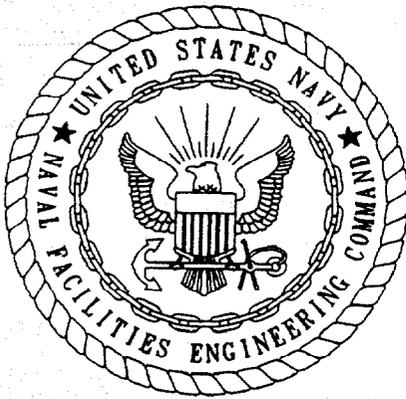


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BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT FOR  
STUDY AREA 47 NTC ORLANDO FL  
1/1/1997  
ABB ENVIRONMENTAL

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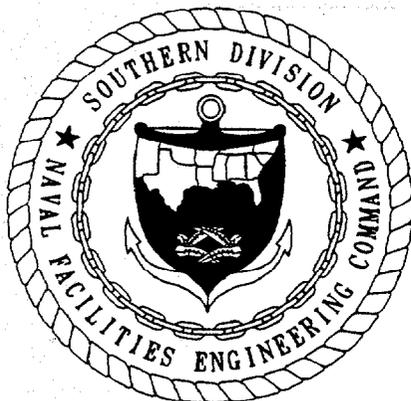
**BASE REALIGNMENT AND CLOSURE  
ENVIRONMENTAL SITE SCREENING REPORT**

**STUDY AREA 47  
FORMER SKEET RANGE**

**NAVAL TRAINING CENTER  
ORLANDO, FLORIDA**

**UNIT IDENTIFICATION CODE: N65928  
CONTRACT NO. N62467-89-D-0317/107**

**JANUARY 1997**



**SOUTHERN DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
NORTH CHARLESTON, SOUTH CAROLINA  
29419-9010**

**BASE REALIGNMENT AND CLOSURE  
ENVIRONMENTAL SITE SCREENING REPORT**

**STUDY AREA 47  
FORMER SKEET RANGE**

**NAVAL TRAINING CENTER  
ORLANDO, FLORIDA**

**Unit Identification Code: N65928**

**Contract No.: N62467-89-D-0317/107**

**Prepared by:**

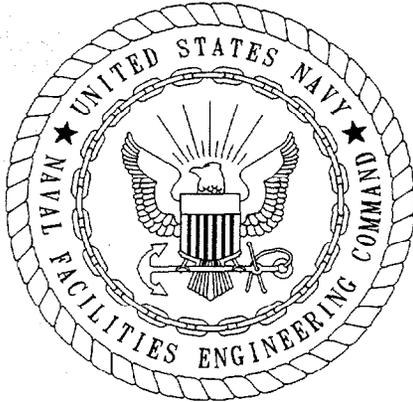
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2590 Executive Center Circle, East  
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**Prepared for:**

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

**Barbara Nwokike, Code 1873, Engineer-in-Charge**

**January 1997**



CERTIFICATION OF TECHNICAL  
DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE: January 14, 1997

NAME AND TITLE OF CERTIFYING OFFICIAL: John Kaiser  
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Richard Allen  
Project Technical Lead

(DFAR 252.227-7036)

TABLE OF CONTENTS

Base Realignment and Closure  
Site Screening Investigation  
Study Area 47, Former Skeet Range  
Naval Training Center  
Orlando, Florida

<u>Chapter</u>	<u>Title</u>	<u>Page No.</u>
1.0	STUDY AREA (SA) 47, ALLEGED SKEET RANGE NEAR DOMESTIC WASTEWATER TREATMENT PLANT, MCCOY ANNEX . . . . .	1
1.1	SA 47, BACKGROUND AND CONDITIONS . . . . .	1
1.2	SA 47, INVESTIGATION SUMMARY . . . . .	1
1.2.1	Geophysical Survey . . . . .	1
1.2.2	Surface Soil Sampling . . . . .	3
1.2.3	Subsurface Soil Sampling . . . . .	3
1.2.4	Groundwater Sampling . . . . .	3
1.3	SA 47, RESULTS . . . . .	5
1.3.1	Geophysical Survey . . . . .	5
1.3.2	Surface Soil . . . . .	5
1.3.3	Subsurface Soil . . . . .	5
1.3.4	Groundwater . . . . .	5
1.4	SA 47, CONCLUSIONS AND RECOMMENDATIONS . . . . .	6

REFERENCE

ATTACHMENTS

- Attachment A: Geophysical Survey
- Attachment B: Summary of Positive Detections in Soil and Groundwater Analytical Results
- Attachment C: Summary of Soil and Groundwater Analytical Results

LIST OF FIGURES

Base Realignment and Closure  
Site Screening Investigation  
Study Area 47, Former Skeet Range  
Naval Training Center  
Orlando, Florida

<u>Figure</u>	<u>Title</u>	<u>Page No.</u>
1	Study Area Location . . . . .	2
2	Sample Locations Former Skeet Range McCoy Annex . . . . .	4

## GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
BEHP	bis(2-ethylhexyl)phthalate
bls	below land surface
DQO	data quality objective
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
RBC	risk-based concentration
SA	study area
SCG	soil cleanup goals
TAL	target analyte list
TC	terrain conductivity
TCL	target compound list
TSS	total suspended solids
USEPA	U.S. Environmental Protection Agency

1.0 STUDY AREA (SA) 47, ALLEGED SKEET RANGE NEAR  
DOMESTIC WASTEWATER TREATMENT PLANT, MCCOY ANNEX

This report describes the details of the activities and results of the screening investigation conducted at SA 47, the alleged skeet range near the former domestic wastewater treatment plant at McCoy Annex. Screening activities at SA 47 were initiated in early June 1996 and completed in late June 1996. The proposed field activities were presented in the Site Screening Plan, Air Force Sites, Addendum 2 (ABB Environmental Services, Inc. [ABB-ES] 1995).

1.1 SA 47, BACKGROUND AND CONDITIONS. SA 47 is located in the southeast corner of the McCoy Annex of the Naval Training Center in Orlando, Florida (Figure 1). SA 47 is contained within the boundary of SA 49. The skeet range was shown on a map of the McCoy Annex dated March 1955 map of McCoy Annex discovered during a search through Air Force records. The map shows that the former range extended 200 feet in the east-west direction and 150 feet in the north-south direction. For this investigation, the study area was lengthened to 400 feet northward to ensure complete coverage of the range. The former range area is currently overgrown with small (less than 30 feet in height) pine trees.

The objective of the site screening activities was to evaluate potential lead contamination in soil and groundwater as the result of former skeet range operations. To accomplish this objective, the following field activities were completed:

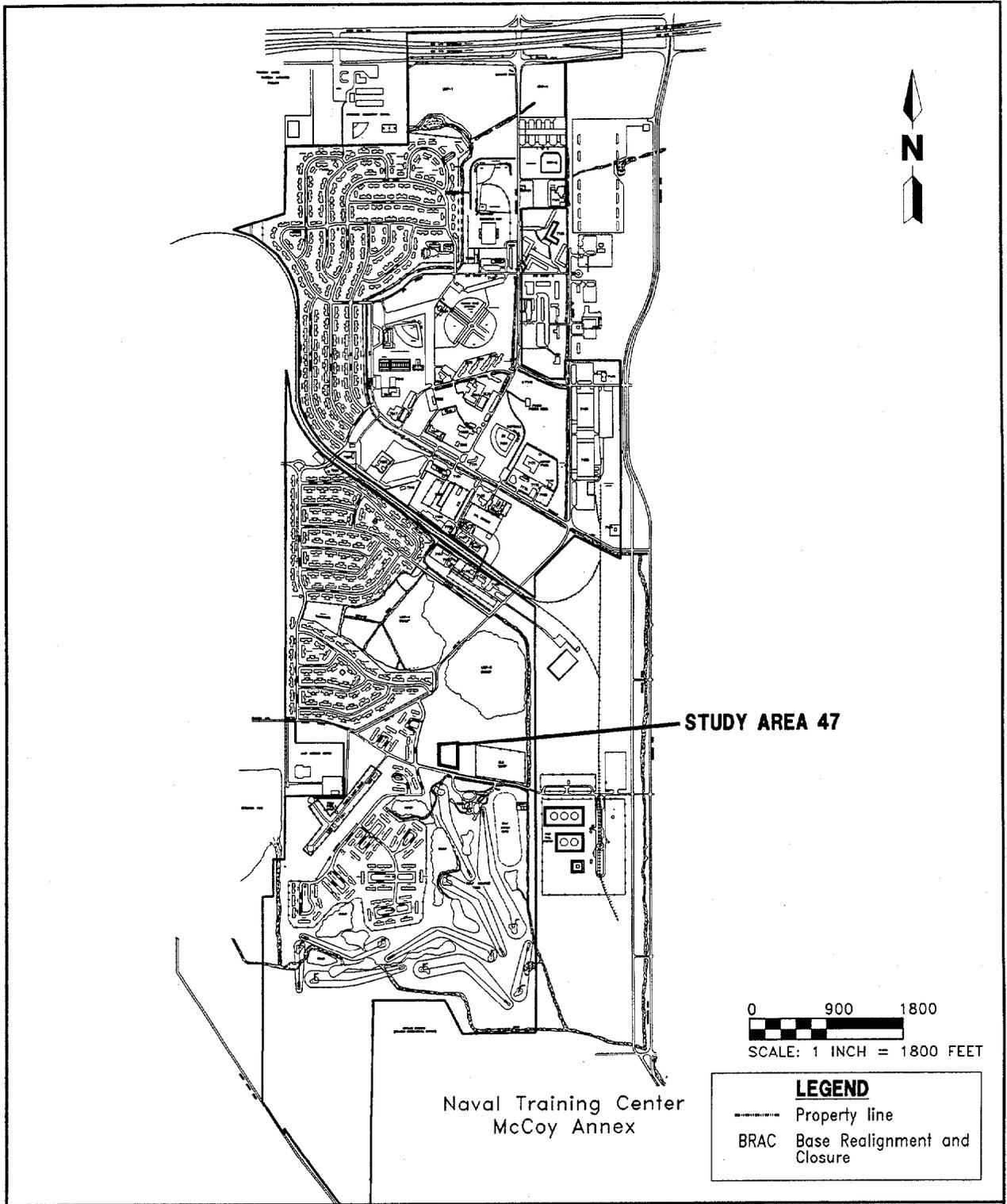
- geophysical survey (magnetometer and terrain conductivity (TC))
- surface soil sampling
- subsurface soil sampling
- temporary monitoring well installation
- groundwater sampling

The geophysical survey was conducted over the entire study area and the soil and groundwater samples were collected from locations within the potentially affected areas.

1.2 SA 47, INVESTIGATION SUMMARY. The site screening investigation performed at SA 47 is described below.

1.2.1 Geophysical Survey Because all of SA 47 and most of SA 46 are situated entirely within the boundaries of SA 49, all three study areas were surveyed concurrently. Prior to the start of the field program, ABB-ES established an arbitrary grid coordinate system in the survey area. The grid system was oriented approximately in line with magnetic north and parallel to Eighth Street in the eastward direction, which extends along the entire length of the southern border of SA 49. The grid consisted of a series of stakes located on 100 square-foot nodes established over the survey area with a cloth measuring tape and level. Interim grid locations were marked with pin flags.

The survey involved the use of magnetometry and TC techniques to evaluate potential subsurface debris disposal. Attachment A presents a detailed



**FIGURE 1**  
**STUDY AREA LOCATION**



**TECHNICAL MEMORANDUM**  
**BRAC ENVIRONMENTAL**  
**SITE SCREENING INVESTIGATION**  
**STUDY AREA 47**  
**NAVAL TRAINING CENTER**  
**ORLANDO, FLORIDA**

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description of the techniques and results of the survey. Included in Attachment A are contour maps showing vertical magnetic gradient contours and quadrature (conductivity) contours.

**1.2.2 Surface Soil Sampling** Twenty-one surface soil samples (47S00101 through 47S02001, and 47B00101) were collected during the investigation. The samples were collected from a preestablished grid with 50 feet of spacing between nodes to ensure coverage of the alleged skeet range. The grid was irregularly shaped and extended 400 feet north from Eighth Street and, at its widest point, 200 feet west to east (Figure 2). The surface soil samples were collected with hand augers from a depth range of 0 to 1 foot below land surface (bls). All of the samples were collected from unique locations except for 47B00101, which was collected at the location of the soil boring. No flame ionization detector (FID) response was noted at any of the surface soil sample locations. Two duplicate samples were also submitted for analysis for quality control purposes. Surface soil samples were submitted for total lead analysis by Inductively Coupled Plasma Atomic Emission Spectrometry.

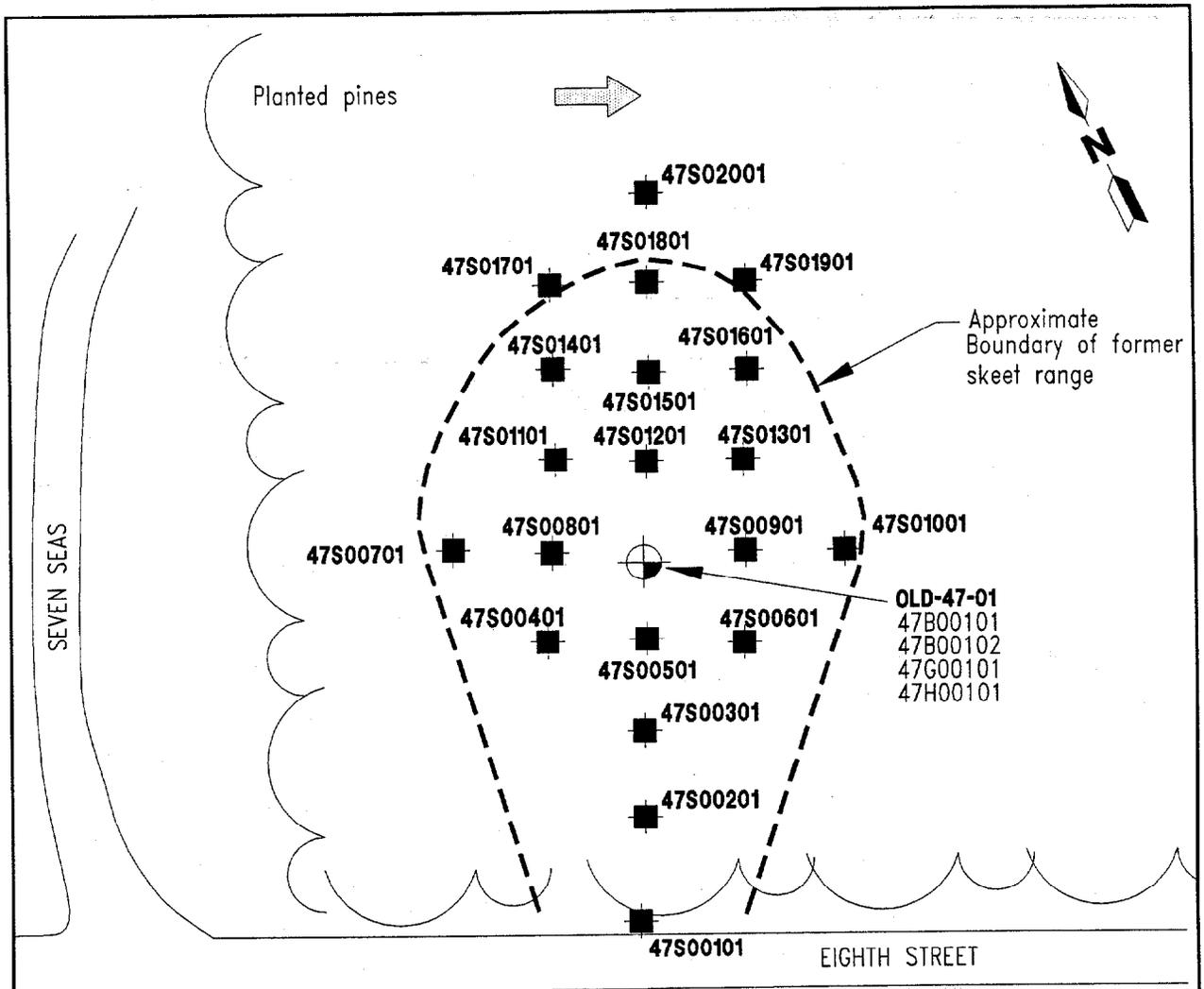
No visual evidence of skeet range activities were noted during the investigation.

**1.2.3 Subsurface Soil Sampling** One soil boring was completed during the investigation near the center of the grid at the location (Figure 2). The sample (47B00102) was collected with a hand auger from immediately above the water table at a depth of approximately 1 to 2 feet bls. No FID response was noted during soil boring completion activities. The soil sample was submitted for total lead analysis by Inductively Coupled Plasma Atomic Emission Spectrometry.

**1.2.4 Groundwater Sampling** A single temporary monitoring well (OLD-47-01) was installed in the soil boring (47B001, Figure 2). The boring was advanced to approximately 4 feet below the water table. A 0.01-inch slotted, 2-inch diameter, polyvinyl chloride well screen was lowered into the boring and the annular space was filled with filter sand. After purging enough water to allow for minimizing the turbidity of the water, both unfiltered and filtered groundwater samples were collected using the low-flow technique. Following collection of the samples, the well screen was withdrawn, and the boring was backfilled with granular bentonite.

The unfiltered groundwater sample (47G00101) was analyzed for low detection limit volatile organic compounds, Contract Laboratory program, target compound list (TCL) semivolatile organic compounds, TCL pesticides and polychlorinated biphenyls, target analyte list (TAL) inorganic analytes and total suspended solids (TSS). The filtered sample (47H00101) was submitted for laboratory analysis of TAL inorganics (the "G" designates the unfiltered sample and "H" designates the filtered sample). Two field duplicate samples and a trip blank were also submitted for analysis.

Soil and groundwater samples submitted for laboratory analysis were analyzed in accordance with U.S. Environmental Protection Agency (USEPA) Level IV data quality objectives (DQOs). Groundwater samples collected during the investigation were analyzed for TSS in accordance with USEPA Level III DQOs.



0 50 100  
 SCALE: 1 INCH = 100 FEET

**LEGEND**

 <b>OLD-47-01</b> 47B00101 47B00201	Temporary monitoring well/ soil boring location and designation
 <b>47S00101</b>	Surface soil location and designation
	Groundwater flow direction
BRAC	Base Realignment and Closure

**FIGURE 2**  
**SAMPLE LOCATIONS**  
**FORMER SKEET RANGE**  
**MCCOY ANNEX**



**TECHNICAL MEMORANDUM**  
**BRAC ENVIRONMENTAL**  
**SITE SCREENING INVESTIGATION**  
**STUDY AREA 47**  
**NAVAL TRAINING CENTER**  
**ORLANDO, FLORIDA**

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1.3 SA 47, RESULTS. Following is a summary of the significant findings from the site screening investigation at SA 47. The results of the geophysical survey are presented in Attachment A. The results of the soil and groundwater analyses are presented as Attachments B and C. Attachment B includes B-1, Summary of Positive Detections in Surface Soil Analytical Results and B-2, Summary of Positive Detections in Groundwater Analytical Results. Attachment C includes C-1, Summary of the Soil Analytical Results and C-2, Summary of the Groundwater Analytical Results.

The surface and subsurface soil analytical results were evaluated by comparing their respective concentrations with (1) their respective site-specific (McCoy Annex) soil background screening concentrations; (2) Florida Department of Environmental Protection's (FDEP's) soil cleanup goals (SCGs) for residential soils, and (3) USEPA Region III risk-based concentrations (RBCs). Groundwater analytical results were compared to basewide groundwater background screening concentrations, FDEP's groundwater guideline values, and USEPA Region III RBCs.

1.3.1 Geophysical Survey. The geophysical data indicate the presence of a number of small magnetic and TC anomalies throughout the survey area in the immediate vicinity of SA 47 but none within the limits of the study area proper. Most of the magnetic and conductive anomalies can be attributed to surface debris observed in the field at the time of the survey. Items such as a car seat, a discarded sofa, and a steel pipe were noted. Also, in the southeast portion of SA 49 there is evidence of reworking or dumping (mounds and depressions) such as might occur with minor excavation or dumptruck-size loads of discarded earth materials. The results of the geophysical survey are described in greater detail in Attachment A.

1.3.2 Surface Soil The lead concentrations in all of the surface soil samples are below background screening criteria, as well as residential RBC and SCG values.

1.3.3 Subsurface Soil As with the surface soil, the lead concentration in the single subsurface soil sample was below both background screening criteria and residential RBC and SCG values.

1.3.4 Groundwater None of the inorganic analytes detected in the unfiltered or filtered groundwater sample (and field duplicate) exceeded the corresponding FDEP groundwater guidance concentration.

Semivolatile organic compounds detected in groundwater include bis(2-ethylhexyl)-phthalate (BEHP) and di-n-butylphthalate. These detections, however, appear to be laboratory artifacts. The only compound detected at a concentration greater than screening criteria (FDEP guidance concentration and USEPA RBC for tap water) was BEHP in the field duplicate sample collected from OLD-47-01. The BEHP detection originated during a reextraction and reanalysis of the field duplicate sample done 10 days outside of the holding time. The reextraction was necessary because the original analysis, of the field duplicate sample only, failed the surrogate recovery criteria (internal laboratory quality assurance and quality control). BEHP was not detected in the original run. Method blank contamination of BEHP was also noted by the laboratory, suggesting that this detection was likely a laboratory artifact, but because the sample concentration exceeded 10 times the method blank value, the value could not be automatically rejected, based on the functional validation guidelines.

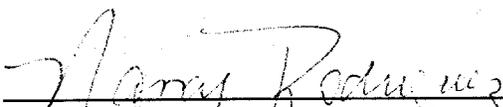
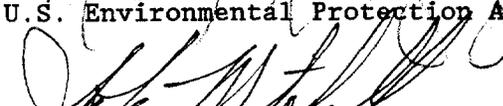
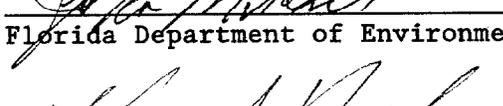
1.4 SA 47, CONCLUSIONS AND RECOMMENDATIONS. All of the surface and subsurface soil samples collected at SA 47 showed no analyte concentrations in excess of screening criteria.

The single groundwater sample collected during the investigation did show BEHP at a concentration above screening values, but the detection can most likely be attributable to an artifact of the laboratory analysis process.

Based on information available and evaluation of site screening data for this study area, ABB-ES recommends the following:

- A classification of 1/White for SA 47, because evidence does not indicate that either the storage, release, or disposal of hazardous substances or petroleum products. Nor does it suggest the migration of these substances from adjacent areas.

SA 47 is suitable for transfer with no further requirement for evaluation. The undersigned members of the Orlando Partnering Team concur with the findings and recommendations of the site screening program for SA 47.

<u>STUDY AREA 47</u>	
 _____ U. S. Environmental Protection Agency, Region IV	<u>1/23/97</u> _____ Date
 _____ Florida Department of Environmental Protection	<u>1/23/97</u> _____ Date
 _____ U. S. Department of the Navy	<u>1/23/97</u> _____ Date

REFERENCE

ABB Environmental Services, Inc., 1995, Site Screening Plan, Former Air Force Sites, Addendum 2, Naval Training Center, Orlando, Orlando, Florida: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina, December.

**ATTACHMENT A**  
**GEOPHYSICAL SURVEY**

TECHNICAL MEMORANDUM  
GEOPHYSICAL SURVEYS  
STUDY AREAS 46, 47, AND 49

NAVAL TRAINING CENTER  
ORLANDO, FLORIDA

**INTRODUCTION.** The following is a summary of the significant findings of the geophysical surveys which took place in the area comprising Study Areas (SAs) 46, 47, and 49, Naval Training Center (NTC), Orlando. Initial surveys took place between January 11 and 17, 1996. Geophysical survey techniques were used at SAs 49 to evaluate potential subsurface debris disposal. Because most of SA 46 and all of SA 47 are contained within the boundary of SA 49, all three study areas were surveyed together. More than 1,000 data points were acquired at 20 foot by 20 foot spacings with both types of geophysical instruments.

The techniques used were magnetometry and terrain conductivity (TC). Ground penetrating radar (GPR) was to be used to investigate magnetometer and TC anomalies, if appropriate.

**GEOPHYSICAL TECHNIQUES.** The magnetic method is a versatile geophysical technique used for evaluating shallow geologic structures and for locating buried manmade objects and buried debris by mapping local distortions in the earth's magnetic field produced by buried magnetic objects (steel and other magnetic materials). Vertical gradient measurements of the earth's magnetic field are often taken during environmental magnetic surveys, as they are more sensitive to the presence of near-surface metal objects than total field values alone. A GSM-19 magnetometer with gradiometer capability was used during this survey.

Terrain conductivity surveys, also referred to as EMI (electro-magnetic induction) surveys, have traditionally been used in mineral exploration for tracing conductive ore bodies (i.e., massive sulfides). More recently, conductivity surveys have been used in environmental studies for mapping buried debris and former structures, and for tracing conductive contaminant plumes in groundwater. TC instruments record two parameters, the quadrature phase and the in-phase components of an induced magnetic field. The quadrature-phase component is a measure of the ground conductivity value expressed in millimhos per meter. The in-phase component is significantly more sensitive to metallic objects and is useful for looking for buried tanks and drums and other man-made objects. The TC instrument used during this work was a Geonics EM-31DL with digital data logger.

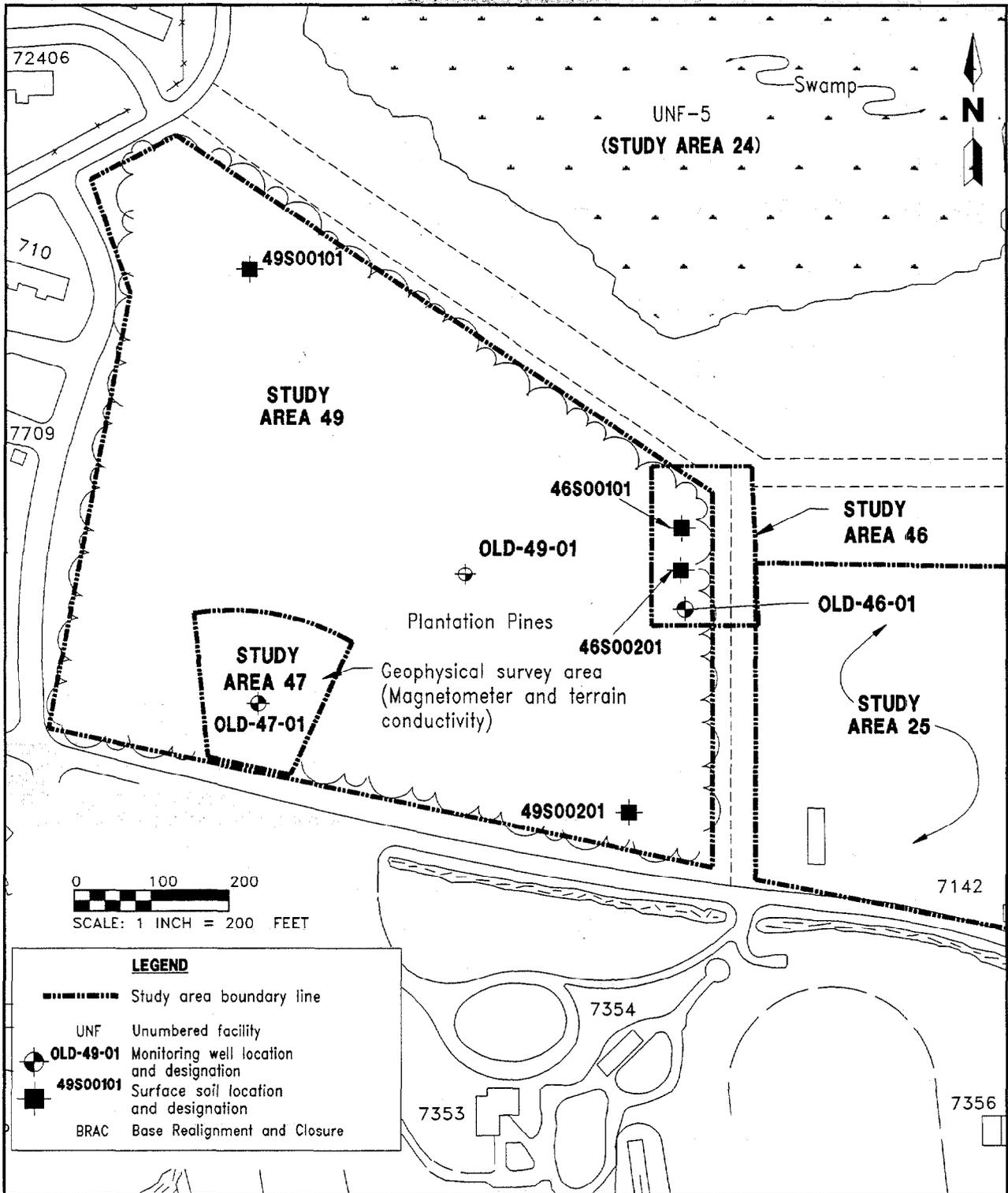
The GPR technique uses high frequency radio waves to determine the presence of subsurface objects and structures. The radio wave energy is reflected from surfaces where there is a contrast in the electrical properties of subsurface materials, such as naturally-occurring geologic horizons or manmade objects (e.g., buried utilities, tanks, drums). Typical applications for GPR include mapping buried utilities, and delineating the boundaries of buried materials and abandoned landfills. No GPR profiling was completed during the investigation, as it was not deemed to be necessary.

Following is a discussion of the results of this investigation.

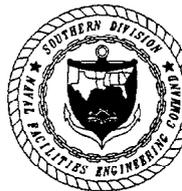
RESULTS - STUDY AREA 49, ALLEGED DISPOSAL AREA. A geophysical survey was completed in Study Area 49, which is 650 feet wide (east to west) by 800 feet long (north to south). A geophysical survey grid with an arbitrary origin and oriented perpendicular to Eighth Street was established. Subsequently, a magnetometer and TC survey were completed in the area shown on Figure 1, an area of approximately 9.6 acres. Figure 2 presents a map generated in the field showing the location of all magnetometer and TC traverses. More than 1000 data points were acquired on a 20-foot by 20-foot measurement grid with each instrument. Contour data is presented as Figures 3 through 5. Figure 3 presents the vertical magnetic gradient contours, and Figures 4 and 5 present the quadrature (conductivity) and inphase (equivalent to a metal detector) contours of the magnetic field induced by the transmitter of the TC instrument.

The geophysical data indicate the presence of a number of small magnetic and TC anomalies in the area, but no anomalies were observed within SA 47. The data indicate the presence of a number of small magnetic and terrain conductivity anomalies. Some of the magnetic and conductivity anomalies can be attributed to surface debris observed in the field at the time of the survey. Items such as a car seat, a discarded sofa, and a steel pipe were noted. Also, in the southeast portion of the study area, there is evidence of reworking or dumping (mounds and depressions) such as might occur with dump truck loads of discarded earth materials.

ABB-ES concludes that the survey area has limited surface disposal of household debris, but that the area is not characterized by systematic disposal and burial of large amounts of debris. Limited surface dumping has taken place along the northern, eastern, and southern boundaries where vehicular access is possible.



**FIGURE 1**  
**GEOPHYSICAL SURVEY**



**TECHNICAL MEMORANDUM**  
**BRAC ENVIRONMENTAL**  
**SITE SCREENING INVESTIGATION**  
**STUDY AREA 47**  
**NAVAL TRAINING CENTER**  
**ORLANDO, FLORIDA**

**STUDY AREAS 46, 47 AND 49  
MAGNETOMETER/TERRAIN CONDUCTIVITY TRAVERSES**

COMP. BY  
JMN

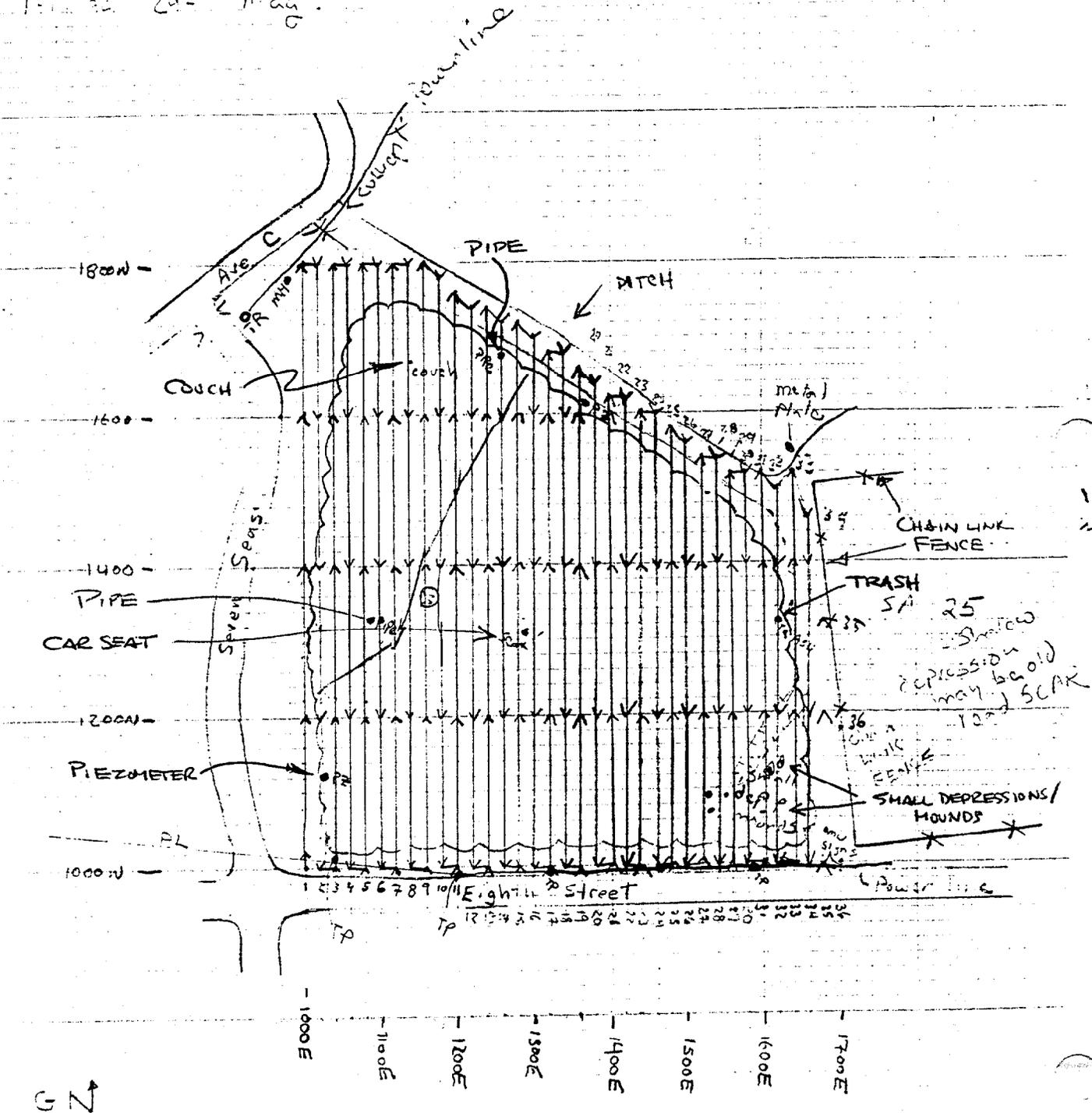
JOB NO.  
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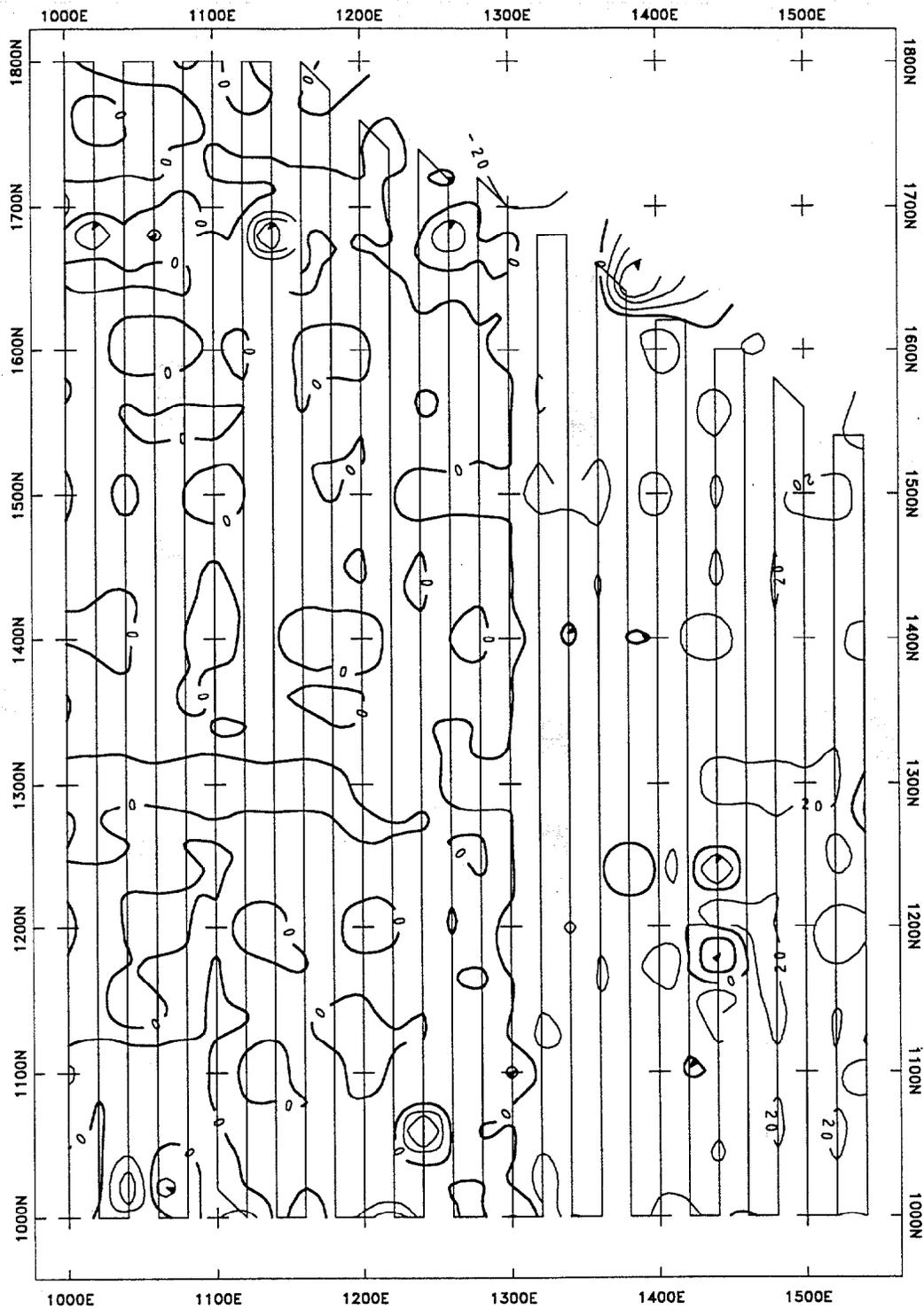
DATE  
1/11/96

1-16/95 1-28 mag, All TC  
km 31 20x20'  
SEM 19

1-17-95 20- mag.



**FIGURE 2  
FIELD MAP OF GEOPHYSICAL SURVEY**



CONTOUR INTERVAL = 20 GAMMAS/METER

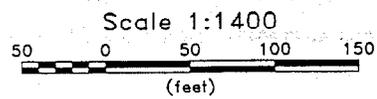
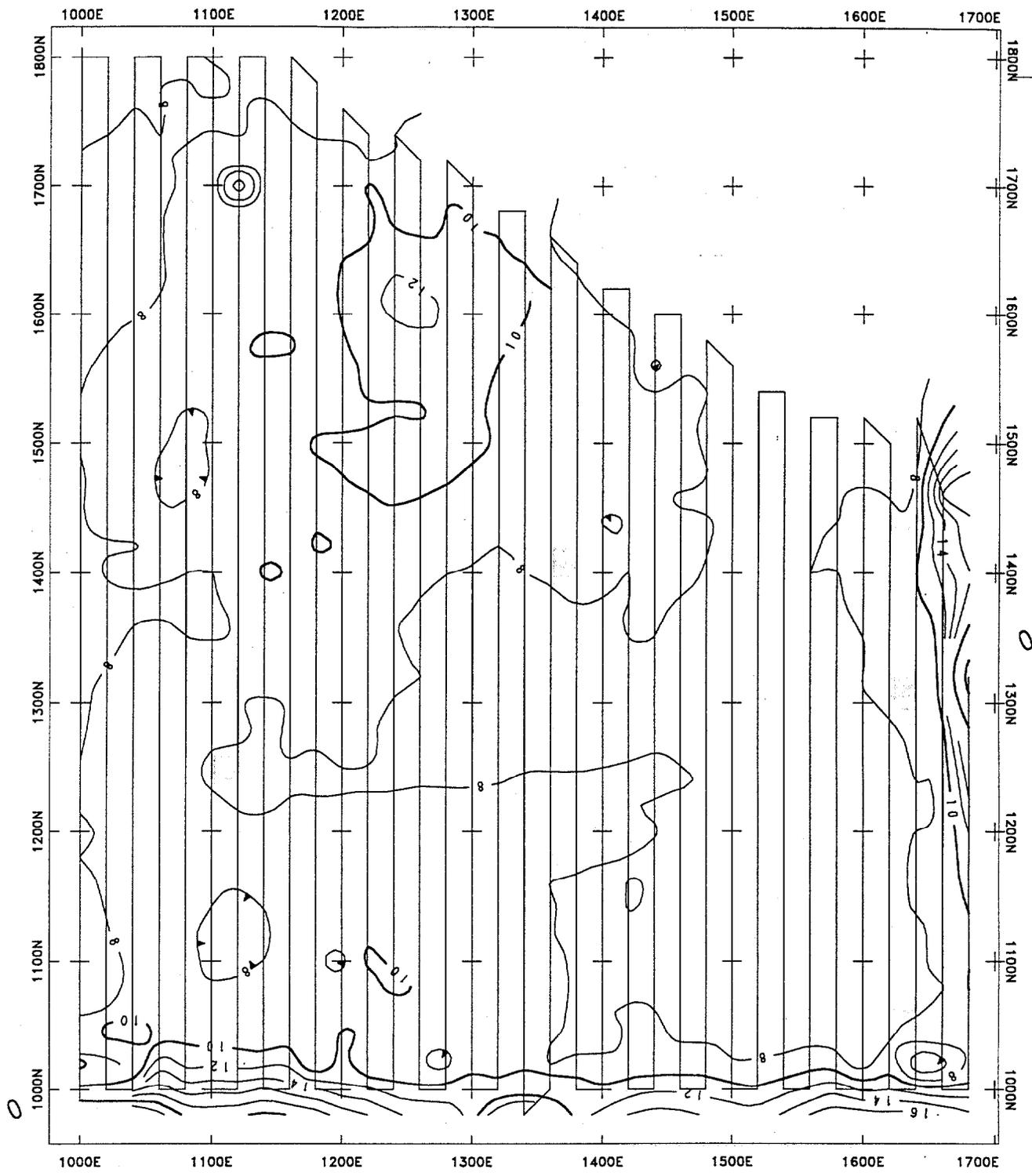


FIGURE 3  
 SOUTHERN DIVISION  
 VERTICAL GRADIENT CONTOURS  
 STUDY AREA 49  
 ABB ENVIRONMENTAL SERVICES, INC.



CONTOUR INTERVAL = 2/10 MILLIMHOS/METER

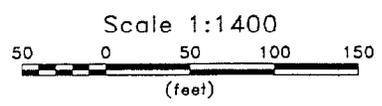
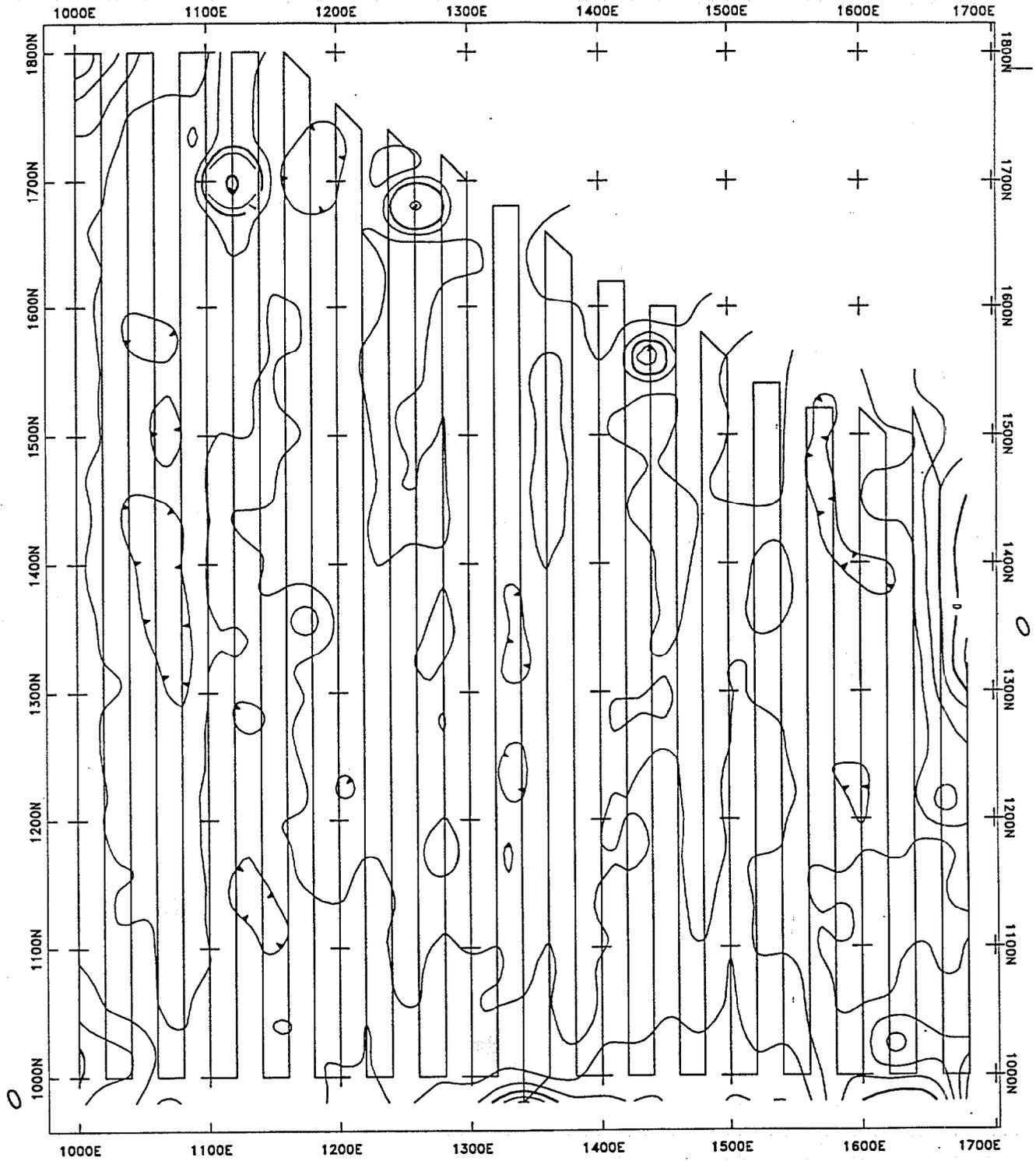


FIGURE 4  
 SOUTHERN DIVISION  
 QUADRATURE CONTOURS  
 TERRAIN CONDUCTIVITY SURVEY  
 STUDY AREA 49  
 ABB ENVIRONMENTAL SERVICES, INC.



CONTOUR INTERVAL = 0.2/1

FIGURE 5

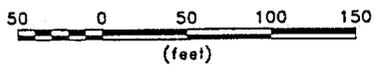
SOUTHERN DIVISION

INPHASE CONTOURS  
TERRAIN CONDUCTIVITY SURVEY

STUDY AREA 49

ABB ENVIRONMENTAL SERVICES, INC.

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**ATTACHMENT B**

**SUMMARY OF POSITIVE DETECTIONS IN SOIL AND GROUNDWATER  
ANALYTICAL RESULTS**

- B-1 Summary of Positive Detections in Surface Soil Analytical Results
- B-2 Summary of Positive Detections in Groundwater Analytical Results

**ATTACHMENT B-1**

**SUMMARY OF POSITIVE DETECTIONS IN SURFACE SOIL  
ANALYTICAL RESULTS**

Attachment B

B-1. Summary of Positive Detections in Surface Soil Analytical Results  
 Total Lead  
 Study Area 47

Site Screening Report  
 Naval Training Center, Orlando  
 Orlando, FL

Sample_ID	Depth, ft bls	Lab_ID	Sampling Date	Lead, mg/kg
Background Screening <sup>1</sup>				21.3
SCG <sup>2</sup>				500
OSWER Guidance Value <sup>3</sup> for Residential Soil				400
47S00301	0-1	MB235003	25-Jun-96	7.1 B
47S01201	0-1	MB236003	25-Jun-96	5.0 B
47S01501D	0-1	MB236007	25-Jun-96	4.1 B
47S02001	0-1	MB236012	25-Jun-96	5.1 B

**NOTES:**

<sup>1</sup> The background screening value is twice the average of detected concentrations for lead in soil.

<sup>2</sup> SCG = Soil Cleanup Goals for Florida, Residential Land Use (Florida Department of Environmental Protection memorandum, September 29, 1995)

<sup>3</sup> Risk-based concentration (as per USEPA Region III) is not available for lead. Therefore, the value indicated is from "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites" (OSWER directive 9355-4-12).

ft bls = feet below land surface

U = Analyte not detected. The number preceding the U qualifier is the reporting limit.

B = Detection is between the instrument detection limit (IDL) and the contract required detection limit (CRDL)

D = Field duplicate sample.

mg/kg = milligrams per kilogram.

OSWER = Office of Solid Waste and Emergency Response.

USEPA = U.S. Environmental Protection Agency.

All inorganics results expressed in milligrams per kilogram (mg/kg) soil dry weight.

**ATTACHMENT B-2**

**SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER  
ANALYTICAL RESULTS**

Attachment B

B-2. Summary of Positive Detections in Groundwater Analytical Results, Study Area 47

Naval Training Center, Orlando  
Orlando, FL

Well ID	OLD-47-01							
Identifier	Background Screening <sup>1</sup>	FDEPG	FEDMCL	RBC <sup>2</sup> for Tap Water	47G00101	47H00101	47G00101D	47H00101D
Sampling Date					21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96
<b>Semivolatile Organics, ug/L</b>								
bis(2-Ethylhexyl)phthalate		6 <sup>5</sup>	6	4.8 c		NA	118 J	NA
Di-n-butylphthalate		700 <sup>4</sup>			2 J	NA		NA
<b>Inorganics, ug/L</b>								
Aluminum	4,067	200 <sup>3</sup>	ND	37,000 n	869 J	765 J	874 J	773 J
Arsenic	5	50 <sup>5</sup>	50	0.045/11 c/n	4.8 BJ	3 J	1.4 BJ	3.9 BJ
Barium	31.4	2,000 <sup>5</sup>	2,000	2,600 n	8 BJ	6.9 J	12 BJ	7 BJ
Calcium	36,830	ND	ND	1,000,000	12700 J	13000 J	12800 J	13200 J
Iron	1,227	300 <sup>3</sup>	ND	11,000 n	446	260	503	260
Lead	4	15 <sup>5</sup>	15	15	1.8 BJ			
Magnesium	4,560	ND	ND	118,807	2350 B	1930 B	2380 B	1940 B
Mercury	0.12	2 <sup>5</sup>	2	11 n	0.23	0.12 B	0.12 B	0.12 B
Selenium	9.7	50 <sup>5</sup>	50	180 n	2.9 B	1.5 BJ		1.4 B
Sodium	18,222	160,000 <sup>5</sup>	ND	396,022	14800 J	12900 J	15300 J	13000 J
Vanadium	20.6	49 <sup>4</sup>	ND	260 n	2.8 B	1.8 B		2.6 B
<b>General chemistry, mg/L</b>								
Total Suspended Solids	ND	ND	ND	ND	4	NA		NA

## Attachment B

### B-2. Summary of Positive Detections in Groundwater Analytical Results, Study Area 47

Naval Training Center, Orlando  
Orlando, FL

#### NOTES:

<sup>1</sup> Groundwater background screening value is twice the average of detected concentrations for inorganic analytes.

<sup>2</sup> RBC = Risk-Based Concentration Table, USEPA Region III, May 1996, R.L. Smith. RBC for lead is not available, value is treatment technology action limit for lead in drinking water distribution system identified in Drinking Water Standards and Health Advisories (USEPA, 1995). For essential nutrients (calcium, magnesium, and sodium) screening values were derived based on recommended daily allowances (RDAs).

<sup>3</sup> Secondary Standard.

<sup>4</sup> Systemic Toxicant

<sup>5</sup> Primary Standard

<sup>6</sup> Organoleptic

n = noncarcinogenic pathway

c = carcinogenic pathway

NA = Not analyzed.

ND = Not determined.

ID = identifier

USEPA = U.S. Environmental Protection Agency.

FDEPG = Florida Department of Environmental Protection, Groundwater Guidance Concentrations, June 1994.

FEDMCL = Federal Maximum Contaminant Levels, Primary Drinking Water Regulations and Health Advisories, February 1996.

B = Reported concentration is between the instrument detection limit (IDL) and the contract required detection limit (CRDL).

J = Reported concentration is an estimated quantity.

ug/l = micrograms per liter.

mg/l = milligrams per liter.

Bold/shaded numbers indicate contaminant concentrations at or above groundwater guidance. The detection of bis(2-Ethylhexyl)phthalate in the field duplicate sample is from reextraction/reanalysis done ten days outside holding time with method blank contamination also noted by the laboratory, suggesting that this detection is a laboratory artifact.

Blank space indicates analyte/compound was not detected at the reporting limit.

**ATTACHMENT C**

**SUMMARY OF SOIL AND GROUNDWATER ANALYTICAL RESULTS**

- C-1 Summary of Soil Analytical Results
- C-2 Summary of Groundwater Analytical Results

**ATTACHMENT C-1**  
**SUMMARY OF SOIL ANALYTICAL RESULTS**

Attachment C

C-1 Summary of Analytical Results in Soil  
Total Lead  
Study Area 47

Site Screening Report  
Naval Training Center, Orlando  
Orlando, FL

Sample_ID	Depth, ft bls	Lab_ID	Sampling Date	Lead, mg/kg
47B00101	0-1	MB235009	25-Jun-96	3.6 U
47B00102	1-2	MB235010	25-Jun-96	3.6 U
47B00102D	1-2	MB235011	25-Jun-96	3.6 U
47S00101	0-1	MB235001	25-Jun-96	3.6 U
47S00201	0-1	MB235002	25-Jun-96	3.5 U
47S00301	0-1	MB235003	25-Jun-96	7.1 B
47S00401	0-1	MB235004	25-Jun-96	3.5 U
47S00501	0-1	MB235005	25-Jun-96	3.5 U
47S00601	0-1	MB235006	25-Jun-96	3.5 U
47S00701	0-1	MB235007	25-Jun-96	3.7 U
47S00801	0-1	MB235008	25-Jun-96	3.7 U
47S00901	0-1	MB235012	25-Jun-96	3.4 U
47S01001	0-1	MB236001	25-Jun-96	3.4 U
47S01101	0-1	MB236002	25-Jun-96	3.5 U
47S01201	0-1	MB236003	25-Jun-96	5.0 B
47S01301	0-1	MB236004	25-Jun-96	3.5 U
47S01401	0-1	MB236005	25-Jun-96	3.5 U
47S01501	0-1	MB236006	25-Jun-96	3.5 U
47S01501D	0-1	MB236007	25-Jun-96	4.1 B
47S01601	0-1	MB236008	25-Jun-96	3.7 U
47S01701	0-1	MB236009	25-Jun-96	3.6 U
47S01801	0-1	MB236010	25-Jun-96	3.6 U
47S01901	0-1	MB236011	25-Jun-96	3.6 U
47S02001	0-1	MB236012	25-Jun-96	5.1 B

**ATTACHMENT C-2**

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS**

Attachment C

C-2. Summary of Groundwater Analytical Results  
Study Area 47

Site Screening Report  
Naval Training Center, Orlando  
Orlando, FL

Sample ID	47G00101	47G00101D			47H00101	47H00101D
Lab ID	MB208002	MB208003	MB208003RE	MB208004	MB208005	
Sampling Date	21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96	
<b>Volatile organics, ug/L</b>						
1,1,1-Trichloroethane	1 U	1 U	NA	NA	NA	
1,1,2,2-Tetrachloroethane	1 U	1 U	NA	NA	NA	
1,1,2-Trichloroethane	1 U	1 U	NA	NA	NA	
1,1-Dichloroethane	1 U	1 U	NA	NA	NA	
1,1-Dichloroethene	1 U	1 U	NA	NA	NA	
1,2-Dibromo-3-chloropropane	1 U	1 U	NA	NA	NA	
1,2-Dibromoethane	1 U	1 U	NA	NA	NA	
1,2-Dichlorobenzene	1 U	1 U	NA	NA	NA	
1,2-Dichloroethane	1 U	1 U	NA	NA	NA	
1,2-Dichloropropane	1 U	1 U	NA	NA	NA	
1,3-Dichlorobenzene	1 U	1 U	NA	NA	NA	
1,4-Dichlorobenzene	1 U	1 U	NA	NA	NA	
2-Butanone	5 UR	5 UR	NA	NA	NA	
2-Hexanone	5 U	5 U	NA	NA	NA	
4-Methyl-2-pentanone	5 U	5 U	NA	NA	NA	
Acetone	5 UR	5 UR	NA	NA	NA	
Benzene	1 U	1 U	NA	NA	NA	
Bromochloromethane	1 U	1 U	NA	NA	NA	
Bromodichloromethane	1 U	1 U	NA	NA	NA	
Bromoform	1 U	1 U	NA	NA	NA	
Bromomethane	1 U	1 U	NA	NA	NA	
Carbon disulfide	1 U	1 U	NA	NA	NA	
Carbon tetrachloride	1 U	1 U	NA	NA	NA	
Chlorobenzene	1 U	1 U	NA	NA	NA	
Chloroethane	1 U	1 U	NA	NA	NA	
Chloroform	1 U	1 U	NA	NA	NA	
Chloromethane	1 U	1 U	NA	NA	NA	
cis-1,2-Dichloroethene	1 U	1 U	NA	NA	NA	
cis-1,3-Dichloropropene	1 U	1 U	NA	NA	NA	
Dibromochloromethane	1 U	1 U	NA	NA	NA	
Ethylbenzene	1 U	1 U	NA	NA	NA	
Methylene chloride	2 U	2 U	NA	NA	NA	
Styrene	1 U	1 U	NA	NA	NA	
Tetrachloroethene	1 U	1 U	NA	NA	NA	
Toluene	1 U	1 U	NA	NA	NA	
trans-1,2-Dichloroethene	1 U	1 U	NA	NA	NA	
trans-1,3-Dichloropropene	1 U	1 U	NA	NA	NA	
Trichloroethene	1 U	1 U	NA	NA	NA	
Vinyl chloride	1 U	1 U	NA	NA	NA	
Xylene (total)	1 U	1 U	NA	NA	NA	
<b>Semivolatile organics, ug/L</b>						
1,2,4-Trichlorobenzene	10 U	10 UR	11 UJ	NA	NA	
1,2-Dichlorobenzene	10 U	10 UR	11 UJ	NA	NA	
1,3-Dichlorobenzene	10 U	10 UR	11 UJ	NA	NA	
1,4-Dichlorobenzene	10 U	10 UR	11 UJ	NA	NA	
2,2'-oxybis(1-Chloropropane)	10 U	10 UR	11 UJ	NA	NA	
2,4,5-Trichlorophenol	25 U	25 UR	28 UJ	NA	NA	
2,4,6-Trichlorophenol	10 U	10 UR	11 UJ	NA	NA	
2,4-Dichlorophenol	10 U	10 UR	11 UJ	NA	NA	

## Attachment C

C-2. Summary of Groundwater Analytical Results  
Study Area 47Site Screening Report  
Naval Training Center, Orlando  
Orlando, FL

Sample ID	47G00101	47G00101D		47H00101	47H00101D
Lab ID	MB208002	MB208003	MB208003RE	MB208004	MB208005
Sampling Date	21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96
2,4-Dimethylphenol	10 U	10 UR	11 UJ	NA	NA
2,4-Dinitrophenol	25 U	25 UR	28 UJ	NA	NA
2,4-Dinitrotoluene	10 U	10 UR	11 UJ	NA	NA
2,6-Dinitrotoluene	10 U	10 UR	11 UJ	NA	NA
2-Chloronaphthalene	10 U	10 UR	11 UJ	NA	NA
2-Chlorophenol	10 U	10 UR	11 UJ	NA	NA
2-Methylnaphthalene	10 U	10 UR	11 UJ	NA	NA
2-Methylphenol	10 U	10 UR	11 UJ	NA	NA
2-Nitroaniline	25 U	25 UR	28 UJ	NA	NA
2-Nitrophenol	10 U	10 UR	11 UJ	NA	NA
3,3'-Dichlorobenzidine	10 U	10 UR	11 UJ	NA	NA
3-Nitroaniline	25 U	25 UR	28 UJ	NA	NA
4,6-Dinitro-2-methylphenol	25 U	25 UR	28 UJ	NA	NA
4-Bromophenyl-phenylether	10 U	10 UR	11 UJ	NA	NA
4-Chloro-3-methylphenol	10 U	10 UR	11 UJ	NA	NA
4-Chloroaniline	10 U	10 UR	11 UJ	NA	NA
4-Chlorophenyl-phenylether	10 U	10 UR	11 UJ	NA	NA
4-Methylphenol	10 U	10 UR	11 UJ	NA	NA
4-Nitroaniline	25 U	25 UR	28 UJ	NA	NA
4-Nitrophenol	25 U	25 UR	28 UJ	NA	NA
Acenaphthene	10 U	10 UR	11 UJ	NA	NA
Acenaphthylene	10 U	10 UR	11 UJ	NA	NA
Anthracene	10 U	10 UR	11 UJ	NA	NA
Benzo(a)anthracene	10 U	10 UR	11 UJ	NA	NA
Benzo(a)pyrene	10 U	10 UR	11 UJ	NA	NA
Benzo(b)fluoranthene	10 U	10 UR	11 UJ	NA	NA
Benzo(g,h,i)perylene	10 U	10 UR	11 UJ	NA	NA
Benzo(k)fluoranthene	10 U	10 UR	11 UJ	NA	NA
bis(2-Chloroethoxy)methane	10 U	10 UR	11 UJ	NA	NA
bis(2-Chloroethyl)ether	10 U	10 UR	11 UJ	NA	NA
bis(2-Ethylhexyl)phthalate	10 U	10 UR	110 J	NA	NA
Butylbenzylphthalate	10 U	10 UR	11 UJ	NA	NA
Carbazole	10 U	10 UR	11 UJ	NA	NA
Chrysene	10 U	10 UR	11 UJ	NA	NA
Di-n-butylphthalate	2 J	10 UR	11 UJ	NA	NA
Di-n-octylphthalate	10 U	10 UR	11 UJ	NA	NA
Dibenz(a,h)anthracene	10 U	10 UR	11 UJ	NA	NA
Dibenzofuran	10 U	10 UR	11 UJ	NA	NA
Diethylphthalate	10 U	10 UR	11 UJ	NA	NA
Dimethylphthalate	10 U	10 UR	11 UJ	NA	NA
Fluoranthene	10 U	10 UR	11 UJ	NA	NA
Fluorene	10 U	10 UR	11 UJ	NA	NA
Hexachlorobenzene	10 U	10 UR	11 UJ	NA	NA
Hexachlorobutadiene	10 U	10 UR	11 UJ	NA	NA
Hexachlorocyclopentadiene	10 U	10 UR	11 UJ	NA	NA
Hexachloroethane	10 U	10 UR	11 UJ	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	10 UR	11 UJ	NA	NA
Isophorone	10 U	10 UR	11 UJ	NA	NA
N-Nitroso-di-n-propylamine	10 U	10 UR	11 UJ	NA	NA
N-Nitrosodiphenylamine	10 U	10 UR	11 UJ	NA	NA

## Attachment C

C-2. Summary of Groundwater Analytical Results  
Study Area 47Site Screening Report  
Naval Training Center, Orlando  
Orlando, FL

Sample ID	47G00101	47G00101D		47H00101	47H00101D
Lab ID	MB208002	MB208003	MB208003RE	MB208004	MB208005
Sampling Date	21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96
Naphthalene	10 U	10 UR	11 UJ	NA	NA
Nitrobenzene	10 U	10 UR	11 UJ	NA	NA
Pentachlorophenol	25 U	25 UR	28 UJ	NA	NA
Phenanthrene	10 U	10 UR	11 UJ	NA	NA
Phenol	10 U	10 UR	11 UJ	NA	NA
Pyrene	10 U	10 UR	11 UJ	NA	NA
<b>Pesticides/PCBs, ug/L</b>					
4,4'-DDD	0.1 UJ	0.1 UJ	NA	NA	NA
4,4'-DDE	0.1 UJ	0.1 UJ	NA	NA	NA
4,4'-DDT	0.1 UJ	0.1 UJ	NA	NA	NA
Aldrin	0.05 UJ	0.05 UJ	NA	NA	NA
alpha-BHC	0.05 UJ	0.05 UJ	NA	NA	NA
alpha-Chlordane	0.05 UJ	0.05 UJ	NA	NA	NA
Aroclor-1016	0.5 UJ	0.5 UJ	NA	NA	NA
Aroclor-1221	0.5 UJ	0.5 UJ	NA	NA	NA
Aroclor-1232	0.5 UJ	0.5 UJ	NA	NA	NA
Aroclor-1242	0.5 UJ	0.5 UJ	NA	NA	NA
Aroclor-1248	0.5 UJ	0.5 UJ	NA	NA	NA
Aroclor-1254	0.5 UJ	0.5 UJ	NA	NA	NA
Aroclor-1260	0.5 UJ	0.5 UJ	NA	NA	NA
beta-BHC	0.05 UJ	0.05 UJ	NA	NA	NA
delta-BHC	0.05 UJ	0.05 UJ	NA	NA	NA
Dieldrin	0.1 UJ	0.1 UJ	NA	NA	NA
Endosulfan I	0.05 UJ	0.05 UJ	NA	NA	NA
Endosulfan II	0.1 UJ	0.1 UJ	NA	NA	NA
Endosulfan sulfate	0.1 UJ	0.1 UJ	NA	NA	NA
Endrin	0.1 UJ	0.1 UJ	NA	NA	NA
Endrin aldehyde	0.1 UJ	0.1 UJ	NA	NA	NA
Endrin ketone	0.1 UJ	0.1 UJ	NA	NA	NA
gamma-BHC (Lindane)	0.05 UJ	0.05 UJ	NA	NA	NA
gamma-Chlordane	0.05 UJ	0.05 UJ	NA	NA	NA
Heptachlor	0.05 UJ	0.05 UJ	NA	NA	NA
Heptachlor epoxide	0.05 UJ	0.05 UJ	NA	NA	NA
Methoxychlor	0.5 UJ	0.5 UJ	NA	NA	NA
Toxaphene	5 UJ	5 UJ	NA	NA	NA
<b>Inorganics, ug/L</b>					
Aluminum	869 J	874 J	NA	765 J	773 J
Antimony	2.6 U	2.6 U	NA	2.6 U	2.6 U
Arsenic	4.8 BJ	1.4 BJ	NA	3 J	3.9 BJ
Barium	8 BJ	12 BJ	NA	6.9 J	7 BJ
Beryllium	0.13 U	0.13 U	NA	0.13 U	0.13 U
Cadmium	3.3 U	3.3 U	NA	3.3 U	3.3 U
Calcium	12700 J	12800 J	NA	13000 J	13200 J
Chromium	4.8 U	2.8 U	NA	3.2 U	2.5 U
Cobalt	2.5 U	2.5 U	NA	2.5 U	2.5 U
Copper	1.2 U	1.2 U	NA	1.2 U	1.2 U
Iron	446	503	NA	260	260
Lead	1.8 BJ	1.2 U	NA	1.2 U	1.2 U
Magnesium	2350 B	2380 B	NA	1930 B	1940 B
Manganese	4.2 U	4.3 U	NA	3.4 U	3.6 U

Attachment C

C-2. Summary of Groundwater Analytical Results  
Study Area 47

Site Screening Report  
Naval Training Center, Orlando  
Orlando, FL

Sample ID	47G00101	47G00101D		47H00101	47H00101D
Lab ID	MB208002	MB208003	MB208003RE	MB208004	MB208005
Sampling Date	21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96	21-Jun-96
Mercury	0.23	0.12 B	NA	0.12 B	0.12 B
Nickel	5.5 U	5.5 U	NA	5.5 U	5.5 U
Potassium	745 U	745 U	NA	745 U	745 U
Selenium	2.9 B	1.3 U	NA	1.5 BJ	1.4 B
Silver	2.2 U	2.2 U	NA	2.2 U	2.2 U
Sodium	14800 J	15300 J	NA	12900 J	13000 J
Thallium	0.86 UR	0.86 UR	NA	0.86 UR	0.86 UR
Vanadium	2.8 B	1.7 U	NA	1.8 B	2.6 B
Zinc	3.8 U	4.3 U	NA	3.4 U	2.8 U
<b>General Chemistry, mg/L</b>					
Total Suspended Solids	4	4 U	NA	NA	NA

## NOTES TO SUMMARY TABLES OF ANALYTICAL RESULTS

Naval Training Center  
Orlando, FL

NA = Identified parameter not analyzed.  
Sample ID = Sample Identifier  
Lab ID = Laboratory identifier

### Units:

mg/kg milligram per kilogram  
ug/kg microgram per kilogram  
mg/L milligram per liter

The following standard validation qualifiers shown next to the number are used in this Attachment.

- U The analyte/compound was analyzed for but was not detected above the reported sample quantitation limit
- J The analyte/compound was positively identified and the associated numerical value is an estimated concentration of the analyte/compound in the sample.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound that has been tentatively identified, and the associated numerical value represents an estimated concentration.
- UJ The analyte/compound was not detected above the reported sample quantitation limit.  
The reported quantitation limit, however, is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte/compound in the sample.
- R The sample results are rejected because of serious deficiencies in meeting quality control criteria.

The following laboratory qualifiers are typically dropped upon validation but are retained here to provide additional information on their associated numerical values.

- B The inorganic analyte was positively identified and the associated numerical value is an estimated concentration because the detection was below the contract required detection limit (CRDL) and above the instrument detection
- E The reported value for the compound exceeds the linear calibration range for that compound. Therefore, the sample have been reanalyzed at an appropriate dilution (sample identifiers ending in DL).
- D The reported value for the compound has been quantified at a secondary dilution factor. This value typically is used in favor of E qualified values. When this applies, the E qualifier are flagged ER;  
D qualified values that are rejected in favor of the original results are flagged DR.