FINAL

FIRST ANNUAL MONITORING ONLY REPORT
FOR
UNDERGROUND STORAGE TANK 100B
FACILITY ID #9-089081
BUILDING 1350
FORT STEWART, GEORGIA

Prepared for

U.S. Army Corps of Engineers – Savannah District
and
Fort Stewart Directorate of Public Works
Under Contract Numbers DACA21-95-D-0022/DACA63-97-D-0041
Delivery Orders 0061/CV01

Prepared by

Science Applications International Corporation
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830

May 2001

TABLE OF CONTENTS

List of Abbreviations and Acronyms

ACL	alternate concentration limit
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
GA EPD	Georgia Environmental Protection Division
IWQS	In-stream Water Quality Standard
PAH	polynuclear aromatic hydrocarbon
SAIC	Science Applications International Corporation
UST	underground storage tank
USTMP	Underground Storage Tank Management Program

MONITORING ONLY REPORT

Submittal Date: May 2001 Monitoring Report Number: 1st Annual

For Period Covering: January 2000 to January 2001

Facility Name: UST 100B, Building 1350 Street Address: Divarty Rd. and McFarland Ave.

Facility ID: 9-089081 City: Fort Stewart County: Liberty Zip Code: 31314

Latitude: 31° 52′ 53″ Longitude: 81° 37′ 58″

Submitted by UST Owner/Operator:		Prepared by Consultant/Contractor:	
Name:	Thomas C. Fry/Environmental Branch	Name:	Patricia A. Stoll
Company:	U.S. Army/HQ 3d, Inf. Div. (Mech)	Company:	SAIC
Address:	Directorate of Public Works, Bldg. 1137	Address:	P.O. Box 2502
	1550 Frank Cochran Drive		
City:	Fort Stewart State: GA	City:	Oak Ridge State: TN
Zip Code:	31314-4927	Zip Code:	37831

I. REGISTERED PROFESSIONAL ENGINEER OR PROFESSIONAL GEOLOGIST CERTIFICATION

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

Name: Patricia A. Stoll

Signature: P A Stoll

Date: 4/20/01

Georgia Stamp or Seal

II. PROJECT SUMMARY

(Appendix I, Figure 1: Site Location Map)

Provide a brief description or explanation of the site and a brief chronology of environmental events leading up to this report.

Underground Storage Tank (UST) 100B, Facility ID #9-089081 was located near Building 1350 at Fort Stewart, Georgia. UST 100B had a capacity of 1,000 gallons and was used for the storage of used oil. The tank was excavated and removed on July 30, 1996, and the ancillary piping was closed in place. Science Applications International Corporation (SAIC) performed a Corrective Action Plan (CAP)–Part A investigation in 1998 and 1999. Results of the 1998/1999 investigation were documented in the *Corrective Action Plan–Part A Report for Underground Storage Tank 100B, Facility ID #9-089081, Building 1350, Fort Stewart, Georgia*, which was submitted to the Georgia Environmental Protection Division (GA EPD) in October 1999 (SAIC 1999). The GA EPD Underground Storage Tank Management Program (USTMP) conducted a technical review of the CAP–Part A Report (SAIC 1999) and approved the recommendation for further investigation in correspondence dated January 25, 2000 (Logan 2000).

The CAP–Part B investigation was conducted in January 2000, and the results of that sampling effort were summarized in the *Corrective Action Plan–Part B Report for Underground Storage Tank 100B, Facility ID #9-089081, Building 1350, Fort Stewart, Georgia*, which was submitted to GA EPD in September 2000 (SAIC 2000). The CAP–Part B Report recommended annual sampling of wells 62-11, 62-12, 62-13, 62-14, 62-15, and 62-16 for benzene, toluene, ethylbenzene, and xylenes (BTEX) and polynuclear aromatic hydrocarbons (PAHs) until the concentrations of benzene, benzo(*a*)anthracene, chyrsene, naphthalene, and phenanthrene in groundwater were below the alternate concentration limits (ACLs) of 71.28 µg/L; 4.4 µg/L; 442 µg/L; 312 µg/L; and 8,760 µg/L, respectively, and the free product in well 62-11 was less than an eighth of an inch. The CAP–Part B Report was approved by GA EPD in correspondence dated February 28, 2001 (Logan 2001).

This report documents the first annual sampling event and analytical results. In accordance with the Monitoring Only Plan, ACLs calculated as part of the CAP–Part B Report have been used in the monitoring program as the monitoring endpoints. The benzene and PAH concentrations have declined during the monitoring only program and are below their respective In-stream Water Quality Standards (IWQSs) and ACLs. As a result, it was not necessary to revise the fate and transport model. Because the benzene concentrations are below the IWQS and ACL and the plume is not expanding, it is recommended that a no-further-action-required status be granted for the site.

III. ACTIVITIES AND ASSESSMENT OF EXISTING CONDITIONS

A. Potentiometric Data:

(Appendix I, Figure 2: Potentiometric Surface Map)
(Appendix II, Table 1: Groundwater Elevations)

Discuss groundwater flow at this site and implications for this project.

Free product was observed in well 62-11 during the CAP–Part B investigation, and absorbent strips were removed and replaced periodically between the CAP–Part B sampling and the first annual monitoring only event, as indicated in Table 1.

During the first annual sampling event in January 2001, groundwater elevations were measured in all of the monitoring wells to determine the groundwater flow direction. In January 2001, the groundwater flow direction was toward the southwest, and the groundwater gradient was approximately 0.0385 foot/foot. The absorbent strips in well 62-11 were removed on January 9, 2001. After removal of the absorbent strips, no measurable free product was observed in the well. New absorbent strips were installed on January 9, 2001.

On March 9, 2001, well 62-11 was overdrilled and a 2-inch polyvinyl chloride well (62-17) was installed. The well was developed and allowed equilibrate for 3.5 weeks before free product measurements were conducted. On April 3, 2001, depth to water was measured at 3.32 feet below top of casing, which was comparable to other readings, and no free product was observed.

B. **Analytical Data:**
(Appendix I, Figure 3: Groundwater Quality Map)
(Appendix II, Table 2: Groundwater Analytical Results)
(Appendix III: Laboratory Analytical Results)

Discuss groundwater analysis results, trend of contaminant concentrations, and implications for this project.

During the first annual sampling event in January 2001, monitoring wells 62-11, 62-12, 62-13, 62-14, 62-15, and 62-16 were sampled for BTEX and PAHs. BTEX and PAH compounds were present in wells 62-11, 62-12, 62-13, 62-14, and 62-15. BTEX and PAH constituents were not detected in well 62-16. In well 62-11, benzene was detected at 7.3 µg/L, toluene was detected at 38.8 µg/L, ethylbenzene was detected at 8.8 µg/L, and total xylenes were detected at 46.3 µg/L. There was insufficient volume in the well for analysis of PAHs. In well 62-12, benzene was detected at 22.1 µg/L, toluene was detected at 2.2 µg/L, ethylbenzene was detected at 7.5 µg/L, total xylenes were detected at 34.4 µg/L, acenaphthene was detected at 1.1 µg/L, fluorene was detected at 1.8 µg/L, naphthalene was detected at 35.2 µg/L, and phenanthrene was estimated at 0.57J µg/L. In well 62-13, benzene was detected at 1.5 µg/L, total xylenes were estimated at 0.43J µg/L, and naphthalene was detected at 8.8 µg/L. In well 62-14, benzene was detected at 1.0 µg/L, and naphthalene was detected at 4.6 µg/L. In well 62-15, benzene was estimated at 0.40 µg/L, ethylbenzene was estimated at 0.53J µg/L, and naphthalene was detected at 3.2 µg/L. None of the constituent concentrations exceeded the respective IWQSs or ACLs. Figure 4 shows the variations in benzene concentrations in groundwater for all the wells.

IV. **SITE RANKING** (Note: re-rank site after each monitoring event.)
(Appendix IV: Site Ranking Form)

Environmental Site Sensitivity Score: 13,350 (CAP–Part B Report)
(April 1999 version of the Site Ranking Form was used.) 850 (Jan. 2001 – First Annual Monitoring Event)
Note: The site ranking score was incorrectly reported in the CAP–Part B Report at 63,100.

V. CONCLUSIONS/RECOMMENDATIONS

Provide justification of no-further-action-required recommendation or briefly discuss future monitoring plans for this site.

Fort Stewart respectfully requests that GA EPD USTMP assign Facility ID #9-089081 a no-further-action-required status for the following reasons:

- The Monitoring Only Plan has been conducted in accordance with the requirements outlined in the CAP–Part B Report (SAIC 2000) and approved by GA EPD USTMP in correspondence February 28, 2001 (Logan 2001).

- The site score for the last round of annual groundwater sampling was 850. Of the 850 points, 600 points were a result of soil samples collected during the 1996 tank removal and 1998/1999 CAP–Part A investigation activities; therefore, 250 points were associated with the current groundwater contamination.

- The approved Monitoring Only Plan indicated that the monitoring only program would be terminated if the benzene, benzo(*a*)anthracene, chyrsene, naphthalene, and phenanthrene concentrations were below their respective ACLs and the free product was less than an eighth of an inch. The achievement of these criteria would take precedence over the site ranking score.

- The benzene and PAH concentrations in all wells were below their respective IWQSs and ACLs during the annual monitoring event in January 2001.

- There was no measurable free product in 62-11 in January 2001 or in the overdrilled well (i.e., 62-17) in April 2001.

- The closest potential receptor is a storm drain located 100 feet south of the former tank pit. The closest surface water bodies are a drainage ditch located 900 feet southwest (downgradient) of the site and Mill Creek located 2,500 feet southwest (downgradient) of the site.

- Natural attenuation has continued to take place at the site, as indicated by the low benzene concentrations.

The monitoring only program at this site will be discontinued. The wells at the site will be abandoned upon GA EPD's concurrence with the recommendation for no further action.

VI. REIMBURSEMENT

Attached _____ N/A X

(Appendix V: Reimbursement Application)

Fort Stewart is a federally owned facility and has funded the investigation for the former UST 100B site, Building 1350, Facility ID #9-089081 using U.S. Department of Defense Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

APPENDIX I

REPORT FIGURES

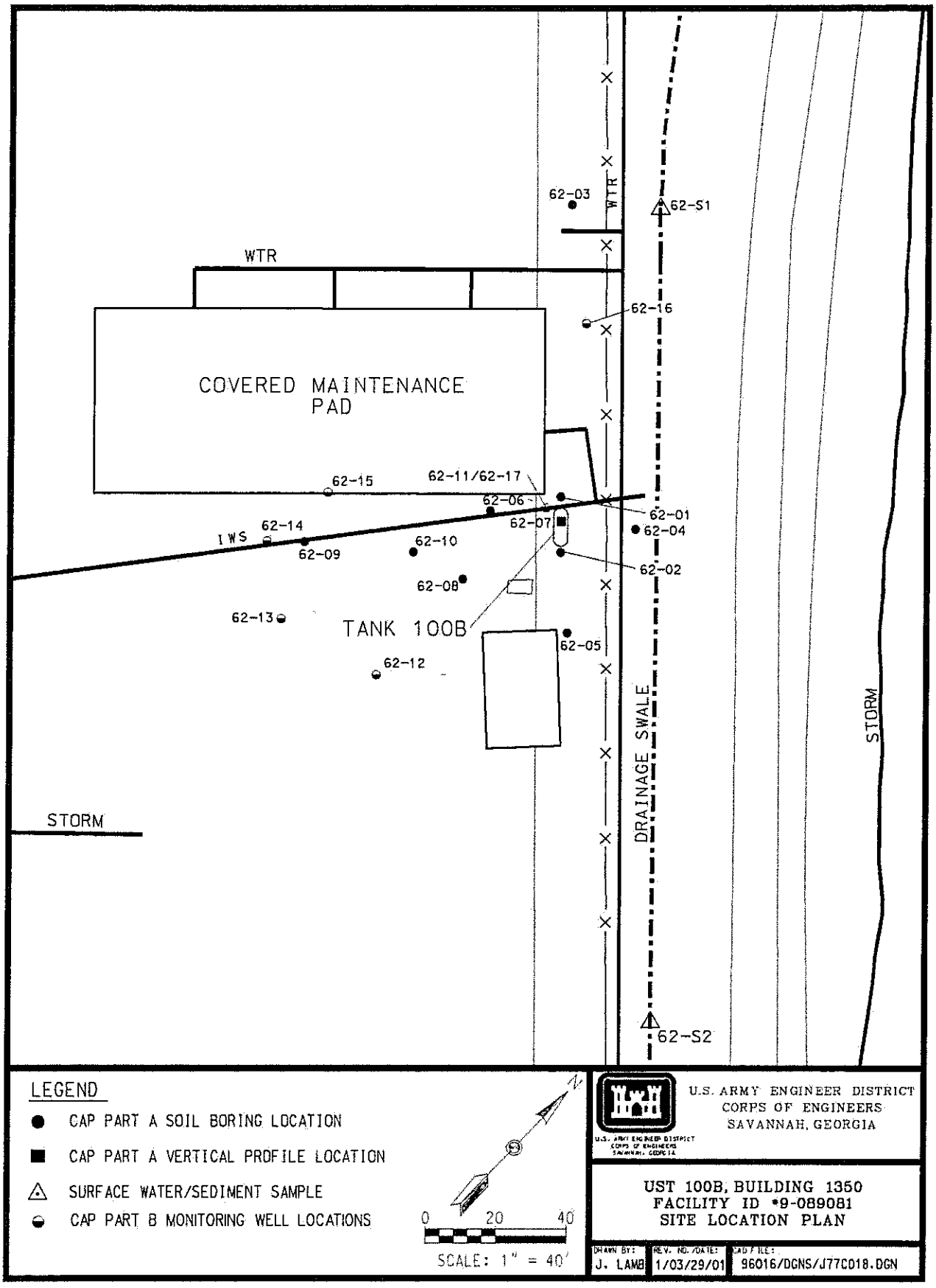

Figure 1. Location Map of UST 100B at Fort Stewart, Liberty County, Georgia

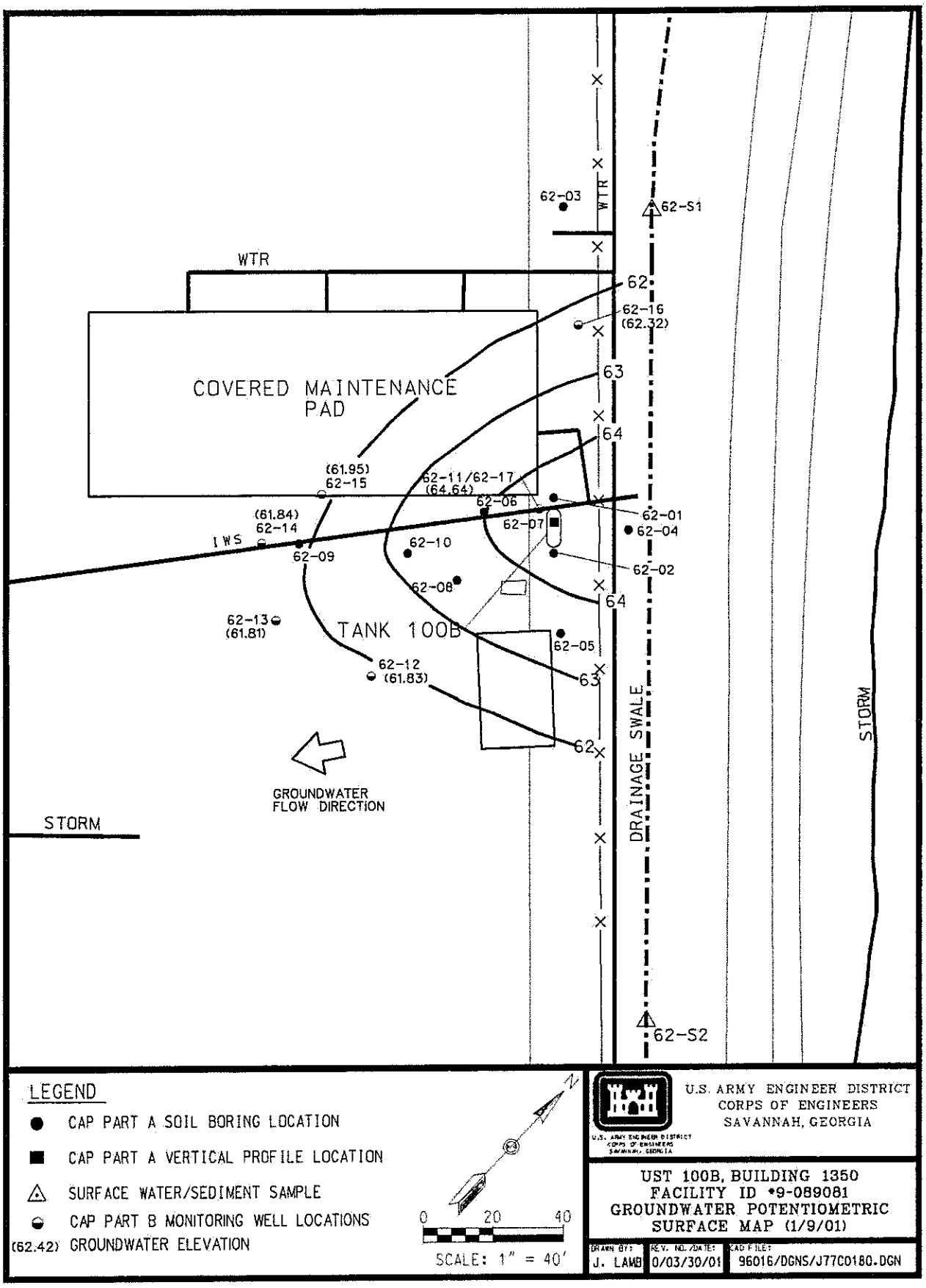

Figure 2. Potentiometric Surface Map of the UST 100B Site (January 2001)

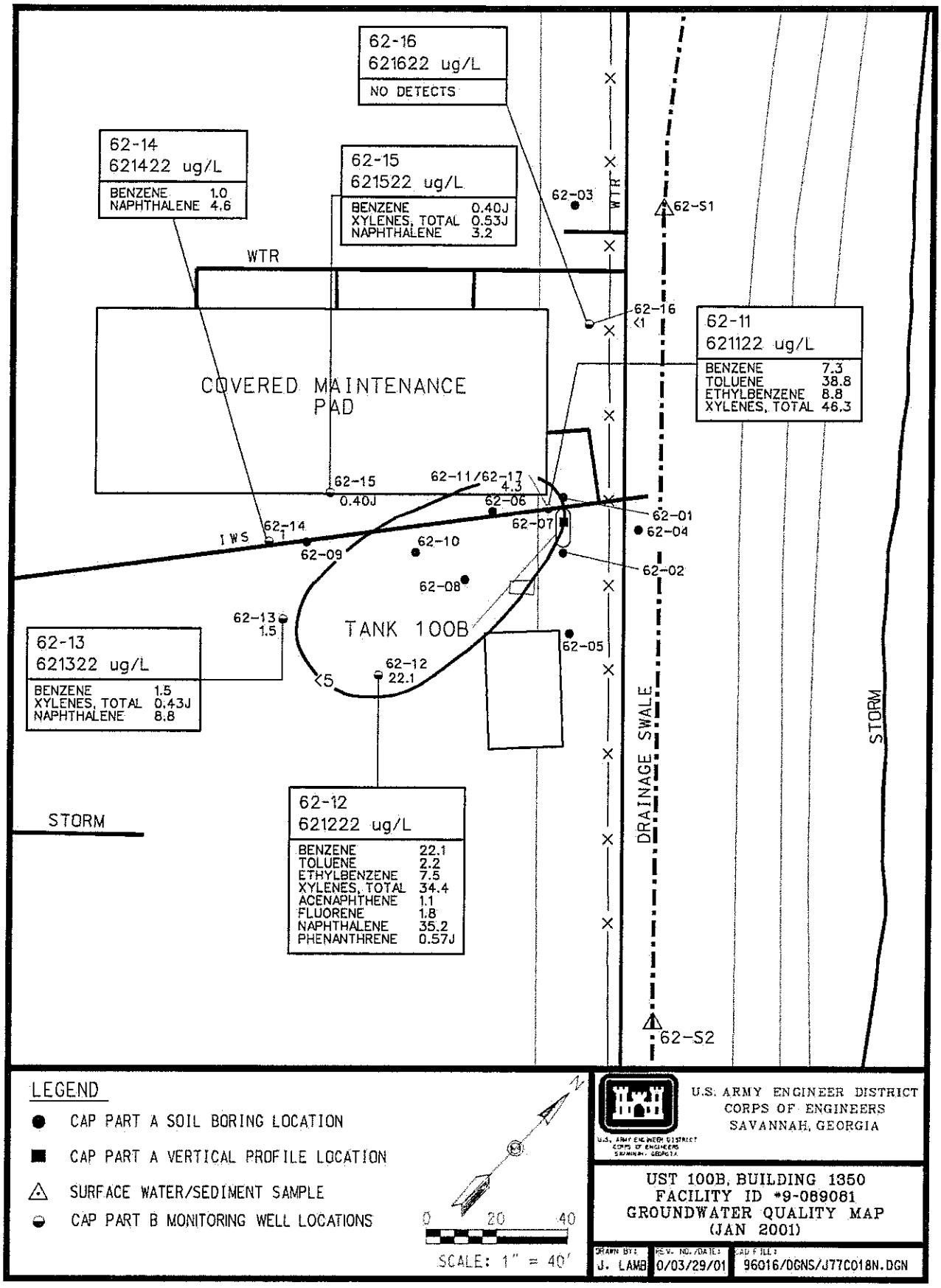

Figure 3. Groundwater Quality Map for the UST 100B Site (January 2001)

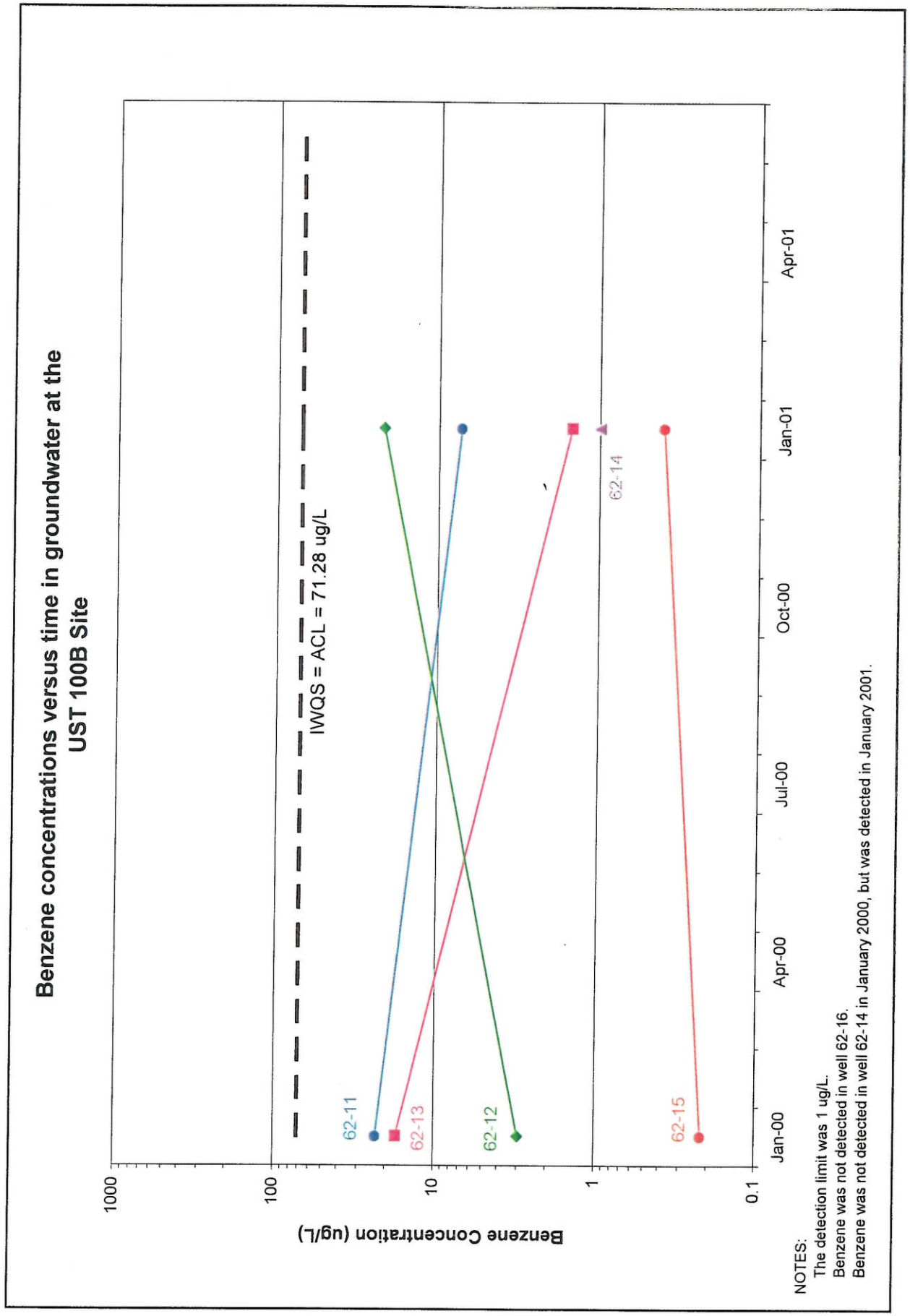

Figure 4. Trend of Benzene Concentrations at the UST 100B Site

APPENDIX II

REPORT TABLES

Table 1. Groundwater Elevations

Well Number	Date Measured	Ground Surface Elev. (feet AMSL)	Top of Casing Elev. (feet AMSL)	Depth of Screened Interval (feet BGS)	Depth of Free Product (feet BTOC)	Water Depth (feet BTOC)	Product Thickness (feet)	Corrected Groundwater Elevation (feet AMSL)
CAP–Part B Investigation – 2000								
62-11	02/21/00	68.91	68.57	2.7 – 7.7	3.85	3.88	0.03	64.69
62-12	02/21/00	68.50	68.24	2.9 – 12.9	NA	6.29	0	61.95
62-13	02/21/00	68.66	68.42	2.9 – 12.9	NA	6.47	0	61.95
62-14	02/21/00	68.86	68.52	2.9 – 12.9	NA	6.49	0	62.03
62-15	02/21/00	69.12	68.76	2.9 – 12.9	NA	6.62	0	62.14
62-16	02/21/00	—	68.33	3.2 – 13.2	NA	5.62	0	62.71
62-11[a]	04/06/00	68.91	68.57	2.7 – 7.7	sheen	4.28	sheen	64.29
62-12	04/06/00	68.50	68.24	2.9 – 12.9	NA	5.82	0	62.42
62-13	04/06/00	68.66	68.42	2.9 – 12.9	NA	6.01	0	62.41
62-14	04/06/00	68.86	68.52	2.9 – 12.9	NA	6.04	0	62.48
62-15	04/06/00	69.12	68.76	2.9 – 12.9	NA	5.98	0	62.78
62-16	04/06/00	—	68.33	3.2 – 13.2	NA	5.17	0	63.16
Absorbent Sock Replacement Between Monitoring Events								
62-11[b]	9/29/00	68.91	68.57	2.7 – 7.7	3.33	3.34	0.01	65.23
62-11[c]	12/06/00	68.91	68.57	2.7 – 7.7	3.95	4.20	0.25	64.62
First Annual Monitoring Event – January 2001								
62-11[d]	01/09/01	68.91	68.57	2.7 – 7.7	NA	3.93	0	64.64
62-12	01/09/01	68.50	68.24	2.9 – 12.9	NA	6.41	0	61.83
62-13	01/09/01	68.66	68.42	2.9 – 12.9	NA	6.61	0	61.81
62-14	01/09/01	68.86	68.52	2.9 – 12.9	NA	6.68	0	61.84
62-15	01/09/01	69.12	68.76	2.9 – 12.9	NA	6.81	0	61.95
62-16	01/09/01	—	68.33	3.2 – 13.2	NA	6.01	0	62.32
Product Removal Well Installation								
62-17[e]	04/03/01	69.03	68.66	3.0 – 8.1	NA	3.32	0	65.34

NOTES:

[a] On April 5, 2000, 0.3 foot of product was measured in well 62-11. The well was pumped dry several times, and a sheen was measured on April 6, 2000. Absorbent strips were placed in the well on May 25, 2000. The absorbent strips were removed and replaced on June 28, 2000.

[b] The absorbent strips were removed and replaced on September 29, 2000.

[c] The absorbent strips were removed and replaced on December 6, 2000.

[d] There was no measurable free product after removal of the absorbent strips on January 9, 2001. The absorbent strips were replaced again on January 9, 2000.

[e] Well 62-11 was overdrilled and well 62-17 was installed in the same location on March 9, 2001, but constructed of 2-inch PVC. Following development of well 62-17 in March 2001, the well was allowed to equilibrate for 3.5 weeks before being checked for free product. No free product was observed on April 3, 2001; therefore, absorbent socks were not installed.

AMSL Above mean sea level
BGS Below ground surface
BTOC Below top of casing
CAP Corrective Action Plan
NA Not applicable
PVC Polyvinyl chloride

Table 2a. Groundwater Analytical Results (VOCs)

Sample Location	Sample ID	Screened Interval (feet BGS)	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
CAP–Part B Investigation – 2000								
62-11	621112	2.7 – 7.7	01/17/00	23.1 =	110 =	27.7 =	133 =	293.8
62-12	621212	2.9 – 12.9	01/17/00	3 =	0.28 J	2.2 =	9.1 =	14.58
62-13	621312	2.9 – 12.9	01/17/00	17.2 =	0.58 J	8.3 =	27.9 =	53.98
62-14	621412	2.9 – 12.9	01/17/00	1 U	1 U	2.2 =	5.4 =	7.60
62-15	621512	2.9 – 12.9	01/17/00	0.22 J	0.32 J	2.3 =	9.1 =	11.94
62-16	621612	3.2 – 13.2	01/17/00	1 U	1 U	1 U	3 U	ND
First Annual Monitoring Event – January 2001								
62-11	621122	2.7 – 7.7	01/09/01	7.3 =	38.8 =	8.8 =	46.3 =	101.2
62-12	621222	2.9 – 12.9	01/09/01	22.1 =	2.2 =	7.5 =	34.4 =	66.2
62-13	621322	2.9 – 12.9	01/09/01	1.5 =	1 U	1 U	0.43 J	1.93
62-14	621422	2.9 – 12.9	01/09/01	1.0 =	1 U	1 U	3 U	1.0
62-15	621522	2.9 – 12.9	01/09/01	0.40 J	1 U	0.53 J	3 U	0.93
62-16	621622	3.2 – 13.2	01/08/01	1 U	1 U	1 U	3 U	ND
In-stream Water Quality Standards (GA EPD Chapter 391-3-6)				71.28	200,000	28,718	NRC	NRC
Alternate Concentration Limits				71.28	—	—	—	—

NOTES:

Bold values exceed IWQSs.
Italic values exceed ACLs.

ACL	Alternate concentration limit
BGS	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
GA EPD	Georgia Environmental Protection Division
IWQS	In-stream Water Quality Standard
ND	Not detected
NRC	No regulatory criteria
VOC	Volatile organic compound

Laboratory Qualifiers

U	Indicates that the compound was not detected above the reported sample quantitation limit.
UJ	Indicates that the compound was not detected above an approximated sample quantitation limit.
J	Indicates that the value for the compound is an estimated value.
=	Indicates that the compound was detected at the concentration reported.

Table 2b. Groundwater Analytical Results (PAHs)

Sample Location	Sample ID	Screened Interval (feet BGS)	Date Sampled	Detected PAH Compounds (µg/L)									Total PAHs (µg/L)
				Acenaphthene	Anthracene	Benzo(a)anthracene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	
CAP–Part B Investigation – 2000													
62-11	621112	2.7 – 2.7	01/17/00	24.2 =	22.3 =	*19.8* =	**12.5 J**	94.6 =	21.5 =	47.9 =	117 =	67.2 =	414.5
62-12	621212	2.9 – 12.9	01/17/00							15.1 =			15.1
62-13	621312	2.9 – 12.9	01/17/00						1.2 J	32.6 =			32.6
62-14	621412	2.9 – 12.9	01/17/00										ND
62-15	621512	2.9 – 12.9	01/17/00							3.2 =			3.2
62-16	621612	3.2 – 13.2	01/17/00										ND
First Annual Monitoring Event – January 2001													
62-11	621112	2.7 – 2.7	01/09/01										IS
62-12	621212	2.9 – 12.9	01/09/01	1.1 =					1.8 =	35.2 =	0.57 J		38.67
62-13	621312	2.9 – 12.9	01/09/01							8.8 =			8.8
62-14	621412	2.9 – 12.9	01/09/01							4.6 =			4.6
62-15	621512	2.9 – 12.9	01/09/01							3.2 =			3.2
62-16	621612	3.2 – 13.2	01/08/01										ND
In-stream Water Quality Standards (GA EPD Chapter 391-3-6)				NRC	110,000	0.0311	0.0311	370	14,000	NRC	NRC	11,000	NRC
Alternate Concentration Limits				—	—	4.4	442	—	—	312	8,760	—	—

NOTES:

Bold values exceed IWQSs.
Italic values exceed ACLs.

BGS Below ground surface
CAP Corrective Action Plan
GA EPD Georgia Environmental Protection Division
IS Insufficient sample volume for analysis
IWQS In-stream Water Quality Standard
ND Not detected
NRC No regulatory criteria
PAH Polynuclear aromatic hydrocarbon

Laboratory Qualifiers

U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
= Indicates that the compound was detected at the concentration reported.

Table 3. Well Construction Details

Well Number	Date Installed	Boring Depth (feet BGS)	Screened Interval (feet BGS)	Type of Completion	Coordinates (NAD83)		Elevation (NAVD 88)	
					Northing	Easting	Ground Surface	Top of Casing
Additional Free Product Removal Activities – March 2001								
62-17	3/9/01	8.4	3.0 – 8.1	2-inch PVC	684650.2	821857.3	69.7	68.66

NOTES:
BGS Below ground surface
PVC Polyvinyl chloride

APPENDIX III

LABORATORY ANALYTICAL RESULTS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621122

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246007

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8S311

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: not dec. _____ Date Analyzed: 01/17/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	7.3		=
108-88-3	Toluene	38.8		= FD4, FD8
100-41-4	Ethylbenzene	8.8		=
1330-20-7	Xylenes (total)	46.3		=

DATE Validated COPY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621222

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8S224

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: not dec. _____ Date Analyzed: 01/16/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	22.1		U
108-88-3	Toluene	2.2		U F07, F07
100-41-4	Ethylbenzene	7.5		U
1330-20-7	Xylenes (total)	34.4		U

DATA VALIDATION

FORM I VOA OLM03.0

33

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621222

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246001

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 7D119

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: ______ decanted: (Y/N) ___ Date Extracted: 01/12/01

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 01/16/01

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
91-20-3	Naphthalene	35.2		=
91-58-7	2-Chloronaphthalene	1.0	U	u
208-96-8	Acenaphthylene	1.0	U	u
83-32-9	Acenaphthene	1.1		=
86-73-7	Fluorene	1.8		=
85-01-8	Phenanthrene	0.57	J	J
120-12-7	Anthracene	1.0	U	u
206-44-0	Fluoranthene	1.0	U	
129-00-0	Pyrene	1.0	U	
56-55-3	Benzo(a)anthracene	1.0	U	
218-01-9	Chrysene	1.0	U	
205-99-2	Benzo(b)fluoranthene	1.0	U	
207-08-9	Benzo(k)fluoranthene	1.0	U	
50-32-8	Benzo(a)pyrene	1.0	U	
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U	
53-70-3	Dibenz(a,h)anthracene	1.0	U	
191-24-2	Benzo(g,h,i)perylene	1.0	U	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621322

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8S223

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: not dec. _____ Date Analyzed: 01/16/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	1.5	
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (total)	0.43	J

FORM I VOA OLM03.0

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621322

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 7D120

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted:01/12/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/16/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	8.8	
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621422

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8S222

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: not dec. _____ Date Analyzed: 01/16/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	1.0	
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (total)	3.0	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621422

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246003

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 7D121

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted:01/12/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/16/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	4.6	
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621522

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246004

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8S517

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: not dec. _____ Date Analyzed: 01/19/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	0.40	J	J J J J
108-88-3	Toluene	1.0	U	
100-41-4	Ethylbenzene	0.53	J	
1330-20-7	Xylenes (total)	3.0	U	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621522

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246004

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 7D122

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted:01/12/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/16/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	3.2	
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621622

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246005

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8S221

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: not dec. _____ Date Analyzed: 01/16/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (total)	3.0	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621622

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246005

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 7D123

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted:01/12/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/16/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.0	U
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621624

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246006

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8S220

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: not dec. _____ Date Analyzed: 01/16/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (total)	3.0	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

621624

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 36246

Matrix: (soil/water) WATER Lab Sample ID: 36246006

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 7D124

Level: (low/med) LOW Date Received: 01/10/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted:01/12/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/16/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.0	U
91-58-7	2-Chloronaphthalene	1.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
86-73-7	Fluorene	1.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
218-01-9	Chrysene	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenz(a,h)anthracene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U

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

CHAIN OF CUSTODY RECORD

COC NO.: GL7, 122

PROJECT NAME: Fort Stewart CAP B LTM

PROJECT NUMBER: 01-1624-04-2725-200

PROJECT MANAGER: Patty Stoll

Sampler (Signature) Laura Lumley (Printed Name) Laura Lumley

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
621222	1/9/01	1438	water	2	2			4		362446001
621322	1/9/01	1410		2	2			4		002
621422	1/9/01	1345		2	2			4		003
621522	1/9/01	1320		2	2			4		004
621622	1/8/01	1720		2	2			4		005
621624	1/8/01	1720		2	2			4		006
621122	1/9/01	1515		2				2		007
TB5515	1/9/01	1200		2				2		008

1/10/01

III-15

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (843) 556-8171

TOTAL NUMBER OF CONTAINERS: 28

Cooler ID: #18, 3°C

Cooler Temperature:

FEDEX NUMBER:

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	1/10/01	M. Eilh	
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Patricia Dowe	Date/Time 1/10/01	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	15:00	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

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APPENDIX IV

SITE RANKING FORM

SITE RANKING FORM

Facility Name: UST 100B, Building 1350 **Ranked by:** S. Stoller

County: Liberty **Facility ID #:** 9-089081 **Date Ranked:** 3/29/01

SOIL CONTAMINATION

A. Total PAHs –
Maximum Concentration found on the site
(Assume <0.660 mg/kg if only gasoline was stored on site)

☐	≤0.660 mg/kg	=	0
☐	>0.66 - 1 mg/kg	=	10
☐	>1 - 10 mg/kg	=	25
* ☒	>10 mg/kg	=	50

* *Closure sample TK100B-S1 (1996)*

B. Total Benzene -
Maximum Concentration found on the site

☐	≤0.005 mg/kg	=	0
☐	>0.005 - .05 mg/kg	=	1
* ☒	>0.05 - 1 mg/kg	=	10
☐	>1 - 10 mg/kg	=	25
☐	>10 - 50 mg/kg	=	40
☐	>50 mg/kg	=	50

* *CAP-Part A soil sample 620811 (1999)*

C. Depth to Groundwater
(bls = below land surface)

☐	>50' bls	=	1
☐	>25' - 50' bls	=	2
☐	>10' - 25' bls	=	5
☒	≤10' bls	=	10

Fill in the blanks: **(A. 50) + (B. 10) = (60) x (C. 10) = (D. 600)**

GROUNDWATER CONTAMINATION

E. Free Product (Nonaqueous-phase liquid hydrocarbons; See Guidelines For definition of "sheen").

☒	No free product	=	0
☐	Sheen - 1/8"	=	250
☐	>1/8" - 6"	=	500
☐	>6" - 1ft.	=	1,000
☐	For every additional inch, add another 100 points = 1,000 +		

F. Dissolved Benzene -
Maximum Concentration at the site
(One well must be located at the source of the release.)

☐	≤5 µg/L	= 0
* ☒	>5 - 100 µg/L	= 5
☐	>100 - 1,000 µg/L	= 50
☐	>1,000 - 10,000 µg/L	= 500
☐	>10,000 µg/L	= 1500

* *LTM Sample 621222 (January 2001)*

Fill in the blanks: **(E. 0) + (F. 5) = (G. 5)**

Facility Name: UST 100B, Building 1350 **County:** Liberty **Facility ID #:** 9-089081

POTENTIAL RECEPTORS (MUST BE FIELD-VERIFIED)

Distance from nearest contaminant plume boundary to the nearest downgradient and hydraulically connected Point of Withdrawal for water supply. **If the point of withdrawal is not hydraulically connected, evidence as outlined in the CAP-A guidance document MUST be presented to substantiate this claim.**

H. Public Water Supply

☐	Impacted	= 2000
☐	≤500'	= 500
☐	>500' - ¼ mi	= 25
☐	¼ mi - 1 mi	= 10
☐	>1 mi - 2 mi	= 2
* ☒	> 2 mi	= 0

For lower susceptibility areas only:

☐	>1 mi	= 0

I. Non-Public Water Supply

☐	Impacted	= 1000
☐	≤100'	= 500
☐	>100' - 500'	= 25
☐	>500' - ¼ mi	= 5
☐	>¼ - ½ mi	= 2
☒	>½ mi	= 0

For lower susceptibility areas only:

☐	>¼ mi	= 0

Note: If site is in lower susceptibility area, do not use the shaded areas.

* For justification that withdrawal point is not hydraulically connected, see attached text.

J. Distance from nearest Contaminant Plume boundary to downgradient Surface Waters **OR UTILITY TRENCHES & VAULTS** (a utility trench may be omitted from ranking if its invert elevation is more than 5 feet above the water table)

☐	Impacted	= 500
* ☒	≤500'	= 50
☐	>500' - 1,000'	= 5
☐	>1,000'	= 2

K. Distance from any Free Product to basements and crawl spaces

☐	Impacted	= 500
☐	<500'	= 50
☐	>500' - 1,000'	= 5
☒	>1,000' or no free product.	= 0

* *Industrial wastewater line is located at or below the water table, benzene concentrations less than IWQS.*

Fill in the blanks: (H. 0) + (I. 0) + (J. 50) + (K. 0) = L. 50

(G. 5) x (L. 50) = M. 250

(M. 250) + (D. 600) = N. 850

P. **SUSCEPTIBILITY AREA MULTIPLIER**

☐ If site is located in a Low Ground-Water Pollution Susceptibility Area = 0.5

☒ All other sites = 1

Q. **EXPLOSION HAZARD**

Have any explosive petroleum vapors, possibly originating from this release, been detected in any subsurface structure (e.g., utility trenches, basements, vaults, crawl spaces, etc.)?

☐ Yes = 200,000

☒ No = 0

Fill in the blanks: (N. 850) x (P. 1) = (850) + (Q. 0)

= 850 (January 2001 - First Annual Monitoring Event)
ENVIRONMENTAL SENSITIVITY SCORE

ADDITIONAL GEOLOGIC AND HYDROGEOLOGIC DATA

The following information is presented to provide supplemental information to Item H of the Site Ranking Form and details relating to the geologic and hydrogeologic conditions at Fort Stewart that support Fort Stewart's determination that the water withdrawal points located at Fort Stewart are not hydraulically connected to the surficial aquifer.

1.0 REGIONAL AND LOCAL GEOLOGY

Fort Stewart is located within the coastal plain physiographic province. This province is typified by nine southeastward-dipping strata that increase in thickness from 0 feet at the fall line, located approximately 150 miles inland from the Atlantic coast, to approximately 4,200 feet at the coast. State geologic records describe a probable petroleum exploration well (the No. 1 Jelks-Rogers) located in the region as encountering crystalline basement rocks at a depth of 4,254 feet below ground surface (BGS). This well provides the most complete record for Cretaceous, Tertiary, and Quaternary sedimentary strata in the region.

The Cretaceous section was found to be approximately 1,970 feet thick and dominated by clastics. The Tertiary section was found to be approximately 2,170 feet thick and dominated by limestone, with a 175-foot-thick cap of dark green phosphatic clay. This clay is regionally extensive and is known as the Hawthorn Group. The interval from approximately 110 feet to the surface is Quaternary in age and composed primarily of sand with interbeds of clay or silt. This section is undifferentiated into separate formations (Herrick and Vochis 1963).

State geologic records contain information regarding a well drilled in October 1942, 1.8 miles north of Flemington at Liberty Field of Camp Stewart (now known as Fort Stewart). This well is believed to be an artesian well located approximately one-quarter mile north of the runway at Wright Army Airfield within the Fort Stewart Military Reservation. The log for this well describes a 410-foot section, the lowermost 110 feet of which consisted predominantly of limestone sediments, above which 245 feet of dark green phosphatic clay typical of the Hawthorn Group were encountered. The uppermost portion of the section was found to be Quaternary-age interbedded sands and clays. The top 15 feet of these sediments were described as sandy clay (Herrick and Vochis 1963).

The surface soil located throughout the Fort Stewart garrison area consists of Stilson loamy sand. The surface layer of this soil is typically dark grayish-brown loamy sand measuring approximately 6 inches in depth. The surface layer is underlain by material consisting of pale yellow loamy sand and extends to a depth of approximately 29 inches. The subsoil is predominantly sandy clay loam and extends to a depth of 72 inches or more (Herrick and Vochis 1963).

2.0 REGIONAL AND LOCAL HYDROGEOLOGY

The hydrogeology in the vicinity of Fort Stewart is dominated by two aquifers referred to as the Principal Artesian and the surficial aquifers. The Principal Artesian Aquifer is the lowermost hydrologic unit and is regionally extensive from South Carolina through Georgia, Alabama, and most of Florida. Known elsewhere as the Floridan, this aquifer is composed primarily of Tertiary-age limestone, including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. These formations are approximately 800 feet thick, and groundwater from this aquifer is used primarily for drinking water (Arora 1984).

The uppermost hydrologic unit is the surficial aquifer, which consists of widely varying amounts of sand and clay ranging from 55 feet to 150 feet in thickness. This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 feet to 10 feet BGS (Geraghty and Miller 1993). The base of the aquifer corresponds to the top of the underlying dense clay of the Hawthorn Group. The Hawthorn Group was not encountered during drilling at this site but is believed to be located at 40 feet to 50 feet BGS; thus, the effective aquifer thickness would be approximately 35 feet to 45 feet. Soil surveys for Liberty and Long counties describe the occurrence of a perched water table within the Stilson loamy sands present within Fort Stewart (Looper 1980).

The confining layer for the Principal Artesian Aquifer is the phosphatic clay of the Hawthorn Group and ranges in thickness from 15 feet to 90 feet. The vertical hydraulic conductivity of this confining unit is on the order of 10^{-8} cm/sec. There are minor occurrences of aquifer material within the Hawthorn Group; however, they have limited utilization (Miller 1990). The Hawthorn Group has been divided into three formations: Coosawhatchie Formation, Markshead Formation, and Parachula Formation, which are listed from youngest to oldest.

The Coosawhatchie Formation is composed predominantly of clay but also has sandy clay, argillaceous sand, and phosphorite units. The formation is approximately 170 feet thick in the Savannah, Georgia, area. This unit disconformably overlies the Markshead Formation and is distinguished from the underlying unit by dark phosphatic clays or phosphorite in the lower part and fine-grained sand in the upper part.

The Markshead Formation is approximately 70 feet thick in the Savannah, Georgia, area and consists of light-colored phosphatic, slightly dolomitic, argillaceous sand to fine-grained sandy clay with scattered beds of dolostone and limestone.

The Parachula Formation consists of sand, clay, limestone, and dolomite and is approximately 10 feet thick in the Savannah, Georgia, area. The Parachula Formation generally overlies the Suwannee Limestone in Georgia.

Groundwater encountered at all the underground storage tank (UST) investigation sites is part of the surficial aquifer system. Based on the fact that all public and nonpublic water supply wells draw water from the Principal Artesian (Floridan) Aquifer and that the Hawthorn confining unit separates the Principal Artesian Aquifer from the surficial aquifer, it is concluded that there is no hydraulic interconnection between the surficial aquifer (and associated groundwater plumes, if applicable) located beneath former UST sites and identified water supply withdrawal points at Fort Stewart.

3.0 REFERENCES

Arora, Ram, 1984. *Hydrologic Evaluation for Underground Injection Control in the Coastal Plain of Georgia,* Department of Natural Resources, Environmental Protection Division, Georgia Geological Survey.

Geraghty and Miller 1993. *RCRA Facility Investigation Work Plan, Fort Stewart, Georgia.*

Herrick, S.M., and R.C. Vochis 1963. *Subsurface Geology of the Georgia Coastal Plain*, Georgia Geologic Survey Information Circular 25.

Looper, Edward E., 1980. *Soil Survey of Liberty and Long Counties, Georgia*, U.S. Department of Agriculture, Soil Conservation Service.

Miller, James A., 1990. *Groundwater Atlas of the United States*, U.S. Department of the Interior, U.S. Geological Survey, Hydrologic Inventory Atlas 730G.

APPENDIX V

REIMBURSEMENT APPLICATION

Fort Stewart is a federally owned facility and has funded the investigation for the former UST 100B site, Building 1350, Facility ID #9-089081 using U.S. Department of Defense Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

ATTACHMENT A

REFERENCES

REFERENCES

Logan, William, 2000. Letter to Ovidio Perez (Fort Stewart Directorate of Public Works, Environmental Branch), January 25.

Logan, William, 2001. Letter to Colonel Gregory V. Stanley (Fort Stewart Directorate of Public Works, Environmental Branch), February 28.

SAIC (Science Applications International Corporation) 1999. *Corrective Action Plan – Part A Report for Underground Storage Tank 100B, Facility ID# 9-089081, Building 1350, Fort Stewart, Georgia,* October.

SAIC 2000. *Corrective Action Plan – Part B Report for Underground Storage Tank 100B, Facility ID# 9-089081, Building 1350, Fort Stewart, Georgia,* September.

ATTACHMENT B

BORING LOG AND WELL CONSTRUCTION DIAGRAM

HTRW DRILLING LOG

HOLE NUMBER 62-17

PROJECT:

INSPECTOR T. Coffey

SHEET 1 OF 1

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0–5	Silty CLAY, slightly plastic weak, moist, mottled, red (10R4/8) to weak red (10R4/3).	0.3ppm 16.9ppm			
	5–6	Silty CLAY, non plastic to slightly plastic, massive, moist to wet, pale red.	65.9ppm			▽ WET BELOW 6.0 FT
	6–8	Silty SAND, fine to medium grained, soft, massive, wet, dark gray (N4)				Strong petroleum odor
	8	Refusal at 8.4 ft. bgs				

PROJECT:

MONITORING WELL
DELIVERY ORDER NO:

WELL NUMBER: 62-17

BEGIN: 3/9/01

END: 3/9/01

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS: