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NAS CECIL FIELD, FL
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SAMPLING AND ANALYSIS REPORT FOR AREA OF INTEREST 22 BASE REALIGNMENT AND CLOSURE ZONE B GOLF COURSE AREA NAS CECIL FIELD FL

9/1/1999

HARDING LAWSON ASSOCIATES

SAMPLING AND ANALYSIS REPORT

AREA OF INTEREST 22

BASE REALIGNMENT AND CLOSURE

ZONE B, GOLF COURSE AREA

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

Contract No.: N62467-89-D-0317/090

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September 1999

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Naval Air Station Cecil Field, Jacksonville, Florida

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc
BCT	Base Realignment and Closure cleanup team
bls	below land surface
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
HLA	Harding Lawson Associates
HI	hazard index
HQ	hazard quotient
PCB	polychlorinated biphenyl
ppm	parts per million
PRE	preliminary risk evaluation
RAC	Response Action Contractor
RBC	risk-based concentration
SAO	Sampling and Analysis Outline
TAL	target analyte list
TCL	target compound list
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

Harding Lawson Associates (HLA), under contract to Southern Division, Naval Facilities Engineering Command, has completed the Sampling and Analysis program for Area of Interest 22 (AOI 22) at Naval Air Station (NAS) Cecil Field. AOI 22 is the site designation assigned to a wooded area west of Fairway Number 7, on the golf course at NAS Cecil Field, Jacksonville, Florida (Figure 1). This report summarizes the related field operations, results, conclusions, and recommendations.

Arsenic was detected at a concentration in excess of current site screening criteria, at one of five sample locations, during a preliminary site investigation of AOI 22 (ABB Environmental Services, Inc. [ABB-ES], 1992, Appendix A). The sample containing the elevated concentration of arsenic was located in an area containing miscellaneous metallic surface debris, including empty drums. No other analytes were detected at concentrations in excess of screening criteria.

A Sampling and Analysis Outline (SAO) for evaluation of the remainder of AOI 22 was prepared by ABB-ES and approved by the Base Realignment and Closure Cleanup Team (BCT) (ABB-ES, 1996). The SAO proposed a geophysical survey of the AOI 22 to identify accumulations of subsurface metallic debris, and excavation of test pits to verify the nature of buried materials. The results of the sampling and analysis program are discussed in Chapters 2 and 3.

2.0 PHASE II INVESTIGATION

HLA conducted a geophysical survey to locate buried metallic debris within AOI 22. Prior to the geophysical survey, all metallic debris visible at the surface within AOI 22 was identified on a site plan, catalogued, and removed by the Response Action Contractor (RAC) (refer to Appendix B).

Total magnetic field, vertical magnetic gradient and terrain conductivity were measured at 10-foot intervals along east-west traverse lines. Traverse lines were spaced at 20-foot intervals. The survey area was bounded by Fairway Number 7 to the east, by Rowell Creek to the west, by Fairway Number 6 to north, and by dense woods to the south. Global positioning survey equipment was used to obtain coordinates for the baseline of the surveyed area. A geophysical survey traverse map is presented in Figure 2.

One area of AOI 22 was not surveyed during the field operations, due to the presence of an exclusion zone set up by the RAC (refer to Figure 2). The exclusion zone was located in an area where partially buried 5-gallon cans of fuel stabilizer were encountered by the RAC. An undetermined amount of the material was released within the area, during removal operations.

Magnetic and terrain conductivity measurements were contoured, and evaluated by an HLA geophysicist. Based on a review of the information, it was determined that a significant amount of buried metallic objects were present throughout much of AOI 22. Twelve locations across the site were proposed for intrusive investigation, based upon the geophysical anomalies (refer to Figure 3). The proposed locations were reviewed and approved by the BCT during the June 1998 BCT meeting. HLA marked the center of each proposed test pit location, with numbered 4-foot stakes, by reference to geophysical survey grid markers. It was subsequently

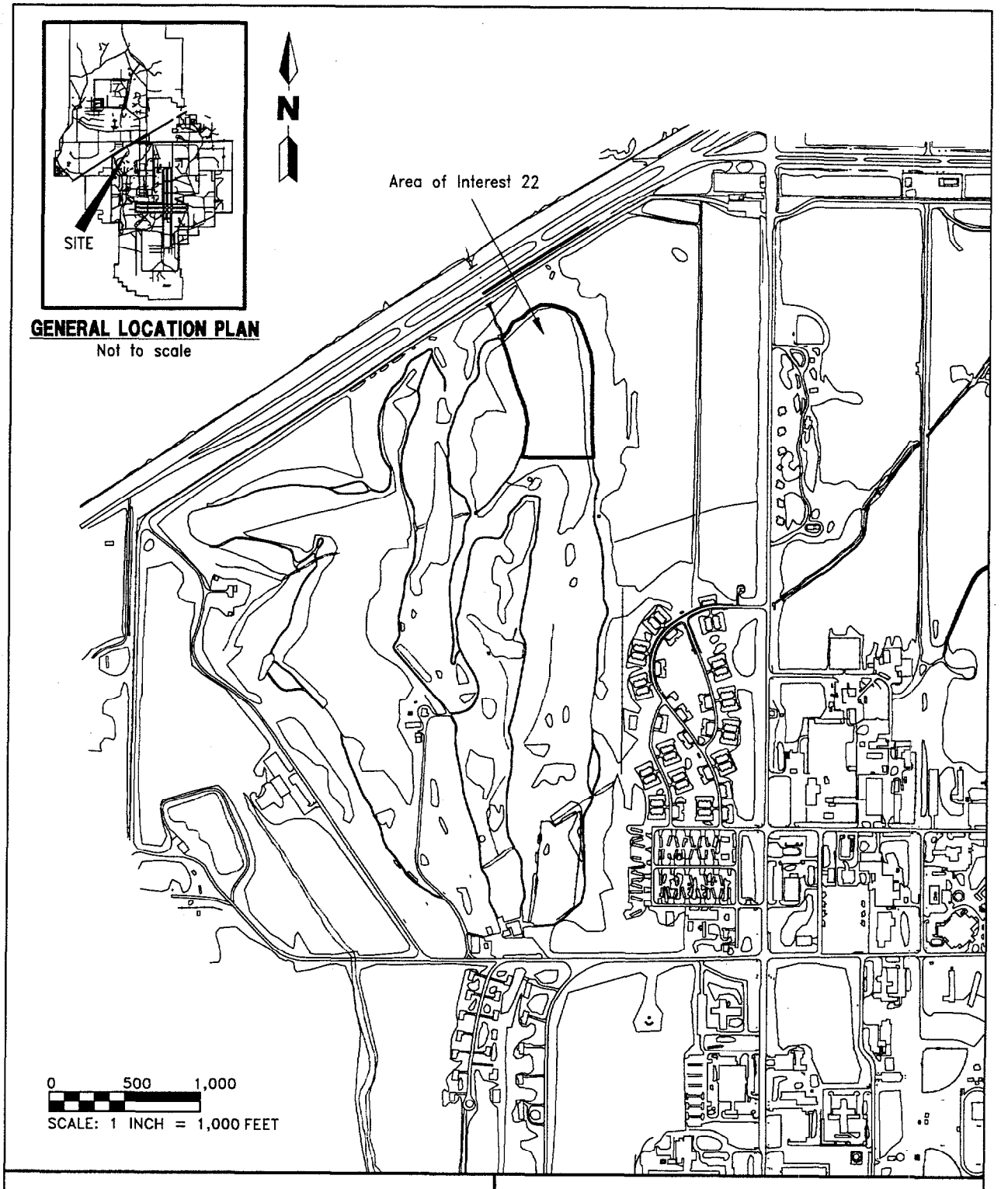

FIGURE 1
AREA OF INTEREST 22
GENERAL LOCATION PLAN

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SAMPLING AND ANALYSIS REPORT

NAVAL AIR STATION CECIL FIELD
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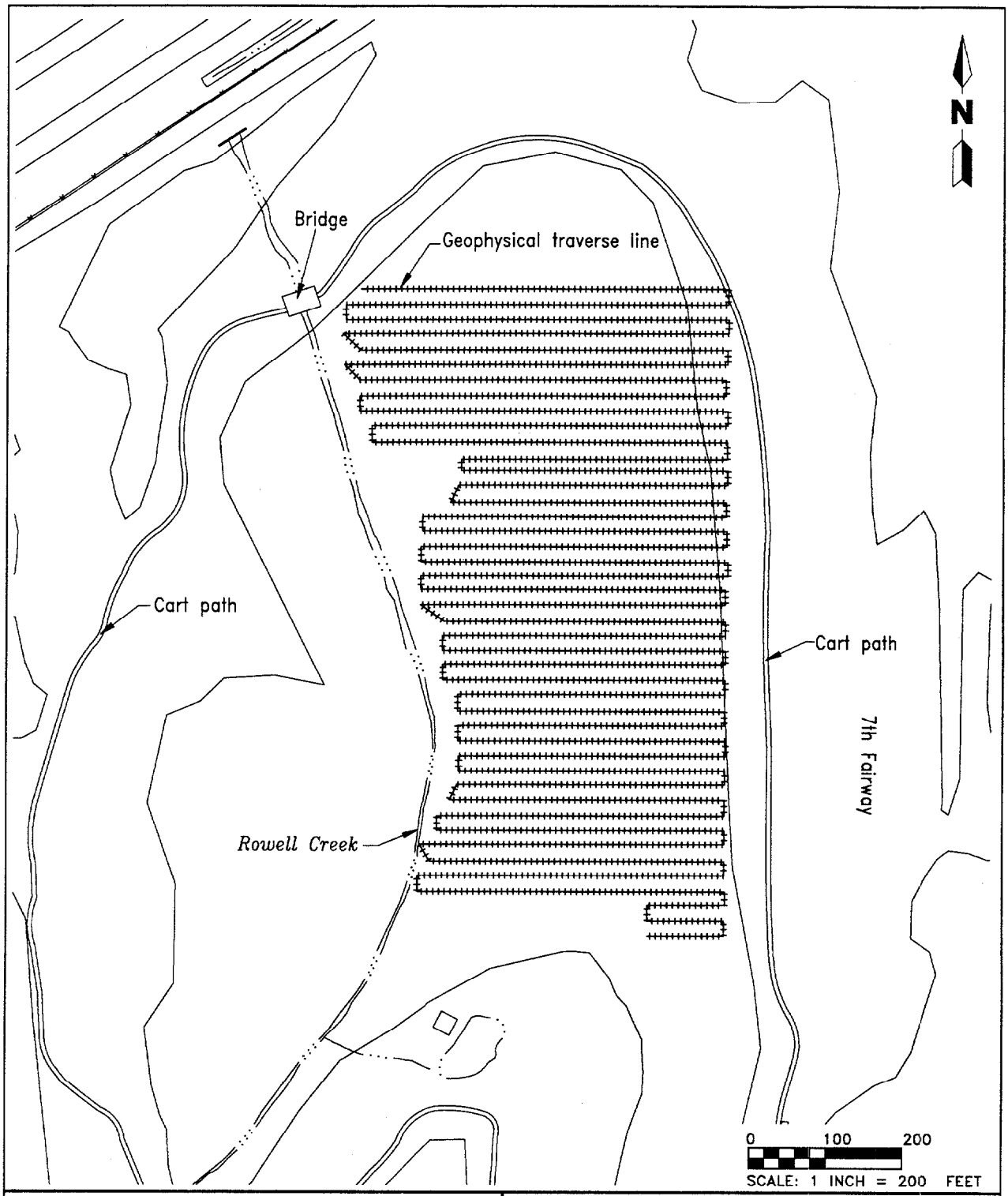

FIGURE 2
AREA OF INTEREST 22
GEOPHYSICAL SURVEY TRAVERSE MAP

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SAMPLING AND ANALYSIS REPORT

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

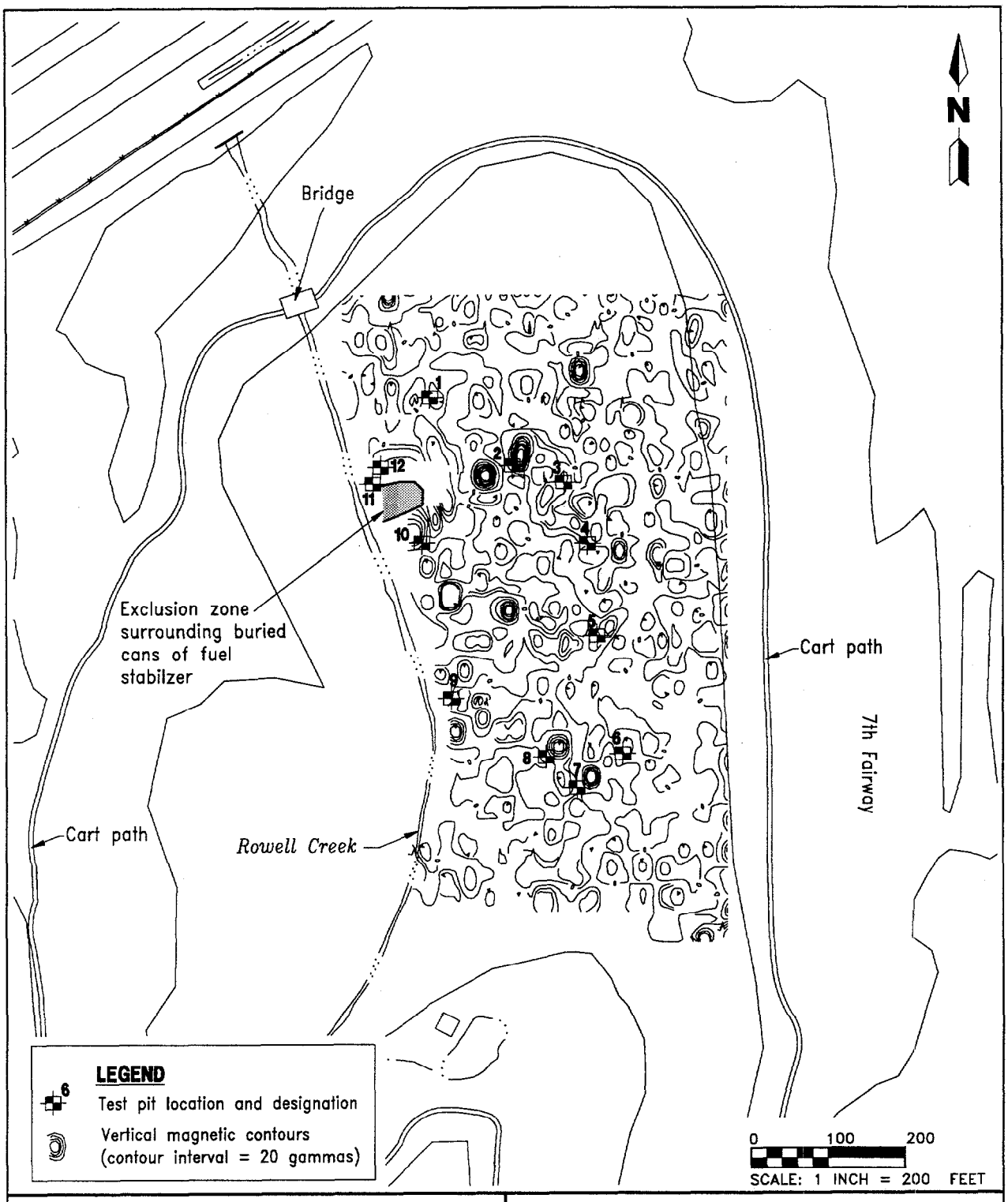

FIGURE 3
AREA OF INTEREST 22
VERTICAL MAGNETIC GRADIENT MAP

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SAMPLING AND ANALYSIS REPORT

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

reported that all stakes had been removed or destroyed by forestry activities in the area, prior to mobilization of the RAC. Estimated coordinates for test pit locations were provided by HLA, based upon a superposition of geophysical survey data and the base map provided in the NAS Cecil Field Environmental Geographic Information System. The test pit locations were re-established in the field by the RAC.

The RAC excavated test pits at each proposed location, between September 29th and October 8th, 1998. The test pit dimensions were 10-foot by 10-foot by 5-foot deep. Miscellaneous buried metallic objects were encountered at each of the test pits. Metallic debris was removed and recycled, ant the test pits were backfilled. No evidence of hazardous materials disposal was encountered during the investigation. A list of materials encountered at each test pit location was recorded by the RAC.

3.0 PRELIMINARY RISK EVALUATION

A preliminary risk evaluation (PRE), based upon the data collected during the 1992 Preliminary Investigation of AOI 22, was conducted to assess potential risks to human receptors posed by contaminants in soil. Primary exposure pathways were evaluated to determine those pathways that potentially contribute to human health and ecological risks. The evaluation was conducted in general conformance with methodology provided in the U.S. Environmental Protection Agency (USEPA) Region IV memorandum entitled Amended Guidance on PREs for the Purpose of Reaching a Finding of Suitability to Lease (USEPA, 1994), a USEPA Region IV bulletin on ecological risk assessment (USEPA, 1995), and minutes of meetings with the USEPA and the Florida Department of Environmental Protection (FDEP) concerning PREs (ABB-ES, 1995a). Site background information and rationale for sample collection and analysis are detailed in the Environmental Baseline Survey Report (ABB-ES, 1994b) and the SAO (ABB-ES, 1995b).

Inorganic analytes were compared to NAS Cecil Field screening criteria for inorganics established by the NAS Cecil Field partnering team. The NAS Cecil Field screening criteria were determined by using the nonparametric upper-outside value cutoffs as described in *Understanding Robust and Exploratory Data Analysis* (Hoaglin et al., 1983). These screening values were developed from data collected throughout NAS Cecil Field. No risk evaluation is conducted for inorganic analytes detected below NAS Cecil Field screening criteria for inorganics.

3.1 PUBLIC HEALTH PRE. All detected analytes were compared to readily available risk-based screening values to assess the likelihood of adverse human health effects associated with potential exposure to surface soil. Risk-based screening values were obtained from USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, 1996) and FDEP Cleanup Target Levels (FDEP, 1998). Most screening values published in the references listed above are based on toxicity constants and standard human exposure scenarios and correspond to fixed levels of risk. The designated level of risk for noncarcinogenic chemicals is based on a hazard quotient (HQ) of 1. The level of risk for carcinogenic chemicals is based on an excess lifetime cancer risk (ELCR) of 1×10^{-6}. Cancer and noncancer risks associated with industrial and residential land use are estimated by dividing the maximum detected analyte concentration by the corresponding USEPA Region III RBC value at the designated level of risk (ELCR of 1×10^{-6} or HQ of 1, respectively). For noncarcinogens, the HQs are summed to determine the cumulative noncancer risk or hazard index (HI).

Arsenic was detected at 1 surface soil sample location (SD-B-1), at a concentration of 23.49 mg/kg, which exceeds the NAS Cecil Field screening criteria for inorganics (2.04 mg/kg) and the FL SCTL. The concentration of arsenic was higher (39.6 mg/kg) in sample SD-B-3, which is a field duplicate of sample SD-B-1. This was the highest arsenic concentration detected among the 5 samples collected within the area of investigation. Based upon this result, an ELCR of $5x10^{-4}$ was calculated in association with a potential surface soil exposure scenario. No other organic or inorganic analytes were detected at concentrations in excess of screening criteria, in surface soil samples collected within the area of investigation. Laboratory analytical data is included in Appendix A.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Arsenic was detected at a concentration in excess of Florida Soil Cleanup Target Levels in surface soil at one sample location within AOI 22. Although elevated concentrations of arsenic are not unusual in golf course surroundings, sample SD-B-1 was collected in a wooded area more than 100 feet from the nearest fairway. In addition, a soil sample collected upgradient of sample SD-B-1 did not contain elevated concentrations of arsenic. Therefore, it is unlikely that the arsenic is naturally occurring or related to normal golf course maintenance. The extent of arsenic contaminated surface soil in the vicinity of sample SD-B-1 should be evaluated. The coordinates for SD-B-1 are estimated to be 373,885 East, and 2,149,205 North, based upon a review of recent aerial photographs in the NAS Cecil Field Environmental Geographic Information System and the site plans provided in the 1992 letter report. The location of sample SD-B-1 was not surveyed, and site plans provided with the letter report are not to scale. In addition, site landmarks have been destroyed during forestry operations. Surface soil may also have been moved or disturbed during forestry operations. Any sample plan developed to evaluate this area should consider these factors.

Miscellaneous debris has been encountered at the surface, and buried at shallow depth, throughout much of AOI 22. All debris encountered at the ground surface was removed from site by the RAC. Hazardous substances (fuel stabilizing compounds) were encountered at one location during the RAC activities. The location was marked, to restrict public access and to facilitate future evaluation or remedial action. Site markers were subsequently destroyed during forestry operations. The coordinates for the partially buried cans of fuel stabilizer have are to be 373,530 East, and 2,149,070 North, based upon a review of recent aerial photographs in the NAS Cecil Field Environmental Geographic Information System and the site grid generated during the geophysical survey. Any soils affected by hazardous substances identified by the RAC should be relocated, delineated, excavated, and removed from site. Further evaluation of soil, groundwater, surface water, and sediment in this area may be required, depending upon the extent of contamination.

An extensive geophysical survey of AOI 22 was conducted to identify locations most likely to contain buried debris. Test pits were excavated at locations most likely to contain buried debris. No hazardous materials were identified in any of the test pits excavated in the area. Most items reportedly encountered in the test pits were restricted to metal and other inert debris.

Based on the information obtained for this assessment, it appears that the historical dumping activities at AOI 22 were, with few exceptions, restricted to inert materials. Efforts undertaken to evaluate the potential for hazardous materials within AOI 22 indicate that there has not likely been any extensive

disposal of hazardous substances in the area. Therefore, with the exception of the two areas for which further evaluation has been proposed, the color classification for AOI 22 should be changed from 7/Grey, to 3/ Light Green. The two areas for which further evaluation has been proposed should be reclassified to 5/Yellow.

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APPENDIX A

SITE SCREENING STUDY (LETTER REPORT, ABB-ES, 1992)

ASEA BROWN BOVERI

7537-08

4 August 1992

Commanding Officer
ATTN: Mr. Cliff Casey, Code 18212
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
Charleston SC 29418

SUBJECT: Site Screening Study
NAS Cecil Field RI/FS
Navy CLEAN District I
Contract N62467-89-D-0317, CTO #0035

Dear Cliff:

This letter report summarizes results from a preliminary investigation of two potentially hazardous waste sites, identified after the Naval Air Station Cecil Field Initial Assessment Study was conducted by Environdyne Engineers, Inc. in 1985. The sites are not currently part of the NAS Cecil Field Remedial Investigation Program (RI). This study was performed to determine the need for additional investigative activities. The goal was to collect samples from potentially contaminated areas. These samples should represent the maximum concentration of contaminants, if present, at each site. The study was not designed to fully characterize the nature or extent of contamination.

INTRODUCTION

The NAS Cecil Field Environmental Section has identified two sites, which may have received hazardous substances due to past activities. These sites are located on the installation golf course but are not part of the RI program Site 11. Figure 1 shows the location of the two sites. Site A is located at the Golf Course Maintenance Area. The site consists of several potential sources of contamination including a former pesticide mixing area, an equipment rinse area, and a pesticide can disposal area. Site B consists of two areas along fairway number 7, where several drums were deposited. The drums disposal areas are about 30 feet apart, located in a wooded terrain.

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Site A, Golf Course Maintenance Area, presently includes five buildings (Figure 2). Building 371 is a relatively modern aluminum building designed to store pesticides. Building 238 houses an office and is used for small equipment and golf cart repairs. Large equipment, such as tractors, are stored in building 388. A kerosene tank and a diesel fuel dispenser are located northeast of building 238, next to a small ditch. A gasoline pump is located in front of building 371.

A small pad, located north of building 238, is used as the equipment washdown area. Before construction of this pad, washdown of equipment and mixing of pesticides was reportedly performed near a faucet, located northeast of building 238. A small concrete swale, designed to collect the washdown water is still visible in the parking lot. Both the former and present washdown areas discharge into a small manmade ditch. The ditch begins at the north side of the maintenance area, the water flows around the maintenance area, then south and eventually discharges through a series of ditches into Rowell Creek. This ditch drains most of the stormwater away from the maintenance area. West of the maintenance area is a small cypress dome that receives the remaining stormwater runoff.

Several types of pesticides, including fungicides, nematocides, insecticides and herbicides are applied to the golf course as part of routine maintenance. The current method of storage, mixing, and applying of pesticides, was not reviewed by ABB-Environmental Services, however, no obvious infractions of state or federal laws were observed during the investigation. The following information was provided by Mr. Richard (Dick) Johnson, the current golf course manager. The current method of pesticide application includes back-mounted handsprayers, and several types of tractor pulled sprayers. Pesticides are purchased in small quantities to minimize storage. Empty pesticide containers and applicator holding tanks are triple rinsed after being used. The rinsate liquids are applied onto the golf course. The cleaned pesticide containers are disposed offsite.

The former method of can/drum disposal included depositing some drums in a waste pile located in a clearing northwest of building 371, other cans were buried in an area now identified as RI Site 11. Because Site 11 is currently under investigation, samples were not collected from this area. The pesticide cans have been removed from the can disposal area, leaving no visual signs of pesticide contamination, however several 55 gallon type drums with petroleum labels were present. Some old equipment and a few old tires were located in a nearby clearing. The general appearance of the equipment indicated this equipment is surplus.

Site B consists of two areas located in the woods near fairway 7 (Figure 3). Both areas are isolated from the fairway by a thick vegetative cover. The general condition of the drums, where most had areas that rusted through, suggests that they were deposited in their present location several years ago. The larger of the two areas at site B consists of about twenty drums, most were cut in half, had welded handles and were painted white. The half drums appear to be litter disposal containers. The smaller area, located about 30 feet northwest of the larger drum disposal area and in a stormwater runoff ditch, consisted of about 6 drums, mostly 30 gallon size.

SAMPLING AND ANALYSIS PROCEDURES

Soil samples were collected using a stainless steel bucket auger. These samples were labeled "Bor" for boring, followed by an "A" or "B" depending on the site they were collected from, followed by the site identification number. The soil sampling procedure consisted of removing the top inch of surface litter before sampling. A bucket auger was then used to collect the next 6 to 8 inches of soil. The volatile organic compound (VOCs) samples were collected directly from the bottom of the auger bucket. The remaining material was placed into a stainless steel bowl and thoroughly mixed. Roots and large leafy material were removed before filling the sample containers.

Sediment samples, representing the bottom of streams, are identified as "SD" followed by site and location identification. VOC samples were collected by submerging the jars directly into the stream bottom. Material for the remaining parameters were collected by scooping material from the stream bottom directly in a stainless steel bowl. The material was mixed with a stainless steel spoon and sample aliquots were collected.

The quality control and quality assurance (QA/QC) consisted of a trip blank for VOCs only, an equipment rinsate blank, a sample duplicate, a matrix spike and a matrix spike duplicate. Chemical analysis were performed using Contract Laboratory Program (CLP) protocol from Statement of Work, February 1988 (SOW 2/88). The QA/QC and supporting documentation was in accordance with Naval Energy and Environmental Support activity QA/QC level "D" (Document 20.2-047b)(1988). This is equivalent to EPA's Level "4" data quality objectives. The samples were analyzed for the Target Compound List (volatile organic compounds, semi-volatile organic compounds, pesticides, and polychlorinated biphenyls) and Target Analyte List (for inorganic chemicals).

The data was validated by an independent subcontractor in accordance with USEPA, 1991, National Functional Guidelines for Organic Data Review and USEPA, 1988, National Functional Guidelines for Inorganic Data Review.

SAMPLING LOCATION RATIONALE

The following is a summary of the rational for each sample location. These locations are shown in Figure 2 for Site A and Figure 4 for Site B.

Site A, Golfcourse Maintenance Area

Samples Bor A-1, Bor A-2, and Bor A-3 were collected from the area identified as the pesticide can disposal pile area. Three samples were collected to insure the former area used for pesticide can storage would be included in at least one sample.

Sample Bor A-4 was collected from the surplus equipment area. This sample was collected to confirm whether residual pesticide or petroleum products were spilled during the time the equipment was stored in this area.

Sample Bor A-5 was collected from the maintenance area to identify non-point source distribution of contaminants (pesticides and fuels) in the maintenance area.

Sample Bor A-6 was collected from an area adjacent to the wash down pad. This sample was collected to identify the release of contaminants through normal mixing and cleaning of pesticide applicators.

Sample Bor A-7 was a duplicate of Bor A-2.

Sample SD-A-1 was collected in the ditch adjacent to the washdown pad. This sample was collected to identify the release of contaminants through current practices.

Sample SD-A-2 was collected in the ditch immediately next to the faucet (the former pesticide mix and equipment rinse area). This sample should identify the worst residual contamination remaining from the old mixing practices.

Sample SD-A-3 was collected from the drainage culvert drown gradient of the site. This station is approximately 100 feet from the source. SD-A-3 was collected to indicate how much of the contamination has been transported away from the site.

Site B, Fairway 7 Drum Site

Site B consists of two distinct areas where drums had been deposited.
Area 1, is the larger of the two areas (see Figure 4).

Sample Bor B-1 was collected from the middle of the disposed drum area. This sample represents potentially the most contaminated soil at the site.

Sample Bor B-2 was collected immediately downgradient of the drums. This sample will indicate if the contaminants have migrated or been transported away from the drums by erosion.

Sample Bor B-3 was collected from a depression downgradient of the site. There were several old tires in the depression. This depression was chosen because it is in the pathway for contaminants moving overland, as a result of erosion and surface runoff, therefore this depression may have been a depositional area.

Area 2, the smaller of the two areas, is located in a stormwater ditch bed (see figure 4).

Sample SD-B-1 was collected about 5 feet downstream of the drum area. This location was chosen to represent the most likely location where contaminants from the drums would be found.

Sample SD-B-2 was collected upstream of the drums. This sample represents the upgradient conditions for the area.

Sample SD-B-3 was a duplicate sample of SD-B-1.

CHEMICAL RESULTS

Table 1, summarizes the organic compounds detected and all inorganic parameters and their reported concentrations for the Site A, Golf Course Maintenance Area. Appendix A contains the complete sampling analytical results. Two VOCs, methylene chloride and 4-methyl-2-pentanone (MIBK), were detected in several samples. Evaluation of the trip blank, rinsate blank, field blank, and the VOC method blanks associated with each sample showed trace levels of methylene chloride and MIBK. Methylene chloride and MIBK, as associated with each blank, indicates that trace concentration of these chemicals were present as artifacts of the sample handling and analysis process. These two chemicals are common artifacts of VOC analysis. Trace concentrations of these chemicals as artifacts in the blanks do not account for the higher concentrations of MIBK and methylene chloride in the environmental samples. Detection of these compounds in surface soils is very unusual considering their volatile nature.

Several semi-volatile compounds were detected with concentrations ranging as high as 140 ug/kg. These results are flagged as estimated because their concentrations are below the nominal Contract Required Quantitation Limit (CRQL) specified in the CLP method. Two plasticizers, the phthalate esters di-n-butylphthalate and bis (2-ethylhexyl) phthalate, were observed. These chemicals are commonly detected at low concentrations in semi-volatile compound samples and analysis due to their common use in plastics and synthetic rubber products. Pentachlorophenol was detected in one sample at an estimated concentration of

100 ug/kg. Pentachlorophenol has been used as a wood preservative and has found limited application as a herbicide. Benzoic Acid is used as a food preservative but also occurs in nature as a breakdown product of complex aromatic hydrocarbons. Several of the samples contained trace concentrations of polynuclear aromatic hydrocarbons (PAH) and/or methylphenols. These chemicals are present in fuel products such as kerosene, diesel, and heavier type petroleum products. PAH are widely distributed due to incomplete combustion of fossil fuels and/or residue of wild fires.

The analysis reported several pesticide residues at site A: chlordane, dichlorodiphenyltrichloroethane (DDT) [and its breakdown products dichlorodiphenyldichloroethene (DDE), dichlorodiphenyldichloroethane (DDD)], dieldrin, and heptachlor expoxide. These pesticides have been banned from use due to their long environmental life and adverse ecological effects. The highest concentration detected was for chlordane. Chlordane appears to be widespread and it was detected in relatively high concentration at SD-A-3, in the ditch (down gradient of the site), suggesting that some off-site migration may have occurred.

Lead, arsenic, and chromium were detected at site A in concentrations above background levels, 47.4, 46.9 and 29 mg/kg respectively. These inorganics should be included as parameters in any future investigative activity.

Table 2, summarizes the organic compounds detected and all inorganic parameters and their concentrations found at Site B, Fairway 7, drum disposal areas. Appendix A contains the complete sampling analytical results. Three VOCs, methylene chloride, MIBK and toluene were detected in several samples. These three chemicals are very common laboratory contaminants and may not represent environmental contamination, however, as at site A their presence as environmental contaminants cannot be ruled out.

Benzoic Acid was found at very high concentrations, up to 34,000 ug/kg. The source of this chemical is not known. 34,000 ug/kg of benzoic acids has a hazard index of $1X10^{-4}$ for a child. A chemical with a Hazard Index less than 1.0 does not pose a significant health threat and should not be a specifically targeted parameter in future studies.

Chlordane was detected in one sample from this site. Chlordane can bioaccumulate in animal tissues, therefore, additional investigative activities are needed to accurately define the human and ecological risk associated with this pesticide.

Both lead and arsenic were detected above background concentrations, 22.9 and 39.6 mg/kg respectively. Lead and arsenic should be included as an analytical parameter in any future investigation.

RECOMMENDATIONS

At both sites A and B, VOCs, semi-volatile compounds, pesticides and inorganics were detected. Several of the analyte, identified above, were detected at concentrations that warrant additional sampling and analysis either to confirm their presence or absence in environmental samples (the VOCs) or define the nature and extent of the contamination. These activities should include analysis for all Contract Laboratory Program (CLP) parameters (VOCs, semi-volatile compounds, pesticides, and inorganics).

The pesticides appear to present the greatest potential threat to humans and to the environment. In an effort to better quantify the risk, the next round of investigative activities should use analytical pesticide methods with lower detection limits than the detection limits established in CLP protocol. Also, the pesticide parameter lists should be expanded to include currently used pesticides. The sampling at Site A, should include sediment samples collected from the entire length of the ditch, from the maintenance area to Rowell Creek.

In addition, the drums at sites A and B should be removed and disposed of properly.

If you have any questions or comments, please contact me or Charlie Donahue at 904-656-1293.

Very truly yours,

ABB ENVIRONMENTAL SERVICES INC.

Barry Lester, P.E.
Task Order Manager

Enclosures: Tables 1 and 2
Figures 1 trough 4
Appendix A

cc: John Dingwall, NAS Cecil Field

TABLE 1
SITE A, GOLF COURSE MAINTENANCE AREA
COLLECTED: 5 NOVEMBER 1991

SITE SCREENING INSPECTION
NAS Cecil Field
Jacksonville, Florida

Locator:	BOR-A-1	BOR-A-2	BOR-A-7 (DUP OF BOR-A-2)	BOR-A-3	BOR-A-4	BOR-A-5	BOR-A-6	SD-A-1	SD-A-2	SD-A-3
Lab Sample #:	20046003	20046004		20046006	20046008	20046009	20046010	20046007	20046011	20046012
VOLATILES										
Methylene Chloride (ug/kg)	170 UJ	740	1100 J	18 U	320 J	170	40 U	49 U	83	240
4-Methyl-2-pentanone (ug/kg)	13 UJ	42 U	77 UJ	11 U	27 UJ	14 U	74	12 U	16 U	120
SEMI-VOLATILES										
2-Methylphenol (ug/kg)	460 U	470 U	460 U	110 J	430 U	460 U	400 U	410 U	470 U	450 U
4-Methylphenol (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	70 J	470 U	450 U
Benzoic Acid (ug/kg)	2300 U	2300 U	2200 U	2000 U	800 J	2300 U	2000 U	2000 U	2300 U	2200 U
Pentachlorophenol(ug/kg)	100 J	2300 U	2200 U	2000 U	2100 U	2300 U	2000 U	2000 U	2300 U	2200 U
Di-n-butylphthalate (ug/kg)	80 J	82 J	460 U	400 U	430 U	460 U	410 U	410 U	470 U	55 J
Fluroanthene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	55 J	450 U
Pyrene (ug/kg)	100 J	64 J	91 J	400 U	430 U	460 U	400 U	410 U	470 U	450 U
Chrysene (ug/kg)	81 J	81 J	68 J	400 U	430 U	460 U	400 U	410 U	470 U	450 U
bis(2-Ethylhexyl)phthalate ug/kg	140 J	110 J	460 U	400 U	72 J	83 J	160 J	410 U	67 J	79 J
Benzo (b) fluoranthene (ug/kg	140 J	120 J	120 J	400 U	56 J	460 U	98 J	410 U	470 U	450 U
Benzo (k) fluoranthene (ug/kg	110 J	87 J	59 J	400 U	430 U	460 U	95 J	410 U	470 U	450 U
Benzo (a) pyrene (ug/kg)	460 U	67 J	86 J	400 U	430 U	460 U	82 J	410 U	470 U	450 U
Indeno(1,2,3-cd) pyrene (ug/kg)	460 U	55 J	63 J	400 U	430 U	460 U	400 U	410 U	470 U	450 U
PESTICIDES AND PCBs										
Heptachlor epoxide (ug/kg)	58 J	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U
Dieldrin (ug/kg)	7.3 J	25 U	22 U	49 U	53 U	110 U	2000 U	50 U	21 J	4.8 J
4,4'-DDE (ug/kg)	30 J	7 J	8.1 J	5.2 J	6.5 J	110 U	2000 U	50 U	63 J	53 J
4,4'-DDD (ug/kg)	110 U	23 U	4.7 J	49 U	53 U	110 U	650 J	50 U	45 J	42 J
4,4'-DDT (ug/kg)	110 U	9.7 J	12 J	49 U	53 U	110 U	2000 U	50 U	57 U	54 U
alpha Chlordane (ug/kg)	530 J	110 U	110 U	58 J	29 J	72 J	680 J	34 J	350	350
gamma-Chlordane (ug/kg)	330 J	110 U	110 U	24 J	12 J	36 J	660 J	21 J	320	320

TABLE 1 (CONTINUED)
SITE A, GOLF COURSE MAINTENANCE AREA
COLLECTED: 5 NOVEMBER 1991

SITE SCREENING INSPECTION
NAS Cecil Field
Jacksonville, Florida

Locator:	BCR-A-1	BCR-A-2	BCR-A-7 (DUP OF BCR-A-2)	BCR-A-3	BCR-A-4	BCR-A-5	BCR-A-6	SD-A-1	SD-A-2	SD-A-3
Lab Sample #:	20046003	20046004		20046006	20046008	20046009	20046010	20046007	20046011	20046012
INORGANICS										
Aluminum (mg/kg)	3370	2530	3110	2700	2260	5170	4270	4500	34900	26500
Antimony (mg/kg)	11 UJ	11 UJ	11.1 UJ	9.7 UJ	10.2 UJ	10.8 UJ	9.3 UJ	9.7 UJ	11.5 UJ	11.3 UJ
Arsenic (mg/kg)	2 J	0.36 J	0.39 J	0.44 J	0.94 J	3	46.9	1.7 J	4.2	8.2
Barium (mg/kg)	10 J	15.1 J	14.2 J	6.4 J	8.4 J	11.1 J	64 J	6.3 J	14.9 J	26.1 J
Beryllium (mg/kg)	0.03 UJ	0.029 UJ	0.029 UJ	0.025 UJ	0.027 U	0.028 UJ	0.024 UJ	0.026 UJ	0.03 UJ	0.03 UJ
Cadmium (mg/kg)	4.5 J	0.44 UJ	0.45 UJ	0.39 UJ	0.41 UJ	0.43 UJ	0.37 UJ	0.39 UJ	0.46 UJ	0.46 UJ
Calcium (mg/kg)	5840	10400	9180	1400	1280	4720	110000	1580	1630	594 J
Chromium (mg/kg)	7.6	4.3	5.7	4.8	4.8	8.7	19	5.7	29	20.8
Cobalt (mg/kg)	1.4 U	1.4 U	1.4 U	1.2 U	1.3 U	1.7 J	1.2 U	1.5 J	1.5 U	1.4 U
Copper (mg/kg)	10.8 J	5.3 J	74.4 U	3.6 J	5.3 J	8.3 J	9.4 J	3.8 J	3.8 J	5.5 J
Iron (mg/kg)	1860 J	798 J	776 J	1060 J	639 J	1090 J	2470 U	917 J	6840 J	9780 J
Lead (mg/kg)	22.5	9.7	11.8	4.9	47.4	22.8	19.4	5.4	6.2	9.1
Magnesium (mg/kg)	221 J	268 J	290 J	111 J	74.9 J	340 J	17500	169 J	520 J	12.5 J
Manganese (mg/kg)	19.9	18.7	12	3.3 J	3.9	30	317	29.9	22.1	4 J
Mercury (mg/kg)	0.76	0.1 U	0.1 U	0.15	0.89	0.38	0.093 U	0.17	1.3	1.1
Nickel (mg/kg)	2 UJ	3 J	70.7 J	2.4 J	2 J	3.4 J	3 J	2.4 J	9 J	8.9 J
Potassium (mg/kg)	49.9 U	48.6 U	49.1 U	42.7 U	44.9 U	109 J	389 J	150 J	308 J	133 J
Selenium (mg/kg)	0.5 J	0.5 J	0.38 J	0.6 J	0.37 J	0.34 J	0.3 J	0.28 U	0.33 U	0.32 U
Silver (mg/kg)	0.65 U	0.64 U	0.64 U	0.56 U	0.99 J	0.62 U	0.54 U	0.56 U	0.66 U	0.65 U
Sodium (mg/kg)	308 UJ	309 UJ	352 UJ	270 UJ	296 UJ	324 UJ	296 UJ	297 UJ	345 UJ	320 UJ
Thallium (mg/kg)	0.4 U	0.39 U	0.39 U	0.34 U	0.36 U	0.38 U	0.33 U	0.34 U	0.4 U	0.4 U
Vanadium (mg/kg)	2.1 J	1.8 J	2.9 J	3.3 J	1.6 J	3.3 J	15.5	3.6 J	28	46.9
Zinc (mg/kg)	43.6 J	14.1 J	27.7 J	7.4 UJ	27.6 J	26.6 J	47.2 J	10.8 J	20.8 J	9 J
Cyanide (mg/kg)	0.51 U	0.5 U	0.51 U	1 J	0.46 U	0.48 U	1.9 J	0.43 U	0.52 U	0.51 U

U=Not detected
J=Estimated value
UJ=Reported quantitation limit is qualified as est.
R=Result is rejected and unuseable

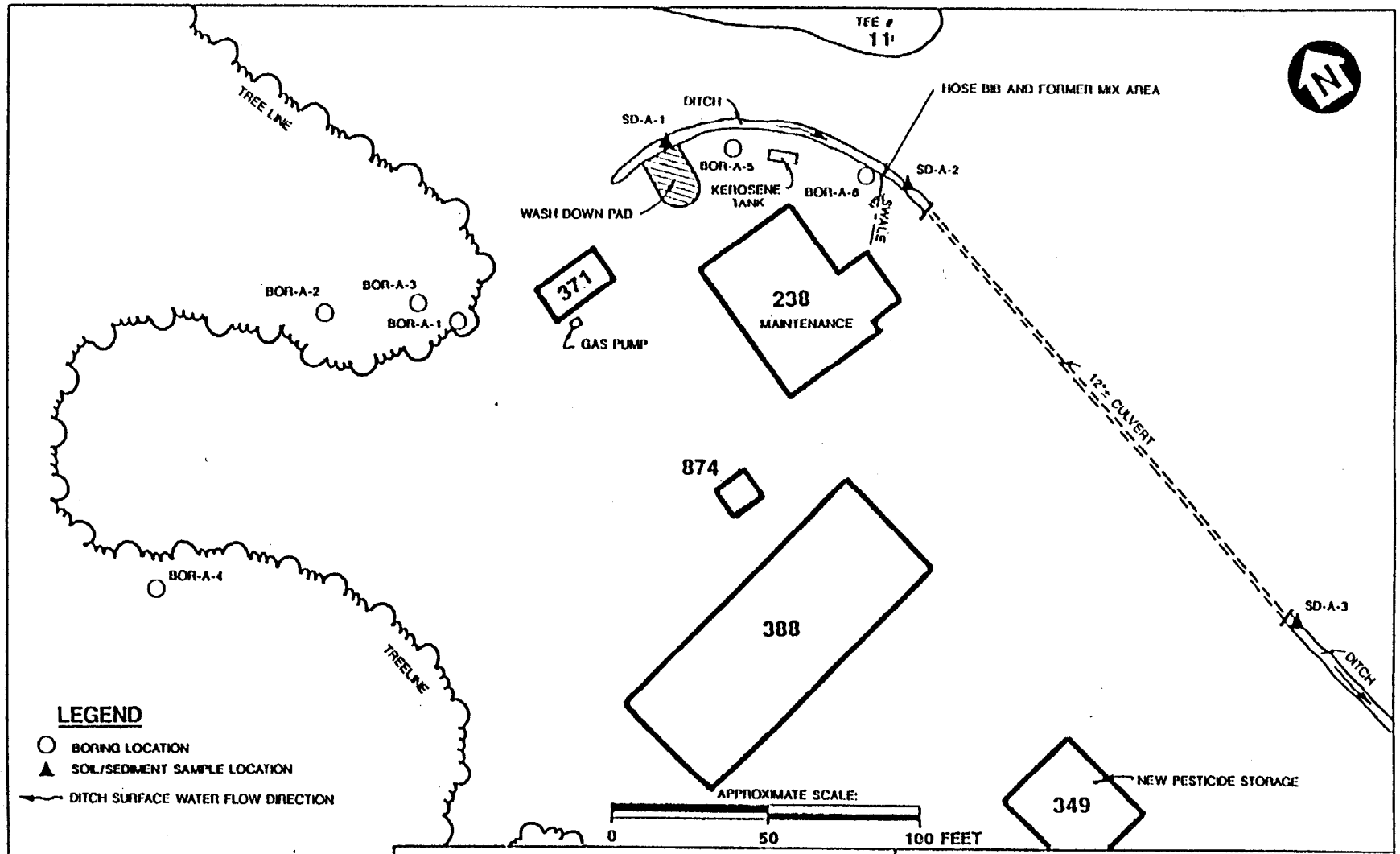


FIGURE 2
SITE A - GOLF COURSE MAINTENANCE
SOIL & SEDIMENT SAMPLING
LOCATIONS
NOVEMBER 5, 1991

SITE SCREENING INSPECTION

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

APPENDIX A
SITE A, GOLF COURSE MAINTENANCE AREA
5 NOVEMBER 1991

CLP VOLATILES	BOR-A-1	BOR-A-2	BOR-A-7 (DUP. OF BOR-A-2)	BOR-A-3	BOR-A-4	BOR-A-5	BOR-A-6	SD-A-1	SD-A-2	SD-A-3	BOR-RB-6 (EQUIPMENT RINSATE) (ug/l)	TRAVEL BLANK (ug/l)
Chloromethane (ug/kg)	13 UJ	42 U	77 UJ	11 U	27 UJ	14 U	13 U	12 U	12 U	12 U	10 U	10 U
Bromomethane (ug/kg)	13 UJ	42 U	77 UJ	11 U	27 UJ	14 U	13 U	12 U	12 U	12 U	10 U	10 U
Vinyl Chloride (ug/kg)	13 UJ	42 U	77 UJ	11 U	27 UJ	14 U	13 U	12 U	12 U	12 U	10 U	10 U
Chloroethane (ug/kg)	13 UJ	42 U	77 UJ	11 U	27 UJ	14 U	13 U	12 U	12 U	12 U	10 U	10 U
Methylene Chloride (ug/kg)	170 UJ	740	1100 J	18 U	320 J	170	40 U	49 U	83	240	6 U	5 U
Acetone (ug/kg)	22 UJ	42 U	77 UJ	110 U	27 UJ	14 U	84 U	12 U	34 U	210 U	62 U	10 U
Carbon Disulfide (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
1,1-Dichloroethene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
1,1-Dichloroethane (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
1,2-Dichloroethene (total)(ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Chloroform (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
1,2-Dichloroethane (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
2-Butanone (ug/kg)	13 UJ	42 U	77 UJ	11 U	27 UJ	14 U	13 U	12 U	12 U	12 U	10 U	10 U
1,1,1-Trichloroethane (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Carbon tetrachloride (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Vinyl Acetate (ug/kg)	13 UJ	42 U	77 UJ	11 U	27 UJ	14 U	13 U	12 U	12 U	12 U	10 U	10 U
Bromodichloromethane (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
1,2-Dichloropropane (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
cis-1,3-Dichloropropene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Trichloroethene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Dibromochloromethane (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
1,1,2-Trichloroethane (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Benzene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
trans-1,3-Dichloropropene(ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Bromoform (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
4-Methyl-2-pentanone (ug/kg)	13 UJ	21 U	77 UJ	11 U	27 UJ	14 U	74	12 U	16 U	120	1 J	10 U
2-Hexanone (ug/kg)	13 UJ	21 U	77 UJ	11 U	27 UJ	14 U	13 U	12 U	12 U	12 U	10 U	10 U
Tetrachloroethene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Toluene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Chlorobenzene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Ethyl Benzene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Styrene (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U
Xylenes (total) (ug/kg)	6 UJ	21 U	38 UJ	6 U	14 UJ	7 U	6 U	6 U	6 U	6 U	5 U	5 U

APPENDIX A
SITE A, GOLF COURSE MAINTENANCE AREA
5 NOVEMBER 1991

CLP SEMIVOLATILES	BOR-A-1	BOR-A-2	BOR-A-7 (DUP. OF BOR-A-2)	BOR-A-3	BOR-A-4	BOR-A-5	BOR-A-6	SD-A-1	SD-A-2	SD-A-3	BOR-RB-6 (EQUIPMENT RINSATE) (ug/l)
Phenol (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
bis(2-Chloroethyl) ether (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2-Chlorophenol (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
1,3-Dichlorobenzene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
1,4-Dichlorobenzene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
Benzyl Alcohol (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
1,2-Dichlorobenzene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2-Methylphenol (ug/kg)	460 U	470 U	460 U	110 J	430 U	460 U	400 U	410 U	470 U	450 U	10 U
bis(2-Chloroisopropyl) ether (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
4-Methylphenol (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	70 J	470 U	450 U	10 U
N-Nitroso-di-n-propylamine(ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
Hexachloroethane (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
Nitrobenzene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
Isophorone (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2-Nitrophenol (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2,4-Dimethylphenol (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
Benzoic Acid (ug/kg)	2300 U	2300 U	2200 U	2000 U	800 J	2300 U	2000 U	2000 U	2300 U	2200 U	50 U
bis(2-Chloroethoxy) methane(ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2,4-Dichlorophenol (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
1,2,4-Trichlorobenzene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
Naphthalene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
4-Chloroaniline (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
Hexachlorobutadiene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
4-Chloro-3-methylphenol(ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2-Methylnaphthalene(ug/kg)	460 U	470 UJ	460 UJ	400 UJ	430 UJ	460 UJ	400 U	410 UJ	470 U	450 UJ	10 U
Hexachlorocyclopentadiene(ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2,4,6-Trichlorophenol(ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2,4,5-Trichlorophenol(ug/kg)	2300 U	2300 U	2200 U	2000 U	2100 U	2300 U	2000 U	2000 UJ	2300 U	2200 U	50 U
2-Chloronaphthalene(ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2-Nitroaniline(ug/kg)	460 U	2300 U	2200 U	2000 U	2100 U	2300 U	2000 U	2000 UJ	2300 U	2200 U	50 U
Dimethylphthalate (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
Acenaphthylene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
2,6-Dinitrotoluene (ug/kg)	460 U	470 U	460 U	400 U	430 U	460 U	400 U	410 U	470 U	450 U	10 U
3-Nitroaniline (ug/kg)	2300 U	2300 U	2200 U	2000 U	2100 U	2300 U	2000 UJ	2000 U	2300 UJ	2200 U	50 UJ

APPENDIX A
SITE A, GOLF COURSE MAINTENANCE AREA
5 NOVEMBER 1991

CLP SEMIVOLATILES Continued	BOR-A-1	BOR-A-2	BOR-A-7 (DUP. OF BOR-A-2)	BOR-A-3	BOR-A-4	BOR-A-5	BOR-A-6	SD-A-1	SD-A-2	SD-A-3	BOR-RB-6 (EQUIPMENT RINSATE) (ug/l)
Acenaphthene (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
2,4-Dinitrophenol (ug/kg)	2300U	2300U	2200U	2000U	2100U	2300U	2000U	2000U	2300U	2200U	50U
4-Nitrophenol (ug/kg)	2300U	2300U	2200U	2000U	2100U	2300U	2000U	2000U	2300U	2200U	50U
Dibenzofuran (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
2,4-Dinitrotoluene(ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Diethylphthalate (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
4-Chlorophenyl-phenylether(ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Fluorene (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
4-Nitroaniline (ug/kg)	2300U	2300U	2200U	2000U	2100U	2300U	2000UJ	2000U	2300UJ	2200U	50UJ
4,6-Dinitro-2-methylphenol(ug/kg)	2300U	2300U	2200U	2000U	2100U	2300U	2000U	2000U	2300U	2200U	50U
N-Nitrosodiphenylamine (1)(ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
1,2-Diphenylhydrazine (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
4-Bromophenyl-phenylether (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Hexachlorobenzene (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Pentachlorophenol (ug/kg)	100J	2300U	2200U	2000U	2100U	2300U	2000U	2000U	2300U	2200U	50U
Phenanthrene (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Anthracene (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Di-n-butylphthalate (ug/kg)	80J	82J	460U	400U	430U	460U	400U	410U	470U	55J	10U
Fluoranthene (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	55J	450U	10U
Pyrene (ug/kg)	100J	64J	91J	400U	430U	460U	400U	410U	470U	450U	10U
Butylbenzylphthalate(ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
3,3'-Dichlorobenzidine(ug/kg)	930U	940U	920U	810U	870U	930U	810U	820U	940U	890U	20U
Benzo (a) anthracene (ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Chrysene (ug/kg)	81J	81J	68J	400U	430U	460U	400U	410U	470U	450U	10U
bis(2-Ethylhexyl) phthalate(ug/kg)	140J	110J	460U	400U	72J	83J	160J	410U	67J	79J	10U
Di-n-octylphthalate(ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Benzo (b) fluoranthene(ug/kg)	140J	120J	120J	400U	56J	460U	98J	410U	470U	450U	10U
Benzo (k) fluoranthene(ug/kg)	110J	87J	59J	400U	430U	460U	95J	410U	470U	450U	10U
Benzo (a) pyrene(ug/kg)	460U	67J	86J	400U	430U	460U	82J	410U	470U	450U	10U
Indeno (1,2,3-cd) pyrene(ug/kg)	460U	55J	63J	400U	430U	460U	400U	410U	470U	450U	10U
Dibenz (a,h) anthracene(ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U
Benzo (g,h,i) perylene(ug/kg)	460U	470U	460U	400U	430U	460U	400U	410U	470U	450U	10U

APPENDIX A
SITE A, GOLF COURSE MAINTENANCE AREA
5 NOVEMBER 1991

CLP PESTICIDES	BOR-A-1	BOR-A-2	BOR-A-7 (Duplicate of Bor-A-2)	BOR-A-3	BOR-A-4	BOR-A-5	BOR-A-6	SD-A-1	SD-A-2	SD-A-3	BOR-RB-6 (Equipment Rinsate) (ug/l)
alpha-BHC (ug/kg)	56 U	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U	0.05 U
beta-BHC (ug/kg)	56 U	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U	0.05 U
delta-BHC (ug/kg)	56 U	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U	0.05 U
gamma-BHC (Lindane) (ug/kg)	56 U	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U	0.05 U
Heptachlor (ug/kg)	56 U	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U	0.05 U
Aldrin (ug/kg)	56 U	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U	0.05 U
Heptachlor epoxide (ug/kg)	58 J	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U	0.05 U
Endosulfan I (ug/kg)	56 U	11 U	11 U	24 U	26 U	56 U	980 U	25 U	28 U	27 U	0.05 U
Dieldrin (ug/kg)	7.3 J	23 U	22 U	49 U	53 U	110 U	2000 U	50 U	21 J	4.8 J	0.1 U
4,4'-DDE (ug/kg)	30 J	7 J	8.1 J	5.2 J	6.5 J	110 U	2000 U	50 U	63 J	53 J	0.1 U
Endrin (ug/kg)	110 U	23 U	22.U	49 U	53 U	110 U	2000 U	50 U	57 U	54.U	0.1 U
Endosulfan II (ug/kg)	110 U	23 U	22.U	49 U	53 U	110 U	2000 U	50 U	57 U	54.U	0.1 U
4,4'-DDD (ug/kg)	110 U	23 U	4.7 J	49 U	53 U	110 U	650 J	50 U	45 J	42 J	0.1 U
Endosulfan sulfate(ug/kg)	110 U	23 U	22.U	49 U	53 U	110 U	2000 U	50 U	57 U	54 U	0.1 U
4,4'-DDT (ug/kg)	110 U	9.7 J	12 J	49 U	53 U	110 U	2000 U	50 U	57 U	54 U	0.1 U
Methoxychlor (ug/kg)	560 U	110 U	110 U	240 U	260 U	560 U	9800 U	250 U	290 U	270 U	0.5 U
Endrin ketone (ug/kg)	110 U	23 U	22 U	49 U	53 U	110 U	2000 U	50 U	57 U	54 U	0.1 U
alpha Chlordane (ug/kg)	530 J	110 U	110 U	58 J	29 J	72 J	680 J	34 J	350	350	0.5 U
gamma-Chlordane (ug/kg)	330 J	230 U	110 U	24 J	12 J	36 J	660 J	21 J	320	320	0.5 U
Toxaphene (ug/kg)	1100 U	230 U	220 U	490 U	530 U	1100 U	20000 U	500 U	570 U	540 U	1 U
Aroclor-1016 (ug/kg)	560 U	110 U	110 U	240 U	260 U	560 U	9800 U	250 U	290 U	270 U	0.5 U
Aroclor-1221 (ug/kg)	560 U	110 U	110 U	240 U	260 U	560 U	9800 U	250 U	290 U	270 U	0.5 U
Aroclor-1232 (ug/kg)	560 U	110 U	110 U	240 U	260 U	560 U	9800 U	250 U	290 U	270 U	0.5 U
Aroclor-1242 (ug/kg)	560 U	110 U	110 U	240 U	260 U	560 U	9800 U	250 U	290 U	270 U	0.5 U
Aroclor-1248 (ug/kg)	560 U	110 U	110 U	240 U	260 U	560 U	9800 U	250 U	290 U	270 U	0.5 U
Aroclor-1254 (ug/kg)	1100 U	230 U	220 U	490 U	530 U	1100 U	20000 U	500 U	570 U	540 U	1 U
Aroclor-1260 (ug/kg)	1100 U	230 U	220 U	490 U	530 U	1100 U	20000 U	500 U	570 U	540 U	1 U

APPENDIX A
SITE A, GOLF COURSE MAINTENANCE AREA
5 NOVEMBER 1991

CLP INORGANICS	BOR-A-1	BOR-A-2	BOR-A-7 (DUP. OF BOR-A-2)	BOR-A-3	BOR-A-4	BOR-A-5	BOR-A-6	SD-A-1	SD-A-2	SD-A-3	BOR-RB-6 (EQUIPMENT RINSATE) (ug/l)
Aluminum (mg/kg)	3370	2530	3110	2700	2260	5170	4270	4500	34900	26500	54.1 U
Antimony (mg/kg)	11	11 UJ	11.1 UJ	9.7 UJ	10.2 UJ	10.8 UJ	9.3 UJ	9.7 UJ	11.5 UJ	11.3 UJ	40 U
Arsenic (mg/kg)	2 J	0.36 J	0.39 J	0.44 J	0.94 J	3	46.9	1.7 J	4.2	8.2	0.83 J
Barium (mg/kg)	10 J	15.1 J	14.2 J	6.4 J	8.4 J	11.1 J	64 J	6.3 J	14.9 J	26.1 J	0.9 J
Beryllium (mg/kg)	0.03 UJ	0.029 UJ	0.029 UJ	0.025 UJ	0.027 U	0.028 UJ	0.024 UJ	0.026 UJ	0.03 UJ	0.03 UJ	0.1 U
Cadmium (mg/kg)	4.5 J	0.44 UJ	0.45 UJ	0.39 UJ	0.41 UJ	0.43 UJ	0.37 UJ	0.39 UJ	0.46 UJ	0.46 UJ	1.6 U
Calcium (mg/kg)	5840	10400	9180	1400	1280	4720	110000	1580	1630	594 J	478 UJ
Chromium (mg/kg)	7.6	4.3	5.7	4.8	4.8	8.7	19	5.7	29	20.8	3.1 J
Cobalt (mg/kg)	1.4 U	1.4 U	1.4 U	1.2 U	1.3 U	1.7 J	1.2 U	1.5 J	1.5 U	1.4 U	5.1 U
Copper (mg/kg)	10.8 J	5.3 J	74.4 U	3.6 J	5.3 J	8.3 J	9.4 J	3.8 J	3.8 J	5.5 J	4.8 J
Iron (mg/kg)	1860 J	798 J	776 J	1060 J	639 J	1090 J	2470 U	917 J	6840 J	9780 J	43.7 J
Lead (mg/kg)	22.5	9.7	11.8	4.9	47.4	22.8	19.4	5.4	6.2	9.1	1.8 J
Magnesium (mg/kg)	221 J	268 J	290 J	111 J	74.9 J	340 J	17500	169 J	520 J	125 J	31.5 U
Manganese (mg/kg)	19.9	18.7	12	3.3 J	3.9	30	317	29.9	22.1	4 J	2.5 J
Mercury (mg/kg)	0.76	0.1 U	0.1 U.	0.15	0.89	0.38	0.093 U	0.17	1.3	1.1	0.16 U
Nickel (mg/kg)	2 UJ	5 J	70.7 J	2.4 J	2 J	3.4 J	3 J	2.4 J	9 J	8.9 J	7 U
Potassium (mg/kg)	49.9 U	48.6 U	49.1 U	42.7 U	44.9 U	109 J	389 J	150 J	308 J	133 J	176 U
Selenium (mg/kg)	0.5 J	0.5 J	0.38 J	0.6 J	0.37 J	0.34 J	0.3 J	0.28 U	0.33 U	0.32 U	1.4 J
Silver (mg/kg)	0.65 U	0.64 U	0.64 U	0.56 U	0.99 J	0.62 U	0.54 U	0.56 U	0.66 U	0.65 U	2.3 U
Sodium (mg/kg)	308 UJ	309 UJ	352 UJ	270 UJ	296 UJ	324 UJ	296 UJ	297 UJ	345 UJ	320 UJ	720 J
Thallium (mg/kg)	0.4 U	0.39 U	0.39 U	0.34 U	0.36 U	0.38 U	0.33 U	0.34 U	0.4 U	0.4 U	1.4 U
Vanadium (mg/kg)	2.1 J	1.8 J	2.9 J	3.3 J	1.6 J	3.3 J	15.5	3.6 J	28	46.9	2.7 UJ
Zinc (mg/kg)	43.6 J	14.1 J	27.7 J	7.4 UJ	27.6 J	26.6 J	47.2 J	10.8 J	20.8 J	9 J	2.7 J
Cyanide (mg/kg)	0.51 U	05 U	0.51 U	1 J	0.46 U	0.48 U	1.9 J	0.43 U	0.52 U	0.51 U	1.8 U

TABLE 2
SITE B, FAIRWAY 7, DRUM DISPOSAL SITES
COLLECTED: 5 NOVEMBER 1991

SITE SCREENING INSPECTION
NAS Cecil Field
Jacksonville, Florida

Locator:	BOR-B-1	BOR-B-2	BOR-B-3	SD-B-1	SD-B-3	SD-B-2	BOR-FB-3
Lab Sample #:	20065017	20065018	20065019	20065014	20065015	20065016	(Field Blank) (ug/l)
VOLATILES							
Methylene Chloride (ug/kg)	32 UJ	170 J	490 J	580 J	560 J	170 J	6 U
4-Methyl-2-pentanone (ug/kg)	12 UJ	15 UJ	12 J	17 J	6 J	13 UJ	1 J
Toluene (ug/kg)	6 UJ	2 J	16 UJ	7 UJ	3 J	6 UJ	5 UJ
SEMI-VOLATILTES							
Benzoic Acid (ug/kg)	3900	34000	3800	1200 J	1300 U	1300 J	50 U
PESTICIDES AND PCBS							
alpha-chlordane	100 U	390 J	100 U	100 U	110 U	100 U	0.5 U
gamma-chlordane	100 U	380 J	100 U	100 U	110 U	100 U	0.5 U
INORGANICS							
Aluminum (mg/kg)	826	1020	1030	1586.81	1600	1700	534 U
Antimony (mg/kg)	9.7 UJ	10.7 UJ	10.6 UJ	11.18 UJ	11.1 UJ	10.1 UJ	40 U
Arsenic (mg/kg)	0.32 UJ	1.1 J	0.32 UJ	23.49 J	39.6 J	0.89 J	1.2 J
Barium (mg/kg)	2.5 J	8.1 J	3 J	4.37 U	4.5 J	3.7 J	0.96 J
Beryllium (mg/kg)	0.088 UJ	0.028 U	0.028 U	0.03 U	0.029 U	0.026 U	0.1 U
Cadmium (mg/kg)	0.39 U	0.48 J	0.43 U	1.11 U	0.45 U	0.41 U	1.6 U
Calcium (mg/kg)	489 J	1990	306 J	308.24 U	560 J	663 J	308 UJ
Chromium (mg/kg)	1.6	7.7	2 J	8.09	5.2	2.8	1.9 U
Cobalt (mg/kg)	1.2 U	1.4 U	1.4 U	1.43 U	1.4 U	1.3 U	5.1 U
Copper (mg/kg)	1.8 UJ	4.8 J	1.7 UJ	24.52	13.7	2.3 UJ	1.4 U
Iron (mg/kg)	454 J	773 J	901 J	23478.7 J	10500 J	680 J	27.4 UJ
Lead (mg/kg)	6.8	22.9	8	7.14 J	6.8	12	0.69 U
Magnesium (mg/kg)	53.9 UJ	204 J	39.2 UJ	44.01	44.2 UJ	56.9 UJ	31.5 U
Manganese (mg/kg)	2.4 J	7 J	3.2 J	72.72 J	28 J	7.7 J	0.56 U
Mercury (mg/kg)	0.064 U	0.092 U	0.095 U	0.1 U	0.048 U	0.081 U	0.16 U
Nickel (mg/kg)	1.7 U	2.2 J	1.8 U	10.03 U	5.5 J	1.8 U	7 U
Potassium (mg/kg)	42.7 U	78.7 J	46.8 U	49.31 U	49 U	44.5 U	176 U
Selenium (mg/kg)	0.28 U	0.35 J	0.3 U	0.34 U	0.33 J	0.29 U	1.1 U
Silver (mg/kg)	0.56 U	0.62 U	0.61 U	0.65 U	0.64 U	0.58 U	2.3 U
Sodium (mg/kg)	171 UJ	185 UJ	187 UJ	102.53 U	210 UJ	81.8 UJ	640 J
Thallium (mg/kg)	0.34 U	0.38 U	0.37 U	0.39 U	0.39 U	0.35 U	1.4 U
Vanadium (mg/kg)	1.6 J	5.1 J	1.5 J	1.68 U	1.1 J	2 J	2.7 U
Zinc (mg/kg)	4.7 J	17.9	4.6 J	7.98	9.8	16.8	4.6 UJ
Cyanide (mg/kg)	0.43 U	0.47 U	0.47 U	0.5 U	0.49 U	0.45 U	18000 U

U=Not detected
J=Estimated value
UJ=Reported quantitation limit is qualified as est.
R=Result is rejected and unuseable

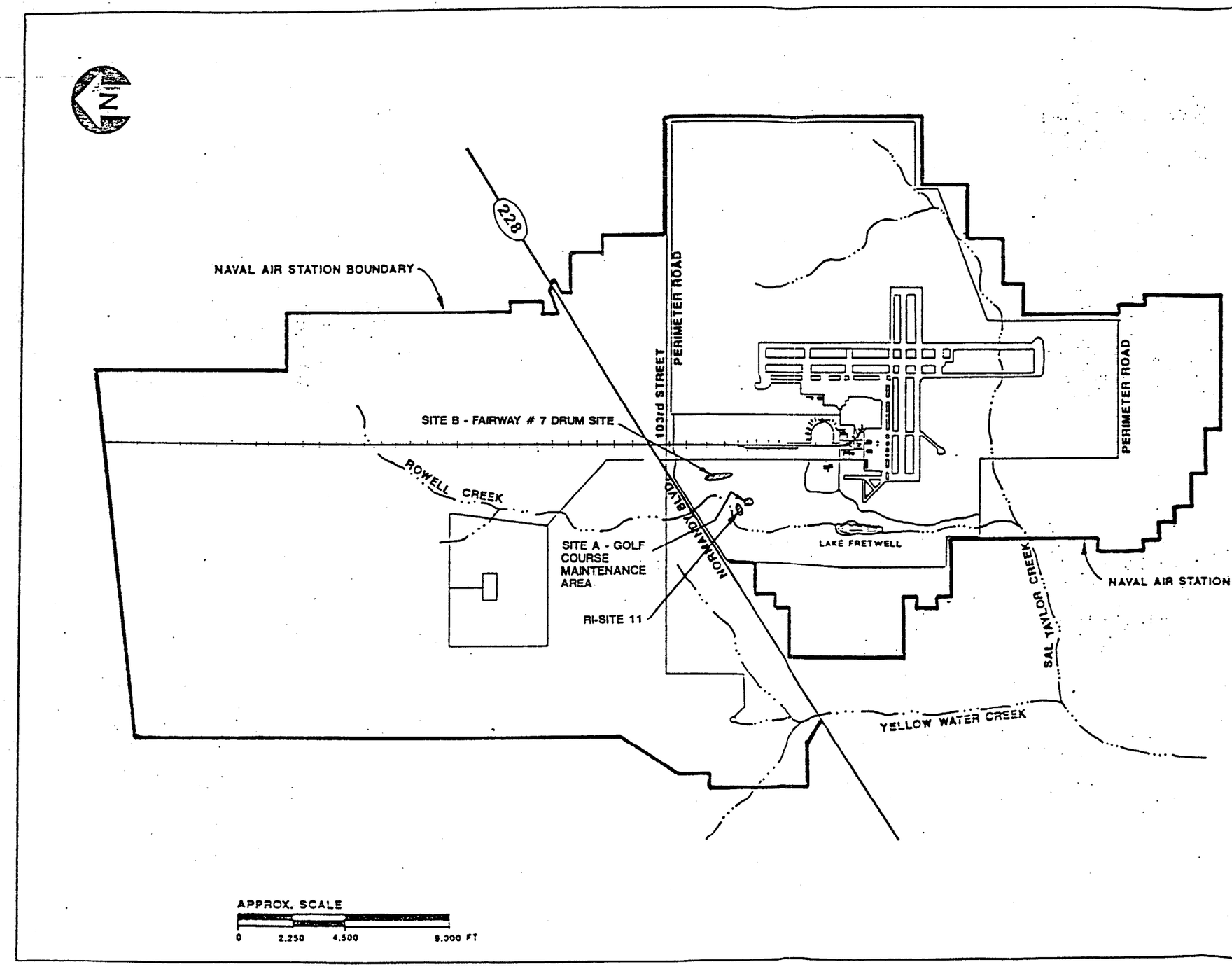


FIGURE 1
LOCATION MAP

SITE SCREENING INSPECTION

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

04472D012

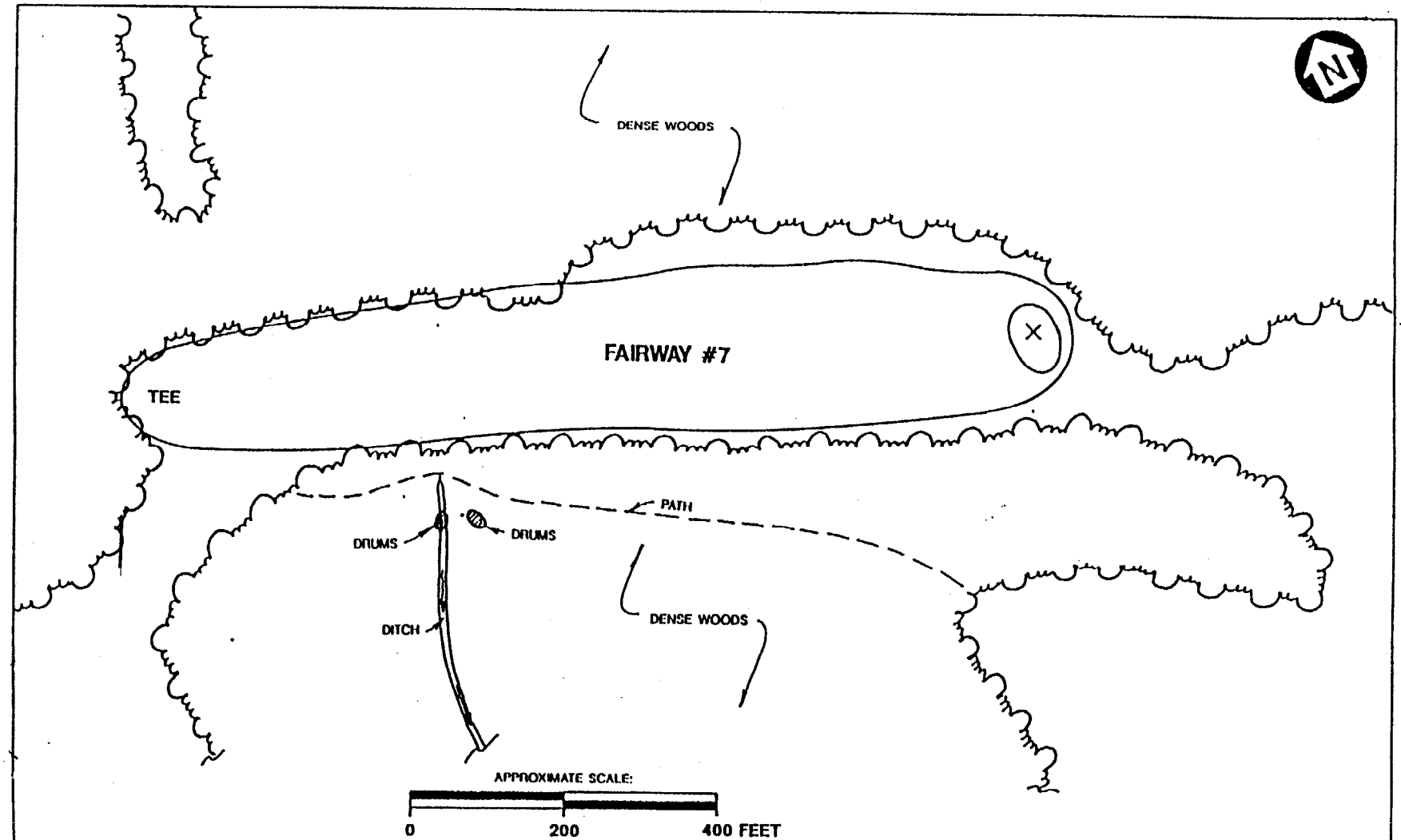
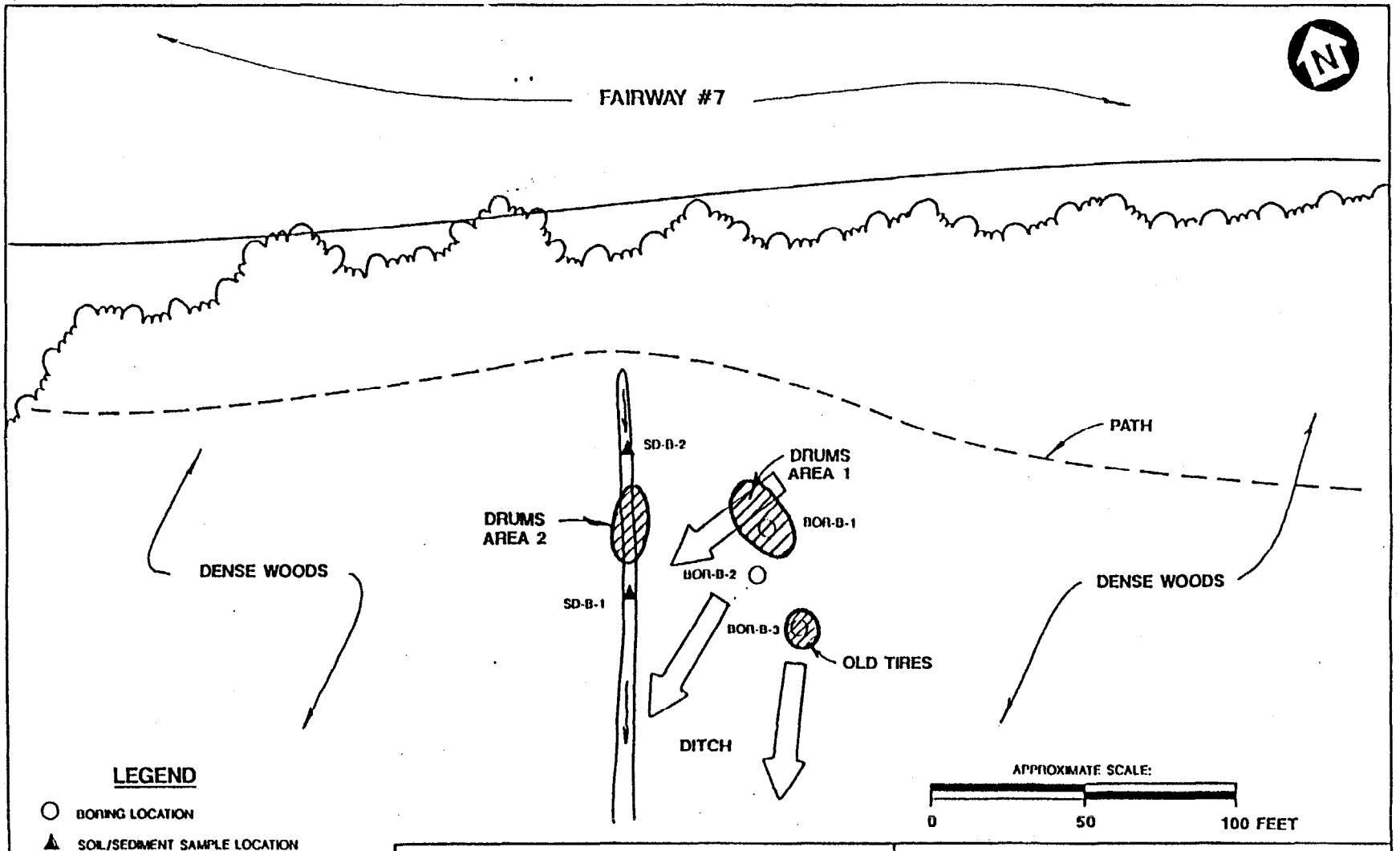


FIGURE 3
SITE B - FAIRWAY # 7 DRUM SITE

SITE SCREENING INSPECTION

NAS CECIL FIELD
JACKSONVILLE, FLORIDA



LEGEND

- ○ BORING LOCATION
- ▲ SOIL/SEDIMENT SAMPLE LOCATION
- ⇦ OVERLAND FLOW PATTERN
- ⟵ DITCH SURFACE WATER FLOW DIRECTION

FIGURE 4
SITE B - FAIRWAY # 7 DRUM SITES
SOIL & SEDIMENT SAMPLING
LOCATIONS
NOVEMBER 5, 1991

SITE SCREENING
INSPECTION

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

APPENDIX A
SITE B, FAIRWAY 7, DRUM SITES
5 NOVEMBER 1991

CLP VOLATILES	BOR-B-1	BOR-B-2	BOR-B-3	SD-B-1	SD-B-3 (Dup of SD-B-1)	SD-B-2	SD-B-3MS (MATRIX SPIKE)	SD-B-3MSD (DUP. MATRIX SPIKE)	BOR-FB-3 (EQUIPMENT RINSATE) (ug/l)	TRAVEL BLANK (ug/l)
Chloromethane (ug/kg)	12 UJ	15 UJ	32 UJ	13 UJ	13 UJ	13 UJ	38 U	38 U	10 U	10 U
Bromomethane (ug/kg)	12 UJ	15 UJ	32 UJ	13 UJ	13 UJ	13 UJ	38 U	38 U	10 U	10 U
Vinyl Chloride (ug/kg)	12 UJ	15 UJ	32 UJ	13 UJ	13 UJ	13 UJ	38 U	38 U	10 U	10 U
Chloroethane (ug/kg)	12 UJ	15 UJ	32 UJ	13 UJ	13 UJ	13 UJ	38 U	38 U	10 U	10 U
Methylene Chloride (ug/kg)	32 UJ	170 J	490 J	580 J	560 J	170 J	240	240	6 U	5 U
Acetone (ug/kg)	12 UJ	17 UJ	32 UJ	69 UJ	13 UJ	13 UJ	29 J	26 J	15 U	10 U
Carbon Disulfide (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
1,1-Dichloroethene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
1,1-Dichloroethane (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
1,2-Dichloroethene (total) (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Chloroform (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
1,2-Dichloroethane (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
2-Butanone (ug/kg)	12 UJ	15 UJ	32 UJ	13 UJ	13 UJ	13 UJ	38 U	38 U	10 U	10 U
1,1,1-Trichloroethane (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Carbon tetrachloride (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Vinyl Acetate (ug/kg)	12 UJ	15 UJ	32 UJ	13 UJ	13 UJ	13 UJ	38 U	38 U	10 U	10 U
Bromodichloromethane (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
1,2-Dichloropropane (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
cis-1,3-Dichloropropene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Trichloroethene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Dibromochloromethane (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
1,1,2-Trichloroethane (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Benzene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
trans-1,3-Dichloropropene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Bromoform (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
4-Methyl-2-pentanone (ug/kg)	12 UJ	15 UJ	12 J	17 J	6 J	13 UJ	38 U	38 U	1 J	10 U
2-Hexanone (ug/kg)	12 UJ	15 UJ	32 UJ	13 UJ	13 UJ	13 UJ	38 U	38 U	10 U	10 U
Tetrachloroethene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 J	6 UJ	19 U	19 U	5 U	5 U
Toluene (ug/kg)	6 UJ	2 J	16 UJ	7 UJ	3 J	6 UJ	19 U	19 U	5 U	5 U
1,1,2,2-Tetrachloroethane (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Chlorobenzene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Ethyl Benzene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Styrene (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U
Xylenes (total) (ug/kg)	6 UJ	7 UJ	16 UJ	7 UJ	6 UJ	6 UJ	19 U	19 U	5 U	5 U

APPENDIX A
SITE B, FAIRWAY 7, DRUM SITES
5 NOVEMBER 1991

CLP SEMIVOLATILES	BOR-B-1	BOR-B-2	BOR-B-3	SD-B-1	SD-B-3 (Dup. of SD-B-1)	SD-B-2	SD-B-3MS (MATRIX SPIKE)	SD-B-3MSD (MATRIX SPIKE DUP)	BOR-FB-3 (Field Blank) (ug/l)
Phenol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
bis(2-Chloroethyl) ether (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2-Chlorophenol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
1,3-Dichlorobenzene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
1,4-Dichlorobenzene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Benzyl Alcohol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
1,2-Dichlorobenzene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2-Methylphenol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
bis(2-Chloroisopropyl) ether (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
4-Methylphenol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
N-Nitroso-di-n-propylamine (ug/kg	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Hexachloroethane (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Nitrobenzene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Isophorone (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2-Nitrophenol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2,4-Dimethylphenol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Benzoic Acid (ug/kg)	3900	34000	3800	1200 J	1300 J	1300 J	930 J	890 J	50 U
bis(2-Chloroethoxy) methane (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2,4-Dichlorophenol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	67 J	10 U
1,2,4-Trichlorobenzene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Naphthalene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	53 J	10 U
4-Chloroaniline (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Hexachlorobutadiene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
4-Chloro-3-methylphenol (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2-Methylnaphthalene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Hexachlorocyclopentadiene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2,4,6-Trichlorophenol(ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2,4,5-Trichlorophenol (ug/kg)	2000 U	2600 U	2100 U	2200 U	2200 U	2000 U	1600 U	1600 U	50 U
2-Chloronaphthalene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2-Nitroaniline (ug/kg)	2000 U	2600 U	2100 U	2200 U	2200 U	2000 U	1600 U	1600 U	50 U

APPENDIX A
SITE B, FAIRWAY 7, DRUM SITES
5 NOVEMBER 1991

CLP SEMIVOLATILES (CONTINUED)	BOR-B-1	BOR-B-2	BOR-B-3	SD-B-1	SD-B-3 (Dup. of SD-B-1)	SD-B-2	SD-B-3MS (MATRIX SPIKE)	SD-B-3MSD (MATRIX SPIKE DUP)	BOR-FB-3 (Field Blank) (ug/l)
3-Nitroaniline (ug/kg)	2000 U	2600 U	2100 U	2200 U	2200 U	2000 U	1600 U	1600 U	50 UJ
Acenaphthene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2,4-Dinitrophenol (ug/kg)	2000 U	2600 U	2100 U	2200 U	2200 U	2000 U	1600 U	1600 U	50 U
4-Nitrophenol (ug/kg)	2000 U	2600 U	2100 U	2200 U	2200 U	2000 U	1600 U	1600 U	50 U
Dibenzofuran (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
2,4-Dinitrotoluene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Diethylphthalate (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
4-Chlorophenyl-phenylether (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Fluorene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 UJ
4-Nitroaniline (ug/kg)	2000 U	2600 U	2100 U	2200 U	2200 U	2000 U	1600 U	1600 U	50 U
4,6-Dinitro-2-methylphenol (ug/kg)	2000 U	2600 U	2100 U	2200 U	2200 U	2000 U	1600 U	1600 U	50 U
N-Nitrosodiphenylamine (1) (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
1,2-Diphenylhydrazine (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
4-Bromophenyl-phenylether (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Hexachlorobenzene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Pentachlorophenol (ug/kg)	2000 U	2600 U	2100 U	2200 U	2200 U	2000 U	1600 U	1600 U	50 U
Phenanthrene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Anthracene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Di-n-butylphthalate (ug/kg)	410 U	530 U	420 J	450 J	450 J	420 J	330 U	330 U	10 U
Fluoranthene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Pyrene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Butylbenzylphthalate (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
3,3'-Dichlorobenzidine (ug/kg)	820 U	1100 U	850 U	890 U	900 U	840 U	660 U	660 U	20 U
Benzo (a) anthracene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Chrysene (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	330 U	330 U	10 U
bis(2-Ethylhexyl) phthalate (ug/kg)	410 U	530 U	420 U	450 U	450 U	420 U	36 J	37 J	10 U
Di-n-octylphthalate (ug/kg)	410 U	530 UJ	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Benzo (b) fluoranthene (ug/kg)	410 U	530 UJ	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Benzo (k) fluoranthene (ug/kg)	410 U	530 UJ	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Benzo (a) pyrene (ug/kg)	410 U	530 UJ	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Indeno (1,2,3-cd) pyrene (ug/kg)	410 U	530 UJ	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Dibenz (a,h) anthracene (ug/kg)	410 U	530 UJ	420 U	450 U	450 U	420 U	330 U	330 U	10 U
Benzo (g,h,i) perylene (ug/kg)	410 U	530 UJ	420 U	450 U	450 U	420 U	330 U	330 U	10 U

APPENDIX A
SITE B, FAIRWAY 7, DRUM SITES
5 NOVEMBER 1991

CLP PESTICIDES	BOR-B-1	BOR-B-2	BOR-B-3	SD-B-1	SD-B-3 (DUP OF SD-B-1)	SD-B-2	SD-B-3MS (MATRIX SPIKE)	SD-B-3MSD (DUP. MATRIX SPIKE)	BOR-FB-3 (FIELD BLANK) (ug/l)
alpha-BHC (ug/kg)	10 U	640 U	10 U	11 U	11 U	10 U	5.5 U	5.5 U	0.05 U
beta-BHC (ug/kg)	10 U	640 U	10 U	11 U	11 U	10 U	11 U	11 U	0.05 U
delta-BHC (ug/kg)	10 U	640 U	10 U	11 U	11 U	10 U	11 U	11 U	0.05 U
gamma-BHC (Lindane) (ug/kg)	10 U	640 U	10 U	11 U	11 U	10 U	7.4 U	7.4 U	0.05 U
Heptachlor (ug/kg)	10 U	640 U	10 U	11 U	11 U	10 U	5.5 U	5.5 U	0.05 U
Aldrin (ug/kg)	10 U	640 U	10 U	11 U	11 U	10 U	7.4 U	7.4 U	0.05 U
Heptachlor epoxide (ug/kg)	10 U	640 U	10 U	11 U	11 U	10 U	11 U	11 U	0.05 U
Endosulfan I (ug/kg)	10 U	640 U	10 U	11 U	11 U	10 U	11 U	11 U	0.05 U
Dieldrin (ug/kg)	20 U	1300 U	20 U	22 U	22 U	20 U	3.6 U	3.6 U	0.1 U
4,4'-DDE (ug/kg)	20 U	1300 U	20 U	22 U	22 U	20 U	7.4 U	7.4 U	0.1 U
Endrin (ug/kg)	20 U	1300 U	20 U	22 U	22 U	20 U	11 U	11 U	0.1 U
Endosulfan II (ug/kg)	20 U	1300 U	20 U	22 U	22 U	20 U	7.4 U	7.4 U	0.1 U
4,4'-DDD (ug/kg)	20 U	1300 U	20 U	22 U	22 U	20 U	20 U	20 U	0.1 U
Endosulfan sulfate (ug/kg)	20 U	1300 U	20 U	22 U	22 U	20 U	22 U	22 U	0.1 U
4,4'-DDT (ug/kg)	20 U	1300 U	20 U	22 U	22 U	20 U	22 U	22 U	0.1 U
Methoxychlor (ug/kg)	100 U	6400 U	100 U	110 U	110 U	100 U	44 U	44 U	0.5 U
Endrin ketone	20 U	1300 U	20 U	22 U	22 U	20 U	22 U	22 U	0.1 U
alpha Chlordane	100 U	390 J	100 U	110 U	110 U	100 U	9 U	9 U	0.5 U
gamma-Chlordane	100 U	380 J	100 U	110 U	110 U	100 U	9 U	9 U	0.5 U
Toxaphene	200 U	13000 U	200 U	220 U	220 U	200 U	180 U	180 U	1 U
Aroclor-1016	100 U	6400 U	100 U	110 U	110 U	100 U	88 U	88 U	0.5 U
Aroclor-1221	100 U	6400 U	100 U	110 U	110 U	100 U	220 U	220 U	0.5 U
Aroclor-1232	100 U	6400 U	100 U	110 U	110 U	100 U	220 U	220 U	0.5 U
Aroclor-1242	100 U	6400 U	100 U	110 U	110 U	100 U	88 U	88 U	0.5 U
Aroclor-1248	100 U	6400 U	100 U	110 U	110 U	100 U	44 U	44 U	0.5 U
Aroclor-1254	200 U	13000 U	200 U	220 U	220 U	200 U	44 U	44 U	1 U
Aroclor-1260	200 U	13000 U	200 U	220 U	220 U	200 U	44 U	44 U	1 U

APPENDIX A
SITE B, FAIRWAY 7, DRUM SITES
5 NOVEMBER 1991

CLP INORGANICS	BOR-B-1	BOR-B-2	BOR-B-3	SD-B-1	SD-B-3	SD-B-2	BOR-FB-3 (Field Blank) (ug/l)
Aluminum (mg/kg)	826	1020	1030	1586.81	1600	1700	534 U
Antimony (mg/kg)	9.7 UJ	10.7 UJ	10.6 UJ	11.18 UJ	11.1 UJ	10.1 UJ	40 U
Arsenic (mg/kg)	0.32 UJ	1.1 J	0.32 UJ	23.49 J	39.6 J	0.89 J	1.2 J
Barium (mg/kg)	2.5 J	8.1 J	3 J	4.37 U	4.5 J	3.7 J	0.96 J
Beryllium (mg/kg)	0.088 UJ	0.028 U	0.028 U	0.03 U	0.029 U	0.026 U	0.1 U
Cadmium (mg/kg)	0.39 U	0.48 J	0.43 U	1.11 U	0.45 U	0.41 U	1.6 U
Calcium (mg/kg)	489 J	1990	306 J	308.24 U	560 J	663 J	308 UJ
Chromium (mg/kg)	1.6	7.7	2 J	8.09	5.2	2.8	1.9 U
Cobalt (mg/kg)	1.2 U	1.4 U	1.4 U	1.43 U	1.4 U	1.3 U	5.1 U
Copper (mg/kg)	1.8 UJ	4.8 J	1.7 UJ	24.52	13.7	2.3 UJ	1.4 U
Iron (mg/kg)	454 J	773 J	901 J	23478.7 J	10500 J	680 J	27.4 UJ
Lead (mg/kg)	6.8	22.9	8	7.14 J	6.8	12	0.69 U
Magnesium (mg/kg)	53.9 UJ	204 J	39.2 UJ	44.01	44.2 UJ	56.9 UJ	31.5 U
Manganese (mg/kg)	2.4 J	. 7 J	3.2 J	72.72 J	28 J	7.7 J	0.56 U
Mercury (mg/kg)	0.064 U	0.092 U	0.095 U	0.1 U	0.048 U	0.081 U	0.16 U
Nickel (mg/kg)	1.7 U	2.2 J	1.8 U	10.03 U	5.5 J	1.8 U	7 U
Potassium (mg/kg)	42.7 U	78.7 J	46.8 U	49.31 U	49 U	44.5 U	176 U
Selenium (mg/kg)	0.28 U	0.35 J	0.3 U	0.34 U	0.33 J	0.29 U	1.1 U
Silver (mg/kg)	0.56 U	0.62 U	0.61 U	0.65 U	0.64 U	0.58 U	2.3 U
Sodium (mg/kg)	171 UJ	185 UJ	187 UJ	102.53 U	210 UJ	81.8 UJ	640 J
Thallium (mg/kg)	0.34 U	0.38 U	0.37 U	0.39 U	0.39 U	0.35 U	1.4 U
Vanadium (mg/kg)	1.6 J	5.1 J	1.5 J	1.68 U	1.1 J	2 J	2.7 U
Zinc (mg/kg)	4.7 J	17.9	4.6 J	7.98	9.8	16.8	4.6 UJ
Cyanide (mg/kg)	0.43 U	047 U	0.47 U	0.5 U	0.49 U	0.45 U	18000 U

APPENDIX B

RESPONSE ACTION CONTRACTOR DEBRIS REMOVAL ACTIVITIES

NAS CECIL FIELD
DIG & HAUL CHECK LIST

Site: AOI - 22 Date: 9/29/98 - 10/8/98

Personnel: BECHTEL ENVIRONMENTAL

Contaminant(s) of Concern: IDENTIFY AND INVENTORY DEBRIS

Quantity Excavated: PER ATTACH cy

Excavation Limits: Draw a schematic of excavation limits on the back of this sheet. Reference the location of the excavation to the nearest building or landmark. Indicate depth of excavation.

Disposal: AFTER METAL EXTRACTED AND RECYCLED, DIRT WAS BACKFILLED INTO ORIGINAL LOCATION

Remarks: 12 DIG LOCATIONS PER ATTACHED DRAWING, DIG AREA FOR EACH LOCATION 10'X10'X5 NOT EXCEED GROUNDWATER

APPENDIX C

RESPONSE ACTION CONTRACTOR TEST PIT ACTIVITIES

Harding Lawson Associates

May 27, 1998

2523-3258

Ms. Debbie Vaughn-Wright
Remedial Project Manager
Federal Facilities Branch
Waste Management Division
USEPA Region IV
61 Forsyth Street
Atlanta, Georgia 30303

SUBJECT: Test Pitting at Sites AOI-22, PSC 19, and MB-11
NAS Cecil Field, Jacksonville, Florida
Contract No. N62467-89-D-0317/090

Dear Ms. Vaughn-Wright:

The purpose of this document is to provide guidance for test pitting of geophysical anomalies at three sites, AOI-22, PSC 19, and MB-11(Figure 1-1), located at NAS Cecil Field. The objective of the test pitting is to investigate these anomalies and uncover and identify buried metallic material. If the material is hazardous, it will be removed from the site. The significance of detected anomalies varies markedly from site to site. Test pitting operations will be conducted at each of the anomalies identified at AOI-22, PSC 19, and MB-11. A short description of known site conditions is summarized below for each location. The contractor should take all necessary health and safety precautions during test pitting operations as unexploded ordnance and hazardous materials (pesticides) have been found during test pitting operations at other NAS Cecil Field sites.

AOI-22 Numerous surface exposures of buried metallic debris, including 5 to 55-gallon drums and aerosol spray cans have been observed within the wooded area west of the NAS Cecil Field golf course fairway number 7 and south of fairway number 6. All visible surface debris was removed from AOI-22 to facilitate geophysical delineation of subsurface anomalies. Five-gallon metal cans, some containing a suspected aviation fuel stabilizer, were encountered by the RAC contractor (BEI) at this time. Historical accounts of golf course activities indicate there is a potential that pesticides, including Nemagon (active ingredient 1,2-dibromo-3-chloropropane), or pesticide residue could be encountered in containers disposed of in this area. Magnetic gradient and terrain conductivity surveys were conducted by HLA-ES (formerly ABB-ES) over the accessible extent of AOI-22. Twelve anomalies indicative of buried metallic debris were detected. The location of these anomalies is shown on Figure 1-2.

PSC 19 A geophysical survey was conducted at PSC 19 by HLA-ES personnel in the summer of 1997. The site was surveyed using a magnetometer and a Geonics EM-31 electromagnetometer unit. There were very few readings above background. In the vicinity of the concrete rubble piles, the geophysical survey indicated little to no variation from background conditions. Where readings appeared above background, metal objects such as pipes and drainage culverts were clearly visible. The geophysical survey results indicate that the rubble piles contain little to no iron or other metal in the concrete. Survey results did not indicate buried material in the north or central parts of PSC 19.

Engineering and
Environmental Services

2590 Executive Center Circle East, Tallahassee, FL 32301 850/656-1293 Fax: 850/656-3386

In the southern part of PSC 19, in the area of the old borrow pit, several locations had readings above background. These locations were marked with white pin flags. Magnetometer readings indicate that these objects are shallow, being just below the land surface. It was interpreted that the geophysical survey results show a pattern of areas above background typical of the indiscriminate dumping associated with rubbish heaps. During a site walkover conducted in April 1998 by HLA-ES personnel, three of the white pin flags were recovered (see Figure 1-3). If other white pin flags are recovered during test pitting, these areas will be test pitted also.

MB-11 The EPIC survey noted a large depression west of the west end of Runway 9R, and suggested that objects noted in 1982 and 1988 aerial photographs were drums. An HLA-ES site walkover confirmed the presence of the depression. No evidence of drum disposal was noted at the surface, however, scattered pieces of buried construction debris (steel rebar and cable) were exposed at the surface in many locations. A long-time employee from the NAS Cecil Field Staff Civil Engineer's office (Mr. Woodrow) indicated that corrugated steel culverts from airfield drainage reconstruction projects were disposed of in this area. HLA-ES conducted magnetic gradient and terrain conductivity surveys over the extent of the depressed area. Ten large anomalies were detected throughout the area. The location of these anomalies is shown on Figure 1-4.

Questions or comments may be directed to HLA-ES at the number listed below or to Mr. Mark Davidson at (843) 820-5669.

Sincerely,

HARDING LAWSON ASSOCIATES

Robert Lunardini, Jr., P.E.
Principal Engineer

FOR
Rao Angara
Installation Manager

cc: Mike Deliz, FDEP (1 copy)
David Porter, SDIV (1 copy)
Mark Davidson, SDIV (1 copy)
David Kruzicki, NASCF (1 copy)
Dale Obenauer, BEI (2 copies)
Eric Blomberg, Harding Lawson Associates (1 copy)
Mark Speranza, Tetra Tech NUS (1 copy)
Mr. Sam Pratt, Tetra Tech NUS (3 copies)
Lewis Shields, City of Jacksonville (1 copy)
file

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BOX

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FIGURE NO.: 1-1 to 1-4

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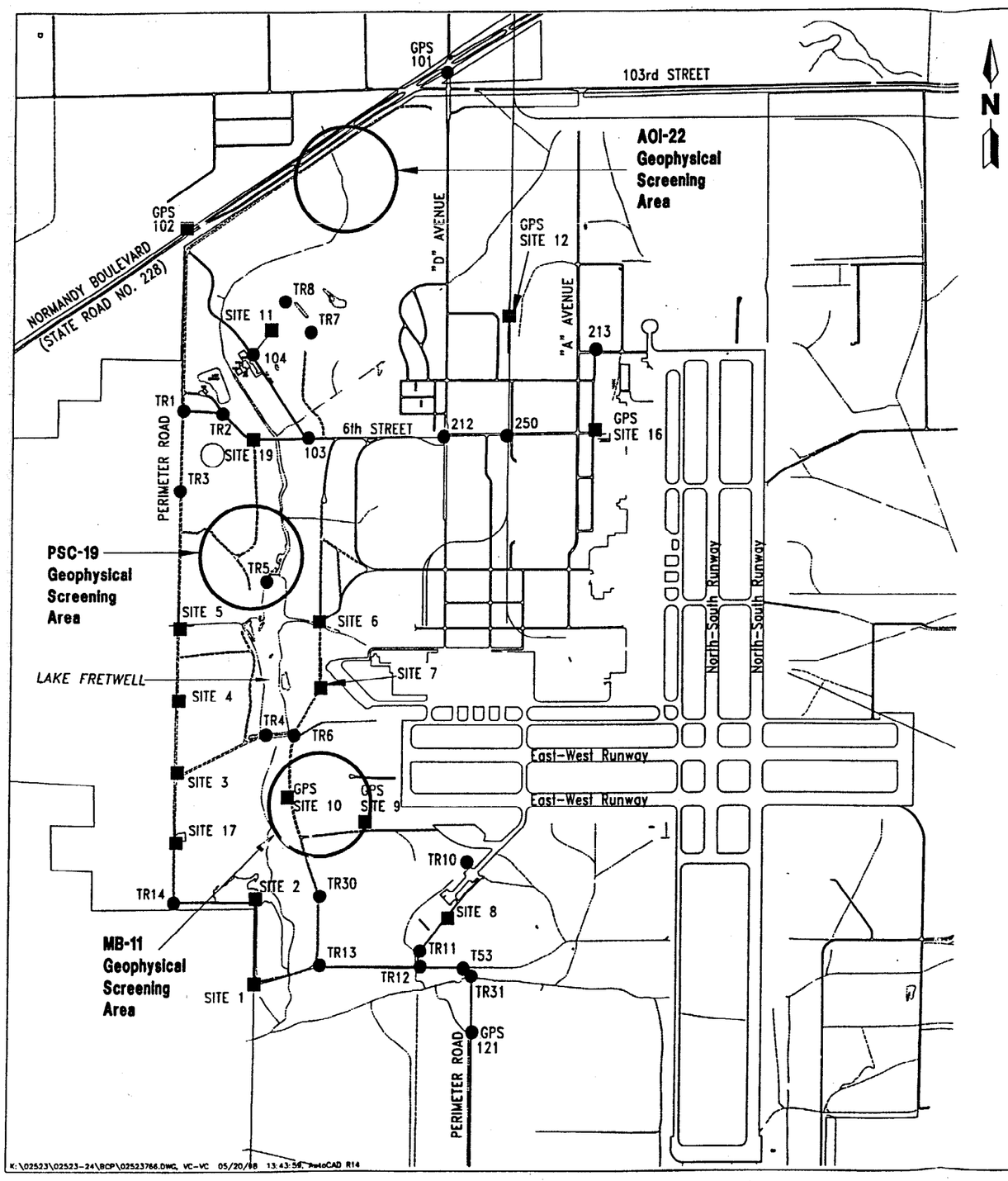
FIGURE NO.:

Z = B & W 11 X 17 Y = COLOR X = OVERSIZE



Survey Control Points		
Name	Easting	Northing
101	375,184.89	2,150,779.13
102	371,049.09	2,148,385.53
103	372,996.21	2,145,124.24
121	375,693.16	2,135,874.93
212	375,160.26	2,145,129.19
213	377,559.88	2,146,489.16
T53	375,543.55	2,136,859.48
TR1	371,013.73	2,145,551.96
TR3	370,972.94	2,144,298.41
TR4	372,358.76	2,140,479.06
TR5	372,342.22	2,142,875.67
TR6	372,806.63	2,140,471.75
TR7	373,025.25	2,146,773.00
TR8	372,610.11	2,147,250.81
TR10	375,585.51	2,138,499.62
TR12	374,847.89	2,136,888.08
TR13	373,247.81	2,136,902.39
TR14	370,916.28	2,137,879.84
TR30	373,235.77	2,137,974.04
TR31	375,671.63	2,136,739.75
SITE 1	372,212.65	2,136,619.17
SITE 2	372,219.34	2,137,935.02
SITE 3	370,964.84	2,139,895.23
SITE 4	370,977.56	2,141,013.00
SITE 5	370,987.99	2,142,139.79
SITE 6	373,201.95	2,142,239.95
SITE 7	373,228.71	2,141,202.02
SITE 8	375,290.09	2,137,630.86
SITE 9	373,945,75	2,139,116.17
SITE 10	372,708.83	2,139,502.44
SITE 11	372,394.58	2,146,804.05
SITE 12	376,194.41	2,147,001.33
SITE 16	377,558.88	2,145,227.58
SITE 17	370,947.74	2,138,801.26
SITE 19	372,126.23	2,145,092.92
104	372,098.62	2,146,434.94
250	376,165.04	2,145,142.14
TR2	371,631.32	2,145,501.61
TR11	374,840.20	2,137,127.14

0 1000 2000
SCALE: 1 INCH = 2000 FEET

LEGEND

SITE 5 ■	Monument
TR4 ●	Iron bar
PSC	Potential source of contamination
AOI	Area of interest
GPS	Gobal positioning system

FIGURE 1-1
TEST PIT SITE LOCATIONS AND SURVEY CONTROL MAP

BASE REALIGNMENT AND CLOSURE TEST PITTING

NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

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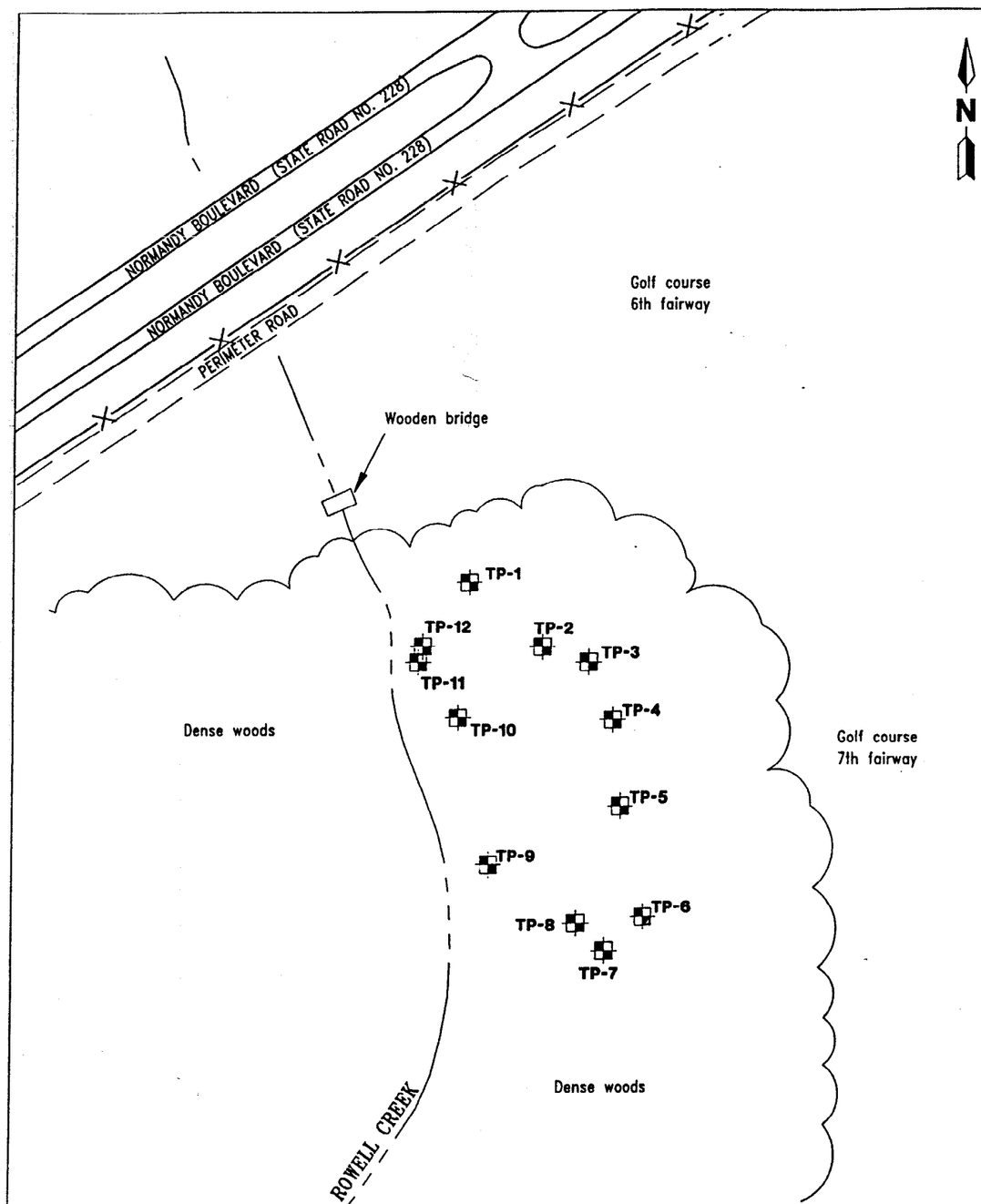

NOTES:

1. Test pit locations are marked with a wooden stake.
2. Test pit a 10-foot x 10-foot area at each stake.
3. Excavate to a minimum depth of 2 feet. If debris is found, continue excavating until undisturbed soil is reached.
4. Place all uncovered debris onto 6 mil Visqueen™ (or equal) next to the test pit.
5. Identify and inventory debris from each test pit.
6. If hazardous or unknown material is discovered, segregate and stockpile securely next to test pit. Contact BCT for disposal instructions.
7. Contractor should be prepared to upgrade to Level B.
8. Return soil back to excavation.
9. Leave nonhazardous debris on site.
10. WARNING: If UXO is unearthed, stop all excavation activities immediately. Notify the BCT for instructions.

AOI-22	1983-90 State Plane		
Test pit number	Easting	Northing	Pit orientation
1	373,615	2,149,217	E-W
2	373,722	2,149,126	N-S
3	373,788	2,149,104	E-W
4	373,820	2,149,022	N-S
5	373,831	2,148,899	N-S
6	373,865	2,148,741	E-W
7	373,805	2,148,697	N-S
8	373,766	2,148,740	E-W
9	373,641	2,148,818	E-W
10	373,603	2,149,024	E-W
11	373,540	2,149,104	E-W
12	373,550	2,149,126	E-W

LEGEND

TP-1	Test pit location and designation
—X—	Fence
BCT	Base Realignment and Closure cleanup team
UXO	Unexploded ordnance
AOI	Area of interest

FIGURE 1-2
AREA OF INTEREST 22
TEST PIT LOCATIONS

BASE REALIGNMENT AND CLOSURE
TEST PITTING

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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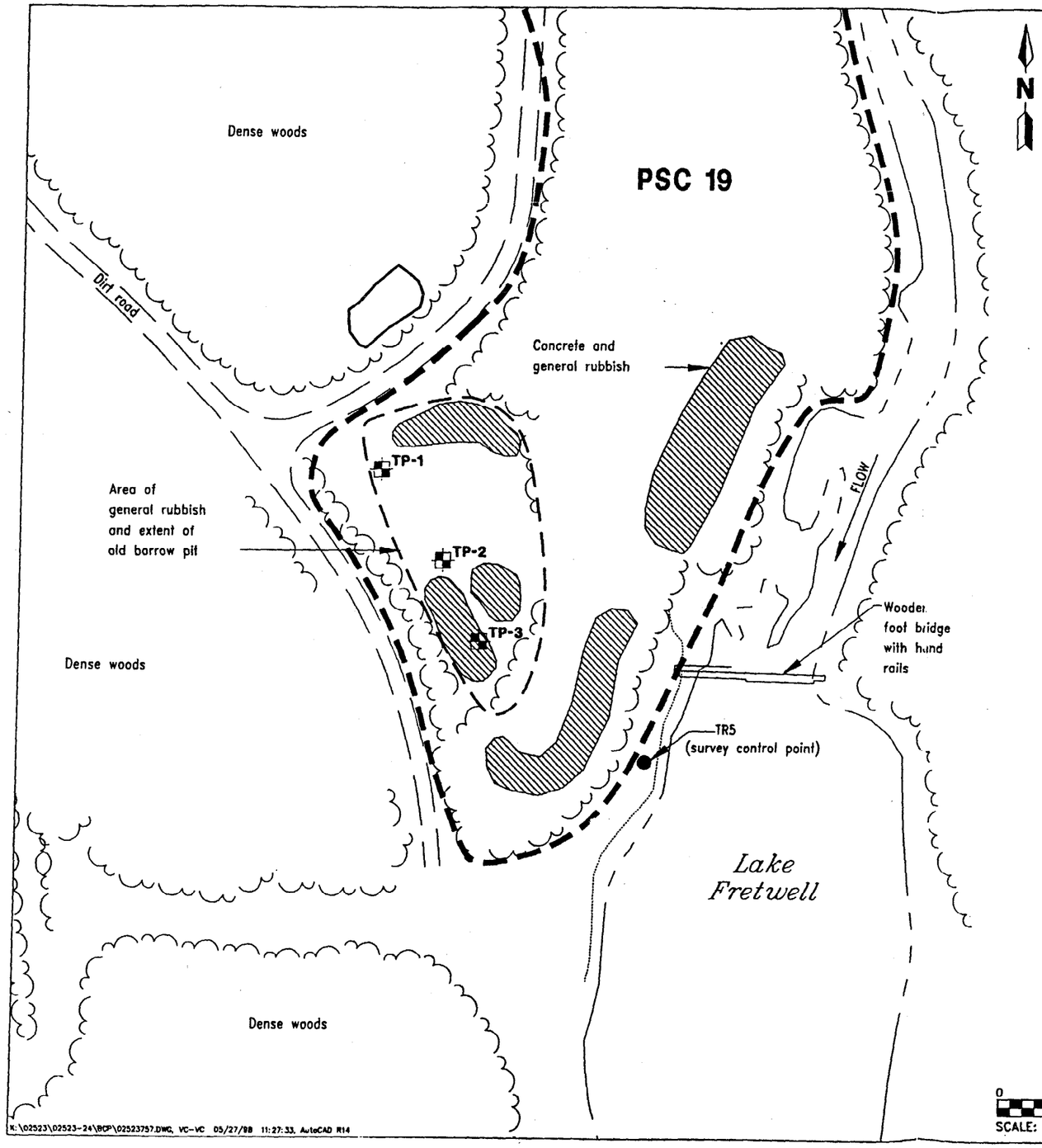


NOTES:

1. Test pit locations are marked with a wooden stake.
2. Test pit a 10-foot x 10-foot area at each stake.
3. Excavate to a minimum depth of 2 feet. If debris is found, continue excavating until undisturbed soil is reached.
4. Place all uncovered debris onto 6 mil Visqueen™ (or equal) next to the test pit.
5. Identify and inventory debris from each test pit.
6. If hazardous or unknown material is discovered, segregate and stockpile securely next to test pit. Contact BCT for disposal instructions.
7. Contractor should be prepared to upgrade to Level B.
8. Return soil back to excavation.
9. Leave nonhazardous debris on site.
10. WARNING: If UXO is unearthed, stop all excavation activities immediately. Notify the BCT for instructions.

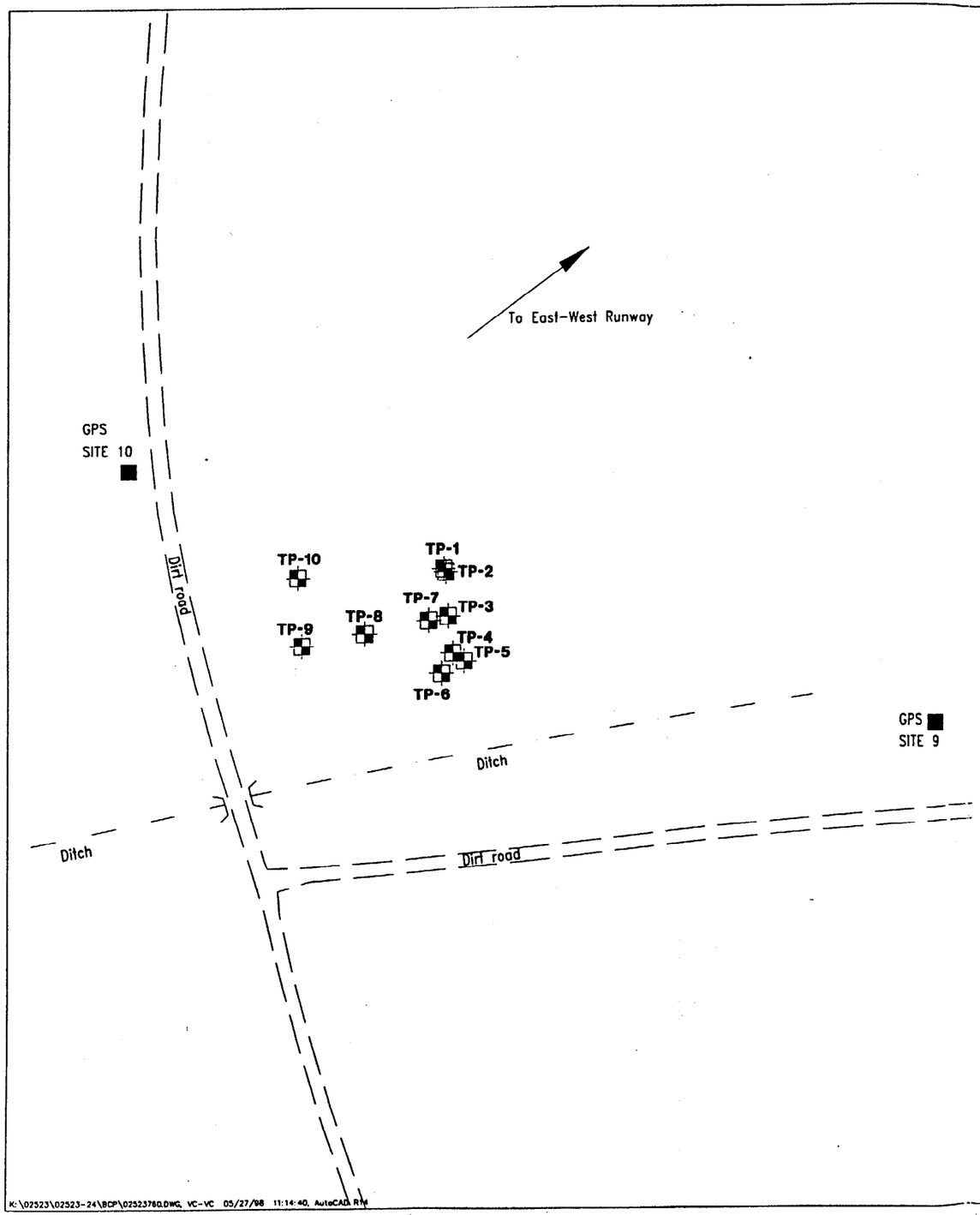
LEGEND

	Approximate locations of observed debris
TP-1	Test pit location and designation
TR5	Iron bar
PSC	Potential source of contamination
	Area of investigation
BCT	Base Realignment and Closure cleanup team
UXO	Unexploded ordnance
FLOW	Flow direction

FIGURE 1-3
POTENTIAL SOURCE OF CONTAMINATION 19
TEST PIT LOCATIONS

BASE REALIGNMENT AND CLOSURE
TEST PITTING

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA



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N

NOTES:

1. Test pit locations are marked with a wooden stake.
2. Test pit a 10-foot x 10-foot area at each stake.
3. Excavate to a minimum depth of 2 feet. If debris is found, continue excavating until undisturbed soil is reached.
4. Place all uncovered debris onto 6 mil Visqueen™ (or equal) next to the test pit.
5. Identify and inventory debris from each test pit.
6. If hazardous or unknown material is discovered, segregate and stockpile securely next to test pit. Contact BCT for disposal instructions.
7. Contractor should be prepared to upgrade to Level B.
8. Return soil back to excavation.
9. Leave nonhazardous debris on site.
10. WARNING: If UXO is unearthed, stop all excavation activities immediately. Notify the BCT for instructions.

MB-11	1983-90 State Plane		
Test pit number	Easting	Northing	Pit orientation
1	373,193	2,139,354	N-S
2	373,196	2,139,350	N-S
3	373,200	2,139,281	N-S
4	373,207	2,139,226	N-S
5	373,224	2,139,215	N-S
6	373,190	2,139,195	N-S
7	373,169	2,139,275	N-S
8	373,072	2,139,255	N-S
9	372,965	2,139,237	N-S
10	372,971	2,139,340	N-S

Survey Control Points		
Name	Easting	Northing
SITE 10	372,708.83	2,139,502.44
SITE 9	373,945.75	2,139,116.17

0 100 200
SCALE: 1 INCH = 200 FEET

LEGEND

TP-1	Test pit location and designation
SITE 10	Monument
BCT	Base Realignment and Closure cleanup team
UXO	Unexploded ordnance
GPS	Global positioning system

FIGURE 1-4
MB-11 TEST PIT LOCATIONS

BASE REALIGNMENT AND CLOSURE TEST PITTING

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Harding Lawson Associates

June 15, 1998 2523-3260

Ms. Debbie Vaughn-Wright
Remedial Project Manager
Federal Facilities Branch
Waste Management Division
USEPA Region IV
61 Forsyth Street
Atlanta, Georgia 30303

SUBJECT: Test Pitting at Sites AOI-22, PSC 19, and MB-11 - Revision I
NAS Cecil Field, Jacksonville, Florida
Contract No. N62467-89-D-0317/090

Dear Ms. Vaughn-Wright:

The purpose of this document is to provide guidance for test pitting of geophysical anomalies at three sites, AOI-22, PSC 19, and MB-11(Figure 1-1), located at NAS Cecil Field. The objective of the test pitting is to investigate these anomalies and uncover and identify buried metallic material. If the material is hazardous, it will be removed from the site. The investigation will be done in a phased approach with test pitting, the first phase, being the identification of the presence or absence of hazardous materials. There will be no environmental sampling during this first phase.

The significance of detected anomalies varies markedly from site to site. Test pitting operations will be conducted at each of the anomalies identified at AOI-22, PSC 19, and MB-11. A short description of known site conditions is summarized below for each location. The contractor should take all necessary health and safety precautions during test pitting operations as unexploded ordnance and hazardous materials (pesticides) have been found during test pitting operations at other NAS Cecil Field sites.

AOI-22 Numerous surface exposures of buried metallic debris, including 5 to 55-gallon drums and aerosol spray cans have been observed within the wooded area west of the NAS Cecil Field golf course fairway number 7 and south of fairway number 6. All visible surface debris was removed from AOI-22 to facilitate geophysical delineation of subsurface anomalies. Five-gallon metal cans, some containing a suspected aviation fuel stabilizer, were encountered by the RAC contractor (BEI) at this time. Historical accounts of golf course activities indicate there is a potential that pesticides, including Nemagon (active ingredient 1,2-dibromo-3-chloropropane), or pesticide residue could be encountered in containers disposed of in this area. Magnetic gradient and terrain conductivity surveys were conducted by HLA-ES (formerly ABB-ES) over the accessible extent of AOI-22. Twelve anomalies indicative of buried metallic debris were detected. The location of these anomalies is shown on Figure 1-2.

PSC 19 A geophysical survey was conducted at PSC 19 by HLA-ES personnel in the summer of 1997. The site was surveyed using a magnetometer and a Geonics EM-31 electromagnetometer unit. There were very few readings above background. In the vicinity of the concrete rubble piles, the geophysical survey indicated little to no variation from background conditions. Where readings appeared above background, metal objects such as pipes and drainage culverts were clearly visible. The geophysical survey results

indicate that the rubble piles contain little to no iron or other metal in the concrete. Survey results did not indicate buried material in the north or central parts of PSC 19.

In the southern part of PSC 19, in the area of the old borrow pit, several locations had readings above background. These locations were marked with white pin flags. Magnetometer readings indicate that these objects are shallow, being just below the land surface. It was interpreted that the geophysical survey results show a pattern of areas above background typical of the indiscriminate dumping associated with rubbish heaps. During a site walkover conducted in April 1998 by HLA-ES personnel, three of the white pin flags were recovered (see Figure 1-3). If other white pin flags are recovered during test pitting, these areas will be test pitted also.

MB-11 The EPIC survey noted a large depression west of the west end of Runway 9R, and suggested that objects noted in 1982 and 1988 aerial photographs were drums. An HLA-ES site walkover confirmed the presence of the depression. No evidence of drum disposal was noted at the surface, however, scattered pieces of buried construction debris (steel rebar and cable) were exposed at the surface in many locations. A long-time employee from the NAS Cecil Field Staff Civil Engineer's office (Mr. Woodrow) indicated that corrugated steel culverts from airfield drainage reconstruction projects were disposed of in this area. HLA-ES conducted magnetic gradient and terrain conductivity surveys over the extent of the depressed area. Ten large anomalies were detected throughout the area. The location of these anomalies is shown on Figure 1-4.

Questions or comments may be directed to HLA-ES at the number listed below or to Mr. Mark Davidson at (843) 820-5669.

Sincerely,

HARDING LAWSON ASSOCIATES

Robert Lunardini, Jr., P.E.
Principal Engineer

Rao Angara
Installation Manager

cc: Mike Deliz, FDEP (1 copy)
David Porter, SDIV (1 copy)
Mark Davidson, SDIV (1 copy)
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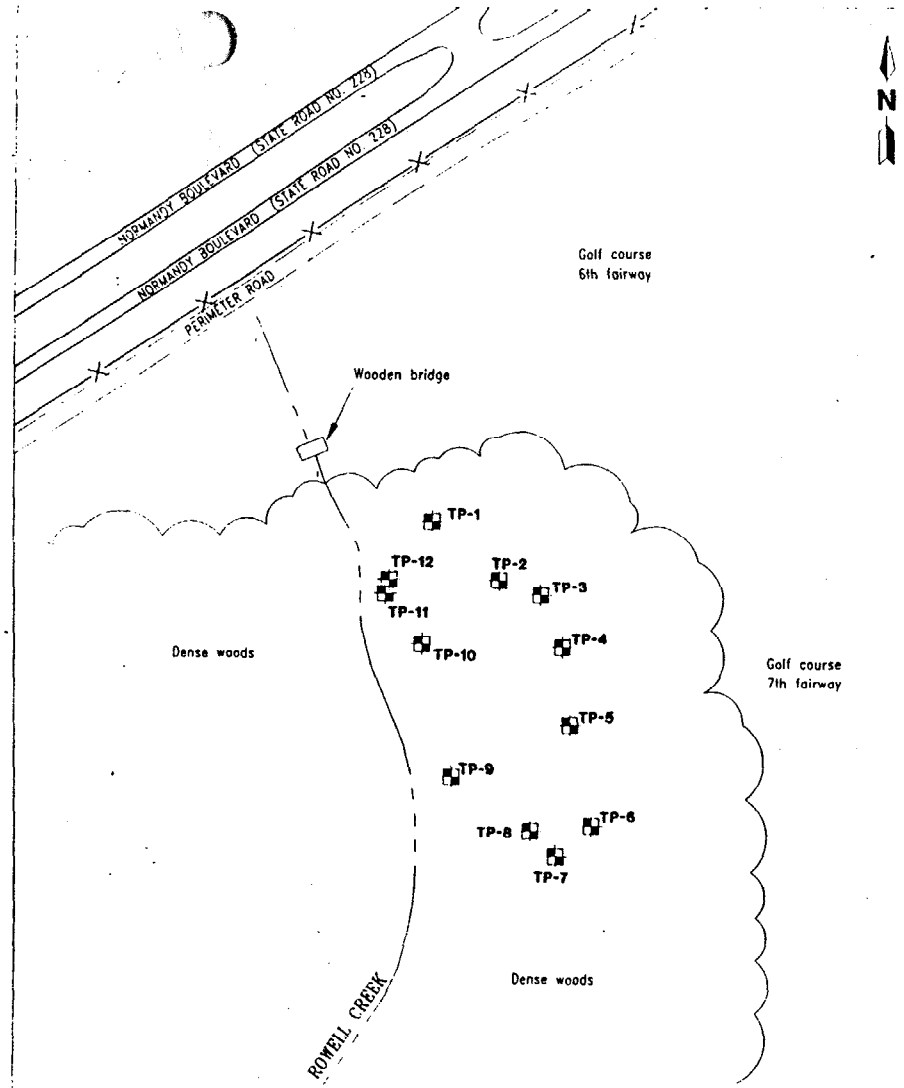
Mr. Sam Pratt, Tetra Tech NUS (3 copies)
Lewis Shields, City of Jacksonville (1 copy)
file



N

0 100 200
SCALE: 1 INCH = 200 FEET

ES:

1. Minimize tree cutting and clearing while mobilizing to each test pit location.
2. Test pit locations are marked with a wooden stake.
3. At each test pit location excavate until the debris is unearthed. Excavation depth shall be to the groundwater table, not to exceed 5 feet. Do not exceed a maximum areal extent of 10 feet x 10 feet.
4. Place all uncovered debris onto 6 mil Visqueen™ (or equal) next to the test pit.
5. Identify and inventory debris from each test pit.
6. If hazardous or unknown material is discovered, segregate and stockpile securely next to test pit. Contact BCT for disposal instructions.
7. Contractor should be prepared to upgrade to Level B.
8. Return soil back to excavation.
9. Leave nonhazardous debris on site.
10. WARNING: If UXO is unearthed, stop all excavation activities immediately. Notify the NAS Cecil Field Environmental Department for instructions.

AOI-22	1983-90 State Plane		
Test pit number	Easting	Northing	Pit orientation
1	373,615	2,149,217	E-W
2	373,722	2,149,126	N-S
3	373,788	2,149,104	E-W
4	373,820	2,149,022	N-S
5	373,831	2,148,899	N-S
6	373,865	2,148,741	E-W
7	373,805	2,148,697	N-S
8	373,766	2,148,740	E-W
9	373,641	2,148,818	E-W
10	373,603	2,149,024	E-W
11	373,540	2,149,104	E-W
12	373,550	2,149,126	E-W

LEGEND

TP-1	Test pit location and designation
—X—	Fence
BCT	Base Realignment and Closure cleanup team
NAS	Naval air station
UXO	Unexploded ordnance
AOI	Area of Interest

FIGURE 1-2
AREA OF INTEREST 22
TEST PIT LOCATIONS

BASE REALIGNMENT AND CLOSURE
TEST PITTING

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA