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REMEDIAL INVESTIGATION REPORT SITE 18, CRASH CREW TRAINING AREA NAS WHITING FIELD FL

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HARDING LAWSON ASSOCIATES

ID 00249

REMEDIAL INVESTIGATION REPORT

SITE 18, CRASH CREW TRAINING AREA

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

Unit Identification Code: N60508

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

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January 1999

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.

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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 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 (HSWA) 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 [IAS] 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 manages and the U.S. Environmental Protection Agency 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) 743-5574.

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 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 August 1992. The subsequent phases of the RI were designated as Phase IIA and Phase IIB. Fieldwork for Phase IIA was completed in March 1994. RI Phase IIB was completed in November 1996.

This RI Report contains the results of assessment activities used to characterize site-specific chemicals detected in environmental media (surface soil, subsurface soil, and groundwater) at Site 18, Crash Crew Training Area, 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:

- surface soil sampling,
- subsurface soil sampling,
- monitoring well installation,
- groundwater sampling, and
- hydrogeologic investigations.

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 18, Crash Crew Training Area, NAS Whiting Field.

- Organic analytes detected in surface soil samples consist of 7 volatile organic compounds (VOCs), 11 semivolatile organic compounds (SVOCs), and total recoverable petroleum hydrocarbons (TRPH). Neither pesticides nor polychlorinated biphenyls (PCBs) were detected in surface soil samples at concentrations exceeding their respective detection limits. Two SVOCs (benzo(a)anthracene and benzo(a)pyrene), and TRPH exceeded their respective residential or industrial Florida soil or U.S. Environmental Protection Agency (USEPA) Region III risk-based concentrations (RBCs). Four inorganics (arsenic, barium, copper, and iron) exceeded their respective residential or industrial Federal or State criteria.

- Organic analytes detected in subsurface soil samples consist of four VOCs, eight SVOCs, three pesticides, and TRPH. No PCBs were detected in subsurface soil samples. Neither VOCs, SVOCs, nor pesticides were detected in subsurface soil samples at concentrations that exceeded Florida Department of Environmental Protection

(FDEP) or Region III RBCs. Twenty-one inorganics were detected in subsurface soil samples. Arsenic was detected in 12 subsurface soil samples at concentrations that exceeded the Region III RBCs and in 10 subsurface soil samples that exceeded the Florida residential soil cleanup target levels for arsenic. None of the other inorganics detected in samples exceeded either Federal or State industrial soil screening criteria.

- The groundwater flow direction in the site area is to the south-southwest and presumably discharges to Clear Creek, which is located approximately 3,000 feet southwest of the site.

- One pesticide, 4,4'-DDT (dichlorodiphenyltrichloroethane), was detected in groundwater samples collected from two monitoring wells (WHF-18-1 and WHF-18-2). The concentrations detected (0.072 and 0.035 micrograms per liter) of the analyte did not exceed either FDEP or USEPA Region III screening criteria. VOCs, SVOCs, and PCBs were not detected in Phase IIB groundwater samples at concentrations that exceeded their respective FDEP or USEPA Region III screening criteria.

- No inorganic analytes were detected in the groundwater samples at concentrations that exceeded Federal or USEPA Region III screening criteria.

- The Human Health Risk Assessment determined that exposures to chemicals detected in soil and groundwater samples at Site 18 are not likely to pose unacceptable carcinogenic risks to the receptors evaluated based on an evaluation of the samples using USEPA and Florida guidelines and target risk ranges.

- The excess lifetime cancer risk associated with ingestion of soil by a hypothetical future resident (2×10^{-6}) exceeds FDEP's target risk level (1×10^{-6}) due to arsenic. The background level for arsenic at the site also exceeds the Florida residential soil cleanup goals and may result in an unacceptable risk carcinogenic risk. Arsenic concentrations detected in background surface soil samples of either natural or anthropogenic origin(s) suggest that arsenic concentrations at Site 18 may not be related to past site practices.

- The noncancer hazards associated with ingestion and direct contact of soil by a hypothetical future child resident slightly exceed the FDEP and USEPA target hazard index of 1; however, no individual analyte exceeded a hazard quotient of 1.

- Noncancer risk in surface soil is primarily from iron. Iron was detected in surface soil samples at concentrations an order of magnitude less than acceptable essential nutrient levels.

- Food web modeling suggests that risks to small mammals and birds (cotton mouse, short-tailed shrew, and mourning dove) associated with ingestion of inorganic constituents may occur but would be minimal due to predation pressures limiting exclusive foraging in the open area of Site 18.

Based on the interpretation of findings from the remedial investigation activities, a focused feasibility study is recommended to address potential risk of a surface soil exposure by a hypothetical future aggregate resident. The calculated risk to a hypothetical resident (2×10^{-6}) exceeded Florida's target level due to arsenic.

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
AFFF	aqueous film-forming foam
BAF	bioaccumulation factor
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
CS	confirmation study
CT	central tendency
DDT	dichlorodiphenyltrichloroethane
DQO	data quality objective
ECPC	ecological chemical of potential concern
ELCR	excess lifetime cancer risk
EPC	exposure point concentration
ERA	ecological risk assessment
FDEP	Florida Department of Environmental Protection
FS	feasibility study
ft/day	feet per day
ft^2/day	square feet per day
ft/ft	feet per foot
GIR	General Information Report
GCTL	groundwater cleanup target level
HHCPC	human health chemical of potential concern
HHRA	human health risk assessment
HI	hazard index
HLA	Harding Lawson Associates
HQ	hazard quotient
HRS	Hazard Ranking System
IAS	initial assessment study
IDL	instrument detection limit
IR	installation restoration
JP-5	jet propellant 5
K_{oc}	carbon partition coefficient
LDC	Laboratory Data Consultants, Inc.
LD_{50}	lethal dose to 50 percent of test population
LOAEL	lowest observed adverse effects level
MCL	maximum contaminant level
MS/MSD	matrix spike and matrix spike duplicate
mg/kg	milligrams per kilogram

GLOSSARY (Continued)

μg/kg	micrograms per kilogram
μg/ℓ	micrograms per liter
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
NFA	no further action
NOAEL	no observable adverse effects level
NPL	National Priority List
NTU	nephelometric turbidity unit
OVA	organic vapor analyzer
PA	preliminary assessment
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCB	polychlorinated biphenyl
PDE	potential dietary exposure
%D	percent difference
%RSD	percent relative standard deviation
QA	quality assurance
QC	quality control
QAPP	Quality Assurance Program Plan
RBC	risk-based concentration
RGO	remedial goal option
RI	remedial investigation
RME	reasonable maximum exposure
RPD	relative percent difference
RRF	relative response factor
RTV	reference toxicity value
SARA	Superfund Amendments and Reauthorization Act
SCTL	soil cleanup target level
SDG	sample delivery group
SFF	site foraging frequency
SI	site inspection
SOUTHNAV-FACENGCOM	Southern Division, Naval Facilities Engineering Command
SQL	sample quantitation limit
SU	standard unit
SVOC	semivolatile organic compound
TAL	target analyte list
TCL	target compound list
TRPH	total recoverable petroleum hydrocarbons
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 a Remedial Investigation (RI) Report for Site 18, Crash Crew Training Area at Naval Air Station (NAS) Whiting Field located in Milton, Florida. The RI Report for Site 18 is one in a series of site-specific reports being completed in conjunction with the NAS Whiting Field General Information Report (GIR) (HLA, 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.

Installation Location and Description. NAS Whiting Field is located in Santa Rosa County, in Florida's northwest coastal area, approximately 5.5 miles north of Milton and 25 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 3,842 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 of the NAS Whiting Field GIR (HLA, 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 substances. 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 18 is an approximately 5-acre parcel located along the unimproved road on the northwestern facility boundary near the North Air Field taxiway (Figure 1-2). Site 18 was used for training firefighting crews between 1951 and 1991. Currently, and at the time of the Confirmation Study (CS), Site 18 consists of 11 burn pits (shallow depressions approximately 1 to 2 feet deep) rimmed by mounded earth within which decommissioned fuel tanks or aircraft bodies were placed to simulate aircraft after a crash. During a firefighting training session, approximately 110 gallons of jet propellant (JP-5) fuel were poured into the burn pit and ignited. The resulting flames were then extinguished using an aqueous film-forming foam (AFFF). According to the facility records, 6,285 gallons of fuel and 3,148 gallons of AFFF were used during 1984.

Investigators conducting soil sampling in 1992, Phase IIA, collected samples in two linear areas they suspected were channels of overland flow oriented to the

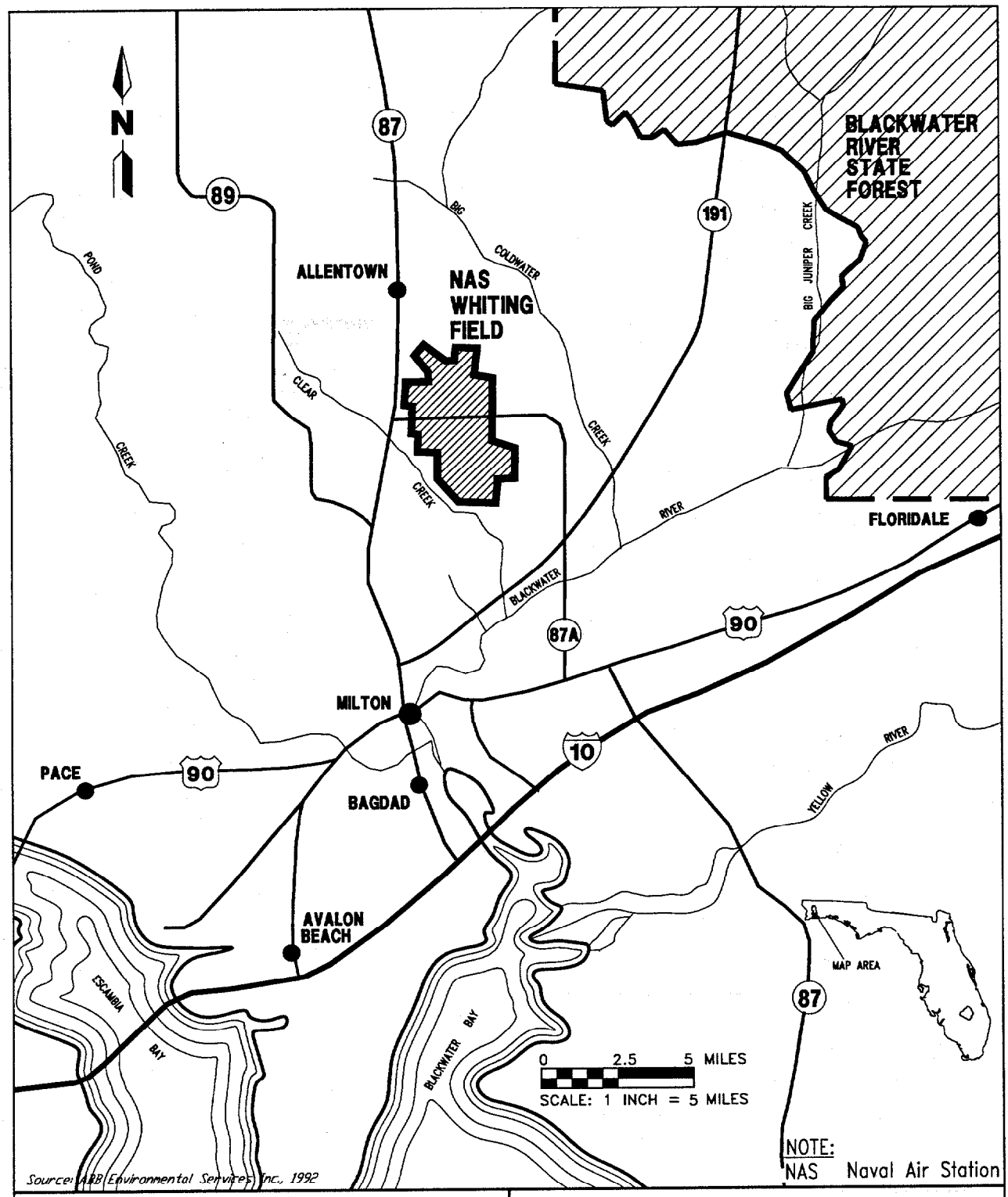

FIGURE 1-1
FACILITY LOCATION MAP

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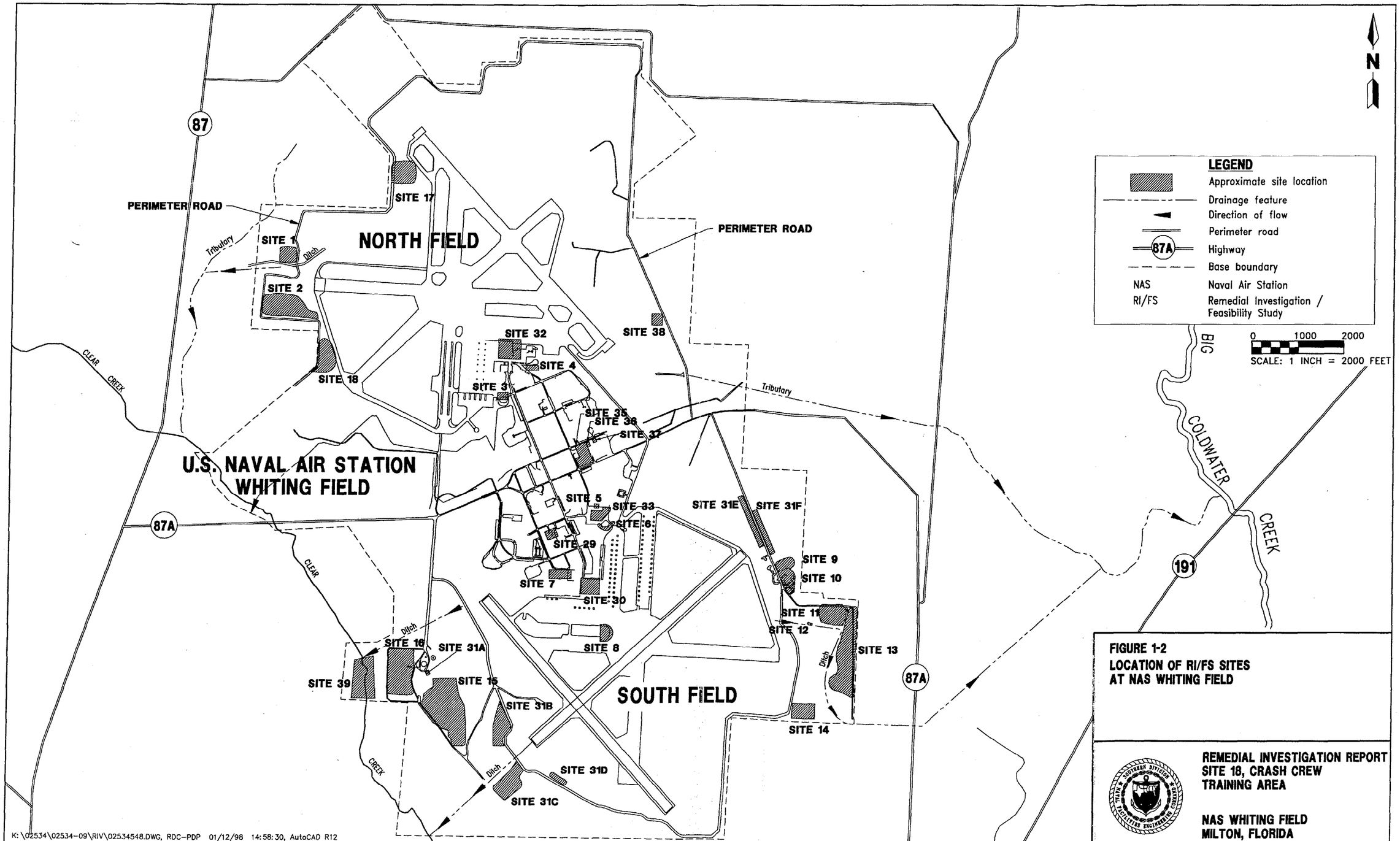

FIGURE 1-2
LOCATION OF RI/FS SITES AT NAS WHITING FIELD

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southwest. Neither the suspected areas nor their boundaries are currently discernable. This change may have been a result of the removal of the fuel tanks and aircraft bodies from the burn pits, after which earth moving equipment spread the rim of mounded soil from around the burn pit depressions to the adjacent surrounding areas in September of 1994. Currently, the site is maintained as an open grassy field. This site has a slight surface gradient that slopes gently toward the southwestern site boundary.

According to the U. S. Department of Agriculture (USDA) (1980), the surficial soil horizon at Site 18 is classified as Lakeland soil. There is no evidence of a clay soil cap over the site area. Because the soil at the site is predominantly silty sand, much of the onsite rainfall infiltrates directly into the soil. Currently the depressions hold surface water runoff 6 to 12 inches deep most of the time.

Current site conditions do not indicate the occurrence of overland flow or surface water moving off site.

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 (PA), site inspection (SI), 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 (March 1991) has been substantially revised and is designed to prioritize sites after the 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 10 chapters (Chapters 1.0 to 10.0). 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 conducting the assessment. 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 the professional review certification.

2.0 PREVIOUS INVESTIGATIONS

This chapter summarizes the previous investigations at Site 18, Crash Crew Training Area at NAS Whiting Field. An initial facilitywide investigation began with the Phase I or Initial Assessment Study (IAS) completed in 1985 by Envirodyne Engineers (Envirodyne Engineers, Inc. 1985). The IAS investigation included Sites 1 through 16. Site 18 had not yet been identified as a potential site and was not part of the IAS.

2.1 CONFIRMATION STUDY. After the IAS was completed, 15 of the original 16 sites warranted further investigation in a CS. Sites 17 and 18 were added to this CS on December 17, 1985, at the request of the Florida Department of Environmental Regulation, currently the Florida Department of Environmental Protection (FDEP). CSs typically consist of two parts: verification and characterization. The verification study involves onsite investigation to confirm the presence and extent of contamination and to evaluate the necessity of conducting mitigating actions or cleanup operations. The verification study for Site 18 was initially addressed in Phase II, (Geraghty and Miller, 1986).

2.2 VERIFICATION STUDY. Background information was gathered for the Verification Study (Geraghty & Miller, 1986) by conducting a record search, performing an onsite survey, conducting interviews with long-time employees and retired personnel familiar with the site, and installing one monitoring well (WHF-18-1) and collecting a groundwater sample. The groundwater sample was analyzed for USEPA priority pollutants, which include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, herbicides (2,4-D and 2,4,5-TP Silvex), polychlorinated biphenyls (PCBs), and metals. One semivolatile, bis(2-ethylhexyl)phthalate, and one pesticide, 4,4'-dichlorodiphenyltrichloroethane (DDT), were detected.

Geraghty and Miller (1986) recommended in their Verification Study that additional work be performed based on the types of wastes (JP-5) possibly disposed of at the site, the potential for off-site migration, and the presence of human and ecological receptors.

The characterization study was not completed because the RI/FS was modified in 1987 and 1988 to be congruent with CERCLA and SARA (ABB Environmental Services, Inc. [ABB-ES], 1997).

3.0 FIELD INVESTIGATIVE METHODS

Field investigative techniques used during the RI to collect the data are described in the RI/FS Sampling and Analysis Plan, 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 (QA/QC) requirements for the RI activities comply with the RI/FS Quality Assurance Project Plan (QAPP) located in Appendix A (Site Management Plan) of the RI/FS Sampling and Analysis Plan, Volume II (E.C. Jordan, 1990). Health and safety requirements are in accordance with the general Data Management and Health and Safety Plan located in Volume III of the *Remedial Investigation and Feasibility Study Planning Document, NAS Whiting Field, Milton, Florida* (E.C. Jordan, 1990).

Field investigative methods where applicable were superseded or, if not covered in the documents identified above, are described in Technical Memorandum No. 7, RI/FS Phase IIB Workplan (ABB-ES, 1995e) and in the NAS Whiting Field GIR (HLA, 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.

The RI Phase IIA investigation (ABB-ES, 1992b) at Site 18 consisted of collecting 47 surface soil samples and 24 subsurface soil samples, installing 2 monitoring wells, and collecting 3 groundwater samples. The Phase IIB investigation consisted of collecting four groundwater samples.

The following provides a brief description of the number and types of environmental samples and the analytical methodology for the RI for Site 18, Crash Crew Training Area.

3.1 SURFACE SOIL ASSESSMENT. The surface soil assessment included the collection of 47 surface soil samples, 18-SL-01 through 18-SL-47. These samples were collected in August 1992 at locations in and around the 11 burn pit areas and areas of suspected overland flow (Areas A-K, Figure 3-1) that were associated with the former firefighting training activities. These surface soil sample locations were selected based on either stained soil locations within the burn pits, high organic vapor analyzer (OVA) readings, or the possibility that adjacent low areas may receive runoff from suspected adjacent contaminated areas.

Surface soil sample depths were based on the appearance of soil staining and high OVA readings; however, all surface soil samples were collected from depths of less than 8 inches below land surface (bls). The surface soil samples were collected using a decontaminated stainless-steel auger (USEPA, 1991a). Soil samples were described using the Unified Soil Classification System and recorded in a bound field logbook by HLA personnel (E.C. Jordan, 1990). The surface soil samples were analyzed for Contract Laboratory Program (CLP) (Naval Energy and

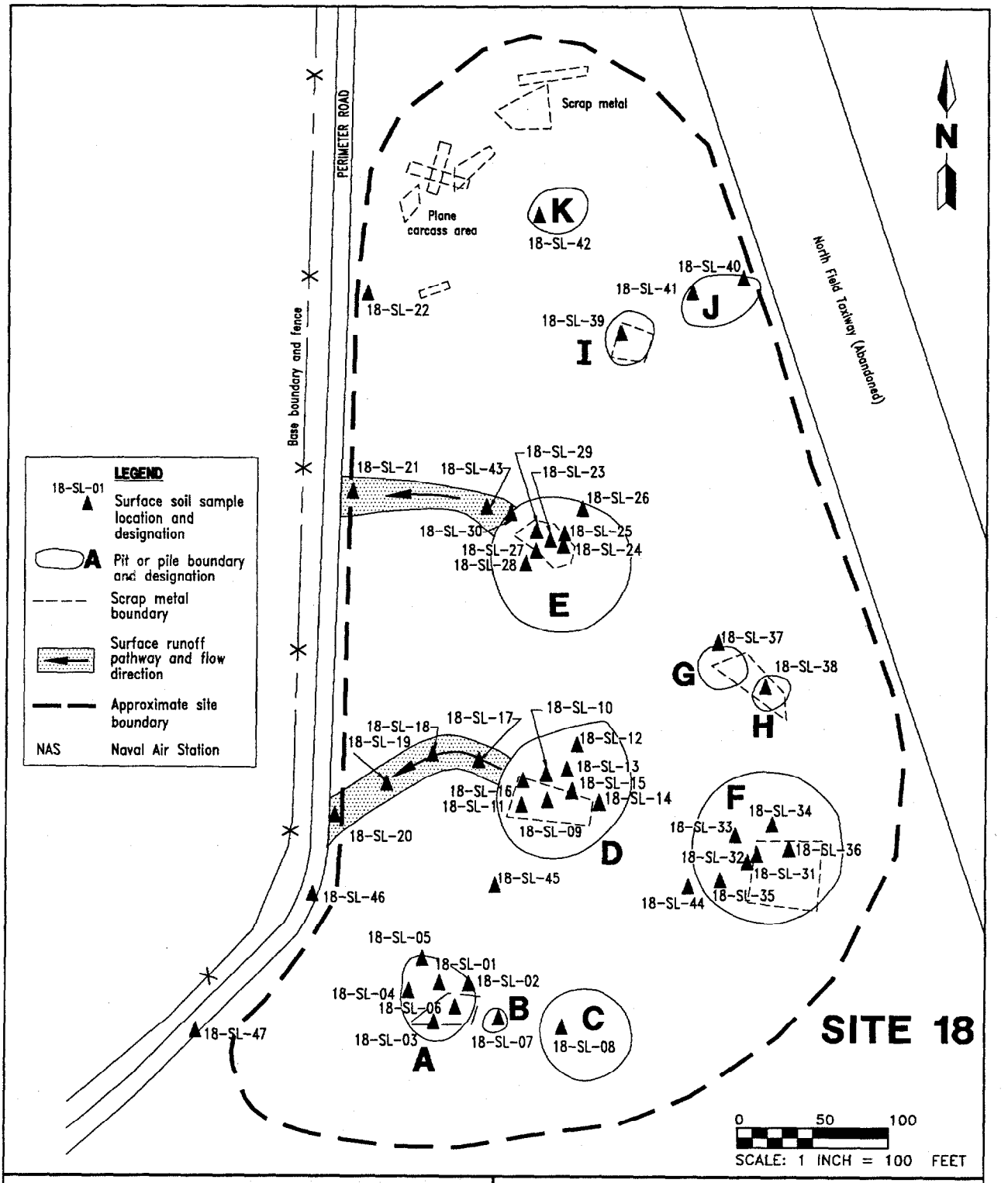

FIGURE 3-1
SURFACE SOIL SAMPLING LOCATIONS

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REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

Environmental Support Activity [NEESA] Level D) target compound list (TCL) VOCs, SVOCs, pesticides, PCBs, target analyte list (TAL) inorganic analytes, and total recoverable petroleum hydrocarbons (TRPH).

Background screening criteria were established by collecting background samples across the installation from each USDA soil type in which RI sites are located at NAS Whiting Field. These data are presented in Subsection 3.3.1 of the GIR (HLA, 1998). The arithmetic mean of each analyte detected in the background soil samples for soil types associated with Site 18 was calculated by summing individual analyte concentrations and then dividing the sum by the number of samples from which the analytes were detected. Site 18 environmental samples are then compared to twice the arithmetic mean of analyte concentrations detected in background surface soil samples associated with the Troup loamy and Lakeland soil types. The surface soil sampling results are discussed in Section 5.1 of this report.

3.2 SUBSURFACE SOIL ASSESSMENT. The RI subsurface investigation at Site 18 included the advancement of 10 soil borings (WHF-18-SB-01 through WHF-18-SB-10) and the installation of three groundwater monitoring wells (WHF-18-1 through WHF-18-3) (Figures 3-2 and 3-3). During the soil boring process, 24 subsurface soil samples were collected using a split-spoon sampler. Lithologic data were recorded during the advancement of the soil borings and the installation of the groundwater monitoring wells. Subsurface soil samples were collected using a standard 2-foot split-spoon sampler, and data were recorded after visual inspection by an HLA geologist. All data were entered into a bound logbook. Split-spoon samples were typically collected at 5-foot intervals during drilling of the soil borings and monitoring wells as described in Paragraph 2.1.4.5 of the GIR (HLA, 1998). Monitoring well installations were conducted in conjunction with the hydrogeologic and groundwater investigations (summarized in Technical Memoranda 4 and 5, respectively [ABB-ES, 1995c and 1995d]). Detailed lithologic descriptions for monitoring wells WHF-18-1, WHF-18-2, and WHF-18-3 are presented in Appendix B.

3.3 HYDROGEOLOGIC ASSESSMENT. The hydrogeologic assessment for Site 18 utilized data from Site 18 and three adjacent sites investigated during the RI field program. The adjacent sites investigated, in addition to Site 18, included Site 1 (Northwest Disposal Area), Site 2 (Northwest Open Disposal Area), and Sites 17 and 18 (two separate Crash Crew Training Areas). The hydrogeologic field investigation activities consisted of collecting water-level data from 15 monitoring wells to develop potentiometric surface maps and the local horizontal and vertical groundwater gradients and conducting slug tests on 4 monitoring wells. Monitoring well construction details for these sites are presented in Table 3-1. Results of the hydrogeologic investigation are presented in Section 5.2 of this report.

3.4 GROUNDWATER ASSESSMENT. Groundwater assessment activities consisted of collecting groundwater samples from monitoring wells WHF-18-1, WHF-18-2, and WHF-18-3 (Figure 3-3) on October 21 and 25, 1993 (Phase IIA) and again July 24 and 29, 1996 (Phase IIB). During Phase IIA, the groundwater samples were collected from the three monitoring wells using a Teflon™ bailer after purging the monitoring wells with a submersible or bladder pump. The groundwater samples

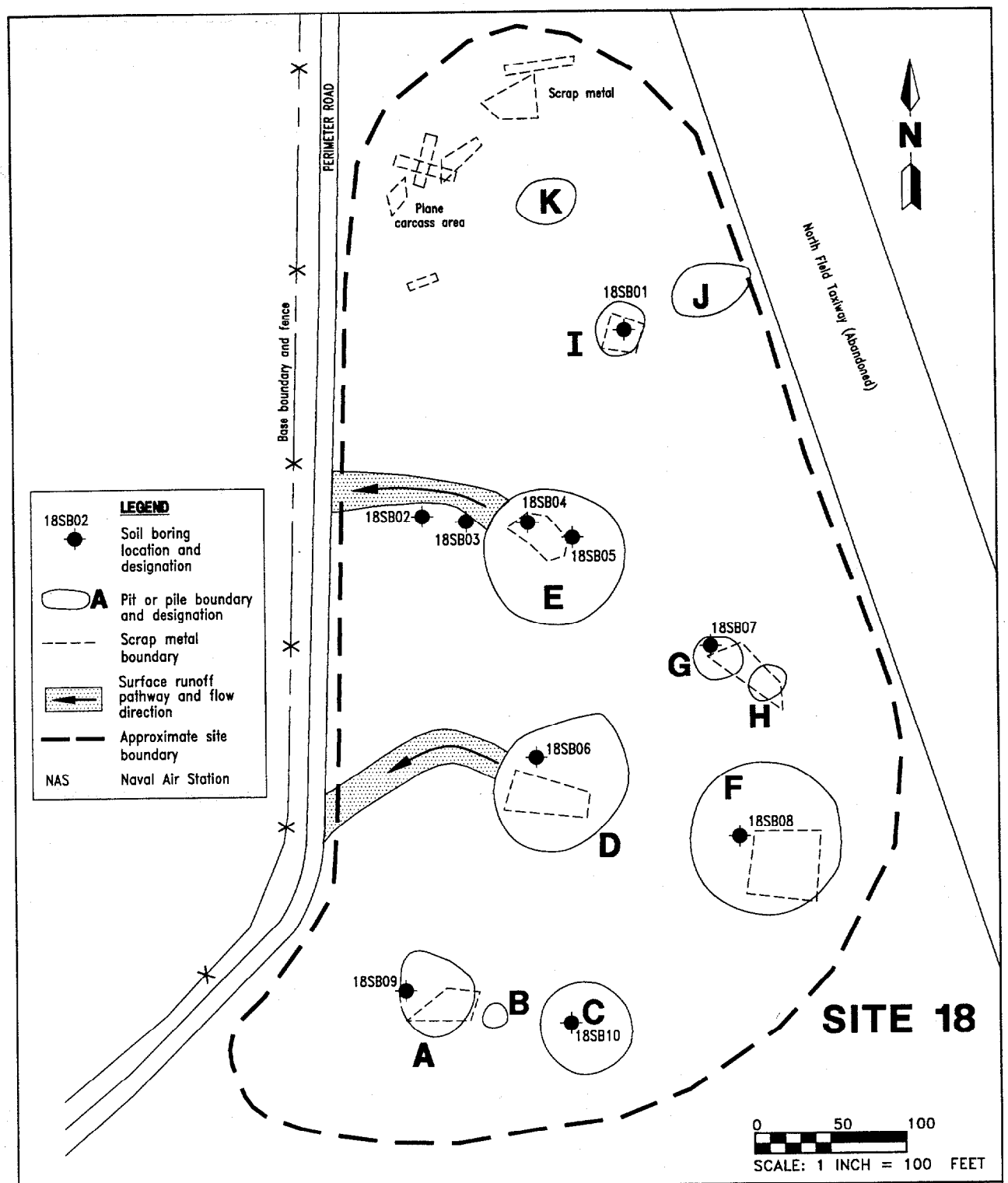

FIGURE 3-2
SUBSURFACE SOIL SAMPLING LOCATIONS

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REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

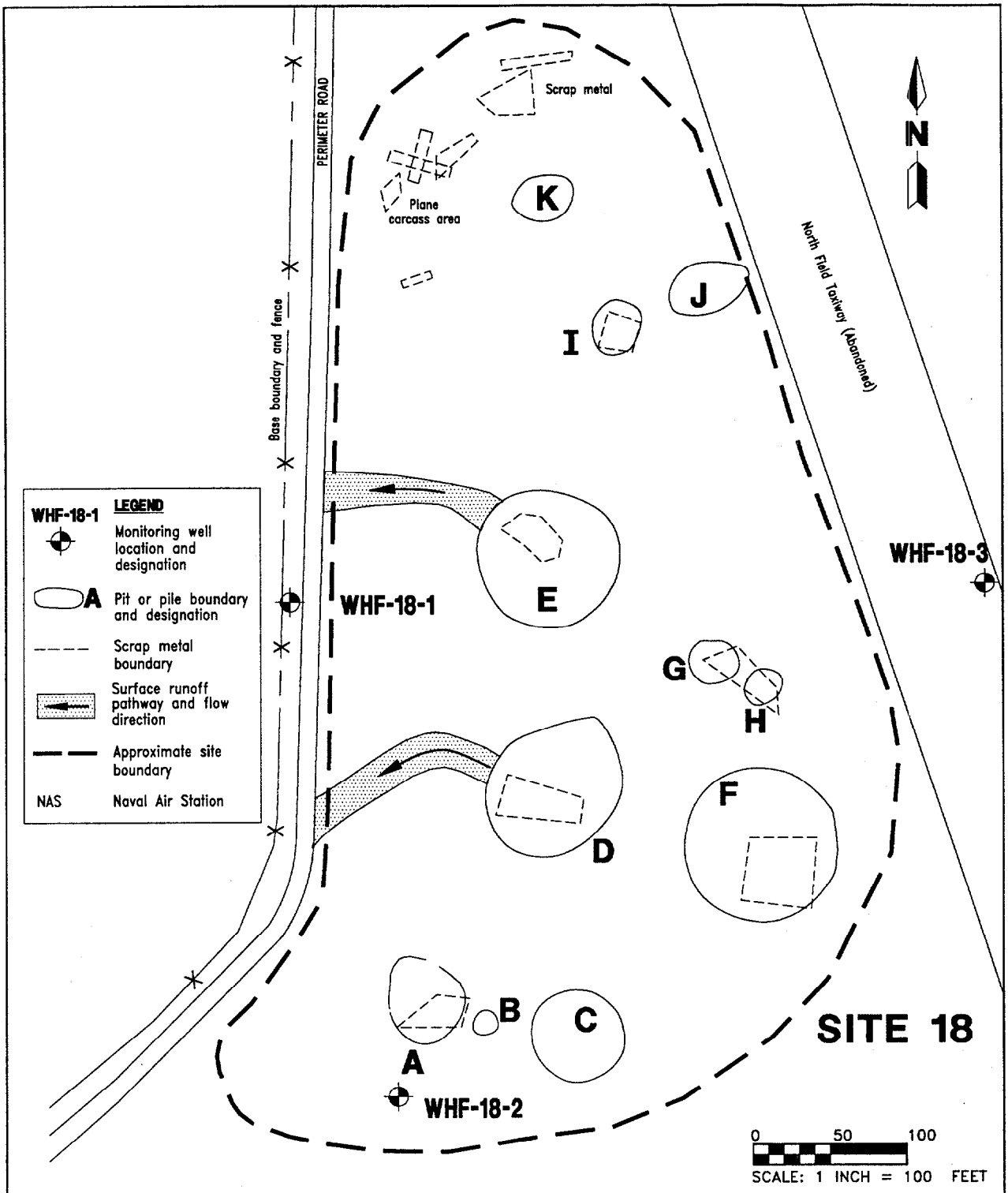

FIGURE 3-3
MONITORING WELL LOCATIONS

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REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

Table 3-1
Summary of Monitoring Well Construction Details

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	RI Phase of Well Completion	Well Diameter (inches)	Land Surface Elevation (feet msl)	TOC Elevation (feet msl)	Total Well Depth (feet BTOC)	Approximate Screen Interval (feet BTOC)
Northwest Disposal and Crash Crew Training Areas						
Site 1, Northwest Disposal Area						
WHF-1-1	VS	4	140.49	142.62	123.00	113 to 123
WHF-1-1S	IIA	2	140.54	143.08	75.40	60 to 75
WHF-1-2	IIA	2	142.59	145.61	78.80	63 to 78
WHF-1-3	IIA	2	152.95	155.50	87.48	72 to 87
WHF-1-4	IIB	2	NA	151.86	79.30	70 to 80
Site 2, Northwest Open Disposal Area						
WHF-2-1	IIA	2	148.48	150.80	87.42	72 to 87
WHF-2-2	IIB	2	NA	159.16	91.70	84 to 94
WHF-2-3	IIB	2	NA	160.63	91.60	83 to 93
Site 17, Crash Crew Training Area						
WHF-17-1	VS	4	192.61	194.71	159.00	149 to 159
WHF-17-1S	IIA	2	192.48	194.96	115.50	100 to 115
WHF-17-2	IIA	2	194.33	197.35	121.90	106 to 121
WHF-17-3	IIA	2	198.89	201.21	126.50	111 to 126
Site 18, Crash Crew Training Area						
WHF-18-1	VS	4	161.56	163.57	120.20	110 to 120
WHF-18-2	IIA	2	162.15	164.75	107.86	92 to 107
WHF-18-3	IIA	2	172.73	175.64	112.90	97 to 112

Notes: RI = Remedial Investigation.
msl = mean sea level.
TOC = top of casing.
BTOC = below top of casing.
VS = Verification Study.
IIA = Remedial Investigation Phase IIA.
IIB = Remedial Investigation Phase IIB.
NA = not available.

were analyzed for CLP (NEESA Level C) TCL VOCs, SVOCs, pesticides and PCBs, and TAL inorganics.

During Phase IIB, the groundwater samples were collected from the three monitoring wells using low flow sampling techniques as detailed in the GIR (HLA, 1998). The groundwater samples were analyzed for CLP (NEESA Level D) TCL VOCs, SVOCs, pesticides and PCBs, and TAL inorganics. Inorganic samples were not filtered during sample collection.

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, color, hardness, ammonia nitrates, total Kjeldahl nitrogen, nitrate and nitrite, pH, phosphorous, total dissolved solids, and sulfides.

4.0 SITE-SPECIFIC DATA QUALITY ASSESSMENT

This chapter describes how the groundwater data generated during Phase IIB of the RI at Site 18 were managed and evaluated. Data Quality Assessments for the Phase IIA investigation are presented in Technical Memoranda 3 and 5 for soil and groundwater, respectively (ABB-ES, 1995a and 1992b). Site 18 groundwater samples were collected in association with Site 1 where duplicate samples were collected. Duplicate samples were not collected at Site 18; therefore, the following evaluation utilizes Site 1 groundwater data, which is associated with data from Site 18. Section 4.1 describes the analytical program and data management for the RI at Site 1. Section 4.2 summarizes the precision, accuracy, representativeness, completeness, and comparability (PARCC) report on the data. Section 4.3 presents a summary of the Data Quality Assessment. No soil samples were collected during the Phase IIB investigation. The PARCCs report is presented in Appendix A (Quality Control Data) of this report.

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

4.1 ANALYTICAL PROGRAM. Samples collected during the Phase IIB of the RI at Site 18 were analyzed using field screening and off-site laboratory analytical methods. Sampling locations are presented in Chapter 3.0 of this report and investigative results are presented in Chapter 5.0.

Groundwater samples were collected and analyzed by an off-site laboratory using CLP methodology for analysis of VOCs, SVOCs, TRPH, 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 (HLA, 1998).

Analytical results obtained for all groundwater 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 QAPP in the NAS Whiting Field Work Plan, Volume 1 (E. C. Jordan, 1990) and GIR (HLA, 1998).
- NEESA guidance document 20.2-047B, Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Program (NEESA, 1988).
- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, February 1994 (USEPA, 1994a).

- USEPA, Contract Laboratory Program 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 (HLA, 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 (HLA, 1998). The Site 18 Phase IIB groundwater analytical data were validated by Laboratory Data Consultants, Inc., of Carlsbad, California, in 1996. The Site 18 Phase IIB data include sample delivery groups (SDGs) WF023 and WF024. 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 RPD criteria were not met for one environmental sample (groundwater) and associated duplicates for one organic (acetone) and several inorganic analytes. None of the organic analytical results were qualified during the data validation process based on RPD criteria for the environmental and associated duplicate sample pairs.

The RPD criteria for one VOC (acetone) and three inorganic analytes (aluminum, iron, and manganese) were not met for one groundwater sample (01G00102) and associated duplicates in SDG WF022.

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 percent 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.

The percent recovery for some of the soil and groundwater samples was above or below the target range; therefore, some analytical results may be biased high or low. Some of the analytical results for SVOCs and inorganic analytes were qualified based on the evaluation of percent recovery.

A summary of the surrogate spike samples and the surrogate compounds that were outside control limits for the Phase IIB samples collected at Site 18 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 (HLA, 1998).

Table 4-1
Precision Summary for Groundwater Field Duplicate Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

SDG Number: WF022 Sample ID: 01G00102	Sample Concentration	Duplicate Concentration	RPD	Control Limits
Volatile Organic Compounds (µg/ℓ)				
Acetone	4	2	67	40
Inorganic Compounds (µg/ℓ)				
Aluminum	19.1	10.3	50	25
Barium	15.6	15.6	0	25
Beryllium	0.53	ND	NC	25
Calcium	5,850	6,250	7	25
Copper	ND	1.4	NC	25
Iron	12.2	8.8	32	25
Lead	1.3	1.5	14	25
Magnesium	337	331	2	25
Manganese	6.7	9.0	29	25
Potassium	938	842	11	25
Sodium	2,100	2,070	1	25
Vanadium	ND	1.6	NC	25
Zinc	10.2	11.4	11	25
Cyanide	1.9	ND	NC	25

SDG Number: WF023 Sample ID: 01G00102	Sample Concentration	Duplicate Concentration	RPD	Control Limits
Volatile Organic Compounds (µg/ℓ)				
Acetone			ND	10
Carbon disulfide			1	ND
Inorganic Compounds (µg/ℓ)				
Aluminum	79.3	84.6	6	25
Barium	128	129	0.8	25
Beryllium	0.39	ND	NC	25
Calcium	113,000	113,000	0	25
Iron	36.2	38.7	7	25
Lead	1.4	1.3	7	25
Magnesium	9,560	9,560	0.3	25
Manganese	13.5	13.7	1	25
Nickel	7.8	9.6	21	25
Potassium	4,610	4,580	0.7	25
Selenium	1.2	0.66	58	25
Sodium	2,200	2,240	2	25

See notes at end of table.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

SDG Number: WF023 Sample ID: 01G00102	Sample Concentration	Duplicate Concentration	RPD	Control Limits
Inorganic Compounds (μg/ℓ) (Continued)				
Vanadium	3.0	2.8	7	25
Zinc	1.8	2.0	11	25
Cyanide	4.5	2.0	77	25

Notes: SDG = sample delivery group.
ID = identification.
RPD = relative percent difference.
ND = nondetect.
NC = not calculable.
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 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

SDG Number	MS/MSD Sample	Analyte	% Recovery MS/MSD[1]	Control Limits
WF022	**Groundwater**			
	BKG00101			
Semivolatile Organic Compounds				
		4-Chloro-3-methylphenol	108/115	23 to 97
		4-Nitrophenol	88/93	10 to 80
		2,4-Dinitrotoluene	100/108	24 to 96
		Pentachlorophenol	106/118	9 to 103
WF023	**Groundwater**			
	02G00301			
Semivolatile Organic Compounds				
		4-Nitrophenol	88/82	10 to 80
		2,4-Dinitrotoluene	97/NA	24 to 96
		Pentachlorophenol	139/122	9 to 103

[1] MSD analyses are generally not performed for inorganic analysis and, therefore, only the percent Recovery for the MS is reported.

Notes: MS/MSD = matrix spike and matrix spike duplicate.
SDG = sample delivery group.
% = percent.
NA = not analyzed.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

SDG Number	Sample ID	Spiked Analyte	Surrogate Recovery (%R)[1]	QC Limits (percent)
WF023	01G00201	Decachlorobiphenyl	32/28	60-150
WF023	01G00301	Decachlorobiphenyl	49/47	60-150

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

Notes QC = quality control.
SDG = sample delivery group.
ID = identification.
%R = percent recovery (the formula is %R = A-B/C × 100, where A is the measured concentration of the spiked analyte, B is the measured concentration of the spike compound in the unspilled sample, and C is the true concentration of the spiked analyte).

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 (RRF) 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 groundwater samples collected at Site 1.

The evaluation of the %RSD for the initial calibrations and the %D for the continuing calibrations indicates 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 J or UJ.

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 analysis] 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.

Table 4-4
Summary of Initial and Continuing Calibration for Site 18 Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

SDG	Compound	Initial Calibration	Continuing Calibration	Qualifier
WF022	4-Chloroaniline	--	31.6	J
	2,4-Dinitrophenol	--	27.6	J
	4,6-Dinitro-2-methylphenol	--	33.8	J
WF023	Acetone	30.2	33.2	J
	4-Nitroaniline	--	37.8	J
	Chrysene	--	27.8	J
	4,4'-DDT	23.6	--	J

Notes: Calibration values expressed as percent recovery (the formula is %R = A-B/C x 100, where A is the measured concentration of the spiked analyte, B is the measured concentration of the spike compound in the unspilled sample, and C is the true concentration of the spiked analyte).

SDG = sample delivery group.
-- = not detected.
J = The analyte was positively identified and is reported as an approximate concentration.
DDT = dichlorodiphenyltrichloroethane.

Table 4-5
Representativeness Summary for Site 18 Field Quality Control Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	01F00101	01R00101	01T00101	01R01101	01T01201
Collect Date:	06-DEC-95	06-DEC-95	05-DEC-95	23-JUL-96	22-JUL-96
Laboratory Sample No.:	G8876013	G8876012	G8864001	RB887005	RB887001
Volatile Organic Compounds (μg/ℓ)					
Acetone	--	--	9.0 J	--	--
2-Butanone	2.0 J	--	--	--	--
Semivolatile Organic Compounds (μg/ℓ)					
Di-*n*-octylphthalate	15	--	NA	--	NA
bis(2-Ethylhexyl)phthalate	--	2.0	NA	--	NA
Pesticides and PCBs (μg/ℓ)					
None detected					
Inorganic Analytes and Cyanide (μg/ℓ)					
Aluminum	--	--	NA	13.3 J	NA
Calcium	--	178 J	NA	--	NA
Zinc	--	2.9 J	NA	--	NA
Cyanide	--	--	NA	2.6 J	NA

Notes: 01F00101 = field blank.
01R00101 and 01R01101 = rinsate blanks.
01T00101 and 01T01201 = trip blanks.
μg/ℓ = micrograms per liter.
-- = analyte not detected.
J = estimated value.
NA = not analyzed.
PCB = polychlorinated biphenyl.

Trip Blanks. Acetone was detected in sample 01T00101 at a concentration of 9 micrograms per liter ($\mu g/\ell$). Environmental samples associated with the trip blanks with results greater than the instrument detection level (IDL) but less than 10 times the amount detected in the trip blank were appropriately annotated with either a J or UJ qualifier (Laboratory Data Consultants, Inc. (LDC), 1996).

Rinsate Blanks. VOCs, if present, were not detected at concentrations exceeding their IDL in the rinsate blanks. One SVOC, bis(2-ethylhexyl)phthalate, was detected in one of the rinsate blank samples at

a concentration of 2 $\mu g/\ell$. SVOCs, if present, were not detected in associated soil samples at concentrations exceeding their IDL.

Metals detected at concentrations exceeding the IDL and less than the Contract Required Detection Limits are aluminum, calcium, cyanide, and zinc.

Field Blank. 2-Butanone and di-*n*-octylphthalate were detected in the field blank at concentrations of 2 J $\mu g/\ell$ and 15 $\mu g/\ell$, respectively. Environmental samples associated with the field blank with results greater than the IDL but less than 10 times the amount detected in the field blank were appropriately annotated with a UJ qualifier.

Laboratory Method and Preparation Blanks. Concentrations of methylene chloride, acetone, di-*n*-butylphthalate, and bis(2-ethylhexyl)phthalate were detected in the laboratory method blanks associated with SDGs WF023 or WF024.

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

Aluminum, calcium, cobalt, copper, iron, magnesium, mercury, selenium, and sodium were detected in laboratory method blanks. Sample results greater than IDL but less than five times the amount detected in the laboratory preparation blanks were appropriately annotated with a J or UJ qualifier (LDC, 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 USEPA, 1994b).

<u>4.2.4 Comparability</u> 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 assured by using standard operating procedures for sample collection, by using standard chemical analytical methods, and by reporting the analytical results in standard units. The sampling, shipment, and analytical protocols were

consistent with USEPA standard operating 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 analysis and units of measure were used throughout the project, therefore 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 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

	Precision[1]	Accuracy[2]	Representativeness	Completeness (%)	Comparability
Surface and Subsurface Soil Samples					
TCL VOC	Acceptable	Acceptable	Acceptable	100	Acceptable
TCL SVOCs	Acceptable	Acceptable	Acceptable	100	Acceptable
TCL 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, representativeness, completeness, and comparability.
% = percent.
TCL VOC = target compound list volatile organic compound.
SVOC = list semivolatile organic compound.
PCB = polychlorinated biphenyl.
TAL = target analyte list.

5.0 INVESTIGATIVE RESULTS

The following sections present the geologic and hydrologic analysis as well as analytical results of the soil gas, surface soil, and groundwater sampling events.

5.1 GEOLOGIC RESULTS. Surface soil (land surface to less than 1 foot) was generally described as yellow to orange (fine- to very fine-grained) clayey sand or light tan (fine- to very fine-grained) silty sand. Shallow subsurface soil (2 to 7 feet bls) tended to be brown to red-brown in color and contained interbedded sandy silt and clay layers.

Beneath the surface soil the lithology of Site 18 primarily consisted of light-colored, poorly graded (fine- to medium-grained) sand to a depth of at least 130 feet bls. Two clay seams greater than one inch in thickness were encountered at the location of one monitoring well (WHF-1-2) drilled at the site. One clay seam, approximately 2 inches in thickness, was encountered at 20 feet bls, and a 1-inch clay seam was encountered at 50 feet bls. Other seams of clay and silt were thin (less than 1 inch in thickness) and infrequently encountered below 20 feet.

Detailed descriptions can be found in the boring and monitoring well logs presented in the RI/FS Technical Memorandum No. 2 (ABB-ES, 1995b) and in Appendix B of this report. A general discussion of the geology at NAS Whiting Field is presented in Subsection 1.4.5 of the GIR (HLA, 1998).

5.2 HYDROGEOLOGIC RESULTS. The hydrogeologic assessment included determining horizontal and vertical hydraulic gradients, hydraulic conductivities, and seepage velocities. The hydrogeologic assessment results are used to evaluate the transport of human health and ecological chemicals of potential concern from the site by groundwater flow. Contaminant fate and transport for human health and ecological chemicals of potential concern at Site 18 is presented in Chapter 8.0 of this report.

The hydrologic assessment of Site 18 also draws on data from Sites 1, 2, and 17. Site 1, the Northwest Disposal Area, and Site 2, the Northwest Open Disposal Area, are located approximately 500 and 2,000 feet, respectively, northwest of Site 18. Site 17, another Crash Crew Training Area, is located approximately 5,000 feet north of Site 18. These four sites are found in the northwest quadrant of NAS Whiting Field.

Groundwater Flow Direction. Table 5-1 summarizes the results of the water-level measurements recorded for the RI/FS sites in the northwest quadrant during the RI field program. Groundwater flow patterns determined from these measurement events are similar, and potentiometric surface maps depicting the February 8 and 9, 1994, event (Figure 5-1) and the November 7 to 9, 1996, event (Figure 5-2) are included in the body of this report. Data from these measurement events indicate groundwater flows to the south-southwest. Facilitywide water table elevation data are provided in Appendix D of the GIR (HLA, 1998).

Table 5-1
Summary of Water-Level Elevations

Remedial Investigation Report
Site 18, Crash Crew Training Area
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		June 22 to 24, 1994	
			Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)
Northwest Disposal and Crash Crew Training Areas								
Site 1, Northwest Disposal Area								
WHF-1-1	142.62	123	64.70	77.92	66.00	76.62	66.26	76.36
WHF-1-1S	143.08	75	64.40	78.68	65.84	77.24	66.11	76.97
WHF-1-2	145.61	78	66.13	79.48	67.53	78.08	67.99	77.62
WHF-1-3	155.50	87	76.68	78.82	78.02	77.48	78.51	76.99
WHF-1-4	151.86	79	--	--	--	--	--	--
Site 2, Northwest Open Disposal Area								
WHF-2-1	150.80	87	77.96	72.84	79.18	71.62	79.00	71.80
WHF-2-2	159.16	91	--	--	--	--	--	--
WHF-2-3	160.63	91	--	--	--	--	--	--
Site 17, Crash Crew Training Area								
WHF-17-1	194.71	159	111.10	83.61	112.39	82.32	113.56	81.15
WHF-17-1S	194.96	115	111.29	83.67	112.60	82.36	113.78	81.18
WHF-17-2	197.35	121	114.05	83.30	115.35	82.00	116.52	80.83
WHF-17-3	198.62	126	117.52	81.10	117.12	81.50	117.53	81.09
Site 18, Crash Crew Training Area								
WHF-18-1	163.57	120	93.29	70.28	94.53	69.04	94.61	68.96
WHF-18-2	164.75	107	95.82	68.93	97.04	67.71	98.03	66.72
WHF-18-3	175.64	112	104.30	71.34	105.59	70.05	105.90	69.74

See notes at end of table.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (ft BTOC)	October 10 to 13, 1994		January 10 to 13, 1995		April 19 and 20, 1995	
			Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)
Northwest Disposal and Crash Crew Training Areas								
Site 1, Northwest Disposal Area								
WHF-1-1	142.62	123	64.15	78.47	64.36	78.26	64.02	78.60
WHF-1-1S	143.08	75	63.92	79.16	64.13	78.95	63.80	79.28
WHF-1-2	145.61	78	65.72	79.89	65.91	79.70	65.57	80.04
WHF-1-3	155.50	87	76.23	79.27	76.32	79.18	76.10	79.40
WHF-1-4	151.86	79	--	--	--	--	--	--
Site 2, Northwest Open Disposal Area								
WHF-2-1	150.80	87	76.94	73.86	77.45	73.35	76.96	73.84
WHF-2-2	159.16	91	--	--	--	--	--	--
WHF-2-3	160.63	91	--	--	--	--	--	--
Site 17, Crash Crew Training Area								
WHF-17-1	194.71	159	111.49	83.22	110.94	83.77	110.97	83.74
WHF-17-1S	194.96	115	111.72	83.24	111.15	83.81	111.17	83.79
WHF-17-2	197.35	121	114.45	82.90	113.89	83.46	113.92	83.43
WHF-17-3	198.62	126	123.65	74.97	114.87	83.75	114.88	83.74
Site 18, Crash Crew Training Area								
WHF-18-1	163.57	120	92.28	71.29	92.50	71.07	92.35	71.22
WHF-18-2	164.75	107	94.76	69.99	94.97	69.78	94.85	69.90
WHF-18-3	175.64	112	103.55	72.09	103.48	72.16	103.46	72.18

See notes at end of table.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
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		January 19 and 20, 1996	
			Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)
Northwest Disposal and Crash Crew Training Areas								
Site 1, Northwest Disposal Area								
WHF-1-1	142.62	123	62.42	80.20	61.84	80.78	58.18	84.44
WHF-1-1S	143.08	75	62.12	80.96	61.58	81.50	57.81	85.27
WHF-1-2	145.61	78	63.86	81.75	63.27	82.34	59.59	86.02
WHF-1-3	155.50	87	74.33	81.17	74.03	81.47	70.08	85.42
WHF-1-4	151.86	79	--	--	--	--	--	--
Site 2, Northwest Open Disposal Area								
WHF-2-1	150.80	87	75.56	75.24	75.21	75.59	71.50	79.30
WHF-2-2	159.16	91	--	--	--	--	--	--
WHF-2-3	160.63	91	--	--	--	--	--	--
Site 17, Crash Crew Training Area								
WHF-17-1	194.71	159	109.17	85.54	108.85	85.86	104.88	89.83
WHF-17-1S	194.96	115	109.39	85.57	109.05	85.91	105.09	89.87
WHF-17-2	197.35	121	112.13	85.22	111.80	85.55	107.87	89.48
WHF-17-3	198.62	126	113.12	85.50	112.73	85.89	109.82	88.80
Site 18, Crash Crew Training Area								
WHF-18-1	163.57	120	90.76	72.81	91.09	72.48	86.81	76.76
WHF-18-2	164.75	107	93.28	71.47	93.69	71.06	89.37	75.38
WHF-18-3	175.64	112	101.93	73.71	102.13	73.51	97.58	78.06

See notes at end of table.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Monitoring Well Designation	Well TOC Elevation (msl)	Well Depth (ft BTOC)	April 25 to 27, 1996		July 25 to 27, 1996		November 7 to 9, 1996	
			Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft msl)
Northwest Disposal and Crash Crew Training Areas								
Site 1, Northwest Disposal Area								
WHF-1-1	142.62	123	57.58	85.04	57.43	85.19	58.92	83.70
WHF-1-1S	143.08	75	57.13	85.95	57.09	85.99	59.53	83.55
WHF-1-2	145.61	78	58.78	86.83	58.76	86.85	60.18	85.43
WHF-1-3	155.50	87	69.40	86.10	69.23	86.27	70.63	84.87
WHF-1-4	151.86	79	66.27	85.59	66.17	85.69	67.62	84.24
Site 2, Northwest Open Disposal Area								
WHF-2-1	150.80	87	71.21	79.59	71.47	79.33	72.95	77.85
WHF-2-2	159.16	91	79.96	79.20	80.08	79.08	81.58	77.58
WHF-2-3	160.63	91	80.40	80.23	80.38	80.25	81.89	78.74
Site 17, Crash Crew Training Area								
WHF-17-1	194.71	159	103.44	91.27	102.82	91.89	103.96	90.75
WHF-17-1S	194.96	115	103.66	91.30	103.83	91.13	104.16	90.80
WHF-17-2	197.35	121	106.40	90.95	105.73	91.62	106.91	90.44
WHF-17-3	198.62	126	107.26	91.36	106.81	91.81	107.68	90.94
Site 18, Crash Crew Training Area								
WHF-18-1	163.57	120	86.69	76.88	86.62	76.95	88.05	75.52
WHF-18-2	164.75	107	89.37	75.38	89.32	75.43	90.73	74.02
WHF-18-3	175.64	112	97.57	78.07	97.51	78.13	98.70	76.94

Notes: TOC = top of casing.
msl = mean sea level.
ft BTOC = feet below top of casing.
ft msl = feet above mean sea level.
-- = not measured.

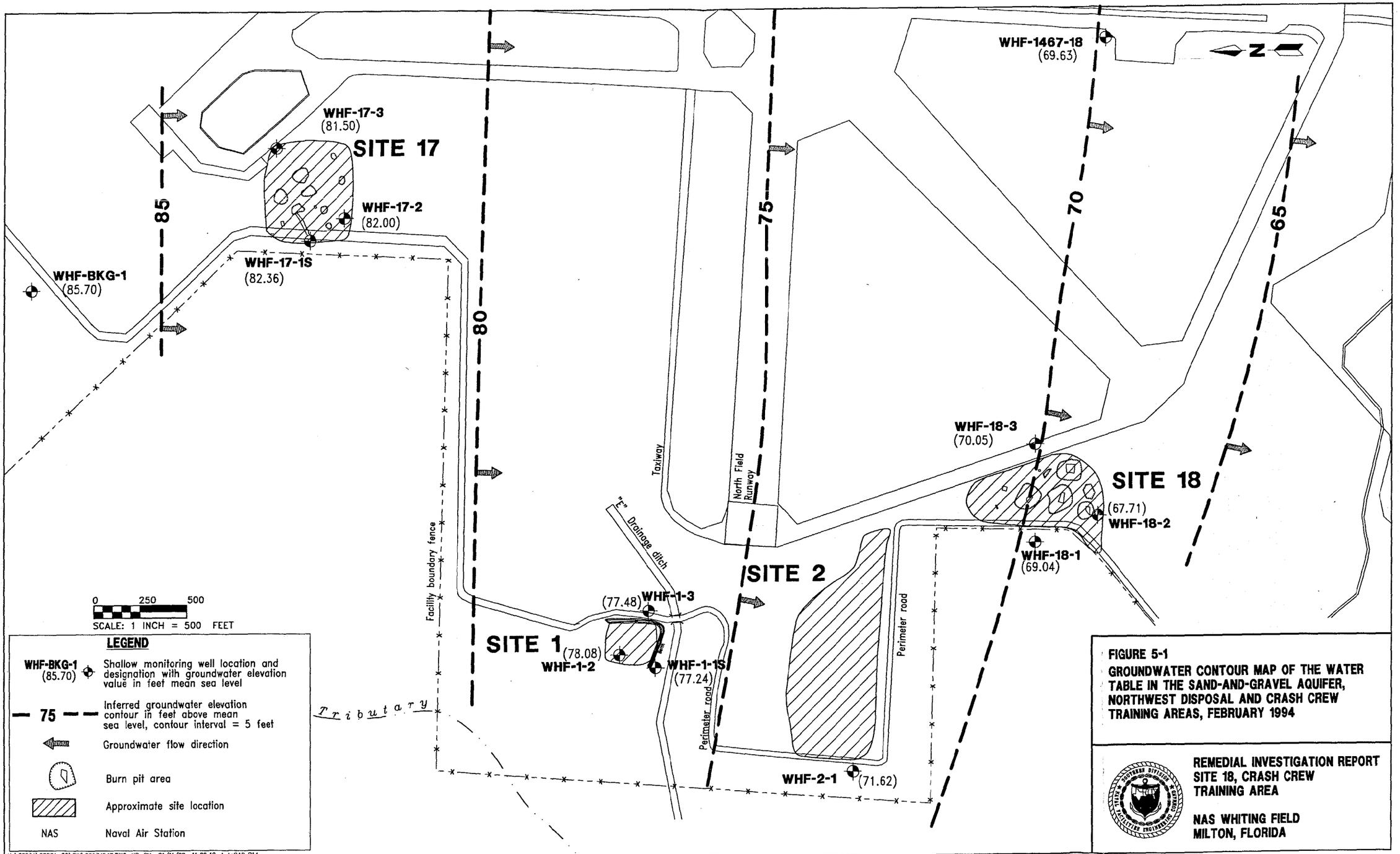

FIGURE 5-1
GROUNDWATER CONTOUR MAP OF THE WATER TABLE IN THE SAND-AND-GRAVEL AQUIFER, NORTHWEST DISPOSAL AND CRASH CREW TRAINING AREAS, FEBRUARY 1994

REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

00249CB22

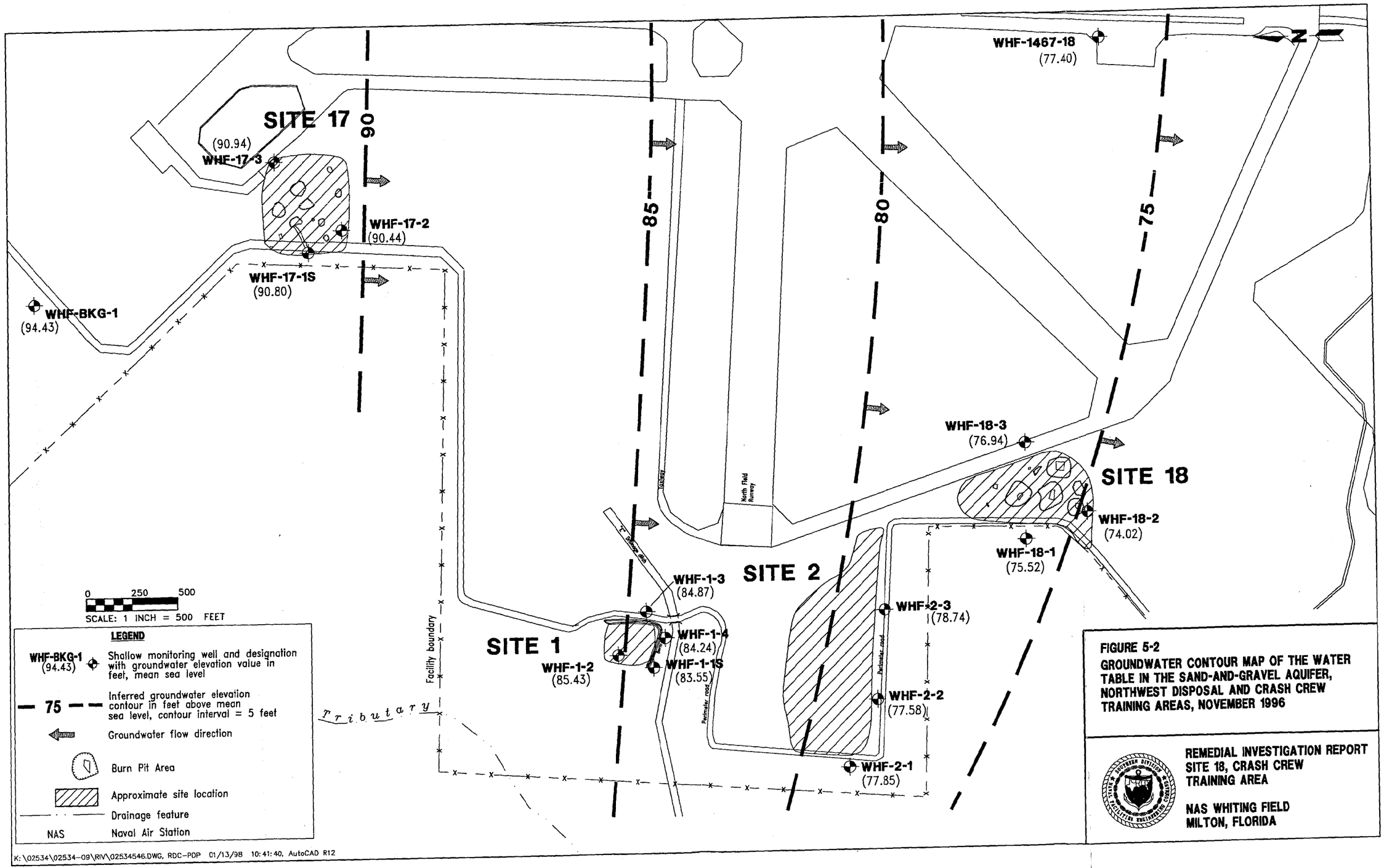

FIGURE 5-2
GROUNDWATER CONTOUR MAP OF THE WATER TABLE IN THE SAND-AND-GRAVEL AQUIFER, NORTHWEST DISPOSAL AND CRASH CREW TRAINING AREAS, NOVEMBER 1996

REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

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Horizontal and Vertical Gradients. Table 5-2 provides a summary of the horizontal hydraulic gradients calculated for Site 18 and the other RI/FS sites in the northwest quadrant. The horizontal hydraulic gradients in the area ranged from 0.0059 foot per foot (ft/ft) (monitoring wells WHF-18-2 and WHF-18-3) to 0.0016 ft/ft (monitoring wells WHF-17-1S and WHF-17-2). Average hydraulic gradients calculated for each measurement event ranged from 0.0034 ft/ft for October 1994 to 0.0053 ft/ft for November 1996. The overall average horizontal hydraulic gradient for all measurement events from 1993 through 1996 was 0.0039 ft/ft.

Site 18 has no paired wells; therefore, Table 5-3 presents a summary of the vertical hydraulic gradients calculated for the northwest quadrant RI/FS sites. The vertical hydraulic gradients were calculated using well pairs at Site 1 (monitoring wells WHF-1-1S and WHF-1-1) and Site 17 (monitoring wells WHF-17-1S and WHF-17-1). Values calculated for the paired monitoring wells ranged from 0.005 ft/ft to 0.0189 ft/ft. Vertical hydraulic gradients were mostly in a downward direction; however, an upward gradient was observed on Site 17 during the July 25 to 27, 1996, survey and observed on Site 1 during the November 7 to 9, 1996, survey.

Hydraulic Conductivity and Seepage Velocity. Four slug tests were conducted in the Northwest Disposal and Crash Crew Training Areas during the RI. Table 5-4 summarizes the hydraulic conductivity values calculated for monitoring wells in the northwest quadrant sites. Three trials of rising head slug tests were conducted in four monitoring wells in the northwest quadrant area.

Hydraulic conductivity data from monitoring well WHF-18-2 were rejected because they exceeded the 20 percent variance criteria in the data validation procedure. The validation of hydraulic conductivity data is presented in Section 2.3 in Table 2-2 of Technical Memorandum No. 4, Hydrogeologic Assessment, January 1995 (ABB-ES, 1995c).

Average hydraulic conductivity values for individual monitoring wells ranged from 4.01 feet per day (ft/day) (1.42×10^{-3} centimeters per second [cm/sec]) for WHF-17-2 to 19.47 ft/day (6.87×10^{-3} cm/sec) for WHF-1-1S. The screen interval lithology (fine- to medium-grained sand) around monitoring wells WHF-1-1S and WHF-2-1 was almost five times more conductive than the lithology (poorly graded medium-grained sand) around WHF-17-2S. The geometric mean of the hydraulic conductivity data from Sites 1, 2, and 17 was 11.43 ft/day (4.03×10^{-3} cm/sec).

Seepage Velocity. Table 5-5 summarizes the seepage velocities (average linear pore water velocity) for the water table zone of the sand-and-gravel aquifer for sites in the northwest quadrant sites. The calculations used an assumed effective porosity (n) of 0.35 for the site. The value represents silty through poorly graded sands (Fetter, 1988). Seepage velocities for individual sites ranged from 0.02 ft/day at Site 17 to 0.26 ft/day at Sites 1 and 2. The average of the seepage velocity values for the northwest quadrant sites was 0.17 ft/day (62 feet per year).

5.3 SURFACE SOIL ANALYTICAL RESULTS. Tables 5-6 and 5-7 summarize the analytical results for organic and inorganic analytes, respectively, detected in 47 surface soil samples and 5 duplicates collected at Site 18. Tables 5-8 and 5-9 summarize the frequency of detection, range of detection limits, range of

Table 5-2
Summary of Horizontal Hydraulic Gradients

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	September 30 to October 1, 1993		February 8 and 9, 1994		June 22 to 24, 1994		October 10 to 13, 1994	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Northwest Disposal and Crash Crew Training Areas									
WHF-17-1S	218	83.67	0.0017	82.36	0.0017	81.18	0.0016	83.24	0.0016
WHF-17-2		83.30		82.00		80.83		82.90	
WHF-18-3	511	71.34	0.0047	70.05	0.0046	69.74	0.0059	72.09	0.0041
WHF-18-2		68.93		67.71		66.72		69.99	
WHF-1-2	205	79.48	0.0039	78.08	0.0041	77.62	0.0032	79.89	0.0036
WHF-1-1S		78.68		77.24		76.97		79.16	
WHF-1-1S	1,201	78.68	0.0049	77.24	0.0047	76.97	0.0043	79.16	0.0044
WHF-2-1		72.84		71.62		71.80		73.86	
		Average gradient	0.0038		0.0038		0.0038		0.0034

See notes at end of table.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	January 10 to 13, 1995		April 19 and 20, 1995		July 28 and 29, 1995		October 12 to 14, 1995	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Northwest Disposal and Crash Crew Training Areas									
WHF-17-1S	218	83.81	0.0016	83.79	0.0017	85.57	0.0016	85.91	0.0017
WHF-17-2		83.46		83.43		85.22		85.55	
WHF-18-3	511	72.16	0.0047	72.18	0.0045	73.71	0.0044	73.51	0.0048
WHF-18-2		69.78		69.90		71.47		71.06	
WHF-1-2	205	79.70	0.0037	80.04	0.0037	81.75	0.0039	82.34	0.0041
WHF-1-1S		78.95		79.28		80.96		81.50	
WHF-1-1S	1,201	78.95	0.0047	79.28	0.0045	80.96	0.0048	81.50	0.0049
WHF-2-1		73.35		73.84		75.24		75.59	
	Average gradient		0.0037		0.0036		0.0037		0.0039

See notes at end of table.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Designation	Distance Between Wells (feet)	January 19 and 20, 1996		April 25 to 27, 1996		July 25 to 27, 1996		November 7 to 9, 1996	
		Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)	Water Level (msl)	Horizontal Gradient (ft/ft)
Northwest Disposal and Crash Crew Training Areas									
WHF-17-1S	218	89.87	0.0018	91.30	0.0016	91.13	0.0022	90.80	0.0017
WHF-17-2		89.48		90.95		91.62		90.44	
WHF-18-3	511	78.06	0.0052	78.07	0.0053	78.13	0.0053	76.94	0.0057
WHF-18-2		75.38		75.38		75.43		74.02	
WHF-1-2	205	86.02	0.0037	86.83	0.0043	86.85	0.0042	85.43	0.0092
WHF-1-1S		85.27		85.95		85.99		83.55	
WHF-1-1S	1,201	85.27	0.0050	85.95	0.0053	85.99	0.0055	83.55	0.0047
WHF-2-1		79.30		79.59		79.33		77.85	
	Average gradient		0.0039		0.0041		0.0043		0.0053

Notes: msl = mean sea level.
ft/ft = feet per foot.

Table 5-3
Summary of Vertical Hydraulic Gradients

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	September 30 and October 1, 1993			February 8 and 9, 1994		
			Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Northwest Disposal and Crash Crew Training Areas								
WHF-1-1S	67.68	48.06	78.68	0.0158	Downward	77.24	0.0129	Downward
WHF-1-1	19.62		77.92			76.62		
WHF-17-1S	79.46	43.75	83.67	0.0013	Downward	82.36	0.0009	Downward
WHF-17-1	35.71		83.61			82.32		

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	June 22 to 24, 1994			October 10 to 13, 1994		
			Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Northwest Disposal and Crash Crew Training Areas								
WHF-1-1S	67.68	48.06	76.97	0.0127	Downward	79.16	0.0144	Downward
WHF-1-1	19.62		76.36			78.47		
WHF-17-1S	79.46	43.75	81.18	0.0007	Downward	83.24	0.0005	Downward
WHF-17-1	35.71		81.15			83.22		

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	January 10 to 13, 1995			April 19 and 20, 1995		
			Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Northwest Disposal and Crash Crew Training Areas								
WHF-1-1S	67.68	48.06	78.95	0.0144	Downward	79.28	0.0141	Downward
WHF-1-1	19.62		78.26			78.60		
WHF-17-1S	79.46	43.75	83.81	0.0009	Downward	83.79	0.0011	Downward
WHF-17-1	35.71		83.77			83.74		

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	July 28 and 29, 1995			October 12 to 14, 1995		
			Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Northwest Disposal and Crash Crew Training Areas								
WHF-1-1S	67.68	48.06	80.96	0.0158	Downward	81.50	0.0150	Downward
WHF-1-1	19.62		80.20			80.78		
WHF-17-1S	79.46	43.75	85.57	0.0007	Downward	85.91	0.0011	Downward
WHF-17-1	35.71		85.54			85.86		

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	January 19 and 20, 1996			April 25 to 27, 1996		
			Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Northwest Disposal and Crash Crew Training Areas								
WHF-1-1S	67.68	48.06	85.27	0.0173	Downward	85.95	0.0189	Downward
WHF-1-1	19.62		84.44			85.04		
WHF-17-1S	79.46	43.75	89.87	0.0009	Downward	91.30	0.0007	Downward
WHF-17-1	35.71		89.83			91.27		

See notes at end of table.

Table 5-3 (Continued)
Summary of Vertical Hydraulic Gradients

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Well Number	Bottom of Well Elevation (msl)	Vertical Distance Between Screens (feet)	July 25 to 27, 1996			November 7 to 9, 1996		
			Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction	Groundwater Elevation (msl)	Vertical Gradient (ft/ft)	Vertical Flow Direction
Northwest Disposal and Crash Crew Training Areas								
WHF-1-1S	67.68	48.06	85.99	0.0166	Downward	83.55	-0.0031	Upward
WHF-1-1	19.62		85.19			83.70		
WHF-17-1S	79.46	43.75	91.13	-0.0174	Upward	90.80	0.0011	Downward
WHF-17-1	35.71		91.89			90.75		

Notes: msl = mean sea level.
ft/ft = feet per foot.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
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)
Shallow/Intermediate Monitoring Wells					
Site 1, Northwest Disposal Area					
WHF-1-1S	18.09 to 20.33	3	0.0135	19.47	6.87×10^{-3}
Site 2, Northwest Open Disposal Area					
WHF-2-1	16.79 to 20.35	3	0.0133	19.14	6.75×10^{-3}
Site 17, Crash Crew Training Area					
WHF-17-2	3.67 to 4.50	2	0.0028	4.01	1.42×10^{-3}
Site 18, Crash Crew Training Area					
WHF-18-2	R	R	R	R	R
			Geometric Mean	11.43	4.03×10^{-3}

Notes: Average is the arithmetic average.

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

Table 5-5
Summary of Seepage Velocities

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Investigation Area	Sites	Monitoring Well Pair	Horizontal[1] Gradient (ft/ft)	K[2] (ft/day)	Effective Porosity (n)	Seepage Velocity (ft/day)
Northwest Disposal and Crash Crew Training Areas	1	WHF-1-1S and WHF-1-2	0.0043	19.47	0.35	0.24
	1 and 2	WHF-1-1S and WHF-2-1	0.0048	19.14	0.35	0.26
	17	WHF-17-1S and WHF-17-2	0.0017	4.01	0.35	0.02
	18	WHF-18-2 and WHF-18-3	0.0049	[3]11.43	0.35	0.16
				Arithmetic Average		0.17

[1] Horizontal gradients are the average value for all groundwater measurements performed between September 30, 1993, and November 9, 1996.
[2] K is averaged where values are available for both wells in the well pair.
[3] K was not determined at Site 18. The value 11.43 is the average K for Sites 1, 2, and 17.

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

Table 5-6
Summary of Organic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-01	18-SL-01A(DUP)	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06
Laboratory Sample No:	22481001	22481002	22462010	22462011	22462012	22507005	22507006
Collection Date:	12-AUG-92	12-AUG-92	12-AUG-92	12-AUG-92	12-AUG-92	14-AUG-92	14-AUG-92
Sample Depth (inches bls):	0 to 4	0 to 4	0 to 4	0 to 4	0 to 4	3 to 6	1 to 5
Volatile Organic Compounds (µg/kg)							
Methylene chloride	64 J	--	--	74 J	--	--	--
Acetone	--	--	--	--	--	--	--
Carbon disulfide	6.0	--	4.0 J	7.0	--	--	--
2-Butanone	--	--	--	--	--	--	--
Toluene	--	--	9.0	1.0 J	--	--	--
Ethylbenzene	--	--	--	--	--	--	--
Xylenes (total)	--	--	--	5.0 J	--	--	--
Semivolatile Organic Compounds (µg/kg)							
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	440 J
Naphthalene	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	700 J	1,200 J	--	--	1,000 J	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--
Other (mg/kg)							
TRPH	9,020	12,400	195	--	13,300	16.7	7,410

See notes at end of table.

Table 5-6 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-07	18-SL-08	18-SL-09	18-SL-10	18-SL-10A(DUP)	18-SL-11	18-SL-12
Laboratory Sample No:	22488001	22488002	22488003	22489001	22489002	22488004	22488005
Collection Date:	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92
Sample Depth (Inches bls):	0 to 3	0 to 5	0 to 5	3 to 6	3 to 6	2 to 4	0 to 5
Volatile Organic Compounds (µg/kg)							
Methylene chloride	--	--	--	--	--	--	--
Acetone	--	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	--	--	--
2-Butanone	--	--	--	36 J	35 J	--	--
Toluene	--	--	--	10 J	28	--	--
Ethylbenzene	--	--	--	23 J	70	--	--
Xylenes (total)	3.0 J	--	--	160	430	2.0 J	--
Semivolatile Organic Compounds (µg/kg)							
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--
Naphthalene	--	--	2,000	--	--	--	--
2-Methylnaphthalene	--	--	8,100	1,100 J	--	--	--
Fluorene	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	56 J	--	340 J	--	--	110 J	--
Benzo(a)pyrene	--	--	--	--	--	--	--
Other (mg/kg)							
TRPH	87.4	4.6	120	6,210	4,820	56.6	--

See notes at end of table.

Table 5-6 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19
Laboratory Sample No:	22488006	22488008	22488009	22488010	22488011	22495001	22495002
Collection Date:	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92
Sample Depth (Inches bls):	0 to 8	1 to 5	1 to 4	2 to 6	1 to 4	1 to 4	1 to 4
Volatile Organic Compounds (µg/kg)							
Methylene chloride	--	--	--	--	--	--	--
Acetone	--	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	--	--	--
2-Butanone	30 J	--	--	36 J	17 J	--	--
Toluene	14 J	--	34	--	--	--	--
Ethylbenzene	--	--	120	15 J	--	--	--
Xylenes (total)	67	3.0 J	1,000	76	--	--	3.0 J
Semivolatile Organic Compounds (µg/kg)							
bis(2-Chloroethoxy) methane	--	--	--	--	--	--	--
Naphthalene	990	--	3,000 J	3,500 J	--	--	--
2-Methylnaphthalene	--	--	11,000 J	15,000 J	--	--	--
Fluorene	440	--	--	--	--	--	--
Phenanthrene	120 J	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	76 J	--	--	--	320 J	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--
Other (mg/kg)							
TRPH	55.7	--	23,500	10,600	7,040	1,350	389

See notes at end of table.

Table 5-6 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-20	18-SL-21	18-SL-22	18-SL-23	18-SL-23A(DUP)	18-SL-24	18-SL-25
Laboratory Sample No:	22495003	22495004	22495005	22489003	22489004	22495006	22495007
Collection Date:	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92
Sample Depth (inches bls):	2 to 6	0 to 5	0 to 5	1 to 4	1 to 4	0 to 4	0 to 1
Volatile Organic Compounds (µg/kg)							
Methylene chloride	--	--	--	--	--	--	--
Acetone	--	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	--	--	--
2-Butanone	--	--	--	--	--	--	--
Toluene	--	--	--	--	--	--	47
Ethylbenzene	--	--	--	--	--	--	190
Xylenes (total)	4.0 J	4.0 J	2.0 J	--	2.0 J	--	670
Semivolatile Organic Compounds (µg/kg)							
bis(2-Chloroethoxy) methane	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	4,100 J
2-Methylnaphthalene	--	--	--	--	--	--	14,000
Fluorene	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	730 J
Fluoranthene	--	--	--	3,500 J	--	--	--
Pyrene	--	--	--	7,700 J	6,200 J	--	--
Benzo(a)anthracene	--	--	--	1,300 J	--	--	--
Chrysene	--	--	--	1,400 J	--	--	--
bis(2-Ethylhexyl)phthalate	--	--	--	5,600 J	4,100 J	68 J	--
Benzo(a)pyrene	--	--	--	1,200 J	--	--	--
Other (mg/kg)							
TRPH	--	2.9	54.8	18,800	17,800	113	9,950

See notes at end of table.

Table 5-6 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30	18-SL-31	18-SL-31A(DUP)	18-SL-32
Laboratory Sample No:	22495008	22495009	22495010	22495001	22495012	22506002	22507003	22506003
Collection Date:	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92
Sample Depth (inches bls):	0 to 4	0 to 5	0 to 4	0 to 4	0 to 4	0 to 5	0 to 5	0 TO 5
Volatile Organic Compounds (µg/kg)								
Methylene chloride	--	--	--	--	--	--	--	86 J
Acetone	--	--	--	--	--	--	--	340 J
Carbon disulfide	--	--	--	--	--	--	11 J	7.0 J
2-Butanone	--	1,700	--	--	--	--	--	140
Toluene	--	190 J	--	--	--	180 J	--	170
Ethylbenzene	--	430 J	--	--	--	290 J	--	73
Xylenes (total)	1.0 J	3,300	1.0 J	--	12 J	1,800	54	530
Semivolatile Organic Compounds (µg/kg)								
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--
Naphthalene	--	7,500 J	--	--	--	--	--	5,700 J
2-Methylnaphthalene	--	33,000 J	--	--	--	1,200 J	--	--
Fluorene	--	--	--	--	--	--	--	--
Phenanthrene	--	2,200 J	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	730 J	2,100 J
Benzo(a)anthracene	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	--	--	--	790 J	600 J	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--	--
Other (mg/kg)								
TRPH	58.6	20,500	--	8,770	2,170	9,190	11,300	15,600

See notes at end of table.

Table 5-6 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37A(DUP)	18-SL-38	18-SL-39
Laboratory Sample No:	22506004	22506005	22506006	22506007	22506008	22507001	22506009	22506010
Collection Date:	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92
Sample Depth (inches bls):	0 to 5	0 to 5	0 to 4	0 to 4	0 to 4	0 to 4	2 to 6	0 to 4
Volatile Organic Compounds (µg/kg)								
Methylene chloride	--	--	--	--	52 J	--	49 J	--
Acetone	--	--	--	--	1,400 J	--	--	--
Carbon disulfide	--	--	--	--	--	--	--	--
2-Butanone	--	--	--	--	--	--	--	--
Toluene	390 J	--	--	210 J	--	--	--	--
Ethylbenzene	800	240 J	--	320 J	--	--	--	--
Xylenes (total)	7,000	2,500	7.0 J	2,700	16 J	--	3.0 J	--
Semivolatile Organic Compounds (µg/kg)								
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--
Naphthalene	8,000 J	--	--	4,200 J	--	--	--	--
2-Methylnaphthalene	24,000	--	--	19,000	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	--	--	170 J	--	1,800 J	3,500	220 J	--
Benzo(a)pyrene	--	--	--	--	--	--	--	--
Other (mg/kg)								
TRPH	17,400	14,100	806	16,300	16,000	19,300	--	--

See notes at end of table.

Table 5-6 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
Laboratory Sample No:	22506011	22507002	22507007	22507008	22507009	22507010	225070011	22507012
Collection Date:	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92
Sample Depth (inches bls):	2 to 8	2 to 5	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12
Volatile Organic Compounds (µg/kg)								
Methylene chloride	--	--	--	--	--	--	--	--
Acetone	--	--	--	--	--	--	--	--
Carbon disulfide	--	--	1.0 J	--	* 4.0 J	2.0 J	--	--
2-Butanone	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	--	--	--	--
Ethylbenzene	--	--	--	--	--	--	--	--
Xylenes (total)	2.0 J	2.0 J	3.0 J	3.0 J	* 3.0 J	--	2.0 J	--
Semivolatile Organic Compounds (µg/kg)								
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	--	--	--	--	75 J	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--	--
Other (mg/kg)								
TRPH	4.9	8.3	--	67.7	842	19.8	15.8	--

Notes: bls = below land surface.
DUP = duplicate.
µg/kg = micrograms per kilogram.
J = estimated value.
-- = concentration of analyte, if present, was less than detection limit.
mg/kg = milligrams per kilogram.
TRPH = total recoverable petroleum hydrocarbons.
* = reextraction value.

Table 5-7
Summary of Inorganic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-01	18-SL-01A(DUP)	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06
Laboratory Sample No:	22481001	22481002	22462010	22462011	22462012	22507005	22507006
Collection Date:	12-AUG-92	12-AUG-92	12-AUG-92	12-AUG-92	12-AUG-92	14-AUG-92	14-AUG-92
Sample Depth (inches bls):	0 to 4	0 to 4	0 to 4	0 to 4	0 to 4	3 to 6	1 to 5
Inorganic Analytes (mg/kg)							
Aluminum	3,850	4,580	3,140	1,300	4,550	3,260	3,140
Antimony	--	5.8 J	--	--	--	--	--
Arsenic	--	--	0.59 J	0.77 J	0.72 J	0.26 J	--
Barium	17.2 J	45.2 J	7.1 J	5.5 J	27.2 J	6.5 J	10.6 J
Beryllium	--	--	--	--	--	--	--
Cadmium	22.6 J	33.7 J	2.8	--	9.0	--	9.3
Calcium	--	--	197 J	151 J	296 J	91.3 J	151 J
Chromium	16.5 J	43.3 J	5.4	2.9	8.3	4.0	10.7
Cobalt	--	--	1.3 J	1.0 J	0.87 J	0.78 J	0.47 J
Copper	177	864	8.4 J	1.8 J	32.6	6.8	45.3
Iron	1,710	2,580	1,800	1,700	2,180	1,790	1,490
Lead	62.6	96.1 J	28.9 J	6.7 J	35.6	5.1	32.6
Magnesium	64.7 J	103 J	94.9 J	116 J	126 J	84.1 J	125 J
Manganese	18.3 J	22.6 J	24.1	102	27.8	18.5	16
Mercury	--	--	--	--	--	--	--
Nickel	--	15.9	--	2.6 J	--	--	--
Potassium	--	216 J	280 J	293 J	--	199 J	194 J
Silver	--	--	--	0.35 J	--	--	--
Sodium	--	--	279 J	164 J	220 J	182 J	155 J
Thallium	--	--	--	--	--	--	--
Vanadium	--	--	4.4 J	4.5 J	5.4 J	4.6 J	4.2 J
Zinc	94.2 J	174 J	10.5 J	4.9 J	50.3 J	9.1 J	38.9

See notes at end of table.

Table 5-7 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-07	18-SL-08	18-SL-09	18-SL-10	18-SL-10A(DUP)	18-SL-11	18-SL-12
Laboratory Sample No:	22488001	22488002	22488003	22489001	22489002	22488004	22488005
Collection Date:	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92
Sample Depth (inches bls):	0 to 3	0 to 5	0 to 5	3 to 6	3 to 6	2 to 4	0 to 5
Inorganic Analytes (mg/kg)							
Aluminum	6,530	3,380	2,880	3,000	2,520 J	3,240	2,480
Antimony	--	--	--	2.9	--	--	--
Arsenic	0.64 J	0.46 J	1.1 J	--	--	0.53 J	0.52 J
Barium	38.6 J	5.7 J	32.4 J	97.7	92.3	14.1 J	4.3 J
Beryllium	--	0.06 J	--	--	0.09 J	--	--
Cadmium	20.6	0.88 J	--	--	0.7 J	0.81 J	--
Calcium	153 J	107 J	115 J	--	--	160 J	112 J
Chromium	39.8	3.6	3.6	95.7 J	10.2 J	4.5	1.5 J
Cobalt	--	--	0.76 J	--	--	0.45 J	--
Copper	201	8.0	13.9	65.3 J	24.9 J	6.5	2.4 J
Iron	1,990	1,690	7,050	35,600 J	14,100 J	1,760	1,600
Lead	76.5	32.3	55.4 J	57.4	88.5	60 J	3.2 J
Magnesium	133 J	81.8 J	116 J	237 J	185 J	92.4 J	63.4 J
Manganese	38.2	27.7	52.6	317 J	124 J	13.8	68.8
Mercury	--	--	--	0.04 J	0.06 J	--	--
Nickel	2.5 J	--	3.7 J	18.9 J	5.4 J	3.4 J	--
Potassium	--	--	175 J	276 J	261 J	318 J	145 J
Silver	--	--	--	--	--	--	--
Sodium	163 J	171 J	196 J	--	--	182 J	169 J
Thallium	--	--	--	--	--	--	--
Vanadium	3.4 J	4.4 J	3.3 J	3.8 J	2.9	4.0 J	3.4 J
Zinc	200	9.4	32.7 J	181 J	99.3 J	21.2 J	4.3 J

See notes at end of table.

Table 5-7 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19
Laboratory Sample No:	22488006	22488008	22488009	22488010	22488011	22495001	22495002
Collection Date:	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92
Sample Depth (inches bls):	0 to 8	1 to 5	1 to 4	2 to 6	1 to 4	1 to 4	1 to 4
Inorganic Analytes (mg/kg)							
Aluminum	3,990	4,880	4,240	3,910	2,260	3,780	2,300
Antimony	--	--	--	--	--	--	--
Arsenic	0.66 J	0.78 J	0.56 J	0.53 J	0.36 J	0.73 J	0.67 J
Barium	5.7 J	6.0 J	10.9 J	7.2 J	25 J	31.4 J	24 J
Beryllium	--	0.07 J	--	--	--	0.06 J	0.09 J
Cadmium	--	0.99 J	--	--	--	1.2	2.5
Calcium	93 J	80.1 J	96.9 J	151 J	96.6 J	181 J	353 J
Chromium	5.4	3.1	8.6	3.8	2.4 J	15.5	5
Cobalt	--	0.81 J	0.4 J	0.4 J	--	1.8 J	1.3 J
Copper	3.2 J	3.5 J	3.0 J	8.7	3.8 J	9.5	10.3
Iron	2,240	2,810	2,870	2,060	1,750	4,190	1,900
Lead	29.6	3.4 J	54.5 J	19	20	48.7	57.9
Magnesium	122 J	88.7 J	106 J	137 J	53.4 J	94.6 J	78.5 J
Manganese	21.3	79.3	19.3	22.9	15.1	20.8	35.2
Mercury	--	--	--	--	--	0.07 J	0.06 J
Nickel	2.9 J	3.9 J	--	7.0 J	3.1 J	2.6 J	--
Potassium	247 J	346 J	301 J	297 J	166 J	181 J	198 J
Silver	--	--	--	--	--	--	--
Sodium	164 J	179 J	195 J	213 J	216 J	155 J	137 J
Thallium	--	--	--	--	--	--	--
Vanadium	5.0 J	6.4 J	6.2 J	4.7 J	3.0 J	8.4 J	2.9 J
Zinc	9.4 J	8.9 J	9.1 J	27.5 J	17.6 J	16.5 J	28.6 J

See notes at end of table.

Table 5-7 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18-SL-20	18-SL-21	18-SL-22	18-SL-23	18-SL-23A(DUP)	18-SL-24	18-SL-25
Laboratory Sample No:	22495003	22495004	22495005	22489003	22489004	22495006	22495007
Collection Date:	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92
Sample Depth (inches bls):	2 to 6	0 to 5	0 to 5	1 to 4	1 to 4	0 to 4	0 to 1
Inorganic Analytes (mg/kg)							
Aluminum	4,690	1,510	1,990	13,200 J	4,970 J	3,480	3,790
Antimony	--	--	--	--	3.5 J	--	--
Arsenic	1.0 J	0.37 J	0.51 J	--	--	0.63 J	0.58 J
Barium	9.2 J	4.8 J	3.4 J	198	188	6.9 J	5.2 J
Beryllium	0.08 J	0.11 J	--	0.09 J	0.08 J	--	0.08 J
Cadmium	--	--	1.0 J	5.5	5.0 J	--	0.6 J
Calcium	1,050 J	367 J	189 J	--	--	185 J	211 J
Chromium	3.5	3.1	3.4	33.9	23.4 J	8.7	3.6
Cobalt	1.4 J	0.77 J	1.1 J	--	--	1.8 J	1.9 J
Copper	3.0 J	7.5 J	7.3 J	236 J	68.6 J	14.5	5.2 J
Iron	3,340	1,140	1,520	12,900	23,500 J	2,070	2,500
Lead	11.5	8.4	10.4	59.6	63.2	24.5	19.1
Magnesium	87.6 J	67.3 J	33.8 J	455 J	267 J	90 J	93.2 J
Manganese	47.8	18	15.1	131	141 J	12.2	134
Mercury	0.06 J	0.09 J	0.08 J	0.25	0.07 J	0.09 J	0.06 J
Nickel	3.3 J	2.6 J	2.6 J	6.5 J	6.7 J	--	--
Potassium	--	--	149 J	1,210	1,060 J	--	301 J
Silver	--	--	--	--	--	--	--
Sodium	150 J	232 J	201 J	--	--	173 J	190 J
Thallium	--	--	--	--	--	--	--
Vanadium	8.0 J	2.6 J	4.0 J	4.3 J	3.8 J	5.0 J	5.4 J
Zinc	21.3 J	10.1 J	9.8 J	9.8 J	210 J	11.7 J	7.0 J

See notes at end of table.

Table 5-7 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Surface Soil Samples

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Naval Air Station Whiting Field
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Sample Identifier:	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30	18-SL-31	18-SL-31A(DUP)	18-SL-32
Laboratory Sample No:	22495008	22495009	22495010	22495001	22495012	22506002	22507003	22506003
Collection Date:	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	13-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92
Sample Depth (inches bls):	0 to 4	0 to 5	0 to 4	0 to 4	0 to 4	0 to 5	0 to 5	0 to 5
Inorganic Analytes (mg/kg)								
Aluminum	2,310	4,100	1,730	2,910	3,330	7,100	13,500	4,590
Antimony	--	--	--	--	--	4.1 J	3.0 J	--
Arsenic	0.56 J	0.71 J	0.24 J	0.81 J	0.74 J	3.1	2.2 J	--
Barium	28.8 J	4.7 J	6.8 J	46.2 J	13.4 J	265	290	59.7
Beryllium	0.1 J	0.08 J	--	--	0.09 J	--	0.14 J	0.07 J
Cadmium	1.2 J	--	--	0.91 J	--	3.3 J	15.6	--
Calcium	100 J	75.2 J	63 J	148 J	167 J	--	592 J	--
Chromium	5.6	3.6	1.8 J	6.6	2.6	23.2	43.8	7.1
Cobalt	1.1 J	1.4 J	--	2.0 J	--	--	5.9 J	--
Copper	6.9 J	6.4 J	5.6 J	27.5	7.2 J	192 J	314	25.2 J
Iron	1,530	2,350	1,490	3,200	1,790	41,600 J	51,700	2,590 J
Lead	16.8	35.1	3.2	32.1	22.2	160	168	61.1
Magnesium	65.4 J	106 J	35.6 J	136 J	83.4 J	518 J	657 J	171 J
Manganese	45.8	21.7	39.6	35.4	45	309 J	457	34.1 J
Mercury	0.05 J	0.08 J	0.19	0.08 J	0.07J	--	--	--
Nickel	4.5 J	--	--	7.2 J	2.5 J	--	19.7	--
Potassium	260 J	259 J	--	359 J	168 J	2,860	2,930	462 J
Silver	--	--	--	--	--	--	--	--
Sodium	231 J	169 J	137 J	203	156 J	--	302 J	--
Thallium	--	--	--	--	--	--	--	--
Vanadium	3.7 J	5.4 J	2.4 J	3.3 J	4.4 J	5.7 J	5.9 J	5.9 J
Zinc	27.9 J	5.5 J	11 J	57.7 J	9.8 J	326	779	--

See notes at end of table.

Table 5-7 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Surface Soil Samples

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Site 18, Crash Crew Training Area
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Sample Identifier:	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37A(DUP)	18-SL-38	18-SL-39
Laboratory Sample No:	22506004	22506005	22506006	22506007	22506008	22507001	22506009	22506010
Collection Date:	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92
Sample Depth (inches bls):	0 to 5	0 to 5	0 to 4	0 to 4	0 to 4	0 to 4	2 to 6	0 to 4
Inorganic Analytes (mg/kg)								
Aluminum	4,350	3,560	3,450	3,790	4,190	3,600	4,100	4,840
Antimony	--	--	--	--	--	--	3.2 J	--
Arsenic	--	--	--	--	--	0.67 J	--	--
Barium	46.1	22.6 J	15.1 J	24.6 J	8.2 J	7.2 J	7.7 J	5.6 J
Beryllium	--	--	--	0.06 J	0.08 J	--	--	0.06 J
Cadmium	--	--	--	1.9	0.84 J	1.4	--	--
Calcium	--	--	--	--	--	147 J	--	--
Chromium	8.0	3.7	3.6	9.0	4.5	3.8	32	4.4
Cobalt	--	--	--	--	--	0.55 J	--	--
Copper	32.7 J	9.2 J	10.9 J	106 J	--	5.6	--	--
Iron	5,610 J	2,110 J	1,760 J	2,090 J	2,110 J	1,980	3,270 J	2,690 J
Lead	44.9	23.4	--	99.5	42.8	43.1	--	--
Magnesium	192 J	114 J	97.2 J	127 J	119 J	69.4 J	122 J	75.8 J
Manganese	57.2 J	28.8 J	23.8 J	21.3 J	15.7 J	13.8	125 J	58.8 J
Mercury	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--
Potassium	436 J	198 J	170 J	235 J	--	--	--	--
Silver	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	185 J	--	--
Thallium	--	--	--	--	--	--	--	--
Vanadium	5.0 J	4.5 J	4.8 J	4.2 J	6.0 J	5.2 J	6.3 J	7.0 J
Zinc	--	--	--	--	--	19 J	--	--

See notes at end of table.

Table 5-7 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Surface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
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Sample Identifier:	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
Laboratory Sample No:	22506011	22507002	22507007	22507008	22507009	22507010	225070011	22507012
Collection Date:	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92	14-AUG-92
Sample Depth (inches bls):	2 to 8	2 to 5	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12	0 to 12
Inorganic Analytes (mg/kg)								
Aluminum	6,050	4,740	8,390	3,880	3,680	3,600	3,330	4,200
Antimony	--	--	--	--	--	--	--	--
Arsenic	--	0.75 J	1.7 J	0.49 J	0.36 J	0.32 J	0.55 J	0.31 J
Barium	5.9 J	6.4 J	7.0 J	5.7 J	10.3 J	25.4 J	2.5 J	5.3 J
Beryllium	0.07 J	--	0.06 J	--	0.08 J	0.07 J	0.07 J	0.08 J
Cadmium	--	--	38.8	0.95 J	--	1.2	--	0.69 J
Calcium	--	245 J	116 J	79.3 J	98.3 J	232 J	157 J	124 J
Chromium	5.4	5.9	8.0	5.2	3.1	6.1	4.1	2.9 J
Cobalt	--	0.53 J	0.88 J	0.62 J	1.0 J	0.74 J	0.54 J	0.62 J
Copper	--	5.6	6.9	6.2	4.6 J	13.5	1.8 J	5.7
Iron	3,880 J	2,840	4,500	2,270	2,350	2,050	2,700	2,370
Lead	--	6.7	10.6	9.3	4.9	22.6	4.3	6.6
Magnesium	83.2 J	140 J	81.5 J	77.5 J	84.6 J	110 J	39.4 J	83.2 J
Manganese	67.8 J	132	77.5	58.6	29.7	92.5	12.1	67.3
Mercury	--	--	--	--	--	--	--	--
Nickel	--	--	2.9 J	3.3 J	2.7 J	--	--	3.1 J
Potassium	--	145 J	165 J	--	--	138 J	--	--
Silver	--	--	--	--	--	--	--	--
Sodium	--	171 J	147 J	170 J	227 J	260 J	181 J	175 J
Thallium	--	--	--	0.53 J	--	--	--	--
Vanadium	9.5 J	7.4 J	12.1	5.6 J	5.2 J	5.3 J	7.1 J	5.5 J
Zinc	--	14.9 J	25.8 J	20.1 J	5.7 J	21.9 J	7.8	9.3 J

Notes: bls = below land surface.
mg/kg = milligrams per kilogram.
-- = concentration of analyte, if present, was less than detection limit.
J = estimated value.
DUP = duplicate.

Table 5-8
Summary of Organic Surface Soil Analytical Results

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Detection Limits	Range of Detected Concentrations[2]	Background Screening Values[3]	USEPA Region III RBCs Residential/Industrial[4]	Florida Soil Cleanup Target Levels Residential/Industrial/ Leachability[5]
TCL Volatile Organic Compounds (µg/kg)						
Acetone	2/47	11 to 1,500	340 to 765	--	7,800,000/200,000,000	770,000/5,500,000/NA
2-Butanone	6/47	11 to 1,500	17 to 1,700	--	47,000,000/1,000,000,000	4,800,000/35,000,000/NA
Carbon disulfide	8/47	5 to 740	1 to 183*	--	7,800,000/200,000,000	200,000/730,000/NA
Ethylbenzene	10/47	5 to 690	15 to 800	--	7,800,000/200,000,000	240,000/240,000/NA
Methylene chloride	5/47	5 to 800	58.5* to 86	--	85,000/760,000	16,000/23,000/NA
Toluene	11/47	5 to 740	1 to 390	--	16,000,000/410,000,000	300,000/520,000/NA
Xylenes (total)	31/47	5 to 690	1 to 7,000	--	160,000,000/4,100,000,000	290,000/290,000/NA
TCL Semivolatile Organic Compounds (µg/kg)						
Benzo(a)anthracene	1/47	350 to 20,000	3,025*	--	870/7,800	1,400/5,200/NA
Benzo(a)pyrene	1/47	350 to 20,000	2,975*	--	87/780	100/500/NA
bis(2-Chloroethoxy)methane	1/47	350 to 20,000	440	--	--	170,000/3,000,000/NA
bis(2-Ethylhexyl)phthalate	15/47	350 to 20,000	56 to 4,580*	80.3	46,000/410,000	75,000/230,000/NA
Chrysene	1/47	350 to 20,000	3,075*	--	87,000/780,000	140,000/510,000/NA
Fluoranthene	1/47	350 to 20,000	4,125*	--	3,100,000/82,000,000	2,800,000/45,000,000/NA
Fluorene	1/47	350 to 20,000	440	--	3,100,000/82,000,000	2,100,000/24,000,000/NA
2-Methylnaphthalene	9/47	350 to 20,000	1,475* to 33,000	--	1,600,000/41,000,000	1,500,000/15,000,000/NA
Naphthalene	9/47	350 to 20,000	990 to 8,000	--	1,600,000/41,000,000	1,000,000/8,600,000/NA
Phenanthrene	3/47	350 to 20,000	120 to 2,200	--	--	1,900,000/29,000,000/NA
Pyrene	3/47	350 to 20,000	1,515* to 6,950*	--	2,300,000/61,000,000	2,200,000/40,000,000/NA

See notes at end of table.

Table 5-8 (Continued)
Summary of Organic Surface Soil Analytical Results

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Detection Limits	Range of Detected Concentrations[2]	Background Screening Values[3]	USEPA Region III RBCs Residential/Industrial[4]	Florida Soil Cleanup Target Levels Residential/Industrial/ Leachability[5]
Other (mg/kg)						
TRPH	38/48	1.7 to 1.9	2.9 to 23,500	--	--	350/2,500/NA

[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 range of detected concentration values indicated by an asterisk is the average of a sample and its duplicate. If the target analyte is not detected in either the environmental sample or associated duplicate, the value used for the nondetection is one-half the reporting limit.
[3] The background screening value for organics is the mean detected concentration and will not be used for screening purposes in the risk assessment. The background screening value for inorganics is two times the mean detected background concentration and will be used for screening purposes in the risk assessment.
[4] Source: USEPA Region III Risk-Based Concentrations Table (October 1, 1998).
[5] Source: Brownfields Cleanup Criteria Rule: Chapter 62-785, Florida Administrative Code, effective July 6, 1998, Florida Department of Environmental Protection. Subject: Soil and Groundwater Cleanup Target Levels (FDEP, 1998).

Notes: USEPA = U.S. Environmental Protection Agency.
RBC = risk-based concentration.
TCL = target compound list.
μg/kg = micrograms per kilograms.
-- criteria not available.
NA = not applicable.
mg/kg = milligrams per kilograms.
* = average of a sample and its duplicate.
TRPH = total recoverable petroleum hydrocarbons.

Table 5-9
Summary of Inorganic Surface Soil Analytical Results

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Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Detection Limits	Range of Detected Concentrations[2]	Background Screening Values[3]	USEPA Region III RBCs Residential/Industrial[4]	Florida Soil Cleanup Target Levels Residential/Industrial/ Leachability[5]
Inorganic Compounds (mg/kg)						
Aluminum	47/47	40	1,510 to 10,300*	13,500	78,000/2,000,000	72,000/1,000,000/SPLP[6]
Antimony	5/47	2.6 to 12	3.2 to 5.9*	8	31/820	26/240/NA
Arsenic	35/47	0.22 to 2	0.24 to 2.65*	2.6	0.43/3.8	0.8/3.7/NA
Barium	47/47	40 to 40	2.5 to 277.5*	18.8	5,500/140,000	105/87,000/NA
Beryllium	23/47	0.05 to 1	0.05* to 0.11	0.36	160/4,100	120/700/NA
Cadmium	23/47	0.58 to 1	0.06* to 38.8	0.98	39/1,000	75/1,300/NA
Calcium	36/47	1,000	63 to 1,050	446	--/--	--/--
Chromium	47/47	2.0	1.5 to 52.95*	10	230/6,100	290/430/NA
Cobalt	29/47	0.34 to 10	0.4 to 5.45*	2.8	4,700/120,000	4,700/110,000/NA
Copper	44/47	5.0	1.8 to 521*	8	3,100/82,000	105/12,000/NA
Iron	47/47	20	1,140 to 46,650*	7,740	23,000/610,000	23,000/490,000/SPLP[6]
Lead	43/47	1.0	3.2 to 164*	10.2	400	500/920/NA
Magnesium	47/47	1,000	33.8 to 587.5*	244	--/--	--/--
Manganese	47/47	3.0	12.1 to 383*	324	1,600/41,000	1,600/20,000/SPLP[6]
Mercury	14/47	0.01 to 0.12	0.05* to 0.19	0.12	--/--	3.7/28/NA
Nickel	23/47	2.3 to 8.0	2.5 to 12.15*	6.8	1,600/41,000	105/28,000/NA
Potassium	32/47	129 to 1,000	138 to 2,895*	177	--/--	--/--
Silver	1/47	0.32 to 2	0.35	0.7	390/10,000	390/9,100/NA
Sodium	36/47	1,000	137 to 401*	382	--/--	--/--
Thallium	1/47	0.34 to 2	0.53	1.16	5.5/140	--/--
Vanadium	46/47	10	2.4 to 12.1	19	550/14,000	15/7,700/6,000
Zinc	39/47	4.0	4.3 to 552.5*	15.8	23,000/610,000	23,000/560,000/NA

See notes at end of table.

Table 5-9 (Continued)
Summary of Inorganic Surface Soil Analytical Results

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Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

[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 range of detected concentration values indicated by an asterisk is the average of a sample and its duplicate. If the target analyte is not detected in either the environmental sample or associated duplicate, the value used for the nondetection is one-half the reporting limit.
[3] The background screening value for organics is the mean detected concentration and will not be used for screening purposes in the risk assessment. The background screening value for inorganics is two times the mean detected background concentration and will be used for screening purposes in the risk assessment.
[4] Source: USEPA Region III Risk-Based Concentrations Table (October 1, 1998).
[5] Source: Brownfields Cleanup Criteria Rule: Chapter 620785, Florida Administrative Code, effective July 6, 1998, Florida Department of Environmental Protection. Subject: Soil Cleanup Target Levels.
[6] Leachability values may be derived using the SPLP test to calculate site-specific soil cleanup target levels or may be determined using toxicity characteristic leaching procedure in the event oily wastes are present.

Notes: USEPA = U.S. Environmental Protection Agency.
RBC = risk-based concentration.
mg/kg = milligrams per kilograms.
* = average of a sample and its duplicate.
SPLP = synthetic precipitation leaching procedure.
-- = criteria not available.

detection concentrations, and comparison to background screening values, USEPA Region III risk-based concentrations (RBCs) for residential and industrial screening criteria (USEPA, 1998) and FDEP residential and industrial soil cleanup target levels (SCTLs) (FDEP, 1998). The complete analytical results for soil samples collected at Site 18 are presented in Appendix C; the sample collection locations are shown on Figure 3-1.

Organic analytes detected in surface soil samples consist of 7 VOCs, 11 SVOCs, and TRPH. Two SVOCs, TRPH, and four inorganics exceed either Florida or Federal screening criteria and are described below. The other VOCs and SVOCs did not exceed their respective Florida or Federal screening criteria. No pesticides or PCBs were detected in the surface soil sample collected from Site 18.

TCL SVOCs. Benzo(a)anthracene and benzo(a)pyrene were detected in surface soil samples at concentrations exceeding their respective USEPA Region III risk-based target goals and Florida SCTLs.

Benzo(a)anthracene was detected in one surface soil sample (18-SL-23) at a concentration of 1,300 micrograms per kilogram (μg/kg) exceeding the residential and industrial USEPA Region III RBCs (870 and 7,800 μg/kg, respectively), but was not detected in the duplicate sample (18-SL-23A). Benzo(a)pyrene was detected in surface soil sample 18-SL-23 at 1,200 μg/kg exceeding the Florida residential and industrial SCTLs (100 and 500 μg/kg, respectively) and the USEPA Region III RBCs (87 and 780 μg/kg, respectively), but was not detected in the duplicate sample (18-SL-23A).

TRPH TRPH were detected in eighteen surface soil samples at concentrations exceeding Florida SCTL of 350 milligrams per kilogram (mg/kg). The highest concentration (23,500 mg/kg) was detected in surface soil sample 18-SL-15.

Inorganics and Cyanide. Twenty-two TAL inorganics were detected in the surface soil samples. Four inorganics (arsenic, barium, copper, and iron) exceeded the Florida residential SCTLs and/or USEPA Region III RBCs (Table 5-9).

Arsenic exceeded the Florida residential soil screening criteria (0.8 mg/kg) in 29 surface soil samples. Arsenic exceeded the USEPA Region III residential soil screening criteria (0.43 mg/kg) in five surface soil samples and one duplicate sample.

Barium was detected at 198 mg/kg in surface soil sample 18-SL-23 and at 290 mg/kg in sample 18SL-31A, exceeding the Florida residential SCTL of 105 mg/kg.

Copper was detected in two surface soil samples, 18-SL-01A (duplicate of 18-SL-01) and in 18-SL-31A (duplicate of 18-SL-31), at concentrations of 864 and 314 mg/kg, respectively, which exceed the Florida residential SCTL criteria of 105 mg/kg; however, copper was detected below the Federal residential screening criteria.

Iron exceeded both the Florida and Federal residential SCTL criteria (23,000 mg/kg) in surface soil sample 18-SL-10 (35,600 mg/kg), 18-SL-23A (duplicate of 18-SL-23) (23,500 mg/kg), and in 18-SL-31 (41,600 mg/kg) and its duplicate sample 18-SL-31A (51,700 mg/kg).

5.4 SUBSURFACE SOIL ANALYTICAL RESULTS. Twenty-four subsurface soil samples and two duplicate samples were collected from depths ranging from 5 to 42 feet bls. Tables 5-10 and 5-11 present concentrations of organic and inorganic analytes, respectively, detected in all Site 18 subsurface soil samples. Tables 5-12 and 5-13 summarize the frequency of detection, range of detection limits, range of detection concentrations, and comparison to background screening values, USEPA Region III RBCs for residential and industrial screening criteria (USEPA, 1998), and FDEP residential and industrial SCTLs (FDEP, 1998). The complete analytical data for Site 18 subsurface soils are provided in Appendix C and the location of the subsurface soil samples is shown on Figure 3-2.

Organic analytes detected in subsurface soil samples consist of four VOCs, eight SVOCs, and three pesticides. No VOCs, SVOCs, pesticides, or PCBs exceeded Florida or Federal residential or industrial screening criteria.

TRPH was detected in 18 of 24 subsurface soil samples and 2 duplicates (Table 5-10). Ten samples exceeded the Florida SCTL (FDEP, 1998) for residential screening criteria (350 mg/kg), and two samples and a corresponding duplicate exceeded the Florida industrial screening criteria (2,500 mg/kg) (Table 5-10).

Inorganics. Twenty-one inorganic analytes were detected in the subsurface soil samples (Table 5-11). Arsenic was detected in 12 subsurface soil samples at concentrations that exceeded the Federal residential screening criterion for arsenic and in 10 subsurface soil samples that exceeded the Florida SCTL for arsenic. No samples contained inorganic analytes at concentrations that exceeded either Federal or Florida industrial screening criteria.

5.5 GROUNDWATER ANALYTICAL RESULTS. The groundwater assessment at Site 18 consisted of collecting groundwater samples from three onsite monitoring wells (WHF-18-1, WHF-18-2, and WHF-18-3) during two separate events: Phase IIA (October of 1993) and IIB (July of 1996). The locations of the Site 18 monitoring wells are shown on Figure 3-3.

5.5.1 Phase II Groundwater Samples Table 5-14 presents field parameter data, and Table 5-15 presents the analytical results for groundwater samples collected at Site 18 during the Phase IIA and IIB sampling events. Below is a discussion of the field parameters and analytical results for the Phase IIA and IIB sampling events.

Field Parameters. Field parameter results are presented in Table 5-14. The pH values for groundwater samples collected at Site 18 in July of 1996 ranged from 2.86 to 6.88 standard units (SUs), which is lower than the NAS Whiting Field shallow background monitoring wells average pH of approximately 5.2 SUs. Therefore, groundwater samples collected from background wells are below the lower range for the Florida secondary drinking water requirements of 6.5 SUs.

The temperature measurements ranged from 22.0 to 27.7 degrees Celsius, and the specific conductance ranged from 16 to 26.6 micromhos per centimeter.

Turbidity measurements for Phase IIA groundwater samples ranged from 2.97 to 1,370 nephelometric turbidity units (NTUs). Turbidity measurements for Phase IIB groundwater samples, collected using low flow sampling methods, ranged from less than 1.0 to 7.1 NTUs. All Phase IIB groundwater samples had turbidity measurements below 10 NTUs.

Table 5-10
Summary of Organic Analytical Results Detected in Site 18 Subsurface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB2-15-17	18SB2-20-22	18SB4-5-7
Laboratory Sample No:	34807015	34807016	34807017	34807018	34807019	34807020	34815001
Collection Date:	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	06-JAN-93
Sample Depth (ft bls):	5 to 7	10 to 12	5 to 7	10 to 12	15 to 17	20 to 22	5 to 7
Volatile Organic Compounds (µg/kg)							
Acetone	58	26	24	--	--	77	--
2-Butanone	--	--	--	--	--	--	--
4-Methyl-2-pentanone	--	--	--	--	--	--	--
Xylenes (total)	--	--	--	--	--	--	--
Semivolatile Organic Compounds (µg/kg)							
Phenol	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	970
Dimethylphthalate	--	40 J	--	--	--	--	--
Dibenzofuran	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--
Pesticides and PCBs (µg/kg)							
4,4'-DDD	--	--	--	--	--	--	--
4,4'-DDE	4.1 J	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--
Total Recoverable Petroleum Hydrocarbons (mg/kg)	2.3	--	3.6	2,660	298	4.9	544

See notes at end of table.

Table 5-10 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Subsurface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18SB4-10-12	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-5-7	18SB6-10-12
Laboratory Sample No:	34815002	34815003	34815004	34815005	34815006	34807001	34807002
Collection Date:	06-JAN-93	06-JAN-93	06-JAN-93	06-JAN-93	06-JAN-93	05-JAN-93	05-JAN-93
Sample Depth (ft bls):	10 to 12	15 to 17	25 to 27	35 to 37	40 to 42	5 to 7	10 to 12
Volatile Organic Compounds (µg/kg)							
Acetone	--	--	210	--	--	--	--
2-Butanone	--	--	--	--	--	21 J	--
4-Methyl-2-pentanone	3.0 J	--	--	--	--	--	--
Xylenes (total)	16	--	--	--	--	--	8,700
Semivolatile Organic Compounds (µg/kg)							
Phenol	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	110 J	--
Naphthalene	720	1,100	--	--	--	230 J	16,000 J
2-Methylnaphthalene	1,700	3,100	--	--	--	830	37,000 J
Dimethylphenol	--	--	--	--	--	--	--
Dibenzofuran	--	--	--	--	--	--	--
Fluorene	79 J	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	42 J	--
Pesticides and PCBs (µg/kg)							
4,4'-DDE	--	--	--	--	5.5 J	--	--
4,4'-DDD	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	21 J	--	--
Total Recoverable Petroleum Hydrocarbon (mg/kg)	1,250	612	41.2	--	--	901	5,420

See notes at end of table.

Table 5-10 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Subsurface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18SB6-10-12A(DUP)	18SB6-15-17	18SB6-20-22	18SB7-5-7	18SB7-15-17	18SB8-5-7	18SB8-5-7A(DUP)
Laboratory Sample No:	34807003	34807004	34807005	34807007	34807006	3479001	3479002
Collection Date:	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	04-JAN-93	04-JAN-93
Sample Depth (ft bls):	10 to 12	15 to 17	20 to 22	5 to 7	15 to 17	5 to 7	5 to 7
Volatile Organic Compounds (µg/kg)							
Acetone	--	20	10 J	--	150	--	--
2-Butanone	--	--	--	--	--	12	6 J
4-Methyl-2-pentanone	--	--	--	--	--	17	6 J
Xylenes (total)	5,600 J	--	--	--	--	--	--
Semivolatile Organic Compounds (µg/kg)							
Phenol	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--
Naphthalene	14,000 J	680	--	--	--	--	--
2-Methylnaphthalene	29,000 J	--	--	--	--	86 J	--
Dimethylphthalate	--	--	--	--	--	--	--
Dibenzofuran	850 J	63 J	--	--	--	--	--
Fluorene	570 J	--	--	--	--	--	--
Pesticides and PCBs (µg/kg)							
4,4'DDE	--	--	--	--	--	--	--
4,4'DDD	--	--	--	--	--	--	--
4,4'DDT	--	--	--	--	--	--	--
Total Recoverable Petroleum Hydrocarbon (mg/kg)	7,190	311	2.4	42.4	7.3	86 J	126

See notes at end of table.

Table 5-10 (Continued)
Summary of Organic Analytical Results Detected in Site 18 Subsurface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18SB8-10-12	18SB8-15-17	18SB9-5-7	18SB9-15-17	18SB10-5-7
Laboratory Sample No:	34799002	34799003	34807013	34807014	34799001
Collection Date:	04-JAN-93	04-JAN-93	05-JAN-93	05-JAN-93	04-JAN-93
Sample Depth (ft bls):	10 to 12	15 to 17	5 to 7	15 to 17	5 to 7
Volatile Organic Compounds (µg/kg)					
Acetone	--	--	--	93	130
2-Butanone	--	--	--	--	--
4-Methyl-2-pentanone	--	--	--	--	--
Xylenes (total)	800 J	--	--	--	--
Semivolatile Organic Compounds (µg/kg)					
Phenol	--	--	--	--	--
4-Methylphenol	--	--	--	--	--
Naphthalene	--	--	--	--	--
2-Methylnaphthalene	910	170 J	--	--	--
Dimethylphthalene	--	--	--	--	--
Dibenzofuran	--	--	--	--	--
Fluorene	56 J	--	--	--	--
Pesticides and PCBs (µg/kg)					
4,4'-DDE	--	--	--	--	--
4,4'-DDD	--	--	--	--	--
4,4'-DDT	--	--	--	--	--
Total Recoverable Petroleum Hydrocarbon (mg/kg)	671	535	--	--	--

Notes: µg/kg = micrograms per kilogram.
-- = concentration of analyte, if present, was less than detection limit.
J = estimated value.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.
mg/kg = milligrams per kilogram.
DUP = duplicate.

Table 5-11
Summary of Inorganic Analytical Results Detected in Site 18 Subsurface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB2-15-17	18SB2-20-22	18SB4-5-7
Laboratory Sample No:	34807015	34807016	34807017	34807018	34807019	34807020	34815001
Collection Date:	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	06-JAN-93
Sample Depth (ft bls):	5 to 7	10 to 12	5 to 7	10 to 12	15 to 17	20 to 22	5 to 7
Inorganic Analytes (mg/kg)							
Aluminum	1,940	3,290	947	6,280	1,640	2,010	2,330
Arsenic	1.1 J	1.6 J	0.6 J	1.6 J	0.63 J	1.2 J	0.66 J
Barium	4.7 J	4.0 J	2.0 J	3.2 J	1.0 J	2.1 J	7.1 J
Beryllium	--	0.09 J	--	--	--	--	0.06 J
Calcium	52.4	43.3 J	--	--	--	14.7 J	58.2 J
Chromium	1.6 J	2.9	1.7 J	5.2	2.2	2.7	3.5
Cobalt	0.6 J	0.71 J	--	0.89 J	0.86 J	--	--
Copper	0.47 J	2.8 J	0.36 J	1.6 J	0.82 J	--	7.0
Iron	1,640	3,130	810	4,140	1,200	1,890	2,410
Lead	1.4	1.7	0.45 J	0.85	--	0.67	3.8
Magnesium	44.6 J	30.1	23.4 J	52.5 J	16.5 J	11.1 J	151 J
Manganese	14.8	18.4	8.3	11.1	4.6	7.1	16.7
Mercury	0.04 J	0.05	--	--	--	--	0.02 J
Nickel	2.9 J	--	--	--	--	--	--
Potassium	--	--	--	119 J	--	--	109 J
Selenium	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--
Vanadium	2.9 J	6.2 J	1.4 J	11	3.3 J	7.9 J	4.3 J
Zinc	2.1 J	2.1 J	1.1 J	2.4 J	0.78 J	0.65 J	4.5
Cyanide	0.52 J	0.6 J	0.75	0.5 J	0.55 J	0.27 J	0.7 J

See notes at end of table.

Table 5-11 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Subsurface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18SB4-10-12	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-5-7	18SB6-10-12
Laboratory Sample No:	34815002	34815003	34815004	34815005	34815006	34807001	34807002
Collection Date:	06-JAN-93	06-JAN-93	06-JAN-93	06-JAN-93	06-JAN-93	05-JAN-93	05-JAN-93
Sample Depth (ft bls):	10 to 12	15 to 17	25 to 27	35 to 37	40 to 42	5 to 7	10 to 12
Inorganic Analytes (mg/kg)							
Aluminum	1,830	1,170	1,360	382	11,100	4,530	2,630
Arsenic	0.78 J	0.56 J	0.5 J	--	2.0 J	1.2 J	0.65 J
Barium	2.5 J	1.6 J	4.1 J	1.2 J	33.3 J	5.2 J	2.1 J
Beryllium	--	--	--	--	0.14 J	--	--
Calcium	--	--	--	--	141 J	180 J	9.4 J
Chromium	2.0 J	2.3	2.9	1.2 J	39.7	6.2	3.2
Cobalt	--	--	--	--	--	0.71 J	--
Copper	--	--	--	--	3.0 J	4.1 J	1.7 J
Iron	1,490	933	431	225	4,360	4,570	1,590
Lead	1.5	0.97	2.0	0.34 J	14.5	4.9	1.8
Magnesium	39 J	19.9 J	16.5 J	--	300 J	99.2 J	39.5
Manganese	6.4	2.8 J	1.6 J	0.44 J	7.3	63	6.4
Mercury	--	--	--	--	0.1 J	--	--
Nickel	--	--	--	--	--	--	--
Potassium	--	110 J	--	--	823 J	873 J	471 J
Selenium	--	--	--	--	1.1 J	--	--
Silver	--	--	--	--	--	--	--
Sodium	--	--	--	--	25.6 J	29.8 J	13.3 J
Vanadium	3.9 J	2.3 J	4.6 J	1.2 J	39.3	14.1	6.9 J
Zinc	2.0 J	2.3 J	0.67 J	1.0 J	2.3 J	1.4 J	1.6 J
Cyanide	0.49 J	0.56 J	0.57 J	0.53 J	0.7 J	0.44 J	0.43 J

See notes at end of table.

Table 5-11 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Subsurface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18SB6-10-12A(DUP)	18SB6-15-17	18SB6-20-22	18SB7-5-7	18SB7-15-17	18SB8-5-7	18SB8-5-7A(DUP)
Laboratory Sample No:	34807003	34807004	34807005	34807007	34807006	3479001	3479002
Collection Date:	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	05-JAN-93	04-JAN-93	04-JAN-93
Sample Depth (ft bls):	10 to 12	15 to 17	20 to 22	5 to 7	15 to 17	5 to 7	5 to 7
Inorganic Analytes (mg/kg)							
Aluminum	860	1,000	1,020	4,680	2,010	10,000 J	3,660 J
Arsenic	0.58 J	--	--	0.9 J	0.65 J	3.5 J	2.9 J
Barium	0.72 J	0.66 J	0.46 J	4.7 J	0.55 J	7.6 J	5.9 J
Beryllium	--	--	--	0.07 J	--	0.09 J	0.09 J
Calcium	--	--	--	7.3 J	--	--	--
Chromium	1.4 J	1.4 J	1.8 J	4.5	2.7	7.9	3.8
Cobalt	--	--	--	0.61 J	--	1.0 J	0.53 J
Copper	1.2 J	--	0.42 J	1.7 J	--	--	--
Iron	528	633	558	3,020	1,250	8,620 J	4,190 J
Lead	1.6	0.63	0.3 J	1.6	1.4	4.8 J	3.7 J
Magnesium	12.9 J	8.9 J	--	73.6 J	--	--	--
Manganese	2.8 J	1.1 J	77 J	22.1	2.4 J	18	8.9
Mercury	--	--	--	--	--	--	--
Nickel	--	--	--	2.7 J	--	--	--
Potassium	211 J	189 J	--	--	--	1,150	1,220
Selenium	--	--	--	--	--	1.4 J	1.0 J
Silver	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--
Vanadium	2.0 J	2.4 J	2.5 J	8.4 J	4.3 J	21.5	11.9
Zinc	0.73 J	1.1 J	1.2 J	2.9 J	0.63 J	--	--
Cyanide	0.42 J	0.44 J	0.38 J	0.41 J	0.42 J	--	--

See notes at end of table.

Table 5-11 (Continued)
Summary of Inorganic Analytical Results Detected in Site 18 Subsurface Soil Samples

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Sample Identifier:	18SB8-10-12	18SB8-15-17	18SB9-5-7	18SB9-15-17	18SB10-5-7
Laboratory Sample No:	34799002	34799003	34807013	34807014	34799001
Collection Date:	04-JAN-93	04-JAN-93	05-JAN-93	05-JAN-93	04-JAN-93
Sample Depth (ft bls):	10 to 12	15 to 17	5 to 7	15 to 17	5 to 7
Inorganic Analytes (mg/kg)					
Aluminum	2,480	8,460	5,910	1,430	2,560
Arsenic	1.0 J	1.7 J	3.0	0.57 J	2.2 J
Barium	4.7 J		7.8 J	0.8 J	4.7 J
Beryllium	--		0.07 J	--	--
Calcium	17.6 J		9.9 J	14.6 J	35.1 J
Chromium	8.6	9.5	4.9	1.6 J	10.4
Cobalt	--		0.88 J	--	--
Copper	0.5 J	1.1 J	1.4 J	0.56 J	0.8 J
Iron	4,000	7,610	4,640	873	5,350
Lead	4.7	2.9	11.1	1.0	5.1
Magnesium	19.2 J		87.6 J	--	26.1 J
Manganese	2.9 J	15.5	23.2	2.0 J	16.2
Mercury	--		--	0.05 J	--
Nickel	--		--	--	--
Potassium	1,230	841 J	312 J	202 J	637 J
Selenium	--	--	--	--	--
Silver	--	0.57 J	--	--	--
Sodium	17.6 J	16.3 J	--	--	--
Vanadium	15.8	23.3	10.3 J	3.2 J	23.9
Zinc	0.58 J	13.1	3.1 J	0.93 J	0.84 J
Cyanide	0.41 J	0.41 J	3.3	0.51 J	0.43 J

Notes: ft bls = feet below land surface.
mg/kg = milligrams per kilogram.
J = estimated value.
-- = concentration of analyte, if present, was less than detection limit.
DUP = duplicate.

Table 5-12
Summary of Organic Subsurface Soil Analytical Results

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Detection Range	Range of Detected Concentrations	Background Screening Values[2]	USEPA Region III RBCs Residential/Industrial[3]	Florida Soil Cleanup Target Levels Residential/Industrial/ Leachability[4]
Volatile Organic Compounds (µg/kg)						
Acetone	11/26	10 to 7,100	24 to 130	NA	7,800,000/200,000,000	770,000/5,500,000/NA
2-Butanone	3/26	10 to 7,100	9* to 21	NA	47,000,000/1,000,000,000	4,800,000/35,000,000/NA
4-Methyl-2-pentanone	3/26	10 to 7,100	3 to 11.5*	NA	6,300,000/160,000,000	280,000/1,900,000/NA
Xylenes (total)	4/26	10 to 7,100	16 to 7,150*	NA	160,000,000/4,100,000,000	290,000/290,000/NA
Semivolatile Organic Compounds (µg/kg)						
Dibenzofuran	2/26	340 to 7,200	2,230*	NA	310,000/8,200,000	270,000/4,400,000/NA
Dimethylphthalate	1/26	340 to 7,200	40	NA	780,000,000/20,000,000,000	1,600,000/1,600,000/NA
Fluorene	3/26	340 to 7,200	56 to 2,090*	NA	3,100,000/82,000,000	2,100,000/24,000,000/NA
2-Methylnaphthalene	9/26	340 to 7,200	136* to 33,000*	NA	1,600,000/41,000,000	1,500,000/15,000,000/NA
4-Methylphenol	3/26	340 to 7,200	110 to 265*	NA	390,000/10,000,000	220,000/2,400,000/NA
Naphthalene	6/26	340 to 7,200	230 to 15,000*	NA	1,600,000/41,000,000	1,000,000/8,600,000/NA
Phenanthrene	2/26	340 to 7,200	42 to 58	NA	--/--	1,900,000/29,000,000/NA
Phenol	2/26	340 to 7,200	94.5*	NA	47,000,000/1,200,000,000	900,000/390,000,000/NA
Pesticides and PCBs (µg/kg)						
4,4'-DDD	1/26	3.4 to 4.4	4.1	NA	2,700/24,000	4,500/17,000
4,4'-DDE	1/26	3.4 to 4.4	5.5	NA	1,900/17,000	3,200/12,000/NA
4,4'-DDT	1/26	3.4 to 4.4	21	NA	1,900/17,000	3,200/13,000/NA
Other (mg/kg)						
Total recoverable petroleum hydrocarbons	11/13	1,800 to 1,900	2,300 to 6,300,000*	NA	--/--	350/2,500/NA

See notes at end of table.

Table 5-12 (Continued)
Summary of Subsurface Soil Analytical Results

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[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] Source: USEPA Region III Risk-Based Concentrations Table (October 1, 1998).
[4] Source: Brownfields Cleanup Criteria Rule: Chapter 62-785, Florida Administrative Code, effective July 6, 1998, Florida Department of Environmental Protection. Subject: Soil Cleanup Target Levels.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: 18SB1-5-7, 18SB1-10-12, 18SB2-5-7, 18SB2-10-12, 18SB2-15-17, 18SB2-20-22, 18SB4-5-7, 18SB4-10-12, 18SB4-15-17, 18SB4-25-27, 18SB4-35-37, 18SB4-40-42, 18SB6-5-7, 18SB6-10-12, 18SB6-15-17, 18SB6-20-22, 18SB7-5-7, 18SB7-15-17, 18SB8-5-7, 18SB8-10-12, 18SB8-15-17, 18SB9-5-7, 18SB9-15-17, and 18SB10-5-7, 18SB10-5-7RE.
Duplicate samples: 18SB6-10-12A, and 18SB8-5-7A, 18SB8-5-7ARE,
Background samples: BKB00101, BKB00102, BKB00201, BKB00202, BKB00301, BKB00302, BKB00401, BKB00402, BKB00501, BKB00601, BKB00602, BKB00701, and BKB00702.
Background duplicate samples: BKB00401D, and BKB00602D.

USEPA = U.S. Environmental Protection Agency.
RBC = risk-based concentrations.
μg/kg = micrograms per kilogram.
-- = criteria not available.
NA = not applicable.
* = average of a sample and its duplicate.
PCB = polychlorinated biphenyl.
mg/kg = milligrams per kilogram.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.

Table 5-13
Summary of Inorganic Subsurface Soil Analytical Results

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Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentrations Range[2]	Background Screening Concentration[3]	USEPA Region III RBCs Residential/Industrial[4]	Florida Soil Cleanup Target Levels Residential/Industrial/ Leachability[5]
Inorganic Analytes (mg/kg)						
Aluminum	26/26	40 to 40	382 to 11,100	27,800	78,000/2,000,000	72,000/1,000,000/SPLP[6]
Arsenic	23/26	2 to 2	0.5 to 3.5	6.2	0.43/3.8	0.8/3.7/NA
Barium	26/26	40 to 40	0.46 to 33.3	15.8	5,500/140,000	105/87,000/NA
Beryllium	7/26	1 to 1	0.06 to 0.14	0.26	160/4,100	120/700/NA
Calcium	13/26	1,000 to 1,000	7.3 to 180	444	--/--	--/--
Chromium	26/26	2 to 2	1.2 to 39.7	22.8	230/6,100	290/430/NA
Cobalt	10/26	10 to 10	0.53 to 1	1.5	4,700/120,000	4,700/110,000/NA
Copper	17/26	5 to 5	0.36 to 7	8.8	3,100/82,000	105/12,000/NA
Cyanide	24/26	0.5 to 1	0.27 to 3.3	ND	1,600/41,000	30/5,000/NA
Iron	26/26	20 to 20	225 to 8,620	18,110	23,000/610,000	23,000/490,000/SPLP[6]
Lead	25/26	0.6 to 1	0.3 to 14.5	8.4	400	500/920/NA
Magnesium	20/26	1,000 to 1,000	8.9 to 300	272	--/--	--/--
Manganese	26/26	3 to 3	0.44 to 63	42.6	1,600/41,000	1,600/20,000/SPLP[6]
Mercury	5/26	0.1 to 0.1	0.02 to 0.1	ND	--/--	3.7/28/NA
Nickel	2/26	8 to 8	2.7 to 2.9	5	1,600/41,000	105/28,000/NA
Potassium	15/26	1,000 to 1,000	109 to 1,230	181	--/--	--/--
Selenium	3/26	1 to 1	1 to 1.4	0.3	390/10,000	390/10,000/NA
Silver	1/26	2 to 2	13.3 to 29.8	0.7	390/10,000	390/9,100/NA
Sodium	5/26	1,000 to 1,000	1.2 to 39.9	ND	--/--	--/--
Vanadium	26/26	10 to 10	0.58 to 13.1	45	550/14,000	15/7,700/6,000
Zinc	24/26	4 to 4	2.3 to 7,190	13.6	23,000/610,000	23,000/560,000/NA

See notes at end of table.

Table 5-13 (Continued)
Summary of Inorganic Subsurface Soil Analytical Results

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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 range of detected concentration values indicated by an asterisk is the average of a sample and its duplicate. If the target analyte is not detected in either the environmental sample or associated duplicate, the value used for the nondetection is one-half the reporting limit.
[3] The background screening value for organics is the mean detected concentration and will not be used for screening purposes in the risk assessment. The background screening value for inorganics is two times the mean detected background concentration and will be used for screening purposes in the risk assessment.
[4] Source: USEPA Region III Risk-Based Concentrations Table (October 1, 1998).
[5] Brownfields Cleanup Criteria Rule: Chapter 62-785, Florida Administrative Code, effective July 6, 1998, Florida Department of Environmental Protection, Subject: Soil Cleanup Target Levels.
[6] Leachability values may be derived using the SPLP test to calculate site-specific soil cleanup target levels or may be determined using toxicity characteristic leaching procedure in the event oily wastes are present.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: 18SB1-5-7, 18SB1-10-12, 18SB2-5-7, 18SB2-10-12, 18SB2-15-17, 18SB2-20-22, 18SB4-5-7, 18SB4-10-12, 18SB4-15-17, 18SB4-25-27, 18SB4-35-37, 18SB4-40-42, 18SB6-5-7, 18SB6-10-12, 18SB6-15-17, 18SB6-20-22, 18SB7-5-7, 18SB7-15-17, 18SB8-5-7, 18SB8-10-12, 18SB8-15-17, 18SB9-5-7, 18SB9-15-17, and 18SB10-5-7, 18SB10-5-7RE.
Duplicate samples: 18SB6-10-12A, and 18SB8-5-7A, 18SB8-5-7ARE.
Background samples: BKB00101, BKB00102, BKB00201, BKB00202, BKB00301, BKB00302, BKB00401, BKB00402, BKB00501, BKB00601, BKB00602, BKB00701, and BKB00702.
Background duplicate samples: BKB00401D, and BKB00602D.

USEPA = U.S. Environmental Protection Agency.
RBC = risk-based concentration.
mg/kg = milligrams per kilogram.
SPLP = synthetic precipitation leaching procedure.
NA = not applicable.
-- = criteria not available.
ND = not detected in any background sample.

Table 5-14
Summary of Groundwater Field Parameters, Site 18

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Monitoring Well Designation	Date Sampled	pH (SU)	Temperature (°C)	Specific Conductance (μmhos/cm)	Turbidity (NTU)	DO (percent)
Phase IIA						
WHF 18-1	21-Oct-93	4.77	24.3	26.6	2.97	--
WHF 18-2	21-Oct-93	4.45	23.8	29	1,370	--
WHF 18-3	25-Oct-93	4.86	22	18	1,192	--
Phase IIB						
WHF 18-1	29-Jul-96	6.88	24.1	22	<1.0	8.0
WHF 18-2	26-Jul-96	2.86	25.4	24	1.0	5.3
WHF 18-3	24-Jul-96	4.95	27.7	16	7.1	4.5

Notes: SU = standard unit.
°C = degrees Celsius.
μmhos/cm = micromhos per centimeter.
NTU = nephelometric turbidity unit.
DO = dissolved oxygen.
-- = not measured.
< = less than.

Table 5-15
Summary of Analytical Results Detected in Site 18 Groundwater Samples

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Phase:	Phase IIA			Phase IIB		
Location Identifier:	WHF18-1	WHF18-2	WHF18-3	WHF18-1	WHF18-2	WHF18-3
Sample Identifier:	WHF18-1	WHF18-2	WHF18-3	18G00101	18G00201	18G00301
Laboratory Sample Number:	90181002	90181003	90186001	RB920002	RB887018	RB887011
Date Sampled:	21-OCT-93	21-OCT-93	25-OCT-93	29-JUL-96	26-JUL-96	24-JUL-96
Semivolatile Organic Compounds (μg/ℓ)						
bis(2-Ethylhexyl)phthalate	--	--	--	3 J	--	2 J
Pesticides and PCBs (μg/ℓ)						
4,4'-DDT	0.072 J	0.035 J	--	--	--	--
Inorganic Analytes (μg/ℓ)						
Aluminum	68.4 J	13,700	10,200	73.5 J	--	78.2 J
Arsenic	--	2.1 J	--	--	--	--
Barium	42.7 J	64.5 J	29 J	46.9 J	36.9 J	15.2 J
Beryllium	--	0.41 J	0.82 J	--	--	--
Cadmium	--	--	--	1.4 J	--	--
Calcium	1,910 J	705 J	345 J	4,850 J	611 J	497 J
Chromium	--	70.8	32.6	3.7 J	--	--
Cobalt	--	4.5 J	--	2.4 J	--	--
Copper	--	43.5 J	--	2.5 J	--	--
Iron	73.2 J	24,800	61,800	--	--	60.2 J
Lead	--	7.4	--	5.2	--	--
Magnesium	1,000 J	1,170 J	650 J	854 J	999 J	499 J
Manganese	6.1 J	74.1	31.4	7.4 J	8.4 J	2.7 J
Mercury	--	0.2 J	--	--	0.11 J	--
Nickel	--	28 J	15.2 J	--	11.9 J	--
Potassium	775 J	2,120 J	685 J	1,330 J	962 J	594 J
Silver	--	--	--	2.9 J	--	--
Sodium	1,670 J	1,430 J	1,320 J	1,410 J	1,020 J	688 J
Vanadium	--	94.8	133	1.2 J	--	--
Zinc	29	461	37	55.8	--	--

Notes: μg/ℓ = micrograms per liter.
-- = concentration of analyte, if present, was less than detection limit.
J = estimated value.
PCB = polychlorinated biphenyl.
DDT = dichlorodiphenyltrichloroethene.

Groundwater samples collected during Phase IIB were collected using the low flow sampling process. This procedure resulted in less turbid groundwater samples for the Phase IIB sampling event as compared to the groundwater samples collected during Phase IIA. Because the low flow sampling method produces less turbid samples that are more representative of the surficial aquifer than those obtained with a bailer, the preferred data set was from the Phase IIB sampling event. The number and concentration of inorganic analytes detected in groundwater samples collected during the 1996 sampling event are generally lower than the corresponding samples collected during the 1993 sampling event.

Phase IIA Sampling Event. No VOCs, SVOCs, or PCBs were detected in any of the groundwater samples collected at Site 18 during the October 1993 sampling event. The pesticide 4,4'-DDT was detected in groundwater samples collected from two monitoring wells (WHF-18-1 and WHF-18-2) (Table 5-15). The detected concentrations (0.072 and 0.035 $\mu g/\ell$, respectively) of the analyte did not exceed either Florida groundwater cleanup target levels (GCTLs) or Federal maximum contaminant levels (MCLs) (Table 5-16).

Eighteen inorganic analytes were detected in groundwater samples collected during Phase IIA from Site 18 monitoring wells (WHF-18-1, WHF-18-2, and WHF-18-3) (Table 5-15). Eight inorganic analytes, including aluminum, chromium, copper, iron, manganese, potassium, vanadium, and zinc were detected at concentrations exceeding the background screening criteria. Three analytes (aluminum, iron, and manganese) were detected at concentrations exceeding Federal MCLs. Four analytes (aluminum, iron, manganese, and vanadium) were detected at concentrations exceeding Florida GCTLS (Table 5-16).

Groundwater samples collected during Phase IIA were collected using bailers and were likely turbid. These groundwater samples were not filtered and are not likely representative of actual groundwater conditions. Subsequent sampling conducted during Phase IIB used low flow methods that resulted in a reduction in detected inorganic analytes as described below.

Phase IIB Sampling Event. No VOCs, pesticides, or PCBs were detected in groundwater samples collected from monitoring wells WHF-18-1 (18G00101), WHF-18-2 (18G00201), or WHF-18-3 (18G00301) during the July 1996 sampling event (Table 5-15). One SVOC (bis(2-ethylhexyl)phthalate) and 18 inorganic analytes were detected in the Phase IIB groundwater samples.

Semivolatile Organic Compounds. One SVOC (bis(2-ethylhexyl)phthalate) was detected in two groundwater samples collected from monitoring wells WHF-18-1 and WHF-18-3 at Site 18. The detected concentrations of 3 and 2 $\mu g/\ell$, respectively, were below the Florida GCTL and Federal MCL (Table 5-16). Bis(2-ethylhexyl)-phthalate is a commonly recognized field or laboratory derived contaminant according to USEPA's CLP Functional Guidelines for Organic Data Review (USEPA, 1991b).

Inorganic Analytes. Eighteen inorganic analytes, including aluminum, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, silver, sodium, vanadium, and zinc were detected during the Phase IIB (July 1996) sampling event in groundwater samples collected from one or more of the following shallow monitoring wells: WHF-18-1 (18G00101), WHF-18-2 (18G00201), and WHF-18-3 (18G00301) (Table 5-15). No groundwater samples collected from monitoring wells WHF-18-1, WHF-18-2, and WHF-18-3 during this sampling event (July 1996) had concentrations of inorganics that exceeded either Florida GCTLs or Federal MCLs (Table 5-15).

Table 5-16
Summary of Groundwater Analytical Results

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentrations Range	Background Screening Concentration[2]	Federal MCLs[3]	Florida Groundwater Cleanup Target Levels[4]
Semivolatile Organic Compounds (µg/ℓ)						
bis(2-Ethylhexyl)phthalate	2/6	10 to 10	2 to 3	NA	6	6
Pesticide and PCBs (µg/ℓ)						
4,4'-DDT	2/6	0.1 to 0.1	0.035 to 0.072	NA	NA	0.1
Inorganic Analytes (µg/ℓ)						
Aluminum	5/6	200 to 200	68.4 to 13,700	654	[5]200	200
Arsenic	1/6	10 to 10	2.1		50	50
Barium	6/6	200 to 200	15.2 to 64.5	72.6	2,000	2,000
Beryllium	2/6	5 to 5	0.41 to 0.82	0.94	4.0	4.0
Cadmium	1/6	5 to 5	1.4	4.4	5.0	5.0
Calcium	6/6	5,000 to 5,000	345 to 4,850	3,320	NA	NA
Chromium	3/6	10 to 10	3.7 to 70.8	30	100	100
Cobalt	2/6	50 to 50	2.4 to 4.5	ND	NA	420
Copper	2/6	25 to 25	2.5 to 43.5	10.8	[5]1,000	1,000
Iron	4/6	100 to 100	60.2 to 61,800	964	[5]300	300
Lead	2/6	3 to 3	5.2 to 7.4	ND	15	15
Magnesium	6/6	5,000 to 5,000	499 to 1,170	2,430	NA	NA
Manganese	6/6	15 to 15	2.7 to 74.1	42.8	[5]50	50
Mercury	2/6	0.2 to 0.2	0.11 to 0.2	ND	2.0	2.0

See notes at end of table.

Table 5-16 (Continued)
Summary of Groundwater Analytical Results

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentrations Range	Background Screening Concentration[2]	Federal MCLs[3]	Florida Groundwater Cleanup Target Levels[4]
Nickel	3/6	40 to 40	11.9 to 28	42.8	100	100
Potassium	6/6	5,000 to 5,000	594 to 2,120	1,530	NA	NA
Silver	1/6	10 to 10	2.9	ND	[5]100	100
Sodium	6/6	5,000 to 5,000	688 to 1,670	4,772	[6]NA	160,000
Vanadium	3/6	50 to 50	1.2 to 133	3.8	260	49
Zinc	4/6	20 to 20	29 to 461	200	[7]5,000	5,000

[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] Background screening values for organic compounds are the arithmetic mean of the concentrations: for inorganic analytes it is two times the arithmetic mean of the concentrations.
[3] Federal MCLs are the maximum permissible concentrations of contaminants in water that are delivered to a user by a public water system.
[4] Brownfields Cleanup Criteria Rule, Chapter 62-785, Florida Administrative Code, effective July 6, 1998. Subject: Groundwater Cleanup Target Levels (FDEP, 1998).
[5] Secondary MCL.
[6] No MCL has been determined for sodium, but a reporting limit of 20,000 $\mu g/\ell$ has been established.

Notes: The following samples were used to generate Table 5-16:
Groundwater samples: WHF18-1, WHF18-2, WHF18-3 and 18G00101 through 18G00301.
Background samples: BKG00101 through BKG00103, BKG00201 through BKG00203, and BKG00301.
Background duplicate sample: BKG00101D.

MCL = *maximum contaminant level.*
$\mu g/\ell$ = micrograms per liter.
NA = not applicable.
PCB = polychlorinated biphenyl.
DDT = dichlorodiphenyltrichloroethane.
NR = not reported.
ND = not detected.

6.0 HUMAN HEALTH RISK ASSESSMENT

An HHRA was conducted as part of the RI for Site 18 at NAS Whiting Field. The HHRA was originally conducted using 1997 USEPA Region III RBCs and 1995 soil cleanup goals as screening criteria. Since the submittal of the Site 18 RI Final Draft, all detected analytes in all media have been compared to USEPA Region III RBCs dated October 1, 1998, and the FDEP Brownfields Cleanup Criteria Rule (SCTLs and GCTLs) (July 6, 1998). The chapter has been modified to reflect the 1998 USEPA Region II and FDEP screening criteria; however, an additional HHRA has not been conducted.

A comparison of the detected analytes to the 1998 regulatory and risk-based screening criteria indicates minimal change from the original HHRA. Concentrations of cadmium and manganese detected in surface soil are no longer above the residential SCTLs. However, two detected concentrations of barium in surface soil are now above the residential SCTL. The SCTL for barium is 105 mg/kg, but the residential Florida soil cleanup goal (1998) for barium is 5,200 mg/kg. The USEPA Region III RBC for barium (5,500 mg/kg) has not changed. Barium was detected in surface soil sample 18-SL-23 at 193 mg/kg (average of sample and duplicate) and surface soil sample 18-SL-31 at 277.5 mg/kg (average of sample and duplicate).

The purpose of the HHRA is to characterize the risks associated with the potential exposures to site-related chemicals. This HHRA is conducted in accordance with the following USEPA guidance documents:

- *Risk Assessment Guidance for Superfund. Volume 1: Evaluation Manual* (Part A) (USEPA, 1989b);
- *Guidance for Data Useability in Risk Assessment* (Parts A and B) (Final) (USEPA, 1992a); and
- *Supplemental Guidance to RAGS: Human Health Risk Assessment* (USEPA, 1995c).

Additionally the HHRA will consider the following FDEP regulations:

- Brownfields Cleanup Criteria Rule, Chapter 62-785, Florida Administrative Code.

The methodology for the HHRA is described in Chapter 2.0 of the GIR (ABB-ES, 1997). The HHRA methodology presented in the GIR (ABB-ES, 1997) consists of the following steps:

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

Site 18 is located in the northwest quadrant of Whiting Field. The location, physical description, and history associated with Site 18 are described in Chapter 1.0 of this report. During the RI, surface soil, subsurface soil, and

groundwater samples were collected from Site 18. 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 sample quantitation limits (SQLs), and evaluating quality of data with respect to qualifiers.

The data for Site 18 were divided into surface soil, subsurface soil, groundwater, and background (for each medium).

SQLs are compared to USEPA Region III RBCs (USEPA, 1998), and Florida SCTLs (FDEP, 1998). Surface and subsurface soil SQLs were compared to Region III RBCs for soils and Florida SCTLs for residential and industrial scenarios, respectively. Groundwater SQLs were compared to Florida GCTLs (FDEP, 1998) and Region III tap water RBCs (USEPA, 1997a). Analyte-specific SQLs that are above USEPA Region III RBCs (USEPA, 1997a), and Florida screening concentrations 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", as well as data with no qualifier (GIR, ABB-ES, 1997, Subsection 2.3.3).

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, 1997). This selection of HHCPC methodology considers (1) frequency of detection, (2) consistency with background conditions, (3) a comparison to regulatory and risk-based screening values, and (4) a comparison to essential nutrient levels.

In selecting HHCPCs, USEPA Region IV criteria will be used (USEPA, 1995c). 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, 1989b) and is not selected as an HHCPC in another medium, it is not selected as an HHCPC. These selection criteria are used only when there are 20 or more samples in the media of concern.

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

- A representative surface soil background data set consisting of Troup loamy soil and Lakeland soil is used for background screening of Site 18 surface soil samples. The background screening values used in the

risk assessment are presented in Table 6-1. The background surface soil data used for screening surface soils at Site 18 are presented in Tables 3-8 and 3-10 of the GIR (ABB-ES, 1997).

- Background subsurface soil sample locations for NAS Whiting Field are identified on Figure 3-10 and are discussed in Subsection 3.3.1 of the GIR (ABB-ES, 1997). Tables 3-15 through 3-17 of the GIR present background screening concentrations for various types of subsurface soil. All background subsurface soil data were combined into one data set for background screening due to the limited number of background samples of certain soil types. Table 3-18 in the GIR (ABB-ES, 1997) presents the summary statistics used for screening Site 18 subsurface soil contamination against background conditions.

- Background groundwater sample locations are identified on Figure 3-12 and are discussed in Subsection 3.3.3 of the GIR (ABB-ES, 1997). Tables 3-21 through 3-23 in the GIR present background screening data for groundwater. Table 3-24 in the GIR presents the summary statistics used for screening the groundwater at Site 18.

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 Federal and Florida standards and guidelines, the analyte is not selected as an HHCPC (USEPA, 1995c). 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, 1995c).

The residential and industrial soil RBCs are used for surface and subsurface soil, respectively. No RBC is available for lead in soil due to a lack of toxicity data. Based on 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 TRPH; therefore, the FDEP SCTL (FDEP, 1998) is used for screening. The maximum detected concentrations of analytes in surface soil are also compared to residential SCTLs. The maximum detected concentration of any organic analyte in surface soil or subsurface soil that was also detected in groundwater (above a standard or guideline) is compared to the Florida Leaching Value reference for that analyte (FDEP, 1998).

Tap water RBCs (USEPA, 1998) and Florida GCTLs (FDEP, 1998) are used for tap water. No RBC is available for lead in groundwater; therefore, the treatment technology action level for lead in drinking water of 15 $\mu g/\ell$ is used (USEPA, 1994b).

Less than Essential Nutrient Screening Values. If the maximum detected concentration of the essential nutrient (i.e., sodium, potassium, magnesium, chloride, iodine, phosphorus, and calcium) in a medium is below its 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 Appendix C-1 of the GIR.

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

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Site 18, Crash Crew Training Area
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]
Volatile Organic Compounds (µg/kg)								
Acetone	2/47	11 to 1,500	340 to 717*	528	NA	770,000	No	F, S
2-Butanone	6/47	11 to 1,500	17 to 1,700	326	NA	4,700,000	No	S
Carbon disulfide	8/47	5 to 740	1 to 183*	26.2	NA	200,000	No	S
Ethylbenzene	10/47	5 to 690	15 to 800	239	NA	240,000	No	S
Methylene chloride	5/47	5 to 800	37* to 86	58.1	NA	16,000	No	S
Toluene	11/47	5 to 740	1 to 390	107	NA	300,000	No	S
Xylenes (total)	31/47	5 to 690	1 to 7,000	618	NA	290,000	No	S
Semivolatile Organic Compounds (µg/kg)								
Benzo(a)anthracene	1/47	350 to 20,000	3,030*	3,030	NA	870	No	F
Benzo(a)pyrene	1/47	350 to 20,000	2,980*	2,980	NA	87	No	F
bis(2-Chloroethoxy)methane	1/47	350 to 20,000	440	440	NA	170,000	No	F, S
bis(2-Ethylhexyl)phthalate	15/47	350 to 20,000	56 to 4,850*	818	NA	46,000	No	S
Chrysene	1/47	350 to 20,000	3,080*	3,080	NA	87,000	No	F, S
Fluoranthene	1/47	350 to 20,000	4,130*	4,130	NA	310,000	No	F, S
Fluorene	1/47	350 to 20,000	440	440	NA	310,000	No	F, S
2-Methylnaphthalene	9/47	350 to 20,000	1,480* to 33,000	14,100	NA	160,000	No	S
Naphthalene	9/47	350 to 20,000	990 to 8,000	4,350	NA	160,000	No	S
Phenanthrene	3/47	350 to 20,000	120 to 2,200	1,020	NA	230,000	No	S
Pyrene	3/47	350 to 20,000	1,515* to 6,950*	3,520	NA	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 18, Crash Crew Training Area
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 (mg/kg)								
Aluminum	47/47	40	1,510 to 10,300*	4,000	13,500	7,800	No	B
Antimony	5/47	2.6 to 12	3.2 to 5.9*	3	8	3.1	No	B
Arsenic	35/47	0.22 to 2	0.24 to 2.65*	0.68	2.6	0.43	Yes	
Barium	47/47	40	2.5 to 277.5*	26.5	18.8	105	No	S
Beryllium	23/47	0.05 to 1	0.05 to 0.11*	0.07	0.36	16	No	B, S
Cadmium	23/47	0.58 to 1	0.6* to 38.8	6.1	0.98	3.9	Yes	
Calcium	36/47	102 to 1,000	63 to 1,050	187	446	1,000,000	No	S
Chromium	47/47	2	1.5 to 52.95*	9	10	23	Yes	
Cobalt	29/47	0.34 to 10	0.4 to 5.45*	1.1	2.8	470	No	S
Copper	44/47	2.3 to 5	1.8 to 521*	37.8	8	105	Yes	
Iron	47/47	20	1,140 to 46,650*	4,230	7,740	2,300	Yes	
Lead	43/47	1 to 16.1	3.2 to 164*	34.1	10.2	400	No	S
Magnesium	47/47	1,000	33.8 to 587.5*	116	244	460,468	No	S
Manganese	47/47	3	12.1 to 383*	57	324	160	Yes	
Mercury	14/47	0.01 to 0.12	0.05* to 0.19	0.09	0.12	2.3	No	S
Nickel	23/47	2.3 to 9.7	2.5 to 12.15*	4.6	6.8	105	No	S
Potassium	32/47	129 to 1,000	138 to 2,895*	351	177	1,000,000	No	S
Silver	1/47	0.32 to 2	0.35	0.35	0.7	39	No	B, S, F
Sodium	36/47	127 to 1,000	137* to 401*	185	382	1,000,000	No	B, S
Thallium	1/47	0.34 to 2	0.53	0.53	1.2	0.55	No	B, S, F
Vanadium	46/47	3.6 to 10	2.4 to 12.1	5.1	19	15	No	B, S
Zinc	39/47	4 to 77	4.3 to 552.5*	52.2	15.8	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 18, Crash Crew Training Area
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]
Other (μg/kg)								
TRPH	38/47	1,700 to 1,900	2,900 to 23,500,000	6,320,000	NA	350,000	Yes	

[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 October 1998 guidance (USEPA, 1998) or the Florida Soil Cleanup Target Levels (SCTLs) residential scenario (FDEP, 1998) was used for screening. For analytes that are HHCPCs in groundwater, the Florida SCTLs based on leachability are used for screening; however, there were no HHCPCs selected in groundwater at Site 18. Values from the USEPA Region III RBC Tables, dated October 1998, are based on an 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. Lead value is from the Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12). Values are presented in Appendix D of this RI Report.
[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.
F = the frequency of detection was less than 5%; 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: Samples: 18-SL-01 through 18-SL-47
Duplicate samples: 18-SL-01A, 18-SL-01DUP (TRPH only), 18-SL-10A, 18-SL-23A, 18-SL-31A, 18-SL-37A, and18-SL-39DUP.
Background samples: BKG-SL-01, BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKG-SL-09, BKG-SL-10, BKS00101, BKS00201, BKS00401, and BKS00501.
Background duplicate sample: BKG-SL-09A, BKS00201D.

HHCPC = human health chemical of potential concern.
μg/kg = micrograms per kilogram.
* = average of a sample and its duplicate.
NA = not applicable.
mg/kg = milligrams per kilogram.
USEPA = U.S. Environmental Protection Agency.
TRPH = total recoverable petroleum hydrocarbons.

Detected concentrations were not screened using the iron essential nutrient value; the RBC for iron was used instead. However, if iron is determined to be a risk driver, a comparison of the risk concentrations against the essential nutrient level for iron will be presented in the uncertainty 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 a chemical of potential concern. In situations where multiple screening values are available, a chemical is excluded only if its maximum detected concentration is less than all of the corresponding screening values. Tables D-1, D-2, and D-3 in Appendix D present 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 medium is presented below in Subsections 6.2.1 through 6.2.3.

6.2.1 Site 18 Surface Soil Forty-seven samples (18-SL-01 through 18-SL-47) and duplicates at 18-SL-01A, 18-SL-01DUP (analysis for TRPH only), 18-SL-10A, 18-SL-23A, 18-SL-31A, 18-SL-37A, and 18-SL-39DUP were considered in the Site 18 HHRA (Figure 3-1). Table 5-6 presents a summary of the analytical results for surface soil samples. The TRPH data for 18-SL-01, 18-SL-01A, and 18-SL-01DUP were treated as triplicate samples. Samples 18-SL-23AR and 18-SL-44R were not considered in the HHRA because the results (available for VOCs only) were not significantly different from the original but rather confirmed the original sample concentrations. VOCs, SVOCs, pesticides, PCBs, TRPH, and inorganic data from all of these samples are evaluated in this HHRA. Six inorganic analytes (arsenic, cadmium, chromium, copper, iron, and manganese), and TRPH were selected as HHCPCs for surface soil at Site 18 (Table 6-1).

6.2.2 Site 18 Subsurface Soil Thirteen subsurface soil samples (18SB1-5-7, 18SB1-10-12, 18SB2-5-7, 18SB2-10-12, 18SB4-5-7, 18SB4-10-12, 18SB6-5-7, 18SB6-10-12, 18SB7-5-7, 18SB8-5-7, 18SB8-10-12, 18SB9-5-7, and 18SB10-5-7), duplicates (18SB6-10-12A and 18SB8-5-7A), and a reanalysis (18SB8-5-7ARE) were collected from Site 18 (Figure 3-1). Table 5-8 presents a summary of the analytical results detected in subsurface soil samples. The reanalysis (18SB8-5-7ARE) was combined with the original sample (18SB8-5-7A) because the former did not have VOC data and the latter had only VOC data. Subsurface soil samples from intervals greater than 15 feet were not included in the risk assessment data set. VOCs, SVOCs, TRPH, and inorganic data from these samples are evaluated in this HHRA. TRPH was selected as an HHCPC for subsurface soil at Site 18 (Table 6-2).

6.2.3 Site 18 Groundwater Three groundwater samples (18G00101, 18G00201, and 18G00301) were collected from Site 18 (Figure 3-3). Table 5-11 presents a summary of the analytical results detected in groundwater soil samples. Only unfiltered groundwater samples collected in 1996 were considered in this HHRA. VOCs, SVOCs, pesticides, PCBs, and inorganic data from these samples are evaluated in this HHRA. Table 6-3 presents the HHCPCs selection for groundwater at Site 18. No analytes were selected as HHCPCs in the groundwater.

6.3 EXPOSURE ASSESSMENT. The exposure assessment methodology is described in Subsection 2.5.3 of the GIR (ABB-ES, 1997). This process involves several steps:

Table 6-2
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil Associated with Site 18

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Site 18, Crash Crew Training Area
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]
Volatile Organic Compounds (µg/kg)								
Acetone	4/13	10 to 7,100	24 to 230	84.5	NA	5,500,000	No	S
2-Butanone	2/13	10 to 7,100	9* to 21	15	NA	35,000,000	No	S
4-Methyl-2-pentanone	2/13	10 to 7,100	3 to 11.5*	7.3	NA	3,700,000	No	S
Xylenes (total)	3/13	10 to 7,100	16 to 7,150*	2,660	NA	290,000	No	S
Semivolatile Organic Compounds (µg/kg)								
Dibenzofuran	1/13	350 to 5,350	2,230*	2,230	NA	820,000	No	S
Dimethylphthalate	1/13	350 to 5,350	40	40	NA	1,600,000	No	S
Fluorene	3/13	350 to 5,350	56 to 2,090*	740	NA	8,200,000	No	S
2-Methylnaphthalene	6/13	350 to 5,350	136* to 33,000*	6,260	NA	4,100,000	No	S
4-Methylphenol	2/13	350 to 5,350	110 to 265*	188	NA	1,000,000	No	S
Naphthalene	3/13	350 to 5,350	230 to 15,000*	5,320	NA	4,100,000	No	S
Phenanthrene	2/13	350 to 5,350	42 to 58	50	NA	6,100,000	No	S
Phenol	1/13	350 to 5,350	94.5*	94.5	NA	120,000,000	No	S
Pesticides and PCBs (µg/kg)								
4,4'-DDD	1/13	3.5 to 4	4.1	4.1	NA	17,000	No	S
Inorganic Analytes (mg/kg)								
Aluminum	13/13	NA	947 to 6,830*	3,490	27,800	200,000	No	B, S
Arsenic	13/13	NA	0.6 to 3.2*	1.4	6.2	3.7	No	B, S
Barium	13/13	NA	1.4* to 7.8	4.5	15.8	14,000	No	B, S

See notes at end of table.

Table 6-2 (Continued)
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil Associated with Site 18

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Site 18, Crash Crew Training Area
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 (mg/kg) (Continued)								
Beryllium	5/13	0.06 to 1	0.06 to 0.09	0.08	0.26	410	No	B, S
Calcium	9/13	6.9 to 1,000	6.5* to 180	45.6	444	1,000,000	No	B, S
Chromium	13/13	NA	1.6 to 10.4	4.6	22.8	430	No	B, S
Cobalt	7/13	0.47 to 10	0.6 to 0.89	0.74	1.5	12,000	No	B, S
Copper	11/13	0.36 to 5	0.36 to 7	2	8.8	8,200	No	B, S
Cyanide	12/13	0.5 to 1	0.41 to 3.3	0.75	ND	4,100	No	S
Iron	13/13	NA	810 to 6,410*	3,280	18,100	61,000	No	B, S
Lead	13/13	NA	0.45 to 11.1	3.3	8.4	400	No	S
Magnesium	12/13	32.2 to 1,000	19.2 to 151	56	272	460,468	No	B, S
Manganese	13/13	3	2.9 to 63	17	42.6	4,100	No	S
Mercury	3/13	0.02 to 0.1	0.02 to 0.05	0.04	ND	28	No	S
Nickel	2/13	2.6 to 8	2.7 to 2.9	2.8	5	4,100	No	B, S
Potassium	8/13	108 to 1,000	109 to 1,230	601	181	1,000,000	No	S
Selenium	1/13	0.445 to 1	1.2*	1.2	0.3	1,000	No	S
Sodium	3/13	11.6 to 1,000	9.6* to 29.8	19	ND	1,000,000	No	S
Vanadium	13/13	10	1.4 to 23.9	9.5	45	1,400	No	B, S
Zinc	12/13	1.66 to 4	0.58 to 4.5	2	15.6	61,000	No	B, S
Other (µg/kg)								
TRPH	11/13	1,800 to 1,900	2,300 to 6,300,000*	1,160,000	NA	2,500,000	Yes	

See notes at end of table.

Table 6-2 (Continued)
Selection of Human Health Chemicals of Potential Concern for Subsurface Soil Associated with Site 18

Remedial Investigation Report
Site 18, Crash Crew Training Area
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 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), lesser of the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for industrial soil exposure per October 1998 guidance (USEPA, 1998) or Florida Soil Cleanup Target Levels industrial scenario (FDEP, 1998) were used for screening. For analytes that are HHCPCs in groundwater, the Florida Soil Cleanup Goals based on leachability are used for screening; however, no HHCPCs were selected for groundwater at Site 18. Actual values are taken from the USEPA Region III RBC Tables dated March 17, 1997, and are based on an 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. Lead value is from the Revised Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-12). Values are presented in Appendix C of this RI Report.
[6] 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: 18SB1-5-7, 18SB1-10-12, 18SB2-5-7, 18SB2-10-12, 18SB4-5-7, 18SB4-10-12, 18SB6-5-7, 18SB6-10-12, 18SB7-5-7, 18SB8-5-7, 18SB8-10-12, 18SB9-5-7, and 18SB10-5-7.
Duplicate samples: 18SB6-10-12A, 18SB8-5-7A, and 18SB8-5-7ARE
Note: 18SB8-5-7A and 18SB8-5-7ARE were combined to achieve a complete data set for this sample.
Background samples: BKB00101, BKB00102, BKB00201, BKB00202, BKB00301, BKB00302, BKB00401, BKB00402, BKB00501, BKB00502, BKB00601, BKB00602, BKB00701, and BKB00702.
Background duplicate samples: BKB00401D, and BKB00602D.

HHCPC = human health chemical of potential concern.
μg/kg = micrograms per kilogram.
NA = not applicable.
* = average of a sample and its duplicate.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
mg/kg = milligrams per kilogram.
ND = not detected in any background sample.
TRPH = total recoverable petroleum hydrocarbons.

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

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Site 18, Crash Crew Training Area
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]
Semivolatile Organic Compounds (µg/ℓ)								
bis(2-Ethylhexyl)phthalate	2/3	10	2 to 3	2.5	NA	4.8	No	S
Inorganic Analytes (µg/ℓ)								
Aluminum	2/3	34	73.5 to 78.2	75.9	654	50	No	B
Barium	3/3	NA	15.2 to 46.9	33	72.6	260	No	B, S
Cadmium	1/3	1.2	1.4	1.4	4.4	1.8	No	B, S
Calcium	3/3	NA	497 to 4,850	1,990	3,320	1,055,398	No	S
Chromium	1/3	2	3.7	3.7	30	18	No	B, S
Cobalt	1/3	2.3	2.4	2.4	ND	220	No	S
Copper	1/3	1.1	2.5	2.5	10.8	150	No	B, S
Iron	1/3	12.2 to 76	60.2	60.2	964	300	No	B, S
Lead	1/3	0.6 to 0.7	5.2	5.2	ND	15	No	S
Magnesium	3/3	NA	499 to 999	784	2,430	118,807	No	B, S
Manganese	3/3	NA	2.7 to 8.4	6.2	42.8	50	No	B, S
Mercury	1/3	0.1	0.11	0.11	ND	1.1	No	S
Nickel	1/3	7.3	11.9	11.9	42.8	73	No	B, S
Potassium	3/3	NA	594 to 1,330	962	1,530	297,016	No	B, S
Silver	1/3	2.5	2.9	2.9	ND	18	No	S

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 18, Crash Crew Training Area
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)								
Sodium	3/3	NA	688 to 1,410	1,040	4,770	160,000	No	B, S
Vanadium	1/3	1.2	1.2	1.2	3.8	26	No	B, S
Zinc	1/3	1.2 to 2.8	55.8	55.8	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 October 1998 guidance (USEPA, 1998) or the Florida Groundwater Cleanup Target Levels (FDEP, 1998) was used for screening. Actual values are taken from the USEPA Region III RBC Tables dated March 17, 1997, and are based on an 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. Values are presented in Appendix C.
[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: Samples: 18G00101, 18G00201, and 18G00301
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.
ND = not detected in any background samples.

- characterization of the exposure setting in terms of the physical characteristics and the populations that may potentially 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 (future) exposure pathways.

Summaries of potential exposure pathways to chemicals detected at Site 18 are presented on Figure 6-1.

The potential pathways including medium and route of exposure, the potentially exposed population, and the rationale for pathway selection or exclusion, are provided in Table 6-4 and are described in more detail in Subsections 6.3.1 through 6.3.3. Receptor-specific exposure parameters for each exposure scenario are presented in Appendix C to the GIR (ABB-ES, 1997). Risk calculation spreadsheets in Appendix D of this RI Report also contain the assumed exposure parameters and quantitation of exposures.

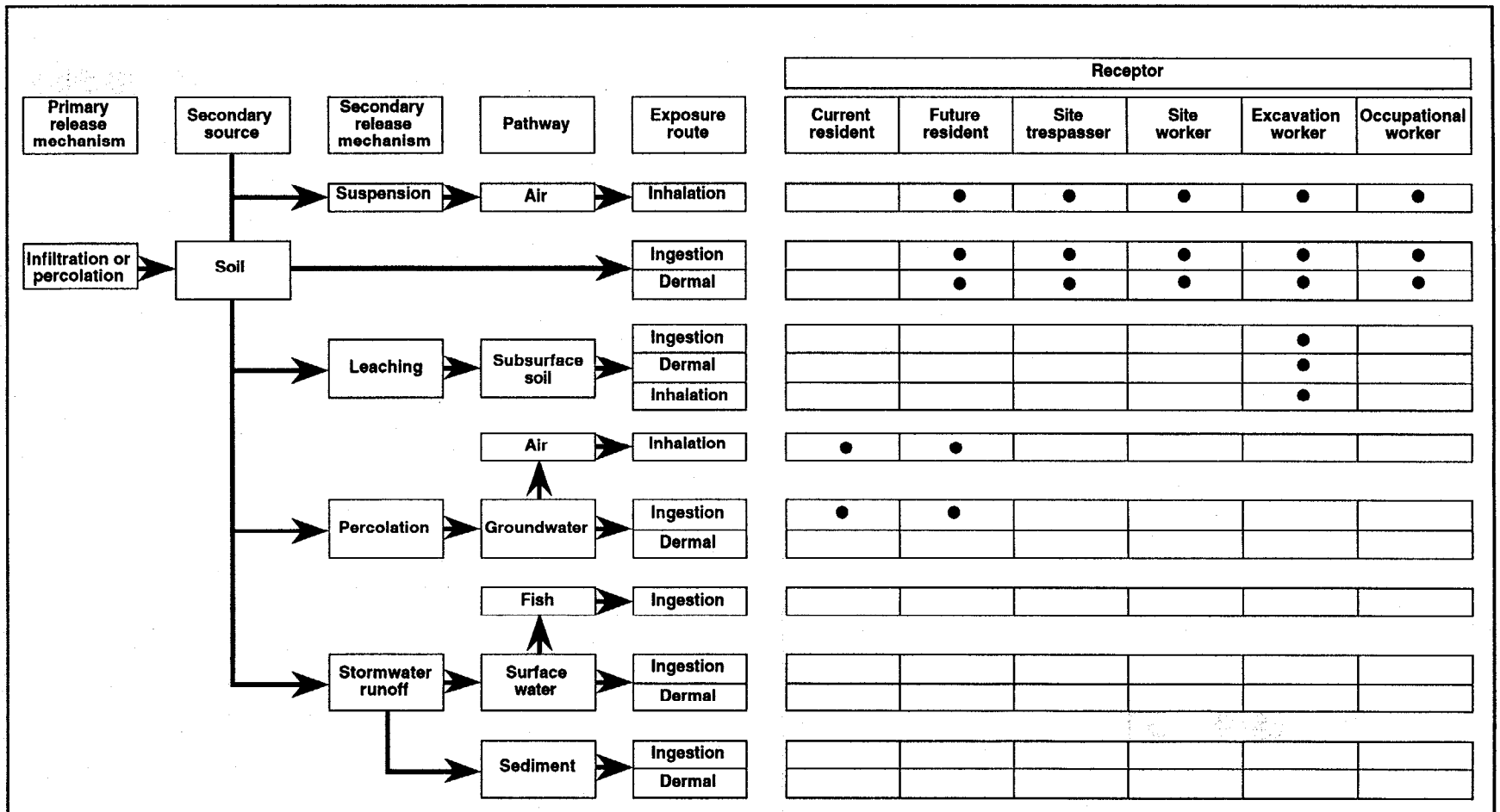
6.3.1 Site 18 Surface Soil No humans currently reside at Site 18. Site 18 may be developed eventually for residential land use; therefore, the residential receptor will be evaluated as part of the hypothetical future land-use scenario. Currently, there are no buildings present at the site; therefore, exposure of occupational workers will only be considered as part of the future land-use scenario. Another possible future exposure scenario includes excavation activities, such as installation of utility lines. Currently, there is one site maintenance worker who mows the grass; therefore, a current site maintenance worker exposure scenario will be evaluated. Additionally, it is possible that trespassers could currently be exposed at the site.

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 Site 18 Subsurface Soil Currently, there are no receptors exposed to subsurface soil at Site 18 because there are no excavation or construction activities on site. A hypothetical future excavation worker scenario will be evaluated.

6.3.3 Site 18 Groundwater Currently, groundwater at Site 18 is not used for any potable or nonpotable purpose nor are there plans to use the water resource in the foreseeable future. However, areas hydraulically downgradient of Site 18 are developed for residential use, and there are drinking water wells within 1 mile of the site. There were no HHCPCs identified in groundwater; therefore, current and future exposure scenarios to groundwater are not evaluated in this HHRA.

6.3.4 Exposure Point Concentrations (EPCs) EPCs for all HHCPCs in surface soil and subsurface soil are calculated according to Paragraph 2.5.3.3 of the GIR (ABB-ES, 1997). 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



NOTE:
NAS = Naval Air Station

FIGURE 6-1
SITE 18, COMPLETE AND POTENTIALLY COMPLETE EXPOSURE PATHWAYS FOR HUMAN RECEPTORS

REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

2530-09 FIG 6-1 121297MAW

Table 6-4
Summary of Potential Exposure Pathways

Remedial Investigation Report
Site 18, Crash Crew Training Area
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 or work at Site 18. 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	No excavation activities are currently ongoing at Site 18.
Groundwater	Ingestion of groundwater as drinking water.	Resident (adult and child)	No	There are drinking water wells located within 1 mile of Site 18 in the direction of the groundwater flow. Therefore, residents may be exposed to contaminants in the surficial aquifer. However, there are no human health chemicals of potential concern selected for groundwater at Site 18; therefore, groundwater will not be evaluated further.
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 18 is developed for residential use, residents could be exposed to chemicals in surface soil. Exposure of trespassers, occupational worker, site maintenance worker and excavation worker to chemicals in surface soil are possible if the site is developed in the future.
Subsurface soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Excavation worker (adult)	Yes	An excavation worker could be exposed to subsurface soil during excavation activities if the site is developed in the future.
Groundwater	Ingestion of groundwater as drinking water and inhalation of volatiles while showering.	Resident (adult and child)	No	If Site 18 is developed for residential use, drinking water wells in the surficial aquifer could be influenced by contaminants in the groundwater associated with Site 18. Therefore, future residents could be exposed to contaminants in the surficial aquifer. There are no HHCPCs selected for groundwater at Site 18; therefore, groundwater will not be evaluated further.

ingest, dermally absorb, or inhale from each exposure pathway. The ultimate goal of this step, as defined in USEPA guidance, is to quantify the maximum level of exposure that may "reasonably" be expected to occur under current and future site conditions (USEPA, 1989a).

The EPCs for HHCPCs in surface soil and subsurface soil are presented in Tables 6-5 and 6-6 (there were no HHCPCs identified for groundwater). The EPCs were used with receptor-specific exposure parameters to quantify exposures to the HHCPCs, as shown in the risk calculation spreadsheets in Appendix D to this report.

6.4 TOXICITY ASSESSMENT. The toxicity assessment methodology is described in Subsection 2.5.4 of the GIR (ABB-ES, 1997). The toxicity assessment evaluates the available evidence on the potential 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 potential 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 an HHCPC and the likelihood of a toxic effect or response. The categories of toxic effects evaluated in this HHRA are carcinogenic and noncarcinogenic. Following USEPA guidance for HHRAs (USEPA, 1989a), these two endpoints (cancer and noncancer effects) are evaluated separately. As a result of the dose-response assessment, identified toxicity values are used to estimate the potential for adverse effects as a function of human exposure to a chemical.

Appendix D to this report contains brief toxicity summaries for HHCPCs identified in surface soil and subsurface soil at Site 18. Appendix D to this report also contains dose-response information for the HHCPCs (Tables D-4 through D-9). Dose-response values used in this HHRA were current as of April 1997 for the Integrated Risk Information System and November 1997 for Health Effects Assessment Summary Tables.

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, 1997).

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Maximum Detected Concentration	95% UCL[2]	Exposure Point Concentration[3]
Inorganic Analytes (mg/kg)				
Arsenic	35/47	2.7	0.73	0.73
Cadmium	23/47	38.8	3.7	3.7
Chromium	47/47	53	10.8	10.8
Copper	44/47	521	44.7	44.7
Iron	47/47	46,700	4,273	4,273
Manganese	47/47	383	70.1	70.1
Other (μg/kg)				
TRPH	38/47	23,500,000	6,970,000	6,970,000

[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.
UCL = upper confidence limit (see footnote 2).
mg/kg = milligrams per kilogram.
μg/kg = micrograms per kilogram.
TRPH = total recoverable petroleum hydrocarbons.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Maximum Detected Concentration	95% UCL[2]	Exposure Point Concentration[3]
Other (μg/kg)				
TRPH	11/13	6,300,000	1,940,000	1,940,000

[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.
UCL = upper confidence limit (see footnote 2).
μg/kg = micrograms per kilogram.
TRPH = total recoverable petroleum hydrocarbons.

Risk estimates for potential exposures to surface soil and subsurface soil under current and hypothetical future land-use scenarios are discussed in Subsections 6.5.1 through 6.5.3. These risk estimates are then compared to Federal USEPA and FDEP carcinogenic and noncarcinogenic target levels.

The USEPA guidelines, established in the NCP, indicate that the total lifetime cancer risk due to exposure to the HHCPCs at a site, by each complete exposure pathway, should not exceed a range of 1 in 1,000,000 (1×10^{-6}) to 1 in 10,000 (1×10^{-4}) (USEPA, 1990). FDEP has indicated that chemical-specific risks greater than one in one million (1×10^{-6}) warrant further consideration.

An 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 specific noncarcinogenic effects.

Table 6-7 summarizes the cancer and noncancer risk under a current land-use scenario for Site 18. Table 6-8 summarizes the cancer and noncancer risk under a hypothetical future land-use scenario for Site 18.

6.5.1 Site 18 Surface Soil The risk calculations for surface soil exposure are shown in Tables C-10 through C-23 in Appendix D to this report. Below are evaluations of the current and hypothetical future land-use exposure pathways for surface soil.

Current Land Use. The cancer risks associated with current exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 1×10^{-7} for an aggregate (combined adult and adolescent) trespasser, and 3×10^{-8} 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 and below the Florida target level. Figure 6-2 presents a summary of cancer risks associated with exposure scenarios under current land use.

The noncancer risks associated with surface soil ingestion, dermal contact, and fugitive dust inhalation under the current land use for an aggregate trespasser (adult and child) and a site maintenance worker are below USEPA's and FDEP's target HI of 1. Figure 6-3 presents a summary of HIs associated with exposure scenarios under the current land use.

Hypothetical Future Land Use. The cancer risks associated with hypothetical future exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 2×10^{-6} for an aggregate resident (combined adult and child), 1×10^{-7} for an aggregate trespasser (combined adult and adolescent), 2×10^{-7} for an occupational worker, 3×10^{-8} for a site maintenance worker, and 9×10^{-9} for an excavation worker. All of these hypothetical future receptor risks are within or below the USEPA acceptable cancer risk range; however, the hypothetical future residential receptor risk exceeds the Florida level of concern of 1×10^{-6} (due to arsenic). Figure 6-4 presents a summary of cancer risks associated with exposure scenarios under future land use.

Table 6-7
Risk Summary, Current Land Use

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Land Use		Exposure Route	HI*	ELCR*
Current Land Use				
Surface Soil:				
	Adult Trespasser:	Incidental ingestion	0.05	6×10^{-8}
		Dermal contact	0.04	3×10^{-9}
		Inhalation of particulates	0.00002	6×10^{-10}
		Total Adult Trespasser:	0.09	6×10^{-8}
	Adolescent Trespasser:	Incidental ingestion	0.1	4×10^{-8}
		Dermal contact	0.05	2×10^{-9}
		Inhalation of particulates	0.00003	4×10^{-10}
		Total Adolescent Trespasser:	0.2	4×10^{-8}
		Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:	NC	1×10^{-7}
	Site Maintenance Worker:	Incidental ingestion	0.02	2×10^{-8}
		Dermal contact	0.03	3×10^{-9}
		Inhalation of particulates	0.00009	3×10^{-9}
		Total Site Maintenance Worker:	0.05	3×10^{-8}

Notes: * = receptor totals may vary for spreadsheets due to rounding algorithm.
HI = hazard index.
ELCR = excess lifetime cancer risk.
NC = not calculated because child and adult HIs are not additive.

Table 6-8
Risk Summary, Future Land Use

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Land Use		Exposure Route	HI*	ELCR*
Future Land Use				
Surface Soil:				
	Adult Trespasser:	Incidental ingestion	0.05	6×10^{-8}
		Dermal contact	0.04	3×10^{-9}
		Inhalation of particulates	0.00002	6×10^{-10}
		Total Adult Trespasser:	0.09	6×10^{-8}
	Adolescent Trespasser:	Incidental ingestion	0.1	4×10^{-8}
		Dermal contact	0.05	2×10^{-9}
		Inhalation of particulates	0.00003	4×10^{-10}
		Total Adolescent Trespasser:	0.2	4×10^{-8}
		Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:	NC	1×10^{-7}
	Adult Resident:	Incidental ingestion	0.4	5×10^{-7}
		Dermal contact	0.3	3×10^{-8}
		Inhalation of particulates	0.0007	2×10^{-8}
		Total Adult Resident:	0.7	5×10^{-7}
	Child Resident:	Incidental ingestion	3	1×10^{-6}
		Dermal contact	0.5	1×10^{-8}
		Inhalation of particulates	0.004	3×10^{-8}
		Total Child Resident:	4	1×10^{-6}
		Total Risk to Resident (Adult and Adolescent) Exposed to Surface Soil:	NC	2×10^{-6}
	Occupational Worker:	Incidental ingestion	0.1	2×10^{-7}
		Dermal contact	0.1	9×10^{-9}
		Inhalation of particulates	0.0003	9×10^{-9}
		Total Occupational Worker:	0.2	2×10^{-7}
	Site Maintenance Worker:	Incidental ingestion	0.02	2×10^{-8}
		Dermal contact	0.03	3×10^{-9}
		Inhalation of particulates	0.00009	3×10^{-9}
		Total Site Maintenance Worker:	0.05	3×10^{-8}
	Site Maintenance Worker:	Incidental ingestion	0.02	2×10^{-8}
		Dermal contact	0.03	3×10^{-9}
		Inhalation of particulates	0.00009	3×10^{-9}
		Total Site Maintenance Worker:	0.05	3×10^{-8}

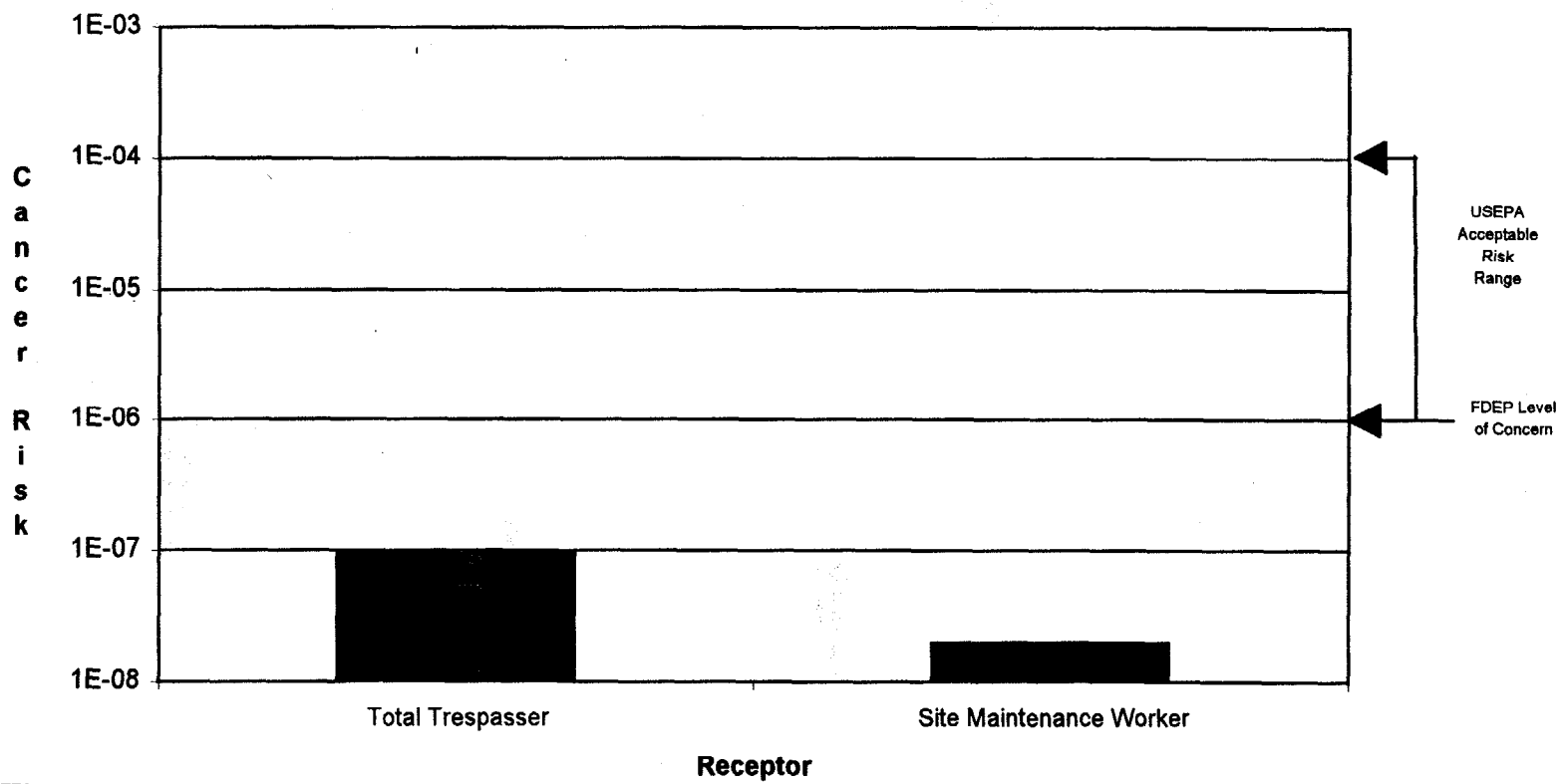
See notes at end of table.

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

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Land Use		Exposure Route	HI*	ELCR*
Future Land Use (Continued)				
	Excavation Worker:	Incidental ingestion	0.03	9×10^{-9}
		Dermal contact	0.03	1×10^{-10}
		Inhalation of particulates	0.00009	1×10^{-10}
		Total Excavation Worker:	0.06	9×10^{-9}
Subsurface Soil:				
	Excavation Worker:	Incidental ingestion	0.004	NE
		Dermal contact	0.005	NE
		Inhalation of particulates	ND	NE
		Total Excavation Worker:	0.009	NE
		Total Excavation Worker Risk to Soil:	0.07	9×10^{-9}

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



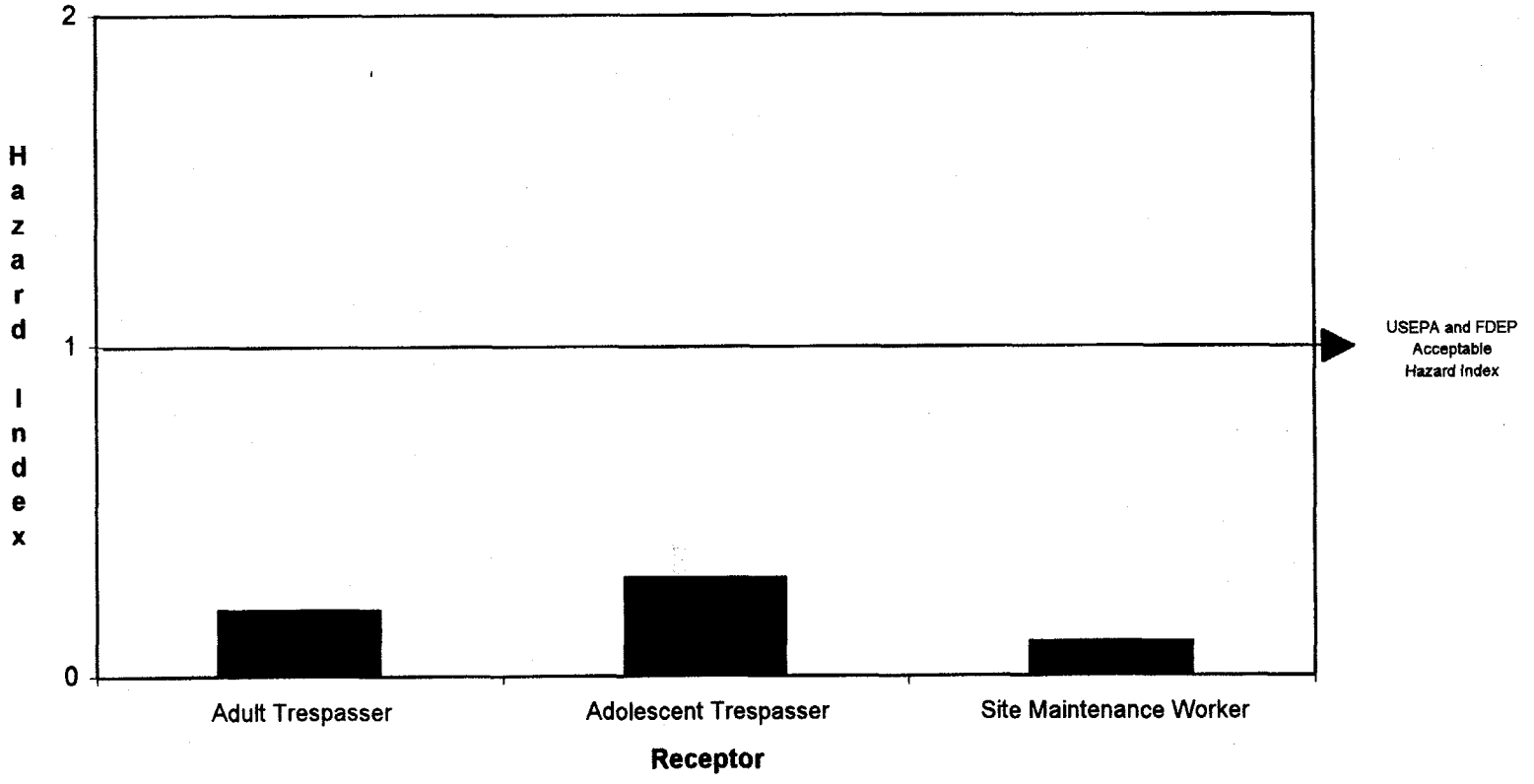
NOTES:
NAS = Naval Air Station
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

FIGURE 6-2
CANCER RISK SUMMARY
CURRENT LAND USE FOR SURFACE SOIL AT SITE 18

REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

G:\USERS\SHARED\DESIGN\MWTEMP\WHITING\2534-09\FIG6-2.PM5 011298MAW



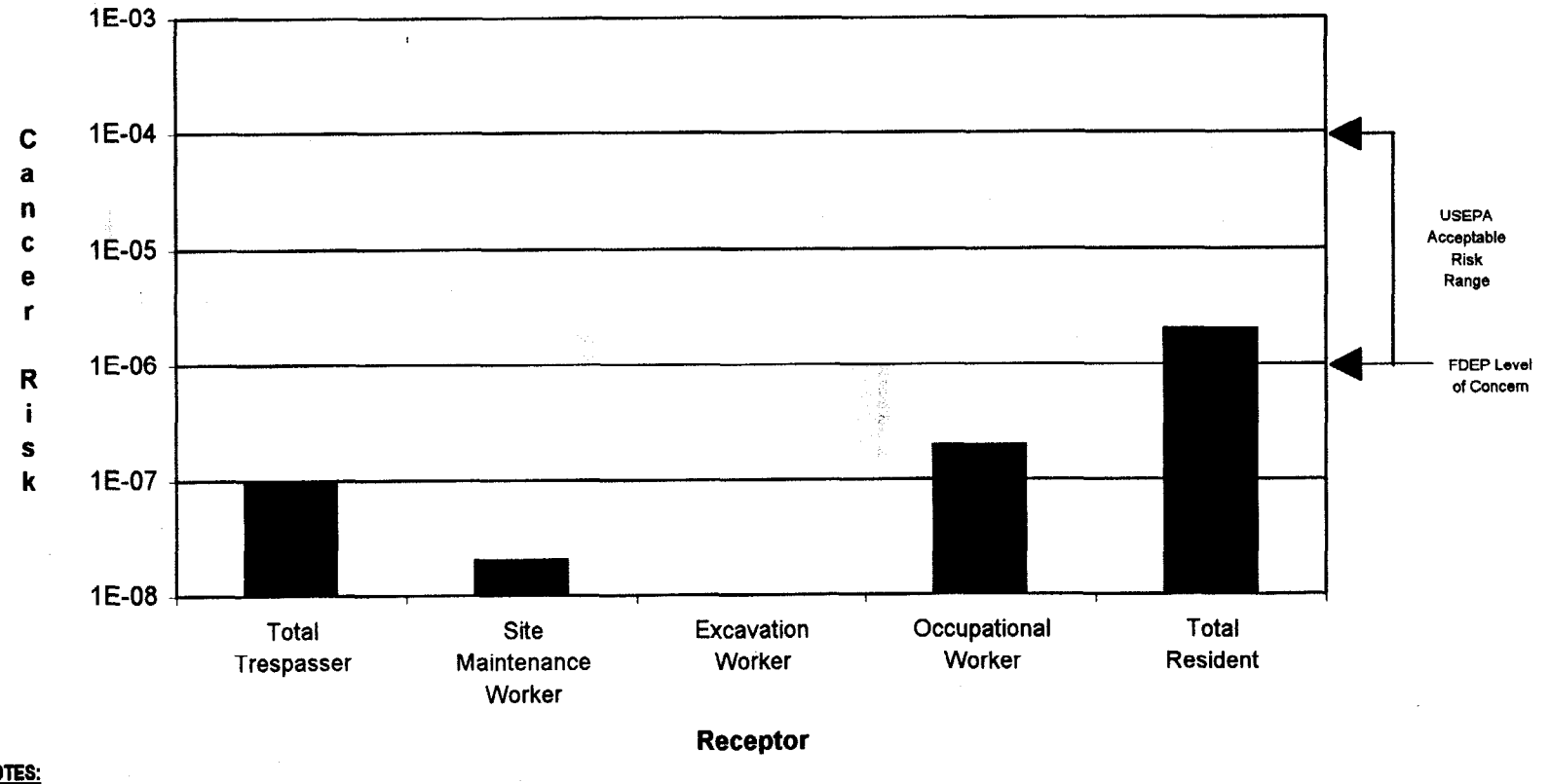
NOTES:
NAS = Naval Air Station
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

FIGURE 6-3
NONCANCER RISK SUMMARY
CURRENT LAND USE FOR SURFACE SOIL AT SITE 18

REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

G:\USERS\SHARED\DESIGN\MWTEMP\WHITING\2534-09\FIG6-3.PM5 011298MAW



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 18

REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

G:\USERS\SHARED\DESIGN\MWTEMP\WHITING\2534-09\FIG6-4.PM5 011298MAW

The noncancer risks associated with surface soil ingestion, dermal contact, and fugitive dust inhalation under a hypothetical future land use are below USEPA's and FDEP's target HI of 1 for an adult resident, an adult and child trespasser, an occupational worker, a site maintenance worker, and an excavation worker. Only the child residential receptor HI (4) exceeds the USEPA's and FDEP's target HI of 1. Figure 6-5 presents a summary of HIs associated with exposure scenarios under future land use.

6.5.2 Site 18 Subsurface Soil The risk calculations for subsurface soil exposure are shown in Tables C-24 and C-25 in Appendix D to this report. Currently, there is no subsurface exposure pathway; therefore, there is no current summary table. Below are evaluations of the hypothetical future land-use exposure pathway for subsurface soil.

Hypothetical Future Land Use. No carcinogenic chemicals of potential concern were selected for subsurface soil; therefore, there is no hypothetical future receptor carcinogenic risk summary figure.

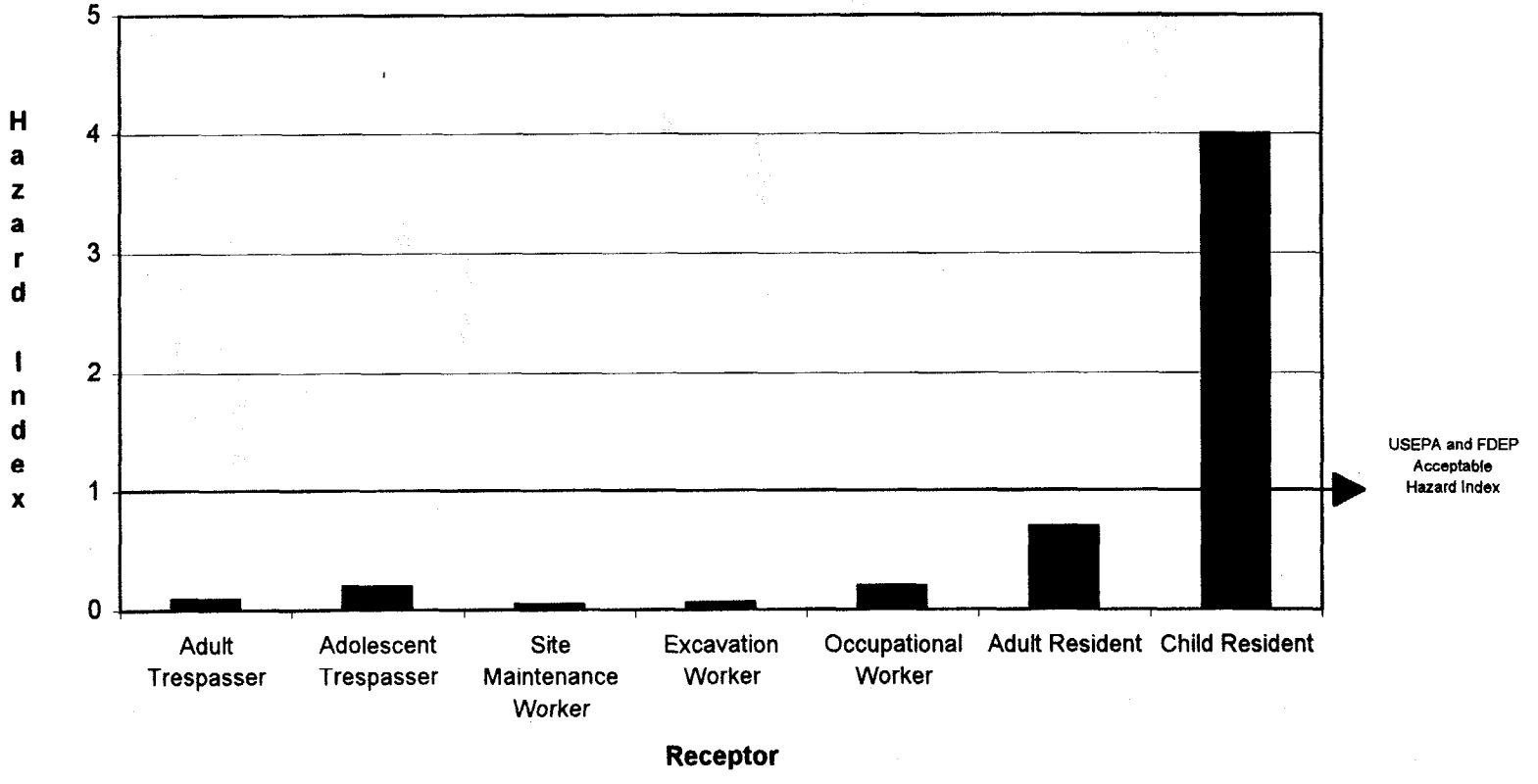
The noncancer risks associated with subsurface soil ingestion, dermal contact, and fugitive dust inhalation under a hypothetical future land use (excavation worker) are below USEPA's and FDEP's target HI of 1. Figure 6-6 presents a summary of HIs associated with exposure scenarios under future land use.

6.5.3 Site 18 Cumulative Risk USEPA Region IV guidance requires an assessment of a cumulative receptor risk. This cumulative evaluation is applicable only to the hypothetical future excavation worker in this HHRA (potentially be exposed to both surface soils and subsurface soils). The cumulative cancer risk to a hypothetical future excavation worker is only associated with exposure to surface soil because there were no carcinogenic HHCPCs in subsurface soil. The cumulative risk of 9×10^{-9} is below the USEPA target risk range and the Florida target risk levels. The cumulative noncancer risk to a hypothetical future excavation worker from surface soil and subsurface soil is below the USEPA and Florida target HI of 1.

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 Paragraph 2.5.5.1 of the GIR (ABB-ES, 1997). Site-specific uncertainties that are important for the interpretation of the risk estimates for surface soil, subsurface soil, and groundwater at Site 18 are discussed below.

- The sample collection design was biased; therefore, the sample results may be artificially high when compared to true site conditions. Surface soil sampling locations were selected based on the presence of burn pit areas, visual observations of stained soil, and elevated OVA readings. As shown on Figure 3-1, surface soil samples were not collected from the grassy maintained area outside of the burn pits; therefore, the data set may be biased high and not representative of the entire area of Site 18. Consequently, risks associated with exposure to surface soil at Site 18 may be overestimated.

  In addition, sampling was done at irregular depth intervals. Instead of the typical composite sample for 0 to 12 inches, samples were taken



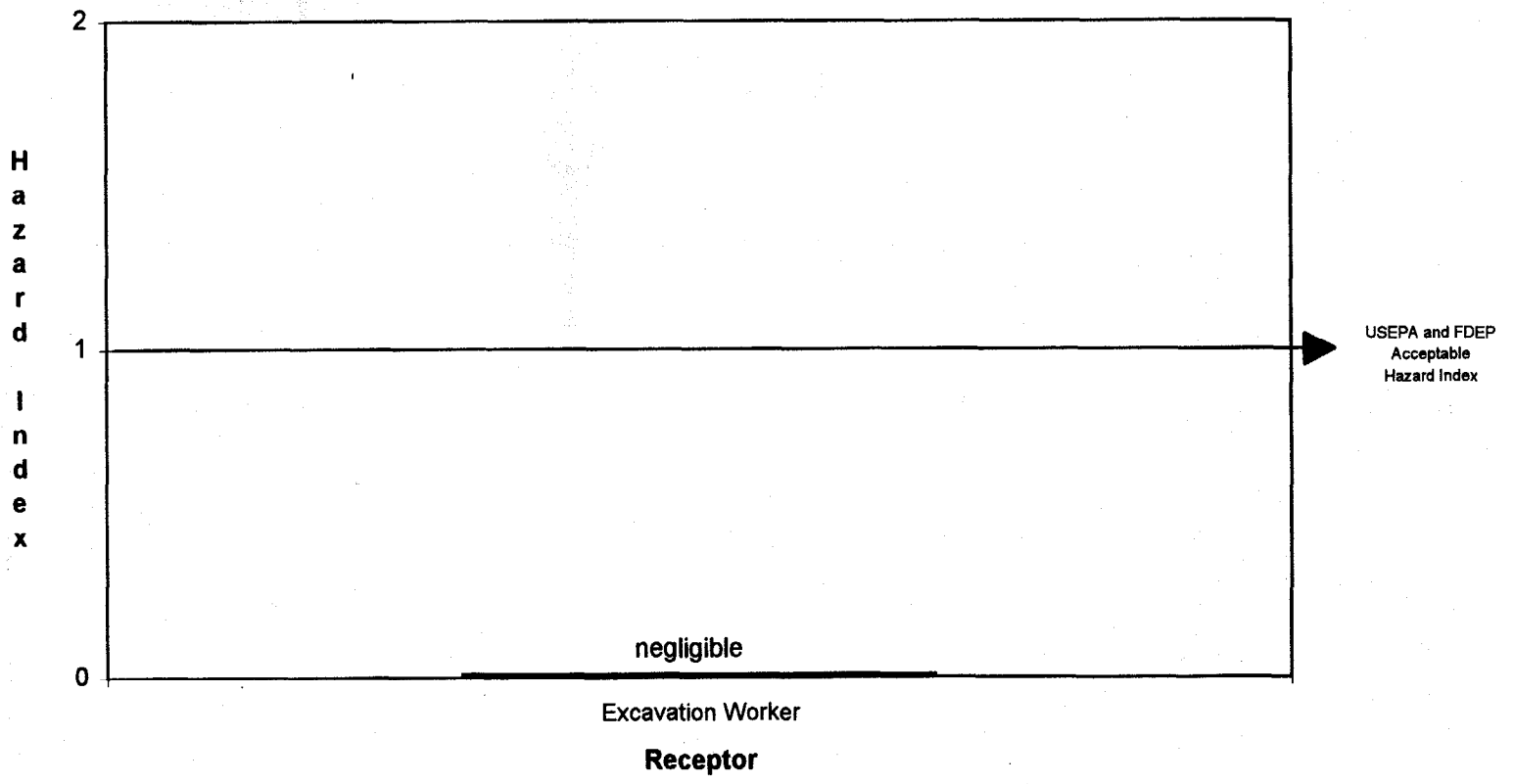
NOTES:
NAS = Naval Air Station
USEPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

FIGURE 6-5
NONCANCER RISK SUMMARY
FUTURE LAND USE FOR SURFACE SOIL AT SITE 18

REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

G:\USERS\SHARED\DESIGN\MWTEMP\WHITING\2534-09\FIG6-5.PM5 011298MAW



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

FIGURE 6-6
NONCANCER RISK SUMMARY
FUTURE LAND USE FOR SUBSURFACE SOIL AT SITE 18

REMEDIAL INVESTIGATION REPORT
SITE 18, CRASH CREW TRAINING AREA

NAS WHITING FIELD
MILTON, FLORIDA

G:\USERS\SHARED\DESIGN\MWTEMP\WHITING\2534-09\FIG6-6.PM5 011298MAW

only at the depth interval that was found to contain the most contamination (based on visual observations and elevated OVA readings). Therefore, the risks associated with exposure to surface soil at Site 18 may be overestimated.

- The surface soil carcinogenic risk is driven by arsenic. Arsenic may be naturally or anthropogenically occurring and not attributed to the firefighting training activities. Therefore, it is uncertain whether or not the risk due to arsenic is actually due to past site operations.

  The risks associated with background screening concentrations of arsenic (2.6 mg/kg) also exceed the FDEP acceptable residential levels (0.8 mg/kg) and would result in an exposure pathway risk of 5×10^{-6}. Therefore, the risks associated with site-related arsenic are likely to be overestimated.

- The lack of toxicity data for TRPH may result in an overestimate of the noncancer risk. The most toxic noncarcinogenic polynuclear aromatic hydrocarbon toxicity value (pyrene value) was selected as a conservative surrogate. Because it is unlikely that all or even a large percentage of the TRPH detected is present as pyrene, the noncancer risk is likely to be overestimated.

- Biodegradation of TRPH was not considered in the calculation of intake and may result in an overestimate of noncancer risk.

- The lack of inhalation reference concentrations for the HHCPCs in surface soil may have resulted in underestimates of the HIs associated with exposure to surface soil at Site 18; however, these noncancer risks are not likely to be significant when compared to oral risks that are fully characterized.

- According to the methodology described in the GIR (ABB-ES, 1997) (Paragraph 2.5.3.3), central tendency (CT) carcinogenic risk to hypothetical future receptors that have risks exceeding Florida levels of concern was evaluated. The CT evaluation coupled with the 95 percent upper confidence limit (UCL) concentration and reasonable but less conservative exposure parameters is designed to provide a probable risk level (USEPA, 1995b).

  The hypothetical future adult and child resident reasonable maximum exposure (RME) carcinogenic risk exceeded its target of 1×10^{-6}; therefore, the CT risks were calculated. The CT carcinogenic risk results for hypothetical future residential land use and the CT exposure parameters (USEPA, 1992b) are presented in Tables C-26 and C-27 in Appendix D of this report. Only the ingestion and dermal exposure pathways were considered because the contribution from inhalation is insignificant to the total risk calculation. The CT risk for aggregate residential receptor is 6×10^{-7}. The CT carcinogenic risk levels for this receptor are below the USEPA acceptable cancer risk range of 1×10^{-4} to 1×10^{-6} and the Florida target risk level of 1×10^{-6}. The risk range of 2×10^{-6} to 6×10^{-7} presented by the RME and CT exposure scenarios for hypothetical future residential receptors is useful as

information to provide perspective for the risk manager and compliance with USEPA guidance (USEPA, 1995b).

A CT evaluation of noncancer risks for a hypothetical future resident was also calculated. Only the ingestion and dermal exposure pathways were considered because the contribution from inhalation is insignificant to the total risk calculation. The child and adult resident CT HI are below the USEPA and FDEP target noncancer level. The exposure frequency, skin surface area, and ingestion rate for the child resident CT deviate from the default values presented in the GIR. The values used are taken from the USEPA *Exposure Factors Handbook* (USEPA, 1996). These less conservative values were selected in an effort to provide risk managers with perspective on the true range of noncancer risks as well as attempt to quantify the uncertainty.

- The SQLs were compared to the risk-based screening criteria and Florida and State regulatory 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). No analytes detected in surface soil or subsurface soil had SQLs that exceeded the screening concentration. One analyte, bis(2-ethylhexyl)phthalate, detected in groundwater had an SQL that exceeded the screening concentration. The risks from this analyte may be underestimated if the chemical is in fact present at a concentration above the risk-based screening criteria.

- Some uncertainty is associated with the representativeness of the groundwater analytical data used to complete the risk evaluation at Site 18. Generally, because the low flow purging and sampling method was used, turbidity in the unfiltered groundwater samples was minimal. However, the analytical results from some of the unfiltered samples may be biased high for inorganic concentrations as a result of suspended solids.

<u>6.7 REMEDIAL GOAL OPTIONS (RGOs)</u>. RGO tables are presented for each medium with a total excess lifetime cancer risk (ELCR) greater than 1×10^{-4} 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. 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.

The analytes with carcinogenic risks in surface soil that exceed Florida's risk management criteria of 1×10^{-6} (arsenic) as well as the noncarcinogenic analytes that contribute greater than 0.1 to a total HI of greater than 1 (iron and TRPH) are presented in Table 6-9.

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

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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 Goal (Residential)[1]	Background Screening Concentration
			10^{-4}	10^{-5}	10^{-6}	3	1	0.1		
Inorganic Analytes (mg/kg)										
Arsenic	0.24 to 2.7	0.73	NR	NR	0.43	NA	NA	NA	0.8	2.6
Iron	1,140 to 46,700	4,273	NA	NA	NA	NR	NR	1,424	NSC	7,740
Other (μg/kg)										
TRPH	2,900 to 23,500,000	6,970,000	NA	NA	NA	6,970,000	2,320,000	232,000	380,000	NA

[1] Values are for residential soil, from Florida Department of Environmental Protection memoranda titled "Soil Cleanup Goals for Florida," dated September 29, 1995, and "Applicability of Soil Cleanup Goals for Florida," dated January 19, 1996.

Notes: mg/kg = milligrams per kilogram.
NR = not reported because the calculated remedial goal option exceeds the exposure point concentration.
NA = not applicable.
NSC = no screening criteria available.
μg/kg = micrograms per kilogram.
TRPH = total recoverable petroleum hydrocarbons.

6.8 SUMMARY OF HHRA FOR SITE 18. HHCPCs were identified and risks were estimated for surface soil and subsurface soil associated with Site 18. There were no HHCPCs identified for groundwater. The following conclusions were drawn based on this HHRA:

- The HHCPCs detected in surface soil and subsurface soil samples do not pose unacceptable carcinogenic risks to the receptors evaluated based on an evaluation of the samples using USEPA and Florida guidelines and target risk ranges.

  The total ELCR associated with surface soil by a hypothetical future aggregate resident (2×10^{-6}) exceeded Florida's target level of 1×10^{-6} due to arsenic. None of the other receptors had risks that exceeded Florida's target risk level. The CT risks to a hypothetical future resident met the Florida risk level of 1×10^{-6}. CT and RME residential risks provide the risk managers and decision makers with a perspective of the hypothetical risk range to future residents.

- The total RME associated with surface soil by a hypothetical future child resident exceeded USEPA's and FDEP's target HI of 1, although the CT HI did not. The HIs for all other receptors evaluated were below the USEPA and FDEP target level.

- The background level of arsenic at the site exceeded the Florida residential SCTL and may result in an unacceptable carcinogenic risk. It is likely that the naturally and/or anthropogenically occurring concentrations of arsenic contribute to the FDEP target risk level exceedance. Additionally, it is uncertain whether or not the detected concentrations of arsenic are related to past site operations.

7.0 ECOLOGICAL RISK ASSESSMENT

The ERA evaluates actual and potential adverse effects to ecological receptors associated with exposure to chemicals from Site 18, the Crash Crew Training Area, at NAS Whiting Field. The ERA for Site 18 follows the methodologies described in the NAS Whiting Field GIR (ABB-ES, 1997), and current guidance materials for ERAs at Superfund sites, including the following:

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

Risk assessment guidance included the USEPA "ECO Update" bulletins (1991c, 1992d, and 1992e), 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 18 at concentrations that could cause adverse ecological effects. The Site 18 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 likelihood estimate of adverse effects;

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

- Summary of Ecological Risk (Section 7.8).

7.1 SITE CHARACTERIZATION. NAS Whiting Field Site 18 is approximately 5 acres in size and is located along Perimeter Road on the northwestern facility boundary near the abandoned North Air Field taxiway (see Figure 1-2). The site is an open maintained grassy field with 11 shallow depressions or burn pits. Old fuel tanks and condemned aircraft bodies were placed in the burn pits from 1951 to 1991 to simulate aircraft following a crash. During the training sessions, JP-5 fuel was poured into the burn pit, ignited, and then extinguished using an AFFF.

The majority of Site 18 consists of maintained grass with localized areas of old field community occurring in the vicinity of the burn pits (Figure 7-1). Occasionally surface water accumulates in the burn pits during periods of heavy rain. In September 1994 mounded soil was spread from around the burn pit depressions to adjacent surrounding areas.

The regular mowing of the maintained field area at Site 18 prevents ecological succession of vegetative communities; however, the following herbaceous species are present: agalinis (*Agalinis setacea*), broomsedge (*Andropogon* sp.), bahia grass (*Bahia* sp.), yellow buttons (*Balduina angustifolia*), golden aster (*Chyrsopsis* sp.), ageratum (*Conoclinium coelestinum*), moss verbena (*Glandularia pulchella*), scratch daisy (*Haplopappus divaricatus*), Mexican clover (*Richardia brasiliensis*), blackberry vine (*Rubus* sp.), and sicklepod (*Senna obtusifolia*). A complete list of the vegetative species occurring at Site 18 is provided in Appendix G of the GIR (ABB-ES, 1997).

The only ecological communities observed at Site 18 were mowed grass and disturbed overgrown field areas. Given the limited cover in the maintained and overgrown field and proximity of the site to the fenced property boundary and the north field taxiway, the occurrence of ecological receptors foraging in this area is expected to be minimal. Large predators (e.g, foxes, owls, and hawks) are not expected to occur in the vicinity of Site 18; however, small mammals or birds may be found foraging at the site.

No mammals or birds were observed at Site 18 during the October 1995 site characterization survey. Small mammals and birds that may occur in the maintained grassy area of Site 18 include the Eastern cottontail rabbit (*Sylvilagus floridanus*), the hispid cotton rat (*Sigmodon hispidus*) cotton mouse (*Peromyscus gossypinus*), American robin (*Turdus migratorius*), American woodcock (*Scolopax minor*), and the mourning dove (*Zenaida macroura*).

It is unlikely that these depressions provide suitable habitat for aquatic receptors because of the intermittent nature of standing water that accumulates in the depressions of the burn pits. The standing pools of surface water may, however, provide an occasional source of drinking water for small terrestrial mammals and birds following a period(s) of heavy rain.

Although no aquatic habitat is present at Site 18, groundwater from Site 18 may discharge to Clear Creek, which is located approximately 2,500 feet downgradient and the southwest of the site. Groundwater discharge to surface water is not

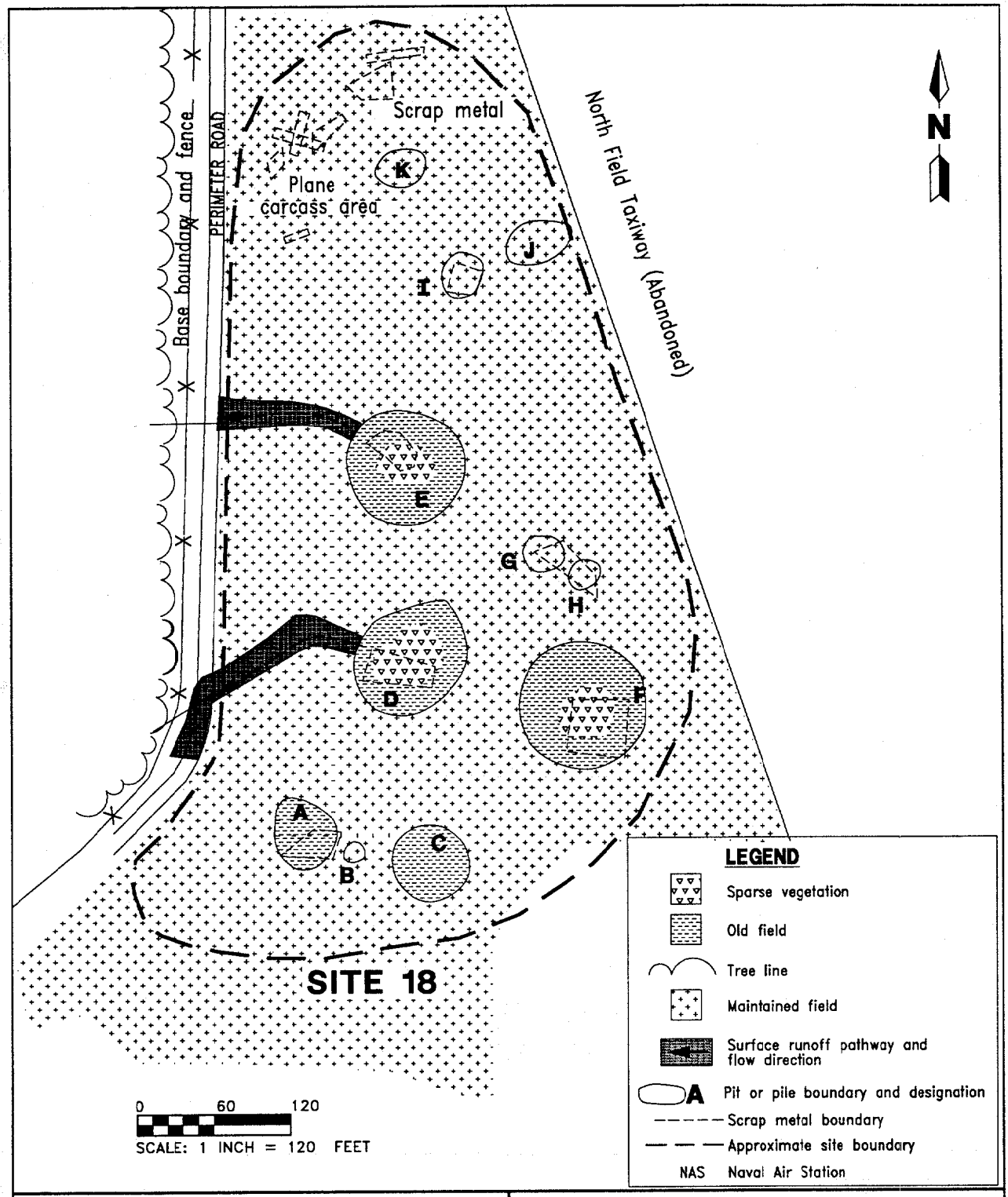

FIGURE 7-1
SITE 18, VEGETATIVE COVER MAP

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evaluated as part of the ERA for Site 18 because Clear Creek receives groundwater discharge and stormwater runoff from multiple sources of potential contamination at NAS Whiting Field. In addition, detected concentrations of contaminants in Site 18 groundwater are low enough that they are not a concern for current and future discharges to surface water. With the exception of bis(2-ethylhexyl)-phthalate, which was detected at concentrations ranging from 0.002 to 0.003 milligrams per liter, no other organic constituents were detected in groundwater. In addition, the majority of inorganic constituents were detected at concentrations below the background screening values. Background screening values are equal to two times the average detected inorganic concentration in background samples and are presented in Section 3.3 of the GIR (ABB-ES, 1997).

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.

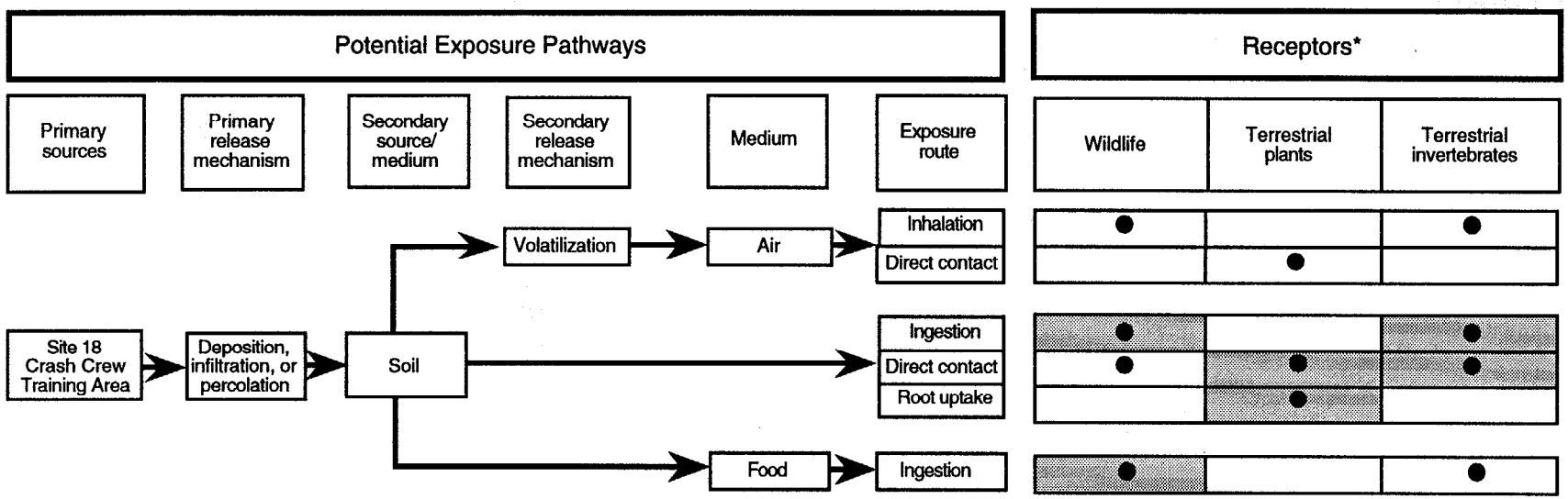
7.2.1 Identification of Receptors Ecological receptors that may potentially utilize the available maintained grassy field habitat at Site 18 include terrestrial wildlife (i.e., mammal, birds, reptiles, and adult amphibians), terrestrial plants, and soil invertebrates. Terrestrial flora and fauna potentially using NAS Whiting Field are identified in the GIR (ABB-ES, 1997). Aquatic receptors are not evaluated in the ERA because no aquatic habitats exist at Site 18.

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, 1997). Observations made during the ecological survey of NAS Whiting Field indicate that no State or federally listed rare, threatened, or endangered species or species of concern are know to inhabit Site 18 (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



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

* Shading indicates the exposure pathways that are quantitatively evaluated for receptors in the Site 18 ERA. Nonshaded pathways are not evaluated because they are not considered significant pathways.

FIGURE 7-2
SITE 18, CONTAMINANT PATHWAY MODEL FOR ECOLOGICAL RECEPTORS

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2524-09 FIG 7-2 (SITE 18) FINAL 011298MAW

ingestion, dermal adsorption, and inhalation of fugitive dust and volatile emissions. Although terrestrial wildlife may also be exposed to surface water in the depressions of the burn pits, this pathway was not evaluated because surface water samples were not collected from these areas. The drinking water exposure pathway is expected to occur only occasionally following a period(s) of heavy rain. Therefore, only exposures to surface soil and potentially contaminated food are evaluated in the Site 18 ERA.

Dermal adsorption is considered to be a negligible exposure pathway because the presence of fur, feathers, or chitinous exoskeleton is likely to prevent contamination from coming in direct contact with the skin (personal communication [Simon, 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 18 would limit the release of fugitive dust. Although VOCs were detected in the surface soil of Site 18, exposures associated with VOCs are not evaluated because burrowing animals are not expected to occur at Site 18 due to the previous fire-training activities, frequent mowing, and the spreading of the burn pit berm. In addition, burrowing animals were not observed at Site 18 during the site characterization.

Potential contaminant exposures for reptiles and adult amphibians exist at NAS Whiting Field; however, ingestion toxicity data and bioaccumulation factors (BAFs) 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 Uncertainty Analysis 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 18 surface soil. Because the depth to groundwater is 80 feet bls, it is unlikely that terrestrial plants are exposed to contamination in groundwater where the roots reach a zone of saturation.

7.2.3 Identification of Endpoints The assessment and measurement endpoints selected for the Site 18 ERA are listed in Table 7-1. Assessment endpoints 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 18 ERA is the survival and maintenance of receptor populations and communities at Site 18. The measurement endpoints used to gauge the likelihood of population- and community-level effects are chemical-specific toxicological benchmark values derived from the literature that are based on laboratory-measured survival, growth, and reproductive effects. 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).

Three hypotheses were developed to gauge potential risks associated with exposure to Site 18 surface soil. These hypotheses are designed for multiple species and

Table 7-1
Endpoints Selected for Ecological Risk Assessment, Site 18

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Assessment Endpoint	Receptor	Measurement Endpoint	Decision Point
Reduction in the biomass of terrestrial plants to limit the availability of cover or forage material used by small mammals and birds.	Terrestrial plants	Chemical concentrations (mg/kg) in surface soil that result in adverse effects on growth, reproduction, or survival to terrestrial plants.	The reasonable maximum exposure concentration (mg/kg) of an ECPC in surface soil is greater than the terrestrial plant RTV.
Reduction in the abundance of terrestrial invertebrates to affect foraging by small mammals and birds.	Terrestrial invertebrates	Chemical concentrations (mg/kg) in surface soil that result in adverse effects on survival (i.e., LC_{50} studies) or measured adverse effects on reproduction and growth to terrestrial invertebrates.	The reasonable maximum exposure concentration (mg/kg) in surface soil is greater than the terrestrial invertebrate RTV.
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.

Notes: mg/kg = milligrams per kilogram.
ECPC = ecological chemical of potential concern.
RTV = reference toxicity value.
LC_{50} = lethal concentration to 50 percent of a test population.
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.
HQ = hazard quotient.
> = greater than.

trophic levels and represent both individual and community dynamics. Hypotheses for the Site 18 ERA include the following:

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 ECPC concentrations in plants and invertebrates sufficiently high as to adversely affect foraging small mammal or bird populations?

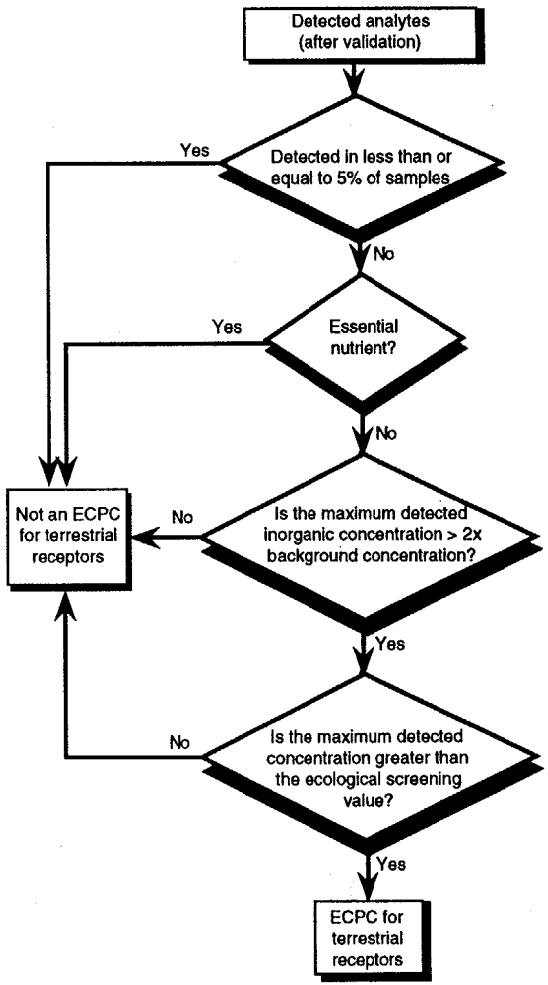
3. Are bioaccumulating chemicals sufficiently high to reduce survivability, growth, or reproduction of small mammal and bird populations?

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, 1997). Analytical data for Site 18 were evaluated for use in risk assessment pursuant to national guidance, *Guidance for Data Useability in Risk Assessment (Parts A and B)* (USEPA, 1992a).

Following the data validation step, analytes are eliminated as ECPCs if detected in 5 percent or fewer of the samples (minimum of 20 samples) analyzed. Calcium, iron, magnesium, potassium, and sodium are also 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, 1997).

A site-specific background investigation was conducted at NAS Whiting Field, and the findings are presented in Paragraph 3.3.1.1 of the GIR (ABB-ES, 1997). The site-specific background study used to establish background screening values for Site 18 consists of 11 surface soil samples (BKG-SL-01, BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKG-SL-09, BKG-SL-10, BKS00101, BKS00201, BKS00401, and BKS00501) and two duplicate samples (BKG-SL-09A and BKS00201D) collected from Troup loamy and Lakeland soils.

Inorganic chemicals representative of background conditions are not selected as ECPCs. In accordance with USEPA Region IV guidance (USEPA, 1991b), an inorganic analyte is not selected as an ECPC if the maximum detected concentration is less than two 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. Analytes that 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.



NOTES:
NAS = Naval Air Station
ECPC = ecological contaminant of potential concern
> = greater than
x = times
% = percent
Terrestrial receptors include wildlife, plants, and soil invertebrates.

FIGURE 7-3
SITE 18, ECOLOGICAL CONTAMINANT OF POTENTIAL CONCERN SELECTION PROCESS

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Forty-seven surface soil samples (18-SL-01 through 18-SL-47 and five duplicates) were collected at Site 18 in August 1992 at locations within the 11 burn pits and other areas (Areas A-K; Figure 3-1) associated with the former firefighting training activities. Surface soil samples collected from 18-SL-01 through 18-SL-47 were analyzed for VOCs, SVOCs, pesticides and PCBs, inorganics, and TRPH, while sample 18-SL-01DUP was analyzed for TRPH only. The 47 locations were selected based on areas of visibly stained soil, high OVA readings, and/or proximity to areas of likely contamination. It should be noted that this method of selecting sampling locations is likely to result in a data set that is biased toward the highest or worst-case exposure concentrations and may not be representative of the entire area of Site 18. This may also result in over-estimation of potential ecological risk.

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 18 include seven VOCs (2-butanone, acetone, carbon disulfide, ethylbenzene, methylene chloride, toluene, and xylenes), five SVOCs (2-methylnaphthalene, naphthalene, phenanthrene, pyrene, and bis(2-ethylhexyl)phthalate), seven inorganic analytes (barium, cadmium, copper, lead, manganese, nickel, and zinc), and TRPH.

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 subsections briefly describe how contaminant exposures are estimated or measured for wildlife, terrestrial plants, and invertebrates at Site 18. The contaminant pathway model (Figure 7-2) provides a summary of the potential exposure pathways that exist at Site 18 for each group of receptors. Additional detail regarding the exposure assessment is provided in the GIR (ABB-ES, 1997).

7.4.1 Calculation of EPCs The EPC is a representative concentration used for evaluating risks throughout this ERA. RME and CT concentrations are derived for each ECPC. If the sample size is greater than or equal to 10, the RME value is equal to the lesser of the maximum detected concentration and the 95th percent UCL calculated on the log-transformed arithmetic mean (USEPA, 1992c). 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.

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 mg/kg 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, 1997).

Table 7-2
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 18

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentration[3]	Background Screening Concentration	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of all Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Volatile Organic Compounds (µg/kg)											
2-Butanone	6/47	11 to 1,500	17 to 1,700	326	ND	NA	Yes	109	104	109	104
Acetone	2/47	11 to 1,500	340 to 765*	553	ND	NA	Yes	262	118	262	118
Carbon disulfide	8/47	5 to 740	1 to 183*	26.2	ND	NA	Yes	47.5	40.2	47.5	40.2
Ethylbenzene	10/47	5 to 690	15 to 800	239	ND	50	Yes	77.5	54.8	77.5	54.8
Methylene chloride	5/47	5 to 740	33.5* to 86	60.2	ND	NA	Yes	122	52.8	86	52.8
Toluene	11/47	5 to 740	1 to 390	107	ND	50	Yes	48.9	36.4	48.9	36.4
Xylenes (total)	31/47	5 to 690	1 to 7,000	618	ND	50	Yes	1,366	409	1,366	409
Total Recoverable Petroleum Hydrocarbons (TRPH) (mg/kg)											
TRPH	39/48	1.7 to 1.9	2.9 to 23,500	6,226	ND	NA	Yes	6,970	5,058	6,970	5,058
Semivolatile Organic Compounds (µg/kg)											
2-Methylnaphthalene	9/47	350 to 20,000	1,475* to 33,000	14,147	ND	NA	Yes	6,974	3,486	6,974	3,486
Benzo(a)anthracene	1/47	350 to 20,000	3,025* to 3,025*	3,025	ND	NA	No[11]				
Benzo(a)pyrene	1/47	350 to 20,000	2,975* to 2,975*	2,975	ND	100	No[11]				
Chrysene	1/47	350 to 20,000	3,075* to 3,075*	3,075	ND	NA	No[11]				
Fluoranthene	1/47	350 to 20,000	4,125* to 4,125*	4,125	ND	100	No[11]				
Fluorene	1/47	350 to 20,000	440 to 440	440	ND	NA	No[11]				
Naphthalene	9/47	350 to 20,000	990 to 8,000	4,354	ND	100	Yes	2,697	1,494	2,697	1,494

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 18

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentration[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]
Semivolatile Organic Compounds (µg/kg) (Continued)											
Phenanthrene	3/47	350 to 20,000	120 to 2,200	1,017	ND	100	Yes	2,465	1,470	2,200	1,470
Pyrene	3/47	350 to 20,000	1,515* to 6,950*	3,522	ND	100	Yes	2,392	1,434	2,392	1,434
bis(2-Chloroethoxy)methane	1/47	350 to 20,000	440 to 440	440	ND	NA	No[11]				
bis(2-Ethylhexyl)phthalate	15/47	350 to 20,000	56 to 4,850*	818	80.3	NA	Yes	2,807	1,498	2,807	1,498
Inorganic Analytes (mg/kg)											
Aluminum	47/47	40 to 40	1,510 to 10,300*	3,996	13,500	NA	No[13]				
Antimony	5/47	2.6 to 12	3.2 to 5.9*	4.4	8	NA	No[13]				
Arsenic	35/47	0.22 to 2	0.24 to 2.65*	0.69	2.6	20	No[12]				
Barium	47/47	40 to 40	2.5 to 277.5*	26.5	18.8	200	Yes	32.8	26.5	32.8	26.5
Beryllium	23/47	0.05 to 1	0.05* to 0.11	0.07	0.36	NA	No[13]				
Cadmium	23/47	0.58 to 1	0.6* to 38.8	6.1	0.98	1	Yes	3.7	3.1	3.7	3.1
Calcium	36/47	1,000 to 1,000	63 to 1,050	196	446	NA	No[14]				
Chromium	47/47	2 to 2	1.5 to 52.95*	9	10	100	No[12]				
Cobalt	29/47	0.34 to 10	0.4 to 5.45*	1.2	2.8	20	No[12]				
Copper	44/47	5 to 5	1.8 to 521*	37.8	8	50	Yes	42.1	35.5	42.1	35.5
Iron	47/47	20 to 20	1,140 to 46,650*	4,229	7,744	NA	No[14]				
Lead	43/47	1 to 1	3.2 to 164*	34.1	10.2	50	Yes	83.9	31.3	83.9	31.3
Magnesium	47/47	1,000 to 1,000	33.8 to 587.5*	116	224	NA	No[14]				
Manganese	47/47	3 to 3	12.1 to 383*	57	324	NA	Yes	70.1	57	70.1	57

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 18

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentration[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) (Continued)											
Mercury	14/47	0.01 to 0.12	0.05* to 0.19	0.09	0.12	0.5	No[12]				
Nickel	23/47	2.3 to 8	2.5 to 12.15*	4.6	6.8	NA	Yes	3.6	3	3.6	3
Potassium	32/47	129 to 1,000	138 to 2,895*	351	177	NA	No[14]				
Silver	1/47	0.32 to 2	0.35 to 0.35	0.35	0.7	NA	No[13]				
Sodium	36/47	1,000 to 1,000	137 to 401*	196	382	NA	No[14]				
Thallium	1/47	0.34 to 2	0.53 to 0.53	0.53	1.16	NA	No[13]				
Vanadium	46/47	10 to 10	2.4 to 12.1	5.1	19	NA	No[13]				
Zinc	39/47	4 to 4	4.3 to 552.5*	52.2	15.8	200	Yes	61.6	43.6	61.6	43.6

[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 contaminants of potential concern).
[5] The ecological screening values are the Dutch Soil Criteria "A" 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 UCL is calculated on the log-transformed average of all samples using the formula provided in the U.S. Environmental Protection Agency (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, 1992c)
[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 RME concentration is equal to the lesser of the maximum detected concentration and the 95th percent UCL.

Notes continued on following page.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 18

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[10] The CT exposure point concentration is equal to the lesser of the average of all samples and the maximum exposure point concentration.
[11] The analyte was detected in less than 5 percent of the samples and was not detected in any other media.
[12] The maximum detected concentration is less than the ecological screening value.
[13] The maximum detected concentration is less than the background screening concentration.
[14] 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: 18-SL-01 through 18-SL-47.
Duplicate samples: 18-SL-01A, 18-SL-01DUP (TRPH only), 18-SL-10A, 18-SL-23A, 18-SL-31A, 18-SL-37A, and 18-SL-39DUP (TRPH only).
Background samples: SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, and BKG-SL-09.
Background duplicate samples: BKG-SL-09A and BKS00201D.

* = average of a sample and its duplicate.
UCL = upper confidence limit, see footnote 7.
μg/kg = micrograms per kilogram.
NA = not available.
ND = not detected in any background sample.
mg/kg = milligrams per kilogram.
% = percent.
RME = reasonable maximum exposure.
CT = central tendency.

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 (ECPCs) when the sample size is ≤ 9, and the lesser of the maximum detected concentration or the 95th percent upper confidence limit (UCL) when the sample size is ≥ 10.
Soil Exposure Concentration:	$\text{Soil Exposure (mg/kg)} = (\text{\% of Diet as Soil} \times \text{Soil Concentration (mg/kg)})$
Primary Prey Item Concentration ([1]):	$\text{Primary Prey Item Concentration (mg/kg)} = (BAF_{inv\ or\ plant} \times \text{Soil Concentration (mg/kg)})$
Secondary Prey Item Concentration ([2]):	$\text{Secondary Prey Item Concentration (mg/kg)} = (BAF_{mam\ or\ bird} \times \text{Tissue Concentration of Prey Items* (mg/kg)})$

where BAF = Bioaccumulation Factor (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, 1997).

See notes at end of table.

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

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Estimation of Chemical Exposures Related to Surface Soil

Total Exposure Related to Surface Soil:

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

where PDE = Potential Dietary Exposure (mg/kg BW-day),
P_N = percent of diet composed of food item N,
T_N = tissue concentration in food item N (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.

[1] Primary prey contain site-related chemicals in their tissues as a result of direct ingestion of contaminated media (i.e., plants, earthworms, etc.).
[2] Secondary prey contain site-related chemicals as a result of ingestion of primary prey food items. Secondary prey do not directly consume contaminated media as a food source.

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

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 respective to their position in the food chain. Terrestrial receptors were chosen to represent the trophic levels typically found in maintained grassy areas and disturbed overgrown field habitat present at Site 18. 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 18.

- **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 home range for the short-tailed shrew is estimated at 0.96 ± 0.09 acres. The shrew represents small omnivorous mammals that may be found in the old field portions of Site 18.

- **Mourning dove** (*Zenaida macroura*). The mourning dove forages by ground-gleaning in railroad right-of-ways, roadsides, and open fields with scattered shrubs and trees. It feeds almost entirely on seeds; however, it is also known to eat occasional insects, snails, and gravel to facilitate seed digestion (Terres, 1980). The mourning dove nests in a variety of man-made structures, and its estimated home range is 5 acres. The dove represents herbivorous avian receptors found in the open areas of Site 18.

- **Red fox** (*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. Although the occurrence of predatory animals is expected to be minimal at Site 18, the red fox may feed on species that have been exposed to affected media at Site 18.

- **Red-tailed hawk** (*Buteo jamaicensis*). The red-tailed hawk forages in open country, frequently on woodland edges, feeding primarily on small mammals. It will also consume invertebrates, reptiles, and small birds in the diet. Red-tailed hawks are year-round residents in the Southeast and are frequently seen perched adjacent to open fields (DeGraaf and Rudis, 1986). Although the occurrence of this species is expected to be minimal at Site 18, the hawk may reside in adjacent forested areas and feed on species that have been exposed to affected media at Site 18.

Table 7-4
Ecological Receptors Evaluated For Surface Soil

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Receptor Evaluated		Method of Evaluation
Common Name	Scientific Name	
Terrestrial plants	NA	Benchmark comparison
Terrestrial invertebrates	NA	Benchmark comparison
Cotton mouse	*Peromyscus gossypinus*	Food-web model
Short-tailed shrew	*Blarina brevicauda*	Food-web model
Mourning dove	*Zenaida macroura*	Food-web model
Red fox	*Vulpes vulpes*	Food-web model
Red-tailed hawk	*Buteo jamaicensis*	Food-web model

Note: NA = not applicable.

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 18 are provided in Table 7-5 and Table E-6 of Appendix E. 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 18 (approximately 5 acres) is larger than the home range for the cotton mouse and short-tailed shrew, approximately equivalent to the home range for the mourning dove, and smaller than the home range for the red fox and red-tailed hawk. 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 and the methodologies described in Subsection 2.4.3 of the GIR (ABB-ES, 1997).

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 18 is summarized in Table 7-6.

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 and snails, fungi, insects, and vegetation. [c]	78% Invertebrates 12% Plants 10% Soil [c]	0.0024 [e]	0.96 ± 0.09 [c]
Mourning dove (*Zenaida macroura*)	0.13 [h]	Mostly seeds and some insects. [h]	1% Invertebrates 94% Plants 5% Soil [h]	0.0154 [i]	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]
Red-tailed hawk (*Buteo jamaicensis*)	1.02 [i]	Primarily small mammals; also birds, snakes, turtles, frogs, crickets, beetles, crayfish, and carp. [c]	70% Small mammals 27% Small birds 3% Soil [c]	0.113 [i]	800 [c]

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] *Wildlife Exposure Factors Handbook* (USEPA, 1993b).
[d] Deer mouse value 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] 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).

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

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 was 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 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 was 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 was 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 was assumed that small birds do not accumulate VOCs.

See notes at end of table.

Table 7-6 (Continued)
Estimation of Bioaccumulation Factors

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[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.
log K_{ow} = logarithmic expression of the octanol-water partition coefficient.
< = less than.
SVOC = semivolatile organic compound.

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). With the exception of cadmium, BAFs for avian species were not available. BAFs for each of the ECPCs evaluated at Site 18 are included in Table E-1 of Appendix E.

7.4.3 Terrestrial Plants and Invertebrates 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 18 surface soil. For the purposes of the Site 18 ERA, exposures to terrestrial plants and invertebrates are assumed to occur within the top 1-foot interval of surface soil. Exposure of terrestrial plants to groundwater is not evaluated because the depth to the water table is approximately 80 feet bls (see hydrogeological discussion in Chapter 5.0 of this report).

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 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, 1997).

Wildlife receptors, terrestrial plants, and terrestrial invertebrates are potentially exposed to ECPCs in surface soil at Site 18. 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 limited habitat present at Site 18. 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 E, Table E-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, 1997b). 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 following

data hierarchy discussed in bullet items 1, 2, and 3, while sublethal RTVs are derived using the methodology discussed in bullet items 1 and 2:

- The highest exposure level that is a no-observed-adverse-effect level (NOAEL) is selected as the RTV for ECPC(s) with well-documented adverse effects.

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

- If NOAEL or LOAEL values are not available, the lowest reported oral dose (in mg/kg body weight-day) lethal to 50 percent of a test population (LD_{50}) 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 E-3 of Appendix E.

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 Uncertainty Analysis section (Section 7.7).

<u>7.5.2 Terrestrial Plants and Invertebrates</u> The assessment endpoints selected for terrestrial plants and soil invertebrates are reduction in the biomass of terrestrial plants and abundance of soil invertebrates used as forage material. Site-specific toxicity data for plants and invertebrates are not available for Site 18; therefore, the results of toxicity studies from the literature that relate the soil concentrations of a contaminant with adverse effects to growth, reproduction, or survival of a test population are used as a measure of the assessment endpoint. These study results are summarized for each ECPC in Appendix E, Tables E-4 (plants) and E-5 (invertebrates).

<u>7.6 RISK CHARACTERIZATION</u>. This section presents the risk characterization for ecological receptors exposed to affected surface soil at Site 18. Potential risks associated with exposures to ECPCs in surface soil at Site 18 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 less than 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 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, 1989b). 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 E-6 through E-11 of Appendix E present the HQ and HI calculations. A summary of risks to representative wildlife receptors is provided in Table 7-7.

Summary HIs for predatory wildlife receptors (e.g., red fox and red-tailed hawk) exposed to RME concentrations of ECPCs for both lethal and sublethal effects were less than 1; therefore, risks are not predicted for these receptors.

Lethal risks are predicted for the short-tailed shrew based on both the RME and CT exposure concentrations from Site 18. The lethal HIs for the short-tailed shrew exceed 1 based on the RME (HI = 6.8) and CT (HI = 2.3) exposure concentrations. The primary contributors to the lethal HI are lead, barium, and zinc. Although the RME HI for the cotton mouse slightly exceeds 1 (HI = 1.4), it is unlikely that population-level effects to the cotton mouse will result from exposure to surface soil from Site 18. CT exposure concentrations from Site 18 surface soil result in an HI of 0.73 for the cotton mouse.

Sublethal risks are predicted for the cotton mouse, short-tailed shrew, and the mourning dove based on both RME and CT exposure concentrations from Site 18. The sublethal HIs for cotton mouse (RME HI = 13 and CT HI = 7.9), short-tailed shrew (RME HI = 50 and CT HI = 16), and the mourning dove (RME HI = 14 and CT HI = 12) are well above 1 based on both the RME and CT exposure concentrations. The primary contributors to the sublethal HI for the cotton mouse and the short-tailed shrew are lead, cadmium, and copper; the primary contributor for the

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

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Ecological Receptors	Lethal Effects from Exposure to Reasonable Maximum EPCS	Lethal Effects from Exposure to Central Tendency EPCs	Sublethal Effects from Exposure to Reasonable Maximum EPCs	Sublethal Effects from Exposure to Central Tendency EPCs
Cotton mouse	1.4	0.73	13	7.9
Mourning dove	0.042	0.0078	14	12
Short-tailed shrew	6.8	2.3	50	16
Red fox	0.0024	0.01	0.19	0.031
Red-tailed hawk	0.00071	0.000063	0.08	0.14

[1] The information is a summary of the HIs presented in Tables E-6 through E-12 of Appendix E.

Notes: EPC = exposure point concentration.
HI = Hazard Index.

mourning dove is cadmium. In addition, barium and zinc are also contributors to sublethal risks predicted for the short-tailed shrew.

The results of the food web modeling suggest that risks to small mammals and birds associated with ingestion of inorganic constituents in the surface soil may occur. However, given the relative lack of ecological habitat at Site 18, it is expected that the occurrence of these receptors would be minimal. In addition, the openness of Site 18 would also preclude small mammals and birds from exclusively foraging in this area due to increased risk of predation.

7.6.2 Terrestrial Plants Risks for terrestrial plants are evaluated by comparing the selected phytotoxicity RTVs to the RME and CT exposure concentrations. The results of this comparison are summarized in Table 7-8. Phytotoxicity benchmarks are not available for 2-butanone, acetone, carbon disulfide, and TRPH.

RME concentrations of cadmium, lead, and zinc only slightly exceed their respective phytotoxicity benchmarks. All CT exposure concentrations are less than the phytotoxicity RTVs, with the exception of cadmium, which has a CT exposure concentration (3.1 mg/kg) that is approximately equivalent to the 3.0 mg/kg benchmark value. With the exception of areas of sparse vegetation in the burn pits, the majority of the site is vegetated with various herbaceous species. The sparsely vegetated areas in the burn pits are likely the result of physical disturbance to the surface caused by fire, rather than direct contact with ECPCs in surface soil. As previously discussed, sample locations were selectively biased toward areas of suspected contamination and may not be representative of the entire area. It is unlikely that the assessment endpoint including plant biomass and/or plant cover would be reduced over the entire area of Site 18 such that small mammal and bird populations would be affected.

7.6.3 Terrestrial Invertebrates. Risks for terrestrial invertebrates are evaluated by comparing invertebrate toxicity benchmark values to RME and CT exposure concentrations. The results of this evaluation for Site 18 surface soil are also presented in Table 7-8. Invertebrate toxicity benchmark values are not available for 2-butanone, acetone, carbon disulfide, barium, manganese, and TRPH.

RME (42.1 mg/kg) and CT (35.5 mg/kg) exposure concentrations for copper slightly exceed its invertebrate toxicity benchmark of 30 mg/kg. Other than copper, which only marginally exceeds its respective RTV, all RME concentrations are well below their respective invertebrate toxicity benchmark values. It is, therefore, unlikely that the assessment endpoint including invertebrate biomass and/or abundance would be reduced over the entire area of Site 18 such that small mammal and bird populations would be affected.

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, 1997).

Specific uncertainties associated with exposure to surface soil at Site 18 include the following:

Table 7-8
Summary of Ecological Risk for Plants and Invertebrates in Surface Soil at Site 18

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Analyte	Exposure Point Concentrations[1]		RTV		RTV Exceeded?[3] (by RME/by CT)	
	RME	CT	Plant[2]	Invertebrate[2]	Plant	Invertebrate
Volatile Organic Compounds (mg/kg)						
2-Butanone	0.109	0.104	NA	NA	NA/NA	NA/NA
Acetone	0.262	0.118	NA	NA	NA/NA	NA/NA
Carbon disulfide	0.0475	0.0402	NA	NA	NA/NA	NA/NA
Ethylbenzene	0.0775	0.0548	200	21	No/No	No/No
Methylene chloride	0.086	0.0528	1,000	150	No/No	No/No
Toluene	0.0489	0.0364	200	21	No/No	No/No
Xylenes (total)	1.366	0.409	1,000	21	No/No	No/No
Semivolatile Organic Compounds (mg/kg)						
2-Methylnaphthalene	6.974	3.486	25	34	No/No	No/No
Naphthalene	2.697	1.494	100	34	No/No	No/No
Phenanthrene	2.2	1.47	25	34	No/No	No/No
Pyrene	2.392	1.434	25	34	No/No	No/No
bis(2-Ethylhexyl)phthalate	2.807	1.498	1,000	478	No/No	No/No
Inorganic Analytes (mg/kg)						
Barium	32.8	26.5	500	NA	No/No	NA/NA
Cadmium	3.7	3.1	3	50	Yes/Yes	No/No
Copper	42.1	35.5	100	30	No/No	Yes/Yes
Lead	83.9	31.3	50	1,190	Yes/No	No/No
Manganese	70.1	57	500	NA	No/No	NA/NA
Nickel	3.6	3.0	30	400	No/No	No/No
Zinc	61.6	43.6	50	130	Yes/No	No/No

See notes at end of table.

Table 7-8 (Continued)
Summary of Ecological Risk for Plants and Invertebrates in Surface Soil at Site 18

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Exposure Point Concentrations[1]		RTV		RTV Exceeded?[3] (by RME/by CT)	
	RME	CT	Plant[2]	Invertebrate[2]	Plant	Invertebrate
Total Recoverable Petroleum Hydrocarbons (TRPHs) (mg/kg)						
TRPHs	6,970	5,058	NA	NA	NA/NA	NA/NA

[1] Exposure point concentrations (EPCs) are presented in Table 7-2. The RME EPCs are equal to the lesser of the maximum detected concentration and the 95 percent upper confidence limit. CT EPCs are equal to the mean of all concentrations. When the mean is greater than the RME EPC, the maximum EPC is used.
[2] Plant and invertebrate RTVs are presented in Appendix E, Tables E-4 and E-5, respectively. Generally, the plant RTVs are the lowest observed effect concentration from among growth studies on plants in solid media, and invertebrate RTVs are the lowest concentration lethal to 50 percent of a test population (14-day soil test on *Eisenia foetida*) from among chemicals in the same chemical class (applies to organic compounds). A conservative factor of 0.2 was applied to invertebrate RTVs; the resultant value should be protective of 99.9 percent of the population from acute effects (Neuhauser et al., 1986).
[3] Comparison shown is RME EPC to RTV/CT EPC to RTV.

Notes: Shading indicates exceedances.

RME = reasonable maximum exposure.
CT = central tendency.
RTV = reference toxicity value.
mg/kg = milligrams per kilogram.
NA = not available.
TRPH = total recoverable petroleum hydrocarbon.

- Surface soil sampling locations were selected based on the presence of burn pit areas, visual observations of stained soil, and elevated OVA readings. As shown on Figure 3-1, surface soil samples were not collected from the grassy maintained area outside of the burn pits; therefore, the data set may be biased high and not representative of the entire area of Site 18. Consequently, risks to ecological receptors may be overestimated.

- Although selected as an ECPC for surface soil, TRPH was not evaluated in the ERA because toxicological benchmarks are not available. TRPH was detected in 38 of 47 locations at concentrations ranging from 2.9 to 23,500 mg/kg. It is believed that detected concentrations of TRPH are the result of JP-5 fuel used during the fire-training activities at Site 18. JP-5 fuel is primarily composed of aliphatic hydrocarbons and other lightweight volatile constituents. It is expected that the more toxic aliphatic hydrocarbons are no longer present in the surface soil (due to volatilization) leaving a residue of heavier-weighted constituents that are less toxic to ecological receptors. Although low molecular weight constituents including naphthalene and 2-methylnaphthalene were detected in the surface soil, the results of the ERA suggest that these constituents do not pose risk for ecological receptors. Therefore, 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 TRPH in the surface soil of Site 18 pose a risk to ecological 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 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.

- Site-specific toxicity data for Site 18 surface soil are not available. Phytotoxicity and invertebrate benchmark values used in the risk assessment were designed for risk screening purposes only and may not be relevant to the specific conditions of the surface soil at Site 18. The conservative nature of these screening tools may overestimate the actual risk to terrestrial plants and invertebrates at Site 18. However, phytotoxicity and invertebrate benchmark values for several analytes are not available, potentially resulting in an underestimation of risk.

- The wildlife food web model conservatively assumes that all representative wildlife species actively forage at the site year round; however, the actual presence of these receptors at Site 18 is expected to be minimal given the lack of ecological habitat.

- Because plant and invertebrate BAFs for some chemicals are not available, the chemical concentrations in plant and/or invertebrate tissues for these chemicals have not been calculated. Therefore, the potential dietary exposure model may underestimate secondary prey tissue concentrations for some chemicals that were derived using ingestion of plants and/or invertebrates. This underestimating of the top predator tissue concentration may result in an underestimation of the hazard quotient in top predators like foxes and hawks.

7.8 SUMMARY OF ECOLOGICAL ASSESSMENT FOR SITE 18. Potential risks for ecological receptors including terrestrial wildlife, terrestrial plants, and soil invertebrates were evaluated for ECPCs in surface soil at Site 18.

Risks associated with exposures to ECPCs in Site 18 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. Risks to small mammals and birds associated with ingestion of lead, cadmium, and copper in surface soil and food items were identified; however, given the relative lack of ecological habitat at Site 18, it is expected that the occurrence of these receptors would be minimal. Therefore, reductions in the survivability, growth, or reproduction of small mammal and bird populations associated with exposure to ECPCs in Site 18 surface soil are not expected to occur.

Summary HIs for all representative wildlife species exposed to RME concentrations of ECPCs for lethal effects were less than 1; therefore, no risks related to survival are predicted for these receptors.

Sublethal HIs for the predatory wildlife receptors (e.g., red fox and red-tailed hawk) exposed to RME and CT concentrations of ECPCs in surface soil were less than 1; therefore, sublethal risks are not predicated for these receptors. Sublethal risks are predicted for the cotton mouse, short-tailed shrew, and mourning dove based on both RME and CT exposure concentrations from Site 18 surface soil. The sublethal HIs for the cotton mouse (RME HI = 7.5 and CT HI = 6.3), mourning dove (RME HI = 14 and CT HI = 11), and short-tailed shrew (RME HI = 2.6 and CT HI = 2.1) exceed 1. Cadmium is the primary contributor to sublethal risks to representative wildlife species from exposure to surface soil.

Risks to terrestrial plants and soil invertebrates were evaluated by comparing exposure concentrations for surface soil with toxicity benchmark values. Based on this comparison, the RME concentrations for cadmium, lead, and zinc slightly exceed the phytotoxic RTV, indicating the possibility for adverse effects on growth, reproduction, or survival to terrestrial plants. However, except for cadmium, the central tendency concentration was less than the phytotoxicity RTVs, suggesting that any adverse effects to terrestrial plants would be on a localized scale. Also, cadmium was the only ECPC that exceeded an invertebrate RTV. Both

the RME and CT exposure concentration exceeded the invertebrate benchmark value. Because the surface soil sampling was biased toward the burn pits, the areas believed to be most heavily contaminated, it is unlikely that plant or soil invertebrate biomass or plant cover availability would be reduced over the entire area of Site 18 such that small mammal or bird populations would be affected.

In summary, the results of the ERA suggest that the assessment endpoints discussed in Subsection 7.2.3 (i.e., reduction in small mammal and bird populations, reduction in the biomass of plant/invertebrates, or reduction of plant cover availability) are not expected to be impacted at Site 18.

8.0 CONTAMINANT FATE AND TRANSPORT

This chapter discusses the fate and transport of human health and ecological chemicals of potential concern detected in soil and groundwater samples at Site 18. Fate, in the context of this chapter, refers to the ultimate disposition of a given chemicals of potential concern 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 18. 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 18. 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 18. Subsection 8.2.3 discusses contaminant transport for Site 18.

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, complexation, precipitation or co-precipitation, 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 co-solvents. For metals

and other inorganic parameters, solubility is generally controlled by chemical speciation, pH, 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 complexing 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 Co-Precipitation. Both chemical precipitation and co-precipitation are important removal mechanisms, particularly for metals and metallo-cyanides in the environment. Precipitation and/or co-precipitation 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 the environmental mobility of a metal 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 as 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 18 Chemicals of Potential Concern This section discusses the persistence and fate characteristics for chemicals of potential concern detected at Site 18. To focus the discussion of persistence and fate characteristics, only those constituents that were (1) identified by the HHCPCs or ECPCs (presented in Chapters 6.0 and 7.0, respectively) as chemicals of potential concern and (2) those constituents that were present above relevant standards will be addressed. These constituents are summarized below by medium for Site 18.

Human Health Assessment Constituents

- Surface soil: No VOCs, SVOCs, pesticides or PCBs, however, there are TRPH and 6 inorganics (arsenic, cadmium, chromium, copper, iron, and manganese)
- Subsurface soil: TRPH
- Groundwater: none selected

Ecological Assessment Constituents

- Surface soil: seven VOCs (2-butanone, acetone, carbon disulfide, ethylbenzene, methylene chloride, toluene, and xylenes); five SVOCs [2-methylnaphthalene, naphthalene, phenanthrene, pyrene, bis(2-ethylhexyl)phthalate] and TRPH; no pesticides or PCBs, and seven inorganics (barium, cadmium, copper, lead, manganese, nickel, and zinc).

- Subsurface soil: none selected
- Groundwater: none selected

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

Inorganics. Aluminum is the third most common element in the environment, though 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 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 co-precipitation (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 co-precipitation) 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 in either sediments (in stream beds or lakes) or in the oceans. Eh and pH conditions largely govern the fate of arsenic (USEPA, 1979).

Chromium is present in minerals predominantly as Cr^{3+}. Dissolved chromium may be present as trivalent cations or as anions in which the oxidation state is Cr^{6+} (hexavalent). Six different ionic forms of chromium are considered to be stable in aqueous systems. The reduced forms are Cr^{3+}, $CrOH^{2+}$, $Cr(OH)_2^+$, and $Cr(OH)_4^-$. Anionic forms present under oxidizing conditions include dichromate $Cr_2O_7^{2-}$ and chromate CrO_4^{2-}. The dissolved forms that predominate in reduced systems between pH 5 and pH 9 probably are $CrOH^{2+}$ and $Cr(OH)_2^+$. Concentrations of chromium in natural waters that have not been affected by waste disposal are commonly less than 10 $\mu g/\ell$ (Hem, 1992).

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 fulvic and humic acids. Aerated or flowing water with a pH in the range of 6.5 to 8.5 should contain little dissolved iron.

Vanadium commonly exists in the V^{3+}, V^{4+}, and V^{5+} valence states. Its aqueous chemistry is quite complex, but overall concentrations seem to be controlled more by availability of a vanadium source, rather than equilibrium considerations. Bioconcentration of vanadium by vegetation has been reported by several researchers.

8.2.3 Transport of Contaminants This section discusses the transport of chemicals in various media at Site 18. All media, surface soil, subsurface soil, surface water, sediment, and groundwater will be discussed.

Surface Soil. Transport of the chemicals of potential concern 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 chemicals of potential concern are transported to other media. Transport of the chemicals of potential concern from soil via wind is not expected to be a major transport mechanism because of the heavy vegetation present at Site 18. 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 18, human activity is not a major transport mechanism for the chemicals of potential concern in soils. This condition may change based on the future use of Site 18.

Water can cause the transport of soil and, therefore, the chemicals of potential concern 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 chemicals of potential concern in soil at Site 18 because of (1) the low grade (slope) of the land surface at the site, (2) the heavy 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 18 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 18. Currently, transport of the chemicals of potential concern at Site 18 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 18, and (4) the tendency of the surface soil contaminants at the sites to remain attached to clays in the soil.

When Site 18 was an active fire-training area, transport of the chemicals of potential concern via surface water runoff may have been a more significant means of contaminant transport. Because training pits were open to rainfall during their operation, it is possible that intense precipitation could have caused the pits to overflow. Transport of the chemicals of potential concern via surface water runoff is not considered important now that the site is inactive and vegetated.

Sediment. The transport of sediment at Site 18 by the action of humans is not currently a significant transport mechanism, as very little human activity occurs in the grassy field. Transport of sediment in water during heavy rain events (by

saltation, traction, and suspension) is not a likely means of sediment transport at Site 18.

Groundwater. As discussed in Section 5.5, the observed concentrations of the inorganics in unfiltered groundwater at Site 18 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 Site 18. 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 18.

Hydrogeology at Site 18 is discussed in Section 5.2 of this report. The aquifer present at the site is the surficial (sand-and-gravel) aquifer. The chemicals of potential concern identified for groundwater are associated with the surficial aquifer system. Recharge of the surficial aquifer at Site 18 occurs primarily by rainfall on the site and in the area north of the site. Groundwater flow direction in the surficial aquifer at Site 18 is primarily to the south-southwest. Clear Creek acts as a point of discharge approximately 3,000 feet southwest of the site.

Hydraulic data from the well cluster (WHF1-1 and WHF1-1S) located approximately 2,000 feet northwest of Site 18 indicate that vertical gradient in the general area is downward. The upper (approximately) 100 feet of material is a sand with varying amounts of silt and clay and should probably act as a single hydraulic unit.

Horizontal hydraulic gradient estimates have been developed for the Site 18 area. The gradient was calculated for eight separate periods between September 1993 and November 1996 and averaged for each period (Table 5-2). The average hydraulic gradient in the surficial aquifer for all eight periods is 0.0039 ft/ft in a south-southwest direction.

Hydraulic conductivity testing was not successful on monitoring well WHF-18-2; however, testing completed on nearby monitoring wells WHF1-1S, WHF-2-1, and WHF-17-2 provide an average hydraulic conductivity value for the area to the north and west of 11.43 ft/day (Table 5-4).

Horizontal groundwater seepage velocity calculations have been completed for the surficial aquifer system at Site 18 using available hydraulic information (Section 5.2). A seepage velocity of 62 ft/yr was calculated using the horizontal gradient 0.0049 ft/ft, the average hydraulic conductivity (11.43 ft/day) from monitoring wells located in Sites 1, 2, and 17, (Table 5-5), and an estimated effective porosity of 0.35. Disposal activities at Site 18 may have begun releasing contaminants to the aquifer approximately 50 years ago. Using the seepage velocity calculated above and a 50-year time frame, the total distance of potential contaminant migration was estimated to be approximately 3,100 feet.

The calculated estimate of 3,100 feet of migration relies on hydraulic conductivity values derived from slug test data from sites near Site 18. Slug tests provide a rough estimate of hydraulic conductivity that can be more accurately measured using pumping tests. If the hydraulic conductivity value used in the calculation were decreased by an order of magnitude, a total

migration of only 310 feet would be expected for the 50-year history of the site.

Clear Creek is the final point of discharge for groundwater from the surficial aquifer at Site 18. Clear Creek is located approximately 3,000 feet southwest of Site 18. Surface water and sediment samples collected during Phase I of the RI from sampling locations located upstream and downstream of the expected groundwater discharge points from Site 18 do not conclusively support any impact to surface water quality of Clear Creek from past Site 18 activities (ABB-ES, 1992b). The results of surface water and sediment sampling are presented in Technical Memorandum No. 4, Surface Water and Sediments, May 1992 (ABB-ES, 1992a) and will also be presented in the future Remedial Investigation Report for Site 39, Clear Creek Flood Plain.

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS. The following is a summary based on the RI at Site 18, Crash Crew Training Area, NAS Whiting Field.

- Organic analytes detected in surface soil samples consist of 7 VOCs, 11 SVOCs, and TRPH. Two SVOCs (benzo (a) anthracene and benzo (a) pyrene), four inorganics (arsenic, barium, copper, and iron), and TRPH exceeded Florida SCTLs or USEPA Region III RBCs residential or industrial criteria. No pesticides or PCBs were detected in the surface soil sample collected from Site 18.

- Organic analytes detected in subsurface soil samples consist of four VOCs, eight SVOCs, TRPH, and three pesticides. PCBs were not detected in the subsurface soil samples collected from Site 18. No VOCs, SVOCs, or pesticides exceeded Florida residential or industrial SCTLs or USEPA Region III industrial screening criteria. TRPH was detected in subsurface soil samples at concentrations exceeding Florida SCTLs for both residential and industrial use scenarios.

- Twenty-one inorganic analytes and cyanide were detected in the subsurface soil samples. Arsenic was detected in 12 subsurface soil samples at concentrations that exceeded the Region III RBCs and in 10 subsurface soil samples that exceed the Florida residential SCTL for arsenic. None of the other inorganics detected in samples exceeded either Federal or State industrial soil screening criteria.

- The groundwater flow direction is to the south-southwest and discharges at Clear Creek, which is located approximately 3,000 feet southwest of the site.

- No VOCs or PCBs were detected in groundwater samples collected from monitoring wells WHF-18-1, WHF-18-2, or WHF-18-3. One SVOC, bis(2-ethylhexyl)phthalate, not previously detected in Phase IIA and 18 inorganic analytes were detected in the Phase IIB groundwater samples. No inorganic analytes exceeded either State or Federal MCLs.

- The HHRA determined that exposures to chemicals detected in soil and groundwater samples at Site 18 are not likely to pose unacceptable carcinogenic risks to the receptors evaluated based on an evaluation of the samples using USEPA and Florida guidelines and target risk ranges.

- The total ELCR associated with surface soil by a hypothetical future aggregate resident (2×10^{-6}) exceeded Florida's target level of 1×10^{-6} due to arsenic. All other target exposure pathways were less than 1×10^{-6} ELCR. It is unlikely that the area will be utilized as a residential land use.

- The total RME associated with surface soil by a hypothetical future child resident exceeded USEPA's and FDEP's target HI of 1, although the CT HI did not. The HIs for all other exposure pathways evaluated were below the USEPA and FDEP target level.

- The background level of arsenic detected in surface soil at NAS Whiting Field exceeds the Florida SCTL and may result in an unacceptable carcinogenic risk. It is likely that the naturally and/or anthropogenically occurring concentrations of arsenic contribute to the FDEP target risk level exceedance. It is uncertain whether or not the concentrations of arsenic detected in Site 18 surface soil samples are related to past site operations.

- No HHCPCs were identified in groundwater; therefore, current and future exposure scenarios did not require evaluation.

- Food web modeling suggests that risks to small mammals and birds (cotton mouse, short-tailed shrew, and mourning dove) associated with ingestion of inorganic constituents may occur but would be minimal due to predation pressures limiting exclusive foraging in the open area of Site 18.

- Terrestrial plants should not be adversely affected by site-related contaminants. RME concentrations for cadmium only slightly exceed its respective phytotoxicity benchmarks; no other detected contaminants exceeded their benchmarks.

- Invertebrates should not be adversely affected by site-related contaminants. RME concentrations of site contaminants did not exceed their respective invertebrate toxicity benchmarks.

9.2 RECOMMENDATIONS. Based on the interpretation of findings from the remedial investigation activities, a focused feasibility study is recommended to address potential risk of a surface soil exposure by a hypothetical future aggregate resident. The calculated risk to a hypothetical resident (2×10^{-6}) exceeded Florida's target level due to arsenic.

10.0 PROFESSIONAL REVIEW CERTIFICATION

The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures 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 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 RI for Site 18, Crash Crew Training Area, was developed for NAS Whiting Field in Milton, Florida, and should not be construed to apply for any other purpose to any other site.

Michael J. Williams
Professional Geologist
P.G. No. 344

1/20/99
Date

REFERENCES

ABB-ES. 1992a. *Remedial Investigation and Feasibility Study, Technical Memorandum No. 4, Surface Water and Sediments, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB-ES. 1992b. *Remedial Investigation and Feasibility Study, Technical Memorandum No. 5, Groundwater Assessment, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB-ES. 1994. *Remedial Investigation and Feasibility Study, Technical Memorandum No. 3, Soil Assessment, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB-ES. 1995a. *Remedial Investigation and Feasibility Study, Technical Memorandum No. 3, Soil Assessment, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB-ES. 1995b. *Remedial Investigation and Feasibility Study, Technical Memorandum No. 2, Geological Assessment, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB-ES. 1995c. *Remedial Investigation and Feasibility Study, Technical Memorandum No. 4, Hydrogeologic Assessment, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB-ES. 1995d. *Remedial Investigation and Feasibility Study, Technical Memorandum No. 5, Groundwater Assessment, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB-ES. 1995e. *Remedial Investigation and Feasibility Study, Technical Memorandum No. 7, Phase IIB Workplan, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB-ES. 1997. *Remedial Investigation and Feasibility Study, General Information Report, Naval Air Station Whiting Field, Milton, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

Baes, C.F. III, R.D. Sharp, A.L. Sjoreen, and R.W. Shor. 1984. *A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture.* ORNL-5786. U.S. Department of Energy, Environmental Sciences Division. Oak Ridge, Tennessee: Oak Ridge National Laboratory (September).

Beyer, W.N. 1990. *Evaluating Soil Contamination*. Biological Report No. 90(2). U.S. Department of the Interior, Fish and Wildlife Service. Washington, D.C.

Briggs, G.G., R.H. Bromilow, and A.A. Evans. 1982. "Relationships Between Lipophilicity and Root Uptake and Translocation of Non-ionised Chemicals by Barley." *Pestic. Sci.* 14 (January):495-504.

Briggs, G.G., R.H. Bromilow, A.A. Evans, and M. Williams. 1983. "Relationships Between Lipophilicity and the Distribution of Non-Ionised Chemicals in Barley Shoots Following Uptake by the Roots." *Pestic. Sci.* 14(February): 492-500.

Burt, W.H., and R.P. Grossenheider. 1976. *A Field Guide to the Mammals*. Boston: Houghton Mifflin Co.

DeGraaf, R.M., and D.D. Rudis. 1986. *New England Wildlife: Habitat, Natural History, and Distribution*. General Technical Report NE-108. U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. Washington, D.C.

E.C. Jordan Co. Inc., 1990. *Remedial Investigation and Feasibility Study Planning Document, Naval Air Station Whiting Field, Milton, Florida. Volume I (Work Plan); Volume II (Sampling and Analysis Plan); Volume III (Data Management and Health and Safety Plan)*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

Envirodyne Engineers, Inc. 1985. *Initial Assessment Study, Naval Air Station Whiting Field, Milton, Florida*. Prepared for Naval Energy and Environmental Support Activity, Port Hueneme, California.

Fetter, C.W. 1988. *Applied Hydrogeology*. Columbus, Ohio: Merrill Publishing Company.

Florida Department of Environmental Protection (FDEP). 1994. *Ground Water Guidance Concentrations*. Tallahassee, Florida (June).

FDEP. 1998. Brownfields Cleanup Criteria Rule. Chapter 62-785, Florida Administrative Code (July).

Geraghty & Miller, Inc. 1986. *Verification Study, Assessment of Potential Groundwater Pollution at NAS Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

Hem, John D. 1992. *Study and Interpretation of the Chemical Characteristics of Natural Water*. 3rd Edition. Water-Supply Paper No. 2254, U.S. Geological Survey.

Laboratory Data Consultants, Inc. 1996. Data Validation Report for Sample Delivery Groups (SDGs) WF006, WF022, and WF023.

Maughan, J.T. 1993. *Ecological Assessment of Hazardous Waste Sites*. New York: Van Nostrand Reinhold.

Nature Conservancy/Florida Natural Areas Inventory. 1997. "Rare Plant, Rare Vertebrate, and Natural Community Survey of Naval Air Station Whiting Field, Blackwater River Recreation Area, and Outlying Landing Fields Harold, Santa Rosa, Holley, Site 8A, Pace, Spencer, Wolf, Barin, Summerdale, and Silverhill." Final Report, sub-agreement (N62467-95-RP00236) to the 1995 Cooperative Agreement between the Department of Defense and the Nature Conservancy. (June).

Naval Energy and Environmental Support Activity (NEESA). 1988. *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Program*. NEESA Guidance Document, 20.2-047B.

Neuhauser, E.F, P.R. Durkin, M.R. Malecki, and M. Anatra. 1986. "Comparative Toxicity of Ten Organic Chemicals to Four Earthworm Species." *Comp. Biochem. Physiol.*, Vol. 83C, No. 1, pp. 197-200, 1986.

Simon, T. 1997. Personal communication between Mr. Ted Simon of U.S. EPA Region 4 and Ms. Anita Pease of ABB-ES, September 18, 1997.

Suter, G. W. 1993. *Ecological Risk Assessment*. Chelsea, Michigan: Lewis Publishers.

Terres, J. 1980. *Audubon Encyclopedia of North American Birds*. New York: Alfred Knopf.

Travis, C.C., and A.D. Arms. 1988. "Bioconcentration of Organics in Beef, Milk, and Vegetation." *Environ. Sci. Tech.* 22:271-274.

U.S. Department of Agriculture. 1980. Soil Survey of Santa Rosa County, Florida. Soil Conservation Service.

U.S. Environmental Protection Agency (USEPA). 1979. *Water-Related Fate of 129 Priority Pollutants*. Volumes I and II. Washington, D.C.

USEPA. 1986a. *Test Methods for Evaluating Solid Waste, Volume IB, Laboratory Manual Physical/Chemical Methods*. Office of Solid Waste and Emergency Response, Washington, D.C. (November).

USEPA. 1986b. *Hazard Evaluation Division Standard Evaluation Procedure: Ecological Risk Assessment*. USEPA/540/9-85-001. Office of Pesticide Programs. Washington, D.C.

USEPA. 1988. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. Washington, D.C. (July 1).

USEPA. 1989a. *Methods for Evaluating the Attainment of Cleanup Standards. Volume I: Soils and Solid Media*. Statistical Policy Branch, Washington, D.C. (February).

USEPA. 1989b. *Risk Assessment Guidance for Superfund. Volumes I and II: Evaluation Manual*. Washington, D.C. (December).

USEPA. 1989c. *Risk Assessment Guidance for Superfund: Environmental Evaluation Manual. Volume 2*. EPA/540/1-89/002 (December). Washington, D.C.

USEPA. 1989d. *Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference*. EPA 600/3-89/013. Environmental Research Laboratory. Corvallis, Oregon.

USEPA. 1989e. *Exposure Factors Handbook*. EPA/600/8-89/043. Office of Health and Environmental Assessment Washington, D.C.

USEPA. 1990. *National Oil and Hazardous Substances Contingency Plan*. Washington, D.C.

USEPA. 1991a. *Standard Operating Procedures and Quality Assurance Manual (SOPQAM)*. Environmental Compliance Branch, Region IV, Atlanta, Georgia (February 1).

USEPA. 1991b. *National Functional Guidelines for Organic Data Review*. Washington, D.C. (June).

USEPA. 1991c-92. *ECO Update*. Volume 1: Number 1 (September, 1991), Number 2 (December, 1991), Number 3 (March, 1992), Number 4 (May, 1992), Number 5 (August, 1992). Publication No. 9345.0.051. Washington, D.C.

USEPA. 1992a. *Guidance for Data Useability in Risk Assessment (Parts A and B)*. Publication No. 9285.07-09A. Office of Emergency and Remedial Response, Washington, D.C. (April).

USEPA. 1992b. *Supplemental Guidance to RAGS: Calculating the Concentration Term*. PB92-963373. Office of Solid Waste and Emergency Response, Washington, D.C. (May).

USEPA. 1992c. *Framework for Ecological Risk Assessment*. USEPA/630/R-92/001 Washington, D.C. (February).

USEPA. 1992d. *ECO Update*. Volume 1, Number 2, Publication 9345.0-051 (May).

USEPA. 1992e. *ECO Update*. Volume 1, Number 3, Publication 9345.0-051 (August).

USEPA. 1993a. "Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening." USEPA Region III (January).

USEPA. 1993b. *Wildlife Exposure Factors Handbook*. Vols. I and II. USEPA/600/-R93/187a,b. Office of Research and Development, Washington, D.C. (December).

USEPA. 1994a. *Contract Laboratory Program National Functional Guidelines for Organic Review*. Office of Emergency and Remedial Response. Washington, D.C.

USEPA. 1994b. *Contract Laboratory Program National Functional Guidelines for Inorganic Review*. Office of Emergency and Remedial Response. Washington, D.C.

USEPA. 1994c. *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*. Office of Solid Waste and Emergency Response, Washington, D.C.

USEPA. 1995a. *Data Collection and Evaluation*. USEPA Region IV (November).

USEPA. 1995b. *Supplemental Guidance to RAGS: Ecological Risk Assessment*. Region IV Bulletins. USEPA Region IV Waste Management Division, Atlanta, Georgia.

USEPA. 1995c. *Supplemental Guidance to RAGs: Human Health Risk Assessment*. Region IV Bulletins. USEPA Region IV Waste Management Division, Atlanta, Georgia.

USEPA. 1996a. *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual*. Washington, D.C. (May).

USEPA. 1996b. *Proposed Guidelines for Ecological Risk Assessment*. Federal Register, 61(175):47552-631. September 9, 1996 .

USEPA. 1997a. *Risk-Based Concentration Table*. USEPA Region III, (March).

USEPA. 1997b. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*. Environmental Response Team, Edison, New Jersey.

USEPA. 1998. Risk-Based Concentration Table. USEPA Region III (October).

APPENDIX A

QUALITY CONTROL DATA

APPENDIX A

Groundwater and Subsurface Soil Investigation, Phase IIB
NAS Whiting Field, Milton Florida
PARCC Summary Tables

APPENDIX A

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NAS Whiting Field, Milton, Florida

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ble 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

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

ble 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

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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

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

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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

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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

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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

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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

Table 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

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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

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

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)**
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

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

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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

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

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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

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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

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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

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

ple 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	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF037	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	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	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	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	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF046	Volatiles	All samples	No rejected results	-
	Semivolatiles	All samples	No rejected results	-
	Pesticides & PCBs	All samples	No rejected results	-
WF047	Volatiles	39T10001	Acetone & 2-Butanone	Initial & Continuing Calibration (RRF)
		39W001	Acetone & 2-Butanone	
		39W002	Acetone & 2-Butanone	
		39W003	Acetone & 2-Butanone	
		39W004	Acetone & 2-Butanone	
		39W005	Acetone & 2-Butanone	
		39W006	Acetone & 2-Butanone	
		39W007	Acetone & 2-Butanone	
		39W008	2-Butanone	
		39W012	Acetone & 2-Butanone	
		39W012D	Acetone & 2-Butanone	
		39W013	Acetone & 2-Butanone	
		39W014	Acetone & 2-Butanone	
		39W015	Acetone & 2-Butanone	
		39W016	Acetone & 2-Butanone	
		39W017	Acetone & 2-Butanone	
		39W024	2-Butanone	
		39W027	2-Butanone	
		39W028	2-Butanone	
		39W031	2-Butanone	
		39W032	Acetone & 2-Butanone	
		39W034	2-Butanone	
		39W034D	Acetone & 2-Butanone	
		STOR_BLK	2-Butanone	
		STOR_BLK2	2-Butanone	
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 Cyanide	All samples All samples	No rejected results No rejected results	- -
WF023	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF024	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF025	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF026	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF027	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF028	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF029	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF030	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF031	All metals Cyanide	All samples 05G00101 05G00301 05G00801 05G00802 05G00901 05G00902 05G01001 05G01001D 05G01002 05R01901 33G00101 33G00201 33G00301 33G00301D 33G00501	No rejected results Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide Cyanide	- Matrix spike (%R)
WF031B	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF032	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF033	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF034	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF035	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF036	All metals Cyanide	All samples All samples	No rejected results No rejected results	- -
WF037	All metals Cyanide	All samples 15F00201	No rejected results Cyanide	- Matrix spike (%R)
/F041	All metals Cyanide	All samples All samples	No rejected results 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-Dichloroethene	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

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
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	6.2 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	48
	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	-	-	None
		Cyanide	-	-	None
WF023	All	Metals	-	-	None
		Cyanide	-	-	None
WF024	All	Metals	-	-	None
		Cyanide	-	-	None
WF025	All	Metals	-	-	None
		Cyanide	-	-	None
WF026	All	Metals	-	-	None
		Cyanide	-	-	None
WF027	All	Metals	-	-	None
		Cyanide	-	-	None
WF028	All	Metals	-	-	None
		Cyanide	-	-	None
WF029	All	Metals	-	-	None
		Cyanide	-	-	None
WF030	All	Metals	-	-	None
		Cyanide	-	-	None
WF031	All	Metals	-	-	None
		Cyanide	-	-	None
WF031B	All	Metals	-	-	None
		Cyanide	-	-	None
WF032	All	Metals	-	-	None
		Cyanide	-	-	None
WF033	All	Metals	-	-	None
		Cyanide	-	-	None
WF034	All	Metals	-	-	None
		Cyanide	-	-	None
WF035	All	Metals	-	-	None
		Cyanide	-	-	None
WF036	All	Metals	-	-	None
		Cyanide	-	-	None
WF037	All	Metals	-	-	None
		Cyanide	-	-	None
WF041	All	Metals	-	-	None
		Cyanide	-	-	None
WF045	All	Metals	-	-	None
		Cyanide	-	-	None
WF046	All	Metals	-	-	None
		Cyanide	-	-	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

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
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	

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
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 B

MONITORING WELL LOGS

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-18-SB-01
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.	**DATE STARTED:** 01/05/93	**COMPLTD:** 01/05/93
METHOD: HSA	**CASE SIZE:** N/A / **SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA / **TOT DPTH:** 12FT.	**DPTH TO ∇** N/A FT.
LOGGED BY: D. Lonergan	**WELL DEVELOPMENT DATE:** N/A	**SITE:** 18 - Crash Training Area

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SAND: Red brown, fine, silt.		SM	POSTHOLE	
5	(5-7')		19/24	0	SAA.		SM	2,3,2,3	
10	(10-12')		20/24	0	SAA, tan to brown.		SM	2,3,4,4	
15									
20									
25									
30									
35									
40									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-18-SB-02
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.	**DATE STARTED:** 01/05/93	**COMPLTD:** 01/05/93
METHOD: HSA	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 22FT.	**DPTH TO ∇** N/A FT.
LOGGED BY: D. Lonergan	**WELL DEVELOPMENT DATE:** N/A	**SITE:** 18 - Crash Training Area

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SILTY SAND: Red brown, fine, silt.		SM	POSTHOLE	
5	(5-7')		17/24	0	SAND: Light brown, fine, silt.		SM	2,3,3,5	
10	(10-12')		18/24	11	SAND: Pink to red, fine to medium, silt, slight odor.		SM	3,5,5,7	
15	(15-17')		19/24	0	SAND: Red to red brown, medium, trace silt.		SP	7,8,13,17	
20	(20-22')		17/24	0	SAND: White, medium to coarse, red striations.		SP	8,8,6,7	
25									
30									
35									
40									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-18-SB-04
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 01/06/93	**COMPLTD:** 01/06/93
METHOD: HSA	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 42FT.	**DPTH TO ∇** N/A FT.
LOGGED BY: D. Lonergan	**WELL DEVELOPMENT DATE:** N/A		**SITE:** 18 - Crash Training Area

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				12	SAND: Brown, fine, silt.		SM	POSTHOLE	
5	(5-7')		18/24	35	SAA.		SM	3,6,8,9	
10	(10-12')		22/24	6	SILTY SAND: Pink to white, fine.		SC	9,17,20,22	
15	(15-17')		19/24	25	SAA.		SM	11,18,25,29	
20			20/24	10	CLAYEY SAND: Pink and brown striated, trace clay.		SC	14,14,12,13	
25	(25-27')		19/24	4	CLAYEY SILT: Red brown, well sorted.		ML	6,11,15,14	
30			22/24	0	SAA, pink to grey.		ML	3,4,5,9	
35	(35-37')		23/24	0	SAA,litho change at 36' SAND: ornage white, fine to medium, trace gravel.		ML SP	12,19,30,33	
40	(40-42')		22/24	0	CLAYEY SILT: Red to pink, slightly moist.		ML	2,2,3,5	
45									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-18-SB-06
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 01/05/93	**COMPLTD:** 01/05/93
METHOD: HSA	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 27FT.	**DPTH TO ∇** N/A FT.
LOGGED BY: D. Lonergan	**WELL DEVELOPMENT DATE:** N/A		**SITE:** 18 - Crash Training Area

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				150	SILTY SAND: Grey to black, stained.		SM	POSTHOLE	
5	(5-7')		17/24	70	SAND: Grey to tan, fine to medium, trace silt.		SP	5,4,4,7	
10	(10-12')		18/24	630	SILTY SAND: Grey to white, pink hue, fine, stained.		SM	6,11,18,21	
15	(15-17')		19/24	300	SAND: White to pink, fine to medium, trace silt.		SP	13,17,21,20	
20	(20-22')		19/24	0	SAND: Orange white, medium, pink striated, trace silt, slightly moist.		SP	23,30,32,42	
25			17/24	0	SAND: White to grey, fine, silt, no odor.		SM	28,25,27,33	
30									
35									
40									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD	**LOG of WELL:** N/A	**BORING NO.** WHF-18-SB-07
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.	**DATE STARTED:** 01/05/93	**COMPLTD:** 01/05/93
METHOD: HSA	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 17FT.	**DPTH TO ∇** N/A FT.
LOGGED BY: D. Lonergan	**WELL DEVELOPMENT DATE:** N/A	**SITE:** 18 - Fire Training

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SILTY SAND: Light brown, no smell, staining.		SM	POSTHOLE	
5	(5-7')		18/24	0	SAND: Red brown, medium, trace silt.		SP	2,3,2,4	
10			18/24	0	SAND: Reddish brown, medium to coarse.		SP	3,6,7,9	
15	(15-17')		20/24	0	SAND: Red brown to white striated, fine, silt.		SM	6,10,13,15	
20									
25									
30									
35									
40									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-18-SB-08
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 01/04/93	**COMPLTD:** 01/04/93
METHOD: HSA	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 27FT.	**DPTH TO ∇** N/A FT.
LOGGED BY: D. Lonergan	**WELL DEVELOPMENT DATE:** N/A		**SITE:** 18 - Crash Training Area

DEPTH FT.	LABORATORY SAMPLE ID:	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				400	SAND: Light to dark brown, fine, silt, poorly graded, heavy diesel odor.		SM	Hand Auger	
5	(5-7')		18/24	9	SAA, reddish brown, trace clay.			4,5,4,5	
10	(10-12')		20/24	35	SAND: Light brown, medium to coase, heavy diesel odor, wet, litho change at 11 ft. to tan mottled silty clay graded to clay.		SP CL	12,14,19,18	
15	(15-17')		18/24	40	SAND: White, medium to coase, 1" stained layer at top with a diesel odor.		SP	17,19,21,24	
20			19/24	0	SAND: Orange and white striations, medium, trace silt, no odor.		SP	7,11,18,23	
25			14/24	0	SAND: Orange and white striations, medium to coarse, no odor.		SP	5,9,16,20	
30									
35									
40									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-18-SB-09
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 01/05/93	**COMPLTD:** 01/05/93
METHOD: HSA	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 17FT.	**DPTH TO ∇** N/A FT.
LOGGED BY: D. Lonergan	**WELL DEVELOPMENT DATE:** N/A		**SITE:** 18 - Crash Training Area

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SAND: Tan to brown, fine, silt.		SM	POSTHOLE	
5	(5-7')		18/24	0	SAA, red brown.		SM	3,4,3,5	
10			20/24	0	SAND: Red to pink, fine to medium, white striated.		SM	5,6,9,10	
15	(15-17')		18/24	0	SAA.		SM	5,9,14,16	
20									
25									
30									
35									
40									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** N/A	**BORING NO.** WHF-18-SB-10
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 01/04/93	**COMPLTD:** 01/04/93
METHOD: HSA	**CASE SIZE:** N/A	**SCREEN INT.:** N/A	**PROTECTION LEVEL:** D
TOC ELEV.: N/A FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 17FT.	**DPTH TO ∇** N/A FT.
LOGGED BY: D. Lonergan	**WELL DEVELOPMENT DATE:** N/A		**SITE:** 18 - Crash Training Area

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	SAND: Light brown, fine.		SP	POSTHOLE	
5	(5-7')		18/24	0	SAND: Light brown to brownish orange, fine, some silt & clay.		SC	2,5,9,14	
10			14/24	0	SAND: White to orange, fine, slightly moist.		SP	5,10,15,18	
15			14/24	0	SAND: White to reddish orange, fine to medium.		SP	4,7,12,17	
20									
25									
30									
35									
40									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS WHITING FIELD RI		**LOG of WELL:** WHF-18-1	**BORING NO.**
CLIENT: SOIV NAVY			**PROJECT NO:** 8500-01
CONTRACTOR: GERAGHTY & MILLER		**DATE STARTED:** NA	**COMPLTD:** NA
METHOD: MUD-ROTARY	**CASE SIZE:** 4-INCH	**BORING DIA.:** 10-INCH	**PROTECTION LEVEL:** D
TOC ELEV.: 183.49 FT.	**MONITOR INST.:** NA	**TOT DPTH:** 122.5FT.	**DPTH TO ∇** 90.88 FT.
LOGGED BY: NA	**WELL DEVELOPMENT DATE:** NA		**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
					SAND-buff fine to coarse sand w/ some gravel, organics (0-5)		SW		
85					SAND-buff fine to coarse sand w/ some gravel		SW		
95					CLAY-buff/brown/tan clay w/ some fine to coarse sand and gravel		CL		
110					SAND-buff fine to coarse sand w/ some gravel		SW		
120					CLAY-yellow/buff/brown clay w/ some fine to coarse sand		CL		

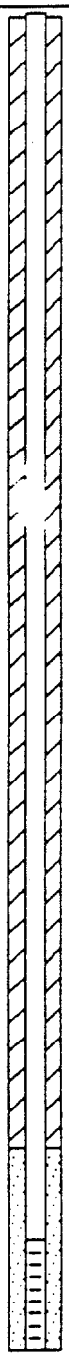

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** WHF-17-3	**BORING NO.** N/A
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 7/13/93	**COMPLTD:** 7/14/93
METHOD: HSA	**CASE SIZE:** 2 in.	**SCREEN INT.:** 109-124 FT	**PROTECTION LEVEL:** D
TOC ELEV.: 201.62 FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 125FT.	**DPTH TO ∇** 117.7 FT.
LOGGED BY: N. Roka	**WELL DEVELOPMENT DATE:**		**SITE:** 17 - Fire Training

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
			16/24		Same as above, trace medium.		SP		
95			20/24	1.0	Same as above, light tan, subrounded.		SP	WOR,45,60,67	
100			20/24	0	SAND - purple, medium, poorly graded, very dense, dry, subrounded to subangular.		SP	40,45,38,41	
105			24/24	0.5			SW	18,22,20,20	
110			24/24	0.5	Same as above, yellow grading to rust at 0.75 ft.		SW	21,23,19,22	
115			24/24	6	Same as above, rust, saturated.		SW	WOR,20,21,19	
120									
125									
130									
135									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** WHF-18-2	**BORING NO.**
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 2/21/93	**COMPLTD:** 2/22/93
METHOD: MUD ROTARY	**CASE SIZE:** 2 in.	**SCREEN INT.:** 90-105 FT	**PROTECTION LEVEL:** D
TOC ELEV.: 164.84 FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 107FT.	**DPTH TO ∇** 96.02 FT.
LOGGED BY: G. Kanchibhatla	**WELL DEVELOPMENT DATE:**		**SITE:** 18 - Fire Training

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			20/24	0	SAND - tan to dark tan, very fine to fine, poorly graded, loose, dry.		SP	2,3,2,3	
10			18/24	0	SAND - SAA, yellowish orange.		SP	3,4,5,8	
15			18/24	0	SAND - SAA, white w/ yellowish orange bands.		SP	5,10,11,14	
20			16/24	0	SAND - yellowish orange, fine to medium, well graded, moderately dense , trace silt, dry.		SW	7,10,10,11	
25			18/24	0	SAND (4") - yellowish orange, fine, poorly graded, loose, trace silt, dry. SANDY CLAY (2") - light purple, dry. SAND (12") - white, very fine to fine, poorly graded, loose, dry.		SP	7,9,10,11	
30			18/24	0	SAND - white to ligh yellow and yellowish orange bands, very fine, trace coarse, poorly graded, loose, dry.		SP	5,6,8,10	
35			18/24	0	SAND - yellowish orange to tan, fine, poorly graded, loose, dry.		SP	8,11,11,15	
40				0			CL/SP	2,8,12,12	

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** WHF-18-2	**BORING NO.**
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 2/21/93	**COMPLTD:** 2/22/93
METHOD: MUD ROTARY	**CASE SIZE:** 2 in.	**SCREEN INT.:** 90-105 FT	**PROTECTION LEVEL:** D
TOC ELEV.: 164.84 FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 107FT.	**DPTH TO ∇** 96.02 FT.
LOGGED BY: G. Kanchibhatla	**WELL DEVELOPMENT DATE:**		**SITE:** 18 - Fire Training

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				
			20/24		CLAY (6") - gray, pink mottling. SAND (14") - yellowish orange, fine to coarse, poorly graded, dry.		CL/SP		
45			20/24	0	SAND - white, fine to coarse, poorly graded, loose, dry.		SP	12,18,10,26	
50			22/24	0	SAND - white, very fine, trace coarse, poorly graded, loose, dry.		SP	11,17,20,22	
55			22/24	0	SAND - white, fine, trace coarse, poorly graded, loose, dry.		SP	24,20,32,44	
60			22/24	0	SAND - SAA, trace very fine to fine, black chips.		SP	16,26,31,36	
65			22/24	0	SAND - SAA, trace medium.		SP	16,22,31,34	
70			22/24	0	SAND - SAA.		SP	14,20,25,26	
75			22/24	1	SAND - very fine to fine, poorly graded, loose, dry.		SP	17,25,35,37	
80				0			SP	10,15,15,18	

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** WHF-18-2	**BORING NO.**
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 2/21/93	**COMPLTD:** 2/22/93
METHOD: MUD ROTARY	**CASE SIZE:** 2 in.	**SCREEN INT.:** 90-105 FT	**PROTECTION LEVEL:** D
TOC ELEV.: 164.84 FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 107FT.	**DPTH TO ∇** 96.02 FT.
LOGGED BY: G. Kanchibhatla	**WELL DEVELOPMENT DATE:**		**SITE:** 18 - Fire Training

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
			18/24		SAND (12") - yellowish orange, fine to medium, poorly graded, moderately dense, slightly moist. SILTY/CLAYEY SAND (6") - bands of silty sand and clayey sand, fine, yellowish orange, purple bands, slightly moist.		SP		
85			18/24	1	SAND - white to yellowish orange, purple bands, fine to coarse, well graded, some silt, slightly moist.		SW	11,12,14,18	
90			22/24	0	SAND - white, purple top 2", fine to trace coarse.		SP	18,30,32,20	
95			22/24	0	SAND - white, fine, poorly graded, saturated.		SP	11,14,14,17	∇
100			22/24	0	SAND - white to light purple, fine to medium, trace coarse poorly graded, moderately dense, saturated.		SP	10,3,15,19	
105									
110									
115									
120									

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		LOG of WELL: WHF-18-3	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 6/27/93	COMPLTD: 6/27/93
METHOD: MUD ROTARY	CASE SIZE: 2 in.	SCREEN INT.: 95-110 FT	PROTECTION LEVEL: D
TOC ELEV.: 176.21 FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 104.58 FT.
LOGGED BY: A. Cohen	WELL DEVELOPMENT DATE:		SITE: 18 - Fire Training

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			1.0/2.0	0	SAND - pale orange-brown to orange-brown, very fine to medium, poorly sorted.		SP	2,2,3,2	
10			2.0/2.0	0	SAND - orange brown, fine, well graded, 2" sandy clay lense, slightly plastic.		SP	4,4,8,7	
15			1.5/2.0	0	SAND - white, very fine, well graded, very fine black phosphatic grains scattered.		SP	8,14,12,7	
20			1.5/2.0	0	SAND - SAA, multiple striations of white, orange-bronw, tan, & very pale purple.		SP	7,8,15,15	
25			1.8/2.0	0	SAND - very pale purple to pale moderate red, medium, well graded, mottled, slightly moist.		SP	9,14,12,16	
30			1.7/2.0	0	SAND - SAA, multiple striations of white, orange-brown, very pale orange, tan, very light tan.		SP	19,16,23,24	
35			1.5/2.0	0	SAND - fine to medium, well graded, striations of orange-brown, white, pale moderate red, light tan, very pale orange, & very pale purple, moist.		SP	16,19,21,23	
40				0			SP	8,9,16,14	

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		**LOG of WELL:** WHF-18-3	**BORING NO.**
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 6/27/93	**COMPLTD:** 6/27/93
METHOD: MUD ROTARY	**CASE SIZE:** 2 in.	**SCREEN INT.:** 95-110 FT	**PROTECTION LEVEL:** D
TOC ELEV.: 176.21 FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 112FT.	**DPTH TO ∇** 104.58 FT.
LOGGED BY: A. Cohen	**WELL DEVELOPMENT DATE:**		**SITE:** 18 - Fire Training

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 1				
			1.8/2.0		SAND - white, fine, poorly sorted, moist.		SP		
45			1.8/2.0	0	SAND - SAA, fine to medium, trace coarse, striations.		SP	12,12,16,15	
50			1.8/2.0	N/A	SAND - dark moderate red to pale gray, very fine to fine, trace clay & silt, moist.		SP	9,8,8,11	
55			2.0/2.0	0	CLAYEY SAND - dark moderate red, pale gray, mottled, moist. CLAY - pale gray, slight dark moderate red mottling, plastic, trace sand. SILTY SAND - tan to white, very fine to fine, striations.		SC	11,9,16,18	
60			1.0/2.0	0	SAND - white, very fine to fine, well graded, moist.		SP	12,14,21,23	
65			1.5/2.0	0	SAND - light tan to white, very fine to fine, well graded.		SP	16,25,36,50	
70			2.0/2.0	0	SAND - white, fine to medium, trace coarse, striations, dense.		SP	28,36,47,45	
75			2.0/2.0	0	SAND - white, very fine to fine, well graded, stirations.		SP	18,30,28,30	
80				0			SP	14,16,20,21	

ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAVAL AIR STATION WHITING FIELD		LOG of WELL: WHF-18-3	BORING NO.
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 6/27/93	COMPLTD: 6/27/93
METHOD: MUD ROTARY	CASE SIZE: 2 in.	SCREEN INT.: 95-110 FT	PROTECTION LEVEL: D
TOC ELEV.: 176.21 FT.	MONITOR INST.: OVA	TOT DPTH: 112FT.	DPTH TO ∇ 104.58 FT.
LOGGED BY: A. Cohen	WELL DEVELOPMENT DATE:		SITE: 18 - Fire Training

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					Continued from PAGE 2				
			1.8/2.0		SAND - white to olive green, very fine to fine, well graded, moist.		SP		
85			1.8/2.0	0	SAND - very light tan to olive gray, fine, well graded, moist. graded, some silt, slightly moist.		SP	12,13,16,19	
90			2.0/2.0	0	SAND - fine to medium, striations, moist.		SP	36,39,41,52	
95			1.5/2.0	0	SAND - fine to medium, well graded, striations, moist.		SP	WOR,25	
100			1.8/2.0	0	SAND - fine to medium, well graded, striations, saturated.		SP	25,35,29,40	
105			2.0/2.0	0	SAND - pale yellow-orange, fine to medium, well graded, saturated.		SP	22,25,31,35	∇
110			2.0/2.0	N/A	SAND - light tan, fine to medium, saturated.		SP	3,6,12,25	
115									
120									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: Naval Air Station Whiting Field		**LOG of WELL:** WHF-29-1	**BORING NO.**
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** RI PHASE IIA
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 6/08/93	**COMPLTD:** 6/08/93
METHOD: Hollow Stem Auger	**CASE SIZE:** 2"	**SCREEN INT.:** 125-140 FT.	**PROTECTION LEVEL:** D
TOC ELEV.: 193.95 FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 141FT.	**DPTH TO ∇** 127.52 FT.
LOGGED BY: D. Wong	**WELL DEVELOPMENT DATE:**		**SITE:** 29 - HOBBY SHOP

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5					SEE WHF-29-2 FOR ADDITIONAL LITHOLOGICAL DESCRIPTIONS.				
10									
15									
20									
25									
30									
35									
40									
45									
50									

ABB ENVIRONMENTAL SERVICES, INC.

APPENDIX C

SAMPLE ANALYTICAL DATA

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:	90181002				RB920002				90181003				RB887018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF18-1				18G00101				WHF18-2				18G00201			
Collect Date:	21-OCT-93				29-JUL-96				21-OCT-93				26-JUL-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	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Bromomethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Vinyl chloride	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Chloroethane	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Methylene chloride	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	UJ	ug/l	10
Acetone	12	UJ	ug/l	10	10	UJ	ug/l	10	10	UJ	ug/l	10	10	UJ	ug/l	10
Carbon disulfide	10	U	ug/l	10	10	UJ	ug/l	10	10	U	ug/l	10	10	UJ	ug/l	10
1,1-Dichloroethene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,1-Dichloroethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloroethene (total)	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Chloroform	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloroethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Butanone	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,1,1-Trichloroethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Carbon tetrachloride	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Bromodichloromethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloropropane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
cis-1,3-Dichloropropene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Trichloroethene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Dibromochloromethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,1,2-Trichloroethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
trans-1,3-Dichloropropene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Bromoform	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Methyl-2-pentanone	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Hexanone	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Tetrachloroethene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Toluene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,1,2,2-Tetrachloroethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Chlorobenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Ethylbenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Styrene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Xylenes (total)	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
CLP SEMIVOLATILES 90-SOW ug/l																
Phenol	10	UJ	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
bis(2-Chloroethyl) ether	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Chlorophenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,3-Dichlorobenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,4-Dichlorobenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2-Dichlorobenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Methylphenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,2-oxybis(1-Chloropropane)	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Methylphenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
N-Nitroso-di-n-propylamine	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachloroethane	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Nitrobenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Isophorone	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Nitrophenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dimethylphenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:	90181002				RB920002				90181003				RB887018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF18-1				18G00101				WHF18-2				18G00201			
Collect Date:	21-OCT-93				29-JUL-96				21-OCT-93				26-JUL-96			
	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	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dichlorophenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2,4-Trichlorobenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Naphthalene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chloroaniline	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobutadiene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chloro-3-methylphenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Methylnaphthalene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorocyclopentadiene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4,6-Trichlorophenol	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4,5-Trichlorophenol	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
2-Chloronaphthalene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Nitroaniline	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Dimethylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Acenaphthylene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,6-Dinitrotoluene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
3-Nitroaniline	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Acenaphthene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrophenol	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
4-Nitrophenol	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Dibenzofuran	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrotoluene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Diethylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chlorophenyl-phenylether	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Fluorene	10	U	ug/l	10	10	U	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	UJ	ug/l	25
4,6-Dinitro-2-methylphenol	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
N-Nitrosodiphenylamine	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Bromophenyl-phenylether	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobenzene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Pentachlorophenol	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Phenanthrene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Anthracene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Carbazole	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Di-n-butylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Fluoranthene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Pyrene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Butylbenzylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
3,3-Dichlorobenzidine	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) anthracene	10	U	ug/l	10	10	U	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	UJ	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10	3	J	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Di-n-octylphthalate	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (b) fluoranthene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (k) fluoranthene	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) pyrene	10	U	ug/l	10	10	U	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	UJ	ug/l	10	10	U	ug/l	10	10	UJ	ug/l	10
CLP PESTICIDES/PCBS 90-SOW ug/l																
alpha-BHC	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:	90181002				RB920002				90181003				RB887018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF18-1				18G00101				WHF18-2				18G00201			
Collect Date:	21-OCT-93				29-JUL-96				21-OCT-93				26-JUL-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
beta-BHC	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
delta-BHC	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
gamma-BHC (Lindane)	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
Heptachlor	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
Aldrin	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
Heptachlor epoxide	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
Endosulfan I	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
Dieldrin	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1
4,4-DDE	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1
Endrin	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1
Endosulfan II	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1
4,4-DDD	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1
Endosulfan sulfate	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1
4,4-DDT	.072	J	ug/l	.1	.1	UJ	ug/l	.1	.035	J	ug/l	.1	.1	UJ	ug/l	.1
Methoxychlor	.5	U	ug/l	.5	.5	U	ug/l	.5	.5	U	ug/l	.5	.5	U	ug/l	.5
Endrin ketone	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1
Endrin aldehyde	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1	.1	U	ug/l	.1
alpha-Chlordane	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
gamma-Chlordane	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05	.05	U	ug/l	.05
Toxaphene	5	U	ug/l	5	5	U	ug/l	5	5	U	ug/l	5	5	U	ug/l	5
Aroclor-1016	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Aroclor-1221	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
Aroclor-1232	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Aroclor-1242	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Aroclor-1248	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Aroclor-1254	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Aroclor-1260	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
CLP METALS AND CYANIDE ug/l																
Aluminum	68.4	J	ug/l	200	73.5	J	ug/l		13700		ug/l	200	34	U	ug/l	
Antimony	20.7	U	ug/l	60	8.6	U	ug/l		20.7	U	ug/l	60	8.6	U	ug/l	
Arsenic	1.6	UJ	ug/l	10	.5	U	ug/l		2.1	J	ug/l	10	.5	U	ug/l	
Barium	42.7	J	ug/l	200	46.9	J	ug/l		64.5	J	ug/l	200	36.9	J	ug/l	
Beryllium	.2	UJ	ug/l	5	.3	U	ug/l		.41	J	ug/l	5	.3	U	ug/l	
Cadmium	3.2	U	ug/l	5	1.4	J	ug/l		3.2	U	ug/l	5	1.2	U	ug/l	
Calcium	1910	J	ug/l	5000	4850	J	ug/l		705	J	ug/l	5000	611	J	ug/l	
Chromium	3.3	U	ug/l	10	3.7	J	ug/l		70.8		ug/l	10	2	U	ug/l	
Cobalt	4.1	U	ug/l	50	2.4	J	ug/l		4.5	J	ug/l	50	2.3	U	ug/l	
Copper	2.1	U	ug/l	25	2.5	J	ug/l		43.5	J	ug/l	25	1.1	U	ug/l	
Iron	73.2	J	ug/l	100	76	U	ug/l		24800		ug/l	100	12.2	U	ug/l	
Lead	1	U	ug/l	3	5.2		ug/l		7.4		ug/l	3	.7	U	ug/l	
Magnesium	1000	J	ug/l	5000	854	J	ug/l		1170	J	ug/l	5000	999	J	ug/l	
Manganese	6.1	J	ug/l	15	7.4	J	ug/l		74.1		ug/l	15	8.4	J	ug/l	
Mercury	.15	U	ug/l	.2	.1	U	ug/l		.2	J	ug/l	.2	.11	J	ug/l	
Nickel	9	U	ug/l	40	7.3	U	ug/l		28	J	ug/l	40	11.9	J	ug/l	
Potassium	775	J	ug/l	5000	1330	J	ug/l		2120	J	ug/l	5000	962	J	ug/l	
Selenium	2	U	ug/l	5	.6	U	ug/l		2	U	ug/l	5	.6	U	ug/l	
Silver	2.7	U	ug/l	10	2.9	J	ug/l		2.7	U	ug/l	10	2.5	U	ug/l	
Sodium	1670	J	ug/l	5000	1410	J	ug/l		1430	J	ug/l	5000	1020	J	ug/l	
Thallium	.88	U	ug/l	10	.6	U	ug/l		.88	U	ug/l	10	.6	U	ug/l	
Vanadium	2.5	U	ug/l	50	1.2	J	ug/l		94.8		ug/l	50	1.2	U	ug/l	
Zinc	29		ug/l	20	55.8		ug/l		461		ug/l	20	2.8	U	ug/l	

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:	90181002				RB920002				90181003				RB887018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	WHF18-1				18G00101				WHF18-2				18G00201			
Collect Date:	21-OCT-93				29-JUL-96				21-OCT-93				26-JUL-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Cyanide	1.7	U	ug/l	10	3.2	U	ug/l		1.7	U	ug/l	10	1.5	U	ug/l	

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:		90186001			RB887011		
Site		WHITING			WHITING		
Locator		WHF18-3			18G00301		
Collect Date:		25-OCT-93			24-JUL-96		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW	ug/l							
Chloromethane		10	U	ug/l	10	10	U	ug/l	10
Bromomethane		10	U	ug/l	10	10	U	ug/l	10
Vinyl chloride		10	U	ug/l	10	10	U	ug/l	10
Chloroethane		10	U	ug/l	10	10	U	ug/l	10
Methylene chloride		10	U	ug/l	10	10	U	ug/l	10
Acetone		12	UJ	ug/l	10	10	UJ	ug/l	10
Carbon disulfide		10	U	ug/l	10	10	U	ug/l	10
1,1-Dichloroethene		10	U	ug/l	10	10	U	ug/l	10
1,1-Dichloroethane		10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloroethene (total)		10	U	ug/l	10	10	U	ug/l	10
Chloroform		10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloroethane		10	U	ug/l	10	10	U	ug/l	10
2-Butanone		10	U	ug/l	10	10	U	ug/l	10
1,1,1-Trichloroethane		10	U	ug/l	10	10	U	ug/l	10
Carbon tetrachloride		10	U	ug/l	10	10	U	ug/l	10
Bromodichloromethane		10	U	ug/l	10	10	U	ug/l	10
1,2-Dichloropropane		10	U	ug/l	10	10	U	ug/l	10
cis-1,3-Dichloropropene		10	U	ug/l	10	10	U	ug/l	10
Trichloroethene		10	U	ug/l	10	10	U	ug/l	10
Dibromochloromethane		10	U	ug/l	10	10	U	ug/l	10
1,1,2-Trichloroethane		10	U	ug/l	10	10	U	ug/l	10
Benzene		10	U	ug/l	10	10	U	ug/l	10
trans-1,3-Dichloropropene		10	U	ug/l	10	10	U	ug/l	10
Bromoform		10	U	ug/l	10	10	U	ug/l	10
4-Methyl-2-pentanone		10	U	ug/l	10	10	U	ug/l	10
2-Hexanone		10	U	ug/l	10	10	U	ug/l	10
Tetrachloroethene		10	U	ug/l	10	10	U	ug/l	10
Toluene		10	U	ug/l	10	10	U	ug/l	10
1,1,2,2-Tetrachloroethane		10	U	ug/l	10	10	U	ug/l	10
Chlorobenzene		10	U	ug/l	10	10	U	ug/l	10
Ethylbenzene		10	U	ug/l	10	10	U	ug/l	10
Styrene		10	U	ug/l	10	10	U	ug/l	10
Xylenes (total)		10	U	ug/l	10	10	U	ug/l	10
CLP SEMIVOLATILES 90-SOW	ug/l							
Phenol		10	U	ug/l	10	10	U	ug/l	10
bis(2-Chloroethyl) ether		10	U	ug/l	10	10	U	ug/l	10
2-Chlorophenol		10	U	ug/l	10	10	U	ug/l	10
1,3-Dichlorobenzene		10	U	ug/l	10	10	U	ug/l	10
1,4-Dichlorobenzene		10	U	ug/l	10	10	U	ug/l	10

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:	90186001				RB887011			
Site	WHITING				WHITING			
Locator	WHF18-3				18G00301			
Collect Date:	25-OCT-93				24-JUL-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2-Dichlorobenzene	10	U	ug/l	10	10	U	ug/l	10
2-Methylphenol	10	U	ug/l	10	10	U	ug/l	10
2,2-oxybis(1-Chloropropane)	10	U	ug/l	10	10	U	ug/l	10
4-Methylphenol	10	U	ug/l	10	10	U	ug/l	10
N-Nitroso-di-n-propylamine	10	U	ug/l	10	10	U	ug/l	10
Hexachloroethane	10	U	ug/l	10	10	U	ug/l	10
Nitrobenzene	10	U	ug/l	10	10	U	ug/l	10
Isophorone	10	U	ug/l	10	10	U	ug/l	10
2-Nitrophenol	10	U	ug/l	10	10	U	ug/l	10
2,4-Dimethylphenol	10	U	ug/l	10	10	U	ug/l	10
bis(2-Chloroethoxy) methane	10	U	ug/l	10	10	U	ug/l	10
2,4-Dichlorophenol	10	U	ug/l	10	10	U	ug/l	10
1,2,4-Trichlorobenzene	10	U	ug/l	10	10	U	ug/l	10
Naphthalene	10	U	ug/l	10	10	U	ug/l	10
4-Chloroaniline	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobutadiene	10	U	ug/l	10	10	U	ug/l	10
4-Chloro-3-methylphenol	10	U	ug/l	10	10	U	ug/l	10
2-Methylnaphthalene	10	U	ug/l	10	10	U	ug/l	10
Hexachlorocyclopentadiene	10	U	ug/l	10	10	U	ug/l	10
2,4,6-Trichlorophenol	10	U	ug/l	10	10	U	ug/l	10
2,4,5-Trichlorophenol	25	U	ug/l	25	25	U	ug/l	25
2-Chloronaphthalene	10	U	ug/l	10	10	U	ug/l	10
2-Nitroaniline	25	U	ug/l	25	25	U	ug/l	25
Dimethylphthalate	10	U	ug/l	10	10	U	ug/l	10
Acenaphthylene	10	U	ug/l	10	10	U	ug/l	10
2,6-Dinitrotoluene	10	U	ug/l	10	10	U	ug/l	10
3-Nitroaniline	25	U	ug/l	25	25	U	ug/l	25
Acenaphthene	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrophenol	25	U	ug/l	25	25	U	ug/l	25
4-Nitrophenol	25	U	ug/l	25	25	U	ug/l	25
Dibenzofuran	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrotoluene	10	U	ug/l	10	10	U	ug/l	10
Diethylphthalate	10	U	ug/l	10	10	U	ug/l	10
4-Chlorophenyl-phenylether	10	U	ug/l	10	10	U	ug/l	10
Fluorene	10	U	ug/l	10	10	U	ug/l	10
4-Nitroaniline	25	U	ug/l	25	25	UJ	ug/l	25
4,6-Dinitro-2-methylphenol	25	U	ug/l	25	25	U	ug/l	25
N-Nitrosodiphenylamine	10	U	ug/l	10	10	U	ug/l	10
4-Bromophenyl-phenylether	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobenzene	10	U	ug/l	10	10	U	ug/l	10
Pentachlorophenol	25	U	ug/l	25	25	U	ug/l	25
Phenanthrene	10	U	ug/l	10	10	U	ug/l	10
Anthracene	10	U	ug/l	10	10	U	ug/l	10
Carbazole	10	U	ug/l	10	10	U	ug/l	10
Di-n-butylphthalate	10	U	ug/l	10	10	U	ug/l	10
Fluoranthene	10	U	ug/l	10	10	U	ug/l	10
Pyrene	10	U	ug/l	10	10	U	ug/l	10
Butylbenzylphthalate	10	U	ug/l	10	10	U	ug/l	10
3,3-Dichlorobenzidine	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) anthracene	10	U	ug/l	10	10	U	ug/l	10
Chrysene	10	U	ug/l	10	10	UJ	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10	2	J	ug/l	10

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:	90186001				RB887011			
Site	WHITING				WHITING			
Locator	WHF18-3				18G00301			
Collect Date:	25-OCT-93				24-JUL-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Di-n-octylphthalate	10	U	ug/l	10	10	U	ug/l	10
Benzo (b) fluoranthene	10	U	ug/l	10	10	U	ug/l	10
Benzo (k) fluoranthene	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) pyrene	10	U	ug/l	10	10	U	ug/l	10
Indeno (1,2,3-cd) pyrene	10	U	ug/l	10	10	U	ug/l	10
Dibenzo (a,h) anthracene	10	U	ug/l	10	10	U	ug/l	10
Benzo (g,h,i) perylene	10	U	ug/l	10	10	UJ	ug/l	10
CLP PESTICIDES/PCBS 90-SOW ug/l								
alpha-BHC	.05	U	ug/l	.05	.05	UJ	ug/l	.05
beta-BHC	.05	U	ug/l	.05	.05	UJ	ug/l	.05
delta-BHC	.05	U	ug/l	.05	.05	UJ	ug/l	.05
gamma-BHC (Lindane)	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Aldrin	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor epoxide	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Endosulfan I	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Dieldrin	.1	U	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDE	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Endrin	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan II	.1	U	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDD	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan sulfate	.1	U	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDT	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Methoxychlor	.5	U	ug/l	.5	.5	UJ	ug/l	.5
Endrin ketone	.1	U	ug/l	.1	.1	UJ	ug/l	.1
Endrin aldehyde	.1	U	ug/l	.1	.1	UJ	ug/l	.1
alpha-Chlordane	.05	U	ug/l	.05	.05	UJ	ug/l	.05
gamma-Chlordane	.05	U	ug/l	.05	.05	UJ	ug/l	.05
Toxaphene	5	U	ug/l	5	5	UJ	ug/l	5
Aroclor-1016	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1221	2	U	ug/l	2	2	UJ	ug/l	2
Aroclor-1232	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1242	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1248	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1254	1	U	ug/l	1	1	UJ	ug/l	1
Aroclor-1260	1	U	ug/l	1	1	UJ	ug/l	1
CLP METALS AND CYANIDE ug/l								
Aluminum	10200		ug/l	200	78.2	J	ug/l	
Antimony	20.7	U	ug/l	60	8.6	U	ug/l	
Arsenic	1.6	UJ	ug/l	10	.5	U	ug/l	
Barium	29	J	ug/l	200	15.2	J	ug/l	
Beryllium	.82	J	ug/l	5	.3	U	ug/l	
Cadmium	3.2	U	ug/l	5	1.2	U	ug/l	
Calcium	345	J	ug/l	5000	497	J	ug/l	
Chromium	32.6		ug/l	10	2	U	ug/l	
Cobalt	4.1	U	ug/l	50	2.3	U	ug/l	
Copper	27.8	UJ	ug/l	25	1.1	U	ug/l	
Iron	61800		ug/l	100	60.2	J	ug/l	
Lead	2.5	UJ	ug/l	3	.6	U	ug/l	
Magnesium	650	J	ug/l	5000	499	J	ug/l	

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:	90186001				RB887011			
Site	WHITING				WHITING			
Locator	WHF18-3				18G00301			
Collect Date:	25-OCT-93				24-JUL-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Manganese	31.4		ug/l	15	2.7	J	ug/l	
Mercury	.15	U	ug/l	.2	.1	U	ug/l	
Nickel	15.2	J	ug/l	40	7.3	U	ug/l	
Potassium	685	J	ug/l	5000	594	J	ug/l	
Selenium	2	U	ug/l	5	.6	U	ug/l	
Silver	2.7	U	ug/l	10	2.5	U	ug/l	
Sodium	1320	J	ug/l	5000	688	J	ug/l	
Thallium	.88	U	ug/l	10	.6	U	ug/l	
Vanadium	133		ug/l	50	1.2	U	ug/l	
Zinc	37		ug/l	20	1.2	U	ug/l	
Cyanide	1.7	U	ug/l	10	2.6	U	ug/l	

NAS Whiting Field, Milton, Florida
Site 18 Groundwater Data

Lab Sample Number:	RB921001				RB886013				RB886007			
Site	WHITING				WHITING				WHITING			
Locator	18G00101				18G00201				18G00301			
Collect Date:	29-JUL-96				26-JUL-96				23-JUL-96			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Groundwater Quality mg/l												
Alkalinity as CaCO3	10	U	mg/l	10	10	U	mg/l	10	10	U	mg/l	10
Ammonia-N	.3	U	mg/l	.3	.3	U	mg/l	.3	.3	U	mg/l	.3
Chloride	10	U	mg/l	10	10	U	mg/l	10	10	U	mg/l	10
Hardness as CaCO3	10	U	mg/l	10	10	U	mg/l	10	10	U	mg/l	10
Nitrate-Nitrite	.79		mg/l	.1	1.18		mg/l	.25	.28		mg/l	.1
Phosphorous-P, Total	.1	U	mg/l	.1	.1	U	mg/l	.1	.1	U	mg/l	.1
Sulfate	.28		mg/l	.1	.14		mg/l	.1	.78		mg/l	.1
Sulfide	2	U	mg/l	2	2	U	mg/l	2	2	U	mg/l	2
Total Dissolved Solids	22		mg/l	10	22		mg/l	10	12		mg/l	10
Total Kjeldahl Nitrogen	.3	U	mg/l	.3	.3	U	mg/l	.3	.3	U	mg/l	.3
Total organic carbon	1.2		mg/l	1	1	U	mg/l	1	1	U	mg/l	1
Total petroleum hydrocarbons	-		mg/l		-		mg/l		-		mg/l	
Dissolved Methane	-		mg/l		-		mg/l		-		mg/l	
Dissolved Organic Carbon	-		mg/l		-		mg/l		-		mg/l	

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- VOLATILES -- REPORT NO. 10509

Lab Sample Number:	34807015				34807016				34807017				34807018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB1-5-7				18SB1-10-12				18SB2-5-7				18SB2-10-12			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	UJ	ug/kg	1300
Bromomethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Vinyl chloride	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Chloroethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Methylene chloride	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Acetone	58		ug/kg	11	26		ug/kg	12	24		ug/kg	10	1300	UJ	ug/kg	1300
Carbon disulfide	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
1,1-Dichloroethene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
1,1-Dichloroethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
1,2-Dichloroethene (total)	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Chloroform	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
1,2-Dichloroethane	11	UJ	ug/kg	11	12	UJ	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
2-Butanone	11	UJ	ug/kg	11	12	UJ	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
1,1,1-Trichloroethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Carbon tetrachloride	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Bromodichloromethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
1,2-Dichloropropane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
cis-1,3-Dichloropropene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Trichloroethene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Dibromochloromethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
1,1,2-Trichloroethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Benzene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
trans-1,3-Dichloropropene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Bromoform	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
4-Methyl-2-pentanone	11	UJ	ug/kg	11	12	UJ	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
2-Hexanone	11	UJ	ug/kg	11	12	UJ	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Tetrachloroethene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Toluene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
1,1,2,2-Tetrachloroethane	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Chlorobenzene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Ethylbenzene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Styrene	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300
Xylenes (total)	11	U	ug/kg	11	12	U	ug/kg	12	10	U	ug/kg	10	1300	U	ug/kg	1300

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- VOLATILES -- REPORT NO. 10509

Lab Sample Number:	34807019				34807020				34815001				34815002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB2-15-17				18SB2-20-22				18SB4-5-7				18SB4-10-12			
Collect Date:	05-JAN-93				05-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	6600	UJ	ug/kg	6600	11	U	ug/kg	11	1300	UJ	ug/kg	1300	11	U	ug/kg	11
Bromomethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Vinyl chloride	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Chloroethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Methylene chloride	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Acetone	6600	UJ	ug/kg	6600	77		ug/kg	11	1300	UJ	ug/kg	1300	11	U	ug/kg	11
Carbon disulfide	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
1,1-Dichloroethene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
1,1-Dichloroethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
1,2-Dichloroethene (total)	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Chloroform	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
1,2-Dichloroethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
2-Butanone	6600	UJ	ug/kg	6600	11	U	ug/kg	11	1300	UJ	ug/kg	1300	11	U	ug/kg	11
1,1,1-Trichloroethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Carbon tetrachloride	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Bromodichloromethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
1,2-Dichloropropane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
cis-1,3-Dichloropropene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Trichloroethene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Dibromochloromethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
1,1,2-Trichloroethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Benzene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
trans-1,3-Dichloropropene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Bromoform	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
4-Methyl-2-pentanone	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	3	J	ug/kg	11
2-Hexanone	6600	UJ	ug/kg	6600	11	U	ug/kg	11	1300	UJ	ug/kg	1300	11	U	ug/kg	11
Tetrachloroethene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Toluene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
1,1,2,2-Tetrachloroethane	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Chlorobenzene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Ethylbenzene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Styrene	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	11	U	ug/kg	11
Xylenes (total)	6600	U	ug/kg	6600	11	U	ug/kg	11	1300	U	ug/kg	1300	16		ug/kg	11

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- VOLATILES -- REPORT NO. 10509

Lab Sample Number:	34815003				34815004				34815005				34815006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB4-15-17				18SB4-25-27				18SB4-35-37				18SB4-40-42			
Collect Date:	06-JAN-93				06-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	1300	UJ	ug/kg	1300	11	UJ	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Bromomethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Vinyl chloride	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Chloroethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Methylene chloride	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Acetone	1300	UJ	ug/kg	1300	210		ug/kg	11	31	UJ	ug/kg	10	54	UJ	ug/kg	13
Carbon disulfide	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
1,1-Dichloroethene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
1,1-Dichloroethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
1,2-Dichloroethene (total)	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Chloroform	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
1,2-Dichloroethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
2-Butanone	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
1,1,1-Trichloroethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Carbon tetrachloride	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Bromodichloromethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
1,2-Dichloropropane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
cis-1,3-Dichloropropene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Trichloroethene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Dibromochloromethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
1,1,2-Trichloroethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Benzene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
trans-1,3-Dichloropropene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Bromoform	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
4-Methyl-2-pentanone	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
2-Hexanone	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Tetrachloroethene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Toluene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
1,1,2,2-Tetrachloroethane	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Chlorobenzene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Ethylbenzene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Styrene	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13
Xylenes (total)	1300	U	ug/kg	1300	11	U	ug/kg	11	10	U	ug/kg	10	13	U	ug/kg	13

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- VOLATILES -- REPORT NO. 10509

Lab Sample Number:	34807001				34807002				34807004				34807005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB6-5-7				18SB6-10-12				18SB6-15-17				18SB6-20-22			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	55	U	ug/kg	55	6500	UJ	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Bromomethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Vinyl chloride	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Chloroethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Methylene chloride	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Acetone	55	U	ug/kg	55	6500	UJ	ug/kg	6500	20		ug/kg	10	10	J	ug/kg	10
Carbon disulfide	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
1,1-Dichloroethene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
1,1-Dichloroethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
1,2-Dichloroethene (total)	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Chloroform	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
1,2-Dichloroethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	UJ	ug/kg	10	10	U	ug/kg	10
2-Butanone	21	J	ug/kg	55	6500	UJ	ug/kg	6500	10	UJ	ug/kg	10	10	U	ug/kg	10
1,1,1-Trichloroethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Carbon tetrachloride	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Bromodichloromethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
1,2-Dichloropropane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
cis-1,3-Dichloropropene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Trichloroethene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Dibromochloromethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
1,1,2-Trichloroethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Benzene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
trans-1,3-Dichloropropene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Bromoform	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
4-Methyl-2-pentanone	55	U	ug/kg	55	6500	U	ug/kg	6500	10	UJ	ug/kg	10	10	U	ug/kg	10
2-Hexanone	55	U	ug/kg	55	6500	UJ	ug/kg	6500	10	UJ	ug/kg	10	10	U	ug/kg	10
Tetrachloroethene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Toluene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
1,1,2,2-Tetrachloroethane	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Chlorobenzene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Ethylbenzene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Styrene	55	U	ug/kg	55	6500	U	ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10
Xylenes (total)	55	U	ug/kg	55	8700		ug/kg	6500	10	U	ug/kg	10	10	U	ug/kg	10

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- VOLATILES -- REPORT NO. 10509

Lab Sample Number:	34807007				34807006				34797001				34799002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB7-5-7				18SB7-15-17				18SB8-5-7				18SB8-10-12			
Collect Date:	05-JAN-93				05-JAN-93				04-JAN-93				04-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	UJ	ug/kg	7100
Bromomethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Vinyl chloride	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Chloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Methylene chloride	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Acetone	11	U	ug/kg	11	150		ug/kg	11	11	U	ug/kg	11	7100	UJ	ug/kg	7100
Carbon disulfide	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
1,1-Dichloroethene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
1,1-Dichloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
1,2-Dichloroethene (total)	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Chloroform	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
1,2-Dichloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
2-Butanone	11	U	ug/kg	11	11	U	ug/kg	11	12		ug/kg	11	7100	UJ	ug/kg	7100
1,1,1-Trichloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Carbon tetrachloride	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Bromodichloromethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
1,2-Dichloropropane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
cis-1,3-Dichloropropene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Trichloroethene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Dibromochloromethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
1,1,2-Trichloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Benzene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
trans-1,3-Dichloropropene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Bromoform	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
4-Methyl-2-pentanone	11	U	ug/kg	11	11	U	ug/kg	11	17		ug/kg	11	7100	U	ug/kg	7100
2-Hexanone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	UJ	ug/kg	7100
Tetrachloroethene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Toluene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
1,1,2,2-Tetrachloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Chlorobenzene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Ethylbenzene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Styrene	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	7100	U	ug/kg	7100
Xylenes (total)	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	800	J	ug/kg	7100

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- VOLATILES -- REPORT NO. 10509

Lab Sample Number:	34799003				34807013				34807014				34799001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB8-15-17				18SB9-5-7				18SB9-15-17				18SB10-5-7			
Collect Date:	04-JAN-93				05-JAN-93				05-JAN-93				04-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	1400	UJ	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Bromomethane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Vinyl chloride	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Chloroethane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Methylene chloride	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Acetone	1400	UJ	ug/kg	1400	11	U	ug/kg	11	93		ug/kg	11	230	J	ug/kg	11
Carbon disulfide	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,1-Dichloroethene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,1-Dichloroethane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,2-Dichloroethene (total)	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Chloroform	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,2-Dichloroethane	1400	U	ug/kg	1400	11	UJ	ug/kg	11	11	UJ	ug/kg	11	11	U	ug/kg	11
2-Butanone	1400	U	ug/kg	1400	11	UJ	ug/kg	11	11	UJ	ug/kg	11	11	U	ug/kg	11
1,1,1-Trichloroethane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Carbon tetrachloride	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Bromodichloromethane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,2-Dichloropropane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
cis-1,3-Dichloropropene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Trichloroethene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Dibromochloromethane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,1,2-Trichloroethane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Benzene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
trans-1,3-Dichloropropene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Bromoform	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
4-Methyl-2-pentanone	1400	U	ug/kg	1400	11	UJ	ug/kg	11	11	UJ	ug/kg	11	11	U	ug/kg	11
2-Hexanone	1400	U	ug/kg	1400	11	UJ	ug/kg	11	11	UJ	ug/kg	11	11	U	ug/kg	11
Tetrachloroethene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Toluene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,1,2,2-Tetrachloroethane	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Chlorobenzene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Ethylbenzene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Styrene	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Xylenes (total)	1400	U	ug/kg	1400	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34807015				34807016				34807017				34807018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB1-5-7				18SB1-10-12				18SB2-5-7				18SB2-10-12			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
bis(2-Chloroethyl) ether	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2-Chlorophenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
1,3-Dichlorobenzene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
1,4-Dichlorobenzene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
1,2-Dichlorobenzene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2-Methylphenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2,2-oxybis(1-Chloropropane)	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
4-Methylphenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
N-Nitroso-di-n-propylamine	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Hexachloroethane	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Nitrobenzene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Isophorone	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2-Nitrophenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2,4-Dimethylphenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
bis(2-Chloroethoxy) methane	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2,4-Dichlorophenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
1,2,4-Trichlorobenzene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Naphthalene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
4-Chloroaniline	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Hexachlorobutadiene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
4-Chloro-3-methylphenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2-Methylnaphthalene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Hexachlorocyclopentadiene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2,4,6-Trichlorophenol	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2,4,5-Trichlorophenol	850	U	ug/kg	850	860	U	ug/kg	860	860	U	ug/kg	860	850	U	ug/kg	850
2-Chloronaphthalene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2-Nitroaniline	850	U	ug/kg	850	860	U	ug/kg	860	860	U	ug/kg	860	850	U	ug/kg	850
Dimethylphthalate	350	U	ug/kg	350	40	J	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Acenaphthylene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2,6-Dinitrotoluene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
3-Nitroaniline	850	U	ug/kg	850	860	U	ug/kg	860	860	U	ug/kg	860	850	U	ug/kg	850
Acenaphthene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2,4-Dinitrophenol	850	U	ug/kg	850	860	U	ug/kg	860	860	U	ug/kg	860	850	U	ug/kg	850
4-Nitrophenol	850	U	ug/kg	850	860	U	ug/kg	860	860	U	ug/kg	860	850	U	ug/kg	850
Dibenzofuran	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
2,4-Dinitrotoluene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Diethylphthalate	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
4-Chlorophenyl-phenylether	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Fluorene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
4-Nitroaniline	850	U	ug/kg	850	860	U	ug/kg	860	860	U	ug/kg	860	850	U	ug/kg	850
4,6-Dinitro-2-methylphenol	850	U	ug/kg	850	860	U	ug/kg	860	860	U	ug/kg	860	850	U	ug/kg	850
N-Nitrosodiphenylamine	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
4-Bromophenyl-phenylether	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Hexachlorobenzene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Pentachlorophenol	850	U	ug/kg	850	860	U	ug/kg	860	860	U	ug/kg	860	850	U	ug/kg	850
Phenanthrene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Anthracene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Carbazole	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Di-n-butylphthalate	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34807015				34807016				34807017				34807018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB1-5-7				18SB1-10-12				18SB2-5-7				18SB2-10-12			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Fluoranthene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Pyrene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Butylbenzylphthalate	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
3,3-Dichlorobenzidine	350	UJ	ug/kg	350	350	UJ	ug/kg	350	350	U	ug/kg	350	350	UJ	ug/kg	350
Benzo (a) anthracene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Chrysene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
bis(2-Ethylhexyl) phthalate	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Di-n-octylphthalate	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Benzo (b) fluoranthene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Benzo (k) fluoranthene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Benzo (a) pyrene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Indeno (1,2,3-cd) pyrene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Dibenzo (a,h) anthracene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Benzo (g,h,i) perylene	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34807019				34807020				34815001				34815002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB2-15-17				18SB2-20-22				18SB4-5-7				18SB4-10-12			
Collect Date:	05-JAN-93				05-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
bis(2-Chloroethyl) ether	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2-Chlorophenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
1,3-Dichlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
1,4-Dichlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
1,2-Dichlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2-Methylphenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2,2-oxybis(1-Chloropropane)	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
4-Methylphenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
N-Nitroso-di-n-propylamine	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Hexachloroethane	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Nitrobenzene	370	U	ug/kg	370	370	U	ug/kg	370	700	UJ	ug/kg	700	700	UJ	ug/kg	700
Isophorone	370	U	ug/kg	370	370	U	ug/kg	370	700	UJ	ug/kg	700	700	UJ	ug/kg	700
2-Nitrophenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2,4-Dimethylphenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
bis(2-Chloroethoxy) methane	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2,4-Dichlorophenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
1,2,4-Trichlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Naphthalene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	720		ug/kg	700
4-Chloroaniline	370	UJ	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Hexachlorobutadiene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
4-Chloro-3-methylphenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2-Methylnaphthalene	370	U	ug/kg	370	370	U	ug/kg	370	970		ug/kg	700	1700		ug/kg	700
Hexachlorocyclopentadiene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2,4,6-Trichlorophenol	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2,4,5-Trichlorophenol	890	U	ug/kg	890	890	U	ug/kg	890	1700	U	ug/kg	1700	1700	U	ug/kg	1700
2-Chloronaphthalene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2-Nitroaniline	890	U	ug/kg	890	890	U	ug/kg	890	1700	U	ug/kg	1700	1700	U	ug/kg	1700
Dimethylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Acenaphthylene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2,6-Dinitrotoluene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
3-Nitroaniline	890	U	ug/kg	890	890	U	ug/kg	890	1700	U	ug/kg	1700	1700	U	ug/kg	1700
Acenaphthene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2,4-Dinitrophenol	890	U	ug/kg	890	890	U	ug/kg	890	1700	U	ug/kg	1700	1700	U	ug/kg	1700
4-Nitrophenol	890	U	ug/kg	890	890	U	ug/kg	890	1700	U	ug/kg	1700	1700	U	ug/kg	1700
Dibenzofuran	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
2,4-Dinitrotoluene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Diethylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
4-Chlorophenyl-phenylether	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Fluorene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	79	J	ug/kg	700

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34807019				34807020				34815001				34815002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB2-15-17				18SB2-20-22				18SB4-5-7				18SB4-10-12			
Collect Date:	05-JAN-93				05-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	890	U	ug/kg	890	890	U	ug/kg	890	1700	U	ug/kg	1700	1700	U	ug/kg	1700
4,6-Dinitro-2-methylphenol	890	U	ug/kg	890	890	U	ug/kg	890	1700	U	ug/kg	1700	1700	U	ug/kg	1700
N-Nitrosodiphenylamine	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
4-Bromophenyl-phenylether	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Hexachlorobenzene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Pentachlorophenol	890	U	ug/kg	890	890	U	ug/kg	890	1700	U	ug/kg	1700	1700	U	ug/kg	1700
Phenanthrene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Anthracene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Carbazole	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Di-n-butylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Fluoranthene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Pyrene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Butylbenzylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	700	UJ	ug/kg	700	700	UJ	ug/kg	700
3,3-Dichlorobenzidine	370	UJ	ug/kg	370	370	UJ	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Benzo (a) anthracene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Chrysene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
bis(2-Ethylhexyl) phthalate	370	U	ug/kg	370	370	U	ug/kg	370	700	UJ	ug/kg	700	700	UJ	ug/kg	700
Di-n-octylphthalate	370	U	ug/kg	370	370	U	ug/kg	370	700	UJ	ug/kg	700	700	UJ	ug/kg	700
Benzo (b) fluoranthene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Benzo (k) fluoranthene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Benzo (a) pyrene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Indeno (1,2,3-cd) pyrene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Dibenzo (a,h) anthracene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700
Benzo (g,h,i) perylene	370	U	ug/kg	370	370	U	ug/kg	370	700	U	ug/kg	700	700	U	ug/kg	700

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34815003				34815004				34815005				34815006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB4-15-17				18SB4-25-27				18SB4-35-37				18SB4-40-42			
Collect Date:	06-JAN-93				06-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
bis(2-Chloroethyl) ether	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2-Chlorophenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
1,3-Dichlorobenzene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
1,4-Dichlorobenzene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
1,2-Dichlorobenzene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2-Methylphenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2,2-oxybis(1-Chloropropane)	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
4-Methylphenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
N-Nitroso-di-n-propylamine	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Hexachloroethane	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Nitrobenzene	690	UJ	ug/kg	690	360	UJ	ug/kg	360	350	UJ	ug/kg	350	440	UJ	ug/kg	440
Isophorone	690	UJ	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2-Nitrophenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2,4-Dimethylphenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
bis(2-Chloroethoxy) methane	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2,4-Dichlorophenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
1,2,4-Trichlorobenzene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Naphthalene	1100		ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
4-Chloroaniline	690	U	ug/kg	690	360	UJ	ug/kg	360	350	UJ	ug/kg	350	440	UJ	ug/kg	440
Hexachlorobutadiene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
4-Chloro-3-methylphenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2-Methylnaphthalene	3100		ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Hexachlorocyclopentadiene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2,4,6-Trichlorophenol	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2,4,5-Trichlorophenol	1700	U	ug/kg	1700	880	U	ug/kg	880	850	U	ug/kg	850	1100	U	ug/kg	1100
2-Chloronaphthalene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2-Nitroaniline	1700	U	ug/kg	1700	880	U	ug/kg	880	850	U	ug/kg	850	1100	U	ug/kg	1100
Dimethylphthalate	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Acenaphthylene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2,6-Dinitrotoluene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
3-Nitroaniline	1700	U	ug/kg	1700	880	U	ug/kg	880	850	U	ug/kg	850	1100	U	ug/kg	1100
Acenaphthene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2,4-Dinitrophenol	1700	U	ug/kg	1700	880	UJ	ug/kg	880	850	UJ	ug/kg	850	1100	UJ	ug/kg	1100
4-Nitrophenol	1700	U	ug/kg	1700	880	U	ug/kg	880	850	U	ug/kg	850	1100	UJ	ug/kg	1100
Dibenzofuran	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
2,4-Dinitrotoluene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Diethylphthalate	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
4-Chlorophenyl-phenylether	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Fluorene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34815003				34815004				34815005				34815006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB4-15-17				18SB4-25-27				18SB4-35-37				18SB4-40-42			
Collect Date:	06-JAN-93				06-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	1700	U	ug/kg	1700	880	UJ	ug/kg	880	850	UJ	ug/kg	850	1100	UJ	ug/kg	1100
4,6-Dinitro-2-methylphenol	1700	U	ug/kg	1700	880	U	ug/kg	880	850	U	ug/kg	850	1100	U	ug/kg	1100
N-Nitrosodiphenylamine	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
4-Bromophenyl-phenylether	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Hexachlorobenzene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Pentachlorophenol	1700	U	ug/kg	1700	880	U	ug/kg	880	850	U	ug/kg	850	1100	U	ug/kg	1100
Phenanthrene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Anthracene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Carbazole	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Di-n-butylphthalate	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Fluoranthene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Pyrene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Butylbenzylphthalate	690	UJ	ug/kg	690	360	UJ	ug/kg	360	350	UJ	ug/kg	350	440	UJ	ug/kg	440
3,3-Dichlorobenzidine	690	U	ug/kg	690	360	UJ	ug/kg	360	350	UJ	ug/kg	350	440	UJ	ug/kg	440
Benzo (a) anthracene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Chrysene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
bis(2-Ethylhexyl) phthalate	690	UJ	ug/kg	690	360	UJ	ug/kg	360	350	UJ	ug/kg	350	440	UJ	ug/kg	440
Di-n-octylphthalate	690	UJ	ug/kg	690	360	UJ	ug/kg	360	350	UJ	ug/kg	350	440	UJ	ug/kg	440
Benzo (b) fluoranthene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Benzo (k) fluoranthene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Benzo (a) pyrene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Indeno (1,2,3-cd) pyrene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Dibenzo (a,h) anthracene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440
Benzo (g,h,i) perylene	690	U	ug/kg	690	360	U	ug/kg	360	350	U	ug/kg	350	440	U	ug/kg	440

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34807001				34807002				34807004				34807005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB6-5-7				18SB6-10-12				18SB6-15-17				18SB6-20-22			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
bis(2-Chloroethyl) ether	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2-Chlorophenol	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
1,3-Dichlorobenzene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
1,4-Dichlorobenzene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
1,2-Dichlorobenzene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2-Methylphenol	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2,2-oxybis(1-Chloropropane)	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
4-Methylphenol	110	J	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
N-Nitroso-di-n-propylamine	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Hexachloroethane	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Nitrobenzene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Isophorone	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2-Nitrophenol	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2,4-Dimethylphenol	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
bis(2-Chloroethoxy) methane	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2,4-Dichlorophenol	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
1,2,4-Trichlorobenzene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Naphthalene	230	J	ug/kg	360	16000	J	ug/kg	7200	680		ug/kg	350	340	U	ug/kg	340
4-Chloroaniline	360	UJ	ug/kg	360	7200	UJ	ug/kg	7200	350	UJ	ug/kg	350	340	UJ	ug/kg	340
Hexachlorobutadiene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
4-Chloro-3-methylphenol	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2-Methylnaphthalene	830		ug/kg	360	37000	J	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Hexachlorocyclopentadiene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2,4,6-Trichlorophenol	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2,4,5-Trichlorophenol	870	U	ug/kg	870	17000	UJ	ug/kg	17000	840	U	ug/kg	840	830	U	ug/kg	830
2-Chloronaphthalene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2-Nitroaniline	870	U	ug/kg	870	17000	UJ	ug/kg	17000	840	U	ug/kg	840	830	U	ug/kg	830
Dimethylphthalate	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Acenaphthylene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2,6-Dinitrotoluene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
3-Nitroaniline	870	U	ug/kg	870	17000	UJ	ug/kg	17000	840	U	ug/kg	840	830	U	ug/kg	830
Acenaphthene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
2,4-Dinitrophenol	870	UJ	ug/kg	870	17000	UJ	ug/kg	17000	840	UJ	ug/kg	840	830	UJ	ug/kg	830
4-Nitrophenol	870	UJ	ug/kg	870	17000	UJ	ug/kg	17000	840	UJ	ug/kg	840	830	UJ	ug/kg	830
Dibenzofuran	360	U	ug/kg	360	7200	UJ	ug/kg	7200	63	J	ug/kg	350	340	U	ug/kg	340
2,4-Dinitrotoluene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Diethylphthalate	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
4-Chlorophenyl-phenylether	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Fluorene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34807001				34807002				34807004				34807005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB6-5-7				18SB6-10-12				18SB6-15-17				18SB6-20-22			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	870	UJ	ug/kg	870	17000	UJ	ug/kg	17000	840	UJ	ug/kg	840	830	UJ	ug/kg	830
4,6-Dinitro-2-methylphenol	870	U	ug/kg	870	17000	UJ	ug/kg	17000	840	U	ug/kg	840	830	U	ug/kg	830
N-Nitrosodiphenylamine	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
4-Bromophenyl-phenylether	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Hexachlorobenzene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Pentachlorophenol	870	U	ug/kg	870	17000	UJ	ug/kg	17000	840	U	ug/kg	840	830	U	ug/kg	830
Phenanthrene	42	J	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Anthracene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Carbazole	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Di-n-butylphthalate	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Fluoranthene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Pyrene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Butylbenzylphthalate	360	UJ	ug/kg	360	7200	UJ	ug/kg	7200	350	UJ	ug/kg	350	340	UJ	ug/kg	340
3,3-Dichlorobenzidine	360	UJ	ug/kg	360	7200	UJ	ug/kg	7200	350	UJ	ug/kg	350	340	UJ	ug/kg	340
Benzo (a) anthracene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Chrysene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
bis(2-Ethylhexyl) phthalate	360	UJ	ug/kg	360	7200	UJ	ug/kg	7200	350	UJ	ug/kg	350	340	UJ	ug/kg	340
Di-n-octylphthalate	360	UJ	ug/kg	360	7200	UJ	ug/kg	7200	350	UJ	ug/kg	350	340	UJ	ug/kg	340
Benzo (b) fluoranthene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Benzo (k) fluoranthene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Benzo (a) pyrene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Indeno (1,2,3-cd) pyrene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Dibenzo (a,h) anthracene	360	U	ug/kg	360	7200	UJ	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340
Benzo (g,h,i) perylene	360	U	ug/kg	360	7200	U	ug/kg	7200	350	U	ug/kg	350	340	U	ug/kg	340

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34807007				34807006				34797001				34797002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB7-5-7				18SB7-15-17				18SB8-5-7				18SB8-5-7A			
Collect Date:	05-JAN-93				05-JAN-93				04-JAN-93				04-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	350	U	ug/kg	350	360	U	ug/kg	360	89	J	ug/kg	370	100	J	ug/kg	370
bis(2-Chloroethyl) ether	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2-Chlorophenol	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
1,3-Dichlorobenzene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
1,4-Dichlorobenzene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
1,2-Dichlorobenzene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2-Methylphenol	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2,2-oxybis(1-Chloropropane)	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
4-Methylphenol	350	U	ug/kg	350	360	U	ug/kg	360	250	J	ug/kg	370	280	J	ug/kg	370
N-Nitroso-di-n-propylamine	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Hexachloroethane	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Nitrobenzene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Isophorone	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2-Nitrophenol	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2,4-Dimethylphenol	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
bis(2-Chloroethoxy) methane	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2,4-Dichlorophenol	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
1,2,4-Trichlorobenzene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Naphthalene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
4-Chloroaniline	350	UJ	ug/kg	350	360	UJ	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Hexachlorobutadiene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
4-Chloro-3-methylphenol	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2-Methylnaphthalene	350	U	ug/kg	350	360	U	ug/kg	360	86	J	ug/kg	370	370	U	ug/kg	370
Hexachlorocyclopentadiene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2,4,6-Trichlorophenol	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2,4,5-Trichlorophenol	860	U	ug/kg	860	870	U	ug/kg	870	890	U	ug/kg	890	890	U	ug/kg	890
2-Chloronaphthalene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2-Nitroaniline	860	U	ug/kg	860	870	U	ug/kg	870	890	U	ug/kg	890	890	U	ug/kg	890
Dimethylphthalate	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Acenaphthylene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2,6-Dinitrotoluene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
3-Nitroaniline	860	U	ug/kg	860	870	U	ug/kg	870	890	U	ug/kg	890	890	U	ug/kg	890
Acenaphthene	350	U	ug/kg	350	360	U	ug/kg	360	370	UJ	ug/kg	370	370	U	ug/kg	370
2,4-Dinitrophenol	860	UJ	ug/kg	860	870	UJ	ug/kg	870	890	UJ	ug/kg	890	890	UJ	ug/kg	890
4-Nitrophenol	860	UJ	ug/kg	860	870	UJ	ug/kg	870	890	U	ug/kg	890	890	UJ	ug/kg	890
Dibenzofuran	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
2,4-Dinitrotoluene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Diethylphthalate	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
4-Chlorophenyl-phenylether	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Fluorene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34807007				34807006				34797001				34797002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB7-5-7				18SB7-15-17				18SB8-5-7				18SB8-5-7A			
Collect Date:	05-JAN-93				05-JAN-93				04-JAN-93				04-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	860	UJ	ug/kg	860	870	UJ	ug/kg	870	890	UJ	ug/kg	890	890	UJ	ug/kg	890
4,6-Dinitro-2-methylphenol	860	U	ug/kg	860	870	U	ug/kg	870	890	U	ug/kg	890	890	U	ug/kg	890
N-Nitrosodiphenylamine	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
4-Bromophenyl-phenylether	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Hexachlorobenzene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Pentachlorophenol	860	U	ug/kg	860	870	U	ug/kg	870	890	U	ug/kg	890	890	U	ug/kg	890
Phenanthrene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Anthracene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Carbazole	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Di-n-butylphthalate	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Fluoranthene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Pyrene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Butylbenzylphthalate	350	UJ	ug/kg	350	360	UJ	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
3,3-Dichlorobenzidine	350	UJ	ug/kg	350	360	UJ	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Benzo (a) anthracene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Chrysene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
bis(2-Ethylhexyl) phthalate	350	UJ	ug/kg	350	360	UJ	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Di-n-octylphthalate	350	UJ	ug/kg	350	360	UJ	ug/kg	360	370	UJ	ug/kg	370	370	U	ug/kg	370
Benzo (b) fluoranthene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Benzo (k) fluoranthene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Benzo (a) pyrene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Indeno (1,2,3-cd) pyrene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Dibenzo (a,h) anthracene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370
Benzo (g,h,i) perylene	350	U	ug/kg	350	360	U	ug/kg	360	370	U	ug/kg	370	370	U	ug/kg	370

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34799002				34799003				34807013				34807014			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB8-10-12				18SB8-15-17				18SB9-5-7				18SB9-15-17			
Collect Date:	04-JAN-93				04-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
bis(2-Chloroethyl) ether	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2-Chlorophenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
1,3-Dichlorobenzene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
1,4-Dichlorobenzene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
1,2-Dichlorobenzene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2-Methylphenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2,2-oxybis(1-Chloropropane)	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
4-Methylphenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
N-Nitroso-di-n-propylamine	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Hexachloroethane	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Nitrobenzene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Isophorone	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2-Nitrophenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2,4-Dimethylphenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
bis(2-Chloroethoxy) methane	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2,4-Dichlorophenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
1,2,4-Trichlorobenzene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Naphthalene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
4-Chloroaniline	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Hexachlorobutadiene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
4-Chloro-3-methylphenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2-Methylnaphthalene	910		ug/kg	380	170	J	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Hexachlorocyclopentadiene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2,4,6-Trichlorophenol	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2,4,5-Trichlorophenol	920	U	ug/kg	920	890	U	ug/kg	890	880	U	ug/kg	880	850	U	ug/kg	850
2-Chloronaphthalene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2-Nitroaniline	920	U	ug/kg	920	890	U	ug/kg	890	880	U	ug/kg	880	850	U	ug/kg	850
Dimethylphthalate	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Acenaphthylene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2,6-Dinitrotoluene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
3-Nitroaniline	920	U	ug/kg	920	890	U	ug/kg	890	880	U	ug/kg	880	850	U	ug/kg	850
Acenaphthene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2,4-Dinitrophenol	920	U	ug/kg	920	890	U	ug/kg	890	880	U	ug/kg	880	850	U	ug/kg	850
4-Nitrophenol	920	UJ	ug/kg	920	890	UJ	ug/kg	890	880	U	ug/kg	880	850	U	ug/kg	850
Dibenzofuran	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
2,4-Dinitrotoluene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Diethylphthalate	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
4-Chlorophenyl-phenylether	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Fluorene	56	J	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34799002				34799003				34807013				34807014			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB8-10-12				18SB8-15-17				18SB9-5-7				18SB9-15-17			
Collect Date:	04-JAN-93				04-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	920	U	ug/kg	920	890	U	ug/kg	890	880	U	ug/kg	880	850	U	ug/kg	850
4,6-Dinitro-2-methylphenol	920	U	ug/kg	920	890	U	ug/kg	890	880	U	ug/kg	880	850	U	ug/kg	850
N-Nitrosodiphenylamine	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
4-Bromophenyl-phenylether	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Hexachlorobenzene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Pentachlorophenol	920	U	ug/kg	920	890	U	ug/kg	890	880	U	ug/kg	880	850	U	ug/kg	850
Phenanthrene	58	J	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Anthracene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Carbazole	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Di-n-butylphthalate	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Fluoranthene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Pyrene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Butylbenzylphthalate	380	UJ	ug/kg	380	370	UJ	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
3,3-Dichlorobenzidine	380	U	ug/kg	380	370	U	ug/kg	370	360	UJ	ug/kg	360	350	UJ	ug/kg	350
Benzo (a) anthracene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Chrysene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
bis(2-Ethylhexyl) phthalate	380	U	ug/kg	380	370	U	ug/kg	370	360	UJ	ug/kg	360	350	UJ	ug/kg	350
Di-n-octylphthalate	380	UJ	ug/kg	380	370	UJ	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Benzo (b) fluoranthene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Benzo (k) fluoranthene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Benzo (a) pyrene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Indeno (1,2,3-cd) pyrene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Dibenzo (a,h) anthracene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350
Benzo (g,h,i) perylene	380	U	ug/kg	380	370	U	ug/kg	370	360	U	ug/kg	360	350	U	ug/kg	350

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34799001
Site	WHITING
Locator	18SB10-5-7
Collect Date:	04-JAN-93

	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW				
Phenol	380	U	ug/kg	380
bis(2-Chloroethyl) ether	380	U	ug/kg	380
2-Chlorophenol	380	U	ug/kg	380
1,3-Dichlorobenzene	380	U	ug/kg	380
1,4-Dichlorobenzene	380	U	ug/kg	380
1,2-Dichlorobenzene	380	U	ug/kg	380
2-Methylphenol	380	U	ug/kg	380
2,2-oxybis(1-Chloropropane)	380	U	ug/kg	380
4-Methylphenol	380	U	ug/kg	380
N-Nitroso-di-n-propylamine	380	U	ug/kg	380
Hexachloroethane	380	U	ug/kg	380
Nitrobenzene	380	U	ug/kg	380
Isophorone	380	U	ug/kg	380
2-Nitrophenol	380	U	ug/kg	380
2,4-Dimethylphenol	380	U	ug/kg	380
bis(2-Chloroethoxy) methane	380	U	ug/kg	380
2,4-Dichlorophenol	380	U	ug/kg	380
1,2,4-Trichlorobenzene	380	U	ug/kg	380
Naphthalene	380	U	ug/kg	380
4-Chloroaniline	380	U	ug/kg	380
Hexachlorobutadiene	380	U	ug/kg	380
4-Chloro-3-methylphenol	380	U	ug/kg	380
2-Methylnaphthalene	380	U	ug/kg	380
Hexachlorocyclopentadiene	380	U	ug/kg	380
2,4,6-Trichlorophenol	380	U	ug/kg	380
2,4,5-Trichlorophenol	930	U	ug/kg	930
2-Chloronaphthalene	380	U	ug/kg	380
2-Nitroaniline	930	U	ug/kg	930
Dimethylphthalate	380	U	ug/kg	380
Acenaphthylene	380	U	ug/kg	380
2,6-Dinitrotoluene	380	U	ug/kg	380
3-Nitroaniline	930	U	ug/kg	930
Acenaphthene	380	U	ug/kg	380
2,4-Dinitrophenol	930	U	ug/kg	930
4-Nitrophenol	930	UJ	ug/kg	930
Dibenzofuran	380	U	ug/kg	380
2,4-Dinitrotoluene	380	U	ug/kg	380
Diethylphthalate	380	U	ug/kg	380
4-Chlorophenyl-phenylether	380	U	ug/kg	380
Fluorene	380	U	ug/kg	380

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10510

Lab Sample Number:	34799001
Site	WHITING
Locator	18SB10-5-7
Collect Date:	04-JAN-93

	VALUE	QUAL	UNITS	DL
4-Nitroaniline	930	U	ug/kg	930
4,6-Dinitro-2-methylphenol	930	U	ug/kg	930
N-Nitrosodiphenylamine	380	U	ug/kg	380
4-Bromophenyl-phenylether	380	U	ug/kg	380
Hexachlorobenzene	380	U	ug/kg	380
Pentachlorophenol	930	U	ug/kg	930
Phenanthrene	380	U	ug/kg	380
Anthracene	380	U	ug/kg	380
Carbazole	380	U	ug/kg	380
Di-n-butylphthalate	380	U	ug/kg	380
Fluoranthene	380	U	ug/kg	380
Pyrene	380	U	ug/kg	380
Butylbenzylphthalate	380	UJ	ug/kg	380
3,3-Dichlorobenzidine	380	U	ug/kg	380
Benzo (a) anthracene	380	U	ug/kg	380
Chrysene	380	U	ug/kg	380
bis(2-Ethylhexyl) phthalate	380	U	ug/kg	380
Di-n-octylphthalate	380	UJ	ug/kg	380
Benzo (b) fluoranthene	380	U	ug/kg	380
Benzo (k) fluoranthene	380	U	ug/kg	380
Benzo (a) pyrene	380	U	ug/kg	380
Indeno (1,2,3-cd) pyrene	380	U	ug/kg	380
Dibenzo (a,h) anthracene	380	U	ug/kg	380
Benzo (g,h,i) perylene	380	U	ug/kg	380

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10511

Lab Sample Number:	34807015				34807016				34807017				34807018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB1-5-7				18SB1-10-12				18SB2-5-7				18SB2-10-12			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW																
alpha-BHC	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
beta-BHC	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
delta-BHC	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
gamma-BHC (Lindane)	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Heptachlor	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Aldrin	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Heptachlor epoxide	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Endosulfan I	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Dieldrin	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
4,4-DDE	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Endrin	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Endosulfan II	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
4,4-DDD	4.1	J	ug/kg	4	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Endosulfan sulfate	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
4,4-DDT	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Methoxychlor	18	UJ	ug/kg	18	18	UJ	ug/kg	18	18	UJ	ug/kg	18	18	UJ	ug/kg	18
Endrin ketone	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Endrin aldehyde	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
alpha-Chlordane	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
gamma-Chlordane	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Toxaphene	180	UJ	ug/kg	180	180	UJ	ug/kg	180	180	UJ	ug/kg	180	180	UJ	ug/kg	180
Aroclor-1016	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1221	71	UJ	ug/kg	71	72	UJ	ug/kg	72	72	UJ	ug/kg	72	71	UJ	ug/kg	71
Aroclor-1232	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1242	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1248	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1254	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1260	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35	35	UJ	ug/kg	35

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10511

Lab Sample Number:	34807019				34807020				34815001				34815002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB2-15-17				18SB2-20-22				18SB4-5-7				18SB4-10-12			
Collect Date:	05-JAN-93				05-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW																
alpha-BHC	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
beta-BHC	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
delta-BHC	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
gamma-BHC (Lindane)	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Heptachlor	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Aldrin	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Heptachlor epoxide	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Endosulfan I	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Dieldrin	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
4,4-DDE	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Endrin	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Endosulfan II	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
4,4-DDD	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Endosulfan sulfate	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
4,4-DDT	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Methoxychlor	19	UJ	ug/kg	19	19	UJ	ug/kg	19	18	UJ	ug/kg	18	18	UJ	ug/kg	18
Endrin ketone	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
Endrin aldehyde	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7	3.5	UJ	ug/kg	3.5	3.5	UJ	ug/kg	3.5
alpha-Chlordane	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
gamma-Chlordane	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8
Toxaphene	190	UJ	ug/kg	190	190	UJ	ug/kg	190	180	UJ	ug/kg	180	180	UJ	ug/kg	180
Aroclor-1016	37	UJ	ug/kg	37	37	UJ	ug/kg	37	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1221	74	UJ	ug/kg	74	74	UJ	ug/kg	74	71	UJ	ug/kg	71	71	UJ	ug/kg	71
Aroclor-1232	37	UJ	ug/kg	37	37	UJ	ug/kg	37	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1242	37	UJ	ug/kg	37	37	UJ	ug/kg	37	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1248	37	UJ	ug/kg	37	37	UJ	ug/kg	37	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1254	37	UJ	ug/kg	37	37	UJ	ug/kg	37	35	UJ	ug/kg	35	35	UJ	ug/kg	35
Aroclor-1260	37	UJ	ug/kg	37	37	UJ	ug/kg	37	35	UJ	ug/kg	35	35	UJ	ug/kg	35

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10511

Lab Sample Number:	34815003				34815004				34815005				34815006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB4-15-17				18SB4-25-27				18SB4-35-37				18SB4-40-42			
Collect Date:	06-JAN-93				06-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW																
alpha-BHC	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
beta-BHC	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
delta-BHC	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
gamma-BHC (Lindane)	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
Heptachlor	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
Aldrin	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
Heptachlor epoxide	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
Endosulfan I	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
Dieldrin	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	4.4	UJ	ug/kg	4.4
4,4-DDE	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	5.5	J	ug/kg	4.4
Endrin	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	4.4	UJ	ug/kg	4.4
Endosulfan II	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	4.4	UJ	ug/kg	4.4
4,4-DDD	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	4.4	UJ	ug/kg	4.4
Endosulfan sulfate	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	4.4	UJ	ug/kg	4.4
4,4-DDT	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	21	J	ug/kg	4.4
Methoxychlor	18	UJ	ug/kg	18	19	UJ	ug/kg	19	18	UJ	ug/kg	18	23	UJ	ug/kg	23
Endrin ketone	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	4.4	UJ	ug/kg	4.4
Endrin aldehyde	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5	4.4	UJ	ug/kg	4.4
alpha-Chlordane	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
gamma-Chlordane	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8	2.3	UJ	ug/kg	2.3
Toxaphene	180	UJ	ug/kg	180	190	UJ	ug/kg	190	180	UJ	ug/kg	180	230	UJ	ug/kg	230
Aroclor-1016	35	UJ	ug/kg	35	36	UJ	ug/kg	36	35	UJ	ug/kg	35	44	UJ	ug/kg	44
Aroclor-1221	71	UJ	ug/kg	71	74	UJ	ug/kg	74	71	UJ	ug/kg	71	89	UJ	ug/kg	89
Aroclor-1232	35	UJ	ug/kg	35	36	UJ	ug/kg	36	35	UJ	ug/kg	35	44	UJ	ug/kg	44
Aroclor-1242	35	UJ	ug/kg	35	36	UJ	ug/kg	36	35	UJ	ug/kg	35	44	UJ	ug/kg	44
Aroclor-1248	35	UJ	ug/kg	35	36	UJ	ug/kg	36	35	UJ	ug/kg	35	44	UJ	ug/kg	44
Aroclor-1254	35	UJ	ug/kg	35	36	UJ	ug/kg	36	35	UJ	ug/kg	35	44	UJ	ug/kg	44
Aroclor-1260	35	UJ	ug/kg	35	36	UJ	ug/kg	36	35	UJ	ug/kg	35	44	UJ	ug/kg	44

U= NOT DETECTED J=ESTIMATED VALUE
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NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10511

Lab Sample Number:	34807001			34807002			34807004			34807005		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	18SB6-5-7			18SB6-10-12			18SB6-15-17			18SB6-20-22		
Collect Date:	05-JAN-93			05-JAN-93			05-JAN-93			05-JAN-93		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP PESTICIDES/PCBS 90-SOW												
alpha-BHC	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
beta-BHC	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
delta-BHC	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
gamma-BHC (Lindane)	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
Heptachlor	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
Aldrin	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
Heptachlor epoxide	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
Endosulfan I	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
Dieldrin	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
4,4-DDE	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
Endrin	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
Endosulfan II	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
4,4-DDD	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
Endosulfan sulfate	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
4,4-DDT	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
Methoxychlor	18	UJ ug/kg	18	18	UJ ug/kg	18	18	UJ ug/kg	18	18	UJ ug/kg	18
Endrin ketone	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
Endrin aldehyde	3.6	UJ ug/kg	3.6	3.6	UJ ug/kg	3.6	3.5	UJ ug/kg	3.5	3.4	UJ ug/kg	3.4
alpha-Chlordane	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
gamma-Chlordane	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8	1.8	UJ ug/kg	1.8
Toxaphene	180	UJ ug/kg	180	180	UJ ug/kg	180	180	UJ ug/kg	180	180	UJ ug/kg	180
Aroclor-1016	36	UJ ug/kg	36	36	UJ ug/kg	36	35	UJ ug/kg	35	34	UJ ug/kg	34
Aroclor-1221	73	UJ ug/kg	73	73	UJ ug/kg	73	71	UJ ug/kg	71	70	UJ ug/kg	70
Aroclor-1232	36	UJ ug/kg	36	36	UJ ug/kg	36	35	UJ ug/kg	35	34	UJ ug/kg	34
Aroclor-1242	36	UJ ug/kg	36	36	UJ ug/kg	36	35	UJ ug/kg	35	34	UJ ug/kg	34
Aroclor-1248	36	UJ ug/kg	36	36	UJ ug/kg	36	35	UJ ug/kg	35	34	UJ ug/kg	34
Aroclor-1254	36	UJ ug/kg	36	36	UJ ug/kg	36	35	UJ ug/kg	35	34	UJ ug/kg	34
Aroclor-1260	36	UJ ug/kg	36	36	UJ ug/kg	36	35	UJ ug/kg	35	34	UJ ug/kg	34

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10511

Lab Sample Number:	34807007				34807006				34797001				34797002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB7-5-7				18SB7-15-17				18SB8-5-7				18SB8-5-7A			
Collect Date:	05-JAN-93				05-JAN-93				04-JAN-93				04-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW																
alpha-BHC	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
beta-BHC	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
delta-BHC	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
gamma-BHC (Lindane)	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
Heptachlor	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
Aldrin	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
Heptachlor epoxide	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
Endosulfan I	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
Dieldrin	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
4,4-DDE	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
Endrin	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
Endosulfan II	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
4,4-DDD	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
Endosulfan sulfate	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
4,4-DDT	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
Methoxychlor	18	UJ	ug/kg	18	18	UJ	ug/kg	18	19	UJ	ug/kg	19	19	UJ	ug/kg	19
Endrin ketone	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
Endrin aldehyde	3.5	UJ	ug/kg	3.5	3.6	UJ	ug/kg	3.6	3.7	UJ	ug/kg	3.7	3.7	UJ	ug/kg	3.7
alpha-Chlordane	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
gamma-Chlordane	1.8	UJ	ug/kg	1.8	1.8	UJ	ug/kg	1.8	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9
Toxaphene	180	UJ	ug/kg	180	180	UJ	ug/kg	180	190	UJ	ug/kg	190	190	UJ	ug/kg	190
Aroclor-1016	35	UJ	ug/kg	35	36	UJ	ug/kg	36	37	UJ	ug/kg	37	37	UJ	ug/kg	37
Aroclor-1221	72	UJ	ug/kg	72	73	UJ	ug/kg	73	74	UJ	ug/kg	74	74	UJ	ug/kg	74
Aroclor-1232	35	UJ	ug/kg	35	36	UJ	ug/kg	36	37	UJ	ug/kg	37	37	UJ	ug/kg	37
Aroclor-1242	35	UJ	ug/kg	35	36	UJ	ug/kg	36	37	UJ	ug/kg	37	37	UJ	ug/kg	37
Aroclor-1248	35	UJ	ug/kg	35	36	UJ	ug/kg	36	37	UJ	ug/kg	37	37	UJ	ug/kg	37
Aroclor-1254	35	UJ	ug/kg	35	36	UJ	ug/kg	36	37	UJ	ug/kg	37	37	UJ	ug/kg	37
Aroclor-1260	35	UJ	ug/kg	35	36	UJ	ug/kg	36	37	UJ	ug/kg	37	37	UJ	ug/kg	37

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10511

Lab Sample Number:	34799002				34799003				34807013				34807014			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB8-10-12				18SB8-15-17				18SB9-5-7				18SB9-15-17			
Collect Date:	04-JAN-93				04-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW																
alpha-BHC	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
beta-BHC	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
delta-BHC	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
gamma-BHC (Lindane)	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
Heptachlor	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
Aldrin	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
Heptachlor epoxide	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
Endosulfan I	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
Dieldrin	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
4,4-DDE	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
Endrin	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
Endosulfan II	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
4,4-DDD	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
Endosulfan sulfate	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
4,4-DDT	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
Methoxychlor	20	UJ	ug/kg	20	19	UJ	ug/kg	19	19	UJ	ug/kg	19	18	UJ	ug/kg	18
Endrin ketone	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
Endrin aldehyde	3.8	UJ	ug/kg	3.8	3.7	UJ	ug/kg	3.7	3.6	UJ	ug/kg	3.6	3.5	UJ	ug/kg	3.5
alpha-Chlordane	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
gamma-Chlordane	2	UJ	ug/kg	2	1.9	UJ	ug/kg	1.9	1.9	UJ	ug/kg	1.9	1.8	UJ	ug/kg	1.8
Toxaphene	200	UJ	ug/kg	200	190	UJ	ug/kg	190	190	UJ	ug/kg	190	180	UJ	ug/kg	180
Aroclor-1016	38	UJ	ug/kg	38	37	UJ	ug/kg	37	36	UJ	ug/kg	36	35	UJ	ug/kg	35
Aroclor-1221	77	UJ	ug/kg	77	74	UJ	ug/kg	74	74	UJ	ug/kg	74	71	UJ	ug/kg	71
Aroclor-1232	38	UJ	ug/kg	38	37	UJ	ug/kg	37	36	UJ	ug/kg	36	35	UJ	ug/kg	35
Aroclor-1242	38	UJ	ug/kg	38	37	UJ	ug/kg	37	36	UJ	ug/kg	36	35	UJ	ug/kg	35
Aroclor-1248	38	UJ	ug/kg	38	37	UJ	ug/kg	37	36	UJ	ug/kg	36	35	UJ	ug/kg	35
Aroclor-1254	38	UJ	ug/kg	38	37	UJ	ug/kg	37	36	UJ	ug/kg	36	35	UJ	ug/kg	35
Aroclor-1260	38	UJ	ug/kg	38	37	UJ	ug/kg	37	36	UJ	ug/kg	36	35	UJ	ug/kg	35

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
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NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10511

Lab Sample Number:	34799001
Site	WHITING
Locator	18SB10-5-7
Collect Date:	04-JAN-93

	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW				
alpha-BHC	2	UJ	ug/kg	2
beta-BHC	2	UJ	ug/kg	2
delta-BHC	2	UJ	ug/kg	2
gamma-BHC (Lindane)	2	UJ	ug/kg	2
Heptachlor	2	UJ	ug/kg	2
Aldrin	2	UJ	ug/kg	2
Heptachlor epoxide	2	UJ	ug/kg	2
Endosulfan I	2	UJ	ug/kg	2
Dieldrin	3.8	UJ	ug/kg	3.8
4,4-DDE	3.8	UJ	ug/kg	3.8
Endrin	3.8	UJ	ug/kg	3.8
Endosulfan II	3.8	UJ	ug/kg	3.8
4,4-DDD	3.8	UJ	ug/kg	3.8
Endosulfan sulfate	3.8	UJ	ug/kg	3.8
4,4-DDT	3.8	UJ	ug/kg	3.8
Methoxychlor	20	UJ	ug/kg	20
Endrin ketone	3.8	UJ	ug/kg	3.8
Endrin aldehyde	3.8	UJ	ug/kg	3.8
alpha-Chlordane	2	UJ	ug/kg	2
gamma-Chlordane	2	UJ	ug/kg	2
Toxaphene	200	UJ	ug/kg	200
Aroclor-1016	38	UJ	ug/kg	38
Aroclor-1221	78	UJ	ug/kg	78
Aroclor-1232	38	UJ	ug/kg	38
Aroclor-1242	38	UJ	ug/kg	38
Aroclor-1248	38	UJ	ug/kg	38
Aroclor-1254	38	UJ	ug/kg	38
Aroclor-1260	38	UJ	ug/kg	38

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
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NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- INORGANICS -- REPORT NO. 10512

Lab Sample Number:	34807015				34807016				34807017				34807018			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB1-5-7				18SB1-10-12				18SB2-5-7				18SB2-10-12			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	1940		mg/kg	40	3290		mg/kg	40	947		mg/kg	40	6280		mg/kg	40
Antimony	5.2	U	mg/kg	12	6	U	mg/kg	12	5.2	U	mg/kg	12	5.3	U	mg/kg	12
Arsenic	1.1	J	mg/kg	2	1.6	J	mg/kg	2	.6	J	mg/kg	2	1.6	J	mg/kg	2
Barium	4.7	J	mg/kg	40	4	J	mg/kg	40	2	J	mg/kg	40	3.2	J	mg/kg	40
Beryllium	.06	U	mg/kg	1	.09	J	mg/kg	1	.06	U	mg/kg	1	.06	U	mg/kg	1
Cadmium	.84	U	mg/kg	1	.96	U	mg/kg	1	.83	U	mg/kg	1	.85	U	mg/kg	1
Calcium	52.4	J	mg/kg	1000	43.3	J	mg/kg	1000	6.9	U	mg/kg	1000	7.1	U	mg/kg	1000
Chromium	1.6	J	mg/kg	2	2.9		mg/kg	2	1.7	J	mg/kg	2	5.2		mg/kg	2
Cobalt	.6	J	mg/kg	10	.71	J	mg/kg	10	.47	U	mg/kg	10	.89	J	mg/kg	10
Copper	.47	J	mg/kg	5	2.8	J	mg/kg	5	.36	J	mg/kg	5	1.6	J	mg/kg	5
Iron	1640		mg/kg	20	3130		mg/kg	20	810		mg/kg	20	4140		mg/kg	20
Lead	1.4		mg/kg	.6	1.7		mg/kg	.6	.45	J	mg/kg	.6	.85		mg/kg	.6
Magnesium	44.6	J	mg/kg	1000	30.1	J	mg/kg	1000	23.4	J	mg/kg	1000	52.5	J	mg/kg	1000
Manganese	14.8		mg/kg	3	18.4		mg/kg	3	8.3		mg/kg	3	11.1		mg/kg	3
Mercury	.04	J	mg/kg	.1	.05		mg/kg	.1	.02	U	mg/kg	.1	.02	U	mg/kg	.1
Nickel	2.9	J	mg/kg	8	3	U	mg/kg	8	2.6	U	mg/kg	8	2.7	U	mg/kg	8
Potassium	109	U	mg/kg	1000	125	U	mg/kg	1000	108	U	mg/kg	1000	119	J	mg/kg	1000
Selenium	.45	U	mg/kg	1	.52	U	mg/kg	1	.45	U	mg/kg	1	.46	U	mg/kg	1
Silver	.51	U	mg/kg	2	.59	U	mg/kg	2	.51	U	mg/kg	2	.52	U	mg/kg	2
Sodium	11.8	U	mg/kg	1000	13.5	U	mg/kg	1000	11.6	U	mg/kg	1000	12	U	mg/kg	1000
Thallium	.54	U	mg/kg	2	.62	U	mg/kg	2	.53	U	mg/kg	2	.55	U	mg/kg	2
Vanadium	2.9	J	mg/kg	10	6.2	J	mg/kg	10	1.4	J	mg/kg	10	11		mg/kg	10
Zinc	2.1	J	mg/kg	4	2.1	J	mg/kg	4	1.1	J	mg/kg	4	2.4	J	mg/kg	4
Cyanide	.52	J	mg/kg	.5	.6	J	mg/kg	.5	.75	J	mg/kg	.5	.5	J	mg/kg	.5

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NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- INORGANICS -- REPORT NO. 10512

Lab Sample Number:	34807019				34807020				34815001				34815002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB2-15-17				18SB2-20-22				18SB4-5-7				18SB4-10-12			
Collect Date:	05-JAN-93				05-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	1640		mg/kg	40	2010		mg/kg	40	2330		mg/kg	40	1830		mg/kg	40
Antimony	5.3	U	mg/kg	12	5.4	U	mg/kg	12	5.2	U	mg/kg	12	5.2	U	mg/kg	12
Arsenic	.63	J	mg/kg	2	1.2	J	mg/kg	2	.66	J	mg/kg	2	.78	J	mg/kg	2
Barium	1	J	mg/kg	40	2.1	J	mg/kg	40	7.1	J	mg/kg	40	2.5	J	mg/kg	40
Beryllium	.06	U	mg/kg	1	.06	U	mg/kg	1	.06	J	mg/kg	1	.06	U	mg/kg	1
Cadmium	.84	U	mg/kg	1	.86	U	mg/kg	1	.83	U	mg/kg	1	.84	U	mg/kg	1
Calcium	7	U	mg/kg	1000	14.7	J	mg/kg	1000	58.2	J	mg/kg	1000	7	U	mg/kg	1000
Chromium	2.2		mg/kg	2	2.7		mg/kg	2	3.5		mg/kg	2	2	J	mg/kg	2
Cobalt	.86	J	mg/kg	10	.49	U	mg/kg	10	.47	UJ	mg/kg	10	.48	UJ	mg/kg	10
Copper	.82	J	mg/kg	5	.37	U	mg/kg	5	7		mg/kg	5	.36	U	mg/kg	5
Iron	1200		mg/kg	20	1890		mg/kg	20	2410		mg/kg	20	1490		mg/kg	20
Lead	.12	U	mg/kg	.6	.67		mg/kg	.6	3.8		mg/kg	1	1.5		mg/kg	1
Magnesium	16.5	J	mg/kg	1000	11.1	J	mg/kg	1000	151	J	mg/kg	1000	39	J	mg/kg	1000
Manganese	4.6		mg/kg	3	7.1		mg/kg	3	16.7		mg/kg	3	6.4		mg/kg	3
Mercury	.02	U	mg/kg	.1	.02	U	mg/kg	.1	.02	J	mg/kg	.1	.02	UJ	mg/kg	.1
Nickel	2.7	U	mg/kg	8	2.7	U	mg/kg	8	2.6	U	mg/kg	8	2.6	U	mg/kg	8
Potassium	109	U	mg/kg	1000	112	U	mg/kg	1000	109	J	mg/kg	1000	109	U	mg/kg	1000
Selenium	.45	U	mg/kg	1	.47	U	mg/kg	1	.45	U	mg/kg	1	.45	U	mg/kg	1
Silver	.52	U	mg/kg	2	.53	U	mg/kg	2	.51	U	mg/kg	2	.51	U	mg/kg	2
Sodium	11.9	U	mg/kg	1000	12.1	U	mg/kg	1000	11.7	U	mg/kg	1000	11.8	U	mg/kg	1000
Thallium	.54	U	mg/kg	2	.55	U	mg/kg	2	.53	U	mg/kg	2	.54	U	mg/kg	2
Vanadium	3.3	J	mg/kg	10	7.9	J	mg/kg	10	4.3	J	mg/kg	10	3.6	J	mg/kg	10
Zinc	.78	J	mg/kg	4	.65	J	mg/kg	4	4.5		mg/kg	4	2	J	mg/kg	4
Cyanide	.55	J	mg/kg	.5	.27	J	mg/kg	.5	.7	J	mg/kg	1	.49	J	mg/kg	1

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R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- INORGANICS -- REPORT NO. 10512

Lab Sample Number:	34815003				34815004				34815005				34815006			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB4-15-17				18SB4-25-27				18SB4-35-37				18SB4-40-42			
Collect Date:	06-JAN-93				06-JAN-93				06-JAN-93				06-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	1170		mg/kg	40	1360		mg/kg	40	382		mg/kg	40	11100		mg/kg	40
Antimony	5.2	U	mg/kg	12	5.6	U	mg/kg	12	5.2	U	mg/kg	12	6.4	U	mg/kg	12
Arsenic	.56	J	mg/kg	2	.5	J	mg/kg	2	.21	U	mg/kg	2	2	J	mg/kg	2
Barium	1.6	J	mg/kg	40	4.1	J	mg/kg	40	1.2	J	mg/kg	40	33.3	J	mg/kg	40
Beryllium	.06	U	mg/kg	1	.06	U	mg/kg	1	.06	U	mg/kg	1	.14	J	mg/kg	1
Cadmium	.83	U	mg/kg	1	.9	U	mg/kg	1	.83	U	mg/kg	1	1	U	mg/kg	1
Calcium	6.9	U	mg/kg	1000	7.5	U	mg/kg	1000	6.9	U	mg/kg	1000	141	J	mg/kg	1000
Chromium	2.3		mg/kg	2	2.9		mg/kg	2	1.2	J	mg/kg	2	39.7		mg/kg	2
Cobalt	.47	UJ	mg/kg	10	.51	UJ	mg/kg	10	.47	UJ	mg/kg	10	.59	UJ	mg/kg	10
Copper	.35	U	mg/kg	5	.38	U	mg/kg	5	.35	U	mg/kg	5	3	J	mg/kg	5
Iron	933		mg/kg	20	431		mg/kg	20	225		mg/kg	20	4360		mg/kg	20
Lead	.97		mg/kg	1	2		mg/kg	1	.34	J	mg/kg	1	14.5		mg/kg	1
Magnesium	19.9	J	mg/kg	1000	16.5	J	mg/kg	1000	7.5	U	mg/kg	1000	300	J	mg/kg	1000
Manganese	2.8	J	mg/kg	3	1.6	J	mg/kg	3	.44	J	mg/kg	3	7.3		mg/kg	3
Mercury	.02	UJ	mg/kg	.1	.02	UJ	mg/kg	.1	.02	UJ	mg/kg	.1	.1	J	mg/kg	.1
Nickel	2.6	U	mg/kg	8	2.8	U	mg/kg	8	2.6	U	mg/kg	8	3.3	U	mg/kg	8
Potassium	110	J	mg/kg	1000	117	U	mg/kg	1000	108	U	mg/kg	1000	823	J	mg/kg	1000
Selenium	.45	U	mg/kg	1	.58	U	mg/kg	1	.45	U	mg/kg	1	1.1	J	mg/kg	1
Silver	.51	U	mg/kg	2	.55	U	mg/kg	2	.51	U	mg/kg	2	.63	U	mg/kg	2
Sodium	11.6	U	mg/kg	1000	12.6	U	mg/kg	1000	11.6	U	mg/kg	1000	25.6	J	mg/kg	1000
Thallium	.53	U	mg/kg	2	.58	U	mg/kg	2	.53	U	mg/kg	2	.66	U	mg/kg	2
Vanadium	2.3	J	mg/kg	10	4.6	J	mg/kg	10	1.2	J	mg/kg	10	39.9		mg/kg	10
Zinc	2.3	J	mg/kg	4	.67	J	mg/kg	4	1	J	mg/kg	4	2.3	J	mg/kg	4
Cyanide	.56	J	mg/kg	1	.57	J	mg/kg	1	.53	J	mg/kg	1	.7	J	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- INORGANICS -- REPORT NO. 10512

Lab Sample Number:	34807001				34807002				34807004				34807005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB6-5-7				18SB6-10-12				18SB6-15-17				18SB6-20-22			
Collect Date:	05-JAN-93				05-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	4530		mg/kg	40	2630		mg/kg	40	1000		mg/kg	40	1020		mg/kg	40
Antimony	5.4	U	mg/kg	12	5.1	U	mg/kg	12	5.2	U	mg/kg	12	5.1	U	mg/kg	12
Arsenic	1.2	J	mg/kg	2	.65	J	mg/kg	2	.33	UJ	mg/kg	2	.21	UJ	mg/kg	2
Barium	5.2	J	mg/kg	40	2.1	J	mg/kg	40	.66	J	mg/kg	40	.46	J	mg/kg	40
Beryllium	.06	U	mg/kg	1	.06	U	mg/kg	1	.06	U	mg/kg	1	.06	U	mg/kg	1
Cadmium	.87	U	mg/kg	1	.82	U	mg/kg	1	.83	U	mg/kg	1	.82	U	mg/kg	1
Calcium	180	J	mg/kg	1000	9.4	J	mg/kg	1000	6.9	U	mg/kg	1000	6.8	U	mg/kg	1000
Chromium	6.2		mg/kg	2	3.2		mg/kg	2	1.4	J	mg/kg	2	1.8	J	mg/kg	2
Cobalt	.71	J	mg/kg	10	.47	U	mg/kg	10	.47	U	mg/kg	10	.47	U	mg/kg	10
Copper	4.1	J	mg/kg	5	1.7	J	mg/kg	5	.35	U	mg/kg	5	.42	J	mg/kg	5
Iron	4570		mg/kg	20	1590		mg/kg	20	633		mg/kg	20	558		mg/kg	20
Lead	4.9		mg/kg	.6	1.8		mg/kg	.6	.63		mg/kg	.6	.3	J	mg/kg	.6
Magnesium	99.2	J	mg/kg	1000	39.5	J	mg/kg	1000	8.9	J	mg/kg	1000	7.4	U	mg/kg	1000
Manganese	63		mg/kg	3	6.4		mg/kg	3	1.1	J	mg/kg	3	.77	J	mg/kg	3
Mercury	.02	U	mg/kg	.1	.02	U	mg/kg	.1	.02	U	mg/kg	.1	.02	U	mg/kg	.1
Nickel	2.7	U	mg/kg	8	2.6	U	mg/kg	8	2.6	U	mg/kg	8	2.6	U	mg/kg	8
Potassium	873	J	mg/kg	1000	471	J	mg/kg	1000	189	J	mg/kg	1000	107	U	mg/kg	1000
Selenium	.47	U	mg/kg	1	.44	U	mg/kg	1	.45	U	mg/kg	1	.44	U	mg/kg	1
Silver	.53	U	mg/kg	2	.5	U	mg/kg	2	.51	U	mg/kg	2	.5	U	mg/kg	2
Sodium	29.8	J	mg/kg	1000	13.3	J	mg/kg	1000	11.6	U	mg/kg	1000	11.6	U	mg/kg	1000
Thallium	.56	U	mg/kg	2	.53	U	mg/kg	2	.53	U	mg/kg	2	.53	U	mg/kg	2
Vanadium	14.1		mg/kg	10	6.9	J	mg/kg	10	2.4	J	mg/kg	10	2.5	J	mg/kg	10
Zinc	1.4	J	mg/kg	4	1.6	J	mg/kg	4	1.1	J	mg/kg	4	1.2	J	mg/kg	4
Cyanide	.44	J	mg/kg	.5	.43	J	mg/kg	.5	.44	J	mg/kg	.5	.38	J	mg/kg	.5

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NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- INORGANICS -- REPORT NO. 10512

Lab Sample Number:	34807007			34807006			34797001			34797002		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	18SB7-5-7			18SB7-15-17			18SB8-5-7			18SB8-5-7A		
Collect Date:	05-JAN-93			05-JAN-93			04-JAN-93			04-JAN-93		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP METALS AND CYANIDE												
Aluminum	4680	mg/kg	40	2010	mg/kg	40	10000 J	mg/kg	40	3660 J	mg/kg	40
Antimony	5.2 U	mg/kg	12	5.3 U	mg/kg	12	5.4 U	mg/kg	12	5.5 U	mg/kg	12
Arsenic	.9 J	mg/kg	2	.65 J	mg/kg	2	3.5 J	mg/kg	2	2.9 J	mg/kg	2
Barium	4.7 J	mg/kg	40	.55 J	mg/kg	40	7.6 J	mg/kg	40	5.9 J	mg/kg	40
Beryllium	.07 J	mg/kg	1	.06 U	mg/kg	1	.09 J	mg/kg	1	.09 J	mg/kg	1
Cadmium	.84 U	mg/kg	1	.85 U	mg/kg	1	.87 U	mg/kg	1	.88 U	mg/kg	1
Calcium	7.3 J	mg/kg	1000	7 U	mg/kg	1000	27.2 UJ	mg/kg	1000	23.3 UJ	mg/kg	1000
Chromium	4.5	mg/kg	2	2.7	mg/kg	2	7.9	mg/kg	2	3.8	mg/kg	2
Cobalt	.61 J	mg/kg	10	.48 U	mg/kg	10	1 J	mg/kg	10	.53 J	mg/kg	10
Copper	1.7 J	mg/kg	5	.36 U	mg/kg	5	1.3 UJ	mg/kg	5	1.1 UJ	mg/kg	5
Iron	3020	mg/kg	20	1250	mg/kg	20	8620 J	mg/kg	20	4190 J	mg/kg	20
Lead	1.6	mg/kg	.6	1.4	mg/kg	.6	4.8 J	mg/kg	1	3.7 J	mg/kg	1
Magnesium	73.6 J	mg/kg	1000	7.7 U	mg/kg	1000	48.6 UJ	mg/kg	1000	15.8 UJ	mg/kg	1000
Manganese	22.1	mg/kg	3	2.4 J	mg/kg	3	18	mg/kg	3	8.9	mg/kg	3
Mercury	.02 U	mg/kg	.1	.02 U	mg/kg	.1	.02 U	mg/kg	.1	.02 U	mg/kg	.1
Nickel	2.7 J	mg/kg	8	2.7 U	mg/kg	8	2.8 U	mg/kg	8	2.8 U	mg/kg	8
Potassium	109 U	mg/kg	1000	110 U	mg/kg	1000	1150	mg/kg	1000	1220	mg/kg	1000
Selenium	.53 U	mg/kg	1	.46 U	mg/kg	1	1.4 J	mg/kg	1	1 J	mg/kg	1
Silver	.51 U	mg/kg	2	.52 U	mg/kg	2	.53 U	mg/kg	2	.54 U	mg/kg	2
Sodium	11.8 U	mg/kg	1000	11.9 U	mg/kg	1000	32.6 UJ	mg/kg	1000	28.7 UJ	mg/kg	1000
Thallium	.54 U	mg/kg	2	.55 U	mg/kg	2	.49 UJ	mg/kg	2	.49 UJ	mg/kg	2
Vanadium	8.4 J	mg/kg	10	4.3 J	mg/kg	10	21.5	mg/kg	10	11.9	mg/kg	10
Zinc	2.9 J	mg/kg	4	.63 J	mg/kg	4	2.4 UJ	mg/kg	4	.92 UJ	mg/kg	4
Cyanide	.41 J	mg/kg	.5	.42 J	mg/kg	.5	.44 UJ	mg/kg	1	.45 UJ	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- INORGANICS -- REPORT NO. 10512

Lab Sample Number:	34799002				34799003				34807013				34807014			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18SB8-10-12				18SB8-15-17				18SB9-5-7				18SB9-15-17			
Collect Date:	04-JAN-93				04-JAN-93				05-JAN-93				05-JAN-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	2480		mg/kg	40	8460		mg/kg	40	5910		mg/kg	40	1430		mg/kg	40
Antimony	5.6	U	mg/kg	12	5.6	U	mg/kg	12	5.4	U	mg/kg	12	5.2	U	mg/kg	12
Arsenic	1	J	mg/kg	2	1.7	J	mg/kg	2	3		mg/kg	2	.57	J	mg/kg	2
Barium	4.7	J	mg/kg	40	5.6	J	mg/kg	40	7.8	J	mg/kg	40	.8	J	mg/kg	40
Beryllium	.06	U	mg/kg	1	.06	U	mg/kg	1	.07	J	mg/kg	1	.06	U	mg/kg	1
Cadmium	.9	U	mg/kg	1	.9	U	mg/kg	1	.87	U	mg/kg	1	.84	U	mg/kg	1
Calcium	17.6	J	mg/kg	1000	21.5	J	mg/kg	1000	9.9	J	mg/kg	1000	14.6	J	mg/kg	1000
Chromium	8.6		mg/kg	2	9.5		mg/kg	2	4.9		mg/kg	2	1.6	J	mg/kg	2
Cobalt	.51	U	mg/kg	10	.92	J	mg/kg	10	.88	J	mg/kg	10	.48	U	mg/kg	10
Copper	.5	J	mg/kg	5	1.1	J	mg/kg	5	1.4	J	mg/kg	5	.56	J	mg/kg	5
Iron	4000		mg/kg	20	7610		mg/kg	20	4640		mg/kg	20	873		mg/kg	20
Lead	4.7		mg/kg	1	2.9		mg/kg	1	11.1		mg/kg	.6	1		mg/kg	.6
Magnesium	19.2	J	mg/kg	1000	52.3	J	mg/kg	1000	87.6	J	mg/kg	1000	7.5	U	mg/kg	1000
Manganese	2.9	J	mg/kg	3	15.5		mg/kg	3	23.2		mg/kg	3	2	J	mg/kg	3
Mercury	.02	U	mg/kg	.1	.02	U	mg/kg	.1	.02	U	mg/kg	.1	.05		mg/kg	.1
Nickel	2.8	U	mg/kg	8	2.8	U	mg/kg	8	2.7	U	mg/kg	8	2.6	U	mg/kg	8
Potassium	1230		mg/kg	1000	841	J	mg/kg	1000	312	J	mg/kg	1000	202	J	mg/kg	1000
Selenium	.8	U	mg/kg	1	.79	U	mg/kg	1	.54	U	mg/kg	1	.45	U	mg/kg	1
Silver	.55	U	mg/kg	2	.57	J	mg/kg	2	.53	U	mg/kg	2	.51	U	mg/kg	2
Sodium	17.6	J	mg/kg	1000	16.3	J	mg/kg	1000	12.2	U	mg/kg	1000	11.8	U	mg/kg	1000
Thallium	.5	U	mg/kg	2	.5	U	mg/kg	2	.56	U	mg/kg	2	.54	U	mg/kg	2
Vanadium	15.8		mg/kg	10	23.3		mg/kg	10	10.3	J	mg/kg	10	3.2	J	mg/kg	10
Zinc	.58	J	mg/kg	4	13.1		mg/kg	4	3.1	J	mg/kg	4	.93	J	mg/kg	4
Cyanide	.41	J	mg/kg	1	.41	J	mg/kg	1	3.3		mg/kg	.5	.51	J	mg/kg	.5

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NAS WHITING FIELD -- SITE 18
SUBSURFACE SOIL -- INORGANICS -- REPORT NO. 10512

Lab Sample Number:	34799001
Site	WHITING
Locator	18SB10-5-7
Collect Date:	04-JAN-93

	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE				
Aluminum	2560		mg/kg	40
Antimony	5.6	U	mg/kg	12
Arsenic	2.2	J	mg/kg	2
Barium	4.7	J	mg/kg	40
Beryllium	.06	U	mg/kg	1
Cadmium	.9	U	mg/kg	1
Calcium	35.1	J	mg/kg	1000
Chromium	10.4		mg/kg	2
Cobalt	.51	U	mg/kg	10
Copper	.8	J	mg/kg	5
Iron	5350		mg/kg	20
Lead	5.1		mg/kg	1
Magnesium	26.1	J	mg/kg	1000
Manganese	16.2		mg/kg	3
Mercury	.02	U	mg/kg	.1
Nickel	2.8	U	mg/kg	8
Potassium	637	J	mg/kg	1000
Selenium	.79	U	mg/kg	1
Silver	.55	U	mg/kg	2
Sodium	12.6	U	mg/kg	1000
Thallium	.5	U	mg/kg	2
Vanadium	23.9		mg/kg	10
Zinc	.84	J	mg/kg	4
Cyanide	.43	J	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22481001				22481002				22462010				22462011			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-01				18-SL-01A				18-SL-02				18-SL-03			
Collect Date:	12-AUG-92				12-AUG-92				12-AUG-92				12-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	11	U	ug/kg	11	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11
Bromomethane	11	U	ug/kg	11	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11
Vinyl chloride	11	U	ug/kg	11	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11
Chloroethane	11	U	ug/kg	11	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11
Methylene chloride	64	J	ug/kg	6	20	UJ	ug/kg	6	52	UJ	ug/kg	6	74	J	ug/kg	5
Acetone	19	UJ	ug/kg	11	12	UJ	ug/kg	12	34	UJ	ug/kg	11	11	UJ	ug/kg	11
Carbon disulfide	6		ug/kg	6	6	U	ug/kg	6	4	J	ug/kg	6	7		ug/kg	5
1,1-Dichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
1,1-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
1,2-Dichloroethene (total)	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Chloroform	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
1,2-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
2-Butanone	11	U	ug/kg	11	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11
1,1,1-Trichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Carbon tetrachloride	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Bromodichloromethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
1,2-Dichloropropane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
cis-1,3-Dichloropropene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Trichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Dibromochloromethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
1,1,2-Trichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Benzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
trans-1,3-Dichloropropene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Bromoform	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
4-Methyl-2-pentanone	11	U	ug/kg	11	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11
2-Hexanone	11	U	ug/kg	11	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11
Tetrachloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Toluene	6	U	ug/kg	6	6	U	ug/kg	6	9		ug/kg	6	1	J	ug/kg	5
1,1,2,2-Tetrachloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Chlorobenzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Ethylbenzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Styrene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5
Xylenes (total)	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	5	J	ug/kg	5

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22462012				22507005				22507006				22488001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-04				18-SL-05				18-SL-06				18-SL-07			
Collect Date:	12-AUG-92				14-AUG-92				14-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	63	U	ug/kg	63	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Bromomethane	63	U	ug/kg	63	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Vinyl chloride	63	U	ug/kg	63	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Chloroethane	63	U	ug/kg	63	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Methylene chloride	32	UJ	ug/kg	160	9	UJ	ug/kg	5	9	UJ	ug/kg	5	57	UJ	ug/kg	6
Acetone	63	UJ	ug/kg	320	24	UJ	ug/kg	11	52	UJ	ug/kg	11	17	UJ	ug/kg	11
Carbon disulfide	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	UJ	ug/kg	6
1,1-Dichloroethene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
1,1-Dichloroethane	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
1,2-Dichloroethene (total)	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Chloroform	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
1,2-Dichloroethane	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
2-Butanone	63	U	ug/kg	63	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,1,1-Trichloroethane	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Carbon tetrachloride	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Bromodichloromethane	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
1,2-Dichloropropane	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
cis-1,3-Dichloropropene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Trichloroethene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Dibromochloromethane	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
1,1,2-Trichloroethane	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Benzene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
trans-1,3-Dichloropropene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Bromoform	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
4-Methyl-2-pentanone	63	U	ug/kg	63	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
2-Hexanone	63	UJ	ug/kg	63	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Tetrachloroethene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Toluene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
1,1,2,2-Tetrachloroethane	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Chlorobenzene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Ethylbenzene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Styrene	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6
Xylenes (total)	32	U	ug/kg	32	5	U	ug/kg	5	5	U	ug/kg	5	3	J	ug/kg	6

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22488002				22488003				22489001				22489002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-08				18-SL-09				18-SL-10				18-SL-10A			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	11	U	ug/kg	11	61	U	ug/kg	61	53	U	ug/kg	53	54	U	ug/kg	54
Bromomethane	11	U	ug/kg	11	61	U	ug/kg	61	53	U	ug/kg	53	54	U	ug/kg	54
Vinyl chloride	11	U	ug/kg	11	61	U	ug/kg	61	53	U	ug/kg	53	54	U	ug/kg	54
Chloroethane	11	U	ug/kg	11	61	U	ug/kg	61	53	U	ug/kg	53	54	U	ug/kg	54
Methylene chloride	5	UJ	ug/kg	5	36	UJ	ug/kg	150	29	UJ	ug/kg	130	47	UJ	ug/kg	140
Acetone	11	UJ	ug/kg	11	61	UJ	ug/kg	300	150	UJ	ug/kg	260	180	UJ	ug/kg	270
Carbon disulfide	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
1,1-Dichloroethene	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
1,1-Dichloroethane	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
1,2-Dichloroethene (total)	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Chloroform	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
1,2-Dichloroethane	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
2-Butanone	11	U	ug/kg	11	61	U	ug/kg	61	36	J	ug/kg	260	35	J	ug/kg	270
1,1,1-Trichloroethane	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Carbon tetrachloride	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Bromodichloromethane	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
1,2-Dichloropropane	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
cis-1,3-Dichloropropene	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Trichloroethene	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Dibromochloromethane	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
1,1,2-Trichloroethane	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Benzene	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
trans-1,3-Dichloropropene	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Bromoform	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
4-Methyl-2-pentanone	11	U	ug/kg	11	61	U	ug/kg	61	53	U	ug/kg	53	54	U	ug/kg	54
2-Hexanone	11	UJ	ug/kg	11	61	UJ	ug/kg	61	53	U	ug/kg	53	54	U	ug/kg	54
Tetrachloroethene	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Toluene	5	U	ug/kg	5	30	U	ug/kg	30	10	J	ug/kg	130	28		ug/kg	140
1,1,2,2-Tetrachloroethane	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Chlorobenzene	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Ethylbenzene	5	U	ug/kg	5	30	U	ug/kg	30	23	J	ug/kg	130	70		ug/kg	140
Styrene	5	U	ug/kg	5	30	U	ug/kg	30	27	U	ug/kg	27	27	U	ug/kg	27
Xylenes (total)	5	U	ug/kg	5	30	U	ug/kg	30	160		ug/kg	130	430		ug/kg	140

U= NOT DETECTED J=ESTIMATED VALUE
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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22488004				22488005				22488006				22488008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-11				18-SL-12				18-SL-13				18-SL-14			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	11	U	ug/kg	11	12	U	ug/kg	12	54	U	ug/kg	54	11	U	ug/kg	11
Bromomethane	11	U	ug/kg	11	12	U	ug/kg	12	54	U	ug/kg	54	11	U	ug/kg	11
Vinyl chloride	11	U	ug/kg	11	12	U	ug/kg	12	54	U	ug/kg	54	11	U	ug/kg	11
Chloroethane	11	U	ug/kg	11	12	U	ug/kg	12	54	U	ug/kg	54	11	U	ug/kg	11
Methylene chloride	7	UJ	ug/kg	5	49	UJ	ug/kg	6	47	UJ	ug/kg	140	23	UJ	ug/kg	5
Acetone	15	UJ	ug/kg	11	32	UJ	ug/kg	12	150	UJ	ug/kg	270	34	UJ	ug/kg	11
Carbon disulfide	5	U	ug/kg	5	6	UJ	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
1,1-Dichloroethene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
1,1-Dichloroethane	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
1,2-Dichloroethene (total)	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Chloroform	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
1,2-Dichloroethane	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
2-Butanone	11	U	ug/kg	11	12	U	ug/kg	12	30	J	ug/kg	270	11	U	ug/kg	11
1,1,1-Trichloroethane	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Carbon tetrachloride	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Bromodichloromethane	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
1,2-Dichloropropane	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
cis-1,3-Dichloropropene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Trichloroethene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Dibromochloromethane	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
1,1,2-Trichloroethane	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Benzene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
trans-1,3-Dichloropropene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Bromoform	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
4-Methyl-2-pentanone	11	U	ug/kg	11	12	U	ug/kg	12	54	U	ug/kg	54	11	U	ug/kg	11
2-Hexanone	11	UJ	ug/kg	11	12	U	ug/kg	12	54	U	ug/kg	54	11	U	ug/kg	11
Tetrachloroethene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Toluene	5	U	ug/kg	5	6	U	ug/kg	6	14	J	ug/kg	140	5	U	ug/kg	5
1,1,2,2-Tetrachloroethane	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Chlorobenzene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Ethylbenzene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Styrene	5	U	ug/kg	5	6	U	ug/kg	6	27	U	ug/kg	27	5	U	ug/kg	5
Xylenes (total)	2	J	ug/kg	5	6	U	ug/kg	6	67		ug/kg	140	3	J	ug/kg	5

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22488009				22488010				22488011				22495001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-15				18-SL-16				18-SL-17				18-SL-18			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	55	U	ug/kg	55	54	U	ug/kg	54	27	U	ug/kg	27	12	U	ug/kg	12
Bromomethane	55	U	ug/kg	55	54	U	ug/kg	54	27	U	ug/kg	27	12	U	ug/kg	12
Vinyl chloride	55	U	ug/kg	55	54	U	ug/kg	54	27	U	ug/kg	27	12	U	ug/kg	12
Chloroethane	55	U	ug/kg	55	54	U	ug/kg	54	27	U	ug/kg	27	12	U	ug/kg	12
Methylene chloride	100	UJ	ug/kg	140	57	UJ	ug/kg	130	46	UJ	ug/kg	34	9	UJ	ug/kg	6
Acetone	230	UJ	ug/kg	270	160	UJ	ug/kg	270	84	UJ	ug/kg	69	20	UJ	ug/kg	12
Carbon disulfide	27	UJ	ug/kg	140	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
1,1-Dichloroethene	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
1,1-Dichloroethane	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
1,2-Dichloroethene (total)	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Chloroform	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
1,2-Dichloroethane	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
2-Butanone	55	U	ug/kg	55	36	J	ug/kg	270	17	J	ug/kg	69	12	U	ug/kg	12
1,1,1-Trichloroethane	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Carbon tetrachloride	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Bromodichloromethane	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
1,2-Dichloropropane	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
cis-1,3-Dichloropropene	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Trichloroethene	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Dibromochloromethane	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
1,1,2-Trichloroethane	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Benzene	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
trans-1,3-Dichloropropene	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Bromoform	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
4-Methyl-2-pentanone	55	U	ug/kg	55	54	U	ug/kg	54	27	U	ug/kg	27	12	U	ug/kg	12
2-Hexanone	55	U	ug/kg	55	54	U	ug/kg	54	27	U	ug/kg	27	12	U	ug/kg	12
Tetrachloroethene	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Toluene	34		ug/kg	140	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
1,1,2,2-Tetrachloroethane	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	UJ	ug/kg	6
Chlorobenzene	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Ethylbenzene	120		ug/kg	140	15	J	ug/kg	130	14	U	ug/kg	14	6	U	ug/kg	6
Styrene	27	U	ug/kg	27	27	U	ug/kg	27	14	U	ug/kg	14	6	U	ug/kg	6
Xylenes (total)	1000		ug/kg	140	76		ug/kg	130	14	U	ug/kg	14	6	U	ug/kg	6

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22495002				22495003				22495004				22495005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-19				18-SL-20				18-SL-21				18-SL-22			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	12	U	ug/kg	12	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13
Bromomethane	12	U	ug/kg	12	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13
Vinyl chloride	12	U	ug/kg	12	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13
Chloroethane	12	U	ug/kg	12	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13
Methylene chloride	29	UJ	ug/kg	6	17	UJ	ug/kg	6	12	UJ	ug/kg	6	25	UJ	ug/kg	6
Acetone	39	UJ	ug/kg	12	71	UJ	ug/kg	12	200	UJ	ug/kg	12	180	UJ	ug/kg	13
Carbon disulfide	6	UJ	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,1-Dichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,1-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethene (total)	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Chloroform	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
2-Butanone	12	U	ug/kg	12	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13
1,1,1-Trichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Carbon tetrachloride	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Bromodichloromethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloropropane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
cis-1,3-Dichloropropene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Trichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Dibromochloromethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,1,2-Trichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Benzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
trans-1,3-Dichloropropene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Bromoform	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
4-Methyl-2-pentanone	12	U	ug/kg	12	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13
2-Hexanone	12	U	ug/kg	12	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13
Tetrachloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Toluene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,1,2,2-Tetrachloroethane	6	UJ	ug/kg	6	6	U	ug/kg	6	6	UJ	ug/kg	6	6	UJ	ug/kg	6
Chlorobenzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Ethylbenzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Styrene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Xylenes (total)	3	J	ug/kg	6	4	J	ug/kg	6	4	J	ug/kg	6	2	J	ug/kg	6

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22489003				22489004				22495006				22495007			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-23				18-SL-23A				18-SL-24				18-SL-25			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11	54	U	ug/kg	54
Bromomethane	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11	54	U	ug/kg	54
Vinyl chloride	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11	54	U	ug/kg	54
Chloroethane	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11	54	U	ug/kg	54
Methylene chloride	32	UJ	ug/kg	6	56	UJ	ug/kg	6	34	UJ	ug/kg	6	57	UJ	ug/kg	27
Acetone	12	UJ	ug/kg	12	14	UJ	ug/kg	11	43	UJ	ug/kg	11	250	UJ	ug/kg	54
Carbon disulfide	6	UJ	ug/kg	6	6	UJ	ug/kg	6	6	UJ	ug/kg	6	27	UJ	ug/kg	27
1,1-Dichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
1,1-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
1,2-Dichloroethene (total)	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Chloroform	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
1,2-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
2-Butanone	12	U	ug/kg	12	11	U	ug/kg	11	11	U	ug/kg	11	54	U	ug/kg	54
1,1,1-Trichloroethane	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Carbon tetrachloride	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Bromodichloromethane	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
1,2-Dichloropropane	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
cis-1,3-Dichloropropene	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Trichloroethene	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Dibromochloromethane	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
1,1,2-Trichloroethane	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Benzene	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
trans-1,3-Dichloropropene	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Bromoform	6	U	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
4-Methyl-2-pentanone	12	UJ	ug/kg	12	11	UJ	ug/kg	11	11	U	ug/kg	11	54	U	ug/kg	54
2-Hexanone	12	UJ	ug/kg	12	11	UJ	ug/kg	11	11	U	ug/kg	11	54	U	ug/kg	54
Tetrachloroethene	6	UJ	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Toluene	6	UJ	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	47		ug/kg	140
1,1,2,2-Tetrachloroethane	6	UJ	ug/kg	6	6	UJ	ug/kg	6	6	UJ	ug/kg	6	27	UJ	ug/kg	27
Chlorobenzene	6	UJ	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Ethylbenzene	6	UJ	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	190		ug/kg	140
Styrene	6	UJ	ug/kg	6	6	UJ	ug/kg	6	6	U	ug/kg	6	27	U	ug/kg	27
Xylenes (total)	6	UJ	ug/kg	6	2	J	ug/kg	6	6	U	ug/kg	6	670		ug/kg	140

U= NOT DETECTED J=ESTIMATED VALUE
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R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22495008				22495009				22495010				22495011			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-26				18-SL-27				18-SL-28				18-SL-29			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	12	U	ug/kg	12	1400	U	ug/kg	1400	11	U	ug/kg	11	61	U	ug/kg	61
Bromomethane	12	U	ug/kg	12	1400	U	ug/kg	1400	11	U	ug/kg	11	61	U	ug/kg	61
Vinyl chloride	12	U	ug/kg	12	1400	U	ug/kg	1400	11	U	ug/kg	11	61	U	ug/kg	61
Chloroethane	12	U	ug/kg	12	1400	U	ug/kg	1400	11	U	ug/kg	11	61	U	ug/kg	61
Methylene chloride	24	UJ	ug/kg	6	680	UJ	ug/kg	680	10	UJ	ug/kg	6	85	UJ	ug/kg	30
Acetone	110	UJ	ug/kg	12	1400	UJ	ug/kg	1400	19	UJ	ug/kg	11	82	UJ	ug/kg	61
Carbon disulfide	6	UJ	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	UJ	ug/kg	30
1,1-Dichloroethene	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
1,1-Dichloroethane	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
1,2-Dichloroethene (total)	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Chloroform	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
1,2-Dichloroethane	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
2-Butanone	12	U	ug/kg	12	1700		ug/kg	1400	11	U	ug/kg	11	61	U	ug/kg	61
1,1,1-Trichloroethane	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Carbon tetrachloride	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Bromodichloromethane	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
1,2-Dichloropropane	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
cis-1,3-Dichloropropene	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Trichloroethene	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Dibromochloromethane	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
1,1,2-Trichloroethane	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Benzene	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
trans-1,3-Dichloropropene	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Bromoform	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
4-Methyl-2-pentanone	12	U	ug/kg	12	1400	U	ug/kg	1400	11	U	ug/kg	11	61	U	ug/kg	61
2-Hexanone	12	U	ug/kg	12	1400	U	ug/kg	1400	11	U	ug/kg	11	61	U	ug/kg	61
Tetrachloroethene	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Toluene	6	U	ug/kg	6	190	J	ug/kg	7	6	U	ug/kg	6	30	U	ug/kg	30
1,1,2,2-Tetrachloroethane	6	UJ	ug/kg	6	680	UJ	ug/kg	680	6	UJ	ug/kg	6	30	UJ	ug/kg	30
Chlorobenzene	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Ethylbenzene	6	U	ug/kg	6	430	J	ug/kg	7	6	U	ug/kg	6	30	U	ug/kg	30
Styrene	6	U	ug/kg	6	680	U	ug/kg	680	6	U	ug/kg	6	30	U	ug/kg	30
Xylenes (total)	1	J	ug/kg	6	3300		ug/kg	7	1	J	ug/kg	6	30	U	ug/kg	30

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22495012			22506002			22507003			22506003		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	18-SL-30			18-SL-31			18-SL-31A			18-SL-32		
Collect Date:	13-AUG-92			14-AUG-92			14-AUG-92			14-AUG-92		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP VOLATILES 90-SOW												
Chloromethane	55	U ug/kg	55	1400	U ug/kg	1400	56	U ug/kg	56	57	U ug/kg	57
Bromomethane	55	U ug/kg	55	1400	U ug/kg	1400	56	U ug/kg	56	57	U ug/kg	57
Vinyl chloride	55	U ug/kg	55	1400	U ug/kg	1400	56	U ug/kg	56	57	U ug/kg	57
Chloroethane	55	U ug/kg	55	1400	U ug/kg	1400	56	U ug/kg	56	57	U ug/kg	57
Methylene chloride	38	UJ ug/kg	27	710	UJ ug/kg	710	74	UJ ug/kg	140	86	J ug/kg	140
Acetone	55	UJ ug/kg	55	1400	UJ ug/kg	1400	60	UJ ug/kg	280	340	J ug/kg	290
Carbon disulfide	27	U ug/kg	27	710	U ug/kg	710	11	J ug/kg	140	7	J ug/kg	140
1,1-Dichloroethene	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
1,1-Dichloroethane	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
1,2-Dichloroethene (total)	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Chloroform	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
1,2-Dichloroethane	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
2-Butanone	55	U ug/kg	55	1400	UJ ug/kg	1400	56	U ug/kg	56	140	ug/kg	290
1,1,1-Trichloroethane	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Carbon tetrachloride	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Bromodichloromethane	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
1,2-Dichloropropane	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
cis-1,3-Dichloropropene	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Trichloroethene	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Dibromochloromethane	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
1,1,2-Trichloroethane	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Benzene	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
trans-1,3-Dichloropropene	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Bromoform	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
4-Methyl-2-pentanone	55	U ug/kg	55	1400	U ug/kg	1400	56	U ug/kg	56	57	U ug/kg	57
2-Hexanone	55	U ug/kg	55	1400	U ug/kg	1400	56	U ug/kg	56	57	U ug/kg	57
Tetrachloroethene	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Toluene	27	U ug/kg	27	180	J ug/kg	7	28	U ug/kg	28	170	ug/kg	140
1,1,2,2-Tetrachloroethane	27	UJ ug/kg	27	710	UJ ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Chlorobenzene	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Ethylbenzene	27	U ug/kg	27	290	J ug/kg	7	28	U ug/kg	28	73	ug/kg	140
Styrene	27	U ug/kg	27	710	U ug/kg	710	28	U ug/kg	28	29	U ug/kg	29
Xylenes (total)	12	J ug/kg	27	1800	ug/kg	7	54	ug/kg	140	530	ug/kg	140

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22506004				22506005				22506006				22506007			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-33				18-SL-34				18-SL-35				18-SL-36			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	1500	U	ug/kg	1500	1400	U	ug/kg	1400	59	U	ug/kg	59	1400	U	ug/kg	1400
Bromomethane	1500	U	ug/kg	1500	1400	U	ug/kg	1400	59	U	ug/kg	59	1400	U	ug/kg	1400
Vinyl chloride	1500	U	ug/kg	1500	1400	U	ug/kg	1400	59	U	ug/kg	59	1400	U	ug/kg	1400
Chloroethane	1500	U	ug/kg	1500	1400	U	ug/kg	1400	59	U	ug/kg	59	1400	U	ug/kg	1400
Methylene chloride	740	UJ	ug/kg	740	800	UJ	ug/kg	690	76	UJ	ug/kg	29	680	UJ	ug/kg	680
Acetone	1500	UJ	ug/kg	1500	1400	UJ	ug/kg	1400	59	UJ	ug/kg	59	1400	UJ	ug/kg	1400
Carbon disulfide	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
1,1-Dichloroethene	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
1,1-Dichloroethane	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
1,2-Dichloroethene (total)	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Chloroform	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
1,2-Dichloroethane	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
2-Butanone	1500	UJ	ug/kg	1500	1400	UJ	ug/kg	1400	59	U	ug/kg	59	1400	UJ	ug/kg	1400
1,1,1-Trichloroethane	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Carbon tetrachloride	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Bromodichloromethane	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
1,2-Dichloropropane	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
cis-1,3-Dichloropropene	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Trichloroethene	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Dibromochloromethane	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
1,1,2-Trichloroethane	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Benzene	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
trans-1,3-Dichloropropene	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Bromoform	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
4-Methyl-2-pentanone	1500	U	ug/kg	1500	1400	U	ug/kg	1400	59	U	ug/kg	59	1400	U	ug/kg	1400
2-Hexanone	1500	U	ug/kg	1500	1400	U	ug/kg	1400	59	U	ug/kg	59	1400	U	ug/kg	1400
Tetrachloroethene	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Toluene	390	J	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	210	J	ug/kg	680
1,1,2,2-Tetrachloroethane	740	UJ	ug/kg	740	690	UJ	ug/kg	690	29	U	ug/kg	29	680	UJ	ug/kg	680
Chlorobenzene	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Ethylbenzene	800		ug/kg	7	240	J	ug/kg	690	29	U	ug/kg	29	320	J	ug/kg	680
Styrene	740	U	ug/kg	740	690	U	ug/kg	690	29	U	ug/kg	29	680	U	ug/kg	680
Xylenes (total)	7000		ug/kg	7	2500		ug/kg	690	7	J	ug/kg	150	2700		ug/kg	680

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22506008				22507001				22506009				22506010			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-37				18-SL-37A				18-SL-38				18-SL-39			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	54	U	ug/kg	54	53	U	ug/kg	53	11	U	ug/kg	11	11	U	ug/kg	11
Bromomethane	54	U	ug/kg	54	53	U	ug/kg	53	11	U	ug/kg	11	11	U	ug/kg	11
Vinyl chloride	54	U	ug/kg	54	53	U	ug/kg	53	11	U	ug/kg	11	11	U	ug/kg	11
Chloroethane	54	U	ug/kg	54	53	U	ug/kg	53	11	U	ug/kg	11	11	U	ug/kg	11
Methylene chloride	52	J	ug/kg	27	74	UJ	ug/kg	130	49	J	ug/kg	5	18	UJ	ug/kg	5
Acetone	1400	J	ug/kg	54	67	UJ	ug/kg	260	16	UJ	ug/kg	11	11	UJ	ug/kg	11
Carbon disulfide	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
1,1-Dichloroethene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
1,1-Dichloroethane	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
1,2-Dichloroethene (total)	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Chloroform	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
1,2-Dichloroethane	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
2-Butanone	54	U	ug/kg	54	53	U	ug/kg	53	11	U	ug/kg	11	11	U	ug/kg	11
1,1,1-Trichloroethane	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Carbon tetrachloride	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Bromodichloromethane	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
1,2-Dichloropropane	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
cis-1,3-Dichloropropene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Trichloroethene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Dibromochloromethane	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
1,1,2-Trichloroethane	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Benzene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
trans-1,3-Dichloropropene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Bromoform	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
4-Methyl-2-pentanone	54	U	ug/kg	54	53	U	ug/kg	53	11	U	ug/kg	11	11	U	ug/kg	11
2-Hexanone	54	U	ug/kg	54	53	U	ug/kg	53	11	U	ug/kg	11	11	U	ug/kg	11
Tetrachloroethene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Toluene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
1,1,2,2-Tetrachloroethane	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Chlorobenzene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Ethylbenzene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Styrene	27	U	ug/kg	27	27	U	ug/kg	27	5	U	ug/kg	5	5	U	ug/kg	5
Xylenes (total)	16	J	ug/kg	27	27	U	ug/kg	27	3	J	ug/kg	5	5	U	ug/kg	5

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22506011				22507002				22507007				22507008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-40				18-SL-41				18-SL-42				18-SL-43			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Bromomethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Vinyl chloride	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Chloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Methylene chloride	26	UJ	ug/kg	6	16	UJ	ug/kg	6	41	UJ	ug/kg	5	28	UJ	ug/kg	5
Acetone	11	UJ	ug/kg	11	11	UJ	ug/kg	11	11	UJ	ug/kg	11	21	UJ	ug/kg	11
Carbon disulfide	6	U	ug/kg	6	6	U	ug/kg	6	1	J	ug/kg	5	5	U	ug/kg	5
1,1-Dichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
1,1-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
1,2-Dichloroethene (total)	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Chloroform	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
1,2-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
2-Butanone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
1,1,1-Trichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Carbon tetrachloride	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Bromodichloromethane	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
1,2-Dichloropropane	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
cis-1,3-Dichloropropene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Trichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Dibromochloromethane	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
1,1,2-Trichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Benzene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
trans-1,3-Dichloropropene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Bromoform	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
4-Methyl-2-pentanone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
2-Hexanone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Tetrachloroethene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Toluene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
1,1,2,2-Tetrachloroethane	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Chlorobenzene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Ethylbenzene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Styrene	6	U	ug/kg	6	6	U	ug/kg	6	5	U	ug/kg	5	5	U	ug/kg	5
Xylenes (total)	2	J	ug/kg	6	2	J	ug/kg	6	3	J	ug/kg	5	3	J	ug/kg	5

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- VOLATILES -- REPORT NO. 10504

Lab Sample Number:	22507009				22507010				22507011				22507012			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-44				18-SL-45				18-SL-46				18-SL-47			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	11	UJ	ug/kg	11	11	UJ	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Bromomethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Vinyl chloride	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Chloroethane	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Methylene chloride	27	UJ	ug/kg	5	30	UJ	ug/kg	5	27	UJ	ug/kg	6	17	UJ	ug/kg	6
Acetone	17	UJ	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
Carbon disulfide	1	J	ug/kg	5	2	J	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
1,1-Dichloroethene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
1,1-Dichloroethane	5	U	ug/kg	5	5	U	ug/kg	5	6	UJ	ug/kg	6	6	UJ	ug/kg	6
1,2-Dichloroethene (total)	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Chloroform	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethane	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
2-Butanone	11	U	ug/kg	11	11	U	ug/kg	11	11	UJ	ug/kg	11	11	UJ	ug/kg	11
1,1,1-Trichloroethane	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Carbon tetrachloride	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Bromodichloromethane	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloropropane	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
cis-1,3-Dichloropropene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Trichloroethene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Dibromochloromethane	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
1,1,2-Trichloroethane	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Benzene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
trans-1,3-Dichloropropene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Bromoform	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
4-Methyl-2-pentanone	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11	11	U	ug/kg	11
2-Hexanone	11	U	ug/kg	11	11	U	ug/kg	11	11	UJ	ug/kg	11	11	UJ	ug/kg	11
Tetrachloroethene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Toluene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
1,1,2,2-Tetrachloroethane	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Chlorobenzene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Ethylbenzene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Styrene	5	U	ug/kg	5	5	U	ug/kg	5	6	U	ug/kg	6	6	U	ug/kg	6
Xylenes (total)	5	U	ug/kg	5	5	U	ug/kg	5	2	J	ug/kg	6	6	U	ug/kg	6

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22481001				22481002				22462010				22462011			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-01				18-SL-01A				18-SL-02				18-SL-03			
Collect Date:	12-AUG-92				12-AUG-92				12-AUG-92				12-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
bis(2-Chloroethyl) ether	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2-Chlorophenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
1,3-Dichlorobenzene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
1,4-Dichlorobenzene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
1,2-Dichlorobenzene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2-Methylphenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2,2-oxybis(1-Chloropropane)	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
4-Methylphenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
N-Nitroso-di-n-propylamine	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Hexachloroethane	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Nitrobenzene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Isophorone	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2-Nitrophenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2,4-Dimethylphenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
bis(2-Chloroethoxy) methane	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2,4-Dichlorophenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
1,2,4-Trichlorobenzene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Naphthalene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
4-Chloroaniline	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Hexachlorobutadiene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
4-Chloro-3-methylphenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2-Methylnaphthalene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Hexachlorocyclopentadiene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2,4,6-Trichlorophenol	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2,4,5-Trichlorophenol	15000	U	ug/kg	15000	15000	U	ug/kg	15000	1900	U	ug/kg	1900	1700	U	ug/kg	1700
2-Chloronaphthalene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2-Nitroaniline	15000	UJ	ug/kg	15000	15000	UJ	ug/kg	15000	1900	U	ug/kg	1900	1700	U	ug/kg	1700
Dimethylphthalate	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Acenaphthylene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2,6-Dinitrotoluene	3000	UJ	ug/kg	3000	3100	UJ	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
3-Nitroaniline	15000	U	ug/kg	15000	15000	U	ug/kg	15000	1900	U	ug/kg	1900	1700	U	ug/kg	1700
Acenaphthene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2,4-Dinitrophenol	15000	UJ	ug/kg	15000	15000	UJ	ug/kg	15000	1900	U	ug/kg	1900	1700	U	ug/kg	1700
4-Nitrophenol	15000	UJ	ug/kg	15000	15000	UJ	ug/kg	15000	1900	U	ug/kg	1900	1700	U	ug/kg	1700
Dibenzofuran	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
2,4-Dinitrotoluene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Diethylphthalate	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
4-Chlorophenyl-phenylether	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Fluorene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
4-Nitroaniline	15000	UJ	ug/kg	15000	15000	UJ	ug/kg	15000	1900	UJ	ug/kg	1900	1700	UJ	ug/kg	1700
4,6-Dinitro-2-methylphenol	15000	U	ug/kg	15000	15000	U	ug/kg	15000	1900	U	ug/kg	1900	1700	U	ug/kg	1700
N-Nitrosodiphenylamine	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
4-Bromophenyl-phenylether	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Hexachlorobenzene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Pentachlorophenol	15000	U	ug/kg	15000	15000	U	ug/kg	15000	1900	U	ug/kg	1900	1700	U	ug/kg	1700
Phenanthrene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Anthracene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Carbazole	-				-				-				-			
Di-n-butylphthalate	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	UJ	ug/kg	380	350	UJ	ug/kg	350

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22481001				22481002				22462010				22462011			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-01				18-SL-01A				18-SL-02				18-SL-03			
Collect Date:	12-AUG-92				12-AUG-92				12-AUG-92				12-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Fluoranthene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Pyrene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	UJ	ug/kg	380	350	UJ	ug/kg	350
Butylbenzylphthalate	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	UJ	ug/kg	380	350	UJ	ug/kg	350
3,3-Dichlorobenzidine	6000	U	ug/kg	6000	6200	U	ug/kg	6200	770	U	ug/kg	770	690	U	ug/kg	690
Benzo (a) anthracene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Chrysene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	UJ	ug/kg	380	350	UJ	ug/kg	350
bis(2-Ethylhexyl) phthalate	700	J	ug/kg	3000	1200	J	ug/kg	3100	380	UJ	ug/kg	380	350	UJ	ug/kg	350
Di-n-octylphthalate	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Benzo (b) fluoranthene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Benzo (k) fluoranthene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Benzo (a) pyrene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Indeno (1,2,3-cd) pyrene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Dibenzo (a,h) anthracene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350
Benzo (g,h,i) perylene	3000	U	ug/kg	3000	3100	U	ug/kg	3100	380	U	ug/kg	380	350	U	ug/kg	350

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22462012				22507005				22507006				22488001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-04				18-SL-05				18-SL-06				18-SL-07			
Collect Date:	12-AUG-92				14-AUG-92				14-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
bis(2-Chloroethyl) ether	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2-Chlorophenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
1,3-Dichlorobenzene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
1,4-Dichlorobenzene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
1,2-Dichlorobenzene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2-Methylphenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2,2-oxybis(1-Chloropropane)	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	UJ	ug/kg	380
4-Methylphenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
N-Nitroso-di-n-propylamine	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Hexachloroethane	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Nitrobenzene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Isophorone	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2-Nitrophenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2,4-Dimethylphenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
bis(2-Chloroethoxy) methane	3300	U	ug/kg	3300	360	U	ug/kg	360	440	J	ug/kg	1800	380	U	ug/kg	380
2,4-Dichlorophenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
1,2,4-Trichlorobenzene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Naphthalene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
4-Chloroaniline	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Hexachlorobutadiene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
4-Chloro-3-methylphenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2-Methylnaphthalene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Hexachlorocyclopentadiene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2,4,6-Trichlorophenol	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2,4,5-Trichlorophenol	16000	U	ug/kg	16000	1800	U	ug/kg	1800	8900	U	ug/kg	8900	1800	U	ug/kg	1800
2-Chloronaphthalene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2-Nitroaniline	16000	UJ	ug/kg	16000	1800	U	ug/kg	1800	8900	U	ug/kg	8900	1800	UJ	ug/kg	1800
Dimethylphthalate	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Acenaphthylene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2,6-Dinitrotoluene	3300	UJ	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	UJ	ug/kg	380
3-Nitroaniline	16000	U	ug/kg	16000	1800	U	ug/kg	1800	8900	U	ug/kg	8900	1800	U	ug/kg	1800
Acenaphthene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2,4-Dinitrophenol	16000	UJ	ug/kg	16000	1800	U	ug/kg	1800	8900	UJ	ug/kg	8900	1800	UJ	ug/kg	1800
4-Nitrophenol	16000	UJ	ug/kg	16000	1800	U	ug/kg	1800	8900	U	ug/kg	8900	1800	UJ	ug/kg	1800
Dibenzofuran	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
2,4-Dinitrotoluene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Diethylphthalate	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
4-Chlorophenyl-phenylether	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Fluorene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22462012				22507005				22507006				22488001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-04				18-SL-05				18-SL-06				18-SL-07			
Collect Date:	12-AUG-92				14-AUG-92				14-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	16000	UJ	ug/kg	16000	1800	U	ug/kg	1800	8900	U	ug/kg	8900	1800	U	ug/kg	1800
4,6-Dinitro-2-methylphenol	16000	U	ug/kg	16000	1800	U	ug/kg	1800	8900	U	ug/kg	8900	1800	U	ug/kg	1800
N-Nitrosodiphenylamine	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
4-Bromophenyl-phenylether	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Hexachlorobenzene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Pentachlorophenol	16000	U	ug/kg	16000	1800	U	ug/kg	1800	8900	U	ug/kg	8900	1800	U	ug/kg	1800
Phenanthrene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Anthracene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Carbazole	-				-				-				-			
Di-n-butylphthalate	3300	U	ug/kg	3300	360	UJ	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Fluoranthene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Pyrene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Butylbenzylphthalate	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	UJ	ug/kg	380
3,3-Dichlorobenzidine	6500	U	ug/kg	6500	730	UJ	ug/kg	730	3700	U	ug/kg	3700	760	U	ug/kg	760
Benzo (a) anthracene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Chrysene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
bis(2-Ethylhexyl) phthalate	1000	J	ug/kg	3200	360	U	ug/kg	360	1800	U	ug/kg	1800	56	J	ug/kg	380
Di-n-octylphthalate	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Benzo (b) fluoranthene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	UJ	ug/kg	380
Benzo (k) fluoranthene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Benzo (a) pyrene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Indeno (1,2,3-cd) pyrene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Dibenzo (a,h) anthracene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380
Benzo (g,h,i) perylene	3300	U	ug/kg	3300	360	U	ug/kg	360	1800	U	ug/kg	1800	380	U	ug/kg	380

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22488002				22488003				22489001				22489002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-08				18-SL-09				18-SL-10				18-SL-10A			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
bis(2-Chloroethyl) ether	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2-Chlorophenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
1,3-Dichlorobenzene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
1,4-Dichlorobenzene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
1,2-Dichlorobenzene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2-Methylphenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2,2-oxybis(1-Chloropropane)	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
4-Methylphenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
N-Nitroso-di-n-propylamine	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Hexachloroethane	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Nitrobenzene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Isophorone	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2-Nitrophenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2,4-Dimethylphenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
bis(2-Chloroethoxy) methane	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2,4-Dichlorophenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
1,2,4-Trichlorobenzene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Naphthalene	360	U	ug/kg	360	2200		ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
4-Chloroaniline	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Hexachlorobutadiene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
4-Chloro-3-methylphenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2-Methylnaphthalene	360	U	ug/kg	360	8100		ug/kg	1900	1100	J	ug/kg	3800	3700	U	ug/kg	3700
Hexachlorocyclopentadiene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2,4,6-Trichlorophenol	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2,4,5-Trichlorophenol	1800	U	ug/kg	1800	9300	U	ug/kg	9300	18000	U	ug/kg	18000	18000	U	ug/kg	18000
2-Chloronaphthalene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2-Nitroaniline	1800	U	ug/kg	1800	9300	U	ug/kg	9300	18000	UJ	ug/kg	18000	18000	UJ	ug/kg	18000
Dimethylphthalate	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Acenaphthylene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2,6-Dinitrotoluene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700
3-Nitroaniline	1800	U	ug/kg	1800	9300	U	ug/kg	9300	18000	U	ug/kg	18000	18000	U	ug/kg	18000
Acenaphthene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2,4-Dinitrophenol	1800	U	ug/kg	1800	9300	U	ug/kg	9300	18000	UJ	ug/kg	18000	18000	UJ	ug/kg	18000
4-Nitrophenol	1800	U	ug/kg	1800	9300	U	ug/kg	9300	18000	UJ	ug/kg	18000	18000	UJ	ug/kg	18000
Dibenzofuran	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
2,4-Dinitrotoluene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Diethylphthalate	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
4-Chlorophenyl-phenylether	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Fluorene	360	UJ	ug/kg	360	1900	UJ	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22488002				22488003				22489001				22489002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-08				18-SL-09				18-SL-10				18-SL-10A			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	1800	U	ug/kg	1800	9300	U	ug/kg	9300	18000	UJ	ug/kg	18000	18000	UJ	ug/kg	18000
4,6-Dinitro-2-methylphenol	1800	U	ug/kg	1800	9300	U	ug/kg	9300	18000	U	ug/kg	18000	18000	U	ug/kg	18000
N-Nitrosodiphenylamine	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
4-Bromophenyl-phenylether	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Hexachlorobenzene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Pentachlorophenol	1800	U	ug/kg	1800	9300	U	ug/kg	9300	18000	U	ug/kg	18000	18000	U	ug/kg	18000
Phenanthrene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Anthracene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Carbazole	-				-				-				-			
Di-n-butylphthalate	360	UJ	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Fluoranthene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Pyrene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Butylbenzylphthalate	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
3,3-Dichlorobenzidine	730	U	ug/kg	730	3800	U	ug/kg	3800	7500	U	ug/kg	7500	7400	U	ug/kg	7400
Benzo (a) anthracene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Chrysene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
bis(2-Ethylhexyl) phthalate	360	U	ug/kg	360	340	J	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Di-n-octylphthalate	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Benzo (b) fluoranthene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Benzo (k) fluoranthene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Benzo (a) pyrene	360	U	ug/kg	360	1900	U	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Indeno (1,2,3-cd) pyrene	360	UJ	ug/kg	360	1900	UJ	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Dibenzo (a,h) anthracene	360	UJ	ug/kg	360	1900	UJ	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700
Benzo (g,h,i) perylene	360	UJ	ug/kg	360	1900	UJ	ug/kg	1900	3700	U	ug/kg	3700	3700	U	ug/kg	3700

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22488004				22488005				22488006				22488008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-11				18-SL-12				18-SL-13				18-SL-14			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
bis(2-Chloroethyl) ether	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2-Chlorophenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
1,3-Dichlorobenzene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
1,4-Dichlorobenzene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
1,2-Dichlorobenzene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2-Methylphenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2,2-oxybis(1-Chloropropane)	360	UJ	ug/kg	360	360	UJ	ug/kg	360	350	UJ	ug/kg	350	360	UJ	ug/kg	360
4-Methylphenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
N-Nitroso-di-n-propylamine	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Hexachloroethane	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Nitrobenzene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Isophorone	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2-Nitrophenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2,4-Dimethylphenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
bis(2-Chloroethoxy) methane	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2,4-Dichlorophenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
1,2,4-Trichlorobenzene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Naphthalene	360	U	ug/kg	360	360	U	ug/kg	360	990		ug/kg	350	360	U	ug/kg	360
4-Chloroaniline	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Hexachlorobutadiene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
4-Chloro-3-methylphenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2-Methylnaphthalene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Hexachlorocyclopentadiene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2,4,6-Trichlorophenol	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2,4,5-Trichlorophenol	1800	U	ug/kg	1800	1800	U	ug/kg	1800	1700	U	ug/kg	1700	1700	U	ug/kg	1700
2-Chloronaphthalene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2-Nitroaniline	1800	UJ	ug/kg	1800	1800	UJ	ug/kg	1800	1700	UJ	ug/kg	1700	1700	UJ	ug/kg	1700
Dimethylphthalate	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Acenaphthylene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2,6-Dinitrotoluene	360	UJ	ug/kg	360	360	UJ	ug/kg	360	350	UJ	ug/kg	350	360	UJ	ug/kg	360
3-Nitroaniline	1800	U	ug/kg	1800	1800	U	ug/kg	1800	1700	U	ug/kg	1700	1700	U	ug/kg	1700
Acenaphthene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2,4-Dinitrophenol	1800	UJ	ug/kg	1800	1800	UJ	ug/kg	1800	1700	UJ	ug/kg	1700	1700	UJ	ug/kg	1700
4-Nitrophenol	1800	UJ	ug/kg	1800	1800	UJ	ug/kg	1800	1700	UJ	ug/kg	1700	1700	UJ	ug/kg	1700
Dibenzofuran	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
2,4-Dinitrotoluene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Diethylphthalate	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
4-Chlorophenyl-phenylether	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Fluorene	360	U	ug/kg	360	360	U	ug/kg	360	440		ug/kg	350	360	U	ug/kg	360

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22488004				22488005				22488006				22488008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-11				18-SL-12				18-SL-13				18-SL-14			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	1800	U	ug/kg	1800	1800	UJ	ug/kg	1800	1700	UJ	ug/kg	1700	1700	UJ	ug/kg	1700
4,6-Dinitro-2-methylphenol	1800	U	ug/kg	1800	1800	U	ug/kg	1800	1700	U	ug/kg	1700	1700	U	ug/kg	1700
N-Nitrosodiphenylamine	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
4-Bromophenyl-phenylether	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Hexachlorobenzene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Pentachlorophenol	1800	U	ug/kg	1800	1800	U	ug/kg	1800	1700	U	ug/kg	1700	1700	U	ug/kg	1700
Phenanthrene	360	U	ug/kg	360	360	U	ug/kg	360	120	J	ug/kg	350	360	U	ug/kg	360
Anthracene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Carbazole	-				-				-				-			
Di-n-butylphthalate	360	UJ	ug/kg	360	360	UJ	ug/kg	360	350	U	ug/kg	350	360	UJ	ug/kg	360
Fluoranthene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Pyrene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Butylbenzylphthalate	360	UJ	ug/kg	360	360	UJ	ug/kg	360	350	UJ	ug/kg	350	360	UJ	ug/kg	360
3,3-Dichlorobenzidine	730	U	ug/kg	730	730	U	ug/kg	730	710	U	ug/kg	710	720	U	ug/kg	720
Benzo (a) anthracene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Chrysene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
bis(2-Ethylhexyl) phthalate	110	J	ug/kg	360	360	U	ug/kg	360	76	J	ug/kg	350	360	U	ug/kg	360
Di-n-octylphthalate	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Benzo (b) fluoranthene	360	UJ	ug/kg	360	360	UJ	ug/kg	360	350	UJ	ug/kg	350	360	UJ	ug/kg	360
Benzo (k) fluoranthene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Benzo (a) pyrene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Indeno (1,2,3-cd) pyrene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Dibenzo (a,h) anthracene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360
Benzo (g,h,i) perylene	360	U	ug/kg	360	360	U	ug/kg	360	350	U	ug/kg	350	360	U	ug/kg	360

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22488009				22488010				22488011				22495001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-15				18-SL-16				18-SL-17				18-SL-18			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
bis(2-Chloroethyl) ether	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2-Chlorophenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
1,3-Dichlorobenzene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
1,4-Dichlorobenzene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
1,2-Dichlorobenzene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2-Methylphenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2,2-oxybis(1-Chloropropane)	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
4-Methylphenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
N-Nitroso-di-n-propylamine	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Hexachloroethane	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Nitrobenzene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Isophorone	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2-Nitrophenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2,4-Dimethylphenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
bis(2-Chloroethoxy) methane	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2,4-Dichlorophenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
1,2,4-Trichlorobenzene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Naphthalene	3000	J	ug/kg	7200	3500	J	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
4-Chloroaniline	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Hexachlorobutadiene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
4-Chloro-3-methylphenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2-Methylnaphthalene	11000	J	ug/kg	7200	15000	J	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Hexachlorocyclopentadiene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2,4,6-Trichlorophenol	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2,4,5-Trichlorophenol	35000	UJ	ug/kg	35000	43000	UJ	ug/kg	43000	9000	U	ug/kg	9000	19000	U	ug/kg	19000
2-Chloronaphthalene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2-Nitroaniline	35000	UJ	ug/kg	35000	43000	UJ	ug/kg	43000	9000	U	ug/kg	9000	19000	U	ug/kg	19000
Dimethylphthalate	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Acenaphthylene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2,6-Dinitrotoluene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
3-Nitroaniline	35000	UJ	ug/kg	35000	43000	UJ	ug/kg	43000	9000	U	ug/kg	9000	19000	U	ug/kg	19000
Acenaphthene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2,4-Dinitrophenol	35000	UJ	ug/kg	35000	43000	UJ	ug/kg	43000	9000	U	ug/kg	9000	19000	U	ug/kg	19000
4-Nitrophenol	35000	UJ	ug/kg	35000	43000	UJ	ug/kg	43000	9000	U	ug/kg	9000	19000	U	ug/kg	19000
Dibenzofuran	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
2,4-Dinitrotoluene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Diethylphthalate	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
4-Chlorophenyl-phenylether	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Fluorene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	UJ	ug/kg	1900	3800	UJ	ug/kg	3800

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22488009				22488010				22488011				22495001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-15				18-SL-16				18-SL-17				18-SL-18			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	35000	UJ	ug/kg	35000	43000	UJ	ug/kg	43000	9000	U	ug/kg	9000	19000	U	ug/kg	19000
4,6-Dinitro-2-methylphenol	35000	UJ	ug/kg	35000	43000	UJ	ug/kg	43000	9000	U	ug/kg	9000	19000	U	ug/kg	19000
N-Nitrosodiphenylamine	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
4-Bromophenyl-phenylether	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Hexachlorobenzene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Pentachlorophenol	35000	UJ	ug/kg	35000	43000	UJ	ug/kg	43000	9000	U	ug/kg	9000	19000	U	ug/kg	19000
Phenanthrene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Anthracene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Carbazole	-				-				-				-			
Di-n-butylphthalate	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Fluoranthene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Pyrene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Butylbenzylphthalate	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
3,3-Dichlorobenzidine	15000	UJ	ug/kg	15000	18000	UJ	ug/kg	18000	3700	U	ug/kg	3700	7700	U	ug/kg	7700
Benzo (a) anthracene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Chrysene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
bis(2-Ethylhexyl) phthalate	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	320	J	ug/kg	1800	3800	U	ug/kg	3800
Di-n-octylphthalate	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Benzo (b) fluoranthene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Benzo (k) fluoranthene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Benzo (a) pyrene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	U	ug/kg	1900	3800	U	ug/kg	3800
Indeno (1,2,3-cd) pyrene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	UJ	ug/kg	1900	3800	UJ	ug/kg	3800
Dibenzo (a,h) anthracene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	UJ	ug/kg	1900	3800	UJ	ug/kg	3800
Benzo (g,h,i) perylene	7300	UJ	ug/kg	7300	8900	UJ	ug/kg	8900	1900	UJ	ug/kg	1900	3800	UJ	ug/kg	3800

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22495002				22495003				22495004				22495005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-19				18-SL-20				18-SL-21				18-SL-22			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
bis(2-Chloroethyl) ether	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2-Chlorophenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
1,3-Dichlorobenzene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
1,4-Dichlorobenzene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
1,2-Dichlorobenzene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2-Methylphenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2,2-oxybis(1-Chloropropane)	1900	U	ug/kg	1900	380	UJ	ug/kg	380	390	UJ	ug/kg	390	390	UJ	ug/kg	390
4-Methylphenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
N-Nitroso-di-n-propylamine	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Hexachloroethane	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Nitrobenzene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Isophorone	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2-Nitrophenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2,4-Dimethylphenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
bis(2-Chloroethoxy) methane	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2,4-Dichlorophenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
1,2,4-Trichlorobenzene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Naphthalene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
4-Chloroaniline	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Hexachlorobutadiene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
4-Chloro-3-methylphenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2-Methylnaphthalene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Hexachlorocyclopentadiene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2,4,6-Trichlorophenol	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2,4,5-Trichlorophenol	9200	U	ug/kg	9200	1900	U	ug/kg	1900	1900	U	ug/kg	1900	1900	U	ug/kg	1900
2-Chloronaphthalene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2-Nitroaniline	9200	U	ug/kg	9200	1900	UJ	ug/kg	1900	1900	UJ	ug/kg	1900	1900	UJ	ug/kg	1900
Dimethylphthalate	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Acenaphthylene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2,6-Dinitrotoluene	1900	U	ug/kg	1900	380	UJ	ug/kg	380	390	UJ	ug/kg	390	390	UJ	ug/kg	390
3-Nitroaniline	9200	U	ug/kg	9200	1900	U	ug/kg	1900	1900	U	ug/kg	1900	1900	U	ug/kg	1900
Acenaphthene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2,4-Dinitrophenol	9200	U	ug/kg	9200	1900	UJ	ug/kg	1900	1900	UJ	ug/kg	1900	1900	UJ	ug/kg	1900
4-Nitrophenol	9200	U	ug/kg	9200	1900	UJ	ug/kg	1900	1900	UJ	ug/kg	1900	1900	UJ	ug/kg	1900
Dibenzofuran	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
2,4-Dinitrotoluene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Diethylphthalate	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
4-Chlorophenyl-phenylether	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Fluorene	1900	UJ	ug/kg	1900	380	UJ	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22495002				22495003				22495004				22495005			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-19				18-SL-20				18-SL-21				18-SL-22			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	9200	U	ug/kg	9200	1900	U	ug/kg	1900	1900	UJ	ug/kg	1900	1900	UJ	ug/kg	1900
4,6-Dinitro-2-methylphenol	9200	U	ug/kg	9200	1900	U	ug/kg	1900	1900	U	ug/kg	1900	1900	U	ug/kg	1900
N-Nitrosodiphenylamine	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
4-Bromophenyl-phenylether	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Hexachlorobenzene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Pentachlorophenol	9200	U	ug/kg	9200	1900	U	ug/kg	1900	1900	U	ug/kg	1900	1900	U	ug/kg	1900
Phenanthrene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Anthracene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Carbazole	-				-				-				-			
Di-n-butylphthalate	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Fluoranthene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Pyrene	1900	U	ug/kg	1900	380	UJ	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Butylbenzylphthalate	1900	U	ug/kg	1900	380	U	ug/kg	380	390	UJ	ug/kg	390	390	UJ	ug/kg	390
3,3-Dichlorobenzidine	3800	U	ug/kg	3800	770	U	ug/kg	770	790	U	ug/kg	790	790	U	ug/kg	790
Benzo (a) anthracene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Chrysene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
bis(2-Ethylhexyl) phthalate	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Di-n-octylphthalate	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Benzo (b) fluoranthene	1900	U	ug/kg	1900	380	UJ	ug/kg	380	390	UJ	ug/kg	390	390	UJ	ug/kg	390
Benzo (k) fluoranthene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Benzo (a) pyrene	1900	U	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Indeno (1,2,3-cd) pyrene	1900	UJ	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Dibenzo (a,h) anthracene	1900	UJ	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390
Benzo (g,h,i) perylene	1900	UJ	ug/kg	1900	380	U	ug/kg	380	390	U	ug/kg	390	390	U	ug/kg	390

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22489003				22489004				22495006				22495007			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-23				18-SL-23A				18-SL-24				18-SL-25			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
bis(2-Chloroethyl) ether	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2-Chlorophenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
1,3-Dichlorobenzene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
1,4-Dichlorobenzene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
1,2-Dichlorobenzene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2-Methylphenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2,2-oxybis(1-Chloropropane)	9500	U	ug/kg	9500	9500	U	ug/kg	9500	370	UJ	ug/kg	370	5400	U	ug/kg	5400
4-Methylphenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
N-Nitroso-di-n-propylamine	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Hexachloroethane	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Nitrobenzene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Isophorone	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2-Nitrophenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2,4-Dimethylphenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
bis(2-Chloroethoxy) methane	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2,4-Dichlorophenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
1,2,4-Trichlorobenzene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Naphthalene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	4100	J	ug/kg	5400
4-Chloroaniline	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Hexachlorobutadiene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
4-Chloro-3-methylphenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2-Methylnaphthalene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	14000		ug/kg	5400
Hexachlorocyclopentadiene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2,4,6-Trichlorophenol	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2,4,5-Trichlorophenol	46000	UJ	ug/kg	46000	46000	UJ	ug/kg	46000	1800	U	ug/kg	1800	26000	U	ug/kg	26000
2-Chloronaphthalene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2-Nitroaniline	46000	UJ	ug/kg	46000	46000	UJ	ug/kg	46000	1800	UJ	ug/kg	1800	26000	U	ug/kg	26000
Dimethylphthalate	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Acenaphthylene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2,6-Dinitrotoluene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	UJ	ug/kg	370	5400	U	ug/kg	5400
3-Nitroaniline	46000	UJ	ug/kg	46000	46000	UJ	ug/kg	46000	1800	U	ug/kg	1800	26000	U	ug/kg	26000
Acenaphthene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2,4-Dinitrophenol	46000	UJ	ug/kg	46000	46000	UJ	ug/kg	46000	1800	UJ	ug/kg	1800	26000	U	ug/kg	26000
4-Nitrophenol	46000	UJ	ug/kg	46000	46000	UJ	ug/kg	46000	1800	UJ	ug/kg	1800	26000	U	ug/kg	26000
Dibenzofuran	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
2,4-Dinitrotoluene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Diethylphthalate	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
4-Chlorophenyl-phenylether	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Fluorene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	UJ	ug/kg	5400

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22489003				22489004				22495006				22495007			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-23				18-SL-23A				18-SL-24				18-SL-25			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	46000	UJ	ug/kg	46000	46000	UJ	ug/kg	46000	1800	UJ	ug/kg	1800	26000	U	ug/kg	26000
4,6-Dinitro-2-methylphenol	46000	UJ	ug/kg	46000	46000	UJ	ug/kg	46000	1800	U	ug/kg	1800	26000	U	ug/kg	26000
N-Nitrosodiphenylamine	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
4-Bromophenyl-phenylether	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Hexachlorobenzene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Pentachlorophenol	46000	UJ	ug/kg	46000	46000	UJ	ug/kg	46000	1800	U	ug/kg	1800	26000	U	ug/kg	26000
Phenanthrene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	730	J	ug/kg	5400
Anthracene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Carbazole	-				-				-				-			
Di-n-butylphthalate	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	UJ	ug/kg	370	5400	U	ug/kg	5400
Fluoranthene	3500	J	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Pyrene	7700	J	ug/kg	9500	6200	J	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Butylbenzylphthalate	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	UJ	ug/kg	370	5400	U	ug/kg	5400
3,3-Dichlorobenzidine	19000	UJ	ug/kg	19000	19000	UJ	ug/kg	19000	750	U	ug/kg	750	11000	U	ug/kg	11000
Benzo (a) anthracene	1300	J	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Chrysene	1400	J	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
bis(2-Ethylhexyl) phthalate	5600	J	ug/kg	9500	4100	J	ug/kg	9500	68	J	ug/kg	380	5400	U	ug/kg	5400
Di-n-octylphthalate	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Benzo (b) fluoranthene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	UJ	ug/kg	370	5400	U	ug/kg	5400
Benzo (k) fluoranthene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Benzo (a) pyrene	1200	J	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	U	ug/kg	5400
Indeno (1,2,3-cd) pyrene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	UJ	ug/kg	5400
Dibenzo (a,h) anthracene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	UJ	ug/kg	5400
Benzo (g,h,i) perylene	9500	UJ	ug/kg	9500	9500	UJ	ug/kg	9500	370	U	ug/kg	370	5400	UJ	ug/kg	5400

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22495008				22495009				22495010				22495011			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-26				18-SL-27				18-SL-28				18-SL-29			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
bis(2-Chloroethyl) ether	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2-Chlorophenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
1,3-Dichlorobenzene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
1,4-Dichlorobenzene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
1,2-Dichlorobenzene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2-Methylphenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2,2-oxybis(1-Chloropropane)	370	UJ	ug/kg	370	8900	UJ	ug/kg	8900	360	UJ	ug/kg	360	4000	U	ug/kg	4000
4-Methylphenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
N-Nitroso-di-n-propylamine	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Hexachloroethane	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Nitrobenzene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Isophorone	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2-Nitrophenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2,4-Dimethylphenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
bis(2-Chloroethoxy) methane	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2,4-Dichlorophenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
1,2,4-Trichlorobenzene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Naphthalene	370	U	ug/kg	370	7500	J	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
4-Chloroaniline	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Hexachlorobutadiene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
4-Chloro-3-methylphenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2-Methylnaphthalene	370	U	ug/kg	370	33000	J	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Hexachlorocyclopentadiene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2,4,6-Trichlorophenol	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2,4,5-Trichlorophenol	1800	U	ug/kg	1800	43000	UJ	ug/kg	43000	1800	U	ug/kg	1800	20000	U	ug/kg	20000
2-Chloronaphthalene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2-Nitroaniline	1800	UJ	ug/kg	1800	43000	UJ	ug/kg	43000	1800	UJ	ug/kg	1800	20000	U	ug/kg	20000
Dimethylphthalate	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Acenaphthylene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2,6-Dinitrotoluene	370	UJ	ug/kg	370	8900	UJ	ug/kg	8900	360	UJ	ug/kg	360	4000	U	ug/kg	4000
3-Nitroaniline	1800	U	ug/kg	1800	43000	UJ	ug/kg	43000	1800	U	ug/kg	1800	20000	U	ug/kg	20000
Acenaphthene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2,4-Dinitrophenol	1800	UJ	ug/kg	1800	43000	UJ	ug/kg	43000	1800	UJ	ug/kg	1800	20000	U	ug/kg	20000
4-Nitrophenol	1800	UJ	ug/kg	1800	43000	UJ	ug/kg	43000	1800	UJ	ug/kg	1800	20000	U	ug/kg	20000
Dibenzofuran	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
2,4-Dinitrotoluene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Diethylphthalate	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
4-Chlorophenyl-phenylether	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Fluorene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	UJ	ug/kg	4000

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22495008				22495009				22495010				22495011			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-26				18-SL-27				18-SL-28				18-SL-29			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	1800	U	ug/kg	1800	43000	UJ	ug/kg	43000	1800	UJ	ug/kg	1800	20000	U	ug/kg	20000
4,6-Dinitro-2-methylphenol	1800	U	ug/kg	1800	43000	UJ	ug/kg	43000	1800	U	ug/kg	1800	20000	U	ug/kg	20000
N-Nitrosodiphenylamine	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
4-Bromophenyl-phenylether	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Hexachlorobenzene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Pentachlorophenol	1800	U	ug/kg	1800	43000	UJ	ug/kg	43000	1800	U	ug/kg	1800	20000	U	ug/kg	20000
Phenanthrene	370	U	ug/kg	370	2200	J	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Anthracene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Carbazole	-				-				-				-			
Di-n-butylphthalate	370	UJ	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Fluoranthene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Pyrene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Butylbenzylphthalate	370	UJ	ug/kg	370	8900	UJ	ug/kg	8900	360	UJ	ug/kg	360	4000	U	ug/kg	4000
3,3-Dichlorobenzidine	750	U	ug/kg	750	18000	UJ	ug/kg	18000	730	U	ug/kg	730	8100	U	ug/kg	8100
Benzo (a) anthracene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Chrysene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
bis(2-Ethylhexyl) phthalate	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	790	J	ug/kg	4000
Di-n-octylphthalate	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Benzo (b) fluoranthene	370	UJ	ug/kg	370	8900	UJ	ug/kg	8900	360	UJ	ug/kg	360	4000	U	ug/kg	4000
Benzo (k) fluoranthene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Benzo (a) pyrene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	U	ug/kg	4000
Indeno (1,2,3-cd) pyrene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	UJ	ug/kg	4000
Dibenzo (a,h) anthracene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	UJ	ug/kg	4000
Benzo (g,h,i) perylene	370	U	ug/kg	370	8900	UJ	ug/kg	8900	360	U	ug/kg	360	4000	UJ	ug/kg	4000

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22495012				22506002				22507003				22506003			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-30				18-SL-31				18-SL-31A				18-SL-32			
Collect Date:	13-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
bis(2-Chloroethyl) ether	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2-Chlorophenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
1,3-Dichlorobenzene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
1,4-Dichlorobenzene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
1,2-Dichlorobenzene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2-Methylphenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2,2-oxybis(1-Chloropropane)	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
4-Methylphenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
N-Nitroso-di-n-propylamine	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Hexachloroethane	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Nitrobenzene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Isophorone	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2-Nitrophenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2,4-Dimethylphenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
bis(2-Chloroethoxy) methane	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2,4-Dichlorophenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
1,2,4-Trichlorobenzene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Naphthalene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	5700	J	ug/kg	19000
4-Chloroaniline	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Hexachlorobutadiene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
4-Chloro-3-methylphenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2-Methylnaphthalene	1500	U	ug/kg	1500	1200	J	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Hexachlorocyclopentadiene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2,4,6-Trichlorophenol	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2,4,5-Trichlorophenol	7400	U	ug/kg	7400	22000	U	ug/kg	22000	22000	U	ug/kg	22000	91000	U	ug/kg	91000
2-Chloronaphthalene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2-Nitroaniline	7400	U	ug/kg	7400	22000	U	ug/kg	22000	22000	U	ug/kg	22000	91000	U	ug/kg	91000
Dimethylphthalate	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Acenaphthylene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2,6-Dinitrotoluene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
3-Nitroaniline	7400	U	ug/kg	7400	22000	U	ug/kg	22000	22000	U	ug/kg	22000	91000	U	ug/kg	91000
Acenaphthene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2,4-Dinitrophenol	7400	U	ug/kg	7400	22000	U	ug/kg	22000	22000	U	ug/kg	22000	91000	U	ug/kg	91000
4-Nitrophenol	7400	U	ug/kg	7400	22000	U	ug/kg	22000	22000	U	ug/kg	22000	91000	U	ug/kg	91000
Dibenzofuran	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
2,4-Dinitrotoluene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Diethylphthalate	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
4-Chlorophenyl-phenylether	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Fluorene	1500	UJ	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22495012				22506002				22507003				22506003			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-30				18-SL-31				18-SL-31A				18-SL-32			
Collect Date:	13-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	7400	U	ug/kg	7400	22000	U	ug/kg	22000	22000	U	ug/kg	22000	91000	U	ug/kg	91000
4,6-Dinitro-2-methylphenol	7400	U	ug/kg	7400	22000	U	ug/kg	22000	22000	U	ug/kg	22000	91000	U	ug/kg	91000
N-Nitrosodiphenylamine	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
4-Bromophenyl-phenylether	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Hexachlorobenzene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Pentachlorophenol	7400	U	ug/kg	7400	22000	U	ug/kg	22000	22000	U	ug/kg	22000	91000	U	ug/kg	91000
Phenanthrene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Anthracene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Carbazole	-				-				-				-			
Di-n-butylphthalate	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Fluoranthene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Pyrene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	730	J	ug/kg	4600	2100	J	ug/kg	19000
Butylbenzylphthalate	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
3,3-Dichlorobenzidine	3100	U	ug/kg	3100	9100	U	ug/kg	9100	9100	UJ	ug/kg	9100	38000	U	ug/kg	38000
Benzo (a) anthracene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Chrysene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
bis(2-Ethylhexyl) phthalate	600	J	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Di-n-octylphthalate	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Benzo (b) fluoranthene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Benzo (k) fluoranthene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Benzo (a) pyrene	1500	U	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Indeno (1,2,3-cd) pyrene	1500	UJ	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Dibenzo (a,h) anthracene	1500	UJ	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000
Benzo (g,h,i) perylene	1500	UJ	ug/kg	1500	4600	U	ug/kg	4600	4600	U	ug/kg	4600	19000	U	ug/kg	19000

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22506004				22506005				22506006				22506007			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-33				18-SL-34				18-SL-35				18-SL-36			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
bis(2-Chloroethyl) ether	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2-Chlorophenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
1,3-Dichlorobenzene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
1,4-Dichlorobenzene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
1,2-Dichlorobenzene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2-Methylphenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2,2-oxybis(1-Chloropropane)	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
4-Methylphenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
N-Nitroso-di-n-propylamine	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Hexachloroethane	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Nitrobenzene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Isophorone	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2-Nitrophenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2,4-Dimethylphenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
bis(2-Chloroethoxy) methane	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2,4-Dichlorophenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
1,2,4-Trichlorobenzene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Naphthalene	8000	J	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	4200	J	ug/kg	13000
4-Chloroaniline	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Hexachlorobutadiene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
4-Chloro-3-methylphenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2-Methylnaphthalene	24000		ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	19000		ug/kg	13000
Hexachlorocyclopentadiene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2,4,6-Trichlorophenol	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2,4,5-Trichlorophenol	99000	U	ug/kg	99000	54000	U	ug/kg	54000	5900	U	ug/kg	5900	62000	U	ug/kg	62000
2-Chloronaphthalene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2-Nitroaniline	99000	U	ug/kg	99000	54000	U	ug/kg	54000	5900	U	ug/kg	5900	62000	U	ug/kg	62000
Dimethylphthalate	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Acenaphthylene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2,6-Dinitrotoluene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
3-Nitroaniline	99000	U	ug/kg	99000	54000	U	ug/kg	54000	5900	U	ug/kg	5900	62000	U	ug/kg	62000
Acenaphthene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2,4-Dinitrophenol	99000	U	ug/kg	99000	54000	U	ug/kg	54000	5900	U	ug/kg	5900	62000	U	ug/kg	62000
4-Nitrophenol	99000	U	ug/kg	99000	54000	U	ug/kg	54000	5900	U	ug/kg	5900	62000	U	ug/kg	62000
Dibenzofuran	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
2,4-Dinitrotoluene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Diethylphthalate	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
4-Chlorophenyl-phenylether	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Fluorene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22506004				22506005				22506006				22506007			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-33				18-SL-34				18-SL-35				18-SL-36			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	99000	U	ug/kg	99000	54000	U	ug/kg	54000	5900	U	ug/kg	5900	62000	U	ug/kg	62000
4,6-Dinitro-2-methylphenol	99000	U	ug/kg	99000	54000	U	ug/kg	54000	5900	U	ug/kg	5900	62000	U	ug/kg	62000
N-Nitrosodiphenylamine	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
4-Bromophenyl-phenylether	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Hexachlorobenzene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Pentachlorophenol	99000	U	ug/kg	99000	54000	U	ug/kg	54000	5900	U	ug/kg	5900	62000	U	ug/kg	62000
Phenanthrene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Anthracene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Carbazole	-				-				-				-			
Di-n-butylphthalate	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Fluoranthene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Pyrene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Butylbenzylphthalate	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
3,3-Dichlorobenzidine	41000	U	ug/kg	41000	22000	U	ug/kg	22000	2400	U	ug/kg	2400	26000	U	ug/kg	26000
Benzo (a) anthracene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Chrysene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
bis(2-Ethylhexyl) phthalate	20000	U	ug/kg	20000	11000	U	ug/kg	11000	170	J	ug/kg	1200	13000	U	ug/kg	13000
Di-n-octylphthalate	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Benzo (b) fluoranthene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Benzo (k) fluoranthene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Benzo (a) pyrene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Indeno (1,2,3-cd) pyrene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Dibenzo (a,h) anthracene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000
Benzo (g,h,i) perylene	20000	U	ug/kg	20000	11000	U	ug/kg	11000	1200	U	ug/kg	1200	13000	U	ug/kg	13000

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22506008				22507001				22506009				22506010			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-37				18-SL-37A				18-SL-38				18-SL-39			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
bis(2-Chloroethyl) ether	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2-Chlorophenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
1,3-Dichlorobenzene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
1,4-Dichlorobenzene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
1,2-Dichlorobenzene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2-Methylphenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2,2-oxybis(1-Chloropropane)	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
4-Methylphenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
N-Nitroso-di-n-propylamine	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Hexachloroethane	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Nitrobenzene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Isophorone	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2-Nitrophenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2,4-Dimethylphenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
bis(2-Chloroethoxy) methane	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2,4-Dichlorophenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
1,2,4-Trichlorobenzene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Naphthalene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
4-Chloroaniline	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Hexachlorobutadiene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
4-Chloro-3-methylphenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2-Methylnaphthalene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Hexachlorocyclopentadiene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2,4,6-Trichlorophenol	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2,4,5-Trichlorophenol	12000	U	ug/kg	12000	7100	U	ug/kg	7100	1800	U	ug/kg	1800	1700	U	ug/kg	1700
2-Chloronaphthalene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2-Nitroaniline	12000	U	ug/kg	12000	7100	U	ug/kg	7100	1800	U	ug/kg	1800	1700	U	ug/kg	1700
Dimethylphthalate	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Acenaphthylene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2,6-Dinitrotoluene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
3-Nitroaniline	12000	U	ug/kg	12000	7100	U	ug/kg	7100	1800	U	ug/kg	1800	1700	U	ug/kg	1700
Acenaphthene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2,4-Dinitrophenol	12000	U	ug/kg	12000	7100	U	ug/kg	7100	1800	U	ug/kg	1800	1700	U	ug/kg	1700
4-Nitrophenol	12000	U	ug/kg	12000	7100	U	ug/kg	7100	1800	U	ug/kg	1800	1700	U	ug/kg	1700
Dibenzofuran	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
2,4-Dinitrotoluene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Diethylphthalate	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
4-Chlorophenyl-phenylether	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Fluorene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22506008				22507001				22506009				22506010			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-37				18-SL-37A				18-SL-38				18-SL-39			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	12000	U	ug/kg	12000	7100	U	ug/kg	7100	1800	U	ug/kg	1800	1700	U	ug/kg	1700
4,6-Dinitro-2-methylphenol	12000	U	ug/kg	12000	7100	U	ug/kg	7100	1800	U	ug/kg	1800	1700	U	ug/kg	1700
N-Nitrosodiphenylamine	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
4-Bromophenyl-phenylether	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Hexachlorobenzene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Pentachlorophenol	12000	U	ug/kg	12000	7100	U	ug/kg	7100	1800	U	ug/kg	1800	1700	U	ug/kg	1700
Phenanthrene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Anthracene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Carbazole	-				-				-				-			
Di-n-butylphthalate	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	UJ	ug/kg	370	360	UJ	ug/kg	360
Fluoranthene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Pyrene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Butylbenzylphthalate	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
3,3-Dichlorobenzidine	5000	U	ug/kg	5000	2900	UJ	ug/kg	2900	730	U	ug/kg	730	720	U	ug/kg	720
Benzo (a) anthracene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Chrysene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
bis(2-Ethylhexyl) phthalate	1800	J	ug/kg	2500	3500		ug/kg	1500	220	J	ug/kg	370	360	U	ug/kg	360
Di-n-octylphthalate	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Benzo (b) fluoranthene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Benzo (k) fluoranthene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Benzo (a) pyrene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Indeno (1,2,3-cd) pyrene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Dibenzo (a,h) anthracene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360
Benzo (g,h,i) perylene	2500	U	ug/kg	2500	1500	U	ug/kg	1500	370	U	ug/kg	370	360	U	ug/kg	360

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22506011			22507002			22507007			22507008		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	18-SL-40			18-SL-41			18-SL-42			18-SL-43		
Collect Date:	14-AUG-92			14-AUG-92			14-AUG-92			14-AUG-92		
	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL	VALUE QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW												
Phenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
bis(2-Chloroethyl) ether	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2-Chlorophenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
1,3-Dichlorobenzene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
1,4-Dichlorobenzene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
1,2-Dichlorobenzene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2-Methylphenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2,2-oxybis(1-Chloropropane)	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
4-Methylphenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
N-Nitroso-di-n-propylamine	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Hexachloroethane	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Nitrobenzene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Isophorone	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2-Nitrophenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2,4-Dimethylphenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
bis(2-Chloroethoxy) methane	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2,4-Dichlorophenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
1,2,4-Trichlorobenzene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Naphthalene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
4-Chloroaniline	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Hexachlorobutadiene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
4-Chloro-3-methylphenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2-Methylnaphthalene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Hexachlorocyclopentadiene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2,4,6-Trichlorophenol	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2,4,5-Trichlorophenol	1800 U	ug/kg	1800	1700 U	ug/kg	1700	1700 U	ug/kg	1700	1700 U	ug/kg	1700
2-Chloronaphthalene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2-Nitroaniline	1800 U	ug/kg	1800	1700 U	ug/kg	1700	1700 U	ug/kg	1700	1700 U	ug/kg	1700
Dimethylphthalate	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Acenaphthylene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2,6-Dinitrotoluene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
3-Nitroaniline	1800 U	ug/kg	1800	1700 U	ug/kg	1700	1700 U	ug/kg	1700	1700 U	ug/kg	1700
Acenaphthene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2,4-Dinitrophenol	1800 U	ug/kg	1800	1700 U	ug/kg	1700	1700 U	ug/kg	1700	1700 U	ug/kg	1700
4-Nitrophenol	1800 U	ug/kg	1800	1700 U	ug/kg	1700	1700 U	ug/kg	1700	1700 U	ug/kg	1700
Dibenzofuran	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
2,4-Dinitrotoluene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Diethylphthalate	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
4-Chlorophenyl-phenylether	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350
Fluorene	370 U	ug/kg	370	350 U	ug/kg	350	350 U	ug/kg	350	350 U	ug/kg	350

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22506011				22507002				22507007				22507008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-40				18-SL-41				18-SL-42				18-SL-43			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	1800	U	ug/kg	1800	1700	U	ug/kg	1700	1700	U	ug/kg	1700	1700	U	ug/kg	1700
4,6-Dinitro-2-methylphenol	1800	U	ug/kg	1800	1700	U	ug/kg	1700	1700	U	ug/kg	1700	1700	U	ug/kg	1700
N-Nitrosodiphenylamine	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
4-Bromophenyl-phenylether	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Hexachlorobenzene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Pentachlorophenol	1800	U	ug/kg	1800	1700	U	ug/kg	1700	1700	U	ug/kg	1700	1700	U	ug/kg	1700
Phenanthrene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Anthracene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Carbazole	-				-				-				-			
Di-n-butylphthalate	370	UJ	ug/kg	370	350	UJ	ug/kg	350	350	UJ	ug/kg	350	350	UJ	ug/kg	350
Fluoranthene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Pyrene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Butylbenzylphthalate	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
3,3-Dichlorobenzidine	750	U	ug/kg	750	690	UJ	ug/kg	690	700	UJ	ug/kg	700	710	UJ	ug/kg	710
Benzo (a) anthracene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Chrysene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
bis(2-Ethylhexyl) phthalate	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Di-n-octylphthalate	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Benzo (b) fluoranthene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Benzo (k) fluoranthene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Benzo (a) pyrene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Indeno (1,2,3-cd) pyrene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Dibenzo (a,h) anthracene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350
Benzo (g,h,i) perylene	370	U	ug/kg	370	350	U	ug/kg	350	350	U	ug/kg	350	350	U	ug/kg	350

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22507009			22507010			22507011			22507012		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	18-SL-44			18-SL-45			18-SL-46			18-SL-47		
Collect Date:	14-AUG-92			14-AUG-92			14-AUG-92			14-AUG-92		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP SEMIVOLATILES 90-SOW												
Phenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
bis(2-Chloroethyl) ether	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2-Chlorophenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
1,3-Dichlorobenzene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
1,4-Dichlorobenzene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
1,2-Dichlorobenzene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2-Methylphenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2,2-oxybis(1-Chloropropane)	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
4-Methylphenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
N-Nitroso-di-n-propylamine	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Hexachloroethane	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Nitrobenzene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Isophorone	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2-Nitrophenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2,4-Dimethylphenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
bis(2-Chloroethoxy) methane	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2,4-Dichlorophenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
1,2,4-Trichlorobenzene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Naphthalene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
4-Chloroaniline	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Hexachlorobutadiene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
4-Chloro-3-methylphenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2-Methylnaphthalene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Hexachlorocyclopentadiene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2,4,6-Trichlorophenol	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2,4,5-Trichlorophenol	1700	U ug/kg	1700	1800	U ug/kg	1800	1900	U ug/kg	1900	1700	U ug/kg	1700
2-Chloronaphthalene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2-Nitroaniline	1700	U ug/kg	1700	1800	U ug/kg	1800	1900	U ug/kg	1900	1700	U ug/kg	1700
Dimethylphthalate	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Acenaphthylene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2,6-Dinitrotoluene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
3-Nitroaniline	1700	U ug/kg	1700	1800	U ug/kg	1800	1900	U ug/kg	1900	1700	U ug/kg	1700
Acenaphthene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2,4-Dinitrophenol	1700	U ug/kg	1700	1800	U ug/kg	1800	1900	UJ ug/kg	1900	1700	UJ ug/kg	1700
4-Nitrophenol	1700	U ug/kg	1700	1800	U ug/kg	1800	1900	U ug/kg	1900	1700	U ug/kg	1700
Dibenzofuran	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
2,4-Dinitrotoluene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Diethylphthalate	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
4-Chlorophenyl-phenylether	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350
Fluorene	350	U ug/kg	350	370	U ug/kg	370	380	U ug/kg	380	350	U ug/kg	350

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- SEMIVOLATILES -- REPORT NO. 10505

Lab Sample Number:	22507009				22507010				22507011				22507012			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-44				18-SL-45				18-SL-46				18-SL-47			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
4-Nitroaniline	1700	U	ug/kg	1700	1800	U	ug/kg	1800	1900	U	ug/kg	1900	1700	U	ug/kg	1700
4,6-Dinitro-2-methylphenol	1700	U	ug/kg	1700	1800	U	ug/kg	1800	1900	U	ug/kg	1900	1700	U	ug/kg	1700
N-Nitrosodiphenylamine	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
4-Bromophenyl-phenylether	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Hexachlorobenzene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Pentachlorophenol	1700	U	ug/kg	1700	1800	U	ug/kg	1800	1900	U	ug/kg	1900	1700	U	ug/kg	1700
Phenanthrene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Anthracene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Carbazole	-				-				-				-			
Di-n-butylphthalate	350	UJ	ug/kg	350	370	UJ	ug/kg	370	380	UJ	ug/kg	380	350	UJ	ug/kg	350
Fluoranthene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Pyrene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Butylbenzylphthalate	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
3,3-Dichlorobenzidine	710	UJ	ug/kg	710	730	UJ	ug/kg	730	770	U	ug/kg	770	710	U	ug/kg	710
Benzo (a) anthracene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Chrysene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
bis(2-Ethylhexyl) phthalate	75	J	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Di-n-octylphthalate	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Benzo (b) fluoranthene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Benzo (k) fluoranthene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Benzo (a) pyrene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Indeno (1,2,3-cd) pyrene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Dibenzo (a,h) anthracene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350
Benzo (g,h,i) perylene	350	U	ug/kg	350	370	U	ug/kg	370	380	U	ug/kg	380	350	U	ug/kg	350

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10506

Lab Sample Number:	22481001				22481002				22507006				22488001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-01				18-SL-01A				18-SL-06				18-SL-07			
Collect Date:	12-AUG-92				12-AUG-92				14-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW																
alpha-BHC	45	U	ug/kg	45	47	U	ug/kg	47	18	U	ug/kg	18	9.2	U	ug/kg	9.2
beta-BHC	45	U	ug/kg	45	47	U	ug/kg	47	18	U	ug/kg	18	9.2	U	ug/kg	9.2
delta-BHC	45	U	ug/kg	45	47	U	ug/kg	47	18	U	ug/kg	18	9.2	U	ug/kg	9.2
gamma-BHC (Lindane)	45	U	ug/kg	45	47	U	ug/kg	47	18	U	ug/kg	18	9.2	U	ug/kg	9.2
Heptachlor	45	U	ug/kg	45	47	U	ug/kg	47	18	U	ug/kg	18	9.2	U	ug/kg	9.2
Aldrin	45	U	ug/kg	45	47	U	ug/kg	47	18	U	ug/kg	18	9.2	U	ug/kg	9.2
Heptachlor epoxide	45	U	ug/kg	45	47	U	ug/kg	47	18	U	ug/kg	18	9.2	U	ug/kg	9.2
Endosulfan I	45	U	ug/kg	45	47	U	ug/kg	47	18	U	ug/kg	18	9.2	U	ug/kg	9.2
Dieldrin	91	U	ug/kg	91	94	U	ug/kg	94	36	U	ug/kg	36	18	U	ug/kg	18
4,4-DDE	91	U	ug/kg	91	94	U	ug/kg	94	36	U	ug/kg	36	18	U	ug/kg	18
Endrin	91	U	ug/kg	91	94	U	ug/kg	94	36	U	ug/kg	36	18	U	ug/kg	18
Endosulfan II	91	U	ug/kg	91	94	U	ug/kg	94	36	U	ug/kg	36	18	U	ug/kg	18
4,4-DDD	91	U	ug/kg	91	94	U	ug/kg	94	36	U	ug/kg	36	18	U	ug/kg	18
Endosulfan sulfate	91	U	ug/kg	91	94	U	ug/kg	94	36	U	ug/kg	36	18	U	ug/kg	18
4,4-DDT	91	U	ug/kg	91	94	U	ug/kg	94	36	U	ug/kg	36	18	U	ug/kg	18
Methoxychlor	450	U	ug/kg	450	470	U	ug/kg	470	180	U	ug/kg	180	92	U	ug/kg	92
Endrin ketone	91	U	ug/kg	91	94	U	ug/kg	94	36	U	ug/kg	36	18	U	ug/kg	18
Endrin aldehyde	-				-				-				-			
alpha-Chlordane	450	U	ug/kg	450	470	U	ug/kg	470	180	U	ug/kg	180	92	U	ug/kg	92
gamma-Chlordane	450	U	ug/kg	450	470	U	ug/kg	470	180	U	ug/kg	180	92	U	ug/kg	92
Toxaphene	910	U	ug/kg	910	940	U	ug/kg	940	360	U	ug/kg	360	180	U	ug/kg	180
Aroclor-1016	450	U	ug/kg	450	470	U	ug/kg	470	180	U	ug/kg	180	92	U	ug/kg	92
Aroclor-1221	450	U	ug/kg	450	470	U	ug/kg	470	180	U	ug/kg	180	92	U	ug/kg	92
Aroclor-1232	450	U	ug/kg	450	470	U	ug/kg	470	180	U	ug/kg	180	92	U	ug/kg	92
Aroclor-1242	450	U	ug/kg	450	470	U	ug/kg	470	180	U	ug/kg	180	92	U	ug/kg	92
Aroclor-1248	450	U	ug/kg	450	470	U	ug/kg	470	180	U	ug/kg	180	92	U	ug/kg	92
Aroclor-1254	910	U	ug/kg	910	940	U	ug/kg	940	360	U	ug/kg	360	180	U	ug/kg	180
Aroclor-1260	910	U	ug/kg	910	940	U	ug/kg	940	360	U	ug/kg	360	180	U	ug/kg	180

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10506

Lab Sample Number:	22488002			22488003			22489001			22489002		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	18-SL-08			18-SL-09			18-SL-10			18-SL-10A		
Collect Date:	13-AUG-92			13-AUG-92			13-AUG-92			13-AUG-92		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP PESTICIDES/PCBS 90-SOW												
alpha-BHC	8.8	U ug/kg	8.8	9.3	U ug/kg	9.3	45	U ug/kg	45	45	U ug/kg	45
beta-BHC	8.8	U ug/kg	8.8	9.3	U ug/kg	9.3	45	U ug/kg	45	45	U ug/kg	45
delta-BHC	8.8	U ug/kg	8.8	9.3	U ug/kg	9.3	45	U ug/kg	45	45	U ug/kg	45
gamma-BHC (Lindane)	8.8	U ug/kg	8.8	9.3	U ug/kg	9.3	45	U ug/kg	45	45	U ug/kg	45
Heptachlor	8.8	U ug/kg	8.8	9.3	U ug/kg	9.3	45	U ug/kg	45	45	U ug/kg	45
Aldrin	8.8	U ug/kg	8.8	9.3	U ug/kg	9.3	45	U ug/kg	45	45	U ug/kg	45
Heptachlor epoxide	8.8	U ug/kg	8.8	9.3	U ug/kg	9.3	45	U ug/kg	45	45	U ug/kg	45
Endosulfan I	8.8	U ug/kg	8.8	9.3	U ug/kg	9.3	45	U ug/kg	45	45	U ug/kg	45
Dieldrin	18	U ug/kg	18	19	U ug/kg	19	91	U ug/kg	91	90	U ug/kg	90
4,4-DDE	18	U ug/kg	18	19	U ug/kg	19	91	U ug/kg	91	90	U ug/kg	90
Endrin	18	U ug/kg	18	19	U ug/kg	19	91	U ug/kg	91	90	U ug/kg	90
Endosulfan II	18	U ug/kg	18	19	U ug/kg	19	91	U ug/kg	91	90	U ug/kg	90
4,4-DDD	18	U ug/kg	18	19	U ug/kg	19	91	U ug/kg	91	90	U ug/kg	90
Endosulfan sulfate	18	U ug/kg	18	19	U ug/kg	19	91	U ug/kg	91	90	U ug/kg	90
4,4-DDT	18	U ug/kg	18	19	U ug/kg	19	91	U ug/kg	91	90	U ug/kg	90
Methoxychlor	88	U ug/kg	88	93	U ug/kg	93	450	U ug/kg	450	450	U ug/kg	450
Endrin ketone	18	U ug/kg	18	19	U ug/kg	19	91	U ug/kg	91	90	U ug/kg	90
Endrin aldehyde	-			-			-			-		
alpha-Chlordane	88	U ug/kg	88	93	U ug/kg	93	450	U ug/kg	450	450	U ug/kg	450
gamma-Chlordane	88	U ug/kg	88	93	U ug/kg	93	450	U ug/kg	450	450	U ug/kg	450
Toxaphene	180	U ug/kg	180	190	U ug/kg	190	910	U ug/kg	910	900	U ug/kg	900
Aroclor-1016	88	U ug/kg	88	93	U ug/kg	93	450	U ug/kg	450	450	U ug/kg	450
Aroclor-1221	88	U ug/kg	88	93	U ug/kg	93	450	U ug/kg	450	450	U ug/kg	450
Aroclor-1232	88	U ug/kg	88	93	U ug/kg	93	450	U ug/kg	450	450	U ug/kg	450
Aroclor-1242	88	U ug/kg	88	93	U ug/kg	93	450	U ug/kg	450	450	U ug/kg	450
Aroclor-1248	88	U ug/kg	88	93	U ug/kg	93	450	U ug/kg	450	450	U ug/kg	450
Aroclor-1254	180	U ug/kg	180	190	U ug/kg	190	910	U ug/kg	910	900	U ug/kg	900
Aroclor-1260	180	U ug/kg	180	190	U ug/kg	190	910	U ug/kg	910	900	U ug/kg	900

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10506

Lab Sample Number:	22489003				22489004				22495007				22506002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-23				18-SL-23A				18-SL-25				18-SL-31			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW																
alpha-BHC	370	UJ	ug/kg	370	370	UJ	ug/kg	370	35	U	ug/kg	35	46	U	ug/kg	46
beta-BHC	370	UJ	ug/kg	370	370	UJ	ug/kg	370	35	U	ug/kg	35	46	U	ug/kg	46
delta-BHC	370	UJ	ug/kg	370	370	UJ	ug/kg	370	35	U	ug/kg	35	46	U	ug/kg	46
gamma-BHC (Lindane)	370	UJ	ug/kg	370	370	UJ	ug/kg	370	35	U	ug/kg	35	46	U	ug/kg	46
Heptachlor	370	UJ	ug/kg	370	370	UJ	ug/kg	370	35	U	ug/kg	35	46	U	ug/kg	46
Aldrin	370	UJ	ug/kg	370	370	UJ	ug/kg	370	35	U	ug/kg	35	46	U	ug/kg	46
Heptachlor epoxide	370	UJ	ug/kg	370	370	UJ	ug/kg	370	35	U	ug/kg	35	46	U	ug/kg	46
Endosulfan I	370	UJ	ug/kg	370	370	UJ	ug/kg	370	35	U	ug/kg	35	46	U	ug/kg	46
Dieldrin	740	UJ	ug/kg	740	740	UJ	ug/kg	740	70	U	ug/kg	70	92	U	ug/kg	92
4,4-DDE	740	UJ	ug/kg	740	740	UJ	ug/kg	740	70	U	ug/kg	70	92	U	ug/kg	92
Endrin	740	UJ	ug/kg	740	740	UJ	ug/kg	740	70	U	ug/kg	70	92	U	ug/kg	92
Endosulfan II	740	UJ	ug/kg	740	740	UJ	ug/kg	740	70	U	ug/kg	70	92	U	ug/kg	92
4,4-DDD	740	UJ	ug/kg	740	740	UJ	ug/kg	740	70	U	ug/kg	70	92	U	ug/kg	92
Endosulfan sulfate	740	UJ	ug/kg	740	740	UJ	ug/kg	740	70	U	ug/kg	70	92	U	ug/kg	92
4,4-DDT	740	UJ	ug/kg	740	740	UJ	ug/kg	740	70	U	ug/kg	70	92	U	ug/kg	92
Methoxychlor	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700	350	U	ug/kg	350	460	U	ug/kg	460
Endrin ketone	740	UJ	ug/kg	740	740	UJ	ug/kg	740	70	U	ug/kg	70	92	U	ug/kg	92
Endrin aldehyde	-				-				-				-			
alpha-Chlordane	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700	350	U	ug/kg	350	460	U	ug/kg	460
gamma-Chlordane	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700	350	U	ug/kg	350	460	U	ug/kg	460
Toxaphene	7400	UJ	ug/kg	7400	7400	UJ	ug/kg	7400	700	U	ug/kg	700	920	U	ug/kg	920
Aroclor-1016	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700	350	U	ug/kg	350	460	U	ug/kg	460
Aroclor-1221	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700	350	U	ug/kg	350	460	U	ug/kg	460
Aroclor-1232	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700	350	U	ug/kg	350	460	U	ug/kg	460
Aroclor-1242	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700	350	U	ug/kg	350	460	U	ug/kg	460
Aroclor-1248	3700	UJ	ug/kg	3700	3700	UJ	ug/kg	3700	350	U	ug/kg	350	460	U	ug/kg	460
Aroclor-1254	7400	UJ	ug/kg	7400	7400	UJ	ug/kg	7400	700	U	ug/kg	700	920	U	ug/kg	920
Aroclor-1260	7400	UJ	ug/kg	7400	7400	UJ	ug/kg	7400	700	U	ug/kg	700	920	U	ug/kg	920

U= NOT DETECTED J=ESTIMATED VALUE
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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10506

Lab Sample Number:	22507003			22506008			22507001			22506009		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	18-SL-31A			18-SL-37			18-SL-37A			18-SL-38		
Collect Date:	14-AUG-92			14-AUG-92			14-AUG-92			14-AUG-92		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP PESTICIDES/PCBS 90-SOW												
alpha-BHC	37	U ug/kg	37	43	U ug/kg	43	18	U ug/kg	18	8.9	U ug/kg	8.9
beta-BHC	37	U ug/kg	37	43	U ug/kg	43	18	U ug/kg	18	8.9	U ug/kg	8.9
delta-BHC	37	U ug/kg	37	43	U ug/kg	43	18	U ug/kg	18	8.9	U ug/kg	8.9
gamma-BHC (Lindane)	37	U ug/kg	37	43	U ug/kg	43	18	U ug/kg	18	8.9	U ug/kg	8.9
Heptachlor	37	U ug/kg	37	43	U ug/kg	43	18	U ug/kg	18	8.9	U ug/kg	8.9
Aldrin	37	U ug/kg	37	43	U ug/kg	43	18	U ug/kg	18	8.9	U ug/kg	8.9
Heptachlor epoxide	37	U ug/kg	37	43	U ug/kg	43	18	U ug/kg	18	8.9	U ug/kg	8.9
Endosulfan I	37	U ug/kg	37	43	U ug/kg	43	18	U ug/kg	18	8.9	U ug/kg	8.9
Dieldrin	74	U ug/kg	74	87	U ug/kg	87	36	U ug/kg	36	18	U ug/kg	18
4,4-DDE	74	U ug/kg	74	87	U ug/kg	87	36	U ug/kg	36	18	U ug/kg	18
Endrin	74	U ug/kg	74	87	U ug/kg	87	36	U ug/kg	36	18	U ug/kg	18
Endosulfan II	74	U ug/kg	74	87	U ug/kg	87	36	U ug/kg	36	18	U ug/kg	18
4,4-DDD	74	U ug/kg	74	87	U ug/kg	87	36	U ug/kg	36	18	U ug/kg	18
Endosulfan sulfate	74	U ug/kg	74	87	U ug/kg	87	36	U ug/kg	36	18	U ug/kg	18
4,4-DDT	74	U ug/kg	74	87	U ug/kg	87	36	U ug/kg	36	18	U ug/kg	18
Methoxychlor	370	U ug/kg	370	430	U ug/kg	430	180	U ug/kg	180	89	U ug/kg	89
Endrin ketone	74	U ug/kg	74	87	U ug/kg	87	36	U ug/kg	36	18	U ug/kg	18
Endrin aldehyde	-			-			-			-		
alpha-Chlordane	370	U ug/kg	370	430	U ug/kg	430	180	U ug/kg	180	89	U ug/kg	89
gamma-Chlordane	370	U ug/kg	370	430	U ug/kg	430	180	U ug/kg	180	89	U ug/kg	89
Toxaphene	740	U ug/kg	740	870	U ug/kg	870	360	U ug/kg	360	180	U ug/kg	180
Aroclor-1016	370	U ug/kg	370	430	U ug/kg	430	180	U ug/kg	180	89	U ug/kg	89
Aroclor-1221	370	U ug/kg	370	430	U ug/kg	430	180	U ug/kg	180	89	U ug/kg	89
Aroclor-1232	370	U ug/kg	370	430	U ug/kg	430	180	U ug/kg	180	89	U ug/kg	89
Aroclor-1242	370	U ug/kg	370	430	U ug/kg	430	180	U ug/kg	180	89	U ug/kg	89
Aroclor-1248	370	U ug/kg	370	430	U ug/kg	430	180	U ug/kg	180	89	U ug/kg	89
Aroclor-1254	740	U ug/kg	740	870	U ug/kg	870	360	U ug/kg	360	180	U ug/kg	180
Aroclor-1260	740	U ug/kg	740	870	U ug/kg	870	360	U ug/kg	360	180	U ug/kg	180

U= NOT DETECTED J=ESTIMATED VALUE
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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- PESTICIDES/PCBs -- REPORT NO. 10506

Lab Sample Number:	22506010				22506011			
Site	WHITING				WHITING			
Locator	18-SL-39				18-SL-40			
Collect Date:	14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW								
alpha-BHC	8.7	U	ug/kg	8.7	9.1	U	ug/kg	9.1
beta-BHC	8.7	U	ug/kg	8.7	9.1	U	ug/kg	9.1
delta-BHC	8.7	U	ug/kg	8.7	9.1	U	ug/kg	9.1
gamma-BHC (Lindane)	8.7	U	ug/kg	8.7	9.1	U	ug/kg	9.1
Heptachlor	8.7	U	ug/kg	8.7	9.1	U	ug/kg	9.1
Aldrin	8.7	U	ug/kg	8.7	9.1	U	ug/kg	9.1
Heptachlor epoxide	8.7	U	ug/kg	8.7	9.1	U	ug/kg	9.1
Endosulfan I	8.7	U	ug/kg	8.7	9.1	U	ug/kg	9.1
Dieldrin	17	U	ug/kg	17	18	U	ug/kg	18
4,4-DDE	17	U	ug/kg	17	18	U	ug/kg	18
Endrin	17	U	ug/kg	17	18	U	ug/kg	18
Endosulfan II	17	U	ug/kg	17	18	U	ug/kg	18
4,4-DDD	17	U	ug/kg	17	18	U	ug/kg	18
Endosulfan sulfate	17	U	ug/kg	17	18	U	ug/kg	18
4,4-DDT	17	U	ug/kg	17	18	U	ug/kg	18
Methoxychlor	87	U	ug/kg	87	91	U	ug/kg	91
Endrin ketone	17	U	ug/kg	17	18	U	ug/kg	18
Endrin aldehyde	-				-			
alpha-Chlordane	87	U	ug/kg	87	91	U	ug/kg	91
gamma-Chlordane	87	U	ug/kg	87	91	U	ug/kg	91
Toxaphene	170	U	ug/kg	170	180	U	ug/kg	180
Aroclor-1016	87	U	ug/kg	87	91	U	ug/kg	91
Aroclor-1221	87	U	ug/kg	87	91	U	ug/kg	91
Aroclor-1232	87	U	ug/kg	87	91	U	ug/kg	91
Aroclor-1242	87	U	ug/kg	87	91	U	ug/kg	91
Aroclor-1248	87	U	ug/kg	87	91	U	ug/kg	91
Aroclor-1254	170	U	ug/kg	170	180	U	ug/kg	180
Aroclor-1260	170	U	ug/kg	170	180	U	ug/kg	180

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22481001				22481002				22462010				22462011			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-01				18-SL-01A				18-SL-02				18-SL-03			
Collect Date:	12-AUG-92				12-AUG-92				12-AUG-92				12-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	3850		mg/kg	40	4580		mg/kg	40	3140		mg/kg	40	3100		mg/kg	40
Antimony	2.9	UJ	mg/kg	12	5.8	J	mg/kg	12	4.4	U	mg/kg	12	2.6	U	mg/kg	12
Arsenic	.55	UJ	mg/kg	2	1.1	UJ	mg/kg	2	.59	J	mg/kg	2	.77	J	mg/kg	2
Barium	17.2	J	mg/kg	40	45.2	J	mg/kg	40	7.1	J	mg/kg	40	5.5	J	mg/kg	40
Beryllium	.06	U	mg/kg	1	.06	U	mg/kg	1	.09	U	mg/kg	1	.05	U	mg/kg	1
Cadmium	22.6	J	mg/kg	1	33.7	J	mg/kg	1	2.8		mg/kg	1	.58	U	mg/kg	1
Calcium	207	UJ	mg/kg	1000	167	UJ	mg/kg	1000	197	J	mg/kg	1000	151	J	mg/kg	1000
Chromium	16.5	J	mg/kg	2	34.3	J	mg/kg	2	5.4		mg/kg	2	2.9		mg/kg	2
Cobalt	.37	UJ	mg/kg	10	1.3	UJ	mg/kg	10	1.3	J	mg/kg	10	1	J	mg/kg	10
Copper	177		mg/kg	5	864		mg/kg	5	8.4	J	mg/kg	5	1.8	J	mg/kg	5
Iron	1710		mg/kg	20	2580		mg/kg	20	1800		mg/kg	20	1700		mg/kg	20
Lead	62.6		mg/kg	1	96.1	J	mg/kg	1	28.9	J	mg/kg	1	6.7	J	mg/kg	1
Magnesium	94.7	J	mg/kg	1000	103	J	mg/kg	1000	94.9	J	mg/kg	1000	116	J	mg/kg	1000
Manganese	18.3	J	mg/kg	3	22.6	J	mg/kg	3	24.1		mg/kg	3	102		mg/kg	3
Mercury	.08	U	mg/kg	.1	.08	U	mg/kg	.1	.12	U	mg/kg	.1	.07	U	mg/kg	.1
Nickel	2.5	U	mg/kg	8	15.9		mg/kg	8	3.8	U	mg/kg	8	2.6	J	mg/kg	8
Potassium	141	U	mg/kg	1000	216	J	mg/kg	1000	280	J	mg/kg	1000	293	J	mg/kg	1000
Selenium	.44	UJ	mg/kg	1	.43	UJ	mg/kg	1	.66	U	mg/kg	1	.39	U	mg/kg	1
Silver	.35	U	mg/kg	2	.7	UJ	mg/kg	2	.53	U	mg/kg	2	.35	J	mg/kg	2
Sodium	176	UJ	mg/kg	1000	230	UJ	mg/kg	1000	279	J	mg/kg	1000	164	J	mg/kg	1000
Thallium	.48	U	mg/kg	2	.48	U	mg/kg	2	.73	U	mg/kg	2	.43	U	mg/kg	2
Vanadium	3.5	UJ	mg/kg	10	3.6	UJ	mg/kg	10	4.4	J	mg/kg	10	4.5	J	mg/kg	10
Zinc	94.2	J	mg/kg	4	174	J	mg/kg	4	10.5	J	mg/kg	4	4.9	J	mg/kg	4
Cyanide	.26	U	mg/kg	1	.26	U	mg/kg	1	.39	U	mg/kg	1	.23	U	mg/kg	1

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22462012				22507005				22507006				22488001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-04				18-SL-05				18-SL-06				18-SL-07			
Collect Date:	12-AUG-92				14-AUG-92				14-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	4550		mg/kg	40	3260		mg/kg	40	3140		mg/kg	40	6530		mg/kg	40
Antimony	3.3	U	mg/kg	12	2.7	U	mg/kg	12	2.7	U	mg/kg	12	2.8	U	mg/kg	12
Arsenic	.72	J	mg/kg	2	.26	J	mg/kg	2	.22	U	mg/kg	2	.64	J	mg/kg	2
Barium	27.2	J	mg/kg	40	6.5	J	mg/kg	40	10.6	J	mg/kg	40	38.6	J	mg/kg	40
Beryllium	.06	U	mg/kg	1	.05	U	mg/kg	1	.05	U	mg/kg	1	.06	U	mg/kg	1
Cadmium	9		mg/kg	1	.6	U	mg/kg	1	9.3		mg/kg	1	20.6		mg/kg	1
Calcium	296	J	mg/kg	1000	91.3	J	mg/kg	1000	151	J	mg/kg	1000	153	J	mg/kg	1000
Chromium	8.3		mg/kg	2	4		mg/kg	2	10.7		mg/kg	2	39.8		mg/kg	2
Cobalt	.87	J	mg/kg	10	.78	J	mg/kg	10	.47	J	mg/kg	10	.35	U	mg/kg	10
Copper	32.6		mg/kg	5	6.8		mg/kg	5	45.3		mg/kg	5	201		mg/kg	5
Iron	2180		mg/kg	20	1790		mg/kg	20	1490		mg/kg	20	1990		mg/kg	20
Lead	35.6		mg/kg	1	5.1		mg/kg	1	32.6		mg/kg	1	76.5		mg/kg	1
Magnesium	126	J	mg/kg	1000	84.1	J	mg/kg	1000	125	J	mg/kg	1000	133	J	mg/kg	1000
Manganese	27.8		mg/kg	3	18.5		mg/kg	3	16		mg/kg	3	38.2		mg/kg	3
Mercury	.09	U	mg/kg	.1	.01	U	mg/kg	.1	.01	U	mg/kg	.1	.08	U	mg/kg	.1
Nickel	2.8	U	mg/kg	8	2.4	U	mg/kg	8	2.4	U	mg/kg	8	2.5	J	mg/kg	8
Potassium	158	U	mg/kg	1000	199	J	mg/kg	1000	194	J	mg/kg	1000	137	U	mg/kg	1000
Selenium	.49	U	mg/kg	1	.46	U	mg/kg	1	.46	U	mg/kg	1	.47	U	mg/kg	1
Silver	.39	U	mg/kg	2	.33	U	mg/kg	2	.33	U	mg/kg	2	.34	U	mg/kg	2
Sodium	220	J	mg/kg	1000	182	J	mg/kg	1000	155	J	mg/kg	1000	163	J	mg/kg	1000
Thallium	.54	U	mg/kg	2	.35	U	mg/kg	2	.35	U	mg/kg	2	.47	U	mg/kg	2
Vanadium	5.4	J	mg/kg	10	4.6	J	mg/kg	10	4.2	J	mg/kg	10	3.4	J	mg/kg	10
Zinc	50.3	J	mg/kg	4	9.1	J	mg/kg	4	38.9		mg/kg	4	200		mg/kg	4
Cyanide	.29	U	mg/kg	1	.24	U	mg/kg	1	.24	U	mg/kg	1	.25	U	mg/kg	1

U= NOT DETECTED J=ESTIMATED VALUE
UJ= REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22488002				22488003				22489001				22489002			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-08				18-SL-09				18-SL-10				18-SL-10A			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	3380		mg/kg	40	2880		mg/kg	40	3000		mg/kg	40	2520	J	mg/kg	40
Antimony	2.7	U	mg/kg	12	2.8	U	mg/kg	12	2.9		mg/kg	12	2.7	UJ	mg/kg	12
Arsenic	.46	J	mg/kg	2	1.1	J	mg/kg	2	.9	UJ	mg/kg	2	2.2	UJ	mg/kg	2
Barium	5.7	J	mg/kg	40	32.4	J	mg/kg	40	97.7		mg/kg	40	92.3		mg/kg	40
Beryllium	.06	J	mg/kg	1	.05	U	mg/kg	1	.06	U	mg/kg	1	.09	J	mg/kg	1
Cadmium	.88	J	mg/kg	1	.61	U	mg/kg	1	.63	UJ	mg/kg	1	.7	J	mg/kg	1
Calcium	107	J	mg/kg	1000	115	J	mg/kg	1000	310	UJ	mg/kg	1000	322	UJ	mg/kg	1000
Chromium	3.6		mg/kg	2	3.6		mg/kg	2	95.7	J	mg/kg	2	10.2	J	mg/kg	2
Cobalt	.34	U	mg/kg	10	.76	J	mg/kg	10	4.3	UJ	mg/kg	10	2.2	UJ	mg/kg	10
Copper	8		mg/kg	5	13.9		mg/kg	5	65.3	J	mg/kg	5	24.9	J	mg/kg	5
Iron	1690		mg/kg	20	7050		mg/kg	20	35600	J	mg/kg	20	14100	J	mg/kg	20
Lead	32.3		mg/kg	1	55.4	J	mg/kg	1	57.4		mg/kg	1	88.5		mg/kg	1
Magnesium	81.8	J	mg/kg	1000	116	J	mg/kg	1000	237	J	mg/kg	1000	185	J	mg/kg	1000
Manganese	27.7		mg/kg	3	52.6		mg/kg	3	317	J	mg/kg	3	124	J	mg/kg	3
Mercury	.07	U	mg/kg	.1	.08	U	mg/kg	.1	.04	J	mg/kg	.1	.06	J	mg/kg	.1
Nickel	2.3	U	mg/kg	8	3.7	J	mg/kg	8	18.9	J	mg/kg	8	5.4	J	mg/kg	8
Potassium	132	U	mg/kg	1000	175	J	mg/kg	1000	276	J	mg/kg	1000	261	J	mg/kg	1000
Selenium	.46	U	mg/kg	1	.47	U	mg/kg	1	.48	U	mg/kg	1	.46	UJ	mg/kg	1
Silver	.33	U	mg/kg	2	.33	U	mg/kg	2	.34	UJ	mg/kg	2	.33	UJ	mg/kg	2
Sodium	171	J	mg/kg	1000	196	J	mg/kg	1000	210	UJ	mg/kg	1000	169	UJ	mg/kg	1000
Thallium	.45	U	mg/kg	2	.46	U	mg/kg	2	.37	UJ	mg/kg	2	.35	UJ	mg/kg	2
Vanadium	4.4	J	mg/kg	10	3.3	J	mg/kg	10	3.8	J	mg/kg	10	2.9		mg/kg	10
Zinc	9.4		mg/kg	4	32.7	J	mg/kg	4	181	J	mg/kg	4	99.3	J	mg/kg	4
Cyanide	.25	U	mg/kg	1	.25	U	mg/kg	1	.26	U	mg/kg	1	.24	U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22488004				22488005				22488006				22488008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-11				18-SL-12				18-SL-13				18-SL-14			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	3240		mg/kg	40	2480		mg/kg	40	3990		mg/kg	40	4880		mg/kg	40
Antimony	2.8	U	mg/kg	12	2.8	U	mg/kg	12	2.7	U	mg/kg	12	2.7	U	mg/kg	12
Arsenic	.53	J	mg/kg	2	.52	J	mg/kg	2	.66	J	mg/kg	2	.78	J	mg/kg	2
Barium	14.1	J	mg/kg	40	4.3	J	mg/kg	40	5.7	J	mg/kg	40	6	J	mg/kg	40
Beryllium	.06	U	mg/kg	1	.05	U	mg/kg	1	.05	U	mg/kg	1	.07	J	mg/kg	1
Cadmium	.81	J	mg/kg	1	.62	U	mg/kg	1	.59	U	mg/kg	1	.99	J	mg/kg	1
Calcium	160	J	mg/kg	1000	112	J	mg/kg	1000	93	J	mg/kg	1000	80.1	J	mg/kg	1000
Chromium	4.5		mg/kg	2	1.5	J	mg/kg	2	5.4		mg/kg	2	3.1		mg/kg	2
Cobalt	.45	J	mg/kg	10	.35	U	mg/kg	10	.34	U	mg/kg	10	.81	J	mg/kg	10
Copper	6.5		mg/kg	5	2.4	J	mg/kg	5	3.2	J	mg/kg	5	3.5	J	mg/kg	5
Iron	1760		mg/kg	20	1600		mg/kg	20	2240		mg/kg	20	2810		mg/kg	20
Lead	60	J	mg/kg	1	3.2	J	mg/kg	1	29.6		mg/kg	1	3.4	J	mg/kg	1
Magnesium	92.4	J	mg/kg	1000	63.4	J	mg/kg	1000	122	J	mg/kg	1000	88.7	J	mg/kg	1000
Manganese	13.8		mg/kg	3	68.8		mg/kg	3	21.3		mg/kg	3	79.3		mg/kg	3
Mercury	.08	U	mg/kg	.1	.08	U	mg/kg	.1	.07	U	mg/kg	.1	.08	U	mg/kg	.1
Nickel	3.4	J	mg/kg	8	2.4	U	mg/kg	8	2.9	J	mg/kg	8	3.9	J	mg/kg	8
Potassium	318	J	mg/kg	1000	145	J	mg/kg	1000	247	J	mg/kg	1000	346	J	mg/kg	1000
Selenium	.47	U	mg/kg	1	.47	U	mg/kg	1	.45	U	mg/kg	1	.46	U	mg/kg	1
Silver	.34	U	mg/kg	2	.33	U	mg/kg	2	.32	U	mg/kg	2	.33	U	mg/kg	2
Sodium	182	J	mg/kg	1000	169	J	mg/kg	1000	164	J	mg/kg	1000	179	J	mg/kg	1000
Thallium	.46	U	mg/kg	2	.46	U	mg/kg	2	.44	U	mg/kg	2	.45	U	mg/kg	2
Vanadium	4	J	mg/kg	10	3.4	J	mg/kg	10	5	J	mg/kg	10	6.4	J	mg/kg	10
Zinc	21.2	J	mg/kg	4	4.3	J	mg/kg	4	9.4	J	mg/kg	4	8.9	J	mg/kg	4
Cyanide	.25	U	mg/kg	1	.25	U	mg/kg	1	.24	U	mg/kg	1	.24	U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22488009				22488010				22488011				22495001			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-15				18-SL-16				18-SL-17				18-SL-18			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	4240		mg/kg	40	3910		mg/kg	40	2260		mg/kg	40	3780		mg/kg	40
Antimony	2.7	U	mg/kg	12	2.7	U	mg/kg	12	2.7	U	mg/kg	12	2.8	U	mg/kg	12
Arsenic	.56	J	mg/kg	2	.53	J	mg/kg	2	.36	J	mg/kg	2	.73	J	mg/kg	2
Barium	10.9	J	mg/kg	40	7.2	J	mg/kg	40	25	J	mg/kg	40	31.4	J	mg/kg	40
Beryllium	.05	U	mg/kg	1	.05	U	mg/kg	1	.05	U	mg/kg	1	.06	J	mg/kg	1
Cadmium	.6	U	mg/kg	1	.59	U	mg/kg	1	.6	U	mg/kg	1	1.2		mg/kg	1
Calcium	96.9	J	mg/kg	1000	151	J	mg/kg	1000	96.6	J	mg/kg	1000	181	J	mg/kg	1000
Chromium	8.6		mg/kg	2	3.8		mg/kg	2	2.4	J	mg/kg	2	15.5		mg/kg	2
Cobalt	.4	J	mg/kg	10	.4	J	mg/kg	10	.34	U	mg/kg	10	1.8	J	mg/kg	10
Copper	3	J	mg/kg	5	8.7		mg/kg	5	3.8	J	mg/kg	5	9.5		mg/kg	5
Iron	2870		mg/kg	20	2060		mg/kg	20	1750		mg/kg	20	4190		mg/kg	20
Lead	54.5	J	mg/kg	1	19		mg/kg	1	20		mg/kg	1	48.7		mg/kg	1
Magnesium	106	J	mg/kg	1000	137	J	mg/kg	1000	53.4	J	mg/kg	1000	94.6	J	mg/kg	1000
Manganese	19.3		mg/kg	3	22.9		mg/kg	3	15.1		mg/kg	3	20.8		mg/kg	3
Mercury	.07	U	mg/kg	.1	.08	U	mg/kg	.1	.09	U	mg/kg	.1	.07	J	mg/kg	.1
Nickel	2.3	U	mg/kg	8	7	J	mg/kg	8	3.1	J	mg/kg	8	2.6	J	mg/kg	8
Potassium	301	J	mg/kg	1000	297	J	mg/kg	1000	166	J	mg/kg	1000	181	J	mg/kg	1000
Selenium	.46	U	mg/kg	1	.45	U	mg/kg	1	.46	U	mg/kg	1	.47	U	mg/kg	1
Silver	.32	U	mg/kg	2	.32	U	mg/kg	2	.33	U	mg/kg	2	.33	UJ	mg/kg	2
Sodium	195	J	mg/kg	1000	213	J	mg/kg	1000	216	J	mg/kg	1000	155	J	mg/kg	1000
Thallium	.45	U	mg/kg	2	.44	U	mg/kg	2	.45	U	mg/kg	2	.36	U	mg/kg	2
Vanadium	6.2	J	mg/kg	10	4.7	J	mg/kg	10	3	J	mg/kg	10	8.4	J	mg/kg	10
Zinc	9.1	J	mg/kg	4	27.5	J	mg/kg	4	17.6	J	mg/kg	4	16.5	J	mg/kg	4
Cyanide	.24	U	mg/kg	1	.24	U	mg/kg	1	.24	U	mg/kg	1	.25	U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22495002			22495003			22495004			22495005		
Site	WHITING			WHITING			WHITING			WHITING		
Locator	18-SL-19			18-SL-20			18-SL-21			18-SL-22		
Collect Date:	13-AUG-92			13-AUG-92			13-AUG-92			13-AUG-92		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
CLP METALS AND CYANIDE												
Aluminum	2300	mg/kg	40	4690	mg/kg	40	1510	mg/kg	40	1990	mg/kg	40
Antimony	2.8 U	mg/kg	12	2.9 U	mg/kg	12	3 U	mg/kg	12	3 U	mg/kg	12
Arsenic	.67 J	mg/kg	2	1 J	mg/kg	2	.37 J	mg/kg	2	.51 J	mg/kg	2
Barium	24 J	mg/kg	40	9.2 J	mg/kg	40	4.8 J	mg/kg	40	3.4 J	mg/kg	40
Beryllium	.09 J	mg/kg	1	.08 J	mg/kg	1	.11 J	mg/kg	1	.06 U	mg/kg	1
Cadmium	2.5	mg/kg	1	.63 U	mg/kg	1	.67 U	mg/kg	1	1 J	mg/kg	1
Calcium	353 J	mg/kg	1000	1050 J	mg/kg	1000	367 J	mg/kg	1000	189 J	mg/kg	1000
Chromium	5	mg/kg	2	3.5	mg/kg	2	3.1	mg/kg	2	3.4	mg/kg	2
Cobalt	1.3 J	mg/kg	10	1.4 J	mg/kg	10	.77 J	mg/kg	10	1.1 J	mg/kg	10
Copper	10.3	mg/kg	5	3 J	mg/kg	5	7.5 J	mg/kg	5	7.3 J	mg/kg	5
Iron	1900	mg/kg	20	3340	mg/kg	20	1140	mg/kg	20	1520	mg/kg	20
Lead	57.9	mg/kg	1	11.5	mg/kg	1	8.4	mg/kg	1	10.4	mg/kg	1
Magnesium	78.5 J	mg/kg	1000	87.6 J	mg/kg	1000	67.3 J	mg/kg	1000	33.8 J	mg/kg	1000
Manganese	35.2	mg/kg	3	47.8	mg/kg	3	18	mg/kg	3	15.1	mg/kg	3
Mercury	.06 J	mg/kg	.1	.06 J	mg/kg	.1	.09 J	mg/kg	.1	.08 J	mg/kg	.1
Nickel	2.4 U	mg/kg	8	3.3 J	mg/kg	8	2.6 J	mg/kg	8	2.6 J	mg/kg	8
Potassium	198 J	mg/kg	1000	139 U	mg/kg	1000	147 U	mg/kg	1000	149 J	mg/kg	1000
Selenium	.47 U	mg/kg	1	.48 U	mg/kg	1	.51 U	mg/kg	1	.5 U	mg/kg	1
Silver	.33 UJ	mg/kg	2	.34 UJ	mg/kg	2	.36 UJ	mg/kg	2	.36 UJ	mg/kg	2
Sodium	137 J	mg/kg	1000	150 J	mg/kg	1000	232 J	mg/kg	1000	201 J	mg/kg	1000
Thallium	.36 U	mg/kg	2	.37 U	mg/kg	2	.39 U	mg/kg	2	.38 U	mg/kg	2
Vanadium	2.9 J	mg/kg	10	8 J	mg/kg	10	2.6 J	mg/kg	10	4 J	mg/kg	10
Zinc	28.6 J	mg/kg	4	21.3 J	mg/kg	4	10.1 J	mg/kg	4	9.8 J	mg/kg	4
Cyanide	.25 U	mg/kg	1	.26 U	mg/kg	1	.27 U	mg/kg	1	.27 U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22489003				22489004				22495006				22495007			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-23				18-SL-23A				18-SL-24				18-SL-25			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	13200	J	mg/kg	40	4970	J	mg/kg	40	3480		mg/kg	40	3790		mg/kg	40
Antimony	2.9	UJ	mg/kg	12	3.5	J	mg/kg	12	2.8	U	mg/kg	12	2.7	U	mg/kg	12
Arsenic	1	UJ	mg/kg	2	1.6	UJ	mg/kg	2	.63	J	mg/kg	2	.58	J	mg/kg	2
Barium	198		mg/kg	40	188		mg/kg	40	6.9	J	mg/kg	40	5.2	J	mg/kg	40
Beryllium	.09	J	mg/kg	1	.08	J	mg/kg	1	.06	U	mg/kg	1	.08	J	mg/kg	1
Cadmium	5.5		mg/kg	1	5	J	mg/kg	1	.63	U	mg/kg	1	.6	J	mg/kg	1
Calcium	786	UJ	mg/kg	1000	555	UJ	mg/kg	1000	185	J	mg/kg	1000	211	J	mg/kg	1000
Chromium	33.9		mg/kg	2	23.4	J	mg/kg	2	8.7		mg/kg	2	3.6		mg/kg	2
Cobalt	2.3	UJ	mg/kg	10	2.9	UJ	mg/kg	10	1.8	J	mg/kg	10	1.9	J	mg/kg	10
Copper	236	J	mg/kg	5	68.6	J	mg/kg	5	14.5		mg/kg	5	5.2	J	mg/kg	5
Iron	12900		mg/kg	20	23500	J	mg/kg	20	2070		mg/kg	20	2500		mg/kg	20
Lead	59.6		mg/kg	1	63.2		mg/kg	1	24.5		mg/kg	1	19.1		mg/kg	1
Magnesium	455	J	mg/kg	1000	267	J	mg/kg	1000	90	J	mg/kg	1000	93.2	J	mg/kg	1000
Manganese	131		mg/kg	3	141	J	mg/kg	3	12.2		mg/kg	3	134		mg/kg	3
Mercury	.25		mg/kg	.1	.07	J	mg/kg	.1	.09	J	mg/kg	.1	.06	J	mg/kg	.1
Nickel	6.5	J	mg/kg	8	6.7	J	mg/kg	8	2.5	U	mg/kg	8	2.3	U	mg/kg	8
Potassium	1210		mg/kg	1000	1060	J	mg/kg	1000	138	U	mg/kg	1000	301	J	mg/kg	1000
Selenium	.49	UJ	mg/kg	1	.48	U	mg/kg	1	.48	U	mg/kg	1	.45	U	mg/kg	1
Silver	.35	UJ	mg/kg	2	.34	UJ	mg/kg	2	.34	UJ	mg/kg	2	.32	UJ	mg/kg	2
Sodium	226	UJ	mg/kg	1000	212	UJ	mg/kg	1000	173	J	mg/kg	1000	190	J	mg/kg	1000
Thallium	.37	UJ	mg/kg	2	.36	UJ	mg/kg	2	.36	U	mg/kg	2	.34	U	mg/kg	2
Vanadium	4.3	J	mg/kg	10	3.8	J	mg/kg	10	5	J	mg/kg	10	5.4	J	mg/kg	10
Zinc	631	J	mg/kg	4	210	J	mg/kg	4	11.7	J	mg/kg	4	7	J	mg/kg	4
Cyanide	.26	U	mg/kg	1	.26	U	mg/kg	1	.26	U	mg/kg	1	.23	U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22495008				22495009				22495010				22495011			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-26				18-SL-27				18-SL-28				18-SL-29			
Collect Date:	13-AUG-92				13-AUG-92				13-AUG-92				13-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	2310		mg/kg	40	4100		mg/kg	40	1730		mg/kg	40	2910		mg/kg	40
Antimony	2.9	U	mg/kg	12	2.7	U	mg/kg	12	2.7	U	mg/kg	12	3.1	U	mg/kg	12
Arsenic	.56	J	mg/kg	2	.71	J	mg/kg	2	.24	J	mg/kg	2	.81	J	mg/kg	2
Barium	28.8	J	mg/kg	40	4.7	J	mg/kg	40	6.8	J	mg/kg	40	46.2	J	mg/kg	40
Beryllium	.1	J	mg/kg	1	.08	J	mg/kg	1	.05	U	mg/kg	1	.06	U	mg/kg	1
Cadmium	1.2	J	mg/kg	1	.59	U	mg/kg	1	.6	U	mg/kg	1	.91	J	mg/kg	1
Calcium	100	J	mg/kg	1000	75.2	J	mg/kg	1000	63	J	mg/kg	1000	148	J	mg/kg	1000
Chromium	5.6		mg/kg	2	3.6		mg/kg	2	1.8	J	mg/kg	2	6.6		mg/kg	2
Cobalt	1.1	J	mg/kg	10	1.4	J	mg/kg	10	.34	U	mg/kg	10	2	J	mg/kg	10
Copper	6.9	J	mg/kg	5	6.4	J	mg/kg	5	5.6	J	mg/kg	5	27.5		mg/kg	5
Iron	1530		mg/kg	20	2350		mg/kg	20	1490		mg/kg	20	3200		mg/kg	20
Lead	16.8		mg/kg	1	35.1		mg/kg	1	3.2		mg/kg	1	32.1		mg/kg	1
Magnesium	65.4	J	mg/kg	1000	106	J	mg/kg	1000	35.6	J	mg/kg	1000	136	J	mg/kg	1000
Manganese	45.8		mg/kg	3	21.7		mg/kg	3	39.6		mg/kg	3	35.4		mg/kg	3
Mercury	.05	J	mg/kg	.1	.08	J	mg/kg	.1	.19		mg/kg	.1	.08	J	mg/kg	.1
Nickel	4.5	J	mg/kg	8	2.3	U	mg/kg	8	2.3	U	mg/kg	8	7.2	J	mg/kg	8
Potassium	260	J	mg/kg	1000	259	J	mg/kg	1000	132	U	mg/kg	1000	359	J	mg/kg	1000
Selenium	.49	U	mg/kg	1	.45	U	mg/kg	1	.46	U	mg/kg	1	.52	U	mg/kg	1
Silver	.35	UJ	mg/kg	2	.32	UJ	mg/kg	2	.33	UJ	mg/kg	2	.37	UJ	mg/kg	2
Sodium	231	J	mg/kg	1000	169	J	mg/kg	1000	137	J	mg/kg	1000	203	J	mg/kg	1000
Thallium	.37	U	mg/kg	2	.34	U	mg/kg	2	.35	U	mg/kg	2	.39	U	mg/kg	2
Vanadium	3.7	J	mg/kg	10	5.4	J	mg/kg	10	2.4	J	mg/kg	10	3.3	J	mg/kg	10
Zinc	27.9	J	mg/kg	4	5.5	J	mg/kg	4	11	J	mg/kg	4	57.7	J	mg/kg	4
Cyanide	.26	U	mg/kg	1	.23	U	mg/kg	1	.24	U	mg/kg	1	.27	U	mg/kg	1

U= NOT DETECTED J=ESTIMATED VALUE
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R= RESULT IS REJECTED AND UNUSABLE

NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22495012				22506002				22507003				22506003			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-30				18-SL-31				18-SL-31A				18-SL-32			
Collect Date:	13-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	3330		mg/kg	40	7100		mg/kg	40	13500		mg/kg	40	4590		mg/kg	40
Antimony	2.8	U	mg/kg	12	4.1	J	mg/kg	12	3	J	mg/kg	12	2.8	U	mg/kg	12
Arsenic	.74	J	mg/kg	2	3.1		mg/kg	2	2.2	J	mg/kg	2	.89	UJ	mg/kg	2
Barium	13.4	J	mg/kg	40	265		mg/kg	40	290		mg/kg	40	59.7		mg/kg	40
Beryllium	.09	J	mg/kg	1	.06	U	mg/kg	1	.14	J	mg/kg	1	.07	J	mg/kg	1
Cadmium	.63	U	mg/kg	1	3.3	J	mg/kg	1	15.6		mg/kg	1	.61	U	mg/kg	1
Calcium	167	J	mg/kg	1000	512	UJ	mg/kg	1000	592	J	mg/kg	1000	181	UJ	mg/kg	1000
Chromium	2.6		mg/kg	2	23.2		mg/kg	2	43.8		mg/kg	2	7.1		mg/kg	2
Cobalt	.36	U	mg/kg	10	4.8	UJ	mg/kg	10	5.9	J	mg/kg	10	1.1	UJ	mg/kg	10
Copper	7.2	J	mg/kg	5	192	J	mg/kg	5	314		mg/kg	5	25.2	J	mg/kg	5
Iron	1790		mg/kg	20	41600	J	mg/kg	20	51700		mg/kg	20	2590	J	mg/kg	20
Lead	22.2		mg/kg	1	160		mg/kg	1	168		mg/kg	1	61.1		mg/kg	1
Magnesium	83.4	J	mg/kg	1000	518	J	mg/kg	1000	657	J	mg/kg	1000	171	J	mg/kg	1000
Manganese	45		mg/kg	3	309	J	mg/kg	3	457		mg/kg	3	34.1	J	mg/kg	3
Mercury	.07	J	mg/kg	.1	.05	U	mg/kg	.1	.01	U	mg/kg	.1	.05	U	mg/kg	.1
Nickel	2.5	J	mg/kg	8	11.4	UJ	mg/kg	8	19.7		mg/kg	8	2.4	U	mg/kg	8
Potassium	168	J	mg/kg	1000	2860		mg/kg	1000	2930		mg/kg	1000	462	J	mg/kg	1000
Selenium	.48	U	mg/kg	1	.49	UJ	mg/kg	1	.48	U	mg/kg	1	.47	U	mg/kg	1
Silver	.34	UJ	mg/kg	2	.44	UJ	mg/kg	2	.34	U	mg/kg	2	.37	UJ	mg/kg	2
Sodium	156	J	mg/kg	1000	270	UJ	mg/kg	1000	302	J	mg/kg	1000	175	UJ	mg/kg	1000
Thallium	.36	U	mg/kg	2	.37	UJ	mg/kg	2	.37	U	mg/kg	2	.36	U	mg/kg	2
Vanadium	4.4	J	mg/kg	10	5.7	J	mg/kg	10	5.9	J	mg/kg	10	5.9	J	mg/kg	10
Zinc	9.8	J	mg/kg	4	326		mg/kg	4	779		mg/kg	4	48.6	UJ	mg/kg	4
Cyanide	.26	U	mg/kg	1	.26	U	mg/kg	1	.26	U	mg/kg	1	.25	U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22506004				22506005				22506006				22506007			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-33				18-SL-34				18-SL-35				18-SL-36			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	4350		mg/kg	40	3560		mg/kg	40	3540		mg/kg	40	3790		mg/kg	40
Antimony	2.7	U	mg/kg	12	2.8	U	mg/kg	12	3.3	U	mg/kg	12	2.7	U	mg/kg	12
Arsenic	1.4	UJ	mg/kg	2	.68	UJ	mg/kg	2	.79	UJ	mg/kg	2	.49	UJ	mg/kg	2
Barium	46.1		mg/kg	40	22.6	J	mg/kg	40	15.1	J	mg/kg	40	24.6	J	mg/kg	40
Beryllium	.05	U	mg/kg	1	.05	U	mg/kg	1	.06	U	mg/kg	1	.06	J	mg/kg	1
Cadmium	.61	U	mg/kg	1	.61	U	mg/kg	1	.72	U	mg/kg	1	1.9		mg/kg	1
Calcium	205	UJ	mg/kg	1000	126	UJ	mg/kg	1000	131	UJ	mg/kg	1000	172	UJ	mg/kg	1000
Chromium	8		mg/kg	2	3.7		mg/kg	2	3.6		mg/kg	2	9		mg/kg	2
Cobalt	1.4	UJ	mg/kg	10	.8	UJ	mg/kg	10	.41	U	mg/kg	10	.99	UJ	mg/kg	10
Copper	32.7	J	mg/kg	5	9.2	J	mg/kg	5	10.9	J	mg/kg	5	106	J	mg/kg	5
Iron	5610	J	mg/kg	20	2110	J	mg/kg	20	1760	J	mg/kg	20	2090	J	mg/kg	20
Lead	44.9		mg/kg	1	23.4		mg/kg	1	15.9	UJ	mg/kg	1	99.5		mg/kg	1
Magnesium	192	J	mg/kg	1000	114	J	mg/kg	1000	97.2	J	mg/kg	1000	127	J	mg/kg	1000
Manganese	57.2	J	mg/kg	3	28.8	J	mg/kg	3	23.8	J	mg/kg	3	21.3	J	mg/kg	3
Mercury	.05	U	mg/kg	.1	.05	U	mg/kg	.1	.06	U	mg/kg	.1	.05	U	mg/kg	.1
Nickel	3	UJ	mg/kg	8	2.4	U	mg/kg	8	3.6	UJ	mg/kg	8	2.3	U	mg/kg	8
Potassium	436	J	mg/kg	1000	198	J	mg/kg	1000	170	J	mg/kg	1000	235	J	mg/kg	1000
Selenium	.46	U	mg/kg	1	.47	U	mg/kg	1	.55	UJ	mg/kg	1	.45	U	mg/kg	1
Silver	.33	UJ	mg/kg	2	.33	U	mg/kg	2	.39	U	mg/kg	2	.32	U	mg/kg	2
Sodium	192	UJ	mg/kg	1000	159	UJ	mg/kg	1000	158	UJ	mg/kg	1000	174	UJ	mg/kg	1000
Thallium	.35	U	mg/kg	2	.36	U	mg/kg	2	.42	U	mg/kg	2	.34	U	mg/kg	2
Vanadium	5	J	mg/kg	10	4.5	J	mg/kg	10	4.8	J	mg/kg	10	4.2	J	mg/kg	10
Zinc	77	UJ	mg/kg	4	29.7	UJ	mg/kg	4	15.2	UJ	mg/kg	4	45.8	UJ	mg/kg	4
Cyanide	.24	U	mg/kg	1	.24	U	mg/kg	1	.66	U	mg/kg	1	.24	U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22506008				22507001				22506009				22506010			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-37				18-SL-37A				18-SL-38				18-SL-39			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	4190		mg/kg	40	3600		mg/kg	40	4100		mg/kg	40	4840		mg/kg	40
Antimony	2.7	U	mg/kg	12	2.7	U	mg/kg	12	3.2	J	mg/kg	12	2.7	U	mg/kg	12
Arsenic	.88	UJ	mg/kg	2	.67	J	mg/kg	2	1.6	UJ	mg/kg	2	1	UJ	mg/kg	2
Barium	8.2	J	mg/kg	40	7.2	J	mg/kg	40	7.7	J	mg/kg	40	5.6	J	mg/kg	40
Beryllium	.08	J	mg/kg	1	.05	U	mg/kg	1	.05	U	mg/kg	1	.06	J	mg/kg	1
Cadmium	.84	J	mg/kg	1	1.4		mg/kg	1	.6	U	mg/kg	1	.59	U	mg/kg	1
Calcium	109	UJ	mg/kg	1000	147	J	mg/kg	1000	118	UJ	mg/kg	1000	102	UJ	mg/kg	1000
Chromium	4.5		mg/kg	2	3.8		mg/kg	2	32		mg/kg	2	4.4		mg/kg	2
Cobalt	.95	UJ	mg/kg	10	.55	J	mg/kg	10	1.3	UJ	mg/kg	10	.63	UJ	mg/kg	10
Copper	4.3	UJ	mg/kg	5	5.6		mg/kg	5	4.5	UJ	mg/kg	5	2.3	UJ	mg/kg	5
Iron	2110	J	mg/kg	20	1980		mg/kg	20	3270	J	mg/kg	20	2690	J	mg/kg	20
Lead	42.8		mg/kg	1	43.1		mg/kg	1	16.1	UJ	mg/kg	1	7.1	UJ	mg/kg	1
Magnesium	119	J	mg/kg	1000	69.4	J	mg/kg	1000	122	J	mg/kg	1000	75.9	J	mg/kg	1000
Manganese	15.7	J	mg/kg	3	13.8		mg/kg	3	125	J	mg/kg	3	58.8	J	mg/kg	3
Mercury	.05	U	mg/kg	.1	.02	U	mg/kg	.1	.05	U	mg/kg	.1	.05	U	mg/kg	.1
Nickel	2.3	U	mg/kg	8	2.3	U	mg/kg	8	2.3	U	mg/kg	8	2.3	U	mg/kg	8
Potassium	129	U	mg/kg	1000	129	U	mg/kg	1000	131	U	mg/kg	1000	130	U	mg/kg	1000
Selenium	.45	U	mg/kg	1	.45	U	mg/kg	1	.46	U	mg/kg	1	.45	U	mg/kg	1
Silver	.32	U	mg/kg	2	.32	U	mg/kg	2	.33	U	mg/kg	2	.32	U	mg/kg	2
Sodium	137	UJ	mg/kg	1000	185	J	mg/kg	1000	127	UJ	mg/kg	1000	140	UJ	mg/kg	1000
Thallium	.34	UJ	mg/kg	2	.34	U	mg/kg	2	.35	UJ	mg/kg	2	.34	UJ	mg/kg	2
Vanadium	6	J	mg/kg	10	5.2	J	mg/kg	10	6.3	J	mg/kg	10	7	J	mg/kg	10
Zinc	15.6	UJ	mg/kg	4	19	J	mg/kg	4	19.1	UJ	mg/kg	4	7.6	UJ	mg/kg	4
Cyanide	.23	U	mg/kg	1	.24	U	mg/kg	1	.24	U	mg/kg	1	.24	U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22506011				22507002				22507007				22507008			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-40				18-SL-41				18-SL-42				18-SL-43			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	6050		mg/kg	40	4740		mg/kg	40	8390		mg/kg	40	3880		mg/kg	40
Antimony	2.8	U	mg/kg	12	2.7	U	mg/kg	12	2.6	U	mg/kg	12	2.7	U	mg/kg	12
Arsenic	1.3	UJ	mg/kg	2	.75	J	mg/kg	2	1.7	J	mg/kg	2	.49	J	mg/kg	2
Barium	5.9	J	mg/kg	40	6.4	J	mg/kg	40	7	J	mg/kg	40	5.7	J	mg/kg	40
Beryllium	.07	J	mg/kg	1	.05	U	mg/kg	1	.06	J	mg/kg	1	.05	U	mg/kg	1
Cadmium	.62	U	mg/kg	1	.61	U	mg/kg	1	38.8		mg/kg	1	.95	J	mg/kg	1
Calcium	121	UJ	mg/kg	1000	245	J	mg/kg	1000	116	J	mg/kg	1000	79.3	J	mg/kg	1000
Chromium	5.4		mg/kg	2	5.9		mg/kg	2	8		mg/kg	2	5.2		mg/kg	2
Cobalt	.92	UJ	mg/kg	10	.53	J	mg/kg	10	.88	J	mg/kg	10	.62	J	mg/kg	10
Copper	3.4	UJ	mg/kg	5	5.6		mg/kg	5	6.9		mg/kg	5	6.2		mg/kg	5
Iron	3880	J	mg/kg	20	2840		mg/kg	20	4500		mg/kg	20	2270		mg/kg	20
Lead	4.6	UJ	mg/kg	1	6.7		mg/kg	1	10.6		mg/kg	1	9.3		mg/kg	1
Magnesium	83.2	J	mg/kg	1000	140	J	mg/kg	1000	81.5	J	mg/kg	1000	77.5	J	mg/kg	1000
Manganese	67.8	J	mg/kg	3	132		mg/kg	3	77.5		mg/kg	3	58.6		mg/kg	3
Mercury	.05	U	mg/kg	.1	.02	U	mg/kg	.1	.01	U	mg/kg	.1	.01	U	mg/kg	.1
Nickel	2.4	U	mg/kg	8	2.4	U	mg/kg	8	2.9	J	mg/kg	8	3.3	J	mg/kg	8
Potassium	136	U	mg/kg	1000	145	J	mg/kg	1000	165	J	mg/kg	1000	130	U	mg/kg	1000
Selenium	.47	U	mg/kg	1	.46	U	mg/kg	1	.45	U	mg/kg	1	.45	U	mg/kg	1
Silver	.34	U	mg/kg	2	.33	U	mg/kg	2	.32	U	mg/kg	2	.32	U	mg/kg	2
Sodium	156	UJ	mg/kg	1000	171	J	mg/kg	1000	147	J	mg/kg	1000	170	J	mg/kg	1000
Thallium	.36	U	mg/kg	2	.35	U	mg/kg	2	.34	U	mg/kg	2	.53	J	mg/kg	2
Vanadium	9.5	J	mg/kg	10	7.4	J	mg/kg	10	12.1		mg/kg	10	5.6	J	mg/kg	10
Zinc	7.3	UJ	mg/kg	4	14.9	J	mg/kg	4	25.8	J	mg/kg	4	20.1	J	mg/kg	4
Cyanide	.56	U	mg/kg	1	.25	U	mg/kg	1	.23	U	mg/kg	1	.24	U	mg/kg	1

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NAS WHITING FIELD -- SITE 18
SURFACE SOIL -- INORGANICS -- REPORT NO. 10507

Lab Sample Number:	22507009				22507010				22507011				22507012			
Site	WHITING				WHITING				WHITING				WHITING			
Locator	18-SL-44				18-SL-45				18-SL-46				18-SL-47			
Collect Date:	14-AUG-92				14-AUG-92				14-AUG-92				14-AUG-92			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	3680		mg/kg	40	3600		mg/kg	40	3330		mg/kg	40	4200		mg/kg	40
Antimony	2.7	U	mg/kg	12	2.7	U	mg/kg	12	2.8	U	mg/kg	12	2.7	U	mg/kg	12
Arsenic	.36	J	mg/kg	2	.32	J	mg/kg	2	.55	J	mg/kg	2	.31	J	mg/kg	2
Barium	10.3	J	mg/kg	40	25.4	J	mg/kg	40	2.5	J	mg/kg	40	5.3	J	mg/kg	40
Beryllium	.08	J	mg/kg	1	.07	J	mg/kg	1	.07	J	mg/kg	1	.08	J	mg/kg	1
Cadmium	.59	U	mg/kg	1	1.2		mg/kg	1	.61	U	mg/kg	1	.69	J	mg/kg	1
Calcium	98.3	J	mg/kg	1000	232	J	mg/kg	1000	157	J	mg/kg	1000	124	J	mg/kg	1000
Chromium	3.1		mg/kg	2	6.1		mg/kg	2	4.1		mg/kg	2	2.9	J	mg/kg	2
Cobalt	1	J	mg/kg	10	.74	J	mg/kg	10	.54	J	mg/kg	10	.62	J	mg/kg	10
Copper	4.6	J	mg/kg	5	13.5		mg/kg	5	1.8	J	mg/kg	5	5.7		mg/kg	5
Iron	2350		mg/kg	20	2050		mg/kg	20	2700		mg/kg	20	2370		mg/kg	20
Lead	4.9		mg/kg	1	22.6		mg/kg	1	4.3		mg/kg	1	6.6		mg/kg	1
Magnesium	84.6	J	mg/kg	1000	110	J	mg/kg	1000	39.4	J	mg/kg	1000	83.2	J	mg/kg	1000
Manganese	29.7		mg/kg	3	92.5		mg/kg	3	12.1		mg/kg	3	67.3		mg/kg	3
Mercury	.02	U	mg/kg	.1	.01	U	mg/kg	.1	.02	U	mg/kg	.1	.01	U	mg/kg	.1
Nickel	2.7	J	mg/kg	8	2.3	U	mg/kg	8	2.4	U	mg/kg	8	3.1	J	mg/kg	8
Potassium	130	U	mg/kg	1000	138	J	mg/kg	1000	135	U	mg/kg	1000	130	U	mg/kg	1000
Selenium	.45	U	mg/kg	1	.46	U	mg/kg	1	.47	U	mg/kg	1	.45	U	mg/kg	1
Silver	.32	U	mg/kg	2	.33	U	mg/kg	2	.33	U	mg/kg	2	.32	U	mg/kg	2
Sodium	227	J	mg/kg	1000	260	J	mg/kg	1000	181	J	mg/kg	1000	175	J	mg/kg	1000
Thallium	.34	U	mg/kg	2	.35	U	mg/kg	2	.36	U	mg/kg	2	.34	U	mg/kg	2
Vanadium	5.2	J	mg/kg	10	5.3	J	mg/kg	10	7.1	J	mg/kg	10	5.5	J	mg/kg	10
Zinc	5.7	J	mg/kg	4	21.9	J	mg/kg	4	7.8		mg/kg	4	9.3	J	mg/kg	4
Cyanide	.24	U	mg/kg	1	.24	U	mg/kg	1	.25	U	mg/kg	1	.24	U	mg/kg	1

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APPENDIX D

HUMAN HEALTH RISK DATA

Table D-1
Screening Concentrations for Surface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Chemical	Risk-Based Screening Concentration[1]	Florida Soil Cleanup Target Level[2]	Florida Soil Cleanup Target Level Based on Leaching	Selected Screening Concentration[3]
Volatile Organic Compounds (µg/kg)				
Acetone	780,000	770,000	2,800	770,000
2-Butanone	4,700,000	4,800,000	22,000	4,700,000
Carbon disulfide	780,000	200,000	5,600	200,000
Ethylbenzene	780,000	240,000	400	240,000
Methylene chloride	85,000	16,000	20	16,000
Toluene	1,600,000	300,000	400	300,000
Xylenes (total)	16,000,000	290,000	300	290,000
Semivolatile Organic Compounds (µg/kg)				
Benzo(a)anthracene	870	1,400	2,900	870
Benzo(a)pyrene	87	100	7,800	87
bis(2-Chloroethoxy)methane	NSC	170,000	30	170,000
bis(2-Ethylhexyl)phthalate	46,000	75,000	27,000	46,000
Chrysene	87,000	140,000	80,000	87,000
Fluoranthene	310,000	2,800,000	550,000	310,000
Fluorene	310,000	2,100,000	87,000	310,000
2-Methylnaphthalene	160,000	1,500,000	6,400	160,000
Naphthalene	160,000	1,000,000	1,000	160,000
Phenanthrene	[5]230,000	1,900,000	120,000	230,000
Pyrene	230,000	2,200,000	570,000	230,000
Inorganic Analytes (mg/kg)				
Aluminum	7,800	72,000	NSC	7,800
Antimony	3.1	26	[10]5	3.1
Arsenic	[6]0.43	0.8	[10]29	0.43
Barium	550	105	[10]1,600	105
Beryllium	0.16	120	[10]63	0.16
Cadmium	3.9	75	[10]8	3.9
Calcium	[7]1,000,000	NSC	NSC	1,000,000
Chromium	23	[8]290	[10]38	23
Cobalt	470	4,700	NSC	470
Copper	310	105	NSC	105
Iron	2,300	23,000	NSC	2,300
Lead	[9]400	500	NSC	400
Magnesium	[7]460,468	NSC	NSC	460,468
Manganese	160	1,600	NSC	160
Mercury	2.3	3.7	[10]2.1	2.3

See notes at end of table.

Table D-1 (Continued)
Screening Concentrations for Surface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Chemical	Risk-Based Screening Concentration[1]	Florida Soil Cleanup Target Level[2]	Florida Soil Cleanup Target Level Based on Leaching	Selected Screening Concentration[3]
Inorganic Analytes (mg/kg) (Continued)				
Nickel	160	105	[10]130	105
Potassium	[7]1,000,000	NSC	NSC	1,000,000
Silver	39	390	[10]34	39
Sodium	[7]1,000,000	NSC	NSC	1,000,000
Thallium	0.55	NSC	NSC	0.55
Vanadium	55	15	[10]6,000	15
Zinc	2,300	23,000	[10]12,000	2,300
Other (μg/kg)				
TRPH	NSC	350,000	340,000	350,000

[1] For all chemicals except the essential nutrients, the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) Table for residential soil (October 1998) has been used, unless otherwise noted. Screening values are based on a cancer risk of 1×10^{-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) Brownfields Cleanup Criteria Rule, July 6, 1998. Cleanup goals are based on a target cancer risk of 1×10^{-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. Only when an analyte was selected as a human health chemical of potential concern (HHCPC) in groundwater, then used the Florida soil cleanup target level based on Leaching. (There were no HHCPCs selected in groundwater; therefore, the Florida cleanup target level based on Leaching was not selected as a screening criterion at Site 18.)
[4] RBC value for naphthalene is used as a surrogate.
[5] RBC value for pyrene is used as a surrogate.
[6] RBC value is based on arsenic as a carcinogen.
[7] Essential nutrient screening value (see General Information Report).
[8] RBC and Florida cleanup goal values are based on chromium VI.
[9] 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).
[10] Values from the USEPA Soil Screening Guidance (1996). These values were derived assuming soil pH of 6.8. These leachability values are dependent upon both the metal concentration in soil and soil characteristics. Thus, if site-specific soil characteristics are different than the defaults, these leachability values may not apply.

Notes: μg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
NSC = no screening criteria available.
TRPH = total recoverable petroleum hydrocarbons.

Table D-2
Screening Concentrations for Subsurface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk-Based Screening Concentration[1]	Florida Soil Cleanup Target Level[2]	Florida Soil Cleanup Target Level Based on Leaching[2]	Selected Screening Concentration[3]
Volatile Organic Compounds (µg/kg)				
Acetone	20,000,000	5,500,000	2,800	5,500,000
2-Butanone	120,000,000	35,000,000	22,000	35,000,000
4-Methyl-2-pentanone	16,000,000	3,700,000	1,100	3,700,000
Xylenes (total)	410,000,000	290,000	300	290,000
Semivolatile Organic Compounds (µg/kg)				
Dibenzofuran	820,000	4,400,000	10,000	820,000
Dimethylphthalate	2,000,000,000	1,600,000	410,000	1,600,000
Fluorene	8,200,000	24,000,000	87,000	8,200,000
2-Methylnaphthalene	4,100,000	15,000,000	6,400	4,100,000
4-Methylphenol	1,000,000	2,400,000	30	1,000,000
Naphthalene	4,100,000	8,600,000	1,000	4,100,000
Phenanthrene	[5]6,100,000	29,000,000	120,000	6,100,000
Phenol	120,000,000	390,000,000	50	120,000,000
Pesticides and PCBs (µg/kg)				
4,4'-DDD	24,000	17,000	200	17,000
Inorganic Analytes (mg/kg)				
Aluminum	200,000	1,000,000	NSC	200,000
Arsenic	[6]3.8	3.7	[10]29	3.7
Barium	14,000	87,000	[10]1,600	14,000
Beryllium	410	700	[10]63	410
Calcium	[7]1,000,000	NSC	NSC	1,000,000
Chromium	610	[8]430	[10]38	430
Cobalt	12,000	110,000	NSC	12,000
Copper	8,200	12,000	NSC	8,200
Cyanide	4,100	5,000	[10]40	4,100
Iron	61,000	490,000	NSC	61,000
Lead	[9]400	920	NSC	400
Magnesium	[7]460,468	NSC	NSC	460,468
Manganese	4,100	20,000	NSC	4,100
Mercury	61	28	[10]2.1	28
Nickel	4,100	28,000	[10]130	4,100
Potassium	[7]1,000,000	NSC	NSC	1,000,000
Selenium	1,000	10,000	[10]5	1,000
Sodium	1,000,000	NSC	NSC	1,000,000
Vanadium	[7]1,400	7,700	[10]6,000	1,400
Zinc	61,000	560,000	[10]120,000	61,000

See notes at end of table.

Table D-2
Screening Concentrations for Subsurface Soil for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Analyte	Risk-Based Screening Concentration[1]	Florida Soil Cleanup Target Level[2]	Florida Soil Cleanup Target Level Based on Leaching[2]	Selected Screening Concentration[3]
Other (μg/kg)				
TRPH	NSC	2,500,000	[10]340,000	2,500,000

[1] For all chemicals except the essential nutrients, the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) Table for industrial soil (October 1998) has been used, unless otherwise noted. Screening values are based on a cancer risk of 1×10^{-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) Brownfields Cleanup Criteria Rule, July 6, 1998. Cleanup goals are based on a target cancer risk of 1×10^{-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. Only when an analyte was selected as a human health chemical of potential concern (HHCPC) in groundwater, then used the Florida soil cleanup target level based on Leaching. (There were no HHCPCs selected in groundwater; therefore, the Florida cleanup target level based on Leaching was not selected as a screening criterion at Site 18.)
[4] RBC value for naphthalene is used as a surrogate.
[5] RBC value for pyrene is used as a surrogate.
[6] RBC value is based on arsenic as a carcinogen.
[7] Essential nutrient screening value (see General Information Report).
[8] RBC and Florida cleanup goal values are based on chromium VI.
[9] 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).
[10] Values from the USEPA Soil Screening Guidance (1996). These values were derived assuming soil pH of 6.8. These leachability values are dependent upon both the metal concentration in soil and soil characteristics. Thus, if site-specific soil characteristics are different than the defaults, these leachability values may not apply.

Notes: μg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
NSC = no screening criteria available.
TRPH = total recoverable petroleum hydrocarbons.

Table D-3
Screening Concentrations for Groundwater for Selection of Chemicals of Potential Concern

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Chemical	Risk-Based Screening Concentration[1]	Federal MCL[2]	Florida Groundwater Cleanup Target Levels[3]	Selected Screening Concentration[4]
Semivolatile Organic Compounds (μg/ℓ)				
bis(2-Ethylhexyl)phthalate	4.8	6	6	4.8
Inorganic Analytes (μg/ℓ)				
Aluminum	3,700	(50-200)	(200)	50
Barium	260	2,000	2,000	260
Cadmium	1.8	5	5	1.8
Calcium	[5]1,055,398	NSC	NSC	1,055,398
Chromium	11	100	[6]100	11
Cobalt	220	NSC	420	220
Copper	150	[7]1,300/(1,000)	(1,000)	150
Iron	1,100	(300)	(300)	300
Lead	NSC	[8]15	15	15
Magnesium	[5]118,807	NSC	NSC	118,807
Manganese	73	(50)	(50)	50
Mercury	1.1	2	2	1.1
Nickel	73	100	100	73
Potassium	[5]297,016	NSC	NSC	297,016
Silver	18	100	100	18
Sodium	[5]396,022	NSC	160,000	160,000
Vanadium	26	NSC	[49]	26
Zinc	1,100	(5,000)	(5,000)	1,100

[1] For all chemicals except the essential nutrients, the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) Table for tap water (October 1998) has been used. Screening values are based on a cancer risk of 1×10^{-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 maximum contaminant levels (MCLs) are taken from USEPA Drinking Water Regulations and Health Advisories from October 1996. Primary MCLs have no marks, Secondary MCLs are indicated by parentheses ( ), 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 from July 1998. Primary Standards have no marks, Secondary Standards are indicated by parentheses ( ), 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 Target Level values.
[5] Essential nutrient screening value (see General Information Report).
[6] RBC value is based on Chromium VI isomer as a conservative screen.
[7] Treatment technology action level for copper in drinking water distribution system (USEPA Drinking Water Standards and Health Advisories May 1996).
[8] Treatment technology action level for lead in drinking water (USEPA Drinking Water Standards and Health Advisories, May 1996).

Notes: μg/ℓ = micrograms per liter.
NSC = not presented in available guidance.

HUMAN HEALTH TOXICITY PROFILES

Arsenic. Arsenic has been 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 in Group A, human carcinogen, based on increased incidence of lung cancer in occupational studies.

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 sediment (in stream beds or lakes) or in the oceans. Eh and pH conditions largely govern the fate of arsenic (USEPA, 1979).

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.

Cadmium. Cadmium is a naturally occurring element used in metal alloys, electroplating, process engraving, photoelectric cells, and in nickel-cadmium electrical storage batteries. Cadmium enters the environment primarily through industrial effluents and landfill leaching.

Acute toxic effects may include the death of animals, birds, or fish, and death or low growth rate in plants. Acute effects are seen in two to four days after animals or plants come in contact with a toxic chemical substance.

In fresh waters, cadmium toxicity is influenced by water hardness -- the harder the water, the lower the toxicity. Cadmium has high acute toxicity to aquatic life. No data are available on the short-term effects of cadmium on plants, birds, or land animals.

Chronic toxic effects may include shortened lifespan, reproductive problems, lower fertility, and changes in appearance or behavior. Chronic effects can be seen long after first exposure(s) to a toxic chemical.

Cadmium has high chronic toxicity to aquatic life. No data are available on the long-term effects of cadmium to plants, birds, or land animals.

Cadmium is slightly soluble in water. Concentration of less than 1 milligram will mix with a liter of water.

Cadmium is highly persistent in water, with a half-life of greater than 200 days. The half-life of a pollutant is the amount of time it takes for one-half of the chemical to be degraded.

Some substances increase in concentration, or bioaccumulate, in living organisms as they breathe contaminated air, drink contaminated water, or eat contaminated food. These chemicals can become concentrated in the tissue and internal organs of animals and humans.

The concentration of cadmium found in fish tissues is expected to be much higher than the average concentration of cadmium in the water from which the fish was taken.

Support Document:
AQUIRE Database, ERL-Duluth, USEPA.

Copper. Copper is a commonly-occurring element in our natural water. At low concentrations, it is an essential element for both plants and animals. At slightly higher concentrations it is toxic to aquatic life. The toxicity of copper and its compounds to aquatic life varies with the physical and chemical conditions of the water. Factors such as water hardness, alkalinity, and pH influence copper toxicity.

Acute toxic effects may include the death of animals, birds, or fish, and death or low growth rate in plants. Acute effects are seen in two to four days after animals or plants come in contact with a toxic chemical substance.

Copper and its compounds have high acute toxicity to aquatic life. No data are available on the short-term effects of copper to plants, birds, or land animals.

Chronic toxic effects may include shortened lifespan, reproductive problems, lower fertility, and changes in appearance or behavior. Chronic effects can be seen long after first exposure(s) to a toxic chemical.

Copper and its compounds have high chronic toxicity to aquatic life. No data are available on the long-term effects of cadmium to plants, birds, or land animals.

Copper and its salts are highly soluble in water. Concentration of 1,000 milligram and more will mix with a liter of water.

Copper is highly persistent in water, with a half-life of greater than 200 days. The half-life of a pollutant is the amount of time it takes for one-half of the chemical to be degraded.

Some substances increase in concentration, or bioaccumulate, in living organisms as they breathe contaminated air, drink contaminated water, or eat contaminated food. These chemicals can become concentrated in the tissue and internal organs of animals and humans.

The concentration of copper found in fish tissues is expected to be considerably higher than the average concentration of copper in the water from which the fish was taken.

Support Document:
AQUIRE Database, ERL-Duluth, USEPA.

Chromium. Chromium is present in minerals predominantly as Cr^{3+}. Dissolved chromium may be present as trivalent cations or as anions in which the oxidation state is Cr^{6+} (hexavalent). Six different ionic forms of chromium are considered to be stable in aqueous systems. The reduced forms are Cr^{3+}, $CrOH^{2+}$, $CrOH^{2+}$, $Cr(OH)_2^+$, and $Cr(OH)^{4-}$. Anionic forms present under oxidizing conditions include dichromate $Cr_2O_7^{2-}$ and chromate CrO_4^{2-}. The dissolved forms that predominate in reduced systems between pH 5 and pH 9 probably are $CrOH^{2+}$ and $Cr(OH)_2^+$. Concentrations of chromium in natural waters that have not been affected by waste disposal are commonly less than 10 $\mu g/\ell$ (Hem, 1992).

Chromium has been used in plating for corrosion resistance and decorative purposes, in the manufacture of alloys, and in printing, dying, and photography. The toxicity of chromium depends upon its valence state. Hexavalent chromium is more toxic than trivalent chromium. The effects of inhalation exposure to hexavalent chromium include ulcers of the upper respiratory tract, nasal inflammation, perforation of the nasal septa and lung cancer. Most trivalent chromium compounds are inactive in short-term genotoxicity assays. Trivalent chromium compounds have not been found to be carcinogenic by any route of exposure. There is epidemiological evidence of an association between hexavalent chromium inhalation exposure and lung cancer. The USEPA has classified hexavalent chromium as an Class A, human carcinogen, by the inhalation route.

References:
Amdur, Mary O., John Doull, Curtis D. Klaassen, 1991. Toxicology: The Basic Science of Poisons, 4th edition; Pergamon Press, Inc. New York.

Integrated Risk Information System (IRIS), 1993. United States Environmental Protection Agency.

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.

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.

Manganese. Manganese is a naturally occurring substance found in many types of rocks, soil, lakes, streams, and food. 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.

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, 1991b).

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.

TRPH. A toxicity profile was not available for TRPH; therefore, exposure data for jet propellant (JP)-4 and JP-7 have been substituted.

JP-4 and JP-7. Jet fuels JP-4 and JP-7 (jet propellant-4 and jet propellant-7) are flammable, colorless to straw-colored liquid mixtures that come from crude petroleum. They smell like kerosene. Jet fuels are blends of other chemicals made according to U.S. Air Force standards for use as aircraft fuels.

Exposure to JP-4 occurs primarily in workers who manufacture, transport, or use jet fuels. Exposure to JP-4 is most likely to occur through skin contact or breathing contaminated air. You may be exposed to JP-4 by breathing some of the chemicals that evaporate from a spill or leak site. You may also be exposed through drinking or swimming in water that has been contaminated with JP-4, or from touching soil contaminated from a spill or leak. There is no information about how individuals may be exposed to JP-7, but it is reasonable to assume that you could be exposed in the same ways as for JP-4.

Animal testing is sometimes necessary to find out how toxic substances might harm people or to treat those who have been exposed. Laws today protect the welfare of research animals and scientists must follow strict guidelines.

Little information is available about the health effects that may be caused by JP-4 and JP-7. Inhaling large amounts of JP-4 vapor may cause painful breathing and a feeling of suffocation, as well as headache, dizziness, nausea, depression, anxiety, memory loss, and irritability.

Animal studies have shown that inhaling extremely large amounts of JP-4 or JP-7 vapor does not cause death. However, animals breathing high levels of JP-4 vapor for short periods exhibited poor coordination and convulsions. A depressed activity level has been seen in animals breathing low levels of JP-4 vapor. Other effects seen in animals breathing JP-4 or JP-7 vapor have been skin and eye irritation, changes in liver cells, and decreased numbers of white blood cells.

It is not known whether JP-4 or JP-7 can cause birth defects or if they affect reproduction in people.

The International Agency for Research on Cancer (IARC) has stated there is not enough information to determine how likely JP-4 and JP-7 are to cause cancer in humans.

Studies with mice and rats have suggested that skin contact with JP-4 may cause skin cancer, although this is not certain. There is also no clear evidence that breathing, eating, or drinking JP-4 or JP-7 causes cancer in animals.

The Occupational Safety and Health Administration (OSHA) has set an exposure limit of 500 parts of petroleum distillates per million parts of air (500 ppm) for an 8-hour workday, 40-hour workweek.

The Air Force Office of Safety and Health (AFOSH) has set an exposure limit of 400 ppm petroleum distillates for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that average workplace air levels not exceed 350 milligrams of petroleum distillates per cubic meter of air (350 mg/m^3) for a 40-hour workweek.

References:

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. "Toxicological Profile for Jet Fuels JP-4 and JP-7." U.S. Department of Health and Human Services, Public Health Service. Atlanta, Georgia.

Table D-4
Oral Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Chemical	Weight of Evidence	Oral Slope Factor (mg/kg/day)(-1)	Source	Test Species	Exposure Route	Tumor Type	Study Source
Semivolatile Organic Compounds							
TRPH	D	NE					
Inorganic Analytes							
Arsenic	A	1.5e+00	IRIS	Human	Oral-drinking water	Skin	IRIS
Cadmium	D	NE					
Chromium	D	NE					
Copper	D	NE					
Iron	D	NE					
Manganese	D	NE					

Weight of Evidence (route-specific):
A = Human carcinogen
D = Not classifiable as to human carcinogenicity

Notes: mg/kg/day = milligrams per kilogram per 24 hour period.
TRPH = total recoverable petroleum hydrocarbons.
NE = not evaluated.
IRIS = Integrated Risk Information System on-line database search, current as of November 1997.

Table D-5
Inhalation Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station 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
Semivolatile Organic Compounds									
TRPH[1]	D	NE		NE					
Inorganic Analytes									
Arsenic	A	15	IRIS	4.3e-03	IRIS	Human	Inhalation	Lung	IRIS
Cadmium	B1	6.3		1.8e-03	IRIS	Human	Inhalation	Lung	IRIS
Chromium	A	4.1e+01	HEAST*	1.2e-02	IRIS*	Human	Inhalation	Lung	IRIS
Copper	D	NE		NE					
Iron	D	NE		NE					
Manganese	D	NE		NE					

[1] Toxicity value for pyrene was used as a surrogate.

Weight of Evidence (route-specific):
- A = Human carcinogen
- B = Probable human carcinogen (B1 = limited human evidence; B2 = sufficient human evidence)
- D = Not classifiable as to human carcinogenicity

Notes: mg/kg/day = milligrams per kilogram per day.
$\mu g/m^3$ = micrograms per cubic meter.
TRPH = total recoverable petroleum hydrocarbons.
NE = not evaluated.
IRIS = Integrated Risk Information System, on-line database search, current as of November 1997.
HEAST = Health Effects Assessment Summary Tables, current as of July 1997.
* = toxicity values for chromium are based on chromium VI.

Table D-6
Dermal Dose-Response Data for Carcinogenic Effects

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Compound	Weight of Evidence	Oral Slope Factor (mg/kg-day)-(1)	Oral Absorption Efficiency	Reference	Dermal Slope Factor (mg/kg-day)-(1)
Semivolatile Organic Compounds					
TRPH[1]	D	NE			NE
Inorganic Analytes					
Arsenic	A	1.5e+00	98%	Vahter, 1983	1.5e+00
Cadmium	D	NE			NE
Chromium	D	NE			NE
Copper	D	NE			NE
Iron	D	NE			NE
Manganese	D	NE			NE

[1] Toxicity values for pyrene were used as a surrogate.

Weight of Evidence (route-specific):
A = Human carcinogen
D = Not classifiable as to human carcinogenicity

Reference: Vahter, M. 1983. "Metabolism of Arsenic." In: Fowler, B.A., ed. *Biological and Environmental Effect of Arsenic.* NY: Elsevier. pp. 171-198.

Notes: For documentation concerning oral slope factors, refer to Table D-4.

mg/kg-day = milligrams per kilogram per day.
TRPH = total recoverable petroleum hydrocarbons.
NE = not evaluated.
% = percent.

Table D-7
Oral Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station 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						
Semivolatile Organic Compounds										
TRPH[1]	3.0e-02	IRIS	3.0e-01	HEAST	Oral-gavag	Low	Renal tubular pathology	Mouse	3000 H,A,-S,D	IRIS
Inorganic Analytes										
Arsenic	3.0e-04	IRIS	3.0e-04	HEAST	Oral-drinking water	Medium	Hyperpigmentation, keratosis	Human	3 D	IRIS
Cadmium										
Food	1.0e-03	IRIS	ND		Oral-diet	High	Proteinuria	Human	10 H	IRIS
Drinking water	5.0e-04	IRIS	ND		Oral-drinking water	High	Proteinuria	Human	10 H	IRIS
Chromium	5.0e-03	IRIS[2]	2.0e-02	HEAST[2]	Oral-drinking water	Low	No effects observed	Rat	500 H,A,S	IRIS
Copper	ND	[3]	ND	[3]						
Iron	3.0e-01	[4]	ND							
Manganese										
Food	1.4e-01	IRIS	1.4e-01	HEAST	Oral-diet	NA	CNS effects	Human	1	IRIS
All other media	4.7e-02	IRIS	ND		Oral-diet	NA	CNS effects	Human	3 M	IRIS

See notes at end of table.

Table D-7 (Continued)
Oral Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

[1] Toxicity value for pyrene was used as a surrogate.
[2] The toxicity values for chromium are based on chromium VI.
[3] A drinking water standard for copper of 1.3 milligrams per liter exists. Inadequate toxicity information is available to calculate an RfD.
[4] 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 no observable adverse effect level
D = Inadequate data
M = Modifying factor

Notes: RfD = reference dose.
mg/kg-day = milligrams per kilogram per day.
TRPH = total recoverable petroleum hydrocarbon.
IRIS = Integrated Risk Information System, on-line database search, current as of November 1997.
HEAST = Health Effects Assessment Summary Tables, current as of July 1997.
ND = do data.
NA = no applicable.
CNS = central nervous system.

Table D-8
Inhalation Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station 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						
Semivolatile Organic Compounds										
TRPH[1]	ND		ND							
Inorganic Analytes										
Arsenic	ND		ND							
Cadmium	ND		ND							
Chromium	ND		ND							
Copper	ND		ND							
Iron	ND		ND							
Manganese	5.0e-02	IRIS	ND		Inhalation	Medium	Impaired neuro-behavioral function	Human	1,000 H,L,D	IRIS

[1] Toxicity values for pyrene were used as a surrogate.

Uncertainty factors:
H = Variation in human sensitivity
L = Extrapolation from lowest observed adverse effect level to no observable adverse effect level
D = Inadequate data

Notes: RfC = reference concentration.
$\mu g/m^3$ = micrograms per cubic meter.
TRPH = total recoverable petroleum hydrocarbon.
ND = no data.
IRIS = Integrated Risk Information System, on-line database search, current as of November 1997.

Table D-9
Dermal Dose-Response Data for Noncarcinogenic Effects

Remedial Investigation Report
Site 18, Crash Crew Training Area
Naval Air Station Whiting Field
Milton, Florida

Chemical	Chronic Oral RfD (mg/kg-day)	Subchronic Oral RfD (mg/kg-day)	Oral Absorption Efficiency (Percent)	Reference	Dermal Chronic RfD (mg/kg-day)	Dermal Subchronic RfD (mg/kg-day)
Semivolatile Organic Compounds						
TRPH[1]	3.0e-02	3.0e-01	91	[2]	2.7e-02	2.7e-01
Inorganic Analytes						
Arsenic	3.0e-04	3.0e-04	98	Vahter, 1983	2.9e-04	2.9e-04
Cadmium	1.0e-03	ND	1	McLellan et al., 1978	1.0e-05	ND
Chromium	5.0e-03	2.0e-02	11	Ogawa, 1976	5.5e-04	2.2e-03
Copper	ND	ND			ND	ND
Iron	3.0e-01	ND	2	Goyer, 1991	6.0e-03	ND
Manganese	4.7e-02	ND	4	ATSDR, 1991b	1.9e-03	ND

[1] Toxicity values for pyrene were used as a surrogate.
[2] The oral absorption efficiency of all polynuclear aromatic hydrocarbons is assumed to be identical to that of benzo(a)pyrene, based on structural analogy.

References:
ATSDR. 1991b. "Toxicological Profile for Manganese." Agency for Toxic Substances and Disease Registry, U.S. Public Health Service (Draft).
Goyer, R.A. 1991. "Toxic Effects of Metals." In: Cassarett and Doull's *Toxicology: The Basic Science of Poisons*, 4th edition. Eds. M.O. Amdur, J. Doull and C.D. Klaassen. New York: Pergamon Press.
McLellan, J.S., P.R. Flanagan, M.J. Chamberlain, and L.S. Valberg. 1978. "Measurement of Dietary Cadmium Absorption in Humans." *J. Toxicol. Environ. Health* 4: 131-138.
Ogawa, G. 1976. "Experimental Study on Absorption, Distribution and Excretion of Trivalent and Hexavalent Chromes." *Jap. J. Pharmacol.* 26: 92-103.
Vahter, M. 1983. "Metabolism of Arsenic." In: Fowler, B.A., ed. *Biological and Environmental Effect of Arsenic*. New York: Elsevier. pp. 171-198.

Note: For documentation concerning chronic and subchronic oral RfDs, refer to Table D-7.

RfD = reference dose.
mg/kg-day = milligrams per kilogram per day.
TRPH = total recoverable petroleum hydrocarbons.
ATSDR = Agency for Toxic Substances and Disease Registry.

TABLE C-10

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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/cm^2-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
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	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

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{HAZARD QUOTIENT} = \text{INTAKE (mg/kg-day)} / \text{REFERENCE DOSE (mg/kg-day)}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ \text{days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ \text{days/yr}}$$

Where:

$$DA_{event} = CS \times AF \times ABS_d \times CF$$

Note: *For noncarcinogenic effects, AT = ED.*

TABLE C-10

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	3.4E-07	1.5	5.1E-07	0.001	2.0E-08	1.5	3.0E-08	5.4E-07
SUMMARY CANCER RISK						5E-07				3E-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 C-10

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	1.0E-06	0.0003	0.003	0.001	5.8E-08	0.00029	0.0002	0.004
Cadmium	I	3.7	mg/kg	5.1E-06	0.001	0.01	0.001	2.9E-07	0.00001	0.03	0.03
Chromium	I	10.8	mg/kg	1.5E-05	0.005	0.003	0.001	8.5E-07	0.00055	0.002	0.005
Copper	I	44.7	mg/kg	6.1E-05	ND		0.001	3.5E-06	ND		
Iron	I	4273	mg/kg	5.9E-03	0.3	0.02	0.001	3.4E-04	0.006	0.1	0.1
Manganese	I	70.1	mg/kg	9.6E-05	0.047	0.002	0.001	5.5E-06	0.0019	0.003	0.005
TPH	O	6970000	ug/kg	9.5E-03	0.03	0.3	0.01	5.5E-03	0.027	0.2	0.5
SUMMARY HAZARD INDEX						0.4				0.3	0.7

[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 C-11

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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 C-11

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	3.7E-11	15	**5.5E-10**
Cadmium	I	3.7	mg/kg	2.98E-09	1.9E-10	6.3	**1.2E-09**
Chromium	I	10.8	mg/kg	8.71E-09	5.5E-10	41	**2.2E-08**
SUMMARY CANCER RISK							**2E-08**

TABLE C-11

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	1.1E-10	ND	
Cadmium	I	3.7	mg/kg	2.98E-09	5.4E-10	ND	
Chromium	I	10.8	mg/kg	8.71E-09	1.6E-09	ND	
Copper	I	44.7	mg/kg	3.60E-08	6.6E-09	ND	
Iron	I	4273	mg/kg	3.45E-06	6.3E-07	ND	
Manganese	I	70.1	mg/kg	5.65E-08	1.0E-08	0.000014	7.4E-04
Total petroleum hydrocarbons	O	6970000	ug/kg	5.62E-06	1.0E-06	ND	
					SUMMARY HAZARD INDEX		7E-04

ND = No data

TABLE C-12

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm²	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	cm²-year/kg	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	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, bodyweight 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.

USEPA, 1989. Exposure Factors Handbook;EPA/600/8-89/043; May 1989.

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)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = (DA_{event} \times EF / AT \times 365\ days/year) \times SA_{soil/adj}$$

Where:

$SA_{soil/adj}$ = SUM (SA x ED / BW)

DA_{event} = CS x AF x ABS x CF

Note: For noncarcinogenic effects, AT = ED.

TABLE C-12

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\cdot day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\cdot day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
Arsenic	I	0.73	mg/kg	8.0E-07	1.5	1.2E-06	0.001	7.7E-09	1.5	1.1E-08	1.2E-06
SUMMARY CANCER RISK						1E-06				1E-08	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 C-12

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	9.3E-06	0.0003	0.03	0.001	8.9E-08	0.00029	0.0003	0.03
Cadmium	I	3.7	mg/kg	4.7E-05	0.001	0.05	0.001	4.5E-07	0.00001	0.05	0.1
Chromium	I	10.8	mg/kg	1.4E-04	0.005	0.03	0.001	1.3E-06	0.00055	0.002	0.03
Copper	I	44.7	mg/kg	5.7E-04	ND		0.001	5.5E-06	ND		
Iron	I	4273	mg/kg	5.5E-02	0.3	0.2	0.001	5.2E-04	0.006	0.1	0.3
Manganese	I	70.1	mg/kg	9.0E-04	0.047	0.02	0.001	8.6E-06	0.0019	0.005	0.02
TPH	O	6970000	ug/kg	8.9E-02	0.03	3	0.01	8.5E-03	0.027	0.3	3
				SUMMARY HAZARD INDEX		3				0.5	4

[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 C-13

INHALATION OF PARTICULATES - SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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 C-13

INHALATION OF PARTICULATES - SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	4.8E-11	15	7.3E-10
Cadmium	I	3.7	mg/kg	2.98E-09	2.5E-10	6.3	1.5E-09
Chromium	I	10.8	mg/kg	8.71E-09	7.2E-10	41	2.9E-08
SUMMARY CANCER RISK							3E-08

TABLE C-13

INHALATION OF PARTICULATES - SURFACE SOIL
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	5.6E-10	ND	
Cadmium	I	3.7	mg/kg	2.98E-09	2.9E-09	ND	
Chromium	I	10.8	mg/kg	8.71E-09	8.4E-09	ND	
Copper	I	44.7	mg/kg	3.60E-08	3.5E-08	ND	
Iron	I	4273	mg/kg	3.45E-06	3.3E-06	ND	
Manganese	I	70.1	mg/kg	5.65E-08	5.4E-08	0.000014	0.004
Total petroleum hydrocarbons	O	6970000	ug/kg	5.62E-06	5.4E-06	ND	
						SUMMARY HAZARD INDEX	0.004

ND = No data

TABLE C-14

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm^2-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm^2	USEPA, 1992
DOSE ABSORBED PER EVENT	DAevent	chemical specific	mg/cm^2-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:

$DAevent = CS \times AF \times ABS_d \times CF$

Note: For noncarcinogenic effects: AT = ED

TABLE C-14

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	3.7E-08	1.5	5.5E-08	0.001	2.1E-09	1.5	3.2E-09	5.8E-08
SUMMARY CANCER RISK						6E-08				3E-09	6E-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 C-14

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	1.3E-07	0.0003	0.0004	0.001	7.4E-09	0.00029	0.00003	0.0005
Cadmium	I	3.7	mg/kg	6.5E-07	0.001	0.001	0.001	3.7E-08	0.00001	0.004	0.004
Chromium	I	10.8	mg/kg	1.9E-06	0.005	0.0004	0.001	1.1E-07	0.00055	0.0002	0.001
Copper	I	44.7	mg/kg	7.9E-06	ND		0.001	4.5E-07	ND		
Iron	I	4273	mg/kg	7.5E-04	0.3	0.003	0.001	4.3E-05	0.006	0.007	0.01
Manganese	I	70.1	mg/kg	1.2E-05	0.047	0.0003	0.001	7.1E-07	0.0019	0.0004	0.0006
TPH	O	6970000	ug/kg	1.2E-03	0.03	0.04	0.01	7.1E-04	0.027	0.03	0.07
SUMMARY HAZARD INDEX						0.05				0.04	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 C-15

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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 C-15

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m^3)	INTAKE (mg/kg-day)	INHALATION CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK
Arsenic	I	0.73	mg/kg	5.89E-10	9.9E-13	15	1.5E-11
Cadmium	I	3.7	mg/kg	2.98E-09	5.0E-12	6.3	3.2E-11
Chromium	I	10.8	mg/kg	8.71E-09	1.5E-11	41	6.0E-10
						SUMMARY CANCER RISK	6E-10

TABLE C-15

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	3.5E-12	ND	
Cadmium	I	3.7	mg/kg	2.98E-09	1.8E-11	ND	
Chromium	I	10.8	mg/kg	8.71E-09	5.1E-11	ND	
Copper	I	44.7	mg/kg	3.60E-08	2.1E-10	ND	
Iron	I	4273	mg/kg	3.45E-06	2.0E-08	ND	
Manganese	I	70.1	mg/kg	5.65E-08	3.3E-10	0.000014	2.4E-05
Total petroleum hydrocarbons	O	6970000	ug/kg	5.62E-06	3.3E-08	ND	
					SUMMARY HAZARD INDEX		2E-05

ND = No data

TABLE C-16

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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.

USEPA, 1989. Exposure Factors Handbook; EPA/600/8-89/043; May 1989.
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 4 Bulletins, Bulletin No. 3, November 1995.

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:

$$SA_{soil/adj} = SUM\ (SA_i \times ED_i / BW_i)$$

$$DA_{event} = CS \times AF \times ABS_d \times CF$$

Note: For noncarcinogenic effects: AT = ED.

TABLE C-16

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	2.9E-08	1.5	4.3E-08	0.001	1.3E-09	1.5	2.0E-09	4.5E-08
				SUMMARY CANCER RISK		4E-08				2E-09	4E-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 C-16

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	2.0E-07	0.0003	0.001	0.001	9.1E-09	0.00029	0.00003	0.001
Cadmium	I	3.7	mg/kg	1.0E-06	0.001	0.001	0.001	4.6E-08	0.00001	0.005	0.006
Chromium	I	10.8	mg/kg	3.0E-06	0.005	0.001	0.001	1.3E-07	0.00055	0.0002	0.001
Copper	I	44.7	mg/kg	1.2E-05	ND		0.001	5.6E-07	ND		
Iron	I	4273	mg/kg	1.2E-03	0.3	0.004	0.001	5.3E-05	0.006	0.01	0.01
Manganese	I	70.1	mg/kg	1.9E-05	0.047	0.0004	0.001	8.8E-07	0.0019	0.0005	0.0009
TPH	O	6970000	ug/kg	1.9E-03	0.03	0.06	0.01	8.7E-04	0.027	0.03	0.1
SUMMARY HAZARD INDEX						0.1				0.05	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 C-17

INHALATION OF PARTICULATES - SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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 C-17

INHALATION OF PARTICULATES - SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	5.8E-13	15	8.6E-12
Cadmium	I	3.7	mg/kg	2.98E-09	2.9E-12	6.3	1.8E-11
Chromium	I	10.8	mg/kg	8.71E-09	8.5E-12	41	3.5E-10
						SUMMARY CANCER RISK	4E-10

TABLE C-17

INHALATION OF PARTICULATES - SURFACE SOIL
ADOLESCENT TRESPASSER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	4.0E-12	ND	
Cadmium	I	3.7	mg/kg	2.98E-09	2.0E-11	ND	
Chromium	I	10.8	mg/kg	8.71E-09	6.0E-11	ND	
Copper	I	44.7	mg/kg	3.60E-08	2.5E-10	ND	
Iron	I	4273	mg/kg	3.45E-06	2.4E-08	ND	
Manganese	I	70.1	mg/kg	5.65E-08	3.9E-10	0.000014	2.8E-05
Total petroleum hydrocarbons	O	6970000	ug/kg	5.62E-06	3.8E-08	ND	
				SUMMARY HAZARD INDEX			3.E-05

ND = No data

TABLE C-18

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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:

$$DA_{event} = CS \times AF \times ABS \times CF$$

Note: For noncarcinogenic effects, AT = ED

TABLE C-18

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	1.3E-07	1.5	1.9E-07	0.001	5.9E-09	1.5	8.8E-09	2.0E-07
SUMMARY CANCER RISK						2E-07				9E-09	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 C-18

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	3.6E-07	0.0003	0.001	0.001	1.6E-08	0.00029	0.0001	0.001
Cadmium	I	3.7	mg/kg	1.8E-06	0.001	0.002	0.001	8.3E-08	0.00001	0.01	0.01
Chromium	I	10.8	mg/kg	5.3E-06	0.005	0.001	0.001	2.4E-07	0.005	0.00005	0.001
Copper	I	44.7	mg/kg	2.2E-05	ND		0.001	1.0E-06	ND		
Iron	I	4273	mg/kg	2.1E-03	0.3	0.01	0.001	9.6E-05	0.006	0.02	0.02
Manganese	I	70.1	mg/kg	3.4E-05	0.047	0.001	0.001	1.6E-06	0.0019	0.001	0.002
TPH	O	6970000	ug/kg	3.4E-03	0.03	0.1	0.01	1.6E-03	0.027	0.06	0.2
SUMMARY HAZARD INDEX						0.1				0.1	0.2

[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 C-19

INHALATION OF PARTICULATES - SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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 [2]
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.
[2] Inhalation rate differs from the GIR report. GIR report presented the site maintenance worker rate in the occupational worker spreadsheet. This rate assumes little outdoor activity.
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 C-19

INHALATION OF PARTICULATES - SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION 15 (mg/kg-day)^-1	CANCER RISK
Chromium	I	0.73	mg/kg	5.89E-10	1.4E-11	15	2.1E-10
Cadmium	I	3.7	mg/kg	2.98E-09	6.9E-11	6.3	4.4E-10
Chromium	I	10.8	mg/kg	8.71E-09	2.0E-10	41	8.3E-09
SUMMARY CANCER RISK							9E-09

TABLE C-19

INHALATION OF PARTICULATES - SURFACE SOIL
OCCUPATIONAL WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	3.8E-11	ND	
Cadmium	I	3.7	mg/kg	2.98E-09	1.9E-10	ND	
Chromium	I	10.8	mg/kg	8.71E-09	5.7E-10	ND	
Copper	I	44.7	mg/kg	3.60E-08	2.4E-09	ND	
Iron	I	4273	mg/kg	3.45E-06	2.2E-07	ND	
Manganese	I	70.1	mg/kg	5.65E-08	3.7E-09	0.000014	2.6E-04
Total petroleum hydrocarbon	O	6970000	ug/kg	5.62E-06	3.7E-07	ND	
SUMMARY HAZARD INDEX							3.E-04

ND = No data

TABLE C-20

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{HAZARD QUOTIENT} = \text{INTAKE (mg/kg-day)} / \text{REFERENCE DOSE (mg/kg-day)}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{\text{CS} \times \text{IR} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{\text{DA}_{event} \times \text{SA} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

Where:

$$\text{DA}_{event} = \text{CS} \times \text{AF} \times \text{ABS} \times \text{CF}$$

Note: For noncarcinogenic effects, AT = ED

TABLE C-20

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	1.5E-08	1.5	2.3E-08	0.001	1.8E-09	1.5	2.6E-09	2.6E-08
SUMMARY CANCER RISK						2E-08				3E-09	3E-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 C-20

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	4.3E-08	0.0003	0.0001	0.001	4.9E-09	0.00029	0.00002	0.0002
Cadmium	I	3.7	mg/kg	2.2E-07	0.001	0.0002	0.001	2.5E-08	0.00001	0.002	0.003
Chromium	I	10.8	mg/kg	6.3E-07	0.005	0.0001	0.001	7.3E-08	0.00055	0.0001	0.0003
Copper	I	44.7	mg/kg	2.6E-06	ND		0.001	3.0E-07	ND		
Iron	I	4273	mg/kg	2.5E-04	0.3	0.001	0.001	2.9E-05	0.006	0.005	0.006
Manganese	I	70.1	mg/kg	4.1E-06	0.047	0.00009	0.001	4.7E-07	0.0019	0.0002	0.0003
TPH	O	6970000	ug/kg	4.1E-04	0.03	0.01	0.01	4.7E-04	0.027	0.02	0.03
SUMMARY HAZARD INDEX						0.02				0.03	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 C-21

INHALATION OF PARTICULATES - SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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 [2]
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.
[2] Inhalation rate differs from the GIR report. GIR report presented the occupational worker rate in the site maintenance worker spreadsheet. This site maintenance worker inhalation rate assumes strenuous outdoor activity.
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 C-21

INHALATION OF PARTICULATES - SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	4.9E-12	15	7.4E-11
Cadmium	I	3.7	mg/kg	2.98E-09	2.5E-11	6.3	1.6E-10
Chromium	I	10.8	mg/kg	8.71E-09	7.3E-11	41	3.0E-09
SUMMARY CANCER RISK							3E-09

TABLE C-21

INHALATION OF PARTICULATES - SURFACE SOIL
SITE MAINTENANCE WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	1.4E-11	ND	
Cadmium	I	3.7	mg/kg	2.98E-09	7.0E-11	ND	
Chromium	I	10.8	mg/kg	8.71E-09	2.0E-10	ND	
Copper	I	44.7	mg/kg	3.60E-08	8.5E-10	ND	
Iron	I	4273	mg/kg	3.45E-06	8.1E-08	ND	
Manganese	I	70.1	mg/kg	5.65E-08	1.3E-09	0.000014	9.5E-05
Total petroleum hydrocarbons	O	6970000	ug/kg	5.62E-06	1.3E-07	ND	
				SUMMARY HAZARD INDEX			9.E-05

ND = No data

TABLE C-22

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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/cm^2-event	USEPA, 1995
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1995
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	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 C-22

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.9E-09	1.5	8.8E-09	0.001	7.0E-11	1.5	1.1E-10	8.9E-09
SUMMARY CANCER RISK						9E-09				1E-10	9E-09

[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 C-22

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	4.1E-07	0.0003	0.001	0.001	4.9E-09	0.00029	0.00002	0.001
Cadmium	I	3.7	mg/kg	2.1E-06	0.001	0.002	0.001	2.5E-08	0.00001	0.002	0.005
Chromium	I	10.8	mg/kg	6.1E-06	0.005	0.0012	0.001	7.3E-08	0.00055	0.000133	0.0013
Copper	I	44.7	mg/kg	2.5E-05	ND		0.001	3.0E-07	ND		
Iron	I	4273	mg/kg	2.4E-03	0.3	0.01	0.001	2.9E-05	0.006	0.005	0.01
Manganese	I	70.1	mg/kg	4.0E-05	0.047	0.0008	0.001	4.7E-07	0.0019	0.0002	0.001
TPH	O	6970000	ug/kg	3.9E-03	0.3	0.01	0.01	4.7E-04	0.027	0.02	0.03
SUMMARY HAZARD INDEX						0.03				0.03	0.05

[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 C-23

INHALATION OF PARTICULATES - SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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 C-23

INHALATION OF PARTICULATES - SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Chromium	I	0.73	mg/kg	5.89E-10	2.0E-13	15	3.0E-12
Cadmium	I	3.7	mg/kg	2.98E-09	1.0E-12	6.3	6.3E-12
Chromium	I	10.8	mg/kg	8.71E-09	2.9E-12	41	1.2E-10
SUMMARY CANCER RISK							1E-10

TABLE C-23

INHALATION OF PARTICULATES - SURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.89E-10	1.4E-11	ND	
Cadmium	I	3.7	mg/kg	2.98E-09	7.0E-11	ND	
Chromium	I	10.8	mg/kg	8.71E-09	2.0E-10	ND	
Copper	I	44.7	mg/kg	3.60E-08	8.5E-10	ND	
Iron	I	4273	mg/kg	3.45E-06	8.1E-08	ND	
Manganese	I	70.1	mg/kg	5.65E-08	1.3E-09	0.000014	9.5E-05
Total petroleum hydrocarbons	O	6970000	ug/kg	5.62E-06	1.3E-07	ND	
SUMMARY HAZARD INDEX							9.E-05

ND = No data

TABLE C-24

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SUBSURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE18

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/cm^2-event	USEPA, 1995
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1995
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	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; 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)

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DAevent \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$DA_{event} = CS \times AF \times ABS \times CF$$

Note: **For noncarcinogenic effects, AT = ED**

TABLE C-24

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SUBSURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE18

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
none											
SUMMARY CANCER RISK						0E+00				0E+00	0E+00

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.
NE = not evaluated.

TABLE C-24

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SUBSURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE18

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
Total petroleum hydrocarbons	O	1940000	ug/kg	1.1E-03	0.3	3.6E-03	0.01	1.3E-04	0.027	4.9E-03	8.5E-03
SUMMARY HAZARD INDEX						0.004				0.005	0.008

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.
ND = no data available.

TABLE C-25

INHALATION OF PARTICULATES - SUBSURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.2E+07	m^3/kg	#REF!
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] PEF has been derived in the PEF Appendix to this report.
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 C-25

INHALATION OF PARTICULATES - SUBSURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
none							
					SUMMARY CANCER RISK		0E+00

NE = not evaluated.

TABLE C-25

INHALATION OF PARTICULATES - SUBSURFACE SOIL
EXCAVATION WORKER
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Total petroleum hydrocarbons	O	1940000	ug/kg	1.62E-04	3.8E-06	ND	
					SUMMARY HAZARD INDEX		0E+00

ND = no data available.

TABLE C-26

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL - CENTRAL TENDENCY
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1992
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	USEPA, 1992
EXPOSURE DURATION	ED	7	years	USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	7	years	USEPA, 1992

USEPA, 1989. Exposure Factors Handbook, May 1989.
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.*

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 C-26

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL - CENTRAL TENDENCY
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	1.0E-07	1.5	1.5E-07	0.001	1.0E-09	1.5	1.5E-09	1.5E-07
SUMMARY CANCER RISK						2E-07				2E-09	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 C-26

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL - CENTRAL TENDENCY
ADULT RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	1.0E-06	0.0003	0.003	0.001	1.0E-08	0.00029	0.00003	0.003
Cadmium	I	3.7	mg/kg	5.1E-06	0.001	0.01	0.001	5.1E-08	0.00001	0.01	0.01
Chromium	I	10.8	mg/kg	1.5E-05	0.005	0.003	0.001	1.5E-07	0.00055	0.0003	0.003
Copper	I	44.7	mg/kg	6.1E-05	ND		0.001	6.1E-07	ND		
Iron	I	4273	mg/kg	5.9E-03	0.3	0.02	0.001	5.9E-05	0.006	0.01	0.03
Manganese	I	70.1	mg/kg	9.6E-05	0.047	0.002	0.001	9.6E-07	0.0019	0.001	0.003
TPH	O	6970000	ug/kg	9.5E-03	0.03	0.3	0.01	9.5E-04	0.027	0.04	0.4
SUMMARY HAZARD INDEX						0.4				0.13	0.4

[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 C-27

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL - CENTRAL TENDENCY
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	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	age-specific	cm²	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	40	days/year [1]	USEPA, 1996
EXPOSURE DURATION	ED	2	years	USEPA, 1992
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{wt\ adj}$	662.8	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] 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 age 1 through 6, the time-weighted, bodyweight 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.

USEPA, 1989. Exposure Factors Handbook; EPA/600/8-89/043; May 1989.

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)

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = (DA_{event} \times EF / AT \times 365\ days/year) \times SA_{wt/adj}$$

Where:

$SA_{wt/adj}$ = SUM (SA x ED / BW)

DA_{event} = CS x AF x ABS x CF

Note: For noncarcinogenic effects, AT = ED.

TABLE C-27

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL - CENTRAL TENDENCY
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	1.5E-08	1.5	2.3E-08	0.001	1.5E-10	1.5	2.3E-10	2.3E-08
SUMMARY CANCER RISK						2E-08				2E-10	2E-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 C-27

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL - CENTRAL TENDENCY
CHILD RESIDENT
NAS WHITING FIELD
MILTON, FLORIDA
SITE 18

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
Arsenic	I	0.73	mg/kg	5.3E-07	0.0003	0.002	0.001	5.3E-09	0.00029	0.00002	0.002
Cadmium	I	3.7	mg/kg	2.7E-06	0.001	0.003	0.001	2.7E-08	0.00001	0.003	0.01
Chromium	I	10.8	mg/kg	7.9E-06	0.005	0.002	0.001	7.8E-08	0.00055	0.0001	0.002
Copper	I	44.7	mg/kg	3.3E-05	ND		0.001	3.2E-07	ND		
Iron	I	4273	mg/kg	3.1E-03	0.3	0.01	0.001	3.1E-05	0.006	0.01	0.02
Manganese	I	70.1	mg/kg	5.1E-05	0.047	0.001	0.001	5.1E-07	0.0019	0.0003	0.001
TPH	O	6970000	ug/kg	5.1E-03	0.03	0.2	0.01	5.1E-04	0.027	0.02	0.2
					SUMMARY HAZARD INDEX	0.2				0.03	0.2

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral RfDs.

APPENDIX E

ECOLOGICAL RISK DATA

Table F
Summary of Bioaccumulation Data

RI/RA Report, Site 18
NAS Whiting Field
Milton, Florida

Analyte	Log K_{ow} [b]	Bioaccumulation Factor [a]			
		Invertebrate [c]	Plant [d]	Mammal [e]	Bird [f]
VOLATILES [g]					
Acetone	-0.24	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA
Carbon disulfide	2.2	NA	NA	NA	NA
Ethylbenzene	3.2	NA	NA	NA	NA
Methylene chloride	1.3	NA	NA	NA	NA
Toluene	2.7	NA	NA	NA	NA
Xylenes (total)	3.2	NA	NA	NA	NA
SEMIVOLATILES					
bis(2-Ethylhexyl)phthalate	5.1	5.1	5.0E-02	8.7E-03	1.9E-01	NA
2-Methylnaphthalene	3.86 0	4.3	5.0E-02	2.5E-02	1.5E-01	NA
Naphthalene	3.6 0	4.3	5.0E-02	2.5E-02	1.5E-01	NA
Phenanthrene	4.5	4.3	5.0E-02	2.5E-02	1.5E-01	NA
Pyrene	5.3	4.3	5.0E-02	2.5E-02	1.5E-01	NA
INORGANICS					
Barium	NA	7.5E-03 [g]	3.0E-02 [h]	7.5E-03 [i]	NA
Cadmium	NA	1.1E+01 0	3.3E+01 [k]	2.1E+00 [i]	3.8E-01 0
Copper	NA	1.6E-01 0	7.8E-01 [m]	6.0E-01 [k]	NA
Lead	NA	7.8E-02 [n]	0.0E+00 [k]	1.5E-02 [i]	NA
Manganese	NA	2.0E-02 [g]	5.0E-02 [h]	2.0E-02 [i]	NA
Nickel	NA	2.3E-01 0	1.2E-02 [h]	3.0E-01 [i]	NA
Zinc	NA	1.8E+00 0	6.1E-01 [m]	2.1E+00 [i]	NA
Total Recoverable Petroleum Hydrocarbon					
TRPH	NA	NA	NA	NA	NA

See notes on following page.

Table E - 1

Summary of Bioaccumulation Data

RI/RA Report, Site 18
NAS Whiting Field
Milton, Florida

[a] Units for bioaccumulation factors (BAFs) are mg/kg (wet) tissue weight over mg/kg (dry) soil weight for invertebrates and plants. The BAF units for small mammals and small birds are mg/kg (wet) tissue weight over mg/kg (wet) food weight.

[b] Log K_{ow} values are from the Superfund Chemical Data Matrix (USEPA, 1993), unless otherwise noted. Average Log K_{ow} for classes of semivolatiles are presented in the second log K_{ow} column. When available, chemical class log K_{ow} averages are used instead of chemical specific log K_{ow} to calculate BAF values.

[c] The value is an average BAF for semivolatiles measured in earthworms (Beyer, 1990) , unless otherwise noted. Dry weight values were converted to wet weight assuming earthworm are 80% water ($BAF_{wet\ weight} = BAF_{dry\ weight}/ 0.2$).

[d] Plant BAF were calculated using the following equation presented by Travis and Arms (1988) unless otherwise noted: log (Plant Bioaccumulation Factor)=1.588-0.578 (log K_{ow}). The calculated plant BAF value was converted from dry weight to wet weight by dividing the BAF by a factor of 0.2 (assuming 80% water content of plants) ($BAF_{wet\ weight} = BAF_{dry\ weight}/ 0.2$).

[e] Mammalian BAFs were calculated using the following equation from Travis and Arms (1988), unless otherwise noted: log BTF (biotransfer factor) = Log K_{ow} - 7.6.

To convert from BTF to BAF, the calculated log BTF is first transformed to base 10 then multiplied by the average ingestion rates for nonlactating and lactating test animals (12 kg/day). BAFs are converted from dry to wet feed weight by dividing the BAF by a factor of 0.2 ($BAF_{wet\ weight}$ = BTF *12 mg/day/0.2). There is an uncertainty involved in using this equation for PAHs because the study by Travis and Arms (1988) did not use PAHs in the regression analysis.
For semivolate analytes with Log K_{ow} less than 5 (log K_{ow} < 5), the BAF was assigned a minimal value of 0.15.
When no literature values for pesticides and PCBs were available, the BAF was calculated regardless of the Log K_{ow}, due to the tendency of these lipophylic compounds to bioaccumulate.

[f] Bioaccumulation data are generally lacking for birds. Therefore, there is uncertainty associated with estimating body dose for birds without considering what chemicals may have bioacumulated in prey-item tissue.

[g] ATSDR (1993) Toxicological Profile for Naphthalene.

[h] Prey-specific value is not available. The value shown is the small mammal BAF for this chemical.

[i] Value from Baes et al. (1984) for leafy portions of plants multiplied by 0.2 to represent 80% water composition of plants.

[j] Value derived from BTFs, presented in Baes et al. (1984) for uptake into cattle. BTF converted to BAF by multiplying by food ingestion rate of 12 kg/day dry weight.

[k] BAF for earthworms from Diercxsens et al. (1985).

[l] Mammal value for copper and plant value for cadmium from Levine et al. (1989). Lead does not accumulate in plant tissue; therefore, a BAF of zero was assigned.

[m] Based on accumulation of cadmium in kidneys of European quail in Pimentel et al. (1984).

[n] Median of values reported from Levine et al. (1989).

[o] Geometric mean of BAF values (wet weight/dry weights) for worms and woodlice (USEPA, 1985b). wet weight tissue concentrations calculated assuming 80% body water content.
Value from nickel sludge document (USEPA, 1985c) multiplied by 0.2 to represent 80% water composition of earthworms.

[p] Value from nickel sludge document (USEPA, 1985c) multiplied by 0.2 to represent 80% water composition of earthworkms.

Table L

Summary of Bioaccumulation Data

RI/RA Report, Site 18
NAS Whiting Field
Milton, Florida

Notes:

Log Kow = Logarithm transformation of the octanol/water partitioning coefficient.
NA = not available
BAF = bioaccumulation factor.
mg/kg = milligrams per kilogram.
BTF = biotransfer factor.
> = greater than.
< = less than.
% = percent.

References:

ATSDR, 1993, "Toxicological Profile for Naphthalene and 2-Methylnaphthalene," Agency for Toxic Substances and Disease Registry, U.S. Public Health Service.

Baes, C.F. III, R.D. Sharp, A.L. Sjoreen, and R.W. Shor. 1984. "A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture." ORNL-5786. U.S. Department of Energy, Environmental Sciences Division Oak Ridge, Tennessee: Oak Ridge National Laboratory (September).

Bailey, S., P.J. Bunyan, D.M. Jennings, and A. Taylor. 1970. [n.t.]. Pestic. Sci. 1:66.

Barker, R.J. 1958. "Notes on Some Ecological Effects of DDT Sprayed on Elms." Journal of Wildlife Management 22:269-274.

Baker, R.H. 1983. Michigan Mammals. East Lansing, Michigan: Michigan State University Press.

Barnthouse, L.W., J.E. Breck, T.D. Jones, G.W. Suter II, C. Easterly, L.R. Glass, B.A. Owen, and A.P. Watson. 1988. Relative Toxicity Estimates and Bioaccumulation Factors for the Defense Priority Model. Publ. No. 2997. U.S. Department of Energy, Environmental Sciences Division. Oak Ridge, Tennessee: Oak Ridge National Laboratory (October).

Beyer, W.N. 1990. "Evaluating Soil Contamination." Biological Report No. 90(2). U.S. Department of the Interior, Fish and Wildlife Service. Washington, D.C.

Beyer, W.N., and E.J. Cromartie. 1987. A Survey of Pb, Cu, Zn, Cd, Cr, As, and Se in Earth worms and Soil from Diverse Sites." Env. Mon. Assessment 8:27-36.

Beyer, W.N., and C. D. Gish. 1980. "Persistence in Earthworms and Potential Hazards to Birds of Soil Applied DDT, Dieldrin, and Heptachlor." Journal of Applied Ecology 17:295-307.

Collett, N. and D.L. Harrison. 1968. "Some Observations on the Effects of Using Organochlorine Sprays in an Orchard." New Zealand Journal of Science 11:371-379.

Cramp, S., and P.J.S. Olney. 1967. Sixth Report on Toxic Chemicals. Joint Committee, British Trust for Ornithology and Royal Society for Protection of Birds.

Davis, B.N.K., and R.B. Harrison. 1996. Nature (London) 211:1424.

Davis, B.N.K. 1968. "The Soil Macrofauna and Organochlorine Insectice Residues at Twelve Agricultural Sites near Huntingdon." Annals of Applied Biology 61:29-45.

Diercxsens, P., D. deWeck, N. Borsinger, B. Rosset, and J. Tarradellas. 1985. "Earthworm Contamination by PCBs and Heavy Metals." Chemosphere 14:511-522.

Dimond, J.B., G.Y. Belyea, R.E. Kadunce, S.A. Getchell, and J.A. Blease. 1970. "DDT Residues in Robins and Earthworms Associated with Contaminated Forest Soils." The Canadian Entomologist 102:1122-1130.

Donahue, R.L., R.W. Miller, and J.C. Skickluna. 1977. Soils: An Introduction to Soils and Plant Growth. 4th ed. New Jersey: Prentice Hall.

Table E - 1
Summary of Bioaccumulation Data

RI/RA Report, Site 18
NAS Whiting Field
Milton, Florida

Edwards, C.A., and A.R. Thompson. 1973. "Pesticides and the Soil Fauna." Residue Reviews 45:1-79.

Eisler, R. 1986. "Polychlorinated Biphenyl Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review." Biological Report No. 85(91.7). U.S. Department of the Interior, Fish and Wildlife Service. Washington, D.C.

Eisler, R. 1990. "Chlordane Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review." Biological Report No. 85(1.21). U.S. Department of the Interior, Fish and Wildlife Service. Washington, D.C.

Evans, M.S., G.E. Noguchi, and C.P. Rice. 1991. "The Biomagnification of Polychlorinated Biphenyls, Toxaphene, and DDT Compounds in a Lake Michigan Offshore Food Web." Arch. Environ. Contam. Toxicol. 20:87-93.

Forsyth, D.J., and T.J. Peterle. 1984. "Species and Age Differences in Accumulation of 36 Cl-DDT by Voles and Shrews in the Field." Env. Poll. (series A) 33:327-340.

Garten, C.T. and J.R. Trabalka. 1983. "Evaluation of Models for Predicting Terrestrial Food Chain Behavior of Xenobiotics." Environ. Sci. Technol. 17(10):590-595.

Gish, C.D. 1970. "Organochlorine Insecticide Residues in Soils and Soil Invertebrates from Agricultural Lands." Pesticides Monit. Journal 3(71).

Hansch, C.H., and A. Leo. 1979. Substituent Constants for Correlation Analysis in Chemistry and Biology. New York: John Wiley & Sons, Inc.

Hunt, L.B., and R.J. Sacho. 1969. [n.t.]. Journal of Wildlife Management 33:336

Jeffries, D.J., and B.N.K. Davis. 1968. "Dynamics of Dieldrin in Soil, Earthworms, and Song Thrushes." Journal of Wildlife Managagement 32:441-456.

Kenaga, E.E. 1973. "Factors to Be Considered in the Evaluation of Pesticides to Birds in Their Environment." In Environmental Quality and Safety: Global Aspects of Chemistry, Toxicology, and Technology as Applied to the Environment, Vol. 2, 166-181. New York: Academic Press.

Levine, M.B., A.T. Hall, G.W. Barrett, and D.H. Taylor. 1989. "Heavy Metal Concentrations During Ten Years of Sludge Treatment to an Old-Field Community." Journal of Environ. Qual. 18:411-418.

MacFadyen, A. 1980. Advances in Ecological Research. Vol. II. New York: Academic Press.

Maughan, J.T. 1993. Ecological Assessment of Hazardous Waste Sites. New York: Van Nostrand Reinhold.

Merry, R.H., K.G. Tiller, and A.M. Alston. 1986. "The Effects of Contamination of Soil with Copper, Lead, and Arsenic on the Growth and Composition of Plants: Effects of Season, Genotype, Soil Temperature, and Fertilizers." Plant Soil 91:115-128.

Pimentel, D.D., M.N. Culliney, G.S. Stoewsand, J.L. Anderson, C.A. Bache, W.H. Gutenmann, and D.J. Lisk. 1984. Cadmium in Japanese Quail Fed Earthworms Inhabiting a Golf Course. Nutr. Rep. Int. 30:475-481.

Sheppard, M.I., D.H. Thibault, and S.C. Sheppard. 1985. "Concentrations and Concentration Ratios of U, As, and Co in Scots Pine Grown in a Waste-Site Soil and an Experimentally Contaminated Soil." Water Air Soil Pollut. 26:85-94.

Stoewsand, G.S., W.H. Gutenmann, and D.J. Lisk. 1978. "Wheat Grown on Fly Ash: High Selenium Uptake and Response When Fed to Japanese Quail." Journal of Agric. Food Chem. 26(3):[n.p.].

Suter, G. W. 1993. "Ecological Risk Assessment." Chelsea Michigan: Lewis Publishers.

Travis, C.C., and A.D. Arms. 1988. "Bioconcentration of Organics in Beef, Milk, and Vegetation." Environ. Sci. Tech. 22:271-274.

U.S. Environmental Protection Agency (USEPA). 1985a. "Environmental Profiles and Hazard Indices for Constituents of Municipal Sludge: DDT/DDE/DDD." Office of Water Regulations and Standards. Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 1985b. "Environmental Profiles and Hazard Indices for Constituents of Municipal Sludge: Lead." Office of Water Regulations and Standards. Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 1985c. "Environmental Profiles and Hazard Indices for Constituents of Municipal Sludge: Nickel." Office of Water Regulations and Standards. Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 1985d. "Environmental Profiles and Hazard Indices for Constituents of Municipal Sludge: Mercury." Office of Water Regulations and Standards. Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 1985f. "Environmental Profiles and Hazard Indices for Constituents of Municipal Sludge: Polychlorinated Biphenyls." Office of Water Regulations and Standards. Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 1990. "Basics of Pump-and-Treat Ground Water Remediation Technology." EPA-600/8-90/003. Office of Research and Development. Washington, D.C.

Table I
Summary of Bioaccumulation Data

RI/RA Report, Site 18
NAS Whiting Field
Milton, Florida

U.S. Environmental Protection Agency (USEPA). 1992. "Dermal Exposure Assessment: Principals and Applications Interim Report." EPA/600/8-91/011B (January). Office of Research and Development. Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 1993. Superfund Chemical Data Matrix (SCDM). Washington, D.C.

Wang, D.S., R.W. Weaver, and J.R. Melton. 1984. "Microbial Decomposition of Plant Tissue Contaminated with Arsenic and Mercury." Environ. Pollut. 43a:275-282.

Webber, M.D., H.D. Monteith, and D.G.M. Corneau. 1983. "Assessment of Heavy Metals and PCBs at Sludge Application Sites." J. WPCF. 55(2):187-195.

Wheatley, G.A. and J.A. Hardman. 1968. "Organochlorine Insecticide Residues in Earthworms from Arable Soils." J. Sci. Fd Agric. 19(April).

Table E-2
Ingestion Toxicity Information for Wildlife

RI/FS Report, Site 18
NAS Whiting Field
Milton, Florida

Chemical	Test Species	Test Type	Duration	Effect	Lethal RTV			Sublethal RTV			Reference
					Oral LD50	LOAEL	RTV [a]	LOAEL	NOAEL	RTV [a]	
VOLATILE ORGANIC COMPOUNDS											
Acetone	Rat	Oral	NR	Reproductive effects				273,000		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
2-Butanone	Rat	Oral LD_{50}	NR	Mortality	2,737		547				RTECS, 1994
	Mouse	Oral LD_{50}	NR	Mortality	4,050						RTECS, 1994
	Rat	Oral (subchronic)	13 weeks	NOAEL for neurological effects					173	173	ATSDR, 1991a
Carbon disulfide	Rabbit	Converted inhalatio	34 weeks	NOAEL for fetotoxicity malformations					11	11	
Ethylbenzene	Rat	Oral (subchronic)	182 days	Liver and kidney toxicity				291		29.1	IRIS, 1991a
	Rat	Oral LD_{50}		Mortality	3,500		700				NIOSH, 1985
Methylene chloride	Rat	Oral LD_{50}	NR	Mortality	1,600		320				RTECS, 1994
	Dog	Oral LD_{50}	NR	Mortality	3,000		600				RTECS, 1994
	Rabbit	Oral LD_{50}	NR	Mortality	1,900						RTECS, 1994
	Rat	Oral (chronic)	2 years	Liver toxicity				52.6		5.3	IRIS, 1991
	Rat	Oral (subchronic)	3 months	Mortality, blood chemistry, histopathology				12.5			USEPA, 1984
Toluene	Rat	Oral (subchronic)	13 weeks	Increased liver and kidney weight				446			IRIS, 1991
	Rat	Oral LD_{50}		Mortality	5,000		1000				NIOSH, 1985
	Mouse	Oral (subchronic)	76 days	Decreased open field activity				76		7.6	
Xylenes (total)	Rat	Oral LD_{50}		Mortality	4,300		860				NIOSH, 1985
	Rat	Oral (chronic)	103 weeks	Hyperactivity, decreased BW, mortality				500		50	IRIS, 1991
	Japanese quail	Oral (acute)	5 days	Mortality	20,000	2,014	201				Hill and Camardese, 1986

Table E-2
Ingestion Toxicity Information for Wildlife

RI/FS Report, Site 18
NAS Whiting Field
Milton, Florida

Chemical	Test Species	Test Type	Duration	Effect	Lethal RTV			Sublethal RTV			Reference
					Oral LD50	LOAEL	RTV [a]	LOAEL	NOAEL	RTV [a]	
SEMIVOLATILE ORGANIC COMPOUNDS											
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	Multigenerational	Decreased fertility of F1 progeny; decreased F2 litter size				[3] 10		10	McClain, R.M., et al., 1972
	Mouse	Oral (subchronic)	6 months	Mortality		120	12				ATSDR, 1993
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				509,000			RTECS, 1993
	Mouse	Oral LD_{50}		Mortality	800		160				RTECS, 1993
	Mouse	Oral (subchronic)	13 weeks	Renal effects				125			RTECS, 1993
2-Methylnaphthalene	Rat	Oral LD_{50}		Mortality	1,630		326				NIOSH, 1985
Naphthalene	Rat	Oral (chronic)	100 weeks	Ocular lesions				41			USEPA, 1990a
	Rat	Oral (subchronic)	13 weeks	Decreased body weight gain				35.7		3.57	USEPA, 1990a
	Mouse	Oral LD_{50}		Mortality	533		107				ATSDR, 1990a
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

Table E-2
Ingestion Toxicity Information for Wildlife

RI/FS Report, Site 18
NAS Whiting Field
Milton, Florida

Chemical	Test Species	Test Type	Duration	Effect	Lethal RTV			Sublethal RTV			Reference
					Oral LD50	LOAEL	RTV [a]	LOAEL	NOAEL	RTV [a]	
INORGANIC ANALYTES											
Barium	Rat	Oral (chronic)	68 weeks	Renal ultrastructure changes				142			IRIS, 1993
	Rat	Oral (subchronic)	13 weeks	Renal effects				91			Dietz et al., 1992
	Rat	Oral (acute)	10 days	Decreased ovarian weight				198		19.8	ATSDR, 1990b
	Rat	Oral (subchronic)	13 weeks	20% population mortality		430	43				Dietz et al., 1992
Cadmium	Rat	Oral	NR	Reproductive effects				155			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				220			RTECS, 1993
	Rat	Oral	NR	Reproductive effects				21.5		2.15	RTECS, 1993
	Rat	Oral	NR	Reproductive effects				23			RTECS, 1993
	Rat	Oral LD_{50}		Mortality	250						Eisler, 1985
	Rat	Oral LD_{50}	NR	Mortality	225						RTECS, 1993
	Mouse	Oral LD_{50}	NR	Mortality	890						RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				448			RTECS, 1993
	Mouse	Oral	NR	Reproductive effects				1,700			RTECS, 1993
	Guinea pig	Oral LD_{50}	NR	Mortality	150		30				Eisler, 1985
	Mallard	Oral (subchronic)	90 days	Egg production suppressed				10		1	Eisler, 1985
Copper	Rat	Single oral dose		Reproductive effects				152			NIOSH, 1985 and RTECS, 1993
	Rat	Oral LD_{50}	NR	Mortality	940		188				Sax, 1984
	Mouse	Oral (chronic)	30 days	Decreased litter sizes with teratogenic effects				100		10	Lecyk, 1980
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 animal	Oral	NR	Reproductive effects				662			RTECS, 1993
	Mammal	Oral	NR	Reproductive effects				2,118			RTECS, 1993
	Kestrel	Diet	NR	Decreased egg laying fertility; decreased shell thickness					4.61	4.61 [b]	Eisler, 1988a
	Kestrel nestlings	Oral	10 days	Reduced growth and brain weight; abnor 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

Table E-2
Ingestion Toxicity Information for Wildlife

RI/FS Report, Site 18
NAS Whiting Field
Milton, Florida

Chemical	Test Species	Test Type	Duration	Effect	Lethal RTV			Sublethal RTV			Reference
					Oral LD50	LOAEL	RTV [a]	LOAEL	NOAEL	RTV [a]	
	Rock dove	Oral LD_{50}		Mortality	375		75				Kendall and Scanlon, 1985
Manganese	Mouse	Oral (subchronic)	90 days	Delayed growth of testes				140		14	ATSDR, 1990c
	Mouse	Oral (chronic)	103 weeks	Mortality				4,050			ATSDR, 1990c
	Rat	Oral LD_{50}	NR	Mortality	410						ATSDR, 1990c
	Rat	Oral LD_{50}	20 days	Mortality	225						ATSDR, 1990c
	Rat	Oral (subchronic)	20 days	Decreased litter weight during gestation					620		ATSDR, 1990c
	Rat	Oral (chronic)	103 weeks	Mortality				930			ATSDR, 1990c
	Guinea pig	Oral LD_{50}	NR	Mortality	400						USEPA, 1984a
	Monkey	Oral (chronic)	18 months	Weakness, rigidity				25			ATSDR, 1990c
	Rodents/livestoc	Oral (subchronic)	10 days - 2 months	Decreased growth rate				100			Cunningham et al., 1966
	Mouse	Oral (subchronic)	180 days	NOAEL for mortality		2,300	2,300				Gianutsos and Murray, 1982
Nickel	Rat	Oral	NR	Reproductive effects				158			RTECS, 1994
	Rat	Oral LD_{50}	NR	Mortality	67		13.4				ATSDR, 1987a
	Rat	Oral (chronic)	2 years	Decreased body weight gain				50		5	ATSDR, 1987a
	Rat	Oral LD_{50}	NR	Mortality	350						Sax, 1984
	Japanese quail	Oral (acute)	5 days	Mortality	504		102				Hill and Camardese, 1986
	Dog	Oral (chronic)	2 years	Histological lesions in bone marrow				62.5			ATSDR, 1987a
Zinc	Rat	Oral LD_{50}		Mortality	2,510						RTECS, 1993
	Rat	Oral	Gestation	Fetal resorptions in 4 to 20% of population				200		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
NOAEL = No Observed Adverse Effect Level
LOAEL = Lowest 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] 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 šu0.651› (kg). Ingestion rates for the chicken from NRC, 1984 (p

Table E-3
RTVs Selected for Ecological Risk Assessment [a]
Units (mg/kgBW/day)

RI/FS Report, Site 18
NAS Whiting Field
Milton, Florida

Compound	Small Mammal [b]		Small Bird [c]		Predatory Mammal [d]		Predatory Bird [e]	
	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal
Volatile Organic Compounds								
Acetone	600	27,300			600	27,300		
2-Butanone	547	173			547	173		
Carbon disulfide		11				11		
Ethylbenzene	700	29			700	29		
Methylene chloride	320	5			600	5		
Toluene	1000	8			1000	8		
Xylenes (total)	860	50	201		860	50	201	
Semivolatile Organic Compounds								
bis(2-Ethylhexyl)phthalate	160	3.5			160	3.5		
2-Methylnaphthalene	326	10 [f]			326	10 [f]		
Naphthalene	107	3.6			107	3.6		
Phenanthrene	140	10 [f]			140	10 [f]		
Pyrene	160	10 [f]			160	10 [f]		
Inorganic Compounds								
Barium	43	19.8			43	19.8		
Cadmium	30	2.2		1	30	2.2		1
Copper	188	10			188	10		
Lead	60	7	75	4.61	60	7	75	4.61
Manganese	2300	620			2300	620		
Nickel	13	5			13	5	102	
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 E-2.

[b] These RTVs represent chemical concentrations that are not anticipated to result in adverse effects for the cotton mouse or the short tailed shrew.

[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 no data were available, the small bird values were used as a surrogate.

[f] The value for benzo(a)pyrene was used as a surrogate.

Table E-4
Summary of Toxicity Data for Plant Receptors

RI/RA Report, Site 18
NAS Whiting Field
Milton, Florida

Chemical	Reference [a]	RTV in soil (mg/kg)
VOLATILE ORGANICS		
Acetone		NA
2-Butanone		NA
Carbon disulfide		NA
Ethylbenzene		200 [b]
Methylene chloride	Hulzebos et al., 1993	>1,000
Toluene	Will and Suter, 1994	200
Xylene (total)	Hulzebos et al., 1993	>1,000
SEMI-VOLATILE ORGANICS		
bis(2-Ethylhexyl)phthalate	Hulzebos et al., 1993	>1,000
2-Methylnaphthalene		25 [c]
Naphthalene	Hulzebos et al., 1993	100
Phenanthrene		25 [c]
Pyrene		25 [c]
INORGANICS		
Barium	Will and Suter, 1994	500
Cadmium	Will and Suter, 1994	3
Copper	Will and Suter, 1994	100
Lead	Will and Suter, 1994	50
Manganese	Will and Suter, 1994	500
Nickel	Will and Suter, 1994	30
Zinc	Will and Suter, 1994	50
TPH		NA

Notes:

[a] Phytotoxicity benchmarks from Will and Suter (1994) are derived by rank ordering the LOEC values and then picking a number that approximates the 10th percentile. Values from Hulzebos et. al. (1993) represent 14-growth EC50s for Lactuca sativa in soil.

[b] Value for toluene used as a surrogate

[c] Value for acenaphthene used as a surrogate.

TPH = Total Petroleum Hydrocarbon.

NA = Not Available.

LOEC = Lowest Observed Effect Concentration.

Table E-5
Summary of Toxicity Data for Terrestrial Invertebrates

RI/RA Report, Site 18
NAS Whiting Field
Milton, Florida

Chemical	Test Type	Test Duration	Test Species	Chemical Concentration (mg/kg)	Effect	RTV (mg/kg)	Reference
VOLATILE ORGANIC COMPOUNDS							
Acetone	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	Soil Test	14 day	E. foetida	106	LC—d50˜	21 [a]	Neuhauser et al., 1985.
Methylene chloride	Soil Test	14 day	E. foetida	740	LC—d50˜	150 [a]	Neuhauser et al., 1985.
Toluene	Soil Test	14 day	E. foetida	106	LC—d50˜	21 [a]	Neuhauser et al., 1985.
Xylene (total)	Soil Test	14 day	E. foetida	106	LC—d50˜	21 [a]	Neuhauser et al., 1985.
SEMIVOLATILE ORGANIC COMPOUNDS							
bis(2-Ethylhexyl)phthalate	Soil Test	14 day	4 test specie	2,390	LC—d50˜	478 [b]	Neuhauser et al., 1986.
2-Methylnaphthalene	Soil Test	14 day	E. foetida	173	LC—d50˜	34 [a]	Neuhauser et al., 1985.
Naphthalene	Soil Test	14 day	E. foetida	173	LC—d50˜	34 [a]	Neuhauser et al., 1985.
Phenanthrene	Soil Test	14 day	E. foetida	173	LC—d50˜	34 [a]	Neuhauser et al., 1985.
Pyrene	Soil Test	14 day	E. foetida	173	LC—d50˜	34 [a]	Neuhauser et al., 1985.
INORGANIC ANALYTES							
Barium	NA	NA	NA	NA	NA	NA	NA
Cadmium	Soil Test	14 day	E. foetida	900	0 % mortality		Bouche et al., 1987
Cadmium	Soil Test	14 day	E. foetida	2,700	100 % mortality		Bouche et al., 1987
Cadmium	Soil Test	14 day	E. foetida	1,000 [d]	LC—d50˜		van Gestel and van Dis, 1988
Cadmium	Soil Test	20 week	E. foetida	50 [e]	Decrease in cocoon productio	50	Malecki et al., 1982
Cadmium	Soil Test	2 week	E. foetida	1,843	LC—d50˜		Neuhauser et al., 1985
Copper	Soil Test	14 day	E. foetida	10	0 % mortality		Bouche et al., 1987
Copper	Soil Test	14 day	E. foetida	30	20 % mortality	30	Bouche et al., 1987
Copper	Soil Test	20 week	E. foetida	2,000 [e]	Decrease in cocoon production		Malecki et al., 1982
Copper	Soil Test	2 week	E. foetida	643	LC—d50˜		Neuhauser et al., 1985
Lead	Soil Test	20 week	E. foetida	5,000 [e]	Decrease in cocoon production		Malecki et al., 1982
Lead	Soil Test	2 week	E. foetida	5,941	LC—d50˜	1,190 [c]	Neuhauser et al., 1985
Manganese	NA	NA	NA	NA	NA	NA	NA
Nickel	Soil Test	20 week	E. foetida	400 [e]	Decrease in cocoon productio	400	Malecki et al., 1982
Nickel	Soil Test	2 week	E. foetida	757	LC—d50˜		Neuhauser et al., 1985
Zinc	Soil Test	20 week	E. foetida	5,000 [e]	Decrease in cocoon production		Malecki et al., 1982
Zinc	Soil Test	2 week	E. foetida	662	LC—d50˜	130 [c]	Neuhauser et al., 1985
TRPH	NA	NA	NA	NA	NA	NA	NA

NOTES:

[a] Equal to the lowest LC—d50˜ in each chemical class, multiplied by a safety factor of 0.2, as described in text. Value for fluorene used for PAHs.

[b] Mean of LC—d50˜s for four test species (—iA. tuberculata, E. foetida, E. eugeniae˜, and —iP. excavatus˜) from artificial soil tests; values used for a whole chemical class are multiplied by a factor of 0.2 (Neuhauser et al., 1986). Value for dimethylphthalate used for phthalates.

[c] Conservative factor of 0.2 applied to endpoint; resultant value should be protective of 99.9% of the exposed population from acute effects (USEPA, 1986a).

[d] LC—d50˜ value for soil at pH = 7.0; LC—d50˜ = 320 ug/g - 560 ug/g for soil pH = 4.1

[e] Acetate salt

NA = Not available

TRPH = Total recoverable petroleum hydrocarbons

Table E-(
Exposure . ameters and Assumptions for Terrestrial Receptors [a]
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

Representative Wildlife Species		Percent Prey in Diet: In 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)	## 88%	0%	0%	2%	0.147	1	1.00E+00	0.0029	0.021
Short-tailed shrew	(Small omn. mammal)	## 12%	0%	0%	10%	0.96	1	1.00E+00	0.0024	0.017
Mourning dove	(Small herb. bird)	## 94%	0%	0%	5%	5	1	1.00E+00	0.0154	0.13
Red fox	(Predatory mammal)	## 10%	57%	10%	3%	250	1	2.00E-02	0.24	4.69
Red-tailed hawk	(Predatory bird)	## 0%	70%	27%	3%	800	1	6.25E-03	0.113	1.02

NOTES:

SITE AREA:	5.0 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 E-7
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
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]
2-Butanone	1.1E-01	NA	0.0E+00	NA	0.0E+00	NA	NA
Acetone	2.6E-01	NA	0.0E+00	NA	0.0E+00	NA	NA
Carbon disulfide	4.8E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
Ethylbenzene	7.8E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
Methylene chloride	8.6E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
Toluene	4.9E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
Xylenes (total)	1.4E+00	NA	0.0E+00	NA	0.0E+00	NA	NA
2-Methylnaphthalene	7.0E+00	5.0E-02	3.5E-01	7.6E-03	5.3E-02	2.4E-01	NA
Naphthalene	2.7E+00	5.0E-02	1.3E-01	7.6E-03	2.0E-02	2.4E-01	NA
Phenanthrene	2.2E+00	5.0E-02	1.1E-01	7.6E-03	1.7E-02	2.4E-01	NA
Pyrene	2.4E+00	5.0E-02	1.2E-01	7.6E-03	1.8E-02	2.4E-01	NA
bis(2-Ethylhexyl)phthalate	2.8E+00	5.0E-02	1.4E-01	6.7E-03	1.9E-02	3.0E-01	NA
Barium	3.3E+01	3.4E-01	1.1E+01	3.0E-02	9.8E-01	7.5E-03	NA
Cadmium	3.7E+00	2.4E+00	8.9E+00	3.3E+01	1.2E+02	2.1E+00	3.8E-01
Copper	4.2E+01	3.9E-01	1.6E+01	7.8E-01	3.3E+01	6.0E-01	NA
Lead	8.4E+01	3.1E-01	2.6E+01	0.0E+00	0.0E+00	1.5E-02	NA
Manganese	7.0E+01	4.8E-01	3.4E+01	5.0E-02	3.5E+00	2.0E-02	NA
Nickel	3.6E+00	3.2E+00	1.2E+01	1.2E-02	4.3E-02	3.0E-01	NA
Zinc	6.2E+01	9.5E-01	5.9E+01	6.1E-01	3.8E+01	2.1E+00	NA
TRPH	7.0E+03	NA	0.0E+00	NA	0.0E+00	NA	NA

ECPC = Ecological Contaminant of Potential Concern
TRPH = Total recoverable petroleum hydrocarbons

[a] Bioaccumulation data presented in: Appendix E, Table E-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
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

POTENTIAL DIETARY EXPOSURE (mg/kgBW/day) [d]

ANALYTE	*Cotton mouse*	*Short-tailed shrew*	*Mourning dove*	*Red fox*	*Red-tailed hawk*
2-Butanone	3.0E-04	1.5E-03	6.5E-04	3.3E-06	2.3E-06
Acetone	7.2E-04	3.7E-03	1.6E-03	8.0E-06	5.4E-06
Carbon disulfide	1.3E-04	6.7E-04	2.8E-04	1.5E-06	9.9E-07
Ethylbenzene	2.1E-04	1.1E-03	4.6E-04	2.4E-06	1.6E-06
Methylene chloride	2.4E-04	1.2E-03	5.1E-04	2.6E-06	1.8E-06
Toluene	1.4E-04	6.9E-04	2.9E-04	1.5E-06	1.0E-06
Xylenes (total)	3.8E-03	1.9E-02	8.1E-03	4.2E-05	2.8E-05
2-Methylnaphthalene	5.9E-02	3.7E-01	5.0E-02	9.6E-04	3.2E-04
Naphthalene	1.5E-02	7.8E-02	1.9E-02	2.1E-04	9.4E-05
Phenanthrene	1.1E-02	5.8E-02	1.5E-02	1.6E-04	7.4E-05
Pyrene	1.3E-02	6.6E-02	1.7E-02	1.8E-04	8.2E-05
bis(2-Ethylhexyl)phthalate	1.5E-02	8.3E-02	1.9E-02	2.3E-04	1.1E-04
Barium	5.3E+00	4.1E+01	7.4E-01	8.0E-02	1.3E-03
Cadmium	1.5E+01	5.7E+00	1.4E+01	1.5E-01	8.1E-02
Copper	1.4E+01	7.7E+01	4.7E+00	4.0E-01	9.5E-02
Lead	3.0E+01	2.4E+02	3.1E+00	4.6E-01	8.8E-03
Manganese	3.3E+01	2.6E+02	3.6E+00	5.2E-01	1.2E-02
Nickel	5.9E-01	4.6E+00	7.5E-02	1.2E-02	2.8E-03
Zinc	5.5E+01	4.0E+02	8.8E+00	2.9E+00	1.6E+00
TRPH	1.9E+01	9.8E+01	4.1E+01	2.1E-01	1.4E-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 E-8
Risk from Potential Lethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	*Cotton mouse*			*Short-tailed shrew*			*Mourning dove*		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
2-Butanone	3.0E-04	5.5E+02	5.5E-07	1.5E-03	5.5E+02	2.8E-06	6.5E-04		0.0E+00
Acetone	7.2E-04	6.0E+02	1.2E-06	3.7E-03	6.0E+02	6.2E-06	1.6E-03		0.0E+00
Carbon disulfide	1.3E-04		0.0E+00	6.7E-04		0.0E+00	2.8E-04		0.0E+00
Ethylbenzene	2.1E-04	7.0E+02	3.1E-07	1.1E-03	7.0E+02	1.6E-06	4.6E-04		0.0E+00
Methylene chloride	2.4E-04	3.2E+02	7.4E-07	1.2E-03	3.2E+02	3.8E-06	5.1E-04		0.0E+00
Toluene	1.4E-04	1.0E+03	1.4E-07	6.9E-04	1.0E+03	6.9E-07	2.9E-04		0.0E+00
Xylenes (total)	3.8E-03	8.6E+02	4.4E-06	1.9E-02	8.6E+02	2.2E-05	8.1E-03	2.0E+02	4.0E-05
2-Methylnaphthalene	5.9E-02	3.3E+02	1.8E-04	3.7E-01	3.3E+02	1.1E-03	5.0E-02		0.0E+00
Naphthalene	1.5E-02	1.1E+02	1.4E-04	7.8E-02	1.1E+02	7.3E-04	1.9E-02		0.0E+00
Phenanthrene	1.1E-02	1.4E+02	8.2E-05	5.8E-02	1.4E+02	4.1E-04	1.5E-02		0.0E+00
Pyrene	1.3E-02	1.6E+02	8.0E-05	6.6E-02	1.6E+02	4.1E-04	1.7E-02		0.0E+00
bis(2-Ethylhexyl)phthalate	1.5E-02	1.6E+02	9.7E-05	8.3E-02	1.6E+02	5.2E-04	1.9E-02		0.0E+00
Barium	5.3E+00	4.3E+01	1.2E-01	4.1E+01	4.3E+01	9.5E-01	7.4E-01		0.0E+00
Cadmium	1.5E+01	3.0E+01	5.1E-01	5.7E+00	3.0E+01	1.9E-01	1.4E+01		0.0E+00
Copper	1.4E+01	1.9E+02	7.3E-02	7.7E+01	1.9E+02	4.1E-01	4.7E+00		0.0E+00
Lead	3.0E+01	6.0E+01	5.1E-01	2.4E+02	6.0E+01	4.0E+00	3.1E+00	7.5E+01	4.1E-02
Manganese	3.3E+01	2.3E+03	1.4E-02	2.6E+02	2.3E+03	1.1E-01	3.6E+00		0.0E+00
Nickel	5.9E-01	1.3E+01	4.5E-02	4.6E+00	1.3E+01	3.6E-01	7.5E-02	1.0E+02	7.4E-04
Zinc	5.5E+01	5.0E+02	1.1E-01	4.0E+02	5.0E+02	7.9E-01	8.8E+00		0.0E+00
TPH	1.9E+01		0.0E+00	9.8E+01		0.0E+00	4.1E+01		0.0E+00
SUMMARY HAZARD INDEX			1.4E+00			6.8E+00			4.2E-02

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Ta)-8
Risk ..om Potential Lethal Effects for Terrestrial Receptors from Reasonable Ma.. ..um Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	Red fox			Red-tailed hawk		
	PDE	RTV	HQ	PDE	RTV	HQ
2-Butanone	3.3E-06	5.5E+02	6.1E-09	2.3E-06		0.0E+00
Acetone	8.0E-06	6.0E+02	1.3E-08	5.4E-06		0.0E+00
Carbon disulfide	1.5E-06		0.0E+00	9.9E-07		0.0E+00
Ethylbenzene	2.4E-06	7.0E+02	3.4E-09	1.6E-06		0.0E+00
Methylene chloride	2.6E-06	6.0E+02	4.4E-09	1.8E-06		0.0E+00
Toluene	1.5E-06	1.0E+03	1.5E-09	1.0E-06		0.0E+00
Xylenes (total)	4.2E-05	8.6E+02	4.9E-08	2.8E-05	2.0E+02	1.4E-07
2-Methylnaphthalene	9.6E-04	3.3E+02	3.0E-06	3.2E-04		0.0E+00
Naphthalene	2.1E-04	1.1E+02	1.9E-06	9.4E-05		0.0E+00
Phenanthrene	1.6E-04	1.4E+02	1.1E-06	7.4E-05		0.0E+00
Pyrene	1.8E-04	1.6E+02	1.1E-06	8.2E-05		0.0E+00
bis(2-Ethylhexyl)phthalate	2.3E-04	1.6E+02	1.5E-06	1.1E-04		0.0E+00
Barium	8.0E-02	4.3E+01	1.9E-03	1.3E-03		0.0E+00
Cadmium	1.5E-01	3.0E+01	4.9E-03	8.1E-02		0.0E+00
Copper	4.0E-01	1.9E+02	2.1E-03	9.5E-02		0.0E+00
Lead	4.6E-01	6.0E+01	7.6E-03	8.8E-03	7.5E+01	1.2E-04
Manganese	5.2E-01	2.3E+03	2.3E-04	1.2E-02		0.0E+00
Nickel	1.2E-02	1.3E+01	9.1E-04	2.8E-03	1.0E+02	5.9E-04
Zinc	2.9E+00	5.0E+02	5.9E-03	1.6E+00		0.0E+00
TPH	2.1E-01		0.0E+00	1.4E-01		0.0E+00
SUMMARY HAZARD INDEX			2.4E-02			7.1E-04

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Table E-9
Risk from Potential Sublethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	Cotton mouse			Short-tailed shrew			Mourning dove		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
2-Butanone	3.0E-04	1.7E+02	1.7E-06	1.5E-03	1.7E+02	8.9E-06	6.5E-04		0.0E+00
Acetone	7.2E-04	2.7E+04	2.7E-08	3.7E-03	2.7E+04	1.4E-07	1.6E-03		0.0E+00
Carbon disulfide	1.3E-04	1.1E+01	1.2E-05	6.7E-04	1.1E+01	6.1E-05	2.8E-04		0.0E+00
Ethylbenzene	2.1E-04	2.9E+01	7.4E-06	1.1E-03	2.9E+01	3.8E-05	4.6E-04		0.0E+00
Methylene chloride	2.4E-04	5.3E+00	4.5E-05	1.2E-03	5.3E+00	2.3E-04	5.1E-04		0.0E+00
Toluene	1.4E-04	7.6E+00	1.8E-05	6.9E-04	7.6E+00	9.1E-05	2.9E-04		0.0E+00
Xylenes (total)	3.8E-03	5.0E+01	7.5E-05	1.9E-02	5.0E+01	3.9E-04	8.1E-03		0.0E+00
2-Methylnaphthalene	5.9E-02	1.0E+01	5.9E-03	3.7E-01	1.0E+01	3.7E-02	5.0E-02		0.0E+00
Naphthalene	1.5E-02	3.6E+00	4.1E-03	7.8E-02	3.6E+00	2.2E-02	1.9E-02		0.0E+00
Phenanthrene	1.1E-02	1.0E+01	1.1E-03	5.8E-02	1.0E+01	5.8E-03	1.5E-02		0.0E+00
Pyrene	1.3E-02	1.0E+01	1.3E-03	6.6E-02	1.0E+01	6.6E-03	1.7E-02		0.0E+00
bis(2-Ethylhexyl)phthalate	1.5E-02	3.5E+01	4.4E-04	8.3E-02	3.5E+01	2.4E-03	1.9E-02		0.0E+00
Barium	5.3E+00	2.0E+01	2.7E-01	4.1E+01	2.0E+01	2.1E+00	7.4E-01		0.0E+00
Cadmium	1.5E+01	2.2E+00	7.0E+00	5.7E+00	2.2E+00	2.6E+00	1.4E+01	1.0E+00	1.4E+01
Copper	1.4E+01	1.0E+01	1.4E+00	7.7E+01	1.0E+01	7.7E+00	4.7E+00		0.0E+00
Lead	3.0E+01	7.0E+00	4.3E+00	2.4E+02	7.0E+00	3.4E+01	3.1E+00	4.6E+00	6.7E-01
Manganese	3.3E+01	6.2E+02	5.4E-02	2.6E+02	6.2E+02	4.2E-01	3.6E+00		0.0E+00
Nickel	5.9E-01	5.0E+00	1.2E-01	4.6E+00	5.0E+00	9.2E-01	7.5E-02		0.0E+00
Zinc	5.5E+01	2.0E+02	2.7E-01	4.0E+02	2.0E+02	2.0E+00	8.8E+00		0.0E+00
TRPH	1.9E+01		0.0E+00	9.8E+01		0.0E+00	4.1E+01		0.0E+00
SUMMARY HAZARD INDEX			1.3E+01			5.0E+01			1.4E+01

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)
TRPH = Total recoverable petroleum hydrocarbons

Table E-
Risk from Potential Sublethal Effects for Terrestrial Receptors from Reasonable Maximum Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	Red fox			Red-tailed hawk		
	PDE	RTV	HQ	PDE	RTV	HQ
2-Butanone	3.3E-06	1.7E+02	1.9E-08	2.3E-06		0.0E+00
Acetone	8.0E-06	2.7E+04	2.9E-10	5.4E-06		0.0E+00
Carbon disulfide	1.5E-06	1.1E+01	1.3E-07	9.9E-07		0.0E+00
Ethylbenzene	2.4E-06	2.9E+01	8.2E-08	1.6E-06		0.0E+00
Methylene chloride	2.6E-06	5.3E+00	5.0E-07	1.8E-06		0.0E+00
Toluene	1.5E-06	7.6E+00	2.0E-07	1.0E-06		0.0E+00
Xylenes (total)	4.2E-05	5.0E+01	8.4E-07	2.8E-05		0.0E+00
2-Methylnaphthalene	9.6E-04	1.0E+01	9.6E-05	3.2E-04		0.0E+00
Naphthalene	2.1E-04	3.6E+00	5.8E-05	9.4E-05		0.0E+00
Phenanthrene	1.6E-04	1.0E+01	1.6E-05	7.4E-05		0.0E+00
Pyrene	1.8E-04	1.0E+01	1.8E-05	8.2E-05		0.0E+00
bis(2-Ethylhexyl)phthalate	2.3E-04	3.5E+00	6.7E-05	1.1E-04		0.0E+00
Barium	8.0E-02	2.0E+01	4.0E-03	1.3E-03		0.0E+00
Cadmium	1.5E-01	2.2E+00	6.7E-02	8.1E-02	1.0E+00	8.1E-02
Copper	4.0E-01	1.0E+01	4.0E-02	9.5E-02		0.0E+00
Lead	4.6E-01	7.0E+00	6.5E-02	8.8E-03	4.6E+00	1.9E-03
Manganese	5.2E-01	6.2E+02	8.4E-04	1.2E-02		0.0E+00
Nickel	1.2E-02	5.0E+00	2.4E-03	2.8E-03		0.0E+00
Zinc	2.9E+00	2.0E+02	1.5E-02	1.6E+00		0.0E+00
TRPH	2.1E-01		0.0E+00	1.4E-01		0.0E+00
SUMMARY HAZARD INDEX			1.9E-01			8.3E-02

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)
TRPH = Total recoverable petroleum hydrocarbons

Table E-10
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Central Tendency Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
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 TENDANCY OSURE CONCENTRATION (mg/kg)	Invert BAF [a]	Concentration in nvertebrate Tissue [b] (mg/kg)	Plant BAF [a]	Concentration in Plant Tissue [c] (mg/kg)	Small Mammal BAF [a]	Small Bird BAF [a]
2-Butanone	1.0E-01	NA	0.0E+00	NA	0.0E+00	NA	NA
Acetone	1.2E-01	NA	0.0E+00	NA	0.0E+00	NA	NA
Carbon disulfide	4.0E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
Ethylbenzene	5.5E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
Methylene chloride	5.3E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
Toluene	3.6E-02	NA	0.0E+00	NA	0.0E+00	NA	NA
Xylenes (total)	4.1E-01	NA	0.0E+00	NA	0.0E+00	NA	NA
2-Methylnaphthalene	3.5E+00	5.0E-02	1.7E-01	7.6E-03	2.6E-02	2.4E-01	NA
Naphthalene	1.5E+00	5.0E-02	7.5E-02	7.6E-03	1.1E-02	2.4E-01	NA
Phenanthrene	1.5E+00	5.0E-02	7.4E-02	7.6E-03	1.1E-02	2.4E-01	NA
Pyrene	1.4E+00	5.0E-02	7.2E-02	7.6E-03	1.1E-02	2.4E-01	NA
bis(2-Ethylhexyl)phthalate	1.5E+00	5.0E-02	7.5E-02	6.7E-03	1.0E-02	3.0E-01	NA
Barium	2.7E+01	3.4E-01	9.0E+00	3.0E-02	8.0E-01	7.5E-03	NA
Cadmium	3.1E+00	2.4E+00	7.4E+00	3.3E+01	1.0E+02	2.1E+00	3.8E-01
Copper	3.6E+01	3.9E-01	1.4E+01	7.8E-01	2.8E+01	6.0E-01	NA
Lead	3.1E+01	3.1E-01	9.7E+00	0.0E+00	0.0E+00	1.5E-02	NA
Manganese	5.7E+01	4.8E-01	2.7E+01	5.0E-02	2.9E+00	2.0E-02	NA
Nickel	3.0E+00	3.2E+00	9.6E+00	1.2E-02	3.6E-02	3.0E-01	NA
Zinc	4.4E+01	9.5E-01	4.1E+01	6.1E-01	2.7E+01	2.1E+00	NA
TRPH	5.1E+03	NA	0.0E+00	NA	0.0E+00	NA	NA

ECPC = Ecological Contaminant of Potential Concern
TRPH = Total recoverable petroleum hydrocarbons

[a] Bioaccumulation data presented in: Appendix E, Table E-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.

Ta -10
Estimated Chronic Exposure to Terrestrial Receptors from Ingestion of Centra endency Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

POTENTIAL DIETARY EXPOSURE (mg/kgBW/day) [d]

ANALYTE	*Cotton mouse*	*Short-tailed shrew*	*Mourning dove*	*Red fox*	*Red-tailed hawk*
2-Butanone	2.9E-04	1.5E-03	6.2E-04	3.2E-06	2.2E-06
Acetone	3.3E-04	1.7E-03	7.0E-04	3.6E-06	2.5E-06
Carbon disulfide	1.1E-04	5.7E-04	2.4E-04	1.2E-06	8.4E-07
Ethylbenzene	1.5E-04	7.7E-04	3.2E-04	1.7E-06	1.1E-06
Methylene chloride	1.5E-04	7.5E-04	3.1E-04	1.6E-06	1.1E-06
Toluene	1.0E-04	5.1E-04	2.2E-04	1.1E-06	7.6E-07
Xylenes (total)	1.1E-03	5.8E-03	2.4E-03	1.3E-05	8.5E-06
2-Methylnaphthalene	2.1E-02	1.2E-01	2.4E-02	3.1E-04	1.3E-04
Naphthalene	7.0E-03	3.4E-02	1.0E-02	9.1E-05	4.8E-05
Phenanthrene	6.9E-03	3.3E-02	1.0E-02	8.9E-05	4.7E-05
Pyrene	6.7E-03	3.2E-02	9.8E-03	8.6E-05	4.6E-05
bis(2-Ethylhexyl)phthalate	6.9E-03	3.4E-02	1.0E-02	9.6E-05	5.2E-05
Barium	3.5E+00	2.7E+01	5.3E-01	5.2E-02	9.4E-04
Cadmium	1.3E+01	4.3E+00	1.1E+01	1.1E-01	6.6E-02
Copper	1.0E+01	5.5E+01	3.9E+00	2.8E-01	6.8E-02
Lead	4.3E+00	3.4E+01	5.5E-01	6.4E-02	1.6E-03
Manganese	2.2E+01	1.7E+02	2.5E+00	3.5E-01	7.9E-03
Nickel	4.1E-01	3.2E+00	5.6E-02	8.3E-03	1.9E-03
Zinc	2.8E+01	2.0E+02	5.4E+00	1.5E+00	8.3E-01
TRPH	1.4E+01	7.1E+01	3.0E+01	1.6E-01	1.1E-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 E-11
Risk from Potential Lethal Effects for Terrestrial Receptors from Central Tendancy Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	Cotton mouse			Short-tailed shrew			Mourning dove		
	PDE	RTV	HQ	PDE	RTV	HQ	PDE	RTV	HQ
2-Butanone	2.9E-04	5.5E+02	5.3E-07	1.5E-03	5.5E+02	2.7E-06	6.2E-04		0.0E+00
Acetone	3.3E-04	6.0E+02	5.4E-07	1.7E-03	6.0E+02	2.8E-06	7.0E-04		0.0E+00
Carbon disulfide	1.1E-04		0.0E+00	5.7E-04		0.0E+00	2.4E-04		0.0E+00
Ethylbenzene	1.5E-04	7.0E+02	2.2E-07	7.7E-04	7.0E+02	1.1E-06	3.2E-04		0.0E+00
Methylene chloride	1.5E-04	3.2E+02	4.6E-07	7.5E-04	3.2E+02	2.3E-06	3.1E-04		0.0E+00
Toluene	1.0E-04	1.0E+03	1.0E-07	5.1E-04	1.0E+03	5.1E-07	2.2E-04		0.0E+00
Xylenes (total)	1.1E-03	8.6E+02	1.3E-06	5.8E-03	8.6E+02	6.7E-06	2.4E-03	2.0E+02	1.2E-05
2-Methylnaphthalene	2.1E-02	3.3E+02	6.5E-05	1.2E-01	3.3E+02	3.6E-04	2.4E-02		0.0E+00
Naphthalene	7.0E-03	1.1E+02	6.6E-05	3.4E-02	1.1E+02	3.1E-04	1.0E-02		0.0E+00
Phenanthrene	6.9E-03	1.4E+02	4.9E-05	3.3E-02	1.4E+02	2.3E-04	1.0E-02		0.0E+00
Pyrene	6.7E-03	1.6E+02	4.2E-05	3.2E-02	1.6E+02	2.0E-04	9.8E-03		0.0E+00
bis(2-Ethylhexyl)phthalate	6.9E-03	1.6E+02	4.3E-05	3.4E-02	1.6E+02	2.1E-04	1.0E-02		0.0E+00
Barium	3.5E+00	4.3E+01	8.1E-02	2.7E+01	4.3E+01	6.2E-01	5.3E-01		0.0E+00
Cadmium	1.3E+01	3.0E+01	4.3E-01	4.3E+00	3.0E+01	1.4E-01	1.1E+01		0.0E+00
Copper	1.0E+01	1.9E+02	5.5E-02	5.5E+01	1.9E+02	2.9E-01	3.9E+00		0.0E+00
Lead	4.3E+00	6.0E+01	7.1E-02	3.4E+01	6.0E+01	5.6E-01	5.5E-01	7.5E+01	7.3E-03
Manganese	2.2E+01	2.3E+03	9.6E-03	1.7E+02	2.3E+03	7.5E-02	2.5E+00		0.0E+00
Nickel	4.1E-01	1.3E+01	3.2E-02	3.2E+00	1.3E+01	2.5E-01	5.6E-02	1.0E+02	5.5E-04
Zinc	2.8E+01	5.0E+02	5.6E-02	2.0E+02	5.0E+02	4.0E-01	5.4E+00		0.0E+00
TRPH	1.4E+01		0.0E+00	7.1E+01		0.0E+00	3.0E+01		0.0E+00
SUMMARY HAZARD INDEX			7.3E-01			2.3E+00			7.8E-03

PDE = Potential Dietary Exposure (mg/kgBW/day) RTV = Reference Toxicity Value (mg/kgBW/day) HQ = Hazard Quotient (calculated by dividing PDE by RTV)
TRPH = Total recoverable petroleum hydrocarbons

le E-11
isk from Potential Lethal Effects for Terrestrial Receptors from Central . dancy Exposure Concentrations of ECPCs in Food and Surface Soil
Site 18
Remedial Investigation and Feasibility Study, Site 18
Naval Air Station Whiting Field, Milton, Florida

ANALYTE	Red fox			Red-tailed hawk		
	PDE	RTV	HQ	PDE	RTV	HQ
2-Butanone	3.2E-06	5.5E+02	5.8E-09	2.2E-06		0.0E+00
Acetone	3.6E-06	6.0E+02	6.0E-09	2.5E-06		0.0E+00
Carbon disulfide	1.2E-06		0.0E+00	8.4E-07		0.0E+00
Ethylbenzene	1.7E-06	7.0E+02	2.4E-09	1.1E-06		0.0E+00
Methylene chloride	1.6E-06	6.0E+02	2.7E-09	1.1E-06		0.0E+00
Toluene	1.1E-06	1.0E+03	1.1E-09	7.6E-07		0.0E+00
Xylenes (total)	1.3E-05	8.6E+02	1.5E-08	8.5E-06		4.2E-08
2-Methylnaphthalene	3.1E-04	3.3E+02	9.5E-07	1.3E-04	2.0E+02	0.0E+00
Naphthalene	9.1E-05	1.1E+02	8.5E-07	4.8E-05		0.0E+00
Phenanthrene	8.9E-05	1.4E+02	6.3E-07	4.7E-05		0.0E+00
Pyrene	8.6E-05	1.6E+02	5.4E-07	4.6E-05		0.0E+00
bis(2-Ethylhexyl)phthalate	9.6E-05	1.6E+02	6.0E-07	5.2E-05		0.0E+00
Barium	5.2E-02	4.3E+01	1.2E-03	9.4E-04		0.0E+00
Cadmium	1.1E-01	3.0E+01	3.8E-03	6.6E-02		0.0E+00
Copper	2.8E-01	1.9E+02	1.5E-03	6.8E-02		0.0E+00
Lead	6.4E-02	6.0E+01	1.1E-03	1.6E-03		2.2E-05
Manganese	3.5E-01	2.3E+03	1.5E-04	7.9E-03	7.5E+01	0.0E+00
Nickel	8.3E-03	1.3E+01	6.3E-04	1.9E-03		4.1E-05
Zinc	1.5E+00	5.0E+02	3.0E-03	8.3E-01	1.0E+02	0.0E+00
TRPH	1.6E-01		0.0E+00	1.1E-01		0.0E+00
SUMMARY HAZARD INDEX			1.1E-02			6.3E-05

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

RESPONSE TO COMMENTS FOR SITE 18 REMEDIAL INVESTIGATION REPORT

RESPONSE TO COMMENTS

EPA Review Comments Report for
Remedial Investigation Report for Site 18
Crash Crew Training Area
February 1998

1. **Page 3-1, Second Paragraph. The text states that the Data Management and Health and Safety Plans are located in Volume III of the RI/FS (E.C. Jordan, 1990). This reference is actually titled Remedial Investigation and Feasibility Study Planning Document Naval Air Station, Whiting Field, Milton, Florida. The text should be corrected to indicate that the reference mentioned is the Planning Document.**

   Response: Agreed, corrections will be made to the text.

2. **Page 3-3, First Paragraph. The text briefly mentions the establishment of background screening criteria but does not reference an approved plan for the collection of background soil samples. The approved method of collecting background samples should be referenced and the background screening criteria should be added to the tables of analytical results for comparisons in the RI Report.**

   Response: The background soil sampling program including the background screening criteria is described in detail in section 3.3.1 of the General Information Report for NAS Whiting Field. The background screening criteria for the individual parameters are included on Table 5-9 which summarizes the site specific analytical data, the background screening criteria , and federal and Florida regulatory values.

3. **Page 3-3, Second Paragraph. The text states that "...29 subsurface soil samples were collected." According to Page 3-1 and Tables 5-10 and 5-11, the number of subsurface soil samples collected was 24. This discrepancy should be corrected.**

   Response: The correct number of surface soil samples is 24, corrections will be made to the text.

4. **Page 5-36, Second Paragraph. The subsection is incorrectly titled TCL VOCs. The correct title should be TCL SVOCs. This correction should be made.**

   Response: Agreed, corrections will be made to the text.

5. **Page 8-6, Fourth Paragraph. The text lists the reduced forms of chromium ions as Cr^{3+}, $CrOH^{2+}$, $CrOH^{2+}$, $Cr(OH)_2^+$ and $CrOH^{4-}$. $CrOH^{2+}$ has been listed twice and the ion, $CrOH^{4-}$ is probably intended to have been listed as, $Cr(OH)_4^-$. The correction should be made.**

   Response: Agreed, corrections will be made to the text.

6. **<u>Page 8-9, Second Paragraph</u>. The text states that "Clear Creek is located approximately <u>5,000</u> feet southwest of Site 18". However, on Page 9-1 (Fourth Bullet), the text states that Clear Creek is located approximately <u>2,500</u> feet southwest of the site. According to Figure 1-2, the scale indicates Clear Creek to be approximately <u>3,500</u> feet southwest of Site 18. These discrepancies in the distance of Clear Creek relative to Site 18 should be corrected.**

   Response: Agreed, The correct distance is approximately 3,000 feet, corrections will be made to the text.

7. **<u>Page 9-1, First Paragraph, Second Bullet</u>. The text states that "PCBs were not detected in the surface soil samples." This statement should be corrected to read "PCBs were not detected in the subsurface soil samples"**

   Response: Agreed, corrections will be made to the text.

8. **<u>Page 9-1, First Paragraph, Second Bullet</u>. The text discusses organic analytes that were detected in subsurface soil samples. The text lists those organic analytes that did not exceed Florida and/or EPA Region III residential and/or industrial screening criteria. However the text fails to mention that total recoverable petroleum hydrocarbon (TRPH) was detected at concentrations that exceed Florida screening criteria. This information should be included.**

   Response: Agreed, corrections will be made to the text.

The following comments were generated from the review of the risk assessment portion of the RI Report:

GENERAL COMMENTS

9. **The groundwater sampling conducted at the site consisted of a Phase IIA investigation in October 1993 and a Phase IIB investigation in July 1996. During Phase IIB, groundwater samples were collected using the low flow sampling process, which results in less turbid groundwater samples when compared with the samples obtained using conventional methods during Phase IIA sampling. Because the less turbid samples were stated to be more representative of the surficial aquifer, the preferred data set was from the Phase IIB sampling event. It was noted that chemicals detected in the groundwater samples collected during the Phase IIA sampling event that were not detected in the groundwater samples collected in Phase IIB were included in the final data set. However, it appears that the presence of dichlorodiphenyltrichloroethene (DDT), detected in two samples during the Phase IIA investigation, was not included in the evaluation of the groundwater at the site. Neither Table 6-3 or Table D-3, which present the screening of constituents against risk-based concentrations (RBCs) to determine the human health chemicals of potential concern (HHCPC), indicate that DDT was evaluated. The document should be corrected to include the evaluation of DDT in groundwater.**

   Response: The statement "chemicals detected in the groundwater samples collected during the Phase IIA sampling event that were not detected in the groundwater samples collected in Phase IIB were included in the final data set." was in error. Only those compounds detected in groundwater

samples collected using the low flow sampling process (samples collected during Phase IIB) were evaluated in the risk assessment. The statement will be removed from the text.

SPECIFIC COMMENTS

10. **<u>Table 5-1, Page 5-5</u>. This table presents a summary of the water-level elevations at Site 18. The groundwater elevation measured during the November 1996 investigation for monitoring well WHF-17-3 is listed in the table as 93.53 feet above mean sea level (ft msl). This is inconsistent with Figure 5-1 which presents the investigation results on a groundwater contour map of the water table. The figure indicates that the groundwater elevation at monitoring well WHF-17-3 is 90.94 ft msl. The inconsistency between the table and figure should be corrected. In addition, pages 5-5 and 5-6 provide identical information. The duplicate copy of this information should be removed from the document to avoid unnecessary confusion.**

    Response: The correct measurement is 90.94 ft msl; corrections will be made to the text. In addition the redundant information on page 5-5 will be removed.

11. **<u>Table 5-8, Page 5-32</u>. The table presents a summary of the analytical results of organic constituents in the surface soil. The table lists the residential risk-based concentrations (RBCs) for benzo(a)anthracene and benzo(a)pyrene as 0.0088 ug/kg and 0.00088 ug/kg, respectively. These values are incorrect. The appropriate RBC value for benzo(a)anthracene is 880 ug/kg and the RBC for benzo(a)pyrene is 88 ug/kg for residential soil. The table should be corrected accordingly.**

    Response: Agreed, corrections will be made to the text.

12. **<u>Table 6-2, Page 6-8</u>. The table presents the selection of HHCPC for subsurface soil associated with Site 18. However, the table does not screen all constituents detected in the subsurface soil against residential RBCs or Florida Soil Cleanup Goals. According to Table 5-12, which presents a summary of the organic constituents in the subsurface soil, the pesticides 4,4-DDD, 4,4-DDE, and 4,4-DDT were detected in one of the subsurface soil samples. Therefore, 4,4-DDD, 4,4-DDE, and 4,4-DDT should be screened against residential RBCs and should appear on Table 6-2.**

    Response: As indicated on page 6-7, second paragraph " Subsurface soil sample from intervals greater then 15 feet were not included in the risk assessment data set." Therefore, although the pesticide compounds 4,4-DDE and 4,4 DDT were detected in subsurface soil samples (Sample 18SB4 40 - 42; sample depth 40 to 42 ft. below land surface), these compounds were not detected in samples from the upper 15 feet of ground surface. The pesticide compound 4,4-DDD was detected (sample 18SB01 5 - 7; depth 5 to 7 ft. below land surface) in a sample within the upper 15 ft of the ground surface and will be added to the risk assessment data base and evaluated.

13. **<u>Section 6.4, Page 6-18</u>. The text states that Appendix D contains brief toxicity summaries for HHCPCs identified in the surface and subsurface soil at Site 18. However, toxicity information for the HHCPC is not provided in the document. The document should include a brief toxicological profile for each of the constituents determined to be HHCPC at the site.**

Response: Agree. Brief toxicological profiles for each of the constituents documented to be HHCPCs will be provided.

14. **<u>Figure 7-3</u>. This figure presents the ecological contaminant of potential concern selection process. The flow chart would more accurately display the selection process if the first decision diamond indicated "detected in less than or equal to 5% of the samples" instead of "detected in less than 5% of the samples".**

Response: Agree. Figure 7-3 will be changed to read "detected in less than or equal to 5% of the samples".

15. **<u>Table 7-3</u>. This table provides the equations used to calculate the potential dietary exposures for wildlife receptors. The variable entitled "secondary prey item concentration" needs to be better defined. Sufficient information should be provided to allow the reader to calculate potential dietary exposures (PDEs) without needing to review the General Information Report prepared by ABB-ES in 1997. Please provide equations to represent how contaminant concentrations in the tissue of mammalian and avian food items are calculated in this ERA.**

Response: Agree. The terms "primary prey item concentration" and "secondary prey concentration" will be defined in a foot note. The following two footnotes will be added to Table 7-3.

"Primary prey contains site related chemicals in their tissues from direct ingestion of contaminated media (i.e., plants, earthworms, etc.)" and

"Secondary prey contains site related chemicals in their tissues from ingestion of primary food items. Secondary prey do not directly consume contaminated media (i.e., surface soil) as a food source".

Also, the variable "T_N" 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 is needed.

Response: Agree. The ERA will redefine the term "T_N". The term refers to the chemical concentration in the tissues of food item "N". The total exposure relates the dietary exposure from all food items, which includes soil, primary prey (tissue concentration as a result of direct ingestion of soil), and secondary prey (tissue concentration as a result of ingestion of chemicals in the tissues of primary prey) items.

16. **<u>Section 7.4.2, Page 7-17, Second Bullet</u>. The home range of the short-tailed shrew is not provided on this page although the home ranges for the other ecological receptors are provided. The home range of the short-tailed shrew should be provided in the second bullet.**

Response: Agree. The home range for the short-tailed shrew is estimated at 0.96 $\pm$ 0.09 acres. This information was presented in Table 7-5 and Table E-6 in Appendix E. However, to make the short-tailed shrew discussion format similar to the format used for other representative species, the short-tailed shrew discussion will include the home range information.

17. <u>Section 7.4.2, Page 7-19</u>. **The discussion of avian bioaccumulation factors (BAFs) should mention that BAFs were unavailable for all of the contaminants of concern, except cadmium. The discussion should include how the avian prey concentration was calculated for use in calculating the red fox and red-tailed hawk potential dietary exposures.**

Response: Agree. Section 7.4.2 will be modified to state "With the exception of cadmium, BAFs for avian species were not available".

Because BAFs and toxicity values are not available for a number of constitutes, the ERA Uncertainty Analysis Section (Section 7.7) includes a discussion of these limitations and potential implications on the risk assessment conclusions. The Uncertainty Analysis Section will be expanded to include a discussion about the cumulative effects to top predators (i.e., foxes and hawks) resulting from ingestion of secondary prey that consumed primary prey (i.e., plants or invertebrates) whose tissue concentrations could not be calculated because BAFs were not available. The following statement will be added to the Uncertainty Analysis section.

"Because plant and invertebrate BAFs for some chemicals are not available, the chemical concentration in plant and/or invertebrate tissues for these chemicals are not calculated. Therefore, the potential dietary exposure model may under estimate secondary prey tissue concentration for some chemicals that were derived using ingestion of plants and/or invertebrates. This under estimating of the top predator tissue concentration may result in an under estimation of the Hazard Quotient in top predators like foxes and hawks".

18. <u>Section 7.8, Page 7-31, Paragraph 1, Sentence 5</u>. **There appears to be a typographical error in this sentence: "RME" should be "RTV". The sentence is as follows. "However, because the concentrations only slightly exceed the RME, it is unlikely that plant or soil invertebrate biomass or plant cover availability would be reduced over the entire area of Site 18 such that small mammal and bird populations would be affected."**

Response: Agree. The typographical error "RME" will be replaced with "RTV".

Also, this conclusions does not directly correlate with the decision points presented in Table 7-1. The terrestrial plant decision point is: if the RME in surface soil is greater than the terrestrial plant RTV, then there is a concentration in surface soil that results in adverse effects on growth, reproduction, or survival to terrestrial plants. The correlating conclusion should be as follows. Some RME concentrations in surface soil slightly exceed the phytotoxic RTVs indicating the possibility for adverse effects on growth, reproduction, or survival to terrestrial plants; however, the central tendency concentrations are less than the phytotoxic RTVs suggesting that any adverse effects to terrestrial plants would be at a localized scale.

Response: Section 7.8 will be modified in accordance with the above suggestions.

The decision point related to the assessment of small mammal and bird populations is a "comparison of potential dietary exposures in mammalian and avian wildlife with literature derived RTVs. HQs > 1 indicate potential risk." The decision points presented in Table 7-1 along with the measurement endpoints do not link adverse effects to mammal or bird populations to a reduction in plant or soil invertebrate biomass as the fifth sentence on page

7-31 does. The conclusions should be revised to better correlate with the measurement endpoints and decision points.

Response: In Table 7-1, the assessment endpoint will be expanded to include the following statements for plants, invertebrates, and wildlife receptors, respectively.

For terrestrial plants, the assessment endpoint will be changed from "Reduction in the biomass of terrestrial plants used as forage material" to "Reduction in the biomass of terrestrial plants so as to limit the availability of cover or forage material used by small mammals and birds".

The assessment endpoint for terrestrial invertebrates will be changed from "Reduction in the abundance of earthworms used as forage material" to "Reduction in the abundance of terrestrial invertebrates as to effect foraging by small mammals and birds".

19. **Section 8.2.3, Page 8-9. This section presents information regarding the fate and transport of chemicals in groundwater. The text states that Clear Creek, which is the final point of discharge for groundwater from the surficial aquifer, is located approximately 5,000 feet southwest of Site 18. However, the conclusions presented in Section 9.1 indicate that Clear Creek is located approximately 2,500 feet southwest of the site. The inconsistency within the text should be corrected.**

Response: Agreed, The correct distance is approximately 3,000 feet, corrections will be made to the text.

20. **Table D-3, Page D-5. Footnote 6 states that the RBC value for chromium is based on chromium IV isomer as a conservative screen. However, the value listed in the table indicates that the RBC value for chromium VI was used for screening chromium concentrations detected in groundwater. Therefore, the footnote should be corrected to indicate that the RBC value used to evaluate chromium in the groundwater was based on the chromium VI isomer.**

Response: Agree. Table D-3 will be corrected.

21. **Table E-1. This table summarizes bioaccumulation factors (BAFs). The reference for the invertebrate BAFs provided in Table E-1 is Beyer 1990. However, data regarding the bioaccumulation of bis(2-ethylhexyl)phthalate, 2-methylnaphthalene, and naphthalene in earthworms are not provided in Beyer 1990. The footnote reference should be revised as appropriate.**

Response: The reference Beyer, 1990 refers to a document titled "Evaluating Soil Contamination" by W. N. Beyer for the Fish and Wildlife Service and US Department of the Interior. The document is a summary of findings from other studies. Beyer sites a study by J. M. Marquenie, J. W. Simmers and S. H. Kay, 1987 titled "Preliminary Assessment of Bioaccumulation of Metals and Organic Contaminants at the Times Beach Confined Disposal Site, Buffalo, N. Y." Because of the study's small data set, variability between analyses, and small differences between BAFs (about and order of magnitude between the different semivolatile BAFs), the ERA created an average semivolatile BAF value. The average semivolatile BAFs were calculated from Table 25

by dividing the earthworm concentration (ppm wet weight) by soil concentration (ppm dry weight). Earthworm concentrations were first converted from dry to wet weight by assuming an 80% moisture content.

The reviewer could not confirm the plant BAFs for semivolatiles using the cited Travis and Arms equation and the dry weight to wet weight conversion. Please re-confirm the calculated plant BAFs.

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. It does not appear as if the average of the ingestion rates for the cotton mouse and short-tailed shrew was used. Please provide more information on the calculation of the mammal BAFs and re-confirm the calculated mammal BAFs.

Response: The footnote will be replaced with: "Mammalian BAFs were calculated using the following equation from Travis and Arms (1988), unless otherwise noted:

log BTF (biotransfer factor) = Log K_{ow} - 7.6.

To convert from BTF to BAF, the calculated log BTF is first transformed to base 10 then multiplied by the average ingestion rate for nonlactating and lactating test animals (12 kg/day). BAFs are converted from dry to wet feed weight by dividing the BAF by a factor of 0.2 (BAFwet weight = BTF * 12 mg/day/0.2). There is an uncertainty involved in using this equation for PAHs because the study Travis and Arms (1988) did not use PAHs in the regression analysis."

22. <u>Table E-2</u>. **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: Under the "lethal RTV" column in the Ingestion Toxicity Table (E-2) there are three subcolumns (Oral LD_{50}, LOAEL, and RTV). Oral LD_{50} and LOAEL both refer to the measurable endpoint used in the test. The lethal LOAEL value represents the lowest observed adverse effect level that resulted in mortality to the test species. Xylene, barium, and manganese each have values under the LOAEL column, therefore this column will remain in the Ingestion Toxicity Table.

23. <u>Table E-3</u>. **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, 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 both pyrene and phenanthrene. Table E-3 has a footnote that indicates a value for benzo(a)pyrene was used as a surrogate for pyrene and phenanthrene; however, benzo(a)-pyrene toxicity data are not presented in Table E-2. The pyrene NOAEL and the phenanthrene LOAEL should be used in this assessment instead of using a surrogate.**

Response: Subsection 7.5.1 presents a discussion of the RTV selection process. In summary, the selection process for sublethal RTVs uses only those tests with reproduction or growth as the identified endpoint. The RTV is the lowest NOAEL from the closest appropriate species. If no NOAEL is available, the 1/10 of the LOAEL is used as a surrogate value. To facilitate the readers

use of Table E-2, the ERA identified the lowest toxicity value for growth and reproduction by boxing the value. The RTVs (NOAEL or 1/10 of LOAEL) are presented under the RTV column and summarized in Table E-3.

The NOAEL value for pyrene (75 mg/kg-BW/day) is based on renal effects. Renal effects do not correspond to the selected measurement endpoint (adverse effect to reproduction or growth); therefore this value was not selected as an RTV.

The phenanthrene LOAEL of 120 mg/kg/BW is based on "increased liver weight"; which also does not apply to the selected measurement endpoint; therefore this value was not selected as an RTV. The box around the sublethal value will be removed before the Site 18 Remedial Investigation Report goes final.

Benzo(a)pyrene is used as a surrogate for 2-methylnaphthalene, phenanthrene, and pyrene. The ingestion toxicity information for benzo (a) pyrene will be added to Table E-2.

24. **Tables E-3 and E-9. The RTV for bis(2-ethylhexyl)phthalate is erroneously typed as 35 mg/kg/BW/day on Table E-3. This error has been carried forth into the hazard quotient calculation presented on Table E-9 for the red fox. The RTV should be 3.5 mg/kg/BW/day. The HQ is still less than one when 3.5 mg/kg/BW/day is used as the RTV. Both tables should be corrected.**

Response: Agree. This typographical error will be corrected as well as a recalculation of the PDE model.

25. **Table E-6. This table provides exposure parameters and assumptions for terrestrial receptors. The note at the bottom of Table E-6 referencing the Cecil Field Naval Air Station appears out of place and should be deleted.**

Response: Agree. This typographical error will be corrected.

26. **Tables E-7 through E-9. The reviewer could not confirm the red fox and red-tailed hawk potential dietary exposures (PDEs). The assumptions used to calculate the PDEs without bird BAFs are not provided in the ERA. An explanation within the ERA is necessary since 10% of the red fox's diet is birds and 27 % of the red-tailed hawk's diet is birds. Please clarify.**

Response: See response to comment #15 above.

27. **Table E-9. The red fox HQ from zinc appears to be in error. When the presented PDE is divided by the presented RTV, the HQ is 4.5×10^{-3}. An HQ of 4.5×10^{-2} is presented in Table E-9. Please correct.**

Response: Agree. The red fox HQ for zinc will be revised as requested.

RESPONSE TO COMMENTS

FDEP Review Comments Report for
Remedial Investigation Report for Site 18
Crash Crew Training Area

1. **The report utilizes SCGs which were in effect during the time of report preparation. I do not object to this; however, I have utilized selected new or revised Soil Cleanup Goals (SCGs) in order to properly evaluate the site. I am referring specifically to the SCG for Total Recoverable Petroleum Hydrocarbon (TRPH) in soils as listed in Chapter 62-785, F.A.C. I feel I must consider TRPH using those SGCs since Site 18 is a site in which petroleum hydrocarbons are a primary contaminant and a component of the operations that were carried out at the site.**

   Response: The Navy will include the newly promulgated standards in a appendix to the document. The values will be discussed in the document text as appropriate.

2. **Based on data presented in the report, risks are predicted for future residents due primarily to arsenic in surface soil. In the conclusions, page 9-2, it states that remediation of surface soil would not substantially reduce exposure to arsenic. While the arsenic concentrations observed in surface soil at the site may 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 as by the Navy at this site. Remediation of the surface soil at Site 18, as (for instance) by appropriate soil cover will indeed reduce the human health and ecological risks. More importantly, the remediation would also directly address the TRPH which is present in the surface soil in amounts up to about ten times the new industrial soil SCG for TRPH. As presented in the report, the site could conceivably be recommended for an industrial land use restriction in order to address the arsenic and other metal contaminants; if this were proposed, I could not support it because of the very high TRPH values that are present.**

   Response: The statement "Remediation of Site 18 surface soil would not substantially reduce exposure to arsenic." will be deleted. The other points of the comment are noted and will be addressed in the Feasibility Study.

3. **I agree that a focused feasibility study be conducted to address the risk to a future resident or others (such as in an industrial or recreational scenario) and that the assessment also address the TRPH in the surface soil which is in excess of Florida's industrial SCG.**

   Response: Comment noted. The comment will be addressed in the Focused Feasibility Study.

RESPONSE TO COMMENTS

Southern Division Review Comments for
Remedial Investigation Report for Site 18
Crash Crew Training Area

1. **The document should be written in a more positive and conclusive tone not in a non conclusive tone. In most case in the executive summary, chapters 6, 7, 8, & 9 phrases like "thought to be, easily, primarily, etc." should be taken out. Another example of this is the whole paragraph on 8-8 stating "It is important.....an actual transport route. Also, do a word search for "that" and "which" and delete them from your sentences.**

   Response: The document is written in a tone that expresses the inconclusive nature of any and all Remedial Investigations. Phrases such as "thought to be, easily, primarily etc.," express the fact that although the site conditions indicated are believed to be accurate other conditions may be present and contributing to interpretations. Without unlimited funds and time all conditions can not be fully explored nor should be explored.

   The referenced paragraph on page 8-8 will be deleted. ABB-ES editors will perform a word search for the occurrence of "that" and "which" and evaluate the appropriate usage of each occurrence. If the appropriateness of the occurrence is questionable, the word will be deleted and the sentence will be reworded.

2. **Change section 7.1 Site Characterization to reflect the information in the Nature Conservancy Report 1997.**

   Response: Section 7.1 will be revised as follows: "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 to inhabit Site 2 (Nature Conservancy, 1997)."

3. **The 1993 groundwater data should not be used in any data set including risk assessment. In some places in the document you say the data is not used and in other places you say it is used.**

   Response: Agreed. The data was not used in the risk assessment and any references to such in the text will be deleted.

4. **In the future do not put "FINAL DRAFT" on any of the inside sheets of the reports.**

   Response: The correction will be incorporated on all future documents.