FINAL

FORSCOM

CORRECTIVE ACTION PLAN

Part A

3d Inf Div (Mech)

Former Heating Oil Tank (HOT)
Building 725
Hunter Army Airfield, Georgia

Prepared for

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

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

January 1999

98-209P(PPT-8Fiery)/012099

DOCUMENT 16

FINAL

CORRECTIVE ACTION PLAN - PART A REPORT FOR FORMER HEATING OIL TANK (HOT) BUILDING 725 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

January 1999

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

List of Appendices

Attachments

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
HOT	Heating Oil Tank
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
MSL	mean sea level
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

THIS PAGE INTENTIONALLY LEFT BLANK

CORRECTIVE ACTION PLAN PART A

Facility Name: Former Heating Oil Tank, Building 725 Street Address: Douglas Street, HAAF

Facility ID: N/A City: Savannah County: Chatham Zip Code: 31406

Latitude: 32°01'45" N Longitude: 81°08'08" 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: 02/02/99

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: 1-22-99

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 Former Heating Oil Tank (HOT), Building 725 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 the Former HOT.

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 ____ NO X
If Yes, please summarize free product recovery efforts.

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

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
N/A	1,000	fuel oil	October 30, 1996

D. Initial Site Characterization

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

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

Characterization of petroleum-related contamination at the site was initiated during system closure activities on October 30, 1996, by Anderson Columbia Environmental, Inc. (ACE). After removal of the Former HOT, the ancillary piping was purged and closed in place by filling with grout. Two soil samples (8102-B725-TK1-7 and 8102-B725-TK1-11) were collected from the tank pit (Figure 7). The soil samples 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 1). However, elevated total petroleum hydrocarbon–diesel-range organics (TPH-DROs) were detected in both samples (Table 5a). Groundwater was not sampled from the tank pit during closure activities.

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

A detailed schematic diagram illustrating the Former HOT and ancillary piping as configured during operation is not available. However, during removal activities by ACE, holes in the tank were not reported. Therefore, the major source of contamination at the Former HOT is believed to have been piping leakage or tank overflow.

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:* 40 *feet*

ii. *Nearest down-gradient public water supply located within:* 8,300 *feet*

iii. *Nearest non-public water supply located within:* 12,480 *feet*

iv. *Nearest down-gradient non-public water supply located within:* >12,480 *feet*

c. *Surface Water Bodies and sewers:*

i. *Nearest surface water located within:* 1,200 *feet*

ii. *Nearest down-gradient surface water located within:* 1,440 *feet*

iii. *Nearest storm or sanitary sewer located within:* 80 *feet*

iv. *Depth to bottom of sewer at a point nearest the plume:* 5.09 *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 four boreholes (M1 through M4). Field headspace gas analyses were performed on each sample to determine organic vapor concentration. Two soil samples were selected from each borehole for laboratory chemical analysis of benzene, toluene, ethylbenzene, and xylene (BTEX); TPH gasoline-range organics (GROs)/DROs; and polynuclear aromatic hydrocarbons (PAHs). In boreholes where organic vapors were detected, 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 saturated zone. If organic vapors were not detected, one sample was collected from the 2.0-foot interval directly below ground surface, and the other from the 2.0-foot interval located immediately above the saturated zone water table. 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 (M1 through M4), one groundwater sample was collected from a depth of approximately 5.0 feet below the saturated zone using a direct-push sampling device. Chemical parameters for groundwater samples submitted for laboratory analysis included BTEX and PAHs. Refer to Attachment A for complete documentation of the technical approach implemented during this investigation.

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:* 3.59 to 4.64 feet BGS *(Table 4: Groundwater Elevations)*

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

c. *Hydraulic Gradient:* 0.106 feet/feet

d. *Geophysical Province:* Coastal Plain

e. *Unique geologic/hydrogeological conditions:* None.

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 the Former HOT on October 30, 1996. The 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 X
Excavated soils treated or disposed off site ____
If soils were excavated, summarize excavation and treatment/disposal activities:

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 ____
(provide justification)

The groundwater and soil analytical data collected during the Corrective Action Plan (CAP)-Part A investigation are sufficient to define the nature and extent of petroleum-related contamination at this site. The results of the investigation indicate that site conditions do not exceed groundwater maximum contaminant levels (MCLs) or the applicable soil threshold levels (see Tables 2 and 3). Therefore, further investigation of the Former HOT, Building 725 site is not required.

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

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

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 X

(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 ___X___

b. Dissolved phase NA ___X___

3. Surface Water N/A ___X___

B. Proposed Investigation of Vadose Zone And Aquifer Characteristics:

V. PUBLIC NOTICE

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

Public notification letters are not required for the Former HOT, Building 725 site because heating oil tanks are not regulated as defined by Georgia Department of Natural Resources (GA DNR) guidance.

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 Former HOT, Building 725 site, which is unregulated as defined by GA DNR guidance and has no Facility Identification Number, 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

THIS PAGE INTENTIONALLY LEFT BLANK

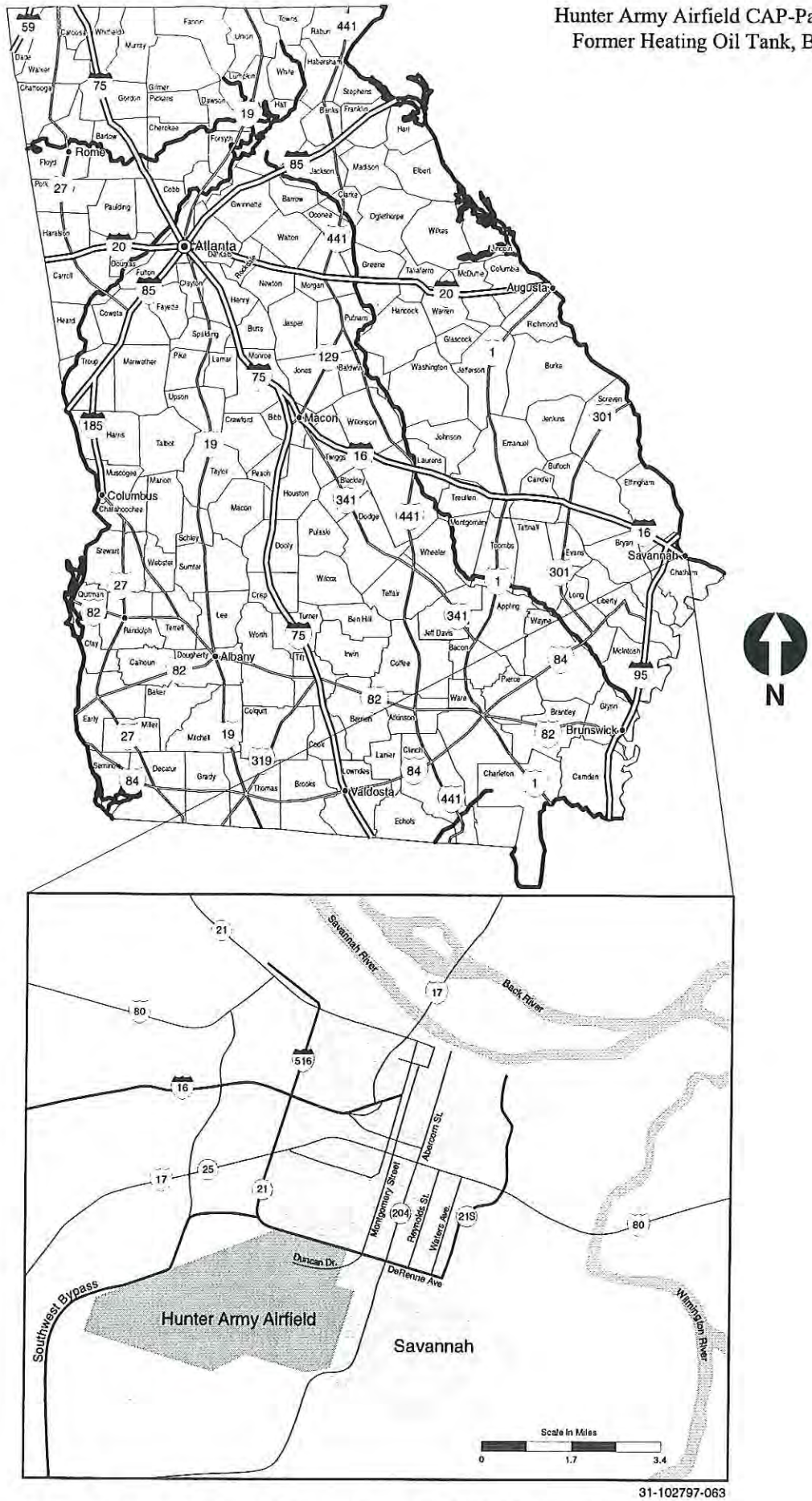


Figure 1. Location Map of Hunter Army Airfield, Chatham County, Georgia

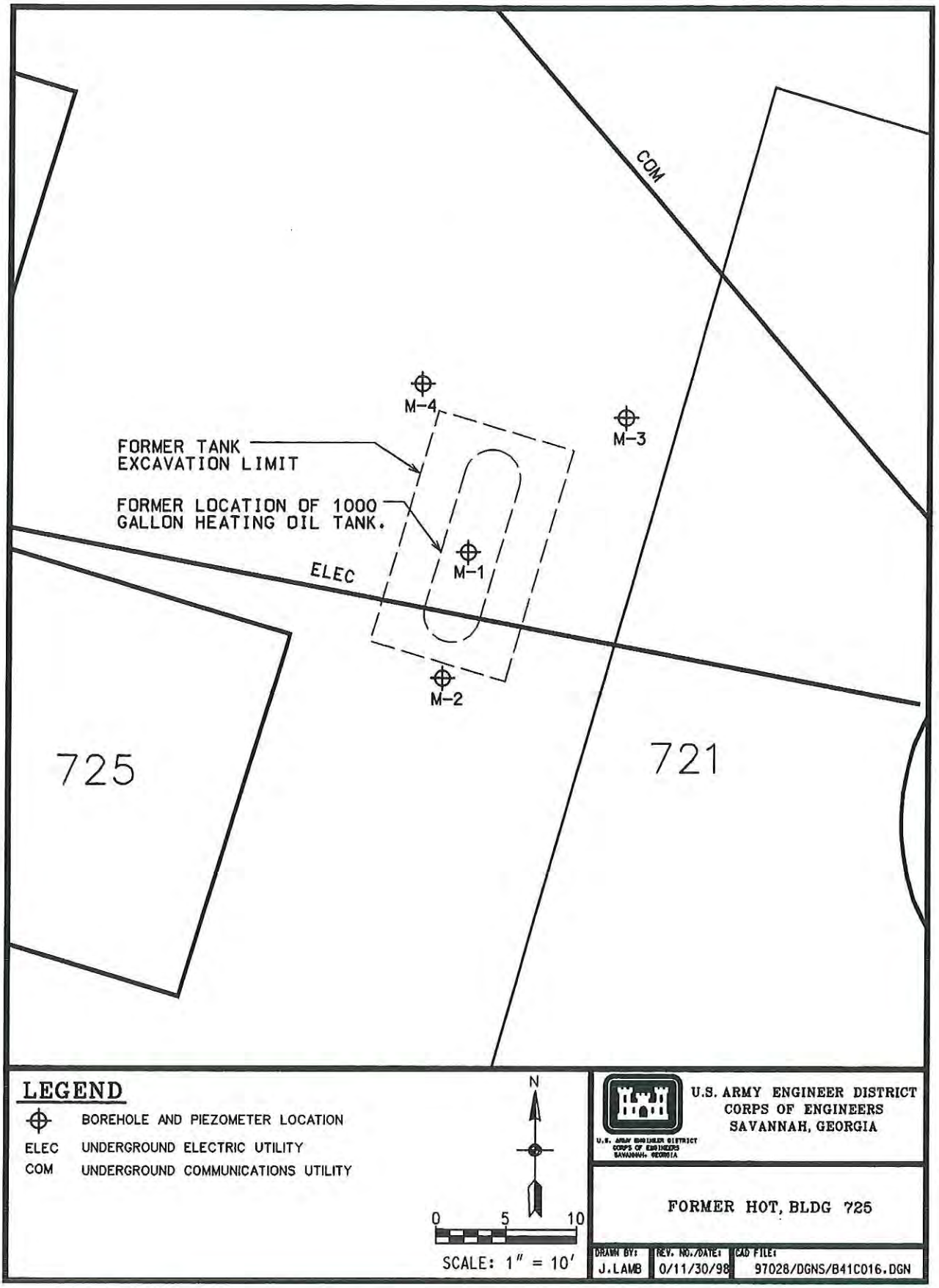


Figure 2. Site Plan for the Former HOT, Building 725 Site Investigation

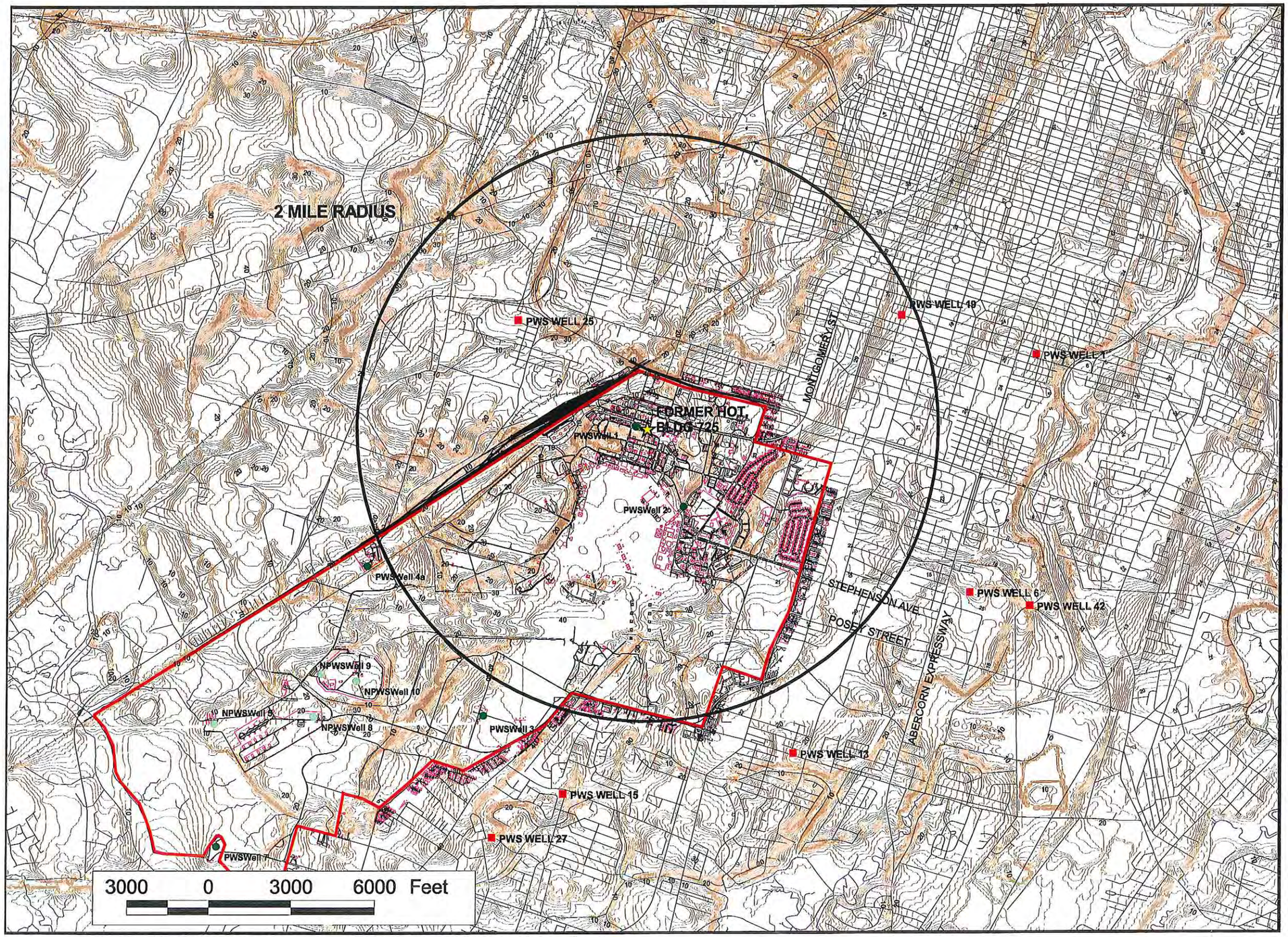


Figure 3a. Topographic Quadrangle Map of Hunter Army Airfield and Surrounding Area

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 Fort Stewart.

N

GA State Plane NAD83 (feet)

SAIC
Science Applications International Corporation

FORMER HOT, BLDG 725

REVISION	DRAWN BY:	CHKD BY:	DATE:
0	M.Norris	A. Bailey	01/26/99

FILE REFERENCES

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

SHT 1 of 1 — DRAWING #

G:\97028\HunterBase\BLDG725.APR — ARCVIEW PROJECT NAME

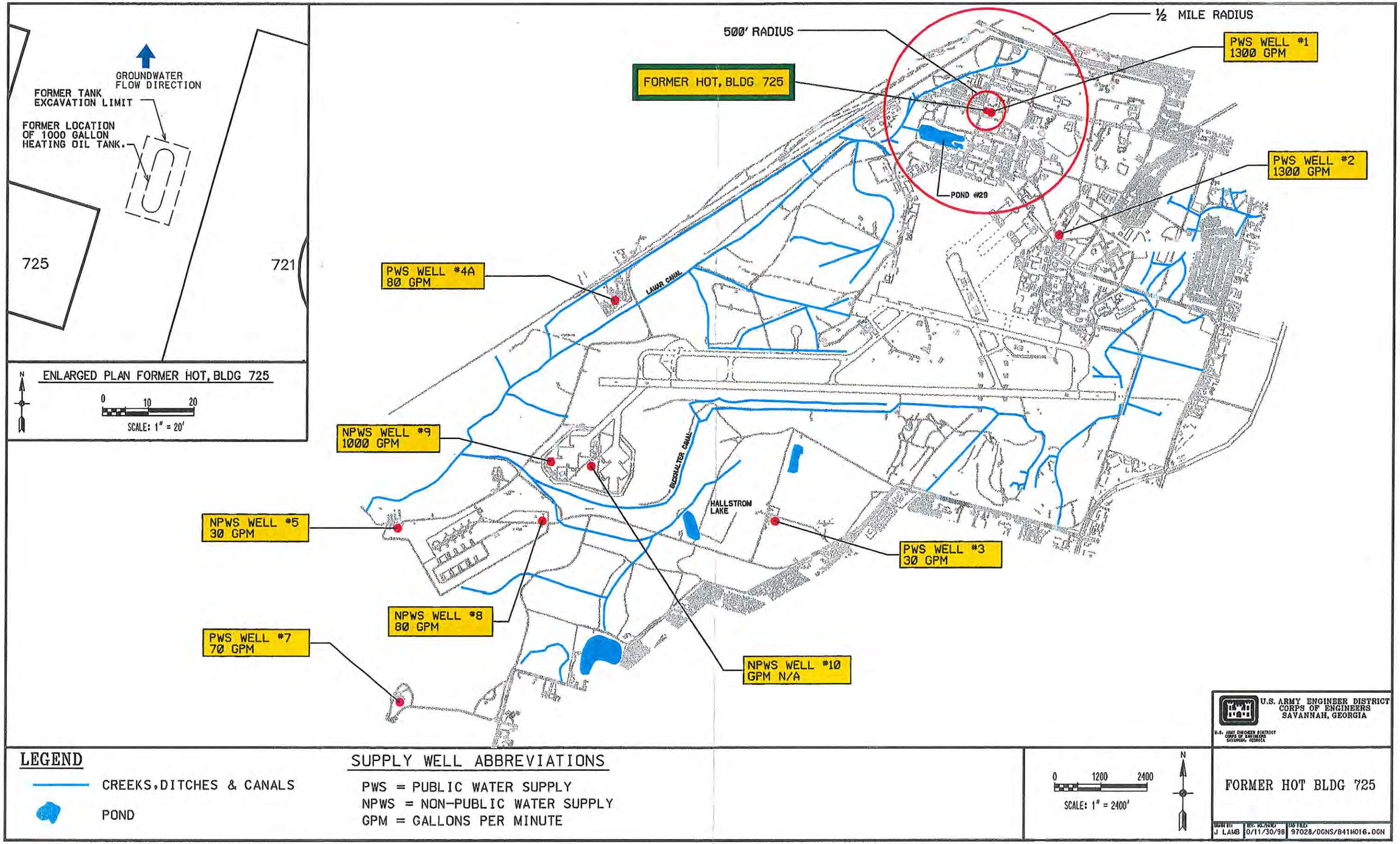


Figure 3b. Detailed Map Showing Public and Private Drinking Water Sources and Surface Water Bodies at Hunter Army Airfield

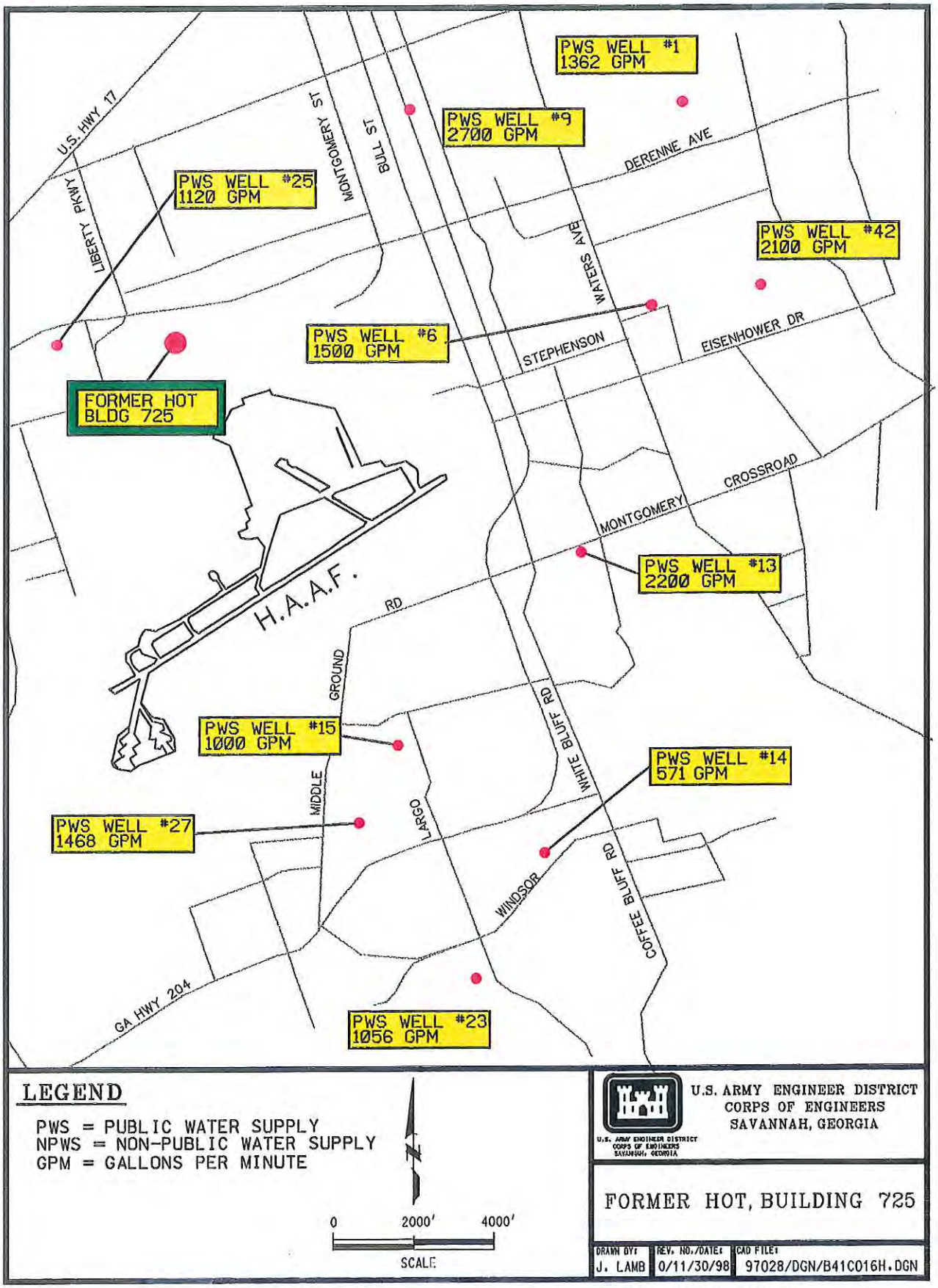


Figure 3c. Detailed Map Showing Public and Private Drinking Water Sources in Areas Adjacent to Hunter Army Airfield

THIS PAGE INTENTIONALLY LEFT BLANK

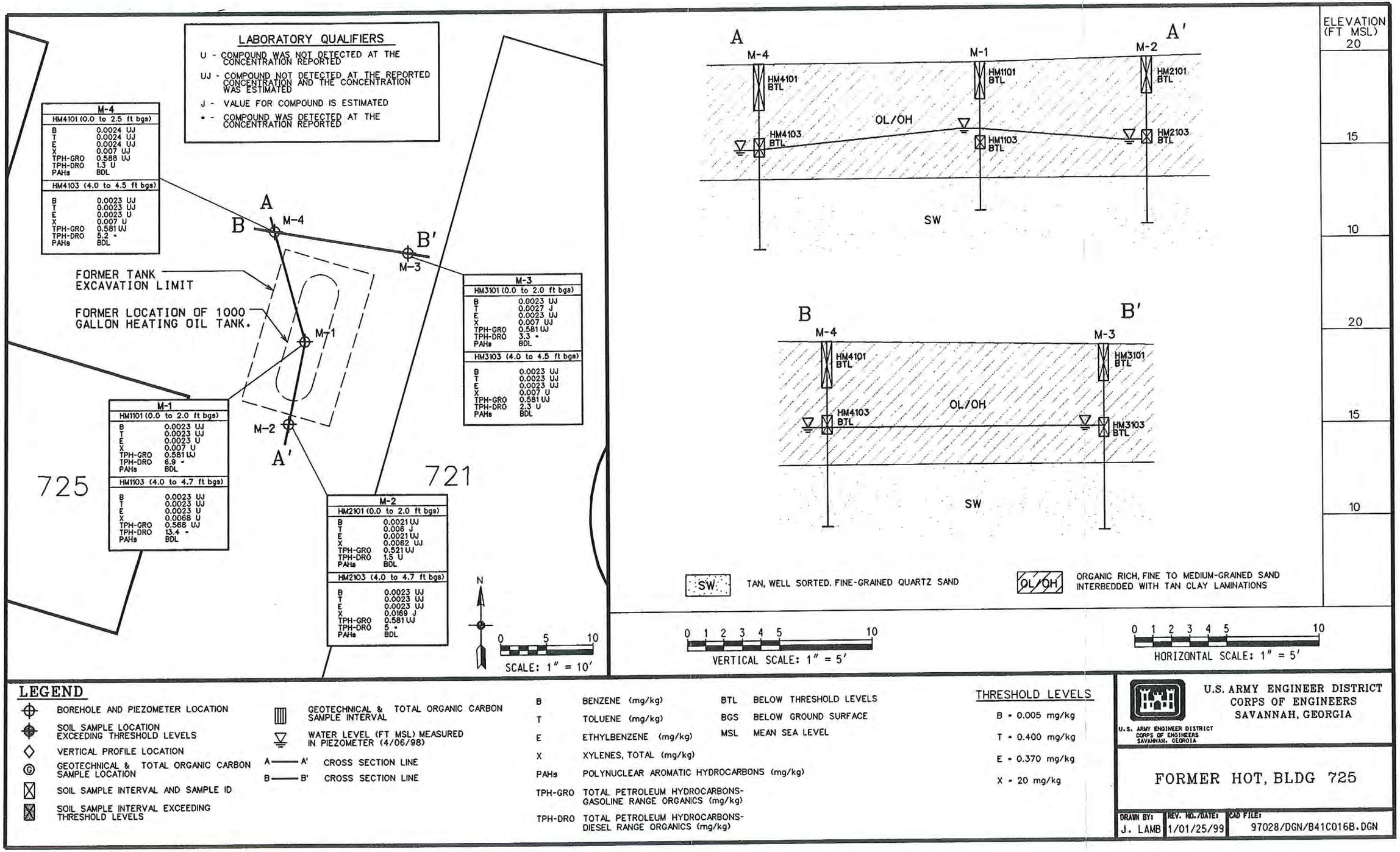


Figure 4. Soil Quality Map of the Former HOT, Building 725 Site

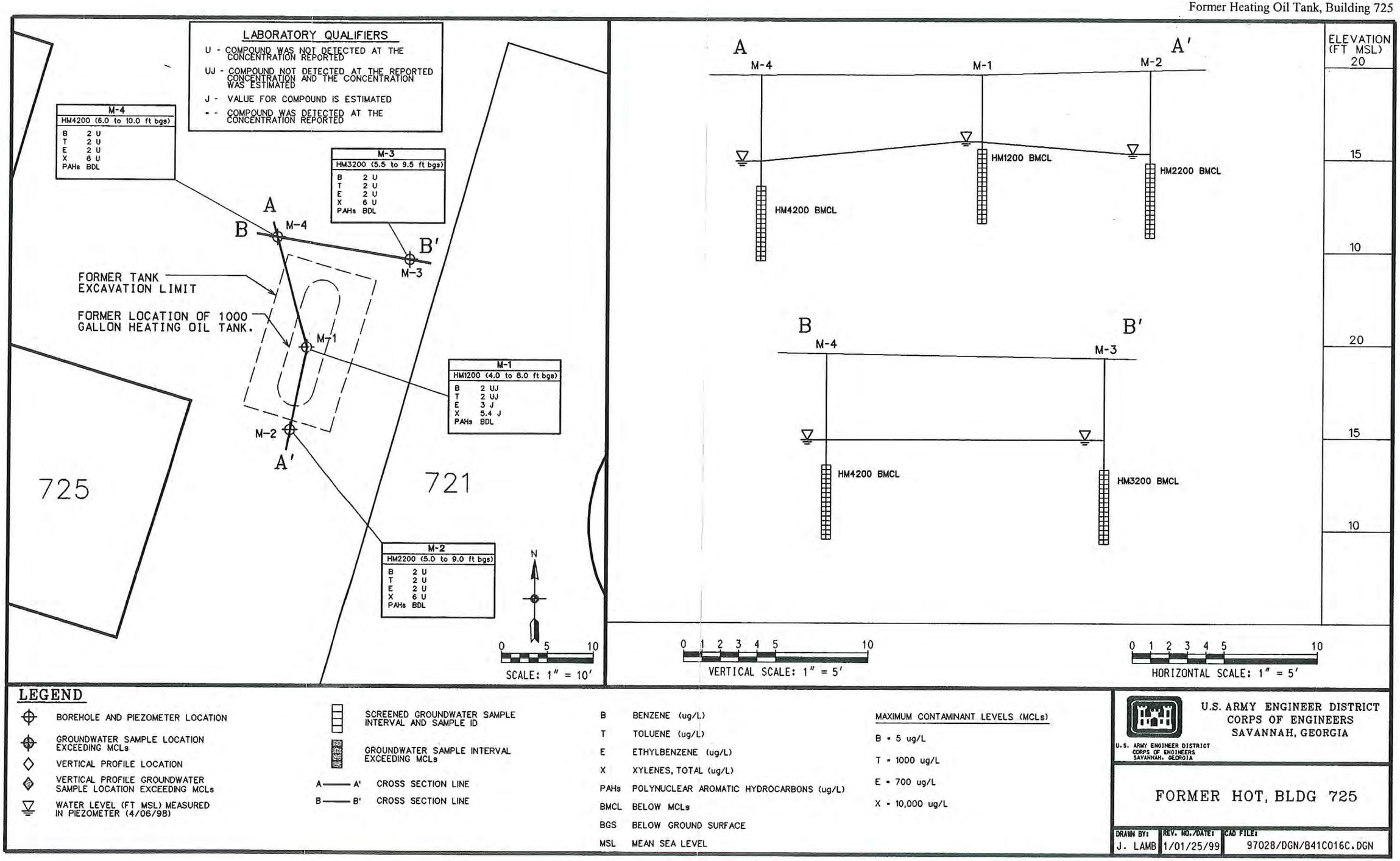


Figure 5. Groundwater Quality Map of the Former HOT, Building 725 Site

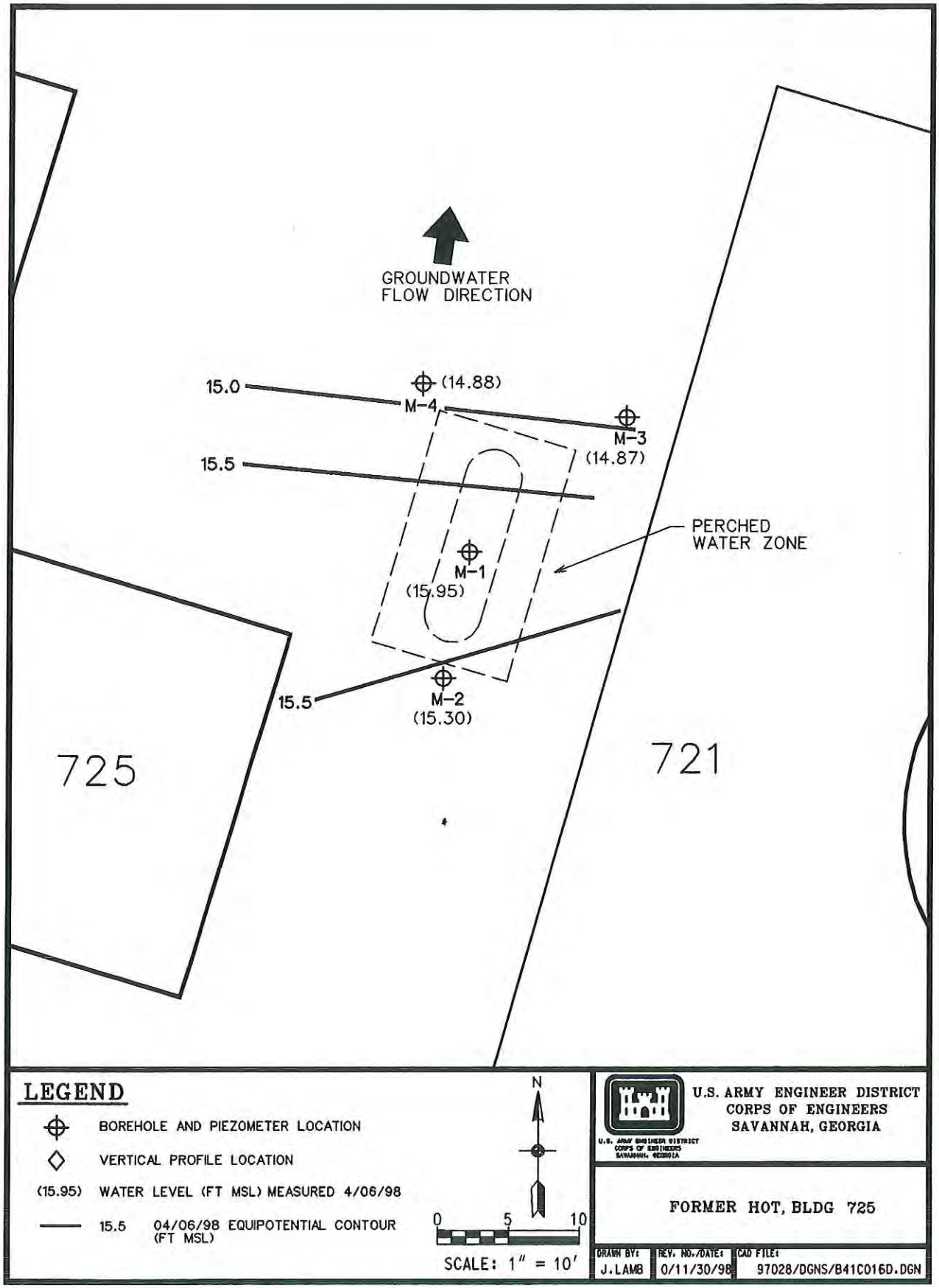


Figure 6. Potentiometric Surface Map of the Former HOT, Building 725 Site

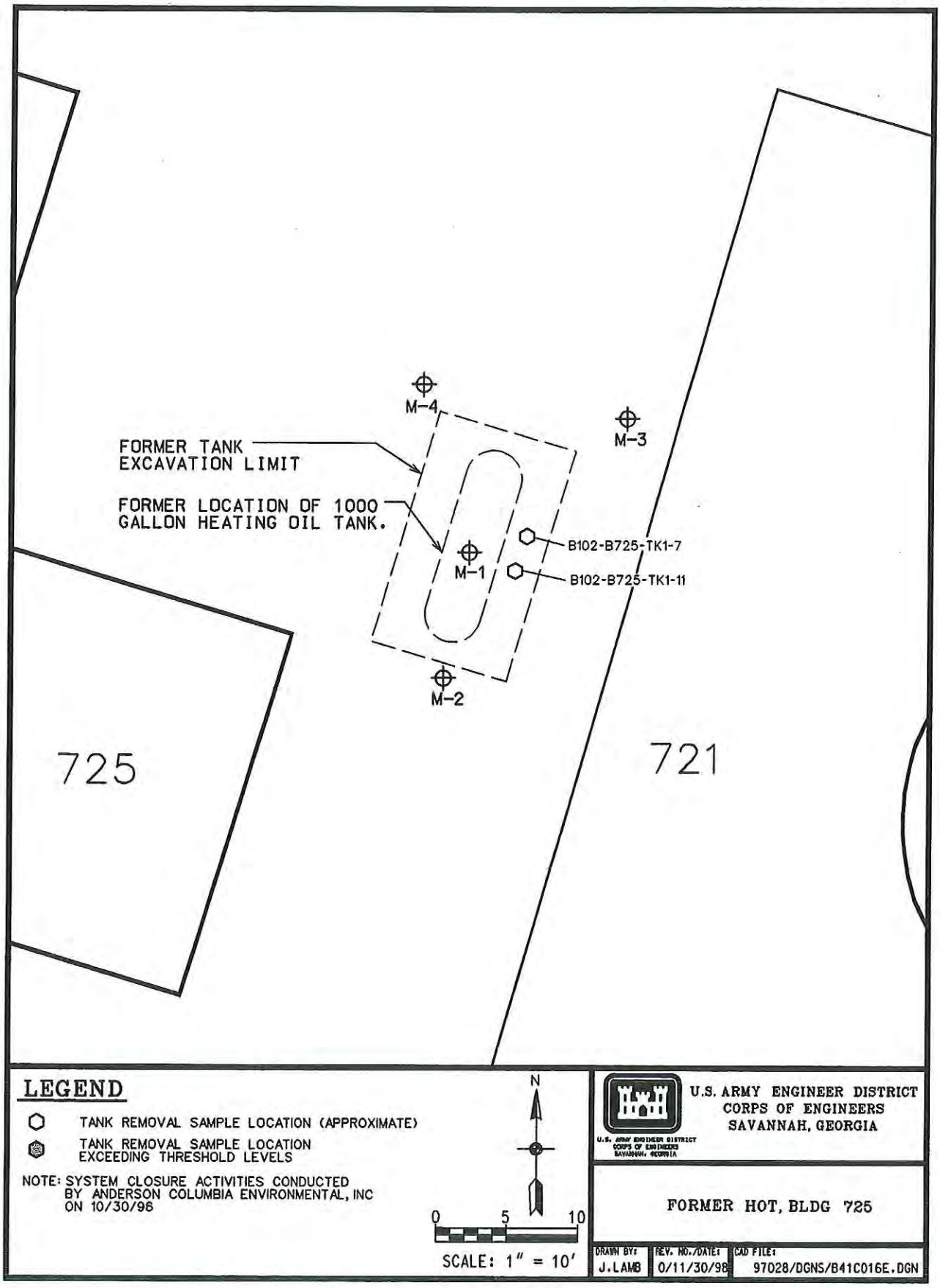


Figure 7. HOT System Closure Sampling Locations at the Former HOT, Building 725 Site

NOT APPLICABLE FOR THE FORMER HOT, BUILDING 725 SITE INVESTIGATION

Figure 8. Proposed Additional Boring/Monitoring Well Locations

THIS PAGE INTENTIONALLY LEFT BLANK

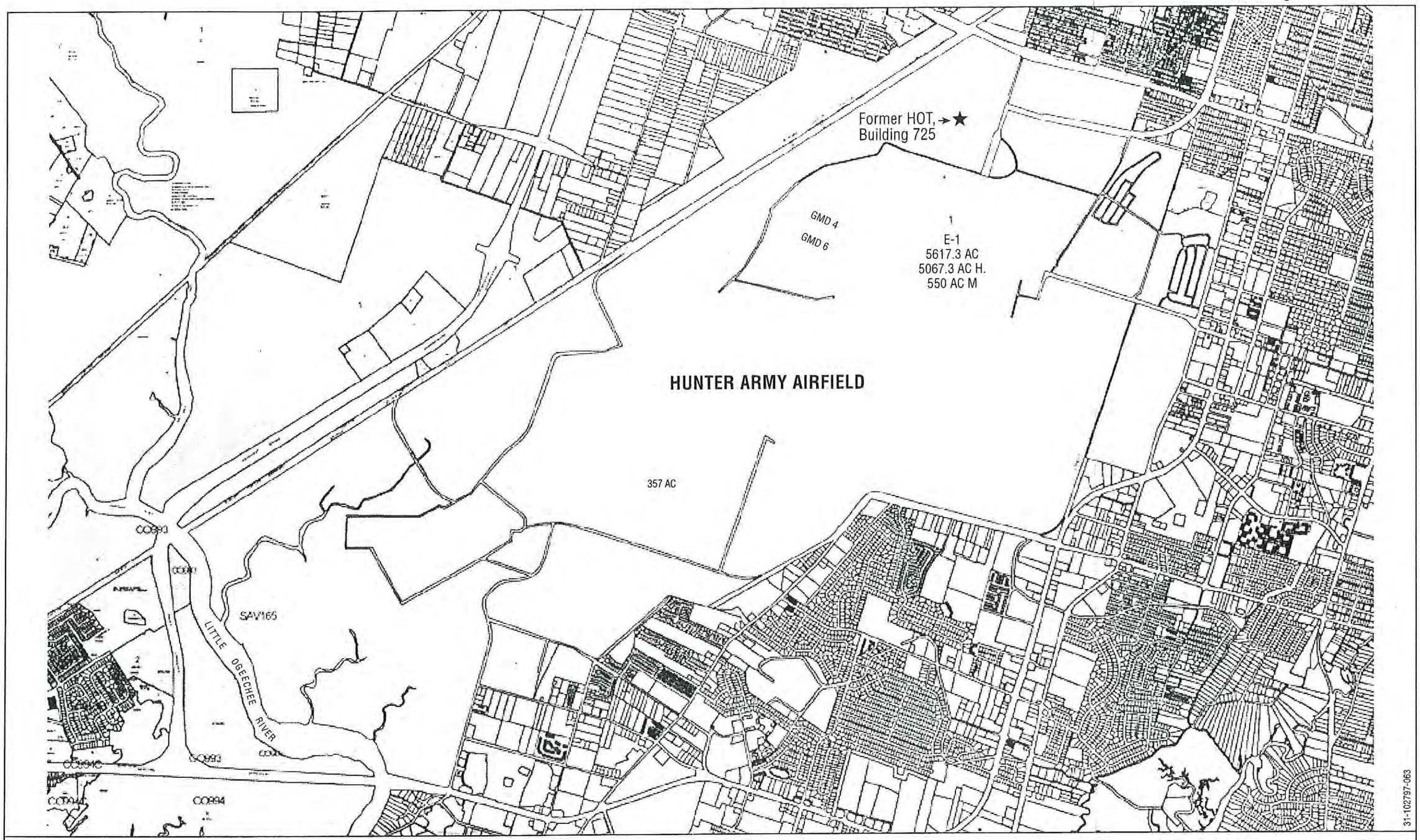


Figure 9. Tax Map of Hunter Army Airfield and Vicinity, Chatham County, Georgia

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX II

REPORT TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

Former HOT, Building 725
Hunter Army Airfield
Chatham County, Facility ID #: N/A

TABLE 1: FREE PRODUCT REMOVAL

Monitoring Well Number: N/A				
Date of Measurement	Groundwater Elev. (ft MSL)	Product Thickness (ft)	Corrected Water Elev. (ft MSL)	Product Removed (gal)
			TOTAL	NONE[1]

Monitoring Well Number: N/A				
Date of Measurement	Groundwater Elev. (ft MSL)	Product Thickness (ft)	Corrected Water Elev. (ft MSL)	Product Removed (gal)
			TOTAL	NONE[1]

NOTE: [1] Free product was not found.
MSL - mean sea level.

Former HOT, Building 725
Hunter Army Airfield
Chatham County, Facility ID #: N/A

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)
M-1	HM1101	0.0 to 2.0	04/02/98	0.0023 UJ	0.0023 UJ	0.0023 U	0.007 U	BDL	6.9 =	0.581 UJ
M-1	HM1103	4.0 to 4.7	04/02/98	0.0023 UJ	0.0023 UJ	0.0023 U	0.0068 U	BDL	13.4 =	0.568 UJ
M-2	HM2101	0.0 to 2.0	04/02/98	0.0021 UJ	0.006 J	0.0021 UJ	0.0062 UJ	0.006	1.5 U	0.521 UJ
M-2	HM2103	4.0 to 4.7	04/02/98	0.0023 UJ	0.0023 UJ	0.0023 UJ	0.0169 J	0.0169	5 =	0.581 UJ
M-3	HM3101	0.0 to 2.0	04/02/98	0.0023 UJ	0.0027 J	0.0023 UJ	0.007 UJ	0.0027	3.3 =	0.581 UJ
M-3	HM3103	4.0 to 4.5	04/02/98	0.0023 UJ	0.0023 UJ	0.0023 UJ	0.007 U	BDL	2.3 U	0.581 UJ
M-4	HM4101	0.0 to 2.5	04/02/98	0.0024 UJ	0.0024 UJ	0.0024 UJ	0.007 UJ	BDL	1.3 U	0.588 UJ
M-4	HM4103	4.0 to 4.5	04/02/98	0.0023 UJ	0.0023 UJ	0.0023 U	0.007 U	BDL	5.2 =	0.581 UJ
Applicable Standards[1]				0.005	0.400	0.370	20.00	NRC	NRC	NRC

NOTE:
[1] Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (Table A, column 1).
[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.**
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.

Former HOT, Building 725
Hunter Army Airfield
Chatham County, Facility ID #: N/A

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]	
M-1	HM1101	0.0 to 2.0	04/02/98						BDL[2]
M-1	HM1103	4.0 to 4.7	04/02/98						
M-2	HM2101	0.0 to 2.0	04/02/98						
M-2	HM2103	4.0 to 4.7	04/02/98						
M-3	HM3101	0.0 to 2.0	04/02/98						
M-3	HM3103	4.0 to 4.5	04/02/98						
M-4	HM4101	0.0 to 2.5	04/02/98						
M-4	HM4103	4.0 to 4.5	04/02/98						
Applicable Standards[1]									NRC

NOTE: [1]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column 1).

[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.

BGS - Below ground surface.

NRC - No regulatory criteria.

PAHs - Polynuclear aromatic hydrocarbons.

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.

Former HOT, Building 725
Hunter Army Airfield
Chatham County, Facility ID #: N/A

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)
M-1	HM1200	4.0 to 8.0	04/02/98	2 UJ	2 UJ	3 J	5.4 J	8.4
M-2	HM2200	5.0 to 9.0	04/02/98	2 U	2 U	2 U	6 U	BDL[2]
M-3	HM3200	5.5 to 9.5	04/02/98	2 U	2 U	2 U	6 U	BDL[2]
M-4	HM4200	6.0 to 10.0	04/02/98	2 U	2 U	2 U	6 U	BDL[2]
Applicable Standards[1]				5	1,000	700	10,000	NRC

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]	
M-1	HM1200	4.0 to 8.0	04/02/98					BDL[2]
M-2	HM2200	5.0 to 9.0	04/02/98					
M-3	HM3200	5.5 to 9.5	04/02/98					
M-4	HM4200	6.0 to 10.0	04/02/98					
Applicable Standards[1]								NRC

NOTE: [1] U.S. Environmental Protection Agency maximum contaminant level.
[2] BDL - Below detection limit; PAH/BTEX compounds were not detected above the laboratory detection limit. Refer to Appendix VIII, Table VIII-A, for complete list of PAH and BTEX 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.**
BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

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.

Former HOT, Building 725
Hunter Army Airfield
Chatham County, Facility ID #: N/A

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)
M-1	4/06/98	19.54	21.03	3.0 to 8.0	N/A	5.08	N/A	N/A	15.95
M-2	4/06/98	19.78	21.51	4.0 to 9.0	N/A	6.21	N/A	N/A	15.30
M-3	4/06/98	19.27	21.14	4.5 to 9.5	N/A	6.27	N/A	N/A	14.87
M-4	4/06/98	19.52	21.30	5.0 to 10.0	N/A	6.42	N/A	N/A	14.88

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

Former HOT, Building 725
Hunter Army Airfield
Chatham County, Facility ID#: N/A

TABLE 5a: HOT 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-DRO (mg/kg)	TPH-GRO (mg/kg)
8102-B725-TK1-7	7.0	10/30/96	BDL	BDL	BDL	BDL	BDL	13,200	N/A
8102-B725-TK1-11	11.0	10/30/96	BDL	BDL	BDL	BDL	BDL	79	N/A
Applicable Standards[2]			0.005	0.400	0.370	20.00	NRC	NRC	NRC

NOTE: [1]Heating Oil Tank system closure performed by Anderson Columbia Environmental, Inc. (1997).
[2] Georgia Department of Natural Resources Applicable Soil Threshold Levels (i.e., Table A, column 1).
BDL - Below detection limit. Analytical result/detection limit not provided.
BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NRC - No regulatory criteria.
TPH-DRO - Total petroleum hydrocarbons–diesel-range organics.
TPH-GRO - Total petroleum hydrocarbons–gasoline-range organics.

Former HOT, Building 725
Hunter Army Airfield
Chatham County, Facility ID #: N/A

TABLE 5b: HOT 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	Naphthalene	Phenanthrene	
8102-B725-TK1-7	7.0	10/30/96	47.60	12.00	5.01	64.61
8102-B725-TK1-11	11.0	10/30/96	BDL	BDL	BDL	BDL
Applicable Standards[2]			NRC	N/A[3]	N/A[3]	NRC

NOTE: [1]Heating Oil Tank system closure performed by Anderson Columbia Environmental, Inc. (1997).
[2]Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, column 1).
[3]Not applicable; the health-based threshold level is exceeded only if free product exists.
BDL - Below detection limit.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

Former HOT, Building 725
Hunter Army Airfield
Chatham County, Facility ID #: N/A

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

Sample Location	Depth (ft BGS)	Date Sampled	Benzene (mg/L)	Toluene (mg/L)	Ethyl - benzene (mg/L)	Xylenes (mg/L)	Total BTEX (mg/L)
N/A[2]							
Applicable Standards[3]			5	1,000	700	10,000	NRC

TABLE 6b: HOT 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[2]							
Applicable Standards[3]							NRC

NOTE: [1]Heating Oil Tank system closure performed by Anderson Columbia Environmental, Inc. (1997).
[2]Not applicable; groundwater samples were not collected.
[3]U.S. Environmental Protection Agency maximum contaminant levels.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

APPENDIX III

WATER RESOURCES SURVEY DOCUMENTATION

THIS PAGE INTENTIONALLY LEFT BLANK

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 from 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 3890 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 containing deep-well

information were used to document the subsurface geology and aquifer characteristics beneath the HAAF area.

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 5000 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 1000-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 5000-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 Figures 3a and 3c, 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 1477 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 FORMER HOT, BUILDING 725 SITE

A field potential receptor survey was conducted for the Former HOT, Building 725 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 Former HOT, Building 725 Site

The Former HOT, Building 725 site is located approximately 40 feet west (cross-gradient) of Well 1. Well 1 is located at Building 711 at the corner of Moore Road and Douglas Street, HAAF (Figure 3b, Appendix I). Therefore, the Former HOT, Building 725 site is classified as being located less than 500 feet to a withdrawal point. Well 1 is a public well that supplies water to 7,500 persons through 525 service connections. As part of the long-term monitoring program for the Former Building 710 site, Well 1 is being sampled on a quarterly basis.

Based on the estimated nature and extent of petroleum-related groundwater contamination at the site, there is no indication that Well 1 has been impacted (Figure 3b, Appendix I).

1.3.2 Surface Water Bodies Near the Former HOT, Building 725 Site

Lamar Canal, which flows southwest, is located approximately 1,200 feet west (cross-gradient) of the Former HOT, Building 725 site (Figures 3a and 3b). Based on the estimated nature and extent of petroleum-related groundwater contamination at the site, there is no indication that nearby surface water bodies (Figure 3b, Appendix I) have been impacted or that sewer lines, culverts, or any other utility lines could serve as preferential pathways for contaminants to surrounding surface water bodies or water supply wells. Therefore, collection and analyses of surface water samples were not conducted as part of the site investigation.

TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

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

TABLE III-A. WATER SUPPLY WELL INFORMATION PROVIDED BY THE FORT STEWART 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	1300	525	7500	Public
1205	2	1941	600	250	1300	525	7500	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	1000	Unk	Unk	Non-public
8464	10	Unk	Unk	Unk	Unk	N/A	N/A	Non-public

NOTE: DPW - Directorate of Public Works.
gpm - Gallons per minute.
N/A - Not applicable.
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	1006	300	1362	Unk	Unk	Public
6	Unk	750	240	1500	Unk	Unk	Public
9	Unk	710	267	2700	Unk	Unk	Public
13	Unk	1000	270	2200	Unk	Unk	Public
14	Unk	800	338	571	Unk	Unk	Public
15	Unk	414	252	1000	Unk	Unk	Public
23	Unk	639	320	1056	Unk	Unk	Public
25	Unk	540	287	1120	Unk	Unk	Public
27	Unk	550	321	1468	Unk	Unk	Public
42	Unk	550	260	2100	Unk	Unk	Public

NOTE: gpm - Gallons per minute.
TBD - To be determined.
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

THIS PAGE INTENTIONALLY LEFT BLANK

HTRW DRILLING LOG

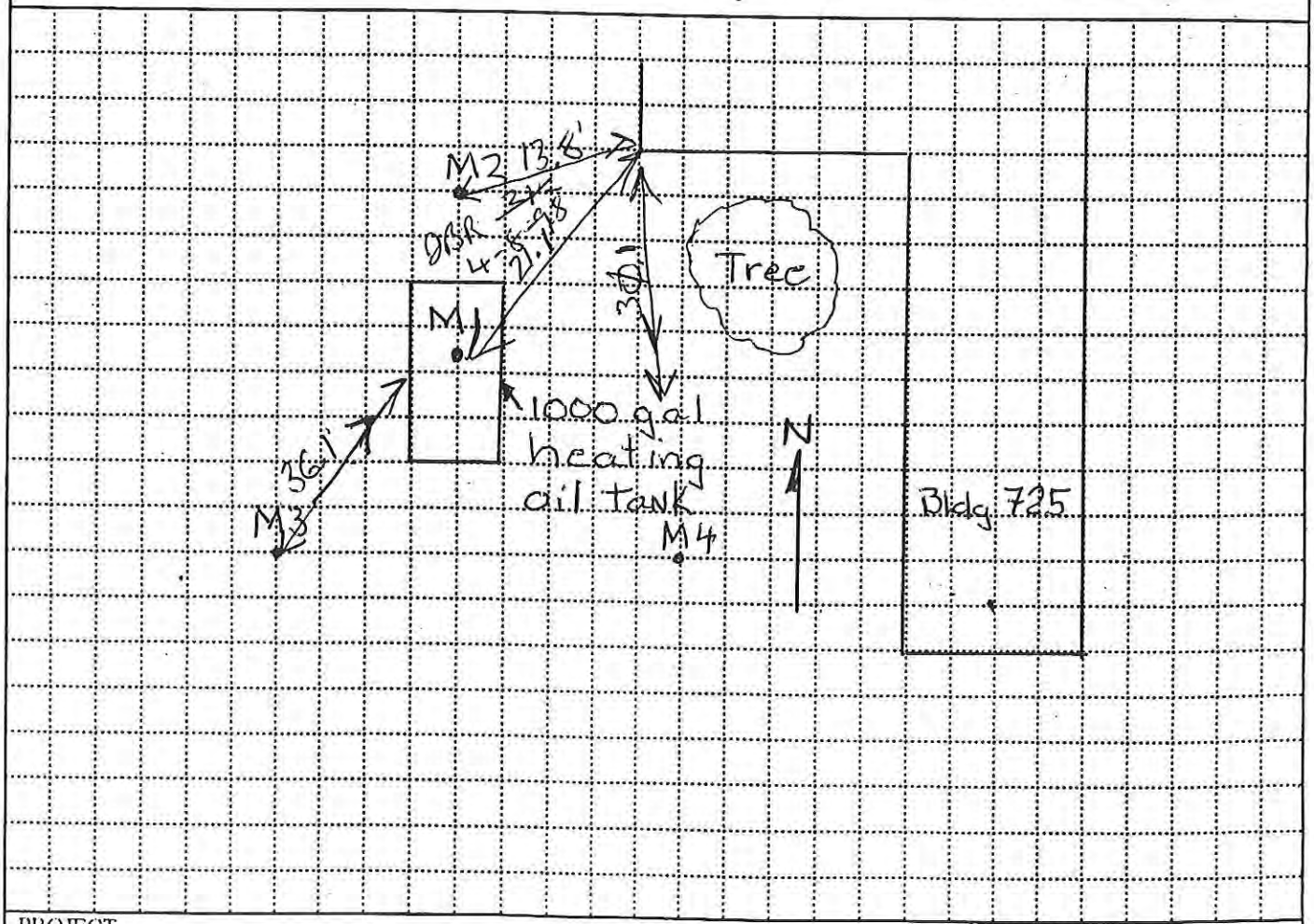
1 COMPANY NAME: SAIC	DISTRICT: USACE Savannah	HOLE NUMBER: M1
2 DRILL SUBCONTRACTOR: RE Wright (SAIC)		SHEET 1 OF 2
3. PROJECT: HAAF CAP Part A, UST Sites	4. LOCATION: Hunter AAF Bldg 725	
5. NAME OF DRILLER: John Hasselhoff	6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe, Salina, KA	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: acetate liner = 4' length; shoe to drive cap = 4.6' length; macrocore = 2" diam.; push rods = 3' and 4'; screen = 3.5' length	8. HOLE LOCATION: M1	
	9. SURFACE ELEVATION: TBD	
	10. DATE STARTED: 4-2-98	11. DATE COMPLETED: 4/2/98
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 4.7' 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: 8.0' 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	DRO OTHER (SPECIFY)	ERO OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
soil / water	2 / 1	2 / 1	2 / 0	2 / 0	NA	81

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

LOCATION SKETCH/COMMENTS — SCALE: NOT TO SCALE



PROJECT: Hunter AAF CAP Part A UST Sites

HOLE NO.: M1

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE (F)	
0	Ø to 4' @BR 4-2-98 Ø to .5' ~~gravely sand~~ Sandy organic OL/OH w gravel	Ø'-2' 157ØppM		HM11Ø1	Start ØB:1Ø end ØB:15 recov 2.5' drilled 4'
2	.5 to 2.5' OL/OH Sandy organic Soil grain size med to fine sand w buff colored clay layers .25' thick sub rounded grains plasticity med moist. cont. moist	2'to2.5' 145ppm			
4	WT 4'to8'	4'to4.7 610ppM			Start 8:20 End 8:25 full recovery drilled 4'
6	same as above contact (grad.) inorganic sand buff tan color fine gr. sand qtz. sand well sorted			HM122Ø (GW split) HM12ØØ (GW sample)	
8	10YR5/3 (buff tan) TD = 8.Ø				

PROJECT: HAAF - CAP Part A

HOLE NO: M1 Bldg. 725

HTRW DRILLING LOG

DISTRICT: USACE Savannah | M2 | SHEET 1 OF 2

1. COMPANY NAME: SAIC
2. DRILL SUBCONTRACTOR: RE Wright (SAIC)
3. PROJECT: Hunter AAB
4. LOCATION: Hunter AAB Bldg 725
5. NAME OF DRILLER: John Hosselhoff
6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe, Salina, KA
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" dia macrocore; acetate liner = 4' length; shoe to drive cap = 4.6' length; macrocore = 2" diam; push rods = 3' and 4'; screen = 3.5' length
8. HOLE LOCATION: M2
9. SURFACE ELEVATION: TBD
10. DATE STARTED: 4-2-98
11. DATE COMPLETED: 4/2/98
12. OVERBURDEN THICKNESS: NA
13. DEPTH DRILLED INTO ROCK: NA
14. TOTAL DEPTH OF HOLE: ~~8.0~~ BLS 9.0 ft
15. DEPTH GROUNDWATER ENCOUNTERED: 4.7 BLS
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: See water level log
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): See water level log
18. GEOTECHNICAL SAMPLES: NA
DISTURBED: NA
UNDISTURBED: NA
19. TOTAL NUMBER OF CORE BOXES: NA
20. SAMPLES FOR CHEMICAL ANALYSIS: soil / water

BTEX VOC	PAH METALS	OTHER (SPECIFY) DRO	OTHER (SPECIFY) GRO	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
2/1	2/1	2/0	2/0	NA	76

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

LOCATION SKETCH/COMMENTS — SCALE:

See Page 34
Logbook #9

PROJECT: Hunter AAF CAP Part A UST Sites
HOLE NO.: M2

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE (F)	
				HM21Ø1	Start Ø9:ØØ End Ø9Ø5 recov. 2.1' drilled 4'
2	Ø - 1.1' Sandy organic OL/OH w gravel 1.1' - 2.1' OL/OH Sandy organic soil grain size fine to med. w buff col. clay layers sub rounded grains plasticity med moist. content moist	Ø'-2' Ø ppm			
4		4' to 4.7' 73 ppm		HM21Ø3	start Ø9:1Ø end Ø9:15 recov 4.Ø' drilled 4'
	~~ wt ~~~ 4' to 8'				
6					
	contact (grad) inorganic sand buff tan color fine gr. sand quartz sand well sorted				
8	10YR 5/3 (buff tan)			HM22ØØ	water sample take at 5' to 9' BGS

PROJECT: HAAF- CAP Part A

HOLE NO: M2 Bldg 725

HTRW DRILLING LOG

DISTRICT: USACE Savannah
HOLE NUMBER: M3
SHEET 1 OF SHEETS 2

1. COMPANY NAME: SAIC
2. DRILL SUBCONTRACTOR: RE Wright (SAIC)
3. PROJECT: HAAF CAP Part A UST Sites
4. LOCATION: Hunter AAF
5. NAME OF DRILLER: John Hasselhoff
6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe, Salina, KA
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" dia macrocore acetate liner = 4' length
Shoe to drive cap = 4.6' length.
Macrocore = 2" diam. push rods 3' + 4'
Screen length = 3.5 ft
8. HOLE LOCATION: M3
9. SURFACE ELEVATION: TBD
10. DATE STARTED: 4-2-98
11. DATE COMPLETED: 4-2-98
12. OVERBURDEN THICKNESS: NA
13. DEPTH DRILLED INTO ROCK: NA
14. TOTAL DEPTH OF HOLE: ~~8.0' BLS~~ 4/6/98 9.5 ft BGS
15. DEPTH GROUNDWATER ENCOUNTERED: 4.5' BLS
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: See water level log
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): See water level log
18. GEOTECHNICAL SAMPLES: NA
DISTURBED: NA
UNDISTURBED: NA
19. TOTAL NUMBER OF CORE BOXES: NA

20. SAMPLES FOR CHEMICAL ANALYSIS	BTEX/VOC	TAL METALS	OTHER (SPECIFY) SPLP	OTHER (SPECIFY) SPLP	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
soil / water	2/1	2/1	2/0	2/0	NA	88

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

LOCATION SKETCH/COMMENTS

SCALE:

See Page 34
log book #9

PROJECT: Hunter AAF CAP Part A, UST Sites
HOLE NO.: M3

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

DEPTH (ft)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYT SAMPLE (F)	
0	Ø to .4' tree root			Ø to 2' HM31Ø1	Started 1Ø15 Finished 1Ø20
	.4' to 1.0' ~~ML Sandy Silt~~ ~~highly organic~~ organic gravely sand ~~1.0' to 1.4'~~ QBR 4-2-98 M poorly sorted damp low plasticity	Ø'-2' 98 ØppM QBR 4-2-98 ~~2'-4'~~ 2'-3' ØppM	NA NA		recov 3.0' drilled 4'
4	1.0' to 4.0' buff tan & dark grey sandy soil (with silt) Moist, soft, med plasticity ~~~~ Wt ~~~~	4' to 4.5' ØppM	NA	4' to 6' HM31Ø3	Start 10:25 Finished 10:36 recov full drilled 4'
	same as above				
	contact (grad)				
	inorganic sand buff tan color fine grain sand quartz sand well ~~graded~~ 4-2-98 sorted wet, soft low plasticity with roots		NA		
8	TD = 9.5 ft		NA	HM32ØØ	water sample taken from 5.5 - 9.5 ft BGS

PROJECT ~~HAAF~~ -CAP A UST Site Investigation. HOLE NO M-3

HTRW DRILLING LOG

DISTRICT: USACE Savannah

HOLE NUMBER: M4

SHEET 1 OF 2 SHEETS

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: RE Wright (SAIC)
3. PROJECT: HAAF CAP Part A UST Sites	4. LOCATION: Hunter AAF Bldg 725
5. NAME OF DRILLER: John Hasselhoff	6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe, Salina, KA
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" dia macrocore acetate liner length = 4'; shoe to drive cap. 4.6" length; push rods 3' + 4' length; screen = 3.5' length.	8. HOLE LOCATION: M4
	9. SURFACE ELEVATION: TBD
	10. DATE STARTED: 4-2-98 — 11. DATE COMPLETED: 4/2/98
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 5.0 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: ~~8.0 BLS~~ mistake 4/4/98 @ 10. 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	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
soil / water	2 / 1	PAH 2 / 1	GRO 2 / 0	DRO 2 / 0	NA	63

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

LOCATION SKETCH/COMMENTS — SCALE:

See Page 34

PROJECT: Hunter AAF CAP Part A — HOLE NO.: M4

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

UNIFIED SOIL CLASS (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE (F)	
	0	Ø to .5' gravel aggregate 7.5YR 2.5/1	Ø to 2.5' Ø ppm		Ø to 2' HM41Ø1	started 11:1Ø finished 11:15 2.5 recovery drilled 4'
		-5' to 1.Ø' No plasticity silty, Med. sand piece of coal				
		contact (grad) silty fine sand with ½" layers 7.5YR 4/3				
		silty clay contact (grad) same as above 7.5YR 2.5/2				
	4	4' to 6.5' silty Silty med. sand 7.5YR 2.5/1 WT OL/OH	4' to 5' Ø ppm		4 to 6 HM41Ø3	started 11:30 finished 11:34 2.5 recovery drilled 4'
					HM42ØØ	water sample taken from 6 to 10' BGS
	8	TD = 1Ø.Ø				

JBR 2.98

PROJECT: HAAF - CAP A UST Investigation

HOLE NO: MW.

APPENDIX V

SOIL LABORATORY REPORTS

THIS PAGE INTENTIONALLY LEFT BLANK

Former HOT, Building 725
Hunter Army Airfield
Chatham County

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

Location Sample ID Date Collected Depth (ft BGS)	Applicable Standards[1]	M-1 HM1101 04/02/98 0.0 to 2.0	M-1 HM1103 04/02/98 4.0 to 4.7	M-2 HM2101 04/02/98 0.0 to 2.0	M-2 HM2103 04/02/98 4.0 to 4.7	M-3 HM3101 04/02/98 0.0 to 2.0	M-3 HM3103 04/02/98 4.0 to 4.5	M-4 HM4101 04/02/98 0.0 to 2.5
VOCs	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	0.005	0.0023 UJ	0.0023 UJ	0.0021 UJ	0.0023 UJ	0.0023 UJ	0.0023 UJ	0.0024 UJ
Toluene	0.400	0.0023 UJ	0.0023 UJ	0.006 J	0.0023 UJ	0.0027 J	0.0023 UJ	0.0024 UJ
Ethylbenzene	0.370	0.0023 U	0.0023 U	0.0021 UJ	0.0023 UJ	0.0023 UJ	0.0023 UJ	0.0024 UJ
Xylenes	20.00	0.007 U	0.0068 U	0.0062 UJ	0.0169 J	0.007 UJ	0.007 U	0.007 UJ
TPH-DRO	NRC	6.9 =	13.4 =	1.5 U	5 =	3.3 =	2.3 U	1.3 U
TPH-GRO	NRC	0.581 UJ	0.568 UJ	0.521 UJ	0.581 UJ	0.581 UJ	0.581 UJ	0.588 UJ
PAHs	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2-Chloronaphthalene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Acenaphthene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Acenaphthylene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Anthracene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Benzo(a)anthracene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Benzo(a)pyrene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Benzo(b)fluoranthene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Benzo(g,h,i)perylene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Benzo(k)fluoranthene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Chrysene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Dibenzo(a,h)anthracene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Fluoranthene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Fluorene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Indeno(1,2,3-cd)pyrene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Naphthalene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Phenanthrene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U
Pyrene	N/A[2]	0.384 U	0.374 U	0.345 U	0.385 U	0.382 U	0.384 U	0.390 U

NOTE: [1]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column 1).
[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]	M-4 HM4103 04/02/98 4.0 to 4.5
VOCs	mg/kg	mg/kg
Benzene	0.008	0.0023 UJ
Toluene	6.00	0.0023 UJ
Ethylbenzene	10.00	0.0023 U
Xylenes	700.00	0.007 U
TPH-DRO	NRC	5.2 =
TPH-GRO	NRC	0.581 UJ
PAHs	mg/kg	mg/kg
2-Chloronaphthalene	N/A[2]	0.385 U
Acenaphthene	N/A[2]	0.385 U
Acenaphthylene	N/A[2]	0.385 U
Anthracene	N/A[2]	0.385 U
Benzo(a)anthracene	N/A[2]	0.385 U
Benzo(a)pyrene	N/A[2]	0.385 U
Benzo(b)fluoranthene	N/A[2]	0.385 U
Benzo(g,h,i)perylene	N/A[2]	0.385 U
Benzo(k)fluoranthene	N/A[2]	0.385 U
Chrysene	N/A[2]	0.385 U
Dibenzo(a,h)anthracene	N/A[2]	0.385 U
Fluoranthene	N/A[2]	0.385 U
Fluorene	N/A[2]	0.385 U
Indeno(1,2,3-cd)pyrene	N/A[2]	0.385 U
Naphthalene	N/A[2]	0.385 U
Phenanthrene	N/A[2]	0.385 U
Pyrene	N/A[2]	0.385 U

NOTE: [1]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column 1).
[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.

SAIC An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

CHAIN OF CUSTODY RECORD

COC NO.:

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	9804063-01 quick turnaround
HD21Ø1	Ø4/Ø1/98	145Ø	soil	X	X	X	X		2	>2ØØØ ppm	9804063-02 quick turnaround
HM11Ø1	Ø4/Ø2/98	Ø82Ø	soil	X	X	X	X		2	157Ø ppm	9804063-05
HM11Ø3	Ø4/Ø2/98	Ø83Ø	soil	X	X	X	X		2	61Ø ppm	06
HM21Ø1	Ø4/Ø2/98	Ø91Ø	soil	X	X	X	X		2	Ø ppm	07
HM21Ø3	Ø4/Ø2/98	Ø925	soil	X	X	X	X		2	73 ppm	08
HM31Ø1	Ø4/Ø2/98	1Ø25	soil	X	X	X	X		2	Ø ppm	09
HM31Ø3	Ø4/Ø2/98	1Ø35	soil	X	X	X	X		2	Ø ppm	10
HM41Ø3	Ø4/Ø2/98	1135	soil	X	X	X	X		2	Ø ppm	11
HM41Ø1	Ø4/Ø2/98	112Ø	soil	X	X	X	X		2	Ø ppm	12
HD12ØØ	Ø4/Ø1/98	135Ø	water	X					2	NA	9804064-01 quick turnaround
HD22ØØ	Ø4/Ø1/98	1445	water	X					2	NA	9804064-02 quick turnaround
HTBØØ1	Ø4/Ø1/98	19ØØ	water	X					2	NA	9804064-03 quick turnaround

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC	4/Ø2/98 1335	COMPANY NAME: GEL	4-2-98 1645	Cooler ID: 479	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME: SAIC	4/Ø2/98 1330	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	4/2/98 1645	COMPANY NAME:			

THIS PAGE INTENTIONALLY LEFT BLANK

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HM1101

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: 9804063-05

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2D105

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

% Moisture: not dec. 14 Date Analyzed: 04/06/98

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	UJ CϕS
108-88-3	Toluene	2.3	U	UJ CϕS
100-41-4	Ethylbenzene	2.3	U	U
1330-20-7	Xylenes (total)	7.0	U	U

FORM I VOA

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

HM1101

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: 9804063-05

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 4B30011

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

% Moisture: 14 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: 5.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	6.9	B	= F01, F08

FORM I SV

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

HM1101 ✓

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: 9804063-05

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1D507

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

% Moisture: not dec. 14 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	581 ~~60.1~~	J	UJ F01,F04,G02

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HM1101

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: 9804063-05
Sample wt/vol: 30.3 (g/mL) G
Lab File ID: I0421
Level: (low/med) LOW
Date Received: 04/02/98
% Moisture: 14 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	384	U
91-58-7	2-chloronaphthalene	384	U
208-96-8	acenaphthylene	384	U
83-32-9	acenaphthene	384	U
86-73-7	fluorene	384	U
85-01-8	phenanthrene	384	U
120-12-7	anthracene	384	U
206-44-0	fluoranthene	384	U
129-00-0	pyrene	384	U
56-55-3	benzo(a)anthracene	384	U
218-01-9	chrysene	384	U
205-99-2	benzo(b)fluoranthene	384	U
207-08-9	benzo(k)fluoranthene	384	U
50-32-8	benzo(a)pyrene	384	U
193-39-5	indeno(1,2,3-cd)pyrene	384	U
53-70-3	dibenz(a,h)anthracene	384	U
191-24-2	benzo(g,h,i)perylene	384	U

U

FORM I SV-1 OLM03.C

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HM1103

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: 9804063-06

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2D106

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

% Moisture: not dec. 12 Date Analyzed: 04/06/98

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	UJ	C@S
108-88-3	Toluene	2.3	U	UJ	C@S
100-41-4	Ethylbenzene	2.3	J	U	
1330-20-7	Xylenes (total)	6.8	U	U	

FORM I VOA

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

HM1103

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: 9804063-06

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 4B30014

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

% Moisture: 12 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: 2.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	13.4	B	= FØ1, FØ8

FORM I SV

FORM I Science Applications02-APR-1998 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

HX1103 ✓

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: 9804063-06

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1D3021

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

% Moisture: not dec. 12 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	568	U	U5 G02,C05

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HM1103

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: 9804063-06

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 10422

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

% Moisture: 12 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	374	U
91-58-7	2-chloronaphthalene	374	U
208-96-8	acenaphthylene	374	U
83-32-9	acenaphthene	374	U
86-73-7	fluorene	374	U
85-01-8	phenanthrene	374	U
120-12-7	anthracene	374	U
206-44-0	fluoranthene	374	U
129-00-0	pyrene	374	U
56-55-3	benzo(a)anthracene	374	U
218-01-9	chrysene	374	U
205-99-2	benzo(b)fluoranthene	374	U
207-08-9	benzo(k)fluoranthene	374	U
50-32-8	benzo(a)pyrene	374	U
193-39-5	indeno(1,2,3-cd)pyrene	374	U
53-70-3	dibenz(a,h)anthracene	374	U
191-24-2	benzo(g,h,i)perylene	374	U

u

FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HM2101

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: 9804063-07

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2C7013

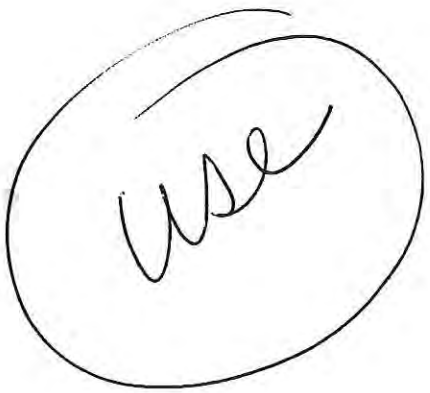
Level: (low/med) LOW Date Received: 04/02/98

% Moisture: not dec. 4 Date Analyzed: 04/05/98

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	2.1	U	UJ C05, K01
108-88-3	Toluene	6.0		J K01
100-41-4	Ethylbenzene	2.1	U	UJ K01
1330-20-7	Xylenes (total)	6.2	U	UJ K01



FORM I VOA

33

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

HM21C1

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: 9804063-07

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 4B30015

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

% Moisture: 4 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	1.5	B	U FD1, FD7

FORM I SV

FORM 1 VOLATILE ORGANICS ANALYSIS DATA SHEET

Science Applications02-APR-1998 SA

HM2101 ✓

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: 9804063-07

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1D3022

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

% Moisture: not dec. 4 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	521	U UJ G02, C05

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HM2101

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: 9804063-07
Sample wt/vol: 30.2 (g/mL) G Lab File ID: 10423
Level: (low/med) LOW Date Received: 04/02/98
% Moisture: 4 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	345	U
91-58-7	2-chloronaphthalene	345	U
208-96-8	acenaphthylene	345	U
83-32-9	acenaphthene	345	U
86-73-7	fluorene	345	U
85-01-8	phenanthrene	345	U
120-12-7	anthracene	345	U
206-44-0	fluoranthene	345	U
129-00-0	pyrene	345	U
56-55-3	benzo(a)anthracene	345	U
218-01-9	chrysene	345	U
205-99-2	benzo(b)fluoranthene	345	U
207-08-9	benzo(k)fluoranthene	345	U
50-32-8	benzo(a)pyrene	345	U
193-39-5	indeno(1,2,3-cd)pyrene	345	U
53-70-3	dibenz(a,h)anthracene	345	U
191-24-2	benzo(g,h,i)perylene	345	U

FORM I SV-1 OLM03.0