

FINAL



FORSKOM

CORRECTIVE ACTION PLAN

Part A



3d Inf Div (Mech)

**Former Heating Oil Tank (HOT)
Building 8593-1
Hunter Army Airfield, Georgia**

Prepared for



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT**

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

September 1998



DOCUMENT 15

FINAL

**CORRECTIVE ACTION PLAN - PART A REPORT
FOR
FORMER HEATING OIL TANK (HOT)
BUILDING 8593-1
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**

September 1998

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List of Abbreviations and Acronyms

| | |
|------|--|
| 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 | data 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 |
| OES | Omega Environmental Services, Inc. |
| OVN | organic vapor meter |
| PAH | polynuclear aromatic hydrocarbon |
| 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

Former Heating Oil Tank,

Facility Name: Building 8593-1 Street Address: Perimeter Rd., Hunter AAF

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

Latitude: 32°01'03" Longitude: 81°09'28"

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: 9-8-98



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 8593-1 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)

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

FORMER UST SYSTEMS (if applicable)

| <u>Tank ID Number</u> | <u>Capacity (gal)</u> | <u>Substance Stored</u> | <u>Date Removed</u> |
|-----------------------|-----------------------|-------------------------|---------------------|
| N/A | 3,000 | fuel oil | January 15, 1997 |

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 January 15, 1997, by Omega Environmental Services (OES). After removal of the Former HOT and ancillary piping, five soil samples were collected from the tank pit (Figure 7). Four soil samples (OES-N-1, OES-S-1, OES-E-1, and OES-W-4) were collected from native soil at the Former HOT excavation base approximately 10 feet below ground surface (BGS), and one soil sample (OES-PL-1) was collected adjacent to product lines at 3 feet BGS (OES 1997). Soil sample OES-N-1 contained benzene and total petroleum hydrocarbons (TPH) above applicable soil threshold levels (Table 5a).

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 OES, no holes in the tank were reported. Therefore, the source of contamination is believed to have been piping leakage and/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: 840 feet

ii. Nearest down-gradient public water supply located within: 10,611 feet

iii. Nearest non-public water supply located within: 5,040 feet

iv. Nearest down-gradient non-public water supply located within: >9,000 feet

c. Surface Water Bodies and sewers:

i. Nearest public water supply located within: 150 feet

ii. Nearest down-gradient surface water located within: 750 feet

iii. Nearest storm or sanitary sewer located within: 92 feet

iv. Depth to bottom of sewer at a point nearest the plume: N/A 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. 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); total petroleum hydrocarbon (TPH) gasoline-range organics/diesel-range organics (GROs/DROs); and polynuclear aromatic hydrocarbon (PAH). 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 water table. 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 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, one groundwater sample was collected from a depth of approximately 5.0 feet below the water table using a direct-push sampling device. At the vertical profile location, discrete groundwater samples were collected every 10 feet below the water table down to approximately 40 feet BGS (the estimated depth of the Hawthorn confining unit). Although the Hawthorn was not encountered at 40 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 PAH. 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:* 4.59 to 8.71 (Table 4: Groundwater Elevations)
b. *Groundwater Flow Direction:* southeast (Figure 6: Potentiometric Surface Map)
c. *Hydraulic Gradient:* 0.006 feet/foot
d. *Geophysical Province:* Coastal Plain
e. *Unique geologic/hydrogeological conditions:* The surficial clayey sand unit at Building 8593-1 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.

OES removed the Former HOT on January 15, 1997. The piping was drained into the tank, and all fuel oil was subsequently removed using a vacuum truck and/or compressor-driven barrel vacuum device. A backhoe was used to excavate down to the tank top. All lines were capped except the fill and vent. 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 .50 cubic yards of soil removed from the Building 8593-1 site were segregated using a photoionization detector (PID) and stockpiled at the OES 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: 10
(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 8593-1 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 8593-1 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

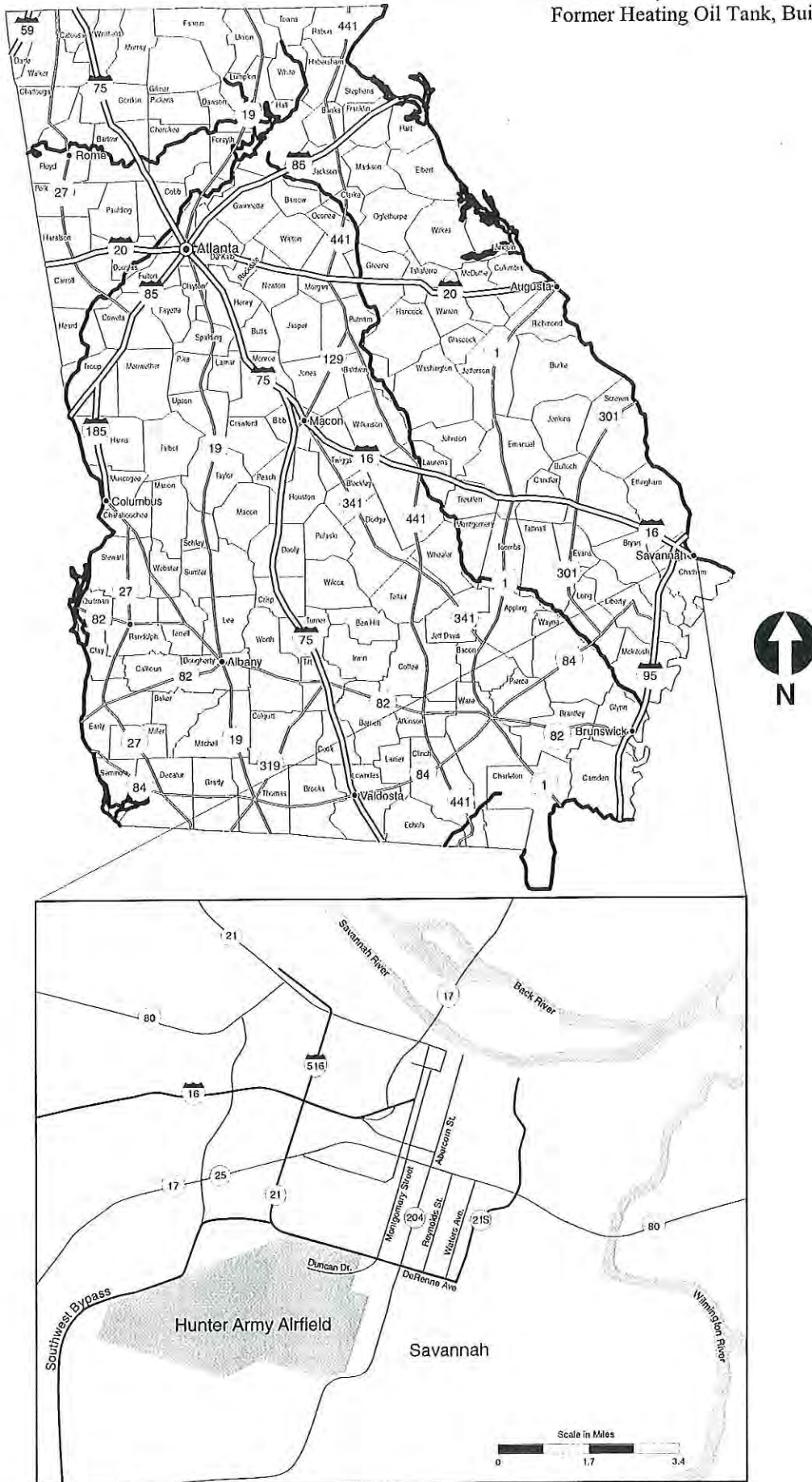
(Appendix XII: GUST Trust Fund Reimbursement Application and Claim for reimbursement)

The HAAF is a federally owned facility and has funded the investigation for the Former HOT, Building 8593-1 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

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

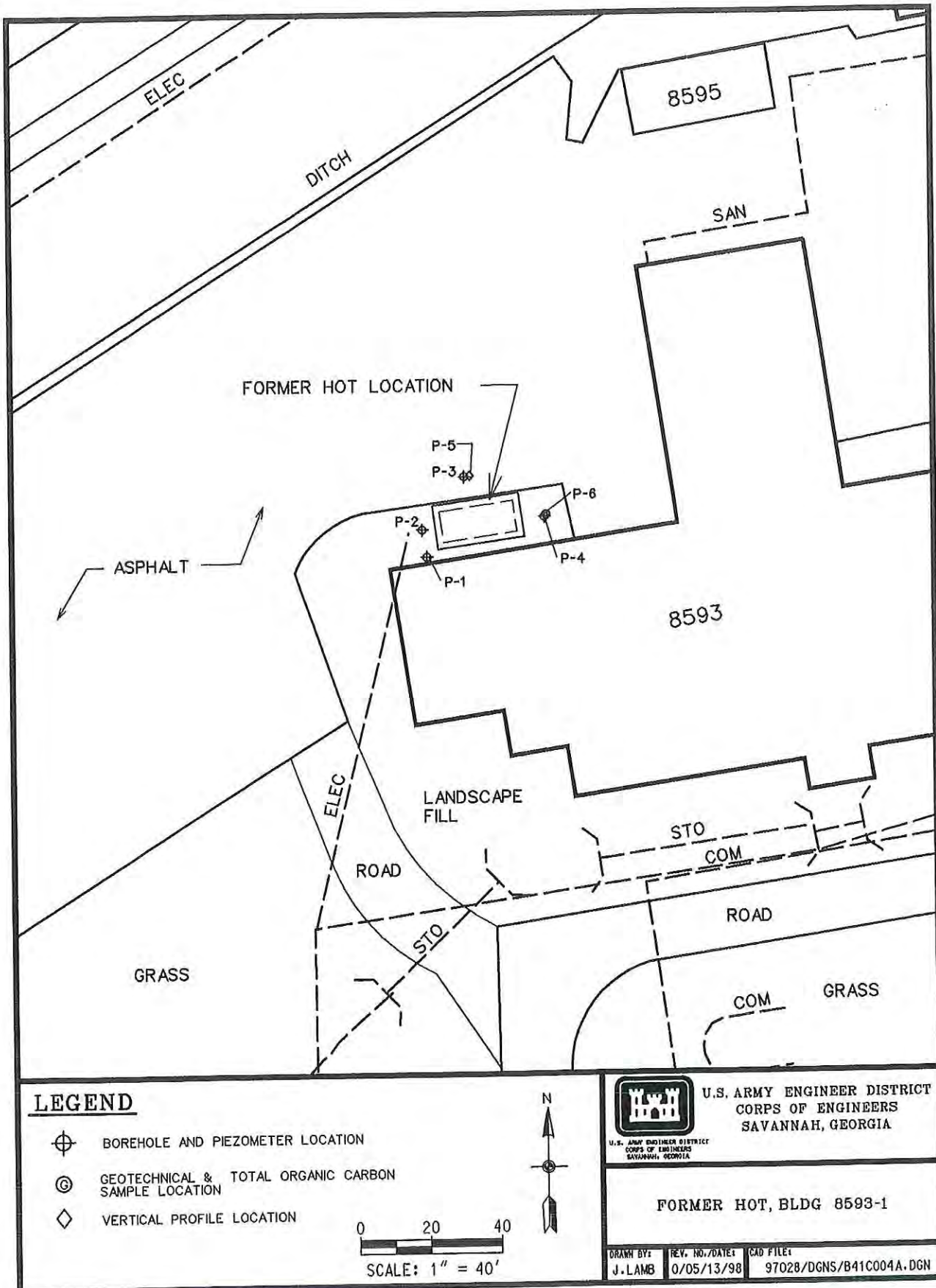
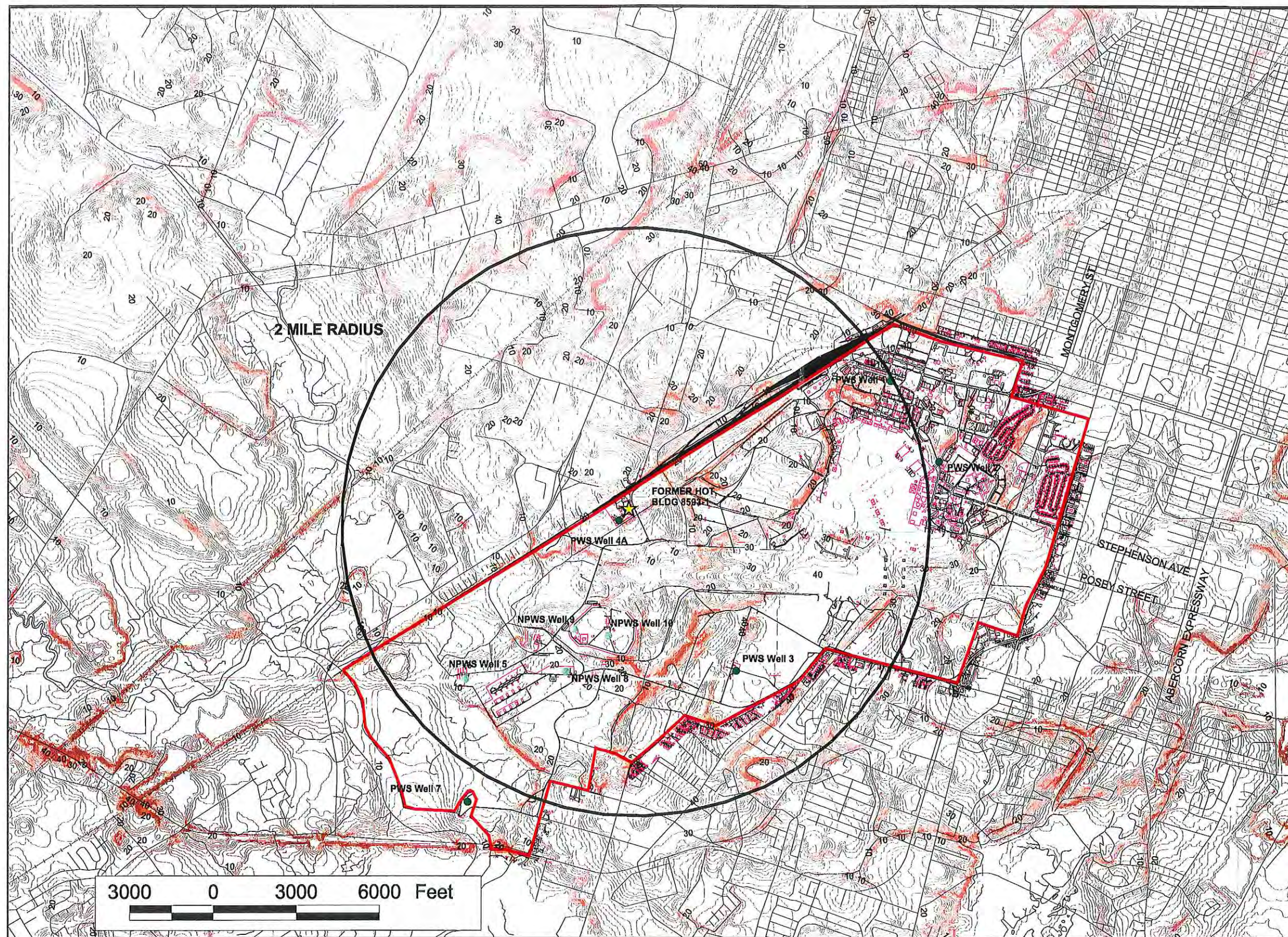


Figure 2. Site Plan for the Former HOT, Building 8593-1 Site Investigation



Legend:

- Hunter Army Airfield Boundary
- ~ Surface Water (streams/rivers/drains)
- Railroad
- Roads (primary)
- Buildings and Planimetric Features
- Ground Contour (1 FT Intervals)
- NPWS= Non-Public Water Supply
- PWS= Public Water Supply

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 minute Topographic Quad sheets: Burroughs, 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.



GA State Plane NAD83 (feet)

SAIC
Science Applications
International Corporation

**FORMER HOT,
BLDG 8593-1**

| REVISION | DRAWN BY: | CHKD BY: | DATE: |
|----------|-----------|-----------|---------|
| 0 | M.Norris | A. Bailey | 9/04/98 |
| | | | |
| | | | |
| | | | |

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

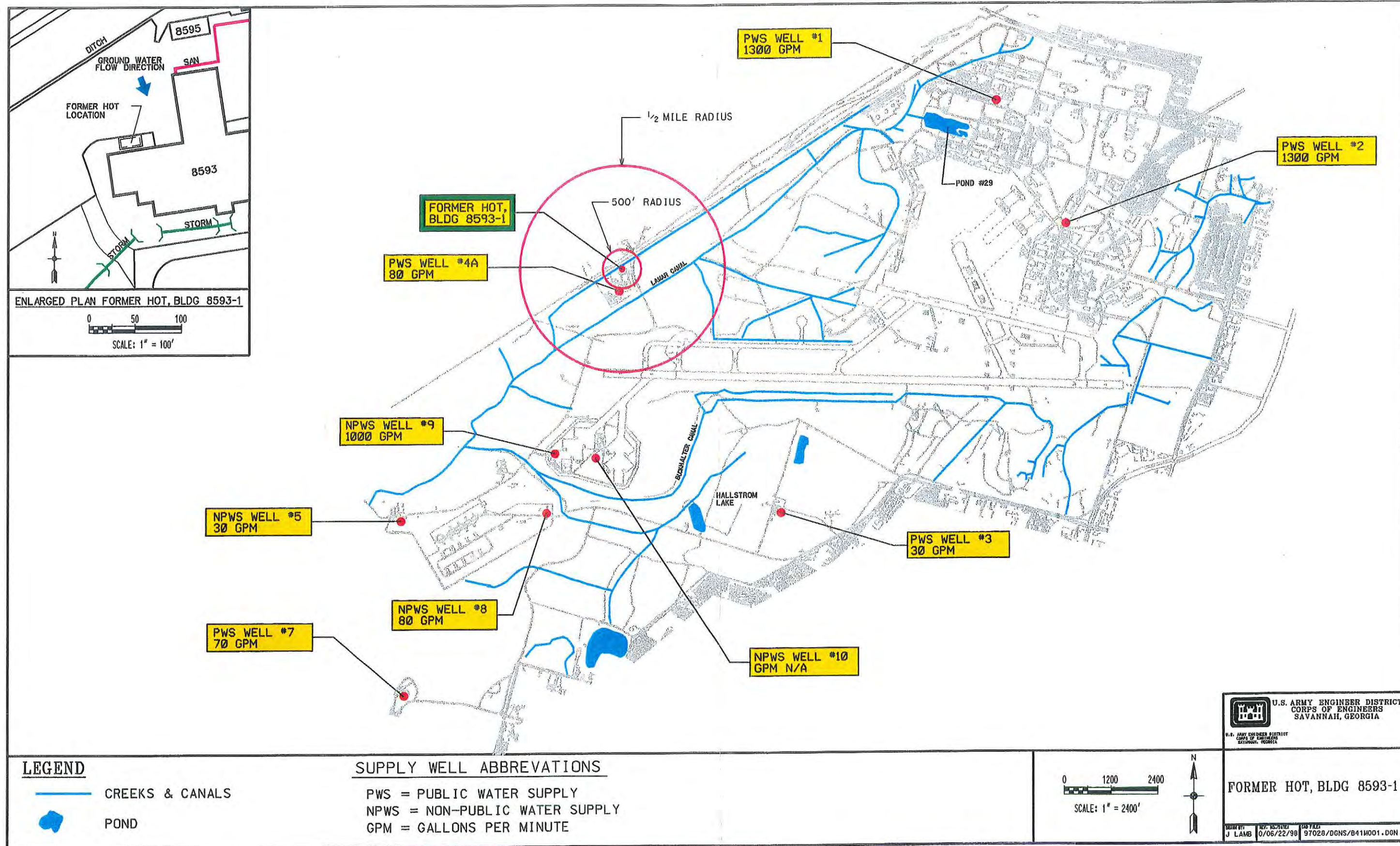


Figure 3b. Detailed Map Showing Public and Private Drinking Water Sources and Surface Water Bodies at Hunter Army Airfield

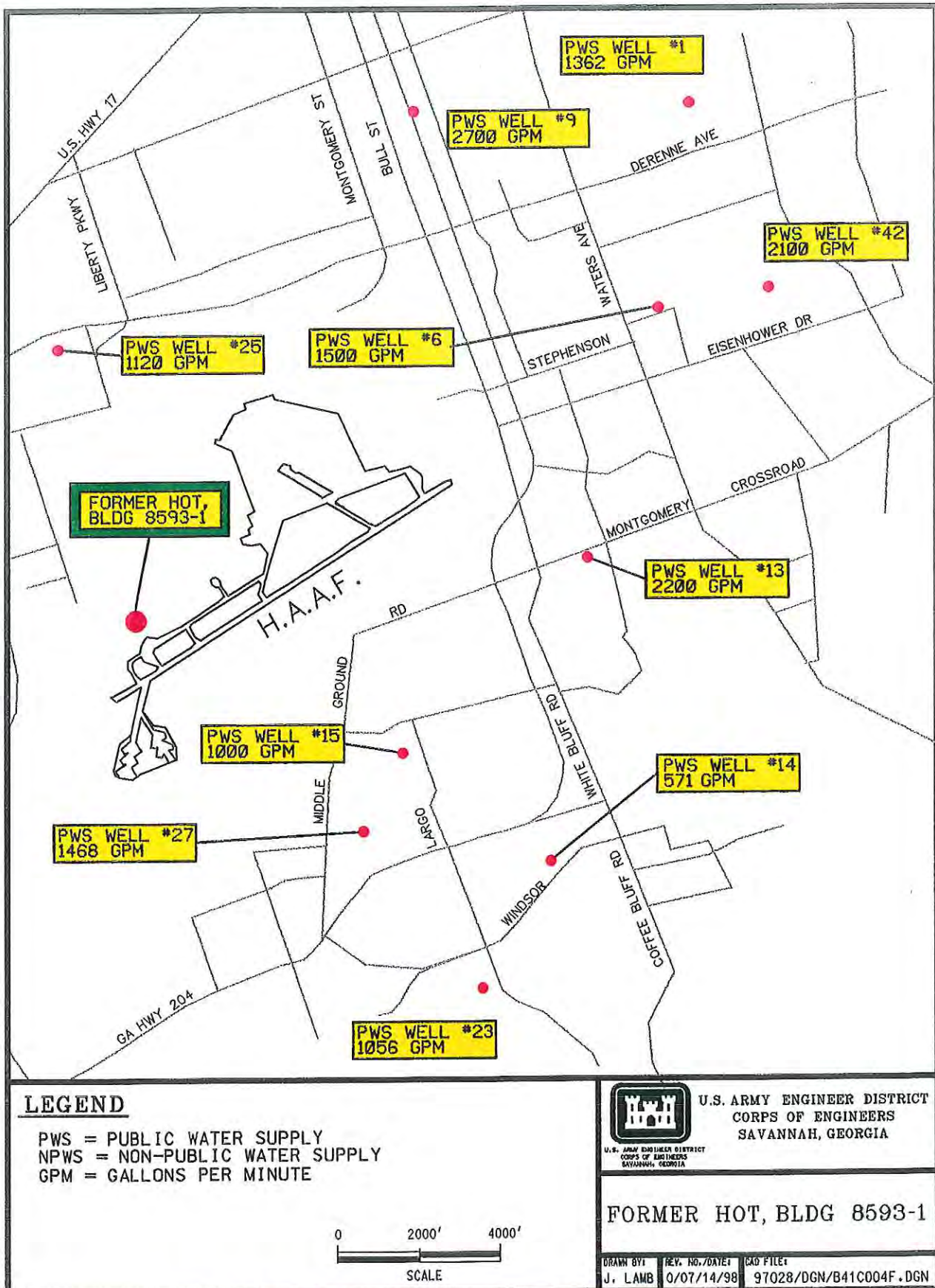


Figure 3c. Detailed Map Showing Public and Private Drinking Water Sources in Areas Adjacent to Hunter Army Airfield

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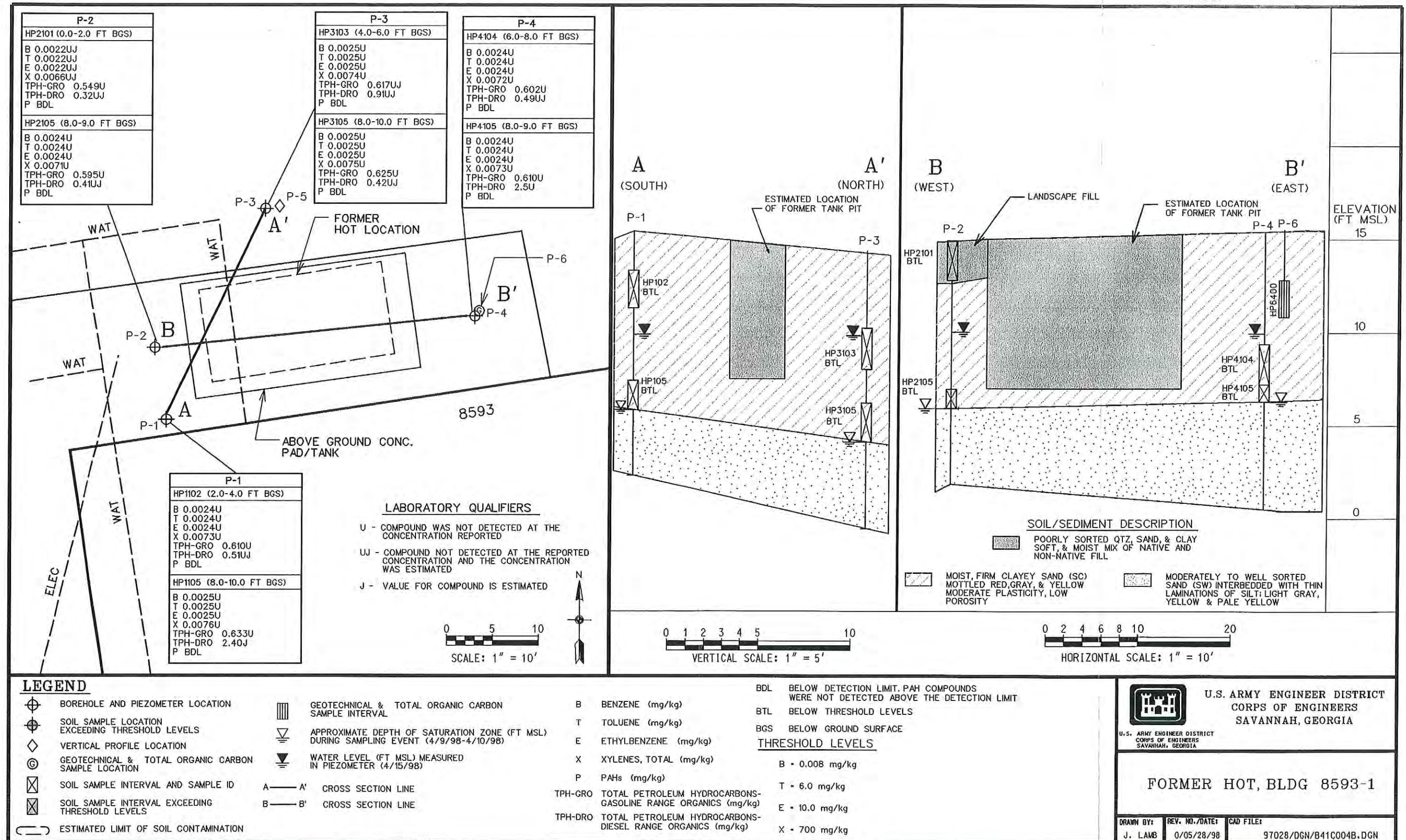


Figure 4. Soil Quality Map of the Former HOT, Building 8593-1 Site

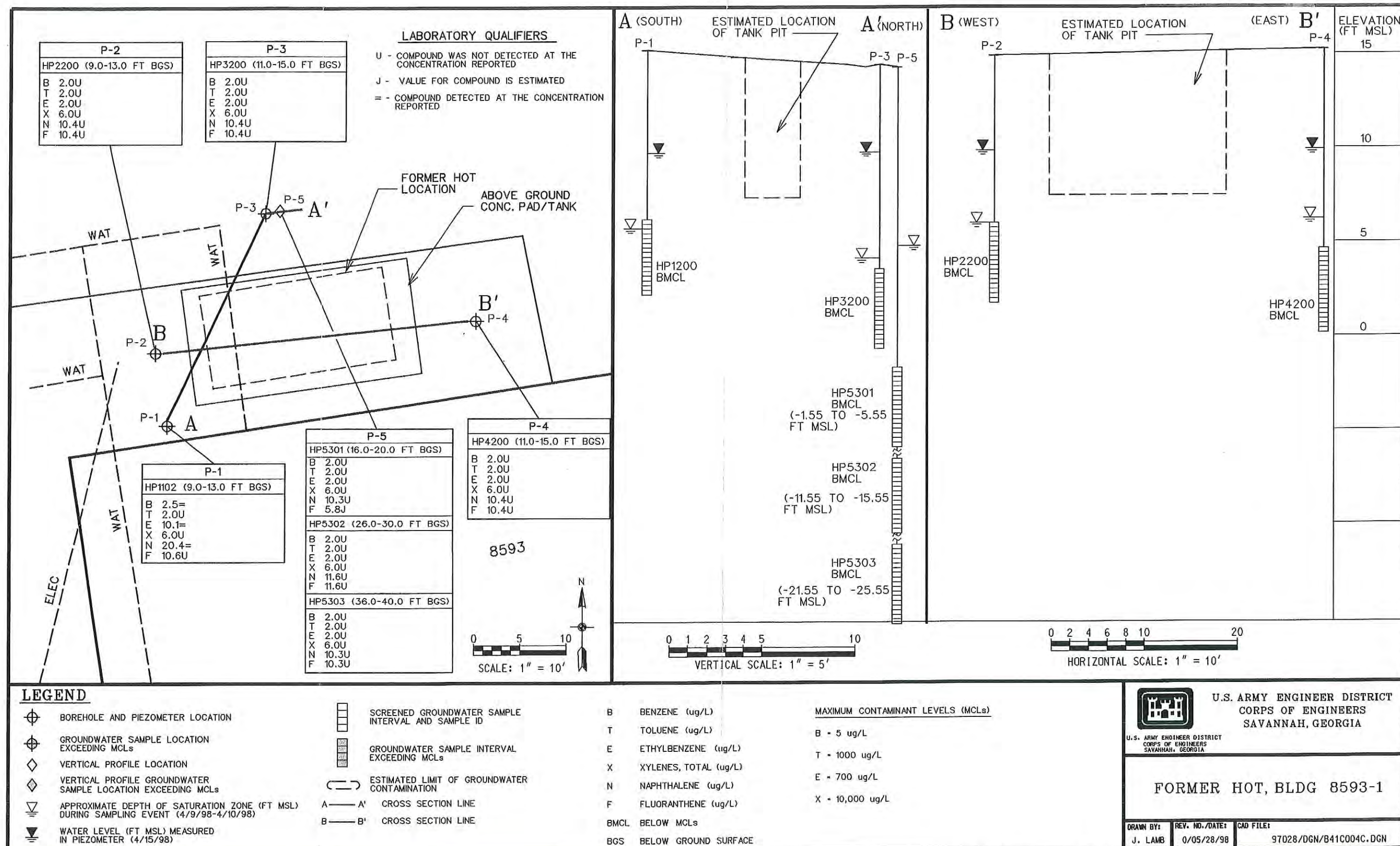


Figure 5. Groundwater Quality Map of the Former HOT, Building 8593-1 Site

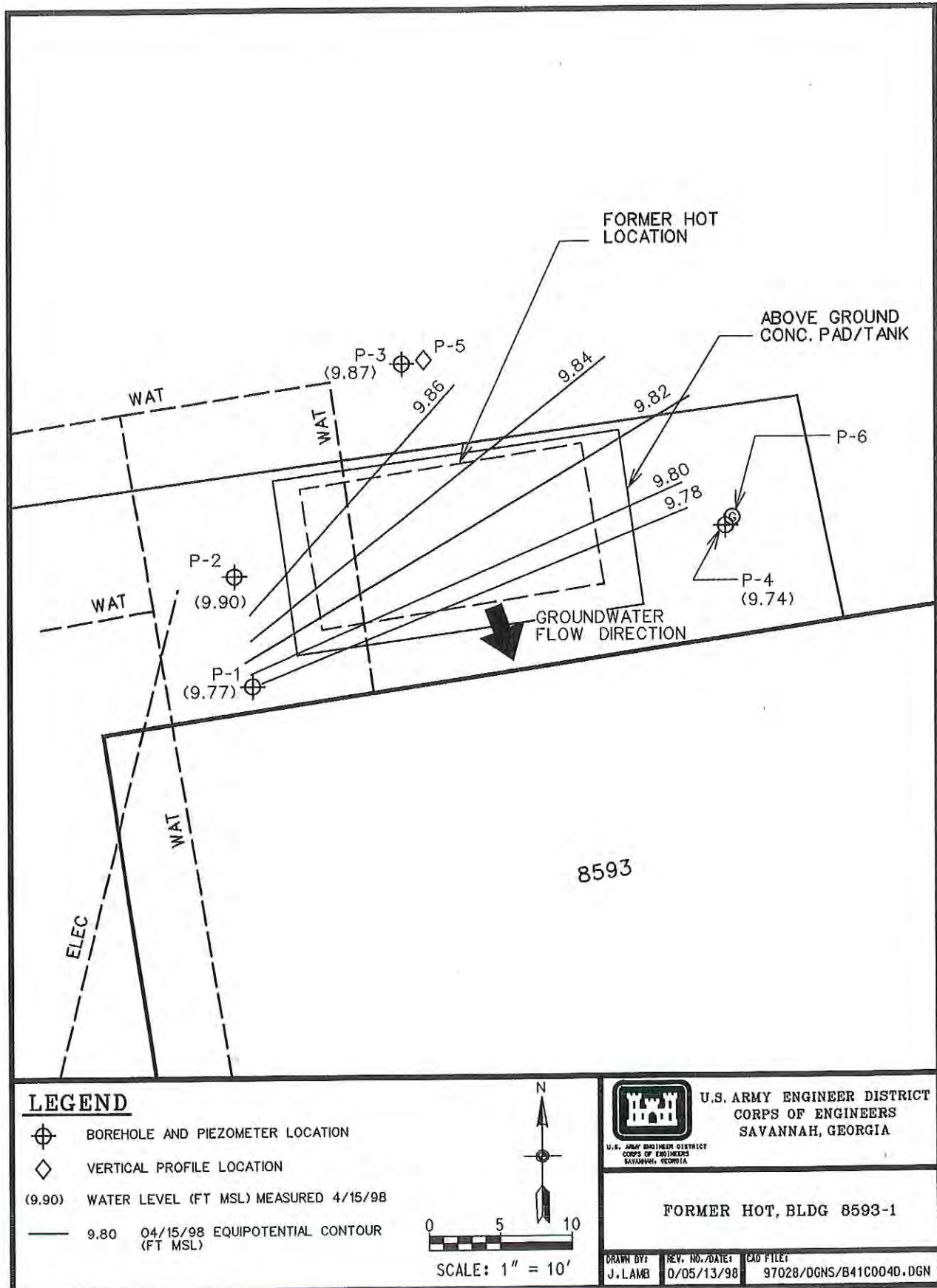


Figure 6. Potentiometric Surface Map of the Former HOT, Building 8593-1 Site

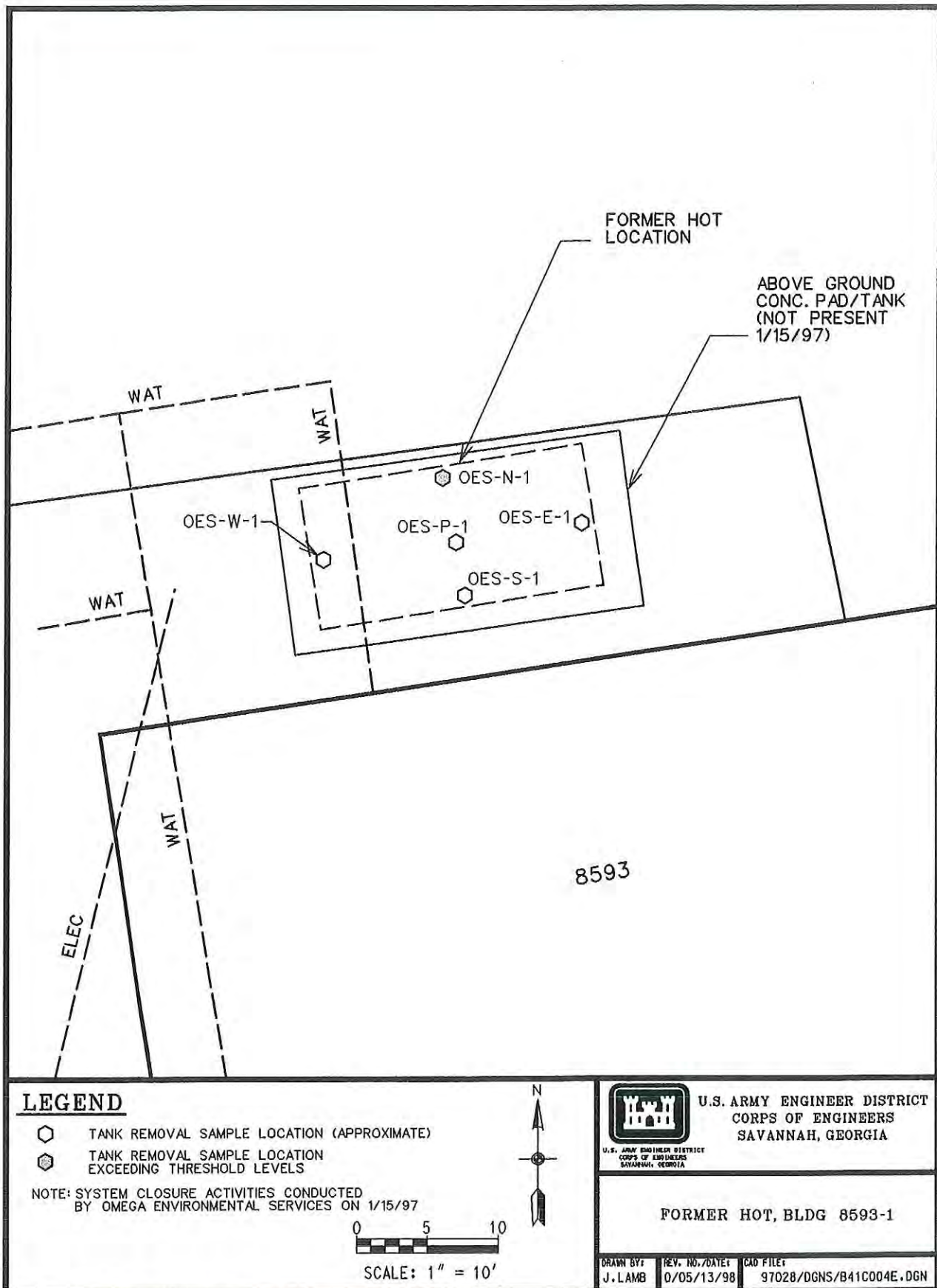
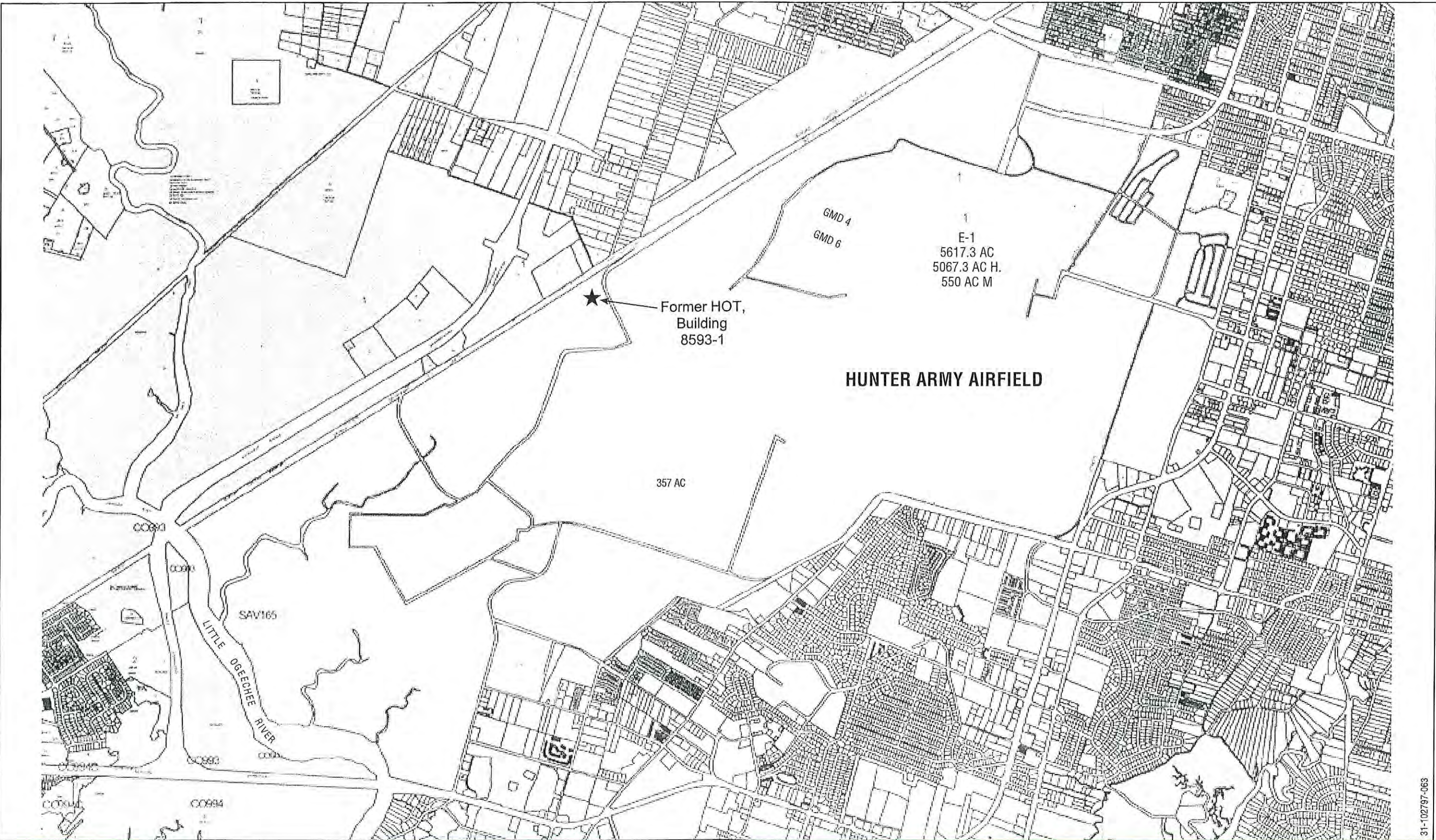


Figure 7. HOT System Closure Sampling Locations at the Former HOT, Building 8593-1 Site

**NOT APPLICABLE FOR THE FORMER HOT,
BUILDING 8593-1 SITE INVESTIGATION**

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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Former HOT, Building 8593-1
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 8593-1
Hunter Army Airfield
Chatham County, Facility ID #: N/A

TABLE 2a: SOIL ANALYTICAL RESULTS³
(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) |
|-----------------------------------|-----------|----------------|--------------|-----------------|-----------------|----------------------|-----------------|---------------------------------|-------------------|-------------------|
| P-1 | HP1102 | 2.0 - 4.00 | 04/09/98 | 0.0024 U | 0.0024 U | 0.0024 U | 0.0073 U | BDL | 0.51 UJ | 0.610 U |
| P-1 | HP1105 | 8.0 - 10.0 | 04/09/98 | 0.0025 U | 0.0025 U | 0.0025 U | 0.0076 U | BDL | 2.40 J | 0.633 U |
| P-2 | HP2101 | 0.0 - 2.0 | 04/09/98 | 0.0022 UJ | 0.0022 UJ | 0.0022 UJ | 0.0066 UJ | BDL | 0.32 UJ | 0.549 U |
| P-2 | HP2105 | 8.0 - 9.0 | 04/09/98 | 0.0024 U | 0.0024 U | 0.0024 U | 0.0071 U | BDL | 0.41 UJ | 0.595 U |
| P-3 | HP3103 | 4.0 - 6.0 | 04/10/98 | 0.0025 U | 0.0025 U | 0.0025 U | 0.0074 U | BDL | 0.91 UJ | 0.617 UJ |
| P-3 | HP3105 | 8.0 - 10.0 | 04/10/98 | 0.0025 U | 0.0025 U | 0.0025 U | 0.0075 U | BDL | 0.42 UJ | 0.625 U |
| P-4 | HP4104 | 6.0 - 8.0 | 04/10/98 | 0.0024 U | 0.0024 U | 0.0024 U | 0.0072 U | BDL | 0.44 UJ | 0.602 U |
| P-4 | HP4105 | 8.0 - 9.0 | 04/10/98 | 0.0024 U | 0.0024 U | 0.0024 U | 0.0073 U | BDL | 2.5 U | 0.610 U |
| 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.

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

R - Indicates the compound was

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 8593-1
Hunter Army Airfield
Chatham County, Facility ID #: N/A

TABLE 2b: SOIL ANALYTICAL RESULTS³
(POLYNUCLEAR AROMATIC HYDROCARBONS)

| Sample Location | Sample ID | Depth (ft BGS) | Date Sampled | Detected PAH Compounds (mg/kg) | | | Total PAHs (mg/kg) |
|-----------------------------------|-----------|----------------|--------------|--------------------------------|--|--|--------------------|
| | | | | | | | |
| P-1 | HP1102 | 2.0 - 4.0 | 04/09/98 | | | | BDL ² |
| P-1 | HP1105 | 8.0 - 9.5 | 04/09/98 | | | | BDL |
| P-2 | HP2101 | 0.0 - 2.0 | 04/09/98 | | | | BDL |
| P-2 | HP2105 | 8.0 - 9.0 | 04/09/98 | | | | BDL |
| P-3 | HP3103 | 4.0 - 6.0 | 04/10/98 | | | | BDL |
| P-3 | HP3105 | 8.0 - 10.0 | 04/10/98 | | | | BDL |
| P-4 | HP4104 | 6.0 - 8.0 | 04/10/98 | | | | BDL |
| P-4 | HP4105 | 8.0 - 9.0 | 04/10/98 | | | | BDL |
| Applicable Standards ¹ | | | | | | | N/A |

NOTE:

¹Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels.

²BDL - 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.

³All 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.

N/A - Not applicable.

PAH - Polynuclear aromatic hydrocarbon.

Laboratory Qualifiers

R - Indicates the compound was rejected.

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 8593-1
Hunter Army Airfield
Chatham County, Facility ID #: N/A

TABLE 3a: GROUNDWATER ANALYTICAL RESULTS⁵
(VOLATILE ORGANIC COMPOUNDS)

| Sample Location | Sample ID | Depth (ft BGS) | Date Sampled | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Xylenes (µg/L) | Total BTEX ⁴ (µg/L) |
|-----------------------------------|-----------|----------------|--------------|----------------|----------------|---------------------|----------------|--------------------------------|
| P-1 | HP1200 | 9.0 - 13.0 | 04/09/98 | 2.5 = | 2 U | 10.1 = | 6 U | 12.6 |
| P-1 | HP1210 | 9.0 - 13.0 | 04/09/98 | 2 U | 2 U | 4.4 = | 6 U | 4.4 |
| P-2 | HP2200 | 9.0 - 13.0 | 04/09/98 | 2 U | 2 U | 2 U | 6 U | BDL |
| P-3 | HP3200 | 11.0 - 15.0 | 04/10/98 | 2 U | 2 U | 2 U | 6 U | BDL |
| P-4 | HP4200 | 11.0 - 15.0 | 04/10/98 | 2 U | 2 U | 2 U | 6 U | BDL |
| P-5 | HP5301 | 16.0 - 20.0 | 04/10/98 | 2 U | 2 U | 2 U | 6 U | BDL |
| P-5 | HP5302 | 26.0 - 30.0 | 04/10/98 | 2 U | 2 U | 2 U | 6 U | BDL |
| P-5 | HP5303 | 36.0 - 40.0 | 04/10/98 | 2 U | 2 U | 2 U | 6 U | BDL |
| Applicable Standards ¹ | | | | 5 | 700 | 1000 | 10000 | NRC |

TABLE 3b: GROUNDWATER ANALYTICAL RESULTS⁵
(POLYNUCLEAR AROMATIC HYDROCARBONS)

| Sample Location | Sample ID | Depth (ft BGS) | Date Sampled | Detected PAH Compounds (µg/L) | | | | Total PAHs ⁴ (µg/L) |
|-----------------------------------|-----------|----------------|--------------|-------------------------------|------------------|------------------|------------------|--------------------------------|
| | | | | Naphthalene | Fluoranthene | BDL ² | BDL ² | |
| P-1 | HP1200 | 9.0 - 13.0 | 04/09/98 | 20.4= | 10.6 U | | | 20.4 |
| P-1 | HP1210 | 9.0 - 13.0 | 04/09/98 | 22.2 J | 10.2 U | | | 22.2 |
| P-2 | HP2200 | 9.0 - 13.0 | 04/09/98 | 10.4 U | 10.4 U | | | BDL |
| P-3 | HP3200 | 11.0 - 15.0 | 04/10/98 | 10.4 U | 10.4 U | | | BDL |
| P-4 | HP4200 | 11.0 - 15.0 | 04/10/98 | 10.4 U | 10.4 U | | | BDL |
| P-5 | HP5301 | 16.0 - 20.0 | 04/10/98 | 10.3 U | 5.8 J | | | 5.8 |
| P-5 | HP5302 | 26.0 - 30.0 | 04/10/98 | 11.6 U | 11.6 U | | | BDL |
| P-5 | HP5303 | 36.0 - 40.0 | 04/10/98 | 10.3 U | 10.3 U | | | BDL |
| Applicable Standards ¹ | | | | N/A ³ | N/A ³ | | | 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 N/A - Not applicable; the health-based threshold level is exceeded only if free product exists.
⁴ 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.
⁵ 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.
 PAH - 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.
 = Indicates the compound was detected at the concentration reported.

Former HOT, Building 8593-1
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) |
|-------------|---------------|-------------------------------|------------------------------|-------------------------------------|---------------------------------|-----------------------|------------------------|-----------------------------|--------------------------------------|
| P-1 | 4/15/98 | 15.30 | 17.70 | 8.0 - 13.0 | N/A | 7.93 | N/A | N/A | 9.77 |
| P-2 | 4/15/98 | 14.86 | 18.61 | 8.0 - 13.0 | N/A | 8.71 | N/A | N/A | 9.90 |
| P-3 | 4/15/98 | 14.46 | 14.46 | 10.0 - 15.0 | N/A | 4.59 | N/A | N/A | 9.87 |
| P-4 | 4/15/98 | 15.02 | 16.50 | 10.0 - 15.0 | N/A | 6.76 | N/A | N/A | 9.74 |

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

Former HOT, Building 8593-1
Hunter Army Airfield
Chatham County, Facility ID#: N/A

TABLE 5a: HOT SYSTEM CLOSURE¹ - SOIL ANALYTICAL RESULTS
(VOLATILE ORGANIC COMPOUNDS)

| Sample Location | Depth (ft BGS) | Date Sampled | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Xylenes (mg/kg) | Total BTEX (mg/kg) | TPH (mg/kg) |
|-----------------------------------|----------------|--------------|-----------------|-----------------|----------------------|-----------------|--------------------|-------------|
| OES-N-1 | 10 | 1/15/97 | 0.015 | BDL | 2.4 | 2.12 | 4.535 | 7549 |
| OES-S-1 | 10 | 1/15/97 | 0.0079 | BDL | BDL | BDL | 0.008 | BDL |
| OES-E-1 | 10 | 1/15/97 | BDL | BDL | 0.360 | 0.260 | 0.620 | 214 |
| OES-W-1 | 10 | 1/15/97 | 0.0038 | 0.073 | 0.580 | 0.440 | 1.097 | 350 |
| OES-PL-1 | 3 | 1/15/97 | BDL | BDL | BDL | BDL | BDL | BDL |
| Applicable Standards ² | | | 0.008 | 6 | 10 | 700 | NRC | NRC |

NOTE: ¹Heating Oil Tank system closure performed by Omega Environmental Services (1997).

² Georgia Department of Natural Resources Applicable Soil Threshold Levels.

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 - Total petroleum hydrocarbons.

Former HOT, Building 8593-1
Hunter Army Airfield
Chatham County, Facility ID #: N/A

TABLE 5b: HOT SYSTEM CLOSURE¹ - SOIL ANALYTICAL RESULTS
(POLYNUCLEAR AROMATIC HYDROCARBONS)

| Sample Location | Depth (ft BGS) | Date Sampled | Detected PAH Compounds (mg/kg) | | | | | | | | Total PAHs (mg/kg) | |
|-----------------------------------|----------------|--------------|--------------------------------|------------------|--------------------|------------------|----------------------|----------------------|------------------|------------------|--------------------|--------|
| | | | Acenaphthylene | Anthracene | Benz(a)-anthracene | Chrysene | 1-Methyl-Naphthalene | 2-Methyl-Naphthalene | Naphthalene | Phenanthrene | | Pyrene |
| OES-N-1 | 10 | 1/15/97 | 1.40 | 3.10 | 14.00 | 2.40 | 72.00 | 62.00 | 11.00 | 18.00 | 5.40 | 189.30 |
| OES-S-1 | 10 | 1/15/97 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| OES-E-1 | 10 | 1/15/97 | BDL | BDL | 0.75 | BDL | 3.30 | 0.58 | 0.12 | 0.72 | 0.29 | 5.76 |
| OES-W-1 | 10 | 1/15/97 | 0.13 | BDL | 2.00 | 0.41 | 5.90 | 4.10 | 0.77 | 1.70 | 0.67 | 15.68 |
| OES-PL-1 | 3 | 1/15/97 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Applicable Standards ² | | | N/A ³ | N/A ³ | N/A ³ | N/A ³ | N/A ³ | N/A ³ | N/A ³ | N/A ³ | N/A ³ | NRC |

NOTE: ¹Heating Oil Tank system closure performed by Omega Environmental Services (1997).

²Georgia Department of Natural Resources Applicable Soil Threshold Levels.

³Not applicable; the health-based threshold level is exceeded only if free product exists.

BDL - Below detection limit. Analytical result/detection limit not provided.

BGS - Below ground surface.

NRC - No regulatory criteria.

PAH - Polynuclear aromatic hydrocarbon.

Former HOT, Building 8593-1
Hunter Army Airfield
Chatham County, Facility ID #: N/A

**TABLE 6a: HOT SYSTEM CLOSURE¹ - 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 | 700 | 1000 | 10000 | NRC |

**TABLE 6b: HOT SYSTEM CLOSURE¹ - 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: ¹Heating Oil Tank system closure performed by Omega Environmental Services (1997).

²Not applicable; groundwater samples were not collected by Omega Environmental Services.

³U.S. Environmental Protection Agency maximum contaminant levels.

BGS - Below ground surface.

NRC - No regulatory criteria.

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 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% urban, 67% forest, and 24% 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 8593-1 SITE

A field potential receptor survey was conducted for the Former HOT, Building 8593-1 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 Former HOT, Building 8593-1

The Former HOT, Building 8593-1 site is located approximately 640 feet northeast (cross-gradient) of Well 4A. Well 4A is located at Building 8581 at the 117th Air National Guard Facility, Perimeter Road, HAAF (Figure 3b, Appendix I). Therefore, the Former HOT, Building 8593-1 site is classified as being located greater than 500 feet to a withdrawal point. Well 4A is a public well that supplies water to 50 persons with 10 service connections. A "bullet" tank with a capacity of 1000 gallons is used for storage.

Based on the estimated nature and extent of petroleum-related groundwater contamination at the site, there is no indication that Well 4A has been impacted (Figure 3b, Appendix I). Therefore, collection and analysis of groundwater samples from Well 4A is not recommended.

1.3.2 Surface Water Bodies Near the Former HOT, Building 8593-1 Site

Lamar Canal, which flows southwest, is located approximately 750 feet southeast (downgradient) of the Former HOT, Building 8593-1 site (Figures 3a and 3b). A small drainage canal located approximately 150 feet north (upgradient) of the site flows southwest along the northwest boundary of HAAF, and ultimately flows southeast into Lamar Canal. As shown on Figure 3b, Hallstrom Lake lies approximately 6000 feet south of the Former HOT, Building 8593-1 site. Based on the distances between the Former HOT, Building 8593-1 site and the nearest surface water bodies, the site is classified as being located greater than 500 feet to a downgradient surface water body.

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.

COMMUNICATION LOGS

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CONTACT REPORT

Hunter Army Airfield CAP-Part A Report
Former Heating Oil Tank, Building 8593-1

PROJECT NAME: HAAF - CAP Part A

DELIVERY ORDER NO: 0019

INDIVIDUAL CONTACTED, TITLE, PHONE:

Mike Coache Savannah

ORIGINATOR:

Mitch Hall

ORGANIZATION:

Savannah Water and sewer

DATE CONTACTED:

6/25/98 (1410 hrs)

ADDRESS:

CITY:

STATE:

ZIP:

Telecon: ☐Visit: ☒

SUBJECT:

water wells (public water supply)

DISCUSSION:

Mike provided map w/ all water wells located.

wells 15 W. Ishire Estates on Largo Dr. (new Tiber Ave)

(27 By St. Josephs hospital on McCawley Dr.

25 Gamble Road, between ACL Blvd & Hwy 17

15 Wilshire estates on Largo Dr (

14 Windsor Forest on Briardell Circle

23 off Largo drive just before Berkshire west (at
Storage Tank)

Leave at 1435 hrs.

COMMENTS, ACTION, DATES

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CONTACT REPORT

Hunter Army Airfield CAP-Part A Report
Former Heating Oil Tank, Building 8593-1

PROJECT NAME: HAAF - CAP Part A

DELIVERY ORDER NO: 0019

| | | | | | |
|---|--|-------------------|--------------|--|--|
| INDIVIDUAL CONTACTED, TITLE, PHONE: BLAKE HARE, ENGINEER, | | | | ORIGINATOR: MITCH HALL BLAKE HARE ^{met at} 6/30/98 | |
| ORGANIZATION: LAYNE- ATLANTIC DRILLING | | | | DATE CONTACTED: 6/30/98 (1530 hrs.) | |
| ADDRESS: | | CITY: Savannah | STATE: GA | ZIP: | Telecon: <input checked="" type="checkbox"/> Visit: <input type="checkbox"/> |
| SUBJECT: DRILL-LOGS FOR HAAF PUBLIC AND NON-PUBLIC SUPPLY WELLS | | | | | |

DISCUSSION:

Blake Hare could not located drillers' logs and well as-built records for water supply wells at Hunter Army Airfield. He is sure that they ~~did~~ ^{not} ^{met at} 6/30/98 installed at least some of the wells at Hunter back in the 1940's and 1950's.

However, the location of their office has been moved many times and the records are probably lost.

COMMENTS, ACTION, DATES

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CONTACT REPORT

Hunter Army Airfield CAP-Part A Report
Former Heating Oil Tank, Building 8593-1

PROJECT NAME: HAAF - CAP Part A

DELIVERY ORDER NO: 0019

INDIVIDUAL CONTACTED, TITLE, PHONE:

PH: (912) 767-7921

ORIGINATOR:

MITCHELL HALL

ORGANIZATION:

Natural Resources Division

DATE CONTACTED:

6/03/98

ADDRESS:

CITY:

STATE:

ZIP:

FT. STEWART GA

Telecon: ☒Visit: ☐

SUBJECT:

HAAF ~~PROP~~ WATER SUPPLY WELL INFO, SURFACE WATER INFO, ETC.

DISCUSSION:

I requested from Pam Babb information concerning non-public and public water supply wells at HAAF. She gave me the following information:

- Type of Storage tanks
- well numbers
- General descriptions of water systems
- did not have info for wells 5 and 9.
- well logs may be obtained by from State of GA POC Jim Bank @ 404-651-5153, Good Luck!
- she will continue to look into surface water information
- well installation logs and as-built records are not available from Ft Stewart DPW
- she will fax this information

Pam Babb was very helpful. She seems to know a lot about the facility and will give me contacts for information that she cannot supply.

MTHA 6/03/98

COMMENTS, ACTION, DATES

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CONTACT REPORT

Hunter Army Airfield CAP-Part A Report
Former Heating Oil Tank, Building 8593-1

PROJECT NAME: HAAF - CAP Part A

DELIVERY ORDER NO: 0019

DIVIDUAL CONTACTED, TITLE, PHONE:

Bill Freshett, Geologist

ORIGINATOR:

MITCHELL HALL

ORGANIZATION:

Georgia Geological Survey

DATE CONTACTED:

7/18/98

ADDRESS:

CITY:

STATE:

ZIP:

Atlanta Ga

Telecon:

☒

Visit:

☐

SUBJECT: Drill Logs for Hunter Army Airfield Water Supply Wells

DISCUSSION:

Bill said that the GGS does not have any record of these logs. He suggested that we ask Layne - Atlantic Eng. in Savannah if they ever put wells in at Hunter. Essential publications that ~~we~~ Bill suggested we use in our reports include:

COMMENTS, ACTION, DATES

- GA G S 1990, Geology and Groundwater Resources of the Coastal Plain of Georgia ; Bulletin 113.
- GAGS 1961 Well Logs of the Coastal Plain of Georgia Bulletin 70; Steve Herrick.
- Paul Huddleston Publications

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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 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 | Casing Depth | Pump Rate (gpm) | Number of Service Connections | Population | Public or Non-Public Supply |
|----------------|---------------------|-------------------|---------------------|------------------------|--------------------------------------|-------------------|------------------------------------|
| 6 | TBD | 750 | 240 | 1500 | TBD | TBD | Public |
| 14 | TBD | 800 | 338 | 571 | TBD | TBD | Public |
| 15 | TBD | 414 | 252 | 1000 | TBD | TBD | Public |
| 23 | TBD | 639 | 320 | 1056 | TBD | TBD | Public |
| 25 | TBD | 540 | 287 | 1120 | TBD | TBD | Public |
| 27 | TBD | 550 | 321 | 1468 | TBD | TBD | Public |
| 36 | TBD | 660 | 325 | 1000 | TBD | TBD | Public |

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

APPENDIX IV

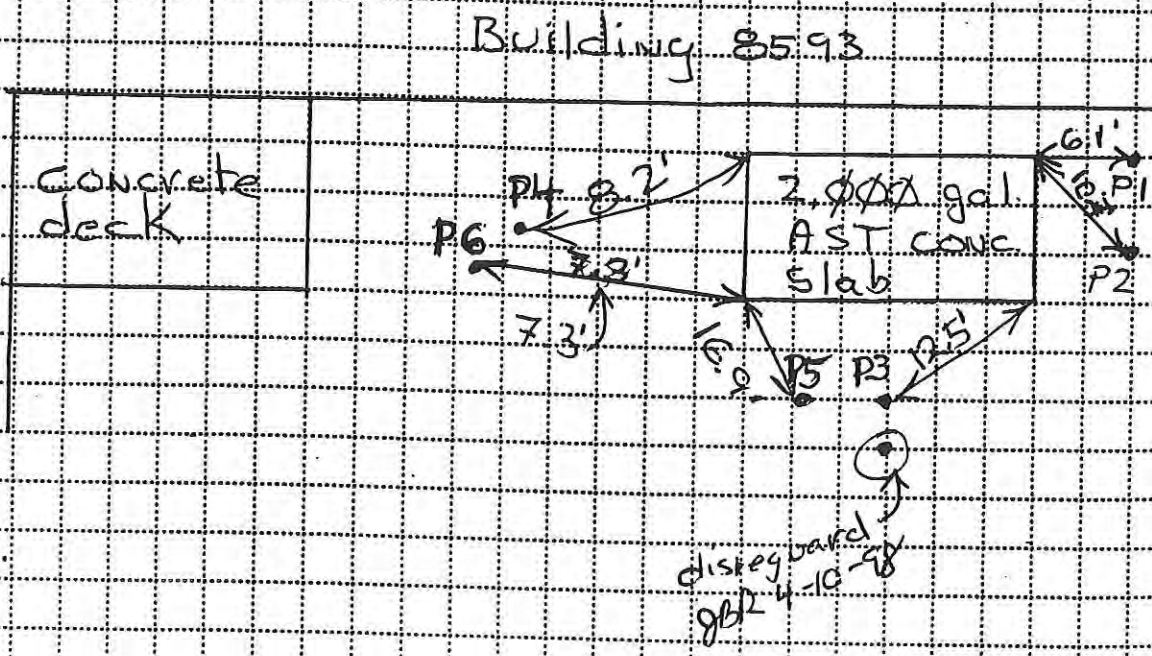
SOIL BORING LOGS

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| | | | | | | | | | |
|---|--|--|--|--|--|----------------------|--|-----------------------------------|--|
| HTRW DRILLING LOG | | DISTRICT | | ASACE Savannah | | HOLE NUMBER | | P1 | |
| 1. COMPANY NAME | | SAIC | | 2. DRILL SUBCONTRACTOR | | RE Wright (SAIC) | | SHEET SHEETS | |
| 3. PROJECT | | HAAF CAP Part A UST sites | | 4. LOCATION | | Hunter AAF Bldg 8593 | | 1 OF 3 | |
| 5. NAME OF DRILLER | | John Hasselhoff | | 6. MANUFACTURERS DESIGNATION OF DRILL | | Geoprobe Sealing KA | | | |
| 7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT | | 2" dia Macrocere accelerator lines = 4' | | 8. HOLE LOCATION | | P1 | | | |
| Shape to drive cap = 4.6' | | | | 9. SURFACE ELEVATION | | TBD | | | |
| push rods = 4' and 3' | | | | 10. DATE STARTED | | 4-9-98 | | 11. DATE COMPLETED | |
| Range line rods = 3' | | | | | | | | 4-9-98 | |
| screens = 3.5' | | | | 12. OVERBURDEN THICKNESS | | NA | | 15. DEPTH GROUNDWATER ENCOUNTERED | |
| | | | | | | | | 9.5' | |
| 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 | | 13' | | 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) | | See water level log | | | |
| 18. GEOTECHNICAL SAMPLES | | NA | | DISTURBED | | NA | | UNDISTURBED | |
| | | | | | | | | 19. TOTAL NUMBER OF CORE BOXES | |
| 20. SAMPLES FOR CHEMICAL ANALYSIS | | VOC | | METALS | | OTHER (SPECIFY) | | OTHER (SPECIFY) | |
| | | | | | | | | | |
| 21. TOTAL CORE RECOVERY | | 95% | | 22. DISPOSITION OF HOLE | | BACKFILLED | | MONITORING WELL | |
| | | | | | | | | | |
| 23. SIGNATURE OF INSPECTOR | | John B. Reeves | | 24. SCALE: | | Not to scale | | | |

LOCATION SKETCH/COMMENTS

SCALE: Not to scale



PROJECT

Hunter AAF CAP Part A UST sites

HOLE NO. 4-9-98

P1

| DEPTH (D) | DESCRIPTION OF MATERIALS (U) | FIELD SCREENING RESULTS (U) | GEOTECH SAMPLE OR CORE BOX NO (E) | ANALYTICAL SAMPLE NO (F) | |
|--------------|--|-----------------------------------|-----------------------------------|--------------------------|--|
| 0 to 4' | clay Fill | head space 0' to 2' 72000 | NA | | Start 1445 end 1450 drilled 4' recovered 3.4' |
| 4' to 1.7' | Partly sorted quartz sand 10% silt with 3" layer of organic rich sand in middle moist and soft yellow 10YR 7/8 | head space 2' to 4' 72000 | NA | 2' to 4' HP1102 | |
| 1.7' to 3.4' | Firm moist clay ⁴⁻⁹⁻⁹⁰ DBR sandy clay (CL) mottled color 10R 4/8 red 10R 6/1 gray 10YR 7/8 yellow moderate plasticity | head space 4' to 6' 212 | NA | NA | Start 1455 end 1500 drilled 4' recovered 4' |
| 3.4' to 6' | | head space 6' to 8' 211 ppm | NA | | |
| 6' to 8' | Same as above | | | | |
| 8' to 9.5' | Same as above | 8' to 10' head space 105 | NA | 8' to 9.5' HP1105 | Start 1510 end 1515 drilled 4' recovered 4' |
| 9.5' to 10' | WT see next page | | | | |

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| DEPTH (ft) | DESCRIPTION OF MATERIALS (ft) | FIELD SCREENING RESISTIVITY (Ω) | GEOTECH SAMPLE OR CORE BOX NO (E) | ANALYTICAL SAMPLE (F) |
|---|---|---------------------------------------|---|---|
| <div data-bbox="129 451 178 493">12</div> | <p>9.5' to 12' Fine grained wet quartz sand laminations of silt interbedded with sand. Soft, grains are subangular moderately sorted</p> <p>Screened interval for water sample collection</p> <p>- TD = 13.0'</p> <p>TD = 14.5' <i>not H</i> 4/9/98</p> | | | <p>HP1200</p> <p>Steel screen pushed to 14.5' TD 13.0' TD water sampled between 10.5' to 14.5' 9' to 13.0'</p> <p><i>not H</i> 4/9/98</p> |

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ENG FORM 5056-R, AUG 94

| DEPTH (ft) | DESCRIPTION OF MATERIALS (C) | FIELD SCREENING RESIST. (D) | GEOTECH SAMPLE OR CORE BOX NO. (E) | ANALYTICAL SAMPLE (F) |
|-------------|--|-----------------------------|------------------------------------|--|
| 0 to 0.7 | clay fill | 0 to 2' head space 516 ppm | 0 to 2' HP2101 | began 1550 end 1555 drilled 4' recovered 4' |
| 0.7 to 1.3 | Poorly sorted quartz sand moist and soft yellow 10YR 7/8 | | | |
| 1.3 to 4.0 | Firm moist sandy clay (CL) mottled color 10YR 4/8 red 10YR 6/1 gray 10YR 7/8 yellow moderate plasticity 9BR 4-9-98 | head space 2' to 4' 68 ppm | | |
| 4.0 to 8.0 | Same as above | 4' to 6' 66 ppm | | began 1600 end 1605 drilled 4' recovered 4' |
| 8.0 to 9' | Same as above | 6' to 8' 17 ppm | | |
| 8.7 to 12.0 | See next page | 8' to 9' 32 ppm | 8' to 9' HP2105 | began 1610 end 1615 drilled 4' recovered 4' |

P2

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ENG FORM 5056-R, AUG 94

| DEPTH (D) | DESCRIPTION OF MATERIALS (C) | FIELD SWEEDING RESULTS (B) | GEOTECH SAMPLE OR CORE BOX NO (E) | ANALYTICAL SAMPLE NO (F) |
|---------------|---|--------------------------------|-----------------------------------|--------------------------|
| 0' | 0' to 0.3' Asphalt | 0' to 2' head space = 300 ppm | NA | |
| 0.3' to 1.9' | Sub-base material ~ asphalt + gravel fine grained sand moist | | | |
| 1.9' to 4.0' | Firm moist sandy clay (CL) mottled color 10YR 4/8 red 10YR 6/1 gray 10YR 7/8 yellow moderate plasticity | 2' to 4' head space | NA | |
| 4.0' to 8.0' | Same as above | 2' to 4' head space = 600 ppm | | |
| 8.0' to 10.0' | Same as above | 8' to 10' head space = 500 ppm | | |
| 10.0' | 9.9' sharp contact and water table | | | |

Start 0710
end 0715
drilled 4'
recovered 1.6'

Start 0730
end 0735
drilled 4'
recovered 4.0'

Start 0740
end 0750
drilled 4'
recovered 4'

18

| DEPTH (ft) | DESCRIPTION OF MATERIALS (1) | FIELD TESTING RESULTS (2) | GEOTECH SAMPLE OR CORE BOX NO (3) | ANALYTICAL SAMPLE NO (4) |
|-----------------------------|---|---------------------------------|---|---------------------------------|
| <div>10</div> <div>12</div> | <p>wet, soft, moderately to well sorted silty fine grained sand (SM) quartz grains = 99% subangular, & depositional environment interpreted to be fluvial; color light gray (7/N) with some yellow and pale yellow TD = 12.5' BGS GWT = 9.9' BGS (ground water table)</p> | | | <p>HP3204 10-15' 11</p> |

n. H
4/19/98

PROJ: 1

HAAF - CAP A & UST Investigations

ROLL NO:

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| HTRW DRILLING LOG | | DISTRICT | | HOLE NUMBER | |
|---|--|---|--|---|--|
| 1. COMPANY NAME ASIC | | 2. DRILL SUBCONTRACTOR RE Wright (ASIC) | | HOLE NUMBER P4 | |
| 3. PROJECT HAAF - CAP A UST Investigations | | 4. LOCATION Bldg Tank | | SHEET 1 OF 3 | |
| 5. NAME OF DRILLER Andy Nickerbocker | | 6. MANUFACTURERS DESIGNATION OF DRILL Geoprobe Salina KA | | | |
| 7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 2" dia macrocore acc'tate liner = 4' slurp to drive cap = 4.6' push rods = 4' and 3' large bore rods = 3' screener = 3.5' | | 8. HOLE LOCATION P4 | | | |
| 12. OVERBURDEN THICKNESS NA | | 9. SURFACE ELEVATION TBD | | | |
| 13. DEPTH DRILLED INTO ROCK NA | | 10. DATE STARTED 4-10-98 | | 11. DATE COMPLETED 4-10-98 | |
| 14. TOTAL DEPTH OF HOLE 12' 15' BGS | | 15. DEPTH GROUNDWATER ENCOUNTERED 8.9' | | | |
| 18. GEOTECHNICAL SAMPLES NA | | 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED See water level log | | 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) See water level log | |
| 20. SAMPLES FOR CHEMICAL ANALYSIS | | 19. TOTAL NUMBER OF CORE BOXES NA | | 21. TOTAL CORE RECOVERY % 93 | |
| 22. DISPOSITION OF HOLE perforated | | 23. SIGNATURE OF INSPECTOR Michael H. H. H. | | | |
| LOCATION SKETCH/COMMENTS | | | | | |
| SCALE: | | | | | |
| <p>See page 62</p> | | | | | |
| PROJECT HAAF - CAP A UST Investigations | | | | HOLE NO. P4 | |

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| DEPTH (ft) | DESCRIPTION OF MATERIALS (ft) | FIELD SCREENING RESULTS (U) | GEOTECH SAMPLE OR CORE BOX NO (E) | ANALYTICAL SAMPLE (F) |
|------------|--|-----------------------------------|-----------------------------------|-----------------------|
| 0-2 | fill material - coarse grained sand - bimodal, poorly sorted - moderately to well rounded - soft, moist, sandy - silty clay (CL) - mottled red orange - - - gradational contact - firm, moist silty clay (CL) yellowish brown | 0-2 HS = 470 ppm | NA | |
| 2-4 | moderate plasticity yellowish brown (10R 5/8) gray (10R 7/1) red (10R 4/6) 3.1 - 4.0 NO Recovery. | 2-4 HS = 460 ppm | NA | |
| 4-6 | Same as above muddy yellowish brown Some gray & red | 4-6 HS = 650 ppm | NA | |
| 6-8 | | 6-8 HS = 1040 ppm | NA | HP4104 |
| 8-10 | SAME AS ABOVE wt table & contact very soft clayey sand one small clay layer 0.3' - 0.5' 0.3 - 1.8' same as description above | 8-10 HS = 8-9 HS = 2000 ppm | NA | HP4105 |

Start: 0855
End: 0900
Drilled: 4' - 4'
Recovery: 3.1
Rec % =

Start: 0905
End: 0910
Drilled: 4' - 8'
Recovery: 4'
R % = 100%

Start: 0915
End: 0920
Drilled: 8-12'
Rec: 4'
WT = 8.9'

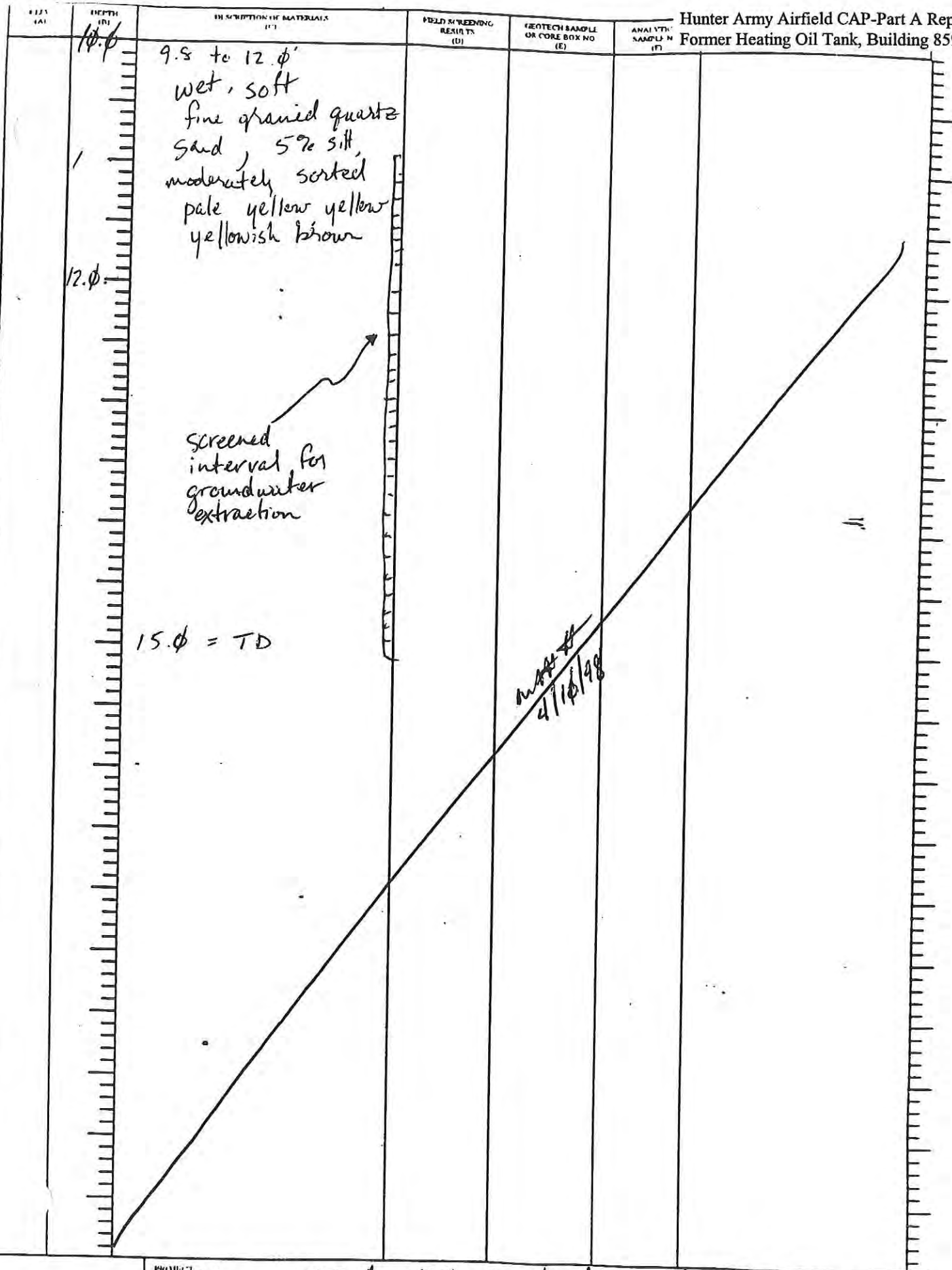
PROJECT

HP4104 - CAP A UST Site

HOLE NO

P4

85



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| | | | | | |
|--|--|--|--|---|--|
| HTRW DRILLING LOG | | DISTRICT USACE Savannah | | HOLE NUMBER P5 | |
| 1. COMPANY NAME SAIC | | 2. DRILL SUBCONTRACTOR RE Wright (SAIC) | | SHEET 1 OF 2 SHEETS | |
| 3. PROJECT Hunter AAF CAP Part A UST Sites | | 4. LOCATION Bldg. 8593-1 Tank X | | | |
| 5. NAME OF DRILLER John Hasselhoff | | 6. MANUFACTURER'S DESIGNATION OF DRILL Geoprobe Salina, KA | | | |
| 7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 2" dia macro pipe Geitrate liner = 4' long Shoe to drive cap = 4.6' long; push rods = 3' and 4' long; large bore rods = 3' long 3/1.5" diam; screen = 3.5' long = 1" diam. | | 8. HOLE LOCATION area P | | | |
| 12. OVERBURDEN THICKNESS NA | | 9. SURFACE ELEVATION TBD | | | |
| 13. DEPTH DRILLED INTO ROCK NA | | 10. DATE STARTED 4-10-98 | | | |
| 14. TOTAL DEPTH OF HOLE 40' ft BGS | | 11. DATE COMPLETED 4-10-98 | | | |
| 18. GEOTECHNICAL SAMPLES NA | | 15. DEPTH GROUNDWATER ENCOUNTERED ~9.0 ft BGS | | | |
| 20. SAMPLES FOR CHEMICAL ANALYSIS water | | 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED See water level log | | | |
| 22. DISPOSITION OF HOLE vertical profile | | 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) See water level log | | | |
| DISTURBED NA | | UNDISTURBED 1 NA | | 19. TOTAL NUMBER OF CORE BOXES NA | |
| BTEX VOC 3 | | METALS NA | | OTHER (SPECIFY) NA | |
| BACKFILLED ✓ | | MONITORING WELL NA | | OTHER (SPECIFY) NA | |
| 21. TOTAL CORE RECOVERY 100 % | | 23. SIGNATURE OF INSPECTOR John B. Reeves | | | |
| LOCATION SKETCH/COMMENTS | | | | | |

SCALE:

See log book #10, page 62

| | |
|---|-----------------------|
| PROJECT Hunter AAF CAP Part A UST Sites | HOLE NO. P5 |
|---|-----------------------|

| DEPTH (ft) | DESCRIPTION OF MATERIALS (ft) | FIELD SCREENING RESULTS (ft) | GEOTECH SAMPLE OR CORE BOX NO (E) | ANALYTICAL SAMPLE (ft) |
|------------|-------------------------------|--|-----------------------------------|------------------------|
| 0 | | | | |
| 5 | | | | |
| 10 | WT = | at 10' below ground water, sample HP5301 collected | | |
| 15 | 15.0 | | | |
| 20 | sampled interval 20.0 | at 20' below ground water sample HP5302 collected | | |
| 25 | 25.0 | | | |
| 30 | sampled interval 30.0 | at 30' below ground water sample 5303 collected | | |
| 35 | 35.0 | | | |
| 40 | sampled interval 40.0 | | | |
| 45 | TD = 39.0' | | | |
| 50 | | | | |

APPENDIX V

SOIL LABORATORY REPORTS

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Former HOT, Building 8593-1
Hunter Army Airfield
Chatham County, Facility ID #: N/A

TABLE V-A. SUMMARY OF SOIL ANALYTICAL RESULTS³

| Location | P-1 | P-1 | P-2 | P-2 | P-3 | P-3 | P-4 | P-4 | |
|------------------------|-----------|-----------|-----------|-----------|----------|------------|-----------|-----------|------------------------|
| Sample ID | HP1102 | HP1105 | HP2101 | HP2105 | HP3103 | HP3105 | HP4104 | HP4105 | |
| Date Collected | 04/09/98 | 04/09/98 | 04/09/98 | 04/09/98 | 35895 | 04/10/98 | 04/10/98 | 04/10/98 | Applicable |
| Depth (ft BGS) | 2.0 - 4.0 | 8.0 - 9.5 | 0.0 - 2.0 | 8.0 - 9.0 | 4.0-6.0 | 8.0 - 10.0 | 6.0 - 8.0 | 8.0 - 9.0 | Standards ¹ |
| VOCs | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Benzene | 0.0024 U | 0.0025 U | 0.0022 UJ | 0.0024 U | 0.0025 U | 0.0025 U | 0.0024 U | 0.0024 U | 0.008 |
| Toluene | 0.0024 U | 0.0025 U | 0.0022 UJ | 0.0024 U | 0.0025 U | 0.0025 U | 0.0024 U | 0.0024 U | 6.000 |
| Ethylbenzene | 0.0024 U | 0.0025 U | 0.0022 U | 0.0024 UJ | 0.0025 U | 0.0025 U | 0.0024 U | 0.0024 U | 10 |
| Xylenes | 0.0073 U | 0.0076 U | 0.0066 UJ | 0.0071 U | 0.0074 U | 0.0075 U | 0.0072 U | 0.0073 U | 700 |
| TPH-DRO | 0.51 UJ | 2.40 J | 0.32 UJ | 0.41 UJ | 0.91 UJ | 0.42 UJ | 0.44 UJ | 2.5 U | NRC |
| TPH-GRO | 0.610 U | 0.633 U | 0.549 U | 0.595 U | 0.617 UJ | 0.625 U | 0.602 U | 0.610 U | NRC |
| PAHs | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| 2-Chloronaphthalene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Acenaphthene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Acenaphthylene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Anthracene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Benzo(a)anthracene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Benzo(a)pyrene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Benzo(b)fluoranthene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Benzo(g,h,i)perylene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Benzo(k)fluoranthene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Chrysene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Dibenzo(a,h)anthracene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Fluoranthene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Fluorene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Indeno(1,2,3-cd)pyrene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Naphthalene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Phenanthrene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |
| Pyrene | 0.401 U | 0.422 U | 0.361 U | 0.397 U | 0.046 U | 0.417 U | 0.402 U | 0.406 U | N/A ² |

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.

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.: 41010B

| PROJECT NUMBER: 0019 | | | | REQUESTED PARAMETERS | | | | | | | | | | | | LABORATORY NAME: General Engineering Laboratory | | | |
|---|----------------|----------------|--------|----------------------|-----|-----|-----|----------------|--|--|--|---|--|--|--|---|----------------------|--|--|
| PROJECT MANAGER: Allison Bailey | | | | | | | | | | | | | | | | LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417 | | | |
| Sampler (Signature) <i>Michael H. Hall</i> | | | | | | | | | | | | | | | | PHONE NO: (803) 556-8171 | | | |
| Sampler (Printed Name) Michael H. Hall | | | | | | | | | | | | | | | | OVA SCREENING | | OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS | |
| Sample ID | Date Collected | Time Collected | Matrix | BTX | PAH | DEP | GRO | TOC | | | | | | | | | No. of Bottles/Vials | | |
| HC1101 | 4/09/98 | 1315 | soil | X | X | X | X | | | | | | | | | 2 | 19000 | 0-2' | |
| HP3103 | 4/10/98 | 0735 | soil | X | X | X | X | | | | | | | | | 2 | 19000 | 4-6' | |
| HP3105 | 4/10/98 | 0750 | soil | X | X | X | X | | | | | | | | | 2 | 5000 | 8-9' | |
| HP2101 | 4/09/98 | 1555 | soil | X | X | X | X | | | | | | | | | 2 | 516 | 0-2' | |
| HP2105 | 4/09/98 | 1615 | soil | X | X | X | X | | | | | | | | | 2 | 32 | 8-9' | |
| HP1102 | 4/09/98 | 1455 | soil | X | X | X | X | | | | | | | | | 2 | >20000 | 2-4' | |
| HP1105 | 4/09/98 | 1525 | soil | X | X | X | X | | | | | | | | | 2 | 105 | 8-10' | |
| HP6400 | 4/10/98 | 0945 | soil | | | | | X | | | | | | | | 1 | NA | 4-6' | |
| HP4105 | 4/10/98 | 0920 | soil | X | X | X | X | | | | | | | | | 2 | >20000 | 8-9' | |
| HP4104 | 4/10/98 | 0915 | soil | X | X | X | X | | | | | | | | | 2 | 1040 | 6-8' | |
| HC2102 | 4/09/98 | 1340 | soil | X | X | X | X | | | | | | | | | 2 | 78 | 2-4' | |
| HC2101 | 4/09/98 | 1335 | soil | X | X | X | X | | | | | | | | | 2 | >20000 | 0-2' | |
| RELINQUISHED BY: <i>Michael H. Hall</i> | | | | RECEIVED BY: | | | | Date/Time | | | | TOTAL NUMBER OF CONTAINERS: 23 | | | | Cooler Temperature: 4°C | | | |
| COMPANY NAME: SAC | | | | COMPANY NAME: | | | | Cooler ID: 326 | | | | FEDEX NUMBER: NA | | | | | | | |
| RECEIVED BY: <i>David Reed</i> | | | | RELINQUISHED BY: | | | | Date/Time | | | | HC1101 } quick turnaround HC2102 } HC2101 } | | | | | | | |
| COMPANY NAME: G. F. L. | | | | COMPANY NAME: | | | | Date/Time | | | | | | | | | | | |
| RELINQUISHED BY: | | | | RECEIVED BY: | | | | Date/Time | | | | | | | | | | | |
| COMPANY NAME: | | | | COMPANY NAME: | | | | Date/Time | | | | | | | | | | | |

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HP1102

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-19

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2F3017

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: not dec. 18 Date Analyzed: 04/22/98

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) | 7.3 | U |

U
↓

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HP1102

Lab Name: GENERAL ENGINEERING LAB-8 Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-19

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 1P520

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: 18 decanted: (Y/N) N Date Extracted: 04/14/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 04/17/98

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 |

FORM I SV-1

OLM03.0

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HP1102

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-19

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 4D40030

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: 18 decanted: (Y/N) N Date Extracted: 04/13/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 04/24/98

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 | 0.51 | JB | JS C14, F01, F06 |
|----------------------------|------|----|------------------|

DATA VALIDATION
COPY

FORM I SV

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HP1102

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-19

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1F106

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: not dec. 18 Date Analyzed: 04/20/98

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 |
|------------------------------|-----|---|---|

1A DATA VALIDATION
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HP1105

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-20

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2F3018

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: not dec. 21 Date Analyzed: 04/22/98

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 | 2.5 | U | |
| 100-41-4----- | Ethylbenzene | 2.5 | U | |
| 1330-20-7----- | Xylenes (total) | 7.6 | U | |

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HP1105

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-20

Sample wt/vol: 30.0 (g/mL) Lab File ID: 1P521

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: 21 decanted: (Y/N) N Date Extracted: 04/14/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 04/17/98

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 | 422 U | U ↓ |
| 91-58-7 | 2-chloronaphthalene | 422 U | |
| 208-96-8 | acenaphthylene | 422 U | |
| 83-32-9 | acenaphthene | 422 U | |
| 86-73-7 | fluorene | 422 U | |
| 85-01-8 | phenanthrene | 422 U | |
| 120-12-7 | anthracene | 422 U | |
| 206-44-0 | fluoranthene | 422 U | |
| 129-00-0 | pyrene | 422 U | |
| 56-55-3 | benzo (a) anthracene | 422 U | |
| 218-01-9 | chrysene | 422 U | |
| 205-99-2 | benzo (b) fluoranthene | 422 U | |
| 207-08-9 | benzo (k) fluoranthene | 422 U | |
| 50-32-8 | benzo (a) pyrene | 422 U | |
| 193-39-5 | indeno (1,2,3-cd) pyrene | 422 U | |
| 53-70-3 | dibenz (a,h) anthracene | 422 U | U ↓ |
| 191-24-2 | benzo (g,h,i) perylene | 422 U | |

FORM 1 Science Applications
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET 10-APR-1998 SA

HP1105

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-20

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 4D40031

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: 21 decanted: (Y/N) N Date Extracted: 04/13/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 04/24/98

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 | 2.4 | B |
|-------|-----------------------|-----|---|

J C14, Feb

FORM I SV

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

HP1105

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-20

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1F3020

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: not dec. 21 Date Analyzed: 04/22/98

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 | 633 | U | U |
|------------------------------|-----|---|---|

DATA VALIDATION
COPY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HP2101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-17

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2F3020

Level: (low/med), LOW Date Received: 04/10/98

% Moisture: not dec. 9 Date Analyzed: 04/22/98

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 |
| 108-88-3-----Toluene | 2.2 | U |
| 100-41-4-----Ethylbenzene | 2.2 | U |
| 1330-20-7-----Xylenes (total) | 6.6 | U |

USE
05 G02
↓ ↓

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HP2101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-17

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 1P518

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: 9 decanted: (Y/N) N Date Extracted: 04/14/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 04/17/98

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 | 361 | U |
| 91-58-7----- | 2-chloronaphthalene | 361 | U |
| 208-96-8----- | acenaphthylene | 361 | U |
| 83-32-9----- | acenaphthene | 361 | U |
| 86-73-7----- | fluorene | 361 | U |
| 85-01-8----- | phenanthrene | 361 | U |
| 120-12-7----- | anthracene | 361 | U |
| 206-44-0----- | fluoranthene | 361 | U |
| 129-00-0----- | pyrene | 361 | U |
| 56-55-3----- | benzo (a) anthracene | 361 | U |
| 218-01-9----- | chrysene | 361 | U |
| 205-99-2----- | benzo (b) fluoranthene | 361 | U |
| 207-08-9----- | benzo (k) fluoranthene | 361 | U |
| 50-32-8----- | benzo (a) pyrene | 361 | U |
| 193-39-5----- | indeno (1,2,3-cd) pyrene | 361 | U |
| 53-70-3----- | dibenz (a,h) anthracene | 361 | U |
| 191-24-2----- | benzo (g,h,i) perylene | 361 | U |

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Science Applications 10-APR-1998 SA

HP2101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-17

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 4D40028

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: 9 decanted: (Y/N) N Date Extracted: 04/13/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 04/24/98

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 | 0.32 | JB | |
|----------------------------|------|----|--|

DC14, F01, F20

DATA VALIDATION
COPY

FORM I SV

EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

HP2101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA011S

Matrix: (soil/water) SOIL Lab Sample ID: 9804286-17

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1F3019

Level: (low/med) LOW Date Received: 04/10/98

% Moisture: not dec. 9 Date Analyzed: 04/22/98

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 | 549 | U | US GDL |
|------------------------------|-----|---|--------|

USE