Date: 9/16/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
	Acetone	3 ug/L	10U ug/L[1]
WF030	**Client ID:** 66T02601		
	Laboratory ID: RC121012		
	Collection Date: 9/19/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
	Acetone	3 ug/L	None
WF031	**Client ID:** 05T02701		
	Laboratory ID: MB928001		
	Collection Date: 9/23/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
WF031	**Client ID:** 33T02801		
	Laboratory ID: MB958001		
	Collection Date: 9/26/96		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
WF031	**Client ID:** 05R01901		
	Laboratory ID: MB928011		
	Collection Date: 9/25/96		
	Type: Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	2 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF031B	**Client ID:** 16T04001 **Laboratory ID:** MC447002 **Collection Date:** 11/21/96 **Type:** Trip blank		
	Volatiles	ND	None
WF032	**Client ID:** 06T02901 **Laboratory ID:** MC011001 **Collection Date:** 9/30/96 **Type:** Trip blank		
	Volatiles	ND	None
WF032	**Client ID:** 29T03001 **Laboratory ID:** MC037001 **Collection Date:** 10/3/96 **Type:** Trip blank		
	Volatiles	ND	None
WF032	**Client ID:** 06R02001 **Laboratory ID:** MC011006 **Collection Date:** 10/2/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	3 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF033	**Client ID:** 29T03101 **Laboratory ID:** MC085001 **Collection Date:** 10/7/96 **Type:** Trip blank		
	Volatiles	ND	None
WF033	**Client ID:** 66T03201 **Laboratory ID:** MC118001 **Collection Date:** 10/10/96 **Type:** Trip blank		
	Volatiles		
	Acetone	26 ug/L	None
WF033	**Client ID:** 66R02101 **Laboratory ID:** MC02101 **Collection Date:** 10/9/96 **Type:** Equipment rinsate		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	6 ug/L	None
	Pesticides/PCBs	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter		Concentration	Qualifier
WF034	**Client ID:**	66T03301		
	Laboratory ID:	MC153001		
	Collection Date:	10/14/96		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF034	**Client ID:**	66T03401		
	Laboratory ID:	MC176001		
	Collection Date:	10/17/96		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF034	**Client ID:**	66R02201		
	Laboratory ID:	MC153007		
	Collection Date:	10/16/96		
	Type:	**Equipment rinsate**		
	Volatiles			
	Toluene		8 ug/L	None
	Ethylbenzene		1 ug/L	None
	Xylenes (total)		2 ug/L	None
	Semivolatiles			
	Di-n-butylphthalate		2 ug/L	None
	Pesticides/PCBs		ND	None
WF035	**Client ID:**	66T03501		
	Laboratory ID:	MC214001		
	Collection Date:	10/21/96		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF035	**Client ID:**	66T03601		
	Laboratory ID:	MC231001		
	Collection Date:	10/24/96		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF035	**Client ID:**	66R02301		
	Laboratory ID:	MC214006		
	Collection Date:	10/23/96		
	Type:	**Equipment rinsate**		
	Volatiles		ND	None
	Semivolatiles			
	Di-n-butylphthalate		3 ug/L	None
	Pesticides/PCBs		ND	None
WF036	**Client ID:**	66T03701		
	Laboratory ID:	MC262001		
	Collection Date:	10/28/96		
	Type:	**Trip blank**		
	Volatiles		ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF036	**Client ID:** 31T03801 **Laboratory ID:** MC284001 **Collection Date:** 10/31/96 **Type:** Trip blank		
	Volatiles	ND	None
WF036	**Client ID:** 54R02401 **Laboratory ID:** MC262007 **Collection Date:** 10/30/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
	Semivolatiles		
	Di-n-butylphthalate	4 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	ND
WF037	**Client ID:** 15T03901 **Laboratory ID:** MC424001 **Collection Date:** 11/18/96 **Type:** Trip blank		
	Volatiles	ND	None
WF037	**Client ID:** 16T04001 **Laboratory ID:** MC448004 **Collection Date:** 11/21/96 **Type:** Trip blank		
	Volatiles	ND	None
WF037	**Client ID:** 15R02501 **Laboratory ID:** MC424009 **Collection Date:** 11/20/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF037	**Client ID:** 15F00201 **Laboratory ID:** MC424010 **Collection Date:** 11/20/96 **Type:** Source blank		
	Volatiles		
	Xylenes (total)	2 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	4 ug/L	10U ug/L[1]
	Pesticides/PCBs	ND	None
WF038	**Client ID:** 36RO2601 **Laboratory ID:** MC687016 **Collection Date:** 12/18/96 **Type:** Rinsate		
	Volatiles	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF038	**Client ID:** 36TO4101 **Laboratory ID:** MC687001 **Collection Date:** 12/17/96 **Type:** Trip Blank		
	Volatiles	ND	None
WF039	**Client ID:** 35TO4201 **Laboratory ID:** MC698001 **Collection Date:** 12/19/97 **Type:** Trip Blank		
	Volatiles	ND	None
WF039	**Client ID:** 35RO2701 **Laboratory ID:** MC698011 **Collection Date:** 12/21/96 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF040	**Client ID:** 35TO4301 **Laboratory ID:** MC783001 **Collection Date:** 1/7/97 **Type:** Trip blank		
	Volatiles		
	Bromomethane	1 ug/L	10U ug/L[1]
WF040	**Client ID:** 37RO2801 **Laboratory ID:** MC783017 **Collection Date:** 1/9/97 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	5 ug/L	10U ug/L[1]
	Carbon disulfide	2 ug/L	None
WF041	**Client ID:** 35T04501 **Laboratory ID:** MD908001 **Collection Date:** 6/11/97 **Type:** Trip blank		
	Volatiles		
	Acetone	6 ug/L	None
WF041	**Client ID:** 37T04601 **Laboratory ID:** MD926001 **Collection Date:** 6/12/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
WF041	**Client ID:** 35T04701 **Laboratory ID:** MD950001 **Collection Date:** 6/15/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	3 ug/L	None
	Xylene (total)	1 ug/L	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF041	**Client ID:** 13T04801		
	Laboratory ID: MD985001		
	Collection Date: 6/16/97		
	Type: Trip blank		
	Volatiles		
	Methylene chloride	2 ug/L	None
	Acetone	6 ug/L	None
WF041	**Client ID:** 35F00301		
	Laboratory ID: MD908002		
	Collection Date: 6/11/97		
	Type: Source blank		
	Semivolatiles		
	Di-n-butylphthalate	3 ug/L	None
	Pesticides & PCBs	**ND**	-
WF041	**Client ID:** 35R03001		
	Laboratory ID: MD908003		
	Collection Date: 6/11/97		
	Type: Equipment rinsate		
	Semivolatiles		
	Di-n-butylphthalate	4 ug/L	None
	Bis(2-ethylhexyl)phthalate	8 ug/L	None
	Pesticides & PCBs	ND	None
WF042	**Client ID:** 05T04901		
	Laboratory ID: ME007001		
	Collection Date: 6/18/97		
	Type: Trip blank		
	Volatiles	ND	None
WF042	**Client ID:** 05T05001		
	Laboratory ID: ME021001		
	Collection Date: 6/20/97		
	Type: Trip blank		
	Volatiles		
	Acetone	2 ug/L	None
WF042	**Client ID:** 05R03101		
	Laboratory ID: ME007006		
	Collection Date: 6/17/97		
	Type: Equipment rinsate		
	Volatiles	ND	None
WF043	**Client ID:** 05R03201		
	Laboratory ID: ME042002		
	Collection Date: 6/23/97		
	Type: Equipment rinsate		
	Volatiles		
	1,2-Dichloropropane	1 ug/L	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF043	**Client ID:** 05T05101 **Laboratory ID:** MW042001 **Collection Date:** 6/23/97 **Type:** Trip blank		
	Volatiles	ND	None
WF043	**Client ID:** 33T05201 **Laboratory ID:** MW053001 **Collection Date:** 6/24/97 **Type:** Trip blank		
	Volatiles		
	Acetone	3 ug/L	None
WF043	**Client ID:** 33T05301 **Laboratory ID:** ME073001 **Collection Date:** 6/25/97 **Type:** Trip blank		
	Volatiles	ND	None
WF043	**Client ID:** 30T05401 **Laboratory ID:** ME087001 **Collection Date:** 6/26/97 **Type:** Trip blank		
	Volatiles		
	Acetone	4 ug/L	None
WF044	**Client ID:** 06R03301 **Laboratory ID:** ME100002 **Collection Date:** 6/29/97 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	7 ug/L	None
	Trichloroethene	6 ug/L	None
	Toluene	3 ug/L	None
	Ethylbenzene	1 ug/L	None
	Xylene (total)	2 ug/L	None
WF044	**Client ID:** 06T05501 **Laboratory ID:** ME100001 **Collection Date:** 6/29/97 **Type:** Trip blank		
	Volatiles	ND	None
WF044	**Client ID:** 66T05601 **Laboratory ID:** ME110001 **Collection Date:** 6/30/97 **Type:** Trip blank		
	Volatiles		
	Acetone	5 ug/L	10U ug/L[1]
WF044	**Client ID:** 66T05701 **Laboratory ID:** ME133001 **Collection Date:** 7/2/97 **Type:** Trip blank		
	Volatiles	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF044	**Client ID:** 66T05801 **Laboratory ID:** ME135001 **Collection Date:** 7/2/97 **Type:** Trip blank		
	Volatiles		
	Acetone	3 ug/L	10U ug/L[1]
WF045	**Client ID:** OWR03401 **Laboratory ID:** ME149002 **Collection Date:** 7/7/97 **Type:** Equipment rinsate		
	Volatiles		
	Acetone	3 ug/L	10U ug/L[1]
	1,2-Dichloropropane	1 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	5 ug/L	10U ug/L[1]
	Pesticides & PCBs	ND	None
WF045	**Client ID:** OWT05901 **Laboratory ID:** ME149001 **Collection Date:** 7/7/97 **Type:** Trip blank		
	Volatiles		
	Acetone	2 ug/L	10U ug/L[1]
WF045	**Client ID:** OWT06001 **Laboratory ID:** ME159001 **Collection Date:** 7/8/97 **Type:** Trip blank		
	Volatiles	ND	None
WF045	**Client ID:** 66T06101 **Laboratory ID:** ME175001 **Collection Date:** 7/9/97 **Type:** Trip blank		
	Volatiles		
	Acetone	2 ug/L	10U ug/L[1]
WF045	**Client ID:** OWT06201 **Laboratory ID:** ME190001 **Collection Date:** 7/10/97 **Type:** Trip blank		
	Volatiles	ND	None
WF045	**Client ID:** OWT06401 **Laboratory ID:** ME226001 **Collection Date:** 7/14/97 **Type:** Trip blank		
	Volatiles		
	Acetone	250 ug/L	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF045	**Client ID:** OWT06401DL **Laboratory ID:** ME226001DL **Collection Date:** 7/14/97 **Type:** Trip blank		
	Volatiles		
	Acetone	250 ug/L	None
WF046	**Client ID:** 31R03301 **Laboratory ID:** MW241002 **Collection Date:** 7/15/97 **Type:** Equipment rinsate		
	Volatiles		
	1,2-Dichloropropane	1 ug/L	None
	Semivolatiles		
	Di-n-butylphthalate	12 ug/L	12U ug/L[1]
	Pesticides & PCBs	ND	None
WF046	**Client ID:** 31T06501 **Laboratory ID:** ME241001 **Collection Date:** 7/15/97 **Type:** Trip blank		
	Volatiles		
	Acetone	4 ug/L	None
WF046	**Client ID:** 31T06601 **Laboratory ID:** ME261001 **Collection Date:** 7/16/97 **Type:** Trip blank		
	Volatiles		
	Toluene	1 ug/L	None
WF046	**Client ID:** 31T06701 **Laboratory ID:** ME305001 **Collection Date:** 7/21/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
WF047	**Client ID:** STOR_BLK **Laboratory ID:** ME243008 **Collection Date:** 7/15/97 **Type:** Storage blank		
	Volatiles	ND	None
WF047	**Client ID:** STOR_BLK2 **Laboratory ID:** ME267008 **Collection Date:** 7/16/97 **Type:** Storage blank		
	Volatiles		
	Acetone	4 ug/L	None
	Toluene	0.4 ug/L	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF047	**Client ID:** 39T10001 **Laboratory ID:** ME244001 **Collection Date:** 7/15/97 **Type:** Trip blank		
	Volatiles		
	Carbon disulfide	0.40 ug/L	None
	Toluene	0.50 ug/L	None
WF048	**Client ID:** 39R03401 **Laboratory ID:** ME264009 **Collection Date:** 7/17/97 **Type:** Equipment rinsate		
	Volatiles		
	1,2-Dichloropropane	1 ug/L	None
WF049	**Client ID:** 39T10201 **Laboratory ID:** ME262001 **Collection Date:** 7/15/97 **Type:** Trip blank		
	Volatiles		
	Toluene	0.90 ug/L	None
WF049	**Client ID:** 39T10401 **Laboratory ID:** ME263007 **Collection Date:** 7/17/97 **Type:** Trip blank		
	Volatiles		
	Toluene	0.40 ug/L	None
WF051	**Client ID:** 16R03501 **Laboratory ID:** ME306002 **Collection Date:** 7/21/97 **Type:** Equipment rinsate		
	Volatiles		
	Methylene chloride	1 ug/L	None
WF051	**Client ID:** 16T06801 **Laboratory ID:** ME306001 **Collection Date:** 7/21/97 **Type:** Trip blank		
	Volatiles		
	Methylene chloride	1 ug/L	None
	Acetone	3 ug/L	None
WF051	**Client ID:** 16T06901 **Laboratory ID:** ME322001 **Collection Date:** 7/22/97 **Type:** Trip blank		
	Volatiles	ND	None
WF051	**Client ID:** 16T07001 **Laboratory ID:** ME340001 **Collection Date:** 7/23/97 **Type:** Trip blank		
	Volatiles	ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter		Concentration	Qualifier
WF051	**Client ID:**	16T07101		
	Laboratory ID:	ME348001		
	Collection Date:	7/25/97		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF052	**Client ID:**	STORAGEBLK		
	Laboratory ID:	ME346008		
	Collection Date:	7/25/97		
	Type:	**Storage blank**		
	Volatiles			
	Methylene chloride		1 ug/L	None
	Acetone		3 ug/L	None
WF052	**Client ID:**	39T10501		
	Laboratory ID:	ME346007		
	Collection Date:	7/25/97		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF053	**Client ID:**	15R03701		
	Laboratory ID:	ME367002		
	Collection Date:	7/27/97		
	Type:	**Equipment rinsate**		
	Volatiles		ND	None
WF053	**Client ID:**	15T07201		
	Laboratory ID:	ME367001		
	Collection Date:	7/27/97		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF053	**Client ID:**	15T07301		
	Laboratory ID:	ME377001		
	Collection Date:	7/28/97		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF053	**Client ID:**	15T07401		
	Laboratory ID:	ME390001		
	Collection Date:	7/29/97		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF053	**Client ID:**	15T07501		
	Laboratory ID:	ME404001		
	Collection Date:	7/30/97		
	Type:	**Trip blank**		
	Volatiles		ND	None
WF054	**Client ID:**	15R03801		
	Laboratory ID:	ME441005		
	Collection Date:	8/5/97		
	Type:	**Equipment rinsate**		
	Volatiles		ND	None

Table IX
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Organic Compounds

SDG	Parameter	Concentration	Qualifier
WF054	**Client ID:** 30R03901 **Laboratory ID:** ME450002 **Collection Date:** 8/6/97 **Type:** Equipment rinsate		
	Volatiles		
	1,2-Dichloropropane	1 ug/L	None
WF054	**Client ID:** 15T07601 **Laboratory ID:** ME441001 **Collection Date:** 8/4/97 **Type:** Trip blank		
	Volatiles	ND	None
WF054	**Client ID:** 30T07701 **Laboratory ID:** ME450001 **Collection Date:** 8/5/97 **Type:** Trip blank		
	Volatiles	ND	None
WF055	**Client ID:** OWR04101 **Laboratory ID:** MF004002 **Collection Date:** 10/27/97 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF055	**Client ID:** 13R04201 **Laboratory ID:** MF004005 **Collection Date:** 10/28/97 **Type:** Equipment rinsate		
	Volatiles	ND	None
WF055	**Client ID:** OWT08001 **Laboratory ID:** MF004001 **Collection Date:** 10/27/97 **Type:** Trip blank		
	Volatiles	ND	None

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table X
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD/Difference	Qualifier
			% Recovery	Difference	MS	MSD		
WF022	BKG00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF023	02G00301	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF024	15G00701	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF025	15G00601	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF026	15G00803	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF027	16G00501	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF028	12G00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF029	14G00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF030	66G00601	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF031	05G01001	Iron	-	±100	-	-	124.8 ug/L	J
		Lead	-	±3.0	-	-	9.2 ug/L	J
		Sodium	-	±5000	-	-	5978 ug/L	J
		Zinc	-	±20.0	-	-	174 ug/L	J
		Cyanide	75-125	-	3.7	-	-	J (det) R (ND)
WF031B	None	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF032	29G00501	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF033	66G00201	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None

Table X
Summary of Percent Recoveries (%R) and Relative Percent Differences (RPD) for Matrix Spike and Laboratory Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Client ID	Analyte	Criteria		% Recovery		RPD/Difference	Qualifier
			% Recovery	Difference	MS	MSD		
WF034	30G00301	Antimony	75-125	-	126.7	-	-	J (all detects)
		Cyanide	-	-	-	-	-	None
WF035	66G01701	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF036	54G00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF037	15F00201	Metals	-	-	-	-	-	None
		Cyanide	75-125	-	3.7	-	-	J (det) R (ND)
WF041	35G00101	Aluminum	-	≤100	-	-	402 ug/L	J
		Iron	-	≤100	-	-	309 ug/L	J
		Manganese	-	≤10	-	-	75.2 ug/L	J
		Cyanide	-	-	-	-	-	None
WF045	OWG00502	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF046	31G00101	Metals	-	-	-	-	-	None
		Cyanide	-	-	-	-	-	None
WF047	39W034	Metals	-	-	-	-	-	None
WF051	None	Metals	-	-	-	-	-	None
WF053	15G00602	Metals	-	-	-	-	-	None
WF054	15G00801	Metals	-	-	-	-	-	None

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF022	**Client ID**	**BKG00101**	**BKG00101D**	
	Laboratory ID	**RB858003**	**RB858004**	
	Collection Date	**7/16/96**	**7/16/96**	
	Aluminum	43.4 ug/L	54.4 ug/L	22
	Barium	15.6 ug/L	15.6 ug/L	0
	Calcium	536 ug/L	558 ug/L	4
	Iron	54.0 ug/L	57.9 ug/L	7
	Lead	ND	0.80 ug/L	Not calculable
	Magnesium	499 ug/L	521 ug/L	4
	Manganese	1.7 ug/L	1.9 ug/L	11
	Selenium	0.67 ug/L	ND	Not calculable
	Sodium	1080 ug/L	1080 ug/L	0
	Zinc	2.4 ug/L	ND	Not calculable
	Cyanide	3.8 ug/L	6.5 ug/L	52
WF022	**Client ID**	**01G00102**	**01G00102D**	
	Laboratory ID	**RB873008**	**RB873009**	
	Collection Date	**7/19/96**	**7/19/96**	
	Aluminum	19.1 ug/L	10.3 ug/L	50
	Barium	15.6 ug/L	15.6 ug/L	0
	Beryllium	0.53 ug/L	ND	Not calculable
	Calcium	5850 ug/L	6250 ug/L	7
	Copper	ND	1.4 ug/L	Not calculable
	Iron	12.2 ug/L	8.8 ug/L	32
	Lead	1.3 ug/L	1.5 ug/L	14
	Magnesium	337 ug/L	331 ug/L	2
	Manganese	6.7 ug/L	9.0 ug/L	29
	Potassium	938 ug/L	842 ug/L	11
	Sodium	2100 ug/L	2070 ug/L	1
	Vanadium	ND	1.6 ug/L	Not calculable
	Zinc	10.2 ug/L	11.4 ug/L	11
	Cyanide	1.9 ug/L	ND	Not calculable
WF023	**Client ID**	**02G00301**	**02G00301D**	
	Laboratory ID	**RB887012**	**RB887013**	
	Collection Date	**7/24/96**	**7/24/96**	
	Aluminum	79.3 ug/L	84.6 ug/L	6
	Barium	128 ug/L	129 ug/L	0.8
	Beryllium	0.39 ug/L	ND	Not calculable
	Calcium	113000 ug/L	113000 ug/L	0
	Iron	36.2 ug/L	38.7 ug/L	7
	Lead	1.4 ug/L	1.3 ug/L	7
	Magnesium	9560 ug/L	9590 ug/L	0.3
	Manganese	13.5 ug/L	13.7 ug/L	1
	Nickel	7.8 ug/L	9.6 ug/L	21
	Potassium	4610 ug/L	4580 ug/L	0.7
	Selenium	1.2 ug/L	0.66 ug/L	58
	Sodium	2200 ug/L	2240 ug/L	2
	Vanadium	3.0 ug/L	2.8 ug/L	7
	Zinc	1.8 ug/L	2.0 ug/L	11
	Cyanide	4.5 ug/L	2.0 ug/L	77

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF024	**Client ID**	**15G00701**	**15G00701D**	
	Laboratory ID	**RB920009**	**RB950010**	
	Collection Date	**7/31/96**	**7/31/96**	
	Aluminum	161 ug/L	173 ug/L	7
	Barium	15.6 ug/L	19.3 ug/L	21
	Calcium	356 ug/L	360 ug/L	1
	Chromium	2.9 ug/L	2.0 ug/L	37
	Iron	183 ug/L	202 ug/L	10
	Lead	0.70 ug/L	0.60 ug/L	15
	Magnesium	433 ug/L	422 ug/L	3
	Manganese	2.8 ug/L	2.6 ug/L	7
	Sodium	1530 ug/L	1610 ug/L	5
	Vanadium	ND	1.2 ug/L	Not calculable
	Zinc	3.4 ug/L	3.6 ug/L	6
	Cyanide	2.6 ug/L	3.2 ug/L	21
WF025	**Client ID**	**15G00601**	**15G00601D**	
	Laboratory ID	**RB956006**	**RB956008**	
	Collection Date	**8/7/96**	**8/7/96**	
	Aluminum	89.4 ug/L	55.8 ug/L	46
	Arsenic	8.0 ug/L	7.8 ug/L	2
	Barium	67.6 ug/L	63.7 ug/L	6
	Calcium	3690 ug/L	3620 ug/L	2
	Iron	31000 ug/L	30500 ug/L	2
	Lead	0.90 ug/L	0.50U ug/L	Not calculable
	Magnesium	1940 ug/L	1900 ug/L	2
	Manganese	139 ug/L	136 ug/L	2
	Potassium	2460 ug/L	2340 ug/L	5
	Sodium	2630 ug/L	2590 ug/L	2
	Zinc	3.4 ug/L	3.3 ug/L	3
	Cyanide	1.5U ug/L	8.1 ug/L	Not calculable
WF026	**Client ID**	**15G00803**	**15G00803D**	
	Laboratory ID	**RB980007**	**RB980008**	
	Collection Date	**8/14/96**	**8/14/96**	
	Aluminum	187 ug/L	146 ug/L	25
	Barium	10.6 ug/L	10.8 ug/L	2
	Calcium	1440 ug/L	1170 ug/L	21
	Chromium	2.9 ug/L	2.0U ug/L	Not calculable
	Cobalt	2.3U ug/L	2.4 ug/L	Not calculable
	Copper	4.0 ug/L	2.4 ug/L	50
	Iron	194 ug/L	175 ug/L	10
	Lead	0.80 ug/L	0.50 ug/L	46
	Magnesium	322 ug/L	296 ug/L	8
	Manganese	33.1 ug/L	32.9 ug/L	0.6
	Potassium	522 ug/L	316U ug/L	Not calculable
	Sodium	5350 ug/L	5380 ug/L	0.6
	Vanadium	2.0 ug/L	1.5 ug/L	29
	Zinc	176 ug/L	178 ug/L	1
	Cyanide	1.6 ug/L	4.2 ug/L	90

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF026	**Client ID**	**16G00403**	**16G00403D**	
	Laboratory ID	**RB980020**	**RB980021**	
	Collection Date	**8/16/96**	**8/16/96**	
	Aluminum	278 ug/L	290 ug/L	4
	Arsenic	1.0 ug/L	0.50U ug/L	Not calculable
	Barium	28.6 ug/L	27.5 ug/L	4
	Calcium	3110 ug/L	3300 ug/L	6
	Chromium	2.3 ug/L	2.9 ug/L	23
	Copper	1.1U ug/L	1.3 ug/L	Not calculable
	Iron	1370 ug/L	879 ug/L	44
	Lead	4.0 ug/L	2.7 ug/L	39
	Magnesium	1320 ug/L	987 ug/L	29
	Manganese	41.3 ug/L	33.5 ug/L	21
	Potassium	540 ug/L	713 ug/L	28
	Sodium	2570 ug/L	2590 ug/L	0.8
	Vanadium	2.2 ug/L	1.2U ug/L	Not calculable
	Zinc	103 ug/L	945 ug/L	161
	Cyanide	2.9 ug/L	1.6 ug/L	58
WF027	**Client ID**	**16G00501**	**16G00501D**	
	Laboratory ID	**RC016009**	**RC016013**	
	Collection Date	**8/21/96**	**8/21/96**	
	Aluminum	12.6 ug/L	16.7 ug/L	28
	Barium	10 ug/L	10 ug/L	0
	Calcium	239 ug/L	234 ug/L	2
	Cobalt	3.2 ug/L	2.3U ug/L	Not calculable
	Iron	9.2 ug/L	5.3 ug/L	54
	Magnesium	276 ug/L	261 ug/L	6
	Manganese	1.0U ug/L	2.1 ug/L	Not calculable
	Sodium	1550 ug/L	1450 ug/L	7
	Zinc	2.6 ug/L	1.6 ug/L	48
WF027	**Client ID**	**09G00301**	**09G00301D**	
	Laboratory ID	**RC016019**	**RC016020**	
	Collection Date	**8/23/96**	**8/23/96**	
	Aluminum	407 ug/L	372 ug/L	9
	Antimony	8.6U ug/L	9.3 ug/L	Not calculable
	Arsenic	2.6 ug/L	2.8 ug/L	7
	Barium	27.1 ug/L	25.8 ug/L	5
	Calcium	15300 ug/L	14600 ug/L	5
	Chromium	4.0 ug/L	2.4 ug/L	50
	Iron	173 ug/L	148 ug/L	16
	Lead	0.50U ug/L	0.60 ug/L	Not calculable
	Magnesium	158 ug/L	160 ug/L	1
	Manganese	1.5 ug/L	1.7 ug/L	12
	Potassium	2390 ug/L	2010 ug/L	17
	Sodium	2070 ug/L	1950 ug/L	6
	Vanadium	16.4 ug/L	14.3 ug/L	14
	Zinc	14.8 ug/L	1.2 ug/L	170

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF028	**Client ID**	**12G00101**	**12G00101D**	
	Laboratory ID	**RC044012**	**RC044017**	
	Collection Date	**8/27/96**	**8/27/96**	
	Aluminum	14.0 ug/L	15.1 ug/L	8
	Barium	14.5 ug/L	14.5 ug/L	0
	Calcium	1840 ug/L	1870 ug/L	2
	Lead	0.60 ug/L	0.50U ug/L	Not calculable
	Magnesium	320 ug/L	327 ug/L	2
	Manganese	1.0U ug/L	1.4 ug/L	Not calculable
	Potassium	2220 ug/L	2290 ug/L	3
	Sodium	2310 ug/L	2360 ug/L	2
	Thallium	0.70 ug/L	0.60U ug/L	Not calculable
	Zinc	6.7 ug/L	5.5 ug/L	20
	Cyanide	1.8U ug/L	2.1 ug/L	Not calculable
WF028	**Client ID**	**11G00201**	**11G00201D**	
	Laboratory ID	**RC044011**	**RC044018**	
	Collection Date	**8/28/96**	**8/28/96**	
	Aluminum	2770 ug/L	2320 ug/L	18
	Arsenic	1.7 ug/L	2.0 ug/L	16
	Barium	50.3 ug/L	51.6 ug/L	3
	Beryllium	0.40 ug/L	0.30U ug/L	Not calculable
	Calcium	35400 ug/L	41800 ug/L	17
	Chromium	20.4 ug/L	19.2 ug/L	6
	Copper	2.0 ug/L	3.1 ug/L	43
	Iron	232 ug/L	337 ug/L	37
	Lead	0.50U ug/L	0.90 ug/L	Not calculable
	Magnesium	388 ug/L	538 ug/L	32
	Manganese	2.2 ug/L	4.8 ug/L	74
	Potassium	12900 ug/L	9610 ug/L	29
	Sodium	3420 ug/L	2950 ug/L	15
	Vanadium	11.0 ug/L	11.0 ug/L	0
	Zinc	3.4 ug/L	24.3 ug/L	151
	Cyanide	1.5U ug/L	3.3 ug/L	Not calculable
WF029	**Client ID**	**14G00101**	**14G00101D**	
	Laboratory ID	**RC092007**	**RC092009**	
	Collection Date	**9/11/96**	**9/11/96**	
	Aluminum	33.1 ug/L	26.5 ug/L	22
	Arsenic	0.50 ug/L	0.50U ug/L	Not calculable
	Barium	22.3 ug/L	22.3 ug/L	0
	Calcium-	3060 ug/L	2870 ug/L	6
	Iron	22.0 ug/L	27.3 ug/L	22
	Lead	1.3 ug/L	0.80 ug/L	48
	Magnesium	702 ug/L	691 ug/L	2
	Manganese	1.9 ug/L	1.9 ug/L	0
	Mercury	0.12 ug/L	0.10U ug/L	Not calculable
	Sodium	1590 ug/L	1570 ug/L	1
	Vanadium	1.2U ug/L	1.4 ug/L	Not calculable
	Zinc	89.5 ug/L	96.8 ug/L	8

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF030	**Client ID**	**66G00601**	**66G00601D**	
	Laboratory ID	**RC121007**	**RC121011**	
	Collection Date	**9/18/96**	**9/18/96**	
	Aluminum	39.9 ug/L	39.7 ug/L	0.5
	Barium	38.1 ug/L	36.2 ug/L	5
	Calcium	863 ug/L	770 ug/L	11
	Copper	1.8 ug/L	1.1U ug/L	**Not calculable**
	Iron	8.2 ug/L	41.9 ug/L	134
	Lead	0.90 ug/L	0.50U ug/L	**Not calculable**
	Magnesium	1130 ug/L	1110 ug/L	2
	Manganese	5.0 ug/L	4.6 ug/L	8
	Potassium	860 ug/L	689 ug/L	22
	Selenium	0.64 ug/L	0.60U ug/L	**Not calculable**
	Sodium	1280 ug/L	1160 ug/L	10
	Zinc	2.9 ug/L	4.8 ug/L	49
WF030	**Client ID**	**66G02203**	**66G02203D**	
	Laboratory ID	**RC121016**	**RC121017**	
	Collection Date	**9/20/96**	**9/20/96**	
	Aluminum	44.0 ug/L	51.9 ug/L	16
	Barium	6.4 ug/L	6.4 ug/L	0
	Calcium	751 ug/L	731 ug/L	3
	Cobalt	2.3U ug/L	2.4 ug/L	Not calculable
	Iron	35.6 ug/L	38.9 ug/L	9
	Magnesium	271 ug/L	242 ug/L	11
	Manganese	9.7 ug/L	9.7 ug/L	0
	Potassium	491 ug/L	316U ug/L	Not calculable
	Sodium	2810 ug/L	2760 ug/L	2
	Zinc	1.2 ug/L	2.2 ug/L	59
	Cyanide	1.8U ug/L	12.0 ug/L	Not calculable
WF031	**Client ID**	**05G01001**	**05G01001D**	
	Laboratory ID	**MB928007**	**MB928012**	
	Collection Date	**9/25/96**	**9/25/96**	
	Barium	27.6 ug/L	27.1 ug/L	2
	Calcium	854 ug/L	803 ug/L	6
	Chromium	0.61 ug/L	0.36 ug/L	52
	Cobalt	0.85 ug/L	0.72 ug/L	17
	Copper	35.6 ug/L	1.7U ug/L	Not calculable
	Iron	40.1 ug/L	31.8U ug/L	Not calculable
	Lead	4.4 ug/L	1.8U ug/L	Not calculable
	Magnesium	874 ug/L	871 ug/L	0.6
	Manganese	3.3 ug/L	2.5 ug/L	28
	Mercury	0.03 ug/L	0.04 ug/L	29
	Nickel	1.4 ug/L	1.4 ug/L	0
	Potassium	3.1U ug/L	825 ug/L	Not calculable
	Selenium	5.4 ug/L	3.9U ug/L	Not calculable
	Sodium	15100 ug/L	14900 ug/L	1
	Thallium	7.4 ug/L	1.9U ug/L	Not calculable
	Vanadium	0.58U ug/L	0.63 ug/L	Not calculable
	Zinc	13.7 ug/L	3.8 ug/L	113

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF031	**Client ID**	**33G00301**	**33G00301D**	
	Laboratory ID	**MB958006**	**MB958007**	
	Collection Date	**9/27/96**	**9/27/96**	
	Aluminum	156	98.7	45
	Antimony	3.5	3.4U	Not calculable
	Barium	59.3	59.9	1
	Calcium	2230	2230	0
	Chromium	0.88	0.34U	Not calculable
	Cobalt	0.70	0.49	35
	Iron	107	50.6	72
	Magnesium	1750	1760	0.6
	Manganese	21.2	21.5	1
	Potassium	31.8	1040	188
	Sodium	5370	5550	3
	Thallium	2.9	3.4	16
	Vanadium	1.0	0.58U	Not calculable
	Zinc	7.4	7.2	3
WF032	**Client ID**	**29G00501**	**29G00501D**	
	Laboratory ID	**MC011007**	**MC011008**	
	Collection Date	**10/2/96**	**10/2/96**	
	Barium	89.7 ug/L	84.2 ug/L	6
	Beryllium	0.14 ug/L	0.19 ug/L	30
	Calcium	1580 ug/L	1470 ug/L	7
	Chromium	2.1 ug/L	2.8 ug/L	29
	Cobalt	0.94 ug/L	0.98 ug/L	4
	Copper	2.7 ug/L	4.4 ug/L	48
	Magnesium	2500 ug/L	2320 ug/L	7
	Manganese	8.4 ug/L	8.0 ug/L	5
	Mercury	0.04 ug/L	0.04 ug/L	0
	Sodium	5040 ug/L	5030 ug/L	0.2
	Zinc	5.1 ug/L	3.8 ug/L	29
	Cyanide	1.0 ug/L	1.2 ug/L	18
WF033	**Client ID**	**66G00201**	**66G00201D**	
	Laboratory ID	**MC118002**	**MC118003**	
	Collection Date	**10/9/96**	**10/9/96**	
	Barium	20.8 ug/L	20.7 ug/L	0.5
	Calcium	3250 ug/L	3100 ug/L	5
	Chromium	0.75 ug/L	0.44 ug/L	52
	Copper	1.7U ug/L	2.7 ug/L	Not calculable
	Iron	73.8 ug/L	31.8U ug/L	Not calculable
	Magnesium	456 ug/L	457 ug/L	0.2
	Manganese	3.4 ug/L	3.2 ug/L	6
	Mercury	0.03 ug/L	0.03 ug/L	0
	Potassium	648 ug/L	1920 ug/L	99
	Sodium	3040 ug/L	3020 ug/L	0.7
	Zinc	3.6 ug/L	6.0 ug/L	50

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF034	**Client ID**	**30G00301**	**30G00301D**	
	Laboratory ID	**MC153005**	**MC153008**	
	Collection Date	**10/16/96**	**10/16/96**	
	Barium	28.0 ug/L	27.8 ug/L	0.7
	Beryllium	0.20 ug/L	0.13U ug/L	Not calculable
	Calcium	1530 ug/L	1480 ug/L	3
	Copper	11.0 ug/L	3.2 ug/L	110
	Iron	626 ug/L	634 ug/L	1
	Lead	3.8 ug/L	2.4 ug/L	45
	Magnesium	642 ug/L	650 ug/L	1
	Manganese	20.7 ug/L	21.0 ug/L	1
	Mercury	0.04 ug/L	0.05 ug/L	22
	Potassium	1880 ug/L	2680 ug/L	35
	Sodium	4600 ug/L	4490 ug/L	2
	Zinc	5.5 ug/L	4.4 ug/L	22
WF035	**Client ID**	**66G01701**	**66G01701D**	
	Laboratory ID	**MC214005**	**MC214007**	
	Collection Date	**10/23/96**	**10/23/96**	
	Aluminum	24.3 ug/L	30.9 ug/L	24
	Barium	10.2 ug/L	10.7 ug/L	5
	Calcium	766 ug/L	816 ug/L	6
	Copper	1.7U ug/L	22.5 ug/L	Not calculable
	Iron	343 ug/L	348 ug/L	1
	Lead	2.0U ug/L	2.6 ug/L	Not calculable
	Magnesium	320 ug/L	324 ug/L	1
	Manganese	4.2 ug/L	5.4 ug/L	25
	Mercury	0.03 ug/L	0.03 ug/L	0
	Selenium	4.0 ug/L	3.9U ug/L	Not calculable
	Sodium	7660 ug/L	7790 ug/L	2
	Zinc	2.5 ug/L	26.3 ug/L	165
WF036	**Client ID**	**54G00101**	**54G00101D**	
	Laboratory ID	**MC262004**	**MC262008**	
	Collection Date	**10/30/96**	**10/30/96**	
	Aluminum	87.6 ug/L	91.6 ug/L	4
	Barium	75.2 ug/L	74.3 ug/L	1
	Beryllium	0.18 ug/L	0.18 ug/L	0
	Calcium	1680 ug/L	1660 ug/L	1
	Chromium	1.2 ug/L	1.0 ug/L	2
	Cobalt	0.90 ug/L	1.4 ug/L	43
	Magnesium	1950 ug/L	1920 ug/L	2
	Manganese	13.9 ug/L	12.9 ug/L	7
	Mercury	0.02 ug/L	0.01U ug/L	Not calculable
	Potassium	2410 ug/L	2530 ug/L	5
	Sodium	2110 ug/L	2070 ug/L	2
	Zinc	4.5 ug/L	3.5 ug/L	25

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF041	**Client ID**	**35G00101**	**35G00101D**	
	Laboratory ID	**MD908004**	**MD908005**	
	Collection Date	**6/11/97**	**6/11/97**	
	Aluminum	47.8 ug/L	45.2 ug/L	6
	Barium	78.8 ug/L	79.0 ug/L	0.2
	Calcium	3150 ug/L	3240 ug/L	3
	Copper	8.2 ug/L	6.8 ug/L	19
	Iron	15.9 ug/L	19.0 ug/L	18
	Lead	1.7 ug/L	0.93U ug/L	Not calculable
	Magnesium	2340 ug/L	2370 ug/L	1
	Manganese	28.7 ug/L	28.9 ug/L	0.7
	Sodium	4330 ug/L	4430 ug/L	2
	Thallium	1.9 ug/L	0.89U ug/L	Not calculable
	Zinc	12.1 ug/L	130 ug/L	166
	Cyanide	ND	ND	-
WF041	**Client ID**	**35G00202**	**35G00202D**	
	Laboratory ID	**MD950002**	**MD950003**	
	Collection Date	**6/15/97**	**6/15/97**	
	Aluminum	65.0 ug/L	50.7 ug/L	25
	Barium	24.8 ug/L	25.3 ug/L	2
	Calcium	973 ug/L	1030 ug/L	6
	Copper	5.6 ug/L	3.5 ug/L	46
	Iron	180 ug/L	196 ug/L	8
	Lead	0.93U ug/L	1.9 ug/L	Not calculable
	Magnesium	813 ug/L	819 ug/L	0.7
	Manganese	9.5 ug/L	9.3 ug/L	2
	Selenium	1.8U ug/L	2.6 ug/L	Not calculable
	Sodium	20900 ug/L	21700 ug/L	4
	Thallium	1.0 ug/L	0.89U ug/L	Not calculable
	Zinc	18.7 ug/L	15.4 ug/L	19
	Cyanide	ND	ND	-
WF045	**Client ID**	**OWG00502**	**OWG00502D**	
	Laboratory ID	**ME149004**	**ME149005**	
	Collection Date	**7/8/97**	**7/8/97**	
	Aluminum	175 ug/L	160 ug/L	9
	Barium	7.3 ug/L	7.1 ug/L	3
	Calcium	648 ug/L	585 ug/L	10
	Copper	2.9 ug/L	4.4 ug/L	41
	Iron	106 ug/L	97.1 ug/L	9
	Magnesium	308 ug/L	317 ug/L	3
	Manganese	3.3 ug/L	3.5 ug/L	6
	Nickel	7.8 ug/L	7.7U ug/L	Not calculable
	Sodium	1990 ug/L	2060 ug/L	3
	Zinc	4.5 ug/L	4.7 ug/L	4
	Cyanide	ND	ND	-

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF045	**Client ID**	**OWG00302**	**OWG00302D**	
	Laboratory ID	**ME190002**	**ME190003**	
	Collection Date	**7/10/97**	**7/10/97**	
	Aluminum	31.5 ug/L	16.6U ug/L	Not calculable
	Barium	10.2 ug/L	10.5 ug/L	3
	Calcium	460 ug/L	454 ug/L	1
	Iron	83.3 ug/L	51.1 ug/L	46
	Lead	1.9 ug/L	1.2U ug/L	Not calculable
	Magnesium	286 ug/L	300 ug/L	5
	Manganese	3.0 ug/L	3.0 ug/L	0
	Sodium	1670 ug/L	1670 ug/L	0
	Zinc	3.4 ug/L	3.8 ug/L	11
	Cyanide	ND	ND	-
WF046	**Client ID**	**31G00101**	**31G00101D**	
	Laboratory ID	**ME241003**	**ME241004**	
	Collection Date	**7/15/97**	**7/15/97**	
	Aluminum	96.0 ug/L	91.1 ug/L	5
	Barium	22.6 ug/L	22.5 ug/L	0.4
	Calcium	857 ug/L	851 ug/L	0.7
	Copper	1.3U ug/L	1.4 ug/L	Not calculable
	Iron	120 ug/L	103 ug/L	15
	Magnesium	662 ug/L	675 ug/L	2
	Manganese	9.7 ug/L	9.9 ug/L	2
	Potassium	1910 ug/L	2200 ug/L	15
	Sodium	1760 ug/L	1890 ug/L	7
	Vanadium	1.8 ug/L	1.7U ug/L	Not calculable
	Zinc	3.5 ug/L	9.8 ug/L	95
	Cyanide	ND	ND	-
WF047	**Client ID**	**39W034**	**39W034D**	
	Laboratory ID	**ME243005**	**ME243006**	
	Collection Date	**7/15/97**	**7/15/97**	
	Aluminum	94.0 ug/L	76.3 ug/L	21
	Barium	22.9 ug/L	22.8 ug/L	0.4
	Calcium	1030 ug/L	1010 ug/L	2
	Copper	8.2 ug/L	1.3U ug/L	Not calculable
	Iron	747 ug/L	751 ug/L	0.5
	Magnesium	871 ug/L	854 ug/L	2
	Manganese	12.5 ug/L	12.6 ug/L	0.8
	Sodium	2210 ug/L	2090 ug/L	6
	Zinc	14.7 ug/L	3.0 ug/L	132
WF051	**Client ID**	**16G00101**	**16G00101D**	
	Laboratory ID	**ME340009**	**ME340010**	
	Collection Date	**7/24/97**	**7/24/97**	
	Barium	20.5 ug/L	20.7 ug/L	1
	Calcium	514 ug/L	520 ug/L	1
	Copper	1.7 ug/L	1.7 ug/L	0
	Iron	11.2 ug/L	14.7 ug/L	27
	Magnesium	617 ug/L	623 ug/L	1
	Manganese	3.2 ug/L	3.0 ug/L	6
	Sodium	2130 ug/L	2110 ug/L	1
	Zinc	3.2 ug/L	8.2 ug/L	88

Table XI
Summary of Relative Percent Differences (RPD) for Original and Field Duplicate Samples
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

SDG	Inorganic Analytes			RPD
WF053	**Client ID**	**15G00602**	**15G00602D**	
	Laboratory ID	**ME367004**	**ME367005**	
	Collection Date	**7/27/97**	**7/27/97**	
	Aluminum	16.6U ug/L	29.9 ug/L	Not calculable
	Barium	13.0 ug/L	13.0 ug/L	0
	Calcium	676 ug/L	675 ug/L	0.1
	Chromium	3.3 ug/L	4.2 ug/L	24
	Iron	33.8 ug/L	92.6 ug/L	93
	Magnesium	504 ug/L	490 ug/L	3
	Manganese	2.3 ug/L	2.7 ug/L	16
	Sodium	2870 ug/L	2740 ug/L	5
	Zinc	3.1 ug/L	3.4 ug/L	9
WF053	**Client ID**	**15G00703**	**15G00703D**	
	Laboratory ID	**ME404003**	**ME404004**	
	Collection Date	**7/30/97**	**7/30/97**	
	Aluminum	43.6 ug/L	108 ug/L	14
	Antimony	17.3U ug/L	21.2 ug/L	Not calculable
	Barium	6.6 ug/L	6.2 ug/L	6
	Calcium	587 ug/L	549 ug/L	7
	Chromium	10.6 ug/L	13.4 ug/L	23
	Copper	2.9 ug/L	4.5 ug/L	43
	Iron	107 ug/L	115 ug/L	7
	Lead	0.93U ug/L	5.1 ug/L	Not calculable
	Magnesium	280 ug/L	266 ug/L	5
	Manganese	6.9 ug/L	6.5 ug/L	6
	Nickel	10.9 ug/L	20.3 ug/L	60
	Sodium	2040 ug/L	1820 ug/L	11
	Zinc	5.2 ug/L	6.1 ug/L	16
WF054	**Client ID**	**15G00801**	**15G00801D**	
	Laboratory ID	**ME441002**	**ME441003**	
	Collection Date	**8/4/97**	**8/4/97**	
	Aluminum	143 ug/L	116 ug/L	21
	Arsenic	2.0 ug/L	1.1U ug/L	Not calculable
	Barium	34.7 ug/L	37.3 ug/L	7
	Calcium	1870 ug/L	2010 ug/L	7
	Copper	5.2 ug/L	2.6 ug/L	67
	Iron	4760 ug/L	4940 ug/L	4
	Magnesium	1370 ug/L	1470 ug/L	7
	Manganese	84.6 ug/L	91.4 ug/L	8
	Mercury	0.04U ug/L	0.07 ug/L	Not calculable
	Sodium	1830 ug/L	1960 ug/L	7
	Thallium	0.89U ug/L	0.90 ug/L	Not calculable
	Zinc	8.5 ug/L	6.6 ug/L	25

Table XII
Summary of Analytes Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Date	Analyte	Initial Calibration r	Continuing Calibration %R	Qualifier
WF022	All	Metals Cyanide	- -	- -	None None
WF023	All	Metals Cyanide	- -	- -	None None
WF024	All	Metals Cyanide	- -	- -	None None
WF025	All	Metals Cyanide	- -	- -	None None
WF026	All	Metals Cyanide	- -	- -	None None
WF027	All	Metals Cyanide	- -	- -	None None
WF028	All	Metals Cyanide	- -	- -	None None
WF029	All	Metals Cyanide	- -	- -	None None
WF030	All	Metals Cyanide	- -	- -	None None
WF031	All	Metals Cyanide	- -	- -	None None
WF031B	All	Metals Cyanide	- -	- -	None None
WF032	All	Metals Cyanide	- -	- -	None None
WF033	All	Metals Cyanide	- -	- -	None None
WF034	All	Metals Cyanide	- -	- -	None None
WF035	All	Metals Cyanide	- -	- -	None None
WF036	All	Metals Cyanide	- -	- -	None None
WF037	All	Metals Cyanide	- -	- -	None None
WF041	All	Metals Cyanide	- -	- -	None None
WF045	All	Metals Cyanide	- -	- -	None None
WF046	All	Metals Cyanide	- -	- -	None None
WF047	All	Metals	-	-	None
WF051	All	Metals	-	-	None

Table XII
Summary of Analytes Exceeding Instrument Calibration
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes					
SDG	**Date**	**Analyte**	**Initial Calibration r**	**Continuing Calibration %R**	**Qualifier**
WF053	All	Metals	-	-	None
WF054	All	Metals	-	-	None

Notes: r = correlation coefficient for initial calibrations

%R = percent recovery for continuing calibrations

J = the analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample because QC criteria were not met (validation "J").

UJ = the analyte was not detected above the reported sample IDL. However, the reported sample is approximate: the analyte concentration may not reliably be presumed to be less than the IDL value.

R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF022	Aluminum	6.240 ug/L	All samples in SDG WF022
	Iron	12.320 ug/L	
	Lead	0.500 ug/L	
	Sodium	38.890 ug/L	
	Zinc	3.660 ug/L	
WF023	Arsenic	-0.500 ug/L	All samples in SDG WF023
	Iron	5.980 ug/L	
	Lead	1.200 ug/L	
	Sodium	34.400 ug/L	
	Zinc	1.200 ug/L	
WF024	Aluminum	10.600 ug/L	All samples in SDG WF024
	Iron	13.190 ug/L	
	Lead	0.500 ug/L	
	Sodium	37.550 ug/L	
WF025	Aluminum	13.650 ug/L	All samples in SDG WF025
	Beryllium	-0.320 ug/L	
	Iron	7.390 ug/L	
	Selenium	0.650 ug/L	
	Zinc	1.610 ug/L	
WF026	Aluminum	17.380 ug/L	All samples in SDG WF026
	Calcium	119.520 ug/L	
	Iron	10.050 ug/L	
	Magnesium	22.940 ug/L	
	Mercury	0.140 ug/L	
	Sodium	41.280 ug/L	
	Zinc	2.510 ug/L	
	Mercury	0.20 ug/L	All samples in SDG WF026
WF027	Aluminum	18.000 ug/L	All samples in SDG WF027
	Antimony	9.280 ug/L	
	Arsenic	0.500 ug/L	
	Calcium	94.550 ug/L	
	Sodium	28.990 ug/L	
	Vanadium	1.280 ug/L	
	Mercury	0.21 ug/L	All samples in SDG WF027
WF028	Aluminum	51.600 ug/L	All samples in SDG WF028
	Antimony	-10.930 ug/L	
	Calcium	113.470 ug/L	
	Magnesium	45.540 ug/L	
	Mercury	0.140 ug/L	
	Potassium	498.120 ug/L	
	Sodium	43.870 ug/L	
	Zinc	1.230 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF029	Aluminum	10.6 ug/L	All samples in SDG WF029
	Barium	3.0 ug/L	
	Cobalt	2.7 ug/L	
	Iron	21.4 ug/L	
	Vanadium	1.4 ug/L	
	Cobalt	2.7 ug/L	All samples in SDG WF029
	Vanadium	1.6 ug/L	
	Mercury	-0.1 ug/L	All samples in SDG WF029
	Iron	5.3 ug/L	All samples in SDG WF029
	Vanadium	1.6 ug/L	
	Calcium	153.810 ug/L	All samples in SDG WF029
	Cobalt	2.390 ug/L	
	Iron	11.590 ug/L	
	Sodium	37.260 ug/L	
	Zinc	1.630 ug/L	
WF030	Calcium	59.580 ug/L	All samples in SDG WF030
	Iron	6.080 ug/L	
	Sodium	54.620 ug/L	
WF031	Mercury	0.030 ug/L	All samples in SDG WF031
	Potassium	-617.8 ug/L	
	Silver	-1.2 ug/L	
	Thallium	3.3 ug/L	
	Mercury	0.047 ug/L	All samples in SDG WF031
	Potassium	34.4 ug/L	
	Silver	-1.6 ug/L	
	Thallium	3.7 ug/L	
	Mercury	0.055 ug/L	All samples in SDG WF031
	Potassium	542.9 ug/L	
	Silver	-1.4 ug/L	
	Mercury	0.070 ug/L	All samples in SDG WF031
	Potassium	-21.4 ug/L	
	Silver	-1.3 ug/L	
	Thallium	3.5 ug/L	
	Mercury	0.047 ug/L	All samples in SDG WF031
	Potassium	-411.210 ug/L	
	Mercury	0.085 ug/L	All samples in SDG WF031
	Potassium	955.8 ug/L	
	Silver	-2.5 ug/L	
	Thallium	3.2 ug/L	
	Mercury	0.127 ug/L	All samples in SDG WF031
	Mercury	0.130 ug/L	All samples in SDG WF031
	Mercury	-0.030 ug/L	All samples in SDG WF031
	Potassium	-335.53 ug/L	
	Silver	-1.420 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF031 cont.	Arsenic	-6.4 ug/L	All samples in SDG WF031
	Chromium	-0.4 ug/L	
	Mercury	0.034 ug/L	
	Potassium	171.0 ug/L	
	Thallium	5.1 ug/L	
	Vanadium	1.4 ug/L	
	Mercury	0.016 ug/L	All samples in SDG WF031
	Potassium	342.4 ug/L	
	Silver	-1.2 ug/L	
	Thallium	5.2 ug/L	
	Vanadium	0.8 ug/L	
	Chromium	-0.7 ug/L	All samples in SDG WF031
	Mercury	0.011 ug/L	
	Potassium	308.7 ug/L	
	Thallium	6.2 ug/L	
	Vanadium	0.7 ug/L	
	Barium	-0.2 ug/L	All samples in SDG WF031
	Chromium	-0.6 ug/L	
	Mercury	-0.021 ug/L	
	Potassium	377.6 ug/L	
	Thallium	7.2 ug/L	
	Mercury	0.014 ug/L	All samples in SDG WF031
	Arsenic	-6.7 ug/L	All samples in SDG WF031
	Barium	-0.2 ug/L	
	Chromium	-0.8 ug/L	
	Mercury	-0.032 ug/L	
	Nickel	-1.4 ug/L	
	Potassium	441.5 ug/L	
	Thallium	5.7 ug/L	
	Vanadium	0.6 ug/L	
WF031B	Copper	604 ug/L	All samples in SDG WF031B
	Aluminum	-19.5 ug/L	All samples in SDG WF031B
	Barium	0.4 ug/L	
	Copper	4.4 ug/L	
	Manganese	0.4 ug/L	
	Barium	0.4 ug/L	All samples in SDG WF031B
	Copper	6.6 ug/L	
	Iron	3.5 ug/L	
	Mercury	0.0 ug/L	
	Nickel	9.5 ug/L	
	Sodium	10.6 ug/L	
	Barium	25.130 ug/L	All samples in SDG WF031B
	Beryllium	-0.830 ug/L	
	Calcium	129.890 ug/L	
	Copper	8.310 ug/L	
	Iron	8.680 ug/L	
	Magnesium	25.430 ug/L	
	Manganese	0.490 ug/L	
	Silver	2.970 ug/L	
	Sodium	84.450 ug/L	
	Vanadium	2.060 ug/L	
	Zinc	3.100 ug/L	
	Cyanide	-0.981 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF032	Copper	4.5 ug/L	All samples in SDG WF032
	Manganese	0.5 ug/L	
	Mercury	0.0242 ug/L	
	Potassium	-1595.8 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF032
	Cobalt	0.3 ug/L	
	Copper	5.5 ug/L	
	Manganese	0.7 ug/L	
	Mercury	0.0265 ug/L	
	Sodium	17.3 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF032
	Copper	4.9 ug/L	
	Manganese	0.6 ug/L	
	Mercury	0.0255 ug/L	
	Potassium	1914.8 ug/L	
	Sodium	11.6 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF032
	Copper	5.6 ug/L	
	Manganese	0.6 ug/L	
	Mercury	-0.0178 ug/L	
	Sodium	17.4 ug/L	
	Barium	1.210 ug/L	All samples in SDG WF032
	Chromium	2.750 ug/L	
	Copper	3.390 ug/L	
	Manganese	0.410 ug/L	
	Mercury	0.015 ug/L	
	Sodium	856.490 ug/L	
	Zinc	2.310 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF032
	Beryllium	0.1 ug/L	
	Cobalt	0.4 ug/L	
	Copper	5.8 ug/L	
	Manganese	0.2 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF032
	Beryllium	0.1 ug/L	
	Copper	5.8 ug/L	
	Manganese	0.4 ug/L	
	Mercury	-0.0874 ug/L	
	Nickel	2.0 ug/L	
	Sodium	11.5 ug/L	
	Barium	0.2 ug/L	All samples in SDG WF032
	Beryllium	0.1 ug/L	
	Copper	5.6 ug/L	
	Manganese	0.5 ug/L	
	Thallium	2.6 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF032
	Beryllium	0.3 ug/L	
	Cobalt	0.6 ug/L	
	Copper	7.0 ug/L	
	Manganese	0.8 ug/L	
	Nickel	1.4 ug/L	
	Thallium	4.3 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF032 cont.	Aluminum	107.660 ug/L	All samples in SDG WF032
	Antimony	4.320 ug/L	
	Barium	1.760 ug/L	
	Cadmium	1.660 ug/L	
	Calcium	105.840 ug/L	
	Cobalt	0.430 ug/L	
	Copper	12.450 ug/L	
	Iron	54.350 ug/L	
	Magnesium	103.090 ug/L	
	Manganese	0.280 ug/L	
	Sodium	154.770 ug/L	
	Zinc	9.120 ug/L	
	Antimony	4.3 ug/L	All samples in SDG WF032
	Barium	0.4 ug/L	
	Beryllium	0.3 ug/L	
	Copper	5.2 ug/L	
	Manganese	0.6 ug/L	
	Sodium	10.2 ug/L	All samples in SDG WF032
WF033	Barium	0.3 ug/L	All samples in SDG WF033
	Beryllium	0.1 ug/L	
	Cobalt	0.4 ug/L	
	Copper	5.8 ug/L	
	Manganese	0.2 ug/L	
	Mercury	0.07 ug/L	
	Potassium	-1595.8 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF033
	Beryllium	0.1 ug/L	
	Copper	5.8 ug/L	
	Manganese	0.4 ug/L	
	Mercury	0.04 ug/L	
	Potassium	655.4 ug/L	
	Barium	0.2 ug/L	All samples in SDG WF033
	Beryllium	0.1 ug/L	
	Copper	5.6 ug/L	
	Manganese	0.5 ug/L	
	Mercury	0.05 ug/L	
	Potassium	1914.8 ug/L	
	Thallium	2.6 ug/L	
	Barium	0.3 ug/L	All samples in SDG WF033
	Beryllium	0.3 ug/L	
	Cobalt	0.6 ug/L	
	Copper	7.0 ug/L	
	Manganese	0.8 ug/L	
	Potassium	425.8 ug/L	
	Thallium	4.3 ug/L	
	Aluminum	164.460 ug/L	All samples in SDG WF033
	Barium	1.220 ug/L	
	Calcium	107.040 ug/L	
	Copper	2.900 ug/L	
	Iron	33.430 ug/L	
	Magnesium	82.790 ug/L	
	Manganese	0.330 ug/L	
	Potassium	1602.780 ug/L	
	Sodium	221.450 ug/L	
	Zinc	1.660 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF033 cont.	Mercury	0.06 ug/L	All samples in SDG WF033
	Barium	0.4 ug/L	All samples in SDG WF033
	Beryllium	0.3 ug/L	
	Copper	5.2 ug/L	
	Manganese	0.6 ug/L	
	Mercury	0.05 ug/L	
	Potassium	163.8 ug/L	
	Antimony	4.810 ug/L	All samples in SDG WF033
	Barium	0.460 ug/L	
	Copper	2.870 ug/L	
	Manganese	0.330 ug/L	
	Potassium	509.990 ug/L	
	Sodium	137.200 ug/L	
	Zinc	3.200 ug/L	
	Barium	0.8 ug/L	All samples in SDG WF033
	Beryllium	0.6 ug/L	
	Cadmium	0.8 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.0 ug/L	
	Potassium	1734.0 ug/L	
	Thallium	2.4 ug/L	
	Vanadium	1.1 ug/L	
	Barium	1.2 ug/L	All samples in SDG WF033
	Beryllium	0.8 ug/L	
	Cadmium	0.9 ug/L	
	Chromium	1.2 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.3 ug/L	
	Potassium	1605.5 ug/L	
	Thallium	3.4 ug/L	
	Vanadium	1.8 ug/L	
	Barium	1.1 ug/L	All samples in SDG WF033
	Beryllium	0.8 ug/L	
	Cadmium	0.8 ug/L	
	Chromium	1.1 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.2 ug/L	
	Potassium	768.8 ug/L	
	Thallium	3.2 ug/L	
	Vanadium	1.7 ug/L	
	Barium	0.7 ug/L	All samples in SDG WF033
	Beryllium	0.7 ug/L	
	Cadmium	0.6 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	0.8 ug/L	
	Manganese	1.0 ug/L	
	Potassium	314.6 ug/L	
	Vanadium	1.2 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF033 cont.	Barium	1.0 ug/L	All samples in SDG WF033
	Beryllium	0.6 ug/L	
	Cadmium	0.6 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.0 ug/L	
	Manganese	1.0 ug/L	
	Potassium	684.9 ug/L	
	Thallium	2.2 ug/L	
	Vanadium	1.2 ug/L	
	Barium	0.9 ug/L	All samples in SDG WF033
	Beryllium	0.7 ug/L	
	Cadmium	0.7 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.0 ug/L	
	Manganese	1.0 ug/L	
	Potassium	722.1 ug/L	
	Thallium	3.4 ug/L	
	Vanadium	1.2 ug/L	
WF034	Copper	5.8 ug/L	All samples in SDG WF034
	Mercury	0.023 ug/L	
	Copper	5.8 ug/L	All samples in SDG WF034
	Manganese	0.4 ug/L	
	Mercury	0.017 ug/L	
	Beryllium	0.1 ug/L	All samples in SDG WF034
	Copper	5.6 ug/L	
	Manganese	0.5 ug/L	
	Mercury	0.030 ug/L	
	Beryllium	0.3 ug/L	All samples in SDG WF034
	Copper	7.0 ug/L	
	Manganese	0.8 ug/L	
	Mercury	0.042 ug/L	
	Sodium	10.2 ug/L	
	Barium	0.460 ug/L	66G02001
	Copper	2.870 ug/L	66G00302
	Sodium	137.200 ug/L	66G01801
	Zinc	3.200 ug/L	30G00301
	Cyanide	-1.327 ug/L	30G00401
			66R02201
			30G00301D
	Mercury	0.024 ug/L	All samples in SDG WF034
	Beryllium	0.3 ug/L	All samples in SDG WF034
	Copper	5.2 ug/L	
	Manganese	0.6 ug/L	
	Mercury	0.026 ug/L	
	Mercury	0.040 ug/L	All samples in SDG WF034
	Mercury	0.033 ug/L	All samples in SDG WF034

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Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF034 cont.	Arsenic	-13.610 ug/L	66G01101
	Barium	1.700 ug/L	66G01301
	Beryllium	-0.710 ug/L	66G00501
	Calcium	108.610 ug/L	66G00501F
	Copper	1.700 ug/L	
	Lead	-8.620 ug/L	
	Manganese	0.790 ug/L	
	Selenium	10.810 ug/L	
	Sodium	70.400 ug/L	
	Zinc	3.200 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF034
	Silver	3.3 ug/L	
	Sodium	11.9 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF034
	Manganese	0.4 ug/L	
	Silver	2.2 ug/L	
	Sodium	12.2 ug/L	
	Beryllium	0.5 ug/L	All samples in SDG WF034
	Copper	1.9 ug/L	
	Manganese	0.6 ug/L	
	Sodium	20.0 ug/L	
	Beryllium	0.1 ug/L	All samples in SDG WF034
	Silver	2.6 ug/L	
	Sodium	17.3 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF034
	Manganese	0.4 ug/L	
	Sodium	9.7 ug/L	
WF035	Barium	0.8 ug/L	All samples in SDG WF035
	Beryllium	0.6 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.0239 ug/L	
	Thallium	2.4 ug/L	
	Barium	1.2 ug/L	All samples in SDG WF035
	Beryllium	0.8 ug/L	
	Manganese	1.3 ug/L	
	Mercury	0.0256 ug/L	
	Thallium	3.4 ug/L	
	Barium	1.1 ug/L	All samples in SDG WF035
	Beryllium	0.8 ug/L	
	Manganese	1.2 ug/L	
	Mercury	0.0401 ug/L	
	Thallium	3.2 ug/L	
	Barium	0.7 ug/L	All samples in SDG WF035
	Beryllium	0.7 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.334 ug/L	
	Aluminum	101.120 ug/L	All samples in SDG WF035
	Barium	0.410 ug/L	
	Iron	56.400 ug/L	
	Manganese	0.430 ug/L	
	Sodium	152.450 ug/L	
	Zinc	2.190 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF035 cont.	Barium	1.0 ug/L	All samples in SDG WF035
	Beryllium	0.6 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.0250 ug/L	
	Thallium	2.2 ug/L	
	Barium	0.9 ug/L	All samples in SDG WF035
	Beryllium	0.7 ug/L	
	Manganese	1.0 ug/L	
	Thallium	3.4 ug/L	
	Barium	0.570 ug/L	All samples in SDG WF035
	Beryllium	-0.910 ug/L	
	Calcium	109.820 ug/L	
	Copper	5.470 ug/L	
	Manganese	0.720 ug/L	
	Zinc	4.400 ug/L	
	Manganese	0.6 ug/L	All samples in SDG WF035
	Manganese	0.4 ug/L	All samples in SDG WF035
	Barium	0.4 ug/L	All samples in SDG WF035
	Beryllium	-0.2 ug/L	
	Manganese	0.6 ug/L	
	Beryllium	-0.2 ug/L	All samples in SDG WF035
	Manganese	0.6 ug/L	
	Beryllium	-0.2 ug/L	All samples in SDG WF035
	Manganese	0.4 ug/L	
WF036	Aluminum	17.7 ug/L	All samples in SDG WF036
	Barium	0.8 ug/L	
	Beryllium	0.6 ug/L	
	Cadmium	0.8 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.0265 ug/L	
	Thallium	2.4 ug/L	
	Vanadium	1.1 ug/L	
	Aluminum	18.4 ug/L	All samples in SDG WF036
	Barium	1.2 ug/L	
	Beryllium	0.8 ug/L	
	Cadmium	0.9 ug/L	
	Chromium	1.2 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.3 ug/L	
	Mercury	0.0251 ug/L	
	Thallium	3.4 ug/L	
	Vanadium	1.8 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF036 cont.	Aluminum	14.7 ug/L	All samples in SDG WF036
	Barium	1.1 ug/L	
	Beryllium	0.8 ug/L	
	Cadmium	0.8 ug/L	
	Chromium	1.1 ug/L	
	Cobalt	1.1 ug/L	
	Manganese	1.2 ug/L	
	Mercury	0.0165 ug/L	
	Thallium	3.2 ug/L	
	Vanadium	1.7 ug/L	
	Barium	0.7 ug/L	All samples in SDG WF036
	Beryllium	0.7 ug/L	
	Cadmium	0.6 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	0.8 ug/L	
	Manganese	1.0 ug/L	
	Mercury	0.0157 ug/L	
	Vanadium	1.2 ug/L	
	Aluminum	63.950 ug/L	All samples in SDG WF036
	Barium	0.730 ug/L	
	Chromium	0.490 ug/L	
	Manganese	0.430 ug/L	
	Mercury	0.014 ug/L	
	Potassium	1817.440 ug/L	
	Cyanide	-1.333 ug/L	
	Barium	1.0 ug/L	All samples in SDG WF036
	Beryllium	0.6 ug/L	
	Cadmium	0.6 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.0 ug/L	
	Manganese	1.0 ug/L	
	Thallium	2.2 ug/L	
	Vanadium	1.2 ug/L	
	Aluminum	91.5 ug/L	All samples in SDG WF036
	Barium	0.9 ug/L	
	Beryllium	0.7 ug/L	
	Cadmium	0.7 ug/L	
	Chromium	0.9 ug/L	
	Cobalt	1.0 ug/L	
	Manganese	1.0 ug/L	
	Thallium	3.4 ug/L	
	Vanadium	1.2 ug/L	
WF037	Copper	6.4 ug/L	All samples in SDG WF037
	Aluminum	-19.5 ug/L	All samples in SDG WF037
	Barium	0.4 ug/L	
	Copper	4.4 ug/L	
	Barium	0.4 ug/L	All samples in SDG WF037
	Copper	6.6 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF037 cont.	Barium	25.130 ug/L	All samples in SDG WF037
	Beryllium	-0.830 ug/L	
	Calcium	129.890 ug/L	
	Copper	8.310 ug/L	
	Iron	8.680 ug/L	
	Magnesium	25.430 ug/L	
	Manganese	0.490 ug/L	
	Silver	2.970 ug/L	
	Sodium	84.450 ug/L	
	Vanadium	2.060 ug/L	
	Zinc	3.100 ug/L	
	Cyanide	-0.981 ug/L	
WF041	Cyanide	-0.6 ug/L	All samples in SDG WF041
	Barium	0.5 ug/L	All samples in SDG WF041
	Sodium	12.2 ug/L	All samples in SDG WF041
	Cyanide	-0.4 ug/L	
	Barium	0.7 ug/L	All samples in SDG WF041
	Sodium	16.3 ug/L	
	Beryllium	-1.010 ug/L	All samples in SDG WF041
	Calcium	133.200 ug/L	
	Copper	3.740 ug/L	
	Iron	9.490 ug/L	
	Lead	1.260 ug/L	
	Sodium	93.470 ug/L	
	Thallium	1.310 ug/L	
	Zinc	19.070 ug/L	
	Cyanide	-1.002 ug/L	
	Barium	-0.6 ug/L	All samples in SDG WF041
	Chromium	-2.9 ug/L	
	Copper	-1.7 ug/L	
	Magnesium	-22.9 ug/L	
	Silver	-2.8 ug/L	
	Vanadium	-3.0 ug/L	
	Copper	6.4 ug/L	All samples in SDG WF041
	Thallium	1.4 ug/L	
	Vanadium	-1.9 ug/L	
	Cobalt	8.9 ug/L	All samples in SDG WF041
	Thallium	1.6 ug/L	
	Cyanide	-0.4 ug/L	
	Beryllium	-0.830 ug/L	All samples in SDG WF041
	Calcium	105.800 ug/L	
	Iron	3.860 ug/L	
	Selenium	-3.230 ug/L	
	Sodium	15.150 ug/L	
	Vanadium	-2.240 ug/L	
	Zinc	0.940 ug/L	
	Selenium	-3.4 ug/L	All samples in SDG WF041
	Thallium	-1.3 ug/L	
	Lead	1.2 ug/L	All samples in SDG WF041
	Selenium	-2.6 ug/L	
	Cyanide	-0.4 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes			
SDG	**Analyte**	**Concentration**	**Associated Samples**
WF041 cont.	Selenium	-3.1 ug/L	All samples in SDG WF041
	Thallium	1.3 ug/L	
	Selenium	-2.8 ug/L	All samples in SDG WF041
	Cyanide	-0.5 ug/L	
	Thallium	-1.0 ug/L	All samples in SDG WF041
	Cyanide	-0.4 ug/L	
	Cyanide	0.4 ug/L	All samples in SDG WF041
	Cyanide	0.4 ug/L	All samples in SDG WF041
	Cyanide	0.4 ug/L	All samples in SDG WF041
WF045	Cyanide	-0.6 ug/L	All samples in SDG WF045
	Cyanide	-0.6 ug/L	All samples in SDG WF045
	Manganese	0.4 ug/L	All samples in SDG WF045
	Vanadium	1.8 ug/L	All samples in SDG WF045
	Beryllium	-0.860 ug/L	All samples in SDG WF045
	Calcium	136.80 ug/L	
	Iron	5.390 ug/L	
	Sodium	32.780 ug/L	
	Vanadium	-1.730 ug/L	
	Zinc	3.340 ug/L	
	Cyanide	-1.013 ug/L	
	Mercury	0.1 ug/L	All samples in SDG WF045
	Cyanide	-0.6 ug/L	All samples in SDG WF045
	Thallium	1.1 ug/L	All samples in SDG WF045
	Cyanide	-0.6 ug/L	
	Cyanide	-0.6 ug/L	All samples in SDG WF045
	Aluminum	17.320 ug/L	All samples in SDG WF045
	Barium	0.450 ug/L	
	Beryllium	-0.550 ug/L	
	Calcium	121.820 ug/L	
	Iron	6.770 ug/L	
	Sodium	45.700 ug/L	
	Thallium	-1.390 ug/L	
	Zinc	2.510 ug/L	
	Cyanide	-0.899 ug/L	
	Beryllium	0.2 ug/L	OWG00401
	Manganese	0.5 ug/L	OWG00201
	Sodium	17.2 ug/L	
	Beryllium	0.2 ug/L	OWG00401
	Manganese	0.7 ug/L	OWG00201
	Sodium	12.2 ug/L	
	Zinc	1.0 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF045 cont.	Barium	0.9 ug/L	OWG00401
	Beryllium	0.5 ug/L	OWG00201
	Chromium	3.0 ug/L	
	Manganese	1.0 ug/L	
	Sodium	19.9 ug/L	
	Thallium	1.2 ug/L	
	Vanadium	2.0 ug/L	
	Zinc	1.6 ug/L	
	Cyanide	-0.377 ug/L	OWG00401 OWG00201
	Beryllium	0.2 ug/L	OWG00401
	Sodium	11.0 ug/L	OWG00201
	Selenium	-2.2 ug/L	OWG00401 OWG00201
	Thallium	-1.0 ug/L	OWG00401 OWG00201
WF046	Beryllium	0.2 ug/L	All samples in SDG WF046
	Sodium	17.2 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF046
	Mercury	0.040 ug/L	
	Sodium	12.2 ug/L	
	Beryllium	0.5 ug/L	All samples in SDG WF046
	Mercury	0.043 ug/L	
	Sodium	19.9 ug/L	
	Aluminum	17.320 ug/L	All samples in SDG WF046
	Barium	0.450 ug/L	
	Beryllium	-0.550 ug/L	
	Calcium	121.820 ug/L	
	Iron	6.770 ug/L	
	Sodium	45.700 ug/L	
	Thallium	-1.390 ug/L	
	Zinc	2.510 ug/L	
	Boron	-0.377 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF046
	Sodium	11.0 ug/L	
WF047	Beryllium	0.2 ug/L	All samples in SDG WF047
	Manganese	0.5 ug/L	
	Mercury	0.1 ug/L	
	Sodium	17.2 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF047
	Manganese	0.7 ug/L	
	Sodium	12.2 ug/L	
	Zinc	1.0 ug/L	
	Barium	0.9 ug/L	All samples in SDG WF047
	Beryllium	0.5 ug/L	
	Chromium	3.0 ug/L	
	Manganese	1.0 ug/L	
	Sodium	19.9 ug/L	
	Thallium	1.1 ug/L	
	Vanadium	2.0 ug/L	
	Zinc	1.6 ug/L	

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Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF047 cont.	Aluminum	17.320 ug/L	All samples in SDG WF047
	Barium	0.450 ug/L	
	Beryllium	-0.550 ug/L	
	Calcium	121.820 ug/L	
	Iron	6.770 ug/L	
	Sodium	45.700 ug/L	
	Thallium	-1.390 ug/L	
	Zinc	2.510 ug/L	
	Beryllium	0.2 ug/L	All samples in SDG WF047
	Sodium	11.0 ug/L	
	Selenium	-2.2 ug/L	All samples in SDG WF047
WF051	Barium	1.0 ug/L	All samples in SDG WF051
	Beryllium	0.2 ug/L	
	Chromium	3.4 ug/L	
	Copper	1.5 ug/L	
	Manganese	0.5 ug/L	
	Silver	2.8 ug/L	
	Vanadium	2.4 ug/L	
	Manganese	-0.5 ug/L	All samples in SDG WF051
	Mercury	0.04 ug/L	
	Vanadium	1.8 ug/L	
	Arsenic	1.1 ug/L	All samples in SDG WF051
	Mercury	0.04 ug/L	
	Selenium	-1.9 ug/L	
	Manganese	-0.5 ug/L	All samples in SDG WF051
	Mercury	0.07 ug/L	
	Beryllium	-0.800 ug/L	All samples in SDG WF051
	Calcium	140.860 ug/L	
	Iron	5.470 ug/L	
	Sodium	36.740 ug/L	
	Zinc	1.980 ug/L	
	Mercury	0.08 ug/L	All samples in SDG WF051
	Silver	-2.4 ug/L	
	Aluminum	16.800 ug/L	All samples in SDG WF051
	Barium	0.600 ug/L	
	Beryllium	-0.680 ug/L	
	Calcium	127.440 ug/L	
	Chromium	3.050 ug/L	
	Cobalt	2.850 ug/L	
	Copper	2.120 ug/L	
	Iron	10.740 ug/L	
	Manganese	0.690 ug/L	
	Silver	3.040 ug/L	
	Sodium	54.160 ug/L	
	Vanadium	2.700 ug/L	
	Zinc	2.710 ug/L	
	Calcium	42.0 ug/L	All samples in SDG WF051

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF051 cont.	Barium	0.6 ug/L	All samples in SDG WF051
	Beryllium	0.4 ug/L	
	Cobalt	2.6 ug/L	
	Copper	1.7 ug/L	
	Manganese	0.9 ug/L	
	Zinc	1.2 ug/L	
	Manganese	0.7 ug/L	All samples in SDG WF051
	Arsenic	-1.130 ug/L	All samples in SDG WF051
	Beryllium	-0.720 ug/L	
	Calcium	131.080 ug/L	
	Iron	12.060 ug/L	
	Zinc	4.540 ug/L	
	Lead	-1.3 ug/L	All samples in SDG WF051
	Lead	-1.4 ug/L	All samples in SDG WF051
	Magnesium	0.5 ug/L	
	Lead	-1.6 ug/L	All samples in SDG WF051
	Aluminum	18.640 ug/L	All samples in SDG WF051
	Barium	0.490 ug/L	
	Beryllium	-0.760 ug/L	
	Calcium	134.210 ug/L	
	Chromium	3.850 ug/L	
	Iron	35.410 ug/L	
	Manganese	0.500 ug/L	
	Sodium	35.200 ug/L	
	Zinc	2.300 ug/L	
	Lead	-2.0 ug/L	All samples in SDG WF051
	Vanadium	2.0 ug/L	
	Barium	0.9 ug/L	All samples in SDG WF051
	Beryllium	0.3 ug/L	
	Lead	-2.0 ug/L	
	Manganese	0.7 ug/L	
	Sodium	9.2 ug/L	
	Sodium	15.0 ug/L	All samples in SDG WF051
	Arsenic	-1.6 ug/L	All samples in SDG WF051
WF053	Aluminum	18.640 ug/L	All samples in SDG WF053
	Barium	0.490 ug/L	
	Beryllium	-0.760 ug/L	
	Calcium	134.210 ug/L	
	Chromium	3.850 ug/L	
	Iron	35.410 ug/L	
	Manganese	0.500 ug/L	
	Sodium	35.200 ug/L	
	Zinc	2.330 ug/L	

Table XIII
Summary of Method Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Analyte	Concentration	Associated Samples
WF053 cont.	Barium	-0.760 ug/L	All samples in SDG WF053
	Calcium	138.650 ug/L	
	Chromium	3.750 ug/L	
	Copper	3.390 ug/L	
	Iron	14.500 ug/L	
	Manganese	0.490 ug/L	
	Nickel	8.370 ug/L	
	Sodium	42.790 ug/L	
	Zinc	2.940 ug/L	
	Aluminum	26.970 ug/L	All samples in SDG WF053
	Beryllium	-0.710 ug/L	
	Calcium	151.990 ug/L	
	Iron	16.430 ug/L	
	Manganese	0.580 ug/L	
	Silver	4.360 ug/L	
	Sodium	52.750 ug/L	
	Zinc	3.720 ug/L	
	Beryllium	-0.970 ug/L	All samples in SDG WF053
	Calcium	130.780 ug/L	
	Copper	1.480 ug/L	
	Iron	19.510 ug/L	
	Lead	-1.380 ug/L	
	Manganese	0.780 ug/L	
	Sodium	13.170 ug/L	
	Zinc	6.090 ug/L	
	Aluminum	52.990 ug/L	All samples in SDG WF053
	Arsenic	1.300 ug/L	
	Beryllium	-0.940 ug/L	
	Calcium	198.990 ug/L	
	Chromium	6.790 ug/L	
	Copper	2.230 ug/L	
	Iron	38.980 ug/L	
	Lead	-1.460 ug/L	
	Manganese	1.000 ug/L	
	Sodium	60.080 ug/L	
	Zinc	2.040 ug/L	
WF054	Mercury	0.1 ug/L	All samples in SDG WF054
	Mercury	0.1 ug/L	All samples in SDG WF054
	Mercury	0.1 ug/L	All samples in SDG WF054
	Beryllium	-0.980 ug/L	All samples in SDG WF054
	Calcium	110.890 ug/L	
	Iron	9.300 ug/L	
	Mercury	0.052 ug/L	
	Vanadium	-2.660 ug/L	
	Zinc	2.260 ug/L	

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter		Concentration	Qualifier
WF022	**Client ID:**	**BKR01001**		
	Laboratory ID:	**RB858002**		
	Collection Date:	**7/16/96**		
	Type:	**Equipment rinsate**		
	Sodium		43.4 ug/L	None
	Aluminum		55.9 ug/L	23.9U ug/L[1]
	Calcium		69.0 ug/L	None
	Iron		23.9 ug/L	43.4U ug/L[1]
	Magnesium		39.7 ug/L	None
	Mercury		0.10 ug/L	None
	Zinc		1.2 ug/L	1.2U ug/L[1]
WF022	**Client ID:**	**BKF01001**		
	Laboratory ID:	**RB858010**		
	Collection Date:	**7/17/96**		
	Type:	**Source blank**		
	Sodium		61.3 ug/L	61.3U ug/L[1]
WF023	**Client ID:**	**01R01101**		
	Laboratory ID:	**RB887005**		
	Collection Date:	**7/23/96**		
	Type:	**Equipment rinsate**		
	Aluminum		13.3 ug/L	None
	Iron		10.8 ug/L	10.8U ug/L[1]
	Zinc		1.2 ug/L	1.2U ug/L[1]
	Cyanide		2.6 ug/L	None
WF024	**Client ID:**	**15R01201**		
	Laboratory ID:	**RB920005**		
	Collection Date:	**7/31/96**		
	Type:	**Equipment rinsate**		
	Aluminum		13.8 ug/L	13.8U ug/L[1]
	Iron		10.5 ug/L	10.5U ug/L[1]
	Sodium		55.4 ug/L	55.4U ug/L[1]
	Cyanide		2.6 ug/L	None
WF025	**Client ID:**	**15R01301**		
	Laboratory ID:	**RB956011**		
	Collection Date:	**8/7/96**		
	Type:	**Equipment rinsate**		
	Iron		5.3 ug/L	5.3U ug/L[1]
	Sodium		26.6 ug/L	None
	Zinc		1.8 ug/L	1.8U ug/L[1]
WF026	**Client ID:**	**15R01401**		
	Laboratory ID:	**RB980012**		
	Collection Date:	**8/14/96**		
	Type:	**Equipment rinsate**		
	Iron		14.8 ug/L	14.8U ug/L[1]
	Zinc		1.1 ug/L	1.1U ug/L[1]
	Cyanide		1.8 ug/L	None

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF027	**Client ID:** 16R01501		
	Laboratory ID: RC016012		
	Collection Date: 8/21/96		
	Type: Equipment rinsate		
	Arsenic	0.50 ug/L	0.50U ug/L[1]
	Calcium	64.0 ug/L	64.0U ug/L[1]
	Lead	0.80 ug/L	None
	Sodium	26.9 ug/L	26.9U ug/L[1]
	Zinc	1.8 ug/L	None
WF028	**Client ID:** 11R01601		
	Laboratory ID: RC044016		
	Collection Date: 8/28/96		
	Type: Equipment rinsate		
	Calcium	67.2 ug/L	67.2U ug/L[1]
	Sodium	30.8 ug/L	30.8U ug/L[1]
	Cyanide	1.5 ug/L	None
WF029	**Client ID:** 13R01701		
	Laboratory ID: RC092008		
	Collection Date: 9/11/96		
	Type: Equipment rinsate		
	Calcium	66.4 ug/L	66.4U ug/L[1]
	Sodium	25.4 ug/L	25.4U ug/L[1]
	Zinc	1.8 ug/L	1.8U ug/L[1]
WF030	**Client ID:** 66R01801		
	Laboratory ID: RC121010		
	Collection Date: 9/18/96		
	Type: Equipment rinsate		
	Calcium	55.7 ug/L	55.7U ug/L[1]
	Iron	9.2 ug/L	9.2U ug/L[1]
	Selenium	0.68 ug/L	None
	Sodium	24.9 ug/L	24.9U ug/L[1]
	Zinc	2.0 ug/L	None
WF031	**Client ID:** 05R01901		
	Laboratory ID: MB928011		
	Collection Date: 9/25/96		
	Type: Equipment rinsate		
	Barium	0.34 ug/L	None
	Manganese	0.38 ug/L	None
	Mercury	0.06 ug/L	0.06U ug/L[1]
	Zinc	2.0 ug/L	None
WF032	**Client ID:** 06R02001		
	Laboratory ID: MC011006		
	Collection Date: 10/2/96		
	Type: Equipment rinsate		
	Barium	2.8 ug/L	2.8U ug/L[1]
	Chromium	2.5 ug/L	2.5U ug/L[1]
	Copper	2.9 ug/L	2.9U ug/L[1]
	Manganese	0.48 ug/L	0.48U ug/L[1]
	Mercury	0.01 ug/L	0.01U ug/L[1]
	Sodium	365 ug/L	None
	Zinc	3.0 ug/L	3.0U ug/L[1]
	Cyanide	1.4 ug/L	None

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter		Concentration	Qualifier
WF033	**Client ID:**	66R02101		
	Laboratory ID:	MC085007		
	Collection Date:	10/9/96		
	Type:	**Equipment rinsate**		
	Barium		1.6 ug/L	1.6U ug/L[1]
	Beryllium		0.32 ug/L	0.32U ug/L[1]
	Chromium		0.55 ug/L	0.55U ug/L[1]
	Cobalt		0.84 ug/L	0.84U ug/L[1]
	Manganese		2.4 ug/L	2.4U ug/L[1]
	Potassium		777 ug/L	777U ug/L[1]
	Sodium		334 ug/L	334U ug/L[1]
	Vanadium		0.63 ug/L	0.63U ug/L[1]
	Zinc		1.4 ug/L	1.4U ug/L[1]
WF034	**Client ID:**	66R0201		
	Laboratory ID:	MC153007		
	Collection Date:	10/16/96		
	Type:	**Equipment rinsate**		
	Barium		0.56 ug/L	0.56 ug/L[1]
	Manganese		0.44 ug/L	0.44 ug/L[1]
	Mercury		0.02 ug/L	0.02 ug/L[1]
	Sodium		119 ug/L	119 ug/L[1]
	Zinc		2.2 ug/L	2.2 ug/L[1]
WF035	**Client ID:**	66R02301		
	Laboratory ID:	MC214006		
	Collection Date:	10/23/96		
	Type:	**Equipment rinsate**		
	Aluminum		30.7 ug/L	30.7 ug/L[1]
	Barium		1.3 ug/L	1.3 ug/L[1]
	Calcium		101 ug/L	101 ug/L[1]
	Manganese		0.94 ug/L	0.94 ug/L[1]
	Mercury		0.03 ug/L	0.03 ug/L[1]
	Sodium		100 ug/L	100 ug/L[1]
	Zinc		2.4 ug/L	2.4 ug/L[1]
WF036	**Client ID:**	54R02401		
	Laboratory ID:	MC262007		
	Collection Date:	10/30/96		
	Type:	**Equipment rinsate**		
	Aluminum		14.8 ug/L	14.8 ug/L[1]
	Barium		0.59 ug/L	0.59 ug/L[1]
	Chromium		0.48 ug/L	0.48 ug/L[1]
	Manganese		0.32 ug/L	0.32 ug/L[1]
	Potassium		756 ug/L	756 ug/L[1]
	Sodium		265 ug/L	None
	Zinc		1.4 ug/L	None
WF037	**Client ID:**	15F00201		
	Laboratory ID:	MC424010		
	Collection Date:	12/2/96		
	Type:	**Source blank**		
	Barium		1.2 ug/L	None
	Calcium		111 ug/L	None
	Copper		6.8 ug/L	None
	Manganese		0.43 ug/L	None
	Sodium		95.7 ug/L	None
	Zinc		2.6 ug/L	None

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter		Concentration	Qualifier
WF041	**Client ID:**	**35F00301**		
	Laboratory ID:	**MD908002**		
	Collection Date:	**6/11/97**		
	Type:	**Source blank**		
	Barium		0.78 ug/L	None
	Calcium		164 ug/L	164U ug/L[1]
	Copper		10.3 ug/L	10.3U ug/L[1]
	Iron		35.6 ug/L	35.6U ug/L[1]
	Lead		1.0 ug/L	1.0U ug/L[1]
	Manganese		0.88 ug/L	None
	Sodium		129 ug/L	129U ug/L[1]
	Zinc		13.3 ug/L	13.3U ug/L[1]
WF041	**Client ID:**	**35R03001**		
	Laboratory ID:	**MD908003**		
	Collection Date:	**6/11/97**		
	Type:	**Equipment rinsate**		
	Barium		1.0 ug/L	None
	Calcium		165 ug/L	165U ug/L[1]
	Copper		4.9 ug/L	4.9U ug/L[1]
	Iron		10.7 ug/L	10.7U ug/L[1]
	Manganese		1.2 ug/L	None
	Sodium		148 ug/L	148U ug/L[1]
	Thallium		1.7 ug/L	1.7U ug/L[1]
	Zinc		15.8 ug/L	15.8U ug/L[1]
WF045	**Client ID:**	**OWR03401**		
	Laboratory ID:	**ME149002**		
	Collection Date:	**7/7/97**		
	Type:	**Equipment rinsate**		
	Barium		0.44 ug/L	0.44U ug/L[1]
	Calcium		133 ug/L	133U ug/L[1]
	Copper		1.8 ug/L	None
	Iron		7.1 ug/L	7.1U ug/L[1]
	Sodium		60.4 ug/L	60.4U ug/L[1]
	Zinc		1.7 ug/L	1.7U ug/L[1]
WF046	**Client ID:**	**31R03301**		
	Laboratory ID:	**MW241002**		
	Collection Date:	**7/15/97**		
	Type:	**Equipment rinsate**		
	Barium		1.1 ug/L	1.1U ug/L[1]
	Calcium		126 ug/L	126U ug/L[1]
	Iron		4.4 ug/L	4.4U ug/L[1]
	Manganese		0.40 ug/L	None
	Sodium		65.6 ug/L	65.6U ug/L[1]
	Zinc		5.4 ug/L	5.4U ug/L[1]

Table XIV
Summary of Field Blank Contamination
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida

Inorganic Analytes

SDG	Parameter	Concentration	Qualifier
WF051	**Client ID:** 16R03601		
	Laboratory ID: ME340005		
	Collection Date: 7/23/97		
	Type: Equipment rinsate		
	Calcium	166 ug/L	166U ug/L[1]
	Copper	1.7 ug/L	1.7U ug/L[1]
	Iron	12.7 ug/L	12.7U ug/L[1]
	Lead	1.2 ug/L	None
	Manganese	0.68 ug/L	0.68U ug/L[1]
	Sodium	48.9 ug/L	48.9U ug/L[1]
	Zinc	2.6 ug/L	2.6U ug/L[1]
WF053	**Client ID:** 15R03701		
	Laboratory ID: ME367002		
	Collection Date: 7/27/97		
	Type: Equipment rinsate		
	Barium	1.6 ug/L	None
	Calcium	134 ug/L	134U ug/L[1]
	Chromium	4.2 ug/L	4.2U ug/L[1]
	Copper	2.1 ug/L	2.1U ug/L[1]
	Iron	18.4 ug/L	None
	Manganese	0.69 ug/L	0.69U ug/L[1]
	Sodium	83.0 ug/L	83.0U ug/L[1]
	Zinc	5.0 ug/L	5.0U ug/L[1]
WF054	**Client ID:** 15R03801		
	Laboratory ID: ME441005		
	Collection Date: 8/5/97		
	Type: Equipment rinsate		
	Cadmium	4.7 ug/L	
	Calcium	159 ug/L	159U ug/L[1]
	Copper	1.3 ug/L	None
	Iron	13.3 ug/L	13.3U ug/L[1]
	Manganese	0.48 ug/L	None
	Mercury	0.05 ug/L	0.05U ug/L[1]
	Sodium	20.0 ug/L	None
	Zinc	1.8 ug/L	None
WF054	**Client ID:** 30R03901		
	Laboratory ID: ME450002		
	Collection Date: 8/6/97		
	Type: Equipment rinsate		
	Aluminum	16.7 ug/L	None
	Barium	0.78 ug/L	None
	Calcium	150 ug/L	150U ug/L
	Copper	3.7 ug/L	None
	Iron	14.0 ug/L	14.0U ug/L
	Manganese	0.58 ug/L	None
	Sodium	67.0 ug/L	None
	Zinc	4.4 ug/L	None

[1] = sample result was modified based on an associated method blank concentration.

Note: see detailed data validation report for the discrete qualifiers.

Table XV
Sample Event PARCC Summary
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF022	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF023	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF024	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF025	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF026	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF027	Volatiles	Acceptable	Acceptable	Acceptable	99.0	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF028	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF029	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF030	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF031	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	**Unacceptable**	Acceptable	**0**	Acceptable
WF031B	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF032	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	99.3	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable

Table XV
Sample Event PARCC Summary
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF033	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF034	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF035	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF036	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF037	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides/PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	**Unacceptable**	Acceptable	**0**	Acceptable
WF038	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF039	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF040	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF041	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides & PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF042	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF043	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF044	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF045	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides & PCBs	**Unacceptable**	**Unacceptable**	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF046	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Pesticides & PCBs	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
	Cyanide	Acceptable	Acceptable	Acceptable	100	Acceptable
WF047	Volatiles	Acceptable	Acceptable	Acceptable	97.0	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
WF048	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF049	Volatiles	Acceptable	Acceptable	Acceptable	95.2	Acceptable
	Semivolatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
WF051	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable
	Metals	Acceptable	Acceptable	Acceptable	100	Acceptable
WF052	Volatiles	Acceptable	Acceptable	Acceptable	94.3	Acceptable

Table XV
Sample Event PARCC Summary
Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton, Florida

SDG	Fraction	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
WF053	Volatiles Metals	Acceptable Acceptable	Acceptable Acceptable	Acceptable Acceptable	100 100	Acceptable Acceptable
WF054	Volatiles Metals	Acceptable Acceptable	Acceptable Acceptable	Acceptable Acceptable	100 100	Acceptable Acceptable
WF055	Volatiles	Acceptable	Acceptable	Acceptable	100	Acceptable

[1]Cumulative of sampling and analytical components
[2]Analytical component.
[3]Samples results rejected for database purposes were not used in the completeness calculation.

Notes: All completeness is expressed as the ratio of number of sample results considered usable (i.e., not qualified as rejected) to the total number of sample results.

% = percent

APPENDIX C

SOIL SAMPLE ANALYTICAL DATA

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```
 ####    #####  ######  #####   #    #  ######  #    #   ####
#          #    #       #    #  #    #  #       ##   #  #
 ####      #    #####   #    #  ######  #####   # #  #   ####
     #     #    #       #####   #    #  #       #  # #       #
#    #     #    #       #       #    #  #       #   ##  #    #
 ####      #    ######  #       #    #  ######  #    #   ####
```

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Request id: lp0-11566

Printer: lp0

Options:

Thu Feb 05 17:30:07 EST 1998

Machine: abb3

Site 11 Soil Data.

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	22526001			33701001			22526002			33701002		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	11-SL-01			11-SL-01			11-SL-01A			11-SL-01A		
Collect Date:	18-AUG-92			18-AUG-92			18-AUG-92			18-AUG-92		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP VOLATILES 90-SOW ug/kg												
Chloromethane	-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Bromomethane	-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Vinyl chloride	-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Chloroethane	-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Methylene chloride	-	ug/kg		25 UJ	ug/kg	5	-	ug/kg		30 UJ	ug/kg	5
Acetone	-	ug/kg		11 UJ	ug/kg	11	-	ug/kg		11 UJ	ug/kg	11
Carbon disulfide	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
1,1-Dichloroethene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
1,1-Dichloroethane	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
1,2-Dichloroethene (total)	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Chloroform	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
1,2-Dichloroethane	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
2-Butanone	-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
1,1,1-Trichloroethane	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Carbon tetrachloride	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Bromodichloromethane	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
1,2-Dichloropropane	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
cis-1,3-Dichloropropene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Trichloroethene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Dibromochloromethane	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
1,1,2-Trichloroethane	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Benzene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
trans-1,3-Dichloropropene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Bromoform	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
4-Methyl-2-pentanone	-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
2-Hexanone	-	ug/kg		11 U	ug/kg	11	-	ug/kg		11 U	ug/kg	11
Tetrachloroethene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Toluene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
1,1,2,2-Tetrachloroethane	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Chlorobenzene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Ethylbenzene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Styrene	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
Xylenes (total)	-	ug/kg		5 U	ug/kg	5	-	ug/kg		5 U	ug/kg	5
CLP SEMIVOLATILES 90-SOW ug/kg												
Phenol	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
bis(2-Chloroethyl) ether	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
2-Chlorophenol	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
1,3-Dichlorobenzene	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
1,4-Dichlorobenzene	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
1,2-Dichlorobenzene	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
2-Methylphenol	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
2,2-oxybis(1-Chloropropane)	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
4-Methylphenol	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
N-Nitroso-di-n-propylamine	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
Hexachloroethane	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
Nitrobenzene	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
Isophorone	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
2-Nitrophenol	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	
2,4-Dimethylphenol	360 U	ug/kg	360	-	ug/kg		370 U	ug/kg	370	-	ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	22526001				33701001				22526002				33701002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-01				11-SL-01				11-SL-01A				11-SL-01A			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
bis(2-Chloroethoxy) methane	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2,4-Dichlorophenol	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
1,2,4-Trichlorobenzene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Naphthalene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
4-Chloroaniline	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Hexachlorobutadiene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
4-Chloro-3-methylphenol	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2-Methylnaphthalene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Hexachlorocyclopentadiene	360	UJ	ug/kg	360	-		ug/kg		370	UJ	ug/kg	370	-		ug/kg	
2,4,6-Trichlorophenol	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2,4,5-Trichlorophenol	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
2-Chloronaphthalene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2-Nitroaniline	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
Dimethylphthalate	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Acenaphthylene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2,6-Dinitrotoluene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
3-Nitroaniline	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
Acenaphthene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2,4-Dinitrophenol	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
4-Nitrophenol	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
Dibenzofuran	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
2,4-Dinitrotoluene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Diethylphthalate	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
4-Chlorophenyl-phenylether	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Fluorene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
4-Nitroaniline	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
4,6-Dinitro-2-methylphenol	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
N-Nitrosodiphenylamine	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
4-Bromophenyl-phenylether	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Hexachlorobenzene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Pentachlorophenol	1800	U	ug/kg	1800	-		ug/kg		1800	U	ug/kg	1800	-		ug/kg	
Phenanthrene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Anthracene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Carbazole	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Di-n-butylphthalate	360	UJ	ug/kg	360	-		ug/kg		370	UJ	ug/kg	370	-		ug/kg	
Fluoranthene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Pyrene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Butylbenzylphthalate	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
3,3-Dichlorobenzidine	730	U	ug/kg	730	-		ug/kg		730	U	ug/kg	730	-		ug/kg	
Benzo (a) anthracene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Chrysene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
bis(2-Ethylhexyl) phthalate	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Di-n-octylphthalate	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Benzo (b) fluoranthene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Benzo (k) fluoranthene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Benzo (a) pyrene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Indeno (1,2,3-cd) pyrene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Dibenzo (a,h) anthracene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
Benzo (g,h,i) perylene	360	U	ug/kg	360	-		ug/kg		370	U	ug/kg	370	-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	8.8	U	ug/kg	8.8	-		ug/kg		8.9	U	ug/kg	8.9	-		ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	22526001				33701001				22526002				33701002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-01				11-SL-01				11-SL-01A				11-SL-01A			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
beta-BHC	8.8	U	ug/kg	8.8	-		ug/kg		8.9	U	ug/kg	8.9	-		ug/kg	
delta-BHC	8.8	U	ug/kg	8.8	-		ug/kg		8.9	U	ug/kg	8.9	-		ug/kg	
gamma-BHC (Lindane)	8.8	U	ug/kg	8.8	-		ug/kg		8.9	U	ug/kg	8.9	-		ug/kg	
Heptachlor	8.8	U	ug/kg	8.8	-		ug/kg		8.9	U	ug/kg	8.9	-		ug/kg	
Aldrin	8.8	U	ug/kg	8.8	-		ug/kg		8.9	U	ug/kg	8.9	-		ug/kg	
Heptachlor epoxide	8.8	U	ug/kg	8.8	-		ug/kg		8.9	U	ug/kg	8.9	-		ug/kg	
Endosulfan I	8.8	U	ug/kg	8.8	-		ug/kg		8.9	U	ug/kg	8.9	-		ug/kg	
Dieldrin	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDE	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endrin	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endosulfan II	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDD	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endosulfan sulfate	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
4,4-DDT	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Methoxychlor	88	U	ug/kg	88	-		ug/kg		89	U	ug/kg	89	-		ug/kg	
Endrin ketone	18	U	ug/kg	18	-		ug/kg		18	U	ug/kg	18	-		ug/kg	
Endrin aldehyde	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
alpha-Chlordane	88	U	ug/kg	88	-		ug/kg		89	U	ug/kg	89	-		ug/kg	
gamma-Chlordane	88	U	ug/kg	88	-		ug/kg		89	U	ug/kg	89	-		ug/kg	
Toxaphene	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
Aroclor-1016	88	U	ug/kg	88	-		ug/kg		89	U	ug/kg	89	-		ug/kg	
Aroclor-1221	88	U	ug/kg	88	-		ug/kg		89	U	ug/kg	89	-		ug/kg	
Aroclor-1232	88	U	ug/kg	88	-		ug/kg		89	U	ug/kg	89	-		ug/kg	
Aroclor-1242	88	U	ug/kg	88	-		ug/kg		89	U	ug/kg	89	-		ug/kg	
Aroclor-1248	88	U	ug/kg	88	-		ug/kg		89	U	ug/kg	89	-		ug/kg	
Aroclor-1254	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
Aroclor-1260	180	U	ug/kg	180	-		ug/kg		180	U	ug/kg	180	-		ug/kg	
CLP METALS AND CYANIDE mg/kg																
Aluminum	9790		mg/kg	40	-		mg/kg		10800		mg/kg	40	-		mg/kg	
Antimony	2.7	U	mg/kg	12	-		mg/kg		2.7	U	mg/kg	12	-		mg/kg	
Arsenic	2	J	mg/kg	2	-		mg/kg		1.6	J	mg/kg	2	-		mg/kg	
Barium	16.4	J	mg/kg	40	-		mg/kg		17.8	J	mg/kg	40	-		mg/kg	
Beryllium	.13	J	mg/kg	1	-		mg/kg		.1	J	mg/kg	1	-		mg/kg	
Cadmium	.6	U	mg/kg	1	-		mg/kg		.6	U	mg/kg	1	-		mg/kg	
Calcium	183	J	mg/kg	1000	-		mg/kg		186	J	mg/kg	1000	-		mg/kg	
Chromium	6.9		mg/kg	2	-		mg/kg		7.4		mg/kg	2	-		mg/kg	
Cobalt	1.2	J	mg/kg	10	-		mg/kg		1.6	J	mg/kg	10	-		mg/kg	
Copper	5.2	J	mg/kg	5	-		mg/kg		5.1	J	mg/kg	5	-		mg/kg	
Iron	5810		mg/kg	20	-		mg/kg		5860		mg/kg	20	-		mg/kg	
Lead	5.7		mg/kg	1	-		mg/kg		5.5		mg/kg	1	-		mg/kg	
Magnesium	108	J	mg/kg	1000	-		mg/kg		142	J	mg/kg	1000	-		mg/kg	
Manganese	275		mg/kg	3	-		mg/kg		285		mg/kg	3	-		mg/kg	
Mercury	.05	J	mg/kg	.1	-		mg/kg		.05	J	mg/kg	.1	-		mg/kg	
Nickel	2.4	U	mg/kg	8	-		mg/kg		2.4	U	mg/kg	8	-		mg/kg	
Potassium	132	U	mg/kg	1000	-		mg/kg		139	J	mg/kg	1000	-		mg/kg	
Selenium	.46	U	mg/kg	1	-		mg/kg		.46	U	mg/kg	1	-		mg/kg	
Silver	1.2	J	mg/kg	2	-		mg/kg		.67	J	mg/kg	2	-		mg/kg	
Sodium	177	J	mg/kg	1000	-		mg/kg		169	J	mg/kg	1000	-		mg/kg	
Thallium	.35	U	mg/kg	2	-		mg/kg		.35	U	mg/kg	2	-		mg/kg	
Vanadium	14.9		mg/kg	10	-		mg/kg		15.7		mg/kg	10	-		mg/kg	
Zinc	8.8	J	mg/kg	4	-		mg/kg		9.9	J	mg/kg	4	-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	22526001				33701001				22526002				33701002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-01				11-SL-01				11-SL-01A				11-SL-01A			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Cyanide	.24	U	mg/kg	1	-		mg/kg		.24	U	mg/kg	1	-		mg/kg	
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		22526003			33701003			33701003RE			22526004		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11-SL-02			11-SL-02			11-SL-02RE			11-SL-03		
Collect Date:		18-AUG-92			18-AUG-92			18-AUG-92			18-AUG-92		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg												
Chloromethane		-	ug/kg		13 UJ	ug/kg	13	13 UJ	ug/kg	13	-	ug/kg	
Bromomethane		-	ug/kg		13 UJ	ug/kg	13	13 UJ	ug/kg	13	-	ug/kg	
Vinyl chloride		-	ug/kg		13 UJ	ug/kg	13	13 UJ	ug/kg	13	-	ug/kg	
Chloroethane		-	ug/kg		13 UJ	ug/kg	13	13 UJ	ug/kg	13	-	ug/kg	
Methylene chloride		-	ug/kg		48 UJ	ug/kg	6	47 UJ	ug/kg	6	-	ug/kg	
Acetone		-	ug/kg		13 UJ	ug/kg	13	100 J	ug/kg	13	-	ug/kg	
Carbon disulfide		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
1,1-Dichloroethene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
1,1-Dichloroethane		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
1,2-Dichloroethene (total)		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Chloroform		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
1,2-Dichloroethane		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
2-Butanone		-	ug/kg		13 UJ	ug/kg	13	13 UJ	ug/kg	13	-	ug/kg	
1,1,1-Trichloroethane		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Carbon tetrachloride		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Bromodichloromethane		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
1,2-Dichloropropane		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
cis-1,3-Dichloropropene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Trichloroethene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Dibromochloromethane		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
1,1,2-Trichloroethane		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Benzene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
trans-1,3-Dichloropropene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Bromoform		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
4-Methyl-2-pentanone		-	ug/kg		13 UJ	ug/kg	13	13 UJ	ug/kg	13	-	ug/kg	
2-Hexanone		-	ug/kg		13 UJ	ug/kg	13	13 UJ	ug/kg	13	-	ug/kg	
Tetrachloroethene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Toluene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
1,1,2,2-Tetrachloroethane		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Chlorobenzene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Ethylbenzene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Styrene		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
Xylenes (total)		-	ug/kg		7 UJ	ug/kg	7	7 UJ	ug/kg	7	-	ug/kg	
CLP SEMIVOLATILES 90-SOW	ug/kg												
Phenol		4000 U	ug/kg	4000	-	ug/kg		-	ug/kg		370 U	ug/kg	370
bis(2-Chloroethyl) ether		4000 U	ug/kg	4000	-	ug/kg		-	ug/kg		370 U	ug/kg	370
2-Chlorophenol		4000 U	ug/kg	4000	-	ug/kg		-	ug/kg		370 U	ug/kg	370
1,3-Dichlorobenzene		4000 U	ug/kg	4000	-	ug/kg		-	ug/kg		370 U	ug/kg	370
1,4-Dichlorobenzene		4000 U	ug/kg	4000	-	ug/kg		-	ug/kg		370 U	ug/kg	370

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	22526003				33701003				33701003RE				22526004			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-02				11-SL-02				11-SL-02RE				11-SL-03			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2-Methylphenol	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,2-oxybis(1-Chloropropane)	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Methylphenol	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
N-Nitroso-di-n-propylamine	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Hexachloroethane	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Nitrobenzene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Isophorone	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2-Nitrophenol	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4-Dimethylphenol	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
bis(2-Chloroethoxy) methane	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4-Dichlorophenol	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
1,2,4-Trichlorobenzene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Naphthalene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Chloroaniline	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Hexachlorobutadiene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Chloro-3-methylphenol	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2-Methylnaphthalene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Hexachlorocyclopentadiene	4000	UJ	ug/kg	4000	-		ug/kg		-		ug/kg		370	UJ	ug/kg	370
2,4,6-Trichlorophenol	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4,5-Trichlorophenol	20000	U	ug/kg	20000	-		ug/kg		-		ug/kg		1800	U	ug/kg	1800
2-Chloronaphthalene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2-Nitroaniline	20000	U	ug/kg	20000	-		ug/kg		-		ug/kg		1800	U	ug/kg	1800
Dimethylphthalate	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Acenaphthylene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,6-Dinitrotoluene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
3-Nitroaniline	20000	U	ug/kg	20000	-		ug/kg		-		ug/kg		1800	U	ug/kg	1800
Acenaphthene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4-Dinitrophenol	20000	U	ug/kg	20000	-		ug/kg		-		ug/kg		1800	U	ug/kg	1800
4-Nitrophenol	20000	U	ug/kg	20000	-		ug/kg		-		ug/kg		1800	U	ug/kg	1800
Dibenzofuran	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4-Dinitrotoluene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Diethylphthalate	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Chlorophenyl-phenylether	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Fluorene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Nitroaniline	20000	U	ug/kg	20000	-		ug/kg		-		ug/kg		1800	U	ug/kg	1800
4,6-Dinitro-2-methylphenol	20000	U	ug/kg	20000	-		ug/kg		-		ug/kg		1800	U	ug/kg	1800
N-Nitrosodiphenylamine	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Bromophenyl-phenylether	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Hexachlorobenzene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Pentachlorophenol	20000	U	ug/kg	20000	-		ug/kg		-		ug/kg		1800	U	ug/kg	1800
Phenanthrene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Anthracene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Carbazole	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Di-n-butylphthalate	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	UJ	ug/kg	370
Fluoranthene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Pyrene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Butylbenzylphthalate	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
3,3-Dichlorobenzidine	8100	U	ug/kg	8100	-		ug/kg		-		ug/kg		730	U	ug/kg	730
Benzo (a) anthracene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Chrysene	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
bis(2-Ethylhexyl) phthalate	4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		22526003				33701003				33701003RE				22526004			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11-SL-02				11-SL-02				11-SL-02RE				11-SL-03			
Collect Date:		18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (b) fluoranthene		4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (k) fluoranthene		4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (a) pyrene		4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Indeno (1,2,3-cd) pyrene		4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Dibenzo (a,h) anthracene		4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (g,h,i) perylene		4000	U	ug/kg	4000	-		ug/kg		-		ug/kg		370	U	ug/kg	370
CLP PESTICIDES/PCBS 90-SOW	ug/kg																
alpha-BHC		490	UJ	ug/kg	490	-		ug/kg		-		ug/kg		18	U	ug/kg	18
beta-BHC		490	UJ	ug/kg	490	-		ug/kg		-		ug/kg		18	U	ug/kg	18
delta-BHC		490	UJ	ug/kg	490	-		ug/kg		-		ug/kg		18	U	ug/kg	18
gamma-BHC (Lindane)		490	UJ	ug/kg	490	-		ug/kg		-		ug/kg		18	U	ug/kg	18
Heptachlor		490	UJ	ug/kg	490	-		ug/kg		-		ug/kg		18	U	ug/kg	18
Aldrin		490	UJ	ug/kg	490	-		ug/kg		-		ug/kg		18	U	ug/kg	18
Heptachlor epoxide		490	UJ	ug/kg	490	-		ug/kg		-		ug/kg		18	U	ug/kg	18
Endosulfan I		490	UJ	ug/kg	490	-		ug/kg		-		ug/kg		18	U	ug/kg	18
Dieldrin		210	J	ug/kg	980	-		ug/kg		-		ug/kg		5.1	J	ug/kg	36
4,4-DDE		88	J	ug/kg	980	-		ug/kg		-		ug/kg		2.5	J	ug/kg	36
Endrin		980	UJ	ug/kg	980	-		ug/kg		-		ug/kg		36	U	ug/kg	36
Endosulfan II		980	UJ	ug/kg	980	-		ug/kg		-		ug/kg		36	U	ug/kg	36
4,4-DDD		140	J	ug/kg	980	-		ug/kg		-		ug/kg		36	U	ug/kg	36
Endosulfan sulfate		980	UJ	ug/kg	980	-		ug/kg		-		ug/kg		36	U	ug/kg	36
4,4-DDT		530	J	ug/kg	980	-		ug/kg		-		ug/kg		30	J	ug/kg	36
Methoxychlor		4900	UJ	ug/kg	4900	-		ug/kg		-		ug/kg		180	U	ug/kg	180
Endrin ketone		980	UJ	ug/kg	980	-		ug/kg		-		ug/kg		36	U	ug/kg	36
Endrin aldehyde		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
alpha-Chlordane		62	J	ug/kg	4900	-		ug/kg		-		ug/kg		180	U	ug/kg	180
gamma-Chlordane		54	J	ug/kg	4900	-		ug/kg		-		ug/kg		180	U	ug/kg	180
Toxaphene		9800	UJ	ug/kg	9800	-		ug/kg		-		ug/kg		360	U	ug/kg	360
Aroclor-1016		4900	UJ	ug/kg	4900	-		ug/kg		-		ug/kg		180	U	ug/kg	180
Aroclor-1221		4900	UJ	ug/kg	4900	-		ug/kg		-		ug/kg		180	U	ug/kg	180
Aroclor-1232		4900	UJ	ug/kg	4900	-		ug/kg		-		ug/kg		180	U	ug/kg	180
Aroclor-1242		4900	UJ	ug/kg	4900	-		ug/kg		-		ug/kg		180	U	ug/kg	180
Aroclor-1248		4900	UJ	ug/kg	4900	-		ug/kg		-		ug/kg		180	U	ug/kg	180
Aroclor-1254		9800	UJ	ug/kg	9800	-		ug/kg		-		ug/kg		360	U	ug/kg	360
Aroclor-1260		9800	UJ	ug/kg	9800	-		ug/kg		-		ug/kg		360	U	ug/kg	360
CLP METALS AND CYANIDE	mg/kg																
Aluminum		10800		mg/kg	40	-		mg/kg		-		mg/kg		9380		mg/kg	40
Antimony		3.5	J	mg/kg	12	-		mg/kg		-		mg/kg		2.7	U	mg/kg	12
Arsenic		3.8		mg/kg	2	-		mg/kg		-		mg/kg		2.1	J	mg/kg	2
Barium		96		mg/kg	40	-		mg/kg		-		mg/kg		13.1	J	mg/kg	40
Beryllium		.14	J	mg/kg	1	-		mg/kg		-		mg/kg		.05	UJ	mg/kg	1
Cadmium		.67	U	mg/kg	1	-		mg/kg		-		mg/kg		.6	U	mg/kg	1
Calcium		1790		mg/kg	1000	-		mg/kg		-		mg/kg		375	J	mg/kg	1000
Chromium		19.6		mg/kg	2	-		mg/kg		-		mg/kg		7.7		mg/kg	2
Cobalt		3.4	J	mg/kg	10	-		mg/kg		-		mg/kg		1.2	J	mg/kg	10
Copper		19.4		mg/kg	5	-		mg/kg		-		mg/kg		5.3	J	mg/kg	5
Iron		11700		mg/kg	20	-		mg/kg		-		mg/kg		5500		mg/kg	20
Lead		2230		mg/kg	1	-		mg/kg		-		mg/kg		22.3		mg/kg	1
Magnesium		1260		mg/kg	1000	-		mg/kg		-		mg/kg		99.7	J	mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	22526003				33701003				33701003RE				22526004			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-02				11-SL-02				11-SL-02RE				11-SL-03			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	230		mg/kg	3	-		mg/kg		-		mg/kg		182		mg/kg	3
Mercury	.06	J	mg/kg	.1	-		mg/kg		-		mg/kg		.04	J	mg/kg	.1
Nickel	10		mg/kg	8	-		mg/kg		-		mg/kg		2.3	U	mg/kg	8
Potassium	166	J	mg/kg	1000	-		mg/kg		-		mg/kg		132	U	mg/kg	1000
Selenium	.51	U	mg/kg	1	-		mg/kg		-		mg/kg		.46	U	mg/kg	1
Silver	1.9	J	mg/kg	2	-		mg/kg		-		mg/kg		.55	J	mg/kg	2
Sodium	307	J	mg/kg	1000	-		mg/kg		-		mg/kg		184	J	mg/kg	1000
Thallium	.39	U	mg/kg	2	-		mg/kg		-		mg/kg		.35	U	mg/kg	2
Vanadium	20.3		mg/kg	10	-		mg/kg		-		mg/kg		14.6		mg/kg	10
Zinc	260		mg/kg	4	-		mg/kg		-		mg/kg		47.8		mg/kg	4
Cyanide	.27	U	mg/kg	1	-		mg/kg		-		mg/kg		.24	U	mg/kg	1
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	33701004				22526005				33701005				22526006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-03				11-SL-04				11-SL-04				11-SL-05			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg																
Chloromethane	11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Bromomethane	11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Vinyl chloride	11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Chloroethane	11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Methylene chloride	22	UJ	ug/kg	5	-		ug/kg		13	UJ	ug/kg	5	-		ug/kg	
Acetone	11	UJ	ug/kg	11	-		ug/kg		11	UJ	ug/kg	10	-		ug/kg	
Carbon disulfide	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
1,1-Dichloroethene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
1,1-Dichloroethane	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
1,2-Dichloroethene (total)	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Chloroform	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
1,2-Dichloroethane	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
2-Butanone	11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
1,1,1-Trichloroethane	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Carbon tetrachloride	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Bromodichloromethane	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
1,2-Dichloropropane	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
cis-1,3-Dichloropropene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Trichloroethene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Dibromochloromethane	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
1,1,2-Trichloroethane	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Benzene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
trans-1,3-Dichloropropene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Bromoform	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
4-Methyl-2-pentanone	11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
2-Hexanone	11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Tetrachloroethene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Toluene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
1,1,2,2-Tetrachloroethane	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Chlorobenzene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Ethylbenzene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Styrene	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
Xylenes (total)	5	U	ug/kg	5	-		ug/kg		5	U	ug/kg	5	-		ug/kg	
CLP SEMIVOLATILES 90-SOW ug/kg																
Phenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
bis(2-Chloroethyl) ether	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2-Chlorophenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
1,3-Dichlorobenzene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
1,4-Dichlorobenzene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	33701004				22526005				33701005				22526006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-03				11-SL-04				11-SL-04				11-SL-05			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2-Methylphenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2,2-oxybis(1-Chloropropane)	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
4-Methylphenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
N-Nitroso-di-n-propylamine	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Hexachloroethane	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Nitrobenzene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Isophorone	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2-Nitrophenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2,4-Dimethylphenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
bis(2-Chloroethoxy) methane	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2,4-Dichlorophenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
1,2,4-Trichlorobenzene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Naphthalene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
4-Chloroaniline	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Hexachlorobutadiene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
4-Chloro-3-methylphenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2-Methylnaphthalene	-		ug/kg		49	J	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Hexachlorocyclopentadiene	-		ug/kg		350	UJ	ug/kg	350	-		ug/kg		350	UJ	ug/kg	350
2,4,6-Trichlorophenol	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2,4,5-Trichlorophenol	-		ug/kg		1700	U	ug/kg	1700	-		ug/kg		1700	U	ug/kg	1700
2-Chloronaphthalene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2-Nitroaniline	-		ug/kg		1700	U	ug/kg	1700	-		ug/kg		1700	U	ug/kg	1700
Dimethylphthalate	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Acenaphthylene	-		ug/kg		110	J	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2,6-Dinitrotoluene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
3-Nitroaniline	-		ug/kg		1700	U	ug/kg	1700	-		ug/kg		1700	U	ug/kg	1700
Acenaphthene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2,4-Dinitrophenol	-		ug/kg		1700	U	ug/kg	1700	-		ug/kg		1700	U	ug/kg	1700
4-Nitrophenol	-		ug/kg		1700	U	ug/kg	1700	-		ug/kg		1700	U	ug/kg	1700
Dibenzofuran	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
2,4-Dinitrotoluene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Diethylphthalate	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
4-Chlorophenyl-phenylether	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Fluorene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
4-Nitroaniline	-		ug/kg		1700	U	ug/kg	1700	-		ug/kg		1700	U	ug/kg	1700
4,6-Dinitro-2-methylphenol	-		ug/kg		1700	U	ug/kg	1700	-		ug/kg		1700	U	ug/kg	1700
N-Nitrosodiphenylamine	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
4-Bromophenyl-phenylether	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Hexachlorobenzene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Pentachlorophenol	-		ug/kg		1700	U	ug/kg	1700	-		ug/kg		1700	U	ug/kg	1700
Phenanthrene	-		ug/kg		2100		ug/kg	350	-		ug/kg		350	U	ug/kg	350
Anthracene	-		ug/kg		280	J	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Carbazole	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Di-n-butylphthalate	-		ug/kg		350	UJ	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Fluoranthene	-		ug/kg		1300		ug/kg	350	-		ug/kg		350	U	ug/kg	350
Pyrene	-		ug/kg		3400		ug/kg	350	-		ug/kg		350	U	ug/kg	350
Butylbenzylphthalate	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
3,3-Dichlorobenzidine	-		ug/kg		710	U	ug/kg	710	-		ug/kg		700	U	ug/kg	700
Benzo (a) anthracene	-		ug/kg		1800		ug/kg	350	-		ug/kg		350	U	ug/kg	350
Chrysene	-		ug/kg		2500		ug/kg	350	-		ug/kg		350	U	ug/kg	350
bis(2-Ethylhexyl) phthalate	-		ug/kg		540		ug/kg	350	-		ug/kg		350	U	ug/kg	350

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	33701004				22526005				33701005				22526006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-03				11-SL-04				11-SL-04				11-SL-05			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Benzo (b) fluoranthene	-		ug/kg		710		ug/kg	350	-		ug/kg		350	U	ug/kg	350
Benzo (k) fluoranthene	-		ug/kg		870		ug/kg	350	-		ug/kg		350	U	ug/kg	350
Benzo (a) pyrene	-		ug/kg		910		ug/kg	350	-		ug/kg		350	U	ug/kg	350
Indeno (1,2,3-cd) pyrene	-		ug/kg		230	J	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Dibenzo (a,h) anthracene	-		ug/kg		350	U	ug/kg	350	-		ug/kg		350	U	ug/kg	350
Benzo (g,h,i) perylene	-		ug/kg		310	J	ug/kg	350	-		ug/kg		350	U	ug/kg	350
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	-		ug/kg		43	U	ug/kg	43	-		ug/kg		340	U	ug/kg	340
beta-BHC	-		ug/kg		43	U	ug/kg	43	-		ug/kg		340	U	ug/kg	340
delta-BHC	-		ug/kg		43	U	ug/kg	43	-		ug/kg		340	U	ug/kg	340
gamma-BHC (Lindane)	-		ug/kg		43	U	ug/kg	43	-		ug/kg		340	U	ug/kg	340
Heptachlor	-		ug/kg		43	U	ug/kg	43	-		ug/kg		340	U	ug/kg	340
Aldrin	-		ug/kg		43	U	ug/kg	43	-		ug/kg		340	U	ug/kg	340
Heptachlor epoxide	-		ug/kg		43	U	ug/kg	43	-		ug/kg		340	U	ug/kg	340
Endosulfan I	-		ug/kg		43	U	ug/kg	43	-		ug/kg		340	U	ug/kg	340
Dieldrin	-		ug/kg		4.9	J	ug/kg	86	-		ug/kg		44	J	ug/kg	680
4,4-DDE	-		ug/kg		4.9	J	ug/kg	86	-		ug/kg		64	J	ug/kg	680
Endrin	-		ug/kg		86	U	ug/kg	86	-		ug/kg		680	U	ug/kg	680
Endosulfan II	-		ug/kg		86	U	ug/kg	86	-		ug/kg		680	U	ug/kg	680
4,4-DDD	-		ug/kg		86	U	ug/kg	86	-		ug/kg		680	U	ug/kg	680
Endosulfan sulfate	-		ug/kg		86	U	ug/kg	86	-		ug/kg		680	U	ug/kg	680
4,4-DDT	-		ug/kg		6.7	J	ug/kg	86	-		ug/kg		45	J	ug/kg	680
Methoxychlor	-		ug/kg		430	U	ug/kg	430	-		ug/kg		3400	U	ug/kg	3400
Endrin ketone	-		ug/kg		86	U	ug/kg	86	-		ug/kg		680	U	ug/kg	680
Endrin aldehyde	-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
alpha-Chlordane	-		ug/kg		39	J	ug/kg	430	-		ug/kg		310	J	ug/kg	3400
gamma-Chlordane	-		ug/kg		29	J	ug/kg	430	-		ug/kg		260	J	ug/kg	3400
Toxaphene	-		ug/kg		860	U	ug/kg	860	-		ug/kg		6800	U	ug/kg	6800
Aroclor-1016	-		ug/kg		430	U	ug/kg	430	-		ug/kg		3400	U	ug/kg	3400
Aroclor-1221	-		ug/kg		430	U	ug/kg	430	-		ug/kg		3400	U	ug/kg	3400
Aroclor-1232	-		ug/kg		430	U	ug/kg	430	-		ug/kg		3400	U	ug/kg	3400
Aroclor-1242	-		ug/kg		430	U	ug/kg	430	-		ug/kg		3400	U	ug/kg	3400
Aroclor-1248	-		ug/kg		430	U	ug/kg	430	-		ug/kg		3400	U	ug/kg	3400
Aroclor-1254	-		ug/kg		860	U	ug/kg	860	-		ug/kg		6800	U	ug/kg	6800
Aroclor-1260	-		ug/kg		860	U	ug/kg	860	-		ug/kg		6800	U	ug/kg	6800
CLP METALS AND CYANIDE mg/kg																
Aluminum	-		mg/kg		6100		mg/kg	40	-		mg/kg		2110		mg/kg	40
Antimony	-		mg/kg		2.6	U	mg/kg	12	-		mg/kg		2.6	U	mg/kg	12
Arsenic	-		mg/kg		1.5	J	mg/kg	2	-		mg/kg		.93	J	mg/kg	2
Barium	-		mg/kg		6.3	J	mg/kg	40	-		mg/kg		6.2	J	mg/kg	40
Beryllium	-		mg/kg		.05	UJ	mg/kg	1	-		mg/kg		.05	UJ	mg/kg	1
Cadmium	-		mg/kg		.58	U	mg/kg	1	-		mg/kg		.58	U	mg/kg	1
Calcium	-		mg/kg		248	J	mg/kg	1000	-		mg/kg		331	J	mg/kg	1000
Chromium	-		mg/kg		4.5		mg/kg	2	-		mg/kg		2.7		mg/kg	2
Cobalt	-		mg/kg		.35	J	mg/kg	10	-		mg/kg		.33	UJ	mg/kg	10
Copper	-		mg/kg		4	J	mg/kg	5	-		mg/kg		8.1		mg/kg	5
Iron	-		mg/kg		3540		mg/kg	20	-		mg/kg		1500		mg/kg	20
Lead	-		mg/kg		7.8		mg/kg	1	-		mg/kg		8.6		mg/kg	1
Magnesium	-		mg/kg		82.7	J	mg/kg	1000	-		mg/kg		65.1	J	mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	33701004				22526005				33701005				22526006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-03				11-SL-04				11-SL-04				11-SL-05			
Collect Date:	18-AUG-92				18-AUG-92				18-AUG-92				18-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	-		mg/kg		39.4		mg/kg	3	-		mg/kg		31.4		mg/kg	3
Mercury	-		mg/kg		.04	J	mg/kg	.1	-		mg/kg		.05	J	mg/kg	.1
Nickel	-		mg/kg		2.3	U	mg/kg	8	-		mg/kg		2.3	U	mg/kg	8
Potassium	-		mg/kg		128	U	mg/kg	1000	-		mg/kg		133	J	mg/kg	1000
Selenium	-		mg/kg		.44	U	mg/kg	1	-		mg/kg		.45	U	mg/kg	1
Silver	-		mg/kg		.93	J	mg/kg	2	-		mg/kg		.79	J	mg/kg	2
Sodium	-		mg/kg		189	J	mg/kg	1000	-		mg/kg		177	J	mg/kg	1000
Thallium	-		mg/kg		.34	U	mg/kg	2	-		mg/kg		.34	U	mg/kg	2
Vanadium	-		mg/kg		9.5	J	mg/kg	10	-		mg/kg		4.4	J	mg/kg	10
Zinc	-		mg/kg		9.4	J	mg/kg	4	-		mg/kg		21.5		mg/kg	4
Cyanide	-		mg/kg		.23	U	mg/kg	1	-		mg/kg		.24	U	mg/kg	1
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		33701006				22935008				22935001				22935002			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11-SL-05				11SS0101				11SS0202				11SS0303			
Collect Date:		18-AUG-92				08-OCT-92				08-OCT-92				08-OCT-92			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg																
Chloromethane		11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Bromomethane		11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Vinyl chloride		11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Chloroethane		11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Methylene chloride		12	UJ	ug/kg	5	18	UJ	ug/kg	11	12	UJ	ug/kg	11	31	UJ	ug/kg	12
Acetone		11	UJ	ug/kg	11	100	J	ug/kg	11	19	UJ	ug/kg	11	80	J	ug/kg	12
Carbon disulfide		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
1,1-Dichloroethene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
1,1-Dichloroethane		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
1,2-Dichloroethene (total)		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Chloroform		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
1,2-Dichloroethane		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
2-Butanone		11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
1,1,1-Trichloroethane		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Carbon tetrachloride		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Bromodichloromethane		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
1,2-Dichloropropane		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
cis-1,3-Dichloropropene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Trichloroethene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Dibromochloromethane		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
1,1,2-Trichloroethane		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Benzene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
trans-1,3-Dichloropropene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Bromoform		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
4-Methyl-2-pentanone		11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
2-Hexanone		11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Tetrachloroethene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Toluene		5	U	ug/kg	5	4	J	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
1,1,2,2-Tetrachloroethane		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Chlorobenzene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Ethylbenzene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Styrene		5	U	ug/kg	5	11	U	ug/kg	11	11	U	ug/kg	11	12	U	ug/kg	12
Xylenes (total)		5	U	ug/kg	5	4	J	ug/kg	11	4	J	ug/kg	11	8	J	ug/kg	12
CLP SEMIVOLATILES 90-SOW	ug/kg																
Phenol		-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
bis(2-Chloroethyl) ether		-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2-Chlorophenol		-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
1,3-Dichlorobenzene		-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
1,4-Dichlorobenzene		-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	33701006				22935008				22935001				22935002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-05				11SS0101				11SS0202				11SS0303			
Collect Date:	18-AUG-92				08-OCT-92				08-OCT-92				08-OCT-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2-Methylphenol	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2,2-oxybis(1-Chloropropane)	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
4-Methylphenol	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
N-Nitroso-di-n-propylamine	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Hexachloroethane	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Nitrobenzene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Isophorone	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2-Nitrophenol	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2,4-Dimethylphenol	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
bis(2-Chloroethoxy) methane	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2,4-Dichlorophenol	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
1,2,4-Trichlorobenzene	-		ug/kg		380	UJ	ug/kg	380	370	UJ	ug/kg	370	4000	U	ug/kg	4000
Naphthalene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
4-Chloroaniline	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Hexachlorobutadiene	-		ug/kg		380	UJ	ug/kg	380	370	U	ug/kg	370	4000	UJ	ug/kg	4000
4-Chloro-3-methylphenol	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2-Methylnaphthalene	-		ug/kg		380	U	ug/kg	380	370	UJ	ug/kg	370	4000	U	ug/kg	4000
Hexachlorocyclopentadiene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	UJ	ug/kg	4000
2,4,6-Trichlorophenol	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2,4,5-Trichlorophenol	-		ug/kg		920	U	ug/kg	920	900	U	ug/kg	900	9800	U	ug/kg	9800
2-Chloronaphthalene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2-Nitroaniline	-		ug/kg		920	U	ug/kg	920	900	U	ug/kg	900	9800	U	ug/kg	9800
Dimethylphthalate	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Acenaphthylene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2,6-Dinitrotoluene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
3-Nitroaniline	-		ug/kg		920	U	ug/kg	920	900	U	ug/kg	900	9800	U	ug/kg	9800
Acenaphthene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2,4-Dinitrophenol	-		ug/kg		920	UJ	ug/kg	920	900	UJ	ug/kg	900	9800	U	ug/kg	9800
4-Nitrophenol	-		ug/kg		920	U	ug/kg	920	900	U	ug/kg	900	9800	U	ug/kg	9800
Dibenzofuran	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
2,4-Dinitrotoluene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Diethylphthalate	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
4-Chlorophenyl-phenylether	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Fluorene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
4-Nitroaniline	-		ug/kg		920	U	ug/kg	920	900	U	ug/kg	900	9800	U	ug/kg	9800
4,6-Dinitro-2-methylphenol	-		ug/kg		920	UJ	ug/kg	920	900	UJ	ug/kg	900	9800	U	ug/kg	9800
N-Nitrosodiphenylamine	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
4-Bromophenyl-phenylether	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Hexachlorobenzene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	UJ	ug/kg	4000
Pentachlorophenol	-		ug/kg		920	U	ug/kg	920	900	U	ug/kg	900	9800	U	ug/kg	9800
Phenanthrene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Anthracene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Carbazole	-		ug/kg		380	UJ	ug/kg	380	370	UJ	ug/kg	370	4000	U	ug/kg	4000
Di-n-butylphthalate	-		ug/kg		380	UJ	ug/kg	380	370	UJ	ug/kg	370	4000	U	ug/kg	4000
Fluoranthene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Pyrene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Butylbenzylphthalate	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
3,3-Dichlorobenzidine	-		ug/kg		380	UJ	ug/kg	380	370	UJ	ug/kg	370	4000	UJ	ug/kg	4000
Benzo (a) anthracene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Chrysene	-		ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
bis(2-Ethylhexyl) phthalate	-		ug/kg		100	J	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		33701006				22935008				22935001				22935002			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11-SL-05				11SS0101				11SS0202				11SS0303			
Collect Date:		18-AUG-92				08-OCT-92				08-OCT-92				08-OCT-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		-	ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Benzo (b) fluoranthene		-	ug/kg		380	UJ	ug/kg	380	370	UJ	ug/kg	370	4000	U	ug/kg	4000
Benzo (k) fluoranthene		-	ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Benzo (a) pyrene		-	ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Indeno (1,2,3-cd) pyrene		-	ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Dibenzo (a,h) anthracene		-	ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
Benzo (g,h,i) perylene		-	ug/kg		380	U	ug/kg	380	370	U	ug/kg	370	4000	U	ug/kg	4000
CLP PESTICIDES/PCBS 90-SOW	ug/kg															
alpha-BHC		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
beta-BHC		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
delta-BHC		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
gamma-BHC (Lindane)		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
Heptachlor		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
Aldrin		-	ug/kg		7	J	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
Heptachlor epoxide		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
Endosulfan I		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
Dieldrin		-	ug/kg		23	J	ug/kg	7.6	2	J	ug/kg	4	33	J	ug/kg	40
4,4-DDE		-	ug/kg		5	J	ug/kg	7.6	27		ug/kg	4	22	J	ug/kg	40
Endrin		-	ug/kg		7.6	U	ug/kg	7.6	3.7	U	ug/kg	3.7	40	U	ug/kg	40
Endosulfan II		-	ug/kg		7.6	U	ug/kg	7.6	3.7	U	ug/kg	3.7	40	U	ug/kg	40
4,4-DDD		-	ug/kg		22	J	ug/kg	7.6	3.7	U	ug/kg	3.7	120		ug/kg	40
Endosulfan sulfate		-	ug/kg		7.6	U	ug/kg	7.6	3.7	U	ug/kg	3.7	40	U	ug/kg	40
4,4-DDT		-	ug/kg		7.6	U	ug/kg	7.6	8.4		ug/kg	4	28	J	ug/kg	40
Methoxychlor		-	ug/kg		39	U	ug/kg	39	19	U	ug/kg	19	210	U	ug/kg	210
Endrin ketone		-	ug/kg		7.6	U	ug/kg	7.6	3.7	U	ug/kg	3.7	40	U	ug/kg	40
Endrin aldehyde		-	ug/kg		7.6	U	ug/kg	7.6	3.7	U	ug/kg	3.7	40	U	ug/kg	40
alpha-Chlordane		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
gamma-Chlordane		-	ug/kg		3.9	U	ug/kg	3.9	1.9	U	ug/kg	1.9	21	U	ug/kg	21
Toxaphene		-	ug/kg		390	U	ug/kg	390	190	U	ug/kg	190	2100	U	ug/kg	2100
Aroclor-1016		-	ug/kg		76	U	ug/kg	76	37	U	ug/kg	37	400	U	ug/kg	400
Aroclor-1221		-	ug/kg		150	U	ug/kg	150	75	U	ug/kg	75	820	U	ug/kg	820
Aroclor-1232		-	ug/kg		76	U	ug/kg	76	37	U	ug/kg	37	400	U	ug/kg	400
Aroclor-1242		-	ug/kg		76	U	ug/kg	76	37	U	ug/kg	37	400	U	ug/kg	400
Aroclor-1248		-	ug/kg		76	U	ug/kg	76	37	U	ug/kg	37	400	U	ug/kg	400
Aroclor-1254		-	ug/kg		260	J	ug/kg	76	37	U	ug/kg	37	400	U	ug/kg	400
Aroclor-1260		-	ug/kg		62	J	ug/kg	76	37	U	ug/kg	37	400	U	ug/kg	400
CLP METALS AND CYANIDE	mg/kg															
Aluminum		-	mg/kg		17100		mg/kg	40	19400		mg/kg	40	11300		mg/kg	40
Antimony		-	mg/kg		2.4	U	mg/kg	12	2.4	U	mg/kg	12	2.6	U	mg/kg	12
Arsenic		-	mg/kg		3.9		mg/kg	2	5.5		mg/kg	2	3.7		mg/kg	2
Barium		-	mg/kg		14.6	J	mg/kg	40	10.7	J	mg/kg	40	28.5	J	mg/kg	40
Beryllium		-	mg/kg		.18	J	mg/kg	1	.21	J	mg/kg	1	.12	J	mg/kg	1
Cadmium		-	mg/kg		5		mg/kg	1	.67	U	mg/kg	1	6.5		mg/kg	1
Calcium		-	mg/kg		601	J	mg/kg	1000	766	J	mg/kg	1000	12100		mg/kg	1000
Chromium		-	mg/kg		19.5		mg/kg	2	17.2		mg/kg	2	11.4		mg/kg	2
Cobalt		-	mg/kg		1.2	J	mg/kg	10	1.1	J	mg/kg	10	1.7	J	mg/kg	10
Copper		-	mg/kg		17.2		mg/kg	5	5.9		mg/kg	5	6.7		mg/kg	5
Iron		-	mg/kg		16800		mg/kg	20	15600		mg/kg	20	7780		mg/kg	20
Lead		-	mg/kg		64.4		mg/kg	1	7.4		mg/kg	1	109		mg/kg	1
Magnesium		-	mg/kg		85.2	J	mg/kg	1000	97	J	mg/kg	1000	311	J	mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	33701006				22935008				22935001				22935002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11-SL-05				11SS0101				11SS0202				11SS0303			
Collect Date:	18-AUG-92				08-OCT-92				08-OCT-92				08-OCT-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	-		mg/kg		20.6		mg/kg	3	41		mg/kg	3	188		mg/kg	3
Mercury	-		mg/kg		.11		mg/kg	.1	.08	J	mg/kg	.1	.2	J	mg/kg	.1
Nickel	-		mg/kg		3.7	J	mg/kg	8	3.5	J	mg/kg	8	3.9	J	mg/kg	8
Potassium	-		mg/kg		154	U	mg/kg	1000	151	U	mg/kg	1000	161	U	mg/kg	1000
Selenium	-		mg/kg		.48	U	mg/kg	1	.56	J	mg/kg	1	.5	U	mg/kg	1
Silver	-		mg/kg		.46	U	mg/kg	2	.45	U	mg/kg	2	.48	U	mg/kg	2
Sodium	-		mg/kg		176	J	mg/kg	1000	167	J	mg/kg	1000	189	J	mg/kg	1000
Thallium	-		mg/kg		.36	U	mg/kg	2	.35	U	mg/kg	2	.38	U	mg/kg	2
Vanadium	-		mg/kg		34.9		mg/kg	10	37.5		mg/kg	10	22.2		mg/kg	10
Zinc	-		mg/kg		298		mg/kg	4	12.8	J	mg/kg	4	100		mg/kg	4
Cyanide	-		mg/kg		.09	U	mg/kg	1	.09	U	mg/kg	1	.1	U	mg/kg	1
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA847014				RA847014				RA847015				RA847015		
Site		WHITING				WHITING				WHITING				WHITING		
Locator		11S00101				11S00101				11S00201				11S00201		
Collect Date:		06-JAN-96				06-JAN-96				06-JAN-96				06-JAN-96		
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg																
Chloromethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Bromomethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Vinyl chloride		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Chloroethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Methylene chloride		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Acetone		12	U	ug/kg	12	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Carbon disulfide		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
1,1-Dichloroethene		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
1,1-Dichloroethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
1,2-Dichloroethene (total)		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Chloroform		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
1,2-Dichloroethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
2-Butanone		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
1,1,1-Trichloroethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Carbon tetrachloride		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Bromodichloromethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
1,2-Dichloropropane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
cis-1,3-Dichloropropene		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Trichloroethene		11	UJ	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
Dibromochloromethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
1,1,2-Trichloroethane		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Benzene		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
trans-1,3-Dichloropropene		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
Bromoform		11	U	ug/kg	11	-		ug/kg		11	U	ug/kg	11	-		ug/kg	
4-Methyl-2-pentanone		11	U	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
2-Hexanone		11	UJ	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
Tetrachloroethene		11	U	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
Toluene		11	U	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
1,1,2,2-Tetrachloroethane		11	UJ	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
Chlorobenzene		11	U	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
Ethylbenzene		11	U	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
Styrene		11	U	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
Xylenes (total)		11	U	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	
CLP SEMIVOLATILES 90-SOW	ug/kg																
Phenol		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
bis(2-Chloroethyl) ether		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2-Chlorophenol		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
1,3-Dichlorobenzene		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
1,4-Dichlorobenzene		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847014				RA847014				RA847015				RA847015			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11S00101				11S00101				11S00201				11S00201			
Collect Date:	06-JAN-96				06-JAN-96				06-JAN-96				06-JAN-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2-Methylphenol	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2,2-oxybis(1-Chloropropane)	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
4-Methylphenol	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
N-Nitroso-di-n-propylamine	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Hexachloroethane	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Nitrobenzene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Isophorone	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2-Nitrophenol	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2,4-Dimethylphenol	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
bis(2-Chloroethoxy) methane	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2,4-Dichlorophenol	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
1,2,4-Trichlorobenzene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Naphthalene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
4-Chloroaniline	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Hexachlorobutadiene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
4-Chloro-3-methylphenol	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2-Methylnaphthalene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Hexachlorocyclopentadiene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2,4,6-Trichlorophenol	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2,4,5-Trichlorophenol	930	U	ug/kg	930	-		ug/kg		910	U	ug/kg	910	-		ug/kg	
2-Chloronaphthalene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2-Nitroaniline	930	U	ug/kg	930	-		ug/kg		910	U	ug/kg	910	-		ug/kg	
Dimethylphthalate	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Acenaphthylene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2,6-Dinitrotoluene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
3-Nitroaniline	930	U	ug/kg	930	-		ug/kg		910	U	ug/kg	910	-		ug/kg	
Acenaphthene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2,4-Dinitrophenol	930	U	ug/kg	930	-		ug/kg		910	U	ug/kg	910	-		ug/kg	
4-Nitrophenol	930	U	ug/kg	930	-		ug/kg		910	U	ug/kg	910	-		ug/kg	
Dibenzofuran	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
2,4-Dinitrotoluene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Diethylphthalate	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
4-Chlorophenyl-phenylether	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Fluorene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
4-Nitroaniline	930	U	ug/kg	930	-		ug/kg		910	U	ug/kg	910	-		ug/kg	
4,6-Dinitro-2-methylphenol	930	U	ug/kg	930	-		ug/kg		910	U	ug/kg	910	-		ug/kg	
N-Nitrosodiphenylamine	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
4-Bromophenyl-phenylether	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Hexachlorobenzene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Pentachlorophenol	930	U	ug/kg	930	-		ug/kg		910	U	ug/kg	910	-		ug/kg	
Phenanthrene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Anthracene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Carbazole	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Di-n-butylphthalate	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Fluoranthene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Pyrene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Butylbenzylphthalate	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
3,3-Dichlorobenzidine	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Benzo (a) anthracene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Chrysene	370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
bis(2-Ethylhexyl) phthalate	370	U	ug/kg	370	-		ug/kg		130	J	ug/kg	360	-		ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA847014				RA847014				RA847015				RA847015			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11S00101				11S00101				11S00201				11S00201			
Collect Date:		06-JAN-96				06-JAN-96				06-JAN-96				06-JAN-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Benzo (b) fluoranthene		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Benzo (k) fluoranthene		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Benzo (a) pyrene		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Indeno (1,2,3-cd) pyrene		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Dibenzo (a,h) anthracene		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
Benzo (g,h,i) perylene		370	U	ug/kg	370	-		ug/kg		360	U	ug/kg	360	-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW	ug/kg																
alpha-BHC		1.9	U	ug/kg	1.9	-		ug/kg		1.9	UJ	ug/kg	1.9	-		ug/kg	
beta-BHC		1.9	U	ug/kg	1.9	-		ug/kg		1.9	UJ	ug/kg	1.9	-		ug/kg	
delta-BHC		1.9	U	ug/kg	1.9	-		ug/kg		1.9	UJ	ug/kg	1.9	-		ug/kg	
gamma-BHC (Lindane)		1.9	U	ug/kg	1.9	-		ug/kg		1.9	UJ	ug/kg	1.9	-		ug/kg	
Heptachlor		1.9	U	ug/kg	1.9	-		ug/kg		4.8	J	ug/kg	2	-		ug/kg	
Aldrin		1.9	U	ug/kg	1.9	-		ug/kg		.96	J	ug/kg	2	-		ug/kg	
Heptachlor epoxide		1.9	U	ug/kg	1.9	-		ug/kg		8.8	J	ug/kg	2	-		ug/kg	
Endosulfan I		1.9	UJ	ug/kg	1.9	-		ug/kg		1.9	UJ	ug/kg	1.9	-		ug/kg	
Dieldrin		3.7	U	ug/kg	3.7	-		ug/kg		20	J	ug/kg	4	-		ug/kg	
4,4-DDE		3.7	U	ug/kg	3.7	-		ug/kg		19	J	ug/kg	4	-		ug/kg	
Endrin		3.7	U	ug/kg	3.7	-		ug/kg		3.6	UJ	ug/kg	3.6	-		ug/kg	
Endosulfan II		3.7	U	ug/kg	3.7	-		ug/kg		3.6	UJ	ug/kg	3.6	-		ug/kg	
4,4-DDD		3.7	U	ug/kg	3.7	-		ug/kg		3.6	UJ	ug/kg	3.6	-		ug/kg	
Endosulfan sulfate		3.7	U	ug/kg	3.7	-		ug/kg		3.6	UJ	ug/kg	3.6	-		ug/kg	
4,4-DDT		3.7	U	ug/kg	3.7	-		ug/kg		27	J	ug/kg	4	-		ug/kg	
Methoxychlor		19	U	ug/kg	19	-		ug/kg		19	UJ	ug/kg	19	-		ug/kg	
Endrin ketone		3.7	U	ug/kg	3.7	-		ug/kg		3.6	UJ	ug/kg	3.6	-		ug/kg	
Endrin aldehyde		3.7	U	ug/kg	3.7	-		ug/kg		3.6	UJ	ug/kg	3.6	-		ug/kg	
alpha-Chlordane		1.9	U	ug/kg	1.9	-		ug/kg		120	R	ug/kg	2	-		ug/kg	
gamma-Chlordane		1.9	U	ug/kg	1.9	-		ug/kg		100	J	ug/kg	2	-		ug/kg	
Toxaphene		190	U	ug/kg	190	-		ug/kg		190	UJ	ug/kg	190	-		ug/kg	
Aroclor-1016		37	U	ug/kg	37	-		ug/kg		36	UJ	ug/kg	36	-		ug/kg	
Aroclor-1221		75	U	ug/kg	75	-		ug/kg		74	UJ	ug/kg	74	-		ug/kg	
Aroclor-1232		37	U	ug/kg	37	-		ug/kg		36	UJ	ug/kg	36	-		ug/kg	
Aroclor-1242		37	U	ug/kg	37	-		ug/kg		36	UJ	ug/kg	36	-		ug/kg	
Aroclor-1248		37	U	ug/kg	37	-		ug/kg		36	UJ	ug/kg	36	-		ug/kg	
Aroclor-1254		37	U	ug/kg	37	-		ug/kg		36	UJ	ug/kg	36	-		ug/kg	
Aroclor-1260		37	U	ug/kg	37	-		ug/kg		36	UJ	ug/kg	36	-		ug/kg	
CLP METALS AND CYANIDE	mg/kg																
Aluminum		9660		mg/kg	40	-		mg/kg		5670		mg/kg	40	-		mg/kg	
Antimony		12	UJ	mg/kg	12	-		mg/kg		12	UJ	mg/kg	12	-		mg/kg	
Arsenic		2.1	J	mg/kg	2	-		mg/kg		1.6	J	mg/kg	2	-		mg/kg	
Barium		15.3	J	mg/kg	40	-		mg/kg		8.6	J	mg/kg	40	-		mg/kg	
Beryllium		.1	J	mg/kg	1	-		mg/kg		.08	J	mg/kg	1	-		mg/kg	
Cadmium		1	U	mg/kg	1	-		mg/kg		.28	J	mg/kg	1	-		mg/kg	
Calcium		206	J	mg/kg	1000	-		mg/kg		332	J	mg/kg	1000	-		mg/kg	
Chromium		6.7		mg/kg	2	-		mg/kg		5		mg/kg	2	-		mg/kg	
Cobalt		2	J	mg/kg	10	-		mg/kg		.94	J	mg/kg	10	-		mg/kg	
Copper		3.7	J	mg/kg	5	-		mg/kg		5.5		mg/kg	5	-		mg/kg	
Iron		5630		mg/kg	20	-		mg/kg		3480		mg/kg	20	-		mg/kg	
Lead		5.2		mg/kg	.6	-		mg/kg		25.2		mg/kg	.6	-		mg/kg	
Magnesium		137	J	mg/kg	1000	-		mg/kg		122	J	mg/kg	1000	-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847014				RA847014				RA847015				RA847015			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11S00101				11S00101				11S00201				11S00201			
Collect Date:	06-JAN-96				06-JAN-96				06-JAN-96				06-JAN-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	194		mg/kg	3	-		mg/kg		46.7		mg/kg	3	-		mg/kg	
Mercury	.1	U	mg/kg	.1	-		mg/kg		.1	U	mg/kg	.1	-		mg/kg	
Nickel	1.6	J	mg/kg	8	-		mg/kg		1.8	J	mg/kg	8	-		mg/kg	
Potassium	115	J	mg/kg	1000	-		mg/kg		109	J	mg/kg	1000	-		mg/kg	
Selenium	.16	J	mg/kg	1	-		mg/kg		1	U	mg/kg	1	-		mg/kg	
Silver	2	U	mg/kg	2	-		mg/kg		2	U	mg/kg	2	-		mg/kg	
Sodium	183	J	mg/kg	1000	-		mg/kg		173	J	mg/kg	1000	-		mg/kg	
Thallium	2	U	mg/kg	2	-		mg/kg		2	U	mg/kg	2	-		mg/kg	
Vanadium	14.4		mg/kg	10	-		mg/kg		9.3	J	mg/kg	10	-		mg/kg	
Zinc	5.7		mg/kg	4	-		mg/kg		23.8		mg/kg	4	-		mg/kg	
Cyanide	.09	J	mg/kg	.5	-		mg/kg		.19	J	mg/kg	.5	-		mg/kg	
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		7		mg/kg	1.8	-		mg/kg		53.1		mg/kg	1.9

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA847015DL				RA847015R				RA847017				RA847017		
Site		WHITING				WHITING				WHITING				WHITING		
Locator		11S00201DL				11S00201R				11S00301				11S00301		
Collect Date:		06-JAN-96				06-JAN-96				06-JAN-96				07-JAN-96		
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg																
Chloromethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Bromomethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Vinyl chloride		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Chloroethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Methylene chloride		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Acetone		-		ug/kg		16	R	ug/kg	16	-		ug/kg		11	U	ug/kg	11
Carbon disulfide		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,1-Dichloroethene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,1-Dichloroethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,2-Dichloroethene (total)		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Chloroform		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,2-Dichloroethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
2-Butanone		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,1,1-Trichloroethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Carbon tetrachloride		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Bromodichloromethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,2-Dichloropropane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
cis-1,3-Dichloropropene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Trichloroethene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Dibromochloromethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,1,2-Trichloroethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Benzene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
trans-1,3-Dichloropropene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Bromoform		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
4-Methyl-2-pentanone		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
2-Hexanone		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	UJ	ug/kg	11
Tetrachloroethene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Toluene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
1,1,2,2-Tetrachloroethane		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Chlorobenzene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Ethylbenzene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Styrene		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
Xylenes (total)		-		ug/kg		11	R	ug/kg	11	-		ug/kg		11	U	ug/kg	11
CLP SEMIVOLATILES 90-SOW	ug/kg																
Phenol		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
bis(2-Chloroethyl) ether		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
2-Chlorophenol		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
1,3-Dichlorobenzene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
1,4-Dichlorobenzene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847015DL			RA847015R			RA847017			RA847017		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	11S00201DL			11S00201R			11S00301			11S00301		
Collect Date:	06-JAN-96			06-JAN-96			06-JAN-96			07-JAN-96		
	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
1,2-Dichlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,2-oxybis(1-Chloropropane)	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
N-Nitroso-di-n-propylamine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachloroethane	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Nitrobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Isophorone	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Nitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dimethylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
bis(2-Chloroethoxy) methane	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2,4-Trichlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Naphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chloroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorobutadiene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chloro-3-methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Methylnaphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorocyclopentadiene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4,6-Trichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4,5-Trichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Chloronaphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dimethylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Acenaphthylene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,6-Dinitrotoluene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
3-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Acenaphthene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dinitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Nitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dibenzofuran	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dinitrotoluene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Diethylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chlorophenyl-phenylether	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Fluorene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4,6-Dinitro-2-methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
N-Nitrosodiphenylamine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Bromophenyl-phenylether	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Pentachlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Phenanthrene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Anthracene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Carbazole	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Di-n-butylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Fluoranthene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Pyrene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Butylbenzylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
3,3-Dichlorobenzidine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzo (a) anthracene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chrysene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
bis(2-Ethylhexyl) phthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA847015DL				RA847015R				RA847017				RA847017			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11S00201DL				11S00201R				11S00301				11S00301			
Collect Date:		06-JAN-96				06-JAN-96				06-JAN-96				07-JAN-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (b) fluoranthene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (k) fluoranthene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (a) pyrene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Indeno (1,2,3-cd) pyrene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Dibenzo (a,h) anthracene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (g,h,i) perylene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW	ug/kg																
alpha-BHC		19	R	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
beta-BHC		19	R	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
delta-BHC		19	R	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
gamma-BHC (Lindane)		19	R	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Heptachlor		19	R	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Aldrin		19	R	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Heptachlor epoxide		10	R	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Endosulfan I		19	R	ug/kg	19	-		ug/kg		1.9	UJ	ug/kg	1.9	-		ug/kg	
Dieldrin		36	R	ug/kg	36	-		ug/kg		23		ug/kg	4	-		ug/kg	
4,4-DDE		20	R	ug/kg	36	-		ug/kg		5.3		ug/kg	4	-		ug/kg	
Endrin		36	R	ug/kg	36	-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
Endosulfan II		36	R	ug/kg	36	-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
4,4-DDD		36	R	ug/kg	36	-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
Endosulfan sulfate		36	R	ug/kg	36	-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
4,4-DDT		33	R	ug/kg	36	-		ug/kg		6.8		ug/kg	4	-		ug/kg	
Methoxychlor		190	R	ug/kg	190	-		ug/kg		19	U	ug/kg	19	-		ug/kg	
Endrin ketone		36	R	ug/kg	36	-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
Endrin aldehyde		36	R	ug/kg	36	-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
alpha-Chlordane		150	J	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
gamma-Chlordane		130	R	ug/kg	19	-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Toxaphene		1900	R	ug/kg	1900	-		ug/kg		190	U	ug/kg	190	-		ug/kg	
Aroclor-1016		360	R	ug/kg	360	-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1221		740	R	ug/kg	740	-		ug/kg		76	U	ug/kg	76	-		ug/kg	
Aroclor-1232		360	R	ug/kg	360	-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1242		360	R	ug/kg	360	-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1248		360	R	ug/kg	360	-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1254		360	R	ug/kg	360	-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1260		360	R	ug/kg	360	-		ug/kg		37	U	ug/kg	37	-		ug/kg	
CLP METALS AND CYANIDE	mg/kg																
Aluminum		-		mg/kg		-		mg/kg		-		mg/kg		5070		mg/kg	40
Antimony		-		mg/kg		-		mg/kg		-		mg/kg		12	UJ	mg/kg	12
Arsenic		-		mg/kg		-		mg/kg		-		mg/kg		2.2	J	mg/kg	2
Barium		-		mg/kg		-		mg/kg		-		mg/kg		4.6	J	mg/kg	40
Beryllium		-		mg/kg		-		mg/kg		-		mg/kg		.05	J	mg/kg	1
Cadmium		-		mg/kg		-		mg/kg		-		mg/kg		1	U	mg/kg	1
Calcium		-		mg/kg		-		mg/kg		-		mg/kg		249	J	mg/kg	1000
Chromium		-		mg/kg		-		mg/kg		-		mg/kg		6		mg/kg	2
Cobalt		-		mg/kg		-		mg/kg		-		mg/kg		10	U	mg/kg	10
Copper		-		mg/kg		-		mg/kg		-		mg/kg		5	UJ	mg/kg	5
Iron		-		mg/kg		-		mg/kg		-		mg/kg		4310		mg/kg	20
Lead		-		mg/kg		-		mg/kg		-		mg/kg		40.3		mg/kg	.6
Magnesium		-		mg/kg		-		mg/kg		-		mg/kg		54.2	J	mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847015DL				RA847015R				RA847017				RA847017			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11S00201DL				11S00201R				11S00301				11S00301			
Collect Date:	06-JAN-96				06-JAN-96				06-JAN-96				07-JAN-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	-		mg/kg		-		mg/kg		-		mg/kg		34.2		mg/kg	3
Mercury	-		mg/kg		-		mg/kg		-		mg/kg		.1	U	mg/kg	.1
Nickel	-		mg/kg		-		mg/kg		-		mg/kg		8	U	mg/kg	8
Potassium	-		mg/kg		-		mg/kg		-		mg/kg		108	J	mg/kg	1000
Selenium	-		mg/kg		-		mg/kg		-		mg/kg		1	U	mg/kg	1
Silver	-		mg/kg		-		mg/kg		-		mg/kg		2	U	mg/kg	2
Sodium	-		mg/kg		-		mg/kg		-		mg/kg		168	J	mg/kg	1000
Thallium	-		mg/kg		-		mg/kg		-		mg/kg		2	U	mg/kg	2
Vanadium	-		mg/kg		-		mg/kg		-		mg/kg		11.9		mg/kg	10
Zinc	-		mg/kg		-		mg/kg		-		mg/kg		8		mg/kg	4
Cyanide	-		mg/kg		-		mg/kg		-		mg/kg		.13	J	mg/kg	.5
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total petroleum hydrocarbons	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA847018			RA847018			RA847017			RA847017		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11S00301			11S00301			11S00401			11S00401		
Collect Date:		07-JAN-96			07-JAN-96			06-JAN-96			07-JAN-96		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg												
Chloromethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Bromomethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Vinyl chloride		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Chloroethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Methylene chloride		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Acetone		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Carbon disulfide		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
1,1-Dichloroethene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
1,1-Dichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
1,2-Dichloroethene (total)		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Chloroform		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
1,2-Dichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
2-Butanone		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
1,1,1-Trichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Carbon tetrachloride		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Bromodichloromethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
1,2-Dichloropropane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
cis-1,3-Dichloropropene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Trichloroethene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Dibromochloromethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
1,1,2-Trichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Benzene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
trans-1,3-Dichloropropene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Bromoform		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
4-Methyl-2-pentanone		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
2-Hexanone		-	ug/kg		-	ug/kg		-	ug/kg		11 UJ	ug/kg	11
Tetrachloroethene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Toluene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
1,1,2,2-Tetrachloroethane		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Chlorobenzene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Ethylbenzene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Styrene		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
Xylenes (total)		-	ug/kg		-	ug/kg		-	ug/kg		11 U	ug/kg	11
CLP SEMIVOLATILES 90-SOW	ug/kg												
Phenol		370 U	ug/kg	370	-	ug/kg		-	ug/kg		370 U	ug/kg	370
bis(2-Chloroethyl) ether		370 U	ug/kg	370	-	ug/kg		-	ug/kg		370 U	ug/kg	370
2-Chlorophenol		370 U	ug/kg	370	-	ug/kg		-	ug/kg		370 U	ug/kg	370
1,3-Dichlorobenzene		370 U	ug/kg	370	-	ug/kg		-	ug/kg		370 U	ug/kg	370
1,4-Dichlorobenzene		370 U	ug/kg	370	-	ug/kg		-	ug/kg		370 U	ug/kg	370

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847018				RA847018				RA847017				RA847017			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11S00301				11S00301				11S00401				11S00401			
Collect Date:	07-JAN-96				07-JAN-96				06-JAN-96				07-JAN-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2-Methylphenol	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,2-oxybis(1-Chloropropane)	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Methylphenol	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
N-Nitroso-di-n-propylamine	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Hexachloroethane	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Nitrobenzene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Isophorone	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2-Nitrophenol	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4-Dimethylphenol	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
bis(2-Chloroethoxy) methane	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4-Dichlorophenol	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
1,2,4-Trichlorobenzene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Naphthalene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Chloroaniline	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Hexachlorobutadiene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Chloro-3-methylphenol	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2-Methylnaphthalene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Hexachlorocyclopentadiene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4,6-Trichlorophenol	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4,5-Trichlorophenol	940	U	ug/kg	940	-		ug/kg		-		ug/kg		940	U	ug/kg	940
2-Chloronaphthalene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2-Nitroaniline	940	U	ug/kg	940	-		ug/kg		-		ug/kg		940	U	ug/kg	940
Dimethylphthalate	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Acenaphthylene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,6-Dinitrotoluene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
3-Nitroaniline	940	U	ug/kg	940	-		ug/kg		-		ug/kg		940	U	ug/kg	940
Acenaphthene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4-Dinitrophenol	940	U	ug/kg	940	-		ug/kg		-		ug/kg		940	U	ug/kg	940
4-Nitrophenol	940	U	ug/kg	940	-		ug/kg		-		ug/kg		940	U	ug/kg	940
Dibenzofuran	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
2,4-Dinitrotoluene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Diethylphthalate	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Chlorophenyl-phenylether	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Fluorene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Nitroaniline	940	U	ug/kg	940	-		ug/kg		-		ug/kg		940	U	ug/kg	940
4,6-Dinitro-2-methylphenol	940	U	ug/kg	940	-		ug/kg		-		ug/kg		940	U	ug/kg	940
N-Nitrosodiphenylamine	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
4-Bromophenyl-phenylether	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Hexachlorobenzene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Pentachlorophenol	940	U	ug/kg	940	-		ug/kg		-		ug/kg		940	U	ug/kg	940
Phenanthrene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Anthracene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Carbazole	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Di-n-butylphthalate	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Fluoranthene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Pyrene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Butylbenzylphthalate	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
3,3-Dichlorobenzidine	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (a) anthracene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Chrysene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
bis(2-Ethylhexyl) phthalate	71	J	ug/kg	380	-		ug/kg		-		ug/kg		52	J	ug/kg	380

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847018				RA847018				RA847017				RA847017			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11S00301				11S00301				11S00401				11S00401			
Collect Date:	07-JAN-96				07-JAN-96				06-JAN-96				07-JAN-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (b) fluoranthene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (k) fluoranthene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (a) pyrene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Indeno (1,2,3-cd) pyrene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Dibenzo (a,h) anthracene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
Benzo (g,h,i) perylene	370	U	ug/kg	370	-		ug/kg		-		ug/kg		370	U	ug/kg	370
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
beta-BHC	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
delta-BHC	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
gamma-BHC (Lindane)	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Heptachlor	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Aldrin	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Heptachlor epoxide	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Endosulfan I	-		ug/kg		-		ug/kg		1.9	UJ	ug/kg	1.9	-		ug/kg	
Dieldrin	-		ug/kg		-		ug/kg		23		ug/kg	4	-		ug/kg	
4,4-DDE	-		ug/kg		-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
Endrin	-		ug/kg		-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
Endosulfan II	-		ug/kg		-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
4,4-DDD	-		ug/kg		-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
Endosulfan sulfate	-		ug/kg		-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
4,4-DDT	-		ug/kg		-		ug/kg		6.8		ug/kg	4	-		ug/kg	
Methoxychlor	-		ug/kg		-		ug/kg		19	U	ug/kg	19	-		ug/kg	
Endrin ketone	-		ug/kg		-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
Endrin aldehyde	-		ug/kg		-		ug/kg		3.7	U	ug/kg	3.7	-		ug/kg	
alpha-Chlordane	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
gamma-Chlordane	-		ug/kg		-		ug/kg		1.9	U	ug/kg	1.9	-		ug/kg	
Toxaphene	-		ug/kg		-		ug/kg		190	U	ug/kg	190	-		ug/kg	
Aroclor-1016	-		ug/kg		-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1221	-		ug/kg		-		ug/kg		76	U	ug/kg	76	-		ug/kg	
Aroclor-1232	-		ug/kg		-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1242	-		ug/kg		-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1248	-		ug/kg		-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1254	-		ug/kg		-		ug/kg		37	U	ug/kg	37	-		ug/kg	
Aroclor-1260	-		ug/kg		-		ug/kg		37	U	ug/kg	37	-		ug/kg	
CLP METALS AND CYANIDE mg/kg																
Aluminum	-		mg/kg		-		mg/kg		-		mg/kg		5070		mg/kg	40
Antimony	-		mg/kg		-		mg/kg		-		mg/kg		12	UJ	mg/kg	12
Arsenic	-		mg/kg		-		mg/kg		-		mg/kg		2.2	J	mg/kg	2
Barium	-		mg/kg		-		mg/kg		-		mg/kg		12.8	J	mg/kg	40
Beryllium	-		mg/kg		-		mg/kg		-		mg/kg		.05	J	mg/kg	1
Cadmium	-		mg/kg		-		mg/kg		-		mg/kg		1	U	mg/kg	1
Calcium	-		mg/kg		-		mg/kg		-		mg/kg		249	J	mg/kg	1000
Chromium	-		mg/kg		-		mg/kg		-		mg/kg		7.8		mg/kg	2
Cobalt	-		mg/kg		-		mg/kg		-		mg/kg		10	U	mg/kg	10
Copper	-		mg/kg		-		mg/kg		-		mg/kg		5	UJ	mg/kg	5
Iron	-		mg/kg		-		mg/kg		-		mg/kg		4310		mg/kg	20
Lead	-		mg/kg		-		mg/kg		-		mg/kg		40.3		mg/kg	.6
Magnesium	-		mg/kg		-		mg/kg		-		mg/kg		54.2	J	mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847018			RA847018			RA847017			RA847017		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	11S00301			11S00301			11S00401			11S00401		
Collect Date:	07-JAN-96			07-JAN-96			06-JAN-96			07-JAN-96		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
Manganese	-	mg/kg		-	mg/kg		-	mg/kg		97.3	mg/kg	3
Mercury	-	mg/kg		-	mg/kg		-	mg/kg		.1 U	mg/kg	.1
Nickel	-	mg/kg		-	mg/kg		-	mg/kg		8 U	mg/kg	8
Potassium	-	mg/kg		-	mg/kg		-	mg/kg		62.1 J	mg/kg	1000
Selenium	-	mg/kg		-	mg/kg		-	mg/kg		1 U	mg/kg	1
Silver	-	mg/kg		-	mg/kg		-	mg/kg		2 U	mg/kg	2
Sodium	-	mg/kg		-	mg/kg		-	mg/kg		168 J	mg/kg	1000
Thallium	-	mg/kg		-	mg/kg		-	mg/kg		2 U	mg/kg	2
Vanadium	-	mg/kg		-	mg/kg		-	mg/kg		11.9	mg/kg	10
Zinc	-	mg/kg		-	mg/kg		-	mg/kg		8	mg/kg	4
Cyanide	-	mg/kg		-	mg/kg		-	mg/kg		.09 J	mg/kg	.5
Total organic carbon	-	mg/kg		-	mg/kg		-	mg/kg		-	mg/kg	
Total petroleum hydrocarbons	-	mg/kg		9.3	mg/kg	1.8	-	mg/kg		-	mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA847017			RA847016			RA847016			RA855001		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11S00401			11S00501			11S00501			11S00601		
Collect Date:		07-JAN-96			06-JAN-96			06-JAN-96			07-JAN-96		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	
CLP VOLATILES 90-SOW ug/kg													
Chloromethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Bromomethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Vinyl chloride	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Chloroethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Methylene chloride	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Acetone	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Carbon disulfide	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
1,1-Dichloroethene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
1,1-Dichloroethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
1,2-Dichloroethene (total)	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Chloroform	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
1,2-Dichloroethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
2-Butanone	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
1,1,1-Trichloroethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Carbon tetrachloride	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Bromodichloromethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
1,2-Dichloropropane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
cis-1,3-Dichloropropene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Trichloroethene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Dibromochloromethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
1,1,2-Trichloroethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Benzene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
trans-1,3-Dichloropropene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Bromoform	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
4-Methyl-2-pentanone	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
2-Hexanone	-		ug/kg		11	UJ	ug/kg	11	-		ug/kg	-	ug/kg
Tetrachloroethene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Toluene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
1,1,2,2-Tetrachloroethane	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Chlorobenzene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Ethylbenzene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Styrene	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
Xylenes (total)	-		ug/kg		11	U	ug/kg	11	-		ug/kg	-	ug/kg
CLP SEMIVOLATILES 90-SOW ug/kg													
Phenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg	-	ug/kg
bis(2-Chloroethyl) ether	-		ug/kg		380	U	ug/kg	380	-		ug/kg	-	ug/kg
2-Chlorophenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg	-	ug/kg
1,3-Dichlorobenzene	-		ug/kg		380	U	ug/kg	380	-		ug/kg	-	ug/kg
1,4-Dichlorobenzene	-		ug/kg		380	U	ug/kg	380	-		ug/kg	-	ug/kg

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847017				RA847016				RA847016				RA855001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11S00401				11S00501				11S00501				11S00601			
Collect Date:	07-JAN-96				06-JAN-96				06-JAN-96				07-JAN-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2-Methylphenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2,2-oxybis(1-Chloropropane)	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
4-Methylphenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
N-Nitroso-di-n-propylamine	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Hexachloroethane	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Nitrobenzene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Isophorone	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2-Nitrophenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2,4-Dimethylphenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
bis(2-Chloroethoxy) methane	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2,4-Dichlorophenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
1,2,4-Trichlorobenzene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Naphthalene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
4-Chloroaniline	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Hexachlorobutadiene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
4-Chloro-3-methylphenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2-Methylnaphthalene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Hexachlorocyclopentadiene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2,4,6-Trichlorophenol	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2,4,5-Trichlorophenol	-		ug/kg		950	U	ug/kg	950	-		ug/kg		-		ug/kg	
2-Chloronaphthalene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2-Nitroaniline	-		ug/kg		950	U	ug/kg	950	-		ug/kg		-		ug/kg	
Dimethylphthalate	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Acenaphthylene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2,6-Dinitrotoluene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
3-Nitroaniline	-		ug/kg		950	U	ug/kg	950	-		ug/kg		-		ug/kg	
Acenaphthene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2,4-Dinitrophenol	-		ug/kg		950	U	ug/kg	950	-		ug/kg		-		ug/kg	
4-Nitrophenol	-		ug/kg		950	U	ug/kg	950	-		ug/kg		-		ug/kg	
Dibenzofuran	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
2,4-Dinitrotoluene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Diethylphthalate	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
4-Chlorophenyl-phenylether	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Fluorene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
4-Nitroaniline	-		ug/kg		950	U	ug/kg	950	-		ug/kg		-		ug/kg	
4,6-Dinitro-2-methylphenol	-		ug/kg		950	U	ug/kg	950	-		ug/kg		-		ug/kg	
N-Nitrosodiphenylamine	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
4-Bromophenyl-phenylether	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Hexachlorobenzene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Pentachlorophenol	-		ug/kg		950	U	ug/kg	950	-		ug/kg		-		ug/kg	
Phenanthrene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Anthracene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Carbazole	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Di-n-butylphthalate	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Fluoranthene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Pyrene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Butylbenzylphthalate	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
3,3-Dichlorobenzidine	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Benzo (a) anthracene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Chrysene	-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
bis(2-Ethylhexyl) phthalate	-		ug/kg		81	J	ug/kg	380	-		ug/kg		-		ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA847017				RA847016				RA847016				RA855001		
Site		WHITING				WHITING				WHITING				WHITING		
Locator		11S00401				11S00501				11S00501				11S00601		
Collect Date:		07-JAN-96				06-JAN-96				06-JAN-96				07-JAN-96		
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Benzo (b) fluoranthene		-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Benzo (k) fluoranthene		-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Benzo (a) pyrene		-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Indeno (1,2,3-cd) pyrene		-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Dibenzo (a,h) anthracene		-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
Benzo (g,h,i) perylene		-		ug/kg		380	U	ug/kg	380	-		ug/kg		-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW	ug/kg																
alpha-BHC		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
beta-BHC		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
delta-BHC		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
gamma-BHC (Lindane)		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
Heptachlor		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
Aldrin		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
Heptachlor epoxide		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
Endosulfan I		-		ug/kg		2	UJ	ug/kg	2	-		ug/kg		-		ug/kg	
Dieldrin		-		ug/kg		13		ug/kg	4	-		ug/kg		-		ug/kg	
4,4-DDE		-		ug/kg		2.1		ug/kg	4	-		ug/kg		-		ug/kg	
Endrin		-		ug/kg		3.8	U	ug/kg	3.8	-		ug/kg		-		ug/kg	
Endosulfan II		-		ug/kg		3.8	U	ug/kg	3.8	-		ug/kg		-		ug/kg	
4,4-DDD		-		ug/kg		3.8	U	ug/kg	3.8	-		ug/kg		-		ug/kg	
Endosulfan sulfate		-		ug/kg		3.8	U	ug/kg	3.8	-		ug/kg		-		ug/kg	
4,4-DDT		-		ug/kg		2.3		ug/kg	4	-		ug/kg		-		ug/kg	
Methoxychlor		-		ug/kg		20	U	ug/kg	20	-		ug/kg		-		ug/kg	
Endrin ketone		-		ug/kg		3.8	U	ug/kg	3.8	-		ug/kg		-		ug/kg	
Endrin aldehyde		-		ug/kg		3.8	U	ug/kg	3.8	-		ug/kg		-		ug/kg	
alpha-Chlordane		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
gamma-Chlordane		-		ug/kg		2	U	ug/kg	2	-		ug/kg		-		ug/kg	
Toxaphene		-		ug/kg		200	U	ug/kg	200	-		ug/kg		-		ug/kg	
Aroclor-1016		-		ug/kg		38	U	ug/kg	38	-		ug/kg		-		ug/kg	
Aroclor-1221		-		ug/kg		77	U	ug/kg	77	-		ug/kg		-		ug/kg	
Aroclor-1232		-		ug/kg		38	U	ug/kg	38	-		ug/kg		-		ug/kg	
Aroclor-1242		-		ug/kg		38	U	ug/kg	38	-		ug/kg		-		ug/kg	
Aroclor-1248		-		ug/kg		38	U	ug/kg	38	-		ug/kg		-		ug/kg	
Aroclor-1254		-		ug/kg		38	U	ug/kg	38	-		ug/kg		-		ug/kg	
Aroclor-1260		-		ug/kg		38	U	ug/kg	38	-		ug/kg		-		ug/kg	
CLP METALS AND CYANIDE	mg/kg																
Aluminum		-		mg/kg		10700		mg/kg	40	-		mg/kg		40		mg/kg	40
Antimony		-		mg/kg		12	UJ	mg/kg	12	-		mg/kg		12		mg/kg	12
Arsenic		-		mg/kg		2.7		mg/kg	2	-		mg/kg		2		mg/kg	2
Barium		-		mg/kg		11.7	J	mg/kg	40	-		mg/kg		40		mg/kg	40
Beryllium		-		mg/kg		.09	J	mg/kg	1	-		mg/kg		1		mg/kg	1
Cadmium		-		mg/kg		.24	J	mg/kg	1	-		mg/kg		1		mg/kg	1
Calcium		-		mg/kg		483	J	mg/kg	1000	-		mg/kg		1000		mg/kg	1000
Chromium		-		mg/kg		11.8		mg/kg	2	-		mg/kg		2		mg/kg	2
Cobalt		-		mg/kg		10	U	mg/kg	10	-		mg/kg		10		mg/kg	10
Copper		-		mg/kg		6.3		mg/kg	5	-		mg/kg		5		mg/kg	5
Iron		-		mg/kg		6690		mg/kg	20	-		mg/kg		20		mg/kg	20
Lead		-		mg/kg		16.5		mg/kg	.6	-		mg/kg		19.3	J	mg/kg	.6
Magnesium		-		mg/kg		139	J	mg/kg	1000	-		mg/kg		1000		mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA847017				RA847016				RA847016				RA855001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11S00401				11S00501				11S00501				11S00601			
Collect Date:	07-JAN-96				06-JAN-96				06-JAN-96				07-JAN-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	-		mg/kg		122		mg/kg	3	-		mg/kg		3		mg/kg	3
Mercury	-		mg/kg		.08		mg/kg	.1	-		mg/kg		.1		mg/kg	.1
Nickel	-		mg/kg		2	J	mg/kg	8	-		mg/kg		8		mg/kg	8
Potassium	-		mg/kg		90.3	J	mg/kg	1000	-		mg/kg		1000		mg/kg	1000
Selenium	-		mg/kg		1	U	mg/kg	1	-		mg/kg		1		mg/kg	1
Silver	-		mg/kg		2	U	mg/kg	2	-		mg/kg		2		mg/kg	2
Sodium	-		mg/kg		160	J	mg/kg	1000	-		mg/kg		1000		mg/kg	1000
Thallium	-		mg/kg		2	U	mg/kg	2	-		mg/kg		2		mg/kg	2
Vanadium	-		mg/kg		17.8		mg/kg	10	-		mg/kg		10		mg/kg	10
Zinc	-		mg/kg		11.2		mg/kg	4	-		mg/kg		4		mg/kg	4
Cyanide	-		mg/kg		.09	J	mg/kg	.5	-		mg/kg		.5		mg/kg	.5
Total organic carbon	-		mg/kg		-		mg/kg		-		mg/kg		-		mg/kg	
Total petroleum hydrocarbons	8.6		mg/kg	1.8	-		mg/kg		11.6		mg/kg	1.9	-		mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA855002			RA855003			RA855004			RA855005		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11S00601D			11S00701			11S00801			11S00901		
Collect Date:		07-JAN-96			07-JAN-96			07-JAN-96			07-JAN-96		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg												
Chloromethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Bromomethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Vinyl chloride		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Methylene chloride		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Acetone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Carbon disulfide		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1-Dichloroethene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1-Dichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2-Dichloroethene (total)		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chloroform		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2-Dichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Butanone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1,1-Trichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Carbon tetrachloride		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Bromodichloromethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2-Dichloropropane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
cis-1,3-Dichloropropene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Trichloroethene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dibromochloromethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1,2-Trichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
trans-1,3-Dichloropropene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Bromoform		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Methyl-2-pentanone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Hexanone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Tetrachloroethene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Toluene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1,2,2-Tetrachloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chlorobenzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Ethylbenzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Styrene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Xylenes (total)		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
CLP SEMIVOLATILES 90-SOW	ug/kg												
Phenol		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
bis(2-Chloroethyl) ether		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Chlorophenol		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,3-Dichlorobenzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,4-Dichlorobenzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA855002			RA855003			RA855004			RA855005		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	11S00601D			11S00701			11S00801			11S00901		
Collect Date:	07-JAN-96			07-JAN-96			07-JAN-96			07-JAN-96		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
1,2-Dichlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,2-oxybis(1-Chloropropane)	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
N-Nitroso-di-n-propylamine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachloroethane	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Nitrobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Isophorone	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Nitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dimethylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
bis(2-Chloroethoxy) methane	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2,4-Trichlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Naphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chloroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorobutadiene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chloro-3-methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Methylnaphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorocyclopentadiene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4,6-Trichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4,5-Trichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Chloronaphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dimethylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Acenaphthylene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,6-Dinitrotoluene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
3-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Acenaphthene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dinitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Nitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dibenzofuran	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dinitrotoluene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Diethylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chlorophenyl-phenylether	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Fluorene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4,6-Dinitro-2-methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
N-Nitrosodiphenylamine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Bromophenyl-phenylether	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Pentachlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Phenanthrene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Anthracene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Carbazole	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Di-n-butylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Fluoranthene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Pyrene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Butylbenzylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
3,3-Dichlorobenzidine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzo (a) anthracene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chrysene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
bis(2-Ethylhexyl) phthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA855002			RA855003			RA855004			RA855005		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11S00601D			11S00701			11S00801			11S00901		
Collect Date:		07-JAN-96			07-JAN-96			07-JAN-96			07-JAN-96		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
Di-n-octylphthalate		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzo (b) fluoranthene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzo (k) fluoranthene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzo (a) pyrene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Indeno (1,2,3-cd) pyrene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dibenzo (a,h) anthracene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzo (g,h,i) perylene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
CLP PESTICIDES/PCBS 90-SOW	ug/kg												
alpha-BHC		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
beta-BHC		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
delta-BHC		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
gamma-BHC (Lindane)		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Heptachlor		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Aldrin		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Heptachlor epoxide		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Endosulfan I		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dieldrin		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4,4-DDE		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Endrin		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Endosulfan II		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4,4-DDD		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Endosulfan sulfate		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4,4-DDT		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Methoxychlor		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Endrin ketone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Endrin aldehyde		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
alpha-Chlordane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
gamma-Chlordane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Toxaphene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Aroclor-1016		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Aroclor-1221		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Aroclor-1232		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Aroclor-1242		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Aroclor-1248		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Aroclor-1254		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Aroclor-1260		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
CLP METALS AND CYANIDE	mg/kg												
Aluminum		40	mg/kg	40	40	mg/kg	40	40	mg/kg	40	40	mg/kg	40
Antimony		12	mg/kg	12	12	mg/kg	12	12	mg/kg	12	12	mg/kg	12
Arsenic		2	mg/kg	2	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2
Barium		40	mg/kg	40	40	mg/kg	40	40	mg/kg	40	40	mg/kg	40
Beryllium		1	mg/kg	1	1	mg/kg	1	1	mg/kg	1	1	mg/kg	1
Cadmium		1	mg/kg	1	1	mg/kg	1	1	mg/kg	1	1	mg/kg	1
Calcium		1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000
Chromium		2	mg/kg	2	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2
Cobalt		10	mg/kg	10	10	mg/kg	10	10	mg/kg	10	10	mg/kg	10
Copper		5	mg/kg	5	5	mg/kg	5	5	mg/kg	5	5	mg/kg	5
Iron		20	mg/kg	20	20	mg/kg	20	20	mg/kg	20	20	mg/kg	20
Lead		25	mg/kg	.6	18.7 J	mg/kg	.6	16.5 J	mg/kg	.6	16.8 J	mg/kg	.6
Magnesium		1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA855002			RA855003			RA855004			RA855005		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	11S00601D			11S00701			11S00801			11S00901		
Collect Date:	07-JAN-96			07-JAN-96			07-JAN-96			07-JAN-96		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
Manganese	3	mg/kg	3	3	mg/kg	3	3	mg/kg	3	3	mg/kg	3
Mercury	.1	mg/kg	.1	.1	mg/kg	.1	.1	mg/kg	.1	.1	mg/kg	.1
Nickel	8	mg/kg	8	8	mg/kg	8	8	mg/kg	8	8	mg/kg	8
Potassium	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000
Selenium	1	mg/kg	1	1	mg/kg	1	1	mg/kg	1	1	mg/kg	1
Silver	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2
Sodium	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000
Thallium	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2
Vanadium	10	mg/kg	10	10	mg/kg	10	10	mg/kg	10	10	mg/kg	10
Zinc	4	mg/kg	4	4	mg/kg	4	4	mg/kg	4	4	mg/kg	4
Cyanide	.5	mg/kg	.5	.5	mg/kg	.5	.5	mg/kg	.5	.5	mg/kg	.5
Total organic carbon	-	mg/kg		-	mg/kg		-	mg/kg		-	mg/kg	
Total petroleum hydrocarbons	-	mg/kg		-	mg/kg		-	mg/kg		-	mg/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA855006			RA855007			RA855008			RA855009		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11S01001			11S01101			11S01201			11S01301		
Collect Date:		07-JAN-96			07-JAN-96			07-JAN-96			07-JAN-96		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/kg												
Chloromethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Bromomethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Vinyl chloride		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Methylene chloride		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Acetone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Carbon disulfide		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1-Dichloroethene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1-Dichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2-Dichloroethene (total)		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chloroform		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2-Dichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Butanone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1,1-Trichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Carbon tetrachloride		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Bromodichloromethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2-Dichloropropane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
cis-1,3-Dichloropropene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Trichloroethene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dibromochloromethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1,2-Trichloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
trans-1,3-Dichloropropene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Bromoform		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Methyl-2-pentanone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Hexanone		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Tetrachloroethene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Toluene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,1,2,2-Tetrachloroethane		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chlorobenzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Ethylbenzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Styrene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Xylenes (total)		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
CLP SEMIVOLATILES 90-SOW	ug/kg												
Phenol		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
bis(2-Chloroethyl) ether		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Chlorophenol		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,3-Dichlorobenzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,4-Dichlorobenzene		-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA855006			RA855007			RA855008			RA855009		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	11S01001			11S01101			11S01201			11S01301		
Collect Date:	07-JAN-96			07-JAN-96			07-JAN-96			07-JAN-96		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
1,2-Dichlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,2-oxybis(1-Chloropropane)	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
N-Nitroso-di-n-propylamine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachloroethane	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Nitrobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Isophorone	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Nitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dimethylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
bis(2-Chloroethoxy) methane	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
1,2,4-Trichlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Naphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chloroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorobutadiene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chloro-3-methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Methylnaphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorocyclopentadiene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4,6-Trichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4,5-Trichlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Chloronaphthalene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dimethylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Acenaphthylene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,6-Dinitrotoluene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
3-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Acenaphthene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dinitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Nitrophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Dibenzofuran	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
2,4-Dinitrotoluene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Diethylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Chlorophenyl-phenylether	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Fluorene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Nitroaniline	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4,6-Dinitro-2-methylphenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
N-Nitrosodiphenylamine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
4-Bromophenyl-phenylether	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Hexachlorobenzene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Pentachlorophenol	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Phenanthrene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Anthracene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Carbazole	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Di-n-butylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Fluoranthene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Pyrene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Butylbenzylphthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
3,3-Dichlorobenzidine	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Benzo (a) anthracene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
Chrysene	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	
bis(2-Ethylhexyl) phthalate	-	ug/kg		-	ug/kg		-	ug/kg		-	ug/kg	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:		RA855006			RA855007			RA855008			RA855009		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11S01001			11S01101			11S01201			11S01301		
Collect Date:		07-JAN-96			07-JAN-96			07-JAN-96			07-JAN-96		
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (b) fluoranthene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (k) fluoranthene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (a) pyrene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Indeno (1,2,3-cd) pyrene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Dibenzo (a,h) anthracene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (g,h,i) perylene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW	ug/kg																
alpha-BHC		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
beta-BHC		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
delta-BHC		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
gamma-BHC (Lindane)		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Heptachlor		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Aldrin		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Heptachlor epoxide		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Endosulfan I		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Dieldrin		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
4,4-DDE		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Endrin		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Endosulfan II		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
4,4-DDD		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Endosulfan sulfate		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
4,4-DDT		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Methoxychlor		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Endrin ketone		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Endrin aldehyde		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
alpha-Chlordane		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
gamma-Chlordane		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Toxaphene		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1016		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1221		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1232		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1242		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1248		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1254		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1260		-		ug/kg		-		ug/kg		-		ug/kg		-		ug/kg	
CLP METALS AND CYANIDE	mg/kg																
Aluminum		40		mg/kg	40	40		mg/kg	40	40		mg/kg	40	40		mg/kg	40
Antimony		12		mg/kg	12	12		mg/kg	12	12		mg/kg	12	12		mg/kg	12
Arsenic		2		mg/kg	2	2		mg/kg	2	2		mg/kg	2	2		mg/kg	2
Barium		40		mg/kg	40	40		mg/kg	40	40		mg/kg	40	40		mg/kg	40
Beryllium		1		mg/kg	1	1		mg/kg	1	1		mg/kg	1	1		mg/kg	1
Cadmium		1		mg/kg	1	1		mg/kg	1	1		mg/kg	1	1		mg/kg	1
Calcium		1000		mg/kg	1000	1000		mg/kg	1000	1000		mg/kg	1000	1000		mg/kg	1000
Chromium		2		mg/kg	2	2		mg/kg	2	2		mg/kg	2	2		mg/kg	2
Cobalt		10		mg/kg	10	10		mg/kg	10	10		mg/kg	10	10		mg/kg	10
Copper		5		mg/kg	5	5		mg/kg	5	5		mg/kg	5	5		mg/kg	5
Iron		20		mg/kg	20	20		mg/kg	20	20		mg/kg	20	20		mg/kg	20
Lead		23.3	J	mg/kg	.6	16.2	J	mg/kg	.6	74.8		mg/kg	.6	43.5		mg/kg	.6
Magnesium		1000		mg/kg	1000	1000		mg/kg	1000	1000		mg/kg	1000	1000		mg/kg	1000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Soil Data

Lab Sample Number:	RA855006			RA855007			RA855008			RA855009		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	11S01001			11S01101			11S01201			11S01301		
Collect Date:	07-JAN-96			07-JAN-96			07-JAN-96			07-JAN-96		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
Manganese	3	mg/kg	3	3	mg/kg	3	3	mg/kg	3	3	mg/kg	3
Mercury	.1	mg/kg	.1	.1	mg/kg	.1	.1	mg/kg	.1	.1	mg/kg	.1
Nickel	8	mg/kg	8	8	mg/kg	8	8	mg/kg	8	8	mg/kg	8
Potassium	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000
Selenium	1	mg/kg	1	1	mg/kg	1	1	mg/kg	1	1	mg/kg	1
Silver	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2
Sodium	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000	1000	mg/kg	1000
Thallium	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2	2	mg/kg	2
Vanadium	10	mg/kg	10	10	mg/kg	10	10	mg/kg	10	10	mg/kg	10
Zinc	4	mg/kg	4	4	mg/kg	4	4	mg/kg	4	4	mg/kg	4
Cyanide	.5	mg/kg	.5	.5	mg/kg	.5	.5	mg/kg	.5	.5	mg/kg	.5
Total organic carbon	-	mg/kg		-	mg/kg		-	mg/kg		-	mg/kg	
Total petroleum hydrocarbons	-	mg/kg		-	mg/kg		-	mg/kg		-	mg/kg	

APPENDIX D

GROUNDWATER SAMPLE ANALYTICAL DATA

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```
 ####   #####   ######  #####   #    #  ######  #    #   ####
#         #     #       #    #  #    #  #       ##   #  #
 ####     #     #####   #    #  ######  #####   # #  #   ####
     #    #     #       #####   #    #  #       #  # #       #
#    #    #     #       #       #    #  #       #   ##  #    #
 ####     #     ######  #       #    #  ######  #    #   ####
```

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Request id: lp0-11567

Printer: lp0

Options:

Thu Feb 05 17:40:43 EST 1998

Machine: abb3

Groundwater Data.

Site 11

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		90194001				90194001RE				90191002				90191002RE		
Site		WHITING				WHITING				WHITING				WHITING		
Locator		WHF11-1				WHF11-1RE				WHF11-1B				WHF11-1BRE		
Collect Date:		29-OCT-93				29-OCT-93				28-OCT-93				28-OCT-93		
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/l																
Chloromethane		10	UJ	ug/l	10	-		ug/l		10	UJ	ug/l	10	-		ug/l	
Bromomethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Vinyl chloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Chloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Methylene chloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Acetone		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Carbon disulfide		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,1-Dichloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,1-Dichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,2-Dichloroethene (total)		10	U	ug/l	10	-		ug/l		9	J	ug/l	10	-		ug/l	
Chloroform		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,2-Dichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2-Butanone		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,1,1-Trichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Carbon tetrachloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Bromodichloromethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,2-Dichloropropane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
cis-1,3-Dichloropropene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Trichloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Dibromochloromethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,1,2-Trichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Benzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
trans-1,3-Dichloropropene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Bromoform		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
4-Methyl-2-pentanone		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2-Hexanone		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Tetrachloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Toluene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,1,2,2-Tetrachloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Chlorobenzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Ethylbenzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Styrene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Xylenes (total)		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
CLP SEMIVOLATILES 90-SOW	ug/l																
Phenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	
bis(2-Chloroethyl) ether		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2-Chlorophenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	
1,3-Dichlorobenzene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
1,4-Dichlorobenzene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
1,2-Dichlorobenzene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2-Methylphenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	
2,2-oxybis(1-Chloropropane)		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
4-Methylphenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	
N-Nitroso-di-n-propylamine		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Hexachloroethane		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Nitrobenzene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Isophorone		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2-Nitrophenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	
2,4-Dimethylphenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		90194001				90194001RE				90191002				90191002RE			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		WHF11-1				WHF11-1RE				WHF11-1B				WHF11-1BRE			
Collect Date:		29-OCT-93				29-OCT-93				28-OCT-93				28-OCT-93			
	VALUE	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
bis(2-Chloroethoxy) methane		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2,4-Dichlorophenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	
1,2,4-Trichlorobenzene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Naphthalene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
4-Chloroaniline		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Hexachlorobutadiene		10	UJ	ug/l	10	10	UJ	ug/l	10	10	UJ	ug/l	10	-		ug/l	
4-Chloro-3-methylphenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	
2-Methylnaphthalene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Hexachlorocyclopentadiene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2,4,6-Trichlorophenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	-		ug/l	
2,4,5-Trichlorophenol		25	R	ug/l	25	25	R	ug/l	25	25	U	ug/l	25	-		ug/l	
2-Chloronaphthalene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2-Nitroaniline		25	U	ug/l	25	25	UJ	ug/l	25	25	U	ug/l	25	-		ug/l	
Dimethylphthalate		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Acenaphthylene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2,6-Dinitrotoluene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
3-Nitroaniline		25	U	ug/l	25	25	UJ	ug/l	25	25	U	ug/l	25	-		ug/l	
Acenaphthene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2,4-Dinitrophenol		25	R	ug/l	25	25	R	ug/l	25	25	UJ	ug/l	25	-		ug/l	
4-Nitrophenol		25	R	ug/l	25	25	R	ug/l	25	25	U	ug/l	25	-		ug/l	
Dibenzofuran		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
2,4-Dinitrotoluene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Diethylphthalate		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
4-Chlorophenyl-phenylether		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Fluorene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
4-Nitroaniline		25	U	ug/l	25	25	UJ	ug/l	25	25	U	ug/l	25	-		ug/l	
4,6-Dinitro-2-methylphenol		25	R	ug/l	25	25	R	ug/l	25	25	U	ug/l	25	-		ug/l	
N-Nitrosodiphenylamine		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
4-Bromophenyl-phenylether		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Hexachlorobenzene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Pentachlorophenol		25	R	ug/l	25	25	R	ug/l	25	25	U	ug/l	25	-		ug/l	
Phenanthrene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Anthracene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Carbazole		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Di-n-butylphthalate		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Fluoranthene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Pyrene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Butylbenzylphthalate		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
3,3-Dichlorobenzidine		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Benzo (a) anthracene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Chrysene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
bis(2-Ethylhexyl) phthalate		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Di-n-octylphthalate		19		ug/l	10	17	J	ug/l	10	10	U	ug/l	10	-		ug/l	
Benzo (b) fluoranthene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Benzo (k) fluoranthene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Benzo (a) pyrene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Indeno (1,2,3-cd) pyrene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Dibenzo (a,h) anthracene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
Benzo (g,h,i) perylene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	-		ug/l	
CLP PESTICIDES/PCBS 90-SOW	ug/l																
alpha-BHC		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	90194001				90194001RE				90191002				90191002RE			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF11-1				WHF11-1RE				WHF11-1B				WHF11-1BRE			
Collect Date:	29-OCT-93				29-OCT-93				28-OCT-93				28-OCT-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
beta-BHC	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
delta-BHC	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
gamma-BHC (Lindane)	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Aldrin	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor epoxide	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Endosulfan I	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Dieldrin	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDE	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endrin	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan II	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDD	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan sulfate	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDT	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Methoxychlor	.5	U	ug/l	.5	-		ug/l		.5	UJ	ug/l	.5	.5	UJ	ug/l	.5
Endrin ketone	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endrin aldehyde	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
alpha-Chlordane	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
gamma-Chlordane	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Toxaphene	5	U	ug/l	5	-		ug/l		5	UJ	ug/l	5	5	UJ	ug/l	5
Aroclor-1016	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1221	2	U	ug/l	2	-		ug/l		2	UJ	ug/l	2	2	UJ	ug/l	2
Aroclor-1232	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1242	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1248	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1254	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1260	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
CLP METALS AND CYANIDE ug/l																
Aluminum	69.8	J	ug/l	200	-		ug/l		16400		ug/l	200	-		ug/l	
Antimony	20.7	U	ug/l	60	-		ug/l		20.7	U	ug/l	60	-		ug/l	
Arsenic	1.6	U	ug/l	10	-		ug/l		1.6	U	ug/l	10	-		ug/l	
Barium	33.8	J	ug/l	200	-		ug/l		97.1	J	ug/l	200	-		ug/l	
Beryllium	.2	U	ug/l	5	-		ug/l		.2		ug/l	5	-		ug/l	
Cadmium	3.2	UJ	ug/l	5	-		ug/l		3.2	UJ	ug/l	5	-		ug/l	
Calcium	6830		ug/l	5000	-		ug/l		49800		ug/l	5000	-		ug/l	
Chromium	3.3	U	ug/l	10	-		ug/l		20.3		ug/l	10	-		ug/l	
Cobalt	4.1	U	ug/l	50	-		ug/l		4.1	U	ug/l	50	-		ug/l	
Copper	5.4	J	ug/l	25	-		ug/l		8.4	J	ug/l	25	-		ug/l	
Iron	142		ug/l	100	-		ug/l		23000		ug/l	100	-		ug/l	
Lead	6		ug/l	3	-		ug/l		5.4		ug/l	3	-		ug/l	
Magnesium	304	J	ug/l	5000	-		ug/l		5220		ug/l	5000	-		ug/l	
Manganese	2.5	J	ug/l	15	-		ug/l		272		ug/l	15	-		ug/l	
Mercury	.15	U	ug/l	.2	-		ug/l		.15	U	ug/l	.2	-		ug/l	
Nickel	9	U	ug/l	40	-		ug/l		13.3	J	ug/l	40	-		ug/l	
Potassium	747	J	ug/l	5000	-		ug/l		1980	J	ug/l	5000	-		ug/l	
Selenium	2	U	ug/l	5	-		ug/l		2	U	ug/l	5	-		ug/l	
Silver	2.7	U	ug/l	10	-		ug/l		2.7	U	ug/l	10	-		ug/l	
Sodium	1800	J	ug/l	5000	-		ug/l		25300		ug/l	5000	-		ug/l	
Thallium	.88	UJ	ug/l	10	-		ug/l		.88	UJ	ug/l	10	-		ug/l	
Vanadium	2.5	U	ug/l	50	-		ug/l		49.8	J	ug/l	50	-		ug/l	
Zinc	37.5		ug/l	20	-		ug/l		32.5		ug/l	20	-		ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	90194001				90194001RE				90191002				90191002RE			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF11-1				WHF11-1RE				WHF11-1B				WHF11-1BRE			
Collect Date:	29-OCT-93				29-OCT-93				28-OCT-93				28-OCT-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Cyanide	1.7	U	ug/l	10	-		ug/l		1.7	U	ug/l	10	-		ug/l	
Groundwater Quality mg/l																
Alkalinity as CaCO3	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Ammonia-N	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Chloride	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Hardness as CaCO3	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Nitrate-Nitrite	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Phosphorous-P, Total	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Sulfate	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Sulfide	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Total Dissolved Solids	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Total Kjeldahl Nitrogen	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Total organic carbon	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Total petroleum hydrocarbons	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Methane	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Organic Carbon	-		mg/l		-		mg/l		-		mg/l		-		mg/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		90191001				90191001RE				90190001				90190002			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		WHF11-2				WHF11-2RE				WHF11-3				WHF11-3A			
Collect Date:		28-OCT-93				28-OCT-93				28-OCT-93				28-OCT-93			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/l																
Chloromethane		10	UJ	ug/l	10	-		ug/l		10	U	ug/l	10	10	UJ	ug/l	10
Bromomethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Vinyl chloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Chloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Methylene chloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Acetone		94	J	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Carbon disulfide		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,1-Dichloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,1-Dichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloroethene (total)		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Chloroform		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2-Butanone		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,1,1-Trichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Carbon tetrachloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Bromodichloromethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloropropane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
cis-1,3-Dichloropropene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Trichloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Dibromochloromethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,1,2-Trichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Benzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
trans-1,3-Dichloropropene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Bromoform		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
4-Methyl-2-pentanone		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
2-Hexanone		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Tetrachloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Toluene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
1,1,2,2-Tetrachloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Chlorobenzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Ethylbenzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Styrene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
Xylenes (total)		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	10	U	ug/l	10
CLP SEMIVOLATILES 90-SOW	ug/l																
Phenol		10	R	ug/l	10	2	R	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10
bis(2-Chloroethyl) ether		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Chlorophenol		10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,3-Dichlorobenzene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,4-Dichlorobenzene		10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	90191001				90191001RE				90190001				90190002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF11-2				WHF11-2RE				WHF11-3				WHF11-3A			
Collect Date:	28-OCT-93				28-OCT-93				28-OCT-93				28-OCT-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Methylphenol	10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,2-oxybis(1-Chloropropane)	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Methylphenol	10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
N-Nitroso-di-n-propylamine	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachloroethane	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Nitrobenzene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Isophorone	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Nitrophenol	10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dimethylphenol	10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
bis(2-Chloroethoxy) methane	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dichlorophenol	10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2,4-Trichlorobenzene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Naphthalene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chloroaniline	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobutadiene	10	UJ	ug/l	10	10	UJ	ug/l	10	10	UJ	ug/l	10	10	UJ	ug/l	10
4-Chloro-3-methylphenol	10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Methylnaphthalene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorocyclopentadiene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4,6-Trichlorophenol	10	R	ug/l	10	10	R	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4,5-Trichlorophenol	25	R	ug/l	25	25	R	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
2-Chloronaphthalene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Nitroaniline	25	U	ug/l	25	25	UJ	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Dimethylphthalate	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Acenaphthylene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,6-Dinitrotoluene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
3-Nitroaniline	25	U	ug/l	25	25	UJ	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Acenaphthene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrophenol	25	R	ug/l	25	25	R	ug/l	25	25	UJ	ug/l	25	25	U	ug/l	25
4-Nitrophenol	25	R	ug/l	25	25	R	ug/l	25	25	U	ug/l	25	25	UJ	ug/l	25
Dibenzofuran	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrotoluene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Diethylphthalate	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chlorophenyl-phenylether	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Fluorene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Nitroaniline	25	U	ug/l	25	25	UJ	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
4,6-Dinitro-2-methylphenol	25	R	ug/l	25	25	R	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
N-Nitrosodiphenylamine	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Bromophenyl-phenylether	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobenzene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Pentachlorophenol	25	R	ug/l	25	25	R	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Phenanthrene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Anthracene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Carbazole	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Di-n-butylphthalate	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Fluoranthene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Pyrene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Butylbenzylphthalate	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
3,3-Dichlorobenzidine	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) anthracene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Chrysene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	90191001				90191001RE				90190001				90190002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF11-2				WHF11-2RE				WHF11-3				WHF11-3A			
Collect Date:	28-OCT-93				28-OCT-93				28-OCT-93				28-OCT-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate	4	J	ug/l	10	5	J	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (b) fluoranthene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (k) fluoranthene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) pyrene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Indeno (1,2,3-cd) pyrene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Dibenzo (a,h) anthracene	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (g,h,i) perylene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
CLP PESTICIDES/PCBS 90-SOW ug/l																
alpha-BHC	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
beta-BHC	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
delta-BHC	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
gamma-BHC (Lindane)	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Aldrin	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor epoxide	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Endosulfan I	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Dieldrin	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDE	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endrin	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan II	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDD	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan sulfate	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDT	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Methoxychlor	.5	U	ug/l	.5	-		ug/l		.5	UJ	ug/l	.5	.5	UJ	ug/l	.5
Endrin ketone	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endrin aldehyde	.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
alpha-Chlordane	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
gamma-Chlordane	.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Toxaphene	5	U	ug/l	5	-		ug/l		5	UJ	ug/l	5	5	UJ	ug/l	5
Aroclor-1016	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1221	2	U	ug/l	2	-		ug/l		2	UJ	ug/l	2	2	UJ	ug/l	2
Aroclor-1232	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1242	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1248	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1254	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1260	1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1	1	UJ	ug/l	1
CLP METALS AND CYANIDE ug/l																
Aluminum	5860		ug/l	200	-		ug/l		24000		ug/l	200	22300		ug/l	200
Antimony	20.7	U	ug/l	60	-		ug/l		21	UJ	ug/l	60	21	UJ	ug/l	60
Arsenic	1.6	U	ug/l	10	-		ug/l		2	R	ug/l	10	2	R	ug/l	10
Barium	63.6	J	ug/l	200	-		ug/l		153	J	ug/l	200	150	J	ug/l	200
Beryllium	.2	U	ug/l	5	-		ug/l		1	U	ug/l	5	1.2	J	ug/l	5
Cadmium	3.2	UJ	ug/l	5	-		ug/l		3	UJ	ug/l	5	3	U	ug/l	5
Calcium	67700		ug/l	5000	-		ug/l		9570		ug/l	5000	9520		ug/l	5000
Chromium	44.4		ug/l	10	-		ug/l		54.3		ug/l	10	55.2		ug/l	10
Cobalt	4.1	U	ug/l	50	-		ug/l		6.1	J	ug/l	50	5.9	J	ug/l	50
Copper	6.4	J	ug/l	25	-		ug/l		34		ug/l	25	27.5		ug/l	25
Iron	2280		ug/l	100	-		ug/l		37800		ug/l	100	36700		ug/l	100
Lead	2.1	J	ug/l	3	-		ug/l		21.9		ug/l	3	19	J	ug/l	3
Magnesium	567	J	ug/l	5000	-		ug/l		3570	J	ug/l	5000	3450	J	ug/l	5000

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		90190002RE			RC044010			RC045008			RC044006		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		WHF11-3ARE			11G00101			11G00101			11G00102		
Collect Date:		28-OCT-93			28-AUG-96			28-AUG-96			27-AUG-96		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/l												
Chloromethane		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 UJ	ug/l	10
Bromomethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Vinyl chloride		-	ug/l		2 J	ug/l	10	-	ug/l		10 U	ug/l	10
Chloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 UJ	ug/l	10
Methylene chloride		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Acetone		-	ug/l		14 UJ	ug/l	14	-	ug/l		10 UJ	ug/l	10
Carbon disulfide		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,1-Dichloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,1-Dichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,2-Dichloroethene (total)		-	ug/l		6 J	ug/l	10	-	ug/l		10 U	ug/l	10
Chloroform		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,2-Dichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
2-Butanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 UJ	ug/l	10
1,1,1-Trichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Carbon tetrachloride		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Bromodichloromethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,2-Dichloropropane		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 U	ug/l	10
cis-1,3-Dichloropropene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Trichloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Dibromochloromethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,1,2-Trichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Benzene		-	ug/l		2 J	ug/l	10	-	ug/l		10 U	ug/l	10
trans-1,3-Dichloropropene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Bromoform		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 U	ug/l	10
4-Methyl-2-pentanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 UJ	ug/l	10
2-Hexanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 UJ	ug/l	10
Tetrachloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Toluene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,1,2,2-Tetrachloroethane		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 U	ug/l	10
Chlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Ethylbenzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Styrene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Xylenes (total)		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
CLP SEMIVOLATILES 90-SOW	ug/l												
Phenol		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
bis(2-Chloroethyl) ether		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
2-Chlorophenol		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,3-Dichlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,4-Dichlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	90190002RE				RC044010				RC045008				RC044006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF11-3ARE				11G00101				11G00101				11G00102			
Collect Date:	28-OCT-93				28-AUG-96				28-AUG-96				27-AUG-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2-Methylphenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,2-oxybis(1-Chloropropane)	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Methylphenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
N-Nitroso-di-n-propylamine	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Hexachloroethane	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Nitrobenzene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Isophorone	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2-Nitrophenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4-Dimethylphenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
bis(2-Chloroethoxy) methane	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4-Dichlorophenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
1,2,4-Trichlorobenzene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Naphthalene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Chloroaniline	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Hexachlorobutadiene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Chloro-3-methylphenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2-Methylnaphthalene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Hexachlorocyclopentadiene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4,6-Trichlorophenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4,5-Trichlorophenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
2-Chloronaphthalene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2-Nitroaniline	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
Dimethylphthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Acenaphthylene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,6-Dinitrotoluene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
3-Nitroaniline	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
Acenaphthene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4-Dinitrophenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
4-Nitrophenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
Dibenzofuran	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4-Dinitrotoluene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Diethylphthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Chlorophenyl-phenylether	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Fluorene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Nitroaniline	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
4,6-Dinitro-2-methylphenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
N-Nitrosodiphenylamine	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Bromophenyl-phenylether	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Hexachlorobenzene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Pentachlorophenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
Phenanthrene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Anthracene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Carbazole	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Di-n-butylphthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Fluoranthene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Pyrene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Butylbenzylphthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
3,3-Dichlorobenzidine	-		ug/l		10	U	ug/l	10	-		ug/l		10	UJ	ug/l	10
Benzo (a) anthracene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Chrysene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		90190002RE				RC044010				RC045008				RC044006			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		WHF11-3ARE				11G00101				11G00101				11G00102			
Collect Date:		28-OCT-93				28-AUG-96				28-AUG-96				27-AUG-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Benzo (b) fluoranthene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Benzo (k) fluoranthene		-		ug/l		10	UJ	ug/l	10	-		ug/l		10	U	ug/l	10
Benzo (a) pyrene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Indeno (1,2,3-cd) pyrene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Dibenzo (a,h) anthracene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Benzo (g,h,i) perylene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
CLP PESTICIDES/PCBS 90-SOW	ug/l																
alpha-BHC		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
beta-BHC		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
delta-BHC		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
gamma-BHC (Lindane)		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
Heptachlor		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
Aldrin		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
Heptachlor epoxide		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
Endosulfan I		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
Dieldrin		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
4,4-DDE		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
Endrin		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
Endosulfan II		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
4,4-DDD		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
Endosulfan sulfate		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
4,4-DDT		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
Methoxychlor		.5	UJ	ug/l	.5	.5	UJ	ug/l	.5	-		ug/l		.5	U	ug/l	.5
Endrin ketone		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
Endrin aldehyde		.1	UJ	ug/l	.1	.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1
alpha-Chlordane		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
gamma-Chlordane		.05	UJ	ug/l	.05	.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05
Toxaphene		5	UJ	ug/l	5	5	UJ	ug/l	5	-		ug/l		5	U	ug/l	5
Aroclor-1016		1	UJ	ug/l	1	1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1
Aroclor-1221		2	UJ	ug/l	2	2	UJ	ug/l	2	-		ug/l		2	U	ug/l	2
Aroclor-1232		1	UJ	ug/l	1	1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1
Aroclor-1242		1	UJ	ug/l	1	1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1
Aroclor-1248		1	UJ	ug/l	1	1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1
Aroclor-1254		1	UJ	ug/l	1	1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1
Aroclor-1260		1	UJ	ug/l	1	1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1
CLP METALS AND CYANIDE	ug/l																
Aluminum		-		ug/l		50	U	ug/l		-		ug/l		14.6	U	ug/l	
Antimony		-		ug/l		8.6	U	ug/l		-		ug/l		8.6	U	ug/l	
Arsenic		-		ug/l		.6	J	ug/l		-		ug/l		.5	U	ug/l	
Barium		-		ug/l		102	J	ug/l		-		ug/l		34.1	J	ug/l	
Beryllium		-		ug/l		.3	U	ug/l		-		ug/l		.3	U	ug/l	
Cadmium		-		ug/l		1.2	U	ug/l		-		ug/l		1.2	U	ug/l	
Calcium		-		ug/l		80800		ug/l		-		ug/l		3520	J	ug/l	
Chromium		-		ug/l		2	U	ug/l		-		ug/l		2	U	ug/l	
Cobalt		-		ug/l		2.3	U	ug/l		-		ug/l		2.3	U	ug/l	
Copper		-		ug/l		1.1	U	ug/l		-		ug/l		1.1	U	ug/l	
Iron		-		ug/l		6690		ug/l		-		ug/l		5	U	ug/l	
Lead		-		ug/l		9.8		ug/l		-		ug/l		.5	U	ug/l	
Magnesium		-		ug/l		7660		ug/l		-		ug/l		238	J	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		90190002RE			RC044010			RC045008			RC044006		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		WHF11-3ARE			11G00101			11G00101			11G00102		
Collect Date:		28-OCT-93			28-AUG-96			28-AUG-96			27-AUG-96		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese		-	ug/l		385		ug/l		-		ug/l		1	U	ug/l	
Mercury		-	ug/l		.1	U	ug/l		-		ug/l		.11	U	ug/l	
Nickel		-	ug/l		7.3	U	ug/l		-		ug/l		7.3	U	ug/l	
Potassium		-	ug/l		3100	J	ug/l		-		ug/l		9760		ug/l	
Selenium		-	ug/l		.6	U	ug/l		-		ug/l		.6	U	ug/l	
Silver		-	ug/l		2.5	U	ug/l		-		ug/l		2.5	U	ug/l	
Sodium		-	ug/l		2870	J	ug/l		-		ug/l		4790	J	ug/l	
Thallium		-	ug/l		.6	U	ug/l		-		ug/l		.7	J	ug/l	
Vanadium		-	ug/l		1.2	U	ug/l		-		ug/l		1.2	U	ug/l	
Zinc		-	ug/l		6.4	J	ug/l		-		ug/l		2.6	U	ug/l	
Cyanide		-	ug/l		1.8	U	ug/l		-		ug/l		4.5	U	ug/l	
Groundwater Quality	mg/l															
Alkalinity as CaCO3		-	mg/l		-		mg/l		178		mg/l	10	-		mg/l	
Ammonia-N		-	mg/l		-		mg/l		.8		mg/l	.3	-		mg/l	
Chloride		-	mg/l		-		mg/l		10	U	mg/l	10	-		mg/l	
Hardness as CaCO3		-	mg/l		-		mg/l		211		mg/l	10	-		mg/l	
Nitrate-Nitrite		-	mg/l		-		mg/l		.1	U	mg/l	.1	-		mg/l	
Phosphorous-P, Total		-	mg/l		-		mg/l		.1	U	mg/l	.1	-		mg/l	
Sulfate		-	mg/l		-		mg/l		43.4		mg/l	1	-		mg/l	
Sulfide		-	mg/l		-		mg/l		2	U	mg/l	2	-		mg/l	
Total Dissolved Solids		-	mg/l		-		mg/l		245		mg/l	10	-		mg/l	
Total Kjeldahl Nitrogen		-	mg/l		-		mg/l		1		mg/l	.3	-		mg/l	
Total organic carbon		-	mg/l		-		mg/l		1	U	mg/l	1	-		mg/l	
Total petroleum hydrocarbons		-	mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Methane		-	mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Organic Carbon		-	mg/l		-		mg/l		-		mg/l		-		mg/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		RC045005			RC044011			RC045009			RC044018		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11G00102			11G00201			11G00201			11G00201D		
Collect Date:		27-AUG-96			28-AUG-96			28-AUG-96			28-AUG-96		
		VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/l												
Chloromethane		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 UJ	ug/l	10
Bromomethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Vinyl chloride		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Chloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Methylene chloride		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Acetone		-	ug/l		10 UJ	ug/l	10	-	ug/l		11 UJ	ug/l	11
Carbon disulfide		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,1-Dichloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,1-Dichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,2-Dichloroethene (total)		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Chloroform		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,2-Dichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
2-Butanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 UJ	ug/l	10
1,1,1-Trichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Carbon tetrachloride		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Bromodichloromethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,2-Dichloropropane		-	ug/l		10 U	ug/l	10	-	ug/l		10 UJ	ug/l	10
cis-1,3-Dichloropropene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Trichloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Dibromochloromethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,1,2-Trichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Benzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
trans-1,3-Dichloropropene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Bromoform		-	ug/l		10 U	ug/l	10	-	ug/l		10 UJ	ug/l	10
4-Methyl-2-pentanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 UJ	ug/l	10
2-Hexanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		10 UJ	ug/l	10
Tetrachloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Toluene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,1,2,2-Tetrachloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		10 UJ	ug/l	10
Chlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Ethylbenzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Styrene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
Xylenes (total)		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
CLP SEMIVOLATILES 90-SOW	ug/l												
Phenol		-	ug/l		4 J	ug/l	10	-	ug/l		6 J	ug/l	10
bis(2-Chloroethyl) ether		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
2-Chlorophenol		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,3-Dichlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10
1,4-Dichlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		10 U	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	RC045005				RC044011				RC045009				RC044018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11G00102				11G00201				11G00201				11G00201D			
Collect Date:	27-AUG-96				28-AUG-96				28-AUG-96				28-AUG-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2-Methylphenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,2-oxybis(1-Chloropropane)	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Methylphenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
N-Nitroso-di-n-propylamine	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Hexachloroethane	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Nitrobenzene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Isophorone	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2-Nitrophenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4-Dimethylphenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
bis(2-Chloroethoxy) methane	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4-Dichlorophenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
1,2,4-Trichlorobenzene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Naphthalene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Chloroaniline	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Hexachlorobutadiene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Chloro-3-methylphenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2-Methylnaphthalene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Hexachlorocyclopentadiene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4,6-Trichlorophenol	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4,5-Trichlorophenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
2-Chloronaphthalene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2-Nitroaniline	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
Dimethylphthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Acenaphthylene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,6-Dinitrotoluene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
3-Nitroaniline	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
Acenaphthene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4-Dinitrophenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
4-Nitrophenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
Dibenzofuran	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
2,4-Dinitrotoluene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Diethylphthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Chlorophenyl-phenylether	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Fluorene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Nitroaniline	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
4,6-Dinitro-2-methylphenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
N-Nitrosodiphenylamine	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
4-Bromophenyl-phenylether	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Hexachlorobenzene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Pentachlorophenol	-		ug/l		25	U	ug/l	25	-		ug/l		25	U	ug/l	25
Phenanthrene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Anthracene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Carbazole	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Di-n-butylphthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Fluoranthene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Pyrene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Butylbenzylphthalate	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
3,3-Dichlorobenzidine	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Benzo (a) anthracene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Chrysene	-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	-		ug/l		5	J	ug/l	10	-		ug/l		4	J	ug/l	10

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		RC045005				RC044011				RC045009				RC044018			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11G00102				11G00201				11G00201				11G00201D			
Collect Date:		27-AUG-96				28-AUG-96				28-AUG-96				28-AUG-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Benzo (b) fluoranthene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Benzo (k) fluoranthene		-		ug/l		10	UJ	ug/l	10	-		ug/l		10	UJ	ug/l	10
Benzo (a) pyrene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Indeno (1,2,3-cd) pyrene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Dibenzo (a,h) anthracene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
Benzo (g,h,i) perylene		-		ug/l		10	U	ug/l	10	-		ug/l		10	U	ug/l	10
CLP PESTICIDES/PCBS 90-SOW	ug/l																
alpha-BHC		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
beta-BHC		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
delta-BHC		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
gamma-BHC (Lindane)		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
Heptachlor		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
Aldrin		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
Heptachlor epoxide		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
Endosulfan I		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
Dieldrin		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
4,4-DDE		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
Endrin		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
Endosulfan II		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
4,4-DDD		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
Endosulfan sulfate		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
4,4-DDT		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
Methoxychlor		-		ug/l		.5	U	ug/l	.5	-		ug/l		.5	UJ	ug/l	.5
Endrin ketone		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
Endrin aldehyde		-		ug/l		.1	U	ug/l	.1	-		ug/l		.1	UJ	ug/l	.1
alpha-Chlordane		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
gamma-Chlordane		-		ug/l		.05	U	ug/l	.05	-		ug/l		.05	UJ	ug/l	.05
Toxaphene		-		ug/l		5	U	ug/l	5	-		ug/l		5	UJ	ug/l	5
Aroclor-1016		-		ug/l		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1
Aroclor-1221		-		ug/l		2	U	ug/l	2	-		ug/l		2	UJ	ug/l	2
Aroclor-1232		-		ug/l		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1
Aroclor-1242		-		ug/l		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1
Aroclor-1248		-		ug/l		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1
Aroclor-1254		-		ug/l		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1
Aroclor-1260		-		ug/l		1	U	ug/l	1	-		ug/l		1	UJ	ug/l	1
CLP METALS AND CYANIDE	ug/l																
Aluminum		-		ug/l		2770		ug/l		-		ug/l		2320		ug/l	
Antimony		-		ug/l		8.6	U	ug/l		-		ug/l		8.6	U	ug/l	
Arsenic		-		ug/l		1.7	J	ug/l		-		ug/l		2	J	ug/l	
Barium		-		ug/l		50.3	J	ug/l		-		ug/l		51.6	J	ug/l	
Beryllium		-		ug/l		.4	J	ug/l		-		ug/l		.3	U	ug/l	
Cadmium		-		ug/l		1.2	U	ug/l		-		ug/l		1.2	U	ug/l	
Calcium		-		ug/l		35400		ug/l		-		ug/l		41800		ug/l	
Chromium		-		ug/l		20.4		ug/l		-		ug/l		19.2		ug/l	
Cobalt		-		ug/l		2.3	U	ug/l		-		ug/l		2.3	U	ug/l	
Copper		-		ug/l		2	J	ug/l		-		ug/l		3.1	J	ug/l	
Iron		-		ug/l		232		ug/l		-		ug/l		337		ug/l	
Lead		-		ug/l		.5	U	ug/l		-		ug/l		.9	J	ug/l	
Magnesium		-		ug/l		388	J	ug/l		-		ug/l		538	J	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	RC045005				RC044011				RC045009				RC044018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11G00102				11G00201				11G00201				11G00201D			
Collect Date:	27-AUG-96				28-AUG-96				28-AUG-96				28-AUG-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	-		ug/l		2.2	J	ug/l		-		ug/l		4.8	J	ug/l	
Mercury	-		ug/l		.1	U	ug/l		-		ug/l		.1	U	ug/l	
Nickel	-		ug/l		7.3	U	ug/l		-		ug/l		7.3	U	ug/l	
Potassium	-		ug/l		12900		ug/l		-		ug/l		9610		ug/l	
Selenium	-		ug/l		.6	U	ug/l		-		ug/l		.6	U	ug/l	
Silver	-		ug/l		2.5	U	ug/l		-		ug/l		2.5	U	ug/l	
Sodium	-		ug/l		3420	J	ug/l		-		ug/l		2950	J	ug/l	
Thallium	-		ug/l		.6	U	ug/l		-		ug/l		.6	U	ug/l	
Vanadium	-		ug/l		11	J	ug/l		-		ug/l		11	J	ug/l	
Zinc	-		ug/l		3.4	U	ug/l		-		ug/l		24.3		ug/l	
Cyanide	-		ug/l		1.8	U	ug/l		-		ug/l		3.3	U	ug/l	
Groundwater Quality mg/l																
Alkalinity as CaCO3	30		mg/l	10	-		mg/l		84		mg/l	10	-		mg/l	
Ammonia-N	.3	U	mg/l	.3	-		mg/l		.3	U	mg/l	.3	-		mg/l	
Chloride	10	U	mg/l	10	-		mg/l		10	U	mg/l	10	-		mg/l	
Hardness as CaCO3	14		mg/l	10	-		mg/l		113		mg/l	10	-		mg/l	
Nitrate-Nitrite	.34		mg/l	.1	-		mg/l		.9		mg/l	.1	-		mg/l	
Phosphorous-P, Total	.1	U	mg/l	.1	-		mg/l		.1	U	mg/l	.1	-		mg/l	
Sulfate	.57		mg/l	.1	-		mg/l		10.6		mg/l	.1	-		mg/l	
Sulfide	2	U	mg/l	2	-		mg/l		2	U	mg/l	2	-		mg/l	
Total Dissolved Solids	30		mg/l	10	-		mg/l		52		mg/l	10	-		mg/l	
Total Kjeldahl Nitrogen	.3	U	mg/l	.3	-		mg/l		.3	U	mg/l	.3	-		mg/l	
Total organic carbon	1	U	mg/l	1	-		mg/l		1	U	mg/l	1	-		mg/l	
Total petroleum hydrocarbons	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Methane	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Organic Carbon	-		mg/l		-		mg/l		-		mg/l		-		mg/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		RC044014			RC044009			RC045007			RC044015		
Site		WHITING			WHITING			WHITING			WHITING		
Locator		11G00201F			11G00301			11G00301			11G00301F		
Collect Date:		28-AUG-96			28-AUG-96			28-AUG-96			28-AUG-96		
		VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP VOLATILES 90-SOW	ug/l												
Chloromethane		-	ug/l		10 UJ	ug/l	10	-	ug/l		-	ug/l	
Bromomethane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Vinyl chloride		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Chloroethane		-	ug/l		10 UJ	ug/l	10	-	ug/l		-	ug/l	
Methylene chloride		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Acetone		-	ug/l		14 UJ	ug/l	14	-	ug/l		-	ug/l	
Carbon disulfide		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,1-Dichloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,1-Dichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,2-Dichloroethene (total)		-	ug/l		2 J	ug/l	10	-	ug/l		-	ug/l	
Chloroform		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,2-Dichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2-Butanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		-	ug/l	
1,1,1-Trichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Carbon tetrachloride		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Bromodichloromethane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,2-Dichloropropane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
cis-1,3-Dichloropropene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Trichloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Dibromochloromethane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,1,2-Trichloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Benzene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
trans-1,3-Dichloropropene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Bromoform		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
4-Methyl-2-pentanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		-	ug/l	
2-Hexanone		-	ug/l		10 UJ	ug/l	10	-	ug/l		-	ug/l	
Tetrachloroethene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Toluene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,1,2,2-Tetrachloroethane		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Chlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Ethylbenzene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Styrene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Xylenes (total)		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
CLP SEMIVOLATILES 90-SOW	ug/l												
Phenol		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
bis(2-Chloroethyl) ether		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2-Chlorophenol		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,3-Dichlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,4-Dichlorobenzene		-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	RC044014			RC044009			RC045007			RC044015		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	11G00201F			11G00301			11G00301			11G00301F		
Collect Date:	28-AUG-96			28-AUG-96			28-AUG-96			28-AUG-96		
	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
1,2-Dichlorobenzene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2-Methylphenol	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2,2-oxybis(1-Chloropropane)	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
4-Methylphenol	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
N-Nitroso-di-n-propylamine	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Hexachloroethane	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Nitrobenzene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Isophorone	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2-Nitrophenol	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2,4-Dimethylphenol	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
bis(2-Chloroethoxy) methane	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2,4-Dichlorophenol	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
1,2,4-Trichlorobenzene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Naphthalene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
4-Chloroaniline	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Hexachlorobutadiene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
4-Chloro-3-methylphenol	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2-Methylnaphthalene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Hexachlorocyclopentadiene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2,4,6-Trichlorophenol	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2,4,5-Trichlorophenol	-	ug/l		25 U	ug/l	25	-	ug/l		-	ug/l	
2-Chloronaphthalene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2-Nitroaniline	-	ug/l		25 U	ug/l	25	-	ug/l		-	ug/l	
Dimethylphthalate	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Acenaphthylene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2,6-Dinitrotoluene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
3-Nitroaniline	-	ug/l		25 U	ug/l	25	-	ug/l		-	ug/l	
Acenaphthene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2,4-Dinitrophenol	-	ug/l		25 U	ug/l	25	-	ug/l		-	ug/l	
4-Nitrophenol	-	ug/l		25 U	ug/l	25	-	ug/l		-	ug/l	
Dibenzofuran	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
2,4-Dinitrotoluene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Diethylphthalate	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
4-Chlorophenyl-phenylether	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Fluorene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
4-Nitroaniline	-	ug/l		25 U	ug/l	25	-	ug/l		-	ug/l	
4,6-Dinitro-2-methylphenol	-	ug/l		25 U	ug/l	25	-	ug/l		-	ug/l	
N-Nitrosodiphenylamine	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
4-Bromophenyl-phenylether	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Hexachlorobenzene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Pentachlorophenol	-	ug/l		25 U	ug/l	25	-	ug/l		-	ug/l	
Phenanthrene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Anthracene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Carbazole	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Di-n-butylphthalate	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Fluoranthene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Pyrene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Butylbenzylphthalate	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
3,3-Dichlorobenzidine	-	ug/l		10 UJ	ug/l	10	-	ug/l		-	ug/l	
Benzo (a) anthracene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
Chrysene	-	ug/l		10 U	ug/l	10	-	ug/l		-	ug/l	
bis(2-Ethylhexyl) phthalate	-	ug/l		6 J	ug/l	10	-	ug/l		-	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		RC044014				RC044009				RC045007				RC044015			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11G00201F				11G00301				11G00301				11G00301F			
Collect Date:		28-AUG-96				28-AUG-96				28-AUG-96				28-AUG-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		-		ug/l		10	U	ug/l	10	-		ug/l		-		ug/l	
Benzo (b) fluoranthene		-		ug/l		10	U	ug/l	10	-		ug/l		-		ug/l	
Benzo (k) fluoranthene		-		ug/l		10	U	ug/l	10	-		ug/l		-		ug/l	
Benzo (a) pyrene		-		ug/l		10	U	ug/l	10	-		ug/l		-		ug/l	
Indeno (1,2,3-cd) pyrene		-		ug/l		10	U	ug/l	10	-		ug/l		-		ug/l	
Dibenzo (a,h) anthracene		-		ug/l		10	U	ug/l	10	-		ug/l		-		ug/l	
Benzo (g,h,i) perylene		-		ug/l		10	U	ug/l	10	-		ug/l		-		ug/l	
CLP PESTICIDES/PCBS 90-SOW	ug/l																
alpha-BHC		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
beta-BHC		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
delta-BHC		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
gamma-BHC (Lindane)		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
Heptachlor		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
Aldrin		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
Heptachlor epoxide		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
Endosulfan I		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
Dieldrin		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
4,4-DDE		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
Endrin		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
Endosulfan II		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
4,4-DDD		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
Endosulfan sulfate		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
4,4-DDT		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
Methoxychlor		-		ug/l		.5	UJ	ug/l	.5	-		ug/l		-		ug/l	
Endrin ketone		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
Endrin aldehyde		-		ug/l		.1	UJ	ug/l	.1	-		ug/l		-		ug/l	
alpha-Chlordane		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
gamma-Chlordane		-		ug/l		.05	UJ	ug/l	.05	-		ug/l		-		ug/l	
Toxaphene		-		ug/l		5	UJ	ug/l	5	-		ug/l		-		ug/l	
Aroclor-1016		-		ug/l		1	UJ	ug/l	1	-		ug/l		-		ug/l	
Aroclor-1221		-		ug/l		2	UJ	ug/l	2	-		ug/l		-		ug/l	
Aroclor-1232		-		ug/l		1	UJ	ug/l	1	-		ug/l		-		ug/l	
Aroclor-1242		-		ug/l		1	UJ	ug/l	1	-		ug/l		-		ug/l	
Aroclor-1248		-		ug/l		1	UJ	ug/l	1	-		ug/l		-		ug/l	
Aroclor-1254		-		ug/l		1	UJ	ug/l	1	-		ug/l		-		ug/l	
Aroclor-1260		-		ug/l		1	UJ	ug/l	1	-		ug/l		-		ug/l	
CLP METALS AND CYANIDE	ug/l																
Aluminum		1930		ug/l		913		ug/l		-		ug/l		6.7	U	ug/l	
Antimony		8.6	U	ug/l		8.6	U	ug/l		-		ug/l		8.6	U	ug/l	
Arsenic		1.1	J	ug/l		.5	U	ug/l		-		ug/l		.5	U	ug/l	
Barium		26.4	J	ug/l		35	J	ug/l		-		ug/l		15.6	J	ug/l	
Beryllium		.3	U	ug/l		.3	U	ug/l		-		ug/l		.3	U	ug/l	
Cadmium		1.2	U	ug/l		1.2	J	ug/l		-		ug/l		1.2	U	ug/l	
Calcium		17800		ug/l		2640	J	ug/l		-		ug/l		1840	J	ug/l	
Chromium		14.1		ug/l		10		ug/l		-		ug/l		2	U	ug/l	
Cobalt		2.3	U	ug/l		2.3	U	ug/l		-		ug/l		2.3	U	ug/l	
Copper		1.1	U	ug/l		4.5	J	ug/l		-		ug/l		1.1	U	ug/l	
Iron		7.4	J	ug/l		4560		ug/l		-		ug/l		5	U	ug/l	
Lead		1.1	J	ug/l		1.8	J	ug/l		-		ug/l		.5	U	ug/l	
Magnesium		378	J	ug/l		485	J	ug/l		-		ug/l		379	J	ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		RC044014				RC044009				RC045007				RC044015			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11G00201F				11G00301				11G00301				11G00301F			
Collect Date:		28-AUG-96				28-AUG-96				28-AUG-96				28-AUG-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese		1	U	ug/l		33.6		ug/l		-		ug/l		18.9		ug/l	
Mercury		.1	U	ug/l		.1	U	ug/l		-		ug/l		.1	U	ug/l	
Nickel		7.3	U	ug/l		7.3	U	ug/l		-		ug/l		7.3	U	ug/l	
Potassium		9970		ug/l		2540	J	ug/l		-		ug/l		1680	U	ug/l	
Selenium		.6	U	ug/l		.6	U	ug/l		-		ug/l		.6	U	ug/l	
Silver		2.5	U	ug/l		2.5	U	ug/l		-		ug/l		2.5	U	ug/l	
Sodium		2950	J	ug/l		4840	J	ug/l		-		ug/l		4230	J	ug/l	
Thallium		.6	U	ug/l		.6	U	ug/l		-		ug/l		.6	U	ug/l	
Vanadium		8.4	J	ug/l		4.5	J	ug/l		-		ug/l		1.2	U	ug/l	
Zinc		1.5	U	ug/l		60.6		ug/l		-		ug/l		74.1		ug/l	
Cyanide		-		ug/l		3.3	U	ug/l		-		ug/l		-		ug/l	
Groundwater Quality	mg/l																
Alkalinity as CaCO3		-		mg/l		-		mg/l		10	U	mg/l	10	-		mg/l	
Ammonia-N		-		mg/l		-		mg/l		.3	U	mg/l	.3	-		mg/l	
Chloride		-		mg/l		-		mg/l		10	U	mg/l	10	-		mg/l	
Hardness as CaCO3		-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Nitrate-Nitrite		-		mg/l		-		mg/l		.1	U	mg/l	.1	-		mg/l	
Phosphorous-P, Total		-		mg/l		-		mg/l		.11		mg/l	.1	-		mg/l	
Sulfate		-		mg/l		-		mg/l		.53		mg/l	.1	-		mg/l	
Sulfide		-		mg/l		-		mg/l		2	U	mg/l	2	-		mg/l	
Total Dissolved Solids		-		mg/l		-		mg/l		33		mg/l	10	-		mg/l	
Total Kjeldahl Nitrogen		-		mg/l		-		mg/l		.3	U	mg/l	.3	-		mg/l	
Total organic carbon		-		mg/l		-		mg/l		1	U	mg/l	1	-		mg/l	
Total petroleum hydrocarbons		-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Methane		-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Organic Carbon		-		mg/l		-		mg/l		-		mg/l		-		mg/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		RC044007				RC045006				RC044005				RC045004			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11G00401				11G00401				11G00402				11G00402			
Collect Date:		27-AUG-96				27-AUG-96				26-AUG-96				26-AUG-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/l																
Chloromethane		10	UJ	ug/l	10	-		ug/l		10	UJ	ug/l	10	-		ug/l	
Bromomethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Vinyl chloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Chloroethane		10	UJ	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Methylene chloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Acetone		10	UJ	ug/l	10	-		ug/l		10	UJ	ug/l	10	-		ug/l	
Carbon disulfide		1	J	ug/l	10	-		ug/l		2	J	ug/l	10	-		ug/l	
1,1-Dichloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,1-Dichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,2-Dichloroethene (total)		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Chloroform		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,2-Dichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2-Butanone		10	UJ	ug/l	10	-		ug/l		10	UJ	ug/l	10	-		ug/l	
1,1,1-Trichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Carbon tetrachloride		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Bromodichloromethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,2-Dichloropropane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
cis-1,3-Dichloropropene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Trichloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Dibromochloromethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,1,2-Trichloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Benzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
trans-1,3-Dichloropropene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Bromoform		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
4-Methyl-2-pentanone		10	UJ	ug/l	10	-		ug/l		10	UJ	ug/l	10	-		ug/l	
2-Hexanone		10	UJ	ug/l	10	-		ug/l		10	UJ	ug/l	10	-		ug/l	
Tetrachloroethene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Toluene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,1,2,2-Tetrachloroethane		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Chlorobenzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Ethylbenzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Styrene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Xylenes (total)		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
CLP SEMIVOLATILES 90-SOW	ug/l																
Phenol		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
bis(2-Chloroethyl) ether		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2-Chlorophenol		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,3-Dichlorobenzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,4-Dichlorobenzene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	RC044007				RC045006				RC044005				RC045004			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11G00401				11G00401				11G00402				11G00402			
Collect Date:	27-AUG-96				27-AUG-96				26-AUG-96				26-AUG-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2-Methylphenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2,2-oxybis(1-Chloropropane)	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
4-Methylphenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
N-Nitroso-di-n-propylamine	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Hexachloroethane	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Nitrobenzene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Isophorone	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2-Nitrophenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2,4-Dimethylphenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
bis(2-Chloroethoxy) methane	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2,4-Dichlorophenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
1,2,4-Trichlorobenzene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Naphthalene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
4-Chloroaniline	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Hexachlorobutadiene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
4-Chloro-3-methylphenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2-Methylnaphthalene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Hexachlorocyclopentadiene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2,4,6-Trichlorophenol	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2,4,5-Trichlorophenol	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	-		ug/l	
2-Chloronaphthalene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2-Nitroaniline	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	-		ug/l	
Dimethylphthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Acenaphthylene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2,6-Dinitrotoluene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
3-Nitroaniline	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	-		ug/l	
Acenaphthene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2,4-Dinitrophenol	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	-		ug/l	
4-Nitrophenol	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	-		ug/l	
Dibenzofuran	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
2,4-Dinitrotoluene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Diethylphthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
4-Chlorophenyl-phenylether	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Fluorene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
4-Nitroaniline	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	-		ug/l	
4,6-Dinitro-2-methylphenol	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	-		ug/l	
N-Nitrosodiphenylamine	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
4-Bromophenyl-phenylether	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Hexachlorobenzene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Pentachlorophenol	25	U	ug/l	25	-		ug/l		25	U	ug/l	25	-		ug/l	
Phenanthrene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Anthracene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Carbazole	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Di-n-butylphthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Fluoranthene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Pyrene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Butylbenzylphthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
3,3-Dichlorobenzidine	10	UJ	ug/l	10	-		ug/l		10	UJ	ug/l	10	-		ug/l	
Benzo (a) anthracene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Chrysene	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:		RC044007				RC045006				RC044005				RC045004			
Site		WHITING				WHITING				WHITING				WHITING			
Locator		11G00401				11G00401				11G00402				11G00402			
Collect Date:		27-AUG-96				27-AUG-96				26-AUG-96				26-AUG-96			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Benzo (b) fluoranthene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Benzo (k) fluoranthene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Benzo (a) pyrene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Indeno (1,2,3-cd) pyrene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Dibenzo (a,h) anthracene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
Benzo (g,h,i) perylene		10	U	ug/l	10	-		ug/l		10	U	ug/l	10	-		ug/l	
CLP PESTICIDES/PCBS 90-SOW	ug/l																
alpha-BHC		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
beta-BHC		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
delta-BHC		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
gamma-BHC (Lindane)		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
Heptachlor		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
Aldrin		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
Heptachlor epoxide		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
Endosulfan I		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
Dieldrin		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
4,4-DDE		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
Endrin		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
Endosulfan II		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
4,4-DDD		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
Endosulfan sulfate		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
4,4-DDT		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
Methoxychlor		.5	UJ	ug/l	.5	-		ug/l		.5	U	ug/l	.5	-		ug/l	
Endrin ketone		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
Endrin aldehyde		.1	UJ	ug/l	.1	-		ug/l		.1	U	ug/l	.1	-		ug/l	
alpha-Chlordane		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
gamma-Chlordane		.05	UJ	ug/l	.05	-		ug/l		.05	U	ug/l	.05	-		ug/l	
Toxaphene		5	UJ	ug/l	5	-		ug/l		5	U	ug/l	5	-		ug/l	
Aroclor-1016		1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1	-		ug/l	
Aroclor-1221		2	UJ	ug/l	2	-		ug/l		2	U	ug/l	2	-		ug/l	
Aroclor-1232		1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1	-		ug/l	
Aroclor-1242		1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1	-		ug/l	
Aroclor-1248		1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1	-		ug/l	
Aroclor-1254		1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1	-		ug/l	
Aroclor-1260		1	UJ	ug/l	1	-		ug/l		1	U	ug/l	1	-		ug/l	
CLP METALS AND CYANIDE	ug/l																
Aluminum		17.8	U	ug/l		-		ug/l		270		ug/l		-		ug/l	
Antimony		8.6	U	ug/l		-		ug/l		8.6	U	ug/l		-		ug/l	
Arsenic		3.3	J	ug/l		-		ug/l		.5	U	ug/l		-		ug/l	
Barium		96.2	J	ug/l		-		ug/l		18	J	ug/l		-		ug/l	
Beryllium		.3	U	ug/l		-		ug/l		.3	U	ug/l		-		ug/l	
Cadmium		1.2	U	ug/l		-		ug/l		1.2	U	ug/l		-		ug/l	
Calcium		69900		ug/l		-		ug/l		8900		ug/l		-		ug/l	
Chromium		2	U	ug/l		-		ug/l		2	U	ug/l		-		ug/l	
Cobalt		2.3	U	ug/l		-		ug/l		2.3	U	ug/l		-		ug/l	
Copper		1.1	U	ug/l		-		ug/l		1.6	J	ug/l		-		ug/l	
Iron		8810		ug/l		-		ug/l		271		ug/l		-		ug/l	
Lead		3.1		ug/l		-		ug/l		1.5	J	ug/l		-		ug/l	
Magnesium		4290	J	ug/l		-		ug/l		963	J	ug/l		-		ug/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	RC044007				RC045006				RC044005				RC045004			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	11G00401				11G00401				11G00402				11G00402			
Collect Date:	27-AUG-96				27-AUG-96				26-AUG-96				26-AUG-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	193		ug/l		-		ug/l		193		ug/l		-		ug/l	
Mercury	.1	U	ug/l		-		ug/l		.14	U	ug/l		-		ug/l	
Nickel	7.3	U	ug/l		-		ug/l		7.3	U	ug/l		-		ug/l	
Potassium	1580	U	ug/l		-		ug/l		1100	U	ug/l		-		ug/l	
Selenium	.6	U	ug/l		-		ug/l		.6	U	ug/l		-		ug/l	
Silver	2.5	U	ug/l		-		ug/l		2.5	U	ug/l		-		ug/l	
Sodium	1780	J	ug/l		-		ug/l		12900		ug/l		-		ug/l	
Thallium	.6	U	ug/l		-		ug/l		.6	U	ug/l		-		ug/l	
Vanadium	1.2	U	ug/l		-		ug/l		1.2	U	ug/l		-		ug/l	
Zinc	1.6	U	ug/l		-		ug/l		144		ug/l		-		ug/l	
Cyanide	2.1	U	ug/l		-		ug/l		7.4	U	ug/l		-		ug/l	
Groundwater Quality mg/l																
Alkalinity as CaCO3	-		mg/l		168		mg/l	10	-		mg/l		35		mg/l	10
Ammonia-N	-		mg/l		.3		mg/l	.3	-		mg/l		.3	U	mg/l	.3
Chloride	-		mg/l		10	U	mg/l	10	-		mg/l		10	U	mg/l	10
Hardness as CaCO3	-		mg/l		196		mg/l	10	-		mg/l		22		mg/l	10
Nitrate-Nitrite	-		mg/l		.1	U	mg/l	.1	-		mg/l		.1	U	mg/l	.1
Phosphorous-P, Total	-		mg/l		.1	U	mg/l	.1	-		mg/l		.1	U	mg/l	.1
Sulfate	-		mg/l		44		mg/l	1	-		mg/l		9.12		mg/l	.1
Sulfide	-		mg/l		2	U	mg/l	2	-		mg/l		2	U	mg/l	2
Total Dissolved Solids	-		mg/l		215		mg/l	10	-		mg/l		33		mg/l	10
Total Kjeldahl Nitrogen	-		mg/l		.5		mg/l	.3	-		mg/l		.3	U	mg/l	.3
Total organic carbon	-		mg/l		2.7		mg/l	1	-		mg/l		1	U	mg/l	1
Total petroleum hydrocarbons	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Methane	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Organic Carbon	-		mg/l		-		mg/l		-		mg/l		-		mg/l	

Naval Air Station Whiting Field, Milton, Florida
Site 11 Groundwater Data

Lab Sample Number:	90191001				90191001RE				90190001				90190002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF11-2				WHF11-2RE				WHF11-3				WHF11-3A			
Collect Date:	28-OCT-93				28-OCT-93				28-OCT-93				28-OCT-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	14.5	J	ug/l	15	-		ug/l		374		ug/l	15	369		ug/l	15
Mercury	.15	U	ug/l	.2	-		ug/l		.15	U	ug/l	.2	.22	J	ug/l	.2
Nickel	9	U	ug/l	40	-		ug/l		16.7	J	ug/l	40	13.9	J	ug/l	40
Potassium	9960		ug/l	5000	-		ug/l		3060	J	ug/l	5000	2940	J	ug/l	5000
Selenium	2	U	ug/l	5	-		ug/l		2	UJ	ug/l	5	2	UJ	ug/l	5
Silver	2.7	U	ug/l	10	-		ug/l		3	U	ug/l	10	3	U	ug/l	10
Sodium	2940	J	ug/l	5000	-		ug/l		12800		ug/l	5000	12800		ug/l	5000
Thallium	.88	U	ug/l	10	-		ug/l		1	U	ug/l	10	1	U	ug/l	10
Vanadium	12.2	UJ	ug/l	50	-		ug/l		61.8		ug/l	50	60.6		ug/l	50
Zinc	15.8	J	ug/l	20	-		ug/l		80.8		ug/l	20	81.5		ug/l	20
Cyanide	1.7	U	ug/l	10	-		ug/l		2	U	ug/l	10	2	U	ug/l	10
Groundwater Quality mg/l																
Alkalinity as CaCO3	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Ammonia-N	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Chloride	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Hardness as CaCO3	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Nitrate-Nitrite	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Phosphorous-P, Total	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Sulfate	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Sulfide	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Total Dissolved Solids	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Total Kjeldahl Nitrogen	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Total organic carbon	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Total petroleum hydrocarbons	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Methane	-		mg/l		-		mg/l		-		mg/l		-		mg/l	
Dissolved Organic Carbon	-		mg/l		-		mg/l		-		mg/l		-		mg/l	

APPENDIX E

HUMAN HEALTH RISK DATA

Table E-1
Screening Concentrations for Surface Soil
for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 11
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk Based Screening Concentration[1]	Florida Cleanup Target Level[2]	Florida Cleanup Target Level Leaching Value[2]	Selected Screening Concentration[3]
Volatile Organic Compounds (µg/kg)				
Acetone	780,000	780,000	2,800	780,000
Semivolatile Organic Compounds (µg/kg)				
2-Methylnaphthalene	160,000[4]	80,000	6,100	80,000
Acenaphthylene	470,000[4]	1,100,000	27,000	470,000
Anthracene	2,300,000	18,000,000	2,500,000	2,300,000
Benzo(a)anthracene	870	1,400	3,200	870
Benzo(a)pyrene	87	100	8,000	87
Benzo(b)fluoranthene	870	1,400	10,000	870
Benzo(g,h,i)perylene	230,000[5]	2,300,000	32,000,000	230,000
Benzo(k)fluoranthene	8,700	15,000	25,000	8,700
bis(2-Ethylhexyl)phthalate	46,000	76,000	3,600,000	46,000
Chrysene	87,000	140,000	77,000	87,000
Fluoranthene	310,000	2,900,000	1,200,000	310,000
Indeno(1,2,3-cd)pyrene	870	1,500	28,000	870
Phenathrene	230,000[5]	2,000,000	250,000	230,000
Pyrene	230,000	2,200,000	880,000	230,000
Pesticides/PCBs (µg/kg)				
4,4-DDD	2,700	4,600	4,000	2,700
4,4-DDE	1,900	3,300	18,000	1,900
4,4-DDT	1,900	3,300	11,000	1,900
Aldrin	38	70	500	38
Dieldrin	40	70	4	40
Heptachlor	140	200	23,000	140
Heptachlor Epoxide	70	100	600	70
alpha-Chlordane	1,800[6]	3,100[6]	9,600[6]	1,800
gamma-Chlordane	1,800[6]	3,100[6]	9,600[6]	1,800

See notes at end of table.

Table E-1
Screening Concentrations for Surface Soil
for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 11
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk Based Screening Concentration[1]	Florida Cleanup Target Level[2]	Florida Cleanup Target Level Leaching Value[2]	Selected Screening Concentration[3]
Inorganics (mg/kg)				
Aluminum	7,800	72,000	NC	7,800
Antimony	3.1	26	5	3.1
Arsenic	0.43[7]	0.8	29	0.43
Barium	550	110	1,600	110
Beryllium	16	120	63	16
Cadmium	3.9	75	8	3.9
Calcium	1,000,000[8]	NSC	NC	1,000,000
Chromium	23[9]	210[9]	38	23
Cobalt	470	4,700	NC	470
Copper	310	110	NC	110
Cyanide	160[10]	30	40	30
Iron	2,300	23,000	NC	2,300
Lead	400[11]	400	NC	400
Magnesium	460,468[8]	NSC	NC	460,468
Manganese	160	1,600	NC	160
Mercury	2.3	3.4	2.1	2.3
Nickel	160	110	130	110
Potassium	1,000,000[8]	NSC	NC	1,000,000
Selenium	39	390	5	39
Silver	39	390	17	39
Sodium	1,000,000[7]	NSC	NC	1,000,000
Vanadium	55	15	980	15
Zinc	2,300	23,000	6,000	2,300
Others (mg/kg)				
Total Petroleum Hydrocarbons	NSC	340	2,500	340

See notes at end of table.

Table E-1
Screening Concentrations for Surface Soil
for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 11
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk Based Screening Concentration[1]	Florida Cleanup Target Level[2]	Florida Cleanup Target Level Leaching Value[2]	Selected Screening Concentration[3]

[1] For all chemicals except the essential nutrients, the USEPA Region III RBC Table for residential soil (October 1, 1998) has been used, unless otherwise noted. Screening values are based on a cancer risk of 10^{-6} or a hazard quotient of 1.0. Noncarcinogenic RBCs have been adjusted to reflect a target hazard quotient of 0.1.
[2] Florida Department of Environmental Protection (FDEP) Cleanup Target Levels, 62-777, FAC (FDEP, 1999) Based on a target cancer risk of 10^{-6} or a target hazard quotient of 1.
[3] The selected screening concentration for the human health risk assessment is the lowest value of the RBC and the Florida Cleanup Target Level.
[4] Naphthalene used as a surrogate.
[5] Pyrene used as a surrogate.
[6] Value for Chlordane was used.
[7] RBC value is based on arsenic as a carcinogen.
[8] Essential nutrient screening value (see GIR Report).
[9] RBC and Florida Cleanup Target Level values are based on Chromium VI.
[10] RBC value is based on hydrogen cyanide.
[11] RBC is not available for lead; value is from Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12).

NOTES:
µg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
PCBs = polychlorinated biphenyls.
RBC = USEPA Region III Risk Based Concentration.
NC = not calculated, per FDEP, 1996.
DDD = Dichlorodiphenyl dichloroethane.
DDE = Dichlorodiphenyl dichloroethene.
DDT = Dichlorodiphenyl trichlorothane.
NSC = no screening criteria available.

Table E-2
Screening Concentrations for Subsurface Soil
for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 11
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk-Based Screening Concentration[1]	Florida Cleanup Target Level[2]	Florida Cleanup Target Level Leaching Value[2]	Selected Screening Concentration[3]
Volatile Organic Compounds (µg/kg)				
Acetone	20,000,000	5,500,000	2,800	5,500,000
Toluene	41,000,000	2,600,000	500	2,600,000
Xylenes (total)	410,000,000	40,000,000	200	40,000,000
Semivolatile Organic Compounds (µg/kg)				
bis(2-Ethylhexyl)phthalate	410,000	280,000	3,600,000	280,000
Pesticides/PCBs (µg/kg)				
4,4-DDD	24,000	18,000	4,000	18,000
4,4-DDE	17,000	13,000	18,000	13,000
4,4-DDT	17,000	13,000	11,000	13,000
Aldrin	340	300	50	300
Aroclor-1254	2,900[4]	2,100[4]	17,000[4]	2,100
Aroclor-1260	2,900[4]	2,100[4]	17,000[4]	2,100
Dieldrin	360	300	4	300
Inorganics (mg/kg)				
Aluminum	200,000	NSC	NSC	200,000
Arsenic	3.8[5]	3.7[5]	29	3.7
Barium	14,000	87,000	1,600	14,000
Beryllium	410	800	63	410
Cadmium	100	1,300	8	100
Calcium	1,000,000[6]	NSC	NSC	1,000,000
Chromium	610[7]	420[7]	38	420
Cobalt	12,000	110,000	NSC	12,000
Copper	8,200	76,000	NSC	8,200
Iron	61,000	480,000	NSC	61,000
Lead	400[8]	920	NSC	400
Magnesium	460,468[6]	NSC	NSC	460,468
Manganese	4,100	22,000	NSC	4,100

See notes at end of table.

Table E-2
Screening Concentrations for Subsurface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 11
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk-Based Screening Concentration[1]	Florida Cleanup Target Level[2]	Florida Cleanup Target Level Leaching Value[2]	Selected Screening Concentration[3]
Inorganics (mg/kg) (Cont.)				
Mercury	61	26	2.1	26
Nickel	4,100	28,000	130	4,100
Selenium	1,000	10,000	5	1,000
Sodium	1,000,000[6]	NSC	NSC	1,000,000
Vanadium	1,400	7,400	980	1,400
Zinc	61,000	560,000	6,000	61,000

[1] For all chemicals except the essential nutrients, the USEPA Region III RBC Table for industrial soil (October 1, 1998) has been used, unless otherwise noted. Screening values are based on a cancer risk of 10^{-6} or a hazard quotient of 1.0. Noncarcinogenic RBCs have been adjusted to reflect a target hazard quotient of 0.1.
[2] Florida Department of Environmental Protection (FDEP) Cleanup Target Levels, Chapter 62-777, FAC, (FDEP,1999). Based on a target cancer risk of 10^{-6} or a target hazard quotient of 1.
[3] The selected screening concentration for the human health risk assessment is the lowest value of the RBC and the Florida Cleanup Target Level..
[4]Polychlorinated biphenyls value was used.
[5]RBC value is based on arsenic's properties as a carcinogen.
[6]Essential nutrient screening value (see GIR Report).
[7]RBC and Florida Cleanup Target Level values are based on Chromium VI.
[8]RBC is not available for lead; value is from Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12).

Notes:
µg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
NSC = no screening criteria available.
RBC = USEPA Region III Risk Based Concentration.
DDD = Dichlorodiphenyl dichloroethane.
DDE = Dichlorodiphenyl dichloroethylene.
DDT = Dichlorodiphenyl trichloroethane.
PCBs = Polychlorinated biphenyls.

Table E-3
Screening Concentrations for Groundwater
For Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 11
Naval Air Station Whiting Field
Milton, Florida

Chemical	Risk-Based Screening Concentration[1]	Federal MCL[2]	Florida Groundwater Cleanup Target Level[3]	Selected Screening Concentration[4]
Volatiles (µg/L)				
1,2-Dichloroethene (total)	5.5	70[5]	70[5]	5.5
Benzene	0.36	5	1	0.36
Carbon disulfide	100	NSC	[700]	100
Vinyl chloride	0.019	2	1	0.019
Semivolatiles (µg/L)				
bis(2-Ethylhexyl)phthalate	4.8	6	6	4.8
Phenol	2,200	NSC	[10]	10
Inorganics (µg/L)				
Aluminum	3,700	(50)	(200)	50
Arsenic	0.045[6]	50	50	0.045
Barium	260	2,000	2,000	260
Beryllium	7.3	4	4	4
Cadmium	1.8	5	5	1.8
Calcium	1,055,398[7]	NSC	NSC	1,055,398
Chromium	11	100	100[7]	11
Copper	150	1,300[9]	(1,000)	150
Iron	1,100	(300)	(300)	300
Lead	NSC	15[10]	15	15
Magnesium	118,807[7]	NSC	NSC	118,807
Manganese	73	(50)	(50)	50
Potassium	297,016[7]	NSC	NSC	297,016

See notes at end of table.

Table E-3
Screening Concentrations for Groundwater
For Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 11
Naval Air Station Whiting Field
Milton, Florida

Chemical	Risk-Based Screening Concentration[1]	Federal MCL[2]	Florida Groundwater Cleanup Target Level[3]	Selected Screening Concentration[4]
Inorganics (μg/L) (Cont.)				
Sodium	396,022[7]	NSC	160,000	160,000
Thallium	0.29[11]	2	2	0.29
Vanadium	26	NSC	[49]	26
Zinc	1,100	(5,000)	(5,000)	1,100

[1] For all chemicals except the essential nutrients, the USEPA Region III RBC Table for tap water (October, 1998) has been used. Screening values are based on a cancer risk of 10^{-6} and a hazard quotient of 1. Per USEPA Region IV Guidance (USEPA, 1995), the noncarcinogenic RBCs have been adjusted to reflect a target hazard quotient of 0.1.
[2] Federal MCLs are taken from USEPA Drinking Water Regulations and Health Advisories from February 1996. Primary MCLs have no marks, Secondary MCLs are indicated by parenthesis (), and Federal maximum contaminant level goals (MCLGs) are indicated by brackets []. The lowest of these nonzero values is presented.
[3] Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777, FAC, (FDEP, 1999). Primary Standards have no marks, Secondary Standards are indicated by parenthesis (), and other criteria (i.e., carcinogen, organoleptic, or a systemic toxicant) are indicated by brackets [].
[4] The selected screening concentration for the human health risk assessment is the lowest value of the RBC, Federal MCL value, and Florida Cleanup Target Level values.
[5] Value is based on 1,2-Dichloroethene (cis).
[6] Value is based on arsenic as a carcinogen.
[7] Essential nutrient screening value (see GIR Report).
[8] RBC value is based on Chromium VI.
[9] Treatment technology action level for copper in drinking water distribution system (USEPA Drinking Water Standards and Health Advisories, May 1996).
[10] Treatment technology action level for lead in drinking water (USEPA Drinking Water Standards and Health Advisories, May, 1996).
[11] RBC value is based on thallium sulfate.

NOTES: μg/L = micrograms per liter. NSC = no screening concentration.
RBC = USEPA Region III Risk-Based Concentration. MCL = maximum contaminant level.

HUMAN HEALTH TOXICITY PROFILES

1,2-Dichloroethene. 1,2-Dichloroethene is a volatile organic compound which exists as cis- and trans-isomers. The commercially used material is usually a mixture of the two isomers. In the past, it was used as a general inhalation anesthetic. It is used most often as a solvent for dyes, perfume oils, waxes, resins, and plastics. It is also used as an intermediate in the synthesis of polymers.

1,2-Dichloroethene is absorbed by all routes of administration. Distribution is rapid and, due to its lipophilic nature, occurs to all organ systems. It is extensively metabolized to dichloroacetaldehyde and chloroacetic acids which are excreted primarily through urine.

Dermal contact to 1,2-dichloroethene may result in defatting of the skin and dermatitis. Exposure to airborne 1,2-dichloroethene causes irritation to eyes, mucous membranes and the upper respiratory tract. Systemically, the trans-isomer is believed to be more toxic than the cis-isomer. However, both have been reported to produce central nervous system depression and toxicity to liver and lungs. No data on the reproductive toxicity of 1,2-dichloroethene exists. Both isomers have tested negative for mutagenicity in vitro tests. Cancer effects have not been studied in humans or animals.

References:
Agency for Toxic Substances and Disease Registry (ATSDR), 1990. "Toxicological Profile for 1,2-Dichloroethene"; Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, February 1990.

Mycroft, F.J., Jones, J.R., and Olson, K.R. 1990. Environmental and Occupational Toxicology. In: Poisoning and Drug Overdose. Ed. K.R. Olson. Appleton & Lange, CT. p. 397.

Aluminum. Aluminum occurs naturally in the soil and makes up approximately 8 percent of the earths crust. Higher soil concentrations are associated with industries which burn coal and aluminum mining and smelting. Human exposures to aluminum may occur through ingestion of foods grown in soil that contains aluminum and use of antacids, antiperspirants, and other drug store items. Aluminum in antiperspirants can cause skin rashes in some people. Factory workers who inhale large amounts of aluminum dust may develop lung problems. Aluminum has caused lower birth weights in some animals. Studies have shown that aluminum accumulates in the brains of people with Alzheimer's disease. However, any causal link between aluminum exposure and this disease is yet to be demonstrated. Both human epidemiological studies and animal experiments strongly suggests that aluminum is not a carcinogen.

References:
Agency for Toxic Substances and Disease Registry (ATSDR), 1989. "Toxicological Profile for Aluminum"; Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, October 1989.

Arsenic. Arsenic had once used in pesticide formulations and has industrial uses in tanneries, as well as the glass and wine making industries. Toxicity depends on its chemical form. Arsenic is an irritant of the skin, mucous membranes, and gastrointestinal tract. Symptoms of acute toxicity include vomiting, diarrhea, convulsions, and a severe drop in blood pressure. Subchronic effects include hyperpigmentation, sensory-motor polyneuropathy, persistent headache, and lethargy. Chronic oral exposure has caused skin lesions, peripheral vascular disease, and peripheral neuropathy. The USEPA has classified arsenic as Group A, human carcinogen, based on increased incidence of skin and lung cancer in epidemiology studies.

References:
Agency for Toxic Substances and Disease Registry (ATSDR), 1992. "Toxicological Profile for Arsenic"; Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, February 1992.

Benzene. Benzene is an organic solvent that is found in the environment from both natural processes from petroleum sources. Benzene is used in the synthesis of many industrial chemicals and pharmaceuticals, for the extraction of fats and oils, in the manufacture of explosives, in is a major component of petroleum based fuels such as gasoline.

Benzene is readily absorbed orally, moderately absorbed by inhalation, and poorly absorbed dermally. Its toxic actions are primarily a result of its metabolites, which are largely produced in the liver, and to some extent, in the bone marrow. Acute exposure to benzene has produced central nervous system depression in humans and animals. Chronic exposures have produced adverse liver effects and hematological toxicity, including aplastic anemia and leukemia. Available evidence does not suggest that benzene is teratogenic in humans or animals. There is sufficient evidence of benzene-induced carcinogenicity in humans via inhalation exposure, placing it in USEPA weight-of-evidence group A, human carcinogen.

References:
MADEP, 1992. "Risk Assessment Shortform Residential Exposure Scenario, Version 1.6"; Policy #WSC/ORS-142-92; Office of Research and Standards and the Bureau of Waste Site Cleanup, Boston, MA; September 1992.

Benzo(a)anthracene. Benzo(a)anthracene is a member of the polycyclic aromatic hydrocarbons (PAH) class of compounds which contain two or more aromatic rings. PAHs are ubiquitous in nature and are also manmade. Benzo(a)anthracene occurs naturally in coal tar, crude oil, and is formed from incomplete combustion of organic material. It is also product of pyrolysis in tobacco smoke.

Benzo(a)anthracene has produced skin tumors in laboratory animals after dermal application. Benzo(a)anthracene produced mutations in bacteria and in mammalian cells, and transformed mammalian cells in culture. Although there are no human data that specifically link exposure to benzo(a)anthracene to human cancers, benzo(a)anthracene is a component of mixtures that have been associated with human cancer. As such, benzo(a)anthracene has been classified by USEPA as a B2, probable human carcinogen.

References:
MADEP, 1992. "Risk Assessment Shortform Residential Exposure Scenario, Version 1.6"; Policy #WSC/ORS-142-92; Office of Research and Standards and the Bureau of Waste Site Cleanup, Boston, MA; September 1992.

Benzo(a)pyrene. Benzo(a)pyrene is a member of the polycyclic aromatic hydrocarbons (PAH) class of compounds which contain two or more aromatic rings. They are ubiquitous in nature and are also man made. Benzo(a)pyrene occurs naturally in coal tar, crude oil, and is formed from incomplete combustion of organic material. Human data demonstrating a causal relationship linking benzo(a)pyrene to carcinogenicity are lacking. However, multiple animal studies in many species demonstrate benzo(a)pyrene to be carcinogenic following administration by a variety of routes. The mechanism through which benzo(a)pyrene elicits its carcinogenic potential is well understood. Benzo(a)pyrene has produced positive results in numerous genotoxicity assays. Benzo(a)pyrene has been classified by the EPA as a B2, probable human carcinogen.

References:
ATSDR, 1989. Toxicological Profile for Polycyclic Aromatic Hydrocarbons. Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, October, 1989.

Clayton, George D. and Florence E. Clayton, editors, 1981. Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition; John Wiley & Sons; New York.

Integrated Risk Information System (IRIS), 1993. United States Environmental Protection Agency.

Benzo(b)fluoranthene. Benzo(b)fluoranthene is a member of the polycyclic aromatic hydrocarbons (PAH) class of compounds which contain two or more aromatic rings. PAHs are ubiquitous in nature and are also manmade. Benzo(b)fluoranthene occurs naturally in coal tar, crude oil, and is formed from incomplete combustion of organic material.

Although there are no human data that specifically link exposure to benzo(b)fluoranthene to human cancers, benzo(b)fluoranthene is a component of mixtures that have been associated with human cancer. These include coal

tar, soots, coke oven emissions and cigarette smoke. Benzo(b)fluoranthene produced tumors in mice after lung implantation, intraperitoneal, or subcutaneous injection, and skin painting. Benzo(b)fluoranthene has produced positive results in several genotoxicity assays. It has been classified as a B2, probable human carcinogen, by the USEPA.

References:
MADEP, 1992. "Risk Assessment Shortform Residential Exposure Scenario, Version 1.6"; Policy #WSC/ORS-142-92; Office of Research and Standards and the Bureau of Waste Site Cleanup, Boston, MA; September 1992.

Benzo(k)fluoranthene. Benzo(k)fluoranthene is a member of the polycyclic aromatic hydrocarbons (PAH) class of compounds which contain two or more aromatic rings. PAHs are ubiquitous in the environment resulting from the incomplete combustion of organic materials, whether natural or man-made. Benzo(k)fluoranthene also occurs in coal tar, and crude oil.

Although there are no human data that specifically link exposure to benzo(k)fluoranthene to human cancers, benzo(k)fluoranthene is a component of mixtures that have been associated with human cancer. These include coal tar, soots, coke oven emissions and cigarette smoke. Benzo(k)fluoranthene produced tumors after lung implantation in mice and when administered with a promoting agent in skin-painting studies. Benzo(k)fluoranthene is mutagenic in bacteria. Benzo(k)fluoranthene has been classified by USEPA as a B2, probable human carcinogen.

References:
MADEP, 1992. "Risk Assessment Shortform Residential Exposure Scenario, Version 1.6"; Policy #WSC/ORS-142-92; Office of Research and Standards and the Bureau of Waste Site Cleanup, Boston, MA; September 1992.

Bis(2-ethylhexyl)phthalate (DEHP). DEHP is used industrially as a plasticizer for resins and is found in many plastic materials as it makes them more flexible. It is also used in manufacturing organic pump fluids in electrical capacitors. Acute exposure to DEHP has produced eye and mucous membrane irritation, nausea, and diarrhea. Chronic exposure of laboratory animals to DEHP indicate that the target organs are the liver, causing morphological and biochemical changes, as well as the testes, producing damage to the seminiferous tubules. DEHP has produced developmental and reproductive effects in laboratory animals including spina bifida and reduced fertility. DEHP has been shown to cause a dose-related increase in liver tumors in mice and rats. Thus, the USEPA has designated DEHP as a B2, probable human carcinogen.

References:
ATSDR, 1991. Toxicological Profile for Di(2-ethylhexyl)phthalate. Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, October, 1991.

Chrysene. Chrysene is one of the polycyclic aromatic hydrocarbons (PAH) compounds which are formed during the combustion of organic material. Although there are no human data that specifically link exposure to chrysene to human cancers, chrysene is a component of mixtures that have been associated with human cancer. These include coal tar, soots, coke oven emissions and cigarette smoke. Chrysene produced chromosomal abnormalities in hamsters and mouse germ cells after gavage exposure, positive responses in bacterial gene mutation assays, and transformed mammalian cells exposed in culture. Due to its similarities with benzo(a)pyrene and other carcinogenic PAHs, chrysene has been classified as a B2, probable human carcinogen.

References:
MADEP, 1992. "Risk Assessment Shortform Residential Exposure Scenario, Version 1.6"; Policy #WSC/ORS-142-92; Office of Research and Standards and the Bureau of Waste Site Cleanup, Boston, MA; September 1992.

Dieldrin. Dieldrin is a man-made chlorinated insecticide that was widely used in agriculture, and for termite-proofing of wooden building material and residential dwellings, until it was banned for use in the U.S. in 1974.

However, it is highly persistent in the environment and bioaccumulates in terrestrial and aquatic food chains. This, combined with extensive past use, has made dieldrin ubiquitous in the environment. Humans may be exposed to dieldrin from consumption of animal and agricultural products exposed to contaminated soil and from exposure associated with the use of dieldrin as a termite-proofing agent.

Exposure to high levels of dieldrin has been associated with central nervous system excitation that resulted in convulsions, and renal toxicity. Long-term low-level exposure to dieldrin has also been associated with occasional cases of nervous system intoxication. In addition, hepatic degeneration, immunosuppression, and possible reproductive/developmental toxicity have been observed in laboratory animals exposed to dieldrin. Chronic oral exposure to dieldrin has produced liver cancer in laboratory mice and rats. Epidemiological investigations have been of insufficient quality to assess dieldrin carcinogenicity in humans. Based on animal data, the USEPA has placed dieldrin into group B2, probable human carcinogen.

References

Agency for Toxic Substances and Disease Registry (ATSDR), 1991. "Toxicological Profile for Aldrin/Dieldrin"; Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, October 1991.

Indeno(1,2,3-cd)pyrene. Indeno(1,2,3-c,d)pyrene is one of the polycyclic aromatic hydrocarbons (PAH) compounds which are formed during the combustion of organic material and is a component of cigarette smoke and smoke stack emissions. No carcinogenicity data specifically for indeno(1,2,3-c,d)pyrene are available in humans, however, toxic effects are attributable to mixtures of PAHs. Animal studies indicate that indeno(1,2,3-c,d)pyrene can induce skin tumors in mice, and may have some immunosuppressive effects. In mammalian cell cultures, indeno(1,2,3-c,d)pyrene was found to be genotoxic. It has been classified by the USEPA as a B2 carcinogen.

References:

MADEP, 1992. "Risk Assessment Shortform Residential Exposure Scenario, Version 1.6"; Policy #WSC/ORS-142-92; Office of Research and Standards and the Bureau of Waste Site Cleanup, Boston, MA; September 1992.

Iron. Iron is a metal which is required for a variety of physiological functions such as heme biosynthesis, oxidative phosphorylation and mixed-function oxidase-mediated metabolic reactions. Only divalent forms of iron are absorbed. As absorption occurs, divalent iron is biochemically converted to trivalent iron, the biologically active form. Under normal conditions, absorbed dietary iron is complexed to hemoglobin and transported to the liver for storage until needed for physiological reactions. The balance of iron is regulated only by the amount of dietary intake and the degree of intestinal absorption. Intestinal absorption tends to be low (2 - 15%) except during periods of increased iron need when absorption efficiency increases dramatically.

Acute iron toxicity has been well characterized following the accidental ingestion of iron-containing preparations by children. Shortly after ingestion, the corrosive effects of iron cause vomiting and diarrhea, often bloody. Later signs include shock, metabolic acidosis, seizures, liver and/or kidney failure, coma, and death. Chronic iron overload manifests as disturbances in liver function, diabetes mellitus, and endocrine and cardiovascular effects. Inhalation of iron containing dust or fumes in occupational settings may result in deposition of iron particles in the lungs leading to interstitial fibrosis. Autopsies of hematite miners noted an increase in lung cancer. However, the etiology of the lung cancer may be related to factors other than iron exposure such as cigarette, silica or PAH exposures.

References:

Aisen, P., Cohen, G. and Kang, J.O., 1990. Iron Toxicosis. Int. Rev. Exp. Pathol. 31:1-46.

Goyer, R.A., 1991. Toxic Effects of Metals. In: Casarett and Doull's Toxicology: The Basic Science of Poisons, 3rd edition. Eds. C.D. Klaassen, M.O. Amdur and J. Doull. Macmillan Publishing Co. N.Y.

Lead. Lead is used in lead acid batteries and was widely in gasoline additives, paints, solder, pipes, ammunition,

and other applications. It is the most ubiquitous toxic metal in the environment. The most serious effects of chronic exposure are encephalopathy, renal damage, and changes in the hematopoietic system, which is the most sensitive indicator of lead exposure. Peripheral nerve dysfunction is observed in adults at blood lead levels of 30 to 50 ìg/dL-blood. The nervous systems of children are reported to be affected at levels of 15 ìg/dL-blood (Benignus and others, 1981). Chronic lead exposure by workers through inhalation has resulted in statistically significant increases in tumors. Oral exposures of lead salts in animals has been shown to increase tumor response.

References:

Amdur, Mary O., John Doull, Curtis D. Klaassen, 1991. Toxicology: The Basic Science of Poisons, 4th edition; Pergamon Press; Inc. New York.

Benignus, V.A., Otto, D.A., Muller, K.E., Seiple, K.J., 1981. "Effects of Age and Body Lead Burden on CNS Function in Young Children. II:EEG Spectra." Electroencephalograph. Clin. Neurophysiol. 52:240-248.

Manganese. Manganese is a naturally-occurring substance found in many types of rock. It does not generally occur in the environment as the pure metal, rather, it is found combined with other chemicals such as sulfur, oxygen, and chlorine. Manganese is mixed with iron to make various types of steel. Manganese is a component of some ceramics, pesticides, fertilizers, and in nutritional supplements. In small doses manganese is beneficial to human health. Manganese miners and steel workers exposed to elevated concentrations of manganese have evidenced mental and emotional disturbances, and slow and clumsy body movements. Target organs of manganese are the lung and CNS. When inhaled, manganese dust can also cause lung irritation. EPA has classified manganese as a Class D, not classifiable as to human carcinogenicity.

References:

Agency for Toxic Substances and Disease Registry (ATSDR), 1991. "Toxicological Profile for Manganese"; Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, February 1991.

Thallium. Thallium is a naturally-occurring soft metal that is a minor constituent in a variety of ores and is obtained as a by-product of the refining of iron, cadmium, and zinc. It is used as a catalyst, in certain alloys, jewelry, thermometers, semiconductors, dyes and pigments, and optical lenses. It has been used medically as a depilatory agent. Additionally, it is used as a rodenticide and insecticide. Thallium is efficiently absorbed from the gastrointestinal tract. Excretion occurs primarily through urine and feces. Following absorption, distribution occurs to kidney tissue to a large extent, with lesser distribution to thyroid, intestines, testes, pancreas, skin, bone, and spleen.

Thallium is one of the more toxic metals. Acute toxicity results in gastrointestinal irritation, shock, ascending paralysis, seizures, and psychic disturbances. Signs of subacute or chronic thallium poisoning include hair loss, nail dystrophy, cataracts, peripheral muscular weakness and atrophy, chorea, peripheral neuropathy, and kidney damage. Loss of vision have been related to industrial thallium exposures. No information is available which addresses the carcinogenic potential of thallium.

References:

Goyer, R.A., 1991. Toxic Effects of Metals. In: Casarett and Doull's Toxicology: The Basic Science of Poisons, 3rd edition. Eds. C.D. Klaassen, M.O. Amdur and J. Doull. Macmillan Publishing Co. N.Y.

Tweig, M., 1990. Thallium. In: Poisoning and Drug Overdose. Ed. K.R. Olson. Appleton & Lange, CT. pps. 276-7.

Vinyl Chloride. Most of the vinyl chloride produced in the United States is used in the manufacture of polyvinyl chloride and other vinyl polymers. Because vinyl chloride is a gas the only significant route of exposure is inhalation. It is highly flammable. Acute exposure to vinyl chloride causes CNS depression. Several epidemiologic studies have found associations between occupational exposure and impaired liver function to vinyl chloride. Symptoms of liver disease associated with occupational exposure include pain, hepatomegaly, portal hypertension,

and thrombocytopenia. Carcinogenicity studies by inhalation and oral routes in rats, mice, and hamsters resulted in liver angiosarcomas in all animals tested. Vinyl chloride workers are at increased risk for developing liver angiosarcomas, brain, skin, and lung tumors, and tumors of the lymph and blood-forming systems. Vinyl chloride is classified in group A, a human carcinogen.

References:

Clayton, George D. and Florence E. Clayton, editors, 1981. Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition; John Wiley & Sons; New York.

Integrated Risk Information System (IRIS), 1993. United States Environmental Protection Agency.

Table E-4
Oral Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Chemical	Weight of Evidence	Oral Slope Factor (mg/kg/day)(-1)	Source	Test Species	Exposure Route	Tumor Type	Study Source
VOLATILES							
1,2-Dichloroethene (total)	D	NE					
Benzene	A	2.9e-02	IRIS	Human	Inhalation	Leukemia	IRIS
Vinyl chloride	A	1.9e+00	HEAST		Oral-diet	Liver, Lung	HEAST
SEMIVOLATILES							
Benzo(a)Anthracene	B2	7.3 (1)					
Benzo(a)Pyrene	B2	7.3	IRIS	Mouse	Oral-diet	Forestomach	IRIS
Benzo(b)Fluoranthene	B2	7.3 (1)					
Benzo(k)Fluoranthene	B2	7.3 (1)					
bis(2-Ethylhexyl)phthalate	B2	1.4e-02	IRIS	Rat	Oral-diet	Liver	IRIS
Chrysene	B2	7.3 (1)					
Indeno(1,2,3-cd)Pyrene	B2	7.3 (1)					
PESTICIDES/PCBs							
Dieldrin	B2	1.6e+01	IRIS	Mouse	Oral-Diet	Liver	IRIS
INORGANICS							
Aluminum	D	NE					
Arsenic	A	1.5e+00	IRIS	Human	Oral-drinking water	Skin	IRIS
Iron	D	NE					
Lead	B2	NE					
Managense	D	NE					
Thallium	D	NE					

Table E-4
Oral Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Chemical	Weight of Evidence	Oral Slope Factor (mg/kg/day)(-1)	Source	Test Species	Exposure Route	Tumor Type	Study Source

Notes:

NE = Not Evaluated

Integrated Risk Information System (IRIS) on-line database search, current as of November 1997.
Health Effects Assessment Summary Tables (HEAST), current as of July 1997.
(1) Per Region IV guidance, toxicity equivalent factors (TEFs) for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were used to convert cPAH concentrations, not slope factors.

Weight of Evidence (route-specific):
A = Human carcinogen
B = Probable human carcinogen (B1 = limited human evidence; B2 = sufficient human evidence)
C = Possible human carcinogen
D = Not classifiable as to human carcinogenicity

Table E-5
Dermal Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Compound	Weight of Evidence	Oral Slope Factor (mg/kg-day)-1	Oral Absorption Efficiency	Source / Reference	Dermal Slope Factor (mg/kg-day)-1
VOLATILES					
1,2-Dichloroethene (total)	D	NE			
Benzene	A	2.9e-02	(1)		2.9e-02
Vinyl chloride	A	1.9e+00	100%	Watanebe et al., 1976	1.9e+00
SEMIVOLATILES					
Benzo(a)Anthracene	B2	7.3 (4)	91%	(2)	8.0
Benzo(a)Pyrene	B2	7.3	91%	IRIS / Hecht et al., 1979	8.0
Benzo(b)Fluoranthene	B2	7.3 (4)	91%	(2)	8.0
Benzo(k)Fluoranthene	B2	7.3 (4)	91%	(2)	8.0
bis(2-Ethylhexyl)phthalate	B2	1.4e-02	100%	Chadwick et al., 1982	1.4e-02
Chrysene	B2	7.3 (4)	91%	(2)	8.0
Indeno(1,2,3-cd)Pyrene	B2	7.3 (4)	91%	(2)	8.0
PESTICIDES/PCBs					
Dieldrin	B2	1.6e+01	80%	(3)	2.0e+01
INORGANICS					
Aluminum	D	NE			NE
Arsenic	A	1.5e+00	98%	Vahter, 1983	1.5e+00
Iron	D	NE			NE
Lead	B2	NE			
Managaese	D	NE			NE
Thallium	D	NE			NE

Table E-5
Dermal Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Compound	Weight of Evidence	Oral Slope Factor (mg/kg-day)-1	Oral Absorption Efficiency	Source / Reference	Dermal Slope Factor (mg/kg-day)-1

Notes:

NE = Not Evaluated

Integrated Risk Information System (IRIS) on-line database search, current as of November 1997.
Health Effects Assessment Summary Tables (HEAST), current as of July 1997.
Vahter, M. 1983. Metabolism of Arsenic. In: Fowler, B.A., ed. Biological and Environmental Effect of Arsenic. NY: Elsevier. pp. 171-198.
Watanebe P.G., McGowan, G.R. and Gehring, P.J. 1976. Fate of ^{14}C-Vinyl Chloride After Single Oral Administration. Toxicol. Appl. Pharmacol. 36: 339-352.

(1) This toxicity values is based on absorbed dose. Therefore, no adjustment of this value is necessary.
(2) The oral absorption efficiency of all PAHs is assumed to be identical to that of benzo(a)pyrene, based on structural analogy.
(3) The oral absorption efficiency of alpha-chlordane is assumed to be identical to that of gamma-chlordane, based on structural analogy.
(4) Per Region IV guidance, toxicity equivalent factors (TEFs) for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were used to convert cPAH concentrations, not slope factors.

Weight of Evidence (route-specific):

A = Human carcinogen
B = Probable human carcinogen (B1 = limited human evidence; B2 = sufficient human evidence)
C = Possible human carcinogen
D = Not classifiable as to human carcinogenicity

Table E-6
Inhalation Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Chemical	Weight of Evidence	Inhalation Slope Factor (mg/kg/day)(-1)	Source	Inhalation Unit Risk ($\mu g/m^3$)(-1)	Source	Test Species	Exposure Route	Tumor Type	Study Source
VOLATILES									
1,2-Dichloroethene (total)	D	NE							
Benzene	A	2.9e-02	HEAST	8.3e-06	IRIS	Human	Inhalation	Leukemia	IRIS
Vinyl chloride	A	3.0e-01	HEAST	8.4e-05	HEAST	Rat	Inhalation	Liver	HEAST
SEMIVOLATILES									
Benzo(a)Anthracene	B2	3.1	Region 4, Guidance	0.88	Region 4, Guidance				
Benzo(a)Pyrene	B2	3.1	Region 4, Guidance	0.88	Region 4, Guidance				
Benzo(b)Fluoranthene	B2	3.1	Region 4, Guidance	0.88	Region 4, Guidance				
Benzo(k)Fluroanthene	B2	3.1	Region 4, Guidance	0.88	Region 4, Guidance				
bis(2-Ethylhexyl)phthalate	D	NE							
Chrysene	B2	3.1	Region 4, Guidance	0.88	Region 4, Guidance				
Indeno(1,2,3-cd)Pyrene	B2	3.1	Region 4, Guidance	0.88	Region 4, Guidance				
PESTICIDES/PCBs									
Dieldrin	B2	1.6+01	HEAST	4.6e-03	IRIS	Mouse	Oral-Diet	Liver	IRIS
INORGANICS									
Aluminum	D	NE		NE					
Arsenic	A	15.	IRIS	4.3e-03	IRIS	Human	Inhalation	Lung	IRIS
Iron	D	NE		NE					

Table E-6
Inhalation Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Chemical	Weight of Evidence	Inhalation Slope Factor (mg/kg/day)(-1)	Source	Inhalation Unit Risk ($\mu g/m^3$)(-1)	Source	Test Species	Exposure Route	Tumor Type	Study Source
Lead	D	NE		NE					
Manganese	D	NE							
Thallium	D	NE		NE					

Notes:

NE = Not Evaluated
Integrated Risk Information System (IRIS) on-line database search, current as of November 1997.
Health Effects Assessment Summary Tables (HEAST), current as of July 1997.
USEPA, 1995, Region IV Bulletin No 2. November, 1995.

Weight of Evidence (route-specific):
A = Human carcinogen
B = Probable human carcinogen (B1 = limited human evidence; B2 = sufficient human evidence)
C = Possible human carcinogen
D = Not classifiable as to human carcinogenicity

Table E-7
Oral Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Chemical	Chronic		Subchronic		Study Type	Confidence Level	Critical Effect	Test Animal	Uncertainty Factor	Study Source
	Oral RfD (mg/kg-day)	Source	Oral RfD (mg/kg-day)	Source						
VOLATILES										
1,2-Dichloroethene (total)	9.0e-03	HEAST	9.0e-03		Oral-drinking water	ND	Liver lesions	Rat	1,000	HEAST
Benzene	3.0e-04	(1)	ND							
Vinyl chloride	ND		ND							
SEMIVOLATILES										
Benzo(a)Anthracene	ND		ND							
Benzo(a)Pyrene	ND		ND							
Benzo(b)Fluoranthene	ND		ND							
Benzo(k)Fluoranthene	ND		ND							
bis(2-Ethylhexyl)phthalate	2.0e-02	HEAST	2.0e-02	HEAST	Oral-diet	Medium	Increased liver weight	Guinea Pig	1,000 H,A,S	IRIS
Chrysene	ND		ND							
Indeno(1,2,3-cd)Pyrene	ND		ND							
PESTICIDES/PCBs										
Dieldrin	5.0e-05	IRIS	5.0e-05	HEAST	Oral-diet	Medium	Liver lesions	Rat	100 H,A	IRIS
INORGANICS										
Aluminum	1.0e+00	(1)	ND							
Arsenic	3.0e-04	IRIS	3.0e-04	HEAST	Oral-drinking water	Medium	Hyperpigmentation, keratosis	Human	3 D	IRIS
Iron	3.0e-01	(1)	ND							
Lead	ND		ND							

Table E-7
Oral Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Chemical	Chronic		Subchronic		Study Type	Confidence Level	Critical Effect	Test Animal	Uncertainty Factor	Study Source
	Oral RfD (mg/kg-day)	Source	Oral RfD (mg/kg-day)	Source						
Manganese (drinking water)	4.7e-02	IRIS	ND		Oral-diet	Medium	No effects observed	Human	1,3 M	IRIS
Thallium	8.0e-05	IRIS	8.0e-04	HEAST	Oral-gavge	Low	No effects observed	Rat	3000 H,A,S,D	IRIS

Notes
ND = No Data

Integrated Risk Information System (IRIS) on-line database search, current as of November 1997.
Health Effects Assessment Summary Tables (HEAST), current as of July 1997.
Environmental Criteria and Assessment Office (ECAO) of the USEPA in response to a specific request.
(1) This value was provided by the Environmental Criteria and Assessment Office (ECAO) of the USEPA in response to a specific request.

Uncertainty factors:
H = Variation in human sensitivity
A = Animal to human extrapolation
S = Extrapolation from subchronic to chronic NOAEL
L = Extrapolation from LOAEL to NOAEL
D = Inadequate data
M = Modifying factor

Table E-8
Dermal Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

	Chronic Oral RfD (mg/kg-day)	Subchronic Oral RfD (mg/kg-day)	Oral Absorption Efficiency	Reference	Dermal Chronic RfD (mg/kg-day)	Dermal Subchronic RfD (mg/kg-day)
VOLATILES						
1,2-Dichloroethene (total)	9.0e-03	9.0e-03	100%	Putcha et al., 1986	9.0e-03	9.0e-03
Benzene	3.0e-04	ND	100%	ATSDR, 1993	3.0e-04	ND
Vinyl chloride	ND	ND			ND	ND
SEMIVOLATILES						
Benzo(a)Anthracene	ND	ND	91%	(1)	ND	ND
Benzo(a)Pyrene	ND	ND	91%	Hecht et al., 1979	ND	ND
Benzo(b)Fluoranthene	ND	ND	91%	(1)	ND	ND
Benzo(k)Fluoranthene	ND	ND	91%	(1)	ND	ND
bis(2-Ethylhexyl)phthalate	2.0e-02	2.0e-02	100%	Chadwick et al., 1982	2.0e-02	2.0e-02
Chrysene	ND	ND	91%	(1)	ND	ND
Indeno(1,2,3-cd)Pyrene	ND	ND	91%	(1)	ND	ND
PESTICIDES/PCBs						
Dieldrin	5.0e-05	5.0e-05	50%	USEPA, 1995	2.5e-05	2.5e-05
INORGANICS						
Aluminum	1.0e+00	ND	20%	(2)	2.0e-01	ND
Arsenic	3.0e-04	3.0e-04	98%	Vahter, 1983	2.9e-04	2.9e-04
Iron	3.0e-01	ND	2%	Goyer, 1991	6.0e-03	ND
Lead	ND	ND			ND	ND
Managanese (drinking water)	4.7e-02	ND	4%	ATSDR, 1991	1.9e-03	ND
Thallium	8.0e-05	8.0e-04	100%	Lie et al., 1960	8.0e-05	8.0e-04

Table E-8
Dermal Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

	Chronic Oral RfD (mg/kg-day)	Subchronic Oral RfD (mg/kg-day)	Oral Absorption Efficiency	Reference	Dermal Chronic RfD (mg/kg-day)	Dermal Subchronic RfD (mg/kg-day)

Notes: ND = No Data

Integrated Risk Information System (IRIS) on-line database search, current as of November 1997.
Health Effects Assessment Summary Tables (HEAST), current as of July 1997.
For documentation concerning chronic and subchronic oral RfDs, refer to Table 3.

(1) The oral absorption efficiency of all PAHs is assumed to be identical to that of benzo(a)pyrene, based on structural analogy.
(2) Inorganics lacking specific information on absorption efficiency are assigned a default value of 20% (USEPA Region IV, 1995).

ATSDR, 1991. "Toxicological Profile for Manganese". Agency for Toxic Substances and Disease Registry, U.S. Public Health Service (Draft).
ATSDR, 1993. "Toxicological Profile for Benzene". Agency for Toxic Substances and Disease Registry, U.S. Public Health Service.
Chadwick, M., Branfman, A.K. and Silveria, D.M. 1982. Dose-dependence of and Effect of Prior Exposure on the Metabolism of DEPH Administered in the Diet to Rats. Report to Chemical Manufacturers Association. Arthur D. Little, Inc.
Goyer, R.A., 1991. Toxic Effects of Metals. In: Cassarett and Doull's Toxicology: The Basic Science of Posions, 4th edition. Eds. M.O. Amdur, J. Doull and C.D. Klaassen. Pergamon Press, N.Y.
Hecht, S.S., Grabowski, W. and Groth, K. 1979. Analysis of Feces for B[a]P After Consumption of Charcoal-Broiled Beef by Rats and Humans. Food Cosmet. Toxicol. 17: 223-227.
Lie, R., Thomas, R. and Scott, J. 1960. The Distribution and Excretion of Thallium^{204} in the Rat, with Suggested MPC's and a Bio-assay Procedure. Health Phys. 2: 334-340.
Putcha, L., Bruchner, J.V. and D'Soyza, R. 1986. Toxicokinetics and Bioavailability of Oral and Intravenous 1,1-Dichloroethylene. Fund. Appl. Toxicol. 6: 240-250.
USEPA, 1995., Chemicals without specific information on absorbtion efficiency are assigned defalut values as follows: VOCs: 80%; SVOCs and pesticides: 50%; inorganics: 20%.
Vahter, M. 1983. Metabolism of Arsenic. In: Fowler, B.A., ed. Biological and Environmental Effect of Arsenic. NY: Elsevier. pp. 171-198.

Table E-9
Inhalation Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Chemical	Chronic		Subchronic		Study Type	Confidence Level	Critical Effect	Test Animal	Uncertainty Factor	Study Source
	RfC ($\mu g/m^3$)	Source	RfC ($\mu g/m^3$)	Source						
VOLATILES										
1,2-Dichloroethene (total)	ND		ND							
Benzene	ND		ND							
Vinyl chloride	ND		ND							
SEMIVOLATILES										
Benzo(a)Anthracene	ND		ND							
Benzo(a)Pyrene	ND		ND							
Benzo(b)Fluoranthene	ND		ND							
Benzo(k)Fluoranthene	ND		ND							
bis(2-Ethylhexyl)phthalate	ND		ND							
Chrysene	ND		ND							
Indeno(1,2,3-cd)Pyrene	ND		ND							
PESTICIDES/PCBs										
Dieldrin	ND		ND							
INORGANICS										
Aluminum	ND		ND							
Arsenic	ND		ND							
Iron	ND		ND							
Lead	ND		ND							
Manganese	5.0e-05		1.4e-05	IRIS	Inhalation	Medium	Neurobehavioral impairment	Human	1,000 H,L,D	IRIS
Thallium	ND		ND							

Table E-9
Inhalation Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 11
NAS, Whiting Field, Milton, Florida

Chemical	Chronic		Subchronic		Study Type	Confidence Level	Critical Effect	Test Animal	Uncertainty Factor	Study Source
	RfC ($\mu g/m^3$)	Source	RfC ($\mu g/m^3$)	Source						

Notes:

ND = No Data

Integrated Risk Information System (IRIS) on-line database search, current as of November 1997.
Health Effects Assessment Summary Tables (HEAST), current as July 1997.

Uncertainty factors:
- A = Animal to human extrapolation
- H = Variation in human sensitivity
- S = Extrapolation from subchronic to chronic NOAEL
- L = Extrapolation from LOAEL to NOAEL
- D = Inadequate data
- M = Modifying factor

TABLE E-10

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DAevent	chemical specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-06	kg/mg	inorganics
	CF	1.00E-09	kg/ug	organics
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	45	days/year [1]	Assumption
EXPOSURE DURATION	ED	20	years	Assumption
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	20	years	Assumption

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.

USEPA, 1992. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; 1/92.

USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DAevent \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$DAevent = AF \times ABS_d \times CF$

Note: For noncarcinogenic effects: AT = ED

TABLE E-10

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	4.9E-09	7.3E+00	3.6E-08	0.01	2.8E-09	8.0E+00	2.3E-08	5.8E-08
Benzo(a)pyrene	O	806	ug/kg	4.1E-08	7.3E+00	3.0E-07	0.01	2.3E-08	8.0E+00	1.9E-07	4.8E-07
Benzo(b)fluoranthene	O	71	ug/kg	3.6E-09	7.3E+00	2.6E-08	0.01	2.1E-09	8.0E+00	1.6E-08	4.3E-08
Benzo(k)fluoranthene	O	8	ug/kg	4.0E-10	7.3E+00	2.9E-09	0.01	2.3E-10	8.0E+00	1.9E-09	4.8E-09
Chyrsene	O	1.14	ug/kg	5.7E-11	7.3E+00	4.2E-10	0.01	3.3E-11	8.0E+00	2.6E-10	6.8E-10
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.0E-09	7.3E+00	7.5E-09	0.01	5.9E-10	8.0E+00	4.7E-09	1.2E-08
Dieldrin	O	74	ug/kg	3.7E-09	1.6E+01	6.0E-08	0.01	2.1E-09	2.0E+01	4.3E-08	1.0E-07
Arsenic	I	2.7	mg/kg	1.4E-07	1.5E+00	2.0E-07	0.001	7.8E-09	1.5E+00	1.2E-08	2.2E-07
Lead	I	166	mg/kg	8.4E-06	ND		0.001	4.8E-07	ND		
SUMMARY CANCER RISK						4E-07				3E-07	7E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-10

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	1.7E-07	ND		0.01	9.9E-08	ND		
Benzo(a)pyrene	O	806	ug/kg	1.4E-07	ND		0.01	8.2E-08	ND		
Benzo(b)fluoranthene	O	710	ug/kg	1.3E-07	ND		0.01	7.2E-08	ND		
Benzo(k)fluoranthene	O	800	ug/kg	1.4E-07	ND		0.01	8.1E-08	ND		
Chrysene	O	1140	ug/kg	2.0E-07	ND		0.01	1.2E-07	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	3.6E-08	ND		0.01	2.1E-08	ND		
Dieldrin	O	74	ug/kg	1.3E-08	5.0E-05	2.6E-04	0.01	7.5E-09	2.5E-05	3.0E-04	5.6E-04
Arsenic	I	2.7	mg/kg	4.8E-07	3.0E-04	1.6E-03	0.001	2.7E-08	2.9E-04	9.4E-05	1.7E-03
Iron	I	6930	mg/kg	1.2E-03	3.0E-01	4.1E-03	0.001	7.0E-05	6.0E-03	1.2E-02	1.6E-02
Lead	I	166	mg/kg	2.9E-05	ND		0.001	1.7E-06	ND		
SUMMARY HAZARD INDEX						0.006				0.01	0.02

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-11

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.24E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0.833	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	20	years	Assumption
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	20	years	USEPA, 1991

[1] Florida Soil Clean-Up Goal Variable. FDEP, 1995.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / INHALATION REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

CA = C x CF x (1/PEF)

Note: For noncarcinogenic effects, AT = ED

TABLE E-11

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)$^{-1}$	CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	7.87E-11	1.3E-13	3.1E+00	4.1E-13
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	1.1E-12	3.1E+00	3.4E-12
Benzo(b)fluoranthene	O	71	ug/kg	5.73E-11	9.6E-14	3.1E+00	3.0E-13
Benzo(k)fluoranthene	O	8	ug/kg	6.45E-12	1.1E-14	3.1E+00	3.4E-14
Chrysene	O	1.14	ug/kg	9.19E-13	1.5E-15	3.1E+00	4.8E-15
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.64E-11	2.7E-14	3.1E+00	8.5E-14
Dieldrin	O	74	ug/kg	5.97E-11	1.0E-13	1.6E+01	1.6E-12
Arsenic	I	2.7	mg/kg	2.18E-09	3.7E-12	1.5E+01	5.5E-11
Lead	I	166	mg/kg	1.34E-07	2.2E-10	ND	
						SUMMARY CANCER RISK	6E-11

TABLE E-11

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION RfD (mg/kg-day)	HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	7.87E-10	4.6E-12	ND	
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	3.8E-12	ND	
Benzo(b)fluoranthene	O	710	ug/kg	5.73E-10	3.4E-12	ND	
Benzo(k)fluoranthene	O	800	ug/kg	6.45E-10	3.8E-12	ND	
Chrysene	O	1140	ug/kg	9.19E-10	5.4E-12	ND	
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.64E-10	9.6E-13	ND	
Dieldrin	O	74	ug/kg	5.97E-11	3.5E-13	ND	
Arsenic	I	2.7	mg/kg	2.18E-09	1.3E-11	ND	
Iron	I	6930	mg/kg	5.59E-06	3.3E-08	ND	
Lead	I	166	mg/kg	1.34E-07	7.9E-10	ND	
						SUMMARY HAZARD INDEX	0E+00

TABLE E-12

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA_i	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganics
	CF	1.00E-09	kg/mg	Organics
BODY WEIGHT	BW	45	kg	USEPA, 1995
AGE-SPECIFIC BODY WEIGHT	BW_i	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	45	days/year [1]	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED_i	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/adj}$	1013	cm²-year/kg	Per USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	Per USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose.
[2] In estimating the dermally absorbed dose for children age 7 through 16, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 10 age periods, age 7 through 16, per USEPA, 1992.

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{HAZARD QUOTIENT} = \text{INTAKE (mg/kg-day)} / \text{REFERENCE DOSE (mg/kg-day)}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ \text{days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = AT \times 365\ \text{days/year}) \times SA_{soil/adj}$$

Where:

$$SA_{soil/adj} = \text{SUM}\ (SA_i \times ED_i / BW_i)$$

$$DA_{event} = CS \times AF \times ABS_d \times CF$$

Note: For noncarcinogenic effects: AT = ED.

TABLE E-12

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	3.8E-09	7.3E+00	2.8E-08	0.01	1.7E-09	8.0E+00	1.4E-08	4.2E-08
Benzo(a)pyrene	O	806	ug/kg	3.2E-08	7.3E+00	2.3E-07	0.01	1.4E-08	8.0E+00	1.2E-07	3.5E-07
Benzo(b)fluoranthene	O	71	ug/kg	2.8E-09	7.3E+00	2.0E-08	0.01	1.3E-09	8.0E+00	1.0E-08	3.0E-08
Benzo(k)fluoranthene	O	8	ug/kg	3.1E-10	7.3E+00	2.3E-09	0.01	1.4E-10	8.0E+00	1.1E-09	3.4E-09
Chyrsene	O	1.14	ug/kg	4.5E-11	7.3E+00	3.3E-10	0.01	2.0E-11	8.0E+00	1.6E-10	4.9E-10
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	7.9E-10	7.3E+00	5.8E-09	0.01	3.6E-10	8.0E+00	2.9E-09	8.7E-09
Dieldrin	O	74	ug/kg	2.9E-09	1.6E+01	4.6E-08	0.01	1.3E-09	2.0E+01	2.6E-08	7.3E-08
Arsenic	I	2.7	mg/kg	1.1E-07	1.5E+00	1.6E-07	0.001	4.8E-09	1.5E+00	7.2E-09	1.7E-07
Lead	I	166	mg/kg	6.5E-06	ND		0.001	3.0E-07	ND		
				SUMMARY CANCER RISK		2E-06				2E-07	2E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-12

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	2.7E-07	ND		0.01	1.2E-07	ND		
Benzo(a)pyrene	O	806	ug/kg	2.2E-07	ND		0.01	1.0E-07	ND		
Benzo(b)fluoranthene	O	710	ug/kg	1.9E-07	ND		0.01	8.9E-08	ND		
Benzo(k)fluoranthene	O	800	ug/kg	2.2E-07	ND		0.01	1.0E-07	ND		
Chrysene	O	1140	ug/kg	3.1E-07	ND		0.01	1.4E-07	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	5.6E-08	ND		0.01	2.5E-08	ND		
Dieldrin	O	74	ug/kg	2.0E-08	5.0E-05	4.1E-04	0.01	9.2E-09	2.5E-05	3.7E-04	7.8E-04
Arsenic	I	2.7	mg/kg	7.4E-07	3.0E-04	2.5E-03	0.001	3.4E-08	2.9E-04	1.2E-04	2.6E-03
Iron	I	6930	mg/kg	1.9E-03	3.0E-01	6.3E-03	0.001	8.7E-05	6.0E-03	1.4E-02	2.1E-02
Lead	I	166	mg/kg	4.5E-05	ND		0.001	2.1E-06	ND		
SUMMARY HAZARD INDEX						0.009				0.01	0.02

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-13

INHALATION OF PARTICULATES - SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.24E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0.625	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

[1] Florida Soil Clean-Up Goal Variable. FDEP, 1995.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA 1995. Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No. 3, November 1995.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / INHALATION REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

CA = C x CF x (1/PEF)

Note: For noncarcinogenic effects: AT = ED

TABLE E-13

INHALATION OF PARTICULATES - SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	7.87E-11	7.7E-14	3.1E+00	2.4E-13
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	6.4E-13	3.1E+00	2.0E-12
Benzo(b)fluoranthene	O	71	ug/kg	5.73E-11	5.6E-14	3.1E+00	1.7E-13
Benzo(k)fluoranthene	O	8	ug/kg	6.45E-12	6.3E-15	3.1E+00	2.0E-14
Chrysene	O	1.14	ug/kg	9.19E-13	9.0E-16	3.1E+00	2.8E-15
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.64E-11	1.6E-14	3.1E+00	5.0E-14
Dieldrin	O	74	ug/kg	5.97E-11	5.8E-14	1.6E+01	9.3E-13
Arsenic	I	2.7	mg/kg	2.18E-09	2.1E-12	1.5E+01	3.2E-11
Lead	I	166	mg/kg	1.34E-07	1.3E-10	ND	
						SUMMARY CANCER RISK	4E-11

TABLE E-13

INHALATION OF PARTICULATES - SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION RfD (mg/kg-day)	HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	7.87E-10	5.4E-12	ND	
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	4.5E-12	ND	
Benzo(b)fluoranthene	O	710	ug/kg	5.73E-10	3.9E-12	ND	
Benzo(k)fluoranthene	O	800	ug/kg	6.45E-10	4.4E-12	ND	
Chrysene	O	1140	ug/kg	9.19E-10	6.3E-12	ND	
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.64E-10	1.1E-12	ND	
Dieldrin	O	74	ug/kg	5.97E-11	4.1E-13	ND	
Arsenic	I	2.7	mg/kg	2.18E-09	1.5E-11	ND	
Iron	I	6930	mg/kg	5.59E-06	3.8E-08	ND	
Lead	I	166	mg/kg	1.34E-07	9.2E-10	ND	
						SUMMARY HAZARD INDEX	0E+00

TABLE E-14

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic.conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.

USEPA, 1992. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; January 1992.

USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$DA_{event} = CS \times AF \times ABS_d \times CF$$

Note: For noncarcinogenic effects, AT = ED.

TABLE E-14

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	4.6E-08	7.3E+00	3.3E-07	0.01	2.6E-08	8.0E+00	2.1E-07	5.5E-07
Benzo(a)pyrene	O	806	ug/kg	3.8E-07	7.3E+00	2.8E-06	0.01	2.2E-07	8.0E+00	1.7E-06	4.5E-06
Benzo(b)fluoranthene	O	71	ug/kg	3.3E-08	7.3E+00	2.4E-07	0.01	1.9E-08	8.0E+00	1.5E-07	4.0E-07
Benzo(k)fluoranthene	O	8	ug/kg	3.8E-09	7.3E+00	2.7E-08	0.01	2.2E-09	8.0E+00	1.7E-08	4.5E-08
Chyrsene	O	1.14	ug/kg	5.4E-10	7.3E+00	3.9E-09	0.01	3.1E-10	8.0E+00	2.5E-09	6.4E-09
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	9.5E-09	7.3E+00	7.0E-08	0.01	5.5E-09	8.0E+00	4.4E-08	1.1E-07
Dieldrin	O	74	ug/kg	3.5E-08	1.6E+01	5.6E-07	0.01	2.0E-08	2.0E+01	4.0E-07	9.6E-07
Arsenic	I	2.7	mg/kg	1.3E-06	1.5E+00	1.9E-06	0.001	7.3E-08	1.5E+00	1.1E-07	2.0E-06
Lead	I	166	mg/kg	7.8E-05	ND		0.001	4.5E-06	ND		
SUMMARY CANCER RISK						4E-06				3E-06	7E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-14

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	1.3E-06	ND		0.01	7.7E-07	ND		
Benzo(a)pyrene	O	806	ug/kg	1.1E-06	ND		0.01	6.3E-07	ND		
Benzo(b)fluoranthene	O	710	ug/kg	9.7E-07	ND		0.01	5.6E-07	ND		
Benzo(k)fluoranthene	O	800	ug/kg	1.1E-06	ND		0.01	6.3E-07	ND		
Chrysene	O	1140	ug/kg	1.6E-06	ND		0.01	9.0E-07	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	2.8E-07	ND		0.01	1.6E-07	ND		
Dieldrin	O	74	ug/kg	1.0E-07	5.0E-05	2.0E-03	0.01	5.8E-08	2.5E-05	2.3E-03	4.4E-03
Arsenic	I	2.7	mg/kg	3.7E-06	3.0E-04	1.2E-02	0.001	2.1E-07	2.9E-04	7.3E-04	1.3E-02
Iron	I	6930	mg/kg	9.5E-03	3.0E-01	3.2E-02	0.001	5.5E-04	6.0E-03	9.1E-02	1.2E-01
Lead	I	166	mg/kg	2.3E-04	ND		0.001	1.3E-05	ND		
SUMMARY HAZARD INDEX						0.05				0.09	0.1

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November, 1995).
[2] Calculated from oral RfDs.

TABLE E-15

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.24E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0.833	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	16	hours/day	Assumption
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	24	years	USEPA, 1995
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Florida Soil Clean-Up Goal Variable. FDEP, 1995.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / INHALATION REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

CA = C x CF x (1/PEF)

Note:

For noncarcinogenic effects: AT = ED

TABLE E-15

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)-1	CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	7.87E-11	4.9E-12	3.1E+00	**1.5E-11**
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	4.1E-11	3.1E+00	**1.3E-10**
Benzo(b)fluoranthene	O	71	ug/kg	5.73E-11	3.6E-12	3.1E+00	**1.1E-11**
Benzo(k)fluoranthene	O	8	ug/kg	6.45E-12	4.0E-13	3.1E+00	**1.3E-12**
Chrysene	O	1.14	ug/kg	9.19E-13	5.8E-14	3.1E+00	**1.8E-13**
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.64E-11	1.0E-12	3.1E+00	**3.2E-12**
Dieldrin	O	74	ug/kg	5.97E-11	3.7E-12	1.6E+01	**6.0E-11**
Arsenic	I	2.7	mg/kg	2.18E-09	1.4E-10	1.5E+01	**2.0E-09**
Lead	I	166	mg/kg	1.34E-07	8.4E-09	ND	
						SUMMARY CANCER RISK	**2E-09**

TABLE E-15

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION RfD (mg/kg-day)	HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	7.87E-10	1.4E-10	ND	
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	1.2E-10	ND	
Benzo(b)fluoranthene	O	710	ug/kg	5.73E-10	1.0E-10	ND	
Benzo(k)fluoranthene	O	800	ug/kg	6.45E-10	1.2E-10	ND	
Chrysene	O	1140	ug/kg	9.19E-10	1.7E-10	ND	
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.64E-10	3.0E-11	ND	
Dieldrin	O	74	ug/kg	5.97E-11	1.1E-11	ND	
Arsenic	I	2.7	mg/kg	2.18E-09	4.0E-10	ND	
Iron	I	6930	mg/kg	5.59E-06	1.0E-06	ND	
Lead	I	166	mg/kg	1.34E-07	2.4E-08	ND	
						SUMMARY HAZARD INDEX	0E+00

TABLE E-16

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm^2-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm^2	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	350	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/adj}$	766	cm^2-year/kg	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose.

[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, body-weight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992.

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day}^{-1}\text{)}$$

$$\text{HAZARD QUOTIENT} = \text{INTAKE (mg/kg-day)} / \text{REFERENCE DOSE (mg/kg-day)}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = (DA_{event} \times EF / AT \times 365 \text{ days/year}) \times SA_{soil/adj}$$

Where:

$$SA_{soil/adj} = \text{SUM } (SA \times ED / BW)$$

$$DA_{event} = CS \times AF \times ABS \times CF$$

TABLE E-16

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	1.1E-07	7.3E+00	7.8E-07	0.01	1.0E-08	8.0E+00	8.2E-08	8.6E-07
Benzo(a)pyrene	O	806	ug/kg	8.8E-07	7.3E+00	6.4E-06	0.01	8.5E-08	8.0E+00	6.8E-07	7.1E-06
Benzo(b)fluoranthene	O	71	ug/kg	7.8E-08	7.3E+00	5.7E-07	0.01	7.5E-09	8.0E+00	6.0E-08	6.3E-07
Benzo(k)fluoranthene	O	8	ug/kg	8.8E-09	7.3E+00	6.4E-08	0.01	8.4E-10	8.0E+00	6.7E-09	7.1E-08
Chyrsene	O	1.14	ug/kg	1.2E-09	7.3E+00	9.1E-09	0.01	1.2E-10	8.0E+00	9.6E-10	1.0E-08
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	2.2E-08	7.3E+00	1.6E-07	0.01	2.1E-09	8.0E+00	1.7E-08	1.8E-07
Dieldrin	O	74	ug/kg	8.1E-08	1.6E+01	1.3E-06	0.01	7.8E-09	2.0E+01	1.6E-07	1.5E-06
Arsenic	I	2.7	mg/kg	3.0E-06	1.5E+00	4.4E-06	0.001	2.8E-08	1.5E+00	4.2E-08	4.5E-06
Lead	I	166	mg/kg	1.8E-04	ND		0.001	1.7E-06	ND		
				SUMMARY CANCER RISK		6E-05				1E-06	6E-05

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-16

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	1.2E-05	ND		0.01	1.2E-06	ND		
Benzo(a)pyrene	O	806	ug/kg	1.0E-05	ND		0.01	9.9E-07	ND		
Benzo(b)fluoranthene	O	710	ug/kg	9.1E-06	ND		0.01	8.7E-07	ND		
Benzo(k)fluoranthene	O	800	ug/kg	1.0E-05	ND		0.01	9.8E-07	ND		
Chrysene	O	1140	ug/kg	1.5E-05	ND		0.01	1.4E-06	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	2.6E-06	ND		0.01	2.5E-07	ND		
Dieldrin	O	74	ug/kg	9.5E-07	5.0E-05	1.9E-02	0.01	9.1E-08	2.5E-05	3.6E-03	2.3E-02
Arsenic	I	2.7	mg/kg	3.5E-05	3.0E-04	1.2E-01	0.001	3.3E-07	2.9E-04	1.1E-03	1.2E-01
Iron	I	6930	mg/kg	8.9E-02	3.0E-01	3.0E-01	0.001	8.5E-04	6.0E-03	1.4E-01	4.4E-01
Lead	I	166	mg/kg	2.1E-03	ND		0.001	2.0E-05	ND		
					SUMMARY HAZARD INDEX	0.4				0.1	0.6

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-17

INHALATION OF PARTICULATES - SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.24E+09	m^3/kg	default [1]
CONCENTRATION IN AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0.625	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	15	kg	USEPA, 1991
EXPOSURE TIME	ET	24	hours/day	Assumption
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1991
EXPOSURE DURATION	ED	6	years	USEPA, 1991
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1991

[1] Florida Soil Clean-Up Goal Variable. FDEP, 1995.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1995. Supplemental Guidance to RAGS: Region 4 Bulletins, Bulletin No. 3, November 1995.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / INHALATION REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

CA = C x CF x (1/PEF)

Note:

For noncarcinogenic effects: AT = ED

TABLE E-17

INHALATION OF PARTICULATES - SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)-1	CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	7.87E-11	6.5E-12	3.1E+00	**2.0E-11**
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	5.3E-11	3.1E+00	**1.7E-10**
Benzo(b)fluoranthene	O	71	ug/kg	5.73E-11	4.7E-12	3.1E+00	**1.5E-11**
Benzo(k)fluoranthene	O	8	ug/kg	6.45E-12	5.3E-13	3.1E+00	**1.6E-12**
Chrysene	O	1.14	ug/kg	9.19E-13	7.6E-14	3.1E+00	**2.3E-13**
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.64E-11	1.3E-12	3.1E+00	**4.2E-12**
Dieldrin	O	74	ug/kg	5.97E-11	4.9E-12	1.6E+01	**7.8E-11**
Arsenic	I	2.7	mg/kg	2.18E-09	1.8E-10	1.5E+01	**2.7E-09**
Lead	I	166	mg/kg	1.34E-07	1.1E-08	ND	
						SUMMARY CANCER RISK	**3E-09**

TABLE E-17

INHALATION OF PARTICULATES - SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION RfD (mg/kg-day)	HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	7.87E-10	7.5E-10	ND	
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	6.2E-10	ND	
Benzo(b)fluoranthene	O	710	ug/kg	5.73E-10	5.5E-10	ND	
Benzo(k)fluoranthene	O	800	ug/kg	6.45E-10	6.2E-10	ND	
Chrysene	O	1140	ug/kg	9.19E-10	8.8E-10	ND	
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.64E-10	1.6E-10	ND	
Dieldrin	O	74	ug/kg	5.97E-11	5.7E-11	ND	
Arsenic	I	2.7	mg/kg	2.18E-09	2.1E-09	ND	
Iron	I	6930	mg/kg	5.59E-06	5.4E-06	ND	
Lead	I	166	mg/kg	1.34E-07	1.3E-07	ND	
						SUMMARY HAZARD INDEX	0E+00

TABLE E-18

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm^2-event	USEPA, 1995
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm^2	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1992. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; 1/92.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$DA_{event} = CS \times AF \times ABS \times CF$$

Note: For noncarcinogenic effects, AT = ED

TABLE E-18

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	2.0E-09	7.3E+00	1.5E-08	0.01	2.4E-09	8.0E+00	1.9E-08	3.4E-08
Benzo(a)pyrene	O	806	ug/kg	1.7E-08	7.3E+00	1.2E-07	0.01	1.9E-08	8.0E+00	1.6E-07	2.8E-07
Benzo(b)fluoranthene	O	71	ug/kg	1.5E-09	7.3E+00	1.1E-08	0.01	1.7E-09	8.0E+00	1.4E-08	2.5E-08
Benzo(k)fluoranthene	O	8	ug/kg	1.7E-10	7.3E+00	1.2E-09	0.01	1.9E-10	8.0E+00	1.5E-09	2.8E-09
Chyrsene	O	1.14	ug/kg	2.4E-11	7.3E+00	1.7E-10	0.01	2.7E-11	8.0E+00	2.2E-10	3.9E-10
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	4.3E-10	7.3E+00	3.1E-09	0.01	4.9E-10	8.0E+00	3.9E-09	7.0E-09
Dieldrin	O	74	ug/kg	1.6E-09	1.6E+01	2.5E-08	0.01	1.8E-09	2.0E+01	3.6E-08	6.1E-08
Arsenic	I	2.7	mg/kg	5.7E-08	1.5E+00	8.5E-08	0.001	6.5E-09	1.5E+00	9.8E-09	9.5E-08
Lead	I	166	mg/kg	3.5E-06	ND		0.001	4.0E-07	ND		
SUMMARY CANCER RISK						1E-06				3E-07	1E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-18

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	5.7E-08	ND		0.01	6.6E-08	ND		
Benzo(a)pyrene	O	806	ug/kg	4.7E-08	ND		0.01	5.4E-08	ND		
Benzo(b)fluoranthene	O	710	ug/kg	4.2E-08	ND		0.01	4.8E-08	ND		
Benzo(k)fluoranthene	O	800	ug/kg	4.7E-08	ND		0.01	5.4E-08	ND		
Chrysene	O	1140	ug/kg	6.7E-08	ND		0.01	7.7E-08	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.2E-08	ND		0.01	1.4E-08	ND		
Dieldrin	O	74	ug/kg	4.3E-09	5.0E-05		0.01	5.0E-09	2.5E-05	2.0E-04	2.0E-04
Arsenic	I	2.7	mg/kg	1.6E-07	3.0E-04	5.3E-04	0.001	1.8E-08	2.9E-04	6.3E-05	5.9E-04
Iron	I	6930	mg/kg	4.1E-04	3.0E-01	1.4E-03	0.001	4.7E-05	6.0E-03	7.8E-03	9.2E-03
Lead	I	166	mg/kg	9.7E-06	ND		0.001	1.1E-06	ND		
SUMMARY HAZARD INDEX						0.002				0.008	0.01

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-19

INHALATION OF PARTICULATES - SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.24E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	2.5	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	30	days/year	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Florida Soil Clean-Up Goal Variable. FDEP, 1995.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance:
"Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1995. Supplemental Guidance to RAGS: Region 4 Bulletins, Bulletin No. 3, November 1995.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / INHALATION REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

CA = C x CF x (1/PEF)

Note: For noncarcinogenic effects, AT = ED

TABLE E-19

INHALATION OF PARTICULATES - SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	7.87E-11	6.6E-13	3.1E+00	2.0E-12
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	5.5E-12	3.1E+00	1.7E-11
Benzo(b)fluoranthene	O	71	ug/kg	5.73E-11	4.8E-13	3.1E+00	1.5E-12
Benzo(k)fluoranthene	O	8	ug/kg	6.45E-12	5.4E-14	3.1E+00	1.7E-13
Chrysene	O	1.14	ug/kg	9.19E-13	7.7E-15	3.1E+00	2.4E-14
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.64E-11	1.4E-13	3.1E+00	4.3E-13
Dieldrin	O	74	ug/kg	5.97E-11	5.0E-13	1.6E+01	8.0E-12
Arsenic	I	2.7	mg/kg	2.18E-09	1.8E-11	1.5E+01	2.7E-10
						SUMMARY CANCER RISK	3E-10

TABLE E-19

INHALATION OF PARTICULATES - SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION RfD (mg/kg-day)	HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	7.87E-10	1.8E-11	ND	
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	1.5E-11	ND	
Benzo(b)fluoranthene	O	710	ug/kg	5.73E-10	1.3E-11	ND	
Benzo(k)fluoranthene	O	800	ug/kg	6.45E-10	1.5E-11	ND	
Chrysene	O	1140	ug/kg	9.19E-10	2.2E-11	ND	
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.64E-10	3.8E-12	ND	
Dieldrin	O	74	ug/kg	5.97E-11	1.4E-12	ND	
Arsenic	I	2.7	mg/kg	2.18E-09	5.1E-11	ND	
Iron	I	6930	mg/kg	5.59E-06	1.3E-07	ND	
Lead	I	166	mg/kg	1.34E-07	3.1E-09	ND	
						SUMMARY HAZARD INDEX	0E+00

TABLE E-20

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm^2-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,300	cm^2	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1995
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	250	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1992. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; 1/92.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

DA_{event} = CS x AF x ABS x CF

Note: For noncarcinogenic effects, AT = ED

TABLE E-20

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	1.7E-08	7.3E+00	1.2E-07	0.01	7.8E-09	8.0E+00	6.3E-08	1.9E-07
Benzo(a)pyrene	O	806	ug/kg	1.4E-07	7.3E+00	1.0E-06	0.01	6.5E-08	8.0E+00	5.2E-07	1.5E-06
Benzo(b)fluoranthene	O	71	ug/kg	1.2E-08	7.3E+00	9.1E-08	0.01	5.7E-09	8.0E+00	4.6E-08	1.4E-07
Benzo(k)fluoranthene	O	8	ug/kg	1.4E-09	7.3E+00	1.0E-08	0.01	6.4E-10	8.0E+00	5.1E-09	1.5E-08
Chyrsene	O	1.14	ug/kg	2.0E-10	7.3E+00	1.5E-09	0.01	9.2E-11	8.0E+00	7.3E-10	2.2E-09
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	3.5E-09	7.3E+00	2.6E-08	0.01	1.6E-09	8.0E+00	1.3E-08	3.9E-08
Dieldrin	O	74	ug/kg	1.3E-08	1.6E+01	2.1E-07	0.01	5.9E-09	2.0E+01	1.2E-07	3.3E-07
Arsenic	I	2.7	mg/kg	4.7E-07	1.5E+00	7.1E-07	0.001	2.2E-08	1.5E+00	3.3E-08	7.4E-07
Lead	I	166	mg/kg	2.9E-05	ND		0.001	1.3E-06	ND		
SUMMARY CANCER RISK						1E-06				6E-07	2E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-20

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	4.8E-07	ND		0.01	2.2E-07	ND		
Benzo(a)pyrene	O	806	ug/kg	3.9E-07	ND		0.01	1.8E-07	ND		
Benzo(b)fluoranthene	O	710	ug/kg	3.5E-07	ND		0.01	1.6E-07	ND		
Benzo(k)fluoranthene	O	800	ug/kg	3.9E-07	ND		0.01	1.8E-07	ND		
Chrysene	O	1140	ug/kg	5.6E-07	ND		0.01	2.6E-07	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	9.9E-08	ND		0.01	4.6E-08	ND		
Dieldrin	O	74	ug/kg	3.6E-08	5.0E-05	7.2E-04	0.01	1.7E-08	2.5E-05	6.7E-04	1.4E-03
Arsenic	I	2.7	mg/kg	1.3E-06	ND		0.001	6.1E-08	ND		
Iron	I	6930	mg/kg	3.4E-03	4.0E-02	8.5E-02	0.001	1.6E-04	4.0E-02	3.9E-03	8.9E-02
Lead	I	166	mg/kg	8.1E-05	4.0E-02	2.0E-03	0.001	3.7E-06	4.0E-02	9.3E-05	2.1E-03
SUMMARY HAZARD INDEX						0.09				0.005	0.09

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-21

INHALATION OF PARTICULATES - SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.24E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0.833	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	250	days/year	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Florida Soil Clean-Up Goal Variable. FDEP, 1995.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance:
"Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1995. Supplemental Guidance to RAGS: Region 4 Bulletins, Bulletin No. 3, November 1995.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / INHALATION REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

CA = C x CF x (1/PEF)

Note: For noncarcinogenic effects, AT = ED.

TABLE E-21

INHALATION OF PARTICULATES - SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	7.87E-11	1.8E-12	3.1E+00	**5.7E-12**
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	1.5E-11	3.1E+00	**4.7E-11**
Benzo(b)fluoranthene	O	71	ug/kg	5.73E-11	1.3E-12	3.1E+00	**4.1E-12**
Benzo(k)fluoranthene	O	8	ug/kg	6.45E-12	1.5E-13	3.1E+00	**4.7E-13**
Chrysene	O	1.14	ug/kg	9.19E-13	2.1E-14	3.1E+00	**6.6E-14**
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.64E-11	3.8E-13	3.1E+00	**1.2E-12**
Dieldrin	O	74	ug/kg	5.97E-11	1.4E-12	1.6E+01	**2.2E-11**
Arsenic	I	2.7	mg/kg	2.18E-09	5.1E-11	1.5E+01	**7.6E-10**
Lead	I	166	mg/kg	1.34E-07	3.1E-09	ND	
				SUMMARY CANCER RISK			**8E-10**

TABLE E-21

INHALATION OF PARTICULATES - SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION RfD (mg/kg-day)	HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	7.87E-10	5.1E-11	ND	
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	4.2E-11	ND	
Benzo(b)fluoranthene	O	710	ug/kg	5.73E-10	3.7E-11	ND	
Benzo(k)fluoranthene	O	800	ug/kg	6.45E-10	4.2E-11	ND	
Chrysene	O	1140	ug/kg	9.19E-10	6.0E-11	ND	
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.64E-10	1.1E-11	ND	
Dieldrin	O	74	ug/kg	5.97E-11	3.9E-12	ND	
Arsenic	I	2.7	mg/kg	2.18E-09	1.4E-10	ND	
Iron	I	6930	mg/kg	5.59E-06	3.6E-07	ND	
Lead	I	166	mg/kg	1.34E-07	8.7E-09	ND	
						SUMMARY HAZARD INDEX	0E+00

TABLE E-22

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	480	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	1	years	USEPA, 1991
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	1	years	USEPA, 1991

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.

USEPA, 1992. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; 1/92.

USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DAevent \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$DA_{event} = CS \times AF \times ABS \times CF$$

Note: For noncarcinogenic effects, AT = ED

TABLE E-22

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	7.9E-10	7.3E+00	5.7E-09	0.01	9.4E-11	8.0E+00	7.5E-10	6.5E-09
Benzo(a)pyrene	O	806	ug/kg	6.5E-09	7.3E+00	4.7E-08	0.01	7.8E-10	8.0E+00	6.2E-09	5.4E-08
Benzo(b)fluoranthene	O	71	ug/kg	5.7E-10	7.3E+00	4.2E-09	0.01	6.8E-11	8.0E+00	5.5E-10	4.7E-09
Benzo(k)fluoranthene	O	8	ug/kg	6.4E-11	7.3E+00	4.7E-10	0.01	7.7E-12	8.0E+00	6.2E-11	5.3E-10
Chyrsene	O	1.14	ug/kg	9.2E-12	7.3E+00	6.7E-11	0.01	1.1E-12	8.0E+00	8.8E-12	7.6E-11
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.6E-10	7.3E+00	1.2E-09	0.01	2.0E-11	8.0E+00	1.6E-10	1.3E-09
Dieldrin	O	74	ug/kg	6.0E-10	1.6E+01	9.5E-09	0.01	7.1E-11	2.0E+01	1.4E-09	1.1E-08
Arsenic	I	2.7	mg/kg	2.2E-08	1.5	3.3E-08	0.001	2.6E-10	1.5	3.9E-10	3.3E-08
Lead	I	166	mg/kg	1.3E-06	ND		0.001	1.6E-08	ND		
SUMMARY CANCER RISK						5E-08				6E-10	5E-08

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-22

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD [1] (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [3] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	5.5E-07	ND		0.01	6.6E-08	ND		
Benzo(a)pyrene	O	806	ug/kg	4.5E-07	ND		0.01	5.4E-08	ND		
Benzo(b)fluoranthene	O	710	ug/kg	4.0E-07	ND		0.01	4.8E-08	ND		
Benzo(k)fluoranthene	O	800	ug/kg	4.5E-07	ND		0.01	5.4E-08	ND		
Chrysene	O	1140	ug/kg	6.4E-07	ND		0.01	7.7E-08	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.1E-07	ND		0.01	1.4E-08	ND		
Dieldrin	O	74	ug/kg	4.2E-08	5.0E-05	8.3E-04	0.01	5.0E-09	4.8E-05	1.0E-04	9.4E-04
Arsenic	I	2.7	mg/kg	1.5E-06	3.0E-04	5.1E-03	0.001	1.8E-08	2.9E-04	6.3E-05	5.1E-03
Iron	I	6930	mg/kg	3.9E-03	3.0E-01	1.3E-02	0.001	4.7E-05	6.0E-03	7.8E-03	2.1E-02
Lead	I	166	mg/kg	9.4E-05	ND		0.001	1.1E-06	ND		
SUMMARY HAZARD INDEX						0.02				0.008	0.03

[1] Subchronic Rfd values were used for the excavation worker due to short exposure scenario.
[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (USEPA, 1995).
[3] Calculated from oral RfDs.

TABLE E-23

INHALATION OF PARTICULATES - SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.24E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	2.5	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	30	days/year	Assumption
EXPOSURE DURATION	ED	1	years	Assumption
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	1	years	USEPA, 1991

[1] Florida Soil Clean-Up Goal Variable. FDEP, 1995.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance:
Standard Default Exposure Factors; OSWER Directive 9285.6-03.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / INHALATION REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

CA = C x CF x (1/PEF)

Note: For noncarcinogens, AT = ED.

TABLE E-23

INHALATION OF PARTICULATES - SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	7.87E-11	2.6E-14	3.1E+00	8.2E-14
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	2.2E-13	3.1E+00	6.8E-13
Benzo(b)fluoranthene	O	71	ug/kg	5.73E-11	1.9E-14	3.1E+00	6.0E-14
Benzo(k)fluoranthene	O	8	ug/kg	6.45E-12	2.2E-15	3.1E+00	6.7E-15
Chrysene	O	1.14	ug/kg	9.19E-13	3.1E-16	3.1E+00	9.6E-16
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.64E-11	5.5E-15	3.1E+00	1.7E-14
Dieldrin	O	74	ug/kg	5.97E-11	2.0E-14	1.6E+01	3.2E-13
Arsenic	I	2.7	mg/kg	2.18E-09	7.3E-13	1.5E+01	1.1E-11
Lead	I	166	mg/kg	1.34E-07	4.5E-11	ND	
				SUMMARY CANCER RISK			1E-11

TABLE E-23

INHALATION OF PARTICULATES - SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION RfD (mg/kg-day)	HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	7.87E-10	1.8E-11	ND	
Benzo(a)pyrene	O	806	ug/kg	6.50E-10	1.5E-11	ND	
Benzo(b)fluoranthene	O	710	ug/kg	5.73E-10	1.3E-11	ND	
Benzo(k)fluoranthene	O	800	ug/kg	6.45E-10	1.5E-11	ND	
Chrysene	O	1140	ug/kg	9.19E-10	2.2E-11	ND	
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.64E-10	3.8E-12	ND	
Dieldrin	O	74	ug/kg	5.97E-11	1.4E-12	ND	
Arsenic	I	2.7	mg/kg	2.18E-09	5.1E-11	ND	
Iron	I	6930	mg/kg	5.59E-06	1.3E-07	ND	
Lead	I	166	mg/kg	1.34E-07	3.1E-09	ND	
						SUMMARY HAZARD INDEX	0E+00

TABLE E-24

INGESTION OF GROUNDWATER AS DRINKING WATER (UNFILTERED SAMPLES)
ADULT RESIDENT
SITE 11
MILTON, FLORIDA

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION WATER	CW	chemical-specific	ug/liter	
INGESTION RATE	IR	2	liters/day	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
CONVERSION FACTOR	CF	0.001	mg/ug	
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1991

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance:
"Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1995. Region IV Supplemental Gudance to RAGS, Bulletin No. 3, November.

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)-1

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{\text{CW x IR x EF x ED x CF}}{\text{BW x AT x 365 days/year}}$$

Note: For noncarcinogenic effects, AT = ED.

TABLE E-24

INGESTION OF GROUNDWATER AS DRINKING WATER (UNFILTERED SAMPLES)
ADULT RESIDENT
SITE 11
MILTON, FLORIDA

CARCINOGENIC EFFECTS

COMPOUND	WATER CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	CANCER SLOPE FACTOR (mg/kg-day)^-1	CANCER RISK INGESTION
Benzene	2	UG/LITER	1.9E-05	2.9E-02	5.4E-07
Vinyl chloride	2	UG/LITER	1.9E-05	1.9E+00	3.6E-05
bis(2-Ethylhexyl)phthalate	5.1	UG/LITER	4.8E-05	1.4E-02	6.7E-07
Arsenic	1.1	UG/LITER	1.0E-05	1.5E+00	1.5E-05
				TOTAL CANCER RISK	5E-05

NONCARCINOGENIC EFFECTS

COMPOUND	WATER CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	REFERENCE DOSE (mg/kg-day)	HAZARD QUOTIENT INGESTION
1,2-Dichloroethene	4.7	UG/LITER	1.3E-04	9.0E-03	1.4E-02
Benzene	2	UG/LITER	5.5E-05	3.0E-04	1.8E-01
Vinyl chloride	2	UG/LITER	5.5E-05	ND	
bis(2-Ethylhexyl)phthalate	5.1	UG/LITER	1.4E-04	2.0E-02	7.0E-03
Aluminum	628	UG/LITER	1.7E-02	1.0E+00	1.7E-02
Arsenic	1.1	UG/LITER	3.0E-05	3.0E-04	1.0E-01
Iron	3440	UG/LITER	9.4E-02	3.0E-01	3.1E-01
Manganese	135	UG/LITER	3.7E-03	4.7E-02	7.9E-02
Thallium	0.37	UG/LITER	1.0E-05	8.0E-05	1.3E-01
				TOTAL HAZARD INDEX	1

ND = no data available.

TABLE E-25

INGESTION OF GROUNDWATER AS DRINKING WATER (UNFILTERED SAMPLES) IN CAPTURE ZONE
CHILD RESIDENT
SITE 11
MILTON, FLORDIA

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION WATER	CW	chemical-specific	ug/liter	
INGESTION RATE	IR	1	liters/day	USEPA, 1995
BODY WEIGHT	BW	15	kg	USEPA, 1991
CONVERSION FACTOR	CF	0.001	mg/ug	
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1991

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance:
"Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1995. Region IV Supplemental Gudance to RAGS, Bulletin No. 3, November.

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)-1

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{\text{CW x IR x EF x ED x CF}}{\text{BW x AT x 365 days/year}}$$

Note: For noncarcinogenic effects, AT = ED.

TABLE E-25

INGESTION OF GROUNDWATER AS DRINKING WATER (UNFILTERED SAMPLES) IN CAPTURE ZONE
CHILD RESIDENT
SITE 11
MILTON, FLORDIA

CARCINOGENIC EFFECTS

COMPOUND	WATER CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	CANCER SLOPE FACTOR (mg/kg-day)^-1	CANCER RISK INGESTION
Benzene	2	UG/LITER	1.1E-05	2.9E-02	3.2E-07
Vinyl chloride	2	UG/LITER	1.1E-05	1.9E+00	2.1E-05
bis(2-Ethylhexyl)phthalate	5.1	UG/LITER	2.8E-05	1.4E-02	3.9E-07
Arsenic	1.1	UG/LITER	6.0E-06	1.5E+00	9.0E-06
				TOTAL CANCER RISK	3E-05

NONCARCINOGENIC EFFECTS

COMPOUND	WATER CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	REFERENCE DOSE (mg/kg-day)	HAZARD QUOTIENT INGESTION
1,2-Dichloroethene	4.7	UG/LITER	3.0E-04	9.0E-03	3.3E-02
Benzene	2	UG/LITER	1.3E-04	3.0E-04	4.3E-01
Vinyl chloride	2	UG/LITER	1.3E-04	ND	
bis(2-Ethylhexyl)phthalate	6	UG/LITER	3.8E-04	2.0E-02	1.9E-02
Aluminum	628	UG/LITER	4.0E-02	1.0E+00	4.0E-02
Arsenic	1.1	UG/LITER	7.0E-05	3.0E-04	
Iron	3440	UG/LITER	2.2E-01	3.0E-01	7.3E-01
Manganese	135	UG/LITER	8.6E-03	4.7E-02	1.8E-01
Thallium	0.37	UG/LITER	2.4E-05	8.0E-05	3.0E-01
				TOTAL HAZARD INDEX	1

TABLE E-26

INHALATION EXPOSURE TO VOCs WHILE SHOWERING
ADULT RESIDENT
SITE 11
MILTON, FLORDIA

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SHOWER AIR	CA [1]	chemical-s	ug/m^3	Modeled
CONVERSION FACTOR 1	CF_1	24	hours/day	
EXPOSURE TIME SHOWER	ET	0.2	hours/day	USEPA. 1989
EXPOSURE FREQUENCY	EF	350	days/year	USEPA. 1991
EXPOSURE DURATION	ED	24	years	USEPA. 1991
CONVERSION FACTOR 2	CF_2	365	days/year	
AVERAGING TIME CANCER	AT	70	years	USEPA. 1989
AVERAGING TIME NONCANCER	AT	24	years	USEPA. 1989

[1] Calculated via model by Foster and Chrostowski, Air Pollution Control Association Annual Meeting. 1987.
USEPA. 1989. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual. (Part A) EPA/540/1-89/002; December 1989.
USEPA. 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Assumptions".

EQUATIONS

CANCER RISK = AVG. CONC. (ug/m^3) * CANCER UNIT RISK (ug/m^3)$^{-1}$

HAZARD QUOTIENT = AVG.CONC.(ug/m^3)/REF. CONC. (ug/m^3)

$$\text{AVG. CONC.} = \frac{CA_{air} * EF * ET * ED}{AT * CF1 * CF2}$$

TABLE E-26

INHALATION EXPOSURE TO VOCs WHILE SHOWERING
ADULT RESIDENT
SITE 11
MILTON, FLORDIA

CARCINOGENIC EFFECTS

COMPOUND	VOLATILE OR NON-VOLATILE? V/NV	SHOWER AIR CONCENTRATION (ug/m^3)	AVERAGE AIR CONCENTRATION LIFETIME (ug/m^3)	INHALATION CANCER UNIT RISK $(ug/m^3)^{-1}$	CANCER RISK
Benzene	V	10.71	2.9E-02	8.3E-06	2.4E-07
Vinyl Chloride	V	12.01	3.3E-02	8.4E-05	2.8E-06
1,2-Dichloroethene	V	23.22	6.4E-02		NA
Arsenic	NV	NA	NA		NA
			SUMMARY CANCER RISK		3E-06

NA = not applicable. This analyte is not volatile and has therefore not been evaluated via this volatilization model.

TABLE E-26

INHALATION EXPOSURE TO VOCs WHILE SHOWERING
ADULT RESIDENT
SITE 11
MILTON, FLORDIA

NONCARCINOGENIC EFFECTS

COMPOUND	VOLATILE OR NON-VOLATILE? V/NV	SHOWER AIR CONCENTRATION (ug/m^3)	AVERAGE AIR CONCENTRATION FOR TIME PERIOD (ug/m^3)	CHRONIC INHALATION RfC [1] (ug/m^3)	HAZARD QUOTIENT
Benzene	V	10.71	8.6E-02	ND	
Vinyl Chloride	V	12.01	9.6E-02	ND	
1,2-Dichloroethene	V	23.22	1.9E-01	ND	
Aluminum	NV	ND	NA	ND	
Arsenic	NV	ND	NA	ND	
Iron	NV	ND	NA	ND	
Manganese	NV	ND	NA	ND	
Thallium	NV	ND	NA	ND	
				SUMMARY HAZARD INDEX	0.00

[1] RfC is the Reference Concentration published by USEPA.
ND = no data available.
NA = not applicable. The analyte is not volatile and has therefore not been evaluated via this volatilization model.

TABLE E-27

CONCENTRATION OF VOCs WHILE SHOWERING
ADULT RESIDENT
SITE 11
MILTON, FLORDIA

EMPIRICAL CONSTANTS

CONSTANT	SYMBOL	VALUE	UNIT	SOURCE
Liquid-film mass transfer for CO_2	K_l (CO_2)	20	cm/hr	Calculated
Gas-film mass transfer for water	K_g (H_2O)	3000	cm/hr	Calculated
Molar gas constant x Temperature	RT	0.024	atm-m³/mole	
Reference temperature	T_1	293	K	
Temperature of shower water	T_s	318	K	Assumption
Viscosity of water at shower temperature	u_s	0.6178	cp	Calculated
Viscosity of water at reference temperature	u_1	0.65	cp	Calculated
Shower droplet free-fall time	t_s	1.5	sec	Assumption
Droplet diameter	d	1	mm	Foster & Chrostowski, 1987
Flow rate in shower	FR	20	l/min	Assumption
Volume of shower area	SV	12	m³	Assumption
Air exchange rate	R	0.03	min^{-1}	Calculated
Time in shower	D_s	12	min	USEPA, 1989
Time at which concentration is being calculated	t	12	min	Assumption

Foster, S.A. and Chrostowski, P.C., 1987. Inhalation Exposures to Volatile Organic Contaminants in the Shower.
USEPA, 1989, Exposure Factors Handbook; EPA/600/8-89/043, May 1989.
All equations and definitions of terms are presented in the Appendix to this report, Calculation of Air Concentration Using the Shower Model.

TABLE E-27

CONCENTRATION OF VOCs WHILE SHOWERING
ADULT RESIDENT
SITE 11
MILTON, FLORDIA
INTERIM CORRECTIVE MEASURE

SHOWER CONCENTRATIONS

COMPOUND	C_w (ug/l)	MW (g/mol)	H (atm-m³/mol)	k_l (cm/hr)	k_g (cm/hr)	K_L (cm/hr)	K_{al} (cm/hr)	C_{wd} (µg/l)	S (µg/m³-min)	$C_{(voc)}$ (µg/m³)
1,2-Dichloroethene (total)	4.7	97.0	0.00758	1.3E+01	1.3E+03	1.3E+01	1.4E+01	1.4E+00	2.3E+00	**2.3E+01**
Benzene	2	78.0	0.0056	1.5E+01	1.4E+03	1.4E+01	1.5E+01	6.4E-01	1.1E+00	**1.1E+01**
Vinyl Chloride	2	63.0	0.027	1.7E+01	1.6E+03	1.7E+01	1.8E+01	7.2E-01	1.2E+00	**1.2E+01**

C_w = Concentration in groundwater
MW = Molecular weight
H = Henry's Law constant
k_l = Chemical-specific mass-transfer coefficient
k_g = Chemical-specific gas mass-transfer coefficient
K_L = Mass transfer coefficient
K_{al} = Temperature correction of mass transfer coefficient
C_{wd} = Analyte concentration in water droplet
S = Release rate of analyte to air
$C_{(voc)}$ = Analyte concentration in bathroom air at time t.

$$C_{(voc)} = (S/R) \times (e^{(RDs)}-1) \times e^{(-Rt)}$$

TABLE E-28

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1996
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	0.2	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS_d	chemical specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,000	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DAevent	chemical specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
	CF	1.00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	45	days/year	USEPA, 1992
EXPOSURE DURATION	ED	7	years	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	7	years	USEPA, 1992

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1992. Region 6 Memorandum: Central Tendency and RME Exposure Parameters.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.
USEPA, 1996. Exposure Factors Handbook, 1996.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DAevent \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$DAevent = AF \times ABS_d \times CF$

Note: For noncarcinogenic effects: AT = ED

TABLE E-28

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	8.6E-10	7.3E+00	6.3E-09	0.01	1.7E-10	8.0E+00	1.4E-09	7.6E-09
Benzo(a)pyrene	O	806	ug/kg	7.1E-09	7.3E+00	5.2E-08	0.01	1.4E-09	8.0E+00	1.1E-08	6.3E-08
Benzo(b)fluoranthene	O	71	ug/kg	6.3E-10	7.3E+00	4.6E-09	0.01	1.3E-10	8.0E+00	1.0E-09	5.6E-09
Benzo(k)fluoranthene	O	8	ug/kg	7.0E-11	7.3E+00	5.1E-10	0.01	1.4E-11	8.0E+00	1.1E-10	6.3E-10
Chyrsene	O	1.14	ug/kg	1.0E-11	7.3E+00	7.3E-11	0.01	2.0E-12	8.0E+00	1.6E-11	8.9E-11
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.8E-10	7.3E+00	1.3E-09	0.01	3.6E-11	8.0E+00	2.9E-10	1.6E-09
Dieldrin	O	74	ug/kg	6.5E-10	1.6E+01	1.0E-08	0.01	1.3E-10	2.0E+01	2.6E-09	1.3E-08
Arsenic	I	2.7	mg/kg	2.4E-08	1.5E+00	3.6E-08	0.001	4.8E-10	1.5E+00	7.1E-10	3.6E-08
Lead	I	166	mg/kg	1.5E-06	ND		0.001	2.9E-08	ND		
SUMMARY CANCER RISK						7E-08				2E-08	9E-08

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-28

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	8.6E-08	ND		0.01	1.7E-08	ND		
Benzo(a)pyrene	O	806	ug/kg	7.1E-08	ND		0.01	1.4E-08	ND		
Benzo(b)fluoranthene	O	710	ug/kg	6.3E-08	ND		0.01	1.3E-08	ND		
Benzo(k)fluoranthene	O	800	ug/kg	7.0E-08	ND		0.01	1.4E-08	ND		
Chrysene	O	1140	ug/kg	1.0E-07	ND		0.01	2.0E-08	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.8E-08	ND		0.01	3.6E-09	ND		
Dieldrin	O	74	ug/kg	6.5E-09	5.0E-05	1.3E-04	0.01	1.3E-09	2.5E-05	5.2E-05	1.8E-04
Arsenic	I	2.7	mg/kg	2.4E-07	3.0E-04	7.9E-04	0.001	4.8E-09	2.9E-04	1.6E-05	8.1E-04
Iron	I	6930	mg/kg	6.1E-04	3.0E-01	2.0E-03	0.001	1.2E-05	6.0E-03	2.0E-03	4.1E-03
Lead	I	166	mg/kg	1.5E-05	ND		0.001	2.9E-07	ND		
SUMMARY HAZARD INDEX						0.003				0.00	0.01

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-29

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1996
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	0.2	mg/cm²-event	USEPA, 1992
AGE-SPECIFIC SURFACE AREA	SA_i	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
	CF	1.00E-09	kg/mg	Organic conversion
BODY WEIGHT	BW	45	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW_i	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	45	days/year [1]	USEPA, 1996
EXPOSURE DURATION	ED	2	years	USEPA, 1992
AGE-SPECIFIC EXPOSURE DURATION	ED_i	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/adj}$	821	cm²-year/kg	GIR -Table C-5-5; USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	2	years	USEPA, 1992

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose.
[2] In estimating the dermally absorbed dose for children age 7 through 16, the time-weighted, bodyweight normalized surface area exposed is

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{soil/adj}$$

Where:

$SA_{soil/adj}$ = SUM $(SA_i \times ED_i / BW_i)$

DA_{event} = CS x AF x ABS_d x CF

Note: For noncarcinogenic effects: AT = ED.

TABLE E-29

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	3.8E-10	7.3E+00	2.8E-09	0.01	2.8E-10	8.0E+00	2.3E-09	5.0E-09
Benzo(a)pyrene	O	806	ug/kg	3.2E-09	7.3E+00	2.3E-08	0.01	2.3E-09	8.0E+00	1.9E-08	4.2E-08
Benzo(b)fluoranthene	O	71	ug/kg	2.8E-10	7.3E+00	2.0E-09	0.01	2.1E-10	8.0E+00	1.6E-09	3.7E-09
Benzo(k)fluoranthene	O	8	ug/kg	3.1E-11	7.3E+00	2.3E-10	0.01	2.3E-11	8.0E+00	1.9E-10	4.1E-10
Chyrsene	O	1.14	ug/kg	4.5E-12	7.3E+00	3.3E-11	0.01	3.3E-12	8.0E+00	2.6E-11	5.9E-11
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	7.9E-11	7.3E+00	5.8E-10	0.01	5.9E-11	8.0E+00	4.7E-10	1.0E-09
Dieldrin	O	74	ug/kg	2.9E-10	1.6E+01	4.6E-09	0.01	2.1E-10	2.0E+01	4.3E-09	8.9E-09
Arsenic	I	2.7	mg/kg	1.1E-08	1.5E+00	1.6E-08	0.001	7.8E-10	1.5E+00	1.2E-09	1.7E-08
Lead	I	166	mg/kg	6.5E-07	ND		0.001	4.8E-08	ND		
SUMMARY CANCER RISK						2E-07				4E-08	2E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-29

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	1.3E-07	ND		0.01	9.9E-08	ND		
Benzo(a)pyrene	O	806	ug/kg	1.1E-07	ND		0.01	8.2E-08	ND		
Benzo(b)fluoranthene	O	710	ug/kg	9.7E-08	ND		0.01	7.2E-08	ND		
Benzo(k)fluoranthene	O	800	ug/kg	1.1E-07	ND		0.01	8.1E-08	ND		
Chrysene	O	1140	ug/kg	1.6E-07	ND		0.01	1.2E-07	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	2.8E-08	ND		0.01	2.1E-08	ND		
Dieldrin	O	74	ug/kg	1.0E-08	5.0E-05	2.0E-04	0.01	7.5E-09	2.5E-05	3.0E-04	5.0E-04
Arsenic	I	2.7	mg/kg	3.7E-07	3.0E-04	1.2E-03	0.001	2.7E-08	2.9E-04	9.4E-05	1.3E-03
Beryllium	I	0			5.0E-03				5.0E-05		
Iron	I	6930	mg/kg	9.5E-04	3.0E-01	3.2E-03	0.001	7.0E-05	6.0E-03	1.2E-02	1.5E-02
Lead	I	166	mg/kg	2.3E-05	ND		0.001	1.7E-06	ND		
SUMMARY HAZARD INDEX						0.005				0.01	0.02

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-30

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1996
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	0.2	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,000	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	USEPA, 1992
EXPOSURE DURATION	ED	7	years	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	7	years	USEPA, 1992

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1992. Region 6 Memorandum: Central Tendency and RME Exposure Parameters.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.
USEPA, 1996. Exposure Factors Handbook, 1996.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$DA_{event} = CS \times AF \times ABS_d \times CF$$

Note: For noncarcinogenic effects, AT = ED.

TABLE E-30

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	6.7E-09	7.3E+00	4.9E-08	0.01	1.3E-09	8.0E+00	1.1E-08	5.9E-08
Benzo(a)pyrene	O	806	ug/kg	5.5E-08	7.3E+00	4.0E-07	0.01	1.1E-08	8.0E+00	8.8E-08	4.9E-07
Benzo(b)fluoranthene	O	71	ug/kg	4.9E-09	7.3E+00	3.6E-08	0.01	9.7E-10	8.0E+00	7.8E-09	4.3E-08
Benzo(k)fluoranthene	O	8	ug/kg	5.5E-10	7.3E+00	4.0E-09	0.01	1.1E-10	8.0E+00	8.8E-10	4.9E-09
Chyrsene	O	1.14	ug/kg	7.8E-11	7.3E+00	5.7E-10	0.01	1.6E-11	8.0E+00	1.2E-10	6.9E-10
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.4E-09	7.3E+00	1.0E-08	0.01	2.8E-10	8.0E+00	2.2E-09	1.2E-08
Dieldrin	O	74	ug/kg	5.1E-09	1.6E+01	8.1E-08	0.01	1.0E-09	2.0E+01	2.0E-08	1.0E-07
Arsenic	I	2.7	mg/kg	1.8E-07	1.5E+00	2.8E-07	0.001	3.7E-09	1.5E+00	5.5E-09	2.8E-07
Lead	I	166	mg/kg	1.1E-05	ND		0.001	2.3E-07	ND		
SUMMARY CANCER RISK						6E-07				1E-07	7E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-30

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	6.7E-07	ND		0.01	1.3E-07	ND		
Benzo(a)pyrene	O	806	ug/kg	5.5E-07	ND		0.01	1.1E-07	ND		
Benzo(b)fluoranthene	O	710	ug/kg	4.9E-07	ND		0.01	9.7E-08	ND		
Benzo(k)fluoranthene	O	800	ug/kg	5.5E-07	ND		0.01	1.1E-07	ND		
Chrysene	O	1140	ug/kg	7.8E-07	ND		0.01	1.6E-07	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.4E-07	ND		0.01	2.8E-08	ND		
Dieldrin	O	74	ug/kg	5.1E-08	5.0E-05	1.0E-03	0.01	1.0E-08	2.5E-05	4.1E-04	1.4E-03
Arsenic	I	2.7	mg/kg	1.8E-06	3.0E-04	6.2E-03	0.001	3.7E-08	2.9E-04	1.3E-04	6.3E-03
Iron	I	6930	mg/kg	4.7E-03	3.0E-01	1.6E-02	0.001	9.5E-05	6.0E-03	1.6E-02	3.2E-02
Lead	I	166	mg/kg	1.1E-04	ND		0.001	2.3E-06	ND		
SUMMARY HAZARD INDEX						0.02				0.02	0.04

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November, 1995).
[2] Calculated from oral RfDs.

TABLE E-31

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	0.2	mg/cm^2-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm^2	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	350	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	2	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/adj}$	766	cm^2-year/kg	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	2	years	USEPA, 1995

[1] Air Force meterological data summary for Eglin AFB (close proximity to Milton) states that there is 0.01 inches of rain for 110 days per year. Exposure frequency assumes half of the rainy days require indoor restriction.

[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{HAZARD QUOTIENT} = \text{INTAKE (mg/kg-day)} / \text{REFERENCE DOSE (mg/kg-day)}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ \text{days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = (DA_{event} \times EF / AT \times 365\ \text{days/year}) \times SA_{soil/adj}$$

Where:

$$SA_{soil/adj} = \text{SUM}\ (SA \times ED / BW)$$

$$DA_{event} = CS \times AF \times ABS \times CF$$

TABLE E-31

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	1.8E-08	7.3E+00	1.3E-07	0.01	2.0E-09	8.0E+00	1.6E-08	1.5E-07
Benzo(a)pyrene	O	806	ug/kg	1.5E-07	7.3E+00	1.1E-06	0.01	1.7E-08	8.0E+00	1.4E-07	1.2E-06
Benzo(b)fluoranthene	O	71	ug/kg	1.3E-08	7.3E+00	9.5E-08	0.01	1.5E-09	8.0E+00	1.2E-08	1.1E-07
Benzo(k)fluoranthene	O	8	ug/kg	1.5E-09	7.3E+00	1.1E-08	0.01	1.7E-10	8.0E+00	1.3E-09	1.2E-08
Chyrsene	O	1.14	ug/kg	2.1E-10	7.3E+00	1.5E-09	0.01	2.4E-11	8.0E+00	1.9E-10	1.7E-09
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	3.7E-09	7.3E+00	2.7E-08	0.01	4.3E-10	8.0E+00	3.4E-09	3.0E-08
Dieldrin	O	74	ug/kg	1.4E-08	1.6E+01	2.2E-07	0.01	1.6E-09	2.0E+01	3.1E-08	2.5E-07
Arsenic	I	2.7	mg/kg	4.9E-07	1.5E+00	7.4E-07	0.001	5.7E-09	1.5E+00	8.5E-09	7.5E-07
Lead	I	166	mg/kg	3.0E-05	ND		0.001	3.5E-07	ND		
					SUMMARY CANCER RISK	9E-06				3E-07	9E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-31

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	6.2E-06	ND		0.01	7.2E-07	ND		
Benzo(a)pyrene	O	806	ug/kg	5.2E-06	ND		0.01	5.9E-07	ND		
Benzo(b)fluoranthene	O	710	ug/kg	4.5E-06	ND		0.01	5.2E-07	ND		
Benzo(k)fluoranthene	O	800	ug/kg	5.1E-06	ND		0.01	5.9E-07	ND		
Chrysene	O	1140	ug/kg	7.3E-06	ND		0.01	8.4E-07	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	1.3E-06	ND		0.01	1.5E-07	ND		
Dieldrin	O	74	ug/kg	4.7E-07	5.0E-05	9.5E-03	0.01	5.4E-08	2.5E-05	2.2E-03	1.2E-02
Arsenic	I	2.7	mg/kg	1.7E-05	3.0E-04	5.8E-02	0.001	2.0E-07	2.9E-04	6.8E-04	5.8E-02
Iron	I	6930	mg/kg	4.4E-02	3.0E-01	1.5E-01	0.001	5.1E-04	6.0E-03	8.5E-02	2.3E-01
Lead	I	166	mg/kg	1.1E-03	ND		0.001	1.2E-05	ND		
					SUMMARY HAZARD INDEX	0.2				0.1	0.30

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-32

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FIELD
SITE 11

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1996
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	0.2	mg/cm^2-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,000	cm^2	USEPA, 1996
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1995
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	250	days/year [1]	USEPA, 1992
EXPOSURE DURATION	ED	9	years	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	9	years	USEPA, 1992

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors";

USEPA, 1992. Region 6 Memorandum: Central Tendency and RME Exposure Parameters.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.
USEPA, 1996. Exposure Factors Handbook, 1996.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$DA_{event} = CS \times AF \times ABS \times CF$$

Note: **For noncarcinogenic effects, AT = ED**

TABLE E-32

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FIELD
SITE 11

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Benzo(a)anthracene	O	97.6	ug/kg	6.1E-09	7.3E+00	4.5E-08	0.01	4.9E-10	8.0E+00	3.9E-09	4.9E-08
Benzo(a)pyrene	O	806	ug/kg	5.1E-08	7.3E+00	3.7E-07	0.01	4.1E-09	8.0E+00	3.2E-08	4.0E-07
Benzo(b)fluoranthene	O	71	ug/kg	4.5E-09	7.3E+00	3.3E-08	0.01	3.6E-10	8.0E+00	2.9E-09	3.5E-08
Benzo(k)fluoranthene	O	8	ug/kg	5.0E-10	7.3E+00	3.7E-09	0.01	4.0E-11	8.0E+00	3.2E-10	4.0E-09
Chyrsene	O	1.14	ug/kg	7.2E-11	7.3E+00	5.2E-10	0.01	5.7E-12	8.0E+00	4.6E-11	5.7E-10
Indeno(1,2,3-cd)pyrene	O	20.3	ug/kg	1.3E-09	7.3E+00	9.3E-09	0.01	1.0E-10	8.0E+00	8.2E-10	1.0E-08
Dieldrin	O	74	ug/kg	4.7E-09	1.6E+01	7.4E-08	0.01	3.7E-10	2.0E+01	7.4E-09	8.2E-08
Arsenic	I	2.7	mg/kg	1.7E-07	1.5E+00	2.5E-07	0.001	1.4E-09	1.5E+00	2.0E-09	2.6E-07
Lead	I	166	mg/kg	1.0E-05	ND		0.001	8.4E-08	ND		
SUMMARY CANCER RISK						4E-07				4E-08	5E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.

TABLE E-32

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (CENTRAL TENDENCY)
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FIELD
SITE 11

NONCARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL RfD (mg/kg-day)	HAZARD QUOTIENT INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL RfD [2] (mg/kg-day)	HAZARD QUOTIENT DERMAL	TOTAL HAZARD QUOTIENT
Benzo(a)anthracene	O	976	ug/kg	4.8E-07	ND		0.01	3.8E-08	ND		
Benzo(a)pyrene	O	806	ug/kg	3.9E-07	ND		0.01	3.2E-08	ND		
Benzo(b)fluoranthene	O	710	ug/kg	3.5E-07	ND		0.01	2.8E-08	ND		
Benzo(k)fluoranthene	O	800	ug/kg	3.9E-07	ND		0.01	3.1E-08	ND		
Chrysene	O	1140	ug/kg	5.6E-07	ND		0.01	4.5E-08	ND		
Indeno(1,2,3-cd)pyrene	O	203	ug/kg	9.9E-08	ND		0.01	7.9E-09	ND		
Dieldrin	O	74	ug/kg	3.6E-08	5.0E-05	7.2E-04	0.01	2.9E-09	2.5E-05	1.2E-04	8.4E-04
Arsenic	I	2.7	mg/kg	1.3E-06	ND		0.001	1.1E-08	ND		
Iron	I	6930	mg/kg	3.4E-03	4.0E-02	8.5E-02	0.001	2.7E-05	4.0E-02	6.8E-04	8.5E-02
Lead	I	166	mg/kg	8.1E-05	4.0E-02	2.0E-03	0.001	6.5E-07	4.0E-02	1.6E-05	2.0E-03
SUMMARY HAZARD INDEX						0.09				0.001	0.09

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

TABLE E-33

INGESTION OF GROUNDWATER AS DRINKING WATER (UNFILTERED SAMPLES) (CENTRAL TENDENCY)
ADULT RESIDENT
SITE 11
MILTON, FLORIDA

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION WATER	CW	chemical-specific	ug/liter	
INGESTION RATE	IR	1.4	liters/day	USEPA, 1992
BODY WEIGHT	BW	70	kg	USEPA, 1991
CONVERSION FACTOR	CF	0.001	mg/ug	
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1992
EXPOSURE DURATION	ED	7	years	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	7	years	USEPA, 1991

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance:
"Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1992. Region 6 Memorandum: Central Tendency and RME Exposure Parameters.

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)-1

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{\text{CW x IR x EF x ED x CF}}{\text{BW x AT x 365 days/year}}$$

Note: For noncarcinogenic effects, AT = ED.

TABLE E-33

INGESTION OF GROUNDWATER AS DRINKING WATER (UNFILTERED SAMPLES) (CENTRAL TENDENCY)
ADULT RESIDENT
SITE 11
MILTON, FLORIDA

CARCINOGENIC EFFECTS

COMPOUND	WATER CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	CANCER SLOPE FACTOR (mg/kg-day)^-1	CANCER RISK INGESTION
Benzene	2	UG/LITER	3.8E-06	2.9E-02	1.1E-07
Vinyl chloride	2	UG/LITER	3.8E-06	1.9E+00	7.3E-06
bis(2-Ethylhexyl)phthalate	5.1	UG/LITER	9.8E-06	1.4E-02	1.4E-07
Arsenic	1.1	UG/LITER	2.1E-06	1.5E+00	3.2E-06
			TOTAL CANCER RISK		1E-05

NONCARCINOGENIC EFFECTS

COMPOUND	WATER CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	REFERENCE DOSE (mg/kg-day)	HAZARD QUOTIENT INGESTION
1,2-Dichloroethene	4.7	UG/LITER	9.0E-05	9.0E-03	1.0E-02
Benzene	2	UG/LITER	3.8E-05	3.0E-04	1.3E-01
Vinyl chloride	2	UG/LITER	3.8E-05	ND	
bis(2-Ethylhexyl)phthalate	5.1	UG/LITER	9.8E-05	2.0E-02	4.9E-03
Aluminum	628	UG/LITER	1.2E-02	1.0E+00	1.2E-02
Arsenic	1.1	UG/LITER	2.1E-05	3.0E-04	7.0E-02
Iron	0.17	UG/LITER	3.3E-06	3.0E-01	1.1E-05
Manganese	135	UG/LITER	2.6E-03	4.7E-02	5.5E-02
Thallium	0.37	UG/LITER	7.1E-06	8.0E-05	8.9E-02
			TOTAL HAZARD INDEX		0.4

ND = no data available.

TABLE E-34

INGESTION OF GROUNDWATER AS DRINKING WATER (UNFILTERED SAMPLES) (CENTRAL TENDENCY)
CHILD RESIDENT
SITE 11
MILTON, FLORDIA

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION WATER	CW	chemical-specific	ug/liter	
INGESTION RATE	IR	0.7	liters/day	USEPA, 1992
BODY WEIGHT	BW	15	kg	USEPA, 1991
CONVERSION FACTOR	CF	0.001	mg/ug	
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1992
EXPOSURE DURATION	ED	2	years	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	2	years	USEPA, 1991

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance:
"Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1992. Region 6 Memorandum: Central Tendency and RME Exposure Parameters.

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)-1

HAZARD QUOTIENT = INTAKE (mg/kg-day) / REFERENCE DOSE (mg/kg-day)

$$\text{INTAKE} = \frac{\text{CW x IR x EF x ED x CF}}{\text{BW x AT x 365 days/year}}$$

Note: For noncarcinogenic effects, AT = ED.

TABLE E-34

INGESTION OF GROUNDWATER AS DRINKING WATER (UNFILTERED SAMPLES) (CENTRAL TENDENCY)
CHILD RESIDENT
SITE 11
MILTON, FLORDIA

CARCINOGENIC EFFECTS

COMPOUND	WATER CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	CANCER SLOPE FACTOR (mg/kg-day)^-1	CANCER RISK INGESTION
Benzene	2	UG/LITER	2.6E-06	2.9E-02	7.4E-08
Vinyl chloride	2	UG/LITER	2.6E-06	1.9E+00	4.9E-06
bis(2-Ethylhexyl)phthalate	5.1	UG/LITER	6.5E-06	1.4E-02	9.1E-08
Arsenic	1.1	UG/LITER	1.4E-06	1.5E+00	2.1E-06
				TOTAL CANCER RISK	7E-06

NONCARCINOGENIC EFFECTS

COMPOUND	WATER CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	REFERENCE DOSE (mg/kg-day)	HAZARD QUOTIENT INGESTION
1,2-Dichloroethene	4.7	UG/LITER	2.1E-04	9.0E-03	2.3E-02
Benzene	2	UG/LITER	8.9E-05	3.0E-04	3.0E-01
Vinyl chloride	2	UG/LITER	8.9E-05	ND	
bis(2-Ethylhexyl)phthalate	5.1	UG/LITER	2.3E-04	2.0E-02	1.1E-02
Aluminum	628	UG/LITER	2.8E-02	1.0E+00	2.8E-02
Arsenic	1.1	UG/LITER	4.9E-05	3.0E-04	1.6E-01
Iron	0.17	UG/LITER	7.6E-06	3.0E-01	2.5E-05
Manganese	135	UG/LITER	6.0E-03	4.7E-02	1.3E-01
Thallium	0.37	UG/LITER	1.7E-05	8.0E-05	2.1E-01
				TOTAL HAZARD INDEX	0.9

APPENDIX F

ECOLOGICAL RISK DATA

Table F-1
Summary of Bioaccumulation Data

RI/FS Report, Site 11
NAS Whiting Field
Milton, Florida

Analyte	log K_{ow}	Bioaccumulation Factor [a]			
		Invertebrate [b]	Plant [c]	Mammal [d]	Bird [e]
VOLATILES					
Acetone	-0.24	NA	NA	NA	NA
SEMIVOLATILES					
Acenaphthylene	4.1	7.7E-02	3.3E-02	1.9E-02	NA
Anthracene	4.5	1.0E-02	1.9E-02	4.8E-02	NA
Benzo(a)anthracene	5.7	2.5E-02	3.9E-03	7.6E-01	NA
Benzo(a)pyrene	6	6.8E-02	2.6E-03	1.5E+00	NA
Benzo(b)fluoranthene	6.1	6.4E-02	2.3E-03	1.9E+00	NA
Benzo(g,h,i)perylene	6.6	4.9E-02	1.2E-03	6.0E+00	NA
Benzo(k)fluoranthene	6.1	5.1E-02	2.3E-03	1.9E+00	NA
Chrysene	5.7	3.5E-02	3.9E-03	7.6E-01	NA
bis(2-Ethylhexyl)phthalate	5.1	7.7E-02	8.7E-03	1.9E-01	NA
Fluoranthene	4.95 [f]	1.6E-02	1.1E-02	1.5E-01	NA
Indeno(1,2,3-cd)pyrene	6.6	8.4E-02	1.2E-03	6.0E+00	NA
2-Methylnaphthalene	3.86 [g]	7.7E-02	4.6E-02	1.5E-01	NA
Phenanthrene	4.5	2.4E-02	1.9E-02	4.8E-03	NA
Pyrene	5.3	1.8E-02	6.7E-03	3.4E-02	NA
PESTICIDES/PCBs					
alpha-Chlordane	5.5	1.6E+00 [h]	5.1E-03	5.5E-01 [i]	1.8E+00 [j]
gamma-Chlordane	5.5	1.6E+00 [h]	5.1E-03	5.5E-01 [i]	1.8E+00 [j]
4,4'-DDD	6	3.3E+00 [k]	1.0E-02 [l]	1.2E+00 [m]	2.9E+00 [n]
4,4'-DDT	6.4	5.7E-01 [k]	1.0E-02 [l]	1.2E+00 [m]	2.9E+00 [n]
Dieldrin	4.6	5.5E+00 [o]	1.7E-02	1.5E+00 [p]	4.4E-01 [q]
INORGANICS					
Lead	NA	7.8E-02 [r]	8.5E-02 [s]	1.5E-02 [t]	NA
Silver	NA	1.5E-01 [u]	8.0E-02 [r]	1.5E-01 [t]	NA
Zinc	NA	1.8E+00 [w]	6.1E-01 [x]	2.1E+00 [t]	NA
TPH	NA	NA	NA	NA	NA

NOTES:

[a] Units for bioaccumulation factors (BAFs) are mg/kg fresh wt tissue over mg/kg dry wt soil for invertebrates and plants, and mg/kg fresh wt tissue over mg/kg fresh wt. food for small mammals and small birds. No BAFs were calculated for VOAs since available evidencesuggests that these analytes do not bioaccumulate.

[b] Average of earthworm BAFs for SVOCs (Beyer, 1990) converted from dry weight to wet weight assuming earthworm is 80% water, unless otherwise noted. Individual BAFs were not available for bis(2-ethylhexyl)phthalate, 2-methylnaphthalene, and acenaphthylene; *therefore, an average of the BAFs reported in Beyer (1990) was used as a surrogate for these constituents.*

[c] Plant BAF calclulated using the following equation presented by Travis and Arms (1988) unless otherwise noted: log (Plant Uptake Factor) = 1.588-0.578 (log Kow). Converted from dry weight to wet weight plant concentration assuming 80% water content.

[d] Calculated using the following equation in Travis and Arms (1988) for semivolatile organic analytes with log K_{ow}s >5: log BTF (biotransfer factor) = log K_{ow} - 7.6; result multiplied by average ingestion rates for non-lactating and lactating test animals to convert from BTFs to BAFs, and divided by a factor of 0.2 to convert from dry feed to fresh feed. All analytes with log Kow's less than 5 were assumed to have a mammal BAF equal to 0.15. There is uncertainty involved in using this equation for PAHs because this study did not use any PAHs in the regression analysis. When no literature values were available, BAFs were calculated for pesticides, regardless of the log K_{ow}, due to the tendancy of these lipophilic compounds to bioaccumulate.

[e] Bioaccumulation data are generally lacking for avians. Therefore, there is uncertainty associated with estimating body-doses for birds without considering what chemicals may have bioaccumulated in prey-item tissue.

[f] USEPA (1992), Dermal Exposure Guidance.

[g] Toxicological Profile for Naphthalene (ATSDR, 1993a).

[h] Geometric mean of reported BAFs for earthworms (Gish, 1970) converted from dry weight to wet weight assuming 80% water *composition of earthworms.*

[i] BAF calculated from data presented in Eisler, 1990. Rats fed 20 mg/kg diet technical chlordane (equivalent to 3.6 mg/kg diet cis- and trans-chlordane) for 350 days accumulated 20 mg/kg in lipids. Assuming 10% lipid content, the whole body concentration is about 2 mg/kg.

[j] BAF calculated from data presented in Eisler, 1990. Red-winged blackbirds fed 10 mg/kg diet technical chlordane (equivalent to 1.8

Table F-1
Summary of Bioaccumulation Data

RI/FS Report, Site 11
NAS Whiting Field
Milton, Florida

Analyte	log K_{ow}	Bioaccumulation Factor [a]			
		Invertebrate [b]	Plant [c]	Mammal [d]	Bird [e]

mg/kg diet cis- and trans- chlordane) for 84 days accumulated 1.8 mg/kg wet weight whole body residue.

[k] Geometric means of 4,4'-DDT [Davis (1968), Davis & Harrison (1966), Wheatley & Hardman (1968), Bailey *et al.* (1970), Cramp & Olney (1967), and Beyer & Gish (1980)], 4,4'-DDE [Davis (1968), Davis & Harrison (1966), Cramp & Olney (1967), Collett & Harrison (1968), Hunt & Sacho (1969), and Gish (1970)], and 4,4-DDD [Barker (1958), Davis (1968), Davis & Harrison (1966), Cramp & Olney (1967), Collett & Harrison (1968), Wheatley & Hardman (1968), Hunt & Sacho (1969), Bailey *et al.* (1970), Dimond *et al.* (1970), Gish (1970), and Beyer & Gish (1980)] reported for earthworms. Dry soil concentrations calculated assuming 10% moisture content in sandy-loam soils (Donahue *et al.*, 1977).

[l] Geometric mean of 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE BAFs (fresh wt/dry wt) reported for roots (carrot, potato, sugar beet), grains (corn, oats), and legumes (alfalfa) derived from USEPA (1985a) converted from dry weight to wet-weight per values provided by Suter (1993).

[m] BAF for shrews and voles calculated using measured concentrations of DDT in stomach content and in whole body (Forsyth & Petrle, 1984).

[n] Whole-body pheasant BAF for 4,4'-DDT presented in USEPA (1985b); derived from Kenaga (1973).

[o] Geometric mean of reported BAFs for earthworms (Edwards & Thompson, 1973). Values provided by Gish (1970) were converted from dry weight to wet weight by multiplying by a conversion factor of 0.2 assuming 80% water composition of earthworms.

[p] BAF calculated from data presented by Potter et. al. (1974). Based on average dieldrin concentration in cow muscle and fat of 0.17 mg/kg dry weight and a dieldrin concentration of 0.11 mg/kg in the diet (dry weight).

[q] Jeffries and Davis (1968).

[r] Geometric mean of BAF values (fresh wt./dry wts.) for worms and woodlice (USEPA, 1985b). Fresh weight tissue concentrations calculated assuming 80% body water content.

[s] Plant BAF for lead is equal to the average of uptake values in lettuce and oats as reported in John and Laerhoven, 1972.

[t] Value derived from biotransfer factors (BTFs), presented in Baes *et al.* (1984) for uptake into cattle. BTF converted to BAF by multiplying by food ingestion rate of 50 kg/day wet weight.

[u] Prey-specific value not available; value shown is small mammal BAF for this chemical.

[v] Value from Baes *et al.* (1984) for leafy portions of plants multiplied by 0.2 to represent 80% water composition of plants.

[w] BCF for earthworms from Diercxsens et al. (1985).

[x] Median of values reported from Levine *et al.* (1989).

NA = Not Available

Table F-2
Ingestion Toxicity Information for Wildlife

RI/FS Report, Site 11
NAS Whiting Field
Milton, Florida

Chemical	Test Species	Test Type	Duration	Effect	Lethal RTV mg/kgBW-day Oral LD50	Lethal RTV mg/kgBW-day LOAEL	Lethal RTV mg/kgBW-day RTV [a]	Sublethal RTV mg/kgBW-day LOAEL	Sublethal RTV mg/kgBW-day NOAEL	Sublethal RTV mg/kgBW-day RTV [a]	Reference
VOLATILE ORGANIC COMPOUNDS											
Acetone	Rat	Oral	NR	Reproductive effects				*******		27,300	RTECS, 1993
	Rat	Oral LD_{50}	NR	Mortality	5,800						RTECS, 1993
	Rat	Oral LD_{50}		Mortality	9,750						Sax, 1984
	Mouse	Oral LD_{50}	NR	Mortality	3,000		600				RTECS, 1993
	Rabbit	Oral LD_{50}	NR	Mortality	5,340						RTECS, 1993
SEMIVOLATILE ORGANIC COMPOUNDS											
Acenaphthylene	Rat	Oral (chronic)	40 days	Physiological changes				600			USEPA, 1984a
Anthracene	Mouse	Oral LD_{50}	NR	Mortality	17,000		3,400				RTECS, 1993
	Rodents	Oral (chronic)	NS	Carcinogenicity				3,300			Eisler, 1987a
	Mouse	Oral (chronic)	90 days	Clinical and pathological effects					1,000		IRIS, 1990
Benzo(a)anthracene	Rodents	Oral (chronic)	NS	Carcinogenicity				2			Eisler, 1987a
Benzo(a)pyrene	Rat	Oral (chronic)	Pregnancy	Sterility in offspring				40			USEPA, 1984b
	Rat	Oral (chronic)	3.5 months	Reproductive				50			USEPA, 1984b
	Mouse	Oral	Multi-generational	Decreased fertility of F1 progeny; decreased F2 litter size.				10 [b]		10	MacKenzie and Angevine, 1981
	Mouse	Oral (subchronic)	6 months	Mortality		120 [b]	12				ATSDR, 1993b
Benzo(b)fluoranthene and Benzo(k)fluoranthene	Rodents	Oral (chronic)	NS	Carcinogenicity				40			Eisler, 1987a
Benzo(g,h,i)perylene	Rodents	Oral (chronic)	NS	Carcinogenicity				99			Eisler, 1987a
Chrysene	Rodents	Oral (chronic)	NS	Carcinogenicity				99			Eisler, 1987a
bis(2-Ethylhexyl)phthalate	Rat	Oral LD_{50}	NR	Mortality	30,600						RTECS, 1993
	Rat	Oral	NR	Reproductive effects				7,140			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				35		3.5	RTECS, 1993
	Rat	Oral	NR	Reproductive effects				6,000			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				17,200			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				10,000			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				9,766			RTECS, 1993
	Mouse	Oral LD_{50}	NR	Mortality	30,000						RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				78,880			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				4,200			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				50			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				1,000			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				2,040			RTECS, 1993
	Rabbit	Oral LD_{50}	NR	Mortality	34,000						RTECS, 1993
	Guinea pig	Oral LD_{50}	NR	Mortality	26,000						RTECS, 1993
	Guinea pig	Oral	NR	Reproductive effects				20,000			RTECS, 1993
	Mammal	Oral	NR	Reproductive effects				20,000			RTECS, 1993
	Mammal	Oral	NR	Reproductive effects				*******			RTECS, 1993
	Mouse	Oral LD_{50}		Mortality	800		160				RTECS, 1993
	Mouse	Oral (subchronic)	13 weeks	Renal effects				125			RTECS, 1993
Fluoranthene	Rat	Oral LD_{50}	NR	Mortality	2,000		400				RTECS, 1994
	Mouse	Oral (subchronic)	90 days	Nephropathy; clinical and pathological effects				250	125		IRIS, 1990
Indeno(1,2,3-cd)pyrene	Rodents	Oral (chronic)	NS	Carcinogenicity				72			Eisler, 1987a
2-Methylnaphthalene	Rat	Oral LD_{50}		Mortality	1,630		326				NIOSH, 1985
Phenanthrene	Mouse	Oral LD_{50}	NR	Mortality	700		140				RTECS, 1994
	Mouse	Oral (subchronic)	6 months	Increased liver weight				120			USEPA, 1989b
Pyrene	Rat	Oral LD_{50}	NR	Mortality	2,700						RTECS, 1993 and NIOSH, 1985
	Mouse	Oral LD_{50}	NR	Mortality	800		160				RTECS, 1993 and NIOSH, 1985
	Mouse	Oral (chronic)	13 weeks	Renal effects				125	75		IRIS, 1990
PESTICIDES/PCBs											
gamma-Chlordane (surrogat for alpha-Chlordane)	Rat	Oral LD_{50}	NR	Mortality	283						RTECS, 1993
	Rat	Oral LD_{50}		Mortality	430						Allen et al., 1979
	Rat	Oral LD_{50}		Mortality	335						Allen et al., 1979
	Rabbit	Oral LD_{50}		Mortality	300						Allen et al., 1979
	Rabbit	Oral LD_{50}		Mortality	100		20				Allen et al., 1979
	Dog	Oral LD_{50}		Mortality	200		40				Allen et al., 1979
	Goat	Oral LD_{50}		Mortality	180						Allen et al., 1979

Table F-2
Ingestion Toxicity Information for Wildlife

RI/FS Report, Site 11
NAS Whiting Field
Milton, Florida

Chemical	Test Species	Test Type	Duration	Effect	Lethal RTV mg/kgBW-day			Sublethal RTV mg/kgBW-day			Reference
					Oral LD50	LOAEL	RTV [a]	LOAEL	NOAEL	RTV [a]	
	Rat	Oral(subchronic)	Multi-generational	Decreased fertility				16		1.6	ATSDR, 1992
	Japanese quail	Oral LD_{50}	5 days	Mortality	35						Hill et al., 1975
	Bobwhite	Oral LD_{50}	5 days	Mortality	29						Hill et al., 1975
	Mallard	Oral LD_{50}	5 days	Mortality	62						Hill et al., 1975
	Pheasant	Oral LD_{50}		Mortality	24		4.8				USFWS, 1984
	Mouse	Oral (chronic)	2 years	Hepatocelluar hypertrophy and necrosis				0.47			ATSDR, 1992
	Mouse	Oral (chronic)	30 months	Regional liver hypertrophy (females)				0.273	0.055		ATSDR, 1992
	Dog	Oral (chronic)	2 years	Histologic changes				0.375			USEPA, 1988a
	Young chicken	Chronic	4 week	Egg hatchability and growth					0.031 [c]	0.031	Eisler, 1990
4,4'-DDT (surrogate for 4,4'-DDD)	Rat	Oral LD_{50}	NR	Mortality	87		17.4				RTECS, 1993
	Rat	Oral LD_{50}		Mortality	100						USEPA, 1985a
	Rat	Oral	NR	Reproductive				112			RTECS, 1993
	Rat	Oral	NR	Reproductive				100			RTECS, 1993
	Rat	Oral	NR	Reproductive				430			RTECS, 1993
	Rat	Oral	NR	Reproductive				1,890			RTECS, 1993
	Rat	Oral	NR	Reproductive				250			RTECS, 1993
	Rat	Oral	NR	Reproductive				50			RTECS, 1993
	Rat	Oral (chronic)	3 generations	Reproductive				0.2		0.02	IRIS, 1991
	Rat	Oral	2 years	Reproductive				2.5			USEPA, 1993c
	Mouse	Oral LD_{50}	NR	Mortality	135						RTECS, 1993
	Mouse	Oral LD_{50}		Mortality	200						USEPA, 1985b
	Mouse	Oral	NR	Reproductive				504			RTECS, 1993
	Mouse	Oral	NR	Reproductive				81			RTECS, 1993
	Mouse	Oral	NR	Reproductive				124			RTECS, 1993
	Mouse	Oral	NR	Reproductive				148			RTECS, 1993
	Rabbit	Oral LD_{50}	NR	Mortality	250						RTECS, 1993
	Rabbit	Oral	NR	Reproductive				150			RTECS, 1993
	Guinea pig	Oral LD_{50}	NR	Mortality	150						RTECS, 1993
	Hamster	Oral LD_{50}	NR	Mortality	>5,000						RTECS, 1993
	Dog	Oral LD_{50}	NR	Mortality	150						RTECS, 1993
	Dog	Oral LD_{50}		Mortality	60		12				USEPA, 1985b
	Dog	Oral	NR	Reproductive				3,540		354	RTECS, 1993
	Monkey	Oral LD_{50}	NR	Mortality	200						RTECS, 1993
	Chicken	Oral (subchronic)	10 weeks	Decreased reproductive success; toxic sympto				91.4 [c]			USEPA, 1985b
	Rock dove	Oral LD_{50}		Mortality	4,000						USFWS, 1984
	Black duck	Oral (chronic)	2 years	Reduced eggshell thickness				0.14 [c]		0.014	Longcore and Stendell, 1977
	Mallard	Oral LD_{50}		Mortality	2,240						USFWS, 1984
	Mallard	Oral (subchronic)	96 days	Reduced eggshell thickness				2.8			Longcore and Stendell, 1977
	Mallard	Oral	NR	Eggshell thinning				1.16			USEPA, 1993c
	Mallard	Oral	NR	Eggshell thinning				2.91			USEPA, 1993c
	Mallard	Oral	2 years	Reproductive				1.45			USEPA, 1993c
	California quail	Oral LD_{50}		Mortality	595		119				USFWS, 1984
	Japanese quail	Oral LD_{50}		Mortality	841						USFWS, 1984
	Pheasant	Oral LD_{50}		Mortality	1,334						USFWS, 1984
	Sandhill crane	Oral LD_{50}		Mortality	1,200						USFWS, 1984
	Kestrel	Oral (chronic)	7 wk - 1 yr	Reduced eggshell thickness				0.56a			USEPA, 1985b
	Kestrel	Oral (chronic)	1 year	Reduced eggshell thickness				0.16a			Wiemeyer, et al., 1986
	Barn owl	Oral (chronic)	2 years	Reduced eggshell thickness				0.14 [c]		0.014	Longcore and Stendell, 1977
Dieldrin	Mouse	Oral LD_{50}	NR	Mortality	38						Allen, J.R., et. al., 1979
	Mouse	Oral (chronic)	80 weeks	Body tremors				0.33			NCI, 1978
	Mouse	Oral (chronic)	2 years	Liver enlargement w/histopathology				0.1			IRIS, 1993
	Mouse	Oral (chronic)	2 years	Hepatic cancer				1.3			ATSDR, 1992
	Rat	Oral (chronic)	2 years	Histologic changes				2			ATSDR, 1992
	Rat	Oral (chronic)	2 years	Liver lesions				0.05			IRIS, 1993
	Dog	Oral (chronic)	2 years	Increased liver weight; liver/body weight				0.05			IRIS, 1993
	Dog	Oral (chronic)	25 months	Hepatocyte degeneration				0.5			ATSDR, 1992e
	Monkey	Oral (chronic)	120 days	Tremors and convulsions				0.1			Smith, R.M., et. al., 1976
	Mouse	Oral (subchronic)	4 weeks	Decreased pup survival				0.65		0.065	Virgo, B.B., et. al., 1975
	Rat	Oral LD_{50}	NR	Mortality	46						Allen, J.R., et. al., 1979
	Guinea pig	Oral LD_{50}	NR	Mortality	25		5				Allen, J.R., et. al., 1979
	Rabbit	Oral LD_{50}	NR	Mortality	45						Allen, J.R., et. al., 1979

Table F-2
Ingestion Toxicity Information for Wildlife

RI/FS Report, Site 11
NAS Whiting Field
Milton, Florida

Chemical	Test Species	Test Type	Duration	Effect	Lethal RTV mg/kgBW-day Oral LD50	Lethal RTV mg/kgBW-day LOAEL	Lethal RTV mg/kgBW-day RTV [a]	Sublethal RTV mg/kgBW-day LOAEL	Sublethal RTV mg/kgBW-day NOAEL	Sublethal RTV mg/kgBW-day RTV [a]	Reference
	House sparrow	Oral LD_{50}	NR	Mortality	48						USFWS, 1984
	Chicken	Oral LD_{50}	NR	Mortality	20						Allen, J.R., et. al., 1979
	Rock dove	*Oral LD_{50}*	*NR*	*Mortality*	27						Virgo, B.B. et. al., 1975
	Gray partridge	Oral LD_{50}	NR	Mortality	9						Virgo, B.B. et. al., 1975
	Chukar	Oral LD_{50}	NR	Mortality	25						Virgo, B.B. et. al., 1975
	Japanese quail	Oral LD_{50}	5 days	Mortality	6						Hill, E.F., et. al., 1975
	Japanese quail	Oral LD_{50}	NR	Mortality	70						Virgo, B.B. et. al., 1975
	California quail	Oral LD_{50}	NR	Mortality	9						Virgo, B.B. et. al., 1975
	Bobwhite	Oral LD_{50}	5 days	Mortality	3		0.6				Hill, E.F., et. al., 1975
	Pheasant	Oral LD_{50}	NR	Mortality	79						Virgo, B.B. et. al., 1975
	Mallard	Oral LD_{50}	5 days	Mortality	12						Hill, E.F., et. al., 1975
	Mallard	Oral LD_{50}	5 days	Mortality	11						Hill, E.F., et. al., 1975
	Mallard	Oral LD_{50}	NR	Mortality	381						Virgo, B.B. et. al., 1975
	Whistling duck	Oral LD_{50}	NR	Mortality	100						Virgo, B.B. et. al., 1975
	Canada goose	Oral LD_{50}	NR	Mortality	141						Virgo, B.B. et. al., 1975
	Goat	Oral LD_{50}	NR	Mortality	100						Allen, J.R., et. al., 1979
	Sheep	Oral LD_{50}	NR	Mortality	50						Allen, J.R., et. al., 1979
	Cattle	Oral LD_{50}	NR	Mortality	60						Allen, J.R., et. al., 1979
	Mule deer	Oral LD_{50}	NR	Mortality	75						Allen, J.R., et. al., 1979
	Cat	Oral LD_{50}	NR	Mortality	300						Allen, J.R., et. al., 1979
INORGANIC ANALYTES											
Lead	Rat	Oral	NR	Reproductive effects				790			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				1,140			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				520			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				1,100			RTECS, 1993
	Calf	Oral LD_{50}	NR	Mortality	220						Eisler, 1988a
	Rat	Oral (subchronic)	12-14 days	Decreased fetal body weight				2.5			McClain and Becker, 1972
	Mouse	Oral	NR	Reproductive effects				1,120			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				6,300			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				300			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				4,800			RTECS, 1993
	Domestic anim	Oral	NR	Reproductive effects				662			RTECS, 1993
	Mammal	Oral	NR	Reproductive effects				2,118			RTECS, 1993
	Kestrel	Diet	NR	Decreased egg laying fertility; decreased egg shell thickness					4.61 [c]	4.61	Eisler, 1988a
	Kestrel nestling	Oral	10 days	Reduced growth and brain weight; abnormal development				125			Eisler, 1988a
	Japanese quail	Oral LD_{50}	5 days	Mortality	24,752						Hill and Camardese, 1986
	Rat	Oral (chronic)	2 generations	Developmental effects					7	7	Kimmel et al., 1980 and Grant et al., 1980
	Guinea pig	Oral LD_{50}		Mortality	300		60				Sax, 1984
	Rock dove	Oral (chronic)	NS	Kidney pathology; learning deficiences				6.25			Anders et al., 1982 and Dietz et al., 1979
	Rock dove	Oral LD_{50}		Mortality	375		75				Kendall and Scanlon, 1985
Silver	Mouse	Intraperitoneal (acute)		Mortality	34		6.8				NIOSH, 1985
	Rat	Oral (chronic)	37 week	Weight gain				222.2			ATSDR, 1990a
	Mouse	Oral (chronic)	125 days	Hypoactivity				18.1		1.81	ATSDR, 1990a
Zinc	Rat	Oral LD_{50}		Mortality	2,510		502				RTECS, 1993
	Rat	Oral	Gestation	Fetal resorptions in 4 to 20% of population				200 [d]		200	Shlicker and Cox, 1968
	Ferret	Oral	3-13 days	Mortality and gastrointestinal effects		390					Straube et al., 1980
	Rat	*Oral (subchronic)*	*NR*	*Kidney toxicity*				160			Llobet, et al., 1988

Notes:
LD_{50} = Dose resulting in 50% mortality in test population
BW = Body weight
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = *No Observed Adverse Effect Level*
NR = Not reported
[a] Selected RTVs are boxed. Lethal and sublethal RTVs are chosen based on the data hierarchy discussed in Section 7.5.1.
[b] Value for benzo(a)pyrene chosen as a surrogate for all PAHs. Chemical-specific toxicity studies for ecologically significant endpoints are lacking for other PAHs. Sublethal RTV for benzo(a)pyrene is equal to the LOAEL

Table F-2
Ingestion Toxicity Information for Wildlife

RI/FS Report, Site 11
NAS Whiting Field
Milton, Florida

Chemical	Test Species	Test Type	Duration	Effect	Lethal RTV mg/kgBW-day			Sublethal RTV mg/kgBW-day			Reference
					Oral LD50	LOAEL	RTV [a]	LOAEL	NOAEL	RTV [a]	

value because the toxicity test is multi-generational.

[c] Converted to dose per kilogram body weight by multiplying by ingestion and dividing by body weight. Body weights for birds obtained from Dunning, 1984.
Ingestion rates were calculated using the following regression equation (for all birds) from USEPA, 1993b: Food Ingestion (kg/day) = 0.00582 * Body Weight $^{0.651}$ (kg). Ingestion rates for the chicken from NRC, 1984 (pg. 13).

[d] The small mammal sublethal RTV for zinc is equal to the EC20 value.

Table F-3
RTVs Selected for Ecological Risk Assessment [a]
Units (mg/kgBW/day)

RI/FS Report, Site 11
NAS Whiting Field
Milton, Florida

Compound	Small Mammal [b]		Small Bird [c]		Predatory Mammal [		Predatory Bird [e]	
	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal
Volatile Organic Compounds								
Acetone	600	27,300			600	27,300		
Semivolatile Organic Compounds								
bis(2-Ethylhexyl)phthalate	160	3.5			160	3.5		
2-Methylnaphthalene	326	10 [f]			326	10 [f]		
Acenaphthylene	12 [f]	10 [f]			12 [f]	10 [f]		
Anthracene	3,400	10 [f]			3,400	10 [f]		
Benzo(a)anthracene	12 [f]	10 [f]			12 [f]	10 [f]		
Benzo(a)pyrene	12	10			12	10		
Benzo(b)fluoranthene	12 [f]	10 [f]			12 [f]	10 [f]		
Benzo(g,h,i)perylene	12 [f]	10 [f]			12 [f]	10 [f]		
Benzo(k)fluoranthene	12 [f]	10 [f]			12 [f]	10 [f]		
Chrysene	12 [f]	10 [f]			12 [f]	10 [f]		
Fluoranthene	400	10 [f]			400	10 [f]		
Indeno(1,2,3-cd)pyrene	12 [f]	10 [f]			12 [f]	10 [f]		
Phenanthrene	140	10 [f]			140	10 [f]		
Pyrene	160	10 [f]			160	10 [f]		
Pesticides/PCBs								
4,4-DDD	17.4	0.02	119	0.014	12	354	119	0.014
4,4-DDT	17.4	0.02	119	0.014	12	354	119	0.014
Dieldrin	5	0.065	0.6		5	0.065	0.6	
alpha-Chlordane	20	1.6	4.8	0.031	40	1.6	4.8	0.031
gamma-Chlordane	20	1.6	4.8	0.031	40	1.6	4.8	0.031
Inorganic Compounds								
Lead	60	7	75	4.61	60	7	75	4.61
Silver	6.8	1.81			6.8	1.81		
Zinc	502	200			502	200		

Notes:
[a] Lethal and sublethal RTVs correspond to the boxed values presented in Table F-2.
[b] These RTVs represent chemical concentrations that are not anticipated to result in adverse effects for the cotton mouse or the short
[c] These RTVs represent chemical concentrations that are not anticipated to result in adverse effects for the eastern meadowlark.
[d] These RTVs represent chemical concentrations that are not anticipated to result in adverse effects for the red fox.
When no data were available, the small mammal values were used as a surrogate.
[e] These RTVs represent chemical concentrations that are not anticipated to result in adverse effects for the great horned owl. When n were available, the small bird values were used as a surrogate.
[f] The value for benzo(a)pyrene was used as a surrogate.

Table F-4
Exposure Parameters and Assumptions for Terrestrial Receptors [a]
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

Representative Wildlife Species		Percent Prey in Diet: Inverts	Plants	Small Mammals	Small Birds	Soil	Home Range (acres)	ED [b]	Site Foraging Frequency [c]	Food Ingestion Rate (kg/day)	Body Weight (kg)
Cotton mouse	(Small herb. mammal)	10%	88%	0%	0%	2%	0.147	1	1.00E+00	0.0029	0.021
Short-tailed shrew	(Small omn. mammal)	78%	12%	0%	0%	10%	0.96	1	1.00E+00	0.0024	0.017
Eastern meadowlark	(Small herb. bird)	75%	20%	0%	0%	5%	5	1	6.00E-01	0.0119	0.087
Red fox	(Predatory mammal)	20%	10%	57%	10%	3%	250	1	1.20E-02	0.24	4.69
Great horned owl	(Predatory bird)	0%	0%	80%	19%	1%	15	1	2.00E-01	0.078	1.5

NOTES:

SITE AREA:	3.0 acres

[a] Documentation of exposure parameters presented in: Table 7-5

[b] ED = Exposure Duration (percentage of year receptor is expected to be found at study area). ED is assumed to be 1 for this risk assessment.

[c] SFF = Site Foraging Frequency (calculated by dividing site area by receptor home range (cannot exceed 1.0)). SFF is assumed to be 1 for lethal exposure scenario.

Table F-5
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

EXPOSURE CONCENTRATION DATA		ESTIMATED CONTAMINANT CONCENTRATIONS IN PRIMARY FOOD ITEMS				BAF VALUES FOR OTHER FOOD ITEMS	
ANALYTE	REASONABLE MAXIMUM EXPOSURE CONCENTRATION (mg/kg)	Invert BAF [a]	Concentration in Invertebrate Tissue [b] (mg/kg)	Plant BAF [a]	Concentration in Plant Tissue [c] (mg/kg)	Small Mammal BAF [a]	Small Bird BAF [a]
Acetone	1.7E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
2-Methylnaphthalene	4.9E-02	7.7E-02	3.8E-03	4.6E-02	2.2E-03	1.5E-01	NA
Acenaphthylene	1.1E-01	7.7E-02	8.4E-03	3.3E-02	3.6E-03	1.9E-02	NA
Anthracene	2.8E-01	1.0E-02	2.9E-03	1.9E-02	5.4E-03	4.8E-02	NA
Benzo(a)anthracene	9.8E-01	2.5E-02	2.4E-02	3.9E-03	3.8E-03	7.6E-01	NA
Benzo(a)pyrene	8.1E-01	6.8E-02	5.5E-02	2.6E-03	2.1E-03	1.5E+00	NA
Benzo(b)fluoranthene	7.1E-01	6.4E-02	4.5E-02	2.3E-03	1.6E-03	1.9E+00	NA
Benzo(g,h,i)perylene	3.1E-01	4.9E-02	1.5E-02	1.2E-03	3.7E-04	6.0E+00	NA
Benzo(k)fluoranthene	8.0E-01	5.1E-02	4.0E-02	2.3E-03	1.8E-03	1.9E+00	NA
Chrysene	1.1E+00	3.5E-02	4.0E-02	3.9E-03	4.5E-03	7.6E-01	NA
Fluoranthene	8.7E-01	1.6E-02	1.4E-02	1.1E-02	9.3E-03	1.5E-01	NA
Indeno(1,2,3-cd)pyrene	2.3E-01	8.4E-02	1.9E-02	1.2E-03	2.7E-04	6.0E+00	NA
Phenanthrene	1.0E+00	2.4E-02	2.5E-02	1.9E-02	2.0E-02	4.8E-03	NA
Pyrene	1.4E+00	1.8E-02	2.5E-02	6.7E-03	9.2E-03	3.0E-01	NA
bis(2-ethylhexyl)phthalate	5.4E-01	7.7E-02	4.1E-02	8.7E-03	4.7E-03	1.9E-01	NA
4,4-DDD	1.2E-01	3.3E+00	4.1E-01	1.0E-02	1.2E-03	1.2E+00	2.9E+00
4,4-DDT	1.7E-01	5.7E-01	9.6E-02	1.0E-02	1.7E-03	1.2E+00	2.9E+00
Dieldrin	7.4E-02	5.5E+00	4.1E-01	1.7E-02	1.3E-03	1.5E+00	4.4E-01
alpha-Chlordane	1.3E-01	1.6E+00	2.1E-01	5.1E-03	6.6E-04	5.5E-01	1.8E+00
gamma-Chlordane	1.1E-01	1.6E+00	1.7E-01	5.1E-03	5.5E-04	5.5E-01	1.8E+00
Lead	1.7E+02	7.8E-02	1.3E+01	8.5E-02	1.4E+01	1.5E-02	NA
Silver	1.3E+00	1.5E-01	2.0E-01	8.0E-02	1.0E-01	1.5E-01	NA
Zinc	1.2E+02	1.8E+00	2.2E+02	6.1E-01	7.6E+01	2.1E+00	NA
TPH	5.3E+01	NA	0.0E+00	NA	0.0E+00	NA	NA

ECPC = Ecological Chemical of Potential Concern
[a] Bioaccumulation data presented in: Appendix F, Table F-1
[b] ECPC concentrations in invertebrate tissue equals the invertebrate BAF multiplied by the maximum soil concentration of the contaminant.
[c] ECPC concentrations in plant tissue equals the plant BAF multiplied by the maximum soil concentration of the contaminant.

Table F-5
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

POTENTIAL DIETARY EXPOSURE (mg/kgBW/day) [d]

ANALYTE	*Cotton mouse*	*Short-tailed shrew*	*Eastern meadowlark*	*Red fox*	*Great horned owl*
Acetone	4.6E-05	2.4E-04	6.9E-05	5.0E-04	1.7E-04
2-Methylnaphthalene	4.6E-04	1.1E-03	4.7E-04	4.8E-03	3.8E-03
Acenaphthylene	8.6E-04	2.5E-03	1.0E-03	5.6E-03	1.5E-03
Ethylbenzene	1.5E-03	4.4E-03	1.4E-03	1.0E-02	3.9E-03
Benzo(a)anthracene	3.5E-03	1.7E-02	5.6E-03	6.5E-02	5.3E-02
Benzo(a)pyrene	3.2E-03	1.7E-02	6.7E-03	9.9E-02	9.7E-02
Benzo(b)fluoranthene	2.8E-03	1.5E-02	5.7E-03	9.9E-02	1.0E-01
Benzo(g,h,i)perylene	1.1E-03	6.0E-03	2.2E-03	1.0E-01	1.3E-01
Benzo(k)fluoranthene	3.0E-03	1.6E-02	5.8E-03	1.0E-01	1.1E-01
Chrysene	4.2E-03	2.1E-02	7.2E-03	8.1E-02	6.5E-02
Fluoranthene	3.7E-03	1.4E-02	4.6E-03	3.5E-02	1.6E-02
Indeno(1,2,3-cd)pyrene	9.3E-04	5.4E-03	2.1E-03	8.9E-02	1.1E-01
Phenanthrene	5.7E-03	1.8E-02	6.2E-03	3.9E-02	1.1E-02
Pyrene	5.3E-03	2.2E-02	7.4E-03	6.4E-02	3.7E-02
bis(2-ethylhexyl)phthalate	2.6E-03	1.2E-02	4.8E-03	3.1E-02	1.4E-02
4,4-DDD	6.1E-03	4.6E-02	2.6E-02	2.2E-01	1.9E-01
4,4-DDT	2.0E-03	1.3E-02	6.6E-03	6.3E-02	5.7E-02
Dieldrin	6.0E-03	4.6E-02	2.5E-02	2.5E-01	2.3E-01
alpha-Chlordane	3.3E-03	2.5E-02	1.3E-02	7.8E-02	4.6E-02
gamma-Chlordane	2.8E-03	2.1E-02	1.1E-02	6.5E-02	3.9E-02
Lead	2.4E+00	4.0E+00	1.7E+00	9.2E+00	1.9E+00
Silver	1.9E-02	4.2E-02	1.9E-02	1.1E-01	3.7E-02
Zinc	1.3E+01	2.8E+01	1.5E+01	1.8E+02	1.8E+02
TPH	1.5E-01	7.5E-01	2.2E-01	1.6E+00	5.3E-01

[d] Calculated by summing the products of individual prey type concentrations and percent in diet, multiplying by the ingestion rate, and dividing by body weight.

Table F-6
Risk from Potential Lethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	*Cotton mouse*			*Short-tailed shrew*			*Eastern meadowlark*		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	4.6E-05	6.0E+02	7.7E-08	2.4E-04	6.0E+02	4.0E-07	6.9E-05		0.0E+00
2-Methylnaphthalene	4.6E-04	3.3E+02	1.4E-06	1.1E-03	3.3E+02	3.5E-06	4.7E-04		0.0E+00
Acenaphthylene	8.6E-04	1.2E+01	7.2E-05	2.5E-03	1.2E+01	2.1E-04	1.0E-03		0.0E+00
Anthracene	1.5E-03	3.4E+03	4.3E-07	4.4E-03	3.4E+03	1.3E-06	1.4E-03		0.0E+00
Benzo(a)anthracene	3.5E-03	1.2E+01	2.9E-04	1.7E-02	1.2E+01	1.4E-03	5.6E-03		0.0E+00
Benzo(a)pyrene	3.2E-03	1.2E+01	2.7E-04	1.7E-02	1.2E+01	1.5E-03	6.7E-03		0.0E+00
Benzo(b)fluoranthene	2.8E-03	1.2E+01	2.3E-04	1.5E-02	1.2E+01	1.3E-03	5.7E-03		0.0E+00
Benzo(g,h,i)perylene	1.1E-03	1.2E+01	9.2E-05	6.0E-03	1.2E+01	5.0E-04	2.2E-03		0.0E+00
Benzo(k)fluoranthene	3.0E-03	1.2E+01	2.5E-04	1.6E-02	1.2E+01	1.3E-03	5.8E-03		0.0E+00
Chrysene	4.2E-03	1.2E+01	3.5E-04	2.1E-02	1.2E+01	1.7E-03	7.2E-03		0.0E+00
Fluoranthene	3.7E-03	4.0E+02	9.3E-06	1.4E-02	4.0E+02	3.5E-05	4.6E-03		0.0E+00
Indeno(1,2,3-cd)pyrene	9.3E-04	1.2E+01	7.8E-05	5.4E-03	1.2E+01	4.5E-04	2.1E-03		0.0E+00
Phenanthrene	5.7E-03	1.4E+02	4.1E-05	1.8E-02	1.4E+02	1.3E-04	6.2E-03		0.0E+00
Pyrene	5.3E-03	1.6E+02	3.3E-05	2.2E-02	1.6E+02	1.4E-04	7.4E-03		0.0E+00
bis(2-ethylhexyl)phthalate	2.6E-03	1.6E+02	1.6E-05	1.2E-02	1.6E+02	7.7E-05	4.8E-03		0.0E+00
4,4-DDD	6.1E-03	1.7E+01	3.5E-04	4.6E-02	1.7E+01	2.7E-03	2.6E-02	1.2E+02	2.1E-04
4,4-DDT	2.0E-03	1.7E+01	1.1E-04	1.3E-02	1.7E+01	7.4E-04	6.6E-03	1.2E+02	5.6E-05
Dieldrin	6.0E-03	5.0E+00	1.2E-03	4.6E-02	5.0E+00	9.2E-03	2.5E-02	6.0E-01	4.2E-02
alpha-Chlordane	3.3E-03	2.0E+01	1.7E-04	2.5E-02	2.0E+01	1.2E-03	1.3E-02	4.8E+00	2.8E-03
gamma-Chlordane	2.8E-03	2.0E+01	1.4E-04	2.1E-02	2.0E+01	1.0E-03	1.1E-02	4.8E+00	2.3E-03
Lead	2.4E+00	6.0E+01	3.9E-02	4.0E+00	6.0E+01	6.7E-02	1.7E+00	7.5E+01	2.3E-02
Silver	1.9E-02	6.8E+00	2.8E-03	4.2E-02	6.8E+00	6.1E-03	1.9E-02		0.0E+00
Zinc	1.3E+01	5.0E+02	2.5E-02	2.8E+01	5.0E+02	5.5E-02	1.5E+01		0.0E+00
TPH	1.5E-01	NA	0.0E+00	7.5E-01	NA	0.0E+00	2.2E-01		0.0E+00
SUMMARY HAZARD INDEX			7.1E-02			1.5E-01			7.0E-02

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Table F-6
Risk from Potential Lethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	*Red fox*			*Great horned owl*		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	5.0E-04	6.0E+02	8.4E-07	1.7E-04		0.0E+00
2-Methylnaphthalene	4.8E-03	3.3E+02	1.5E-05	3.8E-03		0.0E+00
Acenaphthylene	5.6E-03	1.2E+01	4.7E-04	1.5E-03		0.0E+00
Anthracene	1.0E-02	3.4E+03	3.0E-06	3.9E-03		0.0E+00
Benzo(a)anthracene	6.5E-02	1.2E+01	5.4E-03	5.3E-02		0.0E+00
Benzo(a)pyrene	9.9E-02	1.2E+01	8.2E-03	9.7E-02		0.0E+00
Benzo(b)fluoranthene	9.9E-02	1.2E+01	8.3E-03	1.0E-01		0.0E+00
Benzo(g,h,i)perylene	1.0E-01	1.2E+01	8.4E-03	1.3E-01		0.0E+00
Benzo(k)fluoranthene	1.0E-01	1.2E+01	8.7E-03	1.1E-01		0.0E+00
Chrysene	8.1E-02	1.2E+01	6.7E-03	6.5E-02		0.0E+00
Fluoranthene	3.5E-02	4.0E+02	8.8E-05	1.6E-02		0.0E+00
Indeno(1,2,3-cd)pyrene	8.9E-02	1.2E+01	7.4E-03	1.1E-01		0.0E+00
Phenanthrene	3.9E-02	1.4E+02	2.8E-04	1.1E-02		0.0E+00
Pyrene	6.4E-02	1.6E+02	4.0E-04	3.7E-02		0.0E+00
bis(2-ethylhexyl)phthalate	3.1E-02	1.6E+02	1.9E-04	1.4E-02		0.0E+00
4,4-DDD	2.2E-01	1.2E+01	1.8E-02	1.9E-01	1.2E+02	1.6E-03
4,4-DDT	6.3E-02	1.2E+01	5.3E-03	5.7E-02	1.2E+02	4.8E-04
Dieldrin	2.5E-01	5.0E+00	5.0E-02	2.3E-01	6.0E-01	3.9E-01
alpha-Chlordane	7.8E-02	4.0E+01	1.9E-03	4.6E-02	4.8E+00	9.6E-03
gamma-Chlordane	6.5E-02	4.0E+01	1.6E-03	3.9E-02	4.8E+00	8.1E-03
Lead	9.2E+00	6.0E+01	1.5E-01	1.9E+00	7.5E+01	2.5E-02
Silver	1.1E-01	6.8E+00	1.6E-02	3.7E-02		0.0E+00
Zinc	1.8E+02	5.0E+02	3.6E-01	1.8E+02		0.0E+00
TPH	1.6E+00	NA	0.0E+00	5.3E-01		0.0E+00
SUMMARY HAZARD INDEX			6.6E-01			4.3E-01

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Table F-7
Risk from Potential Sublethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	Cotton mouse			Short-tailed shrew			Eastern meadowlark		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	4.6E-05	2.7E+04	1.7E-09	2.4E-04	2.7E+04	8.7E-09	6.9E-05		0.0E+00
2-Methylnaphthalene	6.6E-03	1.0E+01	6.6E-04	1.1E-03	1.0E+01	1.1E-04	4.7E-04		0.0E+00
Acenaphthylene	6.4E-03	1.0E+01	6.4E-04	2.5E-03	1.0E+01	2.5E-04	1.0E-03		0.0E+00
Anthracene	8.1E-03	1.0E+01	8.1E-04	4.4E-03	1.0E+01	4.4E-04	1.4E-03		0.0E+00
Benzo(a)anthracene	2.1E-02	1.0E+01	2.1E-03	1.7E-02	1.0E+01	1.7E-03	5.6E-03		0.0E+00
Benzo(a)pyrene	1.7E-02	1.0E+01	1.7E-03	1.7E-02	1.0E+01	1.7E-03	6.7E-03		0.0E+00
Benzo(b)fluoranthene	1.5E-02	1.0E+01	1.5E-03	1.5E-02	1.0E+01	1.5E-03	5.7E-03		0.0E+00
Benzo(g,h,i)perylene	6.6E-03	1.0E+01	6.6E-04	6.0E-03	1.0E+01	6.0E-04	2.2E-03		0.0E+00
Benzo(k)fluoranthene	1.7E-02	1.0E+01	1.7E-03	1.6E-02	1.0E+01	1.6E-03	5.8E-03		0.0E+00
Chrysene	2.4E-02	1.0E+01	2.4E-03	2.1E-02	1.0E+01	2.1E-03	7.2E-03		0.0E+00
Fluoranthene	1.9E-02	1.0E+01	1.9E-03	1.4E-02	1.0E+01	1.4E-03	4.6E-03		0.0E+00
Indeno(1,2,3-cd)pyrene	5.1E-03	1.0E+01	5.1E-04	5.4E-03	1.0E+01	5.4E-04	2.1E-03		0.0E+00
Phenanthrene	2.4E-02	1.0E+01	2.4E-03	1.8E-02	1.0E+01	1.8E-03	6.2E-03		0.0E+00
Pyrene	2.9E-02	1.0E+01	2.9E-03	2.2E-02	1.0E+01	2.2E-03	7.4E-03		0.0E+00
bis(2-ethylhexyl)phthalate	1.3E-02	3.5E+00	3.6E-03	1.2E-02	3.5E+00	3.5E-03	4.8E-03		0.0E+00
4,4-DDD	9.3E-03	2.0E-02	4.7E-01	4.6E-02	2.0E-02	2.3E+00	2.6E-02	1.4E-02	1.8E+00
4,4-DDT	5.9E-03	2.0E-02	3.0E-01	1.3E-02	2.0E-02	6.5E-01	6.6E-03	1.4E-02	4.7E-01
Dieldrin	9.2E-03	6.5E-02	1.4E-01	4.6E-02	6.5E-02	7.1E-01	2.5E-02	NA	0.0E+00
alpha-Chlordane	6.1E-03	1.6E+00	3.8E-03	2.5E-02	1.6E+00	1.5E-02	1.3E-02	3.1E-02	4.3E-01
gamma-Chlordane	5.2E-03	1.6E+00	3.2E-03	2.1E-02	1.6E+00	1.3E-02	1.1E-02	3.1E-02	3.6E-01
Lead	3.6E+00	7.0E+00	5.1E-01	4.0E+00	7.0E+00	5.7E-01	1.7E+00	4.6E+00	3.7E-01
Silver	3.9E-02	1.8E+00	2.1E-02	4.2E-02	1.8E+00	2.3E-02	1.9E-02		0.0E+00
Zinc	5.7E+00	2.0E+02	2.8E-02	2.8E+01	2.0E+02	1.4E-01	1.5E+01		0.0E+00
TPH	1.1E+00	NA	0.0E+00	7.5E-01	NA	0.0E+00	2.2E-01		0.0E+00
SUMMARY HAZARD INDEX			1.5E+00			4.5E+00			3.5E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

2.7

Table F-7
Risk from Potential Sublethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	*Red fox*			*Great horned owl*		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	5.0E-04	2.7E+04	1.8E-08	1.7E-04		0.0E+00
2-Methylnaphthalene	4.8E-03	1.0E+01	4.8E-04	3.8E-03		0.0E+00
Acenaphthylene	5.6E-03	1.0E+01	5.6E-04	1.5E-03		0.0E+00
Anthracene	1.0E-02	1.0E+01	1.0E-03	3.9E-03		0.0E+00
Benzo(a)anthracene	6.5E-02	1.0E+01	6.5E-03	5.3E-02		0.0E+00
Benzo(a)pyrene	9.9E-02	1.0E+01	9.9E-03	9.7E-02		0.0E+00
Benzo(b)fluoranthene	9.9E-02	1.0E+01	9.9E-03	1.0E-01		0.0E+00
Benzo(g,h,i)perylene	1.0E-01	1.0E+01	1.0E-02	1.3E-01		0.0E+00
Benzo(k)fluoranthene	1.0E-01	1.0E+01	1.0E-02	1.1E-01		0.0E+00
Chrysene	8.1E-02	1.0E+01	8.1E-03	6.5E-02		0.0E+00
Fluoranthene	3.5E-02	1.0E+01	3.5E-03	1.6E-02		0.0E+00
Indeno(1,2,3-cd)pyrene	8.9E-02	1.0E+01	8.9E-03	1.1E-01		0.0E+00
Phenanthrene	3.9E-02	1.0E+01	3.9E-03	1.1E-02		0.0E+00
Pyrene	6.4E-02	1.0E+01	6.4E-03	3.7E-02		0.0E+00
bis(2-ethylhexyl)phthalate	3.1E-02	3.5E+00	8.8E-03	1.4E-02		0.0E+00
4,4-DDD	2.2E-01	3.5E+02	6.1E-04	1.9E-01	1.4E-02	1.3E+01
4,4-DDT	6.3E-02	3.5E+02	1.8E-04	5.7E-02	1.4E-02	4.1E+00
Dieldrin	2.5E-01	6.5E-02	3.8E+00	2.3E-01	NA	3.9E-01
alpha-Chlordane	7.8E-02	1.6E+00	4.8E-02	4.6E-02	3.1E-02	1.5E+00
gamma-Chlordane	6.5E-02	1.6E+00	4.0E-02	3.9E-02	3.1E-02	1.2E+00
Lead	9.2E+00	7.0E+00	1.3E+00	2.0E+00	7.5E+01	2.4E-02
Silver	1.1E-01	1.8E+00	5.8E-02	3.7E-02		0.0E+00
Zinc	1.8E+02	2.0E+02	9.1E-01	1.8E+02		0.0E+00
TPH	1.6E+00	NA	0.0E+00	5.3E-01		0.0E+00
SUMMARY HAZARD INDEX			6.3E+00			2.0E+01 ok

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Table F-8
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Central Tendency Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

EXPOSURE CONCENTRATION DATA		ESTIMATED CONTAMINANT CONCENTRATIONS IN PRIMARY FOOD ITEMS				BAF VALUES FOR OTHER FOOD ITEMS	
ANALYTE	CENTRAL TENDENCY EXPOSURE CONCENTRATION (mg/kg)	Invert BAF [a]	Concentration in Invertebrate Tissue [b] (mg/kg)	Plant BAF [a]	Concentration in Plant Tissue [c] (mg/kg)	Small Mammal BAF [a]	Small Bird BAF [a]
Acetone	1.0E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
2-Methylnaphthalene	4.9E-02	7.7E-02	3.8E-03	4.6E-02	2.2E-03	1.5E-01	NA
Acenaphthylene	1.1E-01	7.7E-02	8.4E-03	3.3E-02	3.6E-03	1.9E-02	NA
Anthracene	2.8E-01	1.0E-02	2.9E-03	1.9E-02	5.4E-03	4.8E-02	NA
Benzo(a)anthracene	5.3E-01	2.5E-02	1.3E-02	3.9E-03	2.1E-03	7.6E-01	NA
Benzo(a)pyrene	4.4E-01	6.8E-02	3.0E-02	2.6E-03	1.1E-03	1.5E+00	NA
Benzo(b)fluoranthene	4.2E-01	6.4E-02	2.7E-02	2.3E-03	9.6E-04	1.9E+00	NA
Benzo(g,h,i)perylene	3.1E-01	4.9E-02	1.5E-02	1.2E-03	3.7E-04	6.0E+00	NA
Benzo(k)fluoranthene	4.3E-01	5.1E-02	2.2E-02	2.3E-03	1.0E-03	1.9E+00	NA
Chrysene	6.0E-01	3.5E-02	2.1E-02	3.9E-03	2.3E-03	7.6E-01	NA
Fluoranthene	4.8E-01	1.6E-02	7.5E-03	1.1E-02	5.1E-03	1.5E-01	NA
Indeno(1,2,3-cd)pyrene	2.3E-01	8.4E-02	1.9E-02	1.2E-03	2.7E-04	6.0E+00	NA
Phenanthrene	5.6E-01	2.4E-02	1.4E-02	1.9E-02	1.1E-02	4.8E-03	NA
Pyrene	6.9E-01	1.8E-02	1.3E-02	6.7E-03	4.6E-03	3.0E-01	NA
bis(2-ethylhexyl)phthalate	3.6E-01	7.7E-02	2.8E-02	8.7E-03	3.1E-03	1.9E-01	NA
4,4-DDD	5.6E-02	3.3E+00	1.8E-01	1.0E-02	5.6E-04	1.2E+00	2.9E+00
4,4-DDT	6.7E-02	5.7E-01	3.8E-02	1.0E-02	6.7E-04	1.2E+00	2.9E+00
Dieldrin	3.5E-02	5.5E+00	1.9E-01	1.7E-02	6.0E-04	1.5E+00	4.4E-01
alpha-Chlordane	7.0E-02	1.6E+00	1.1E-01	5.1E-03	3.6E-04	5.5E-01	1.8E+00
gamma-Chlordane	5.8E-02	1.6E+00	9.3E-02	5.1E-03	3.0E-04	5.5E-01	1.8E+00
Lead	1.5E+02	7.8E-02	1.1E+01	8.5E-02	1.2E+01	1.5E-02	NA
Silver	1.0E+00	1.5E-01	1.5E-01	8.0E-02	8.0E-02	1.5E-01	NA
Zinc	4.1E+01	1.8E+00	7.3E+01	6.1E-01	2.5E+01	2.1E+00	NA
TPH	1.8E+01	NA	0.0E+00	NA	0.0E+00	NA	NA

ECPC = Ecological Chemical of Potential Concern
[a] Bioaccumulation data presented in: Appendix F, Table F-1
[b] ECPC concentrations in invertebrate tissue equals the invertebrate BAF multiplied by the maximum soil concentration of the contaminant.
[c] ECPC concentrations in plant tissue equals the plant BAF multiplied by the maximum soil concentration of the contaminant.

Table F-8
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Central Tendency Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

POTENTIAL DIETARY EXPOSURE (mg/kgBW/day) [d]

ANALYTE	*Cotton mouse*	*Short-tailed shrew*	*Eastern meadowlark*	*Red fox*	*Great horned owl*
Acetone	2.8E-05	1.5E-04	4.2E-05	3.1E-04	1.0E-04
2-Methylnaphthalene	4.6E-04	1.1E-03	4.7E-04	4.8E-03	3.8E-03
Acenaphthylene	8.6E-04	2.5E-03	1.0E-03	5.6E-03	1.5E-03
Ethylbenzene	1.5E-03	4.4E-03	1.4E-03	1.0E-02	3.9E-03
Benzo(a)anthracene	1.9E-03	8.9E-03	3.0E-03	3.6E-02	2.9E-02
Benzo(a)pyrene	1.8E-03	9.5E-03	3.7E-03	5.4E-02	5.4E-02
Benzo(b)fluoranthene	1.6E-03	8.9E-03	3.4E-03	5.9E-02	6.2E-02
Benzo(g,h,i)perylene	1.1E-03	6.0E-03	2.2E-03	1.0E-01	1.3E-01
Benzo(k)fluoranthene	1.6E-03	8.6E-03	3.1E-03	5.7E-02	6.0E-02
Chrysene	2.2E-03	1.1E-02	3.8E-03	4.3E-02	3.4E-02
Fluoranthene	2.0E-03	7.7E-03	2.5E-03	2.0E-02	9.2E-03
Indeno(1,2,3-cd)pyrene	9.3E-04	5.4E-03	2.1E-03	8.9E-02	1.1E-01
Phenanthrene	3.0E-03	9.5E-03	3.3E-03	2.1E-02	5.8E-03
Pyrene	2.6E-03	1.1E-02	3.7E-03	3.2E-02	1.9E-02
bis(2-ethylhexyl)phthalate	1.8E-03	8.2E-03	3.2E-03	2.1E-02	9.4E-03
4,4-DDD	2.8E-03	2.1E-02	1.2E-02	1.0E-01	8.7E-02
4,4-DDT	7.9E-04	5.1E-03	2.6E-03	2.7E-02	2.5E-02
Dieldrin	2.9E-03	2.2E-02	1.2E-02	1.2E-01	1.2E-01
alpha-Chlordane	1.8E-03	1.3E-02	7.2E-03	4.2E-02	2.5E-02
gamma-Chlordane	1.5E-03	1.1E-02	6.0E-03	3.5E-02	2.1E-02
Lead	2.1E+00	3.5E+00	1.5E+00	8.1E+00	1.7E+00
Silver	1.5E-02	3.2E-02	1.5E-02	8.2E-02	3.0E-02
Zinc	4.1E+00	9.0E+00	5.1E+00	6.0E+01	5.9E+01
TPH	4.9E-02	2.5E-01	7.3E-02	5.4E-01	1.8E-01

[d] Calculated by summing the products of individual prey type concentrations and percent in diet, multiplying by the ingestion rate, and dividing by body weight.

Table F-9
Risk from Potential Sublethal Effects for Terrestrial Receptors from Central Tendency Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	*Cotton mouse*			*Short-tailed shrew*			*Eastern meadowlark*		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	2.8E-05	2.7E+04	1.0E-09	1.5E-04	2.7E+04	5.3E-09	4.2E-05		0.0E+00
2-Methylnaphthalene	4.6E-04	1.0E+01	4.6E-05	1.1E-03	1.0E+01	1.1E-04	4.7E-04		0.0E+00
Acenaphthylene	8.6E-04	1.0E+01	8.6E-05	2.5E-03	1.0E+01	2.5E-04	1.0E-03		0.0E+00
Anthracene	1.5E-03	1.0E+01	1.5E-04	4.4E-03	1.0E+01	4.4E-04	1.4E-03		0.0E+00
Benzo(a)anthracene	1.9E-03	1.0E+01	1.9E-04	8.9E-03	1.0E+01	8.9E-04	3.0E-03		0.0E+00
Benzo(a)pyrene	1.8E-03	1.0E+01	1.8E-04	9.5E-03	1.0E+01	9.5E-04	3.7E-03		0.0E+00
Benzo(b)fluoranthene	1.6E-03	1.0E+01	1.6E-04	8.9E-03	1.0E+01	8.9E-04	3.4E-03		0.0E+00
Benzo(g,h,i)perylene	1.1E-03	1.0E+01	1.1E-04	6.0E-03	1.0E+01	6.0E-04	2.2E-03		0.0E+00
Benzo(k)fluoranthene	1.6E-03	1.0E+01	1.6E-04	8.6E-03	1.0E+01	8.6E-04	3.1E-03		0.0E+00
Chrysene	2.2E-03	1.0E+01	2.2E-04	1.1E-02	1.0E+01	1.1E-03	3.8E-03		0.0E+00
Fluoranthene	2.0E-03	1.0E+01	2.0E-04	7.7E-03	1.0E+01	7.7E-04	2.5E-03		0.0E+00
Indeno(1,2,3-cd)pyrene	9.3E-04	1.0E+01	9.3E-05	5.4E-03	1.0E+01	5.4E-04	2.1E-03		0.0E+00
Phenanthrene	3.0E-03	1.0E+01	3.0E-04	9.5E-03	1.0E+01	9.5E-04	3.3E-03		0.0E+00
Pyrene	2.6E-03	1.0E+01	2.6E-04	1.1E-02	1.0E+01	1.1E-03	3.7E-03		0.0E+00
bis(2-ethylhexyl)phthalate	1.8E-03	3.5E+00	5.0E-04	8.2E-03	3.5E+00	2.3E-03	3.2E-03		0.0E+00
4,4-DDD	2.8E-03	2.0E-02	1.4E-01	2.1E-02	2.0E-02	1.1E+00	1.2E-02	1.4E-02	8.3E-01
4,4-DDT	7.9E-04	2.0E-02	3.9E-02	5.1E-03	2.0E-02	2.6E-01	2.6E-03	1.4E-02	1.9E-01
Dieldrin	2.9E-03	6.5E-02	4.4E-02	2.2E-02	6.5E-02	3.4E-01	1.2E-02	NA	0.0E+00
alpha-Chlordane	1.8E-03	1.6E+00	1.1E-03	1.3E-02	1.6E+00	8.3E-03	7.2E-03	3.1E-02	2.3E-01
gamma-Chlordane	1.5E-03	1.6E+00	9.3E-04	1.1E-02	1.6E+00	6.9E-03	6.0E-03	3.1E-02	1.9E-01
Lead	2.1E+00	7.0E+00	3.0E-01	3.5E+00	7.0E+00	5.0E-01	1.5E+00	4.6E+00	3.3E-01
Silver	1.5E-02	1.8E+00	8.0E-03	3.2E-02	1.8E+00	1.8E-02	1.5E-02		0.0E+00
Zinc	4.1E+00	2.0E+02	2.1E-02	9.0E+00	2.0E+02	4.5E-02	5.1E+00		0.0E+00
TPH	4.9E-02	NA	0.0E+00	2.5E-01	NA	0.0E+00	7.3E-02		0.0E+00
SUMMARY HAZARD INDEX			5.5E-01			2.2E+00			1.8E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Table F-9
Risk from Potential Sublethal Effects for Terrestrial Receptors from Central Tendency Exposure Concentrations of ECPCs in Food and Surface Soil
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	*Red fox*			*Great horned owl*		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	3.1E-04	2.7E+04	1.1E-08	1.0E-04		0.0E+00
2-Methylnaphthalene	4.8E-03	1.0E+01	4.8E-04	3.8E-03		0.0E+00
Acenaphthylene	5.6E-03	1.0E+01	5.6E-04	1.5E-03		0.0E+00
Anthracene	1.0E-02	1.0E+01	1.0E-03	3.9E-03		0.0E+00
Benzo(a)anthracene	3.6E-02	1.0E+01	3.6E-03	2.9E-02		0.0E+00
Benzo(a)pyrene	5.4E-02	1.0E+01	5.4E-03	5.4E-02		0.0E+00
Benzo(b)fluoranthene	5.9E-02	1.0E+01	5.9E-03	6.2E-02		0.0E+00
Benzo(g,h,i)perylene	1.0E-01	1.0E+01	1.0E-02	1.3E-01		0.0E+00
Benzo(k)fluoranthene	5.7E-02	1.0E+01	5.7E-03	6.0E-02		0.0E+00
Chrysene	4.3E-02	1.0E+01	4.3E-03	3.4E-02		0.0E+00
Fluoranthene	2.0E-02	1.0E+01	2.0E-03	9.2E-03		0.0E+00
Indeno(1,2,3-cd)pyrene	8.9E-02	1.0E+01	8.9E-03	1.1E-01		0.0E+00
Phenanthrene	2.1E-02	1.0E+01	2.1E-03	5.8E-03		0.0E+00
Pyrene	3.2E-02	1.0E+01	3.2E-03	1.9E-02		0.0E+00
bis(2-ethylhexyl)phthalate	2.1E-02	3.5E+00	5.9E-03	9.4E-03		0.0E+00
4,4-DDD	1.0E-01	3.5E+02	2.8E-04	8.7E-02	1.4E-02	6.2E+00
4,4-DDT	2.7E-02	3.5E+02	7.7E-05	2.5E-02	1.4E-02	1.8E+00
Dieldrin	1.2E-01	6.5E-02	1.9E+00	1.2E-01	NA	0.0E+00
alpha-Chlordane	4.2E-02	1.6E+00	2.6E-02	2.5E-02	3.1E-02	8.2E-01
gamma-Chlordane	3.5E-02	1.6E+00	2.2E-02	2.1E-02	3.1E-02	6.9E-01
Lead	8.1E+00	7.0E+00	1.2E+00	1.7E+00	7.5E+01	2.3E-02
Silver	8.2E-02	1.8E+00	4.5E-02	3.0E-02		0.0E+00
Zinc	6.0E+01	2.0E+02	3.0E-01	5.9E+01		0.0E+00
TPH	5.4E-01	NA	0.0E+00	1.8E-01		0.0E+00
SUMMARY HAZARD INDEX			3.5E+00			9.5E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Table F-10
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil (Revised RMEs for 4,4-DDD, 4,4_DDT, dieldrin, and lead)
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

EXPOSURE CONCENTRATION DATA		ESTIMATED CONTAMINANT CONCENTRATIONS IN PRIMARY FOOD ITEMS				BAF VALUES FOR OTHER FOOD ITEMS	
ANALYTE	REASONABLE MAXIMUM EXPOSURE CONCENTRATION (mg/kg)	Invert BAF [a]	Concentration in Invertebrate Tissue [b] (mg/kg)	Plant BAF [a]	Concentration in Plant Tissue [c] (mg/kg)	Small Mammal BAF [a]	Small Bird BAF [a]
Acetone	1.7E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
2-Methylnaphthalene	4.9E-02	7.7E-02	3.8E-03	4.6E-02	2.2E-03	1.5E-01	NA
Acenaphthylene	1.1E-01	7.7E-02	8.4E-03	3.3E-02	3.6E-03	1.9E-02	NA
Anthracene	2.8E-01	1.0E-02	2.9E-03	1.9E-02	5.4E-03	4.8E-02	NA
Benzo(a)anthracene	9.8E-01	2.5E-02	2.4E-02	3.9E-03	3.8E-03	7.6E-01	NA
Benzo(a)pyrene	8.1E-01	6.8E-02	5.5E-02	2.6E-03	2.1E-03	1.5E+00	NA
Benzo(b)fluoranthene	7.1E-01	6.4E-02	4.5E-02	2.3E-03	1.6E-03	1.9E+00	NA
Benzo(g,h,i)perylene	3.1E-01	4.9E-02	1.5E-02	1.2E-03	3.7E-04	6.0E+00	NA
Benzo(k)fluoranthene	8.0E-01	5.1E-02	4.0E-02	2.3E-03	1.8E-03	1.9E+00	NA
Chrysene	1.1E+00	3.5E-02	4.0E-02	3.9E-03	4.5E-03	7.6E-01	NA
Fluoranthene	8.7E-01	1.6E-02	1.4E-02	1.1E-02	9.3E-03	1.5E-01	NA
Indeno(1,2,3-cd)pyrene	2.3E-01	8.4E-02	1.9E-02	1.2E-03	2.7E-04	6.0E+00	NA
Phenanthrene	1.0E+00	2.4E-02	2.5E-02	1.9E-02	2.0E-02	4.8E-03	NA
Pyrene	1.4E+00	1.8E-02	2.5E-02	6.7E-03	9.2E-03	3.0E-01	NA
bis(2-ethylhexyl)phthalate	5.4E-01	7.7E-02	4.1E-02	8.7E-03	4.7E-03	1.9E-01	NA
4,4-DDD	ND	3.3E+00	0.0E+00	1.0E-02	0.0E+00	1.2E+00	2.9E+00
4,4-DDT	4.5E-02	5.7E-01	2.6E-02	1.0E-02	4.5E-04	1.2E+00	2.9E+00
Dieldrin	4.4E-02	5.5E+00	2.4E-01	1.7E-02	7.5E-04	1.5E+00	4.4E-01
alpha-Chlordane	1.3E-01	1.6E+00	2.1E-01	5.1E-03	6.6E-04	5.5E-01	1.8E+00
gamma-Chlordane	1.1E-01	1.6E+00	1.7E-01	5.1E-03	5.5E-04	5.5E-01	1.8E+00
Lead	3.7E+01	7.8E-02	2.9E+00	8.5E-02	3.1E+00	1.5E-02	NA
Silver	1.3E+00	1.5E-01	2.0E-01	8.0E-02	1.0E-01	1.5E-01	NA
Zinc	1.2E+02	1.8E+00	2.2E+02	6.1E-01	7.6E+01	2.1E+00	NA
TPH	5.3E+01	NA	0.0E+00	NA	0.0E+00	NA	NA

ECPC = Ecological Chemical of Potential Concern
[a] Bioaccumulation data presented in: Appendix F, Table F-1
[b] ECPC concentrations in invertebrate tissue equals the invertebrate BAF multiplied by the maximum soil concentration of the contaminant.
[c] ECPC concentrations in plant tissue equals the plant BAF multiplied by the maximum soil concentration of the contaminant.

Table F-10
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil (Revised RMEs for 4,4-DDD, 4,4_DDT, dieldrin, an
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

POTENTIAL DIETARY EXPOSURE (mg/kgBW/day) [d]

ANALYTE	*Cotton mouse*	*Short-tailed shrew*	*Eastern meadowlark*	*Red fox*	*Great horned owl*
Acetone	4.6E-05	2.4E-04	6.9E-05	5.0E-04	1.7E-04
2-Methylnaphthalene	4.6E-04	1.1E-03	4.7E-04	4.8E-03	3.8E-03
Acenaphthylene	8.6E-04	2.5E-03	1.0E-03	5.6E-03	1.5E-03
Ethylbenzene	1.5E-03	4.4E-03	1.4E-03	1.0E-02	3.9E-03
Benzo(a)anthracene	3.5E-03	1.7E-02	5.6E-03	6.5E-02	5.3E-02
Benzo(a)pyrene	3.2E-03	1.7E-02	6.7E-03	9.9E-02	9.7E-02
Benzo(b)fluoranthene	2.8E-03	1.5E-02	5.7E-03	9.9E-02	1.0E-01
Benzo(g,h,i)perylene	1.1E-03	6.0E-03	2.2E-03	1.0E-01	1.3E-01
Benzo(k)fluoranthene	3.0E-03	1.6E-02	5.8E-03	1.0E-01	1.1E-01
Chrysene	4.2E-03	2.1E-02	7.2E-03	8.1E-02	6.5E-02
Fluoranthene	3.7E-03	1.4E-02	4.6E-03	3.5E-02	1.6E-02
Indeno(1,2,3-cd)pyrene	9.3E-04	5.4E-03	2.1E-03	8.9E-02	1.1E-01
Phenanthrene	5.7E-03	1.8E-02	6.2E-03	3.9E-02	1.1E-02
Pyrene	5.3E-03	2.2E-02	7.4E-03	6.4E-02	3.7E-02
bis(2-ethylhexyl)phthalate	2.6E-03	1.2E-02	4.8E-03	3.1E-02	1.4E-02
4,4-DDD	0.0E+00	0.0E+00	0.0E+00	3.4E-03	4.8E-03
4,4-DDT	5.3E-04	3.5E-03	1.8E-03	2.0E-02	1.9E-02
Dieldrin	3.6E-03	2.7E-02	1.5E-02	1.5E-01	1.4E-01
alpha-Chlordane	3.3E-03	2.5E-02	1.3E-02	7.8E-02	4.6E-02
gamma-Chlordane	2.8E-03	2.1E-02	1.1E-02	6.5E-02	3.9E-02
Lead	5.2E-01	8.9E-01	3.8E-01	2.0E+00	4.3E-01
Silver	1.9E-02	4.2E-02	1.9E-02	1.1E-01	3.7E-02
Zinc	1.3E+01	2.8E+01	1.5E+01	1.8E+02	1.8E+02
TPH	1.5E-01	7.5E-01	2.2E-01	1.6E+00	5.3E-01

[d] Calculated by summing the products of individual prey type concentrations and percent in diet, multiplying by the ingestion rate, and dividing by body weight.

Table F-11
Risk from Potential Sublethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil (Revised RMEs for 4,4-DDD, 4,4-DDT, dieldrin, and le
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	*Cotton mouse*			*Short-tailed shrew*			*Eastern meadowlark*		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	4.6E-05	2.7E+04	1.7E-09	2.4E-04	2.7E+04	8.7E-09	6.9E-05		0.0E+00
2-Methylnaphthalene	4.6E-04	1.0E+01	4.6E-05	1.1E-03	1.0E+01	1.1E-04	4.7E-04		0.0E+00
Acenaphthylene	8.6E-04	1.0E+01	8.6E-05	2.5E-03	1.0E+01	2.5E-04	1.0E-03		0.0E+00
Anthracene	1.5E-03	1.0E+01	1.5E-04	4.4E-03	1.0E+01	4.4E-04	1.4E-03		0.0E+00
Benzo(a)anthracene	3.5E-03	1.0E+01	3.5E-04	1.7E-02	1.0E+01	1.7E-03	5.6E-03		0.0E+00
Benzo(a)pyrene	3.2E-03	1.0E+01	3.2E-04	1.7E-02	1.0E+01	1.7E-03	6.7E-03		0.0E+00
Benzo(b)fluoranthene	2.8E-03	1.0E+01	2.8E-04	1.5E-02	1.0E+01	1.5E-03	5.7E-03		0.0E+00
Benzo(g,h,i)perylene	1.1E-03	1.0E+01	1.1E-04	6.0E-03	1.0E+01	6.0E-04	2.2E-03		0.0E+00
Benzo(k)fluoranthene	3.0E-03	1.0E+01	3.0E-04	1.6E-02	1.0E+01	1.6E-03	5.8E-03		0.0E+00
Chrysene	4.2E-03	1.0E+01	4.2E-04	2.1E-02	1.0E+01	2.1E-03	7.2E-03		0.0E+00
Fluoranthene	3.7E-03	1.0E+01	3.7E-04	1.4E-02	1.0E+01	1.4E-03	4.6E-03		0.0E+00
Indeno(1,2,3-cd)pyrene	9.3E-04	1.0E+01	9.3E-05	5.4E-03	1.0E+01	5.4E-04	2.1E-03		0.0E+00
Phenanthrene	5.7E-03	1.0E+01	5.7E-04	1.8E-02	1.0E+01	1.8E-03	6.2E-03		0.0E+00
Pyrene	5.3E-03	1.0E+01	5.3E-04	2.2E-02	1.0E+01	2.2E-03	7.4E-03		0.0E+00
bis(2-ethylhexyl)phthalate	2.6E-03	3.5E+00	7.5E-04	1.2E-02	3.5E+00	3.5E-03	4.8E-03		0.0E+00
4,4-DDD	0.0E+00	2.0E-02	0.0E+00	0.0E+00	2.0E-02	0.0E+00	0.0E+00	1.4E-02	0.0E+00
4,4-DDT	5.3E-04	2.0E-02	2.7E-02	3.5E-03	2.0E-02	1.7E-01	1.8E-03	1.4E-02	1.3E-01
Dieldrin	3.6E-03	6.5E-02	5.5E-02	2.7E-02	6.5E-02	4.2E-01	1.5E-02	NA	0.0E+00
alpha-Chlordane	3.3E-03	1.6E+00	2.1E-03	2.5E-02	1.6E+00	1.5E-02	1.3E-02	3.1E-02	4.3E-01
gamma-Chlordane	2.8E-03	1.6E+00	1.7E-03	2.1E-02	1.6E+00	1.3E-02	1.1E-02	3.1E-02	3.6E-01
Lead	5.2E-01	7.0E+00	7.5E-02	8.9E-01	7.0E+00	1.3E-01	3.8E-01	4.6E+00	8.3E-02
Silver	1.9E-02	1.8E+00	1.0E-02	4.2E-02	1.8E+00	2.3E-02	1.9E-02		0.0E+00
Zinc	1.3E+01	2.0E+02	6.3E-02	2.8E+01	2.0E+02	1.4E-01	1.5E+01		0.0E+00
TPH	1.5E-01	NA	0.0E+00	7.5E-01	NA	0.0E+00	2.2E-01		0.0E+00
SUMMARY HAZARD INDEX			2.4E-01			9.3E-01			1.0E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Table F-11
Risk from Potential Sublethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil (Revised RMEs for 4,4-DDD, 4,4-DD
Site 11
Remedial Investigation and Feasibility Study, Site 11
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	*Red fox*			*Great horned owl*		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	5.0E-04	2.7E+04	1.8E-08	1.7E-04		0.0E+00
2-Methylnaphthalene	4.8E-03	1.0E+01	4.8E-04	3.8E-03		0.0E+00
Acenaphthylene	5.6E-03	1.0E+01	5.6E-04	1.5E-03		0.0E+00
Anthracene	1.0E-02	1.0E+01	1.0E-03	3.9E-03		0.0E+00
Benzo(a)anthracene	6.5E-02	1.0E+01	6.5E-03	5.3E-02		0.0E+00
Benzo(a)pyrene	9.9E-02	1.0E+01	9.9E-03	9.7E-02		0.0E+00
Benzo(b)fluoranthene	9.9E-02	1.0E+01	9.9E-03	1.0E-01		0.0E+00
Benzo(g,h,i)perylene	1.0E-01	1.0E+01	1.0E-02	1.3E-01		0.0E+00
Benzo(k)fluoranthene	1.0E-01	1.0E+01	1.0E-02	1.1E-01		0.0E+00
Chrysene	8.1E-02	1.0E+01	8.1E-03	6.5E-02		0.0E+00
Fluoranthene	3.5E-02	1.0E+01	3.5E-03	1.6E-02		0.0E+00
Indeno(1,2,3-cd)pyrene	8.9E-02	1.0E+01	8.9E-03	1.1E-01		0.0E+00
Phenanthrene	3.9E-02	1.0E+01	3.9E-03	1.1E-02		0.0E+00
Pyrene	6.4E-02	1.0E+01	6.4E-03	3.7E-02		0.0E+00
bis(2-ethylhexyl)phthalate	3.1E-02	3.5E+00	8.8E-03	1.4E-02		0.0E+00
4,4-DDD	3.4E-03	3.5E+02	9.7E-06	4.8E-03	1.4E-02	3.4E-01
4,4-DDT	2.0E-02	3.5E+02	5.5E-05	1.9E-02	1.4E-02	1.3E+00
Dieldrin	1.5E-01	6.5E-02	2.3E+00	1.4E-01	NA	0.0E+00
alpha-Chlordane	7.8E-02	1.6E+00	4.8E-02	4.6E-02	3.1E-02	1.5E+00
gamma-Chlordane	6.5E-02	1.6E+00	4.0E-02	3.9E-02	3.1E-02	1.2E+00
Lead	2.0E+00	7.0E+00	2.9E-01	4.3E-01	7.5E+01	5.7E-03
Silver	1.1E-01	1.8E+00	5.8E-02	3.7E-02		0.0E+00
Zinc	1.8E+02	2.0E+02	9.1E-01	1.8E+02		0.0E+00
TPH	1.6E+00	NA	0.0E+00	5.3E-01		0.0E+00
SUMMARY HAZARD INDEX			3.8E+00			4.4E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix F Reference List
Site 11
NAS Whiting Field, Milton, Florida

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Appendix F
Statistical Analyses of Biological and Chemical Data
Site 11 Surface Soil

Remedial Investigation and Feasbility Study
Site 11
NAS Whiting Field
Milton, Florida

TPH in Surface Soil versus Earthworm Survival

Sample ID	TPH Surface Soil (mg/kg) (x)	Earthworm Survival (%) (y)
11N00201	53.1	23
11N00301	9.3	100
11N00401	8.6	100
11N00501	11.6	100

Regression Output:

Constant		117.3715
Std Err of Y Est		2.788292
R Squared		0.996503
No. of Observations		4
Degrees of Freedom		2
X Coefficient(s)	-1.77344	
Std Err of Coef.	0.074284	

bis(2-Ethylhexyl)phthalate in Surface Soil versus Earthworm Survival

Sample ID	bis(2-Ethylhexyl)phthalate Surface Soil (mg/kg) (x)	Earthworm Survival (%) (y)
11N00201	0.13	23
11N00301	0.071	100
11N00401	0.052	100
11N00501	0.081	100
BKN00301	0.185	100
BKN00101	0.18	100

Regression Output:

Constant		94.55205
Std Err of Y Est		34.91037
R Squared		0.013337
No. of Observations		6
Degrees of Freedom		4
X Coefficient(s)	-63.3938	
Std Err of Coef.	272.625	

4,4-DDT in Surface Soil versus Earthworm Survival

Sample ID	4,4-DDT Surface Soil (mg/kg) (x)	Earthworm Survival (%) (y)
11N00201	0.027	23
11N00301	0.0068	100
11N00401	0.0068	100
11N00501	0.0023	100
BKN00301	0.0037	100
BKN00101	0.0018	100

Regression Output:

Constant		113.1116
Std Err of Y Est		7.935443
R Squared		0.94902
No. of Observations		6
Degrees of Freedom		4
X Coefficient(s)	-3216.31	
Std Err of Coef.	372.7272	

Dieldrin in Surface Soil versus Earthworm Survival

Sample ID	Dieldrin Surface Soil (mg/kg) (x)	Earthworm Survival (%) (y)
11N00201	0.02	23
11N00301	0.023	100
11N00401	0.023	100
11N00501	0.013	100
BKN00301	0.0185	100
BKN00101	0.018	100

Regression Output:

Constant		103.0763
Std Err of Y Est		34.97536
R Squared		0.00966
No. of Observations		6
Degrees of Freedom		4
X Coefficient(s)	-826.476	
Std Err of Coef.	4184.093	

Lead in Surface Soil versus Earthworm Survival

Sample ID	Lead Surface Soil (mg/kg) (x)	Earthworm Survival (%) (y)
11N00201	25.2	23
11N00301	40.3	100
11N00401	40.3	100
11N00501	16.5	100
BKN00301	6.2	100
BKN00101	3.9	100

Regression Output:

Constant		91.3018
Std Err of Y Est		34.98436
R Squared		0.009151
No. of Observations		6
Degrees of Freedom		4
X Coefficient(s)	-0.18739	
Std Err of Coef.	0.974993	

Zinc in Surface Soil versus Earthworm Survival

Sample ID	Zinc Surface Soil (mg/kg) (x)	Earthworm Survival (%) (y)
11N00201	23.8	23
11N00301	8	100
11N00401	8	100
11N00501	11.2	100
BKN00301	4	100
BKN00101	2	100

Regression Output:

Constant		122.2241
Std Err of Y Est		14.81121
R Squared		0.822401
No. of Observations		6
Degrees of Freedom		4
X Coefficient(s)	-3.69026	
Std Err of Coef.	0.857444	

Notes:

1/2 of the detection limit is used as a surrogate for non-detect values.

APPENDIX G

SITE 11 LITHOLOGIC LOGS AND TEST PIT LOGS

LITHOLOGIC LOG FOR WELL NUMBER (SITE 11)
WHF-11-1

Description	Depth (ft)	Thickness (ft)
Clay, red, gray; sand, fine to medium grained.....	0 - 36.0	36.0
Clay, red, blue gray, light gray, orange yellow, white.....	36.0 - 72.0	36.0
Sand, fine to coarse grained white; clay streaks.....	72.0 - 100.0	28.0
Sand, fine to medium grained, white; clay streaks.....	100.0 - 115.0	15.0
Sand, fine to coarse grained, white; gravel, few mafics.....	115.0 - 127.0	12.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 12)

Description	Depth (ft)	Thickness (ft)
Clay, brown, red; sand, fine to medium grained.....	0 - 26.0	26.0
Sand, fine to coarse grained, white; clay, red, white, streaks.....	26.0 - 55.0	29.0
Clay, red, white, light gray; sand, fine to coarse grained, white, streaks.....	55.0 - 95.0	40.0
Sand, fine to coarse grained, white; gravel; clay, red, white, streaks.....	95.0 - 112.0	17.0

Verification Study, Assessmement of Potential Groundwater Pollution at NAS Whiting Field, Florida
Prepared for NAVFACENGCOM by Geraghty & Miller Inc., December 1986.

TITLE: NAS WHITING FIELD RI		LOG of WELL: WHF-11-2	BORING NO.
CLIENT: SOIV NAVY			PROJECT NO: 6500-01
CONTRACTOR: WILLIAMS & ASSOC.		DATE STARTED: 11-27-90	COMPLTD: 12-1-90
METHOD: MUD-ROTARY	CASE SIZE: 4-INCH	SCREEN INT.: 10-INCH	PROTECTION LEVEL: D
TOC ELEV.: 148.17 FT.	MONITOR INST.: OVA	TOT DPTH: 130FT.	DPTH TO ∇ 89.86 FT.
LOGGED BY: E. BLOMBERG	WELL DEVELOPMENT DATE: 1-8-91		SITE: WHITING FIELD

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			1.1/1.5		SAND-red orange/brown fine sand w/ little silt, trace clay		SP		
							SC		
5		2	1.2/1.5	0	SAND-dark red fine sand w/ some clay			4-6-7	
							SP		
10		3	1.0/1.5	0	SAND-dark red fine sand w/ little clay and silt			3-5-5	
							SP		
15		4	1.0/1.5	0	SAND-dark red to red orange fine sand w/ little silt and clay			9-13-17	
							SP		
20		5	0.9/1.5	0	SAND-red brown/gray/yellow fine sand w/ little silt and clay, mottled			10-17-18	
							CL		
25		6	1.1/1.5	0	CLAY-blue gray/dark purple clay w/ some silt, mottled			2-5-7	
							SM		
30		7	1.4/1.5	0	SAND-dark red to yellow fine sand w/ some silt			3-7-7	
							SP		
35		8	1.2/1.5	0	SAND-pink/yellow/gray fine sand w/ little silt and clay, mottled			9-8-5	
							SP		
40		9	1.5/1.5	0	SAND-yellow/pink/maroon/gray fine sand w/ little silt and clay			7-5-5	
							SP		
45		10	0.7/1.5	0	SAND-red/yellow/gray/pink fine sand w/ trace clay and gravel			10-12-15	
							SP		
50		11	0.7/1.5	0	SAND-light brown fine to medium sand, dense			18-30-40	
							SW		
55		12	0.8/1.5	0	SAND-light brown fine to coarse sand, dense, well sorted			19-22-30	
							SP		
60		13	0.4/1.5	0	SAND-brown coarse sand w/ little medium sand			12-18-20	
							SP		
65		14		0				13-13-21	

TITLE: NAS WHITING FIELD RI		LOG of WELL: WHF-11-2	BORING NO.
CLIENT: SDIV NAVY			PROJECT NO: 6500-01
CONTRACTOR: WILLIAMS & ASSOC.		DATE STARTED: 11-27-90	COMPLTD: 12-1-90
METHOD: MUD-ROTARY	CASE SIZE: 4-INCH	SCREEN INT.: 10-INCH	PROTECTION LEVEL: D
TOC ELEV.: 148.17 FT.	MONITOR INST.: OVA	TOT DPTH: 130FT.	DPTH TO ∇ 89.86 FT.
LOGGED BY: E. BLOMBERG	WELL DEVELOPMENT DATE: 1-8-91		SITE: WHITING FIELD

Continued from PAGE 1

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			1.0/1.5		SAND-brown/purple/gray/yellow fine sand w/ little clay, stratified		SP		
70		15	0.7/1.5	0	SAND-brown/yellow fine sand w/ trace silt and clay		SW	8-11-20	
75		16	1.5/1.5	0	CLAY-purple/light gray clay, moderate plasticity, mottled		CL-CH	8-9-13	
80		17	1.5/1.5	0	CLAY-purple/lt gray/yellow clay,w/ trace silt, moderate plasticity, mottled		CL-CH	7-9-13	
85		18	0.2/1.5	0	CLAY-brown/gray clay		CL-CH	7-14-19	
90		19	1.5/1.5	0	CLAY-brown/gray clay, moderate plasticity		CL-CH	6-8-125	∇
95		20	1.0/1.5	0	SAND-pink/gray fine to medium sand w/ some clay		SP	20-40-42	
100		21	1.0/1.5	0	CLAY-pink/gray/red clay, low plasticity		CL	20-40-42	
105		22	1.0/1.5	0	SAND-pink/gray medium sand		SP	26-30-30	
110		23	0.5/1.5	0	SAND-lt brown/tan fine sand		SP	50/5	
115		24	1.0/1.5	0	SAND-lt gray/white medium sand w/ some gravel		SP	40-50/50	
120		25	1.0/1.5	0	SAND-lt brown/tan coarse sand w/ some gravel		SP		
125			1.0/1.5		SAND-tan/brown fine to medium sand w/ some coarse sand CLAY-yellow/buff/brown clay w/ some fine to coarse sand		SP		
130									

TITLE: Naval Air Station Whiting Field		LOG of WELL: WHF-11-3	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/22/93	COMPLTD: 3/9/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 55-70 FT	PROTECTION LEVEL: D
TOC ELEV.: 117.24 FT.	MONITOR INST.: OVA	TOT DPTH: 118FT.	DPTH TO ▽ 62.45 FT.
LOGGED BY: L. Foster	WELL DEVELOPMENT DATE:		SITE: 11

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND - reddish brown, fine, poorly graded, loose, moist.		SP	POSTHOLE	
5			20/24	0	SAND - dark reddish brown, fine, silt, poorly graded, stiff, slightly moist.		SM	3,3,3,4	
10			24/24	0	SAND - SAA.		SM	6,8,10,11	
15			20/24	0	SAND - SAA.		SM	6,9,11,11	
20			24/24	0	SAND - orangish brown, fine, poorly graded.		SP	4,5,6,6	
25			24/24	0	SAND - fine, moist, loose.		SP	4,5,6,6	
30			23/24	0	SAND - off-white, fine, poorly graded, loose, dry.		SP	4,11,18,28	
35			24/24	0	SAND - SAA.		SW	5,10,13,17	
40			24/24	7	CLAY - gray to red, stiff, moist.		CL	2,3,5,7	
			24/24	6	CLAY - SAA.		CL	5,7,8,9	
45				4	CLAY - red to tan, inorganic, trace silt, plastic, moist.		CL	2,3,4,6	

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: Naval Air Station Whiting Field		LOG of WELL: WHF-11-3	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/22/93	COMPLTD: 3/9/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 55-70 FT	PROTECTION LEVEL: D
TOC ELEV.: 117.24 FT.	MONITOR INST.: OVA	TOT DPTH: 118FT.	DPTH TO ▽ 62.45 FT.
LOGGED BY: L. Foster	WELL DEVELOPMENT DATE:		SITE: 11

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN
					Continued from PAGE 1			
			24/24	5	CLAY - SAA, 8" light brown, some fine sand matrix, moist.		CL CL	3,4,8,10
50			24/24	0.6	CLAY - yellowish orange, lower 2" maroonish red, fine sand, firm, moist.		CL	1,1,2,1
55			16/24	0	CLAYEY SAND - brown to red, mottled, moderately firm, slightly moist.		SC	6,10,11,12
60			12/24	3	SAND - yellowish orange, fine to medium, poorly graded, medium dense, wet.		SW	12,13,12,12
65			04/24	0.7	SAND - yellowish orange, fine to medium, trace very fine and coarse, moderately graded, medium dense, wet.		SW	13,23,18,16
70			14/24	4	SAND - pale orangish red, fine to medium, well graded, dense, moist.		SW	16,17,19,24
75			15/24	3.5	Same as above, slightly more medium sand.		SW	X,X,27,28
80			13/24	3.5	SAND - grade pale pink to white, grade coarse to fine, well graded, stiff.		SW	6,6,17,20
85			08/24	0	SAND - very light gray to light tan, fine, poorly graded, medium dense, moist.		SP	7,11,23,27
90			10/24	4	SAND - light tan, medium coarse, trace fine, well graded, medium dense, wet.		SW	23,19,14,24

WELL DATA

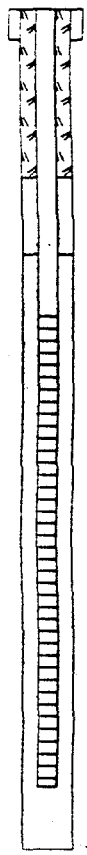


 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: Naval Air Station Whiting Field		LOG of WELL: WHF-11-3	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 2/22/93	COMPLTD: 3/9/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 55-70 FT	PROTECTION LEVEL: D
TOC ELEV.: 117.24 FT.	MONITOR INST.: OVA	TOT DPTH: 118FT.	DPTH TO ∇ 62.45 FT.
LOGGED BY: L. Foster	WELL DEVELOPMENT DATE:		SITE: 11

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			10/24		Continued from PAGE 2		SW		
95			11/24	4	SAND - brown to red to gray banding, fine to medium, poorly graded, dense, well rounded, wet.		SP	10,19,22,26	
100			12/24	4.5	SAND - pinkish tan, medium to coarse, trace fines, well graded, dense, trace gravel, lower 3" saturated.		SW	17,13,13,16	
105			08/24	5	CLAY - red brown and white, fine to medium, well graded, firm, stiff, moist to wet.		CL/SW	7,14,25,27	
110			08/24	3	SAND - light tan, fine to medium, moderately well graded, saturated.		SW	15,15,19,21	
115			07/24	0	SAND - light tan, medium to coarse, some fine, well graded, moderately dense, saturated.		SW	16,12,15,13	
120			05/24	5	Same as above, saturated. THE HOLE WAS OVERDRILLED TO 118 FT. IT WAS THEN BACKFILLED TO 80 FT. WITH SAND BEFORE THE WELL WAS SET.		SW	9,11,14,15	
125									
130									
135									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: Naval Air Station Whiting Field		LOG of WELL: WHF-11-IS	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 7/21/93	COMPLTD: 7/21/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 36-51 FT	PROTECTION LEVEL: D
TOC ELEV.: 117.15 FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ∇ 45.64 FT.
LOGGED BY: N. Roka	WELL DEVELOPMENT DATE:		SITE: 11

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN
5			21/24	BKG	SAND - red, little fine to medium, poorly graded, medium dense, wet, subangular.		SP	4,5,6,7
					SAND - red, fine, little silt, medium dense, moist.			
10			18/24	BKG	Same as above, except mostly silt, medium dense, damp.		SM/ML	8,8,9,11
15			20/24	BKG	Same as above.		SM/ML	6,5,9,11
20			18/24	2.0	Same as above. SILT - red, very soft, saturated.		SM/ML	7,8,9,9
25			15/24	3.0	SAND - red grade to light orange, fine to medium, trace silt, poorly graded, medium dense, subangular.		SP	11,12,13,11
30			19/24	8.5	CLAY - redish yellow, gray mottled, firm to stiff, damp.		SP	15,17,22,28
					SANDY SILT - brown, medium firm, soft.			
					SAND - mustard yellow, fine, poorly graded, dense, damp.			
35			10/24	60	Same as above, light tannish orange, very dense, moist.		SP	33,51,REF
40				81			SP	32,29,41,47

WELL DATA

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: Naval Air Station Whiting Field		LOG of WELL: WHF-11-1S	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 7/21/93	COMPLTD: 7/21/93
METHOD: MUD ROTARY	CASE SIZE: 2"	SCREEN INT.: 36-51 FT	PROTECTION LEVEL: D
TOC ELEV.: 117.15 FT.	MONITOR INST.: OVA	TOT DPTH: 52FT.	DPTH TO ▽ 45.64 FT.
LOGGED BY: N. Roka	WELL DEVELOPMENT DATE:		SITE: 11

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				
			15/24		SAND - reddish orange grading to bluish gray, fine to medium, poorly graded, wet, subangular.		SP		
45			12/24	1.0	SAND - purple, red, yellow mottled, fine to medium, poorly graded, medium dense, saturated.		SP	18,13,16,20	
50			24/24	BKG	CLAY - gray with red and yellow mottling, fat, firm, plastic, moist.		CL	6,9,9,9	
					SAND - gray with red and yellow mottling, poorly graded, medium dense, wet, subangular.				
					Resume CLAY.				
55									
60									
65									
70									
75									
80									

 ABB ENVIRONMENTAL SERVICES, INC.

Test Pit ~~14~~ 11-01

Time	Depth	Soil Description	Monitoring Equipment FID	O_2	LEL	Radiation Monitor	Remarks.
1745	0 – 2	Tan to Brown Sand fine to v. fine	2/2	19.9	0	0	
	2 – 4	Concrete Rubble, Construction debris	2/2	19.9	0	0	Bricks, Concrete rubble, Asphalt debris
	4 – 7½.	Brown wood. Asphalt layer. (debris)	0	19.9	0	0	Coke bottle Aluminum (1.5") Crushed Aluminum Can
1800	7½ – 8	light olive green Clayey sand.	0	19.9	0	0	Visibly Clean layer of Soil
		Collect soil sample at 7.8 ft bls label it as WHF-1A-14-SS-01-01.					
1805	8 – 10	Brick Red Clayey Sand	0	19.9	0	0	Visibly clean layer -

1815 Backfilling Completed. Start Deconing

1835 Deconing Completed. mobilize the equipment to Site ~~14~~ 11-02.

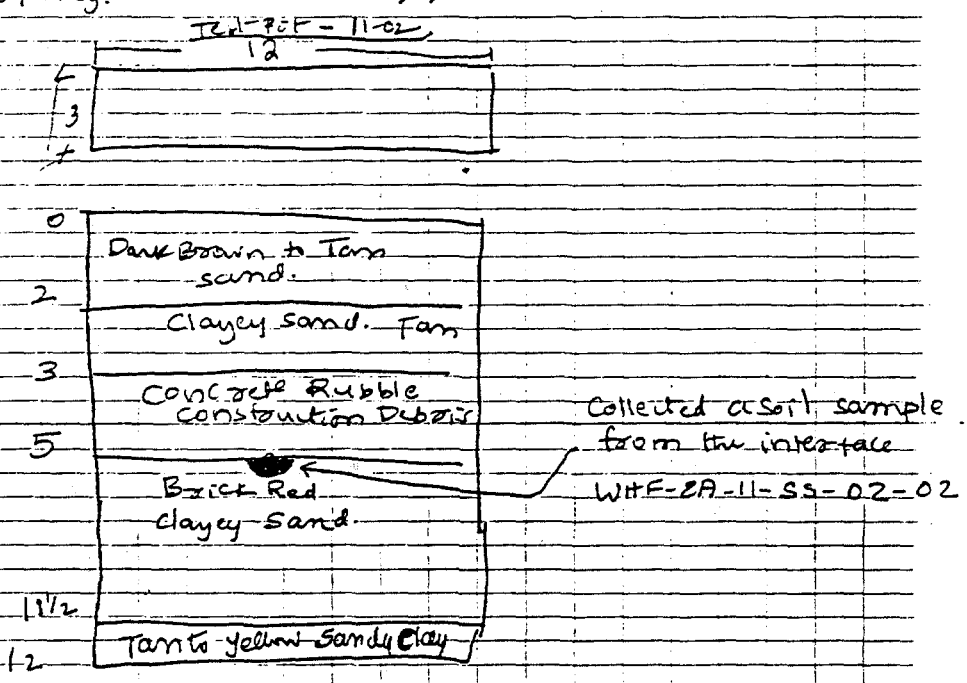
1900 Leave Site ~~14~~ 11. Come back to trailer.

Test pit 11-02

Time	Depth	Soil Description	Monitoring Equipment FID	O_2	Radiation Monitor	LEL	Remarks
900	0 - 2	Dark Brown to Tan sand. fine to v. fine (Organic Content)	0	19.9	0	0	
	2 - 3	clayey sand. Tan.	0	19.9	0	0	
	3 - 5	Concrete Rubble Steel Cable	0	19.9	0	0	Construction Debris, Concrete Rubble, Brick tiles.
	5 - 6	Brick Red clayey sand.	0	19.9	0	0	
	6 - ~~9~~ 11½	Brick Red clayey sand.	1/1	19.9	0	0	(metal) Grafici Can.

920 collected a soil sample from 5-6 ft bls. Labeled it as WHF-2A-SS-10-02-02.

~~9~~ - ~~11½~~ 11½ - 12.	Tan to yellow Sandy Clay.	0	19.9	



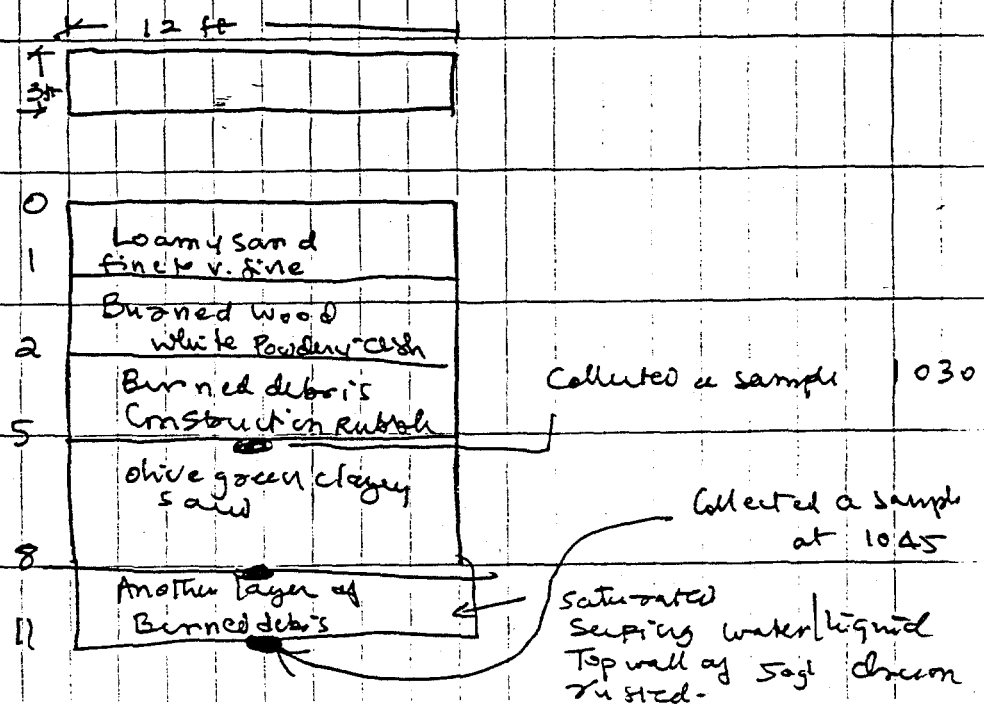
930 Start Backfilling the Pit

945 Backfilling completed. Start decoying. Put Stakes at the border of the Pit.

Test Pit 11-03

Time	Depth	Soil Description	Monitoring Equipment FID	O_2	LEL	Radiation Monitor	Remarks
1015	0-1	Loamy Sand Fine to V. fine	0	19.9	0	0	
(5)	1-2	Burned debris White Powdery ash	1020 to pit	19.9	0	0	Burned wood
1020	2-5	Burned debris					Crushed metal cans. construction debris, Styrofoam insulating material.
1025	Collect a sample at 5-6 ft bls label the sample WHF-2A-SS-11-03-03 Upgrade the PPE from mod 'D' to 'C'						(Smelly Sulphur)
1030	5-6	olive green Clayey Sand.	Peak of 20ppm	19.9	0	0	
	6-8	olive green Clayey sand	3/3 Bzone Headspace Reading	19.9	0-0		
				300/10	19.9	0	
	8-11	New layer of Burned debris	1015	19.9	0		Top wall of 50 gal drum soil saturated seeping liquid (FID did not indicate high Readings.
(4)							
1040	Collect another sample at 10-11 ft bls Back fill the pit.						
1045	Continue back filling the pit						

Test Pit 11-03



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Kg

(Continued)

APPENDIX H

EVALUATION OF BACKGROUND CONCENTRATIONS FOR COVERED LANDFILL SITES

Evaluation of Background Arsenic Concentrations for Covered Landfill Sites

Naval Air Station (NAS) Whiting Field, Milton, Florida

At NAS Whiting Field nine soil types, as identified by the U. S. Department of Agriculture, Soil Conservation Service (USSCS), are present. The Remedial Investigation (RI) sites at NAS Whiting Field are associated with seven of the nine soil types. The background surface soil data set for each RI site was initially determined to be comprised of background surface soil samples from the same USSCS soil types as occur on the individual sites. However, available information and review of historical aerial photographs indicated that in the construction of landfills at the facility, a borrow pit was dug to an approximate depth of 10 to 15 feet below land surface (bls) and the excavated soil was piled to the side. Following landfill operations, the borrow materials comprised of undifferentiated surface and subsurface soils, were used for the landfill cover. Any additional soils required to complete the landfill cover are believed to have been obtained from other borrow pits located at the facility.

If a mix of surface and subsurface soils were used in the cover for landfills, it would be appropriate to use the combined data set of surface and subsurface soil samples as the background screening value. However in order to be protective of human health and the environment, it is proposed that the background surface and subsurface data set be combined to a single value as be used as the "Industrial Use Soil Cleanup Goal". This modified "Industrial Use Soil Cleanup Goal" is specifically limited to the covered landfill sites including: Site 1, 2, 9, 10, 11, 13, 14, 15, and 16 and to the inorganic analyte arsenic.

Tables 3-8 through 3-18 in the General Information Report present the detected concentrations and summarize the analytical data for the individual background soil samples collected at NAS Whiting Field. A summary of the arsenic background data set and the modified "Industrial Use Soil Cleanup Goal" for arsenic is presented Table I-1. As indicated on the table the modified "Industrial Use Soil Cleanup Goal" for arsenic to be used at covered landfill sites is 4.62 mg/kg.

Table A-1
Summary of Arsenic Detected in Surface and Subsurface Background Soil Samples

Feasibility Study
Site 12, Tetraethyl Lead Disposal Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection Surface Soil Samples[1]	Mean of Detected Concentrations Surface Soil Samples[2]	Frequency of Detection Sub-surface Soil Samples[1]	Mean of Detected Concentrations Subsurface Soil Samples[2]	Frequency of Detection Surface and Subsurface Soil Samples[1]	Mean of Detected Concentrations Surface and Subsurface Soil Samples[2]	Surface and Subsurface Soil Background Screening Concentration (modified Industrial Use Cleanup Goal)
Inorganic Analytes (mg/kg)							
Arsenic	15/15	1.54	14/14	3.14	29/29	2.31	4.62

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed.
[2] The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples in which the analyte was not detected.

Note: mg/kg = milligrams per kilogram.

DRAFT

Table A-2
Comparison of Detected Arsenic Concentrations in Surface and Subsurface Soil Samples to Florida Soil Cleanup Goals

Feasibility Study
Site 12, Tetraethyl Lead Disposal Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Minimum Detected Concentration	Maximum Detected Concentration	Mean of Detected Concentrations	Soil Cleanup Target Levels for Florida (Residential)[1]	Soil Cleanup Target Levels for Florida (Industrial)[1]	Surface and Subsurface Soil Background Screening Concentration (modified Industrial Use Cleanup Goal)[2]
Inorganic Analyte (mg/kg)						
Arsenic	0.52	6.3	2.31	0.8	3.7	4.62

[1] Source: Chapter 62-785, Florida Administrative Code.
[2] The modified Industrial Use Cleanup Goal for arsenic is the Florida Department of Environmental Protection approved site specific cleanup gaol for Perimeter Road sites at Naval Air Station, Whiting Field.

Note: mg/kg = milligrams per kilogram.

DRAFT

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

April 27, 1998

Ms. Linda Martin
Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive, PO Box 190010
North Charleston, SC 29419-9010

file: arsenic1.doc

RE: Request for Site-Specific Arsenic Soil Cleanup Levels: Covered Landfill Sites, NAS Whiting Field

Dear Ms. Martin:

I have reviewed the request for approval of a site-specific Soil Cleanup Goal for arsenic at the "covered landfill sites" at NAS Whiting Field from Mr. Gerald Walker, ABB Environmental Services, dated April 22, 1998 (received April 22, 1998). Based on the prior presentation to Department Staff and the summary information furnished in the letter and the attached Appendix I, the request is granted to utilize a site-specific Soil Cleanup Goal for arsenic of 4.62 mg/kg at Sites 1, 2, 9, 10, 11, 12, 13, 14, 15 and 16., with the following conditions:

1. The sites may be utilized for activities that involve less than full-time contact with the site. This may include, but is not limited to, a.) parks b.) recreation areas that receive heavy use (such as soccer or baseball fields) or, c.) agricultural sites where farming practices result in moderate site contact (approximately 100 days/year, or less).

2. The Navy must assure adherence to the land use by incorporating the site and conditions in a legally binding Land Use Contol agreement.

3. The above Soil Cleanup Goal shall not be utilized at any other site without specific Department approval.

If you have questions or require further clarification, please contact me at (904) 921-4230.

Sincerely,

James H. Cason, P.G.
Remedial Project Manager

APPENDIX I

NAVY RESPONSE TO COMMENTS

Final Response to Review Comments for
Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B)
NAS Whiting Field, Milton, Florida

Florida Department of Environmental Protection

1. The report utilizes the 1996 Soil Cleanup Goals. As we have previously discussed, the Navy should also compare the analytical results to the Chapter 62-785, F. A. C. Soil Cleanup Target Levels. This may be done as an appendix or supplement tot he document if you desire or these values may be utilized in the existing tables. In either case, cleanup or other management decisions should be based on the information derived from the newer values. In some cases, such as vanadium, the SCTLs are lower than previously, in other cases, such as beryllium, the values have increased. In other cases, there are values which were not present previously, such as copper and TRPH. In all cases, the newer SCTLs should be used for investigations at NAS Whiting Field. Following this, the conclusions and recommendations should be revised, if necessary.

   Response: SCTLs will be incorporated in the Final RI

2. Please present figures which indicate the locations where soil and groundwater exceeds cleanup target levels.

   Response: Figures will be revised to include exceedances of cleanup target levels.

3. Based on data presented in the report, risks are predicted for future residents due primarily to arsenic and benzo(a)pyrene in surface soil. In the conclusions, page 9-2, it states that remediation of surface soil would not substantially reduce exposure from arsenic. While the arsenic concentrations observed in surface soil at the site may indeed be an expression of the natural background, the results of excavation and construction or other reasons, it may also be a result of the activities carried out by the Navy at this site. Please address this possibility.

   Response: The conclusion will be revised to indicate a Feasibility Study will be prepared to address risks associated with the exposure to arsenic and benzo(a)pyrene in surface soil.

4. I agree that a focused feasibility study be conducted to address the risk to a future resident or others (such as an industrial or recreational scenario) from surface soil. Based on our recent conversations, I also understand that the Navy will address the ground water contamination, including evaluation of soil leaching, at this site in connection with the Site 40 basewide ground water assessment. If so, this should be clearly stated in the focused feasibility study.

   Response: As recommended by the reviewer, the feasibility study will identify the need for groundwater to be addressed under the Site 40 Basewide Groundwater Assessment.

Final Response to Review Comments for
Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B)
NAS Whiting Field, Milton, Florida

U.S. Environmental Protection Agency

SPECIFIC COMMENTS

1. **Page 3-2, Section 3.2, Second Paragraph.** This section states that a total of 31 soil gas samples were collected, referring the reader to Figure 3-1. However, Figure 3-1 identifies 48 soil gas sample locations. While all soil gas locations may not have provided adequate soil gas results, Figure 3-1 should be modified to distinguish which of the 48 locations correspond to the 31 sample locations referred to in Section 3.2.

   Response: Table 5-6 provides a list of the 31 sample locations sampled during the soil gas survey. Samples were collected from locations with the sample ID numbers 9 through 20, 23 through 34, 37 through 41, and 43 through 48.

1a. *The text should contain the information provided in the response for clarification.*

Response: Text provided in the above response will be added to Section 3.2

2. **Page 3-2, Section 3.2, Third Paragraph.** This paragraph indicates that a "common problem" utilizing the organic vapor analyzer (OVA) was probe flame-out due to high humidity or high CO_2/low oxygen. In this case, a landfill gas analyzer was to be used to measure methane and CO_2 levels. However, Table 5-6 of the Final Draft RI Report provides no results of methane and CO_2 measurements from soil gas locations. Clarification should be provided as to whether the landfill gas analyzer was utilized. If so, the data should be summarized in the report.

   Response: Clarification on the use of the landfill gas analyzer will be included in the final RI.

3. **Page 3-5, Section 3.3, Second Paragraph.** This paragraph states, "The remaining eight Phase IIB surface soil samples (11S00601 through 11S01301) were collected on a ten-foot-radius around Phase IIA soil sample 11S00401." Apparently, these eight additional samples were to delineate lead contamination. This description is confirmed in Figure 3-2. However, sample 11S00401 is marked as a Phase IIB sample location on Figure 3-2. Additionally, according to Table 5-8 (Page 5-27), sample 11S00401 only contained lead at 40.3 mg/kg, which is comparable to sample 11S00301. It appears, based on the data presented in Table 5-8, that the delineation of lead should have focused on Phase IIA sample 11-SSL-02, which had a lead concentration of 2,230 mg/kg (several orders of magnitude higher than other samples). Section 5.5 also refers to the surface soil

delineation around sample 11S00401. This discrepancy should be clarified and modifications to the text and figure made accordingly.

Response: Field notes indicate the collection of the subject samples to be around 11S00401. The samples may have been collected at the wrong location. The Navy recommends collection of delineation samples adjacent to sample location 11-SSL-02.

4. **Page 3-5, Section 3.4.1, First Paragraph**. This paragraph states that lithologic data was recorded during monitoring well installation and entered into field logbooks. However, Appendix G includes only lithologic descriptions; no field log notes were provided. It is recommended that either field log notes be included in the report or soil boring/monitoring logs be provided for all soil boring and monitoring well locations.

Response: All lithologic data collected and entered in the field logbooks is presented on the monitoring well construction logs in Appendix G.

5. **Page 3-6, Section 3.4.2, Fourth Paragraph**. This paragraph indicates that physical descriptions for the test pits were recorded in field log notes. However, no field log notes are provided. It is recommended that either field log notes describing the test pit investigation activities be included in the report or test pit logs be provided.

Response: In general, lithologic description for test pitting operations is not presented in an RI report. However, a copy of the log book with test pit information is attached to the Response to Comments.

5a. When the RI is finalized, a copy of the log book with the test pit information should be appended to the report.

Response: *Test pit information from the log book will be provided in an appendix.*

6. **Page 4-7, Table 4-2.** The control limit cited for pyrene is "< 36." This appears to be inaccurate. Control limits are typically cited as a range. This number should be verified.

Response: The control limit of "< 36" is accurate. Any value greater than 36 meets the acceptance criteria.

7. **Page 4-8, Section 4.2.2, First Paragraph**. This paragraph states that since the percent recovery exceeded the target range, "some analytical results may be biased low." However a review of the data tables found in Section 5 does not indicate any "L" qualifiers which are typically used to qualify biased low data. This discrepancy requires correction or clarification.

Response: The last sentence of the subject paragraph states an acceptable level of accuracy was achieved. In the judgement of the data validator, the 'L' qualifier was not required.

8. **Page 5-1, Section 5.0.** This section contains subsections describing the geologic and hydrogeologic assessments. However, these sections do not describe the underlying geologic or hydrogeologic zones encountered at the site. This information should be provided to correlate the data collected to specific geologic and hydrogeologic units.

   Response: In an effort to streamline the RI report, discussion of specific geologic and hydrogeologic units is presented in the NAS Whiting Field General Information Report. Also, the basewide groundwater investigation (Site 40) will address these issues.

9. **Page 5-1, Section 5.2.** This section describes the direction of groundwater flow based on water level readings found in various monitoring wells at this, and other sites in the area. Table 5-1 summarizes the water level readings, while Figures 5-1 and 5-2 depict the groundwater flow direction for the sand and gravel (shallow) unit. Monitoring well WHF-11-2 is not depicted on either figure, nor is there any figure depicting the flow direction in the deeper hydrogeologic zone below the clay layer. The current figures should be modified to include WHF-11-2 and additional figures depicting groundwater flow in the deeper unit should be developed.

   Response: The addition of monitoring well WHF-11-2 to Figures 5-1 and 5-2 would not affect the potentiometric surface maps of the water table as this well is screened in the deeper hydrogeologic zone. However, the assessment of the deeper hydrogeologic zones (including monitoring well WHF-11-2) will be included in the basewide groundwater investigation (Site 40). However, the location of monitoring well WHF-11-2 will be presented on the referenced figures.

9a. *Will the response be restated to "the well will be added"?*

   Response: Monitoring well WHF-11-2 will be added to Figures 5-1 and 5-2.

10. **Page 5-1, Section 5.2, Second Paragraph.** This paragraph, which describes the groundwater flow direction in the shallow and deeper hydrogeologic zones, refers to Figure 5-1, which depicts the flow direction. However, according to Figure 5-1, groundwater data from wells WHF-11-1S and WHF-11-1 were not used in the calculations. The legend in Figure 5-1 indicates that WHF-11-1S was not included, presumably as a result of a "perched" groundwater layer. This section should clearly indicate the different hydrogeologic zones and clarify why some wells were not used in these calculations.

Response: These concerns will be addressed in the basewide groundwater investigation (Site 40).

10a. *The response does not address the comment. Is the text going to be revised to clarify why some wells were not used?*

Response: Clarification will be provided in the final RI.

11. **Page 5-12, Table 5-2.** The June 1994 average horizontal gradient, based on the six horizontal gradients provided, should be 0.0028, not 0.0029 as cited. The table should be modified accordingly.

    Response: The average horizontal gradient will be changed to 0.0028.

12. **Page 5-16, Table 5-2.** The November 1996 horizontal gradient cited for well WHF-11-2 is 0.014. This value appears to be erroneous based on a comparison to other values obtained for that and similar wells. Additionally, this value does not figure into the average hydraulic gradient calculation. This number should be verified, and the table modified accordingly.

    Response: The water level values were verified and appear to be anomalous. The table will be modified to indicate the horizontal gradient of 0.014 for well WHF-11-2 is an anomalous reading and was not included in the average gradient calculation.

13. **Page 5-20, Section 5.4, Second Paragraph.** The first sentence states that 31 of "148" proposed soil gas locations were sampled. However, according to Figure 3-1, this number should be "48". The text should be modified accordingly.

    Response: Please see response to Specific Comment No. 1.

14. **Page 5-35, Table 5-12.** The EPA Region III screening criteria listed for the aroclor compounds is "0.32." This is inaccurate since it is in units of mg/kg. Since all of the results are cited in ug/kg, the corresponding EPA Region III screening value is 320 ug/kg. It is recommended that all screening values be converted to the appropriate units as cited for the soil data. Furthermore, all screening values should be verified to ensure the appropriate conversions are being used.

    Response: The screening criteria for aroclor compounds will be changed as suggested and all other screening values will be checked for appropriate units.

15. **Page 5-48, Table 5-16.** The values cited for the column "Federal MCLs" is confusing. The column header indicates Federal MCLs, while the footnote to this column (Footnote

5) indicates that the lesser of the EPA Region III risk base concentration (RBCs) for tap water or the Florida Groundwater Guidance Concentration is to be used. It is not clear which is being applied. For instance, the benzene value listed (5 ug/l) is the MCL for that contaminant; however, the EPA Region III RBC for tap water for benzene is 0.36 ug/l, based on the October 1997 RBC tables. In this case, the lower value was not cited. Similar circumstances apply to other chemicals as well. Clarification as to which value is being utilized in this column should be provided in the report.

Response: The Federal MCL column will be changed to reflect the MCLs identified in the USEPA Drinking Water Regulations and Health Advisories tables.

16. **Page 5-48, Table 5-16**. The value cited for aluminum (200 ug/l) can not be verified. The source of this value should be provided.

Response: No Federal MCL for aluminum is available and the value of 200 ug/l will be changed to "NA" (not applicable).

16a. The response does not address the fact that there is a secondary MCL for Aluminum.

Response: *The 200 ug/l value for Aluminum, as stated in comment 16a, will be identified as a Secondary MCL. Appropriate reference will be added to the Table.*

17. **Page 8-11, Section 8.2.3, Eighth Paragraph**. This paragraph should discuss the potential, or lack thereof, for groundwater discharge to surface water bodies downgradient of the site

Response: It appears this comment is addressed on Page 8-12, second paragraph, which identifies Big Coldwater Creek as a point of groundwater discharge for groundwater at Site 11.

18. **Page 9-3, Section 9.1**. Both the human health and ecological risk assessment (ERA) conclusions should be qualified. It does not appear, based on data presented in the report, that the surficial lead contamination near 11-SL-02 has been fully delineated unless the reference to sample location 11S00401 in Comment No. 6 actually is sample number 11-SL-02). A clarification should be provided.

Response: As stated in response to comment number 3, contamination around 11-SL-02 has not been delineated. The Navy recommends collection of delineation sample at this location.

Final Response to Review Comments for
Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B)
NAS Whiting Field, Milton, Florida

USEPA RISK REVIEW COMMENTS

GENERAL COMMENTS

1. Chapter seven discusses how risks are calculated for terrestrial wildlife using HQs and His. A discussion is provided about how HQs less than one will result in no adverse ecological effects and how His greater than one will result in possible adverse ecological effects and warrant further discussion. However, there is no discussion on how an HI or HQ equal to one will be addressed. This scenario should be addressed in the risk characterization section of the text.

   Response: The risk characterization will be expanded to include a discussion on how an HI or HQ equal to one will be addressed. In general, if the HI is greater than or equal to one, the ecological significance of the HQs comprising the HI will be discussed. Although adverse effects to individual birds and mammals are possible at HI values of one, the likelihood of population-level effects to terrestrial wildlife populations, which was selected as the assessment endpoint for the ERA, are considered negligible.

2. When sublethal and lethal hazard indices (His) were calculated for each receptor using reasonable maximum exposure (RME) point concentrations, the His for each receptor were greater than one (except for the cotton mouse). When sublethal His were calculated using central tendencies (CTs), the His for each receptor were again greater than one (except for the cotton mouse). When sublethal His were recalculated excluding sample location 11-SL-02 values, His for each receptor were still greater than or equal to one (except for the cotton mouse). His for the short-tailed shrew and the eastern meadowlark were both equal to one but were determined to be insignificant because each of the hazard quotient (HQ) values that were summed to calculate the His were less than one. The purpose of calculating an HI is to predict the cumulative risks to a receptor from of the combined contaminants. Ruling an HI insignificant because it is composed of HQs that are each less than one defeats the purpose of calculating an HI. Based on the results of this ERA, there is a possibility of adverse effects to reproduction and growth of small mammals and birds inside *and* outside the immediate area of sample area 11-SL-02. The risk to small mammals and birds with His greater than or equal to one as well as higher trophic level receptors with His greater than or equal to one need further risk evaluation and assessment in the PRG development process.

   Response: See the response to General Comment #1. Based on the results of the ERA, it is possible that adverse effects to reproduction and growth of individual small mammals and birds inside and outside the immediate area of sampling location 11-SL-02 may occur; however, the assessment endpoint chosen for the ERA focuses on population-level impacts, not impacts to individual species. As previously stated in Section 7.6.1, the number of affected individuals in a population presumably increases with increasing HQ or HI values; therefore, the likelihood of population-level effects occurring is generally expected to

decrease with lower HQ or HI values.

3. The surface soil assessment description within Section 3 of the RI does not appear to be consistent with the data that are used in the ecological risk assessment. The numbers of samples and the suite of analytes are not consistent between these two sections. For example, Section 3.3, pages 3-2 and 3-5 state that in Phase IIB 5 of the 13 surface soil sample locations were selected for TCL VOCs, SVOCs, pesticides, PCBs, TAL inorganics, and TPH analysis to support the risk assessment; while the remaining eight surface soil samples were only analyzed for lead.

   Table 7-2 within the ecological risk assessment indicates that 10 samples were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, TAL inorganics, while 18 were analyzed for lead. Were five of these samples from Phase IIB and the other five from another phase of the RI? Appendix C presents data from sampling that occurred in August 1992, October 1992, and January 1996. It does not appear that the October 1992 data were used in the ecological risk assessment. Appendix C appears to present surface soil data from 22 sampling locations. All recent validated sampling data should have been used in the ecological risk assessment. The inconsistencies of sample numbers, sample locations, and analysis need to be clarified.

   Response: The 10 samples that were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL inorganics include five samples collected during the August 1992 Phase IIA investigation (sample locations 11-SL-01 through 11-SL-05) and five samples collected during the January 1996 Phase IIB investigation (sample locations 11S00101 through 11S00501). The 18 samples analyzed for lead include the aforementioned 10 samples in addition to 8 samples collected during the January 1996 Phase IIB investigation (11S00601 through 11S01301), which were analyzed for lead only. The October 1992 soil data presented in Appendix C were not used as part of the surface soil data set because these data are from subsurface soil sampling locations. All recent validated surface soil data was used to evaluate ecological risks at Site 11.

4. Site diagrams presented in the RI Report show a drainage feature labeled "Y" Ditch. The ditch is shown to be hydraulically down gradient from Site 11, but it is not clear if surface drainage flows toward the "Y" Ditch. Sampling of surface water and sediment does not appear to have been collected from the ditch. The lack of surface water and sediment data for the "Y" Ditch is a potential data gap in the characterization of potential contamination at Site 11. Surface flow drainage should be discussed in the text. In addition, the rationale for not collecting sediment and surface water samples should be presented in the text. Additional sampling may be necessary.

   Response: As discussed in the Site Characterization (Section 7.1), off-site migration of site-related constituents to the Y-ditch is unlikely because the topography of Site 11 gently slopes toward the east-northeast. It is expected that any runoff from the site would migrate in a

northeasterly direction toward Big Coldwater Creek, which is located approximately 1.7 miles from Site 11.

5. Discussion in the Human Health Risk Assessment refers consistently to the risk calculations and the exposure variables that are presented in Appendix C. The information is actually presented in Appendix E. All references to Appendix C for exposure parameter and risk calculation data should be changed accordingly.

   Response: The text will be revised accordingly.

SPECIFIC COMMENTS

1. **Section 5.5 Page 5-33.** The discussion of the lead concentrations refers to the "USEPA Region III RBC of 400 mg/kg." EPA does not currently have a Region III RBC for lead. The correct source of the screening value should be presented in the text.

   Response: The correct source of the screening value will be presented in the text.

2. **Section 6.5.2, Page 6-20**. The text states that inhalation and ingestion of groundwater while showering was evaluated for the future residential scenario. The text does not provide a rationale for not evaluating the dermal exposure pathway for this scenario. An evaluation of the dermal pathway should be presented in the text, or the rationale for not evaluating pathway should be presented. In addition, the exposure parameters used in the calculation presented in Appendix E indicate that the ingestion of tap water was evaluated, not incidental ingestion while showering. The text should be modified .

   Response: An explanation for not evaluating the dermal pathway will be presented in the text. The text will be modified to reflect the reviewer's comment concerning ingestion of tap water.

3. **Table 7-1, P. 7-7**. The assessment endpoints for terrestrial plants are stated as a "Reduction in the biomass of terrestrial plants used as forage material," and "Survival and growth of plant communities." One of these endpoints is a positive endpoint (survival of communities) while the other is a negative endpoint (reduction in biomass). These two endpoints are essentially the same with one being phrased negatively and the other phrased positively. One of these endpoints should be omitted from Table 7-1.

   The assessment endpoints for terrestrial invertebrates are stated as a "Reduction in the abundance of earthworms used as forage material," and "Survival and growth of terrestrial invertebrate communities." Again, one of these endpoints is a positive endpoint (survival of communities) while the other is a negative endpoint (reduction in abundance). These

endpoints should be combined and both phrased either positively or negatively.

Response: The endpoints for terrestrial plants and soil invertebrates will be revised so that they are "positively" phrased.

4. **Section 7.3, P. 7-10**. The second paragraph on page 7-10 states that the site-specific background study used to establish background screening values for Site 11 consists of nine surface soil samples (BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501) and one duplicate sample (BKS00201D). However, the analytical data for these background samples is not included with the rest of the soil sample analytical data in Appendix C. These data should be provided.

   Response: The surface soil background data for Site 11 are included as part of the General Information Report (HLA, 1998).

5. **Section 7.4.2, Terrestrial Wildlife, p. 7-15**. The second bullet at the bottom of page 7-15 provides a discussion of the short-tailed shrew as a wildlife receptor. The home range of the short-tailed shrew is not provided in this discussion although the home ranges for the other ecological receptors are provided in this section. The home range of the short-tailed shrew should be provided in the second bullet.

   Response: The home range of short-tailed shrew will be added to the second bullet.

6. **Table 7-3, p. 7-16**. This table provides the equations used to calculate the potential dietary exposures for wildlife receptors. The variable "TN" is given three different definitions in Table 7-3. They are as follows, 1) the tissue concentration in food item N, 2) the secondary prey item concentration, and 3) the primary prey item concentration. Clarification in Table 7-3 would be beneficial.

   Response: The variable T_N will be modified so that T_{N1} refers to the tissue concentration of the primary prey item, T_{N2} refers to the tissue concentration of the secondary prey item, and T_N refers to the tissue concentration of either the primary or the secondary prey item.

7. **Table 7-5, p. 7-18**. This table describes the exposure parameters for representative wildlife species used as receptors in this remedial investigation. Many of the parameters are cited from the *Wildlife Exposure Factors Handbook* (USEPA, 1993); however, it is not consistently stated whether an average of the exposure parameter is calculated or if a certain study was selected. For example, it is not explained in Table 7-5 how the values in the column titled, "Assumed Diet for Terrestrial Exposure Assessment (% of diet)," were derived. The dietary composition data for the deer mouse (surrogate for the cotton mouse) provided in the handbook are seasonal percentages as high as 63% of the deer mouse's diet

but Table 7-5 states that invertebrates make up 10% of the deer mouse's diet. It should be clarified in Table 7-5 how the values in the dietary composition column were derived from the data provided in the handbook.

Response: The dietary composition data in Table 7-5 were derived based on average exposure parameters cited in the *Wildlife Exposure Factors Handbook* (USEPA, 1993). The table footnotes will be revised to clarify this distinction.

8. **Section 7.4.2, Terrestrial Wildlife, p. 7-19**. The second paragraph on page 7-19 discusses how the methodologies for the potential dietary exposure (PDE) calculations can be referred to in the General Information Report (GIR) prepared by ABB-ES in 1998. It would be helpful for pertinent excerpts of these methodologies to be provided in an appendix to this report.

   Response: Pertinent excerpts of the PDE calculation methodology from the GIR will be included in Section 7.4.2.

9. **Section 7.6.1, Terrestrial Wildlife, p. 7-25**. The first sentence of the last paragraph on page 7-25 states that, "Sublethal risks to small mammals and birds are not predicted based on the revised RMEs for 4,4'-DDD, 4,4'-DDT, dieldrin, and lead." The very next sentence also discusses sublethal risks to small mammals and birds based on the revised RMEs but states that HIs were one. It appears as if the word "sublethal" should be changed to "lethal" in the first sentence.

   Response: Based on the recalculated PDE values, sublethal risks are not predicted for small birds because the HI value for the meadowlark is less than one. The HI value for the shrew was equal to one, and all HQ values comprising the HI were less than one. As previously discussed in the response to General Comment #1, adverse effects to individual small mammals are possible at HI values of one. However, the assessment endpoint for terrestrial wildlife is adverse effects at the population level, not the individual species level. At HI values of one, it is assumed that population-level impacts to small mammals would be negligible.

10. **Section 9. P. 9-3**. When sublethal HIs were recalculated excluding sample location 11-SL-02 values, HIs for receptors, other than the cotton mouse, were one or greater. Therefore, risk to small mammals and birds is possible for the entire area of Site 11 but is greatest at sample location 11-SL-02. The ecological risk conclusion presented in Section 9 should be clarified to express this point.

    Response: As discussed in the responses to General Comment #1 and Specific Comment #9, sublethal risks to individual small mammal species are possible; however the assessment endpoint for terrestrial wildlife is focused on population-level effects. At an HI value of one,

population-level impacts to small mammals are not anticipated.

11. **Appendix C**. Soil sample analytical data for Site 11 is provided in Appendix C. Data for soil samples 11SS0101, 11SS0202, and 11SS0303 are shown in Appendix C but these sample locations are never mentioned in the sampling discussion in Section 7.3 of the text. The purpose and relevance of these sampling locations need to be addressed in the text.

    Response: Samples 11SS0101, 11SS0202, and 11SS0303 are subsurface soil samples. The data from these samples is not included as part of the sampling discussion in Section 7.3 because ecological risks are evaluated for only surface soil, not subsurface soil.

12. **Appendix F**. It is unclear as to why all of the tables in Appendix F are titled using the letter E and not F. Tables in Appendix E and Appendix F are titled using the letter E which can confuse the reader. This discrepancy should be clarified.

    Response: The tables in Appendices E and F will be renamed so that the table numbers are consistent with the Appendices in which they appear.

13. **Table E-1**. This table presents bioaccumulation factors (BAFs) for terrestrial invertebrates, terrestrial plants, mammals, and birds.

    - The terrestrial invertebrate BAFs for PAHs are referenced as the average of values presented in Beyer 1990. It would be preferable to use the individual PAH BAFs presented in Beyer 1990 instead of an average. In cases where an individual value is not presented, then use of an average PAH BAF as a surrogate is appropriate. An average value would be appropriate as a surrogate for bis(2-ethylhexyl)phthalate, 2-methylnaphthalene, and acenaphthylene since values are not provided in Beyer, 1990. The footnote reference should be revised as appropriate.

      Response: The individual PAH BAFs presented in Beyer 1990 will be used instead of the average values. In addition, the footnote reference will also be revised.

    - The terrestrial plant BAFs for PAHs are derived by using the Travis and Arms equations; however, an average log K_{ow} value is used. The usefulness of averaging log K_{ow} values is questionable. Since K_{ow} values are chemical specific and can differ among PAH congeners, individual K_{ow} values should be used to derive BAFs.

Response: The terrestrial plant BAFs will be recalculated using the chemical-specific K_{ow} values.

- A terrestrial plant BAF is not calculated for lead. Footnote "t" states, "lead does not accumulate in plant tissue, therefore, a BAF of zero was assigned." The literature varies regarding lead accumulation in vascular plants. A BAF should be calculated for lead.

  Response: A plant BAF for lead will be calculated based on the available literature.

- The reviewer could not confirm the mammal BAFs for semivolatiles using the cited Travis and Arms equation for biotransfer factors with conversion to BAFs. The average ingestion rate used for this calculation in the ERA was not provided. Please provide more information on the calculation of the mammal BAFs and re-confirm the calculated mammal BAFs.

  Response: The average ingestion rate for lactating and non-lactating cows is 12 kg feed/day. All mammalian BAF values will be reviewed for potential errors.

- Table E-1 provides a plant BAF of 6.7E-03 for bis(2-ethylhexyl)phthalate. However, when recalculated using the equation in footnote [d], a plant BAF of 8.7E-3 was obtained. Please review this calculation and address this discrepancy.

  Response: The calculation was reviewed, and a plant BAF of 8.7E-3 was obtained. The table will be revised to address this discrepancy.

14. **Table E-2**. Table E-2 presents ingestion toxicity information. The LOAEL column heading should not be under the lethal RTV heading. The LOAEL should be presented with sublethal RTVs. The column headings need to be verified to ensure that they reflect the data in the column and be revised as necessary.

    Response: LOAEL values for mortality are available; therefore, it is appropriate to list these values under the "lethal RTV" heading. As described in Section 7.5.1 of the ERA, data used to select lethal RTVs includes NOAEL and LOAEL data, as well as LD_{50} values from the literature.

15. **Table E-3**. Table E-3 presents the reference toxicity values (RTVs) selected for the ERA. Table E-2 presents ingestion toxicity data for wildlife. Pyrene has a NOAEL of 75 mg/kg/BW/day, anthracene has a NOAEL of 1000 mg/kg/BW/day, and phenanthrene has a LOAEL of 120 mg/kg/BW/day presented on Table E-2; therefore, it is not clear why Table

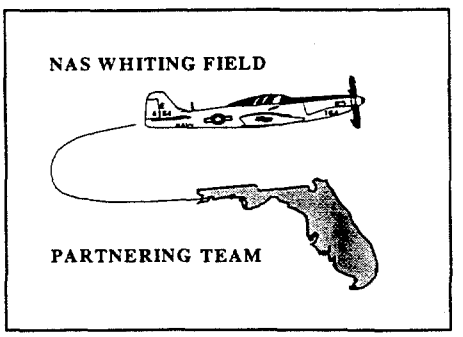
E-3 presents a surrogate RTV of 10 mg/kg/BW/day for pyrene, anthracene and phenanthrene. The pyrene and anthracene NOAELs and the phenanthrene LOAEL should be used in this assessment instead of using a surrogate.

Response: The pyrene and anthracene NOAELs and the phenanthrene LOAEL values were not used as the selected RTVs because the effects measured in the laboratory tests were not related to the chosen sublethal assessment endpoints (i.e., growth and reproduction). The surrogate RTV of 10 mg/kg/BW/day for benzo(a)pyrene was selected as most relevant to the chosen assessment endpoint because reproductive effects were measured.

APPENDIX J

RESULTS OF ADDITIONAL SOIL SAMPLING AT SITE 11

Results of Additional Soil Sampling at Site 11



PREPARED FOR: NAS Whiting Field Partnering Team

PREPARED BY: Amy Twitty, P.G.

DATE: February 23, 2000

Background

Site 11 is one of the Perimeter Road sites at Naval Air Station (NAS) Whiting Field and is located along the eastern facility property boundary near the South Air Field (**FIGURE 1**). The site was originally identified as an approximately 3-acre area encompassing an old borrow pit, previously used as an open disposal area from 1943 until approximately 1970. The site had uncontrolled access and received a wide variety of wastes, including general refuse, construction debris, tree clippings, furniture, waste solvents, paint, transformer oils, hydraulic fluid, and various other oils (ABB-ES, 1998).

Five surface soil samples were collected at Site 11 in August 1992 as part of the Phase IIA Remedial Investigation (RI). An additional 13 surface soil samples were collected in January 1996 during the Phase IIB RI. These soil sample locations are presented in **FIGURE 2**.

The five Phase IIA surface soil sampling locations (11-SL-01 through 11-SL-05, and duplicate sample 11-SL-01A) were identified based on visual inspection and geophysical anomalies. Surface soil samples were collected from the land surface to approximately 1 foot below land surface (bls) and were analyzed for target compound list (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides and polychlorinated biphenyls (PCBs), and target analyte list (TAL) inorganic compounds (ABB-ES, 1998).

Five of the thirteen Phase IIB samples (11SO0101 through 11SO0501) were selected to obtain an unbiased characterization of onsite surface soil. Sample locations were determined using a systematic sampling method. Samples 11SO0101 through 11SO0501 were analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganic compounds, and total petroleum hydrocarbons (TPH).

The remaining eight Phase IIB samples (11SO0601 through 11SO1301) were collected on a 10-foot radius around Phase IIB soil sample 11SO0401. These samples were collected for source delineation of lead at this location and were analyzed for lead only. However, the elevated lead concentration was actually detected in the Phase IIA sample 11-SL-02 (2,230 milligrams per kilogram [mg/kg]) not sample 11SO0401. All of the samples collected to

delineate lead (11SO0601 through 11SO1301) were collected in the wrong location and exhibited lead concentrations below the U.S. Environmental Protection Agency (EPA) Region III Risk-Based Concentration (RBC) of 400 mg/kg and then current Florida Department of Environmental Protection (FDEP) residential and industrial soil cleanup levels of 500 mg/kg and 1,000 mg/kg, respectively (ABB-ES, 1998).

One out of the ten surface soil samples collected and analyzed for SVOCs contained concentrations of benzo(a)pyrene above the federal and state industrial cleanup levels. Phase IIA sample 11-SL-04 exhibited a concentration of benzo(a)pyrene at 910 micrograms per kilogram (µg/kg). The EPA Region III RBC for benzo(a)pyrene is 88 µg/kg for residential cleanup and 780 µg/kg for industrial cleanup. The FDEP residential and industrial soil cleanup levels for benzo(a)pyrene are 100 µg/kg and 500 µg/kg, respectively (Chapter 62-777, Florida Administrative Code [F.A.C.]).

Soil Investigation

On April 1, 1999, a 100-foot by 100-foot sampling grid was set up around the location of former Phase IIA sample 11-SL-02 (as identified by the land surveyor). The grid was set up on 25-foot centers to aid in the delineation of lead. CH2M HILL collected 25 surface soil samples (plus the appropriate quality assurance and quality control [QA/QC] samples) from the grid area surrounding 11-SL-02 (**FIGURE 3**). Based on the results of the initial round of sampling, CH2M HILL collected five additional samples on April 7, 1999.

The samples were collected from 0 to 1 foot bls using decontaminated stainless-steel hand augers. Soil was placed into stainless-steel bowls, thoroughly mixed using stainless-steel spoons, and placed in glass jars. Soil samples were described using the Unified Soil Classification System and recorded in a bound logbook by CH2M HILL personnel. All sampling was conducted in accordance with CH2M HILL's FDEP-approved Field Comprehensive Quality Assurance Plan (CompQAP).

Soil samples were shipped to Accutest Laboratories in Orlando, Florida (a Navy-approved laboratory) for analysis within 24 hours. Samples from the grid area were analyzed for lead only using Contract Laboratory Program (CLP) TAL inorganic compounds methodology (Inorganic Laboratory Method 03.0). Level IV Data Quality Objectives were used for reporting purposes.

As part of this investigation, a land surveyor also located former Phase IIA sample location 11-SL-04 (**FIGURE 2**). On June 2, 1999, CH2M HILL personnel excavated an area 2 feet long by 2 feet wide and approximately 2 feet deep at the sample location to reanalyze the soil reportedly containing elevated levels of benzo(a)pyrene. The soil was placed in a 55-gallon drum pending receipt of analytical results. The drum will be properly disposed of by the facility.

Four side-wall samples (11SO4801 [north], 11SO4901 [south], 11SO5001 [east], and 11SO5101 [west]) and one bottom sample (11SS4701) were collected from the excavation (**FIGURE 4**). The samples were sent to Accutest Laboratories in Orlando, Florida, and analyzed for SVOCs in accordance with SW-846 Method 8270. An Accutest chemist notified CH2M HILL that some of the soil samples were oily in nature and likely contained petroleum hydrocarbons. The chemist also noted that several pesticides were showing up

on the chromatograph. CH2M HILL notified the Navy, and the samples were subsequently analyzed for total recoverable petroleum hydrocarbons (TRPH) in accordance with Florida Petroleum Residual Organic (FL-PRO) methodology and for pesticides in accordance with SW-846 Method 8081.

On September 1, 1999, CH2M HILL personnel collected two additional samples from the bottom of the excavation (11SS4702 and 11SS4703). Each sample was sent to a different laboratory (Accutest Laboratories in Orlando, Florida and Severn Trent Laboratories in Pensacola, Florida) and analyzed for SVOCs in accordance with SW-846 Method 8310. On January 13, 2000, CH2M HILL personnel collected one sample from the contents of the 55-gallon drum. The sample was sent to Severn Trent Laboratories in Pensacola, Florida, and analyzed for SVOCs in accordance with SW-846 Method 8310.

Results

Of the 25 original samples collected and analyzed for lead under this investigation, only one sample exhibited a total lead concentration above the associated FDEP and EPA residential soil cleanup levels. Sample 11SO3801 exhibited a lead concentration of 666 mg/kg, which is above the EPA Region III residential RBC of 400 mg/kg and the current FDEP residential soil cleanup level adopted in August 1999 (also 400 mg/kg). The remaining 24 sample results did not exceed residential soil cleanup levels.

To delineate the area containing elevated lead levels at sample location 11SO3801, five additional soil samples were collected around the original sample location. The analytical results of these five additional samples were below the residential soil cleanup levels. **TABLE 1** presents a summary of the soil analytical results. The complete results are presented in Attachment A. **FIGURE 5** graphically presents the results of the lead investigation.

A total of five soil samples were collected from the excavation around sample location 11-SL-04 and analyzed for SVOCs. None of the samples exhibited benzo(a)pyrene concentrations above the associated detection limits. The detection limit for most samples was 360 µg/kg; however, due to their oily nature, two samples (11SS4701 and 11SO5101) were diluted by a factor of 10 in order to be analyzed. The detection limit on these samples was 3,600 µg/kg, higher than the industrial soil cleanup levels of 500 µg/kg (FDEP) and 780 µg/kg (EPA). As part of the QA/QC protocol, one matrix spike/matrix spike duplicate (MS/MSD) sample was collected as a split sample of 11SO5101. This MS/MSD sample was not diluted and did not contain detectable concentrations of benzo(a)pyrene above 360 µg/kg. **FIGURE 6** graphically presents the results of the benzo(a)pyrene investigation.

In order to quantify the bottom of the excavation, two additional samples (11SS4702 and 11SS4703) were collected and analyzed for SVOCs. The resulting benzo(a)pyrene concentrations were <10 µg/kg and 43 µg/kg, respectively, lower than the residential soil cleanup levels of 100 µg/kg (FDEP) and 88 µg/kg (EPA).

Two of the original samples collected from the excavation were also analyzed for TRPH (11SS4701 and 11SO4901). One sample (11SS4701, collected from the bottom of the excavation) contained detectable TRPH at 302 mg/kg, below the Soil Cleanup Target Level (SCTL) of 340 mg/kg. TRPH results are shown in **FIGURE 6**.

All five of the samples collected from the excavation were also analyzed for pesticides. Concentrations of alpha-chlordane, gamma-chlordane, dieldrin, 4,4'-DDE, 4,4'-DDT, heptachlor, and heptachlor epoxide were detected in at least one of these samples. Only dieldrin was detected above any residential standards, but concentrations did not exceed any of the industrial soil standards. Dieldrin results are shown in **FIGURE 6**.

Benzo(a)pyrene was not detected (<10 μg/kg) in the soil sample collected from the 55-gallon drum. Other SVOCs were detected, but all concentrations fell well below the residential soil cleanup levels.

The Data Quality Evaluation (DQE) performed for the analytical results is presented in Attachment B. Survey coordinates for the soil sample locations are presented in Attachment C.

Conclusions

Soil samples analyzed for lead, SVOCs, TRPH, and pesticides did not exhibit concentrations above industrial soil target cleanup levels. Lead and dieldrin were detected at concentrations exceeding both the federal and state residential soil target cleanup levels.

Works Cited

ABB-ES. *Remedial Investigation Report, Site 11, Southeast Open Disposal Area (B) (Landfill), Naval Air Station Whiting Field, Milton, Florida*. April 1998.

CH2M HILL, Inc. *Health and Safety Plan, Whiting Field, Milton, Florida*. 1999.

CH2M HILL, Inc. *Field Comprehensive Quality Assurance Plan*. 1998.

This Data Transfer Memorandum for Site 11 at Naval Air Station Whiting Field was prepared under the direction of a Registered Professional Geologist.

Amy T. Twitty, P.G. No. 1703

2/15/00

Date

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TABLE 1
Analytical Results of Additional Soil Sampling
Site 11, NAS Whiting Field

					Sample ID:	11SO1401	11SO1501	11SO1601	11SO1701	11SO1801	11SO1901
					Sample Depth (feet bls):	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
					Date Sampled:	4/1/99	4/1/99	4/1/99	4/1/99	4/1/99	4/1/99
		APPLICABLE CRITERIA									
		62-777, F.A.C.		EPA Region III							
		Direct Exposure		RBC Cleanup Goals							
Analyte	**Units**	**Residential**	**Industrial**	**Residential**	**Industrial**						
Inorganics											
Lead	mg/kg	400	920	400	NC	10.4	10.7	8.8	19.8	23.9	36.2
Pesticides											
alpha-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
gamma-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
Dieldrin	ug/kg	70	300	40	360	NA	NA	NA	NA	NA	NA
4,4'-DDE	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
4,4'-DDT	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
Heptachlor	ug/kg	200	900	140	1,300	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	ug/kg	100	400	70	630	NA	NA	NA	NA	NA	NA
Semivolatiles											
Benzo(a)pyrene	ug/kg	100	500	88	780	NA	NA	NA	NA	NA	NA
TRPH	mg/kg	340	2,500	NC	NC	NA	NA	NA	NA	NA	NA

Notes:
bls = below land surface
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
NA = not analyzed
NC = no criteria
RBC = risk-based concentration
TRPH = total recoverable petroleum hydrocarbons

(CONTINUED)

TABLE 1 (CONTINUED)
Analytical Results of Additional Soil Sampling
Site 11, NAS Whiting Field

					Sample ID:	11SO2001	11SO2101	11SO2201	11SO4001	11SO2301	11SO2401
					Sample Depth (feet bls):	0 to 1	0 to 1	0 to 1	(duplicate of	0 to 1	0 to 1
					Date Sampled:	4/1/99	4/1/99	4/1/99	11SO2201)	4/1/99	4/1/99
		APPLICABLE CRITERIA									
		62-777, F.A.C.		EPA Region III							
		Direct Exposure		RBC Cleanup Goals							
Analyte	**Units**	**Residential**	**Industrial**	**Residential**	**Industrial**						
Inorganics											
Lead	mg/kg	400	920	400	NC	58.4	29.4	15.4	17.0	17.9	41.7
Pesticides											
alpha-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
gamma-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
Dieldrin	ug/kg	70	300	40	360	NA	NA	NA	NA	NA	NA
4,4'-DDE	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
4,4'-DDT	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
Heptachlor	ug/kg	200	900	140	1,300	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	ug/kg	100	400	70	630	NA	NA	NA	NA	NA	NA
Semivolatiles											
Benzo(a)pyrene	ug/kg	100	500	88	780	NA	NA	NA	NA	NA	NA
TRPH	mg/kg	340	2,500	NC	NC	NA	NA	NA	NA	NA	NA

Notes:
bls = below land surface
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
NA = not analyzed
NC = no criteria
RBC = risk-based concentration
TRPH = total recoverable petroleum hydrocarbons

(CONTINUED)

TABLE 1 (CONTINUED)
Analytical Results of Additional Soil Sampling
Site 11, NAS Whiting Field

					Sample ID:	11SO2501	11SO2601	11SO3901	11SO2701	11SO2801	11SO2901
					Sample Depth (feet bls):	0 to 1	0 to 1	(duplicate of	0 to 1	0 to 1	0 to 1
					Date Sampled:	4/1/99	4/1/99	11SO2601)	4/1/99	4/1/99	4/1/99
		APPLICABLE CRITERIA									
		62-777, F.A.C.		EPA Region III							
		Direct Exposure		RBC Cleanup Goals							
Analyte	**Units**	**Residential**	**Industrial**	**Residential**	**Industrial**						
Inorganics											
Lead	mg/kg	400	920	400	NC	23.2	161	180	9.3	16.1	68.6
Pesticides											
alpha-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
gamma-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
Dieldrin	ug/kg	70	300	40	360	NA	NA	NA	NA	NA	NA
4,4'-DDE	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
4,4'-DDT	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
Heptachlor	ug/kg	200	900	140	1,300	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	ug/kg	100	400	70	630	NA	NA	NA	NA	NA	NA
Semivolatiles											
Benzo(a)pyrene	ug/kg	100	500	88	780	NA	NA	NA	NA	NA	NA
TRPH	mg/kg	340	2,500	NC	NC	NA	NA	NA	NA	NA	NA

Notes:
bls = below land surface
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
NA = not analyzed
NC = no criteria
RBC = risk-based concentration
TRPH = total recoverable petroleum hydrocarbons

(CONTINUED)

TABLE 1 (CONTINUED)
Analytical Results of Additional Soil Sampling
Site 11, NAS Whiting Field

					Sample ID:	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501
					Sample Depth (feet bls):	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
					Date Sampled:	4/1/99	4/1/99	4/1/99	4/1/99	4/1/99	4/1/99
		APPLICABLE CRITERIA									
		62-777, F.A.C.		EPA Region III							
		Direct Exposure		RBC Cleanup Goals							
Analyte	**Units**	**Residential**	**Industrial**	**Residential**	**Industrial**						
Inorganics											
Lead	mg/kg	400	920	400	NC	31.2	17.3 J	8.8	7.0 J	79.0 J	126 J
Pesticides											
alpha-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
gamma-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
Dieldrin	ug/kg	70	300	40	360	NA	NA	NA	NA	NA	NA
4,4'-DDE	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
4,4'-DDT	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
Heptachlor	ug/kg	200	900	140	1,300	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	ug/kg	100	400	70	630	NA	NA	NA	NA	NA	NA
Semivolatiles											
Benzo(a)pyrene	ug/kg	100	500	88	780	NA	NA	NA	NA	NA	NA
TRPH	mg/kg	340	2,500	NC	NC	NA	NA	NA	NA	NA	NA

Notes:
bls = below land surface
J = estimated value
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
NA = not analyzed
NC = no criteria
RBC = risk-based concentration
TRPH = total recoverable petroleum hydrocarbons

(CONTINUED)

TABLE 1 (CONTINUED)
Analytical Results of Additional Soil Sampling
Site 11, NAS Whiting Field

					Sample ID:	11SO3601	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301
					Sample Depth (feet bls):	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1	0 to 1
					Date Sampled:	4/1/99	4/1/99	4/1/99	4/7/99	4/7/99	4/7/99
		APPLICABLE CRITERIA									
		62-777, F.A.C.		EPA Region III							
		Direct Exposure		RBC Cleanup Goals							
Analyte	**Units**	**Residential**	**Industrial**	**Residential**	**Industrial**						
Inorganics											
Lead	mg/kg	400	920	400	NC	8.9 J	6.9 J	666 J	13.6	5.2	7.5
Pesticides											
alpha-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
gamma-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA	NA	NA	NA	NA	NA
Dieldrin	ug/kg	70	300	40	360	NA	NA	NA	NA	NA	NA
4,4'-DDE	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
4,4'-DDT	ug/kg	3,300	13,000	1,900	17,000	NA	NA	NA	NA	NA	NA
Heptachlor	ug/kg	200	900	140	1,300	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	ug/kg	100	400	70	630	NA	NA	NA	NA	NA	NA
Semivolatiles											
Benzo(a)pyrene	ug/kg	100	500	88	780	NA	NA	NA	NA	NA	NA
TRPH	mg/kg	340	2,500	NC	NC	NA	NA	NA	NA	NA	NA

Notes:
bls = *below land surface*
J = estimated value
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
NA = not analyzed
NC = no criteria
RBC = risk-based concentration
TRPH = *total recoverable* petroleum hydrocarbons

(CONTINUED)

TABLE 1 (CONTINUED)
Analytical Results of Additional Soil Sampling
Site 11, NAS Whiting Field

						Sample ID:	11SO4401	11SO4601	11SO4501	11SS4701	11SS4702	11SS4703
						Sample Depth (feet bls):	0 to 1	(duplicate of	0 to 1	2	2	2
						Date Sampled:	4/7/99	11SO4401)	4/7/99	6/2/99	9/1/99	9/1/99
		APPLICABLE CRITERIA										
		62-777, F.A.C.		EPA Region III								
		Direct Exposure		RBC Cleanup Goals								
Analyte	**Units**	**Residential**	**Industrial**	**Residential**	**Industrial**							
Inorganics												
Lead	mg/kg	400	920	400	NC		9.9	10.4	10.9	NA	NA	NA
Pesticides												
alpha-Chlordane	ug/kg	3,100	12,000	1,800	16,000		NA	NA	NA	216	NA	NA
gamma-Chlordane	ug/kg	3,100	12,000	1,800	16,000		NA	NA	NA	184	NA	NA
Dieldrin	ug/kg	70	300	40	360		NA	NA	NA	136	NA	NA
4,4'-DDE	ug/kg	3,300	13,000	1,900	17,000		NA	NA	NA	<73	NA	NA
4,4'-DDT	ug/kg	3,300	13,000	1,900	17,000		NA	NA	NA	36.5 J	NA	NA
Heptachlor	ug/kg	200	900	140	1,300		NA	NA	NA	<36	NA	NA
Heptachlor epoxide	ug/kg	100	400	70	630		NA	NA	NA	19.9 J	NA	NA
Semivolatiles												
Benzo(a)pyrene	ug/kg	100	500	88	780		NA	NA	NA	<3600	<10	43
TRPH	mg/kg	340	2,500	NC	NC		NA	NA	NA	302 J	NA	NA

Notes:
bls = below land surface
J = estimated value
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
NA = not analyzed
NC = no criteria
RBC = risk-based concentration
TRPH = total recoverable petroleum hydrocarbons

(CONTINUED)

TABLE 1 (CONTINUED)
Analytical Results of Additional Soil Sampling
Site 11, NAS Whiting Field

					Sample ID:	11SO4801	11SO4901	11SO5301	11SO5001	11SO5101	11SO5401
					Sample Depth (feet bls):	0 to 1	0 to 1	(duplicate of	0 to 1	0 to 1	(MS/MSD w/
					Date Sampled:	6/2/99	6/2/99	11SO4901)	6/2/99	6/2/99	11SO5101)
		APPLICABLE CRITERIA									
		62-777, F.A.C.		EPA Region III							
		Direct Exposure		RBC Cleanup Goals							
Analyte	**Units**	**Residential**	**Industrial**	**Residential**	**Industrial**						
Inorganics											
Lead	mg/kg	400	920	400	NC	NA	NA	NA	NA	NA	NA
Pesticides											
alpha-Chlordane	ug/kg	3,100	12,000	1,800	16,000	549	21.9	20.8	24.7	198	157
gamma-Chlordane	ug/kg	3,100	12,000	1,800	16,000	678	19.4	16.6	21.0	170	157
Dieldrin	ug/kg	70	300	40	360	92.3	4.4	3.9	3.5	25.3	72.7
4,4'-DDE	ug/kg	3,300	13,000	1,900	17,000	<140	<3.5	<3.5	<3.5	<36	187
4,4'-DDT	ug/kg	3,300	13,000	1,900	17,000	<140	<3.5	<3.5	<3.5	<36	54.8
Heptachlor	ug/kg	200	900	140	1,300	139	<1.8	<1.8	<1.8	<18	<18
Heptachlor epoxide	ug/kg	100	400	70	630	62.6 J	1.1 J	1.4 J	<1.8	18.6	22.7
Semivolatiles											
Benzo(a)pyrene	ug/kg	100	500	88	780	<360	<350	<350	<350	<3600	<360
TRPH	mg/kg	340	2,500	NC	NC	NA	<8.8 J	NA	NA	NA	NA

Notes:
bls = below land surface
J = estimated value
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
NA = not analyzed
NC = no criteria
RBC = risk-based concentration
TRPH = total recoverable petroleum hydrocarbons

(CONTINUED)

TABLE 1 (CONTINUED)
Analytical Results of Additional Soil Sampling
Site 11, NAS Whiting Field

					Sample ID:	IDW SITE 11 NASWF
					Sample Depth (feet bls):	DRUM SAMPLE
					Date Sampled:	1/13/00
		APPLICABLE CRITERIA				
		62-777, F.A.C.		EPA Region III		
		Direct Exposure		RBC Cleanup Goals		
Analyte	**Units**	**Residential**	**Industrial**	**Residential**	**Industrial**	
Inorganics						
Lead	mg/kg	400	920	400	NC	NA
Pesticides						
alpha-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA
gamma-Chlordane	ug/kg	3,100	12,000	1,800	16,000	NA
Dieldrin	ug/kg	70	300	40	360	NA
4,4'-DDE	ug/kg	3,300	13,000	1,900	17,000	NA
4,4'-DDT	ug/kg	3,300	13,000	1,900	17,000	NA
Heptachlor	ug/kg	200	900	140	1,300	NA
Heptachlor epoxide	ug/kg	100	400	70	630	NA
Semivolatiles						
Benzo(a)pyrene	ug/kg	100	500	88	780	<10
TRPH	mg/kg	340	2,500	NC	NC	NA

Notes:
bls = below land surface
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
NA = not analyzed
NC = no criteria
RBC = risk-based concentration
TRPH = total recoverable petroleum hydrocarbons

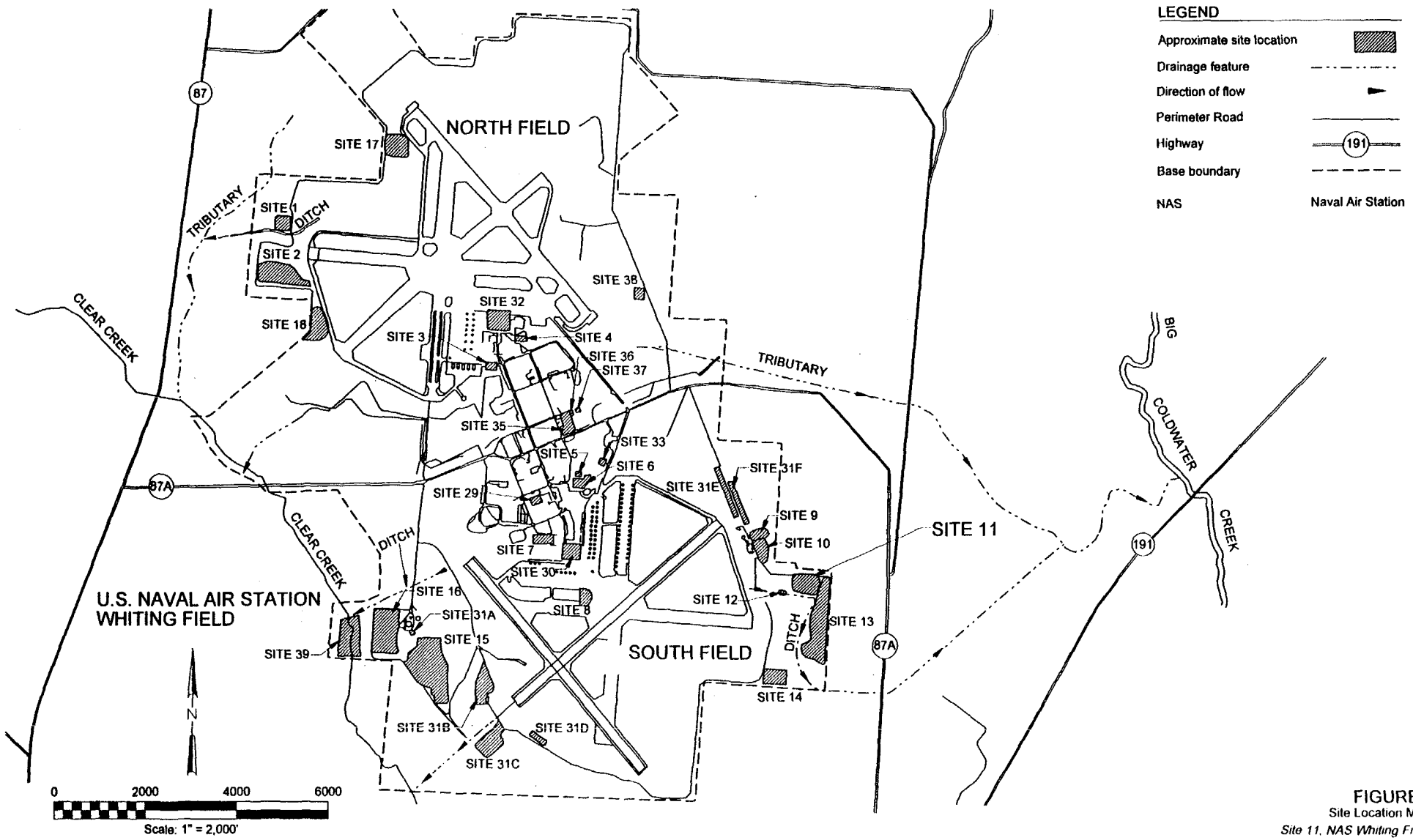

FIGURE 1
Site Location Map
Site 11, NAS Whiting Field

CH2MHILL

2170FIG1.DLV
12-OCT-1999

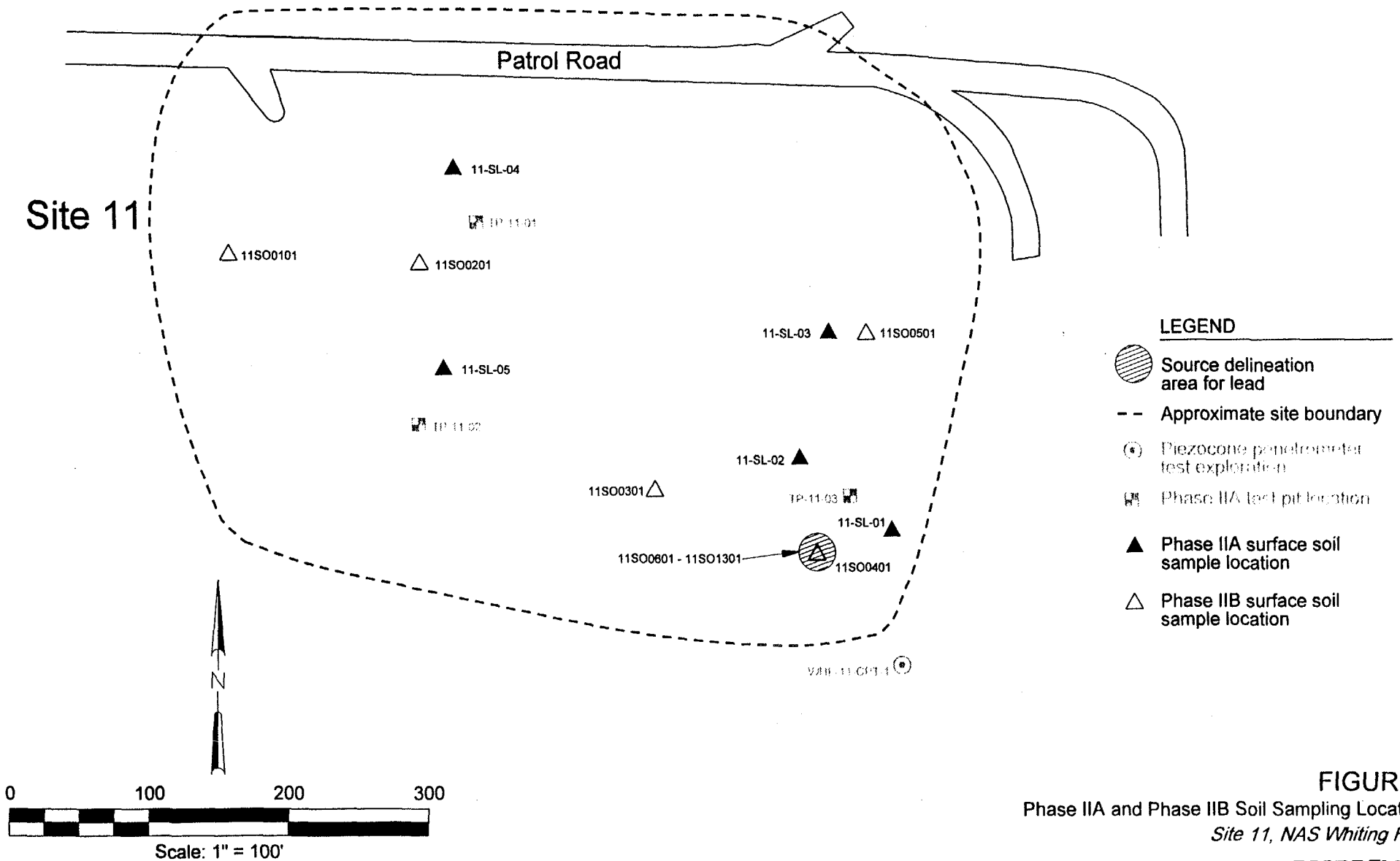

FIGURE 2
Phase IIA and Phase IIB Soil Sampling Locations
Site 11, NAS Whiting Field

CH2MHILL

2170Fig2.dlv
12-OCT-1999

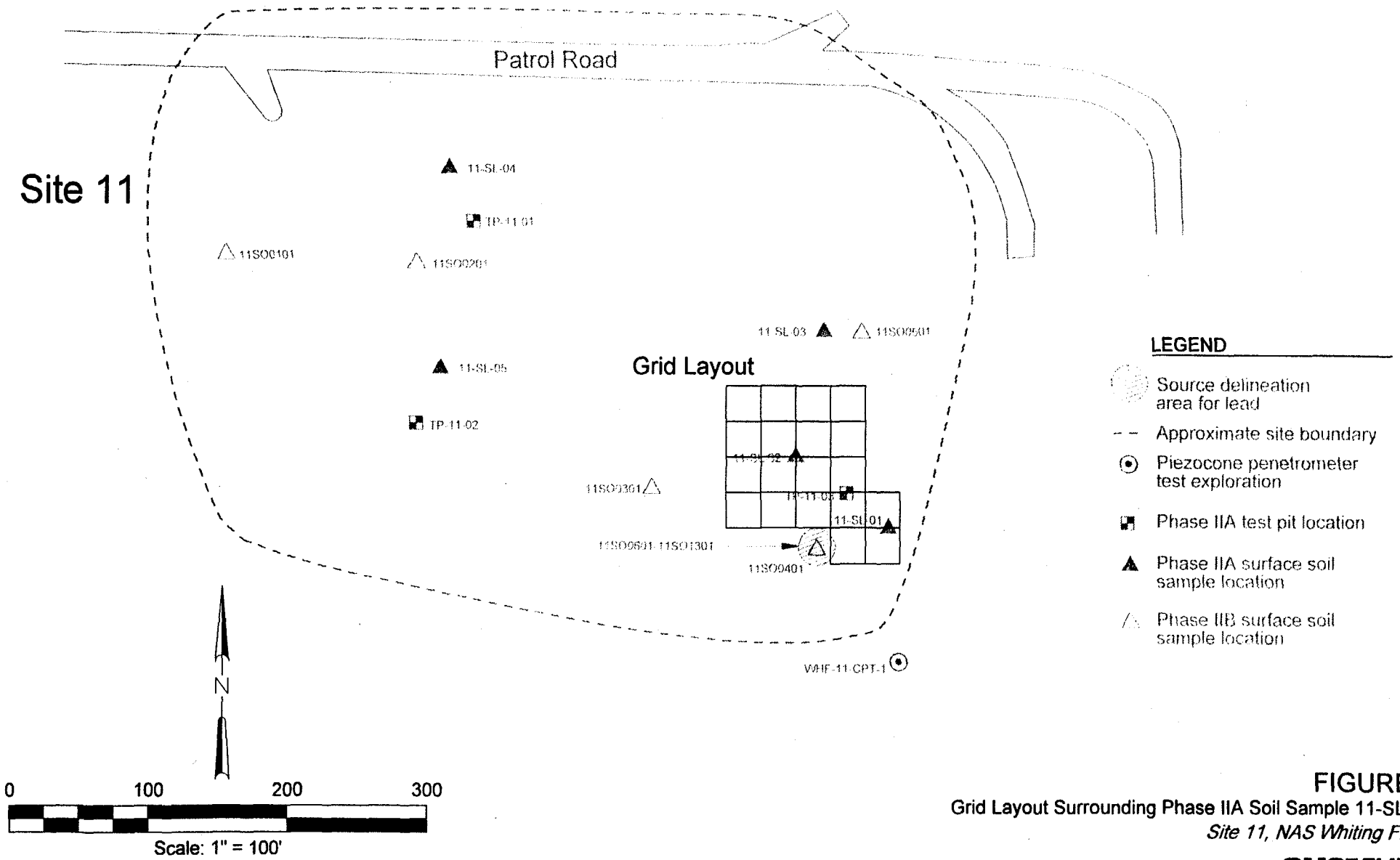

FIGURE 3
Grid Layout Surrounding Phase IIA Soil Sample 11-SL-02
Site 11, NAS Whiting Field

CH2MHILL

2170Fig3.dlv
12-OCT-199

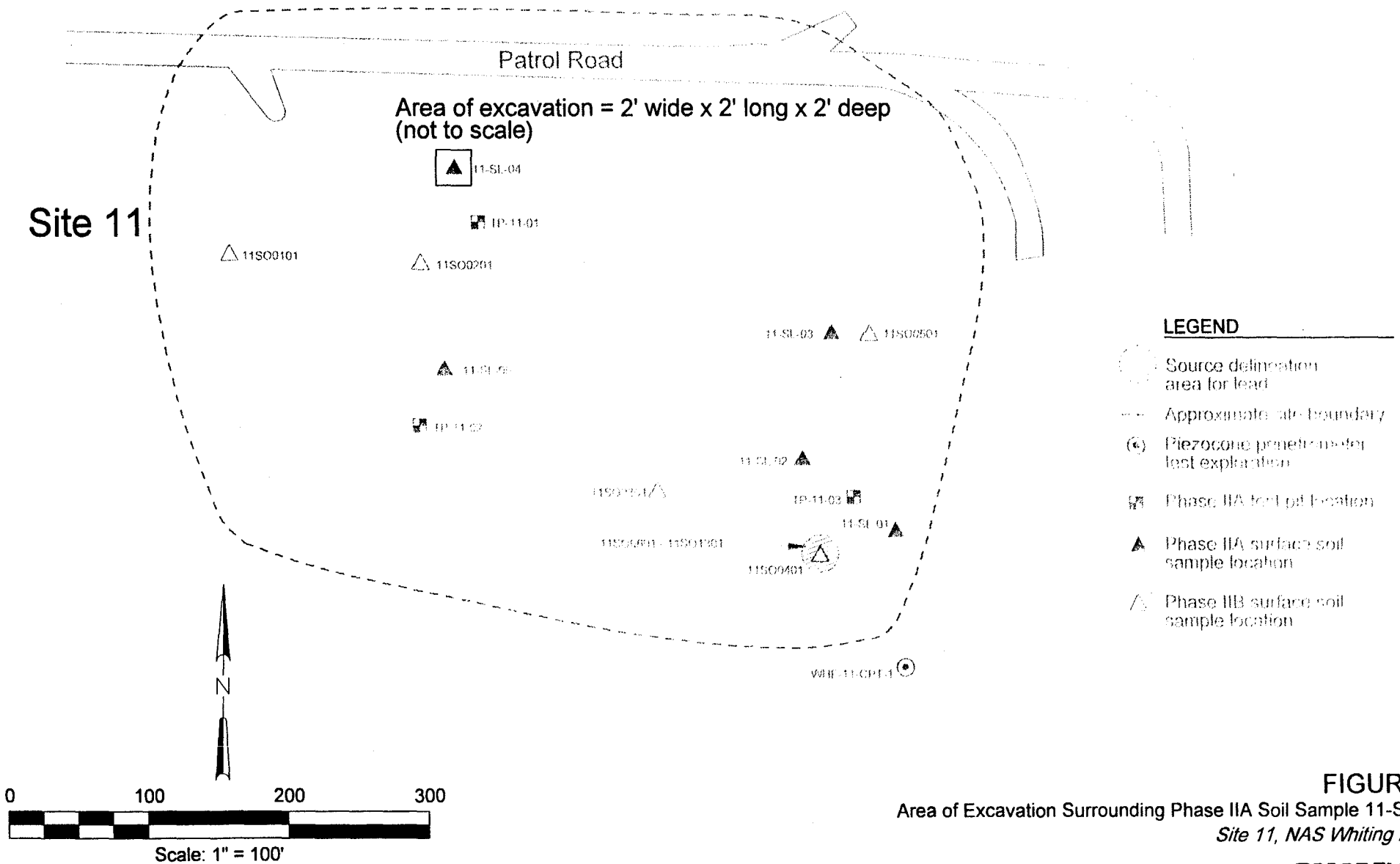

FIGURE 4

Area of Excavation Surrounding Phase IIA Soil Sample 11-SL-04

Site 11, NAS Whiting Field

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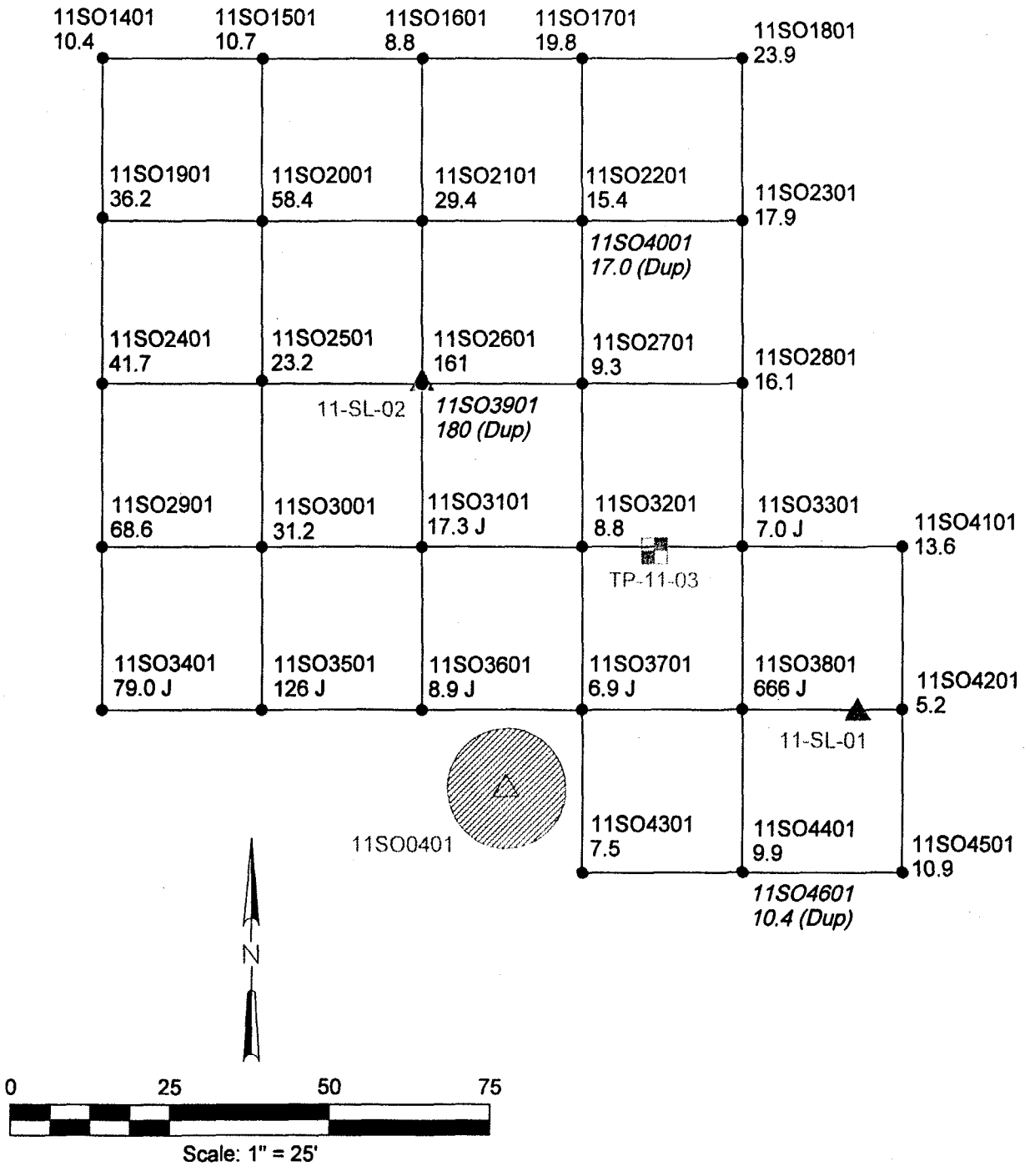
2170Fig4.dlv
12-OCT-1999



LEGEND

- Source delineation area for lead
- Phase IIA test pit location
- Phase IIA surface soil sample location
- Phase IIB surface soil sample location
- April 1999 surface soil sample location
- 10.4 Lead Analytical Result (mg/kg)
- J Estimated value

FIGURE 5

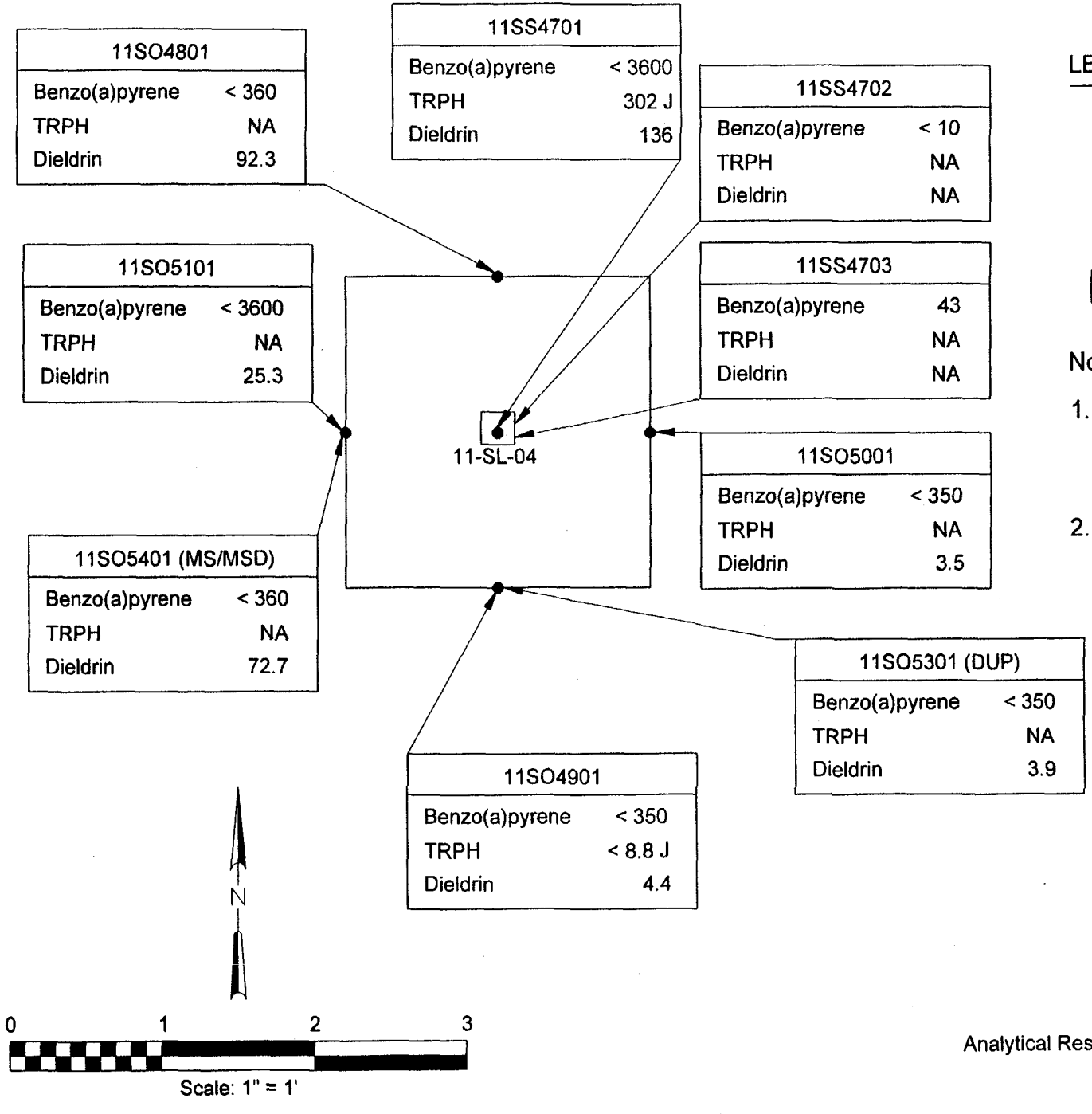
Analytical Results for Lead in Soil

Site 11, NAS Whiting Field

CH2MHILL

2170FIG5.DL\

12-OCT-199



LEGEND

- Phase IIA surface soil sample location
- June 1999 surface soil sample location
- September 1999 surface soil sample location

Notes:

1. Benzo(a)pyrene and dieldrin results are shown in ug/kg. TRPH results are shown in mg/kg.
2. TRPH = total recoverable petroleum hydrocarbons

   NA = not analyzed

FIGURE 6
Analytical Results for Benzo(a)pyrene, TRPH, and Dieldrin in Soil
Site 11, NAS Whiting Field

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2170FIG6.DLV
12-OCT-1999

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