U.S. Army Corps
of Engineers

Final CORRECTIVE ACTION PLAN - PART B
EPD FACILITY ID: 9025090
PHASE 2 SITE INVESTIGATION
AT PUMP HOUSE #6

at

HUNTER ARMY AIRFIELD
SAVANNAH, GEORGIA

under

Contract No. DACA21-93-D-0049
Delivery Order No. 22

March 1998

Submitted to:
U.S. Army Corps of Engineers
Savannah, Georgia

Presented by:
Metcalf & Eddy, Inc.
Atlanta, Georgia

DOCUMENT 7

The following Final Corrective Action Plan-Part B (CAP-Part-B) is subject to release under the Freedom of Information Act (FOIA). Requests for the document must be referred to Commander, U.S. Army Corps of Engineers, PM-H, P. O. Box 889, Savannah, GA 31402-0889.

This Final CAP-Part B was prepared in accordance with the Statement of Work (SOW) prepared by the United States Army Corps of Engineers (USACE) for the investigation of Pump Houses #1, #2, and #6 at Hunter Army Airfield. This document was prepared under the supervision of David Wilderman, P.G., Project Manager.

This document was reviewed and approved by:

David M.Wilderman, P.G.

Project Manager
Title

3.6.98
Date

PUMP HOUSE #6

Georgia Department of Natural Resources
Environmental Protection Division
Underground Storage Tank Management Program
4244 International Parkway, Suite 104, Atlanta, Georgia 30354
Lonice C. Barrett, Commissioner
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CORRECTIVE ACTION PLAN
PART B

Facility Name: Hunter Army Airfield
Street Address: Strachan Extension, Building 8070
City: Savannah County: Chatham
Facility ID: 9025090

Submitted by UST Owner/Operator:
Name: Mr. John Spears (AFZP-DEV)
Company: Directorate of Public Works
Address: 1557 Frank Cochran Drive
City: Ft. Stewart State: Georgia
Zip Code: 31314-4928

Prepared by:
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I. PLAN CERTIFICATION:

A. UST Owner/Operator

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

Name: John Spears, Chief Environmental
Signature: John Spears Date: 3/24/98

B. Professional Engineer or Professional Geologist

Name: David M. Wilderman, P.G.
Signature:
Date: 3·6·98

Georgia No. Stamp or Seal

Check all boxes below that apply. Attach supporting documentation, i.e., narrative, figures, tables, maps, boring/well logs, etc., for all items checked. Supporting documentation should be three-hole punched and prepared in conformity with the guidance document "Underground Storage Tank (UST) Release: Corrective Action Plan - Part B (CAP-B) Content," GUST-7B.

II. SITE INVESTIGATION REPORT

A. Horizontal and Vertical Extent of Contamination: See Supporting Documentation, Section II.A.

■ Soil ■ Groundwater ☐ Free product ☐ Surface water

B. Local and Site Hydrogeology: See Supporting Documentation, Section II.B.

■ Documentation of Local Groundwater Conditions

■ Stratigraphic Boring Logs **(see Appendix A)**

■ Stratigraphic Cross Sections **(Figures 5 and 6)**

■ Referenced or Documented Calculations of Relevant Aquifer Parameters

■ Direction of Groundwater Flow:

- ■ Table of Monitoring Well Data **(Table 4)**
- ■ Potentiometric Map **(Figure 7)**
- ■ Flow Net Superimposed on a Base map **(Figure 7)**

III. REMEDIAL ACTION PLAN:

A. Corrective Action Completed or In-Progress: Not Applicable*

☐ Recovery/Removal of Free Product (Non-aqueous Phase Hydrocarbons)

☐ Remedial/Treatment of Contaminated Backfill Material & Native Soils

☐ Other (specify) _____

_____

B. Objectives of Corrective Action: See Supporting Documentation, Section III.B.

☐ Remove Free Product that Exceeds One-Eighth Inch

☐ Remediate Groundwater Contamination that Exceeds:

- ☐ Maximum Contaminant Levels (MCLs)

OR

*** - The Risk-Based Corrective Action evaluation, discussed in Section III.B., indicates a corrective action system is not required at this site. This CAP-Part B recommends no further action at Pump House #6.**

B. Objectives of Corrective Action (continued):

- ☐ In-stream Water Quality Standards

☐ Remediate Soil Contamination that Exceeds:

- ☐ Threshold Values Listed in Table A

  OR

- ☐ Threshold Values Listed in Table B

  OR

- ☐ Alternate Threshold Levels (ATLs) (Reference CAP A App. I)

☐ Provide Risk-Based Corrective Action (Reference CAP B App. I)

- ☐ Remediate Soil and/or Groundwater Contamination that Exceeds Alternate Concentration Limits (ACLs) and Monitor Residual Contaminants

  OR

- ☐ Monitor Soil and/or Groundwater Contamination that Exceeds Levels in Rule - .09(3) But is Less than ACLs

C. Design and Operation of Corrective Action Systems: Not Applicable*

☐ Soil ☐ Groundwater ☐ Free Product ☐ Surface Water

D. Implementation: Not Applicable*

Includes, as a minimum, the following:

- ▸ Milestone schedule for site remediation
- ▸ Inspection and preventive maintenance schedule for all specialized remediation equipment
- ▸ Monitoring/sampling and reporting plan for measuring interim progress and project completion
- ▸ Plan to decommission equipment/wells and close site

IV. PUBLIC NOTICE:

- ☐ Certified Letters to Adjacent, and Potentially Affected Property Owners and Local Officials
- ■ Legal Notice in Newspaper, as approved by EPD. **See Supporting Documentation, Section IV.**
- ☐ Other EPD-approved Method (specify)

*** - The Risk-Based Corrective Action evaluation, discussed in Section III.B., indicates a corrective action system is not required at this site. This CAP-Part B recommends no further action at Pump House #6.**

Pump House #6

V. CLAIM FOR REIMBURSEMENT (For GUST Trust Fund sites only)*

- ☐ GUST Trust Fund Application (GUST-36), must be attached if applicable
- ☐ Cost Proposal
  - ☐ Non-Reimbursable Costs

    OR
  - ☐ Reimbursable Costs
    - ☐ Total Project Costs
      - ☐ Costs incurred to date, per GUST-92
      - ☐ Estimated costs to complete corrective action, per GUST-92
    - ☐ Invoices and Proofs-of-Payment for Costs Incurred To-Date
- ☐ Proposed Schedule for Reimbursement
  - ☐ Lump Sum Payment Upon Completion of Corrective Action

    OR
  - ☐ Interim Payments With Final Payment Upon Completion

*Note: Ft. Stewart is a Federal Installation and is not eligible for funding through the GUST Trust Fund.

SUPPORTING DOCUMENTATION
FINAL CORRECTIVE ACTION PLAN - PART B
EPD FACILITY ID: 9025090

PUMP HOUSE #6, BUILDING 8070
HUNTER ARMY AIRFIELD
SAVANNAH, GEORGIA
CONTRACT NO. DACA 21-93-D-0049
DELIVERY ORDER NO. 0022

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LIST OF ACRONYMS

ATL	Alternate Threshold Levels
bls	below land surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAP-Part A	Corrective Action Plan - Part A
CAP-Part B	Corrective Action Plan - Part B
cm/s	centimeters per second
DAACG	Departure Arrival/Airfield Control Group
DRO	Diesel Range Organics
EPA	Environmental Protection Agency
EPD	Environmental Protection Division (State of Georgia, Department of Natural Resources)
ft/day	feet per day
ft/ft	feet per feet
GRO	Gasoline Range Organics
GUST	Georgia Underground Storage Tank
HAAF	Hunter Army Airfield
IWQS	Instream Water Quality Standard
MCL	Maximum Contaminant Level
M&E	Metcalf & Eddy, Inc.
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSL	Mean Sea Level
MTBE	methyl tert-butyl ether
MW	Monitoring Well
PAH	Polynuclear Aromatic Hydrocarbons
PRS	Potential Receptor Survey
PVC	Polyvinyl chloride
ROEA	Risk of Exposure Assessment
SB	Soil Boring
SI	Site Investigation
SIP	Site Investigation Plan
STL	Soil Threshold Level
SWE	Surface Water/Sediment
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
µg/L	micrograms per liter
USGS	United States Geological Survey
UST	Underground storage tank
USACE	United States Army Corps of Engineers

LIST OF REFERENCES

Burroughs Quadrangle, Georgia, 7.5 Minute Series Topographic Map, 1988.

Clarke, John S., Hacke, Charles M. and Peck, Michael F., 1990, Geology and Ground Water Resources of the Coastal Area of Georgia, Department of Natural Resources, Bulletin 113, 106p.

Fetter, C.W., 1994, Applied Hydrogeology, Third Edition, Prentice - Hall, Inc., Englewood Cliffs, New Jersey, p. 145, 249.

Garden City Quadrangle, Georgia, 7.5 Minute Series Topographic Map, 1980.

Georgia Department of Natural Resources, Environmental Protection Division, February 1995, Underground Storage Tank Management, Chapter 391-3-15.

Isle of Hope Quadrangle, Georgia, 7.5 Minute Series Topographic Map, 1988.

Metcalf & Eddy, Inc., September 1996, Draft Corrective Action Plan - Part B, DAACG Facility Area, EPD Facilty No. 9025085, Hunter Army Airfield, Savannah, Georgia.

Metcalf & Eddy, Inc., April 1997, Final Corrective Action Plan - Part A, EPD Facility ID: 9025090, Phase I Site Investigation at Pump House #6 . Hunter Army Airfield, Savannah, Georgia.

Metcalf & Eddy, Inc., September 1997, Draft Corrective Action Plan - Part B, Former Building 728, EPD Facility ID: 9025035 and 9025049, Hunter Army Airfield, Savannah, Georgia.

Savannah Quadrangle, Georgia 7.5 Minute Series Topographic Map, 1978.

State of Georgia, 1995, Georgia Underground Storage Tank Act, Section 12-b.

U.S. Army Corps of Engineers, Savannah District, March 11, 1996, Scope of Work, Phase I and Phase II Site Investigation at Pump Houses #1, #2, and #6. Hunter Army Airfield, Georgia.

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INTRODUCTION

Metcalf & Eddy, Inc. (M&E) was retained by the U.S. Army Corps of Engineers (USACE) to conduct a subsurface investigation of Pump House #6 at Hunter Army Airfield (HAAF). The Corrective Action Plan (CAP)-Part B follows the Site Investigation Plan (SIP) outlined in the CAP-Part A (M&E, 1997) dated April, 1997. Information presented in the following sections of this Supporting Documentation is arranged in the order referenced in the "GUST-CAPB.FOR" form, dated February 1995. The section titles in this Supporting Documentation are identical to the section titles on the form for simplicity of reference. Information required by the Georgia Environmental Protection Division (EPD) is presented herein. A scaled site plan showing the investigation area is provided on **Figure 1**.

This CAP-Part B investigation was performed concurrently with subsurface investigations at Pump House #1 and Pump House #2 at HAAF. All three Pump House areas were previously assessed during the CAP-Part A Phase of this project site investigation. Another previous investigation conducted at the Departure Arrival/Airfield Control Group (DAACG) facility located upgradient northwest of the Pump House #6 area identified contamination in soil and groundwater. The DAACG investigation was summarized in a CAP-Part B report dated September 1996.

The main purpose of the investigation at Pump House #6 was to define the horizontal and vertical extent of the petroleum hydrocarbons identified during the CAP-Part A and to evaluate appropriate remedial measures to conform with state guidance and rules.

SECTION II.A. Horizontal and Vertical Extent of Contamination

Soil

A total of 9 soil borings (SB60 through SB68) and 3 well borings (MW33 through MW35) were advanced to define the extent of subsurface contamination at the Pump House #6 from May 5 through May 7, 1997. **Figure 2** illustrates the sampling locations. Two soil samples were collected at each soil and well boring location. Samples were analyzed for benzene, toluene, ethylbenzene, and xylenes/methyl tert-butyl ether (BTEX/MTBE), polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), gasoline range organics (GRO), and diesel range organics (DRO) by EPA methods 8020, 8100, Modified 8015, and Modified 8100, respectively. Geologic boring logs are provided in **Appendix A**.

The site investigation (SI) conducted during the CAP-Part A phase of this project compared soil analytical data against soil threshold levels (STLs) provided in Table B, Column 2 of Georgia Rule, Chapter 391-3-15. The CAP-Part A concluded that soil within the Pump House #6 study area exceeded these STLs. A potential receptor survey (PRS), conducted during the CAP-Part B investigation, identified several public water supply wells within a 2-mile radius of Pump House #6. No private wells were located within a 0.5-mile radius. The closest of the public wells is located 3,200 feet upgradient of Pump House #6 and the nearest downgradient well is 7,340 feet southwest of the site. Available geologic reports for the Savannah area indicated two confining units exist between the shallow aquifer and deeper potable water aquifer (Floridan). The PRS also confirmed that the nearest surface water body was located 610 feet downgradient of the pump house. Additional information on the findings of the PRS are provided in Section II.B. of this CAP-Part B. The potential receptor information was summarized in a letter from Ft. Stewart (Carey Brown) to the EPD (Dr. White) dated October 7, 1997. The letter proposed using Georgia Rule, Chapter 391-3-15, Table B, Column 2 STLs for evaluating CAP-Part B soil sample analytical results based primarily on the short distance to the most likely receptor, the storm water

drainage ditch. The letter also proposed the use of in-stream water quality standards (IWQS) outlined in Chapter 391-3-6 as screening criteria for groundwater instead of maximum contaminant levels (MCLs). The EPD agreed with the proposal and, accordingly, the Table B, Column 2 STLs and IWQS are used in this CAP-Part B as screening criteria.

Minor concentrations of petroleum hydrocarbons were identified in soil around the Pump House #6 area during the CAP-Part A and B investigations. **Figure 3** illustrates petroleum hydrocarbon concentrations in soil. **Table 1** lists petroleum constituents and concentrations identified in soil samples. Analytical data is provided in **Appendix B**. Benzene concentrations exceeded the STL listed in Georgia Rule, Chapter 391-3-15, Table B, Column 2 at one location (SB65 at 10 feet). However, the laboratory detection limit for benzene exceeded the STL due to interferences at SB67 and SB16 (performed during the CAP-Part A investigation). Location SB16 at 10 ft below land surface (bls) also contained ethylbenzene and toluene above STLs. Thus, it appears BTEX contamination is confined to the area around SB65 and SB16. PAHs are not regulated since the site is greater than 500 feet from a surface water body. Alternate Threshold Levels (ATLs) were calculated for benzene in soil that exceeded the soil screening criteria listed in the Georgia Rule Table B. Since the ATLs were lower than the Table B screening criteria for benzene, ATLs were not considered applicable for use at Pump House #6.

Groundwater

Two shallow monitoring wells (MW33 and MW34) and one deep monitoring well (MW35) were installed at the Pump House #6 area on May 7 and May 8, 1997. The locations were selected to define the extent of soluble petroleum hydrocarbon contamination identified in the CAP-Part A investigation conducted in November/December 1996. Shallow monitoring wells screen depths extended from approximately 4.5 to 14.5 feet bls and were constructed with a 10-foot long section of machine slotted, polyvinyl chloride (PVC) well screen placed to bracket the water table.

The deep monitoring well screen was placed approximately 24.5 to 29.5 feet bls and was constructed with a 5-foot screen to determine groundwater quality at depth. Monitoring well schematics, development sheets, and photographs are provided in **Appendix C**.

Groundwater samples were collected at the Pump House #6 site from the three new monitoring wells on May 29, 1997. The samples were submitted for laboratory analysis by EPA methods 8020 and 8310 (BTEX/MTBE and PAHs, respectively). No free product was detected while sampling. Benzene, ethylbenzene, and xylene were detected in MW33 and MW34 at concentrations well below IWQS. No PAH constituent detected is regulated. **Table 2** summarizes petroleum constituents identified in groundwater. Analytical laboratory reports are provided in **Appendix B**.

The presence of a soluble petroleum hydrocarbon plume in groundwater has not been identified in the Pump House #6 area. The concentrations detected were minimal and well below IWQS.

Surface Water

Sampling during the CAP-Part A investigation identified only one occurrence of xylene at a concentration below IWQS in surface water samples. This sample was collected from the man-made drainage ditch located 610 feet south of Pump House #6 (see **Figure 2**). No surface water samples were collected during the CAP-Part B phase of the SI.

Sediment

Sampling during the CAP-Part A investigation indicated no impact by BTEX or PAH compounds. Sediment samples were collected from the same locations as surface water samples. No sediment samples were collected during the CAP-Part B Phase of the SI.

SECTION II.B. Local and Site Hydrogeology

Documentation of Local Groundwater Conditions

No potable water supply wells have been identified within a 1/2-mile radius of the site. Nine potable wells were identified within a 2-mile radius. Although the Pump House #6 site is located in the high or average groundwater pollution susceptibility area, all wells in use within the 2-mile radius are cased to a minimum depth of 200 feet bls and they are not hydraulically connected with the surficial aquifer due to several interbedded clay layers at depth. The closest of these public wells (Hunter 2) is located approximately 3200 feet north (upgradient) of the Pump House #6 area and cased to a depth of 260 feet bls. Information on the location of potable wells identified during M&E's well survey is provided in **Table 3**. Documented reports of investigations conducted throughout the coastal plain area on groundwater resources indicate three major aquifers exist in the study area: the surficial aquifer, Brunswick aquifer, and the upper and lower portions of the Floridan aquifer (Clarke et al, 1990). Separating the surficial aquifer from the deeper aquifers are two confining units. The upper confining unit, Miocene unit A, ranges in thickness from about 20 feet to 90 feet with a vertical hydraulic conductivity of 5.3×10^{-5} to 1.3×10^{-4} feet/day (Clarke et al, 1990). The Miocene A unit is encountered approximately 60 feet bls in the Savannah area. The lower confining unit, Miocene unit B, ranges in thickness from about 10 feet to 50 feet with a vertical hydraulic conductivity of 6.7×10^{-5} feet/day to 1.3×10^{-2} feet/day (Clarke et al, 1990). This unit lies directly beneath the Miocene A unit in the Savannah area.

Local Geology

The local geology has been documented by the installation of six monitoring wells around the Pump House #6 area and nearby subsurface investigations at other underground storage tanks (UST) sites. Depth of drilling was generally 14.5 feet bls with one deeper boring continuing to a depth of 29.5 feet bls.

The lithology encountered was predominantly a dark gray to dark brown, very fine to medium-grained sand, with variable silt and clay content. Generally, the samples with higher silt and clay content were within a few feet of the surface. Less silt and clay content was noted with depth. Soil samples from the three new monitoring well locations (**Figure 2**) were analyzed for grain size distribution. In MW35, at a depth of about 13 feet, grain size increases to fine-coarse, but this grain size increase was not noted elsewhere. Two of three samples contained less than 9.3 percent fines which prevented Atterburg limits testing. The average moisture content in soil samples was 26 percent. Geotechnical data is presented in **Appendix D**. **Figure 2** illustrates cross-section transects and **Figures 5** and **6** show cross-sections A-A' and B-B', respectively across the Pump House #6 site.

All monitoring wells (new and existing) were gauged on May 29, 1997. Groundwater in the study area is under water table conditions and is encountered between 7.6 to 9.1 feet bls, averaging 8.4 feet bls. **Table 4** lists screen intervals, water levels, and elevation information for all wells used in this investigation. **Figure 7** shows the potentiometric surface at the site.

Groundwater flows toward the south with an approximate gradient of 0.006 ft/ft and changes to the southeast with a gradient of 0.003 ft/ft downgradient of Pump House #6.

Documented Calculations of Relevant Aquifer Parameters

A total of three Shelby tube samples were collected during the CAP-Part B investigation at Pump House #6. The Shelby tube samples were collected from soil borings SB60 (6-8 ft), SB64 (5-7 ft), and SB67 (6-8 ft). The samples were analyzed for grain size distribution, moisture content, and permeability. Results of the Shelby tube analysis are presented in **Appendix D**. The three Shelby tube samples averaged 91.2 percent sand, 13.7 percent moisture content, and 1.6×10^{-3} cm/s permeability. A permeability test using high octane unleaded gasoline was performed on SB-67 (7-8 feet) with the results being 1.0×10^{-2} cm/s.

Using the average permeability (equivalent to hydraulic conductivity), the hydraulic gradient (range 0.006-0.003 ft/ft), and an average effective porosity of 0.18 (from Building 728 CAP-Part B; M&E, September 1997), seepage velocity calculated for the shallow aquifer at Pump House #6 ranges from 5.3×10^{-5} to 2.7×10^{-5} cm/s. All calculations for determining seepage velocity are provided in **Appendix D**.

SECTION III.B. Objectives of Corrective Action

The CAP-Part B analytical results indicate that only soil samples from one boring location, SB65, exceeded the benzene STL criteria established in Table B, Column, 2 of Georgia Rule, Chapter 391-3-15.09. CAP-Part A soil boring SB16 exceeded toluene and ethylbenzene criteria. These two soil boring locations are 20 feet apart and thereby represent a small area of impacted soil. No groundwater samples collected during this CAP-Part B investigation exceeded IWQS. In accordance with Georgia EPD CAP-Part B guidance, a risk of exposure assessment (ROEA) was performed to identify potential receptors in proximity to the site. Elements of the ROEA at this site are discussed in the following paragraphs.

Provide Risk-Based Corrective Action

The risk of exposure assessment is designed to assess the potential for soil and groundwater contamination to impact potential downgradient receptors. All potential receptors within a 0.5-mile radius of the site were identified. A one-dimensional fate-transport model was not utilized at this site since the contamination identified was below IWQS.

Potential Receptor Survey

M&E performed a potential receptor survey (PRS) for the area within a 0.5-mile radius of the site. The survey was performed by studying a topographic quadrangle map of the area , contacting the United States Geological Survey (USGS), city water department, HAAF Water and Sewer Department, and conducting field reconnaissance to confirm the existence of the potential receptors. Land usage of the local area is military, with the nearest boundary 0.67 mile from Pump House #6. As previously discussed, shallow groundwater is not used for potable purposes in the area and aquifers utilized for drinking water are isolated from shallow groundwater by two confining units. The survey did identify one surface water body 610 feet southeast of the site. This drainage feature is considered the only potential receptor to contaminants identified at Pump House #6.

Conclusions and Recommendations

The extent of soil contamination in excess of state criteria is confined to a small area around soil borings SB16 and SB65 at a depth of approximately 10 feet. Potential soil exposure is minimum due to the depth of contamination. No further action is recommended for soil based on the limited extent of soil contamination and lack of an exposure pathway.

Groundwater contamination was detected in two wells (680 feet apart) at concentrations below IWQS. Concentrations of 9.1 µg/L and 11 µg/L of benzene in wells MW33 and MW34 are not considered significant enough to warrant remedial action. The shallow groundwater is not used for potable purposes in the area and the nearest downgradient potential receptor (surface drainage ditch) is 610 feet away. Based on the above information, no further action is recommended for groundwater. Natural attenuation or degradation should be sufficient to remediate the minimal contamination identified.

SECTION IV Public Notice

The site is located within the boundaries of HAAF, with the closest property boundary being 0.67 mile away. Although no private property is contiguous to the study area, public notification of the Corrective Action Plan will be provided by Ft. Stewart Environmental Branch personnel. A copy of the public notice that will be published in *The Savannah Morning News* concurrently with the submittal of this document is provided in **Appendix E**.

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TABLE 1
HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
SUMMARY OF CONSTITUENTS DETECTED IN SOIL SAMPLES

CONSTITUENT: (Units in mg/kg)	SOIL THRESHOLD LEVELS (a)	SITE: / SAMPLE ID: / DATE: / DEPTH (ft): / RESULT TYPE:	MW33 WB3301 5/7/97 6.0 Primary	MW33 WB3302 5/7/97 10.0 Primary	MW33 WB6201 5/7/97 10.0 Duplicate	MW34 WB3401 5/7/97 6.0 Primary	MW34 WB3402 5/7/97 10.0 Primary
Benzene	0.120		< 0.006	< 0.0058	< 0.006	< 0.0055	< 0.0062
Ethylbenzene	140		0.025 J	< 0.0058	0.0092	< 0.0055	< 0.0062
Toluene	500		0.12 J	0.013	0.023	< 0.0055	0.0079
Xylene (total)	700		0.17 J	0.14	0.12	0.008	< 0.0062
Benzo(a)pyrene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Benzo(b,k)fluoranthene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Benzo(ghi)perylene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Chrysene + Benzo(a)anthracene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Fluoranthene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Fluorene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Indeno(1,2,3-cd)pyrene+Dibenzo(	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Naphthalene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Phenanthrene + Anthracene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Pyrene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
1-Methylnaphthalene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
2-Methylnaphthalene	NA		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
GRO	-		0.21	0.34	0.22	< 0.2	< 0.22
DRO	-		15 J	< 12 J	< 12 J	< 10	< 12

(a) - Soil Threshold Levels - GA EPD DNR, Chapter 391-3-15-.09, UST Management, Table B, Col.2 .
Susceptibility Area based on a distance of >500 feet to a surface water body.
NA - Not Applicable; The health-based threshold level exceeds the expected soil concentration under free product condition.
[ ] Concentration exceeds Soil Threshold Level
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED. (-) = No level listed

TABLE 1
HUNTER army AIRFIELD
CAP-B PUMPHOUSE # 6
SUMMARY OF CONSTITUENTS DETECTED IN SOIL SAMPLES

CONSTITUENT: (Units in mg/kg)	SOIL THRESHOLD LEVELS (a)	SITE: SAMPLE ID: DATE: DEPTH (ft): RESULT TYPE:	MW35 WB3501 5/7/97 6.0 Primary	MW35 WB3502 5/7/97 10.0 Primary	SB60 SB6001 5/5/97 2.0 Primary	SB60 SB6002 5/5/97 8.0 Primary	SB61 SB6101 5/6/97 6.0 Primary
Benzene	0.120		< 0.006	< 0.0061	< 0.0054 J	< 0.0061 J	< 0.0056
Ethylbenzene	140		< 0.006	< 0.0061	< 0.0054	< 0.0061	0.0099
Toluene	500		0.014	0.016	< 0.0054	< 0.0061	0.062
Xylene (total)	700		0.016	0.013	< 0.0054	< 0.0061	0.034
Benzo(a)pyrene	NA		< 0.39	< 0.4	9.2 J	< 0.4	< 0.38
Benzo(b,k)fluoranthene	NA		< 0.39	< 0.4	21 J	< 0.4	< 0.38
Benzo(ghi)perylene	NA		< 0.39	< 0.4	6.6 J	< 0.4	0.75
Chrysene + Benzo(a)anthracene	NA		< 0.39	< 0.4	25	< 0.4	< 0.38
Fluoranthene	NA		< 0.39	< 0.4	23 J	< 0.4	< 0.38
Fluorene	NA		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
Indeno(1,2,3-cd)pyrene+Dibenzo(	NA		< 0.39	< 0.4	8.9	< 0.4	< 0.38
Naphthalene	NA		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
Phenanthrene + Anthracene	NA		< 0.39	< 0.4	16 J	< 0.4	< 0.38
Pyrene	NA		< 0.39	< 0.4	19 J	< 0.4	< 0.38
1-Methylnaphthalene	NA		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
2-Methylnaphthalene	NA		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
GRO	-		< 0.21	< 0.21	< 0.2	< 0.22	0.3
DRO	-		< 12	< 12	34	< 12	14

(a) - Soil Threshold Levels - GA EPD DNR, Chapter 391-3-15-.09, UST Management, Table B, Col.2 .
Susceptibility Area based on a distance of >500 feet to a surface water body.
NA - Not Applicable; The health-based threshold level exceeds the expected soil concentration under free product condition.
[ ] Concentration exceeds Soil Threshold Level
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED. (-) = No level listed

TABLE 1
HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
SUMMARY OF CONSTITUENTS DETECTED IN SOIL SAMPLES

CONSTITUENT: (Units in mg/kg)	SOIL THRESHOLD LEVELS (a)	SITE: SAMPLE ID: DATE: DEPTH (ft): RESULT TYPE:	SB61 SB6102 5/6/97 10.0 Primary	SB62 SB6201 5/6/97 6.0 Primary	SB62 SB6202 5/6/97 10.0 Primary	SB63 SB6301 5/5/97 6.0 Primary	SB63 SB6302 5/5/97 10.0 Primary
Benzene	0.120		< 0.006	< 0.0058	< 0.0066	< 0.0058 J	< 0.0064 J
Ethylbenzene	140		< 0.006	< 0.0058	0.0082	< 0.0058	< 0.0064
Toluene	500		0.031	0.014	0.05	< 0.0058	< 0.0064
Xylene (total)	700		0.013	0.025	0.042	< 0.0058	< 0.0064
Benzo(a)pyrene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Benzo(b,k)fluoranthene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Benzo(ghi)perylene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Chrysene + Benzo(a)anthracene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Fluoranthene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Fluorene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Indeno(1,2,3-cd)pyrene+Dibenzo(	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Naphthalene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Phenanthrene + Anthracene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
Pyrene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
1-Methylnaphthalene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
2-Methylnaphthalene	NA		< 0.39	< 0.38	< 0.44	< 0.38	< 0.42
GRO	-		< 0.21	< 0.2	0.51	< 0.21	< 0.23
DRO	-		< 12	< 11	< 13	< 12	< 12

(a) - Soil Threshold Levels - GA EPD DNR, Chapter 391-3-15-.09, UST Management, Table B, Col.2 .
Susceptibility Area based on a distance of >500 feet to a surface water body.
NA - Not Applicable; The health-based threshold level exceeds the expected soil concentration under free product condition.
[ ] Concentration exceeds Soil Threshold Level
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED. (-) = No level listed

TABLE 1
HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
SUMMARY OF CONSTITUENTS DETECTED IN SOIL SAMPLES

CONSTITUENT: (Units in mg/kg)	SOIL THRESHOLD LEVELS (a)	SITE: / SAMPLE ID: / DATE: / DEPTH (ft): / RESULT TYPE:	SB64 SB6401 5/6/97 6.0 Primary	SB64 SB6402 5/6/97 8.0 Primary	SB65 SB6501 5/6/97 6.0 Primary	SB65 SB10701 5/6/97 6.0 Duplicate	SB65 SB6502 5/6/97 10.0 Primary
Benzene	0.120		< 0.0058	< 0.006	< 0.027	< 0.47(*)	[1.3]
Ethylbenzene	140		< 0.0058	< 0.006	1.2	3.8	4.4
Toluene	500		< 0.0058	< 0.006	0.04	< 0.47	1.5
Xylene (total)	700		< 0.0058	< 0.006	1.6	1.5	3.3
Benzo(a)pyrene	NA		< 0.38	< 0.4	< 0.72	< 3.8	< 0.8
Benzo(b,k)fluoranthene	NA		< 0.38	< 0.4	< 0.72	< 3.8	< 0.8
Benzo(ghi)perylene	NA		< 0.38	< 0.4	< 0.72	< 3.8	< 0.8
Chrysene + Benzo(a)anthracene	NA		0.47	< 0.4	< 0.72 J	< 3.8	< 0.8
Fluoranthene	NA		0.64	< 0.4	< 0.72 J	< 3.8	< 0.8
Fluorene	NA		< 0.38	< 0.4	< 0.72 J	3.9	< 0.8
Indeno(1,2,3-cd)pyrene+Dibenzo(	NA		< 0.38	< 0.4	< 0.72	< 3.8	< 0.8
Naphthalene	NA		< 0.38	< 0.4	1.8 J	11	2.4
Phenanthrene + Anthracene	NA		< 0.38	< 0.4	< 0.72 J	< 3.8	< 0.8
Pyrene	NA		< 0.38	< 0.4	< 0.72 J	< 3.8	< 0.8
1-Methylnaphthalene	NA		< 0.38	< 0.4	2.4 J	14	2
2-Methylnaphthalene	NA		< 0.38	< 0.4	1.8 J	15	2.4
GRO	-		< 0.2	< 0.21	310	350	290
DRO	-		< 11	< 12	640 J	450	240

(a) - Soil Threshold Levels - GA EPD DNR, Chapter 391-3-15-.09, UST Management, Table B, Col.2 .
Susceptibility Area based on a distance of >500 feet to a surface water body.
NA - Not Applicable; The health-based threshold level exceeds the expected soil concentration under free product condition.
[ ] Concentration exceeds Soil Threshold Level
[*] Detection Limit exceeds Soil Threshold Level
J = RESULT IS ESTIMATED.
R = RESULT IS REJECTED.
(-) = No level listed

TABLE 1
HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
SUMMARY OF CONSTITUENTS DETECTED IN SOIL SAMPLES

CONSTITUENT: (Units in mg/kg)	SOIL THRESHOLD LEVELS (a)	SITE: / SAMPLE ID: / DATE: / DEPTH (ft): / RESULT TYPE:	SB66 SB6601 5/6/97 6.0 Primary	SB66 SB6602 5/6/97 10.0 Primary	SB67 SB6701 5/6/97 6.0 Primary	SB67 SB6702 5/6/97 10.0 Primary	SB68 SB6801 5/6/97 6.0 Primary
Benzene	0.120		< 0.0053	< 0.0061	< 0.0054	< 0.032	< 0.0053
Ethylbenzene	140		< 0.0053	< 0.0061	< 0.0054	< 0.032	< 0.0053
Toluene	500		0.011	0.018	0.0059	0.043	< 0.0053
Xylene (total)	700		< 0.0053	< 0.0061	0.012	0.2	< 0.0053
Benzo(a)pyrene	NA		< 0.35	< 0.4	< 0.36	< 0.42	0.45
Benzo(b,k)fluoranthene	NA		< 0.35	< 0.4	< 0.36	< 0.42	1.2
Benzo(ghi)perylene	NA		< 0.35	< 0.4	< 0.36	< 0.42	< 0.35
Chrysene + Benzo(a)anthracene	NA		< 0.35	< 0.4	< 0.36	< 0.42	1.4
Fluoranthene	NA		< 0.35	< 0.4	< 0.36	< 0.42	1.7
Fluorene	NA		< 0.35	< 0.4	< 0.36	< 0.42	< 0.35
Indeno(1,2,3-cd)pyrene+Dibenzo(	NA		< 0.35	< 0.4	< 0.36	< 0.42	< 0.35
Naphthalene	NA		< 0.35	< 0.4	< 0.36	< 0.42	< 0.35
Phenanthrene + Anthracene	NA		< 0.35	< 0.4	< 0.36	< 0.42	1.0
Pyrene	NA		< 0.35	< 0.4	< 0.36	< 0.42	< 0.35
1-Methylnaphthalene	NA		< 0.35	< 0.4	< 0.36	< 0.42	< 0.35
2-Methylnaphthalene	NA		< 0.35	< 0.4	0.64	< 0.42	< 0.35
GRO	-		< 0.2	< 0.22	< 0.2	400	< 0.2
DRO	-		17	< 12	260	< 12	< 10

(a) - Soil Threshold Levels - GA EPD DNR, Chapter 391-3-15-.09, UST Management, Table B, Col.2 .
Susceptibility Area based on a distance of >500 feet to a surface water body.
NA - Not Applicable; The health-based threshold level exceeds the expected soil concentration under free product condition.
[ ] Concentration exceeds Soil Threshold Level
[*] Detection Limit exceeds Soil Threshold Level
J = RESULT IS ESTIMATED.
R = RESULT IS REJECTED.
(-) = No level listed

TABLE 1
HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
SUMMARY OF CONSTITUENTS DETECTED IN SOIL SAMPLES

CONSTITUENT: (Units in mg/kg)	SOIL THRESHOLD LEVELS (a)	SITE: SAMPLE ID: DATE: DEPTH (ft): RESULT TYPE:	SB68 SB6802 5/6/97 10.0 Primary
Benzene	0.120		< 0.0064
Ethylbenzene	140		0.013
Toluene	500		0.007
Xylene (total)	700		< 0.0064
Benzo(a)pyrene	NA		< 0.42
Benzo(b,k)fluoranthene	NA		< 0.42
Benzo(ghi)perylene	NA		< 0.42
Chrysene + Benzo(a)anthracene	NA		< 0.42
Fluoranthene	NA		< 0.42
Fluorene	NA		< 0.42
Indeno(1,2,3-cd)pyrene+Dibenzo(	NA		< 0.42
Naphthalene	NA		< 0.42
Phenanthrene + Anthracene	NA		< 0.42
Pyrene	NA		< 0.42
1-Methylnaphthalene	NA		< 0.42
2-Methylnaphthalene	NA		< 0.42
GRO	-		< 0.23
DRO	-		< 12

(a) - Soil Threshold Levels - GA EPD DNR, Chapter 391-3-15-.09, UST Management, Table B, Col.2 .
Susceptibility Area based on a distance of >500 feet to a surface water body.
NA - Not Applicable; The health-based threshold level exceeds the expected soil concentration under free product condition.
[ ] Concentration exceeds Soil Threshold Level
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED. (-) = No level listed

TABLE 2
HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
SUMMARY OF CONSTITUENTS DETECTED IN GROUNDWATER SAMPLES

CONSTITUENT: (Units in ug/l)	GEORGIA IWQS (1)	SITE: / SAMPLE ID: / DATE: / RESULT TYPE:	MW33 / MW3301 / 5/29/97 / Primary	MW34 / MW3401 / 5/29/97 / Primary	MW35 / MW3501 / 5/29/97 / Primary
Benzene	71.28		9.1	11	< 1
Ethylbenzene	28,718		17	110	< 1
Xylene (total)	-		370	60	< 2
Naphthalene	-		5	71	< 1
1-Methylnaphthalene	-		< 1	24	< 1
2-Methylnaphthalene	-		1.2	33	< 1

(1) - Georgia Rule, Chapter 391-3-6, In-stream Water Quality Standards (IWQS)
(-) IWQS not listed
[] = Greater than IWQS
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED.

TABLE 3
WATER SUPPLY WELLS WITHIN A 2-MILE RADIUS OF PUMP HOUSE #6

Well I.D.	Quad.	Owner	Total Depth	Casing Depth	Distance/ Direction	Use
290	36Q	U.S. Army, Hunter 4	300	90	10,200 ft W	Abandoned
289	36Q	U.S. Army, Hunter 4A	360	267	10,400 ft W	Public
112	36Q	SCL RR, Shops	508	275	8,000 ft NW	Commercial
285	36Q	U.S. Army, Hunter 1	504	259	6,100 ft NNW	Public
286	36Q	U.S. Army, Hunter 2	555	260	3,200 ft NNE	Public
036	36P	City of Savannah 36	414	252	9,200 ft SW	Public
287	36Q	U.S. Army, Hunter 3	370	324	7,700 ft WSW	Public
078	37P	Rivers End Subdiv. 01	440	200	9,800 ft SE	Public
079	37P	Rivers End Subdiv. 02	400	227	10,200 ft SE	Public
006	37P	City of Savannah 13	1000	270	7,300 ft SE	Public

Quad: Georgia Grid System. The full well name as in Bulletin 113 is 37Q290.

Sources:
Hunter AAF in AT&E, 1993.
GA Geologic Survey, Bulletin 113, 1990.
U.S.G.S. Well Listing, 1996.
City of Savannah Well Listing, 1996.
Hunter AAF, Water and Sewer Dept., pers. comm, 1997

TABLE 4 Pump House #6 Area Monitoring Well Summary						
Location	Screen Interval ft, bls	Water Depth, TOC	TOC Elevation, ft, msl	Water Level Elevation, ft, msl	Surface Elevation, ft, msl	Free Prod. Thickness ft.
CAP-PART A						
MW07	6.5-16.5	7.89	38.17	30.28	38.4	ND
MW08	3.0-13.0	6.34	37.60	31.26	37.7	ND
MW09	5.0-15.0	7.91	38.97	31.06	39.1	ND
CAP-PART B						
MW33	4.5-14.5	8.46	38.07	29.61	38.2	ND
MW34	4.5-14.5	9.10	38.80	29.70	39.0	ND
MW35	24.5-29.5	7.63	36.65	29.02	36.9	ND

bls-below land surface

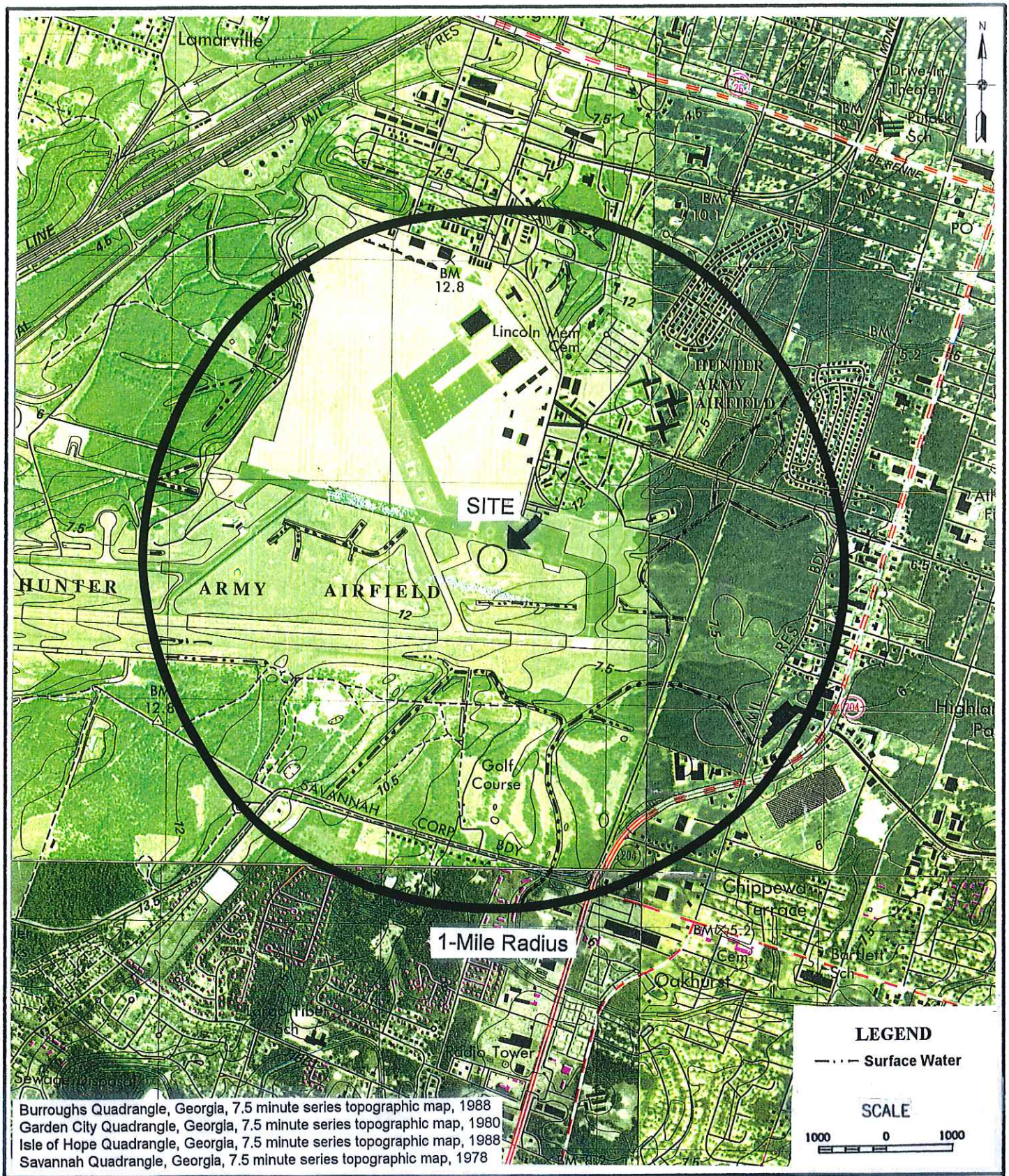
TOC-top of casing

msl-mean sea level

Measurements on 5/29/97

ND-Not Detected

(p:\hazwaste\hunter4\pb6\wellsum.wk1)



Burroughs Quadrangle, Georgia, 7.5 minute series topographic map, 1988
Garden City Quadrangle, Georgia, 7.5 minute series topographic map, 1980
Isle of Hope Quadrangle, Georgia, 7.5 minute series topographic map, 1988
Savannah Quadrangle, Georgia, 7.5 minute series topographic map, 1978

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

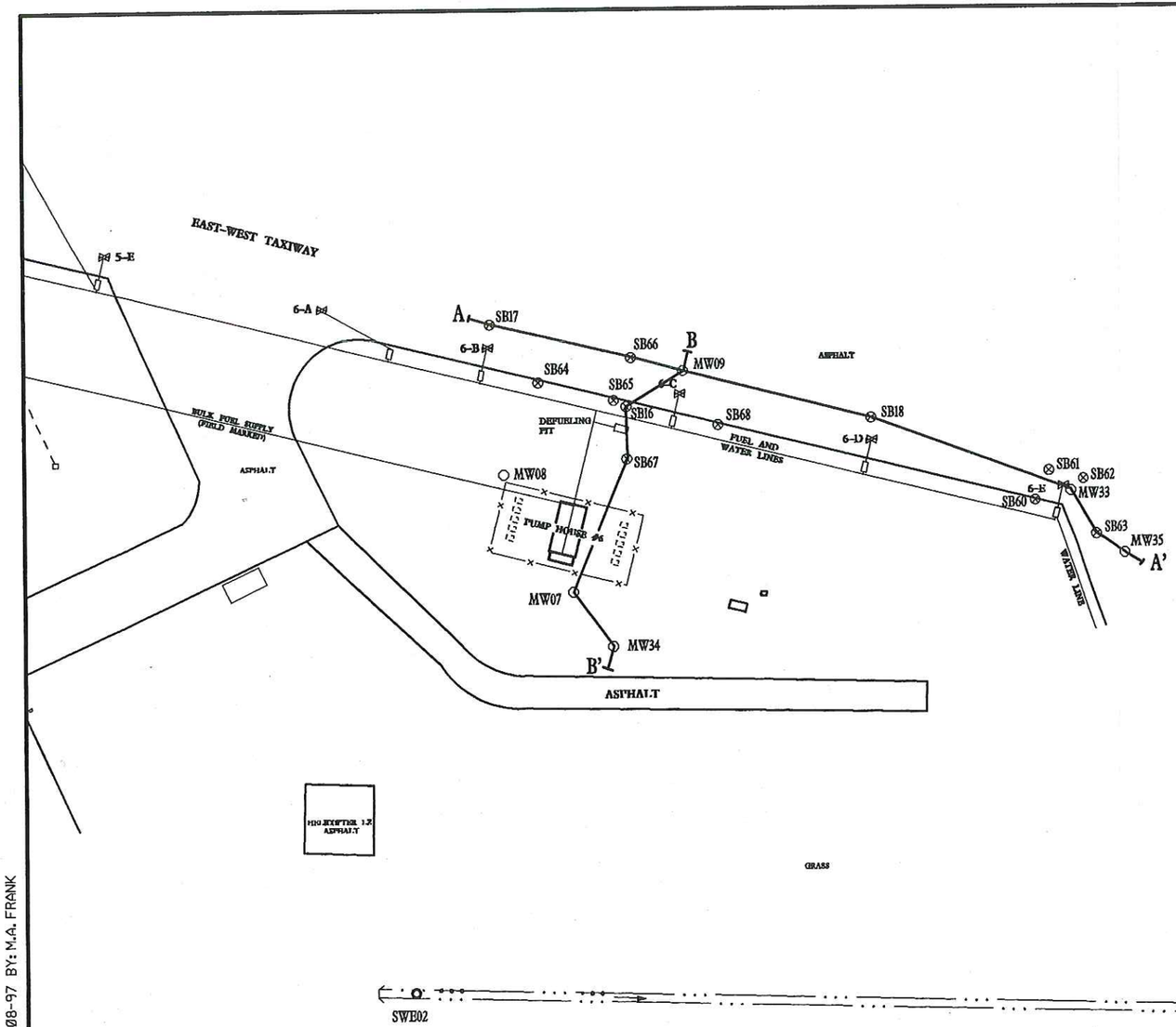
SITE LOCATION and SURFACE WATER WITHIN A 1-MILE RADIUS

PUMPHOUSE #6
HUNTER ARMY AIRFIELD, SAVANNAH GEORGIA

FIGURE 1

METCALF & EDDY

SCALE:	DATE:	APPROVED:	



N

LEGEND:

o SWE02	SURFACE WATER/ SEDIMENT LOCATION
○ MW07	MONITORING WELL LOCATION
⊗ SB16	SOIL BORING LOCATION
— · · · —	DITCH
A-A'	CROSS SECTION LOCATION
[ ]	PRESENT UST LOCATION
-X——X-	FENCE
6-A	FUELING PIT
⋈	FUEL VALVE
□	DROP INLET

SCALE

200 100 0 200 400FT

FIGURE 2

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

PUMP HOUSE #6 SAMPLING AND CROSS SECTION LOCATION MAP

HUNTER ARMY AIRFIELD SAVANNAH, GEORGIA

METCALF & EDDY

LOC: p:\proj\ 19457HAF\C\CHHAF010.DGN DATED: 09-08-97 BY: M.A. FRANK

EAST-WEST TAXIWAY

5-E

6-A

6-B

6-C

6-D

6-E

SB17 | BDL | BDL | 8' | 0.103 | BDL

SB64 | BDL | BDL | 6' | BDL | 1.11

SB66 | BDL | BDL | 10' | 0.018 | BDL

MW09 | BDL | BDL | 10' | 0.198 | BDL

SB65 | <4.9 | 16J | 10' | 123.6 | 28J

SB16 | 1.3 | 2.4 | 10' | 10.5 | 6.8

SB68 | BDL | BDL | 6' | BDL | 5.75

SB18 | BDL | BDL | 3' | 0.027 | BDL

SB67 | BDL | BDL | 10' | 0.037 | BDL

MW08 | <0.032 | BDL | 10' | 0.275 | BDL

SB61 | BDL | BDL | 6' | 0.106 | 0.75

SB62 | BDL | BDL | 6' | 0.039 | BDL

SB60 | BDL | BDL | 6' | 0.315J | BDL

MW33 | BDL | <1.8 | 2' | BDL | 128.7

SB63 | BDL | BDL | BDL | BDL

MW35 | BDL | BDL | 10' | 0.029 | BDL

MW07 | BDL | BDL | BDL | BDL

MW34 | BDL | BDL | 10' | 0.0079 | BDL

BULK FUEL SUPPLY (FIELD MARKED)

ASPHALT

GRASS

PUMP HOUSE #6

8070

8078

8071

DEFUELING PIT

FUEL AND WATER LINES

WATER LINE

ASPHALT

GRASS

HELICOPTER LZ ASPHALT

N

SCALE

100 50 0 100 200FT

SAMPLING DATES:
MW07, 08, 09, SB16, 17, 18 - 11/20/96 (CAP-A)
MW33, 34, 35, SB60-68 - 5/7/97 (CAP-B)

LEGEND:

- ○ MW07 MONITORING WELL LOCATION
- ⊗ SB16 SOIL BORING LOCATION

BENZENE	2-METHYLNAPHTHALENE	SAMPLE DEPTH
TOTAL BTEX	TOTAL PAH	

UNITS IN mg/kg

J - ESTIMATED

BDL - BELOW DETECTION LEVEL

- PRESENT UST LOCATION
- -X——X- FENCE
- 6-A FUELING PIT
- FUEL VALVE
- DROP INLET

NOTE:
ALL VALUES PRESENTED ON THIS MAP REPRESENT DEPTHS WHERE THE MOST ELEVATED CONCENTRATIONS WERE ENCOUNTERED. ANALYTICAL RESULTS FROM BOTH CAP-A AND CAP-B INVESTIGATIONS ARE ILLUSTRATED.

FIGURE 3

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

PUMP HOUSE #6
PETROLEUM HYDROCARBONS DETECTED IN SOIL SAMPLES

HUNTER ARMY AIRFIELD SAVANNAH, GEORGIA

M&E
METCALF & EDDY

LOC: p:\proj\ 19457HAF\C\CHHAF006.DGN DATED: 09-05-97 BY: M.A. FRANK

EAST-WEST TAXIWAY

5-E

6-A

SB17

6-B

SB66

MW09

3.6J	66
380.6J	147.26J

ASPHALT

SB64

SB65

SB16

6-C

SB68

SB18

6-D

BULK FUEL SUPPLY (FIELD MARKED)

DEFUELING PIT

FUEL AND WATER LINES

SB67

MW08

<1.1	20
576	61

ASPHALT

GRASS

SB61

SB62

6-E

MW33

9.1	5
387	6.2

SB60

PUMP HOUSE #6

8070

SB63

MW35

BDL	BDL
BDL	BDL

WATER LINE

8078

MW07

1.3	1.8
22.6	24.2J

8071

GRASS

MW34

11	71
181	128

ASPHALT

GRASS

HELICOPTER LZ ASPHALT

N

NOTE:

ANALYTICAL RESULTS FROM BOTH CAP-A AND CAP-B INVESTIGATIONS ARE ILLUSTRATED.

SAMPLING DATES:
MW07, 08, 09 - 12/10/96
MW33, 34, 35 - 5/29/97

SCALE

100 50 0 100 200FT

LEGEND:

- ○ MW07 MONITORING WELL LOCATION
- ⊗ SB17 SOIL BORING LOCATION

BENZENE	NAPHTHALENE
TOTAL BTEX	TOTAL PAHS

UNITS IN ug/L

J - ESTIMATED

- PRESENT UST LOCATION
- -X——X- FENCE
- 6-A FUELING PIT
- ⋈ FUEL VALVE
- □ DROP INLET

FIGURE 4

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

PUMP HOUSE #6
PETROLEUM HYDROCARBONS DETECTED IN GROUNDWATER SAMPLES

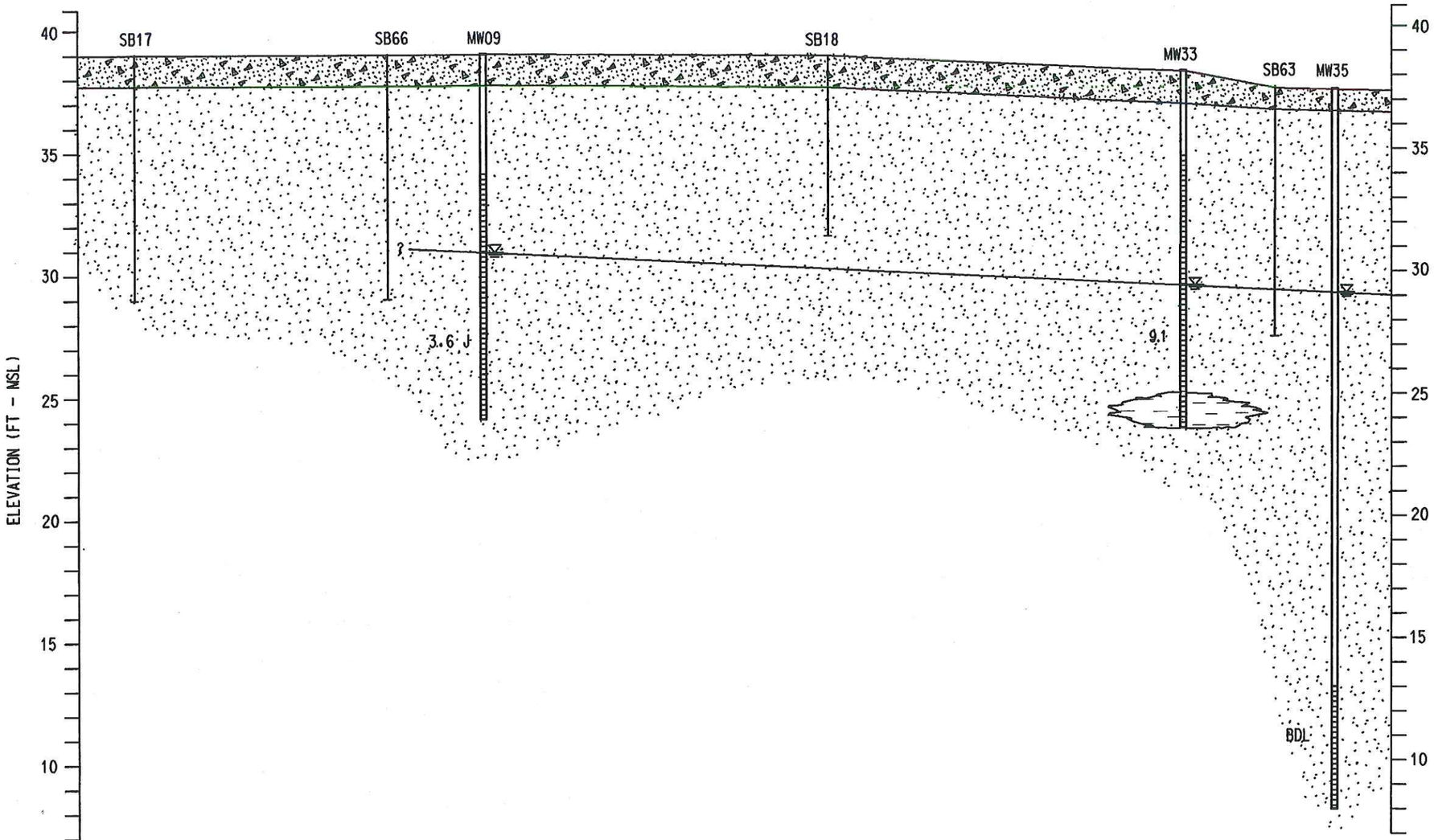
HUNTER ARMY AIRFIELD SAVANNAH, GEORGIA

METCALF & EDDY

LOC: p:\proj\ 19457HAF\C\CHHAF008.DGN DATED: 09-08-97 BY: M.A. FRANK

A (WEST)

A' (EAST)



CONCRETE/ASPHALT

SAND, FINE/MED. GRAIN, BR/BLK/RED/GY

CLAY, SANDY

SCREEN

BORING

WATER LEVEL 5/29/97

3.6 J BENZENE CONCENTRATION, UG/L (J = ESTIMATED)

BDL BELOW DETECTION LIMIT

Ø 100'
HORIZONTIAL
Ø 5'
VERTICAL
V.E. = 20X

SAMPLING DATES
MW09 - 12/10/96
MW33, 35 - 5/29/97

FIGURE 5

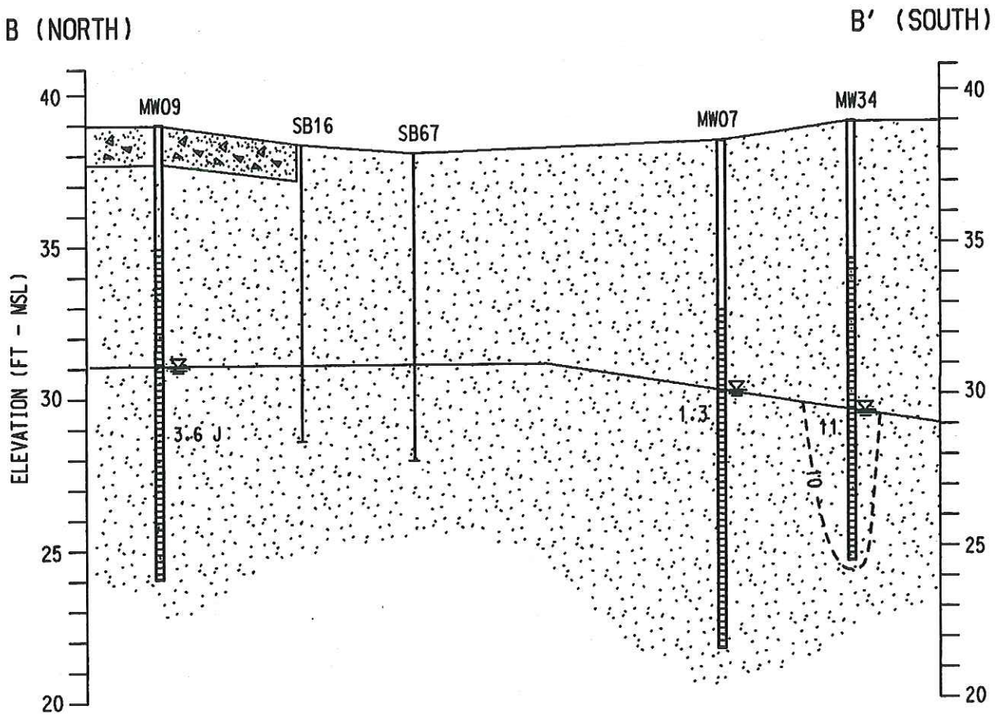
U.S. ARMY
ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

PUMP HOUSE #6
CROSS SECTION A–A'

HUNTER army AIRFIELD SAVANNAH, GEORGIA

METCALF & EDDY

LOC: p:\proj\19457haf\c\cxhaf006.DGN DATED: 09-05-97 BY: M.A. FRANK



CONCRETE/ASPHALT

SAND, FINE/MED. GRAIN, BR/GY

SCREEN

BORING

WATER LEVEL 5/29/97

~10~ BENZENE ISOPLETH CONTOUR, UG/L

3.6 J BENZENE CONCENTRATION, UG/L (J = ESTIMATED)

Ø 100'
HORIZONTIAL

Ø 5'
VERTICAL
V.E. • 20X

SAMPLING DATES
MW09, 07- 12/10/96
MW34 - 5/29/97

FIGURE 6

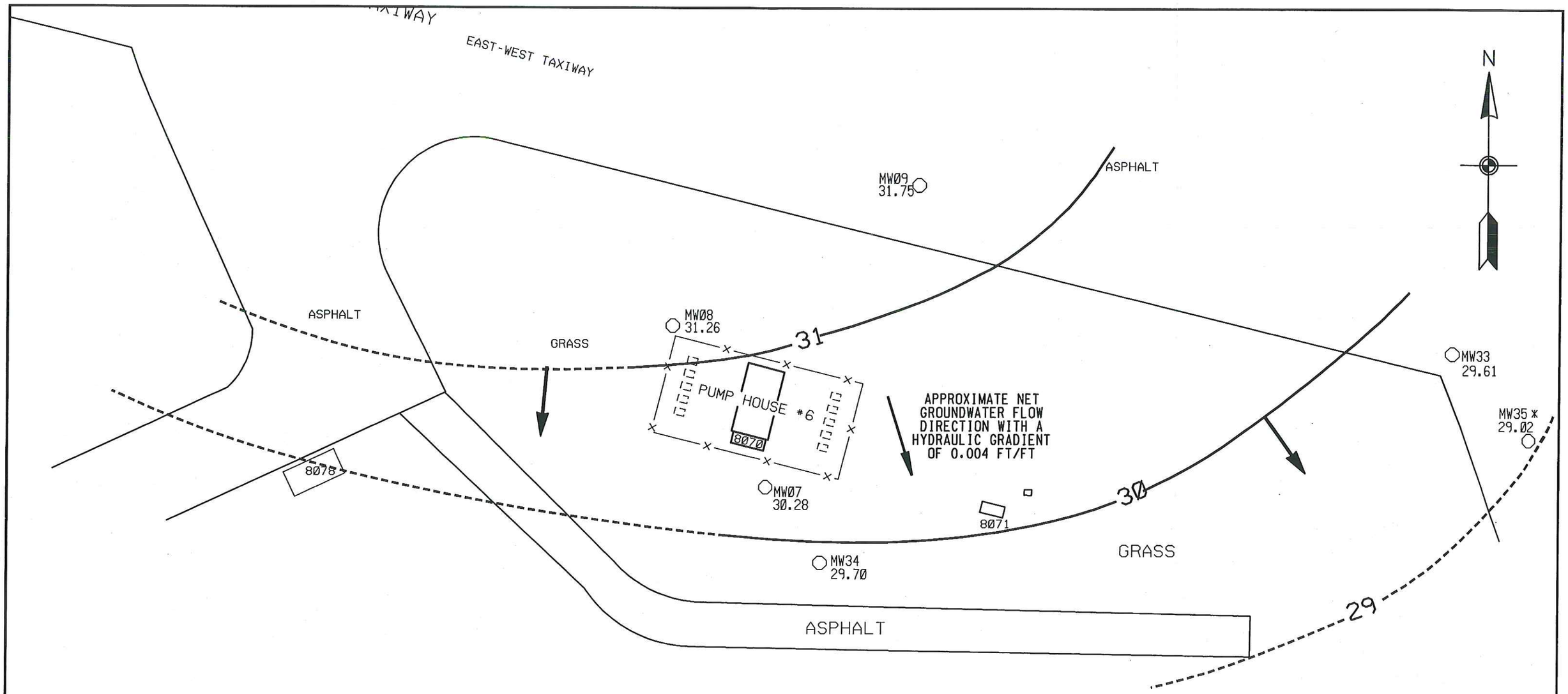
U.S. ARMY
ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

PUMP HOUSE #6
CROSS SECTION B-B'

HUNTER army AIRFIELD SAVANNAH, GEORGIA

METCALF & EDDY

LOC: p:\proj\19457haf\c\cxhaf005.DGN DATED: 09-05-97 BY: M.A. FRANK



LEGEND:

- MW07 — MONITORING WELL LOCATION
- PRESENT UST LOCATION
- 29 — POTENTIOMETRIC CONTOUR (ft.)
- DROP INLET
- FLOW DIRECTION

LEVELS MEASURED 5-29-97

* DEEP WELL

SCALE

100 50 0 100 200FT

FIGURE 7	U.S. ARMY ENGINEER DISTRICT, SAVANNAH CORPS OF ENGINEERS SAVANNAH, GEORGIA	
PUMP HOUSE #6 POTENTIOMETRIC SURFACE MAP HUNTER army AIRFIELD SAVANNAH, GEORGIA		
METCALF & EDDY		

LOC: p:\proj\ 19457HAF\C\CHHAF014.DGN DATED: 03-11-98 BY: M.A. FRANK

APPENDIX A

GEOLOGIC LOGS

Hole No. MW33

DRILLING LOG	DIVISION	INSTALLATION	SHEET / OF / SHEETS
	SAN DIST	HAAF	

1. PROJECT: Pumphouse 1,2,6 CAP B
2. LOCATION (Coordinates or Station):
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): MW33
5. NAME OF DRILLER: K. Durham
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 15.0'
8. DEPTH DRILLED INTO ROCK: Ø
9. TOTAL DEPTH OF HOLE: 15.0'
10. SIZE AND TYPE OF BIT: 6 1/4" ID HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED Ø
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: 29.61'
16. DATE HOLE: STARTED 5/7/97; COMPLETED 5/7/97
17. ELEVATION TOP OF HOLE: 38.07' TOC
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D Humphus

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0		Asphalt	hand auger	1	BLOWS / OVA, ppm NA BZ- 0 HS- 0
	2		concrete SAND: fine-med, LtYellBr 10YR 6/4, well sorted silt 5%, tr. heavy mins, dry (SW)			
	4		as above GyBr 10YR 5/2 (SW)	hand auger	2	NA BZ- 0 HS- 0
	6		: as above, black, no odor, silty 10-20 v. loose - loose. (SM)	100	3	34-3-5 Lab BZ- 0 HS- 65
	8		Cuttings mix of above damp/moist	—	Auger	
	10		as above, wet, loose - firm. Red BlK 2.5YR 2.5/1 (SM)	75	4	3" spoon 7-9-11-18 * initial wet sample Lab BZ- 0 HS- 200 monitor well install
	12		Cuttings as above	—	Auger	
	14		CLAY: GyBr 2.5Y 5/2, low plastic, sandy 30% dry, soft - hard (CL)	50	5	4-15-24-34 Geotech BZ- 0
	16		SAND: fine-med, Lt olive Br 2.5Y 5/3, well sorted, wet, silty 5% (SW)			
	18		E.O.B. @ 15.0' bgs			

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. MW34

DRILLING LOG	DIVISION	INSTALLATION	SHEET / OF / SHEETS
	SAN DIST	HAAF	1 / 1

1. PROJECT	Pumphouse 1,2,6 CAP B
2. LOCATION (Coordinates or Station)	
3. DRILLING AGENCY	PSI
4. HOLE NO. (As shown on drawing title and file number)	MW34
5. NAME OF DRILLER	K. Durham
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	15.0
8. DEPTH DRILLED INTO ROCK	Ø
9. TOTAL DEPTH OF HOLE	15.0
10. SIZE AND TYPE OF BIT	6 1/4" ID HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 5 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	– 29.70'
16. DATE HOLE	STARTED 5/7/97 / COMPLETED 5/7/97
17. ELEVATION TOP OF HOLE	38.80' TOC
18. TOTAL CORE RECOVERY FOR BORING	— %
19. SIGNATURE OF INSPECTOR	D. Humphris

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2		SAND: fine-med; 10YR 3/2 v dk GyBr ← Lt YellBr - 1/4 well sorted, silty 5-10%, dry tr. heavy mins. (SW)	hand auger	1	BLOWS: NA; OVA, ppm: BZ- 0, HS- 0
	4		as above - v. pale Br 10YR 6/3, silty 5%, uniform. (SW)	hand auger	2	NA; BZ- 0, HS- 0
	6		Lt Gy 10YR 7/1, well sorted, uniform, silty 5%, tr. heavy mins. v loose - loose. (Beach sand) (SW)	75	3	4-4-7-7 Lab; BZ- 0, HS- 0
	8		Cuttings as above - YellBr 10YR 5/6, moist	—	Auger	
	10		: as above. v. loose - firm. wet. (SW)	67	4	3" spoon 3-8-13-18 ∇ initial wet sample, ∇ in well at install Lab; BZ- 0, HS- 0.5
	12		Cuttings as above	—	Auger	
	14		: Lt. olive Gy 5Y 6/2, well sorted, tr. micaf heavy mins. silty 5%, v. loose - loose, sl. HC odor (SW)	58	5	4-7-7-10 Geotech; BZ- 0
	16		E.O.B. @ 15.0' bgs			
	18					

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. MW35

DRILLING LOG	DIVISION SAW DIST	INSTALLATION HAAF	SHEET 1 OF 2 SHEETS

1. PROJECT: Pumphouse 1,2,6 CAPB
2. LOCATION (Coordinates or Station):
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): MW 3.5
5. NAME OF DRILLER: K. Durham
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 30.5'
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 30.5'
10. SIZE AND TYPE OF BIT: 6 1/4" ID HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: 29.02'
16. DATE HOLE: STARTED 5/7/97; COMPLETED 5/7/97
17. ELEVATION TOP OF HOLE: 36.65' TOC
18. TOTAL CORE RECOVERY FOR BORING: —%
19. SIGNATURE OF INSPECTOR: D. Humphries

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
			asphaltic concrete			BLOWS	OVA, ppm
			SAND: fine-med; Lt. Yell Br 10YR6/4, well sorted, silty 5%, dry, (SW)	hand auger	1	NA	BZ-0 HS-0
	2		as above, tr. heavy mins. Gy 10YR5/1 (SW)	hand auger	2	NA	BZ-0 HS-0
	4		: as above, V. dk. Br 10YR 2/2. V. loose-loose (SW)	83	3	2-3-6-7 Lab	BZ-0 HS-0
	6		Cuttings as above	—	Auger		
	8		: fine-med. V. dusky red 10R 2.5/2, well sorted, tr. Fe cement, well/sorted, wet, v. dense. tr. heavy mins. (SW)	25	4	50/6 Lab & initial wet sample	BZ-0 HS-3
	10		Cuttings as above	—	Auger		
	12						
	14		: fine-coarse; dk. Red Br. 5YR 3/4, well sorted, wet, silty 5%, tr. mica + heavy mins. uniform, v. firm-dense (SW)	75	5	25-35-38-27	BZ-0
	16		Cuttings as above	—	Auger		
	18						
	20		: fine-med : tr. Fe cemented nodules coarse : fine-med; Olive Gy 5Y 5/2, well sorted silty 5%, tr. heavy mins, wet. tr. mica (SW) V. loose-loose	100	6	4-4-5-6 running sands add 4 gal	BZ-0
	22		Cuttings mix of above	—	Auger		
	24		: Gy 5Y 5/1, v. loose-loose, well sorted tr. mica + heavy mins. wet, silty 5% (SW)	46	7	3-5-7-9	BZ=0
	26			—	Auger		

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. MW35

PROJECT: Pumphouse 1, 2, 6 | INSTALLATION: HAAF | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	26			—	Auger	BLOWS OVA, ppm
	28		as above	60	8	4-3-3-3 Geotech BZ=0
	30		(SW)		AUGER	
			E.O.B.@ 30.5' bgs			
	32					

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB 60

DRILLING LOG	DIVISION SAV	INSTALLATION HAAF	SHEET 1 OF 1 SHEETS

1. PROJECT: Pumphouses 1, 2, & 6
2. LOCATION (Coordinates or Station): SAV. GA.
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): SB60
5. NAME OF DRILLER: M. Gribble
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 8.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 8.0'
10. SIZE AND TYPE OF BIT: 4 1/4" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 5-5-97; COMPLETED 5-5-97
17. ELEVATION TOP OF HOLE: 37.9'
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0–2		sand, v. fine, brown, 10YR 4/3, round, moist. ≤ 5% silt (SW)	Hand Auger	1	Blows / OVA, ppm 1515 Lab — HS = 2, BZ = 0
	2–4		sand, v. fine, yellowish brown, 10YR 5/6, moist, round ≤ 5% silt. (SW)	Hand Auger	2	1525 — HS = 0, BZ = 0
	4–6		sand, v. fine, M. gray, 10YR 7/1, round, moist. color chg @ 5.5' v. dk. gray 10YR 3/1 (SW)	85%	3	12-13-6-6 / 1535 — HS = 0, BZ = 0
	6–8		sand, v. fine, dk. yellowish brown, 10YR 3/6, round, wet (SW)	85%	4	9-15-20-14 / 1540 Lab Shelby Tube — HS = 0, BZ = 0
	8–10		EOB @ 8.0' BGS			
	10–12					

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB61

DRILLING LOG	DIVISION SAV	INSTALLATION HAAF	SHEET 1 OF 1 SHEETS

1. PROJECT	Pumphouses 1, 2, +6
2. LOCATION (Coordinates or Station)	SAV. GA.
3. DRILLING AGENCY	PSI
4. HOLE NO. (As shown on drawing title and file number)	SB61
5. NAME OF DRILLER	M. Gribble
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	10.0'
8. DEPTH DRILLED INTO ROCK	—
9. TOTAL DEPTH OF HOLE	10.0'
10. SIZE AND TYPE OF BIT	4¼" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 4 / UNDISTURBED Ø
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	—
16. DATE HOLE	STARTED 5-6-97 / COMPLETED 5-6-97
17. ELEVATION TOP OF HOLE	38.4'
18. TOTAL CORE RECOVERY FOR BORING	— %
19. SIGNATURE OF INSPECTOR	D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			15" concrete CORE			Blows / OVA, ppm
	2		sand, brown, 10YR5/3, v. fine, round, moist, <5% silt (SW)	HAND AUGER	1	1030 HS = 0 BZ = 0
	4		sand, dk. grayish brown, 10YR 4/2, round, organics 5-10% silt, moist (SW)	HAND AUGER	2	1035 HS = 2 BZ = 0
	6		As above. 2" root @ 5'	80%	3	3-4-37 lab 1040 HS = 60 BZ = 0
	8		As Above	AUGER		1
	10		sand, dk. reddish brown, 5YR3/2, wet, v. fine, round. (SW)	50%	4	12-50/4 V 1050 lab HS = 110 BZ = 0
	12		EOB @ 10.0' BGS			

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB 62

DRILLING LOG	DIVISION SAV	INSTALLATION HAAF	SHEET 1 OF 1 SHEETS

1. PROJECT: Pumphouses 1, 2, + 6
2. LOCATION (Coordinates or Station): SAV. GA.
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): SB62
5. NAME OF DRILLER: M. Gribble
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 10.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 10.0'
10. SIZE AND TYPE OF BIT: 4 1/4" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 5-6-97; COMPLETED 5-6-97
17. ELEVATION TOP OF HOLE: 38.3'
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
						BLOWS	OVA, ppm
	0		14" concrete core				
	2		SAND, brown, 10YR 5/3, v. fine, round, <5% silt, dry (SW)	HAND AUGER	1	0750	HS = 0 BZ = 0
	4		As Above	HAND AUGER	2	0755	HS = 0 BZ = 0
	6		SAND, dk. brown, 7.5YR 3/3, v. fine, round, <5% silt, moist (SW)	100%	3	12-20-22-20 0800 LAB	HS = 0 BZ = 0
	8		As Above	AUGER			
	10		As Above, wet	100%	4	7-7-21-50/3 ▽ 0815 LAB	HS = 6 BZ = 0
	12		EOB @ 10.0' BGS				

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB 63

DRILLING LOG	DIVISION SAV	INSTALLATION HAAF	SHEET 1 OF 1 SHEETS

1. PROJECT: Pumphouses 1, 2, +6
2. LOCATION (Coordinates or Station): SAV. GA.
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): SB60
5. NAME OF DRILLER: M. Gribble
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 10.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 10.0'
10. SIZE AND TYPE OF BIT: 4¼" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 5-5-97; COMPLETED 5-5-97
17. ELEVATION TOP OF HOLE: 37.4'
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
						BLOWS	OVA, ppm
	2		concrete 1.0'				
			sand, yellow, 10YR 7/6, v. fine, round, Dry (SW)	HAND AUGER	1	1645	HS = 0 BZ = 0
	4		AS above	HAND AUGER	2	1650	HS = 0 BZ = 0
			sand, v. dk. gray, 10YR 3/1, v fine, round, moist, <5% silt. (SW)	100%	3	6-5-7-9 1705 Lab	HS = 1 BZ = 0
	6		AS Above	AUGER			HS = NA BZ = 0
	8		sand dk reddish brown, 5YR 3/2, v. fine, wet, round, semi-cemented (SW)	50%	4	31, 50/4 1710 Lab	HS = 11 BZ = 0
	10		EOB @ 10.0' BGS				
	12						

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB64

DRILLING LOG

DIVISION: SAV

INSTALLATION: HAAF

SHEET 1 OF 1 SHEETS

1. PROJECT: Pumphouses 1, 2, +6
2. LOCATION (Coordinates or Station): SAV. GA.
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): SB 64
5. NAME OF DRILLER: M. Gribble
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 8.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 8.0'
10. SIZE AND TYPE OF BIT: 4¼" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 5-6-97; COMPLETED 5-6-97
17. ELEVATION TOP OF HOLE: 38.7'
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0–2		SAND, v. pale brown, 10YR 7/3, v. fine, round, moist, <5% silt (SW)	HAND AUGER	1	Blows: 1605 — OVA, ppm: HS = 0, BZ = 0
	2–4		As Above	HAND AUGER	2	1610 — HS = 0, BZ = 0
	4–6		As Above, moist	90%	3	7-9-10-12; 1615 lab — HS = 0, BZ = 0
	6–8		As Above, Saturated	80%	4	4-7-7-8; 1620 lab — HS = 0, BZ = 0
	8–10		EOB @ 8.0' BGS			Shelby tube 5'-7'
	10–12					

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB65

DRILLING LOG	DIVISION SAV	INSTALLATION HAAF	SHEET 1 OF 1 SHEETS

1. PROJECT: Pumphouses 1, 2, +6
2. LOCATION (Coordinates or Station): SAV. GA.
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): SB65
5. NAME OF DRILLER: M. Gribble
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 10.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 10.0'
10. SIZE AND TYPE OF BIT: 4¼" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 5-6-97; COMPLETED 5-6-97
17. ELEVATION TOP OF HOLE: 38.5'
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2		SAND, v. pale brown, 10YR 7/3, v. fine round moist <5% silt (SW)	HAND AUGER	1	Blows: 1445 — OVA, ppm: HS = 1, BZ = 0
	4		As Above	HAND AUGER	2	1450 — HS = 400, BZ = 0
	6		Sand, white 10YR 8/1, v. fine <5% silt, round. moist. (SW)	90%	3	11-10-14-14; 1455 Lab — HS = >1000, BZ = 0
	8		AS Above	AUGER		
	10		AS Above. Saturated.	90%	4	SI = 8-8-10-10; 1510 Lab — HS = 5100, BZ = 0
	12		EOB @ 10.0' BGS			

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB66

DRILLING LOG	DIVISION SAV	INSTALLATION HAAF	SHEET 1 OF 1 SHEETS

1. PROJECT: Pumphouses 1, 2, & 6
2. LOCATION (Coordinates or Station): SAV. GA.
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): SB66
5. NAME OF DRILLER: M. Gribble
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 10.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 10.0'
10. SIZE AND TYPE OF BIT: 4¼" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED Ø
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 5-6-97; COMPLETED 5-6-97
17. ELEVATION TOP OF HOLE: 39.1'
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			15" concrete core			Blows / OVA, ppm
	2		Sand, v. pale brown, 10YR7/3, v. fine dry, round, <5% silt (SW)	1	HAND AUGER	1410 HS=0 BZ=0
			As Above	2	HAND AUGER	HS=0 BZ=0
	4					1415
			sand, pale brown, 10YR/6/3, v. fine round, moist, 5-10% silt (SM)	3	75%	8-9-12-12 1420 lab HS=0 BZ=0
	6		As Above <5% silt	AUGER		
	8		As Above ~~Saturated~~	4	85%	2-77-12 ▽ 1425 lab HS=58 BZ=0
	10		EOB @ 10.0' BGS			
	12					

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB67

DRILLING LOG	DIVISION SAV	INSTALLATION HAAF	SHEET 1 OF 1 SHEETS

1. PROJECT: Pumphouses 1, 2, +6
2. LOCATION (Coordinates or Station): SAV. GA.
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): SB67
5. NAME OF DRILLER: M. Gribble
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 10.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 10.0'
10. SIZE AND TYPE OF BIT: 4¼" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (GM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 / UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 5-6-87 / COMPLETED 5-6-87
17. ELEVATION TOP OF HOLE: 37.9'
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2		sand, v.f.ine, lt. yellowish brown, 10YR6/4, moist, round, <5% silt (SW)	HAND AUGER	1	BLOWS / OVA, ppm 1115 HS = 0 BZ = 0
	4		As Above	HAND AUGER	2	1120 HS = 0 BZ = 0
	6		sand, lt. pale brown, 10YR 7/3, v.fine, <5% silt, moist, round (SW)	85%	3	4-8-9-8 lab HS = 740 1125 BZ = 0
	8		As Above	Auger		Shelby Tube
	10		As Above SATURATED	100%	4	6-7-8-12 BZ = 0 1135 lab HS = 740
	12		EOB @ 10.0' BGS			

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

Hole No. SB 68

DRILLING LOG	DIVISION SAV	INSTALLATION HAAF	SHEET 1 OF 1 SHEETS

1. PROJECT: Pumphouses 1, 2, +6
2. LOCATION (Coordinates or Station): SAV. GA.
3. DRILLING AGENCY: PSI
4. HOLE NO. (As shown on drawing title and file number): SB68
5. NAME OF DRILLER: M. Gribble
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 10.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 10.0'
10. SIZE AND TYPE OF BIT: 4¼" I.D. HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4; UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 5-6-97; COMPLETED 5-6-97
17. ELEVATION TOP OF HOLE: 38.5'
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: D. Rowell

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	OVA, ppm
	2		SAND, yellowish brown, 10YR 5/4, v. fine, <5% silt, dry, round (SW)	HAND AUGER	1	Blows 0845	HS = 0 BZ = 0
	4		As Above, increasing silt 5-10% (SM)	HAND AUGER	2	0850	HS = 0 BZ = 0
	6		SAND, v. Pale brown, 10YR 7/3, v. fine, round <5% silt, dry (SW)	80%	3	2-7-4-10 lab 0900	HS = 0 BZ = 0
	8		As Above	AUGER		▽	
	10		SAND, dk. yellowish brown, 10YR 4/4, v.f.ine, round, saturated, 5-10% silt. (SW)	90%	4	1-1-3-6 lab Shelby tube 0910	BZ = 0 HS = 320
	12		EOB @ 10.0' BGS				

Split-spoon samples for lithologic definition and/or chemical analysis were collected from 3 to 5 feet below ground surface (BGS) and every 5 feet or lithologic change thereafter (unless otherwise noted).

APPENDIX B

ANALYTICAL DATA

DATA QUALITY SUMMARY REPORT

Hunter Army Airfield - Pump House 1, 2 & 6
July 17, 1997

1.0 INTRODUCTION

Metcalf & Eddy , Inc. was contracted by the United States Army Corps of Engineers, Savannah District, to perform a site investigation at the former Hunter Army Airfield. The purpose of this investigation is to determine the extent of contamination present in the soil and groundwater at this site.

Metcalf & Eddy, Inc. contracted with Savannah Laboratories to perform the required analyses of soil samples. The analytical data was validated according to USEPA National Functional Guidelines for Organics Data Review and Inorganics Analysis. This guidance follows the Quality Assurance (QA)/Quality Control (QC) requirements outlined in the USEPA's Test Methods for Evaluating Solid Waste (EPA SW-846). Overall these guidelines mimic the most current editions of the EPA's Functional Guidelines for Reviewing Organic and Inorganic Analyses conducted outside the EPA's Contract Laboratory Program (CLP).

The following sections of this Data Quality Summary Report discuss the laboratory reporting, data validation, problems encountered and corrective actions as applied to the samples and data collected during this determination.

1.1 Field Samples and Analysis

The following report summarizes the validation findings of the samples included in the Sample Data Groups listed below.

SDG	*Date*	*Matrix*	*Samples*	*Field Duplicates*	*Trip Blanks*	*Equipment Blanks*
HAA57	05/05/97	SOIL	10	2	0	0
HAA58	05/06/97	SOIL	40	2	0	0
HAA59	05/07/97	SOIL	22	3	0	0
HAA60	05/08/97	SOIL	28	3	0	0
HAA61	05/09/97	SOIL	6	0	0	0
HAA62	05/12/97	SOIL	14	1	0	0
HAA63	05/13/97	SOIL	22	3	0	0
HAA64	05/07/97	SOIL	12	0	0	0
HAA67	05/29/97	WATER	24	2	1	1
HAA68	05/30/97	WATER	11	2	1	1

Reviewed by: Wayne Vaught

Date: 7/17/97

Samples were analyzed by Savannah Laboratories - Savannah, Georgia using the following USEPA SW-846 Methods:

6010	Lead
8015M	Gasoline Range Organics - (GRO)
8020	Volatile Aromatics
8100M	Diesel Range Organics - (DRO)
8100/8310	Polynuclear Aromatic Hydrocarbons
9060	Total Organic Carbon
9038	Sulfate
SM3500	Iron (+2)
360.1	Dissolved Oxygen

One hundred fifty-four soil samples, fourteen soil field duplicates, thirty-five water samples, four water field duplicates, two water equipment blanks and two water trip blanks were analyzed. All samples were not analyzed by all methods. All soil sample results were reported on a dry weight basis.
All data was reviewed and validated using the guidance established in the USEPA National Functional Guidelines for Organic Review and Inorganics Analysis. Control limits (QC limits) are established by the laboratory according to the criteria established in the SW-846 methods.

2.0 LABORATORY REPORTING

2.1 Laboratory Blanks

Laboratory blanks or method blanks are artificial samples prepared from the same matrix type as the samples to be analyzed. These blanks are taken through sample preparation and analyzed before the field samples to determine if the glassware, sample preparation or laboratory environment has contaminated the field samples.

All laboratory blanks for all methods of analysis of soils and groundwater were free of contaminants at and above the method reporting limits.

2.2 Laboratory Control Samples (% Recovery)

Laboratory control samples are artificial samples prepared from the same matrix type as the samples to be analyzed. These samples are processed through sample preparation and analyzed to assess the performance of each analytical system that the laboratory using to analyze the field samples.

All laboratory control samples for all methods of analysis of soils and groundwater were within required control limits.

2.3 Precision (% RPD)

Laboratory precision is evaluated by calculating the relative percent difference (RPD) between the values reported for a matrix spiked sample (MS) and its duplicate, the matrix spiked duplicate (MSD), or any other set of duplicate parameters. The following equation is utilized for this calculation:

$$RPD = \frac{|Vs - Vd|}{[Vs + Vd] / 2} \times 100$$

Where Vs is the value reported for the matrix spiked sample (MS) and Vd is the value reported for it's duplicate (MSD). Sample RPDs are compared to the analyzing laboratory's precision control limits which are primarily derived from their in-house quality control data.

RPDs for all methods of analysis of spiked soil samples were within required control limits with the exception of twenty-seven samples analyzed for GRO, eleven samples analyzed for DRO, and six samples analyzed for volatile aromatics. No qualifiers were required.

RPDs for all methods of analysis of spiked groundwater samples were within required control limits with the exception of fourteen samples analyzed for PAH's. No qualifiers were required.

RPDs of field duplicates for all methods of analysis of soils were within the required control limits with the exception of ten samples analyzed for volatile aromatics, five samples analyzed for GRO and three samples analyzed for PAH's. No qualifiers were required.

RPDs of field duplicates for all methods of analysis of groundwater were within the required control limits.

2.4 Surrogate Recovery

Surrogates are compounds similar to analytes of interest but are not normally found in environmental samples. Prior to sample preparation and analysis, surrogates are spiked into laboratory control samples, calibration and check standards, matrix spiked samples and field samples. Accuracy is measured by calculating percent recoveries for each surrogate as follows:

$$\%R = \frac{\text{Concentration of spike found}}{\text{Concentration of spike added}} \times 100$$

High surrogate recovery was exhibited for ten soil samples analyzed for GRO and seven soil samples analyzed for volatile aromatics. Slightly low surrogate recovery was exhibited for three soil samples analyzed for volatile aromatics. Zero surrogate recovery was exhibited for three soil samples analyzed for volatile aromatics, four samples analyzed for PAH's, one sample analyzed for GRO and two samples analyzed for DRO. All other surrogate recoveries were within the required control limits.

All groundwater sample surrogate recoveries were within the required control limits.

2.5 Holding Time

Holding time is the storage time allowed between sample collection and sample analysis when the designated preservation and storage techniques are employed.

All soil samples were within required holding times for all methods of analysis with the exception of seventeen samples that required re-analysis. All re-analyses occurred less than eight hours outside of hold time. No qualifiers were applied.

All groundwater samples were within required holding times for all methods of analysis.

2.6 Temperature

Cooler receipts and chain of custory forms indicate that all samples were hand delivered by the field sampling team the same day that the samples were collected. All samples were cooled on ice and were refrigerated by the laboratory upon receipt.

3.0 DATA VALIDATION

The objective when evaluating the quality of chemical data is to determine its usability. The evaluation is based upon the interpretation of the laboratory QC data, the field QC data, and the project Data Quality Objectives (DQOs). The evaluation process is often termed "data validation".

3.1 Laboratory Data Validation

Laboratory data were evaluated to assess , holding times, laboratory blanks, laboratory control samples, surrogate recoveries, and matrix spike/matrix spike duplicate (MS/MSD) relative percent differences (RPDs). These criteria were used to evaluate the bias and precision of the data generated by the laboratory. The bias of the laboratory data was assessed through consideration of the following:

- Adherence to the prescribed method
- Recovery of MS/MSD from field samples
- Method blank contamination
- Adherence to sample preparation and holding times
- Recovery of surrogate spikes
- Field duplicate precision

3.2 Definition of Data Qualifiers

During the data validation process, all laboratory data had to be evaluated and assigned a data qualifier, as applicable. These qualifiers are defined in the 1991 EPA document titled, "National Functional Guidelines for Organic Data Review." The guidance also describes procedures to be followed when qualifying data. The data qualifiers are defined as follows:

When the compound was analyzed for, but was not detected above the level of the associated value, a "U" was used to flag the compounds. A flag of "J" is usually used when the associated value is an estimated quantity. Data flagged with "R" are unusable. In some cases the flag "UJ" may be used to mean that the compound was analyzed for, but was not detected, and the associated value is an estimate and may be inaccurate or imprecise. Data qualifier flags were not assigned to data that were totally in compliance with Quality Control requirements.

For organic data, specifically VOCs, the positive and undetected (U) results were qualified as estimated (J/UJ) if one surrogate compound was detected outside acceptable recovery limits and/or the recovery was greater than 10 percent. If the recoveries of one surrogate compound were less than 10 percent, then the positive results were qualified as estimated (J) and the undetected results were rejected (R).

Results of SVOC are validated in the same manner as VOC except that qualifiers are applied to results with two or more surrogate compounds detected outside the acceptable recovery limits for each fraction (acid and base neutral extractable compounds).

Results for individual metals were qualified if percent recoveries for MS/MSD samples are low or outside acceptable recovery limits. If MS/MSD recoveries were greater than 125 percent, the positive results are acceptable (no qualifiers applied) and the undetected results were qualified as estimated (UJ). If percent recoveries of MS/MSD samples were between 30-74 percent, both the positive and undetected results were qualified as estimated (J/UJ). If recoveries were less than 30 percent, positive results were qualified as estimated (J) and undetected results are rejected (R).

3.3 Qualified Results

Volatile Aromatics - Four matrix spiked soil sample exhibited matrix spike recovery below the control limits for benzene. All associated samples were non-detect and qualified as estimated (UJ). Thirteen soil samples exhibited matrix spike recoveries above the control limits. All associated samples were non-detect and qualified as estimated (UJ).

Three soil sample surrogate recoveries were diluted out due to high concentrations of target analytes. Detects for these samples were qualified as estimated (J), non-detects were not qualified.

One matrix spiked groundwater sample exhibited matrix spike recovery above the control limits for benzene. All associated samples were non-detect and did not require qualification.

Polynuclear Aromatic Hydrocarbons - Twenty-one matrix spiked groundwater samples exhibited matrix spike recoveries below the control limits for spiked compounds. All associated samples were qualified as estimated (J), non-detects as (UJ or R). Of these samples, only MW2101 and MW3101 were detects. Fourteen of these spiked groundwater samples also contained some spiked compounds above the control limit. The affected compounds in these samples were qualified as estimated (J), non-detects were not qualified.

Four soil sample surrogate recoveries were diluted out due to high concentrations of target analytes. All associated samples were non-detect and did not require qualification.

Gasoline Range Organics - Six matrix spiked soil samples exhibited matrix spike recoveries below control limits for GRO. Of these samples only five were detects. All associated samples detects were qualified as estimated (J), non-detects as (UJ).

One soil sample surrogate recovery was diluted out due to high concentrations of target analytes. Detects for this sample was qualified as estimated (J), non-detects were not qualified.

Diesel Range Organics - Nine matrix spiked soil samples exhibited matrix spike recoveries below control limits for DRO. Of these samples only three were detects. All associated samples detects were qualified as estimated (J), non-detects as (UJ).

Two soil sample surrogate recoveries were diluted out due to high concentrations of target analytes. Detects for these samples were qualified as estimated (J), non-detects were not qualified.

Sulfate - One matrix spiked groundwater sample exhibited a matrix spike recovery above control limits for sulfate. All associated samples were non-detect and did not require qualification.

4.0 PROBLEMS ENCOUNTERED

The problems encountered during sample analysis for this investigation are described in detail below. Analytical data that did not meet the QC requirements were qualified as stated in Section 3.3.

4.1 Holding Times

No problems were present regarding hold times.

4.2 Surrogate Recovery

Surrogate compounds were diluted out of several soil samples due to the presence of high concentrations of target analytes.

4.3 Precision (% RPD)

No problems outside of occasional sample result qualification were encountered.

4.4 Field Duplicates

In addition to the matrix spike sample, field duplicates were collected to assess sampling precision. Twelve duplicate samples were collected at a frequency of approximately 10%, one for every ten field samples (rounded up), per matrix, per site, per sampling event. Field duplicates were within quality control RPD limits for 95% of the parameters analyzed. Sample duplicate precision is indicative that these data are comparable and representative of field conditions.

4.5 Equipment Rinsates

One equipment rinsate was collected during this investigation and found to be free of contaminants.

4.6 Laboratory Blanks

All laboratory blanks were analyzed and found to be free of contaminants.

4.7 Laboratory Control Standards

All laboratory control standards were within required control limits.

5.0 SUMMARY OF DATA QUALITY

The amount of data obtained compared to the amount of data that was expected to be obtained is enough to achieve the goal of > 95% completeness. The results of the data validation indicate the quality of the data is within QC limits and is acceptable to verify or deny any contamination present in the soil at this site.

HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
PRIMARY ANALYTICAL RESULTS FOR SOILS

	SITE:	MW33	MW33	MW33	MW34	MW34
	SAMPLE ID:	WB3301	WB3302	WB6201	WB3401	WB3402
	DATE:	5/7/97	5/7/97	5/7/97	5/7/97	5/7/97
CONSTITUENT:	DEPTH (ft):	6.0	10.0	10.0	6.0	10.0
(Units in mg/kg)	RESULT TYPE:	Primary	Primary	Duplicate	Primary	Primary
MTBE		< 0.06	< 0.058	< 0.06	< 0.055	< 0.062
Benzene		< 0.006	< 0.0058	< 0.006	< 0.0055	< 0.0062
Ethylbenzene		0.025 J	< 0.0058	0.0092	< 0.0055	< 0.0062
Toluene		0.12 J	0.013	0.023	< 0.0055	0.0079
Xylene (total)		0.17 J	0.14	0.12	0.008	< 0.0062
Acenaphthene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Acenaphthylene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Benzo(a)pyrene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Benzo(b,k)fluoranthene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Benzo(ghi)perylene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Chrysene + Benzo(a)anthracene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Fluoranthene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Fluorene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Indeno(1,2,3-cd)pyrene+Dibenzo(a,h)anthr		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Naphthalene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Phenanthrene + Anthracene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
Pyrene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
1-Methylnaphthalene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
2-Methylnaphthalene		< 0.4	< 0.38	< 0.39	< 0.36	< 0.41
GRO		0.21	0.34	0.22	< 0.2	< 0.22
DRO		15 J	9.8 J	5.8 J	< 10	< 12
Lead						15
TOC						15000

( ) = Reported at less than reporting limit
EPA METHODS:8020,8100,8015M,8100M,6010,9060. For RCL8000RSLS
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED.

HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
PRIMARY ANALYTICAL RESULTS FOR SOILS

	SITE:	MW35	MW35	SB60	SB60	SB61
	SAMPLE ID:	WB3501	WB3502	SB6001	SB6002	SB6101
	DATE:	5/7/97	5/7/97	5/5/97	5/5/97	5/6/97
CONSTITUENT:	DEPTH (ft):	6.0	10.0	2.0	8.0	6.0
(Units in mg/kg)	RESULT TYPE:	Primary	Primary	Primary	Primary	Primary
MTBE		< 0.06	< 0.061	< 0.054	< 0.062	< 0.056
Benzene		< 0.006	< 0.0061	< 0.0054 J	< 0.0061 J	< 0.0056
Ethylbenzene		< 0.006	< 0.0061	< 0.0054	< 0.0061	0.0099
Toluene		0.014	0.016	< 0.0054	< 0.0061	0.062
Xylene (total)		0.016	0.013	< 0.0054	< 0.0061	0.034
Acenaphthene		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
Acenaphthylene		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
Benzo(a)pyrene		< 0.39	< 0.4	9.2 J	< 0.4	< 0.38
Benzo(b,k)fluoranthene		< 0.39	< 0.4	21 J	< 0.4	< 0.38
Benzo(ghi)perylene		< 0.39	< 0.4	6.6 J	< 0.4	0.75
Chrysene + Benzo(a)anthracene		< 0.39	< 0.4	25 J	< 0.4	< 0.38
Fluoranthene		< 0.39	< 0.4	23 J	(0.081)	< 0.38
Fluorene		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
Indeno(1,2,3-cd)pyrene+Dibenzo(a,h)anthr		< 0.39	< 0.4	8.9	< 0.4	< 0.38
Naphthalene		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
Phenanthrene + Anthracene		< 0.39	< 0.4	16 J	< 0.4	< 0.38
Pyrene		< 0.39	< 0.4	19 J	(0.053)	< 0.38
1-Methylnaphthalene		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
2-Methylnaphthalene		< 0.39	< 0.4	< 1.8	< 0.4	< 0.38
GRO		< 0.21	< 0.21	< 0.2	< 0.22	0.3
DRO		(5.75)	(6.2)	34	< 12	14
Lead		6.1				
TOC		26000				

( ) = Reported at less than reporting limit
EPA METHODS:8020,8100,8015M,8100M,6010,9060. For RCL8000RSLS
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED.

HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
PRIMARY ANALYTICAL RESULTS FOR SOILS

	SITE:	SB61	SB62	SB62	SB63
	SAMPLE ID:	SB6102	SB6201	SB6202	SB6301
	DATE:	5/6/97	5/6/97	5/6/97	5/5/97
CONSTITUENT:	DEPTH (ft):	10.0	6.0	10.0	6.0
(Units in mg/kg)	RESULT TYPE:	Primary	Primary	Primary	Primary
MTBE		< 0.06	< 0.057	< 0.066	< 0.058
Benzene		< 0.006	< 0.0058	< 0.0066	< 0.0058 J
Ethylbenzene		< 0.006	< 0.0058	0.0082	< 0.0058
Toluene		0.031	0.014	0.05	< 0.0058
Xylene (total)		0.013	0.025	0.042	< 0.0058
Acenaphthene		< 0.39	< 0.38	< 0.44	< 0.38
Acenaphthylene		< 0.39	< 0.38	< 0.44	< 0.38
Benzo(a)pyrene		< 0.39	< 0.38	< 0.44	(0.20)
Benzo(b,k)fluoranthene		< 0.39	< 0.38	< 0.44	< 0.38
Benzo(ghi)perylene		(0.13)	< 0.38	< 0.44	(0.12)
Chrysene + Benzo(a)anthracene		< 0.39	< 0.38	< 0.44	< 0.38
Fluoranthene		< 0.39	(0.051)	(0.06)	(0.09)
Fluorene		< 0.39	< 0.38	< 0.44	(0.059)
Indeno(1,2,3-cd)pyrene + Dibenzo(a,h)anthr		< 0.39	< 0.38	(0.37)	< 0.38
Naphthalene		< 0.39	< 0.38	< 0.44	< 0.38
Phenanthrene + Anthracene		< 0.39	< 0.38	< 0.44	< 0.38
Pyrene		< 0.39	< 0.38	< 0.44	(0.081)
1-Methylnaphthalene		< 0.39	< 0.38	< 0.44	< 0.38
2-Methylnaphthalene		< 0.39	< 0.38	< 0.44	< 0.38
GRO		< 0.21	< 0.2	0.51	< 0.21
DRO		< 12	< 11	< 13	< 12
Lead					
TOC					

( ) = Reported at less than reporting limit
EPA METHODS:8020,8100,8015M,8100M,6010,9060. For RCL8000RSLS
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED.

HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
PRIMARY ANALYTICAL RESULTS FOR SOILS

	SITE:	SB63	SB64	SB64	SB65	SB65
	SAMPLE ID:	SB6302	SB6401	SB6402	SB6501	SB10701
	DATE:	5/5/97	5/6/97	5/6/97	5/6/97	5/6/97
CONSTITUENT:	DEPTH (ft):	10.0	6.0	8.0	6.0	6.0
(Units in mg/kg)	RESULT TYPE:	Primary	Primary	Primary	Primary	Duplicate
MTBE		< 0.064	< 0.057	< 0.06	< 0.27	< 4.7
Benzene		< 0.0064 J	< 0.0058	< 0.006	< 0.027	< 0.47
Ethylbenzene		< 0.0064	< 0.0058	< 0.006	1.2	3.8
Toluene		< 0.0064	< 0.0058	< 0.006	0.04	< 0.47
Xylene (total)		< 0.0064	< 0.0058	< 0.006	1.6	1.5
Acenaphthene		< 0.42	< 0.38	< 0.4	0.24 J	< 3.8
Acenaphthylene		< 0.42	< 0.38	< 0.4	< 0.72	< 3.8
Benzo(a)pyrene		(0.098)	< 0.38	< 0.4	< 0.72	< 3.8
Benzo(b,k)fluoranthene		< 0.42	< 0.38	< 0.4	< 0.72	< 3.8
Benzo(ghi)perylene		(0.3)	< 0.38	< 0.4	< 0.72	< 3.8
Chrysene + Benzo(a)anthracene		< 0.42	0.47	< 0.4	0.18 J	(1.0)
Fluoranthene		(0.069)	0.64	< 0.4	0.31 J	(1.70)
Fluorene		(0.07)	< 0.38	< 0.4	0.58 J	3.9
Indeno(1,2,3-cd)pyrene+Dibenzo(a,h)anthr		< 0.42	< 0.38	< 0.4	< 0.72	< 3.8
Naphthalene		< 0.42	< 0.38	< 0.4	1.8 J	11
Phenanthrene + Anthracene		< 0.42	0.28	< 0.4	0.34 J	< 3.8
Pyrene		< 0.42	< 0.38	< 0.4	0.2 J	(1.6)
1-Methylnaphthalene		< 0.42	< 0.38	< 0.4	2.4 J	14
2-Methylnaphthalene		< 0.42	< 0.38	< 0.4	1.8 J	15
GRO		< 0.23	< 0.2	< 0.21	310	350
DRO		< 12	< 11	< 12	640 J	450
Lead				3.2		
TOC				410		

( ) = Reported at less than reporting limit
EPA METHODS:8020,8100,8015M,8100M,6010,9060. For RCL8000RSLS
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED.

HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
PRIMARY ANALYTICAL RESULTS FOR SOILS

	SITE:	SB65	SB66	SB66	SB67	SB67
	SAMPLE ID:	SB6502	SB6601	SB6602	SB6701	SB6702
	DATE:	5/6/97	5/6/97	5/6/97	5/6/97	5/6/97
CONSTITUENT:	DEPTH (ft):	10.0	6.0	10.0	6.0	10.0
(Units in mg/kg)	RESULT TYPE:	Primary	Primary	Primary	Primary	Primary
MTBE		< 4.8	< 0.054	< 0.062	< 0.054	< 0.32
Benzene		1.3	< 0.0053	< 0.0061	< 0.0054	< 0.032
Ethylbenzene		4.4	< 0.0053	< 0.0061	< 0.0054	(0.019)
Toluene		1.5	0.011	0.018	0.0059	0.043
Xylene (total)		3.3	< 0.0053	< 0.0061	0.012	0.2
Acenaphthene		(0.16)	< 0.35	< 0.4	< 0.36	< 0.42
Acenaphthylene		(0.4)	(0.061)	< 0.4	(0.16)	(0.089)
Benzo(a)pyrene		< 0.8	< 0.35	< 0.4	< 0.36	< 0.42
Benzo(b,k)fluoranthene		< 0.8	< 0.35	< 0.4	< 0.36	< 0.42
Benzo(ghi)perylene		< 0.8	< 0.35	< 0.4	< 0.36	< 0.42
Chrysene + Benzo(a)anthracene		(0.21)	< 0.35	< 0.4	< 0.36	< 0.42
Fluoranthene		(0.21)	< 0.35	< 0.4	(0.066)	< 0.42
Fluorene		< 0.8	< 0.35	< 0.4	< 0.36	< 0.42
Indeno(1,2,3-cd)pyrene+Dibenzo(a,h)anthr		< 0.8	< 0.35	< 0.4	< 0.36	< 0.42
Naphthalene		2.4	< 0.35	< 0.4	(0.35)	< 0.42
Phenanthrene + Anthracene		(0.3)	< 0.35	< 0.4	< 0.36	< 0.42
Pyrene		(0.23)	< 0.35	< 0.4	(0.05)	< 0.42
1-Methylnaphthalene		2.0	< 0.35	< 0.4	(0.19)	(0.048)
2-Methylnaphthalene		2.4	< 0.35	< 0.4	0.64	(0.066)
GRO		290	< 0.2	< 0.22	< 0.2	400
DRO		240	17	< 12	260	< 12
Lead						
TOC						

( ) = Reported at less than reporting limit
EPA METHODS:8020,8100,8015M,8100M,6010,9060. For RCL8000RSLS
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED.

HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
PRIMARY ANALYTICAL RESULTS FOR SOILS

CONSTITUENT: (Units in mg/kg)	SITE:	SB68	SB68
	SAMPLE ID:	SB6801	SB6802
	DATE:	5/6/97	5/6/97
	DEPTH (ft):	6.0	10.0
	RESULT TYPE:	Primary	Primary
MTBE		< 0.053	< 0.064
Benzene		< 0.0053	< 0.0064
Ethylbenzene		< 0.0053	0.013
Toluene		< 0.0053	0.007
Xylene (total)		< 0.0053	< 0.0064
Acenaphthene		(0.053)	< 0.42
Acenaphthylene		< 0.35	< 0.42
Benzo(a)pyrene		0.45	< 0.42
Benzo(b,k)fluoranthene		1.2	< 0.42
Benzo(ghi)perylene		(0.3)	< 0.42
Chrysene + Benzo(a)anthracene		1.4	< 0.42
Fluoranthene		1.7	< 0.42
Fluorene		(0.054)	< 0.42
Indeno(1,2,3-cd)pyrene + Dibenzo(a,h)anthr		< 0.35	< 0.42
Naphthalene		< 0.35	(0.061)
Phenanthrene + Anthracene		1.0	< 0.42
Pyrene		(0.053)	< 0.42
1-Methylnaphthalene		< 0.35	(0.039)
2-Methylnaphthalene		< 0.35	(0.032)
GRO		< 0.2	< 0.23
DRO		< 10	< 12
Lead			
TOC			

( ) = Reported at less than reporting limit
EPA METHODS:8020,8100,8015M,8100M,6010,9060. For RCL8000RSLS
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED.

HUNTER ARMY AIRFIELD
CAP-B PUMPHOUSE # 6
PRIMARY ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES

CONSTITUENT: (Units in ug/l)	SITE: / SAMPLE ID: / DATE: / RESULT TYPE:	MW33 MW3301 5/29/97 Primary	MW34 MW3401 5/29/97 Primary	MW35 MW3501 5/29/97 Primary
MTBE		< 100	< 100	< 10
Benzene		(9.1)	11	< 1
Ethylbenzene		17	110	< 1
Toluene		(2.9)	(4.7)	< 1
Xylene (total)		370	60	< 2
Acenaphthene		0.048 J	0.19 J	< 1 R
Acenaphthylene		< 1	(1.2)	< 1
Anthracene		< 0.2	< 1	< 0.2
Benzo(a)anthracene		< 0.031	< 0.16	< 0.031
Benzo(a)pyrene		< 0.031	< 0.16	< 0.031
Benzo(b)fluoranthene		< 0.2	< 1	< 0.2
Benzo(k)fluoranthene		< 0.031	< 0.16	< 0.031
Benzo(ghi)perylene		< 0.5	< 2.6	< 0.5
Chrysene		< 0.031	< 0.16	< 0.031
Dibenzo(a,h)anthracene		< 0.036	< 0.18	< 0.036
Fluoranthene		< 0.5	< 2.6	< 0.5
Fluorene		< 0.5 R	0.95 J	< 0.5 R
Indeno(1,2,3-cd)pyrene		< 0.031	< 0.16	< 0.031
Naphthalene		5	71	< 1
Phenanthrene		0.029 J	0.37 J	< 0.2
Pyrene		< 0.5	< 2.6	< 0.5
1-Methylnaphthalene		(0.31)	24	< 1
2-Methylnaphthalene		1.2	33	< 1
Iron, Total		860	2400	9700
Iron, Ferric +3		310	2400	7000
Oxygen, dissolved		14000	4900	600
Sulfate		5500	14000	68000

( ) = Reported at less than reporting limit
J = RESULT IS ESTIMATED. R = RESULT IS REJECTED.

CHAIN - OF - CUSTODY - RECORD

Metcalf & Eddy

PROJECT NAME: Hunter IV

PROJECT NO: 019457-4102

LABORATORY ID: SLS

SAMPLER(S) NAME: Daniel Howard

TASK ORDER NO.

SAMPLE EVENT:

PROGRAM TYPE:

SAMPLER(S) SIGNATURE: Daniel Howard

ANALYTICAL PARAMETERS/METHODS

DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS.	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F)FIELD	VOCS	SVOC PAH	METALS ICP Hg CVAA GFAA	HERBICIDES	PESTICIDES	PCB	TPH/DRO	GRO	
Method No.										8020	8100					8100M	8015M	
5/5/97	1305	S	WB1901	MW19	PP01	8/10	2	N	—	X	X					X	X	
	1305	S	WB5901	MW19	PD1	8/10	2	N	—	X	X					X	X	
	1315	S	WB1902	MW19	PP01	13/15	2	N	—	X	X					X	X	
	1434	S	WB1801	MW18	PP01	8/10	2	N	—	X	X					X	X	
	1446	S	WB1802	MW18	PP01	13/15	2	N	—	X	X					X	X	
*	1606	S	WB1701	MW17	PP01	4/6	2	N	—	X	X					X	X	
	1615	S	WB1702	MW17	PP01	8/10	2	N	—	X	X					X	X	
	1515	S	SB6001	SB60	PP01	0/2	2	N	—	X	X					X	X	
	1540	S	SB6002	SB60	PP01	6/8	2	N	—	X	X					X	X	
	1540	S	SB10601	SB60	PD2	6/8	2	N	—	X	X					X	X	
	1705	S	SB6301	SB63	PP01	4/6	2	N	—	X	X					X	X	
	1710	S	SB6302	SB63	PP01	8/10	2	N	—	X	X					X	X	
	—	W	TEMP	Blank			1											

Relinquished by: (Signature) Daniel L Howard 5/5/97 1811 Date/Time:

Received by: Bob Daly 1811 5/5/97 Date/Time:

Cooler Temperature:

Remarks: * Use sample WB1701 as MS/MSD also

AIRBILL CO. Hand Delivered by M+E

TRACKING NO:

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):

(H) HCl/VOC,
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER _____

STORED/SHIPPED IN ICE Y/N

Metcalf & Eddy

CHAIN - OF - CUSTODY - RECORD

PROJECT NAME: Hunter IV

PROJECT NO: 019457-4102

LABORATORY ID: SLS

SAMPLER(S) NAME: Daniel Howard

TASK ORDER NO.

SAMPLE EVENT:

PROGRAM TYPE:

SAMPLER(S) SIGNATURE: Daniel Howard

DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS.	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F)FIELD
5/6/97	1455	S	SB10701	SB65	PDI	4/6	2	N	—
↓	—	S/W	Blank Temp	Blank			1		

ANALYTICAL PARAMETERS/METHODS

	VOCS	SVOC PAH	METALS ICP Hg CVAA GFAA	HERBICIDES	PESTICIDES	PCB	TPH/DRO	GRO	
Method No.	8020	8100					8100M	8015M	
	X	X					X	X	

Relinquished by: (Signature) Daniel L Howard Date/Time: 5/6/97/1835

Received by: Date/Time: 5/7/97 1835

Cooler Temperature:

Remarks:

AIRBILL CO. Hand Delivered by M+E

TRACKING NO:

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):

(H) HCl/VOC,
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER _____

STORED/SHIPPED IN ICE (Y)/N

Metcalf & Eddy

CHAIN - OF - CUSTODY - RECORD

PROJECT NAME: Hunter IV

PROJECT NO: 019457-4102

LABORATORY ID: SLS

SAMPLER(S) NAME: Daniel Howard

TASK ORDER NO.

SAMPLE EVENT:

PROGRAM TYPE:

SAMPLER(S) SIGNATURE: Daniel Howard

	DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS.	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F) FIELD
	5/6/97	0800	S	SB6201	SB62	PP01	4/6	2	N	—
		0815	S	SB6202	SB62	PP01	8/10	2	N	—
		0900	S	SB6801	SB68	PP01	4/6	2	N	—
		0910	S	SB6802	SB68	PP01	8/10	2	N	—
		1040	S	SB6101	SB61	PP01	4/6	2	N	—
		1050	S	SB6102	SB61	PP01	8/10	2	N	—
		1125	S	SB6701	SB67	PP01	4/6	2	N	—
		1135	S	SB6702	SB67	PP01	8/10	2	N	—
*		1420	S	SB6601	SB66	PP01	4/6	2	N	—
		1425	S	SB6602	SB66	PP01	8/10	2	N	—
		1455	S	SB6501	SB65	PP01	4/6	2	N	—
	↓	1510	S	SB6502	SB65	PP01	8/10	2	N	—

ANALYTICAL PARAMETERS/METHODS

Method No.	VOCS 8020	SVOC/PAH 8100	METALS ICP Hg CVAA GFAA	HERBICIDES	PESTICIDES	PCB	TPH/DRO 8100M	GRO 8015M	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	

Relinquished by: (Signature) Daniel L Howard Date/Time: 5/6/97/1835

Received by: Date/Time: 5/6/97 1835

Cooler Temperature:

Remarks: * Use sample SB6601 as MS/MSD also

AIRBILL CO. Hand Delivered by M+E

TRACKING NO:

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):

(H) HCl/VOC,
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER _____

STORED/SHIPPED IN ICE Y/N

CHAIN - OF - CUSTODY - RECORD

Metcalf & Eddy

PROJECT NAME: Hunter IV

PROJECT NO: 019457-4102

LABORATORY ID: SADL

SAMPLER(S) NAME: Daniel Howard

TASK ORDER NO.

SAMPLE EVENT:

PROGRAM TYPE:

SAMPLER(S) SIGNATURE: Daniel Howard

DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS.	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F)FIELD
5/6/97	0831	S	WB2402	MW24	PS1	13/15	2	N	—
↓	1055	S	WB2102	MW21	PS2	13/15	2	N	—
	0815	S	SB6202	SB62	PS3	8/10	2	N	—
	1125	S	SB6701	SB67	PS4	4/6	2	N	—
↓	—		TEMP	Blank			1		

ANALYTICAL PARAMETERS/METHODS

Method No.	VOCS 8020	SVOC PAH 8100	METALS ICP Hg CVAA GFAA	HERBICIDES	PESTICIDES	PCB	TPH/DRO 8100M	GRO 8015M	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	

Relinquished by: (Signature) Daniel L Howard

Date/Time: 5/6/97 1830

Received by:

Date/Time:

Cooler Temperature:

Remarks:

AIRBILL CO. Fed Ex

TRACKING NO: 105992592

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):

(H) HCl/VOC,
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER _____

STORED/SHIPPED IN ICE (Y)/N

CHAIN - OF - CUSTODY - RECORD

Metcalf & Eddy

PROJECT NAME: Hunter IV

PROJECT NO: 019457-4102

LABORATORY ID: SLS

SAMPLER(S) NAME: Daniel Howard

TASK ORDER NO.

SAMPLE EVENT:

PROGRAM TYPE:

SAMPLER(S) SIGNATURE: Daniel Howard

ANALYTICAL PARAMETERS/METHODS

DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F)FIELD	VOCS	SVOC PAH	METALS ICP Hg CVAA GFAA	HERBICIDES	PESTICIDES	PCB	TPH/DRO	GRO	
Method No.										8020	8100					8100M	8015M	
5/6/97	1615	S	~~DT~~ SB6401	SB64	PP01	4/6	2	N	—	X	X					X	X	
	1620	S	SB6402	SB64	PP01	6/8	2	N	—	X	X					X	X	
	1700	S	SB5301	SB53	PP01	0/2	2	N	—	X	X					X	X	
↓	1720	S	SB5302	SB53	PP01	6/8	2	N	—	X	X					X	X	

Relinquished by: (Signature) Daniel K Howard — Date/Time: 5/7/97/1803

Received by: M. Hamblett — Date/Time: 5.7.97 6:06

Cooler Temperature:

Remarks: Lot # 72546

AIRBILL CO. Hand Delivered by M+E

TRACKING NO:

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):

(H) HCl/VOC,
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER _____

STORED/SHIPPED IN ICE Y/N

CHAIN - OF - CUSTODY - RECORD

Metcalf & Eddy

PROJECT NAME: Hunter IV

PROJECT NO: 019457-4102

LABORATORY ID: SLS

SAMPLER(S) NAME: Daniel Howard

TASK ORDER NO.

SAMPLE EVENT:

PROGRAM TYPE:

SAMPLER(S) SIGNATURE: Daniel Howard

ANALYTICAL PARAMETERS/METHODS

DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS.	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F) FIELD	VOCs	SVOC PAH	METALS ICP Hg CVAA GFAA	HERBICIDES	PESTICIDES	PCB	TPH/DRO	GRO	
Method No.										8020	8100					8100M	8015M	
5/7/97	0924	S	WB3301	MW33	PP01	4/6	2	N	—	X	X					X	X	
	0936	S	WB3302	MW33	PP01	8/10	2	N	—	X	X					X	X	
	0936	S	WB6201	MW33	PD1	8/10	2	N	—	X	X					X	X	
*	1040	S	WB3401	MW34	PP01	4/6	2	N	—	X	X					X	X	
	1050	S	WB3402	MW34	PP01	8/10	2	N	—	X	X					X	X	
	1340	S	WB3501	MW35	PP01	4/6	2	N	—	X	X					X	X	
	1346	S	WB3502	MW35	PP01	8/10	2	N	—	X	X					X	X	
	—	W	TEMP	Blank			1											

Relinquished by: (Signature) Daniel Howard Date/Time: 5/7/97 1803

Received by: Date/Time: 5.7.97 6:06

Cooler Temperature:

Remarks: * Use sample WB3401 as MS/MSD also

AIRBILL CO. Hand Delivered By M+E

TRACKING NO:

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):

(H) HCl/VOC,
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER _____

STORED/SHIPPED IN ICE (Y)/N

CHAIN - OF - CUSTODY - RECORD

Metcalf & Eddy

PROJECT NAME: Hunter IV

PROJECT NO: 019457-4102

LABORATORY ID: SADL

SAMPLER(S) NAME: Daniel Howard

TASK ORDER NO.

SAMPLE EVENT:

PROGRAM TYPE:

SAMPLER(S) SIGNATURE: Daniel Howard

DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS.	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F) FIELD
5/7/97	1050	S	WB3402	WB34	PS1	8/10	2	N	—
↓	0845	S	SB5202	SB52	PS2	6/8	2	N	—
↓	1525	S	SB5204701	SB47	PS3	4/6	2	N	—
↓	—	W	TEMP	Blank			1		

ANALYTICAL PARAMETERS/METHODS

Method No.	VOCS 8020	SVOC PAH 8100	METALS ICP Hg CVAA GFAA	HERBICIDES	PESTICIDES	PCB	TPH/DRO 8100M	GRO 8015M	
	X	X					X	X	
	X	X					X	X	
	X	X					X	X	

Relinquished by: (Signature) Daniel Howard — Date/Time: 5/7/97/1830

Received by: — Date/Time: — Cooler Temperature:

Remarks:

AIRBILL CO. FedEx

TRACKING NO: 1059922603

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):

(H) HCl/VOC,
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER _____

STORED/SHIPPED IN ICE Y/N

CHAIN - OF - CUSTODY - RECORD

Metcalf & Eddy

PROJECT NAME: Hunter IV

PROJECT NO: 019457-4102

LABORATORY ID: SLS

SAMPLER(S) NAME: Daniel Howard

TASK ORDER NO.

SAMPLE EVENT:

PROGRAM TYPE:

SAMPLER(S) SIGNATURE: Daniel Howard

ANALYTICAL PARAMETERS/METHODS

DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F)FIELD	Method No.	VOCS	SVOC	METALS ICP Hg CVAA GFAA	HERBICIDES	PESTICIDES	PCB	TPH/DRO	GRO	TOC DI
													Lead 6010 Trace						9060
5/7/97	1340	S	WB3501	MW35	PP01	4/6		N	—				X						X
5/7/97	1050	S	WB3402	MW34	PP01	8/10		N	—				X						X
5/6/97	1620	S	SB6402	SB64	PP01	6/8		N	—				X						X
5/8/97	1100	S	SB4301	SB43	PP01	4/6		N	—				X						X
5/9/97	0815	S	WB2702	MW27	PP01	13/15		N	—				X						X
5/7/97	0800	S	SB5401	SB54	PP01	4/6		N	—				X						X
5/13/97	1252	S	WB3202	MW32	PP01	8/10		N	—				X						X
5/12/97	1630	S	WB1301	MW13	PP01	8/10		N	—				X						X
5/12/97	0952	S	WB1502	MW15	PP01	8/10		N	—				X						X
5/13/97	0850	S	SB3102	SB31	PP01	PM 8/10 AM		N	—				X						X
5/5/97	1315	S	WB1902	MW19	PP01	13/15		N	—				X						X
5/13/97	1305	S	SB2701	SB27	PP01	2/4		N	—				X						X

Relinquished by: (Signature) Daniel L Howard Date/Time: 5/16/97/1500

Received by: Date/Time:

Cooler Temperature:

Remarks: The DI TOC + Lead are requested for the above samples

* Use sample SB5401 as MS/MSD also

AIRBILL CO.

TRACKING NO:

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):

(H) HCl/VOC,
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER

STORED/SHIPPED IN ICE (Y)/N

CHAIN - OF - CUSTODY - RECORD

Metcalf & Eddy

PROJECT NAME: Hunter Pump Houses 1, 2 + 6 TASK ORDER NO. 1848-01 Mod

PROJECT NO: 019457-4102 SAMPLE EVENT:

LABORATORY ID: SLS PROGRAM TYPE:

SAMPLER(S) NAME: Daniel Howard SAMPLER(S) SIGNATURE: Daniel Howard

DATE	TIME MILITARY	MATRIX (S/W)	FIELD SAMPLE ID	SITE ID	RES CODE	DEPTH (FT.)	NO. OF CONTS.	STANRDARD PRESERV. (Y/N)*	FILTERED (L) LAB (F) FIELD	ANALYTICAL PARAMETERS/METHODS: VOCs (Method No. 8020)	SVOC PAH (8310)	METALS ICP Hg CVAA GFAA (Fe 6010/Pb 239.2)	HERB PES Fe+2 (3500)	PESTICIDES	PCB	TPH/DRO	GRO DO (5310-)	Sulfate (SDW 375.2)
5/29/97 ~~1605~~	1605	W	TB01	MW33	BT1		3	Y	NA	3								
5/29/97	1610	W	ER01	MW33	BR1		5	Y		3	2							
	1620	W	MW3301	MW33	PP01		9	Y		3	2	1	1				1	1
	1640	W	MW3501	MW35	PP01		9	Y		3	2	1	1				1	1
	1650	W	MW3401	MW34	PP01		9	Y		3	2	1	1				1	1
	1700	W	MW2501	MW25	PP01		9	Y		3	2	1	1				1	1
	1715	W	MW2601	MW26	PP01		3	Y		3								
	1730	W	MW2801	MW28	PP01		3	Y		3								
	1740	W	MW2901	MW29	PP01		3	Y		3								
	1740	W	MW5601	MW29	PD1		3	Y		3								
	1755	W	MW3201	MW32	PP01		3	Y		3								
	1805	W	MW3001	MW30	PP01		3	Y		3								

Relinquished by: (Signature) Daniel Howard Date/Time: 5/29/97 2013

Received by: Bob Daly Date/Time: 5/29/97 2013

Cooler Temperature:

Remarks:

AIRBILL CO. Hand Delivered by M+E

TRACKING NO:

Send Results to:

Christine Hettinger c/o METCALF & EDDY, INC.
1201 Peachtree St., N.E., 400 Colony Square, Suite 1101
Atlanta, Georgia 30361
(404) 881-8010, FAX (404) 872-3161

STANDARD PRESERVATION (Y):
(H) HCl/VOC, + Fe^{+2}
(N) HNO_3/METALS
(S) H_2SO_4/
(O) OTHER _____
STORED/SHIPPED IN ICE (Y)/N

SAMPLE RECEIPT CONFIRMATION SUMMARY REPORT

TO BE COMPLETED BY SUBCONTRACTOR SAMPLE CUSTODIAN FOR EACH SHIPMENT RECEIVED FROM METCALF & EDDY
UPON COMPLETION, FAX TO THE DESIGNATED M&E REPRESENTATIVE LISTED BELOW SAME DAY AS SHIPMENT

METCALF & EDDY Representative Christine Hettinger FAX # ~~912~~ (404) 872-3161

SUBCONTRACTOR Savannah Lab PROJECT # 019457-4102

SAMPLE CUSTODIAN A. Campbell ~~37-7550~~ ~~37-7550R~~ TODAY'S DATE 5/6/97

DATE/TIME SAMPLES RECEIVED 5/5/97 6:11

AIRBILL NUMBER _____ NO. OF COOLERS IN SHIPMENT 1

COOLER OPENED: DATE 5/6/97 TIME 8:30

CHAIN OF CUSTODY SEAL INTACT?	YES ☑	NO ☐
CHAIN OF CUSTODY PROVIDED?	YES ☑	NO ☐
SAMPLE LABELS PRESENT?	YES ☑	NO ☐
BOTTLE LABELS CORRESPOND W/COC?	YES ☑	NO ☐

TYPE OF COOLANT USED Wet Ice

COOLANT CONDITION: MELTED _____ PARTIALLY MELTED/FROZEN ✓

FROZEN _____

COOLER NUMBER # 1	TEMP INSIDE COOLER 1.0°C
#	
#	
#	
#	

RECORD TEMPERATURE BLANK (1) 1.0°C (2) _____ (3) _____

CONDITION OF BOTTLES IN SHIPMENT: (BROKEN, LEAKING, (INTACT?))

IF BROKEN OR LEAKING LIST SAMPLE ID#'S AND BOTTLE TYPES AFFECTED

LIST SAMPLE ID'S IN EACH SHIPMENT: WB1901, WB1501, WB1902, WB1801, WB1802, WB1701, WB1702, WB1602, SB1601, SB1602, SB1401, SB1301, SB1302

Samples hand-delivered by client. bmc 5/6/97

SAMPLE RECEIPT CONFIRMATION SUMMARY REPORT

Metcalf & Eddy

TO BE COMPLETED BY SUBCONTRACTOR SAMPLE CUSTODIAN FOR EACH SHIPMENT RECEIVED FROM METCALF & EDDY.
UPON COMPLETION, FAX TO THE DESIGNATED M&E REPRESENTATIVE LISTED BELOW SAME DAY AS SHIPMENT

METCALF & EDDY Representative Christine Hettinger FAX # 404-872-3161

SUBCONTRACTOR Savannah Lab PROJECT # 019457-4102

SAMPLE CUSTODIAN Maxine Hounshell TODAY'S DATE 5/8/97

DATE/TIME SAMPLES RECEIVED 5.7.97 6:06

AIRBILL NUMBER _____ NO. OF COOLERS IN SHIPMENT 1

COOLER OPENED: DATE 5.8.97 TIME 6:06

CHAIN OF CUSTODY SEAL INTACT? YES ☑ NO ☐

CHAIN OF CUSTODY PROVIDED? YES ☑ NO ☐

SAMPLE LABELS PRESENT? YES ☑ NO ☐

BOTTLE LABELS CORRESPOND W/COC? YES ☑ NO ☐

TYPE OF COOLANT USED Wet ICE

COOLANT CONDITION: MELTED _____ PARTIALLY MELTED/FROZEN _____ FROZEN _____

COOLER NUMBER #	Cooler A	TEMP INSIDE COOLER 3.3
#		
#		
#		
#		

RECORD TEMPERATURE BLANK (1) 3.3 (2) _____ (3) _____

CONDITION OF BOTTLES IN SHIPMENT: (BROKEN, LEAKING, INTACT?)

IF BROKEN OR LEAKING LIST SAMPLE ID#'S AND BOTTLE TYPES AFFECTED

LIST SAMPLE ID'S IN EACH SHIPMENT:
WB3301 WB3302 WB6201 WB3401 WB3402
WB3501 WB3502

Metcalf & Eddy

SAMPLE RECEIPT CONFIRMATION SUMMARY REPORT

TO BE COMPLETED BY SUBCONTRACTOR SAMPLE CUSTODIAN FOR EACH SHIPMENT RECEIVED FROM METCALF & EDDY
UPON COMPLETION, FAX TO THE DESIGNATED M&E REPRESENTATIVE LISTED BELOW SAME DAY AS SHIPMENT

METCALF & EDDY Representative Christine Hettinger FAX# 404-872-3161

SUBCONTRACTOR Savannah Lab PROJECT # 019457-4102

SAMPLE CUSTODIAN D Campbell 57-70846 cooler A TODAY'S DATE 5/7/97

DATE/TIME SAMPLES RECEIVED 5/6/97 /10:35

AIRBILL NUMBER ______ NO. OF COOLERS IN SHIPMENT 2

COOLER OPENED: DATE 5/7/97 TIME 8:35

CHAIN OF CUSTODY SEAL INTACT? YES ☑ NO ☐

CHAIN OF CUSTODY PROVIDED? YES ☑ NO ☐

SAMPLE LABELS PRESENT? YES ☑ NO ☐

BOTTLE LABELS CORRESPOND W/COC? YES ☑ NO ☐

TYPE OF COOLANT USED Wet Ice

COOLANT CONDITION: MELTED ______ PARTIALLY MELTED/FROZEN ✓

FROZEN ______

COOLER NUMBER	TEMP INSIDE COOLER
# Cooler A	1.1°C
# Cooler B	1.4°C
#	
#	
#	

RECORD TEMPERATURE BLANK (1) 1.1°C (2) 1.4°C (3) ______

CONDITION OF BOTTLES IN SHIPMENT: (BROKEN, LEAKING, (INTACT?))

IF BROKEN OR LEAKING LIST SAMPLE ID#'S AND BOTTLE TYPES AFFECTED

LIST SAMPLE ID'S IN EACH SHIPMENT: ~~WB0001~~, SB0001, SB0202, ~~SB~~ SB0801, SB0802, SB0101, SB0102, SB0701, SB0702, SB0601, SB0602, SB0501, SB0502, SB1001, SB0402, SB5302, SB0401, SB5301.

SAMPLE RECEIPT CONFIRMATION SUMMARY REPORT

97-73006-BA

TO BE COMPLETED BY SUBCONTRACTOR SAMPLE CUSTODIAN FOR EACH SHIPMENT RECEIVED FROM METCALF & EDDY

UPON COMPLETION, FAX TO THE DESIGNATED M&E REPRESENTATIVE LISTED BELOW SAME DAY AS SHIPMENT

METCALF & EDDY Representative Christine Hettinger FAX # 404-872-3161 ~~019457-4102~~

SUBCONTRACTOR Savannah Lab PROJECT # 019457-4102

SAMPLE CUSTODIAN M. Sancomb TODAY'S DATE 5.30.97

DATE/TIME SAMPLES RECEIVED 5/29/97 2013

AIRBILL NUMBER _____ NO. OF COOLERS IN SHIPMENT 3

COOLER OPENED: DATE 5-30-97 TIME 8:00

CHAIN OF CUSTODY SEAL INTACT? YES ☑ NO ☐

CHAIN OF CUSTODY PROVIDED? YES ☑ NO ☐

SAMPLE LABELS PRESENT? YES ☑ NO ☐

BOTTLE LABELS CORRESPOND W/COC? YES ☑ NO ☐

TYPE OF COOLANT USED Wet ICE

COOLANT CONDITION: MELTED _____ PARTIALLY MELTED/FROZEN ✓

FROZEN _____

COOLER NUMBER #	Cooler A	TEMP INSIDE COOLER 9.6
#	Cooler B	11.5
#	Cooler C	7.2
#		
#		

RECORD TEMPERATURE BLANK (1) 9.6 (2) 11.5 (3) 7.2

CONDITION OF BOTTLES IN SHIPMENT: (BROKEN, LEAKING, (INTACT?))

IF BROKEN OR LEAKING LIST SAMPLE ID#'S AND BOTTLE TYPES AFFECTED

LIST SAMPLE ID'S IN EACH SHIPMENT: TB01 ER01 MW330I MW350I MW340I MW250I MW260I MW280I MW290I MW560I MW320I MW300I MW300/MS/MSD MW310I MW220I MW210I MW190I MW1170I

APPENDIX C

MONITORING WELL SCHEMATICS, MONITORING WELL DEVELOPMENT SHEETS, AND PHOTOGRAPHS

GROUND WATER INSTALLATION

PROJECT: Pumphouse 1,2,6 JOB NO. 019457 WELL NO. MW33

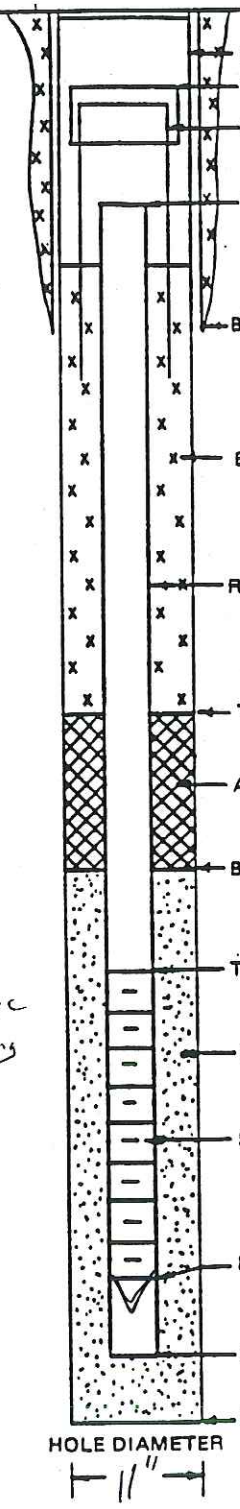
DRILLING CONTRACTOR: PSI COORDINATES:

BEGUN: 5/7/97 SUPERVISOR: D. Humphris WELL SITE: WATER LEVEL: DEPTH/ELEV. 8.46'TOC / 29.61'

FINISHED: 5/7/97 DRILLER: K. Durham

REFERENCE POINT & ELEVATION:

GENERALIZED GEOLOGIC LOG



Flush Mount

Sackrete grout DH

Sackrete 5000 psi Portland DH

DIA.: 2" TYPE: PVC sch 40

ANNULAR SEAL: TYPE: bentonite · Wyo Ben Pellets

TYPE: 30/45 Silica Sand

SCREEN: DIA.: 2" TYPE: PVC sch 40

OPENING WIDTH: 0.010 in TYPE: slotted

W.L = 8.46'TOC at sampling

	DEPTH IN	ELEV. IN
GROUND SURFACE	0	38.2
SURFACE CASING / TOP OF PROTECTIVE CASING	—	—
PROTECTIVE CASING / TOP OF RISER CASING	0.1	38.09
BOTTOM OF SURFACE CASING	—	—
BACKFILL / RISER CASING	1.5	36.7
TOP OF SEAL / ANNULAR SEAL	2.5	35.7
BOTTOM OF SEAL	4.5	33.7
TOP OF SCREEN / FILTER MATERIAL / SCREEN	14.5	23.7
BOTTOM OF SCREEN	—	—
BOTTOM OF SUMP / BOTTOM OF HOLE	15.0	23.2

METHOD DRILLED: 6 1/4" ID HSA

METHOD DEVELOPED: See Develop Log

TIME DEVELOPED:

COMMENTS:

Metcalf & Eddy

GROUND WATER INSTALLATION

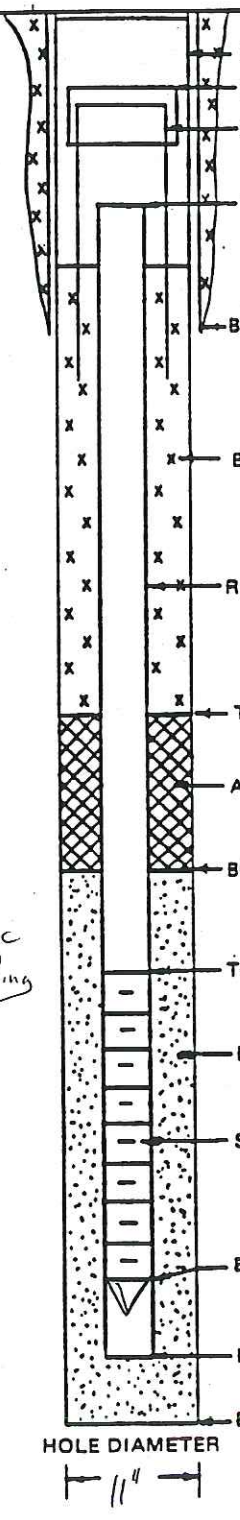
PROJECT: Pumphouse 1,2,6 | JOB NO. 019457 | WELL NO. MW34

DRILLING CONTRACTOR: PSI | COORDINATES:

BEGUN: 5/7/97 | SUPERVISOR: D. Humphris | WELL SITE: | WATER LEVEL: DEPTH/ELEV. 9.10' TOC / 29.70'

FINISHED: 5/7/97 | DRILLER: K. Durham

REFERENCE POINT & ELEVATION:



Flush Mount

DEPTH IN	ELEV. IN
0	39.0
—	—
0.2	38.80
—	—
1.0	38.0
2.5	36.5
4.5	34.5
14.5	24.5
—	—
15.0	24.0

METHOD DRILLED: 6 1/4" ID HSA

METHOD DEVELOPED: See Develop Log

TIME DEVELOPED:

COMMENTS:

Metcalf & Eddy

GROUND WATER INSTALLATION

PROJECT: Pumphouse 1,2,6 JOB NO. 019457 WELL NO. MW35

DRILLING CONTRACTOR: PSI

COORDINATES:

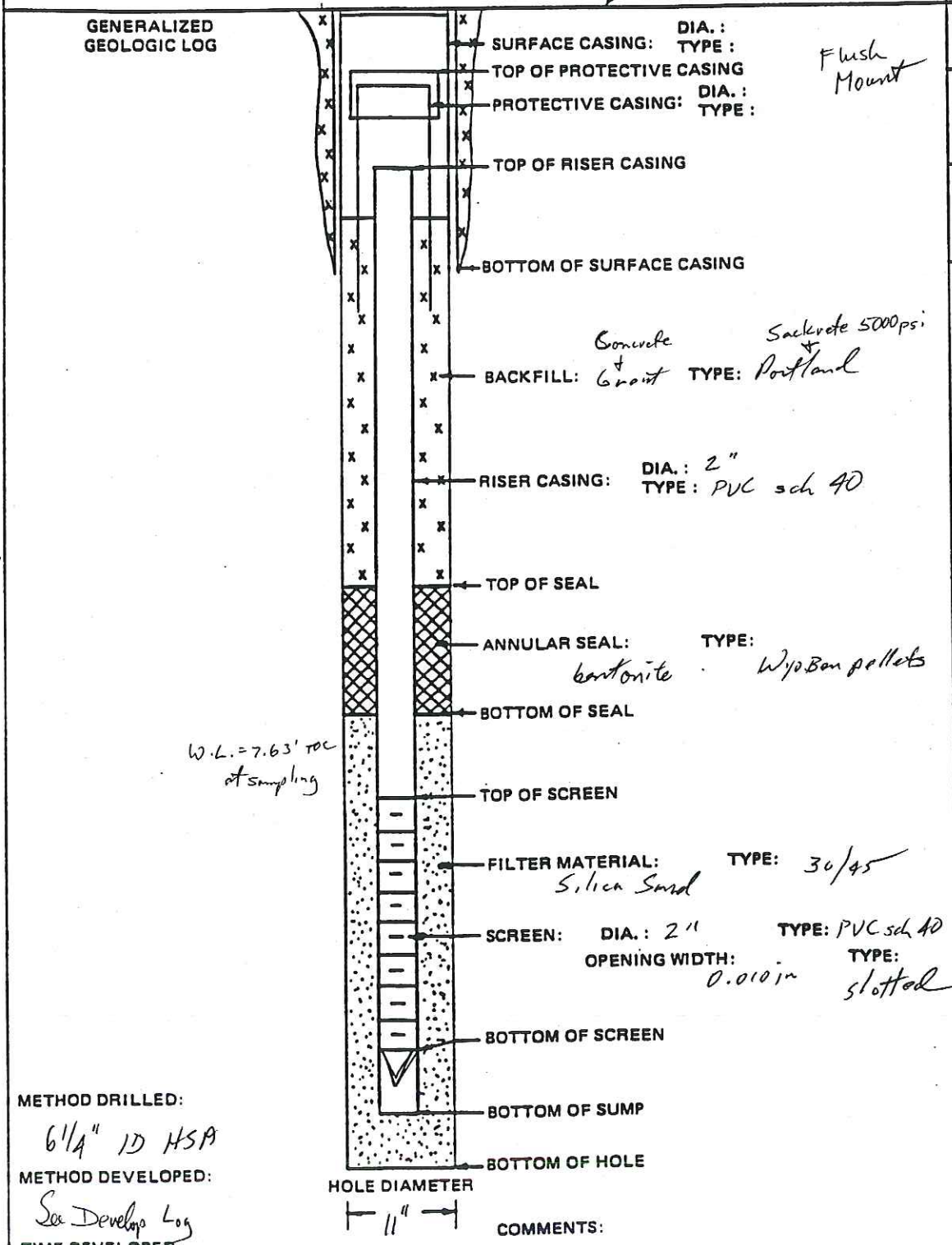
BEGUN: 5/7/97 FINISHED: 5/7/97

SUPERVISOR: D. Humphris DRILLER: K. Durham

WELL SITE:

WATER LEVEL: DEPTH/ELEV. 7.63' TOC / 29.02'

REFERENCE POINT & ELEVATION:



DEPTH IN	ELEV. IN
0	36.9
—	—
0.2	36.65
—	—
19.5	17.4
22.5	14.4
24.5	12.4
29.5	7.4
—	—
30.5	6.4

METHOD DRILLED: 6 1/4" ID HSA

METHOD DEVELOPED: See Develop Log

TIME DEVELOPED:

COMMENTS:

Metcalf & Eddy

MONITORING WELL DEVELOPMENT

Metcalf & Eddy

WELL I.D. NO.: MW33

METHOD OF DEVELOPMENT: 2" Grundfos

DATE: 5/14/97

STATIC WATER LEVEL: 8.39' TOC (8.5 bgs)

LOGGED BY: D. Humphus

TD - 14.5' 6'
48 Gal = 5 vol

SAMPLE NO.	TIME 1156	PARAMETERS				PUMPING RATE (gpm)	VOLUME PUMPED (gal)	PHOTO TAKEN	OBSERVATIONS
		TEMP (°F)	pH	COND'Y (umhos)	TURBIDITY (NTU)				
1	1201	85.2	5.25	114.7		1.1	2.5		Surge @ 0, 2.5
2	1206	83.2	5.20	110.1			5		Surge @ 5, 7.5, 10
3	1212	85.1	5.19	103.2			7.5		discharge tube heating in sun
4	1215	84.1	5.09	97.5			10		Surge @ 10, 12.5, 15
5	1223	82.2	5.22	96.1		1.2	15		
6	1229	81.7	5.19	92.1			20		Surge @ 20
7	1235	82.5	5.14	90.9			25		
8	1240	83.3	5.14	87.7			30		
9	1244	83.2	5.15	87.9			35		
10	1249	82.9	5.15	88.1			40		
11	1253	82.7	4.95	86.4			45		
12	1257	82.7	5.13	85.7			50		Br. Color - no sediment in jar @ 10 min.
13	1301	82.3	4.99	85.9			55		slight clearing - Lt. Br.
14	1307	82.4	5.20	82.8		1.2/2.0	60		stop pump - dry
15	13:21	82.2	5.17	86.7		2.0	70		
16	1328	82.5	5.12	82.7		1.5	80		
17	1337	84.7	5.14	81.3			90		
18	1345	84.1	5.20	82.7			100		No change in 40 gal, no sediment in jar. Lt. Br. color likely Fe content.
19	1353	85.1	5.15	83.7			105	Y	
	END								

TOTAL DEVELOPMENT TIME: 1:59

TOTAL VOLUME PURGED: 105 Gal

COMMENTS

PG. 1 OF 1

MONITORING WELL DEVELOPMENT

Metcalf & Eddy

WELL I.D. NO.: MW 34

METHOD OF DEVELOPMENT: 2" Grundfos

DATE: 5/19/97

STATIC WATER LEVEL: 9.18' TOC (9.3 bgs)

LOGGED BY: D. Humphris

TD - 14.5' 5.3'

43 Gal = 5 vol

SAMPLE NO.	TIME 1420	PARAMETERS				PUMPING RATE (gpm)	VOLUME PUMPED (gal)	PHOTO TAKEN	OBSERVATIONS
		TEMP (°F)	pH	COND'Y (umhos)	TURBIDITY (NTU)				
1	1431	80.1	5.60	48.6		1.3	2.5		Surge @ 0, 2.5, 5
2	1438	79.2	5.26	51.1			5		clearing quickly Surge @ 7.5, 10
3	1441	75.7	5.38	51.2			10		Surge @ 15
4	1446	75.3	5.13	50.6			15		Surge @ 20
5	1449	75.2	5.23	51.1			20		
6	1454	74.4	5.30	50.4			25		clearing
7	1458	73.9	5.17	49.6			30		clear
8	1501	75.0	5.19	50.8			35		
9	1505	74.5	5.20	50.0			40		
10	1508	73.9	5.19	50.9			43	Y	clear -
11	-	END -							
12									
13									
14									
15									

TOTAL DEVELOPMENT TIME: : 48

TOTAL VOLUME PURGED: 43 Gal

COMMENTS clear

MONITORING WELL DEVELOPMENT

Metcalf & Eddy

WELL I.D. NO.: MW 35

METHOD OF DEVELOPMENT: 2" Grundfos

DATE: 5/14/97

STATIC WATER LEVEL: 7.8' bgs 7.56' TOC

LOGGED BY: D. Humphrey

TD = 29.5' 5' screen

40 + 13.5 + 70 gal = 123.5

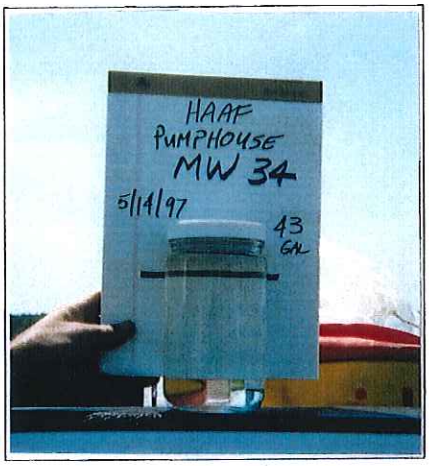
SAMPLE NO.	TIME 911	PARAMETERS				PUMPING RATE (gpm)	VOLUME PUMPED (gal)	PHOTO TAKEN	OBSERVATIONS
		TEMP (°F)	pH	COND'Y (umhos)	TURBIDITY (NTU)				
1	921	79.3	6.59	1251		1.2	1.0		Surge @ 0, 2 1/2, 5, 7 1/2
2	927	79.8	6.72	1119			5.0		
3	936	80.6	6.53	811			10.		Surge @ 10
4	940	81.4	6.11	530			15		Surge @ 15
5	943	80.5	5.97	352		2.0	20		Surge @ 20, 25
6	950	80.3	5.77	215			30		Surge @ 30
7	955	80.1	5.64	145.3			40		less thick - gray
8	1000	80.4	5.63	129.2			50		
9	1006	80.0	5.67	109.5			60		
10	1011	79.5	5.63	101.1			70		
11	1015	78.9	5.63	94.8			80		
12	1024	78.2	5.59	90.4			90		clearing
13	1030	79.5	5.56	85.2			100		Lt gray - no sediment in jar @ 10 min
14	1045	81.3	5.55	86.4		0.8	110		slow pump rate
15	1057	82.3	5.57	90.0		0.1 (2 gpm for 3 gal)	120		No change since 90 gal Lt gray but no sediment
16	1134	83.5	5.88	95.6			130	Y	STOP - no change in clarity
17									

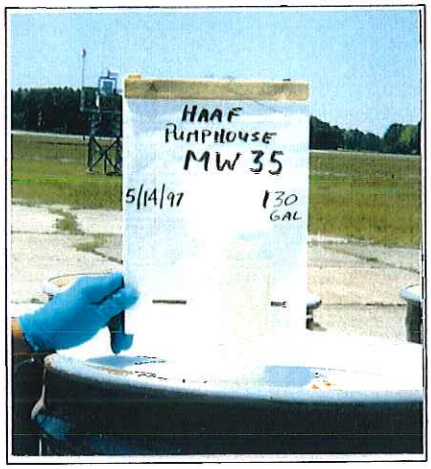
TOTAL DEVELOPMENT TIME: 2:23

TOTAL VOLUME PURGED: 130 GAL

COMMENTS Sl fur odor

PG. 1 OF 1



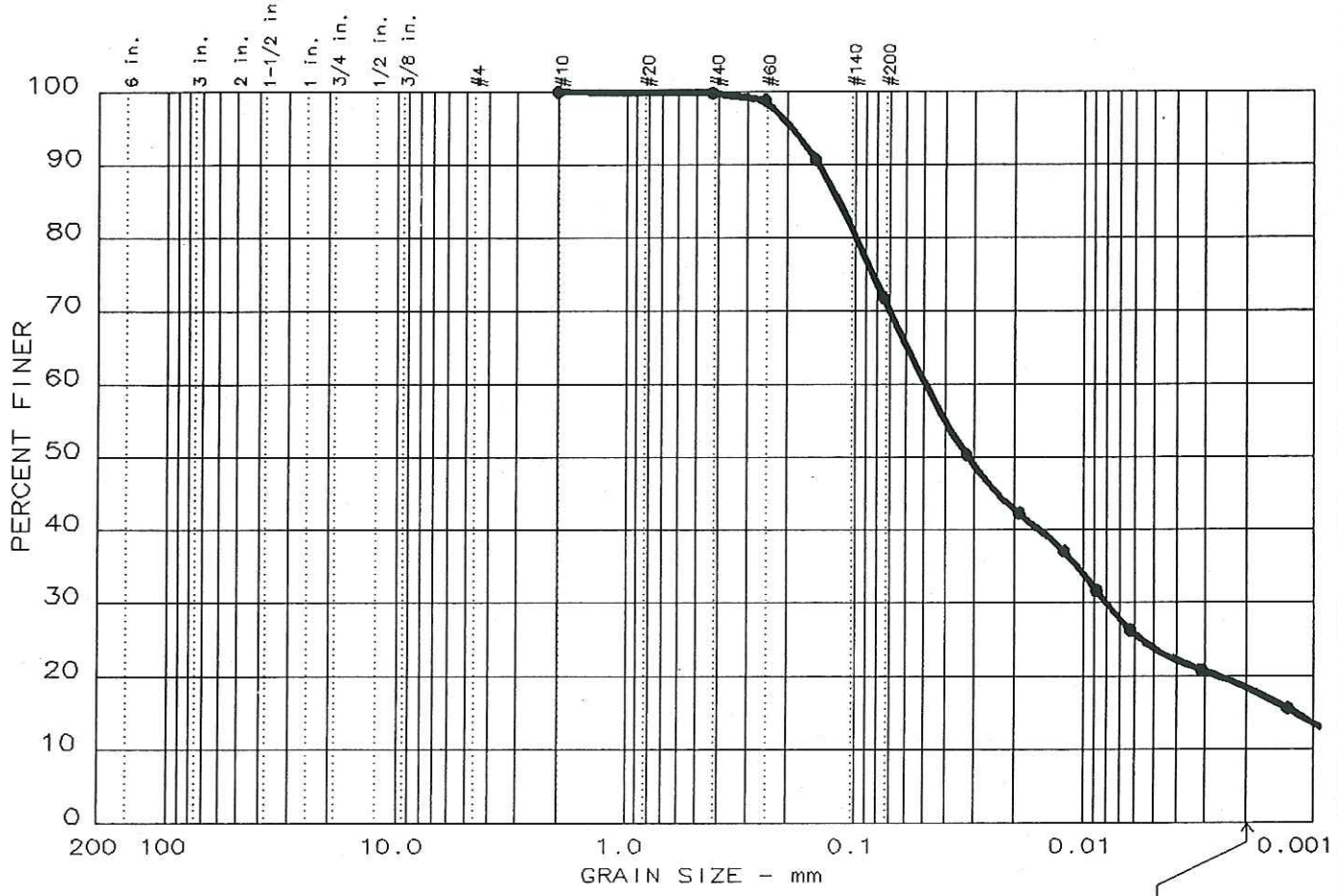


PUMPHOUSE #6
MONITORING WELL DEVELOPMENT PHOTOS

APPENDIX D

GEOTECHNICAL DATA

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	19	0.0	0.0	28.2	53.3	18.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	42	14	0.12		0.03	0.008	0.0012			

MATERIAL DESCRIPTION	USCS	AASHTO
● LIGHT BROWN CLAYEY SILTY SAND	ML	A-7-6

Project No.: 778-62024
Project: HUNTER IV (4) / TASK ORDER# 18 & 18A
● Location: STA. MW33, 13' - 15'

Date: 06/16/97

GRAIN SIZE DISTRIBUTION TEST REPORT

PROFESSIONAL SERVICE INDUSTRIES, INC.

Remarks:

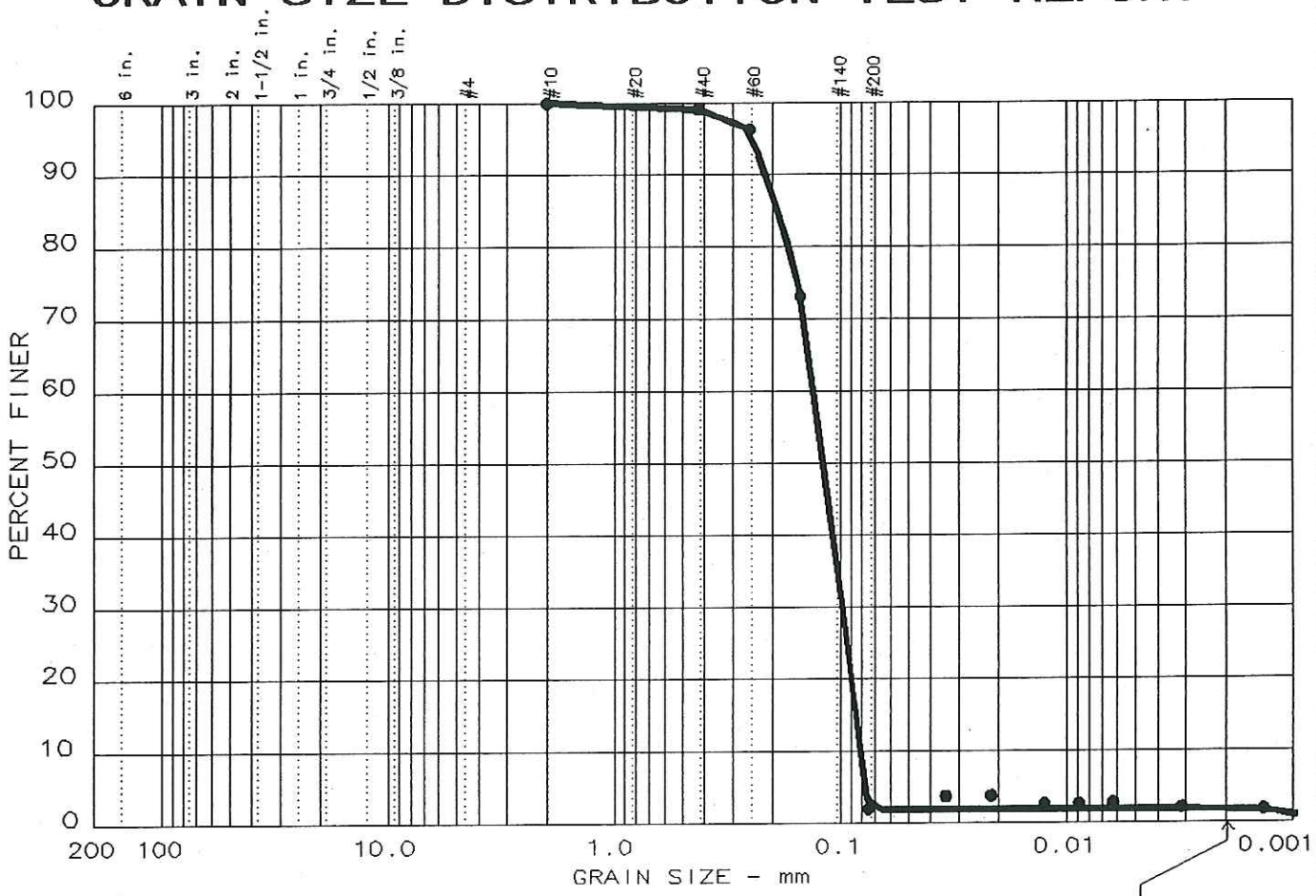
TESTED BY:J.CARTER

CHECKED BY:D.MOORE

NMC = 25.7%

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	4	0.0	0.0	98.0	0.1	1.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	0.19	0.13	0.12	0.098	0.0851	0.0810	0.91	1.6

MATERIAL DESCRIPTION	USCS	AASHTO
●	SP	A-3

Project No.: 778-62024
Project: HUNTER 4 / TASK ORDER# 18 & 18A
● Location: STA. MW 34, 13' - 15'

Date: 05/28/97

GRAIN SIZE DISTRIBUTION TEST REPORT

PROFESSIONAL SERVICE INDUSTRIES, INC.

Remarks:

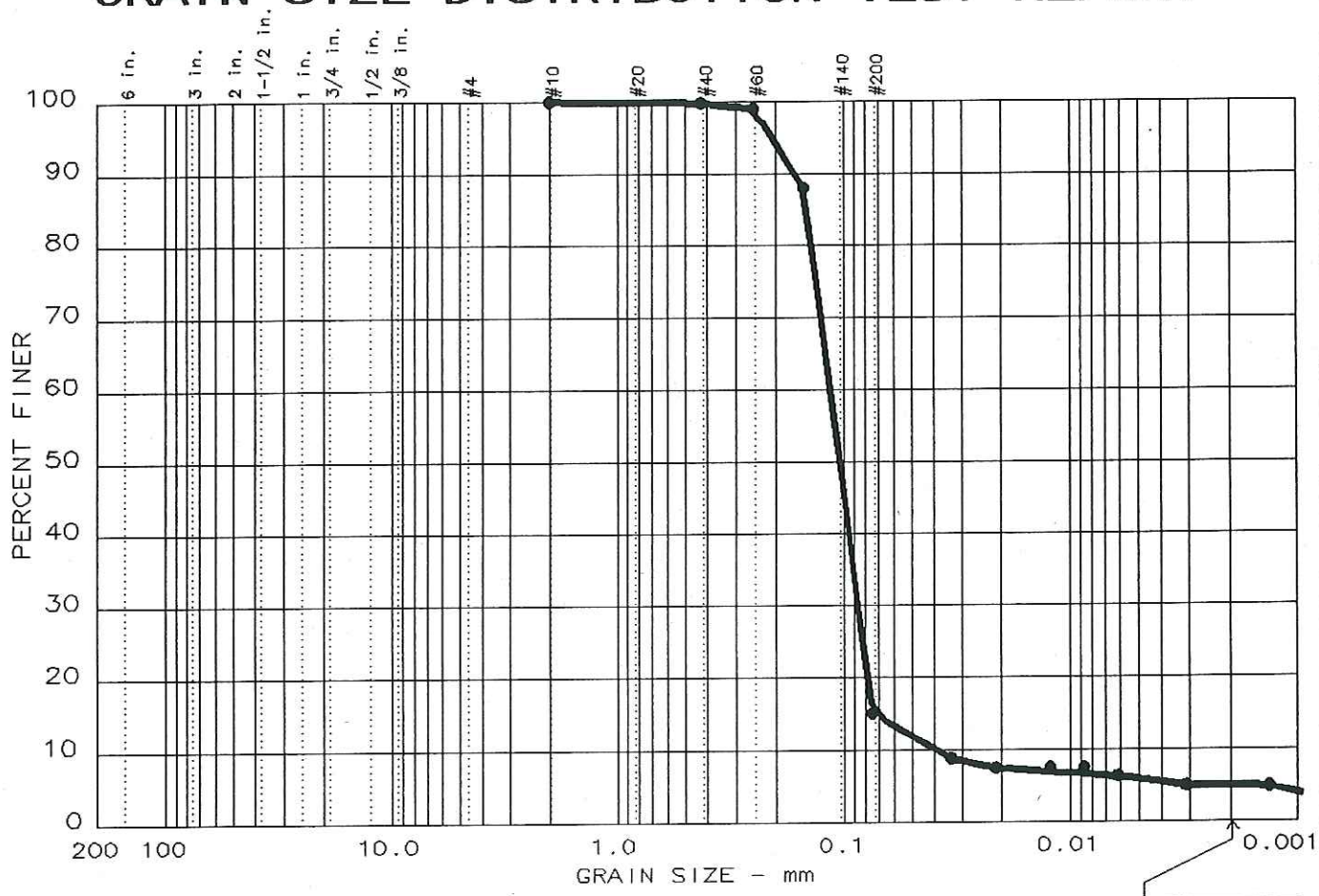
TESTED BY:JC/DM

CHECKED BY:D.MOORE

NMC = 27.0%

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	0.0	84.9	10.1	5.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	0.15	0.11	0.10	0.086	0.0735	0.0386	1.68	3.0

MATERIAL DESCRIPTION	USCS	AASHTO
●	SM	A-2-4

Project No.: 778-62024
Project: HUNTER 4 / TASK ORDER# 18 & 18A
● Location: STA. MW 35, 28' - 30'

Date: 05/28/97

GRAIN SIZE DISTRIBUTION TEST REPORT

PROFESSIONAL SERVICE INDUSTRIES, INC.

Remarks:

TESTED BY:JC/DM

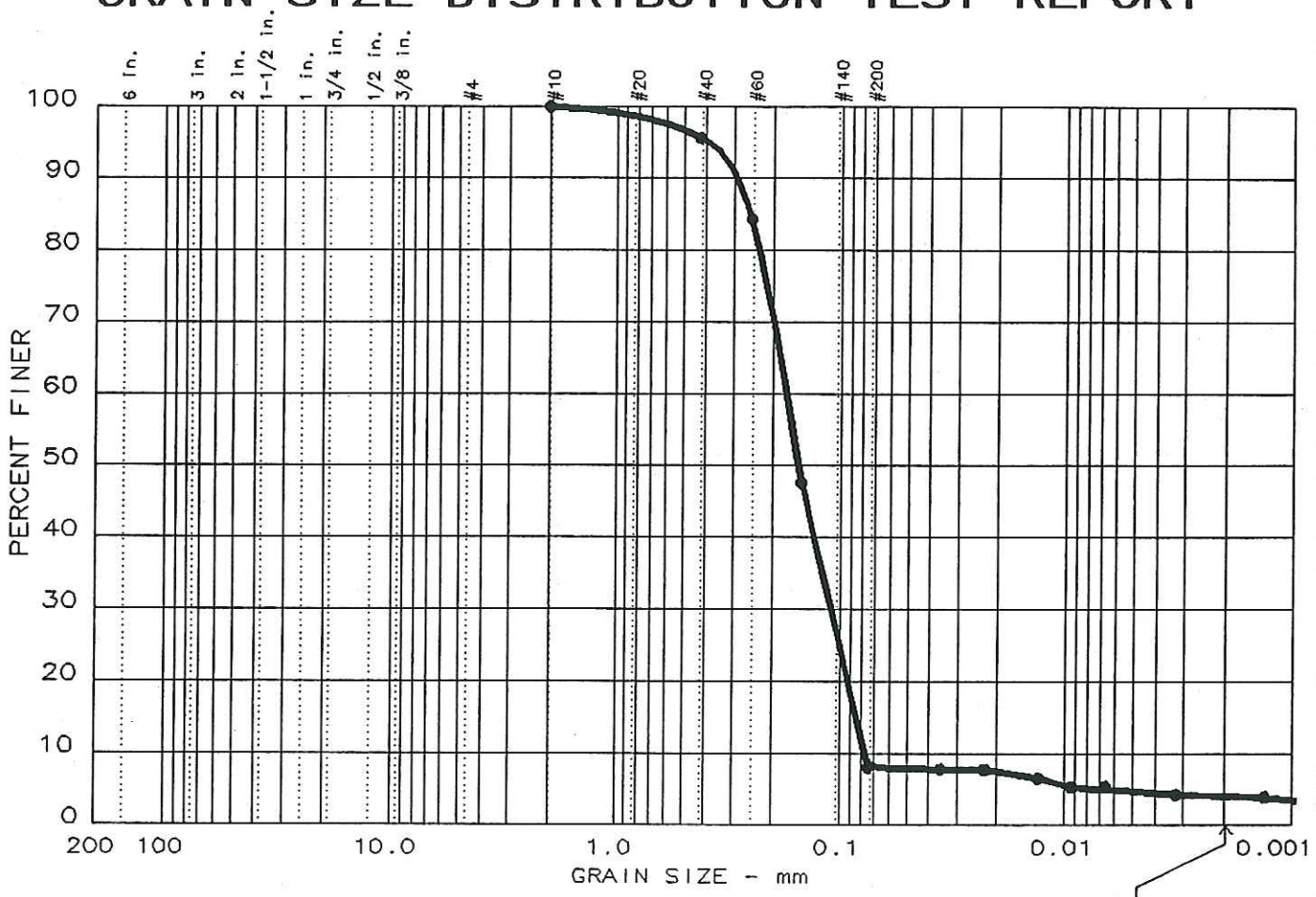
CHECKED BY:D.MOORE

NMC = 25.5%

Figure No. _____

SHELBY TUBE DATA

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	0.0	91.8	4.1	4.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.25	0.17	0.15	0.110	0.0844	0.0774	0.90	2.3

MATERIAL DESCRIPTION	USCS	AASHTO
● GRAY AND BROWN FINE SAND	SP-SM	A-3

Project No.: 778-62024
Project: HUNTER IV (4) / PHASE 1
● Location: STA. SB60, 6' - 8'

Date: 07/11/97

GRAIN SIZE DISTRIBUTION TEST REPORT

PROFESSIONAL SERVICE INDUSTRIES, INC.

Remarks:

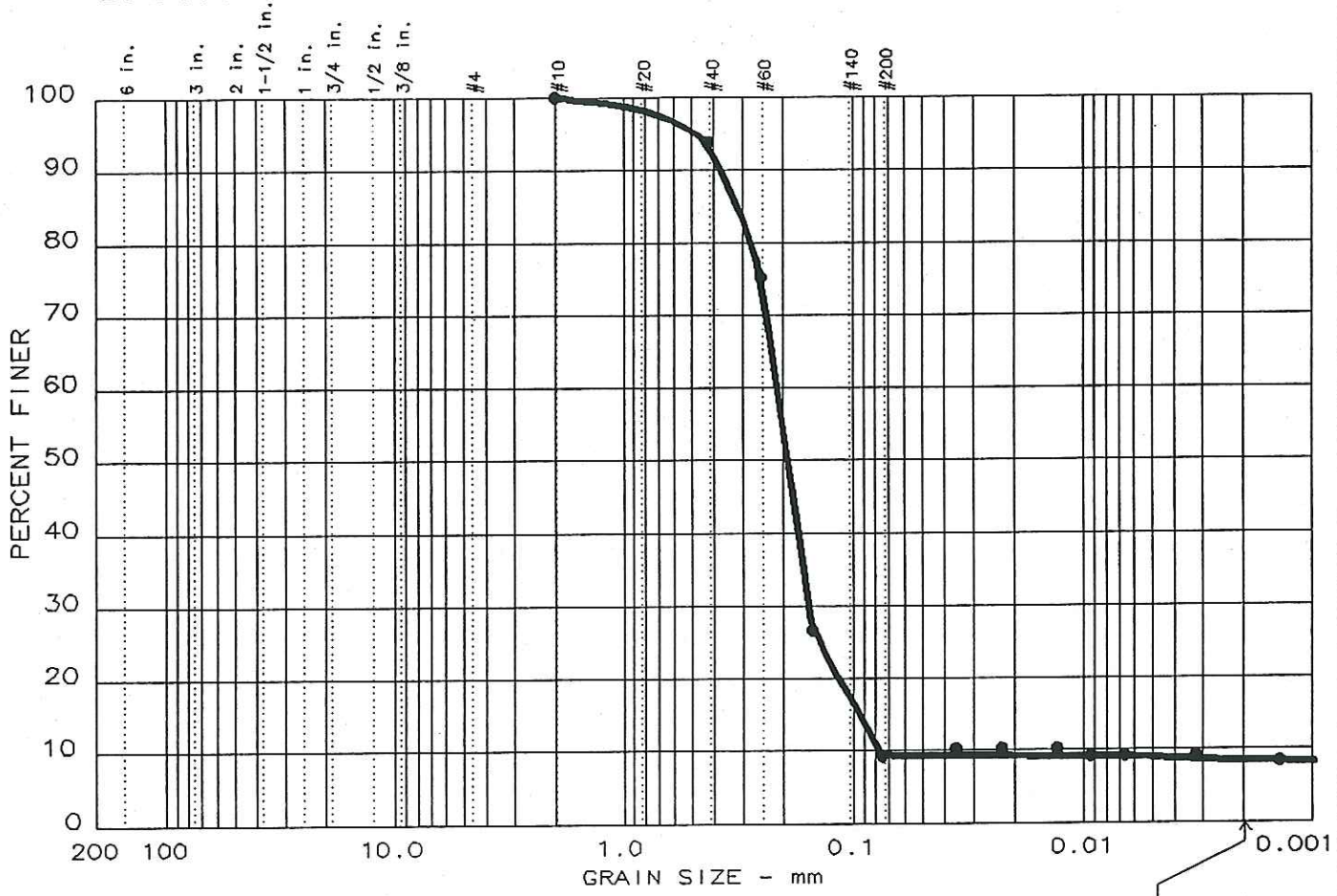
TESTED BY:JC/DM/AW

CHECKED BY:D.MOORE

NMC = 12.5%

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.0	90.7	0.8	8.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.32	0.21	0.19	0.155	0.0935	0.0769	1.47	2.8

MATERIAL DESCRIPTION	USCS	AASHTO
● LIGHT GRAY FINE SAND	SP-SM	A-3

Project No.: 778-62024
Project: HUNTER IV (4) / PHASE 1
● Location: STA. SB64, 5' -- 7'

Date: 07/11/97

Remarks:
TESTED BY:JC/DM/AW
CHECKED BY:D.MOORE

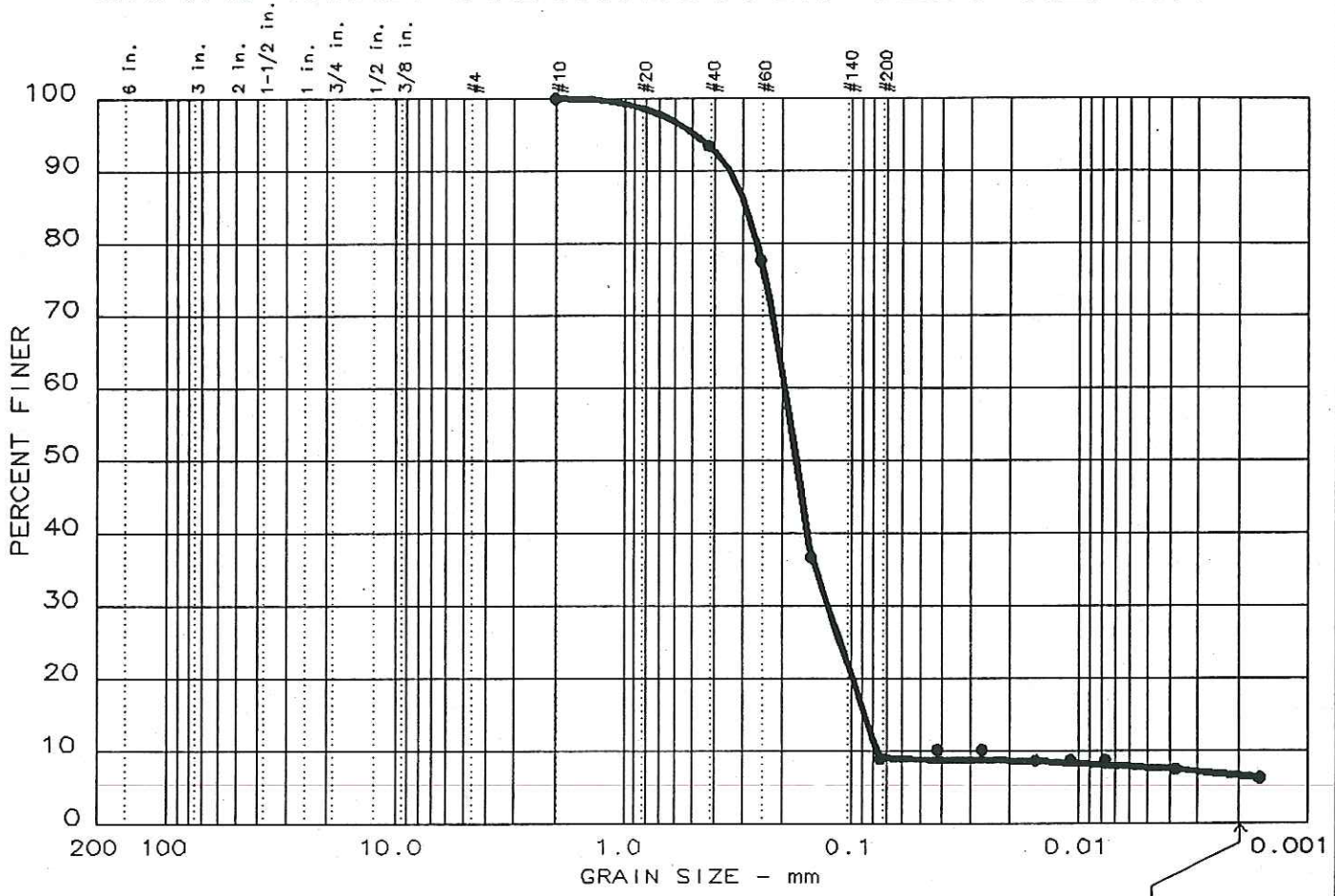
NMC = 14.8%

GRAIN SIZE DISTRIBUTION TEST REPORT

PROFESSIONAL SERVICE INDUSTRIES, INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.0	91.0	2.4	6.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.29	0.19	0.17	0.126	0.0871	0.0767	1.06	2.5

MATERIAL DESCRIPTION	USCS	AASHTO
● LIGHT BROWN FINE SAND	SP-SM	A-3

Project No.: 778-62024
Project: HUNTER IV
● Location: STA. SB67, 7' - 8'

Date: 07-28-97

GRAIN SIZE DISTRIBUTION TEST REPORT

PROFESSIONAL SERVICE INDUSTRIES, INC.

Remarks:

TESTED BY: AW/DM

CHECKED BY: D.MOORE

Figure No. _____

Sample	Specific Gravity	Volumetric Content Soil Pore Water (volume/unit volume) Vw(in-situ)	Volumetric Content Soil Vapor (volume/unit volume) Va(in-situ)	Total Soil Porosity n	Soil Bulk Density (lb/cu.ft)	Saturated Hydraulic Conductivity (cm/sec)	Range of Volumetric Air Content Capillary Fringe Soils (volume/unit volume)		Range of Volumetric Content Vadose Zone Soils (volume/unit volume)				Volumetric Water Content Saturated Zone Soils (volume/unit volume) Vw(sat)
							Va(cap)[2]	Va(cap)[1]	Vw(vad)[1]	Va(vad)[2]	Vw(vad)[2]	Va(vad)[1]	
MW 15, 7-9	2.56	0.256	0.212	47	100.9	4.50E-06	0.278	0.007	0.041	0.428	0.218	0.251	0.476
MW 16, 7-9	2.64	0.292	0.157	45	108.9	1.70E-05	0.246	0.014	0.044	0.406	0.232	0.217	0.436
MW 21, 10-12[1]						5.30E-03							
MW 21, 10-12	2.88	0.275	0.227	50	106.8	7.10E-03	0.300	0.013	0.043	0.458	0.230	0.272	0.445
MW 22, 8-10						5.00E-04							
MW 22, 8-10[2]	2.54	0.122	0.354	48	90.7	2.60E-03	0.289	0.196	0.040	0.436	0.213	0.263	0.466
MW 26, 6-8	2.64	0.359	0.067	43	116.9	7.30E-03	0.214	0.018	0.045	0.381	0.242	0.184	0.409
MW 27, 7-9						5.10E-03							
MW 27, 7-9[1]	2.59	0.003	0.407	41	95.5	8.80E-03	0.196	0.105	0.046	0.364	0.244	0.166	0.535
SB 33, 8-10						7.10E-03							
SB 33, 8-10[2]	2.59	0.008	0.304	31	111.6	1.10E-03	0.064	0.010	0.053	0.259	0.285	0.028	0.623
SB 46, 8-10	2.59	0.112	0.279	39	105.5	5.10E-03	0.169	0.012	0.047	0.343	0.253	0.138	0.395
SB 52, 5-7	2.61	0.120	0.294	41	102.9	7.10E-03	0.200	0.001	0.046	0.368	0.245	0.170	0.413
SB 60, 6-8	2.56	0.191	0.211	40	107.4	5.00E-04	0.188	0.020	0.046	0.357	0.245	0.158	0.413
SB 64, 5-7	2.56	0.207	0.246	45	100.3	2.60E-03	0.257	0.019	0.042	0.411	0.224	0.229	0.462
SB 67, 7-8[1]	2.56	0.097	0.255	35	109.7	1.00E-02	0.119	0.019	0.050	0.302	0.266	0.086	0.581

NOTES: Va= Volumetric Air Content
Vw= Volumetric Water Content
[1]= approximate lower range
[2]= approximate upper range
(1)=saturated hydraulic conductivity performed with unleaded gasoline permeant
(2)=saturated hydraulic conductivity performed with kerosene permeant

Thickness of Capillary Fringe

Sample	Approximate Vadose Zone at Time of Drilling (below existing grade) in feet	Approximate Capillary Zone at Time of Drilling (below existing grade) in feet
MW 15, 7-9	0.0 - 7.3	7.3 - 8.7
MW 16, 7-9	0.0 - 6.5	6.5 - 7.9
MW 21, 10-12	0.0 - 9.5	9.5 - 10.9
MW 22, 8-10	0.0 - 8.6	8.6 - 10.0
MW 26, 6-8	0.0 - 6.0	6.0 - 7.4
MW 27, 7-9	0.0 - 10.3	10.3 - 11.6
SB 33, 8-10	0.0 - 8.6	8.6 - 10.0
SB 46, 8-10	0.0 - 8.6	8.6 - 10.0
SB 52, 5-7	0.0 - 4.6	4.6 - 6.0
SB 60, 6-8	0.0 - 4.6	4.6 - 6.0
SB 64, 5-7	0.0 - 4.6	4.6 - 6.0
SB 67, 7-8	0.0 - 6.6	6.6 - 8.0

HAAF - Pumphouse #6
SEEPAGE VELOCITY CALCULATION

$$V_x = \frac{Ki}{n_e}$$

(Fetter, 1994)

where:

V_x = average linear velocity or seepage velocity (cm/s)
K = hydraulic conductivity (from Shelby tube data)
i = flow gradient
n_e = effective porosity (from Building 728)

$$V_x = \frac{(1.6 \times 10^{-3} \text{ cm/s})(0.006)}{0.18}$$

$V_x = 5.35 \times 10^{-5}$ cm/s (1.7×10^{-6} ft/sec or 0.15 ft/day) (gradient 0.006)

$V_x = 2.7 \times 10^{-5}$ cm/s (8.7×10^{-7} ft/sec or 0.08 ft/day) (gradient 0.003)

Public Notice

Notification of Corrective Action Plan, Underground Storage Tank Releases, Hunter Army Airfield, Savannah, Georgia.

The United States Army Corps of Engineers and Fort Stewart Directorate of Public Works have prepared a Corrective Action Plan (CAP) - Part B report to assess the environmental impact of diesel and/or gasoline releases from underground storage tanks (USTs) located at Building 8070 (Pumphouse #6), Hunter Army Airfield. This report was submitted to the Environmental Protection Division on or about March 15, 1998. The EPD facility number for this location is 9-025090.

The Georgia rules for UST Management require notification of the public most directly affected by the plans. If you would like a copy of any of the plans, please contact:

Commander, Directorate of Public Works, 1557 Frank Cochran Dr., Fort Stewart, GA 31314-4928, Attn.: AFZP-DEV (M. Little).

A copy of each requested plan will be mailed at a nominal copying and shipping fee.

If you desire to make comments of any of the plans, or to examine the Georgia Environmental Protection Division's files, you should contact the Corrective Action Unit, at 404-362-2687. The Underground Storage Tank Management Program will accept public comments on the CAP-Part B report up to 30 days in after submittal to the Georgia Environmental Protection Division. Their mailing address is: Corrective Action Unit, Underground Storage Tank Management Program, 4244 International Parkway, Suite 100, Atlanta, GA 30354