FINAL

FORSCOM

CORRECTIVE ACTION PLAN

Part A

3d Inf Div (Mech)

Underground Storage Tank 108
Building 1346
Facility Identification Number: 9-025104
Hunter Army Airfield, Georgia

Prepared for

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

Contract No. DACA21-95-D-0022
Delivery Order 0019

March 1999

98-182P(PPT-8Fiery)/021999

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FINAL

CORRECTIVE ACTION PLAN - PART A REPORT FOR UNDERGROUND STORAGE TANK 108 BUILDING 1346 FACILITY IDENTIFICATION NUMBER: 9-025104 HUNTER ARMY AIRFIELD, GEORGIA

Prepared for:

U.S. Army Corps of Engineers - Savannah District
and
Fort Stewart Directorate of Public Works
Under Contract Number DACA21-95-D-0022
Delivery Order 0019

Prepared by:

Science Applications International Corporation
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831

March 1999

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List of Abbreviations and Acronyms

ACE	Anderson Columbia Environmental, Inc.
ASTM	American Society for Testing and Materials
ATL	alternate threshold level
BDL	below detection limit
BGS	below ground surface
BLS	below land surface
BTEX	benzene, toluene, ethylbenzene, and xylene
BTL	below threshold level
CAP	Corrective Action Plan
CL	clay
COE	(U.S. Army) Corps of Engineers
CX	Center of Excellence
DOT	U.S. Department of Transportation
DPW	Directorate of Public Works
DQA	data quality assessment
DQCR	Daily Quality Control Report
DQO	date quality objective
DRO	diesel-range organics

EPA	U.S. Environmental Protection Agency
EPD	Environmental Protection Division
FS	Fort Stewart
GA DNR	Georgia Department of Natural Resources
GEL	General Engineering Laboratories
gpm	gallons per minute
GRO	gasoline-range organics
GUST	Georgia Underground Storage Tank
HAAF	Hunter Army Airfield
ID	inside diameter
IDW	investigation-derived waste
IWTP	Industrial Waste Treatment Plant
LCS	laboratory control sample
MCL	maximum contaminant level
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MPR	Monthly Progress Report
MS	matrix spike
N/A	not applicable
NCO	noncommissioned officer
NRC	no regulatory criteria
OVM	organic vapor meter
PAHs	polynuclear aromatic hydrocarbons
PID	photoionization detector
ppm	parts per million
PVC	polyvinyl chloride
QA	quality assurance
QA/QC	quality assessment/quality control
QAPjP	Quality Assurance Project Plan
QC	quality control
QCSR	Quality Control Summary Report
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
SAIC	Science Applications International Corporation
SAS	South Atlantic Savannah (Division)
SC	clayey sand
SC-SM	clayey, silty sand
SM	silty sand
SP-SC	poorly graded, clayey sand
SW	sand
TBD	to be determined
TCLP	Toxicity Characteristic Leaching Procedure
TOC	total organic carbon
TPH	total petroleum hydrocarbon
UNK	unknown
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
UST	underground storage tank

USTMP	Underground Storage Tank Management Program
VOC	volatile organic compound

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CORRECTIVE ACTION PLAN PART A

Facility Name: UST 108, Building 1346 Street Address: Tubb Street, HAAF

Facility ID: 9-025104 City: Savannah County: Chatham Zip Code: 31406

Latitude: 32°00'57"N Longitude: 81°06'21"W

Submitted by UST Owner/Operator:
Name: Thomas C. Fry/Environmental Branch
Company: U.S. Army/HQ 3d, Inf. Div. (Mech)
Address: DPW ERD ENV. Br. (Fry)
1557 Frank Cochran Drive
City: Fort Stewart State: Georgia
Zip Code: 31314-4928
Telephone: (912) 767-1078

Prepared by Consultant/Contractor:
Name: C. Allison Bailey
Company: SAIC
Address: P.O. Box 2502
City: Oak Ridge State: TN
Zip Code: 37831
Telephone: (423) 481-8719

I. PLAN CERTIFICATION:

A. UST Owner/Operator Certification

I hereby certify that the information contained in this plan and in all the attachments is true, accurate, and the plan satisfies all criteria and requirements of rule 391-3-15-09 of the Georgia Rules for Underground Storage Tank Management.

Name: Thomas C. Fry
Signature: Thomas C. Fry Date: 03/22/99

B. Registered Professional Engineer or Professional Geologist Certification

I hereby certify that I have directed and supervised the field work and preparation of this plan, in accordance with State Rules and Regulations. As a registered professional geologist and/or professional engineer, I certify that I am a qualified groundwater professional, as defined by the Georgia State Board of Professional Geologists. All of the information and laboratory data in this plan and in all of the attachments are true, accurate, complete, and in accordance with applicable State Rules and Regulations.

Name: John B. Reeves, P.E.
Signature: John B Reeves
Date: 3-16-99

Georgia Stamp or Seal

General: READ THE GUIDANCE DOCUMENT FOR CAP PART-A BEFORE COMPLETING THIS FORM. FAILURE TO READ THE GUIDANCE DOCUMENT WILL MOST LIKELY RESULT IN PREPARATION OF AN UNACCEPTABLE REPORT. All text, figures, and tables requested in their respective sections should be prepared strictly in accordance with the Georgia EPD CAP-A guidance document. Please fill out this form as provided. Do not change the size of the fields or alter the placement of each section on each page.
(Appendix I: All Report Figures)
(Appendix II: All Report Tables)

II. INITIAL RESPONSE REPORT

A. Initial Abatement

Were initial abatement actions initiated? YES ____ NO X
If Yes, please summarize. If No, please explain why not.

Actions were not required to abate imminent hazards and/or emergency conditions at the underground storage tank (UST) 108, Building 1346 site. Therefore, contaminant migration and release prevention, fire and vapor mitigation, or emergency free product removal were not performed prior to, or during, the removal of UST 108.

B. Free Product Removal

(Table 1: Summary of Free Product Removal – must include Free Product thickness in each well in which it was detected, and volume of product removed)

Free Product Detected? YES X NO ____
If Yes, please summarize free product recovery efforts.

Approximately 0.2 foot of free product was discovered in piezometer D-1 (Figure 2) on April 3, 1998. Free product was detected by placing a sample of groundwater extracted from the piezometer into a 50-mL glass vial and allowing the sample to equilibrate for 24 hours. Upon discovery of the free product, a passive removal system consisting of a 5.0-foot-long, threaded steel rod wrapped with absorbent material (i.e., absorbent sock) fastened with chemically inert plastic ties was installed in piezometer D-1. To maximize free product absorption, the material was installed across the water table. The passive removal system was in operation at the site from April 4 through November 18, 1998. On June 25, 1998, a water-product interface meter was used for the detection of free product thickness. However, none was detected. On November 18, 1998, the absorbent sock was removed to allow the piezometer to equilibrate. Measurements made with a water-product interface meter on November 30 indicated free product was no longer present at this site. Please refer to Table 1 for a summary of the free product removal efforts.

Continuing free product recovery proposed? YES ____ NO X
If yes, please indicate the method and frequency of removal.

Continuing free product removal efforts are not required for this site as free product no longer exists, as evidenced by the removal of the absorbent sock on November 18 and measurements made with the water-product interface meter in piezometer D-1 on November 30, 1998 (Table 1).

C. Tank History

List current and former UST's operated at site based on owner/operator knowledge consistent with EPA 7530-1 Form). Systems must be illustrated on Figure 2 (Site Plan), as described in section D below.

CURRENT UST SYSTEMS (if applicable)

Tank ID Number	Capacity (gal)	Substance Stored	Age (yrs)	Meets 1998 Upgrade Standards (Yes/No)
N/A	N/A	N/A	N/A	N/A

FORMER UST SYSTEMS (if applicable)

Tank ID Number	Capacity (gal)	Substance Stored	Date Removed
108	500	used oil	September 19, 1996

D. Initial Site Characterization

(Figure 1: Vicinity/Location Map)
(Figure 2: Site Plan)

1. Regulated Substance Released (gasoline, diesel, used oil, etc.): used oil.
   Discuss how this determination was made and circumstances of discovery.

Characterization of petroleum-related contamination at the site was initiated during UST system closure activities on September 19, 1996, by Anderson Columbia Environmental, Inc. (ACE). After removal of the tank, the ancillary piping was purged and closed in place by filling with grout. One soil sample (8102-TK108-S1) was collected from the bottom of the former tank pit (Figure 7). The soil sample collected during tank closure activities did not contain contaminant concentrations that exceeded Georgia Environmental Protection Division (GA EPD) applicable soil threshold levels (i.e., Table A, Column 2). However, elevated total petroleum hydrocarbon (TPH) concentrations were detected in the soil samples (Tables 5a and 5b).

2. Source(s) of Contamination: Unknown; piping leakage or tank overflow suspected.
   Discuss how this determination was made.

Although ACE (1996) presented a diagram showing approximate locations of the former UST and associated ancillary piping, a detailed schematic diagram is not available. During tank removal activities by ACE, holes in the tank were not reported. During the Corrective Action Plan (CAP)-Part A investigation, free product was detected in direct-push boring D-1 (Figure 2). Therefore, the major source of contamination at the UST 108, Building 1346 site is believed to have been piping leakage or tank overflow. Free product removal efforts using a passive removal system were employed at the site in piezometer D-1 from April 4 through November 18, 1998. As determined by measurements made on November 30, 1998, free product no longer exists at the site.

3. Local Water Resources

(Figure 3: Quadrangle Map - Public and Private drinking water and surface water)
(Appendix III: Water resources survey documentation, including, but not limited to: USGS database search, interview forms, and documentation of field survey)

a. *Site located in high/average* X *OR low* ____ *groundwater pollution susceptibility area?*

b. *Water Supplies within applicable radii?* YES X NO ____
If yes,
i. *Nearest public water supply located within:* 3,000 *feet*

ii. *Nearest down-gradient public water supply located within:* 6,700 *feet*

iii. *Nearest non-public water supply located within:* 14,880 *feet*

iv. *Nearest down-gradient non-public water supply located within:* >14,880 *feet*

c. *Surface Water Bodies and sewers:*

i. *Nearest surface water located within:* 20 *feet*

ii. *Nearest down-gradient surface water located within:* 20 *feet*

iii. *Nearest storm or sanitary sewer located within:* 30 *feet*

iv. *Depth to bottom of sewer at a point nearest the plume:* 6.6 *feet*

4. Impacted Environmental Media

a. *Soil Impacted*
(Table 2: Soil Analysis Results)
(Figure 4: Soil Quality Map)
(Appendix IV: Soil Boring Logs)
(Appendix V: Soil Laboratory Reports)
(Appendix VI: ATL Calculations, if applicable)

Provide a brief discussion of soil sampling.

Continuous direct-push soil cores were collected at 2.0-foot intervals during the installation of six boreholes (D-1 through D-6). Field headspace gas analyses were performed on each sample to determine organic vapor concentration. Soil samples were selected from each borehole for laboratory chemical analysis of benzene, toluene, ethylbenzene, and xylene (BTEX); TPH gasoline-range organics/diesel-range organics (GROs/DROs); and polynuclear aromatic hydrocarbons (PAHs). In boreholes D-4, D-5, and D-6, one sample was collected from the 2.0-foot interval where the highest vapor concentration was recorded, and the other from the 2.0-foot interval located immediately above the water table. During the installation of D-1, D-2, and D-3, saturated soil was encountered at shallow depths < 3.0 feet deep; therefore, only one soil sample was collected from these boreholes. In addition, an undisturbed (Shelby-tube) soil sample, D-8, was collected and analyzed for geotechnical parameters to determine vadose zone and aquifer characteristics at the site. The results are presented in Appendix VI, Table VI-A. Refer to Attachment A for complete documentation of the technical approach implemented during this investigation.

i. Soil contamination above applicable threshold levels?

YES ____ NO X

If yes, indicate highest concentrations in soil along with locations and depths detected.

ii. ATLs calculated? YES ____ NO X

If yes, present ATLs.

iii. If ATL's calculated, is soil contamination above ATL's?

YES ____ NO ____ N/A X

b. Groundwater Impacted

(Table 3: Groundwater Analysis Results)
(Figure 5: Groundwater Quality Map)
(Appendix VII: Monitoring Well Details)
(Appendix VIII: Groundwater Laboratory Results)

Provide a brief discussion of groundwater sampling.

At each borehole location (D-1 through D-6), one groundwater sample was collected from a depth interval of approximately 1.0 to 5.0 feet below the water table using a direct-push sampling device. At the vertical profile location (D-7), discrete groundwater samples were collected every 10 feet below the water table down to approximately 38 feet below ground surface (BGS) [the estimated depth of the Hawthorn confining unit]. Although the Hawthorn was not encountered at 38 feet BGS, the vertical profile was terminated at this depth because of the difficulty experienced during the extraction of groundwater samples. Chemical parameters for groundwater samples submitted for laboratory analysis included BTEX and PAHs. Refer to Attachment A for complete documentation of the technical approach used to collect groundwater samples.

i. Groundwater contamination above MCLs? YES ____ NO X

ii. Groundwater contamination above In-Stream Water Quality Standards?

YES ____ NO X

If yes, indicate highest concentrations in groundwater along with the locations.

c. *Surface Water Impacted?* YES ____ NO X
If Yes, indicate concentration(s) of surface water sample(s) taken from the surface water body/bodies impacted.

d. *Point of Withdrawal Impacted?* YES ____ NO ____ N/A X
If Yes, indicate concentration(s) of water sample(s) taken from withdrawal point(s).

5. Other Geologic/Hydrogeologic Data

a. *Depth to Groundwater:* 1.6 to 3.84 feet BGS *(Table 4: Groundwater Elevations)*

b. *Groundwater Flow Direction:* southeast *(Figure 6: Potentiometric Surface Map)*

c. *Hydraulic Gradient:* 0.08 feet/feet

d. *Geophysical Province:* Coastal Plain

e. *Unique geologic/hydrogeological conditions:* The silty clay unit at the UST 108, Building 1346 site acts as a confining layer to the surficial aquifer.

6. Corrective Action Completed or In-Progress (if applicable)
(Table 5: UST System Closure Sampling)
(Figure 7: UST System Closure Sampling)
(Appendix IX: Contaminated Soil Disposal Manifests)

a. *Underground Storage Tank (UST) System Closure:* N/A ____
If applicable, summarize UST system closure activities conducted.

ACE removed UST 108 on September 19, 1996. The UST piping was drained into the tank, and all remaining contents were subsequently removed using a vacuum truck and/or compressor-driven barrel vacuum device. The piping was then closed in place by filling with grout. A backhoe was used to excavate down to the tank top. After the tank atmosphere was tested with a combustible gas indicator, all accessible tank openings were capped and the tank was lifted from the excavation pit.

b. Excavation and Treatment/Disposal of Backfill Materials and Native Soils

Check one: *No UST removal performed* ____
Returned to UST excavation ____
Excavated soils treated or disposed off site X

If soils were excavated, summarize excavation and treatment/disposal activities:

Approximately 75.22 tons of soil were removed from the Building 1346 site and stockpiled at the ACE temporary soil containment area located at Hunter Army Airfield (HAAF) where it was tested in accordance with the disposal facility requirements. The soil was transported to Kedesh, Inc., Highway 84, Ludowici, GA 31316. The Installation has records of all manifests and weight tickets for the total project. However, site-specific information is not available.

7. Site Ranking:

Environmental Site Sensitivity Score: *0*
(Appendix X: Site Ranking Form)

8. Conclusions and Recommendations

Complete applicable section below, one section only

a. No Further Action Required (if applicable) N/A X
(provide justification)

b. Monitoring Only (if applicable) N/A X
(provide justification)

c. CAP-B (if applicable N/A ____
(provide justification)

Further investigation of the UST 108, Building 1346, Facility ID: 9-025104 site is recommended to confirm that the site is free of contamination.

III. MONITORING ONLY PLAN (if applicable): N/A X

A. Monitoring points

B. Period/Frequency of monitoring and reporting

C. Monitoring Parameters

D. Milestone Schedule

E. Scenarios for site closure or CAP-Part B

IV. SITE INVESTIGATION PLAN (if applicable): N/A _____

(Figure 8: Proposed additional boring/monitoring well location)

A. Proposed Investigation of Horizontal and Vertical Extent of Contamination In:

1. Soil N/A X

2. Groundwater

a. Free Product N/A_____

To verify that all measurable free product has been removed at the UST 108, Building 1346 site, the installation of three, 2-inch-diameter polyvinyl chloride groundwater monitoring wells is proposed (Figure 8). The proposed locations are: (1) the former tank area in the vicinity of piezometer D-1, (2) downgradient of the site in the vicinity of D-7, and (3) downgradient of the wash racks in the vicinity of the former tank piping system and D-4.

b. Dissolved phase NA_____

The proposed monitoring wells will also be used to evaluate and verify the absence of any groundwater contamination.

3. Surface Water N/A_____

To assess the potential impact of petroleum contaminants to the surface water body, two surface water and two sediment samples will be collected from the unnamed drainage ditch located approximately 20 feet downgradient (southeast) of the site (Figure 8).

B. Proposed Investigation of Vadose Zone And Aquifer Characteristics:

During the CAP-Part A investigation, vadose zone and aquifer characteristics at the UST 108, Building 1346 site were determined by collecting an undisturbed (Shelby-tube) soil sample (D-8), which was analyzed for geotechnical parameters. The results are presented in Appendix VI, Table VI-A. Therefore, further investigation is not being proposed.

V. PUBLIC NOTICE

(Figure 9. Tax Map)
(Appendix XI: Copies of public notification letters & certified return receipts or newspaper notice if approved)

UST 108, Building 1346, Facility ID: 9-025104, is located within the confines of HAAF, which is part of the Fort Stewart Military Reservation, a federally owned facility. All of the property contiguous to the site is owned by the U.S. Government. The Fort Stewart Directorate of Public Works has complied with the public notice requirements defined by Georgia Department of Natural Resources (GA DNR) guidance by publishing an announcement in the local newspaper over a period of 2 weeks. Publication of this announcement has been completed simultaneously with the submittal of this CAP-Part A report for review by the GA DNR EPD Underground Storage Tank Management Program (USTMP). A copy of the newspaper announcement used for public notification is presented in Appendix XI.

VI. CLAIM FOR REIMBURSEMENT (for GUST Trust Fund sites only): N/A X

(Appendix XII: GUST Trust Fund Reimbursement Application and Claim for reimbursement)

The HAAF is a federally owned facility and has funded the investigation for the UST 108, Building 1346 site, Facility ID: 9-025104, using Environmental Restoration Account funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

APPENDIX I

REPORT FIGURES

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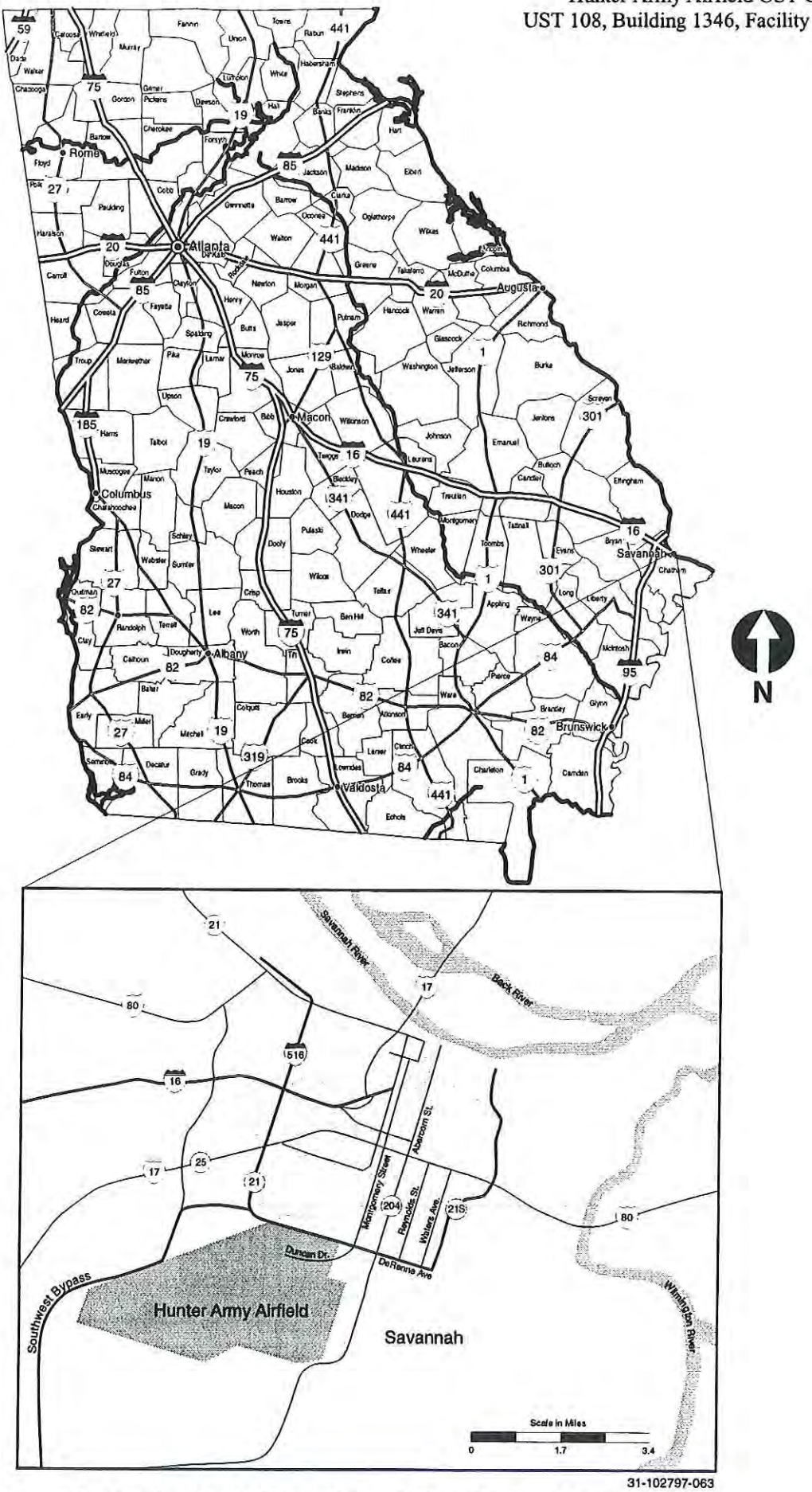


Figure 1. Location Map of Hunter Army Airfield, Chatham County, Georgia

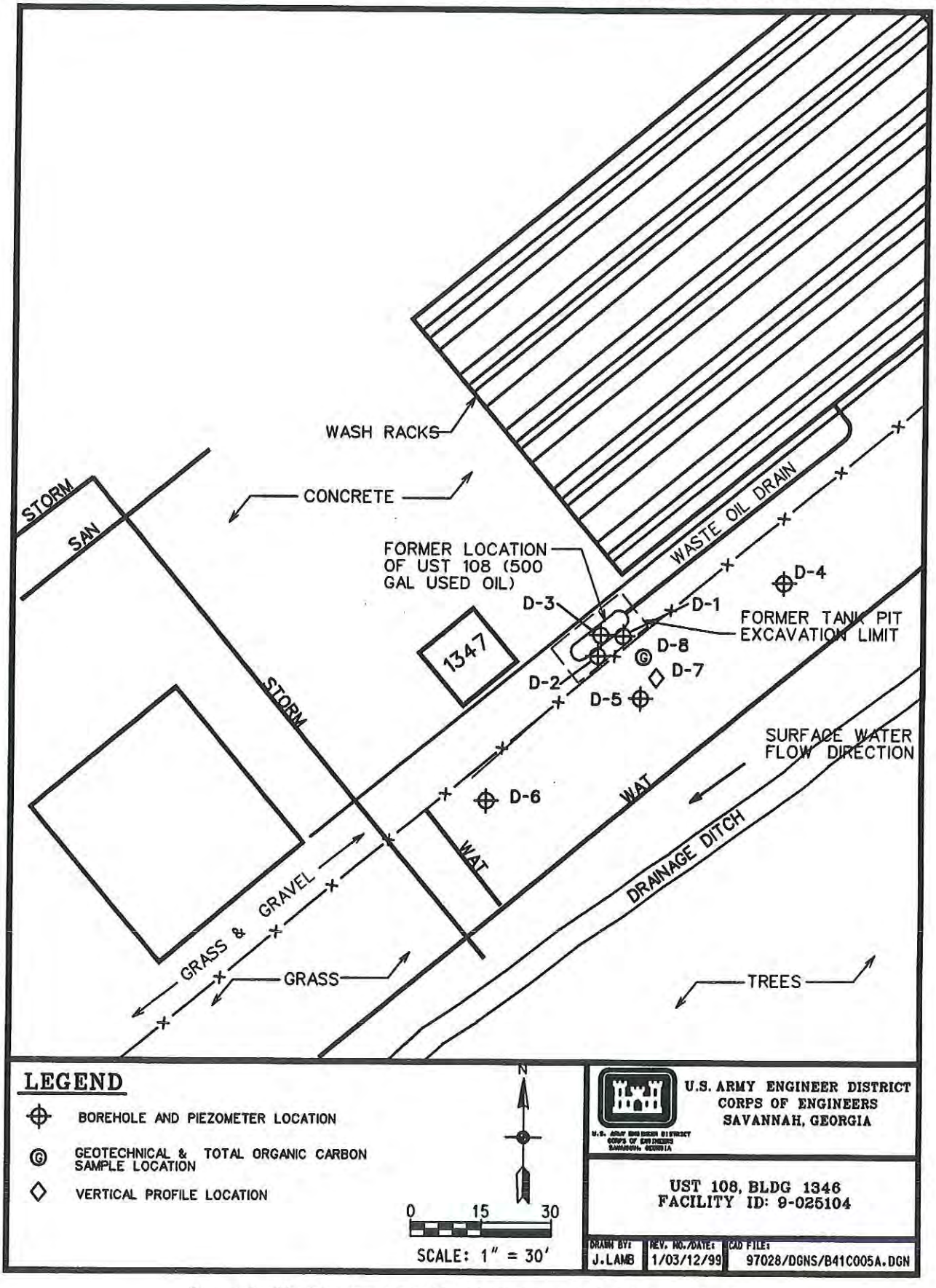
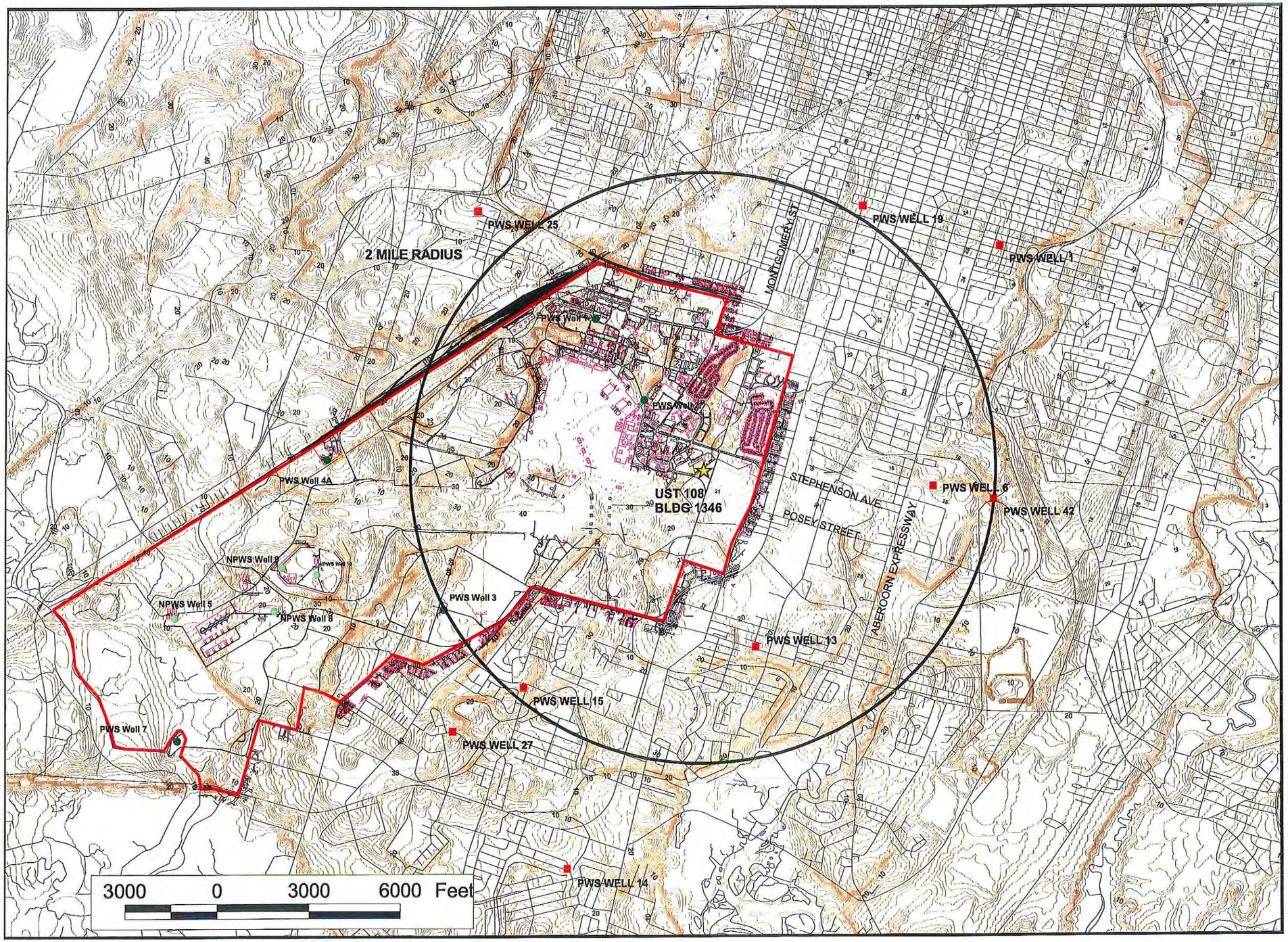


Figure 2. Site Plan for the UST 108, Building 1346 Site Investigation



Legend:

- Hunter Army Airfield Boundary
- Surface Water (streams/rivers/drains)
- Railroad
- Roads (primary)
- Buildings and Planimetric Features
- Ground Contour (1 FT Intervals)
- HAAF Non-Public Water Supply Well
- HAAF Public Water Supply Well
- City of Savannah Public Water Supply Well

NOTE:

Contours were created from Digital Elevation Models translated from http://mapping.usgs.gov/, which were obtained from the following U.S.G.S. 7.5 minuteTopographic Quad sheets: Borroughs, Isle of Hope, Savannah, and Garden City. Roads, surface water, and railroad were translated from http://www.gis.state.ga.us/ . Hunter Army Airfield BaseMap received as Microstation files from Port Stewart.

N

GA State Plane NAD83 (feet)

SAIC
Science Applications International Corporation

UST 108, BLDG 1346
FACILITY ID: 9-025104

REVISION	DRAWN BY:	CHKD BY:	DATE:
0	M.Norris	A. Bailey	10/15/98

FILE REFERENCES

051rds_polyline	burroughsctrf
051hyd_polyline	isleofhopectrf
051rr	savannahctrf
hunterarea	gardencityctrf
	trveh.dgn
	bggen.dgn

SHT 1 of 1 — DRAWING #

G:\HunterAFB\HunterBase.APR — ARCVIEW PROJECT NAME

Figure 3a. Topographic Quadrangle Map of Hunter Army Airfield and Surrounding Area

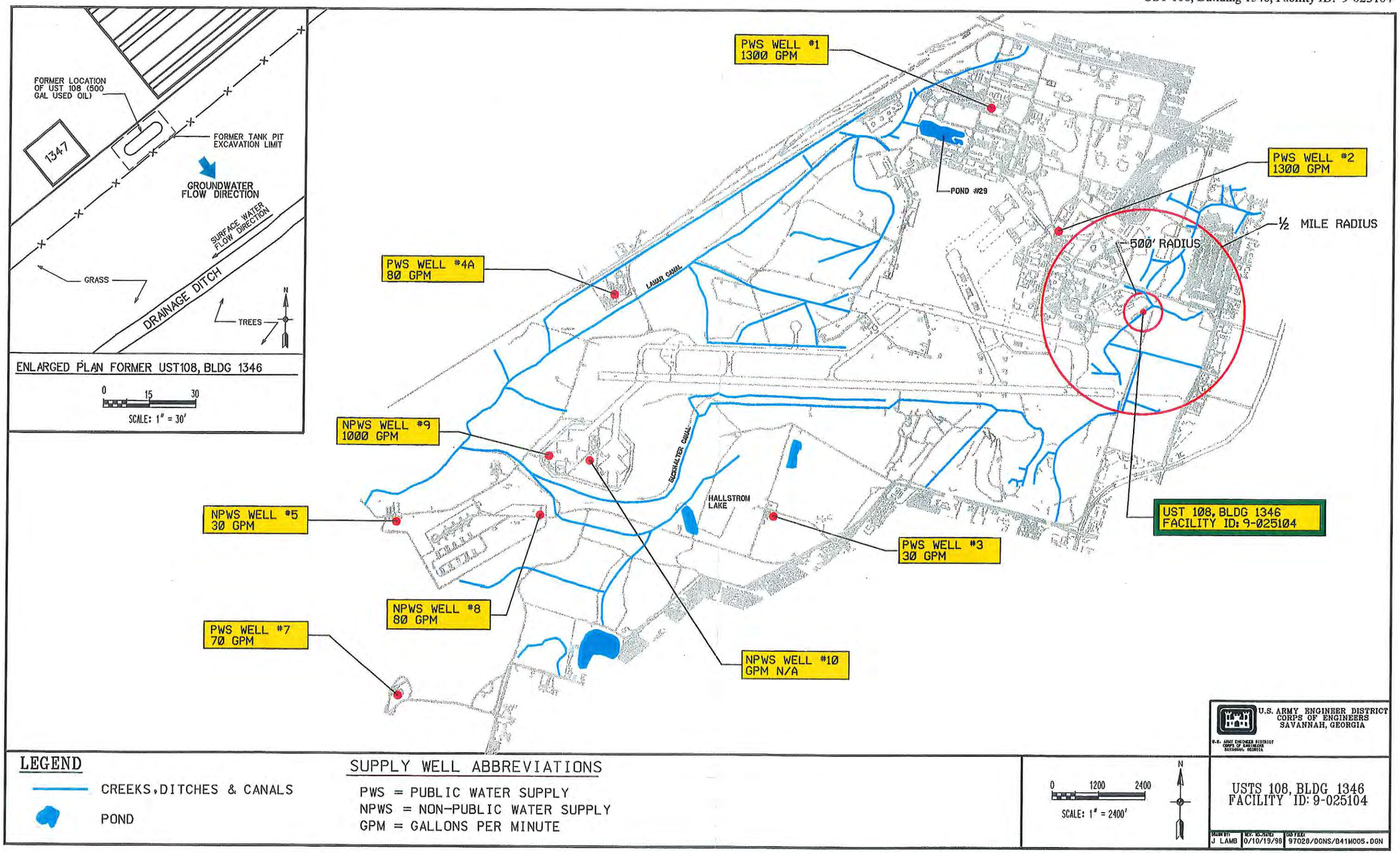


Figure 3b. Detailed Map Showing Public and Private Drinking Water Sources and Surface Water Bodies at Hunter Army Airfield

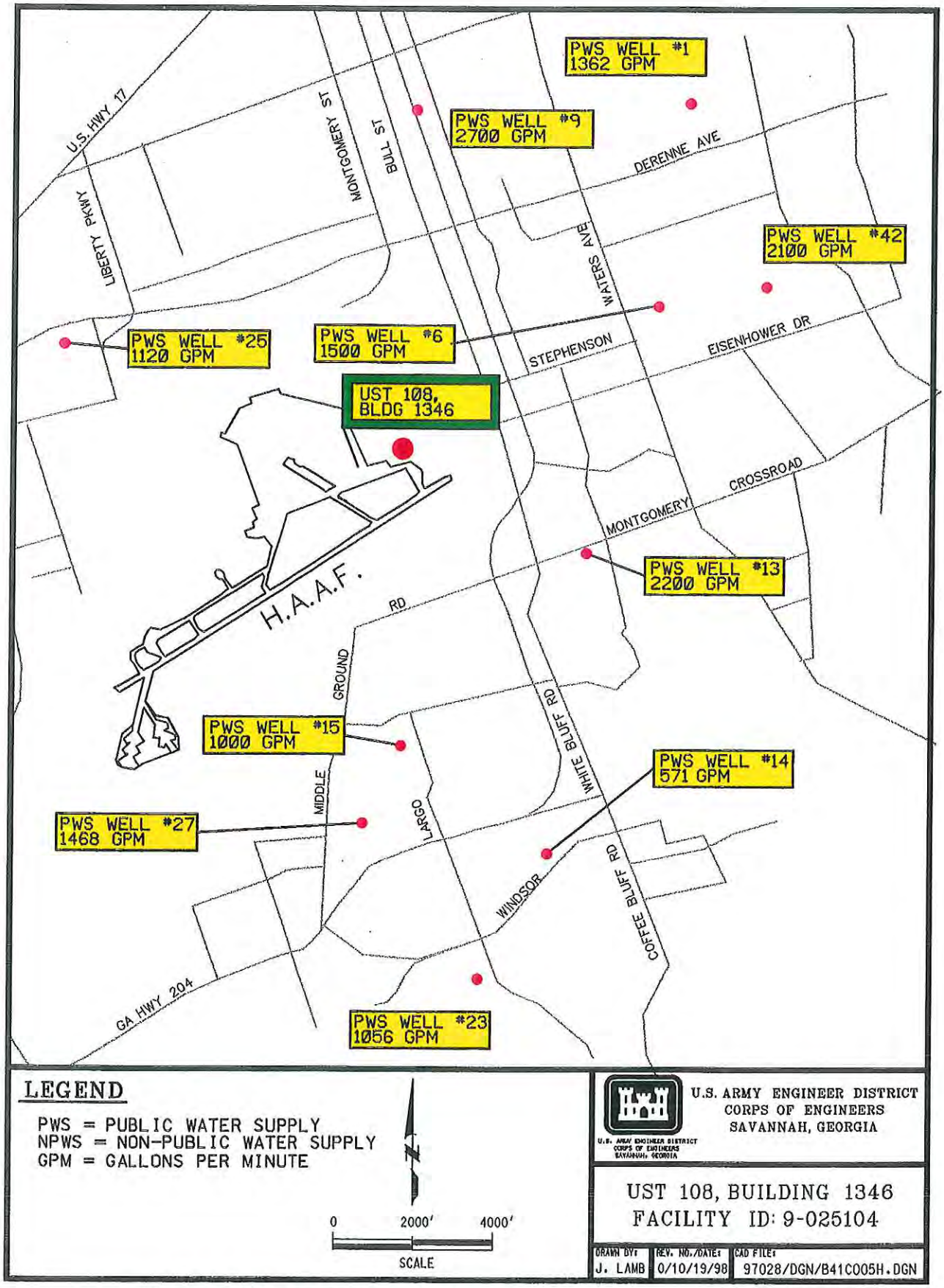


Figure 3c. Detailed Map Showing Public and Private Drinking Water Sources in Areas Adjacent to Hunter Army Airfield

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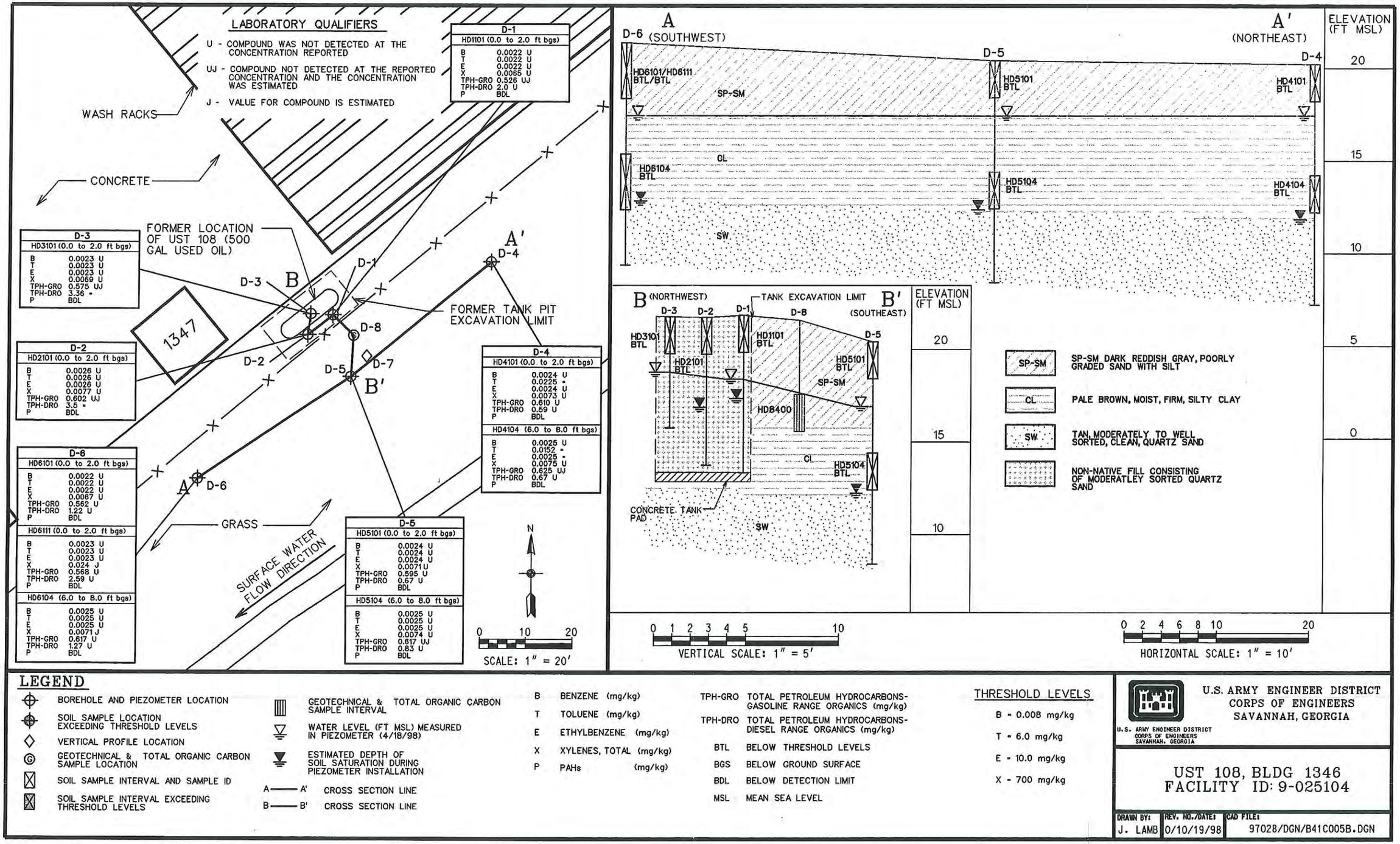

LEGEND

- BOREHOLE AND PIEZOMETER LOCATION
- SOIL SAMPLE LOCATION EXCEEDING THRESHOLD LEVELS
- VERTICAL PROFILE LOCATION
- GEOTECHNICAL & TOTAL ORGANIC CARBON SAMPLE LOCATION
- SOIL SAMPLE INTERVAL AND SAMPLE ID
- SOIL SAMPLE INTERVAL EXCEEDING THRESHOLD LEVELS
- GEOTECHNICAL & TOTAL ORGANIC CARBON SAMPLE INTERVAL
- WATER LEVEL (FT MSL) MEASURED IN PIEZOMETER (4/18/98)
- ESTIMATED DEPTH OF SOIL SATURATION DURING PIEZOMETER INSTALLATION
- A —— A' CROSS SECTION LINE
- B —— B' CROSS SECTION LINE

B BENZENE (mg/kg)
T TOLUENE (mg/kg)
E ETHYLBENZENE (mg/kg)
X XYLENES, TOTAL (mg/kg)
P PAHs (mg/kg)

TPH-GRO TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE ORGANICS (mg/kg)
TPH-DRO TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE ORGANICS (mg/kg)
BTL BELOW THRESHOLD LEVELS
BGS BELOW GROUND SURFACE
BDL BELOW DETECTION LIMIT
MSL MEAN SEA LEVEL

THRESHOLD LEVELS
B = 0.008 mg/kg
T = 6.0 mg/kg
E = 10.0 mg/kg
X = 700 mg/kg

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS SAVANNAH, GEORGIA

UST 108, BLDG 1346
FACILITY ID: 9-025104

DRAWN BY:	REV. NO./DATE:	CAD FILE:
J. LAMB	0/10/19/98	97028/DGN/B41C005B.DGN

Figure 4. Soil Quality Map of the UST 108, Building 1346 Site

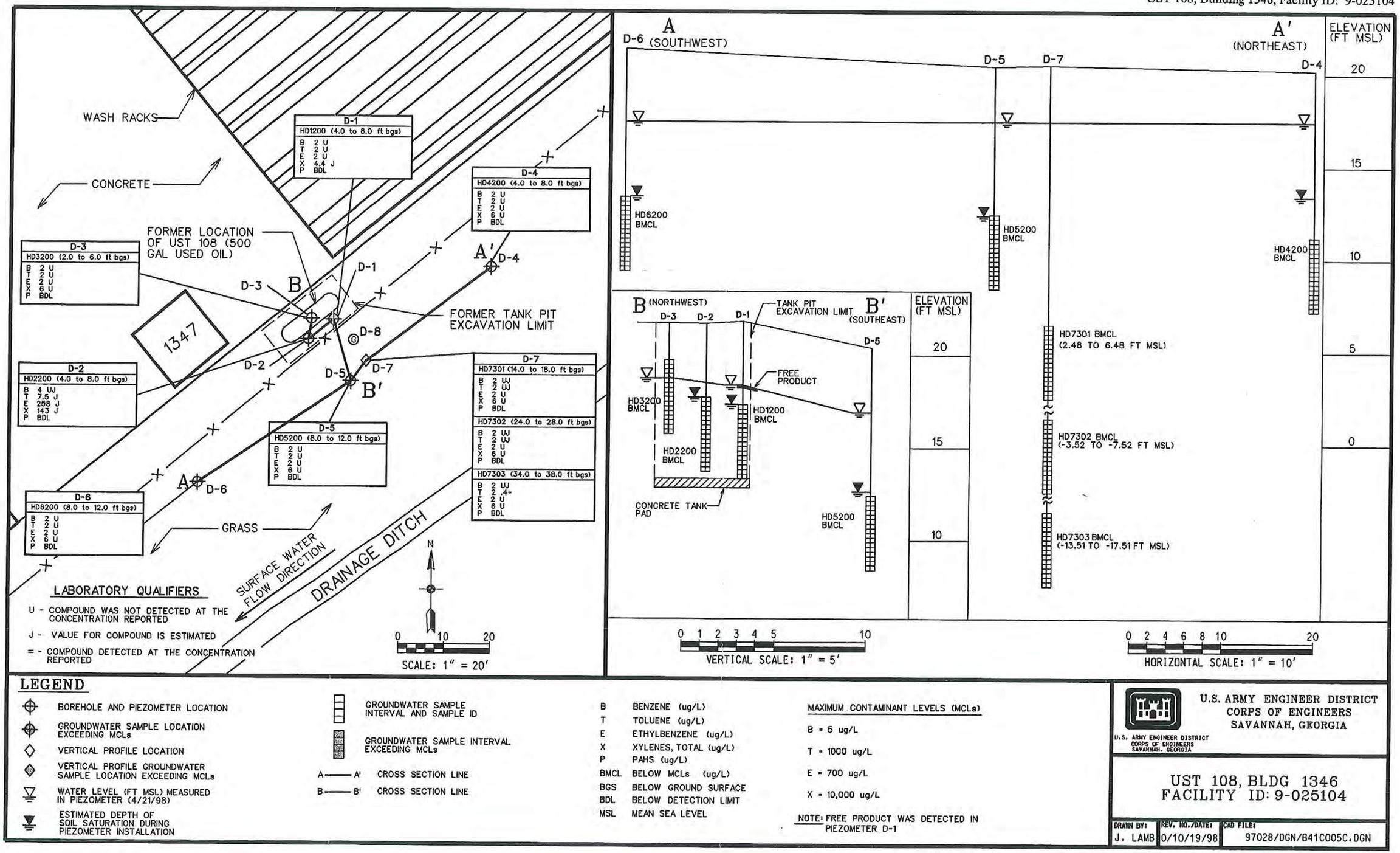

Figure 5. Groundwater Quality Map of the UST 108, Building 1346 Site

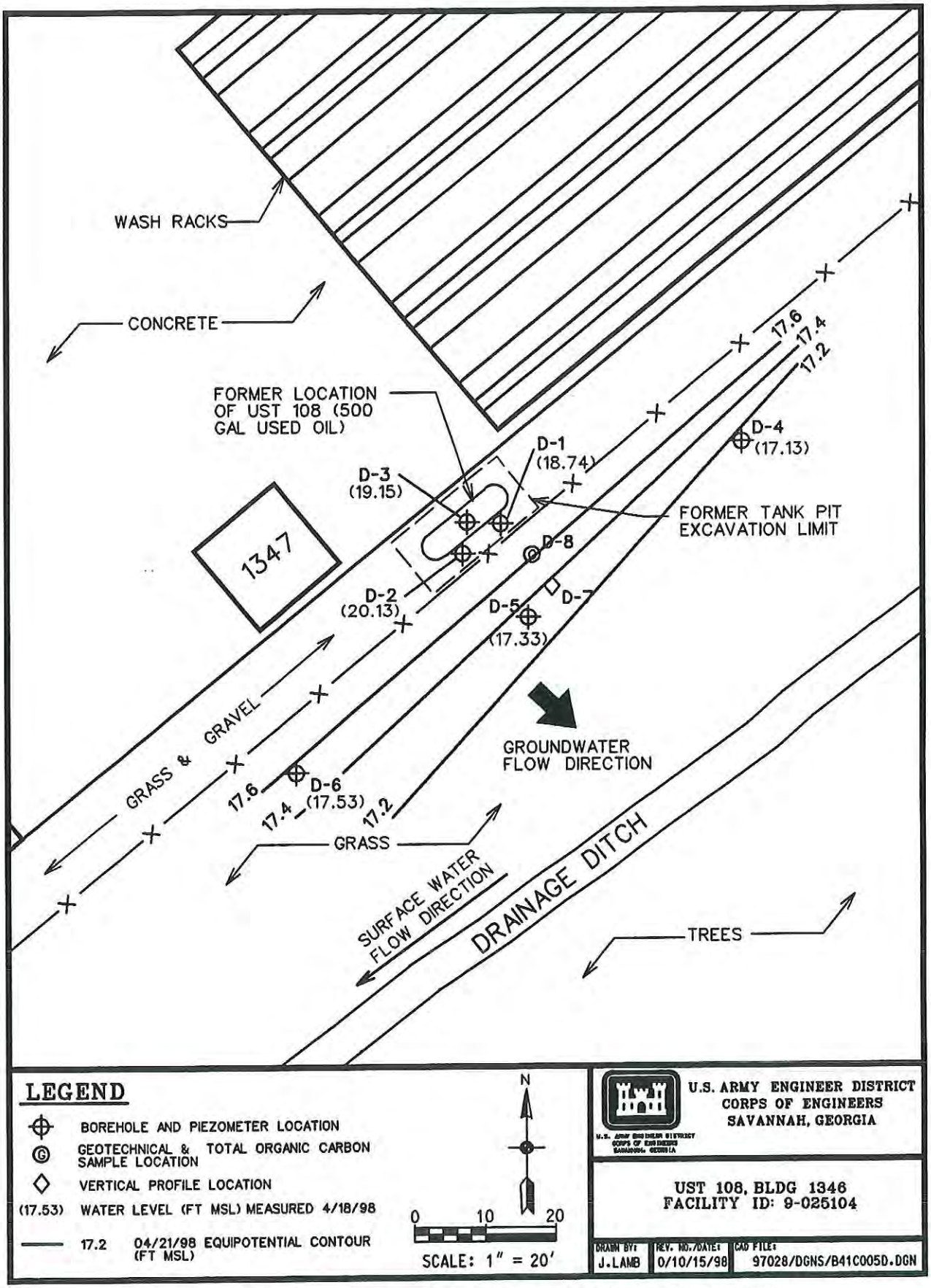

Figure 6. Potentiometric Surface Map of the UST 108, Building 1346 Site

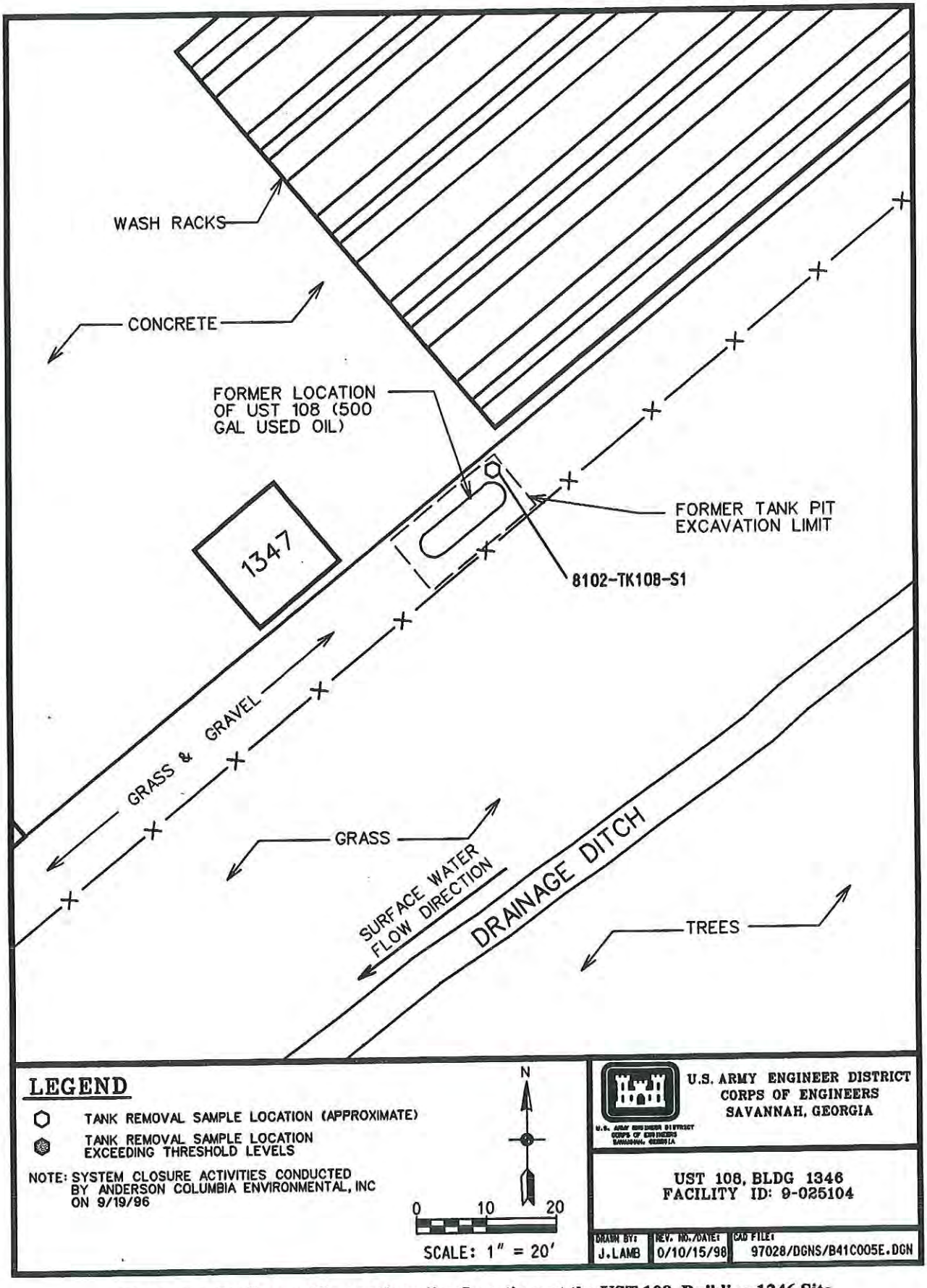

Figure 7. UST System Closure Sampling Locations at the UST 108, Building 1346 Site

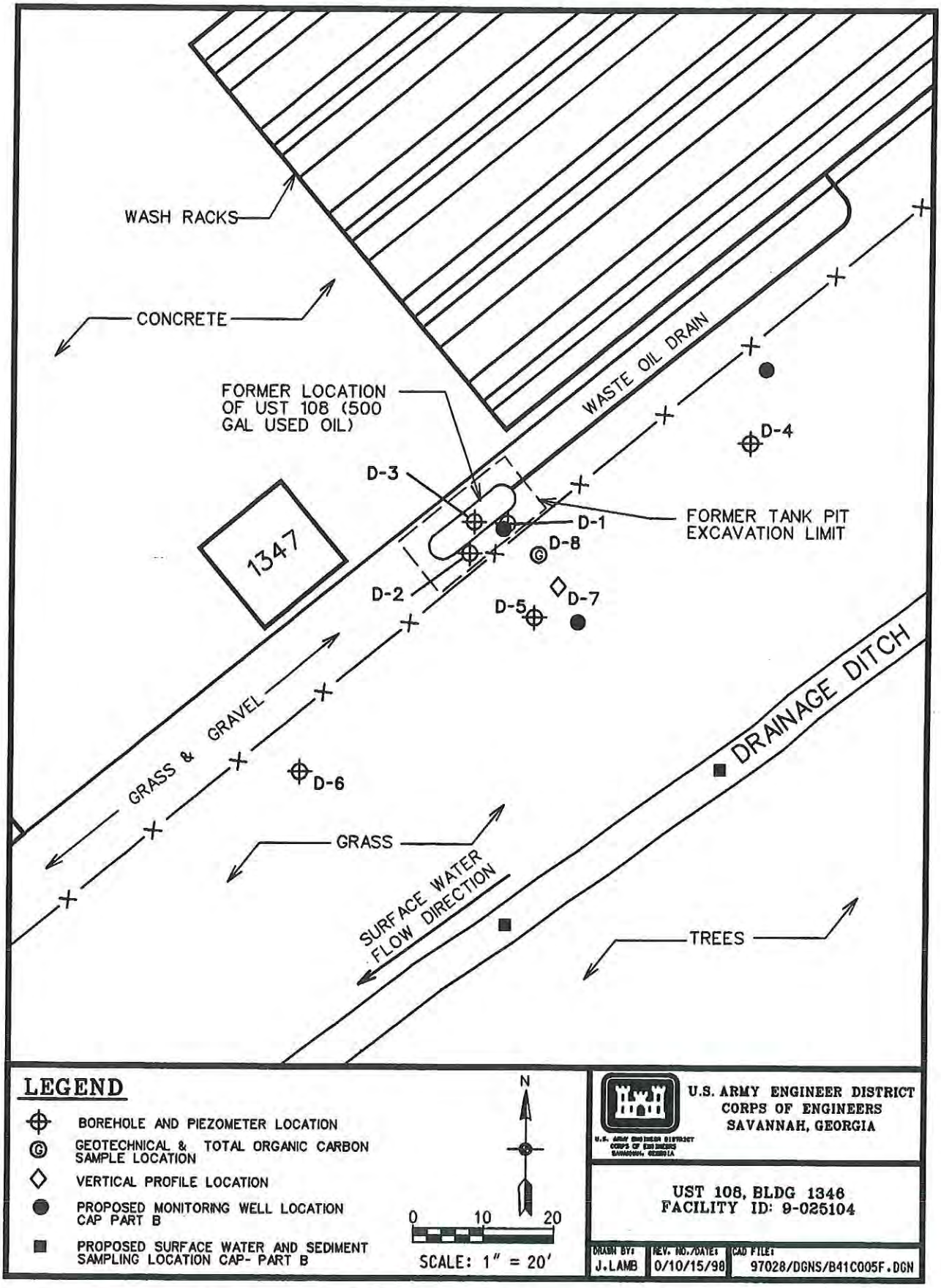

Figure 8. Proposed Additional Boring/Monitoring Well Locations

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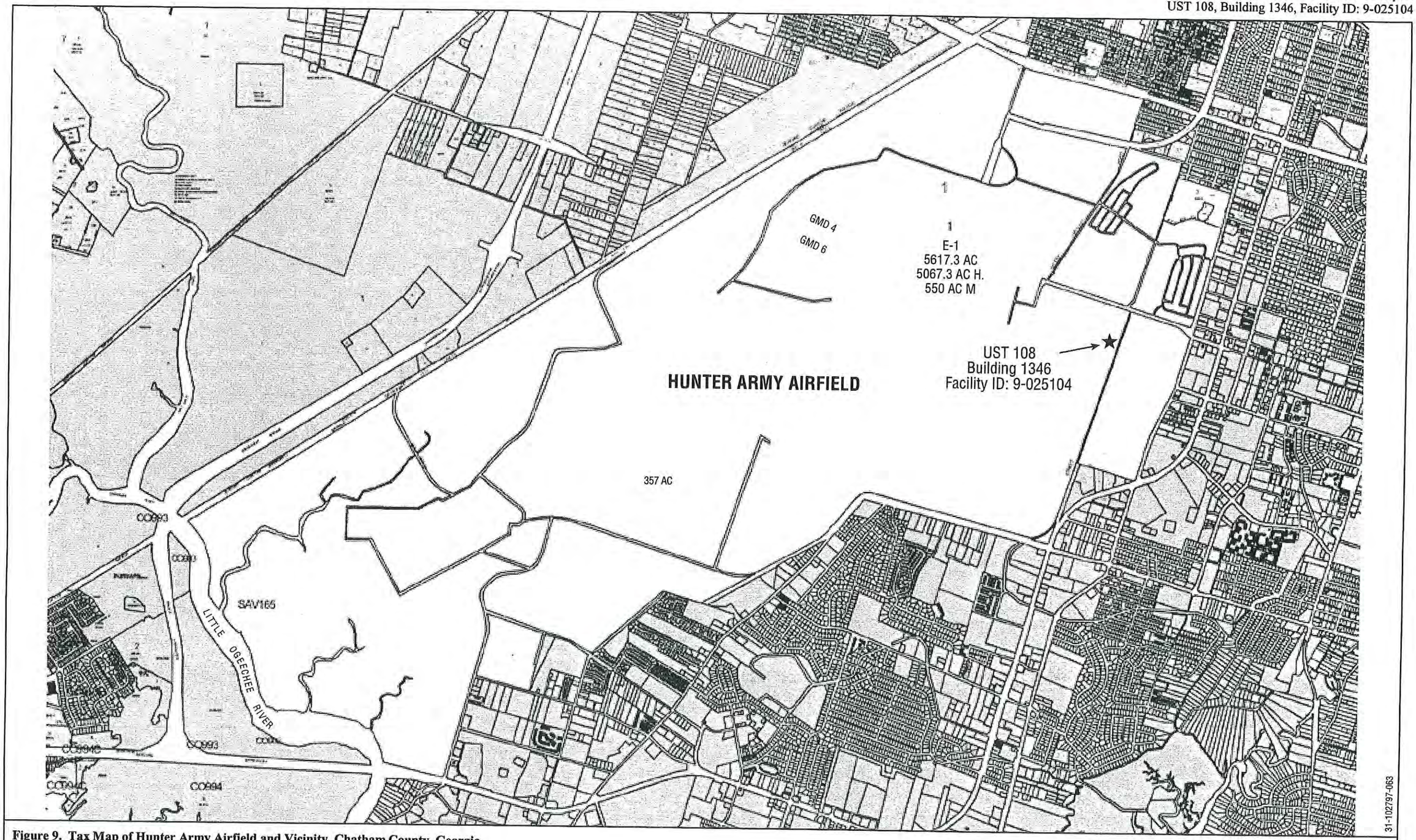

Figure 9. Tax Map of Hunter Army Airfield and Vicinity, Chatham County, Georgia

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APPENDIX II

REPORT TABLES

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UST 108, Building 1346
Hunter Army Airfield
Chatham County, Facility ID: 9-025104

TABLE 1: FREE PRODUCT REMOVAL

Monitoring Well Number: D-1[5]				
Date of Measurement	Groundwater Elev. (ft MSL)	Product Thickness[1] (ft)	Corrected Water Elev. (ft MSL)	Product Removed (gal)[4]
04/03/98	17.46	0.2	17.46	0.00
04/04/98	N/A[3]	N/A[3]	N/A[3]	0.02
04/05/98	N/A[3]	N/A[3]	N/A[3]	0.02
04/06/98	N/A[3]	N/A[3]	N/A[3]	0.02
04/07/98	N/A[3]	N/A[3]	N/A[3]	0.02
04/09/98	17.78	N/A[3]	17.78	0.02
04/10/98	N/A[3]	N/A[3]	N/A[3]	0.02
04/17/98	17.76	N/A[3]	17.76	0.02
04/20/98	N/A[3]	N/A[3]	N/A[3]	0.02
04/21/98	N/A[3]	N/A[3]	N/A[3]	0.02
04/23/98	N/A[3]	N/A[3]	N/A[3]	0.02
06/25/98	15.43	N/A[2]	15.43	0.02
07/21/98	N/A[3]	N/A[3]	N/A[3]	0.00
09/22/98	N/A[3]	N/A[3]	N/A[3]	0.00
11/18/98[6]	N/A[3]	N/A[3]	N/A[3]	0.00
11/30/98	16.33	N/A[2]	16.33	0.00
			TOTAL	0.22

NOTE: MSL - mean sea level.
[1]Free product thickness measurement explained in Section IIB on page 2.
[2]Free product thickness determination attempted with water-product interface meter; product was not detected.
[3]The passive removal system (i.e., absorbent sock) impeded the measurement of accurate groundwater elevation and free product thickness; therefore, the measurements were not obtained.
[4]Volume of product removal is an estimated value.
[5]Free product was only found in piezometer D-1.
[6]The absorbent sock was removed from piezometer D-1 to allow equilibration.

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TABLE 2a: SOIL ANALYTICAL RESULTS[3]
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX[2] (mg/kg)	TPH-DRO (mg/kg)	TPH-GRO (mg/kg)
D-1	HD1101	0.0 to 2.0	04/01/98	0.0022 U	0.0022 U	0.0022 U	0.0065 U	BDL	2 U	0.526 UJ
D-2	HD2101	0.0 to 2.0	04/01/98	0.0026 U	0.0026 U	0.0026 U	0.0077 U	BDL	3.5 =	0.602 UJ
D-3	HD3101	0.0 to 2.0	04/17/98	0.0023 U	0.0023 U	0.0023 U	0.0069 U	BDL	3.36 =	0.575 UJ
D-4	HD4101	0.0 to 2.0	04/17/98	0.0024 U	0.0225 =	0.0024 U	0.0073 U	0.0225	0.59 U	0.610 U
D-4	HD4104	6.0 to 8.0	04/17/98	0.0025 U	0.0152 =	0.0025 U	0.0075 U	0.0152	0.67 U	0.625 UJ
D-5	HD5101	0.0 to 2.0	04/17/98	0.0024 U	0.0024 U	0.0024 U	0.0071 U	BDL	0.67 U	0.595 U
D-5	HD5104	6.0 to 8.0	04/17/98	0.0025 U	0.0025 U	0.0025 U	0.0074 U	BDL	0.83 U	0.617 UJ
D-6	HD6101	0.0 to 2.0	04/20/98	0.0022 U	0.0022 U	0.0022 U	0.0067 U	BDL	1.22 U	0.562 U
D-6	HD6111[4]	0.0 to 2.0	04/20/98	0.0023 U	0.0023 U	0.0023 U	0.0024 J	0.0024	2.59 U	0.568 U
D-6	HD6104	6.0 to 8.0	04/20/98	0.0025 U	0.0025 U	0.0025 U	0.0071 J	0.0071	1.27 U	0.617 UJ
Applicable Standards[1]				0.008	6.000	10	700	NRC	NRC	NRC

NOTE:
[1]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column 2).
[2]The total value reported represents the sum of all detected compounds. A total is not reported if all the compounds are below the laboratory detection limits.
[3]**All field work and analytical sampling were performed prior to the release of the new GA DNR Corrective Action Plan (CAP)-Part A Guidance (i.e., May 1998); therefore, the new analytical methods specified were not used.**
[4]Duplicate sample for sample collected from location D-6 at a depth of 0.0 to 2.0 feet BGS.
BDL - Below detection limit
BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NRC - No regulatory criteria.
TPH-DRO - Total petroleum hydrocarbon–diesel-range organics.
TPH-GRO - Total petroleum hydrocarbon–gasoline-range organics.

Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.

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TABLE 2b: SOIL ANALYTICAL RESULTS[3]
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (mg/kg)					Total PAHs (mg/kg)
				BDL[2]	BDL[2]	BDL[2]	BDL[2]	BDL[2]	
D-1	HD1101	0.0 to 2.0	04/01/98						BDL[2]
D-2	HD2101	0.0 to 2.0	04/01/98						
D-3	HD3101	0.0 to 2.0	04/17/98						
D-4	HD4101	0.0 to 2.0	04/17/98						
D-4	HD4104	6.0 to 8.0	04/17/98						
D-5	HD5101	0.0 to 2.0	04/17/98						
D-5	HD5104	6.0 to 8.0	04/17/98						
D-6	HD6101	0.0 to 2.0	04/20/98						
D-6	HD6111[4]	0.0 to 2.0	04/20/98						
D-6	HD6104	6.0 to 8.0	04/20/98						
Applicable Standards[1]									NRC

NOTE:
[1]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column 2).
[2]BDL - Below detection limit; PAH compounds were not detected above the laboratory detection limit. Refer to Appendix V, Table V-A, for a complete list of PAH results.
[3]**All field work and analytical sampling were performed prior to the release of the new GA DNR Corrective Action Plan (CAP)-Part A Guidance (i.e., May 1998); therefore, the new analytical methods specified were not used.**
[4]Duplicate sample for sample collected from location D-6 at a depth of 0.0 to 2.0 feet BGS.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

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TABLE 3a: GROUNDWATER ANALYTICAL RESULTS[4]
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX[3] (µg/L)
D-1	HD1200	4.0 to 8.0	04/01/98	2 U	2 U	2 U	4.4 J	4.4
D-2	HD2200	4.0 to 8.0	04/01/98	4 UJ	7.5 J	258 J	143 J	408.5
D-3	HD3200	2.0 to 6.0	04/17/98	2 U	2 U	2 U	6 U	BDL[2]
D-4	HD4200	9.0 to 13.0	04/17/98	2 U	2 U	2 U	6 U	BDL
D-5	HD5200	8.0 to 12.0	04/17/98	2 U	2 U	2 U	6 U	BDL
D-6	HD6200	8.0 to 12.0	04/20/98	2 U	2 U	2 U	6 U	BDL
D-6	HD6210	8.0 to 12.0	04/20/98	2 U	2 U	2 U	6 U	BDL
D-7	HD7301	14.0 to 18.0	04/19/98	2 UJ	2 UJ	2 U	6 U	BDL
D-7	HD7302	24.0 to 28.0	04/19/98	2 UJ	2 UJ	2 U	6 U	BDL
D-7	HD7303	34.0 to 38.0	04/19/98	2 U	2.4 =	2 U	6 U	2.4
Applicable Standards[1]				5	1,000	700	10,000	NRC

NOTE: [1]U.S. Environmental Protection Agency maximum contaminant level.
[2]BDL - Below detection limit.
[3]The total value reported represents the sum of all detected compounds. A total is not reported if all the compounds are below the laboratory detection limits.
[4]All field work and analytical sampling were performed prior to the release of the new Georgia Department of Natural Resources (GA DNR) Corrective Action Plan (CAP)-Part A Guidance (i.e., May 1998); therefore, the new analytical methods specified were not used.
BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NRC - No regulatory criteria.

Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.

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TABLE 3b: GROUNDWATER ANALYTICAL RESULTS[4]
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (µg/L)				Total PAHs[3] (µg/L)
				BDL[2]	BDL[2]	BDL[2]	BDL[2]	
D-1	HD1200	4.0 to 8.0	04/01/98					
D-2	HD2200	4.0 to 8.0	04/01/98					
D-3	HD3200	2.0 to 6.0	04/17/98					
D-4	HD4200	9.0 to 13.0	04/17/98					
D-5	HD5200	8.0 to 12.0	04/17/98					
D-6	HD6200	8.0 to 12.0	04/20/98					
D-6	HD6210[5]	8.0 to 12.0	04/20/98					
D-7	HD7301	14.0 to 18.0	04/19/98					
D-7	HD7302	24.0 to 28.0	04/19/98					
D-7	HD7303	34.0 to 38.0	04/19/98					
Applicable Standards[1]								NRC

NOTE: [1]U.S. Environmental Protection Agency maximum contaminant level.
[2]BDL - Below detection limit; PAH compounds were not detected above the laboratory detection limit. Refer to Appendix VIII, Table VIII-A, for complete list of PAH results.
[3]The total value reported represents the sum of all detected compounds. A total is not reported if all the compounds are below the laboratory detection limits.
[4]**All field work and analytical sampling were performed prior to the release of the new Georgia Department of Natural Resources (GA DNR) Corrective Action Plan (CAP)-Part A Guidance (i.e., May 1998); therefore, the new analytical methods specified were not used.**
[5]Duplicate sample for sample collected from location D-6 at a depth of 8.0 to 12.0 feet BGS.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

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TABLE 4: GROUNDWATER ELEVATIONS

Well Number	Date Measured	Ground Surface Elev. (ft MSL)	Top of Casing Elev. (ft MSL)	Depth of Screened Interval (ft BGS)	Depth of Free Product (ft BTOC)	Water Depth (ft BTOC)	Product Thickness (ft)	Specific Gravity Adjustment	Corrected Groundwater Elev. (ft MSL)
D-1	04/21/98	21.84	22.79	3.0 to 8.0	4.25	4.05	0.2	N/A	18.74
D-2	04/21/98	21.73	22.79	3.0 to 8.0	N/A	2.66	N/A	N/A	20.13
D-3	04/21/98	21.76	23.85	1.0 to 6.0	N/A	4.70	N/A	N/A	19.15
D-4	04/21/98	20.21	21.13	8.0 to 13.0	N/A	4.00	N/A	N/A	17.13
D-5	04/21/98	20.41	23.43	7.0 to 12.0	N/A	6.10	N/A	N/A	17.33
D-6	04/21/98	21.37	21.98	7.0 to 12.0	N/A	4.45	N/A	N/A	17.53

NOTE: MSL - Mean sea level.
BGS - Below ground surface.
BTOC - Below top of casing.
N/A - Not applicable.

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TABLE 5a: UST SYSTEM CLOSURE[1] - SOIL ANALYTICAL RESULTS
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Depth (ft BGS)	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH (mg/kg)
8102-TK108-S1	10	9/19/96	BDL	BDL	BDL	BDL	BDL	889
Applicable Standards[2]			0.008	6	10	700	NRC	NRC

NOTE: [1]Underground storage tank system closure performed by Anderson Columbia Environmental, Inc. (1996).
[2]Georgia Department of Natural Resources Applicable Soil Threshold Levels (i.e., Table A, column 2).
BDL - Below detection limit.
BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NRC - No regulatory criteria.
TPH - Total petroleum hydrocarbon.

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TABLE 5b: UST SYSTEM CLOSURE[1] - SOIL ANALYTICAL RESULTS
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (mg/kg)				Total PAHs (mg/kg)
			2-Methyl-Naphthalene	BDL	BDL	BDL	
8102-TK-108-S1	10	9/19/96	.440				.440
Applicable Standards[2]			NRC				NRC

NOTE: [1]Underground storage tank system closure performed by Anderson Columbia Environmental, Inc. (1996).
[2]Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, column 2).
BDL - Below detection limit.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

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TABLE 6a: UST SYSTEM CLOSURE[1] - GROUNDWATER ANALYTICAL RESULTS
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Depth (ft BGS)	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
N/A							
Applicable Standards[2]			5	1,000	700	10,000	NRC

TABLE 6b: UST SYSTEM CLOSURE[1] - GROUNDWATER ANALYTICAL RESULTS
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (µg/L)			Total PAHs (µg/L)
N/A						
Applicable Standards[2]						NRC

NOTE: [1]UST system closure performed by Anderson Columbia Environmental, Inc. (1996).
[2]U.S. Environmental Protection Agency maximum contaminant levels.
BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
N/A - Not applicable. Groundwater samples not collected.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

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APPENDIX III

WATER RESOURCES SURVEY DOCUMENTATION

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WATER RESOURCES SURVEY DOCUMENTATION

1.0 LOCAL WATER RESOURCES

As required by the Georgia Department of Natural Resources (GA DNR) Underground Storage Tank (UST) Corrective Action Plan (CAP)-Part A Guidance (GA DNR 1998b), a water resource survey documenting information for public and non-public water supply wells, surface water bodies, underground utilities, and potential receptors was conducted for all the Hunter Army Airfield (HAAF) UST investigation sites in April, May, and June 1998. The information presented in this section provides the supporting documentation for Section II.D.3 of the CAP-Part A form.

1.1 WATER SUPPLY WELL SURVEY

The water supply well survey was conducted using the following GA DNR guidelines/requirements:

- HAAF is located in an area of average or higher groundwater pollution susceptibility (GA DNR 1976).
- Locate all public supply wells, as defined by the GA DNR, that exist within 2 miles of the investigation sites.
- Locate all non-public supply wells that exist within 0.5 miles of the investigation sites.
- Locate all supply wells nearest the investigation sites.
- Locate all wells downgradient of the investigation sites.

The required survey was accomplished by obtaining information from the Fort Stewart Directorate of Public Works (FS DPW) and the City of Savannah Bureau of Water Operations, performing a field survey, and conducting a U.S. Geological Survey (USGS) database search. A summary of the information obtained during the survey is provided in the following sections.

1.1.1 Fort Stewart Directorate of Public Works Survey Summary

According to the FS DPW, nine water supply wells are located within the confines of the HAAF area (Figures 3a and 3b, Appendix I). These wells have the potential to provide up to 3,890 gallons per minute (gpm) of water to occupants of the HAAF installation. The FS DPW was unable to provide documentation listing the companies responsible for well installation, and drillers' logs showing as-built information and subsurface geologic data. Information concerning such documentation was requested from several water well drilling companies in the Chatham County area; however, data were procured with very limited success. The FS DPW provided well locations, pump rates, treatment methods, casing depths, and total depths for eight of the nine wells located at HAAF (Table III-A). However, documentation of subsurface geology based on HAAF drill logs remains extremely limited. Therefore, other references providing deep-well

information were used to document the subsurface geology and aquifer characteristics beneath the HAAF area. Refer to Appendix X, Section 1.0, for further geologic discussion.

Wells 1 and 2, both public water supply wells located in the cantonment area of HAAF, constitute the main water supply system at the HAAF installation. Well 1, located at Building 711 on the corner of Moore Road and Douglas Street, is a 12-inch-diameter well with a 100-hp turbine pump serving a 100,000-gallon elevated storage tank (Tank 1) through 10-inch lines. Water from Well 1 is injected with hydrofluosilic acid and chlorine gas solution at the well house. Well 2, located at Building 1205 on the corner of Neal Street and Strachan Road, is a 12-inch-diameter well with a 100-hp turbine pump serving a 200,000-gallon elevated tank (Tank 2) through 10-inch lines. Water from Well 2 is also injected with hydrofluosilic acid and chlorine gas solution at the well house. Wells 1 and 2 provide water to a 500,000-gallon elevated storage tank (Tank 3) located on Middleground Road behind noncommissioned officer (NCO) family housing. This tank provides potable water to 694 service connections, which are used by an average of at least 5,000 individuals year-round.

Wells 3, 4A, and 7 are public supply wells located outside the cantonment area of HAAF. Well 3, located at Building 8455, is a 4.0-inch-diameter well with a 1.0-hp electric submersible pump serving a 1,000-gallon hydropneumatic storage tank through 1.5-inch galvanized steel lines. Water from Well 3 is treated with calcium hypochlorite solution and is consumed by approximately 25 people during daytime hours, year-round. Well 4A, located at Building 8581 at the 117th Air National Guard Facility, is a 4.0-inch-diameter well. Pumpage is accomplished with a 0.75-hp turbine pump with 80 gpm capacity. Well 4A provides water for approximately 50 people per day year-round. Well 7 is located at Building 8703 on the Forest River, west of Rio Road. Well 7 is a 4.0-inch well with a 3.0-hp submersible pump serving a 5,000-gallon hydropneumatic tank through 2.0-inch galvanized steel lines. Well 7 serves approximately 500 people on a part-time basis. Sanitary protection for Wells 3, 4A, and 7 is provided by a pump motor block, concrete slab, sealed well head, and screened casing vent.

Based on the GA DNR criteria of serving potable water to less than 25 occupants per day and having less than 15 service connections, wells 5, 8, and 9 are classified as non-public supply wells (Figure 3b, Appendix I). Pump rates, casing depths, bore depths, treatment methods, and storage tank information are provided in Table III-A.

Well 10 is a non-potable water source (Figure 3b, Appendix I). Water from Well 10 is used for the cleaning of military equipment at a wash-rack facility. Additional information including capacity, borehole depth, and casing depth is not available.

1.1.2 City of Savannah Bureau of Water Operations Survey Summary

The locations of supply wells found outside the boundary of HAAF that are within 2 miles of one or more of the CAP-Part A investigation sites are shown on Figure 3b, Appendix I. These wells include 25, 15, 27, 14, 23, 6, and 9. Data concerning casing depths, borehole depths, casing sizes, and capacities are listed in Table III-B. The City of Savannah Bureau of Water Operations was unable to provide drill logs or as-built well information.

1.1.3 U.S. Geological Survey Summary

Chatham County encompasses three watersheds: Lower Savannah, Lower Ogeechee, and Ogeechee Coastal (EPA 1998). The HAAF installation is located within the Ogeechee Coastal watershed which covers 1,477 square miles; includes 18 rivers and streams, including the Little Ogeechee River which borders the south western portion of HAAF; and contains land usage areas

classified as 2 percent urban, 67 percent forest, and 24 percent agricultural. Water use survey data for the watershed estimate that the area has a total population of 200,000 with domestic, industrial, and commercial water supplies mainly derived from groundwater sources (USGS 1990). Domestic water supply data show that a population of 144,000 receives public-supplied water from groundwater sources, 48,000 receive water from self-supplied groundwater sources, and 8,000 from public-supplied surface water sources. The water use survey also reports that two industrial facilities within the watershed are self-supplied with water obtained from groundwater sources. The survey also notes that a total of five wastewater facilities are located in the area with three reported as public wastewater treatment facilities.

1.2 SURFACE WATER BODIES

Surface water(s) in the State of Georgia, as defined by *Rules and Regulations for Water Quality Control, Chapter 391-3-6* (GA DNR 1998a), shall mean any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs producing 100,000 gallons per day, and all other bodies of surface water, natural or artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation The surface water body survey was conducted using the following GA DNR guidelines/requirements:

- surface water bodies that exist within 1 mile of the investigation sites,
- all surface water bodies nearest the investigation sites if these bodies lie outside the 1-mile radius of concern,
- all surface water bodies downgradient of the investigation sites, and
- the storm and sanitary sewers adjacent to investigation sites.

The locations of surface water bodies at HAAF were obtained from USGS aerial photographs, USGS topographic maps, and from maps provided by the FS DPW. Storm and sanitary sewer location maps, storm sewer invert elevations, and storm sewer and culvert construction details were provided by the FS DPW and the City of Savannah Bureau of Water and Sewer Planning (1998).

Surface water bodies at HAAF include Hallstrom Lake, Lamar Canal, Buckhalter Canal, Springfield Canal, Pond 29 located northwest of Buildings 336 and 232, and an unnamed pond located along the southeast boundary of the HAAF installation (Figure 3b, Appendix I). Several unnamed drainage canals exist throughout HAAF. Most of these canals drain southwest into the Little Ogeechee River, which is part of the Lower Ogeechee watershed. The remaining drainage canals located on the east side of the HAAF installation flow east and eventually drain into the Vernon River, which is located southeast of the HAAF installation.

Surface water bodies at HAAF and adjacent areas are not used as public water supplies. The ponds and lakes are perennial, whereas most of the drainage canals and ditches are intermittent. Most of the drainage canals are at least partially enclosed in culverts.

1.3 POTENTIAL RECEPTOR SURVEY SUMMARY OF THE UST 108, BUILDING 1346 SITE

A field potential receptor survey was conducted for the UST 108, Building 1346 site on April 30, 1998. The site and adjacent areas were surveyed for locations of surface water bodies, utility lines, and basements. Basements do not exist in the buildings adjacent to the site. Additional information, provided by the FS DPW, was used to determine the location of the nearest public and non-public water supply wells and downgradient surface water bodies not located during the field survey.

1.3.1 Water Supply Wells Near the UST 108, Building 1346 Site

The UST 108, Building 1346 site is located approximately 3,000 feet southeast (cross-gradient) of HAAF Well 2, which is located at Building 1205 on Strachan Drive, HAAF (Figure 3a, Appendix I). Therefore, the UST 108, Building 1346 site is classified as being greater than 500 feet to a withdrawal point. Well 2 is part of the main public water supply system at HAAF. This system supplies water to 7,500 persons through 525 service connections. Based on the estimated nature and extent of petroleum-related groundwater contamination at the site, there is no indication that Well 2 has been impacted (Figure 3b, Appendix I). Therefore, collection and analysis of groundwater samples from Well 2 is not recommended.

1.3.2 Surface Water Bodies Near the UST 108, Building 1346 Site

A southwest-flowing, unnamed drainage ditch is located approximately 20 feet southeast (downgradient) of the UST 108, Building 1346 site. Water that drains into this ditch ultimately flows into the Vernon River, located southeast of HAAF. To assess the potential impact of petroleum contaminants to the drainage ditch, two surface water and two sediment samples will be collected from the unnamed ditch.

TABLES

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CAP-Part A UST Investigation Sites
Hunter Army Airfield, Chatham County

TABLE III-A. WATER SUPPLY WELL INFORMATION PROVIDED BY THE FORT STEWART/HAAF DPW

Building	Well ID	Year Drilled	Bore Depth	Casing Depth	Pump Rate (gpm)	Number of Service Connections	Population	Public or Non-Public Supply
711	1	1941	550	250	1,300	525	7,500	Public
1205	2	1941	600	250	1,300	525	7,500	Public
8455	3	1951	360	40	30	2	25	Public
8581	4A	Unk	300	92	80	10	50	Public
8641	5	1955	380	85	30	Unk	Unk	Non-public
8703	7	1980	450	330	70	8	500	Public
8632	8	1956	370	255	80	5	Unk	Non-public
8654	9	Unk	600	255	1,000	Unk	Unk	Non-public
8464	10	Unk	Unk	Unk	Unk	N/A	N/A	Non-public

NOTE: DPW - Directorate of Public Works.
HAAF - Hunter Army Airfield.
N/A - Not applicable.
gpm - Gallons per minute.
Unk - Unknown.

CAP-Part A UST Investigation Sites
Hunter Army Airfield, Chatham County

TABLE III-B. WATER SUPPLY WELL INFORMATION PROVIDED BY THE CITY OF SAVANNAH BUREAU OF WATER OPERATIONS

Well ID	Year Drilled	Bore Depth (feet)	Casing Depth (feet	Pump Rate (gpm)	Number of Service Connections	Population[1]	Public or Non-Public Supply[1]
1	Unk	1,006	300	1,362	Unk	Unk	Public
6	Unk	750	240	1,500	Unk	Unk	Public
9	Unk	710	267	2,700	Unk	Unk	Public
13	Unk	1,000	270	2,200	Unk	Unk	Public
14	Unk	800	338	571	Unk	Unk	Public
15	Unk	414	252	1,000	Unk	Unk	Public
23	Unk	639	320	1,056	Unk	Unk	Public
25	Unk	540	287	1,120	Unk	Unk	Public
27	Unk	550	321	1,468	Unk	Unk	Public
42	Unk	550	260	2,100	Unk	Unk	Public

NOTE: gpm - Gallons per minute.
Unk - Unknown.
[1]All wells are part of the same public water supply system serving the population of the City of Savannah.

APPENDIX IV

SOIL BORING LOGS

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HTRW DRILLING LOG

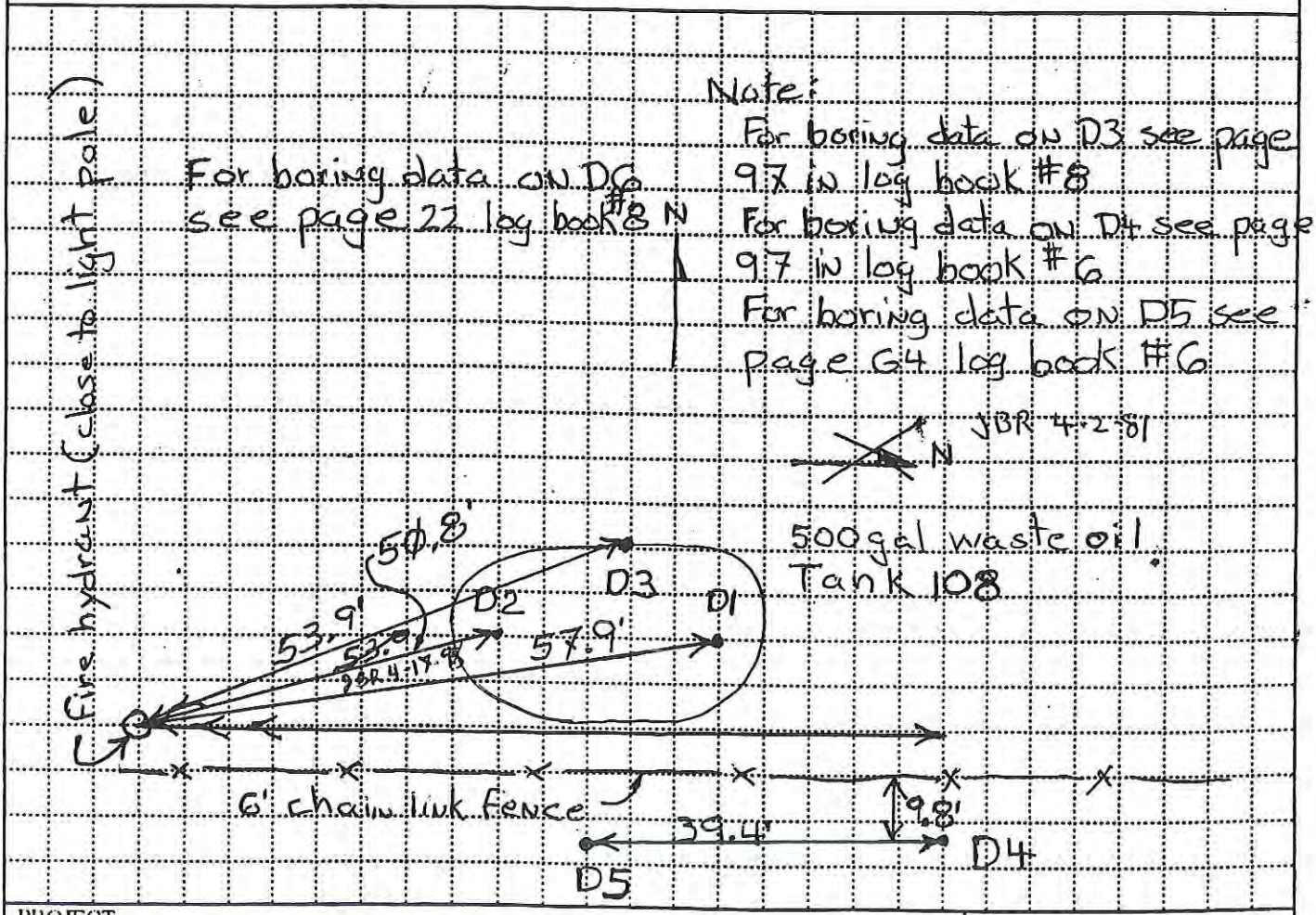
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: RE Wright (SAIC)	HOLE NUMBER: D1
3. PROJECT: HAAF CAP Part A, UST Sites	4. LOCATION: Hunter AAF Bldg 1346 Tank 108	SHEET 1 OF 2
5. NAME OF DRILLER: John Hasselhoff	6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe, Salina, KA	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Direct Push - Geoprobe microcore: 2" dia acitate liner 4' shoe to drive cap 4.6' push rods 4' & 3', large bore rods 3' dia 1.5" sampling pt. 1½" x 1½" dia, Screen length 3.5' screen dia. 1"	8. HOLE LOCATION: D1	
	9. SURFACE ELEVATION: TBD -	
	10. DATE STARTED: 4-1-98	11. DATE COMPLETED: 4-2-98 (completed drilling)
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 4.0' BLS	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: SEE WATER LEVEL LOG	
14. TOTAL DEPTH OF HOLE: 8.5' BLS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): SEE WATER LEVEL LOG	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	~~BTEX~~ VOC	~~PAH~~ METALS	~~DRO~~ OTHER (SPECIFY)	~~GRO~~ OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
soil / groundwater	1/1	PAH - 1/1	DRO - 1/0	GRO 1/0	NA	78

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
piezometer	✓	NA	NA	John B Reece

LOCATION SKETCH/COMMENTS — SCALE:



PROJECT: HAAF CAP Part A, UST Sites — HOLE NO.: D1

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

UNIT (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	(F)	
	0	Ø-2' GBR 4-1-98 UNconsol. mod. sorted sand S (sand) moist very soft GBR 4-1-98 quartz ~~structureless~~ 7.5YR 6/3 stratified (light brown) med grained sand part. shape mod angular	HEADSPACE 544 ppm 0-2'		VOA - 0-2 - 1330 Ø to 2' HD11Ø1	drilled Ø to 4' recovery 2.Ø' start 13:25 end 13:30
	2		NOT ENOUGH RECOVERY FOR 2-4 Headspace			moist disregard drilled rec. start end 4/1/98
	4.Ø	Wt				
		same as above				start: 1335 end 1340 drilled - 4-8' rec. - 4.Ø'
	5	Interval 5.Ø-9.Ø water sample collected			HD12ØØ	
		light brn dark grey para. same as above but clayey ~~sand~~ sand GBR 4-1-98				Drilled ~~8-12'~~ 1.Ø ~~rec. 4.Ø' 1.Ø'~~ moist 4/1/98 start 1345 end 1354
	10	TD = 9.Ø				

PROJECT: HAAF - CAP PART A UST Investigations. BOREHOLE NO: D-1 Bldg 1346

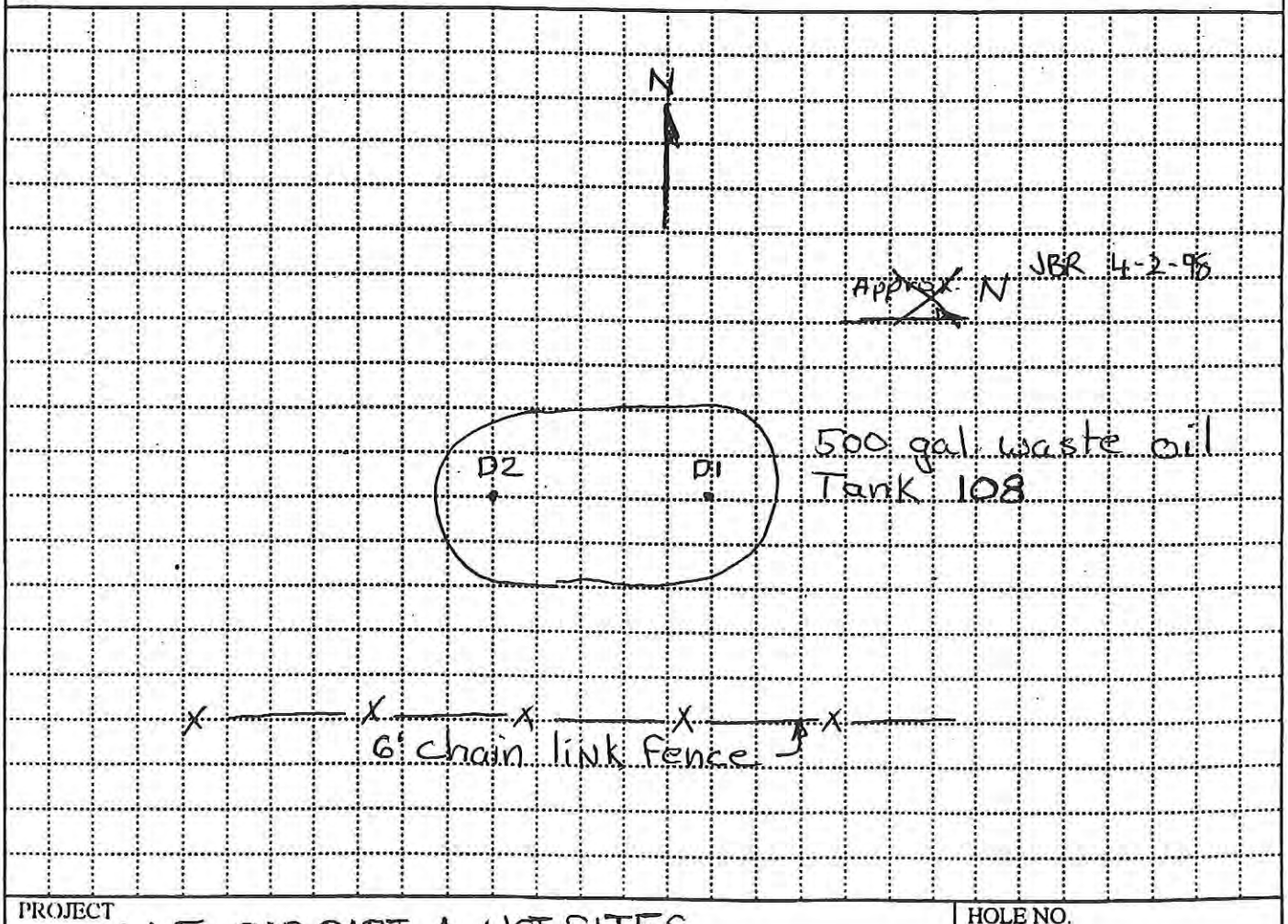
HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: RE Wright (SAIC)	DISTRICT: USACE Savannah; HOLE NUMBER: D2; SHEET 1 OF 2
3. PROJECT: HAAF CAP Part A, UST Sites	4. LOCATION: Hunter AAB Bldg 1346 Tank 108	
5. NAME OF DRILLER: John Hosselhoff	6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe, Salina, KA	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Direct Push-Geoprobe acitate liner 4', shoe to drive cap 4.6' microcore 2" dia push rods 3' +4', large bore rods 3' dia, 1.5', sampling pt 1½" x 1½" dia, screen length 3.55', screen dia. 1"	8. HOLE LOCATION: D2	
	9. SURFACE ELEVATION: TBD	
	10. DATE STARTED: 4-1-98	11. DATE COMPLETED: 4-2-98 (completed drilling)
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 4.0 BLS	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: See water level log	
14. TOTAL DEPTH OF HOLE: 9.0' BLS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): See water level log	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	BTEX VOC	PAH METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
soil / groundwater	1 / 1	1 / 1	1 / 0	1 / 0	N/A	25
22. DISPOSITION OF HOLE	**BACKFILLED**	**MONITORING WELL**	**OTHER (SPECIFY)**	**23. SIGNATURE OF INSPECTOR**		
piezometer	✓	N/A	N/A	John B Reeves		

LOCATION SKETCH/COMMENTS — SCALE: NOT TO SCALE



PROJECT	HOLE NO.
HAAF CAP PART A UST SITES	D2

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

(A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	(F)	
	0	Ø - 4' unconsol mod sorted sand S (sand) moist quartz very soft, stratified 7.5YR 6/3 (light brown) med-gr. sand partical shape mod. angular	Headsp. - off scale >2000 ppm			start 14:20 end 14:25 drilled 0-4' recov 1.0'
	2		Due to low recovery, second headspace was not taken.		HD2101	(soil sample) recov to wet sample at end of tube
	4	wt				water sample taken 5' below ~~ground~~ water table
		water sample taken from 5.Ø to 9.Ø ftBGS			HD22Ø4	(GW sample)
	8	~~water 2"~~ TD				
	9	TD 9.Ø'				

PROJECT: HAAF - CAP A UST Investigations | BOR. NO: D-2

HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: RE Wright (SAIC)	DISTRICT: USACE Savannah; HOLE NUMBER: D3; SHEET 1 OF 1
3. PROJECT: Hunter AAF CAP Part A UST Sites	4. LOCATION: Bldg 1346 Tank 108	
5. NAME OF DRILLER: Andy Knickerbocker	6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe Salina, KA	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" dia macrocore; 4' Acetate liner shoe to drive cap = 4/6"; Push rods = 3' & 4' Large bore rods 3'X1.5"; Screen 3.5'X1.0"	8. HOLE LOCATION: D-3	
	9. SURFACE ELEVATION: TBD	
	10. DATE STARTED: 4/17/98	11. DATE COMPLETED: 4/17/98
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 1.5 Ft	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: See water level log	
14. TOTAL DEPTH OF HOLE: 6.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): See water level log	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	BTEX VOC	PAH METALS	DRO	OTHER (SPECIFY) GRO	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
Soil/Water	1/1	1/1	1/0	1/0	NA		72

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Piezometer	✓	NA	NA	John B Reeves

LOCATION SKETCH/COMMENTS

SCALE: NA

See page 20 in log book #9 for location

PROJECT	HOLE NO.
Hunter AAF CAP Part A UST Sites	D3

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

DEPTH (ft) (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)		
0'	QBR 4-17-98				
	0 to 1.65 ~~concrete~~ Slab	head space >20000	NA	HD310	Start 1330 end 1335 drilled 4' recovered 1.8'
	0 to 1.8' coarse grained wet poorly graded sand 10YR5/2 grayish brown	QBR 4-17-98			
4'					Start 1338 end 1342 drilled 4' recovered
8'					

98

PROJECT

HOLE NO D-3

97

HTRW DRILLING LOG	DISTRICT USACE Savannah	HOLE NUMBER D4
1. COMPANY NAME SAIC	2. DRILL SUBCONTRACTOR RE Wright	SHEET OF SHEETS
3. PROJECT Hunter AAF	4. LOCATION Bldg 1346 Tank 1Ø8	
5. NAME OF DRILLER Andy Knickerbocker	6. MANUFACTURERS DESIGNATION OF DRILL Geoprobe Saliva KA	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 2" dia macrocore; acetate liner = 4' length; shoe to drive cap = 4.6'; push rods = 4' + 3'; large bore rods = 3'; 1.5" diam screen = 3.5'	8. HOLE LOCATION D4	
	9. SURFACE ELEVATION TBD	
	10. DATE STARTED 4-17-98	11. DATE COMPLETED 4-17-98
12. OVERBURDEN THICKNESS NA	15. DEPTH GROUNDWATER ENCOUNTERED 8.Ø'	
13. DEPTH DRILLED INTO ROCK NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED See water level log	
14. TOTAL DEPTH OF HOLE 12'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) See water level log	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	BTEX ~~VOC~~	PAH ~~METALS~~	GRO ~~OTHER (SPECIFY)~~	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
Soil / Water	2 / 1	2/1	GRO 2/Ø	DRO 2/Ø	NA	58

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
piezometer	✓	NA	NA	John B Rowe [signature]

LOCATION SKETCH/COMMENTS SCALE:

See page 2Ø log book #9

PROJECT	HOLE NO.
HAAF CAP A UST SITES INVEST.	D4

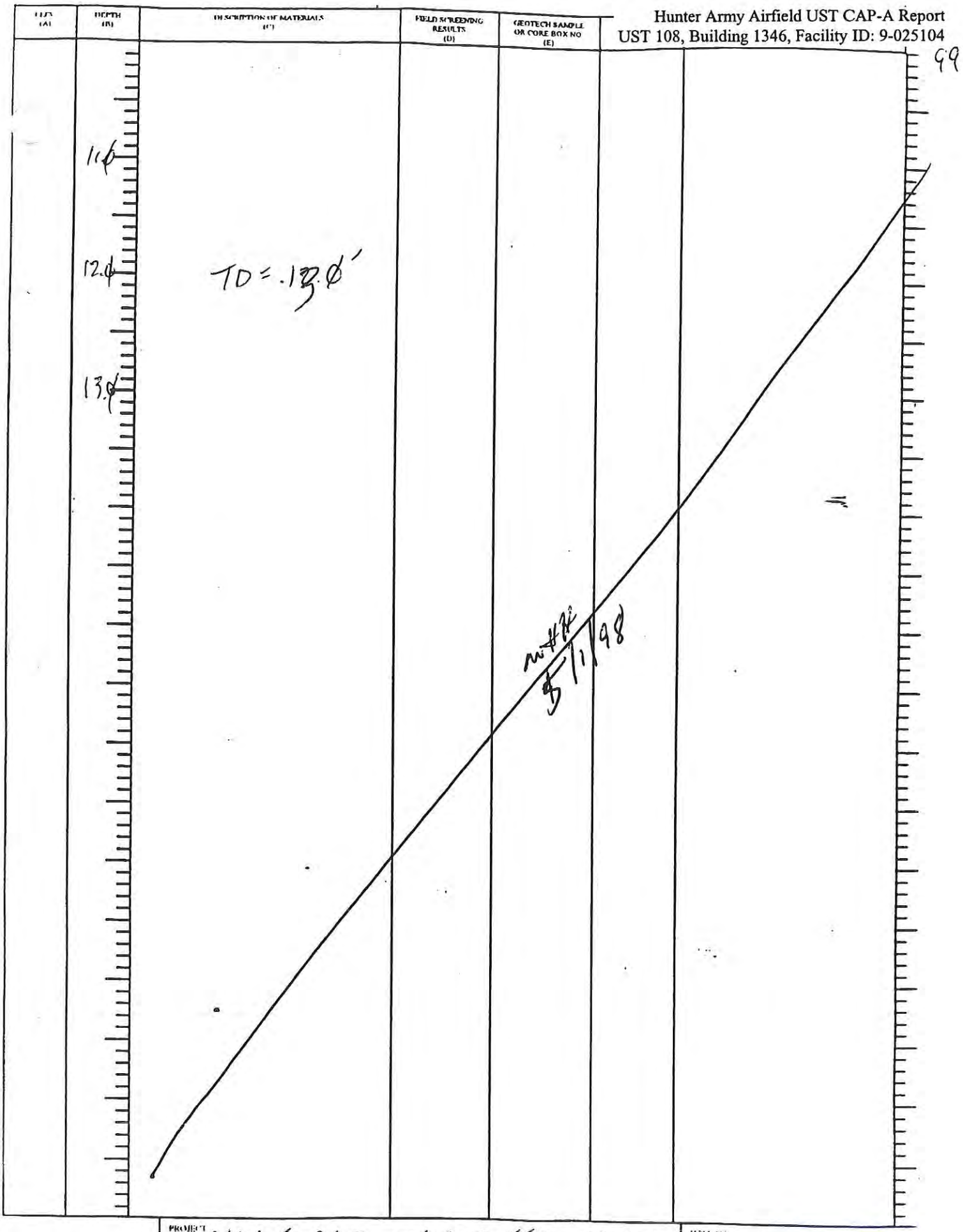
ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

48

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)		
0	0 to 2.7 Sandy organic clay 2.5YR 2.5/1 reddish black	head space >2000 0 to 2		0 to 2' HD4101	Start 1525 END 1530 Drilled 4' Recovered 2.7
		head space 2' to 4' 1600			
4	disregard JBR 4-17-98				
	4.0' to ~~4.3'~~ 6.1' JBR 4-17-98 same as above	head space 4' to 6' 390			Start 1540 END 1545 drilled 4' recovered 3.8'
	6.1' to 7.8' coarse poorly graded Sand 10YR6/1 reddish gray	head space 6' to 8' 180		6' to 8' HD4104	
8	WT 8' to 12' to wet to recover very fine grained silty sand very moist 10YR5/1 gray			HD4200 8-12'	Start 1550 Finish 1555 Recovery 0.5' Drilled 4.8'

PROJECT: HAAF CAP A UST Invest.

HOLE NO: D4


DEPTH (ft)
DESCRIPTION OF MATERIALS (C)
FIELD SCREENING RESULTS (D)
GEOTECH SAMPLE OR CORE BOX NO (E)
99
11.0
12.0
13.0
TD = 13.0'
WHH 5/1/98
PROJECT
HAAF CAP UST SITES INVEST.
HOLE NO

USCS (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)		
	0'	0' to 3.5' Sandy organic clay 2.5YR 2.5/1 reddish black	0 to 2' head space >2000		See page 112	Started 1610 end 1615 drilled 4' recovered 3.5'
			2' to 4' head space 1750			
	4'	4' to 8' same as above	4' to 6' head space 716			Started 1620 end 1625 drilled 4' recovered 4'
			6' to 8' head space 350		See page 113	
	8'	WT				

PROJECT: HAAF - CAP A UST Investigation

HOLE NO: D5

HTRW DRILLING LOG

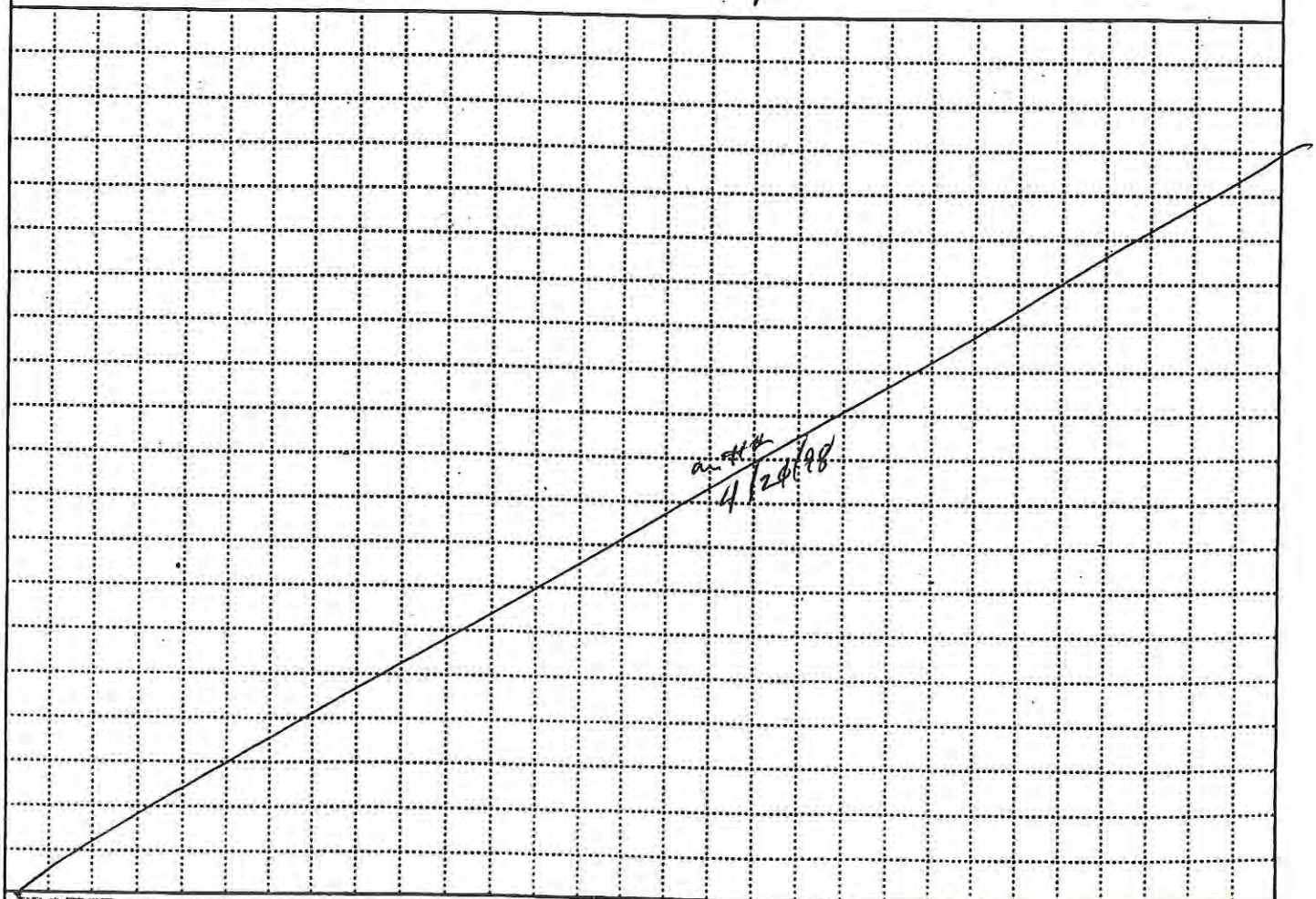
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: RE WRIGHT (SAIC)	HOLE NUMBER: D-6
3. PROJECT: HAAF CAP A UST Investigation	4. LOCATION: AREA D BLDG 1346 TNK 108	SHEET / SHEETS OF
5. NAME OF DRILLER: Andy Nickerbocker	6. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE SALINA, KS	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: macrocore = 2" diam; acetate liner = 4' length. shoe to drive cap = 4.6'; push rods 1 & 3' and 4' length; screen length = 3.5	8. HOLE LOCATION: D-6	
	9. SURFACE ELEVATION: TBD	
	10. DATE STARTED: 4/20/98	11. DATE COMPLETED: 4/20/98
12. OVERBURDEN THICKNESS: 12' +	15. DEPTH GROUNDWATER ENCOUNTERED: 8.0 ft BGS	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: See water level log	
14. TOTAL DEPTH OF HOLE: 12.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): "	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	BTEX VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
Soil/Water	2/1	NA	DRO 2/0	GRO 2/0	PAH 2/1	95

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
piezometer	✓	NA	Piezometer	[signature]

LOCATION SKETCH/COMMENTS: SITE MAP IN LOG #9 p.20 SCALE: NOT TO SCALE



PROJECT	HOLE NO.
HAAF CAP PART A UST SITES	D-6

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

USCS (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	(F)	(G)
	0	TOPSOIL: GRASS	Ø-2 HS = >2ØØØ	NA	HD61Ø1 HD6111 (DUP)	START Ø915 STOP: Ø92Ø DRILLED: 4.Ø ft REC: 2.8 ft
	1.Ø	(OL) ORGANIC SOIL WITH SAND, MOIST, LOW to MOD. PLASTICITY, FIRM, 5YR 4/2 (DRK. REDDISH GREY)				
	2.Ø	(SP) POORLY GRADED SAND WITH SILT, COARSE TO VERY COARSE QTZ SAND, POORLY SORTED MOIST SOFT, WELL ROUNDED GRAINS, SILTY LENSES (10YR8/2) v. pale brown) reddish; SHARP CONTACT		NA	~~HD61Ø4~~ ~~HD6124 (SPLIT)~~	~~4~~ 4/2Ø/98
		ORGANIC RICH SANDY SILTY CLAY, MOIST, MOD PLASTICITY 5YR 2.5/1 black	2.Ø-2.8. HS = >2ØØØ			According to Andy - Ø-4' BGS used hammer to push
	3.Ø	2.8 - 4.Ø No Recovery				
	4.Ø	SATURATED POORLY SORTED SAND W/ SILT, COARSE TO VERCOARSE QTZ. SAND. INTERPRETED AS PERCHED WATER	4-6 HS = >2ØØØ	NA	HD61Ø4 HD6124 (split)	START: Ø925 STOP: Ø93Ø DRILLED: 4.Ø ft REC: 4.Ø ft
	5.Ø	SHARP CONTACT - 5.4' MOIST ~~SAN~~ ORGANIC RICH SANDY SILTY CLAY (10YR8/2) very pale brown, moist, firm MODERATE PLASTICITY				
	6.Ø		6-8 HS = >2ØØØ	NA		
	7.Ø					4-8' BGS Did not use hammer to push
	8.Ø	WT				
		Screened - Screened interval probably in clear sand due to moderately clear tan water.	NA		HD62Ø4 HD621Ø (DUP.) HD6224 (SPLIT)	START: Ø935 STOP: Ø94Ø DRILLED: 4.Ø to set screen screen 8-12.Ø ft 8-12' BGS DID NOT USE HAMMER TO PUSH

PROJECT: HAAF- CAP A

HOLE NO: D6

56

USCS (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	AI Sa
	10.0				
	11.0				
	12.0	TD = 12.0'			

SEE COMMENTS ON PREVIOUS PAGE

4/20/98

PROJECT: HAAF - CAP A UST SITES

HOLE NO: D-6

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HTRW DRILLING LOG

1. COMPANY NAME: SAIC	DISTRICT: USACE Savannah	HOLE NUMBER: D7
3. PROJECT: Hunter AAF CAP Part A UST Sites	2. DRILL SUBCONTRACTOR: RE Wright (SAIC)	SHEET 1 OF 2 SHEETS
5. NAME OF DRILLER: Andy Knickerbocker	4. LOCATION: Bldg 1346 Tank 108	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" dia macrocore acetate liner = 4' long; sleeve to drive cap = 4.6' long; push rods = 3' + 4' length. Large bore rods = 4' length + 1.5" diam screen = 3.5' length	6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe Saliva KS	
	8. HOLE LOCATION: D7	
	9. SURFACE ELEVATION: TBD	
	10. DATE STARTED: 4-19-98	11. DATE COMPLETED: 4-19-98
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: ~8.0 ft	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: See water level log	
14. TOTAL DEPTH OF HOLE: 38'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): See water level log	

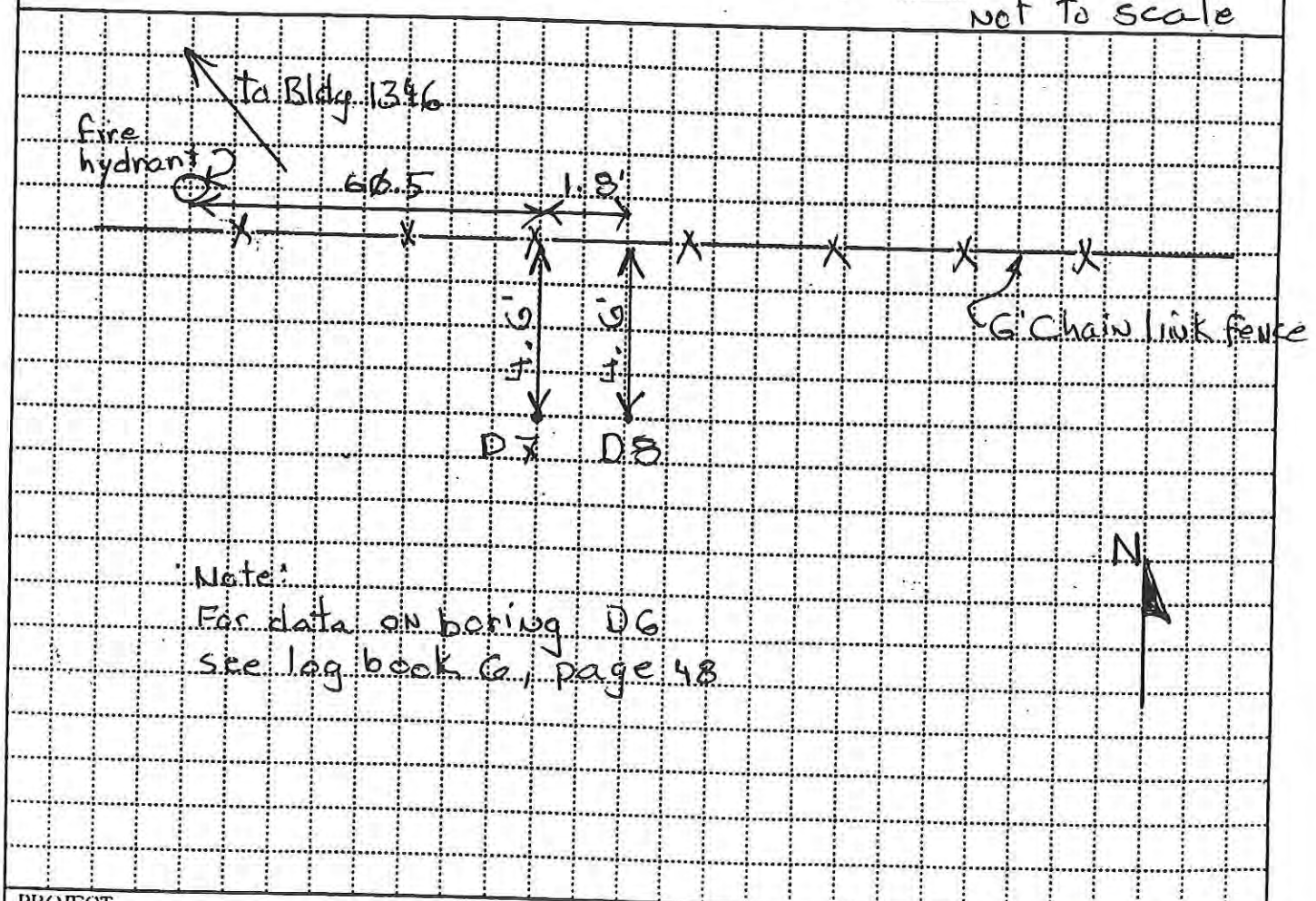
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	D-8 1 ~~NA~~	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	BTEX/VOC	METALS/PAH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
water	3	3	NA	NA	NA	100

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
vertical profile	✓	DA	NA	John B Reeves

LOCATION SKETCH/COMMENTS

SCALE: not to scale



PROJECT: Hunter AAF CAP Part A UST Sites

HOLE NO.: D7

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

(A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	(F)

0'
5'
10'
15'
20'
25'
30'
35'
40'
45'

8.0 ft - GW TABLE

14-18' BGS water sample collected

24-28' BGS water sample collected

34-38' BGS water sample collected

TD = 38.0'

at 10' below groundwater surface Sample HD73001 collected

at 20' below groundwater surface Sample HD73002 collected

at 30' below groundwater surface Sample HD73003 collected

PROJECT: HAAF CAP A UST Site Investigation

HOLE NO: D7

APPENDIX V

SOIL LABORATORY REPORTS

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UST 108, Building 1346
Hunter Army Airfield
Chatham County, Facility ID: 9-025104

TABLE V-A. SUMMARY OF SOIL ANALYTICAL RESULTS[3]

Location Sample ID Date Collected Depth (ft BGS)	Applicable Standards[1]	D-1 HD1101 04/01/98 0.0 to 2.0	D-2 HD2101 04/01/98 0.0 to 2.0	D-3 HD3101 04/01/98 0.0 to 2.0	D-4 HD4101 04/17/98 0.0 to 2.0	D-4 HD4104 04/17/98 6.0 to 8.0	D-5 HD5101 04/17/98 0.0 to 2.0	D-5 HD5104 04/17/98 6.0 to 8.0
VOCs	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	0.008	0.0022 U	0.0026 U	0.0023 U	0.0024 U	0.0025 U	0.0024 U	0.0025 U
Toluene	6.00	0.0022 U	0.0026 U	0.0023 U	0.0225 =	0.0152 =	0.0024 U	0.0025 U
Ethylbenzene	10.00	.0.0022 U	0.0026 U	0.0023 U	0.0024 U	0.0025 U	0.0024 U	0.0025 U
Xylenes	700.00	0.0065 U	0.0077 U	0.0069 U	0.0073 U	0.0075 U	0.0071 U	0.0074 U
TPH-DRO	NRC	2 U	3.5 =	3.36 =	0.59 U	0.67 U	0.67 U	0.83 U
TPH-GRO	NRC	0.526 UJ	0.602 UJ	0.575 UJ	0.610 U	0.625 UJ	0.595 U	0.617 UJ
PAHs	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2-Chloronaphthalene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Acenaphthene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Acenaphthylene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Anthracene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Benzo(a)anthracene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Benzo(a)pyrene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Benzo(b)fluoranthene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Benzo(g,h,i)perylene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Benzo(k)fluoranthene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Chrysene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Dibenzo(a,h)anthracene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Fluoranthene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Fluorene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Indeno(1,2,3-cd)pyrene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Naphthalene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Phenanthrene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U
Pyrene	N/A[2]	0.346 U	0.395 U	0.379 U	0.401 U	0.411 U	0.394 U	0.409 U

NOTE: [1]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column 2).
[2]Not applicable; the health-based threshold level exceeds the expected soil concentration under free-product conditions.
[3]All field work and analytical sampling were performed prior to the release of the new GA DNR Corrective Action Plan (CAP)-Part A Guidance (i.e., May 1998); therefore, the new analytical methods specified were not used.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.
TPH-DRO - Total petroleum hydrocarbon–diesel-range organics.
TPH-GRO - Total petroleum hydrocarbon–gasoline-range organics.
VOCs - Volatile organic compounds.

Laboratory Qualifier
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.

TABLE V-A. SUMMARY OF SOIL ANALYTICAL RESULTS[3] (continued)

Location Sample ID Date Collected Depth (ft BGS)	Applicable Standards[1]	D-6 HD6101 04/20/98 0.0 to 2.0	D-6 HD6111[4] 04/20/98 0.0 to 2.0	D-6 HD6104 04/20/98 6.0 to 8.0
VOCs	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	0.008	0.0022 U	0.0023 U	0.0025 U
Toluene	6.00	0.0022 U	0.0023 U	0.0025 U
Ethylbenzene	10.00	0.0022 U	0.0023 U	0.0025 U
Xylenes	700.00	0.0067 U	0.0024 J	0.0071 J
TPH-DRO	NRC	1.22 U	2.59 U	1.27 U
TPH-GRO	NRC	0.562 U	0.568 U	0.617 UJ
PAHs	mg/kg	mg/kg	mg/kg	mg/kg
2-Chloronaphthalene	N/A[2]	0.371 U	0.375 U	0.409 U
Acenaphthene	N/A[2]	0.371 U	0.375 U	0.409 U
Acenaphthylene	N/A[2]	0.371 U	0.375 U	0.409 U
Anthracene	N/A[2]	0.371 U	0.375 U	0.409 U
Benzo(a)anthracene	N/A[2]	0.371 U	0.375 U	0.409 U
Benzo(a)pyrene	N/A[2]	0.371 U	0.375 U	0.409 U
Benzo(b)fluoranthene	N/A[2]	0.371 U	0.375 U	0.409 U
Benzo(g,h,i)perylene	N/A[2]	0.371 U	0.375 U	0.409 U
Benzo(k)fluoranthene	N/A[2]	0.371 U	0.375 U	0.409 U
Chrysene	N/A[2]	0.371 U	0.375 U	0.409 U
Dibenzo(a,h)anthracene	N/A[2]	0.371 U	0.375 U	0.409 U
Fluoranthene	N/A[2]	0.371 U	0.375 U	0.409 U
Fluorene	N/A[2]	0.371 U	0.375 U	0.409 U
Indeno(1,2,3-cd)pyrene	N/A[2]	0.371 U	0.375 U	0.409 U
Naphthalene	N/A[2]	0.371 U	0.375 U	0.409 U
Phenanthrene	N/A[2]	0.371 U	0.375 U	0.409 U
Pyrene	N/A[2]	0.371 U	0.375 U	0.409 U

NOTE: [1]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels.
[2]Not applicable; the health-based threshold level is exceeded only if free product exists.
[3]**All field work and analytical sampling were performed prior to the release of the new GA DNR Corrective Action Plan (CAP)-Part A Guidance (i.e., May 1998); therefore, the new analytical methods specified were not used.**
[4]Duplicate sample for sample collected from location D-6 at a depth of 0.0 to 2.0 feet BGS.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAH - Polynuclear aromatic hydrocarbon.
TPH-DRO - Total petroleum hydrocarbon–diesel-range organics.
TPH-GRO - Total petroleum hydrocarbon–gasoline-range organics.
VOCs - Volatile organic compounds.

Laboratory Qualifier
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.

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CHAIN OF CUSTODY RECORD

COC NO.: 40 81

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall **(Printed Name):** Mitchell Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD11Ø1	Ø4/Ø1/98	133Ø	soil	X	X	X	X		2	544 ppm	quick turnaround
HD21Ø1	Ø4/Ø1/98	145Ø	soil	X	X	X	X		2	>2ØØØ ppm	quick turn aloo
HM11Ø1	Ø4/Ø2/98	ØØ82Ø	soil	X	X	X	X		2	157Ø ppm	
HM11Ø3	Ø4/Ø2/98	ØØ83Ø	soil	X	X	X	X		2	61Ø ppm	
HM21Ø1	Ø4/Ø2/98	Ø91Ø	soil	X	X	X	X		2	Ø ppm	
HM21Ø3	Ø4/Ø2/98	Ø925	soil	X	X	X	X		2	73 ppm	
HM31Ø1	Ø4/Ø2/98	1Ø25	soil	X	X	X	X		2	Ø ppm	
HM31Ø3	Ø4/Ø2/98	1Ø35	soil	X	X	X	X		2	Ø ppm	
HM41Ø3	Ø4/Ø2/98	1135	soil	X	X	X	X		2	Ø ppm	
HM41Ø1	Ø4/Ø2/98	112Ø	soil	X	X	X	X		2	Ø ppm	
HD12ØØ	Ø4/Ø1/98	135Ø	water	X					2	NA	quick turnaro
HD22ØØ	Ø4/Ø1/98	1445	water	X					2	NA	quick turnaro
HTBØØ1	Ø4/Ø1/98	19ØØ	water	X					2	NA	quick turn a

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC	4/02/98 1335	COMPANY NAME:		Cooler ID: 479	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME: SAIC	4/02/98 1335	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

V-5

Hunter Army Airfield UST CAP-A Report
UST 108, Building 1346, Facility ID: 9-025104

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CHAIN OF CUSTODY RECORD

COC NO.: 4Ø298B

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell H. Hall (Printed Name): Mitchell H. Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD12ØØ	Ø4/Ø1/98	135Ø	water		X				2	NA	
HD22ØØ	Ø4/Ø1/98	1445	water		X				2	NA	
~~HM122Ø~~	~~Ø4/Ø2/98~~	~~ØØ35~~	~~water~~		X				2	~~NA~~	~~Spl.t~~
HM32ØØ	Ø4/Ø2/98	1Ø35	water		X				2	NA	
HM223Ø	Ø4/Ø2/98	ØØ15	water		X				2	NA	Equip Rinsate

V-7

4/02/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Mitchell H. Hall	4/02/98 1320		
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY:	Date/Time:	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	4/02/98 1320	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: 3Ø1

Cooler Temperature: 4°C.

FEDEX NUMBER:

Hunter Army Airfield UST CAP-A Report
UST 108, Building 1346, Facility ID: 9-025104

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CHAIN OF CUSTODY RECORD

COC NO.: 410.3B

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature) (Printed Name)

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD31Ø1	4/17/98	1335	Soil	X	X	X	X		2	NA	Ø.Ø - 2.Ø ft
HD41Ø4	4/17/98	1545	Soil	X	X	X	X		2	NA	6.Ø - 8.Ø ft
HD41Ø1	4/17/98	153Ø	Soil	X	X	X	X		2	NA	Ø.Ø - 2.Ø ft
HD51Ø1	4/17/98	162Ø	Soil	X	X	X	X		2	NA	Ø.Ø - 2.Ø ft
HD51Ø4	4/17/98	1635	Soil	X	X	X	X		2	NA	6.Ø - 8.Ø ft
HO54ØØ	4/16/98	1Ø2Ø	Soil					X	1	NA	2.Ø - 4.Ø ft
HO53Ø3	4/18/98	1125	~~Soil~~ water 4/18		X				2	NA	36.Ø - 4Ø.Ø ft

Analysis 4/16/98

V-9

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 13	Cooler Temperature: 4°C
COMPANY NAME: SAIC	4/16/98 1339	COMPANY NAME:		Cooler ID: 504	FEDEX NUMBER: NA
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time	HD31Ø1, HD41Ø4, HD41Ø1, HD51Ø1, HD51Ø4 } Quick turnaround	
COMPANY NAME: GEL	4/18/98 1339	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

Hunter Army Airfield UST CAP-A Report
UST 108, Building 1346, Facility ID: 9-025104

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CHAIN OF CUSTODY RECORD

COC NO.: 420 D

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall (Printed Name): Mitchell Hall

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HL84ØØ	4/18/98	15ØØ	soil					X	1	NA	~~Ø~~ 2.Ø - 4.Ø ft
HD84ØØ	4/19/98	1Ø2Ø	soil					X	1	NA	~~4.Ø-6.Ø ft 6.Ø - 8.Ø ft~~
HD611	4/2Ø/98	Ø92Ø	soil	X	X	X	X		2	>2ØØØ	Ø.Ø - 2.Ø ft Dup.
HD61Ø4	4/2Ø/98	Ø94Ø	soil	X	X	X	X		2	>2ØØØ	6.Ø - 8.Ø ft
HD61Ø1	4/2Ø/98	Ø92Ø	soil	X	X	X	X		2	>2ØØØ	Ø.Ø - 2.Ø ft

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Mitchell Hall	4/2Ø/98 1315		
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEC	4/2Ø/98 1315	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 8

Cooler ID: 322

Cooler Temperature: 4°C

FEDEX NUMBER: NA

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Hunter Army Airfield UST CAP-A Report
UST 108, Building 1346, Facility ID: 9-025104

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CHAIN OF CUSTODY RECORD

COC NO.: 423 A

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall (Printed Name): Mitchell Hall

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	GRAIN SIZE	MOISTURE CONTENT	PERMEABILITY	SPECIFIC GRAVITY	POROSITY	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HL84ØØ	4/18/98	15ØØ	soil	X	X	X	X	X	1	NA	2.Ø - 4.Ø ft
HD84ØØ	4/19/98	1Ø2Ø	soil	X	X	X	X	X	1	NA	4.Ø - 6.Ø ft
HJ64ØØ	4/16/98	1315	soil	X	X	X	X	X	1	NA	2.Ø - 4.Ø ft
HO54ØØ	4/18/98	1Ø2Ø	soil	X	X	X	X	X	1	NA	2.Ø - 4.Ø ft
HP54ØØ	4/1Ø/98	Ø945	soil	X	X	X	X	X	1	NA	4.Ø - 6.Ø ft
HI84ØØ	4/15/98	135Ø	soil	X	X	X	X	X	1	NA	2.Ø - 4.Ø ft
HH64ØØ	4/[illegible]/98	1535	soil	X	X	X	X	X	1	NA	Ø.Ø - 2.Ø ft
HG64ØØ	4/7/98	1115	soil	X	X	X	X	X	1	NA	Ø.Ø - 2.Ø ft

LABORATORY NAME: Catlin Laboratories

LABORATORY ADDRESS: 1051 Johnnie Dodds Blvd. Suite C Mt. Pleasant, SC 29464

PHONE NO: (803)881-6000

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 8	Cooler Temperature:
COMPANY NAME: SAIC	4/23/98 1120	COMPANY NAME:		Cooler ID:	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME: CAT LIN	4/23/98 11:25	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD1101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA001S

Matrix: (soil/water) SOIL Lab Sample ID: 9804063-01

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C4026

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: not dec. 8 Date Analyzed: 04/03/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.2	U	U
108-88-3	Toluene	2.2	U	
100-41-4	Ethylbenzene	2.2	U	
1330-20-7	Xylenes (total)	6.5	U	

FORM I VOA

FORM 1 Science Applications02-APR-1998 SA
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD1101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA0018

Matrix: (soil/water) SOIL Lab Sample ID: 9804063-03

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 4B3009

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/03/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/08/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	Diesel Range Organics	2.0	B U	F01, F07

FORM I SV

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA001S

Matrix: (soil/water) SOIL Lab Sample ID: 9804063-03

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1D3018

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: not dec. 5 Date Analyzed: 04/09/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics	526	U	UJ C05

DATA VALIDATION
COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD1101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA001S

Matrix: (soil/water) SOIL Lab Sample ID: 9804063-03

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 20504

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/03/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/10/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
91-20-3	naphthalene	346	U	U
91-58-7	2-chloronaphthalene	346	U	
209-96-8	acenaphthylene	346	U	
83-32-9	acenaphthene	346	U	
86-73-7	fluorene	346	U	
85-01-8	phenanthrene	346	U	
120-12-7	anthracene	346	U	
206-44-0	fluoranthene	346	U	
129-00-0	pyrene	346	U	
56-55-3	benzo(a)anthracene	346	U	
218-01-9	chrysene	346	U	
205-99-2	benzo(b)fluoranthene	346	U	UJ CØ5
207-08-9	benzo(k)fluoranthene	346	U	U
50-32-8	benzo(a)pyrene	346	U	
193-39-5	indeno(1,2,3-cd)pyrene	346	U	
53-70-3	dibenz(a,h)anthracene	346	U	
191-24-2	benzo(g,h,i)perylene	346	U	

FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HD2101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA001S

Matrix: (soil/water) SOIL Lab Sample ID: 9804063-02

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C505

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: not dec. 22 Date Analyzed: 04/04/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.6	U
108-88-3	Toluene	2.6	U
100-41-4	Ethylbenzene	2.6	U
1330-20-7	Xylenes (total)	7.7	U

U

FORM I VOA

FORM 1 Science Applications02-APR-1998 SA
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD2101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA001S

Matrix: (soil/water) SOIL Lab Sample ID: 9804063-04

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 4B30010

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: 17 decanted: (Y/N) N Date Extracted:04/03/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/08/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	3.5	B	= F01, F08

FORM I SV

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VOLATILE ORGANICS ANALYSIS DATA SHEET

HD2101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA001S

Matrix: (soil/water) SOIL Lab Sample ID: 9804063-04

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1D506

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: not dec. 17 Date Analyzed: 04/10/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
	----------Gasoline Range Organics	602 ~~76.3~~	J U F01, F06

DATA VALID.....
COPY

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD2101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA001S

Matrix: (soil/water) SOIL Lab Sample ID: 9804063-04

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 10420

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: 17 decanted: (Y/N) N Date Extracted: 04/03/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/09/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	395	U
91-58-7	2-chloronaphthalene	395	U
208-96-8	acenaphthylene	395	U
83-32-9	acenaphthene	395	U
86-73-7	fluorene	395	U
85-01-8	phenanthrene	395	U
120-12-7	anthracene	395	U
206-44-0	fluoranthene	395	U
129-00-0	pyrene	395	U
56-55-3	benzo(a)anthracene	395	U
218-01-9	chrysene	395	U
205-99-2	benzo(b)fluoranthene	395	U
207-08-9	benzo(k)fluoranthene	395	U
50-32-8	benzo(a)pyrene	395	U
193-39-5	indeno(1,2,3-cd)pyrene	395	U
53-70-3	dibenz(a,h)anthracene	395	U
191-24-2	benzo(g,h,i)perylene	395	U

U

FORM I SV-1

CLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD3101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-11

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2G3014

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 13 Date Analyzed: 04/29/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.3	U	U
108-88-3	Toluene	2.3	U	
100-41-4	Ethylbenzene	2.3	U	
1330-20-7	Xylenes (total)	6.9	U	

FORM I VOA

DATA VALIDATION COPY

FORM 1 Science Applications18-APR-1998 SA
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD3101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5A80017

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 13 decanted: (Y/N) N Date Extracted:04/28/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/03/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	3.36	B	= F01, F08

FORM I SV

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HD3101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-11

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1G4031

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 13 Date Analyzed: 05/01/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	Gasoline Range Organics	575	U	UJ G02

USE

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HD3101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-11

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 1S118

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 13 decanted: (Y/N) N Date Extracted: 04/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	379	U
91-58-7	2-chloronaphthalene	379	U
208-96-8	acenaphthylene	379	U
83-32-9	acenaphthene	379	U
86-73-7	fluorene	379	U
85-01-8	phenanthrene	379	U
120-12-7	anthracene	379	U
206-44-0	fluoranthene	379	U
129-00-0	pyrene	379	U
56-55-3	benzo(a)anthracene	379	U
218-01-9	chrysene	379	U
205-99-2	benzo(b)fluoranthene	379	U
207-08-9	benzo(k)fluoranthene	379	U
50-32-8	benzo(a)pyrene	379	U
193-39-5	indeno(1,2,3-cd)pyrene	379	U
53-70-3	dibenz(a,h)anthracene	379	U
191-24-2	benzo(g,h,i)perylene	379	U

U

FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD4101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-13

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2G3012

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 18 Date Analyzed: 04/29/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.4	U	U
108-88-3	Toluene	22.5		=
100-41-4	Ethylbenzene	2.4	U	U
1330-20-7	Xylenes (total)	7.3	U	U

FORM I VOA

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD4101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5A80019

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 18 decanted: (Y/N) N Date Extracted:04/28/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics_____	0.59	JB	U FΦ1, FΦ6

FORM I SV

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD4101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-13

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1G505

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 18 Date Analyzed: 05/01/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics	610	U	U

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD4101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-13

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 1S120

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 18 decanted: (Y/N) N Date Extracted:04/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	401	U
91-58-7	2-chloronaphthalene	401	U
208-96-8	acenaphthylene	401	U
83-32-9	acenaphthene	401	U
86-73-7	fluorene	401	U
85-01-8	phenanthrene	401	U
120-12-7	anthracene	401	U
206-44-0	fluoranthene	401	U
129-00-0	pyrene	401	U
56-55-3	benzo(a)anthracene	401	U
218-01-9	chrysene	401	U
205-99-2	benzo(b)fluoranthene	401	U
207-08-9	benzo(k)fluoranthene	401	U
50-32-8	benzo(a)pyrene	401	U
193-39-5	indeno(1,2,3-cd)pyrene	401	U
53-70-3	dibenz(a,h)anthracene	401	U
191-24-2	benzo(g,h,i)perylene	401	U

U

FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD4104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-12

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2G3011

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 20 Date Analyzed: 04/29/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.5	U	U
108-88-3	Toluene	15.2		
100-41-4	Ethylbenzene	2.5	U	U
1330-20-7	Xylenes (total)	7.5	U	U

FORM I VOA

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD4104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5A80018

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 20 decanted: (Y/N) N Date Extracted:04/28/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics_____	0.67	JB	U F01, F06

FORM I SV

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD4104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-12

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1G4032

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 20 Date Analyzed: 05/01/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics____	625	U	UJ G02

use

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD4104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-12

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 1S119

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 20 decanted: (Y/N) N Date Extracted: 04/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	411	U
91-58-7	2-chloronaphthalene	411	U
208-96-8	acenaphthylene	411	U
83-32-9	acenaphthene	411	U
86-73-7	fluorene	411	U
85-01-8	phenanthrene	411	U
120-12-7	anthracene	411	U
206-44-0	fluoranthene	411	U
129-00-0	pyrene	411	U
56-55-3	benzo(a)anthracene	411	U
218-01-9	chrysene	411	U
205-99-2	benzo(b)fluoranthene	411	U
207-08-9	benzo(k)fluoranthene	411	U
50-32-8	benzo(a)pyrene	411	U
193-39-5	indeno(1,2,3-cd)pyrene	411	U
53-70-3	dibenz(a,h)anthracene	411	U
191-24-2	benzo(g,h,i)perylene	411	U

U

FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD5101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-14

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2G2036

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 16 Date Analyzed: 04/29/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.4	U
108-88-3	Toluene	2.4	U
100-41-4	Ethylbenzene	2.4	U
1330-20-7	Xylenes (total)	7.1	U

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FORM I VOA

FORM 1 Science Applications18-APR-1998 SA
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD5101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5A80020

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 16 decanted: (Y/N) N Date Extracted:04/28/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	0.67	JB	U F01, F06

FORM I SV

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD5101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-14

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1G4035

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 16 Date Analyzed: 05/01/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics	595	U	U

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD5101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-14

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 1S121

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 16 decanted: (Y/N) N Date Extracted: 04/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	394	U
91-58-7	2-chloronaphthalene	394	U
208-96-8	acenaphthylene	394	U
83-32-9	acenaphthene	394	U
86-73-7	fluorene	394	U
85-01-8	phenanthrene	394	U
120-12-7	anthracene	394	U
206-44-0	fluoranthene	394	U
129-00-0	pyrene	394	U
56-55-3	benzo(a)anthracene	394	U
218-01-9	chrysene	394	U
205-99-2	benzo(b)fluoranthene	394	U
207-08-9	benzo(k)fluoranthene	394	U
50-32-8	benzo(a)pyrene	394	U
193-39-5	indeno(1,2,3-cd)pyrene	394	U
53-70-3	dibenz(a,h)anthracene	394	U
191-24-2	benzo(g,h,i)perylene	394	U

U

FORM I SV-1 OLM03.0