FINAL

CORRECTIVE ACTION PLAN - PART A REPORT
FOR
UNDERGROUND STORAGE TANK 38
FACILITY ID #9-089109
BUILDING 1510
FORT STEWART, GEORGIA

Prepared for:

U.S. Army Corps of Engineers - Savannah District
and
Fort Stewart Directorate of Public Works
Under Contract Number DACA21-95-D-0022
Delivery Order 0024

Prepared by:

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

August 1999

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Attachments

List of Abbreviations and Acronyms

ACE	Anderson Columbia Environmental, Inc.
ACL	alternate concentration limits
AMSL	above mean sea level
ARAR	applicable, relevant, and appropriate requirement
ASTM	American Society for Testing and Materials
ATL	alternate threshold level
BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
BTOC	below top of casing
CAP	Corrective Action Plan
COCs	chemicals of concern
DAF	dilution-attenuation factor
DPW	Directorate of Public Works
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency

GA EPD	Georgia Environmental Protection Division
GRO	gasoline-range organics
HQ	hazard quotient
ID	inside diameter
IDW	investigation-derived waste
MCL	maximum contaminant level
MSL	mean sea level
ND	not detected
NRC	no regulatory criteria
OVA	organic vapor analyzer
OVM	organic vapor meter
PAH	polynuclear aromatic hydrocarbon
PVC	polyvinyl chloride
SAIC	Science Applications International Corporation
TPH	total petroleum hydrocarbon
USACE	U.S. Army Corps of Engineers
UST	underground storage tank
USTMP	Underground Storage Tank Management Program

CORRECTIVE ACTION PLAN PART A

Facility Name: UST 38, Building 1510 Street Address: West 8th Street

Facility ID: 9-089109 City: Fort Stewart County: Liberty Zip Code: 31314

Latitude: 32° 16′ 04″ Longitude: 82° 05′ 34″

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: DPW ENRD ENV. Br. (Fry)	Address: P.O. Box 2502
1557 Frank Cochran Drive	
City: Fort Stewart State: GA	City: Oak Ridge State: TN
Zip Code: 31314-4928	Zip Code: 37831
Telephone: (912) 767-2010	Telephone: (423) 481-8792

I. PLAN CERTIFICATION:

A. UST Owner/Operator Certification

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

Name: Thomas C. Fry

Signature: Thomas C. Fry Date: 09/07/99

B. Registered Professional Engineer or Professional Geologist Certification

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

Name: Patricia A. Stoll

Signature: Patricia A. Stoll

Date: 8/19/99

GEORGIA REGISTERED 22851 PROFESSIONAL ENGINEER A. STOLL

8/19/99

Georgia Stamp or Seal

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

II. INITIAL RESPONSE REPORT

A. Initial Abatement

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

Actions were not required to abate imminent hazards and/or emergency conditions at the UST 38 site. Therefore, contaminant migration and release prevention, fire and vapor migration, or emergency free product removal was not performed prior to, or during, the removal of UST 38.

B. Free Product Removal

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

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

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

C. Tank History

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

CURRENT UST SYSTEMS (if applicable)

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

FORMER UST SYSTEMS (if applicable)

Tank ID Number	Capacity (gal)	Substance Stored	Date Removed
38	1,000	used oil	8/9/96

D. Initial Site Characterization

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

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

   Anderson Columbia Environmental, Inc. (ACE) initiated characterization of petroleum-related contamination at the site during UST system closure activities on August 9, 1996. After removal of the tank, one groundwater sample was collected from the tank pit (Figure 7). Benzene was detected in sample TK38-GW at a concentration of 20 µg/L. Ethylbenzene and xylenes were also detected in the groundwater sample, but not at concentrations above their respective MCLs. No soil samples were collected during the tank removal activities.

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

   A detailed schematic diagram illustrating the former UST 38 and ancillary piping as configured during operation is presented in Figure 2. During removal activities by ACE, no holes in the tank were reported. Therefore, the source of contamination is believed to have been piping leakage and/or tank overflow.

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

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

b. *Water Supplies within applicable radii?* YES X NO ____
If yes,

i. *Nearest public water supply located within:*	3100	*feet*
ii. *Nearest down-gradient public water supply located within:*	5200	*feet*
iii. *Nearest non-public water supply located within:*	>10,560	*feet*
iv. *Nearest down-gradient non-public water supply located within:*	>10,560	*feet*

c. *Surface Water Bodies and sewers:*

i. *Nearest surface water located within*	1200	*feet*
ii. *Nearest down-gradient surface water located within*	2500	*feet*
iii. *Nearest storm or sanitary sewer located within:*	35	*feet*
iv. *Depth to bottom of sewer at a point nearest the plume*	3.0	*feet*

4. Impacted Environmental Media

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

Provide a brief discussion of soil sampling.
Continuous soil cores were collected at 1.5- or 2.0-foot intervals during the installation of seven boreholes. Field headspace gas analyses were performed on each sample to determine the organic vapor concentration. Two soil samples were selected from each borehole for laboratory chemical analysis of BTEX, TPH, and PAH. In boreholes where organic vapors were detected, one sample was collected from the sample interval where the highest vapor concentration was recorded, and the other from the deepest sample interval with the lowest concentration. If organic vapors were not detected, one sample was collected from the sample interval nearest the midpoint of the boring, and the other from the sample interval located immediately above the water table. Refer to Attachment A for complete documentation of the technical approach implemented during this investigation.

i. *Soil contamination above applicable threshold levels?*

YES _____ NO X

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

ii. *ATLs calculated?* YES _____ NO X

If yes, present ATLs.

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

YES _____ NO _____ N/A X

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

Provide a brief discussion of groundwater sampling.

At each borehole location, except the vertical profile boring, one groundwater sample was collected from the temporary piezometer screened from ground surface to approximately 5.0 feet below the water table. At the vertical profile locations (80-05 and 80-09), groundwater samples were collected every 5 feet below the water table until several groundwater sample intervals indicated a headspace gas measurement of zero. Chemical parameters for groundwater samples submitted for laboratory analysis included BTEX and PAH. Refer to Attachment A for complete documentation of the technical approach used to collect groundwater samples.

i. *Groundwater contamination above MCLs?* YES X NO _____

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

YES X NO _____

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

In June 1998, benzene was present in borings 80-03 and 80-04 at concentrations of 34.4 µg/L and 25.8 µg/L, respectively. Both of these borings were located outside the former tank pit on the southeast and southwest sides. In addition, several sample intervals of the vertical profile boring (80-05) contained benzene concentrations in excess of the MCL, including the deepest sample at 26.0 – 30.0 feet BGS. The highest benzene concentration in boring 80-05 was 229 µg/L at the 6.0 – 10.0 feet BGS interval.

In November 1998 and February 1999, the investigation was extended to include additional sampling in an effort to determine extent and also to install an additional vertical profile boring. Benzene was not present in the four additional borings that were installed around the perimeter of contamination. Minor concentrations of toluene, ethylbenzene, and xylenes were present in two of the borings. Refer to Attachment C for supplemental information on risk screening and fate and transport modeling.

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

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

5. Other Geologic/Hydrogeologic Data

a. *Depth to Groundwater (ft BTOC):* 7.04 – 10.44 *(Table 4: Groundwater Elevations)*
b. *Groundwater Flow Direction:* west *(Figure 6: Potentiometric Surface Map)*
c. *Hydraulic Gradient* 0.0046 ft/ft
d. *Geophysical Province:* coastal plain
e. *Unique geologic/hydrological conditions:* The Hawthorn Formation acts as a confining unit between the surficial and Floridan aquifers.

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

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

ACE removed UST 38 on August 9, 1996. The UST piping was drained into the tank, and all used oil was subsequently removed using a vacuum truck and/or compressor-driven barrel vacuum device. A backhoe was used to excavate down to the tank top. All lines were capped except the fill and vent. After the tank atmosphere was tested with a combustible gas indicator, all accessible tank openings were capped and the tanks were lifted from the excavation pit. The ancillary piping was closed in-place due to the fact that it was covered with 12 inches of high strength concrete. In-place closure consisted of purging the line and grouting the end at the tank and the end at the grease rack.

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

Check one: *No UST removal performed* _____

Returned to UST excavation _____

Excavated soils treated or disposal off site X

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

All contaminated soil removed during the entire project (i.e., all USTs removed under contract with ACE, to include clean and nonclean closures) was tested in accordance with the disposal facility requirements and transported to Kedesh, Inc., Highway 84, Ludowici, GA 31316. The Closure Report was not submitted to GA EPD because review of the closure analytical data indicated that a CAP-Part A would be required (i.e., per requirements of GUST-9, Item 15, page 12, dated August 1995). However, all pertinent information (i.e., copies of analytical data, manifests, and maps) are provided in this CAP-Part A Report. Disposal manifests for the UST 38 site were submitted to GA EPD USTMP in September 1998 with the UST 207A (Facility ID#9-089039) Closure Report response to comments correspondence (Perez 1998). Approximately 20.56 tons of contaminated soil was excavated from the site.

7. Site Ranking:

Environmental Site Sensitivity Score: 2500

(Appendix X: Site Ranking Form)

8. Conclusions and Recommendations

Complete applicable section below, one section only

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

(provide justification)

b. Monitoring Only (if applicable) N/A _____

(provide justification)

There is no soil contamination in excess of applicable GUST soil threshold levels (i.e., Table A Column 2). Benzene was detected in six groundwater samples from three temporary wells with the highest concentration being 229 µg/L. Fate and transport modeling results indicate that benzene concentrations in excess of the 5 µg/L MCL may extend up to 23 feet from the former tank pit. These results have been confirmed by CAP-Part A sampling results. In addition, benzene will not reach the drainage ditch located 800 feet west of the site at detectable concentrations. The horizontal and vertical extent of contamination was determined during the CAP-Part A.

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

(provide justification)

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

A. Monitoring points

Four shallow monitoring wells will be installed as part of the long-term monitoring as shown in Figure 8. The shallow wells will be screened across the water table with 3 to 5 feet of screen above the water table in order to detect the presence of free product. All monitoring wells will be completed flush with the ground surface. Boring logs and well construction diagrams will be provided in the first annual monitoring only report.

B. Period/Frequency of monitoring and reporting

Groundwater monitoring will be completed on a semiannual basis and the results will be summarized in an annual monitoring only report submitted to GA EPD. Monitoring will continue for a period of up to two years, for a total of up to four sampling events.

C. Monitoring Parameters

One groundwater sample will be collected from each of the four monitoring wells and analyzed for BTEX. No PAH compounds were detected in groundwater during the CAP-Part A investigation, thus PAH analysis will not be performed during the semiannual monitoring.

D. Milestone Schedule

Monitoring well installation will be conducted pending the availability of FY2000 funding. A milestone schedule will be provided to GA EPD upon availability of funds and approval of the monitoring only plan.

E. Scenarios for site closure or CAP-Part B

The monitoring system will be evaluated annually. A recommendation for no further action required will be made if benzene concentrations remain below the predicted two-year maximum concentrations.

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

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

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

1. Soil N/A X

2. Groundwater

   a. Free Product N/A X

   b. Dissolved phase N/A X

3. Surface Water N/A X

B. Proposed Investigation of Vadose Zone And Aquifer Characteristics:

Additional vadose zone and aquifer characteristics were collected as part of the CAP-Part A investigation, thus no additional data is required.

V. PUBLIC NOTICE

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

UST 38 is located within the confines of Fort Stewart Military Reservation, a federal facility. The U.S. Government owns all of the property contiguous to the site. The Fort Stewart Directorate of Public Works (DPW) has complied with the public notice requirements defined by Georgia Environmental Protection Division (GA EPD) guidance by publishing an announcement in the *Savannah Morning News* on July 19 and 26, 1998.

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

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

Fort Stewart is a federally owned facility and has funded the investigation for UST 38, Building 1510, Facility ID #9-089109, using 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

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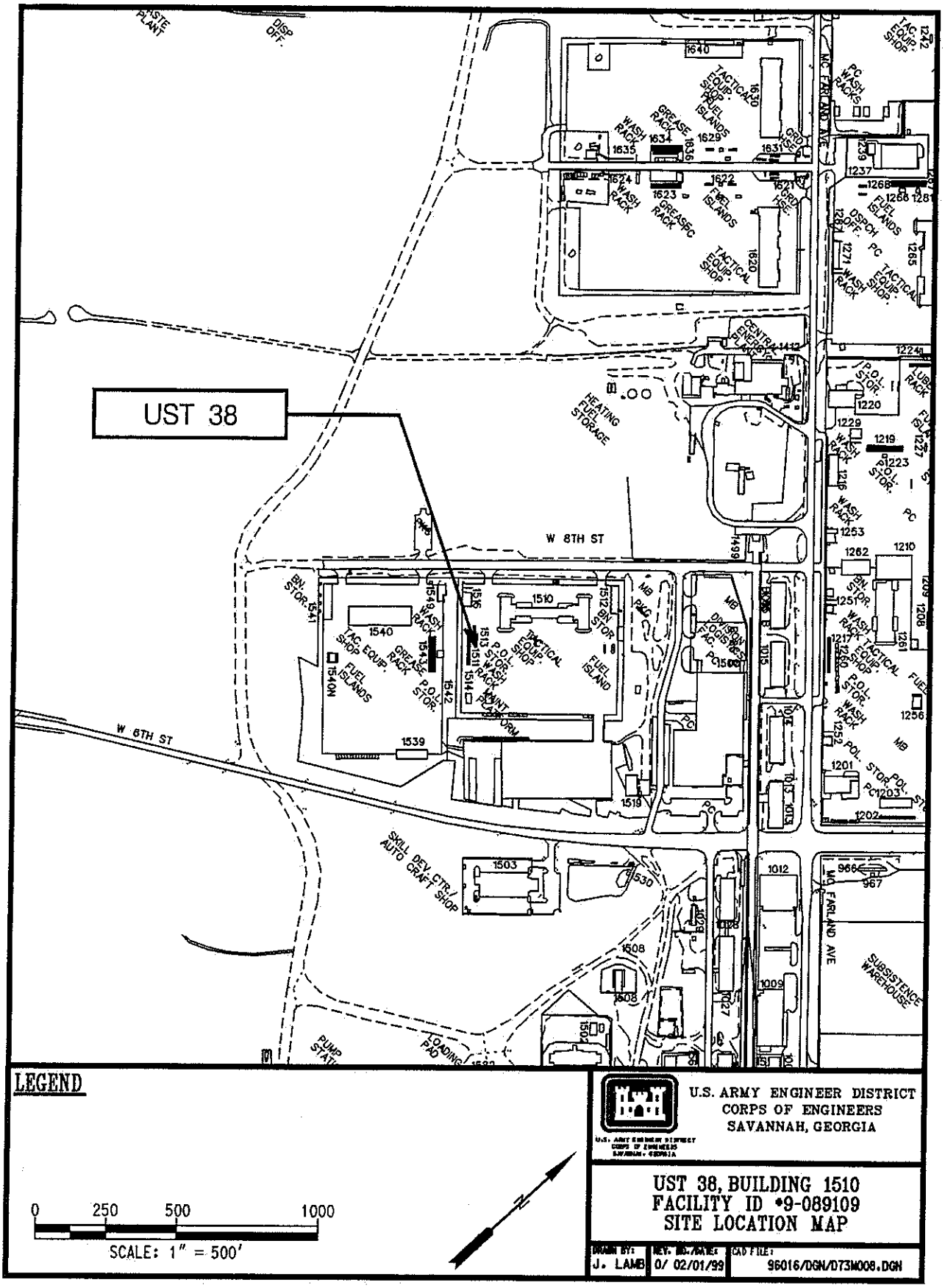

Figure 1. Location Map of UST 38, Fort Stewart, Liberty County, Georgia

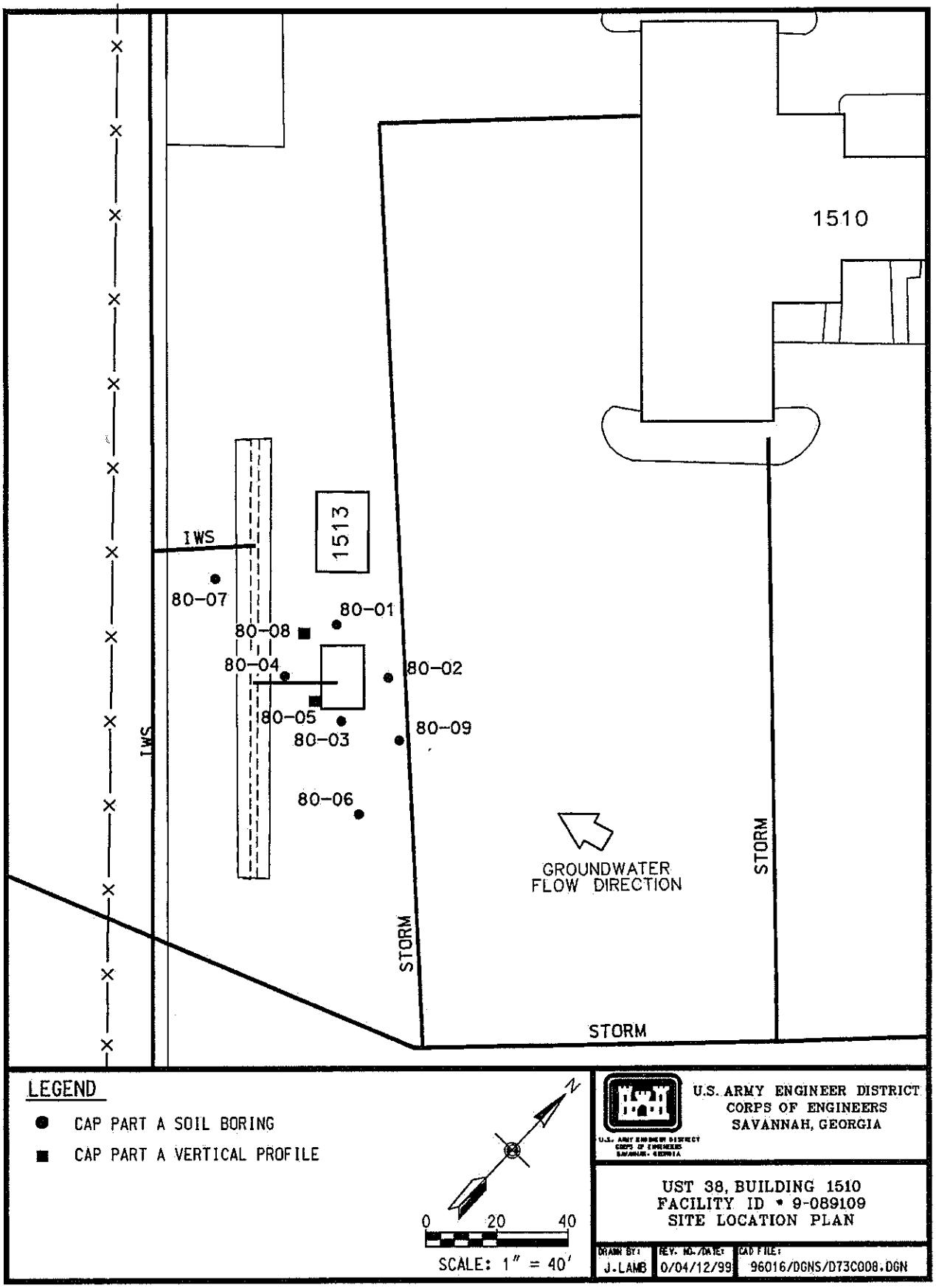

Figure 2. Site Plan for the UST 38 Site Investigation

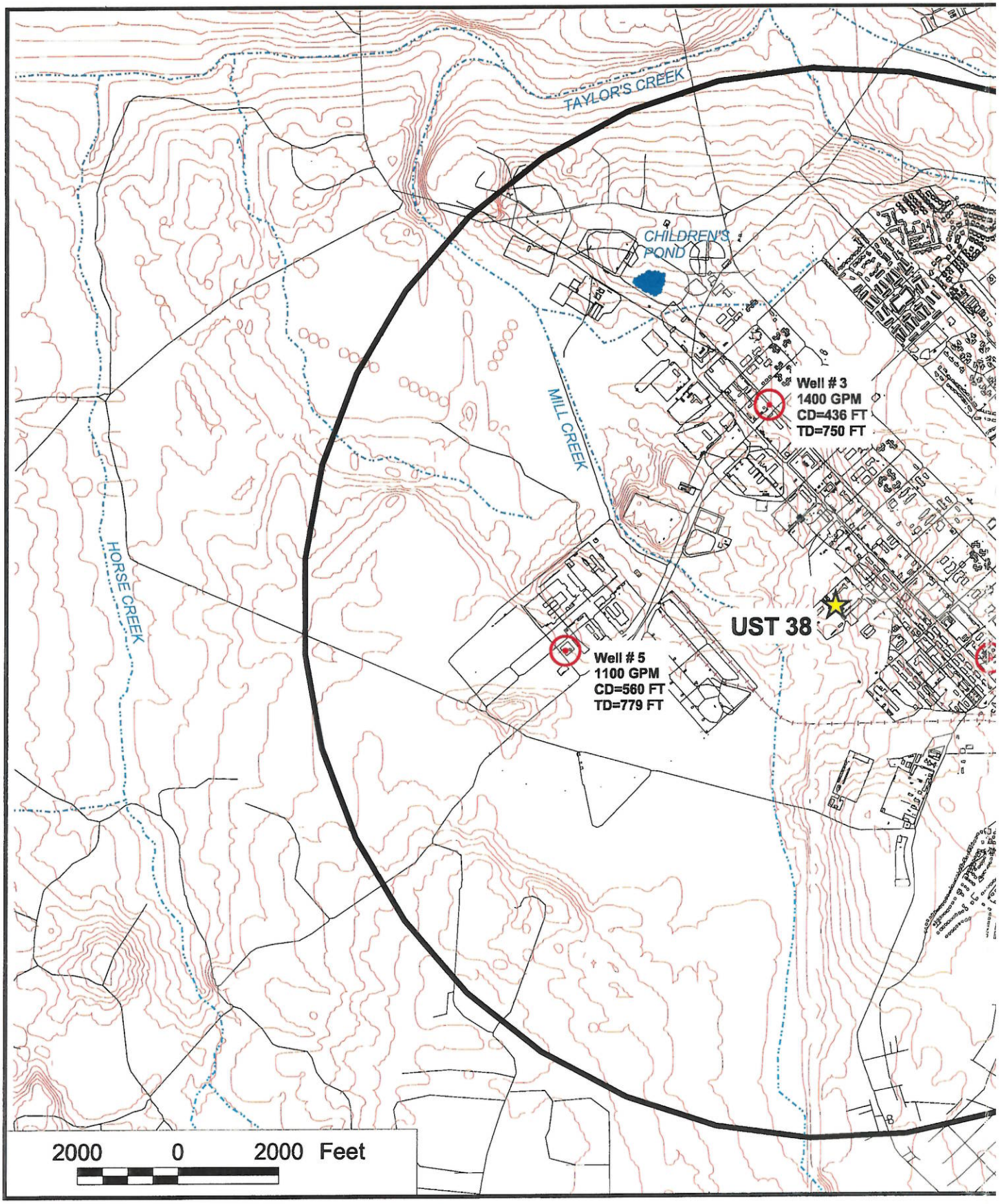

Figure 3. Map Showing Public and Private Drinking Wat
Bodies at Fort Stewart, Liberty Count

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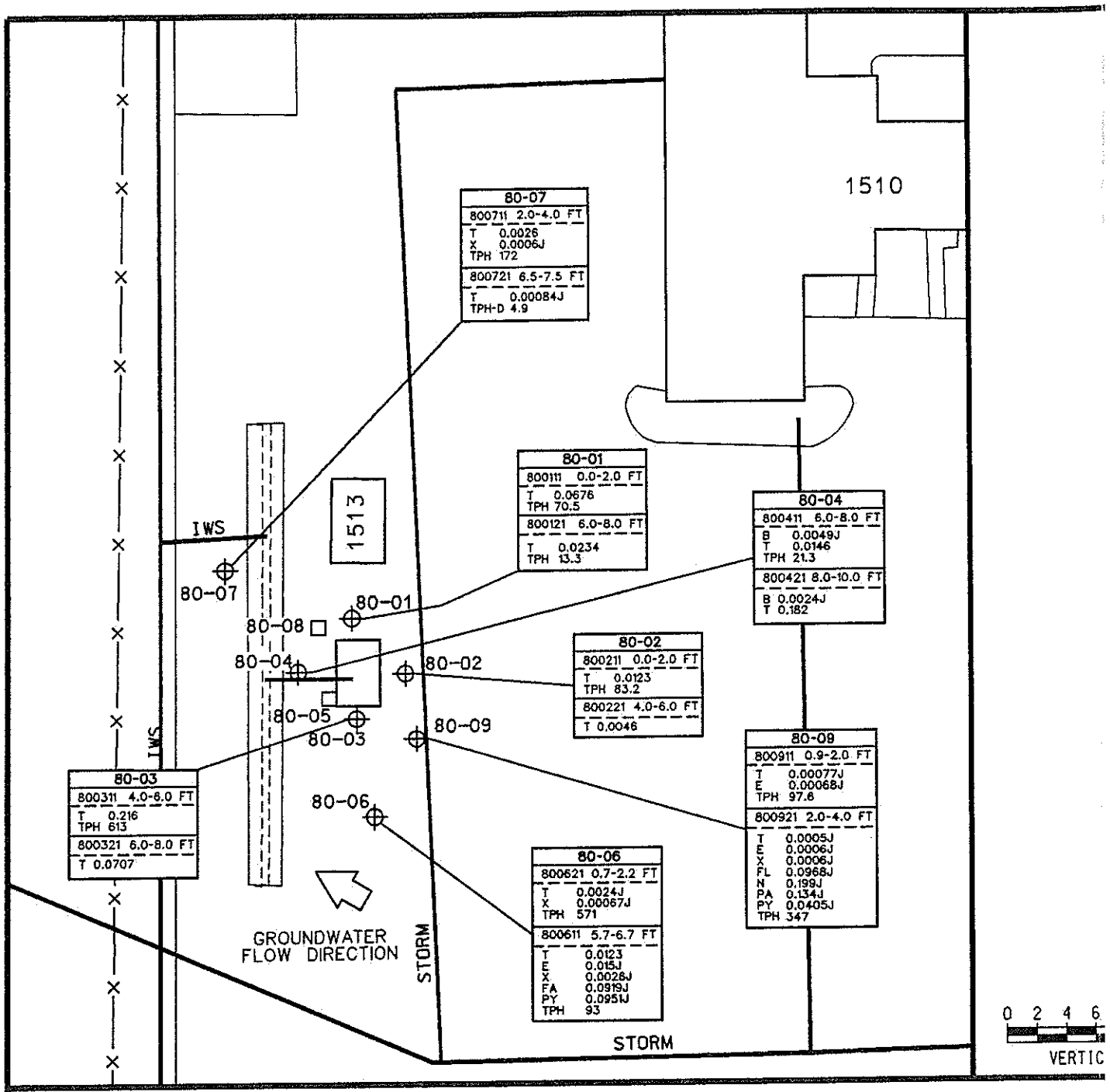

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Figure 4. Soil Quality Map

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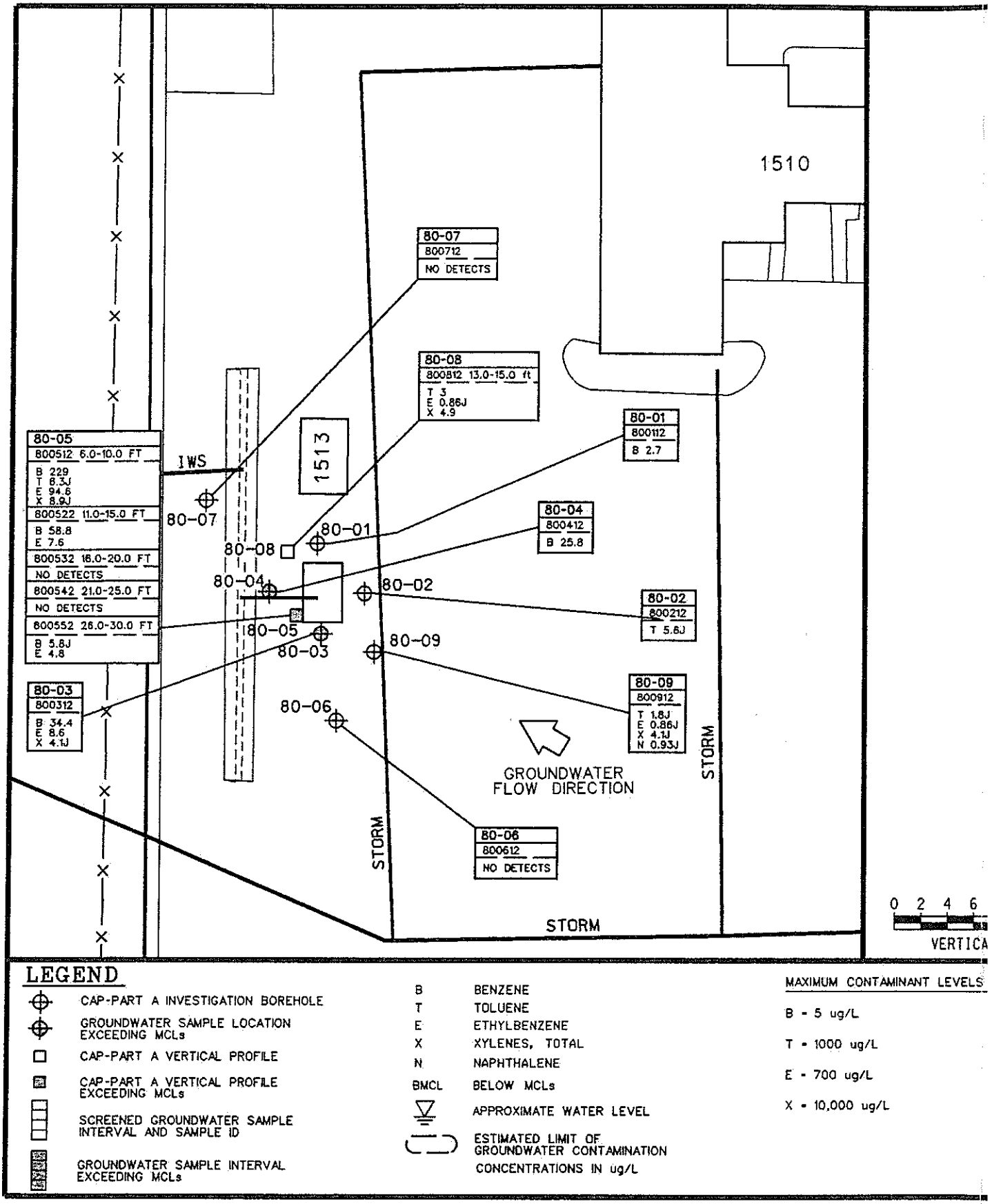

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Figure 5. Groundwater Qu

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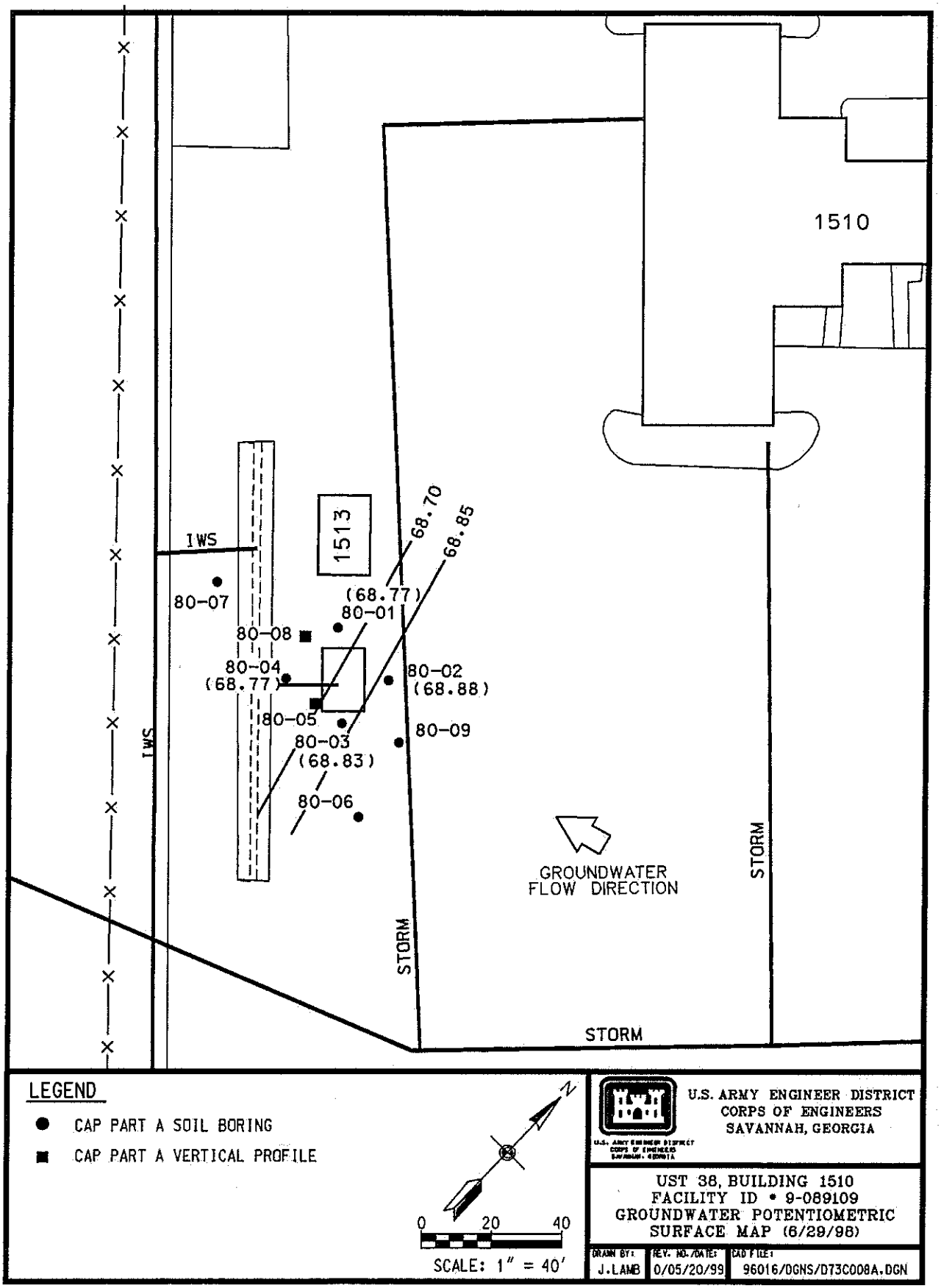

Figure 6. Potentiometric Surface Map of the UST 38 Site

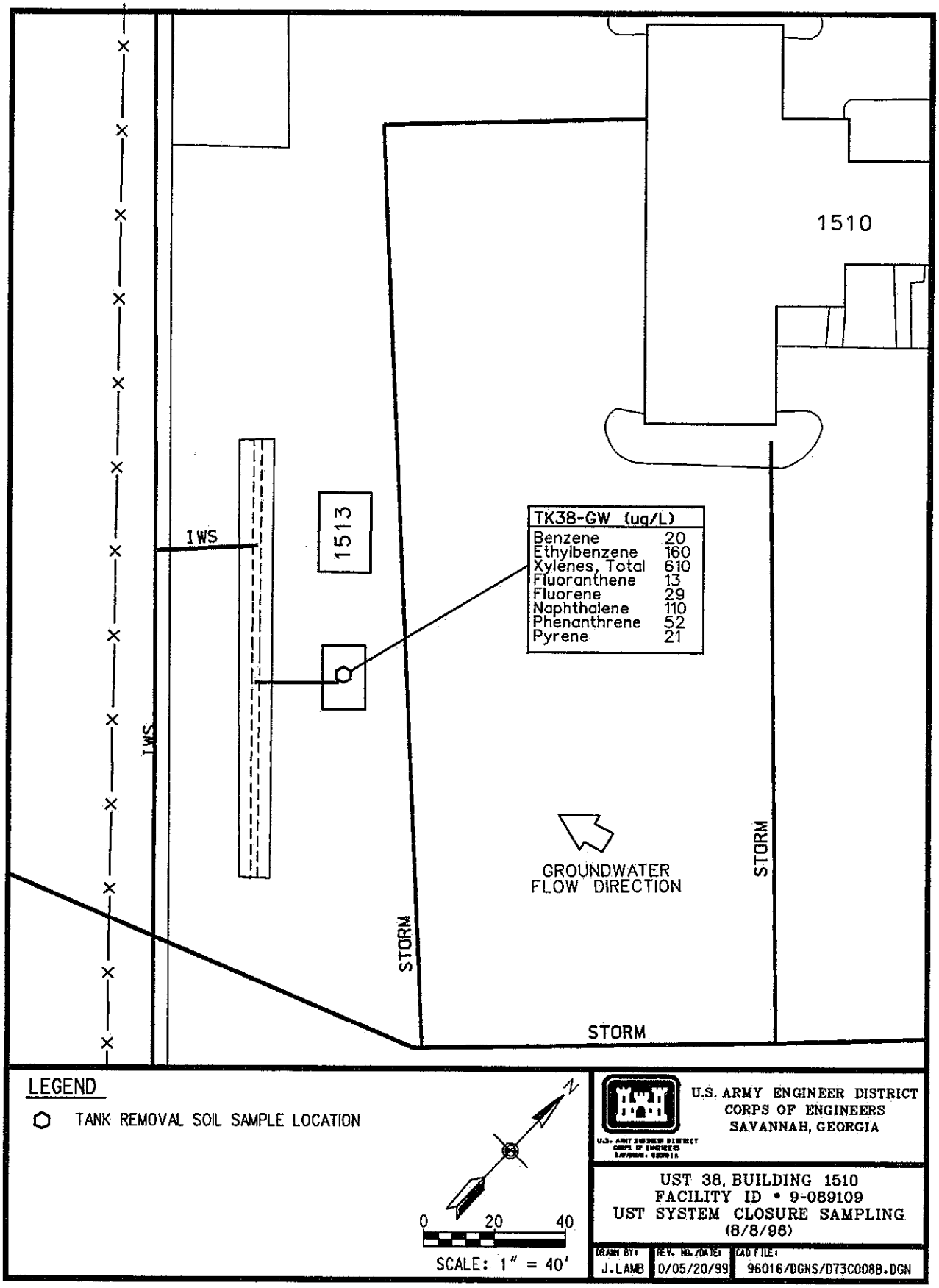

Figure 7. UST System Closure Sampling Locations at the UST 38 Site

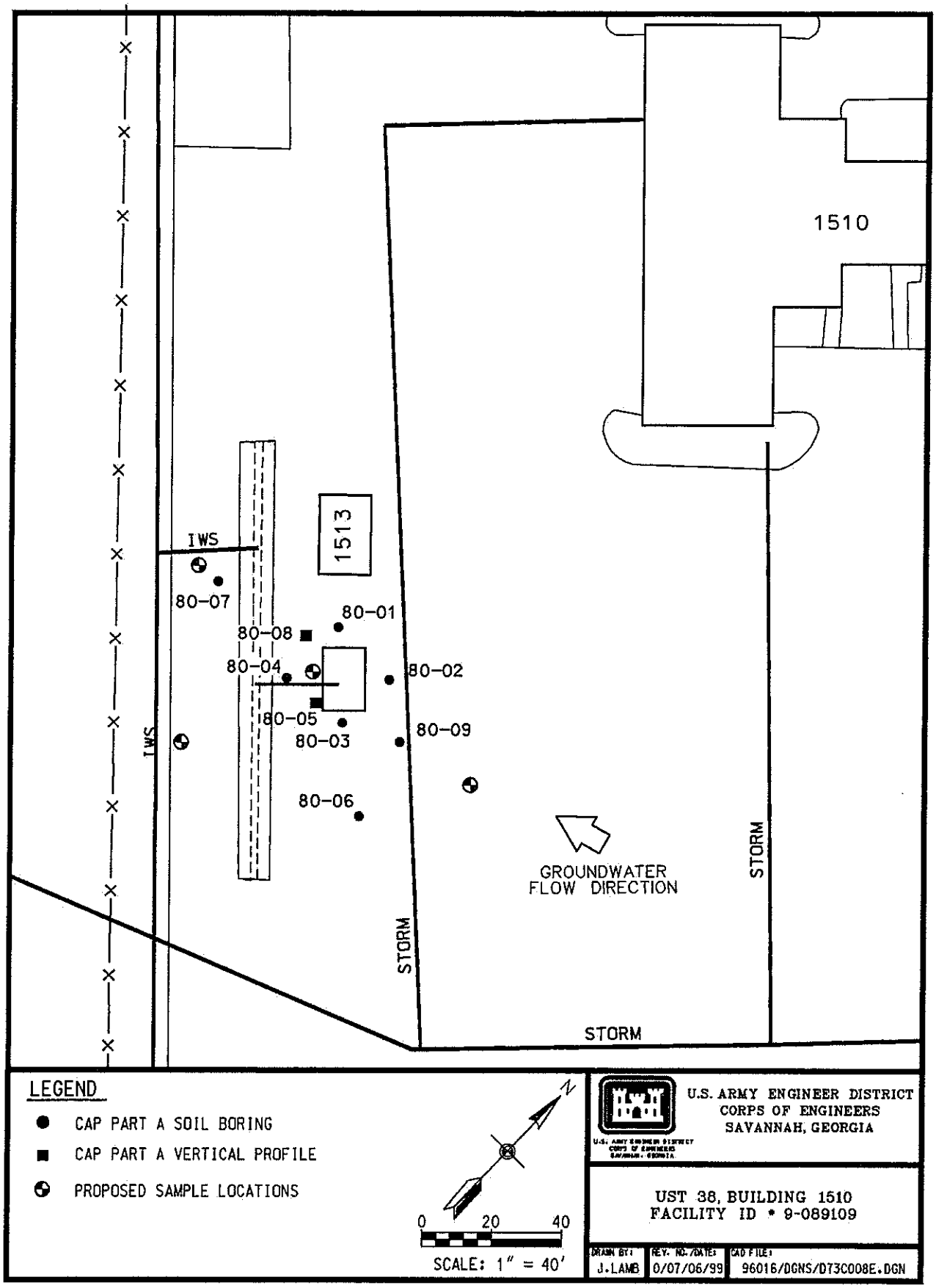

Figure 8. Proposed Additional Boring/Monitoring Well Locations

No tax map is available for Fort Stewart Military Reservation, which is a government owned facility.

Figure 9. Tax Map

APPENDIX II

REPORT TABLES

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TABLE 1: FREE PRODUCT REMOVAL

Monitoring Well Number: N/A				
Date of Measurement	Groundwater Elev. (ft AMSL)	Product Thickness (ft)	Corrected Water Elev. (ft AMSL)	Product Removed (gal)
No Free Product Detected				
			TOTAL	NONE

Monitoring Well Number: N/A				
Date of Measurement	Groundwater Elev. (ft AMSL)	Product Thickness (ft)	Corrected Water Elev. (ft AMSL)	Product Removed (gal)
No Free Product Detected				
			TOTAL	NONE

NOTE:
AMSL Above mean sea level.

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

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH (mg/kg)	TPH-DRO (mg/kg)
80-01	800111	0.0 - 2.0	06/25/98	0.0022 U	0.0676 =	0.0022 U	0.0065 U	0.0676	70.5 =	
80-01	800121	6.0 - 8.0	06/25/98	0.0024 U	0.0234 =	0.0024 U	0.0071 U	0.0234	13.3 =	
80-02	800211	0.0 - 2.0	06/26/98	0.0022 U	0.0123 =	0.0022 U	0.0065 U	0.0123	83.2 =	
80-02	800221	4.0 - 6.0	06/26/98	0.0022 U	0.0046 =	0.0022 UJ	0.0067 UJ	0.0046	3.94 U	
80-03	800311	4.0 - 6.0	06/26/98	0.0022 U	0.216 =	0.0022 U	0.0066 U	0.216	613 =	
80-03	800321	6.0 - 8.0	06/26/98	0.0024 U	0.0707 =	0.0024 U	0.007 U	0.0707	4.76 U	
80-04	800411	6.0 - 8.0	06/26/98	0.0049 J	0.0146 =	0.0023 U	0.0068 UJ	0.0195	21.3 =	
80-04	800421	8.0 - 10.0	06/26/98	0.0024 J	0.182 =	0.0025 U	0.0076 U	0.1844	5.72 U	
80-06	800611	5.7 - 6.7	11/13/98	0.0022 U	0.0123 =	0.015 J	0.0026 J	0.0299	93 =	
80-06	800621	0.7 - 2.2	11/13/98	0.0022 U	0.0024 J	0.0022 U	0.00067 J	0.00307	571 =	
80-07	800711	2.0 - 4.0	11/13/98	0.0022 U	0.0026 =	0.0022 U	0.0006 J	0.0032	172 =	
80-07	800721	6.5 - 7.5	11/13/98	0.0022 U	0.00084 J	0.0022 U	0.0033 U	0.00084		4.9 =
80-09	800911	0.9 - 2.0	02/21/99	0.0024 U	0.00077 J	0.00068 J	0.0036 U	0.00145	97.6 =	
80-09	800921	2.0 - 4.0	02/21/99	0.002 U	0.0005 J	0.0006 J	0.0006 J	0.0037	347 =	
Applicable Standards[1]				0.008	6	10	700	NRC	NRC	NRC

NOTES:

Contract for June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

Beginning November 1998, sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)
BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylene
ND Not detected
NRC No regulatory criteria
TPH Total petroleum 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.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

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

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (mg/kg)							Total PAHs (ug/L)
				Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene			
80-01	800111	0.0 - 2.0	06/25/98								ND
80-01	800121	6.0 - 8.0	06/25/98								ND
80-02	800211	0.0 - 2.0	06/26/98								ND
80-02	800221	4.0 - 6.0	06/26/98								ND
80-03	800311	4.0 - 6.0	06/26/98								ND
80-03	800321	6.0 - 8.0	06/26/98								ND
80-04	800411	6.0 - 8.0	06/26/98								ND
80-04	800421	8.0 - 10.0	06/26/98	0.0919 J				0.0951 J			0.187
80-06	800611	5.7 - 6.7	11/13/98								ND
80-06	800621	0.7 - 2.2	11/13/98								ND
80-07	800711	2.0 - 4.0	11/13/98								ND
80-07	800721	6.5 - 7.5	11/13/98								ND
80-09	800911	0.9 - 2.0	02/21/99								ND
80-09	800921	2.0 - 4.0	02/21/99		0.0968 J	0.199 J	0.134 J	0.0405 J			0.4703
Applicable Standards[1]				NRC	NRC	NRC	NRC	NRC			NRC

NOTES:

Contract for June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

Beginning November 1998, sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)
BGS Below ground surface
ND Not detected (refer to Appendix V, Table V-A, for complete list of PAH results)
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 3a: GROUNDWATER ANALYTICAL RESULTS
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Screened Interval (ft BGS)	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethyl - benzene (ug/L)	Xylenes (ug/L)	Total BTEX (ug/L)
80-01	800112	4.0 - 9.0	06/25/98	2.7 =	2 U	2 U	6 U	2.7
80-02	800212	6.0 - 11.0	06/28/98	2 U	5.6 J	2 U	6 U	ND
80-03	800312	5.0 - 10.0	06/26/98	34.4 =	2 U	8.6 =	4.1 J	47.1
80-04	800412	7.0 - 12.0	06/26/98	25.8 =	2 U	2 U	6 U	25.8
80-05	800512	6.0 - 10.0	06/28/98	229 =	6.3 J	94.6 =	8.9 J	329.9
80-05	800522	11.0 - 15.0	06/28/98	58.8 =	2 U	7.6 =	6 UJ	66.4
80-05	800532	16.0 - 20.0	06/28/98	2 U	2 U	2 U	6 UJ	ND
80-05	800542	21.0 - 25.0	06/28/98	2 U	2 U	2 U	6 UJ	ND
80-05	800552	26.0 - 30.0	06/28/98	5.8 J	2 U	4.8 =	6 U	10.6
80-06	800612	0.0 - 11.7	11/13/98	2 U	2 U	2 U	3 U	ND
80-07	800712	0.0 - 12.0	11/13/98	2 U	2 U	2 U	3 U	ND
80-08	800812	13.0 - 15.0	02/20/99	2 U	3 =	0.86 J	4.9 =	8.76
80-09	800912	0.0 - 10.0	02/21/99	2 U	1.8 J	0.86 J	4.1 J	6.76
Applicable Standards[1]				5	1000	700	10000	NRC

NOTE:

Contract for June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

Beginning November 1998, sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

[1] U.S. Environmental Protection Agency maximum contaminant level

BTEX Benzene, toluene, ethylbenzene, and xylene

BGS Below ground surface

ND Not detected

NRC No regulatory criteria

Laboratory Qualifiers

U Indicates 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 the value for the compound is an estimated value.

= Indicates the compound was detected at the concentration reported.

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

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (mg/kg)							Total PAHs (ug/L)
				Naphthalene							
80-01	800112	4.0 - 9.0	06/25/98								ND
80-02	800212	6.0 - 11.0	06/28/98								NA
80-03	800312	5.0 - 10.0	06/26/98								ND
80-04	800412	7.0 - 12.0	06/26/98								ND
80-05	800512	6.0 - 10.0	06/28/98								ND
80-05	800522	11.0 - 15.0	06/28/98								ND
80-05	800532	16.0 - 20.0	06/28/98								ND
80-05	800542	21.0 - 25.0	06/28/98								ND
80-05	800552	26.0 - 30.0	06/28/98								ND
80-06	800612	0.0 - 11.7	11/13/98								ND
80-07	800712	0.0 - 12.0	11/13/98								ND
80-08	800812	13.0 - 15.0	02/20/99								ND
80-09	800912	0.0 - 10.0	02/21/99	0.93 J							0.93
Applicable Standards[1]				NRC							NRC

NOTE:

Contract for June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998, thus the new SW-846 analytical methods were not used during that sampling event.

Beginning November 1998, sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

[1] U.S. Environmental Protection Agency maximum contaminant level

BGS Below ground surface

N/A Not analyzes, insufficient sample volume for analysis

ND Not detected (refer to Appendix VIII, Table VIII-A, for complete list of PAH results)

NRC No regulatory criteria

PAH Polynuclear aromatic hydrocarbon

Laboratory Qualifiers

U Indicates 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 the value for the compound is an estimated value.

= Indicates the compound was detected at the concentration reported.

TABLE 4: GROUNDWATER ELEVATIONS

Well Number	Date Measured	Ground Surface Elev. (ft MSL)	Top of Casing Elev. (ft MSL)	Depth of Screened Interval (ft BGS)	Depth of Free Product (ft BTOC)	Water Depth (ft BTOC)	Product Thickness (ft)	Specific Gravity Adjustment	Corrected Groundwater Elev. (ft MSL)
80-01	6/29/98	74.90	76.07	4.0 - 9.0	N/A	7.30	N/A	N/A	68.77
80-02	6/29/98	74.82	75.92	6.0 - 11.0	N/A	7.04	N/A	N/A	68.88
80-03	6/29/98	74.79	77.20	5.0 - 10.0	N/A	8.37	N/A	N/A	68.83
80-04	6/29/98	74.90	79.21	7.0 - 12.0	N/A	10.44	N/A	N/A	67.77
80-06	11/18/98	74.68	78.51	0.0 - 11.7	N/A	9.95	N/A	N/A	68.56
80-07	11/18/98	74.86	77.03	0.0 - 12.0	N/A	8.43	N/A	N/A	68.60

NOTE:

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

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

Sample Location	Depth (ft BGS)	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH (mg/kg)
			No soil samples were collected during tank removal					
Applicable Standards[1]			0.008	6	10	700	NRC	NRC

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

Sample Location	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (mg/kg)				Total PAHs (mg/kg)
			No soil samples were collected during tank removal				
Applicable Standards[2]							NRC

NOTE:

[1] Underground storage tank system closure performed by Anderson Columbia Environmental, Inc. (1996)
[2] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)
BGS Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylene
NRC No regulatory criteria.
PAH Polynuclear aromatic hydrocarbon.

Laboratory Qualifiers

U Indicates 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 the value for the compound is an estimated value.
= Indicates the compound was detected at the concentration reported.

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

Sample Location	Depth (ft BGS)	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethyl – benzene (ug/L)	Xylenes (ug/L)	Total BTEX (ug/L)
TK38-GW	unknown	8/8/96	20 =	20 U	160 =	610 =	790
Applicable Standards[2]			5	1,000	700	10,000	NRC

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

Sample Location	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (ug/L)									Total PAHs (ug/L)
			Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene					
TK38-GW	unknown	8/8/96	13 =	29 =	110 =	52 =	21 =					225
Applicable Standards[1]			NRC	NRC	NRC	NRC	NRC					NRC

NOTE:

1	Underground storage tank system closure performed by Anderson Columbia Environmental, Inc. (1996)
2	U.S. Environmental Protection Agency maximum contaminant levels
BGS	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylene
NRC	No regulatory criteria.
PAH	Polynuclear aromatic hydrocarbons

Laboratory Qualifiers

U	Indicates 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 the value for the compound is an estimated value.
=	Indicates the compound was detected at the concentration reported.

APPENDIX III

WATER RESOURCES SURVEY DOCUMENTATION

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WATER RESOURCES SURVEY DOCUMENTATION

1.0 LOCAL WATER RESOURCES

As required by the GA EPD UST CAP-Part A guidance, a water resource survey documenting information for public and non-public water supply wells, surface water bodies, underground utilities, and potential receptors was conducted for the Fort Stewart UST investigation sites. The information presented in this appendix provides the supporting documentation for Section II.D.3 of the CAP-Part A Form.

1.1 WATER SUPPLY WELL SURVEY

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

- Fort Stewart is located in an area of average or higher groundwater pollution susceptibility.
- Locate all public supply wells as defined by GA EPD that exist within 2 miles of the investigation sites.
- Locate all non-public supply wells that exist within 0.5 miles of the investigation sites.
- Locate all supply wells nearest the investigation sites.
- Locate all wells downgradient of the investigation sites.

A total of seven groundwater supply wells are located within a 2-mile radius of the Fort Stewart garrison area. Six of these wells are located within the confines of the garrison area. The other well is located at Wright Army Airfield, approximately 1.2 miles northeast of the garrison area. All of the groundwater supply wells are classified as public wells that supply water to Fort Stewart for drinking and nondrinking purposes. These wells are approximately 450 feet deep and draw groundwater from the Principal Artesian (also known as the Floridian) aquifer. Chlorine and fluoride are added into the groundwater at the well heads prior to being pumped into storage tanks and/or water towers, according to Fort Stewart DPW personnel. The location of these wells, along with a 500-foot radius drawn around each well, is shown in Figure 3.

1.2 SURFACE WATER BODIES

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

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

Several surface water bodies are located within a 1-mile radius of the Fort Stewart garrison area. These are shown in Figure 3 and include Mill Creek, Taylors Creek, Peacock Creek, Childpen's Pond, and two unnamed ponds. Mill Creek extends along the western side of the garrison area and flows into Taylors Creek, located approximately 0.75 miles northwest of the garrison area. Taylors Creek then flows northward approximately 3.5 miles to its confluence with Canoochee Creek. Peacock Creek originates near the east corner of the garrison area and flows southward from the garrison. Mill Creek, Taylors Creek, and Peacock Creek all have natural streambeds and exhibit perennial flow.

Childpen's Pond is located at the northwest end of the garrison area. The two unnamed ponds are located at the northwest end of the facility golf course in the vicinity of Childpen's Pond. All of the ponds are isolated water bodies that are relatively small in size, measuring less than 500 feet in diameter.

Typically, surface water run-off from the UST site moves over the existing concrete and asphalt cover to the Fort Stewart storm water drainage system. Since petroleum contamination at the sites primarily impacts surficial groundwater, the surface water run-off pathway is not a viable contaminant transport mechanism because of the concrete acting as a barrier and the location of the nearest surface water body.

2.0 POTENTIAL RECEPTOR SURVEY SUMMARY OF THE UST 38 SITE

A field potential receptor survey was conducted for the UST 38 site in June 1998. The site and adjacent areas were surveyed for locations of surface water bodies, utility lines, and basements. Basements do not exist in the buildings adjacent to the site. Additional information, provided by DPW, was used to determine the location of the nearest public and non-public water supply wells and downgradient surface water bodies not located during the field survey.

2.1 Water Supply Wells Near the UST 38 Site

The UST 38 site is located approximately 3100 feet west-northwest (downgradient) of the Well #1. Well #5 is located approximately 5200 feet west (downgradient) of the site. Therefore, the UST 38 site is classified as being located greater than 500 feet to a withdrawal point. There are no other non-public supply wells located downgradient of the site within a 2-mile radius.

2.2 Surface Water Bodies Near the UST 38 Site

At the closest point to the site, a tributary to Mill Creek is located approximately 1200 feet southwest (downgradient) of the site. In the direction of groundwater flow, a storm water drainage ditch is located approximately 800 feet southwest of the site and Mill Creek is located approximately 2500 feet west of the site. Based on the distances between the UST and the nearest surface water body, the site is classified as being located greater than 500 feet to a downgradient surface water body.

2.3 Underground Utility Lines Near the UST 38 Site

An industrial wastewater line is located about 35 feet northwest of the former tank pit. The invert elevation of this line is estimated to be approximately 71.00 feet AMSL or approximately 3.0 feet BGS, which is above the water table, thus the industrial wastewater line is not considered a preferential pathway. In addition, there is a storm drain that is located upgradient of the former tank pit to the northeast.

Science Applications International Corporation

CONTACT REPORT

INDIVIDUAL CONTACTED, TITLE: Pam Babbs	ORIGINATOR: Patty Stoll
ORGANIZATION: Fort Stewart DPW - Water Resources	DATE CONTACTED: October 10, 1998
PHONE: 912 - 767 - 2281	TIME CONTACTED: 11:00 am
ADDRESS:	CONTACT TYPE: telephone

SUBJECT: Update Supply Well Information for Fort Stewart Supply Wells for Water Resources Survey

DISCUSSION:	COMMENTS, ACTIONS, DATES
During a telephone conversation with Pam Babbs on October 10, 1998 the following information on the supply wells at Fort Stewart was provided. Well No.1 1750 gpm, CD = 451 ft, TD = 816 ft Well No.2 1400 gpm, CD = 470 ft, TD = 808 ft Well No.3 1400 gpm, CD = 436 ft, TD = 750 ft Well No.5 1100 gpm, CD = 560 ft, TD = 779 ft Well No.6A 500 gpm, CD = 374 ft, TD = 472 ft Well No.6B 500 gpm, CD = 393 ft, TD = 508 ft Evans Well 190 gpm, CD = 404 ft, TD = 600 ft Camp Oliver Well 400 gpm, CD = 451 ft, TD = 706 ft	Incorporate new pumping rate data into the CAP Part A and B reports being prepared for Fort Stewart.

DISTRIBUTION: Melanie Little (Fort Stewart DPW)
Central Records (SAIC)
Project File (SAIC)

Science Applications International Corporation

CONTACT REPORT

INDIVIDUAL CONTACTED, TITLE: Jeff Barnes	ORIGINATOR: Patty Stoll
ORGANIZATION: Georgia Department of Natural Resources	DATE CONTACTED: October 1, 1997
PHONE: 912 - 353 - 3225	TIME CONTACTED: 11:00 am
ADDRESS:	CONTACT TYPE: telephone

SUBJECT: Update Supply Well Information for Liberty County Supply Wells for Water Resources Survey

DISCUSSION:	COMMENTS, ACTIONS, DATES
During a telephone conversation with the Ga DNR, regarding drinking water wells in Liberty County, it was suggested I contact Mr. Jeff Barnes. After being transfered to Mr. Jeff Barnes and explaining our needs, he agreed to send a printout of the permitted drinking water systems in Liberty County. On October 17, 1997 we received the list of permitted drinking water systems in Liberty County.	Review list of permitted drinking water supply wells for proximity to Fort Stewart CAP Part A and B sites.

DISTRIBUTION: Melanie Little (Fort Stewart DPW)
Central Records (SAIC)
Project File (SAIC)

APPENDIX IV

SOIL BORING LOGS

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HTRW DRILLING LOG

HOLE NUMBER 80-01

PROJECT: Fort Stewart USTs

INSPECTOR: M. Vest

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)
		SAND, with silt, fine to medium grained, low density, very dark gray (10YR 3/1), damp				Ran 4.0 Rec. 4.0
	1	silty SAND, fine to medium grained, low density to loose, grayish brown (10YR 5/2), damp	72ppm		Soil Sample 80011	
	2					
		silty SAND, fine grained, loose to low density, dark gray (5Y 4/1), damp				
	3		68ppm			
	4					Ran 4.0 Rec. 4.0
		grades to SAND with silt, fine grained, loose to medium density, grayish brown (10YR 5/2), moist				
	5		19.8ppm			
	6	clayey, silty, SAND, fine grained, loose to low density, dark gray (10YR 4/1), wet				▼ Wet below 5.9 FT BGS
		silty SAND, fine grained, loose to low density, black (10YR 2/1), wet				
	7		16.6ppm		Soil Sample 80012	COLLECTED GROUNDWATER SAMPLE 80012 FROM TEMPORARY PIEZOMETER SCREENED FROM 4.0 TO 9.0 FT BGS
	8	Same as above except moist to wet and very dark gray (10YR 3/1)	0ppm			Ran 1.0 Rec. 1.0
	9					End of drilling at 9.0 FT BGS Set Piezometer
	10					

HTRW DRILLING LOG

HOLE NUMBER 80-02

PROJECT: Fort Stewart USTs

INSPECTOR M. Vest

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)
	1	Silty SAND, fine grained, non-plastic, loose to low density, very dark gray, (10YR 3/1), damp	26.3ppm		Soil Sample 800211	Ran 4.0 Rec. 4.0
	2	Same as above except dark gray (10YR 4/1)				
	3	Same as above except very dense and black (10YR 2/1)	14.4ppm			
		SILT, finegrained, loose, non-plastic, light gray, (10YR 7/1) dry				
	4	Same as above except dark grayish brown (10YR 4/2) and damp				Ran 4.0 Rec. 4.0
	5	Silty SAND, fine grained, non-plastic, loose to low density, olive (5Y 5/3) damp to moist	3.5ppm		Soil Sample 800211	
	6	Silty SAND, fine grained, non-plastic, low density, dark gray (10YR 4/1), moist				Wet below 6.3 FT BGS
	7	Clayey, silty SAND, fine grained, non to low plasticity, low to medium density, black (10YR 2/1), wet	8.8ppm			
	8	grades to medium density with depth. Clays and silts decrease. Mostly SAND with some silt by 8.5FT BGS				Ran 3.0 Rec. 3.0
	9		5.6ppm			COLLECTED GROUNDWATER SAMPLE 800212 FROM TEMPORARY PIEZOMETER SCREENED AT 6.0 TO 11.0 FTBGS
	10	SILT with fine grained sand, medium to low density non-plastic, dark brown (7.5YR 3/2), wet				End of drilling at 11.0 FT BGS Set Piezometer

HTRW DRILLING LOG

HOLE NUMBER 80-03

PROJECT: Fort Stewart USTs

INSPECTOR M. Vest

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)
	1	SAND, with silt, fine grained, loose to low density, dark brown (7.5YR 3/2) damp	57.3ppm			Ran 4.0 Rec. 4.0
	2					
	3	grades to silty SAND, fine grained, loose to low density, light gray (10YR 7/2) damp	44.0ppm			
	4					
	5	SAND with silt, fine grained, low density, very dark grayish brown, (10YR 3/2), damp				Ran 4.0 Rec. 4.0
		grades to SAND with silt, fine grained, loose, olive gray (5Y 5/2), moist	68.2ppm		Soil Sample 800311	
	6					
	7	SAND with silt, fine grained, hard, very dark grayish brown (10YR 3/2), moist	39.4ppm		Soil Sample 800321	
	8					▼ Wet below 7.9 FT BGS
	9	Shelby Tube		Soil Sample 800331		COLLECTED GROUNDWATER SAMPLE 800312 FROM TEMPORARY PIEZOMETER SCREENED FROM 5.0 TO 10.0 FT BGS
	10					End of drilling at 10.0 FT BGS Set piezometer

HTRW DRILLING LOG

HOLE NUMBER 80-04

PROJECT: Fort Stewart USTs | INSPECTOR M. Vest | SHEET 1 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1 2	Silty SAND, fine grained, loose, dark brown (10YR 3/3) damp	14.0ppm			Ran 4.0 Rec. 4.0
	3 4	grades to silty SAND, fine grained, loose, dark gray (10YR 4/1), damp	11.5ppm			Ran 4.0 Rec. 4.0
	5 6		10.8ppm			
	7	grades to silty SAND, fine grained, loose, brown (10YR 4/3), damp to moist	9.0ppm		Soil Sample 800411	
	8 9	clayey silty SAND, fine grained, loose to low density, very dark grayish brown (10YR 3/2) with fragments of wood, wet below 8.0 FT BGS	14.2ppm		Soil Sample 800421	▼ Wet below = 8.0 FT BGS Ran 4.0 Rec. 4.0
	10	silty SAND, fine grained, loose, very dark brown (7.5 YR 2/2), mois to wet w/ wood fragments				

HTRW DRILLING LOG

HOLE NUMBER 80-04

PROJECT: Fort Stewart USTs | INSPECTOR M. Vest | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11	SILT, with fine grained sand, medium density, dark brown (7.5YR 3/3), wet, with some wood fragments	12.9ppm			Collected groundwater sample 800412 from temporary piezometer screened from 7.0 to 12.0 ft BGS
	12					End of drilling at 12.0 ft BGS Set Piezometer
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					

HTRW DRILLING LOG

HOLE NUMBER 80-05

PROJECT: Fort Stewart USTs

INSPECTOR P. Lucot

SHEET 1 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		Vertical profile borehole for the purpose of collecting groundwater samples. No soil was collected for lithlogic description				
	2					
	4					
	6					
	8		119 ppm		Groundwater Sample 800512	PUSHED TO 10.0 FT BGS AND PULLED BACK TO 6.0 FT BGS TO EXPOSE SCREEN
	10					
	12		3.9 ppm		Groundwater Sample 800522	PUSHED TO 15.0 FT BGS AND PULLED BACK TO 11.0 FT BGS TO EXPOSE SCREEN
	14					
	16					
	18		25.4 ppm		Groundwater Sample 800532	PUSHED TO 20.0 FT BGS AND PULLED BACK TO 16.0 FT BGS TO EXPOSE SCREEN
	20					

HTRW DRILLING LOG

HOLE NUMBER 80-05

PROJECT: Fort Stewart USTs

INSPECTOR P. Lucot

SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		Vertical profile borehole for the purpose of collecting groundwater samples. No soil was collected for lithlogic description				
	22		0.0ppm		Groundwater Sample 800542	PUSHED TO 25.0 FT BGS AND PULLED BACK TO 21.0 FT BGS TO EXPOSE SCREEN
	24					
	26					
	28		0.0ppm		Groundwater Sample 800552	PUSHED TO 30.0 FT BGS AND PULLED BACK TO 26.0 FT BGS TO EXPOSE SCREEN
	30	END OF DRILLING AT 30.0 FT				
	32					
	34					
	36					
	38					
	40					

HTRW DRILLING LOG

HOLE NUMBER 80-06

PROJECT: Fort Stewart USTs

INSPECTOR J. Shiflet

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)
		CONCRETE				
	1	SAND(SP), fine to coarse grained, some silt, subrounded, dark brown to gray to tan	28.5 ppm		Soil Sample 800621	
	2					
	3	silty SAND(SM), fine to medium grained, moist to saturated, black to brown to gray				
	4					
	5					
	6		21.4 ppm		Soil Sample 800611	∇ wet below 6.7 ft BGS
	7					
	8					COLLECTED GROUNDWATER SAMPLE 800612 FROM TEMPORARY PIEZOMETER SCREENED FROM 0.0 TO 11.7 FT BGS.
	9					
	10					END OF DRILLING AT 11.7 FT BGS AND SET TEMPORARY PIEZOMETER

HTRW DRILLING LOG

HOLE NUMBER 80-07

PROJECT: Fort Stewart USTs | INSPECTOR J. Shiflet | 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)
		CONCRETE				
	1	SAND (SP), fine to medium grained, some silt, dark brown				
	2					
	3		31.9ppm		Soil Sample 800711	
		silty SAND (SM), fine to medium grained, dark brown				
	4	SAND (SP), fine to medium grained, some silt, dark brown to dark gray				
	5					
	6					
	7		11.7ppm		Soil Sample 800721	▽ wet below 7.5 ft BGS
	8	silty sand (SM), fine to medium grained, black				
	9					COLLECTED GROUND WATER SAMPLE 800712 FROM TEMPORARY PIEZOMETER SCREENED FROM 0.0 TO 12.0 FT BGS
	10					END OF DRILLING AT 12.0 FT BGS AND SET TEMPORARY PIEZOMETER

HTRW DRILLING LOG

HOLE NUMBER 80-08

PROJECT: Fort Stewart USTs

INSPECTOR

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)
		Vertical profile borehole for the purpose of collecting groundwater samples No soil was collected for lithlogic description				
	2					
	4					
	6					
	8					
	10					
	12					
	14		3.0 ppm		Groundwater Sample 800812	PUSHED TO 15.0 FT BGS AND PULLED BACK TO 13.0 FT BGS TO EXPOSE SCREEN
	16					
	18					
	20					

HTRW DRILLING LOG

HOLE NUMBER 80-09

PROJECT: Fort Stewart USTs | INSPECTOR K. Ledbetter | 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)
		CONCRETE				
	1	silty SAND (SM), 15% silt, fine grained, soft, dry, dark brown (10YR 3/3)	19.6ppm		Soil Sample 800921	
	2					
	3		8.5ppm		Soil Sample 800911	
	4					▽ WET BELOW 4.0 FT BGS
	5					
	6					
	7					COLLECTED GROUNDWATER SAMPLE 800912 FROM TEMPORARY PIEZOMETER SCREENED FROM 0.0 TO 10.0 FT BGS
	8					
	9					PUSHED TO 10.0 FT BGS TO SET TEMPORARY PIEZOMETER
	10					

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APPENDIX V

SOIL LABORATORY REPORTS

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TABLE V-A. Summary of Soil Analytical Results

Station:	GA UST	80-01	80-01	80-02	80-02	80-03
Sample ID:	Soil	800111	800121	800211	800221	800311
Sample Interval (ft BGS):	Threshold	0.0' - 2.0'	6.0' - 8.0'	0.0' - 2.0'	4.0' - 6.0'	4.0' - 6.0'
Collection Date:	Levels[1]	25-Jun-98	25-Jun-98	26-Jun-98	26-Jun-98	26-Jun-98
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOLATILE ORGANIC COMPOUNDS						
Benzene	0.008	0.0022 U	0.0024 U	0.0022 U	0.0022 U	0.0022 U
Toluene	6	0.0676 =	0.0234 =	0.0123 =	0.0046 =	0.216 =
Ethylbenzene	10	0.0022 U	0.0024 U	0.0022 U	0.0022 UJ	0.0022 U
Xylenes, Total	700	0.0065 U	0.0071 U	0.0065 U	0.0067 UJ	0.0066 U
POLYNUCLEAR AROMATIC HYDROCARBONS						
2-Chloronaphthalene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Acenaphthene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Acenaphthylene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Anthracene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Benzo(a)anthracene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Benzo(a)pyrene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Benzo(b)fluoranthene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Benzo(g,h,i)perylene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Benzo(k)fluoranthene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Chrysene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Dibenzo(a,h)anthracene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Fluoranthene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Fluorene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Indeno(1,2,3-cd)pyrene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Naphthalene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Phenanthrene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
Pyrene	NRC	1.45 U	0.397 U	0.362 U	0.370 U	0.366 U
OTHER ANALYTES						
Lead	NRC		7.6 =		1.1 =	
Total Organic Carbon	NRC					
TPH-Diesel Range Organics	NRC					
Total Petroleum Hydrocarbons	NRC	70.5 =	13.3 =	83.2 =	3.94 U	613 =

NOTE:

Contract for the June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

November 1998 and February 1999 sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

Analytical data for QA/QC samples 800113 (duplicate) and 800613 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content, such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)

Bold values exceed soil threshold levels

NRC No regulatory criteria

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.

R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.

TABLE V-A. Summary of Soil Analytical Results (continued)

Station:	GA UST	80-03	80-04	80-04	80-06	80-06
Sample ID:	Soil	800321	800411	800421	800611	800621
Sample Interval (ft BGS):	Threshold	6.0' - 8.0'	6.0' - 8.0'	8.0' - 10.0'	5.7' - 6.7'	0.7' - 2.2'
Collection Date:	Levels[1]	26-Jun-98	26-Jun-98	26-Jun-98	13-Nov-98	13-Nov-98
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOLATILE ORGANIC COMPOUNDS						
Benzene	0.008	0.0024 U	0.0049 J	0.0024 J	0.0022 U	0.0022 U
Toluene	6	0.0707 =	0.0146 =	0.182 =	0.0123 =	0.0024 J
Ethylbenzene	10	0.0024 U	0.0023 U	0.0025 U	0.015 J	0.0022 U
Xylenes, Total	700	0.007 U	0.0068 UJ	0.0076 U	0.0026 J	0.00067 J
POLYNUCLEAR AROMATIC HYDROCARBONS						
2-Chloronaphthalene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Acenaphthene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Acenaphthylene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Anthracene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Benzo(a)anthracene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Benzo(a)pyrene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Benzo(b)fluoranthene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Benzo(g,h,i)perylene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Benzo(k)fluoranthene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Chrysene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Dibenzo(a,h)anthracene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Fluoranthene	NRC	0.392 U	0.379 U	0.422 U	0.0919 J	1.43 U
Fluorene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Indeno(1,2,3-cd)pyrene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Naphthalene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Phenanthrene	NRC	0.392 U	0.379 U	0.422 U	1.5 U	1.43 U
Pyrene	NRC	0.392 U	0.379 U	0.422 U	0.0951 J	1.43 U
OTHER ANALYTES						
Lead	NRC	9.3 =		5.3 =		25.5 =
Total Organic Carbon	NRC	15900 =				
TPH-Diesel Range Organics	NRC					
Total Petroleum Hydrocarbons	NRC	4.76 U	21.3 =	5.72 U	93 =	571 =

NOTE:

Contract for the June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

November 1998 and February 1999 sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

Analytical data for QA/QC samples 800113 (duplicate) and 800613 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content, such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)

Bold values exceed soil threshold levels

NRC No regulatory criteria

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.

R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.

TABLE V-A. Summary of Soil Analytical Results (continued)

Station:	GA UST	80-07	80-07	80-09	80-09
Sample ID:	Soil	800711	800721	800911	800921
Sample Interval (ft BGS):	Threshold	2.0' - 4.0'	6.5' - 7.5'	0.9' - 2.0'	2.0' - 4.0'
Collection Date:	Levels[1]	13-Nov-98	13-Nov-98	21-Feb-99	21-Feb-99
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOLATILE ORGANIC COMPOUNDS					
Benzene	0.008	0.0022 U	0.0022 U	0.0024 U	0.002 U
Toluene	6	0.0026 =	0.00084 J	0.00078 J	0.0005 J
Ethylbenzene	10	0.0022 U	0.0022 U	0.00068 J	0.0006 J
Xylenes, Total	700	0.0006 J	0.0033 U	0.0036 U	0.0006 J
POLYNUCLEAR AROMATIC HYDROCARBONS					
2-Chloronaphthalene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Acenaphthene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Acenaphthylene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Anthracene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Benzo(a)anthracene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Benzo(a)pyrene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Benzo(b)fluoranthene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Benzo(g,h,i)perylene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Benzo(k)fluoranthene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Chrysene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Dibenzo(a,h)anthracene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Fluoranthene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Fluorene	NRC	1.46 U	1.48 U	0.366 U	0.0968 J
Indeno(1,2,3-cd)pyrene	NRC	1.46 U	1.48 U	0.366 U	0.362 U
Naphthalene	NRC	1.46 U	1.48 U	0.366 U	0.199 J
Phenanthrene	NRC	1.46 U	1.48 U	0.366 U	0.134 J
Pyrene	NRC	1.46 U	1.48 U	0.366 U	0.0405 J
OTHER ANALYTES					
Lead	NRC		3.2 =		26.3 =
Total Organic Carbon	NRC				
TPH-Diesel Range Organics	NRC		4.9 =		
Total Petroleum Hydrocarbons	NRC	172 =		97.6 =	347 =

NOTE:

Contract for the June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

November 1998 and February 1999 sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

Analytical data for QA/QC samples 800113 (duplicate) and 800613 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content, such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] Georgia Department of Natural Resources Applicable Soil Threshold Levels (Table A, Column 2)

Bold values exceed soil threshold levels

NRC No regulatory criteria

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.

R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA - Case No.: NA SAS No.: NA SDG No.: FS4A03S

Matrix: (soil/water) SOIL Lab Sample ID: 9806805-12

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P2019

Level: (low/med) LOW Date Received: 06/26/98

% Moisture: not dec. 8 Date Analyzed: 06/30/98

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

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.2	U
108-88-3	Toluene	67.6	
100-41-4	Ethylbenzene	2.2	U
1330-20-7	Xylenes (total)	6.5	U

CC=C

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LW
8-05-98

FORM I VOA

22

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A03S

Matrix: (soil/water) SOIL Lab Sample ID: 9806805-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7B319

Level: (low/med) LOW Date Received: 06/26/98

% Moisture: 8 decanted: (Y/N) N Date Extracted: 06/29/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 07/09/98

Injection Volume: 1.0 (uL) Dilution Factor: 4.0

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1450	U
91-58-7	2-chloronaphthalene	1450	U
208-96-8	acenaphthylene	1450	U
83-32-9	acenaphthene	1450	U
86-73-7	fluorene	1450	U
85-01-8	phenanthrene	1450	U
120-12-7	anthracene	1450	U
206-44-0	fluoranthene	1450	U
129-00-0	pyrene	1450	U
56-55-3	benzo(a)anthracene	1450	U
218-01-9	chrysene	1450	U
205-99-2	benzo(b)fluoranthene	1450	U
207-08-9	benzo(k)fluoranthene	1450	U
50-32-8	benzo(a)pyrene	1450	U
193-39-5	indeno(1,2,3-cd)pyrene	1450	U
53-70-3	dibenz(a,h)anthracene	1450	U
191-24-2	benzo(g,h,i)perylene	1450	U

U

LW
8-05-98

FORM I SV-1 OLM03.0

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: July 09, 1998

Sample ID	: 800111
Lab ID	: 9806805-12
Matrix	: Soil
Date Collected	: 06/25/98
Date Received	: 06/26/98
Priority	: Routine
Collector	: Client

DATA VALIDATION COPY

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		70.5	2.16	10.0	mg/kg	1.0	JLP	06/30/98	1600	125127	1

F08

M = Method	Method-Description
M 1	EPA 418.1 Modified

LW
8-18-98

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

DUPLICATE
EPA SAMPLE NO.

800113

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A03S

Matrix: (soil/water) SOIL Lab Sample ID: 9806805-13

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P2020

Level: (low/med) LOW Date Received: 06/26/98

% Moisture: not dec. 7 Date Analyzed: 06/30/98

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

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.2	U
108-88-3	Toluene	45.3	
100-41-4	Ethylbenzene	2.2	U
1330-20-7	Xylenes (total)	6.4	U

LW
8-05-98

FORM I VOA

DUPLICATE

EPA SAMPLE NO.

800113

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A03S

Matrix: (soil/water) SOIL Lab Sample ID: 9806805-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7B320

Level: (low/med) LOW Date Received: 06/26/98

% Moisture: 7 decanted: (Y/N) N Date Extracted: 06/29/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/09/98

Injection Volume: 1.0(uL) Dilution Factor: 4.0

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1430	U
91-58-7	2-chloronaphthalene	1430	U
208-96-8	acenaphthylene	1430	U
83-32-9	acenaphthene	1430	U
86-73-7	fluorene	1430	U
85-01-8	phenanthrene	1430	U
120-12-7	anthracene	1430	U
206-44-0	fluoranthene	1430	U
129-00-0	pyrene	1430	U
56-55-3	benzo(a)anthracene	1430	U
218-01-9	chrysene	1430	U
205-99-2	benzo(b)fluoranthene	1430	U
207-08-9	benzo(k)fluoranthene	1430	U
50-32-8	benzo(a)pyrene	1430	U
193-39-5	indeno(1,2,3-cd)pyrene	1430	U
53-70-3	dibenz(a,h)anthracene	1430	U
191-24-2	benzo(g,h,i)perylene	1430	U

U

LW 8-05-98

FORM I SV-1 OLM03.0

DUPLICATE

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: July 09, 1998

Sample ID	: 800113
Lab ID	: 9806805-13
Matrix	: Soil
Date Collected	: 06/25/98
Date Received	: 06/26/98
Priority	: Routine
Collector	: Client

DATA VALIDATION COPY

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		55.6	2.14	10.0	mg/kg	1.0	JLP	06/30/98	1600	125127	1

= FOR

M = Method	Method-Description -
M 1	EPA 418.1 Modified

LW
8-18-98

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

9806805-13

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VOLATILE ORGANICS 1A ANALYSIS DATA SHEET

EPA SAMPLE NO.

800121

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA - Case No.: NA SAS No.: NA SDG No.: FS4A03S

Matrix: (soil/water) SOIL Lab Sample ID: 9806805-19

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P2028

Level: (low/med) LOW Date Received: 06/26/98

% Moisture: not dec. 16 Date Analyzed: 07/01/98

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

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.4	U
108-88-3	Toluene	23.4	
100-41-4	Ethylbenzene	2.4	U
1330-20-7	Xylenes (total)	7.1	U

CCPC

LW
8-05-98

FORM I VOA

24

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800121

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A03S

Matrix: (soil/water) SOIL Lab Sample ID: 9806805-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7B405

Level: (low/med) LOW Date Received: 06/26/98

% Moisture: 16 decanted: (Y/N) N Date Extracted: 06/29/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 07/09/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	397	U
91-58-7	2-chloronaphthalene	397	U
208-96-8	acenaphthylene	397	U
83-32-9	acenaphthene	397	U
86-73-7	fluorene	397	U
85-01-8	phenanthrene	397	U
120-12-7	anthracene	397	U
206-44-0	fluoranthene	397	U
129-00-0	pyrene	397	U
56-55-3	benzo(a)anthracene	397	U
218-01-9	chrysene	397	U
205-99-2	benzo(b)fluoranthene	397	U
207-08-9	benzo(k)fluoranthene	397	U
50-32-8	benzo(a)pyrene	397	U
193-39-5	indeno(1,2,3-cd)pyrene	397	U
53-70-3	dibenz(a,h)anthracene	397	U
191-24-2	benzo(g,h,i)perylene	397	U

U

LW
8-05-98

FORM I SV-1

OLM03.0

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: July 09, 1998

Sample ID	: 800121
Lab ID	: 9806805-19
Matrix	: Soil
Date Collected	: 06/25/98
Date Received	: 06/26/98
Priority	: Routine
Collector	: Client

DATA VALIDATION COPY

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		13.3	2.36	10.0	mg/kg	1.0	JLP	06/30/98	1600	125127	1

F08

M = Method	Method-Description
M 1	EPA 418.1 Modified

LW
8-18-98

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

9806805-19

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4A03S

Method Type: Total Metals

Sample ID: 9806805-19

Client ID: 800121

Contract: SAIC00598 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 6/26/98 Level: LOW

% Solids: 84.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	7.6	mg/kg			P	0.17	TJA61 Trace ICPAES	980701-3

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

DATA VALIDATION COPY

DATA VALIDATION
COPY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800211

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A10S

Matrix: (soil/water) SOIL Lab Sample ID: 9806843-20

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P3039

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. 8 Date Analyzed: 07/02/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.2	U	U
108-88-3	Toluene	12.3		
100-41-4	Ethylbenzene	2.2	U	U
1330-20-7	Xylenes (total)	6.5	U	U

LW
8-14-98

FORM I VOA

DATA VALIDATION COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800211

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A10S

Matrix: (soil/water) SOIL Lab Sample ID: 9806843-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7C104

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: 8 decanted: (Y/N) N Date Extracted: 07/01/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 07/13/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	362	U
91-58-7	2-chloronaphthalene	362	U
208-96-8	acenaphthylene	362	U
83-32-9	acenaphthene	362	U
86-73-7	fluorene	362	U
85-01-8	phenanthrene	362	U
120-12-7	anthracene	362	U
206-44-0	fluoranthene	362	U
129-00-0	pyrene	362	U
56-55-3	benzo(a)anthracene	362	U
218-01-9	chrysene	362	U
205-99-2	benzo(b)fluoranthene	362	U
207-08-9	benzo(k)fluoranthene	362	U
50-32-8	benzo(a)pyrene	362	U
193-39-5	indeno(1,2,3-cd)pyrene	362	U
53-70-3	dibenz(a,h)anthracene	362	U
191-24-2	benzo(g,h,i)perylene	362	U

LW
8-14-98

FORM I SV-1

OLM03.0

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: August 06, 1998 Page 1 of 1

Sample ID	: 800211
Lab ID	: 9806843-20
Matrix	: Soil
Date Collected	: 06/26/98
Date Received	: 06/29/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		83.2	=	2.16	10.9	mg/kg	1.0	AAT	07/10/98	1030	125813	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

DATA VALIDATION COPY

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414
(803) 556-8171 • Fax (803) 766-1178
Printed on recycled paper.

9806843-20

DATA VALIDATION COPY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800221

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A11S

Matrix: (soil/water) SOIL Lab Sample ID: 9806844-08

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P3032

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. 10 Date Analyzed: 07/02/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q		
71-43-2	Benzene	2.2	U	U	
108-88-3	Toluene	4.6		=	
100-41-4	Ethylbenzene	2.2	U	UJ	C14
1330-20-7	Xylenes (total)	6.7	U	UJ	C14

LW
8-06-98

FORM I VOA

DATA VALIDATION COPY

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800221

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A11S

Matrix: (soil/water) SOIL Lab Sample ID: 9806844-08

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 4B503

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: 10 decanted: (Y/N) N Date Extracted: 07/06/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 07/10/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	370	U
91-58-7	2-chloronaphthalene	370	U
208-96-8	acenaphthylene	370	U
83-32-9	acenaphthene	370	U
86-73-7	fluorene	370	U
85-01-8	phenanthrene	370	U
120-12-7	anthracene	370	U
206-44-0	fluoranthene	370	U
129-00-0	pyrene	370	U
56-55-3	benzo(a)anthracene	370	U
218-01-9	chrysene	370	U
205-99-2	benzo(b)fluoranthene	370	U
207-08-9	benzo(k)fluoranthene	370	U
50-32-8	benzo(a)pyrene	370	U
193-39-5	indeno(1,2,3-cd)pyrene	370	U
53-70-3	dibenz(a,h)anthracene	370	U
191-24-2	benzo(g,h,i)perylene	370	U

U

LW
8-10-98

FORM I SV-1

OLM03.0

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: July 14, 1998

Sample ID	: 800221
Lab ID	: 9806844-08
Matrix	: Soil
Date Collected	: 06/26/98
Date Received	: 06/29/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	3.94	2.20	11.1	mg/kg	1.0	JLP	07/09/98	1100	125709	1

U
FDL

M = Method	Method-Description
M 1	EPA 418.1 Modified

LW
8-21-98

Notes:
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standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

DATA VALIDATION COPY

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4A11S

Method Type: Total Metals

Sample ID: 9806844-08

Client ID: 800221

Contract: SAIC00598 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 6/29/98 Level: LOW

% Solids: 90.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	1.1	mg/kg			P	0.16	TJA61 Trace ICPAES	980630-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

DATA VALIDATION COPY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800311

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A10S

Matrix: (soil/water) SOIL Lab Sample ID: 9806843-18

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P3037

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. 9 Date Analyzed: 07/02/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.2	U
108-88-3	Toluene	216	
100-41-4	Ethylbenzene	2.2	U
1330-20-7	Xylenes (total)	6.6	U

CC = C

LW
8-14-98

FORM I VOA

DATA VALIDATION COPY

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800311

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A10S

Matrix: (soil/water) SOIL Lab Sample ID: 9806843-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7B510

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: 9 decanted: (Y/N) N Date Extracted: 07/01/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 07/10/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	366	U
91-58-7	2-chloronaphthalene	366	U
208-96-8	acenaphthylene	366	U
83-32-9	acenaphthene	366	U
86-73-7	fluorene	366	U
85-01-8	phenanthrene	366	U
120-12-7	anthracene	366	U
206-44-0	fluoranthene	366	U
129-00-0	pyrene	366	U
56-55-3	benzo(a)anthracene	366	U
218-01-9	chrysene	366	U
205-99-2	benzo(b)fluoranthene	366	U
207-08-9	benzo(k)fluoranthene	366	U
50-32-8	benzo(a)pyrene	366	U
193-39-5	indeno(1,2,3-cd)pyrene	366	U
53-70-3	dibenz(a,h)anthracene	366	U
191-24-2	benzo(g,h,i)perylene	366	U

LW
8-14-98

FORM I SV-1

OLM03.0

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: July 14, 1998 Page 1 of 1

Sample ID : 800311
Lab ID : 9806843-18
Matrix : Soil
Date Collected : 06/26/98
Date Received : 06/29/98
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		613	=	54.5	275	mg/kg	25.	AAT	07/10/98	1030	125813	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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DATA VALIDATION COPY

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414
(803) 556-8171 • Fax (803) 766-1178

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9806843-18

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800321

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A11S

Matrix: (soil/water) SOIL Lab Sample ID: 9806844-11

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P3016

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. 15 Date Analyzed: 07/01/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.4	U
108-88-3	Toluene	70.7	
100-41-4	Ethylbenzene	2.4	U
1330-20-7	Xylenes (total)	7.0	U

LW
8-06-98

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800321

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A11S

Matrix: (soil/water) SOIL Lab Sample ID: 9806844-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 4B506

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: 15 decanted: (Y/N) N Date Extracted: 07/06/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 07/10/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	392	U
91-58-7	2-chloronaphthalene	392	U
209-96-8	acenaphthylene	392	U
83-32-9	acenaphthene	392	U
86-73-7	fluorene	392	U
85-01-8	phenanthrene	392	U
120-12-7	anthracene	392	U
206-44-0	fluoranthene	392	U
129-00-0	pyrene	392	U
56-55-3	benzo(a)anthracene	392	U
218-01-9	chrysene	392	U
205-99-2	benzo(b)fluoranthene	392	U
207-08-9	benzo(k)fluoranthene	392	U
50-32-8	benzo(a)pyrene	392	U
193-39-5	indeno(1,2,3-cd)pyrene	392	U
53-70-3	dibenz(a,h)anthracene	392	U
191-24-2	benzo(g,h,i)perylene	392	U

LW
8-10-98

FORM I SV-1

OLM03.0

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: July 14, 1998

Sample ID	: 800321
Lab ID	: 9806844-11
Matrix	: Soil
Date Collected	: 06/26/98
Date Received	: 06/29/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	4.76	2.34	11.8	mg/kg	1.0	JLP	07/09/98	1100	125709	1
TOTAL ORGANIC CARBON (TOC)		15900	24.1	100	mg/kg	1.0	LS	07/09/98	1523	125629	2

FD
U F01,
= F08

M = Method	Method-Description
M 1	EPA 418.1 Modified
M 2	SW846 9060 modified

LW
8-21-98

Notes:
The qualifiers in this report are defined as follows:
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

9806844-11

DATA VALIDATION COPY

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS4A11S

Method Type: Total Metals

Sample ID: 9806844-11

Client ID: 800321

Contract: SAIC00598 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 6/29/98 Level: LOW

% Solids: 85.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	9.3	mg/kg			P	0.17	TJA61 Trace ICPAES	980630-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

DATA VALIDATION COPY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800411

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A10S

Matrix: (soil/water) SOIL Lab Sample ID: 9806843-11

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P3015

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. 12 Date Analyzed: 07/01/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q		
71-43-2	Benzene	4.9	P	J	M08
108-88-3	Toluene	14.6		=	
100-41-4	Ethylbenzene	2.3	U	U	
1330-20-7	Xylenes (total)	6.8	U	UJ	C14

LW
8-14-98

FORM I VOA

DATA VALIDATION COPY

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800411

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A10S

Matrix: (soil/water) SOIL Lab Sample ID: 9806843-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7B420

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: 12 decanted: (Y/N) N Date Extracted: 07/01/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 07/10/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

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

U

LW
8-14-98

FORM I SV-1

OLM03.0

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598

Report Date: July 14, 1998

Sample ID	: 800411
Lab ID	: 9806843-11
Matrix	: Soil
Date Collected	: 06/26/98
Date Received	: 06/29/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		21.3	=	2.26	11.4	mg/kg	1.0	JLP	06/30/98	1600	125127	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
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in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

295

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800421

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A11S

Matrix: (soil/water) SOIL Lab Sample ID: 9806844-04

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2P308

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. 21 Date Analyzed: 07/01/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.4	J
108-88-3	Toluene	182	
100-41-4	Ethylbenzene	2.5	U
1330-20-7	Xylenes (total)	7.6	U

ug/L

LW
8-06-98

FORM I VOA

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800421

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A11S

Matrix: (soil/water) SOIL Lab Sample ID: 9806844-04

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 4B417

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: 21 decanted: (Y/N) N Date Extracted: 07/06/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 07/10/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	422	U
91-58-7	2-chloronaphthalene	422	U
209-96-8	acenaphthylene	422	U
83-32-9	acenaphthene	422	U
86-73-7	fluorene	422	U
85-01-8	phenanthrene	422	U
120-12-7	anthracene	422	U
206-44-0	fluoranthene	422	U
129-00-0	pyrene	422	U
56-55-3	benzo(a)anthracene	422	U
218-01-9	chrysene	422	U
205-99-2	benzo(b)fluoranthene	422	U
207-08-9	benzo(k)fluoranthene	422	U
50-32-8	benzo(a)pyrene	422	U
193-39-5	indeno(1,2,3-cd)pyrene	422	U
53-70-3	dibenz(a,h)anthracene	422	U
191-24-2	benzo(g,h,i)perylene	422	U

U

LWJ
8-10-98

FORM I SV-1 OLM03.0

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part A for UST Sites (Task Order No. 8)

cc: SAIC00598 Report Date: July 14, 1998

Sample ID	: 800421
Lab ID	: 9806844-04
Matrix	: Soil
Date Collected	: 06/26/98
Date Received	: 06/29/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	5.72	2.51	12.7	mg/kg	1.0	JLP	07/09/98	1100	125709	1

U FC
FDC

M = Method	Method-Description
M 1	EPA 418.1 Modified

LW
8-21-98

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Reviewed By

9806844-04

DATA VALIDATION COPY

Form I: Inorganic Analyses Data Sheet

SDG No.: FS4A11S

Method Type: Total Metals

Sample ID: 9806844-04

Client ID: 800421

Contract: SAIC00598 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 6/29/98 Level: LOW

% Solids: 79.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	5.3	mg/kg			P	0.19	TJA61 Trace ICPAES	980630-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

1 of 4

CHAIN OF CUSTODY RECORD

COC NO.: GA006

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
880111	6/24/98	1505	Soil						1	1			2	9806805-01 33018
880211	6/25/98	1020							1	1			2	-02
880123	6/25/98	855							1	1			2	-03
880411	6/24/98	1350							1	1			2	-04
880421	6/24/98	1415							1		1		2	-05
880121	6/25/98	855							1		1		2	-06
880221	6/25/98	1035							1		1		2	-07
860111	6/25/98	1430		1		1							2	-08
860411	6/25/98	1000		1		1							2	-09
810113	6/25/98	1830		1		1							2	-10
810211	6/25/98	1705		1		1							2	-11
800111	6/25/98	1515		1		1							2	-12
800113	6/25/98	1515		1		1							2	-13

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/26/98 12:55	Diane Marcus	6/26/98 1640
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Raymond Reed	Date/Time 6/26/98 12:55	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: Raymond Reed	Date/Time 6/26/98 16:40	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #627

Cooler Temperature: 4°C

FEDEX NUMBER:

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2 of 4

CHAIN OF CUSTODY RECORD

COC NO.: GA0006

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
810111	6/25/98	1635	Soil	1		1							2	9806805-14 33618 13
810221	6/25/98	1715		1			1						2	-15 14
860121	6/25/98	~~1630~~ 1455		1			1						2	-16
810121	6/25/98	1830		1			1						2	-17
860421	6/25/98	935		1			1						2	-18
800121	6/25/98	1540		1			1						2	-19
880112	6/25/98	925	Water	2									2	9806806-01 33619 1
810512	6/25/98	1510		2									2	-02
830512	6/25/98	1655		2									2	-03
810514	6/25/98	1510		2									2	-04
830532	6/25/98	1640		2									2	-05
830522	6/25/98	1755		2									2	-06
810522	6/25/98	1555		2									2	-07

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/26/98 12:55	Donna Francis	6/26/98 1640
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Raymond Reed	Date/Time 6/26/98	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	12:55	COMPANY NAME:	
RELINQUISHED BY: Raymond Reed	Date/Time 6/26/98	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	16:40	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #627

Cooler Temperature: 4°C

FEDEX NUMBER:

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1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GA017

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
840211	6/27/98	1330	Soil	1		1							2	33643 14 9806843-07
830221	6/26/98	1720		1		1							2	-08
840311	6/27/98	920		1		1							2	-09
860311	6/27/98	1645		1		1							2	-10
800411	6/26/98	1105		1		1							2	-11
830111	6/26/98	1610		1		1							2	-12
810411	6/27/98	925		1		1							2	-13
840421	6/27/98	1200		1		1							2	-14
860211	6/26/98	1115		1		1							2	-15
840111	6/27/98	1300		1		1							2	-16
830311	6/26/98	1820		1		1							2	-17
800311	6/26/98	930		1		1							2	-18
830411	6/26/98	1855		1		1							2	-19

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98	[illegible]	6/29/98
COMPANY NAME: SAIC	1215	COMPANY NAME: GEL	1645
RECEIVED BY: [illegible]	Date/Time 6-29-98	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	1215	COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 6/29/98	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	1645	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: # 643

Cooler Temperature: 4°C

FEDEX NUMBER:

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

-012

CHAIN OF CUSTODY RECORD

COC NO.: GA017

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
800211	6/26/98	1205	Soil	1		1							2	33643.4 9806843-20
810421	6/27/98	935		1			1						2	9806844-01 33604.1
840221	6/27/98	1350		1			1						2	-02
830321	6/26/98	825		1			1						2	-03
800421	6/26/98	1140		1			1						2	-04
830123	6/26/98	1650		1			1						2	-05
830421	6/26/98	1910		1			1						2	-06
840411	6/27/98	1135		1			1						2	-07
800221	6/26/98	1220		1			1						2	-08
830121	6/26/98	1650		1			1						2	-09
830211	6/26/98	1714		1				1					2	-10
800321	6/26/98	935		1				1					2	-11
840321	6/27/98	925		1				1					2	-12

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98	D Francis	6/29/98
COMPANY NAME: SAIC	1215	COMPANY NAME: GEL	1645
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
[illegible]	6-29-98		
COMPANY NAME: GEL	1215	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
[illegible]	6/29/98		
COMPANY NAME: GEL	1645	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 52

Cooler ID: #643

Cooler Temperature: 4°C

FEDEX NUMBER:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800611

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-09

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 7J529

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: not dec. 11 Date Analyzed: 11/20/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	benzene	2.2	U
108-88-3	toluene	12.3	
100-41-4	ethylbenzene	1.5	J
1330-20-7	xylenes (total)	2.6	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800611

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-09

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V117

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: 11 decanted: (Y/N) N Date Extracted: 11/18/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 11/23/98

Injection Volume: 1.0 (uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1500	U
91-58-7	2-chloronaphthalene	1500	U
208-96-8	acenaphthylene	1500	U
83-32-9	acenaphthene	1500	U
86-73-7	fluorene	1500	U
85-01-8	phenanthrene	1500	U
120-12-7	anthracene	1500	U
206-44-0	fluoranthene	91.9	J
129-00-0	pyrene	95.1	J
56-55-3	benzo(a)anthracene	1500	U
218-01-9	chrysene	1500	U
205-99-2	benzo(b)fluoranthene	1500	U
207-08-9	benzo(k)fluoranthene	1500	U
50-32-8	benzo(a)pyrene	1500	U
193-39-5	indeno(1,2,3-cd)pyrene	1500	U
53-70-3	dibenz(a,h)anthracene	1500	U
191-24-2	benzo(g,h,i)perylene	1500	U

FORM I SV-1 OLM03.0

DATA VALIDATION
COPY

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part A for UST Sites

cc: SAIC01498 Report Date: December 03, 1998

Sample ID	: 800611
Lab ID	: 9811477-09
Matrix	: Soil
Date Collected	: 11/13/98
Date Received	: 11/14/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		93.0	=	5.56	11.2	mg/kg	1.0	AAT	11/30/98	1000	136808	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

9811477.00

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DUPLICATE

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800613

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-05

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 7J525

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: not dec. 7 Date Analyzed: 11/20/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	2.2	U	U
108-88-3	toluene	0.90	J	
100-41-4	ethylbenzene	2.2	U	U
1330-20-7	xylenes (total)	3.2	U	U

FORM I VOA OLM03.0

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DUPLICATE

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800613

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-05

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V113

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: 7 decanted: (Y/N) N Date Extracted: 11/18/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/23/98

Injection Volume: 1.0(uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
91-20-3	naphthalene	1430	U	U
91-58-7	2-chloronaphthalene	1430	U	
208-96-8	acenaphthylene	1430	U	
83-32-9	acenaphthene	1430	U	
86-73-7	fluorene	1430	U	
85-01-8	phenanthrene	1430	U	
120-12-7	anthracene	1430	U	
206-44-0	fluoranthene	127	J	J
129-00-0	pyrene	120	J	
56-55-3	benzo(a)anthracene	82.4	J	
218-01-9	chrysene	79.4	J	
205-99-2	benzo(b)fluoranthene	1430	U	U
207-08-9	benzo(k)fluoranthene	1430	U	
50-32-8	benzo(a)pyrene	1430	U	
193-39-5	indeno(1,2,3-cd)pyrene	1430	U	
53-70-3	dibenz(a,h)anthracene	1430	U	
191-24-2	benzo(g,h,i)perylene	1430	U	

FORM I SV-1 OLM03.0

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DATA VALIDATION
COPY

DUPLICATE

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part A for UST Sites

cc: SAIC01498 Report Date: December 03, 1998

Sample ID	: 800613
Lab ID	: 9811477-05
Matrix	: Soil
Date Collected	: 11/13/98
Date Received	: 11/14/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		190	=	5.33	10.8	mg/kg	1.0	AAT	11/30/98	1000	136808	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

199

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800621

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-16

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 7J536

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: not dec. 7 Date Analyzed: 11/21/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	2.2	U	U
108-88-3	toluene	2.4		J HD4
100-41-4	ethylbenzene	2.2	U	U
1330-20-7	xylenes (total)	0.67	J	J HD4

FORM I VOA OLM03.0

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800621

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V124

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: 7 decanted: (Y/N) N Date Extracted:11/18/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/24/98

Injection Volume: 1.0(uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1430	U
91-58-7	2-chloronaphthalene	1430	U
208-96-8	acenaphthylene	1430	U
83-32-9	acenaphthene	1430	U
86-73-7	fluorene	1430	U
85-01-8	phenanthrene	1430	U
120-12-7	anthracene	1430	U
206-44-0	fluoranthene	1430	U
129-00-0	pyrene	1430	U
56-55-3	benzo(a)anthracene	1430	U
218-01-9	chrysene	1430	U
205-99-2	benzo(b)fluoranthene	1430	U
207-08-9	benzo(k)fluoranthene	1430	U
50-32-8	benzo(a)pyrene	1430	U
193-39-5	indeno(1,2,3-cd)pyrene	1430	U
53-70-3	dibenz(a,h)anthracene	1430	U
191-24-2	benzo(g,h,i)perylene	1430	U

U

FORM I SV-1 OLM03.0

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Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part A for UST Sites

cc: SAIC01498 Report Date: December 03, 1998

Sample ID	: 800621
Lab ID	: 9811477-16
Matrix	: Soil
Date Collected	: 11/13/98
Date Received	: 11/14/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		571	=	66.6	135	mg/kg	13.	AAT	11/30/98	1000	136808	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

207

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS6008S

Method Type: Total Metals

Sample ID: 9811477-16

Client ID: 800621

Contract: SAIC01498 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 11/14/98 Level: LOW

% Solids: 93.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	25.5	mg/kg			P	0.16	TJA61 Trace ICPAES	981124-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800711

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-06

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 7J526

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: not dec. 9 Date Analyzed: 11/20/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	benzene	2.2	U
108-88-3	toluene	2.6	
100-41-4	ethylbenzene	2.2	U
1330-20-7	xylenes (total)	0.60	J

genc

FORM I VOA OLM03.0

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800711

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-06

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V114

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: 9 decanted: (Y/N) N Date Extracted: 11/18/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/23/98

Injection Volume: 1.0(uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1460	U
91-58-7	2-chloronaphthalene	1460	U
208-96-8	acenaphthylene	1460	U
83-32-9	acenaphthene	1460	U
86-73-7	fluorene	1460	U
85-01-8	phenanthrene	1460	U
120-12-7	anthracene	1460	U
206-44-0	fluoranthene	1460	U
129-00-0	pyrene	1460	U
56-55-3	benzo(a)anthracene	1460	U
218-01-9	chrysene	1460	U
205-99-2	benzo(b)fluoranthene	1460	U
207-08-9	benzo(k)fluoranthene	1460	U
50-32-8	benzo(a)pyrene	1460	U
193-39-5	indeno(1,2,3-cd)pyrene	1460	U
53-70-3	dibenz(a,h)anthracene	1460	U
191-24-2	benzo(g,h,i)perylene	1460	U

U

FORM I SV-1 OLM03.0

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DATA VALIDATION
COPY

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part A for UST Sites

cc: SAIC01498 Report Date: December 03, 1998

Sample ID	: 800711
Lab ID	: 9811477-06
Matrix	: Soil
Date Collected	: 11/13/98
Date Received	: 11/14/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
Total Rec. Petro. Hydrocarbons		172	=	5.45	11.0	mg/kg	1.0	AAT	11/30/98	1000	136808	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800721

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-12

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 7J532

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: not dec. 10 Date Analyzed: 11/21/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	2.2	U	U
108-88-3	toluene	0.84	J	
100-41-4	ethylbenzene	2.2	U	U
1330-20-7	xylenes (total)	3.3	U	U

FORM I VOA OLM03.0

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800721

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V120

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: 10 decanted: (Y/N) N Date Extracted: 11/18/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/23/98

Injection Volume: 1.0(uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1480	U
91-58-7	2-chloronaphthalene	1480	U
208-96-8	acenaphthylene	1480	U
83-32-9	acenaphthene	1480	U
86-73-7	fluorene	1480	U
85-01-8	phenanthrene	1480	U
120-12-7	anthracene	1480	U
206-44-0	fluoranthene	1480	U
129-00-0	pyrene	1480	U
56-55-3	benzo(a)anthracene	1480	U
218-01-9	chrysene	1480	U
205-99-2	benzo(b)fluoranthene	1480	U
207-08-9	benzo(k)fluoranthene	1480	U
50-32-8	benzo(a)pyrene	1480	U
193-39-5	indeno(1,2,3-cd)pyrene	1480	U
53-70-3	dibenz(a,h)anthracene	1480	U
191-24-2	benzo(g,h,i)perylene	1480	U

U

FORM I SV-1 OLM03.0

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FORM 1 Science Applications14-NOV-1998 SA

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

800721

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6008S

Matrix: (soil/water) SOIL Lab Sample ID: 9811477-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 11D1028

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: 10 decanted: (Y/N) N Date Extracted:11/20/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/23/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
	----------Diesel Range Organics_____	4.9	B

= FD8

FORM I SV

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS6008S

Method Type: Total Metals

Sample ID: 9811477-12

Client ID: 800721

Contract: SAIC01498 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 11/14/98 Level: LOW

% Solids: 90.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	3.2	mg/kg			P	0.17	TJA61 Trace ICPAES	981124-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

1 of 3

CHAIN OF CUSTODY RECORD

COC NO.: GA010

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-9805-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, DRO, Lead	PAH, TPH, Lead	PAH, DRO, Lead, TOC	PAH, TPH, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
160921	11/13/98	1600	Soil			✓			✓				2	9811477-01
160821	11/13/98	1500				✓			✓				2	-02
160911	11/13/98	1600				✓	✓						2	-03
160811	11/13/98	1500				✓	✓						2	-04
800613	11/13/98	1615		✓				✓					2	-05
800711	11/13/98	1215		✓				✓					2	-06
840611	11/13/98	915		✓				✓					2	-07
840811	11/13/98	1030		✓				✓					2	-08
800611	11/13/98	1615		✓				✓					2	-09
860711	11/13/98	1745		✓				✓					2	-10
840621	11/13/98	915		✓					✓				2	-11
800721	11/13/98	1215		✓					✓				2	-12
840821	11/13/98	1030		✓					✓				2	-13

3667 .1 .2 .3 .4

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/14/98 1105	[illegible]	11/14/98 1330
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Carol Sandel	Date/Time 11/14/98 1105	RELINQUISHED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	
RELINQUISHED BY: Carol Sandel	Date/Time 11/14/98 1330	RECEIVED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #712

Cooler Temperature:

FEDEX NUMBER:

NOTE: Cooler Receipt Checklist indicates a cooler temperature of 3°-5° C upon arrival at the laboratory.

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

2 of 3

CHAIN OF CUSTODY RECORD

COC NO.: GA010

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-9805-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, DRO, Lead	PAH, TPH, Lead	PAH, DRO, Lead, TOC	PAH, TPH, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
840623	11/13/98	915	Soil	1						1			2	9811477-14
860721	11/13/98	1745	↓	1						1			2	-15
800621	11/13/98	1615	↓	1						1			2	-16
680642	11/13/98	1745	water	2									2	9811478-01
680632	11/13/98	1640	↓	2									2	02
860712	11/13/98	1745	↓	2									2	-03
* 160912	11/13/98	1600	↓	2									2	04
680622	11/13/98	1615	↓	2									2	-05
680612	11/13/98	1550	↓	2									2	-06
160842	11/13/98	1500	↓	2									2	-07
920812	11/13/98	950	↓	2									2	-08
800612	11/13/98	1615	↓	2									2	-09
840812	11/13/98	1635	↓	2									2	-10

366935 ↓ 366940

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/14/98 1105	[illegible]	11/14/98 1330
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Carol Sandel	Date/Time 11/14/98 1105	RELINQUISHED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	
RELINQUISHED BY: Carol Sandel	Date/Time 11/14/98 1330	RECEIVED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #712

Cooler Temperature:

FEDEX NUMBER:

NOTE: Cooler Receipt Checklist indicates a cooler temperature of 3°-5°C upon arrival at the laboratory.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800911

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA09S

Matrix: (soil/water) SOIL Lab Sample ID: 9902838-09

Sample wt/vol: 4.6 (g/mL) G Lab File ID: 2Y415

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: not dec. 9 Date Analyzed: 03/04/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	benzene	2.4	U
108-88-3	toluene	0.77	J
100-41-4	ethylbenzene	0.68	J
1330-20-7	xylenes (total)	3.6	U

FORM I VOA OLM03.0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800911

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA09S

Matrix: (soil/water) SOIL Lab Sample ID: 9902838-09

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7I506

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: 9 decanted: (Y/N) N Date Extracted: 02/24/99

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 02/26/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	366	U
91-58-7	2-chloronaphthalene	366	U
208-96-8	acenaphthylene	366	U
83-32-9	acenaphthene	366	U
86-73-7	fluorene	366	U
85-01-8	phenanthrene	366	U
120-12-7	anthracene	366	U
206-44-0	fluoranthene	366	U
129-00-0	pyrene	366	U
56-55-3	benzo(a)anthracene	366	U
218-01-9	chrysene	366	U
205-99-2	benzo(b)fluoranthene	366	U
207-08-9	benzo(k)fluoranthene	366	U
50-32-8	benzo(a)pyrene	366	U
193-39-5	indeno(1,2,3-cd)pyrene	366	U
53-70-3	dibenz(a,h)anthracene	366	U
191-24-2	benzo(g,h,i)perylene	366	U

U

FORM I SV-1 OLM03.0

DATA VALIDATION COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Leslie Barbour
Project Description: CAP-Part A and B UST Sites

cc: SAIC00299

Report Date: March 17, 1999

Sample ID	: 800911
Lab ID	: 9902838-09
Matrix	: Soil
Date Collected	: 02/21/99
Date Received	: 02/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		97.6	10.9	22.0	mg/kg	1.0	AAT	03/16/99	1500	144666	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800921

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA09S

Matrix: (soil/water) SOIL Lab Sample ID: 9902838-03

Sample wt/vol: 5.4 (g/mL) G Lab File ID: 2Y430

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: not dec. 8 Date Analyzed: 03/04/99

GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	benzene	2.0	U
108-88-3	toluene	0.50	J
100-41-4	ethylbenzene	0.60	J
1330-20-7	xylenes (total)	0.60	J

U
J

FORM I VOA OLM03.0

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800921

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA09S

Matrix: (soil/water) SOIL Lab Sample ID: 9902838-03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7I422

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: 8 decanted: (Y/N) N Date Extracted: 02/24/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/26/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	199	J
91-58-7	2-chloronaphthalene	362	U
208-96-8	acenaphthylene	362	U
83-32-9	acenaphthene	362	U
86-73-7	fluorene	96.8	J
85-01-8	phenanthrene	134	J
120-12-7	anthracene	362	U
206-44-0	fluoranthene	362	U
129-00-0	pyrene	40.5	J
56-55-3	benzo(a)anthracene	362	U
218-01-9	chrysene	362	U
205-99-2	benzo(b)fluoranthene	362	U
207-08-9	benzo(k)fluoranthene	362	U
50-32-8	benzo(a)pyrene	362	U
193-39-5	indeno(1,2,3-cd)pyrene	362	U
53-70-3	dibenz(a,h)anthracene	362	U
191-24-2	benzo(g,h,i)perylene	362	U

FORM I SV-1 OLM03.0

Form 1: Inorganic Analyses Data Sheet

SDG No.: FSA09S

Method Type: Total Metals

Sample ID: 9902838-03

Client ID: 800921

Contract: SAIC00299 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 2/22/99 Level: LOW

% Solids: 92.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-92-1	Lead	26.3	mg/kg	=		P	0.15	TJA61 Trace ICPAES	990308-1

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Leslie Barbour
Project Description: CAP-Part A and B UST Sites

cc: SAIC00299 Report Date: March 17, 1999

Sample ID	: 800921
Lab ID	: 9902838-03
Matrix	: Soil
Date Collected	: 02/21/99
Date Received	: 02/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		347	10.8	21.7	mg/kg	1.0	AAT	03/16/99	1500	144666	1

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: D03512

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1593-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, TPH	PAH, TPH, Lead	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	Ethylene Glycol	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
040311	2/21/99	1545	Soil	1				1					2	99028 38-01
621021	2/21/99	1235		1				1					2	-02
800921	2/21/99	1440		1				1					2	-03
860921	2/21/99	1040		1				1					2	-04
861021	2/21/99	915		1				1					2	-05
621011	2/21/99	1240		1									2	-06
860911	2/21/99	1020		1									2	-07
861011	2/21/99	920		1									2	-08
800911	2/21/99	1445		1									2	-09
970111	2/22/99	825		1				1					2	-10
841412	2/20/99	1600	Water		2								2	99028 39-01
970112	2/22/99	845		2	2								4	02
530512	2/19/99	1800										2	2	03

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	2/22/99 1145	[illegible]	2/22/99 1530
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: [illegible]	2/22/99 1145	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	2/22/99 1530	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #244 / 4°C

Cooler Temperature:

FEDEX NUMBER:

PERMEABILITY TEST ANALYSIS (ASTM D5084)

Project : Fort Stewart

Location of Project : CAP Part A

Description of Soil : Dark Brown Silty Sand

Job # : 98066
Date of Testing: 7/29-31/98
Tested by: BV-CA
Boring # :
Sample # : 800331
Sample Depth :

Sample Type (Undisturbed or Remolded)
Standard Proctor:
Maximim Dry Density: _____ pcf
Optimum Moisture Content: _____ %

% Sample Compaction: _____ %
Sample Dry Density: _____ pcf
Sample Moisture Content: _____ %
Sample Wet Density: _____ pcf

Sample Permeation:

De-Aired Water
% Saturation: 98 %
Cell Pressure: 75 psi
Lower Pressure: 71 psi
Upper Pressure: 70 ' psi
Gradient: 14.97

Sample Dimensions		
	Before	After
Length (cm)	4.70	4.10
Diameter (cm)	4.70	4.85
Water Content (%)	20.0	22.7
Weight (g)	145.1	139.7

Constant Head Calculation:

$$K = [V(t_1,t_2)\ LR_T]/[P_B A t]\ \text{(cm/sec)}$$

$V(t_1,t_2)$ = Volume of flow from t_1 to t_2 (cm^2)
L = Length of Sample = 4.70 cm
A = Area of Sample = 17.35 cm^2
t = $t_2 - t_1$ (sec)
P_B = Bias Pressure = 1 psi x 70.37 cm/psi $_{(cm - H2O)}$ 70.37 cm
R_T = Temperature correction = 0.931

t_2 (min)	t_1 (min)	$(t_2 - t_1)*60$ (sec)	V (cm^3)	$[LR_T]/[P_B A]$ (cm^3)	K (cm/sec)
314	313	60	0.6	3.58E-03	3.58E-05
316	315	60	0.7	3.58E-03	4.18E-05
317	316	60	0.6	3.58E-03	3.58E-05
318	317	60	0.7	3.58E-03	4.18E-05

K_{avg} = 3.88E-05 cm/sec

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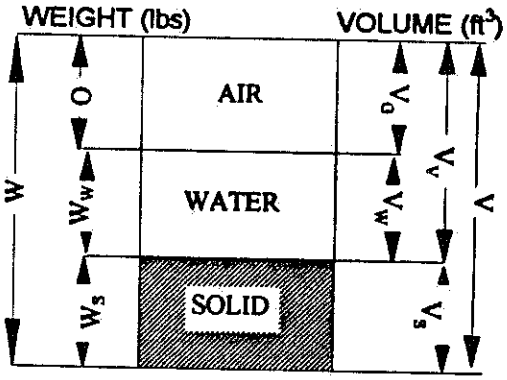
SPECIFIC GRAVITY AND POROSITY

PROJECT: Fort Stewart
LOCATION OF PROJECT: CAP Part A
DESCRIPTION OF SOIL: Dark Brown Silty Sand
TESTED BY: B.J. Vance

JOB NO.: 98066
SAMPLE NO: 800331
DEPTH OF SAMPLE:
DATE OF TESTING: 7/29/98



$W = 1.12632$
$W_W = W - W_S = 0.15235$
$W_S = Y_d{*}V = 0.9740$

$V = 0.00833$
$V_W = W_W/Y_W = 0.0024$
$V_S = W_S/G_S{*}Y_W = 0.0052$
$V_G = V - (V_S + V_W) = 0.00069$
$V_V = V_G + V_W = 0.0031$

MEASUREMENTS OF TUBE/CAN

HEIGHT= 13.6 cm
DIAMETER= 4.7 cm

CALCULATED VOLUME OF TUBE/CAN

V= 235.95 cm^3
0.00833 ft^3

WT. OF TUBE/CAN + WET SOIL= 763.60 g
WEIGHT OF TUBE/CAN= 252.7 g
WEIGHT OF WET SOIL= 510.90 g
W = 1.12632 lb

MOISTURE CONTENT

M_{CWS} = 31.60 g
M_{CDS} = 29.36 g
M_W = 2.24 g
M_C = 15.04 g
M_S = 14.32 g
w = 15.6 %

Wet Density, $Y_m = W / V$

Dry Density, $Y_d = W_s / V$ or $Y_d = Y_m / (1+ w)$

double check	$Y_d = Y_m / (1+ w)$
$Y_d = W_s / V$	Y_m= 135.15 lbs/ft^3
Y_d= 116.87 lbs/ft^3	Y_d= 116.87 lbs/ft^3

Void Ratio, $e = V_V/V_S$
e = 0.6026

Porosity, $n = V_V / V$
n = 0.38

Specific Gravity = 3.00

Degree of Saturation, $S = V_W/V_V$
S = 0.7788

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GRAIN SIZE ANALYSIS-SIEVE (ASTM D422)

Project Fort Stewart — Job No. 98060

Location of Project Camp Part A. — Sample No. ~~#~~ 800331

Description of Soil Dk Brown Silty Sand — Depth of Sample — Boring No.

Tested By CA — Date of Testing 7/23/90

Sample preparation procedures outlined in ASTM D421 and D2217.

Nominal diameter of largest particle	Approximate minimum Wt. of sample, g
No. 10 sieve	200
No. 4 sieve	500
3/4 in.	1500

Weight of sample used, M_{ws} = _____ g

M_{cwt}	M_{ada}	M_c x3	M_w	M_s	w %	M_{ws}	M_s
		112.14					1331.2

Sieve analysis and grain shape

Sieve no.	Diam. (mm)	Wt. retained	% retained	Σ % retained	% passing
3"					
2"					
1 1/2 "					
3/4"					
3/8"					
#4		0.43	0.32	0.32	99.68
#10		6.38	4.79	5.11	94.89
#20		25.10	18.86	23.97	76.03
#40		17.13	12.87	36.84	63.16
#60		18.98	14.26	51.1	48.9
#140		50.93	38.24	89.36	10.64
#200		1.73	1.30	90.66	9.34
pan		0.19	0.14	90.80	—

% retained = (Wt. retained/W_s) · 100

% passing = 100 - Σ % retained.

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APPENDIX VI

ALTERNATE THRESHOLD LEVEL (ATL) CALCULATIONS

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The contaminant concentrations in soil did not exceed their respective soil threshold levels, thus no alternate threshold levels were calculated.

The maximum benzene concentration in groundwater was 229 μg/L in June 1998. The modeling of benzene estimated infinite dilution attenuation factors (DAFs) for the drainage ditch and Mill Creek indicating that contamination will never reach these locations, thus no alternate concentration limits were developed for these locations. The results of fate and transport modeling are presented in Attachment C.

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APPENDIX VII

MONITORING WELL DETAILS

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Monitoring wells were not installed as part of the CAP-Part A investigation. Temporary piezometers were installed at the UST 38 site for the determination of free product. Refer to Figure 5 (Appendix I) for locations and screened intervals.

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APPENDIX VIII

GROUNDWATER LABORATORY RESULTS

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TABLE VIII-A. Summary of Groundwater Analytical Results

Station:		In Stream	80-01	80-02	80-03	80-04	80-05
Sample ID:	Federal	Water	800112	800212	800312	800412	800512
Screened Interval (ft BGS)	SDWA	Quality	4.0' - 9.0'	6.0' - 11.0'	5.0' - 10.0'	7.0' - 12.0'	6.0' - 10.0'
Collection Date:	MCLs	Standards	25-Jun-98	28-Jun-98	26-Jun-98	26-Jun-98	28-Jun-98
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS							
Benzene	5	71.28	2.7 =	2 U	**34.4** =	**25.8** =	**229** =
Toluene	1000	200000	2 U	5.6 J	2 U	2 U	6.3 J
Ethylbenzene	700	28718	2 U	2 U	8.6 =	2 U	94.6 =
Xylenes, Total	10000	NRC	6 U	6 U	4.1 J	6 U	8.9 J
POLYNUCLEAR AROMATIC HYDROCARBONS							
2-Chloronaphthalene	NRC	NRC	10 U	*	10 U	12.5 U	40 U
Acenaphthene	NRC	NRC	10 UJ	*	10 UJ	12.5 U	40 U
Acenaphthylene	NRC	NRC	10 U	*	10 U	12.5 U	40 U
Anthracene	NRC	110000	10 U	*	10 U	12.5 U	40 U
Benzo(a)anthracene	NRC	0.0311	10 U	*	10 U	12.5 U	40 U
Benzo(a)pyrene	0.2	0.0311	10 U	*	10 U	12.5 U	40 U
Benzo(b)fluoranthene	NRC	NRC	10 U	*	10 U	12.5 U	40 U
Benzo(g,h,i)perylene	NRC	NRC	10 U	*	10 U	12.5 U	40 U
Benzo(k)fluoranthene	NRC	0.0311	10 U	*	10 U	12.5 U	40 U
Chrysene	NRC	0.0311	10 U	*	10 U	12.5 U	40 U
Dibenzo(a,h)anthracene	NRC	0.0311	10 U	*	10 U	12.5 U	40 U
Fluoranthene	NRC	370	10 U	*	10 U	12.5 U	40 U
Fluorene	NRC	14000	10 U	*	10 U	12.5 U	40 U
Indeno(1,2,3-cd)pyrene	NRC	0.0311	10 U	*	10 U	12.5 U	40 U
Naphthalene	NRC	NRC	10 U	*	10 U	12.5 U	40 U
Phenanthrene	NRC	NRC	10 U	*	10 U	12.5 U	40 U
Pyrene	NRC	11000	10 U	*	10 U	12.5 U	40 U

NOTES:

Contract for June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

November 1998 and February 1999 sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

Analytical data for the UST closure is summarized in Appendix II and included at the end of this appendix but is not summarized in this table.

Analytical data for QA/QC samples 800514 (duplicate) and 800824 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content, such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] U.S. Environmental Protection Agency Safe Drinking Water Act Maximum Contaminant Level

[2] GA EPD water quality standards (Chapter 391-3-6.03)

* Insufficient sample volume for analysis.

Bold values exceed MCLs

Laboratory Qualifiers

U Indicates the compound was not detected above the reported quantitation limit.

UJ Indicates that the compound was not detected above an approximated sample quantitation limit.

J Indicates the value for the compound is an estimated value.

= Indicates the compound was detected at the concentration reported.

TABLE VIII-A. Summary of Groundwater Analytical Results (continued)

Station: Sample ID: Screened Interval (ft BGS) Collection Date: Units:	Federal SDWA MCLs (ug/L)	In Stream Water Quality Standards (ug/L)	80-05 800522 11.0' - 15.0' 28-Jun-98 (ug/L)	80-05 800532 16.0' - 20.0' 28-Jun-98 (ug/L)	80-05 800542 21.0' - 25.0' 28-Jun-98 (ug/L)	80-05 800552 26.0' - 30.0' 28-Jun-98 (ug/L)	80-06 800612 0.0' - 11.7' 13-Nov-98 (ug/L)
VOLATILE ORGANIC COMPOUNDS							
Benzene	5	71.28	**58.8 =**	2 U	2 U	**5.8 J**	2 U
Toluene	1000	200000	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	700	28718	7.6 =	2 U	2 U	4.8 =	2 U
Xylenes, Total	10000	NRC	6 UJ	6 UJ	6 UJ	6 U	3 U
POLYNUCLEAR AROMATIC HYDROCARBONS							
2-Chloronaphthalene	NRC	NRC	40 U	10 U	10 U	10 U	10.2 U
Acenaphthene	NRC	NRC	40 U	10 U	10 U	10 U	10.2 U
Acenaphthylene	NRC	NRC	40 U	10 U	10 U	10 U	10.2 U
Anthracene	NRC	110000	40 U	10 U	10 U	10 U	10.2 U
Benzo(a)anthracene	NRC	0.0311	40 U	10 U	10 U	10 U	10.2 U
Benzo(a)pyrene	0.2	0.0311	40 U	10 U	10 U	10 U	10.2 U
Benzo(b)fluoranthene	NRC	NRC	40 U	10 U	10 U	10 U	10.2 U
Benzo(g,h,i)perylene	NRC	NRC	40 U	10 U	10 U	10 U	10.2 U
Benzo(k)fluoranthene	NRC	0.0311	40 U	10 U	10 U	10 U	10.2 U
Chrysene	NRC	0.0311	40 U	10 U	10 U	10 U	10.2 U
Dibenzo(a,h)anthracene	NRC	0.0311	40 U	10 U	10 U	10 U	10.2 U
Fluoranthene	NRC	370	40 U	10 U	10 U	10 U	10.2 U
Fluorene	NRC	14000	40 U	10 U	10 U	10 U	10.2 U
Indeno(1,2,3-cd)pyrene	NRC	0.0311	40 U	10 U	10 U	10 U	10.2 U
Naphthalene	NRC	NRC	40 U	10 U	10 U	10 U	10.2 U
Phenanthrene	NRC	NRC	40 U	10 U	10 U	10 U	10.2 U
Pyrene	NRC	11000	40 U	10 U	10 U	10 U	10.2 U

NOTES:

Contract for June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

November 1998 and February 1999 sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

Analytical data for the UST closure is summarized in Appendix II and included at the end of this appendix but is not summarized in this table.

Analytical data for QA/QC samples 800514 (duplicate) and 800824 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content, such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] U.S. Environmental Protection Agency Safe Drinking Water Act Maximum Contaminant Level

[2] GA EPD water quality standards (Chapter 391-3-6.03)

Bold values exceed MCLs

Laboratory Qualifiers

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

TABLE VIII-A. Summary of Groundwater Analytical Results (continued)

Station:		In Stream	80-07	80-08	80-09
Sample ID:	Federal	Water	800712	800812	800912
Screened Interval (ft BGS)	SDWA	Quality	0.0' - 12.0'	13.0' - 15.0'	0.0' - 10.0'
Collection Date:	MCLs	Standards	13-Nov-98	20-Feb-99	21-Feb-99
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS					
Benzene	5	71.28	2 U	2 U	2 U
Toluene	1000	200000	2 U	3 =	1.8 J
Ethylbenzene	700	28718	2 U	0.86 J	0.86 J
Xylenes, Total	10000	NRC	3 U	4.9 =	4.1 J
POLYNUCLEAR AROMATIC HYDROCARBONS					
2-Chloronaphthalene	NRC	NRC	11.5 U	10.2 UJ	12.3 U
Acenaphthene	NRC	NRC	11.5 U	10.2 UJ	12.3 U
Acenaphthylene	NRC	NRC	11.5 U	10.2 UJ	12.3 U
Anthracene	NRC	110000	11.5 U	10.2 UJ	12.3 U
Benzo(a)anthracene	NRC	0.0311	11.5 U	10.2 UJ	12.3 U
Benzo(a)pyrene	0.2	0.0311	11.5 U	10.2 UJ	12.3 U
Benzo(b)fluoranthene	NRC	NRC	11.5 U	10.2 UJ	12.3 U
Benzo(g,h,i)perylene	NRC	NRC	11.5 U	10.2 UJ	12.3 U
Benzo(k)fluoranthene	NRC	0.0311	11.5 U	10.2 UJ	12.3 U
Chrysene	NRC	0.0311	11.5 U	10.2 UJ	12.3 U
Dibenzo(a,h)anthracene	NRC	0.0311	11.5 U	10.2 UJ	12.3 U
Fluoranthene	NRC	370	11.5 U	10.2 UJ	12.3 U
Fluorene	NRC	14000	11.5 U	10.2 UJ	12.3 U
Indeno(1,2,3-cd)pyrene	NRC	0.0311	11.5 U	10.2 UJ	12.3 U
Naphthalene	NRC	NRC	11.5 U	10.2 UJ	0.93 J
Phenanthrene	NRC	NRC	11.5 U	10.2 UJ	12.3 U
Pyrene	NRC	11000	11.5 U	10.2 UJ	12.3 U

NOTES:

Contract for June 1998 sampling was issued prior to the new CAP-Part A guidance that was published in May 1998. Thus, the new SW-846 analytical methods were not used during that sampling event.

November 1998 and February 1999 sampling was performed in accordance with the CAP-Part A guidance that was published in May 1998.

Analytical data for the UST closure is summarized in Appendix II and included at the end of this appendix but is not summarized in this table.

Analytical data for QA/QC samples 800514 (duplicate) and 800824 (duplicate) are contained within this appendix, but are not summarized in this table.

Elevated PAH detection limits are a result of associated organic content, such as TPH or other organic compounds. During extraction of the PAH compounds, all other organic compounds are extracted, causing a wide range of organic compounds to be present; thus, the target PAHs become small peaks in the chromatograph. As a result, the laboratory dilutes the concentrate, in turn elevating the detection limit.

[1] U.S. Environmental Protection Agency Safe Drinking Water Act Maximum Contaminant Level

[2] GA EPD water quality standards (Chapter 391-3-6.03)

Bold values exceed MCLs

Laboratory Qualifiers

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

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DATA VALIDATION COPY

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800112

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A04W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806806-08

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 206015

Level: (low/med) LOW Date Received: 06/26/98

% Moisture: not dec. _____ Date Analyzed: 06/27/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.7	
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

LW
7-22-98

FORM I VOA

DATA VALIDATION
COPY

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800112

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A06W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806839-04

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 1B510

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50 (mL) Date Analyzed: 07/10/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
209-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

U
UJ P02
U

LW
8-19-98

FORM I SV-1

OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A14W

Matrix: (soil/water) WATER Lab Sample ID: 9806849-06

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2Q1031

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/07/98

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

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	5.6	P
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

CCJC MOB

LW
8-18-98

FORM I VOA

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DATA VALIDATION COPY

800312

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A12W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806846-10

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2Q1020

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/06/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	34.4		~~J~~ =
108-88-3	Toluene	2.0	U	~~J~~ U
100-41-4	Ethylbenzene	8.6		~~J~~ =
1330-20-7	Xylenes (total)	4.1	J	~~J~~ J

MR
8/5/98

LW
7-28-98

FORM I VOA

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800312

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A06W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806839-02

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 1B508

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50 (mL) Date Analyzed: 07/10/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
209-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

U

UJ P02

U

LW
8-19-98

FORM I SV-1

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DATA VALIDATION COPY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800412

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A12W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806846-11

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2Q106

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/06/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	25.8	
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800412

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A08W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806841-14

Sample wt/vol: 400.0 (g/mL) ML Lab File ID: 2C509

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50 (mL) Date Analyzed: 07/17/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	12.5	U
91-58-7	2-chloronaphthalene	12.5	U
209-96-8	acenaphthylene	12.5	U
83-32-9	acenaphthene	12.5	U
86-73-7	fluorene	12.5	U
85-01-8	phenanthrene	12.5	U
120-12-7	anthracene	12.5	U
206-44-0	fluoranthene	12.5	U
129-00-0	pyrene	12.5	U
56-55-3	benzo(a)anthracene	12.5	U
218-01-9	chrysene	12.5	U
205-99-2	benzo(b)fluoranthene	12.5	U
207-08-9	benzo(k)fluoranthene	12.5	U
50-32-8	benzo(a)pyrene	12.5	U
193-39-5	indeno(1,2,3-cd)pyrene	12.5	U
53-70-3	dibenz(a,h)anthracene	12.5	U
191-24-2	benzo(g,h,i)perylene	12.5	U

U

FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800512

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A14W

Matrix: (soil/water) WATER Lab Sample ID: 9806849-11

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2Q1036

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/07/98

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

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

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USE

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	LW 8-18-98 229 ~~275~~	~~E~~ D
108-88-3	Toluene	6.3	P
100-41-4	Ethylbenzene	94.6	
1330-20-7	Xylenes (total)	8.9	P

J = J = M08 M08

LW 8-18-98

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800512

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A07W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806840-15

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 2C518

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50(mL) Date Analyzed: 07/17/98

Injection Volume: 1.0(uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	40.0	U
91-58-7	2-chloronaphthalene	40.0	U
209-96-8	acenaphthylene	40.0	U
83-32-9	acenaphthene	40.0	U
86-73-7	fluorene	40.0	U
85-01-8	phenanthrene	40.0	U
120-12-7	anthracene	40.0	U
206-44-0	fluoranthene	40.0	U
129-00-0	pyrene	40.0	U
56-55-3	benzo(a)anthracene	40.0	U
218-01-9	chrysene	40.0	U
205-99-2	benzo(b)fluoranthene	40.0	U
207-08-9	benzo(k)fluoranthene	40.0	U
50-32-8	benzo(a)pyrene	40.0	U
193-39-5	indeno(1,2,3-cd)pyrene	40.0	U
53-70-3	dibenz(a,h)anthracene	40.0	U
191-24-2	benzo(g,h,i)perylene	40.0	U

LW
8-20-98

FORM I SV-1 OLM03.0

DUPLICATE

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800514

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A14W

Matrix: (soil/water) WATER Lab Sample ID: 9806849-09

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2Q1032

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/07/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 5.0

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	246	
108-88-3	Toluene	10.0	U
100-41-4	Ethylbenzene	80.3	
1330-20-7	Xylenes (total)	30.0	U

U = U

LW
8-18-98

FORM I VOA

DATA VALIDATION COPY

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

DUPLICATE
EPA SAMPLE NO.

800514

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A07W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806840-18

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 2C521

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50 (mL) Date Analyzed: 07/17/98

Injection Volume: 1.0 (uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	40.0	U
91-58-7	2-chloronaphthalene	40.0	U
209-96-8	acenaphthylene	40.0	U
83-32-9	acenaphthene	40.0	U
86-73-7	fluorene	40.0	U
85-01-8	phenanthrene	40.0	U
120-12-7	anthracene	40.0	U
206-44-0	fluoranthene	40.0	U
129-00-0	pyrene	40.0	U
56-55-3	benzo(a)anthracene	40.0	U
218-01-9	chrysene	40.0	U
205-99-2	benzo(b)fluoranthene	40.0	U
207-08-9	benzo(k)fluoranthene	40.0	U
50-32-8	benzo(a)pyrene	40.0	U
193-39-5	indeno(1,2,3-cd)pyrene	40.0	U
53-70-3	dibenz(a,h)anthracene	40.0	U
191-24-2	benzo(g,h,i)perylene	40.0	U

LW
8-20-98

FORM I SV-1

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800522

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A14W

Matrix: (soil/water) WATER Lab Sample ID: 9806849-10

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2Q1022

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/06/98

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

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	58.8	
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	7.6	
1330-20-7	Xylenes (total)	6.0	U

LW
8-18-98

FORM I VOA

DATA VALIDATION COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800522

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A07W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806840-17

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 2C520

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50 (mL) Date Analyzed: 07/17/98

Injection Volume: 1.0 (uL) Dilution Factor: 4.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	40.0	U
91-58-7	2-chloronaphthalene	40.0	U
209-96-8	acenaphthylene	40.0	U
83-32-9	acenaphthene	40.0	U
86-73-7	fluorene	40.0	U
85-01-8	phenanthrene	40.0	U
120-12-7	anthracene	40.0	U
206-44-0	fluoranthene	40.0	U
129-00-0	pyrene	40.0	U
56-55-3	benzo(a)anthracene	40.0	U
218-01-9	chrysene	40.0	U
205-99-2	benzo(b)fluoranthene	40.0	U
207-08-9	benzo(k)fluoranthene	40.0	U
50-32-8	benzo(a)pyrene	40.0	U
193-39-5	indeno(1,2,3-cd)pyrene	40.0	U
53-70-3	dibenz(a,h)anthracene	40.0	U
191-24-2	benzo(g,h,i)perylene	40.0	U

U

LW
8-20-98

FORM I SV-1

OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800532

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A14W

Matrix: (soil/water) WATER Lab Sample ID: 9806849-07

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2Q1020

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/06/98

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

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	2.0	U	U
108-88-3	Toluene	2.0	U	↓
100-41-4	Ethylbenzene	2.0	U	
1330-20-7	Xylenes (total)	6.0	U	UJ C14

LW
8-18-98

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800532

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A07W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806840-16

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 2C519

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50 (mL) Date Analyzed: 07/17/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
209-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

LW
8-20-98

FORM I SV-1 OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800542

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A14W

Matrix: (soil/water) WATER Lab Sample ID: 9806849-08

Sample wt/vol: 10.00 (g/mL) ML Lab File ID: 2Q1021

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/06/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	2.0	U	U
108-88-3	Toluene	2.0	U	↓
100-41-4	Ethylbenzene	2.0	U	
1330-20-7	Xylenes (total)	6.0	U	UJ C14

LW
8-18-98

FORM I VOA

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800542

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A07W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806840-19

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 2C522

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50 (mL) Date Analyzed: 07/17/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
209-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

LW
8-20-98

FORM I SV-1

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800552

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A13W

Matrix: (soil/water) WATER Lab Sample ID: 9806848-12

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2P5020

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: not dec. _____ Date Analyzed: 07/03/98

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q		
71-43-2	Benzene	5.8	P	J	MOB
108-88-3	Toluene	2.0	U	U	
100-41-4	Ethylbenzene	4.8		=	
1330-20-7	Xylenes (total)	6.0	U	U	

LW
7-30-98

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800552

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS4A07W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9806840-20

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 2C704

Level: (low/med) LOW Date Received: 06/29/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/30/98

Concentrated Extract Volume: 0.50 (mL) Date Analyzed: 07/19/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
209-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

LW
8-20-98

FORM I SV-1

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

3 of 4

CHAIN OF CUSTODY RECORD

COC NO.: GA0006

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
800112	6/25/98	1715	water	2									2	9806806-08 ~~33409~~ 11
820522	6/25/98	1200		2									2	-09
860425	6/25/98	920		2									2	-10
820512	6/25/98	1015		2									2	-11
880212	6/25/98	1055		2									2	-12
870522	6/24/98	1755		2									2	-13
880562	6/24/98	1240		2									2	-14
870512	6/24/98	1715		2									2	-15
880572	6/24/98	1315		2									2	-16
880582	6/24/98	1400		2									2	-17
880552	6/24/98	1150		2									2	-18
880532	6/24/98	1050		2									2	-19
880512	6/24/98	905		2									2	-20

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/26/98 12:55	[illegible]	6/26/98 1640
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Raymond Reed	Date/Time 6/26/98 12:55	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: Raymond Reed	Date/Time 6/26/98 16:40	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #627

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GA007

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
810312	6/26/98	1020	water		2								2	9806839-01 33639 '1
800312	6/26/98	1400			2								2	-02
860212	6/26/98	1230			2								2	-03
800112	6/26/98	1035			2								2	-04
870212	6/26/98	1435			2								2	-05
870225	6/26/98	1350								3			3	-06 '2

6/29/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98 12.15	[illegible]	6/29/98 1645
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: [illegible]	6/29/98 1215	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	6/29/98 1645	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 13

Cooler ID: #4 4866

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GA012

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
4804025	6/27/98	1115	water			4							4	4806840-13 33640.2
4600312	6/26/98	1500			2								2	-14
4600512	6/26/98	1110			2								2	-15
4600532	6/26/98	1215			2								2	-16
4600522	6/26/98	1150			2								2	-17
*4600514	6/26/98	1110			1								1	

6/29/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98 1215	Dionne Francis	6/29/98 1645
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: [illegible]	Date/Time 6/29/98 1215	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 6/29/98 1645	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 13

Cooler ID: #635

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GA013

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
800514	6/26/98	1110	water		1								1	9806840-18 33640.1
800542	6/26/98	1245			2								2	-19
800552	6/26/98	1320			2								2	-20
840512	6/27/98	1500			2								2	9806841-01 33641.1
840514	6/27/98	1500			2								2	-02
840522	6/27/98	1520			2								2	-03
840542	6/27/98	1630			2								2	-04

6/29/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98 1215	Francis	6/29/98 1645
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
[illegible]	6/29/98 1215		
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 6/29/98 1645	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 13

Cooler ID: #628

Cooler Temperature: 4 °C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GA015

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
930412	6/27/98	1555	water		1								1	9806841-11 3364
930312	6/28/98	1030			2								2	-12
930212	6/27/98	1355			2								2	-13
930412	6/26/98	1311			2								2	-14

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98	[illegible]	6/29/98
COMPANY NAME: SAIC	1215	COMPANY NAME: GEL	1645
RECEIVED BY: [illegible]	6/29/98	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	1215	COMPANY NAME:	
RELINQUISHED BY: [illegible]	6/29/98	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	1645	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 7

Cooler ID: 304

Cooler Temperature: 4°C

FEDEX NUMBER:

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2015

CHAIN OF CUSTODY RECORD

COC NO.: GA018

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
930552	6/27/98	1140	water	2									2	9806846-07 3.5648.1
940412	6/26/98	1810		2									2	-08
880312	6/27/98	855		2									2	-09
800312	6/26/98	1400		2									2	-10
800412	6/26/98	1311		2									2	-11
870412	6/26/98	1540		2									2	-12
870414	6/26/98	1540		2									2	-13
870112	6/26/98	1650		2									2	-14
930216	6/27/98	1345		2									2	-15
940514	6/26/98	1030		2									2	-16
830412	6/26/98	2010		2									2	-17
870212	6/26/98	1435		2									2	-18
940312	6/26/98	1630		2									2	-19

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98 1215	[illegible]	6/29/98 1645
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: [illegible]	Date/Time 6/29/98 1215	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 6/29/98 1645	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: # 580

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GA018

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
930212	6/27/98	1355	water	2									2	9806846-20 33645.1
840512	6/27/98	1500		2									2	9806848-01 33646.1
840522	6/27/98	1520		2									2	-02
840312	6/27/98	1100		2									2	-03
840412	6/27/98	1215		2									2	-04
830212	6/26/98	1920		2									2	-05
840112	6/27/98	1330		2									2	-06
840425	6/27/98	1115		2									2	-07
840212	6/27/98	1425		2									2	-08
840532	6/27/98	1555		2									2	-09
840514	6/27/98	1500		2									2	-10
860312	6/26/98	1500		2									2	-11
800552	6/26/98	1320		2									2	-12

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98 1215	D Mancel	6/29/98 1645
COMPANY NAME: SAIC		COMPANY NAME: SAIC	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
[illegible]	6/29/98 1215		
COMPANY NAME: SAIC		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 6/29/98 1645	RECEIVED BY:	Date/Time
COMPANY NAME: SAIC		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #580

Cooler Temperature: 4°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GA018

PROJECT NAME: Fort Stewart CAP Part A UST Investigations (Options)

PROJECT NUMBER: 01-0331-04-9805-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, TPH	PAH, TPH, Lead	PAH, TPH, Lead, TOC	BTEX, GRO	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
800212	6/26/98	1300	water	2									2	9806849-06
800532	6/26/98	1215		2									2	-07
800542	6/26/98	1245		2									2	-08
800511	6/26/98	1110		2									2	-09
800522	6/26/98	1150		2									2	-10
800512	6/26/98	1110		2									2	-11
TBA016	6/26/98	745		2									2	-12
TBA017	6/27/98	745		2									2	-13
TBA018	6/28/98	600		2									2	-14
860212	6/26/98	1230		2									2	-15 Unpreserved
810312	6/26/98	1020		2									2	-16 Unpreserved
810412	6/27/98	955		2									2	-17 Unpreserved
870225	6/26/98	1350							2				2	-18

TOTAL NUMBER OF CONTAINERS: 130

Cooler Temperature: 4°C

Cooler ID: #580

FEDEX NUMBER:

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/29/98	[illegible]	6/29/98
COMPANY NAME: SAIC	1215	COMPANY NAME:	1645
RECEIVED BY: [illegible]	Date/Time 6/29/98	RELINQUISHED BY:	Date/Time
COMPANY NAME:	1215	COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 6/29/98	RECEIVED BY:	Date/Time
COMPANY NAME:	1645	COMPANY NAME:	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800612

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6009W

Matrix: (soil/water) WATER Lab Sample ID: 9811478-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 7J712

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: not dec. _____ Date Analyzed: 11/22/98

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	3.0	U

FORM I VOA OLM03.0

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800612

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6007W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9811476-15

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 8U521

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/16/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/21/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.2	U
91-58-7	2-chloronaphthalene	10.2	U
208-96-8	acenaphthylene	10.2	U
83-32-9	acenaphthene	10.2	U
86-73-7	fluorene	10.2	U
85-01-8	phenanthrene	10.2	U
120-12-7	anthracene	10.2	U
206-44-0	fluoranthene	10.2	U
129-00-0	pyrene	10.2	U
56-55-3	benzo(a)anthracene	10.2	U
218-01-9	chrysene	10.2	U
205-99-2	benzo(b)fluoranthene	10.2	U
207-08-9	benzo(k)fluoranthene	10.2	U
50-32-8	benzo(a)pyrene	10.2	U
193-39-5	indeno(1,2,3-cd)pyrene	10.2	U
53-70-3	dibenz(a,h)anthracene	10.2	U
191-24-2	benzo(g,h,i)perylene	10.2	U

U

FORM I SV-1 OLM03.0

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800712

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6009W

Matrix: (soil/water) WATER Lab Sample ID: 9811478-19

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 7J561

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: not dec. _____ Date Analyzed: 11/21/98

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	2.0	U
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	3.0	U

FORM I VOA OLM03.0

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800712

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS6007W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9811476-11

Sample wt/vol: 870.0 (g/mL) ML Lab File ID: 8U517

Level: (low/med) LOW Date Received: 11/14/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/16/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/20/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	11.5	U
91-58-7	2-chloronaphthalene	11.5	U
208-96-8	acenaphthylene	11.5	U
83-32-9	acenaphthene	11.5	U
86-73-7	fluorene	11.5	U
85-01-8	phenanthrene	11.5	U
120-12-7	anthracene	11.5	U
206-44-0	fluoranthene	11.5	U
129-00-0	pyrene	11.5	U
56-55-3	benzo(a)anthracene	11.5	U
218-01-9	chrysene	11.5	U
205-99-2	benzo(b)fluoranthene	11.5	U
207-08-9	benzo(k)fluoranthene	11.5	U
50-32-8	benzo(a)pyrene	11.5	U
193-39-5	indeno(1,2,3-cd)pyrene	11.5	U
53-70-3	dibenz(a,h)anthracene	11.5	U
191-24-2	benzo(g,h,i)perylene	11.5	U

U

FORM I SV-1 OLM03.0

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CHAIN OF CUSTODY RECORD

COC NO.: GA0068

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-9805-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, DRO, Lead	PAH, TPH, Lead	PAH, DRO, Lead, TOC	PAH, TPH, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
680612	11/13/98	1615	water		2								2	9811476-07
970814	11/13/98	950			2								2	-08
840812	11/13/98	1045			2								2	-09
840612	11/13/98	915			2								2	-10
800712	11/13/98	1215			2								2	-11
680612	11/13/98	1550			2								2	-12

3667

11/14/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/14/98	Brancato	11/14/98
COMPANY NAME: SAIC	1105	COMPANY NAME: GEL	1330
RECEIVED BY: Carol Sandel	Date/Time 11/14/98	RELINQUISHED BY:	Date/Time
COMPANY NAME: General Engineering	1105	COMPANY NAME:	
RELINQUISHED BY: Carol Sandel	Date/Time 11/14/98	RECEIVED BY:	Date/Time
COMPANY NAME: General Engineering	1330	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 12

Cooler ID: #725

Cooler Temperature:

FEDEX NUMBER:

NOTE: Cooler Receipt Checklist indicates a cooler temperature of 3°-5°C upon arrival at the laboratory.

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CHAIN OF CUSTODY RECORD

COC NO.: GA009

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-9805-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, DRO, Lead	PAH, TPH, Lead	PAH, DRO, Lead, TOC	PAH, TPH, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
160814	11/13/98	1500	water		Z								Z	981476-13
860712	11/13/98	1745			Z								Z	-14
800612	11/13/98	1615			Z								Z	-15
160812	11/13/98	1500			Z								Z	-16
160916	11/13/98	1600			Z								Z	-17
160912	11/13/98	1600			Z								Z	-18

11/13/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/14/98 1105	D Francis	11/14/98 1330
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Carol Sandel	11/14/98 1105	RELINQUISHED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	
RELINQUISHED BY: Carol Sandel	11/14/98 1330	RECEIVED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #715

Cooler Temperature:

FEDEX NUMBER:

NOTE: Cooler Receipt Checklist indicates a cooler temperature of 3°-5°C upon arrival at the laboratory.

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2 of 3

CHAIN OF CUSTODY RECORD

COC NO.: GA010

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-9805-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, DRO, Lead	PAH, TPH, Lead	PAH, DRO, Lead, TOC	PAH, TPH, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
840623	11/13/98	915	Soil	1						1			2	9811477-14
860721	11/13/98	1745	↓	1						1			2	-15
800621	11/13/98	1615	↓	1						1			2	-16
680642	11/13/98	1745	water	2									2	9811478-01
680632	11/13/98	1640	↓	2									2	02
860712	11/13/98	1745	↓	2									2	-03
* 160912	11/13/98	1600	↓	2									2	04
680622	11/13/98	1615	↓	2									2	-05
680612	11/13/98	1550	↓	2									2	-06
160812	11/13/98	1500	↓	2									2	-07
920812	11/13/98	950	↓	2									2	-08
800612	11/13/98	1615	↓	2									2	-09
840812	11/13/98	1835	↓	2									2	-10

366675 ↓ 366690

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/14/98 1105	[illegible]	11/14/98 1330
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: Carol Sandel	Date/Time 11/14/98 1105	RELINQUISHED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	
RELINQUISHED BY: Carol Sandel	Date/Time 11/14/98 1330	RECEIVED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #712

Cooler Temperature:

FEDEX NUMBER:

Note: Cooler Receipt Checklist indicates a cooler temperature of 3°-5° C upon arrival at the laboratory.

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of 3

CHAIN OF CUSTODY RECORD

COC NO.: GA010

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-9805-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, DRO, Lead	PAH, TPH, Lead	PAH, DRO, Lead, TOC	PAH, TPH, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
161012	11/13/98	1225	water	2									2	98114 78-11
840612	11/13/98	915		2									2	-12
920822	11/13/98	1030		2									2	-13
920814	11/13/98	950		2									2	-14
161014	11/13/98	1225		2									2	-15
160912	11/13/98	1600		2									2	-16
160814	11/13/98	1500		2									2	-17
TBA032	11/13/98	745		2									2	-18
800712	11/14/98	840		2									2	-19

11/14/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/14/98 1105	[illegible]	11/14/98 1330
COMPANY NAME: SAIC		COMPANY NAME: [illegible]	
RECEIVED BY: Carol Sandel	11/14/98 1105	RELINQUISHED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	
RELINQUISHED BY: Carol Sandel	11/14/98 1330	RECEIVED BY:	Date/Time
COMPANY NAME: General Engineering		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 70

Cooler ID: # 712

Cooler Temperature:

FEDEX NUMBER:

NOTE: Cooler Receipt Checklist indicate a cooler temperature of 3°-5°C upon arrival at the laboratory.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET
DATA VALIDATION

EPA SAMPLE NO.

800812

Lab Name: GENERAL ENGINEERING LABORY Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA07W

Matrix: (soil/water) WATER Lab Sample ID: 9902817-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1Y411

Level: (low/med) LOW Date Received: 02/21/99

% Moisture: not dec. _____ Date Analyzed: 03/04/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	benzene	2.0	U	U
108-88-3	toluene	3.0		
100-41-4	ethylbenzene	0.86	J	J
75-71-8	xylenes (total)	4.9		

FORM I VOA OLM03.0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800812

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA07W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9902817-10

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 8K115

Level: (low/med) LOW Date Received: 02/21/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 03/08/99

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 03/09/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
91-20-3	naphthalene	10.2	U	UJ ADI
91-58-7	2-chloronaphthalene	10.2	U	
208-96-8	acenaphthylene	10.2	U	
83-32-9	acenaphthene	10.2	U	UJ PDL, ADI
86-73-7	fluorene	10.2	U	UJ ADI
85-01-8	phenanthrene	10.2	U	
120-12-7	anthracene	10.2	U	
206-44-0	fluoranthene	10.2	U	
129-00-0	pyrene	10.2	U	
56-55-3	benzo(a)anthracene	10.2	U	
218-01-9	chrysene	10.2	U	
205-99-2	benzo(b)fluoranthene	10.2	U	
207-08-9	benzo(k)fluoranthene	10.2	U	
50-32-8	benzo(a)pyrene	10.2	U	
193-39-5	indeno(1,2,3-cd)pyrene	10.2	U	
53-70-3	dibenz(a,h)anthracene	10.2	U	
191-24-2	benzo(g,h,i)perylene	10.2	U	

FORM I SV-1 OLM03.0

DUPLICATE

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800824

DATA VALIDATION COPY

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA07W

Matrix: (soil/water) WATER Lab Sample ID: 9902817-05

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1Y412

Level: (low/med) LOW Date Received: 02/21/99

% Moisture: not dec. _____ Date Analyzed: 03/04/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	benzene	2.0	U
108-88-3	toluene	3.0	
100-41-4	ethylbenzene	0.93	J
75-71-8	xylenes (total)	5.2	

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DUPLICATE

EPA SAMPLE NO.

800824

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA07W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9902817-11

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 8K116

Level: (low/med) LOW Date Received: 02/21/99

% Moisture: _____ decanted: (Y/N) __ Date Extracted: 03/08/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 03/09/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
91-20-3	naphthalene	10.2	U	UJ A01
91-58-7	2-chloronaphthalene	10.2	U	
208-96-8	acenaphthylene	10.2	U	
83-32-9	acenaphthene	10.2	U	UJ P02, A01
86-73-7	fluorene	10.2	U	UJ A01
85-01-8	phenanthrene	10.2	U	
120-12-7	anthracene	10.2	U	
206-44-0	fluoranthene	10.2	U	
129-00-0	pyrene	10.2	U	
56-55-3	benzo(a)anthracene	10.2	U	
218-01-9	chrysene	10.2	U	
205-99-2	benzo(b)fluoranthene	10.2	U	
207-08-9	benzo(k)fluoranthene	10.2	U	
50-32-8	benzo(a)pyrene	10.2	U	
193-39-5	indeno(1,2,3-cd)pyrene	10.2	U	
53-70-3	dibenz(a,h)anthracene	10.2	U	
191-24-2	benzo(g,h,i)perylene	10.2	U	

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800912

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA10W

Matrix: (soil/water) WATER Lab Sample ID: 9902839-12

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y517

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: not dec. _____ Date Analyzed: 03/05/99

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	2.0	U
108-88-3	toluene	1.8	J
100-41-4	ethylbenzene	0.86	J
1330-20-7	xylenes (total)	4.1	J

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J

FORM I VOA OLM03.0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

800912

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FSA10W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9902839-09

Sample wt/vol: 810.0 (g/mL) ML Lab File ID: 7I708

Level: (low/med) LOW Date Received: 02/22/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/24/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 02/28/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	0.93	J
91-58-7	2-chloronaphthalene	12.3	U
208-96-8	acenaphthylene	12.3	U
83-32-9	acenaphthene	12.3	U
86-73-7	fluorene	12.3	U
85-01-8	phenanthrene	12.3	U
120-12-7	anthracene	12.3	U
206-44-0	fluoranthene	12.3	U
129-00-0	pyrene	12.3	U
56-55-3	benzo(a)anthracene	12.3	U
218-01-9	chrysene	12.3	U
205-99-2	benzo(b)fluoranthene	12.3	U
207-08-9	benzo(k)fluoranthene	12.3	U
50-32-8	benzo(a)pyrene	12.3	U
193-39-5	indeno(1,2,3-cd)pyrene	12.3	U
53-70-3	dibenz(a,h)anthracene	12.3	U
191-24-2	benzo(g,h,i)perylene	12.3	U

J U

FORM I SV-1 OLM03.0

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CHAIN OF CUSTODY RECORD

COC NO.: D03509

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1593-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, TPH	PAH, TPH, Lead	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
841312	2/20/99	1720	water		X		X		X		X	2	99028 17 - 09
8005612	2/20/99	1400			X		X		X		X	2	- 10
8004624	2/20/99	1400			X		X		X		X	2	- 11
762212	2/20/99	930			X		X		X		X	2	- 12
161112	2/20/99	1600			X		X		X		X	2	- 13
161212	2/20/99	1530			X		X		X		X	2	- 14

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	2/21/99	[illegible]	2/22/99
COMPANY NAME: SAIC	1045	COMPANY NAME: GEL	
RECEIVED BY: [illegible]	Date/Time 2/21/99	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	1045	COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 2/22/99	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	1445	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 12

Cooler ID: #625 5°C

Cooler Temperature:

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: D03511

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1593-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, TPH	PAH, TPH, Lead	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
040312	2/21/99	1610	water									2	9902839-04
602012	2/21/99	1315	↓									2	05
860912	2/21/99	1105										2	06
860916	2/21/99	1055										2	07
861012	2/21/99	955										2	08
800912	2/21/99	1510	↓									2	09

2/22/99

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	2/22/99 1145	[signature]	2/22/99 1530
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY: [signature]	Date/Time 2/22/99 1145	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [signature]	Date/Time 2/22/99 1530	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 12

Cooler ID: # 2846 / 4°C

Cooler Temperature:

FEDEX NUMBER:

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2 of 2

CHAIN OF CUSTODY RECORD

COC NO.: D0351Z

PROJECT NAME: Fort Stewart CAP Part A UST Investigations

PROJECT NUMBER: 01-0331-04-1693-220

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	GRO	PAH, TPH	PAH, TPH, Lead	PAH, DRO	PAH, DRO, Lead	PAH, DRO, Lead, TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
040312	2/21/99	1610	water	Z								Z	99028B9-10
162101Z	2/21/99	1315		Z								Z	-11
800912	2/21/99	1510		Z								Z	-12
860912	2/21/99	1105		Z								Z	-13
860916	2/21/99	1055		Z								Z	-14
861012	2/21/99	955		Z								Z	-15
TB0005	2/21/99	745		Z								Z	-16
TB0006	2/22/99	745		Z								Z	-17*

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	2/22/99	[illegible]	2/22/99
COMPANY NAME: SAIC	1145	COMPANY NAME: GEL	1530
RECEIVED BY: [illegible]	Date/Time 2/22/99	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	1145	COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 2/22/99	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	1530	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 44

Cooler ID: #444 / 4°C

Cooler Temperature:

FEDEX NUMBER:

GROUNDWATER ANALYTICAL DATA OBTAINED DURING UST 38 CLOSURE ACTIVITIES (August 1996)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

South Atlantic Division Laboratory
U.S. Army Corps of Engineers
611 South Cobb Drive
Marietta, GA 30060
Attn: Mr. Blaise Willis

August 26, 1996

P.O. No. DACW01-96-A-0001

SAD Lab #: 29743
Field ID: TK38-GW

Date Collected: 08/08/96
Time Collected: 10:10

ASI Lab No. 75049-4
Date Received: 08/10/96
Time Received: 07:30
Sample Type: Groundwater

Analyte	Result	Det Limit	Units	Date	Time	Analyst	Method
BTEX (EPA 8020) - Georgia UST							8020
Dilution Factor	1						
Benzene	20	20	ug/l	08/15/96	0217	BDL	8020
Ethylbenzene	160	40	ug/l	08/15/96	0217	BDL	8020
Toluene	BDL	20	ug/l	08/15/96	0217	BDL	8020
Xylenes	610	50	ug/l	08/15/96	0217	BDL	8020
Total BTEX	790	20	ug/l	08/15/96	0217	BDL	8020

BDL - Below Detection Limit

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

South Atlantic Division Laboratory
U.S. Army Corps of Engineers
611 South Cobb Drive
Marietta, GA 30060
Attn: Mr. Blaise Willis

August 26, 1996

P.O. No. DACW01-96-A-0001

SAD Lab #: 29743
Field ID: TK38-GW

ASI Lab No. 75049-4
Date Received: 08/10/96
Time Received: 07:30
Sample Type: Groundwater

Date Collected: 08/08/96
Time Collected: 10:10

Analyte	Result	Det Limit	Units	Date	Time	Analyst	Method
Acid Extractable Organics (EPA 8270)							
Dilution Factor	1						8270
Prepared/Extracted				08/13/96	0900	BLM	
4-Chloro-3-methylphenol	BDL	10	ug/l	08/14/96	1943	DMB	8270
2-Chlorophenol	BDL	10	ug/l	08/14/96	1943	DMB	8270
2,4-Dichlorophenol	BDL	10	ug/l	08/14/96	1943	DMB	8270
2,4-Dimethylphenol	BDL	10	ug/l	08/14/96	1943	DMB	8270
4,6-Dinitro-2-methylphenol	BDL	50	ug/l	08/14/96	1943	DMB	8270
2,4-Dinitrophenol	BDL	50	ug/l	08/14/96	1943	DMB	8270
2-Methylphenol	BDL	10	ug/l	08/14/96	1943	DMB	8270
4-Methylphenol	BDL	10	ug/l	08/14/96	1943	DMB	8270
2-Nitrophenol	BDL	50	ug/l	08/14/96	1943	DMB	8270
4-Nitrophenol	BDL	50	ug/l	08/14/96	1943	DMB	8270
Pentachlorophenol	BDL	20	ug/l	08/14/96	1943	DMB	8270
Phenol	BDL	10	ug/l	08/14/96	1943	DMB	8270
2,4,5-Trichlorophenol	BDL	10	ug/l	08/14/96	1943	DMB	8270
2,4,6-Trichlorophenol	BDL	10	ug/l	08/14/96	1943	DMB	8270

BDL - Below Detection Limit

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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611 South Cobb Drive
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Attn: Mr. Blaise Willis

August 26, 1996

P.O. No. DACW01-96-A-0001

SAD Lab #: 29743
Field ID: TK38-GW

Date Collected: 08/08/96
Time Collected: 10:10

ASI Lab No. 75049-4
Date Received: 08/10/96
Time Received: 07:30
Sample Type: Groundwater

Analyte	Result	Det Limit	Units	Date	Time	Analyst	Method
Base/Neutral Extractable Organics (EPA 8270)							8270
Dilution Factor	1						
Prepared/Extracted				08/13/96	0900	BLM	
Acenaphthene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Acenaphthylene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Anthracene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Benzoic Acid	BDL	50	ug/l	08/14/96	1943	DMB	8270
Benzo(a)anthracene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Benzo(b)fluoranthene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Benzo(k)fluoranthene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Benzo(ghi)perylene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Benzo(a)pyrene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Benzyl Alcohol	BDL	20	ug/l	08/14/96	1943	DMB	8270
Bis(2-chloroethoxy)methane	BDL	10	ug/l	08/14/96	1943	DMB	8270
Bis(2-chloroethyl)ether	BDL	10	ug/l	08/14/96	1943	DMB	8270
Bis(2-chloroisopropyl)ether	BDL	10	ug/l	08/14/96	1943	DMB	8270
Bis(2-ethylhexyl)phthalate	BDL	10	ug/l	08/14/96	1943	DMB	8270
4-Bromophenyl phenyl ether	BDL	10	ug/l	08/14/96	1943	DMB	8270
Benzyl butyl phthalate	BDL	10	ug/l	08/14/96	1943	DMB	8270
4-Chloroaniline	BDL	20	ug/l	08/14/96	1943	DMB	8270
2-Chloronaphthalene	BDL	10	ug/l	08/14/96	1943	DMB	8270
4-Chlorophenyl phenyl ether	BDL	10	ug/l	08/14/96	1943	DMB	8270
Chrysene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Dibenzo(a,h)anthracene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Dibenzofuran	BDL	10	ug/l	08/14/96	1943	DMB	8270
Di-n-butylphthalate	BDL	10	ug/l	08/14/96	1943	DMB	8270
1,3-Dichlorobenzene	BDL	10	ug/l	08/14/96	1943	DMB	8270
1,4-Dichlorobenzene	BDL	10	ug/l	08/14/96	1943	DMB	8270
1,2-Dichlorobenzene	BDL	10	ug/l	08/14/96	1943	DMB	8270
3,3'-Dichlorobenzidine	BDL	20	ug/l	08/14/96	1943	DMB	8270

BDL - Below Detection Limit

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

South Atlantic Division Laboratory
U.S. Army Corps of Engineers
611 South Cobb Drive
Marietta, GA 30060
Attn: Mr. Blaise Willis

August 26, 1996

P.O. No. DACW01-96-A-0001

SAD Lab #: 29743
Field ID: TK38-GW

Date Collected: 08/08/96
Time Collected: 10:10

ASI Lab No. 75049-4
Date Received: 08/10/96
Time Received: 07:30
Sample Type: Groundwater

Analyte	Result	Det Limit	Units	Date	Time	Analyst	Method
Base/Neutral Extractable Organics (EPA 8270)							
Diethylphthalate	BDL	10	ug/l	08/14/96	1943	DMB	8270
Dimethylphthalate	BDL	10	ug/l	08/14/96	1943	DMB	8270
2,4-Dinitrotoluene	BDL	20	ug/l	08/14/96	1943	DMB	8270
2,6-Dinitrotoluene	BDL	20	ug/l	08/14/96	1943	DMB	8270
Di-n-octylphthalate	BDL	10	ug/l	08/14/96	1943	DMB	8270
Fluoranthene	13	10	ug/l	08/14/96	1943	DMB	8270
Fluorene	29	10	ug/l	08/14/96	1943	DMB	8270
Hexachlorobenzene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Hexachlorobutadiene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Hexachlorocyclopentadiene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Hexachloroethane	BDL	2	ug/l	08/14/96	1943	DMB	8270
Indeno(1,2,3-cd)pyrene	BDL	10	ug/l	08/14/96	1943	DMB	8270
Isophorone	BDL	10	ug/l	08/14/96	1943	DMB	8270
2-Methylnaphthalene	120	10	ug/l	08/14/96	1943	DMB	8270
Naphthalene	110	10	ug/l	08/14/96	1943	DMB	8270
2-Nitroaniline	BDL	50	ug/l	08/14/96	1943	DMB	8270
3-Nitroaniline	BDL	50	ug/l	08/14/96	1943	DMB	8270
4-Nitroaniline	BDL	50	ug/l	08/14/96	1943	DMB	8270
Nitrobenzene	BDL	10	ug/l	08/14/96	1943	DMB	8270
N-Nitrosodimethylamine	BDL	10	ug/l	08/14/96	1943	DMB	8270
N-Nitrosodiphenylamine	BDL	10	ug/l	08/14/96	1943	DMB	8270
N-Nitrosodi-n-propylamine	BDL	10	ug/l	08/14/96	1943	DMB	8270
Phenanthrene	52	10	ug/l	08/14/96	1943	DMB	8270
Pyrene	21	10	ug/l	08/14/96	1943	DMB	8270
1,2,4-Trichlorobenzene	BDL	10	ug/l	08/14/96	1943	DMB	8270

Respectfully Submitted,

Project Manager

BDL - Below Detection Limit

Job #4069

SADD Labs

ANDERSON COLUMBIA ENVIRONMENTAL, INC.

CHAIN OF CUSTODY RECORD

5C TOPO

Page 1 of 1

Project No.: 8101

Project Name: Ft. Stewart

Samplers (Signature): Steven R Clark

Sample Number	Date	Time	Grab	Comp.	Sample Location	No. of Containers	Preservative	8020	8270	8015 (GRO)	8015 (DRO)			Remarks
1824-D1	8/7/96	1445	✓	S		4	none	✓	✓	✓	✓	39740		Soil Samples
1824-D3	8/7/96	1400	✓	S		4	none	✓	✓	✓	✓		41	From dispense
1824-D2	8/7/96	1630	✓	S		4	none	✓	✓	✓	✓		42	islands
TK38-GW	8/8/96	1010	✓	W		4	see note*	✓	✓				43	*VOA's preserved w/ HCl
Trip Blank	8/8/96		✓	W		1	HCl	✓					44	Ground water has a stain

Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
Steven R Clark	8/8/96 1000	[illegible]	[illegible]	8/8/96 0900	
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Remarks:
Relinquished by:	Date / Time	Received by:			

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APPENDIX IX

CONTAMINATED SOIL DISPOSAL MANIFESTS

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All contaminated soil removed during the entire project (i.e., all USTs removed under contract with ACE, to include clean and nonclean closures) was tested in accordance with the disposal facility requirements and transported to Kedesh, Inc., Highway 84, Ludowici, GA 31316. The Closure Report was not submitted to GA EPD because review of the closure analytical data indicated that a CAP-Part A would be required (i.e., per requirements of GUST-9, Item 15, page 12, dated August 1995). However, all pertinent information (i.e., copies of analytical data, manifests, and maps) are provided in this CAP-Part A Report. Disposal manifests for the UST 38 site were submitted to GA EPD USTMP in September 1998 with the UST 207A (Facility ID#9-089039) Closure Report response to comments correspondence (Perez 1998). Approximately 20.56 tons of contaminated soil was excavated from the site.

I certify that the above information is true and accurate.

Name: Thomas C. Fry

Title: Acting Chief, ENRD

Signature: Thomas C. Fry

Date: 09/07/99

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Mel.

DEPARTMENT OF THE ARMY
HEADQUARTERS, 3D INFANTRY DIVISION (MECHANIZED) AND FORT STEWART
Directorate of Public Works
1557 Frank Cochran Drive
Fort Stewart, Georgia 31314-4928

SEP 15 1998

REPLY TO
ATTENTION OF

Directorate of Public Works

CERTIFIED MAIL
Z-098-024-167

Georgia Department of Natural Resources
Environmental Protection Division
Underground Storage Tank Management Program
Attention: Mr. William Logan, Environmental Specialist
4244 International Parkway, Suite 104
Atlanta, Georgia 30354

Dear Mr. Logan:

Fort Stewart is pleased to receive the Georgia Environmental Protection Division's correspondence dated August 14, 1998, in reference to the Closure Report submitted for Fort Stewart's former Underground Storage Tank (UST) #207A, Building 230, Facility Identification Number 9089039. As requested in that correspondence, the April 3, 1998 Closure Report Addendum should be amended to include the enclosed manifests for Anderson Columbia Environmental Delivery Order 101, which are provided for your use and convenience. These manifests include additional UST sites (as shown on the attached list). A total of 45 USTs were removed under this delivery order. In addition, this delivery order removed dispensing islands (note included on the provided list) from another 22 sites, for a total of 67 sites as noted in the Closure Report Addendum.

If you have any questions or comments, please contact Ms. Melanie Little or Ms. Tressa Rutland, Directorate of Public Works, Environmental Branch, at (405) 364-8461 or (912) 767-7919, respectively.

Sincerely,

Dale F. Kiefer
for Ovidio E. Perez
Colonel, U.S. Army
Director, Public Works

Enclosure

FORT STEWART UST Removal List for FY 1996

Anderson Columbia Delivery Order #101

TANK #	LOCATION	SIZE	FACILITY ID #
2	Bldg 1840: Diesel	25,000	9-089065
3	Bldg 1850: Mogas	5,000	9-089065
4	Bldg 1840: Waste Oil	2,500	9-089065
4A	Bldg 1840: Waste Oil	1,000	9-089065
5	Bldg 1824: Mogas	6,000	9-089066
6	Bldg 1824: Diesel	25,000	9-089066
22	Bldg 1720: Waste Oil	2,000	9-089011
24	Bldg 1720: Waste Oil	2,000	9-089011
28B	Bldg 1720: Waste Oil	2,000	9-089011
38	Bldg 1510/13: Waste Oil	1,000	9-089109
41	Bldg 1542: Waste Oil	1,000	9-089145
45	Bldg 1172: Waste Oil	500	9-089054
56	Bldg 1056: Waste Oil	2,000	9-089116
65	Bldg 927: Mogas	10,000	9-089091
66	Bldg 967: Diesel	10,000	9-089091
71	Bldg 1203: Waste Oil	1,000	9-089022
71A	Bldg 1260: Waste Oil	1,000	9-089023
74	Bldg 1280: Waste Oil	2,500	9-089072
79	Bldg 1224: Waste Oil	1,000	9-089026
87	Bldg 1245: Diesel	5,000	9-089073
88	Bldg 1245: Diesel	5,000	9-089073
93	Bldg 1330: Waste Oil	2,500	9-089112
94	Bldg 1320/23: Waste Oil	1,000	9-089076
94B	Bldg 1339: Waste Oil	1,000	9-089110
94C	Bldg 1339A: Waste Oil	1,000	9-089110
100A	Bldg 1349: Waste Oil	1,000	9-089080
100B	Bldg 1350: Waste Oil	1,000	9-089081
201A	Bldg 260: Waste Oil	1,000	9-089043
201B	Bldg 260: Waste Oil	1,000	9-089043
207	Bldg 232: Waste Oil	500	9-089038
207A	Bldg 230: Waste Oil	2,500	9-089039
214	Bldg 1503: Waste Oil	550	9-089015
215	Bldg 1503: Waste Oil	500	9-089015
216	Bldg 4502: Waste Oil	1,000	9-089060
224	Bldg 4528: Waste Oil	1,000	9-089063
225	Bldg 4529: Waste Oil	1,000	9-089090
238	Bldg 4586: Waste Oil	1,000	9-089044
241	Bldg 241: Waste Oil	2,000	9-089041
242	Bldg 241: Waste Oil	1,000	9-089041
243	Bldg 241: Waste Oil	1,000	9-089041
244	Bldg 241: Waste Oil	1,000	9-089041
261	Bldg 430 (AAFES):Waste Oil	500	9-089118
115	Bldg 15003 Em. Gen: Diesel	250	9-054005
118	Bldg 1239 Em. Gen: Diesel	1,000	9-089070
123	Bldg 933 Em. Gen: Diesel	1,000	9-089092

REYNOLDS CONSTRUCTION COMPANY
Highway 84 • P. O. Box 749
Ludowici, Georgia 31316
Office (912) 368-7488 • Plant (912) 876-8085

Date _____ 19__ Load No. 52

Customer: Triple K. Mgmt Description: PCS

Project Number: RRR 104

Location: Stewart County: Liberty

34920 lb Net.
20160 lb Tare
55080 lb+ Gross
12:22 PM AU 30 96

Signature of Weigher

TONS: 17.46 TOTAL TONS: 956.99

TRUCKER: Hendrick TRUCK NO. 121

DRIVER: Mark B. Bass TICKET NO. 60164

VIP-1518-HV

NON-HAZARDOUS WASTE MANIFEST

Manifest Document No.

1. Page 1 of 1

2. Generator's Name and Mailing Address
Ft. Stewart
Hinesville, GA 31313

3. Generator's Phone (912) 234-6579

4. Transporter 1 Company Name
Hendricks Hauling

5. Transporter 2 Company Name

6. Designated Facility Name and Site Address
Triple R Management, Inc. C/O Reynolds Construction Co.
Rt. 84
Ludowici GA 31316

A. Transporter's Phone 912-427-6758
B. Transporter's Phone
C. Facility's Phone 912-756-3655

7. Waste Shipping Name and Description	8. Containers No.	Type	9. Total Quantity	10. Unit Wt/Vol
a. Petroleum Contaminated Soil	1	TT	18.00	CY
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

11. Special Handling Instructions and Additional Information
8101
Tank# _____

12. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: Tom Fry
Signature: Tom Fry
Month Day Year: 8 30 96

13. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Raymond G. Baca
Signature: Raymond G. Baca
Month Day Year: 8 30 96

14. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name:
Signature:
Month Day Year:

15. Discrepancy Indication Space

16. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19

Printed/Typed Name: Charles Pruitt
Signature: Charles Pruitt
Month Day Year: 8 30 96

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL – RETURN TO GENERATOR

REYNOLDS CONSTRUCTION COMPANY
Highway 84 • P. O. Box 749
Ludowici, Georgia 31316
Office (912) 368-7488 • Plant (912) 876-8085

Date _____ 19__ Load No. 51

Customer: Triple R. Mart

Description: PCS

Project Number: R.R.R. 104

Location: D Stewart

County: Liberty

41940 lb Net
21700 lb Tare
63640 lb+ Gross
12:17 PM AU 30 96

Signature of Weigher

TONS: 20.97

TOTAL TONS: ~~941.50~~ 939.53

TRUCKER: Hendrix

TRUCK NO. 64

DRIVER

TICKET NO. 60163

VIP-1518-HV

NON-HAZARDOUS WASTE MANIFEST

Manifest Document No.

1. Page 1 of 1

2. Generator's Name and Mailing Address
Ft. Stewart
Hinesville, GA 31313

3. Generator's Phone (912) 234-6579

4. Transporter 1 Company Name
Hendricks Hauling

5. Transporter 2 Company Name

6. Designated Facility Name and Site Address
Triple R Management, Inc. C/O Reynolds Construction Co.
Rt. 84
Ludowici GA 31316

A. Transporter's Phone
B. Transporter's Phone ~~912-427-6758~~
C. Facility's Phone 912-756-3655

7. Waste Shipping Name and Description	8. Containers No.	Type	9. Total Quantity	10. Unit Wt/Vol
a. Petroleum Contaminated Soil	1	TT	18.00	CY
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

11. Special Handling Instructions and Additional Information
8101
Tank#_____

12. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: Tom Fry
Signature: Tom Fry
Month 08 Day 30 Year 96

13. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Malcolm B Ransom
Signature: [illegible]
Month 08 Day 30 Year 96

14. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name
Signature
Month Day Year

15. Discrepancy Indication Space

16. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: Charles Pruitt
Signature: Charles Pruitt
Month 8 Day 30 Year 96

GENERATOR — TRANSPORTER — FACILITY

ORIGINAL – RETURN TO GENERATOR

APPENDIX X

SITE RANKING FORM

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SITE RANKING FORM

Facility Name: UST 38, Building 1510 **Ranked by:** S. Stoller

County: Liberty **Facility ID #:** 9-089109 **Date Ranked:** 6/30/99

SOIL CONTAMINATION (based on CAP-Part A soil data, no soil closure data)

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

* *Elevated PAH reporting limit for several samples, however, no estimated concentrations below that limit*

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

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. 0) + (B. 0) = (0) x (C. 10) = (D. 0)

GROUNDWATER CONTAMINATION (based on CAP-Part A groundwater data)

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 = 100
- ☐ >10,000 µg/L = 250

Fill in the blanks: (E. 0) + (F. 50) = (G. 50)

Facility Name: UST 38, Building 1510 **County:** Liberty **Facility ID #:** 9-089109

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 & VAULT** (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' = 1

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

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

(G. 50) x (L. 50) = M. 2500

(M. 2500)+ (D. 0) = N. 2500

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. 2500) x (P. 1) = (2500) + (Q. 0)

= 2500 (based on CAP-Part A soil and groundwater data)
ENVIRONMENTAL SENSITIVITY SCORE

ADDITIONAL GEOLOGIC AND HYDROLOGIC DATA

The following information is presented to provide supplemental information to Section II.D.5 of the CAP-Part A form and Item H of the Site Ranking Form and provides detailed information relating to the geologic and hydrogeologic conditions at Fort Stewart which supports Fort Stewart's determination that the water withdrawal point(s) located at Fort Stewart is (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 4254 feet 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 1970 feet thick and dominated by clastics. The Tertiary section was found to be approximately 2170 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 was 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 dominantly 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 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 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 to 50 feet BGS; thus, the effective aquifer thickness would be approximately 35 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 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 the 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 UST investigation sites is part of the Surficial Aquifer system. Based on the fact that all public and non-public water supply wells draw water from the Principal (Floridan) Aquifer, and that the Hawthorn confining unit separates the Principal 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.

APPENDIX XI

COPIES OF PUBLIC NOTIFICATION LETTERS AND CERTIFIED RECEIPTS OF NEWSPAPER NOTICE

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STATE OF GEORGIA
CHATHAM COUNTY

Affidavit of Publication
___Savannah Morning News
___Savannah Evening Press

Personnally appeared before me, Lynnette Tuck, to me known, who being sworn, deposes and says:

That he is the Class. Inside Sales Mgr. of Southeastern Newspapers Corporation, a Georgia corporation, doing business in Chatham County, Georgia, under the trade name of Savannah Morning News/Savannah Evening Press, a daily newspaper published in said county;

That he is authorized to make affidavits of publication on behalf of said published corporation;

That said newspaper is of general circulation in said county and in the area adjacent thereto;

That he has reviewed the regular editions of the Savannah Morning News/Savannah Evening Press, published on 6-27, 1999, 7-4, 1999, _____, 1999, _____, 1999, and finds that the following Advertisement, to-wit:

015 Miscellaneous Notices

PUBLIC NOTICE

Notification of Corrective Action Plan, Underground Storage Tank Releases, Fort Stewart Garrison Area, Fort Stewart, Ga.

The Georgia EPD (GEPD) has required Fort Stewart Directorate of Public Works to prepare a Corrective Action Plans Part-A to investigate and/or clean up contamination at the underground storage tank sites listed at the end of this notification. These plans will be submitted to the GEPD on or before September 30, 1999. If you want to examine a copy of one or more of the plans, please contact Commander, 3rd Infantry Division (Mechanized) and Fort Stewart, attn: DPW ENRD ENV. Br. (T. Rutland), 1557 Frank Cochran, Fort Stewart, Ga. 31314-4928

A copy will be mailed at a nominal fee.

Comments to the plan will be accepted until October 31, 1999, and should be directed to GEPD at 404-362-2687. Following is the mailing address:

GEPD USTMP, 4244 International Parkway, Suite 104, Atlanta, Ga. 30354

Fort Stewart CAP - Part A and Part B Underground Storage Tank Sites

UST: Building; Facility ID#
2 & 3, 1848, 9-[illegible]65
5 & 6, 1884, 9-[illegible]66
28B, 1720, 9-089011
36 & 37m 1510, 9-089016
38, 1510/13, 9-089109
63 & 64, 1128, 9-089051
71, 1203, 9-089022
79, 1224, 9-089026
87 & 88, 1245, 9-089073
100B, 1350, 9-089081
122, 7705, 9-089083
123, 933, 9-089092
214, 1503, 9-089015
225, 4529, 9-089090
242 & 244, 241, 9-089041
248 & 249, 15016, 9-054006
4 & 5 NGTC, 9395, 0-890028
6 & 7 NGTC, 9795, 0-890028

appeared in each of said editions.

Lynnette Tuck
(Deponent)

Sworn to and subscribed before me this 7 day of July, 1999.

Zillie D. Ray
Notary Public, Chatham County, Georgia

Form 121 rev.

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APPENDIX XII

GUST TRUST FUND REIMBURSEMENT APPLICATION AND CLAIM FOR REIMBURSEMENT

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Fort Stewart is a federally owned facility and has funded the investigation for UST 38, Building 1510, Facility ID #9-089109, using Department of Defense Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

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ATTACHMENT A

TECHNICAL APPROACH

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TECHNICAL APPROACH

1.0 INTRODUCTION

The overall objective of this project is to provide the engineering services required to produce Corrective Action Plans (CAPs) for the subject UST sites. These reports will conform to the site closure requirements of a CAP-Part A for sites in Georgia. The field investigations necessary to support the report preparation included the installation of temporary piezometers, soil borings, and associated sampling of soil and groundwater. Upon completion of the field investigations, a CAP-Part A will be prepared to meet GA EPD, Fort Stewart, and the USACE-Savannah requirements.

2.0 FIELD ACTIVITIES

The following sections detail the methodologies used for geoprobe drilling, sampling, and piezometer installation. A geologist from SAIC was on site at all times during operations. No drilling activities were undertaken until all utility clearances and permits had been obtained from Fort Stewart's utility personnel.

2.1 Subsurface Soil Sampling

2.1.1 Geoprobe Drilling

The geoprobe method was used during the project for collecting soil samples. During all geoprobe drilling, soil samples were collected continuously on 4.0-foot centers from the ground surface to the bottom of the borehole. The total depth of each borehole was dictated by the depth where the water table was encountered.

2.1.2 Sample Collection

Soil samples for chemical analyses were collected from boreholes using 4.0-foot macro-core samplers. Upon retrieval of the sampling device, the soil core was split into two 2.0-foot sections using a stainless steel knife. A portion of each 2.0-foot section was collected for possible laboratory analysis. The remaining portion of each 2.0-foot section was used for field measurements.

During the May and June 1998 sampling events, samples designated for possible laboratory analysis were collected from the section using a stainless steel spoon. The spoon was run lengthwise down the core to collect a sample representative of the entire core section. The portion of the sample designated for volatile organic analyses was placed into laboratory sample containers first, followed by placement of the remaining portion of the sample into the containers designated for other types of analyses. Sample containers designated for volatile organic analyses were filled so that minimal headspace was present in the containers. Headspace gas concentration measurements were made using a field organic vapor meter (OVM). Initially, soil from each 2.0-foot interval was placed into a glass jar, leaving some air space, and covered with aluminum foil to create an air-tight seal. The sample was allowed to volatilize for a minimum of 15 minutes. The sealed jar was punctured with the OVM probe and headspace gas drawn until the meter reading was stable. The concentration of the headspace gas was recorded to the nearest 0.1 part per million.

Due to a change in the state regulations governing sample analysis, the collection of samples designated for volatile organic analyses was modified beginning with the November 1998 field effort. Soil samples designated for volatile organic analyses were collected using En Core™ samplers. The samplers were locked into an En Core T-Handle. Using the T-Handle, the sampler was pushed into the soil until the coring body of the sampler was full. Once the samplers were filled, caps were locked onto them insuring that no

headspace was present. The samplers were then removed from the handle and placed in an En Core zipper bag. Three encore samples are collected from each section 2.0-foot section.

Immediately after collection of each sample and completion of bottle label information, each potential analytical sample container was placed into an ice-filled cooler to ensure preservation. A clean split-barrel sampling device was used to collect soil core from each interval of the project boreholes. Information regarding the criteria for selection of soil samples for off-site shipment to a laboratory for chemical analysis is presented in Section 3.1.3 of the project Work Plan. Soil samples, which were not selected for laboratory analysis, were disposed of as investigation-derived waste (IDW).

2.2 Groundwater Sampling

2.2.1 Groundwater Collection

Groundwater samples from geoprobe boreholes installed during Preliminary Groundwater and CAP-Part A investigations were collected using a geoprobe sampler or from temporary piezometers. The geoprobe sampler is a probe that allows the collection of a groundwater sample from a discrete undisturbed depth interval in a soil boring. Temporary piezometers were constructed of 1.0-inch inside diameter (ID) polyvinyl chloride (PVC) casing with a 5-foot or 10-foot screened interval. These piezometers were installed in the open borehole following completion of all drilling activities.

Each soil borehole was advanced to the top of the water table using direct push methods. For each borehole, the geoprobe sampler was lowered to the bottom of the borehole and driven through the undisturbed soil to a depth of approximately 3.0 feet below the water table. The outer casing of the geoprobe sampler was retracted to expose the screen and allow groundwater to enter the chamber. In cases where the geoprobe sampler could not be driven or where groundwater recovery through the geoprobe sampler was poor, the groundwater sample was collected through the temporary piezometer.

Groundwater samples were collected using a peristaltic pump or a 0.75-inch diameter stainless steel bailer. The portion of the sample designated for volatile organic analysis was poured into laboratory sample containers first, followed by pouring the remaining sample portion into containers designated for other types of chemical analyses. Sample containers designated for volatile organic analysis were filled so that no headspace was present in the containers.

2.2.2 Field Measurements

Groundwater field measurements performed during the project included measurement of static groundwater level, pH, specific conductance, and temperature. Measurement of groundwater levels in soil boreholes was accomplished through the installation of temporary PVC piezometers. A summary of the procedures and criteria to be used for groundwater sample field measurements is presented in the following sections.

Static Groundwater Level

Static groundwater level measurements were made using an electronic water level indicator. Initially, the indicator probe was lowered into each temporary piezometer casing until the alarm sounded and/or the indicator light illuminated. The probe was withdrawn several feet and slowly lowered again until the groundwater surface was contacted as noted by the alarm and/or indicator light. Water level measurements were estimated to the nearest 0.01 foot based on the difference between the nearest probe cord mark to the top of the piezometer casing.

The distance between the top of casing and the surrounding ground surface was taken into account in measuring the water level to within 0.01 foot. The static water level measurement procedure was repeated two or three times to ensure that the water level measurements were consistent (plus or minus 0.01 foot). If this was the case, then the first measured level was recorded as the depth to groundwater. If this was not the case, the procedure was repeated until consistent readings were obtained from three consecutive measurements.

pH, Specific Conductance, and Temperature

The pH, specific conductance, and temperature measurements were recorded for groundwater during groundwater sampling. The pH, temperature, and conductivity measurements were made using a combination meter designed to measure these parameters. A portion of each groundwater sample was retrieved from the PowerPunch sampler and poured into the collection cup. With the combination meter set in the pH mode, the meter electrode was swirled at a slow constant rate within the sample until the meter reading reached equilibrium. The sample pH was recorded to the nearest 0.1 pH unit. The pH measurement procedure was repeated, using a new sample each time, until the pH measurements were consistent (less than 0.2 pH units variation).

Upon completion of the pH measurement, conductivity and temperature measurements were made on a groundwater sample collected in the same manner as described above. With the combination meter set in the conductivity mode, the meter electrode was swirled at a slow constant rate within the sample until the meter reading reached equilibrium. Concurrently, a temperature probe was placed into the sample and allowed to reach equilibrium. The sample conductivity was recorded to the nearest 10 mmhos/cm and the temperature to the nearest 0.1° C. All recorded conductivity values were converted to conductance at 25° C. The conductivity and temperature measurement procedure was repeated a minimum of three times using a new sample each time, until the measurements were consistent (less than 10 percent variation for conductance and less than 0.5° C variation for temperatures).

2.3 Temporary Piezometer Installation

Following the collection of the groundwater sample, a 1.0-inch PVC piezometer, with a 5-foot or 10-foot screened section, was installed in the borehole to prevent the borehole from collapsing. These piezometers remained in the boreholes approximately 24 hours, after which time the static water level was measured. During field activities in November 1998 or later, the temporary piezometers were screened from ground surface to the bottom of the borehole.

2.4 Borehole Abandonment

Once the static water level was measured, the temporary piezometers were removed and the boreholes were abandoned. Abandonment was conducted in a manner precluding any current or subsequent fluid media from entering or migrating within the subsurface environment along the axis or from the endpoint of the borehole. Abandonment was accomplished by filling the entire volume of the borehole with grout.

2.5 Surveying

A topographic survey of the horizontal and vertical locations of all soil boreholes was conducted after completion of all field activities. The topographic survey was conducted by a surveyor registered in the state of Georgia.

The horizontal coordinates for each soil borehole were surveyed to the closest 1.0 foot and referenced to the State Plane Coordinate System. Ground elevations were surveyed to the closest 0.1 foot. Elevations were referenced to the National Geodetic Vertical Datum of 1983.

2.6 Decontamination Procedures

2.6.1 Geoprobe Equipment

Decontamination of equipment used for drilling boreholes was conducted within the temporary decontamination pad constructed at the central staging area. The decontamination pad was constructed so that all decontamination liquids were contained from the surrounding environment and were recovered for disposal as IDW. The entire geoprobe vehicle and equipment were decontaminated once they arrived on site and the geoprobe sampling equipment was decontaminated after completion of each soil borehole. The equipment was decontaminated by removing the caked soil material from the exterior of equipment using a rod and/or brush, steam cleaning the interior and exterior of equipment, allowing the equipment to air dry as long as possible, and wrapping or covering the equipment in plastic.

2.6.2 Sampling Equipment

Decontamination of equipment used for soil sampling and collection of groundwater samples was conducted at the temporary decontamination area. Nondedicated equipment was decontaminated after each use. The sampling equipment was washed with potable water and phosphate-free detergent using various types of brushes required to remove particulate matter and surface films, followed by a potable water rinse, American Society for Testing and Materials (ASTM) Type I or equivalent water rinse, isopropyl alcohol rinse, ASTM Type I or equivalent water rinse, allowed to air dry, and wrapped in plastic or aluminum foil.

In addition to the sampling equipment, field measurement instruments were also decontaminated between uses. Only those portions of each instrument that come into contact with potentially contaminated environmental media were decontaminated. Because of the delicate nature of these instruments, the decontamination procedure only involved initial rinsing of the instrument probes with ASTM Type I or equivalent water.

2.7 Documentation of field activities

All information pertinent to sampling activities, including instrument calibration data, was recorded in field logbooks. The logbooks were bound and the pages consecutively numbered. Entries in the logbooks were made in black permanent ink and included, at a minimum, a description of all activities, individuals involved in drilling and sampling activities, date and time of drilling and sampling, weather conditions, any problems encountered, and all field measurements.

Sufficient information was recorded in the logbooks to permit reconstruction of all sampling activities. For a detailed description of all field documentation, see section 4.5 of Attachment IV of the Work Plan.

3.0 SAMPLE HANDLING AND ANALYSIS

3.1 Analytical Program

Soil samples were screened for the presence of volatile vapors using a MiniRae organic vapor analyzer (PID). The MiniRae was calibrated daily using 100 parts per million (ppm) isobutylene. The headspace of each sample was measured approximately 15 minutes after collection.

For sites where the UST had contained waste oil, soil samples were analyzed for BTEX by method SW846-8020, PAH by method SW846-8270, TPH by method SW846-9073, and lead by method SW846-6010/7000, during the May and June 1998 field effort. Beginning in November 1998, BTEX was analyzed using method SW846-5035/8260B, while the analyses for the other contaminants remained the same. Groundwater samples were analyzed for BTEX by method SW846-8260 and PAH by method SW 846-8270. All samples were sent to General Engineering Laboratories, Charleston, South Carolina.

For sites where the UST had contained gasoline or diesel, soil samples were analyzed for BTEX by method SW846-8020, PAH by method SW846-8270, TPH by method SW846-8015 (modified), and lead by method SW846-6010/7000. Groundwater samples were analyzed for BTEX by method SW846-8260 and PAH by method SW 846-8270. TPH analysis included both gasoline range organics (GRO) and diesel range organics (DRO). Beginning in November 1998, soil samples were analyzed for BTEX using method SW846-5035/8260B. All samples were sent to General Engineering Laboratories, Charleston, South Carolina.

Duplicate samples of soil and groundwater were collected throughout the project and represented approximately 10 percent of the total sample population. Rinsate blanks were collected to determine whether the sampling equipment was causing cross-contamination of the samples and represented approximately 5 percent of the total sample population. Duplicates and rinsates were submitted to General Engineering Laboratories, Charleston, South Carolina.

3.2 Sample Containers, Preservation, and Holding Times

The soil sample containers, preservatives, and holding times are summarized in Table A-1. The groundwater sample containers, preservatives, and holding times are summarized in Table A-2.

3.3 Sampling Packaging and Shipment

Each sample container was labeled, taped shut with electrical tape (except those containing samples designated for volatile organic analysis), and an initialed/dated custody seal was placed over the lid. Each sample bottle was placed into a separate plastic bag and sealed. The samples were placed upright in thermally insulated rigid-body coolers and surrounded by vermiculite to prevent breakage during shipment. In addition, samples were cooled to approximately 4° C with wet ice. These measures were taken to slow the decomposition and volatilization of contaminants during shipping and handling. The sample coolers were shipped to the analytical laboratory via courier service provided by the laboratory.

Table A-1. Summary of Sample Containers, Preservation Techniques, and Holding Times for Soil Samples Collected During the Site Investigation

Analyte Group	Container	Minimum Sample Size	Preservative	Holding Time
BTEX/TPH-GRO	1 – 4 oz jar with Teflon®-lined cap (no headspace)	20 g	Cool, 4°C	14 d
BTEX (beginning 11/98)	3 – En Core™ Samplers	15 g	Cool, 0°C	48 hrs
TPH-GRO (beginning 11/98)	1 – 4 oz jar with Teflon®-lined cap (no headspace)	20 g	Cool, 4°C	14 d
PAHs	1 – 8 oz jar with Teflon®-lined cap	90 g	Cool, 4°C	14 d (extraction) 40 d (analysis)
TPH-DRO	use same container as PAHs	90 g	Cool, 4°C	14 d (extraction) 40 d (analysis)
TPH	use same container as PAHs	90 g	Cool, 4°C	14 d (extraction) 40 d (analysis)
Metals (lead)	use same container as PAHs	20 g	Cool, 4°C	180 d

Table A-2. Summary of Sample Containers, Preservation Techniques, and Holding Times for Groundwater Samples Collected During the Site Investigation

Analyte Group	Container	Minimum Sample Size	Preservative	Holding Time
BTEX	2 – 40 mL glass vials with Teflon®-lined septum (no headspace)	40 mL	Cool, 4°C HCl to pH < 2	14 d
PAHs	2 – 1L amber glass bottle with Teflon®-lined lid	1000 mL	Cool, 4°C	7 d (extraction) 40 d (analysis)

ATTACHMENT B

REFERENCES

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Anderson Columbia Environmental Inc., 1996. *Closure Report, Gasoline and Diesel Tanks, Building 1510, Tanks 5 & 6*, Facility ID: 9-089109, Fort Stewart, Georgia, November.

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.

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

Herrick, S.M. and Vorchis, R.C. 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.

Perez, Olivido E. 1998. Letter to William Logan (Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Management Program), September 15.

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ATTACHMENT C

SUPPLEMENTAL INFORMATION
RISK-BASED CORRECTIVE ACTION

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1. RISK-BASED CORRECTIVE ACTION

A risk-based approach was used to aid in the decision making process to determine the need for further action at the UST 38 site. Due to the nature of the contamination (petroleum hydrocarbon contamination of groundwater), the risk-based approach was limited to human health concerns. Ecological risk concerns are negligible because of the lack of habitat available for ecological receptors as a result of the 10 to 12 inches of concrete overlying the majority of the site.

The methods for assessing human health concerns for the site were derived from GUST CAP Part B guidance (GA EPD 1995) and recent GA EPD guidance (GA EPD 1996). These were supplemented by the additional guidance documents on risk assessment methods referenced in this section. In general, the risk-based corrective action approach is performed in two steps:

1. Results were screened against readily available regulatory levels and risk-based screening levels to identify chemicals of potential concern (COPCs).

2. Site-specific ACLs were developed for COPCs using the results of the fate and transport modeling and identified receptor locations.

The following sections present the conceptual model of the exposure setting and potential receptors as well as the general methodology employed to perform the screening for COPCs and the development of ACLs.

1.1 Potential receptor survey

The exposure assessment identifies any potentially complete pathways between the contaminant source and potential receptors. This involves identifying potential current and future receptors, release mechanisms through which contamination might come into contact with the receptors, and the routes of exposure through which the receptors might be exposed.

The UST 38 site is located within Fort Stewart, an active military installation, and within an access-controlled fence of a secured motorpool. The land use at the site is currently military industrial. In the direction of groundwater flow, an underground industrial waste water line is located above the water table and approximately 35 feet west of the site, a drainage ditch is located approximately 800 feet west of the site, and Mill Creek is located approximately 2500 feet west of the site.

No connection between site contamination and current off-site receptors has been identified. Site contamination may migrate to the surficial aquifer. The Hawthorn Group separates the surficial aquifer from the deep drinking water aquifer, the Floridan aquifer, which is approximately 90 feet of clay. There appears to be no vertical migration from the surficial aquifer to the Floridan aquifer. Well #5 is located approximately 5200 feet downgradient of the UST 38 site. However, the Hawthorn Group, a thick and highly effective confining unit, separates the water supply well from the surficial aquifer.

No current on-site receptors have been identified for the site. Potential future on-site receptors might include industrial workers and military residents.

Potential future on-site industrial receptors may come in direct contact with site soil contamination during construction or excavation activities. No near-term on-site receptors are likely to come into contact with groundwater, unless the surficial aquifer discharges into the drainage ditch.

1.2 Screening for Chemicals of Potential Concern

1.2.1 Screening Methodology

The purpose of a risk evaluation screen is to identify the COPCs and areas of concern at a site and possibly to identify sites for which no further action is needed. The first step in the risk process uses screening levels that are readily obtainable and that, due to their conservative nature, can be used with a high degree of confidence to indicate sites for which no further action is required.

An American Society of Testing and Materials (ASTM) (ASTM 1995) Tier 1–type risk evaluation process will be applied to the data collected for the UST 38 site to identify any COPCs and media for which no further action is needed. The risk evaluation screen involves the steps listed below.

- Identify potential migration and exposure pathways associated with the site, and identify potential exposure scenarios that should be used to select screening levels.
- Identify risk-based screening levels and regulatory based screening levels for each contaminant.
- Compare site-related concentrations to screening levels to determine if any potential COPCs exist at the site.
- Compare detection limits to screening levels to identify potential false negative screening results.

The screening levels for the UST 38 site data have been taken from the following sources based on GA EPD guidance (GA EPD 1996):

- federal MCLs (EPA 1989),
- GUST Soil Threshold Levels (i.e., Table A, Column 2),
- soil screening levels developed by the U.S. Environmental Protection Agency (EPA) (EPA 1996a), and
- soil and groundwater risk-based concentrations developed by EPA Region 3 (EPA 1996b).

These values reflect screening levels based on a combination of regulatory screening levels (i.e., MCLs and GUST soil threshold levels), and calculated risk-based values (i.e., EPA Region 3 risk-based concentrations).

Screening levels inherently incorporate assumptions about land use. In identifying COPCs, it is generally accepted that screening levels will reflect any potential future land uses, and thus, they usually reflect a conservative residential use scenario (EPA 1991; EPA 1996a; ASTM 1995). Based on GA EPD guidance, risk-based screening levels reflect residential land use for groundwater and industrial land use for deep soils (GA EPD 1996).

Default residential exposure scenarios for groundwater assume that use of the land could someday be residential and that the following exposures could occur:

- ingestion of groundwater and
- inhalation of volatiles during showering.

The default industrial exposure assumptions for deep soils assume that the following exposures could occur:

- incidental ingestion of soil and
- inhalation of volatiles and dust.

EPA's *Soil Screening Guidance* (EPA 1996a) provides two options for selecting soil values that address protection of groundwater. One value assumes no contaminant dilution or attenuation would occur between the soil and groundwater; a second value assumes a 20-fold dilution attenuation factor (DAF). A DAF of 20 was used to develop soil screening values protective of groundwater at the UST 38 site.

If ARAR- or risk-based values are not available, it generally means that (1) the chemical is not considered to be toxic except perhaps at extremely high concentrations (e.g., aluminum, sodium); (2) the dose-response data do not indicate a toxic effect; or (3) EPA is currently reviewing toxicity information, and no reference dose or cancer slope factor is currently available.

1.2.2 Screening Results

The risk screening process is a systematic screening of sample results to identify site-related COPCs. Constituent concentrations below risk- or regulatory-based screening levels are not considered COPCs and are not evaluated further. Table C-1 presents the results of the risk-based screening for the Part A SI soil data. Table C-2 presents the results of the risk-based screening for the Part A SI groundwater data.

No constituents were detected above screening levels for soil data collected during the Part A SI. Benzene, ethylbenezene, toluene, xylenes, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene, lead, and TPH were detected below screening levels during the Part A sampling. No constituents were identified as a COPC for UST 38 site soils.

Detection limits for benzo(a)pyrene and dibenzo(a,h)anthracene exceeded risk-based screening levels for soils in five samples. No COPCs for soils were selected for the site based on the detection limit screening.

Benzene was detected in six groundwater samples from three temporary wells (80-03, 80-04, and 80-05) at concentrations above the risk-based screening level for benzene of 0.36 µg/L. Five of these results also exceeded the federal MCL for benzene of 5 µg/L. Ethylbenzene, toluene, and xylenes, were detected below screening values for the Part A SI. Benzene was selected as a COPC for the UST 38 site groundwater.

Detection limits for benzene and several PAHs exceeded risk-based screening levels for the Part A groundwater data. For these constituents, risk-based values represent values below analytically achievable levels. The detection limits for one PAH, benzo(*a*)pyrene, also exceeded the federal MCL of 0.2 µg/L by two orders of magnitude. No additional COPCs were selected for groundwater based on the detection limit screening.

1.3 Site-Specific Levels

Detections exceeding the conservative generic screening levels are considered COPCs. ACLs are developed, when appropriate, for the COPCs using site-specific information from the fate and transport modeling and available regulatory screening levels. When regulatory screening levels were not available, then ACLs were developed based on risk-based levels. No risk-based ACLs were developed for UST 38.

1.3.1 Alternate Threshold Levels

No COPCs were identified for UST 38 site soils; thus no alternate threshold levels were developed for soils.

1.3.2 Alternative Concentration Limits

Benzene was identified as a COPC for groundwater at the site. Benzene was modeled to two potential downgradient locations where a receptor may come in contact with migrating site contamination. These two locations were a drainage ditch 800 feet downgradient and Mill Creek 2500 feet downgradient from the site. Fate and transport modeling was used to develop site-specific dilution attenuation factors (DAF) between the source and the receptor locations (see 1.3.3 below). The modeling estimated infinite DAFs for the drainage ditch and Mill Creek. An infinite DAF indicates that contamination will never reach these locations, thus no ACLs were developed for these locations.

1.3.3 Fate and Transport Model

1.3.3.1 Model Selection

Site-specific dilution attenuation factors between the source and the receptor locations were developed. The DAF is a numerical value that represents the attempt to mathematically quantify the natural physical, chemical, and biological processes (e.g., advection-dispersion, sorption-retardation, biodegradation, volatilization) that result in the decrease of a chemical concentration in an environmental medium. In simple terms, the DAF is the ratio of chemical concentration at the source (or the point of origin) to the concentration at the exposure point. The DAFs reflect the natural attenuation concepts outlined in the ASTM's Risk Based Corrective Action (RBCA) protocol (ASTM 1995).

Fate and transport models are used as tools for developing DAFs. The application of fate and transport models at any release site must ensure that the modeling results are protective of human health and the environment. Therefore, the selection process of a predictive model at a release site must consider its performance, characteristics, and applicability to the site being considered. The following characteristics were considered before selecting an appropriate model for Fort Stewart:

- the model provides conservative predictions,
- the model is technically sound,
- the model is a public-domain model or is readily available,
- the model has received adequate peer review,
- the model has been applied to other similar sites, and
- the model is easy to use.

The Analytical Transient 1-, 2-, 3-Dimensional Model (AT123D) meets all of the above criteria, and was selected for performing fate and transport analysis for this site. AT123D is a well-known and commonly used analytical groundwater pollutant fate and transport model. It computes the spatial-temporal concentration distribution of chemicals in the aquifer system and predicts the transient spread of a chemical plume through a groundwater aquifer. The fate and transport processes accounted for in AT123D are advection, dispersion, adsorption/retardation, and decay. This model can be used as a tool for estimating the dissolved concentration of a chemical in one, two, or three dimensions in the groundwater, resulting from a mass release (either continuous or instant or depleting source) over a source area (i.e., point, line, area, or volume source).

1.3.3.2 Fate and Transport Results

The AT123D model was used to determine the impact of dissolved hydrocarbons on potential receptors. A steady-state AT123D model was developed by calibrating the model against observed maximum concentrations in the groundwater (i.e., 229 μg/L) beneath the UST 38 site. Site specific geotechnical information was collected during the CAP-Part A investigation and is presented in Table C-3. Modeling of the leaching of soil contamination to the groundwater was not performed because the additional contaminant contribution to the groundwater was negligible compared to the existing groundwater contamination. Potential receptors are a drainage ditch located 800 feet west of the site and Mill Creek located approximately 2500 feet west of the site. The industrial wastewater line located approximately 35 feet west of the site and the invert elevation is approximately 4.0 feet above the water table and is not considered a potential preferrential pathway.

Vertical migration of the contaminant plume through the confining unit to the Principal Artesian aquifer is improbable. The confining unit has a vertical hydraulic conductivity on the order of 10^{-8} cm/sec and ranges from 15 to 90 feet in thickness. Assuming a vertical gradient of 1.0 ft/ft and an effective porosity of 0.06 (Mills et al. 1985) for the confining unit, the groundwater travel time is estimated to be 87 years. However, benzene will not travel at the same speed as water because of retardation due to adsorption. The retardation factor for benzene through the confining unit is 5.05. Therefore, the travel time for benzene through the confining unit (15 feet thick) is greater than 400 years (i.e., 87 years × 5.05 = 439 years). The surficial aquifer in which the contaminant plume is located is not used as a source of drinking water.

The fate and transport modeling results are provided in Table C-4 and Section 1.5. Two potential downgradient locations, a drainage ditch and Mill Creek, at which a receptor might encounter migrating groundwater contamination, were modeled. These are the nearest possible locations at which a receptor might encounter migrating groundwater contamination due to a possible hydraulic connection between the groundwater and the surface water in the ditch and the creek. Contaminant fate and transport simulations were performed to predict the maximum concentrations at these receptor locations over a simulation period of 100 years. The modeling results indicate that the benzene concentrations at the drainage ditch and Mill Creek are predicted to be 0 μg/L. Therefore, potential receptors and surface water will not be impacted at concentrations above MCLs by the current site conditions at the UST 38 site, Facility ID #: 9-089109.

Based on modeling results, the estimated DAFs for at the drainage ditch and Mill Creek are both infinity, indicating that the predicted concentrations at these receptors are zero. Simulations were not performed to predict the maximum concentrations of benzene over a simulation period of two years because there are no permanent monitoring wells at the site to confirm the model predictions. This simulation will be performed during the long-term monitoring at the site.

1.4 Conclusions and Recommendations

The conclusions below are based on a fate and transport modeling assuming a continuous source of contamination of infinite duration at the site based on the maximum observed benzene concentration (i.e. 229 μg/L) in groundwater during the CAP-Part A investigation.

- Risk-based screening results show that benzene concentrations in groundwater exceed the initial screening levels.

- The modeling of benzene estimated infinite DAFs for the drainage ditch and Mill Creek indicating that contamination will never reach these locations, thus no ACLs were developed for these locations.

- The horizontal and vertical extent of soil and groundwater contamination was determined during the CAP-Part A investigation.

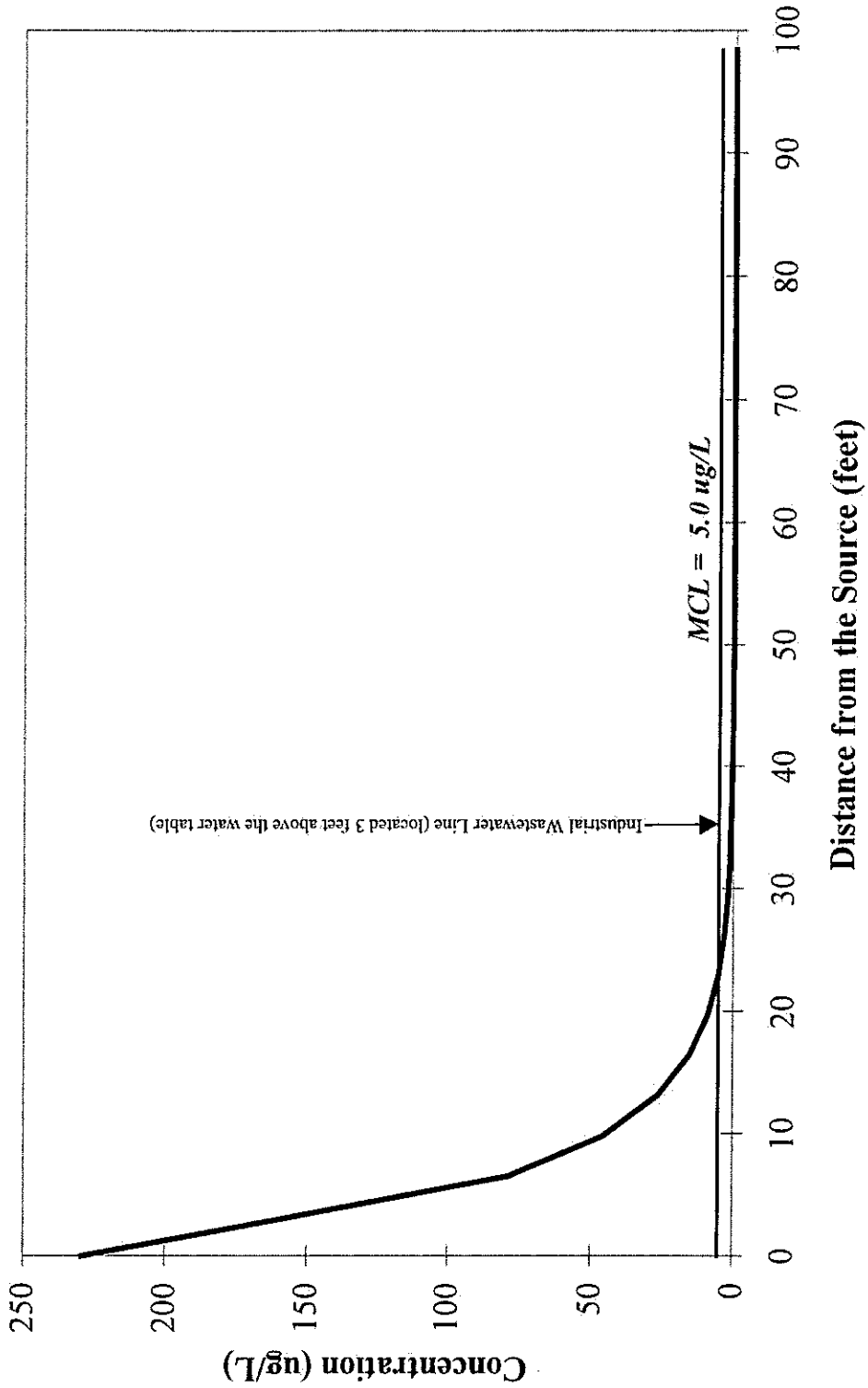
- Fate and transport modeling of benzene indicates that contamination does not exceed MCLs at the conservatively defined downgradient receptors, a drainage ditch and Mill Creek.

Considering the site characteristics, a monitoring only plan is recommended to confirm that natural attenuation is taking place at the site.

1.5 Fate and Transport Model Output Results

Following are the data for fate and transport modeling.

Figure C-1. AT123D modeled maximum concentration of benzene in the groundwater versus downgradient distance from the source (UST 38)



Ft Stewart USTs 38 Benzene (calibrated plume)

NO. OF POINTS IN X-DIRECTION	9
NO. OF POINTS IN Y-DIRECTION	5
NO. OF POINTS IN Z-DIRECTION	1
NO. OF ROOTS: NO. OF SERIES TERMS	400
NO. OF BEGINNING TIME STEP	145
NO. OF ENDING TIME STEP	360
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION	12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE	1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE	0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT	1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD	2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ...	0.1006E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ...	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.3700E+01
END POINT OF X-SOURCE LOCATION (METERS)	0.0000E+00
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.2740E+01
END POINT OF Y-SOURCE LOCATION (METERS)	0.2740E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.2500E+01

POROSITY	0.2000E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.7200E-02
HYDRAULIC GRADIENT	0.4600E-02
LONGITUDINAL DISPERSIVITY (METER)	0.1000E+02
LATERAL DISPERSIVITY (METER)	0.3000E+01
VERTICAL DISPERSIVITY (METER)	0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.1288E-02
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)..	0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR)	0.3530E-05
DECAY CONSTANT (PER HOUR)	0.4015E-04
BULK DENSITY OF THE SOIL (KG/M**3)	0.1860E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE	0.1000E-02
DENSITY OF WATER (KG/M**3)	0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) ..	0.7300E+03
DISCHARGE TIME (HR)	0.8760E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) .	0.2819E-05

RETARDATION FACTOR	0.1298E+02
RETARDED DARCY VELOCITY (M/HR)	0.1276E-04
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) ..	0.1290E-03
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) .	0.3964E-04
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR).	0.1412E-04

```
LIST OF Z-EIGENVALUES
   0.3123E+00  0.6246E+00  0.9369E+00  0.1249E+01  0.1561E+01  0.1874E+01  0.2186E+01  0.2498E+01  0.2811E+01  0.3123E+01
   0.3435E+01  0.3747E+01  0.4060E+01  0.4372E+01  0.4684E+01  0.4997E+01  0.5309E+01  0.5621E+01  0.5933E+01  0.6246E+01
   0.6558E+01  0.6870E+01  0.7183E+01  0.7495E+01  0.7807E+01  0.8119E+01  0.8432E+01  0.8744E+01  0.9056E+01  0.9369E+01
   0.9681E+01  0.9993E+01  0.1031E+02  0.1062E+02  0.1093E+02  0.1124E+02  0.1155E+02  0.1187E+02  0.1218E+02  0.1249E+02
   0.1280E+02  0.1312E+02  0.1343E+02  0.1374E+02  0.1405E+02  0.1437E+02  0.1468E+02  0.1499E+02  0.1530E+02  0.1561E+02
   0.1593E+02  0.1624E+02  0.1655E+02  0.1686E+02  0.1718E+02  0.1749E+02  0.1780E+02  0.1811E+02  0.1842E+02  0.1874E+02
   0.1905E+02  0.1936E+02  0.1967E+02  0.1999E+02  0.2030E+02  0.2061E+02  0.2092E+02  0.2124E+02  0.2155E+02  0.2186E+02
   0.2217E+02  0.2248E+02  0.2280E+02  0.2311E+02  0.2342E+02  0.2373E+02  0.2405E+02  0.2436E+02  0.2467E+02  0.2498E+02
   0.2530E+02  0.2561E+02  0.2592E+02  0.2623E+02  0.2654E+02  0.2686E+02  0.2717E+02  0.2748E+02  0.2779E+02  0.2811E+02
   0.2842E+02  0.2873E+02  0.2904E+02  0.2935E+02  0.2967E+02  0.2998E+02  0.3029E+02  0.3060E+02  0.3092E+02  0.3123E+02
   0.3154E+02  0.3185E+02  0.3217E+02  0.3248E+02  0.3279E+02  0.3310E+02  0.3341E+02  0.3373E+02  0.3404E+02  0.3435E+02
   0.3466E+02  0.3498E+02  0.3529E+02  0.3560E+02  0.3591E+02  0.3623E+02  0.3654E+02  0.3685E+02  0.3716E+02  0.3747E+02
   0.3779E+02  0.3810E+02  0.3841E+02  0.3872E+02  0.3904E+02  0.3935E+02  0.3966E+02  0.3997E+02  0.4028E+02  0.4060E+02
   0.4091E+02  0.4122E+02  0.4153E+02  0.4185E+02  0.4216E+02  0.4247E+02  0.4278E+02  0.4310E+02  0.4341E+02  0.4372E+02
   0.4403E+02  0.4434E+02  0.4466E+02  0.4497E+02  0.4528E+02  0.4559E+02  0.4591E+02  0.4622E+02  0.4653E+02  0.4684E+02
   0.4716E+02  0.4747E+02  0.4778E+02  0.4809E+02  0.4840E+02  0.4872E+02  0.4903E+02  0.4934E+02  0.4965E+02  0.4997E+02
   0.5028E+02  0.5059E+02  0.5090E+02  0.5121E+02  0.5153E+02  0.5184E+02  0.5215E+02  0.5246E+02  0.5278E+02  0.5309E+02
   0.5340E+02  0.5371E+02  0.5403E+02  0.5434E+02  0.5465E+02  0.5496E+02  0.5527E+02  0.5559E+02  0.5590E+02  0.5621E+02
   0.5652E+02  0.5684E+02  0.5715E+02  0.5746E+02  0.5777E+02  0.5809E+02  0.5840E+02  0.5871E+02  0.5902E+02  0.5933E+02
   0.5965E+02  0.5996E+02  0.6027E+02  0.6058E+02  0.6090E+02  0.6121E+02  0.6152E+02  0.6183E+02  0.6214E+02  0.6246E+02
   0.6277E+02  0.6308E+02  0.6339E+02  0.6371E+02  0.6402E+02  0.6433E+02  0.6464E+02  0.6496E+02  0.6527E+02  0.6558E+02
   0.6589E+02  0.6620E+02  0.6652E+02  0.6683E+02  0.6714E+02  0.6745E+02  0.6777E+02  0.6808E+02  0.6839E+02  0.6870E+02
   0.6902E+02  0.6933E+02  0.6964E+02  0.6995E+02  0.7026E+02  0.7058E+02  0.7089E+02  0.7120E+02  0.7151E+02  0.7183E+02
   0.7214E+02  0.7245E+02  0.7276E+02  0.7307E+02  0.7339E+02  0.7370E+02  0.7401E+02  0.7432E+02  0.7464E+02  0.7495E+02
   0.7526E+02  0.7557E+02  0.7589E+02  0.7620E+02  0.7651E+02  0.7682E+02  0.7713E+02  0.7745E+02  0.7776E+02  0.7807E+02
   0.7838E+02  0.7870E+02  0.7901E+02  0.7932E+02  0.7963E+02  0.7995E+02  0.8026E+02  0.8057E+02  0.8088E+02  0.8119E+02
   0.8151E+02  0.8182E+02  0.8213E+02  0.8244E+02  0.8276E+02  0.8307E+02  0.8338E+02  0.8369E+02  0.8400E+02  0.8432E+02
   0.8463E+02  0.8494E+02  0.8525E+02  0.8557E+02  0.8588E+02  0.8619E+02  0.8650E+02  0.8682E+02  0.8713E+02  0.8744E+02
   0.8775E+02  0.8806E+02  0.8838E+02  0.8869E+02  0.8900E+02  0.8931E+02  0.8963E+02  0.8994E+02  0.9025E+02  0.9056E+02
   0.9088E+02  0.9119E+02  0.9150E+02  0.9181E+02  0.9212E+02  0.9244E+02  0.9275E+02  0.9306E+02  0.9337E+02  0.9369E+02
   0.9400E+02  0.9431E+02  0.9462E+02  0.9493E+02  0.9525E+02  0.9556E+02  0.9587E+02  0.9618E+02  0.9650E+02  0.9681E+02
   0.9712E+02  0.9743E+02  0.9775E+02  0.9806E+02  0.9837E+02  0.9868E+02  0.9899E+02  0.9931E+02  0.9962E+02  0.9993E+02
   0.1002E+03  0.1006E+03  0.1009E+03  0.1012E+03  0.1015E+03  0.1018E+03  0.1021E+03  0.1024E+03  0.1027E+03  0.1031E+03
   0.1034E+03  0.1037E+03  0.1040E+03  0.1043E+03  0.1046E+03  0.1049E+03  0.1052E+03  0.1056E+03  0.1059E+03  0.1062E+03
   0.1065E+03  0.1068E+03  0.1071E+03  0.1074E+03  0.1077E+03  0.1081E+03  0.1084E+03  0.1087E+03  0.1090E+03  0.1093E+03
   0.1096E+03  0.1099E+03  0.1102E+03  0.1105E+03  0.1109E+03  0.1112E+03  0.1115E+03  0.1118E+03  0.1121E+03  0.1124E+03
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```

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    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00
    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00
    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00
    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00
    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00    0.1988E+00
 LIST OF ZS-SERIES
    0.2254E+01    0.1601E+01    0.7653E+00    0.1500E-01   -0.4421E+00   -0.5335E+00   -0.3339E+00   -0.1500E-01    0.2408E+00    0.3199E+00
    0.2162E+00    0.1499E-01   -0.1633E+00   -0.2282E+00   -0.1612E+00   -0.1499E-01    0.1222E+00    0.1773E+00    0.1293E+00    0.1498E-01
   -0.9671E-01   -0.1448E+00   -0.1085E+00   -0.1497E-01    0.7937E-01    0.1222E+00    0.9377E-01    0.1496E-01   -0.6679E-01   -0.1057E+00
   -0.8284E-01   -0.1494E-01    0.5723E-01    0.9299E-01    0.7439E-01    0.1493E-01   -0.4973E-01   -0.8294E-01   -0.6764E-01   -0.1491E-01
    0.4367E-01    0.7477E-01    0.6213E-01    0.1489E-01   -0.3868E-01   -0.6800E-01   -0.5753E-01   -0.1487E-01    0.3448E-01    0.6230E-01
    0.5364E-01    0.1485E-01   -0.3091E-01   -0.5741E-01   -0.5030E-01   -0.1483E-01    0.2784E-01    0.5319E-01    0.4739E-01    0.1480E-01
   -0.2515E-01   -0.4949E-01   -0.4484E-01   -0.1478E-01    0.2279E-01    0.4622E-01    0.4258E-01    0.1475E-01   -0.2069E-01   -0.4331E-01
   -0.4056E-01   -0.1472E-01    0.1882E-01    0.4070E-01    0.3874E-01    0.1468E-01   -0.1714E-01   -0.3834E-01   -0.3709E-01   -0.1465E-01
    0.1561E-01    0.3621E-01    0.3559E-01    0.1462E-01   -0.1423E-01   -0.3425E-01   -0.3421E-01   -0.1458E-01    0.1296E-01    0.3246E-01
    0.3294E-01    0.1454E-01   -0.1180E-01   -0.3082E-01   -0.3177E-01   -0.1450E-01    0.1073E-01    0.2929E-01    0.3069E-01    0.1446E-01
   -0.9741E-02   -0.2788E-01   -0.2967E-01   -0.1441E-01    0.8825E-02    0.2656E-01    0.2873E-01    0.1437E-01   -0.7972E-02   -0.2533E-01
   -0.2784E-01   -0.1432E-01    0.7178E-02    0.2418E-01    0.2700E-01    0.1427E-01   -0.6435E-02   -0.2310E-01   -0.2621E-01   -0.1422E-01
    0.5739E-02    0.2208E-01    0.2547E-01    0.1417E-01   -0.5086E-02   -0.2111E-01   -0.2476E-01   -0.1412E-01    0.4472E-02    0.2020E-01
    0.2408E-01    0.1406E-01   -0.3893E-02   -0.1934E-01   -0.2344E-01   -0.1401E-01    0.3346E-02    0.1852E-01    0.2283E-01    0.1395E-01
   -0.2830E-02   -0.1774E-01   -0.2224E-01   -0.1389E-01    0.2340E-02    0.1700E-01    0.2168E-01    0.1383E-01   -0.1877E-02   -0.1629E-01
   -0.2114E-01   -0.1376E-01    0.1437E-02    0.1561E-01    0.2062E-01    0.1370E-01   -0.1019E-02   -0.1497E-01   -0.2012E-01   -0.1363E-01
    0.6212E-03    0.1434E-01    0.1964E-01    0.1357E-01   -0.2425E-03   -0.1375E-01   -0.1917E-01   -0.1350E-01   -0.1182E-03    0.1317E-01
    0.1872E-01    0.1343E-01    0.4623E-03   -0.1262E-01   -0.1829E-01   -0.1336E-01   -0.7905E-03    0.1209E-01    0.1786E-01    0.1328E-01
    0.1104E-02   -0.1158E-01   -0.1745E-01   -0.1321E-01   -0.1404E-02    0.1108E-01    0.1705E-01    0.1313E-01    0.1690E-02   -0.1061E-01
   -0.1667E-01   -0.1306E-01   -0.1964E-02    0.1015E-01    0.1629E-01    0.1298E-01    0.2226E-02   -0.9701E-02   -0.1592E-01   -0.1290E-01
   -0.2477E-02    0.9270E-02    0.1556E-01    0.1282E-01    0.2718E-02   -0.8852E-02   -0.1521E-01   -0.1274E-01   -0.2948E-02    0.8447E-02
    0.1486E-01    0.1265E-01    0.3168E-02   -0.8054E-02   -0.1453E-01   -0.1257E-01   -0.3380E-02    0.7673E-02    0.1420E-01    0.1248E-01
    0.3582E-02   -0.7303E-02   -0.1388E-01   -0.1240E-01   -0.3776E-02    0.6944E-02    0.1357E-01    0.1231E-01    0.3962E-02   -0.6594E-02
   -0.1326E-01   -0.1222E-01   -0.4141E-02    0.6255E-02    0.1295E-01    0.1213E-01    0.4311E-02   -0.5924E-02   -0.1266E-01   -0.1203E-01
   -0.4475E-02    0.5603E-02    0.1237E-01    0.1194E-01    0.4632E-02   -0.5290E-02   -0.1208E-01   -0.1185E-01   -0.4782E-02    0.4985E-02
    0.1180E-01    0.1175E-01    0.4926E-02   -0.4688E-02   -0.1152E-01   -0.1165E-01   -0.5063E-02    0.4399E-02    0.1125E-01    0.1156E-01
    0.5195E-02   -0.4116E-02   -0.1098E-01   -0.1146E-01   -0.5320E-02    0.3842E-02    0.1072E-01    0.1136E-01    0.5441E-02   -0.3573E-02
   -0.1046E-01   -0.1126E-01   -0.5555E-02    0.3312E-02    0.1020E-01    0.1116E-01    0.5665E-02   -0.3057E-02   -0.9952E-02   -0.1105E-01
   -0.5770E-02    0.2808E-02    0.9704E-02    0.1095E-01    0.5869E-02   -0.2565E-02   -0.9459E-02   -0.1085E-01   -0.5964E-02    0.2327E-02
    0.9218E-02    0.1074E-01    0.6054E-02   -0.2096E-02   -0.8981E-02   -0.1064E-01   -0.6139E-02    0.1870E-02    0.8746E-02    0.1053E-01
    0.6221E-02   -0.1649E-02   -0.8515E-02   -0.1042E-01   -0.6298E-02    0.1434E-02    0.8287E-02    0.1031E-01    0.6370E-02   -0.1223E-02
   -0.8062E-02   -0.1020E-01   -0.6439E-02    0.1018E-02    0.7839E-02    0.1009E-01    0.6504E-02   -0.8168E-03   -0.7620E-02   -0.9981E-02
   -0.6565E-02    0.6209E-03    0.7403E-02    0.9869E-02    0.6622E-02   -0.4295E-03   -0.7189E-02   -0.9757E-02   -0.6675E-02    0.2425E-03
    0.6978E-02    0.9644E-02    0.6725E-02   -0.6008E-04   -0.6770E-02   -0.9530E-02   -0.6771E-02   -0.1182E-03    0.6564E-02    0.9416E-02
    0.6814E-02    0.2922E-03   -0.6360E-02   -0.9301E-02   -0.6853E-02   -0.4622E-03    0.6159E-02    0.9186E-02    0.6890E-02    0.6279E-03
   -0.5961E-02   -0.9069E-02   -0.6923E-02   -0.7897E-03    0.5765E-02    0.8953E-02    0.6952E-02    0.9478E-03   -0.5571E-02   -0.8836E-02
   -0.6979E-02   -0.1102E-02    0.5379E-02    0.8718E-02    0.7003E-02    0.1252E-02   -0.5190E-02   -0.8600E-02   -0.7024E-02   -0.1399E-02
    0.5003E-02    0.8481E-02    0.7042E-02    0.1542E-02   -0.4819E-02   -0.8362E-02   -0.7057E-02   -0.1682E-02    0.4636E-02    0.8243E-02
    0.7069E-02    0.1818E-02   -0.4456E-02   -0.8123E-02   -0.7079E-02   -0.1950E-02    0.4278E-02    0.8003E-02    0.7086E-02    0.2079E-02
   -0.4102E-02   -0.7883E-02   -0.7090E-02   -0.2205E-02    0.3929E-02    0.7762E-02    0.7092E-02    0.2328E-02   -0.3757E-02   -0.7641E-02
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DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.970E-02	0.621E-02	0.448E-02	0.308E-02	0.203E-02	0.129E-02	0.798E-03	0.481E-03	0.282E-03
4.	0.300E-01	0.162E-01	0.108E-01	0.685E-02	0.425E-02	0.257E-02	0.152E-02	0.887E-03	0.507E-03
3.	0.912E-01	0.360E-01	0.216E-01	0.128E-01	0.753E-02	0.437E-02	0.251E-02	0.142E-02	0.793E-03
2.	0.185E+00	0.595E-01	0.339E-01	0.194E-01	0.110E-01	0.625E-02	0.352E-02	0.196E-02	0.108E-02
0.	0.228E+00	0.776E-01	0.446E-01	0.254E-01	0.144E-01	0.811E-02	0.453E-02	0.250E-02	0.137E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.981E-02	0.632E-02	0.458E-02	0.316E-02	0.210E-02	0.135E-02	0.843E-03	0.515E-03	0.308E-03
4.	0.302E-01	0.164E-01	0.109E-01	0.698E-02	0.435E-02	0.266E-02	0.159E-02	0.938E-03	0.544E-03
3.	0.914E-01	0.363E-01	0.218E-01	0.130E-01	0.767E-02	0.448E-02	0.260E-02	0.149E-02	0.844E-03
2.	0.186E+00	0.597E-01	0.342E-01	0.196E-01	0.112E-01	0.640E-02	0.363E-02	0.205E-02	0.114E-02
0.	0.229E+00	0.779E-01	0.448E-01	0.257E-01	0.146E-01	0.828E-02	0.466E-02	0.261E-02	0.145E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.989E-02	0.639E-02	0.465E-02	0.322E-02	0.215E-02	0.139E-02	0.877E-03	0.541E-03	0.328E-03
4.	0.303E-01	0.165E-01	0.110E-01	0.706E-02	0.442E-02	0.272E-02	0.164E-02	0.977E-03	0.573E-03
3.	0.916E-01	0.364E-01	0.220E-01	0.131E-01	0.777E-02	0.457E-02	0.266E-02	0.154E-02	0.883E-03
2.	0.186E+00	0.599E-01	0.343E-01	0.197E-01	0.113E-01	0.650E-02	0.371E-02	0.211E-02	0.119E-02
0.	0.229E+00	0.782E-01	0.450E-01	0.258E-01	0.148E-01	0.840E-02	0.476E-02	0.268E-02	0.150E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.995E-02	0.644E-02	0.469E-02	0.326E-02	0.218E-02	0.142E-02	0.902E-03	0.562E-03	0.343E-03
4.	0.304E-01	0.165E-01	0.111E-01	0.712E-02	0.448E-02	0.276E-02	0.168E-02	0.101E-02	0.596E-03
3.	0.917E-01	0.365E-01	0.221E-01	0.132E-01	0.784E-02	0.462E-02	0.271E-02	0.158E-02	0.912E-03
2.	0.186E+00	0.600E-01	0.344E-01	0.198E-01	0.114E-01	0.657E-02	0.377E-02	0.216E-02	0.123E-02
0.	0.229E+00	0.783E-01	0.451E-01	0.259E-01	0.149E-01	0.848E-02	0.482E-02	0.273E-02	0.154E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.998E-02	0.648E-02	0.473E-02	0.329E-02	0.221E-02	0.144E-02	0.921E-03	0.577E-03	0.355E-03
4.	0.304E-01	0.166E-01	0.111E-01	0.716E-02	0.451E-02	0.279E-02	0.170E-02	0.103E-02	0.612E-03
3.	0.917E-01	0.366E-01	0.221E-01	0.133E-01	0.789E-02	0.466E-02	0.274E-02	0.161E-02	0.933E-03
2.	0.186E+00	0.601E-01	0.345E-01	0.199E-01	0.115E-01	0.662E-02	0.381E-02	0.219E-02	0.125E-02
0.	0.229E+00	0.784E-01	0.452E-01	0.260E-01	0.149E-01	0.853E-02	0.487E-02	0.277E-02	0.157E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.100E-01	0.650E-02	0.475E-02	0.331E-02	0.223E-02	0.146E-02	0.934E-03	0.588E-03	0.364E-03
4.	0.305E-01	0.166E-01	0.111E-01	0.719E-02	0.454E-02	0.281E-02	0.172E-02	0.104E-02	0.624E-03
3.	0.918E-01	0.366E-01	0.222E-01	0.133E-01	0.792E-02	0.469E-02	0.277E-02	0.162E-02	0.949E-03
2.	0.186E+00	0.602E-01	0.345E-01	0.199E-01	0.115E-01	0.665E-02	0.384E-02	0.221E-02	0.127E-02
0.	0.229E+00	0.784E-01	0.453E-01	0.261E-01	0.150E-01	0.857E-02	0.490E-02	0.280E-02	0.159E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.100E-01	0.652E-02	0.476E-02	0.333E-02	0.224E-02	0.147E-02	0.944E-03	0.596E-03	0.371E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.721E-02	0.456E-02	0.283E-02	0.173E-02	0.105E-02	0.633E-03
3.	0.918E-01	0.366E-01	0.222E-01	0.133E-01	0.794E-02	0.471E-02	0.278E-02	0.164E-02	0.960E-03
2.	0.186E+00	0.602E-01	0.346E-01	0.199E-01	0.115E-01	0.667E-02	0.386E-02	0.223E-02	0.129E-02
0.	0.229E+00	0.785E-01	0.453E-01	0.261E-01	0.150E-01	0.860E-02	0.493E-02	0.282E-02	0.161E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1664E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.100E-01	0.653E-02	0.478E-02	0.334E-02	0.225E-02	0.148E-02	0.951E-03	0.602E-03	0.375E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.723E-02	0.457E-02	0.284E-02	0.174E-02	0.106E-02	0.640E-03
3.	0.918E-01	0.366E-01	0.222E-01	0.133E-01	0.796E-02	0.473E-02	0.280E-02	0.165E-02	0.969E-03
2.	0.186E+00	0.602E-01	0.346E-01	0.200E-01	0.116E-01	0.669E-02	0.387E-02	0.224E-02	0.129E-02
0.	0.229E+00	0.785E-01	0.453E-01	0.261E-01	0.150E-01	0.862E-02	0.494E-02	0.283E-02	0.162E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.100E-01	0.654E-02	0.478E-02	0.334E-02	0.226E-02	0.148E-02	0.956E-03	0.606E-03	0.379E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.724E-02	0.458E-02	0.285E-02	0.175E-02	0.107E-02	0.645E-03
3.	0.919E-01	0.367E-01	0.222E-01	0.133E-01	0.797E-02	0.474E-02	0.280E-02	0.166E-02	0.974E-03
2.	0.186E+00	0.602E-01	0.346E-01	0.200E-01	0.116E-01	0.670E-02	0.388E-02	0.225E-02	0.130E-02
0.	0.229E+00	0.785E-01	0.454E-01	0.261E-01	0.150E-01	0.863E-02	0.495E-02	0.284E-02	0.163E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1840E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.101E-01	0.654E-02	0.479E-02	0.335E-02	0.226E-02	0.149E-02	0.960E-03	0.609E-03	0.382E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.724E-02	0.458E-02	0.285E-02	0.176E-02	0.107E-02	0.648E-03
3.	0.919E-01	0.367E-01	0.222E-01	0.133E-01	0.797E-02	0.474E-02	0.281E-02	0.166E-02	0.978E-03
2.	0.186E+00	0.602E-01	0.346E-01	0.200E-01	0.116E-01	0.671E-02	0.389E-02	0.225E-02	0.131E-02
0.	0.229E+00	0.785E-01	0.454E-01	0.261E-01	0.150E-01	0.864E-02	0.496E-02	0.285E-02	0.163E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1927E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.101E-01	0.655E-02	0.479E-02	0.335E-02	0.226E-02	0.149E-02	0.962E-03	0.611E-03	0.383E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.725E-02	0.459E-02	0.286E-02	0.176E-02	0.107E-02	0.650E-03
3.	0.919E-01	0.367E-01	0.222E-01	0.134E-01	0.798E-02	0.475E-02	0.281E-02	0.166E-02	0.981E-03
2.	0.186E+00	0.602E-01	0.346E-01	0.200E-01	0.116E-01	0.671E-02	0.389E-02	0.226E-02	0.131E-02
0.	0.229E+00	0.785E-01	0.454E-01	0.261E-01	0.150E-01	0.864E-02	0.496E-02	0.285E-02	0.164E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2015E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.101E-01	0.655E-02	0.479E-02	0.335E-02	0.227E-02	0.149E-02	0.964E-03	0.613E-03	0.385E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.725E-02	0.459E-02	0.286E-02	0.176E-02	0.108E-02	0.652E-03
3.	0.919E-01	0.367E-01	0.222E-01	0.134E-01	0.798E-02	0.475E-02	0.282E-02	0.167E-02	0.983E-03
2.	0.186E+00	0.603E-01	0.346E-01	0.200E-01	0.116E-01	0.672E-02	0.390E-02	0.226E-02	0.131E-02
0.	0.229E+00	0.785E-01	0.454E-01	0.262E-01	0.150E-01	0.865E-02	0.497E-02	0.285E-02	0.164E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2102E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.101E-01	0.655E-02	0.480E-02	0.336E-02	0.227E-02	0.149E-02	0.965E-03	0.614E-03	0.386E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.725E-02	0.459E-02	0.286E-02	0.176E-02	0.108E-02	0.653E-03
3.	0.919E-01	0.367E-01	0.222E-01	0.134E-01	0.798E-02	0.475E-02	0.282E-02	0.167E-02	0.985E-03
2.	0.186E+00	0.603E-01	0.346E-01	0.200E-01	0.116E-01	0.672E-02	0.390E-02	0.226E-02	0.131E-02
0.	0.229E+00	0.785E-01	0.454E-01	0.262E-01	0.150E-01	0.865E-02	0.497E-02	0.286E-02	0.164E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2190E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.101E-01	0.655E-02	0.480E-02	0.336E-02	0.227E-02	0.150E-02	0.966E-03	0.615E-03	0.386E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.725E-02	0.459E-02	0.286E-02	0.176E-02	0.108E-02	0.654E-03
3.	0.919E-01	0.367E-01	0.222E-01	0.134E-01	0.799E-02	0.475E-02	0.282E-02	0.167E-02	0.986E-03
2.	0.186E+00	0.603E-01	0.346E-01	0.200E-01	0.116E-01	0.672E-02	0.390E-02	0.226E-02	0.131E-02
0.	0.229E+00	0.785E-01	0.454E-01	0.262E-01	0.151E-01	0.865E-02	0.497E-02	0.286E-02	0.164E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2278E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.101E-01	0.655E-02	0.480E-02	0.336E-02	0.227E-02	0.150E-02	0.967E-03	0.615E-03	0.387E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.725E-02	0.459E-02	0.286E-02	0.176E-02	0.108E-02	0.655E-03
3.	0.919E-01	0.367E-01	0.222E-01	0.134E-01	0.799E-02	0.475E-02	0.282E-02	0.167E-02	0.987E-03
2.	0.186E+00	0.603E-01	0.346E-01	0.200E-01	0.116E-01	0.672E-02	0.390E-02	0.227E-02	0.132E-02
0.	0.229E+00	0.785E-01	0.454E-01	0.262E-01	0.151E-01	0.865E-02	0.497E-02	0.286E-02	0.164E-02

STEADY STATE SOLUTION HAS BEEN OBTAINED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2365E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1288E+01 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	0.	2.	3.	4.	5.	6.	7.	8.	9.
5.	0.101E-01	0.655E-02	0.480E-02	0.336E-02	0.227E-02	0.150E-02	0.967E-03	0.616E-03	0.387E-03
4.	0.305E-01	0.167E-01	0.112E-01	0.725E-02	0.459E-02	0.286E-02	0.176E-02	0.108E-02	0.655E-03
3.	0.919E-01	0.367E-01	0.222E-01	0.134E-01	0.799E-02	0.475E-02	0.282E-02	0.167E-02	0.987E-03
2.	0.186E+00	0.603E-01	0.346E-01	0.200E-01	0.116E-01	0.672E-02	0.390E-02	0.227E-02	0.132E-02
0.	0.229E+00	0.785E-01	0.454E-01	0.262E-01	0.151E-01	0.865E-02	0.497E-02	0.286E-02	0.164E-02

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Table C-1. Comparison of Fort Stewart CAP-Part A UST 38 Soil Results to Screening Level

Station:	Screening Levels			80-01	80-01	80-02	80-02	80-03	80-03	80-04
Sample ID:	GA UST	Risk-based		800111	800121	800211	800221	800311	800321	800411
Sample Interval (ft BGS):	Soil Threshold	Screening	Leaching to	0.0' - 2.0'	6.0' - 8.0'	0.0' - 2.0'	4.0' - 6.0'	4.0' - 6.0'	6.0' - 8.0'	6.0' - 8.0'
Collection Date:	Level[a]	Level[b]	Groundwater[c]	25-Jun-98	25-Jun-98	26-Jun-98	26-Jun-98	26-Jun-98	26-Jun-98	26-Jun-98
Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
VOLATILE ORGANIC COMPOUNDS										
Benzene	8	200000	30	2.2 U	2.4 U	2.2 U	2.2 U	2.2 U	2.4 U	4.9 J
Toluene	6000	410000000	12000	67.6 =	23.4 =	12.3 =	4.6 =	216 =	70.7 =	14.6 =
Ethylbenzene	10000	200000000	13000	2.2 U	2.4 U	2.2 U	2.2 UJ	2.2 U	2.4 U	2.3 U
Xylenes, Total	700000	1000000000	190000	6.5 U	7.1 U	6.5 U	6.7 UJ	6.6 U	7 U	6.8 UJ
POLYNUCLEAR AROMATIC HYDROCARBONS										
2-Chloronaphthalene[d]	N/A[e]	82000000	84000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Acenaphthene	N/A[e]	120000000	570000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Acenaphthylene	N/A[e]	61000000	4200000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Anthracene	N/A[e]	610000000	12000000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Benzo(a)anthracene	N/A[e]	7800	2000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Benzo(a)pyrene	N/A[e]	780	8000	*1450 U*	397 U	362 U	370 U	366 U	392 U	379 U
Benzo(b)fluoranthene	N/A[e]	7800	5000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Benzo(g,h,i)perylene	N/A[e]			1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Benzo(k)fluoranthene	N/A[e]	78000	49000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Chrysene	N/A[e]	780000	160000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Dibenzo(a,h)anthracene	N/A[e]	780	2000	*1450 U*	397 U	362 U	370 U	366 U	392 U	379 U
Fluoranthene	N/A[e]	82000000	4300000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Fluorene	N/A[e]	82000000	560000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Indeno(1,2,3-cd)pyrene	N/A[e]	7800	14000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Naphthalene	N/A[e]	82000000	84000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Phenanthrene[f]	N/A[e]	61000000	4200000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
Pyrene	N/A[e]	61000000	4200000	1450 U	397 U	362 U	370 U	366 U	392 U	379 U
OTHER ANALYTES										
Lead	--	5000000	--		7600 =		1100 =		9300 =	
Total Organic Carbon	--	--	--						15900000 =	
TPH-Diesel Range Organics	--	--	--							
Total Petroleum Hydrocarbons	--	--	--	70500 =	13300 =	83200 =	3940 U	613000 =	4760 U	21300 =

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Protective of soil exposure during Industrial Land Use.
[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
[d] Values based on naphthalene as a surrogate chemical.
[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.
[f] Values based on pyrene as a surrogate chemical.
Bold values indicate results exceeding Georgia UST action levels

Italicized values indicate results exceeding risk-based screening levels.
Underlined values indicate results exceeding leaching to groundwater screening levels.
U Indicates that the compound was not detected above the reported sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

Table C-1. Comparison of Fort Stewart CAP-Part A UST 38 Soil Results to Screening Levels (continued)

Station:	Screening Levels			80-04	80-06	80-06	80-07	80-07	80-09	80-09
Sample ID:	GA UST	Risk-based		800421	800611	800621	800711	800721	800911	800921
Sample Interval (ft BGS):	Soil Threshold	Screening	Leaching to	8.0' - 10.0'	5.7' - 6.7'	0.7' - 2.2'	2.0' - 4.0'	6.5' - 7.5'	0.9' - 2.0'	2.0' - 4.0'
Collection Date:	Level[a]	Level[b]	Groundwater[c]	26-Jun-98	13-Nov-98	13-Nov-98	13-Nov-98	13-Nov-98	21-Feb-99	21-Feb-99
Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
VOLATILE ORGANIC COMPOUNDS										
Benzene	8	200000	30	2.4 J	2.2 U	2.2 U	2.2 U	2.2 U	2.4 U	2 U
Toluene	6000	410000000	12000	182 =	12.3 =	2.4 J	2.6 =	0.84 J	0.77 J	0.5 J
Ethylbenzene	10000	200000000	13000	2.5 U	1.5 J	2.2 U	2.2 U	2.2 U	0.68 J	0.6 J
Xylenes, Total	700000	1000000000	190000	7.6 U	2.6 J	0.67 J	0.6 J	3.3 U	3.6 U	0.6 J
POLYNUCLEAR AROMATIC HYDROCARBONS										
2-Chloronaphthalene[d]	N/A[e]	82000000	84000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Acenaphthene	N/A[e]	120000000	570000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Acenaphthylene	N/A[e]	61000000	4200000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Anthracene	N/A[e]	610000000	12000000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Benzo(a)anthracene	N/A[e]	7800	2000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Benzo(a)pyrene	N/A[e]	780	8000	422 U	*1500 U*	*1430 U*	*1460 U*	*1480 U*	366 U	362 U
Benzo(b)fluoranthene	N/A[e]	7800	5000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Benzo(g,h,i)perylene	N/A[e]			422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Benzo(k)fluoranthene	N/A[e]	78000	49000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Chrysene	N/A[e]	780000	160000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Dibenzo(a,h)anthracene	N/A[e]	780	2000	422 U	*1500 U*	*1430 U*	*1460 U*	*1480 U*	366 U	362 U
Fluoranthene	N/A[e]	82000000	4300000	422 U	91.9 J	1430 U	1460 U	1480 U	366 U	362 U
Fluorene	N/A[e]	82000000	560000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	96.8 J
Indeno(1,2,3-cd)pyrene	N/A[e]	7800	14000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	362 U
Naphthalene	N/A[e]	82000000	84000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	199 J
Phenanthrene[f]	N/A[e]	61000000	4200000	422 U	1500 U	1430 U	1460 U	1480 U	366 U	134 J
Pyrene	N/A[e]	61000000	4200000	422 U	95.1 J	1430 U	1460 U	1480 U	366 U	40.5 J
OTHER ANALYTES										
Lead	--	5000000	--	5300 =		25500 =		3200 =		26300 =
Total Organic Carbon	--	--	--							
TPH-Diesel Range Organics	--	--	--					4900 =		
Total Petroleum Hydrocarbons	--	--	--	5720 U	93000 =	571000 =	172000 =		97600 =	347000 =

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Protective of soil exposure during Industrial Land Use.
[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
[d] Values based on naphthalene as a surrogate chemical.
[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.
[f] Values based on pyrene as a surrogate chemical.
Bold values indicate results exceeding Georgia UST action levels

Italicized values indicate results exceeding risk-based screening levels.
Underlined values indicate results exceeding leaching to groundwater screening levels.

U Indicates that the compound was not detected above the reported sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

Table C-2. Comparison of Fort Stewart CAP-Part A UST 38 Groundwater Results to Screening Levels

Station:	Screening Levels		80-01	80-02	80-03	80-04	80-05	80-05	80-05
Sample ID:	Federal		800112	800212	800312	800412	800512	800522	800532
Screened Interval (ft BGS)	SDWA	Risk-	4.0' - 9.0'	6.0' - 11.0'	5.0' - 10.0'	7.0' - 12.0'	6.0' - 10.0'	11.0' - 15.0'	16.0' - 20.0'
Collection Date:	MCLs	based[a]	25-Jun-98	28-Jun-98	26-Jun-98	26-Jun-98	28-Jun-98	28-Jun-98	28-Jun-98
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS									
Benzene	5	0.36	**2.7** =	2 U	**34.4** =	**25.8** =	**229** =	**58.8** =	2 U
Toluene	1000	1300	2 U	5.6 J	2 U	2 U	6.3 J	2 U	2 U
Ethylbenzene	700	750	2 U	2 U	8.6 =	2 U	94.6 =	7.6 =	2 U
Xylenes, Total	10000	12000	6 U	6 U	4.1 J	6 U	8.9 J	6 UJ	6 UJ
POLYNUCLEAR AROMATIC HYDROCARBONS									
2-Chloronaphthalene[b]	-	1500	10 U		10 U	12.5 U	40 U	40 U	10 U
Acenaphthene	-	2200	10 UJ		10 UJ	12.5 U	40 U	40 U	10 U
Acenaphthylene	-	1100	10 U		10 U	12.5 U	40 U	40 U	10 U
Anthracene	-	11000	10 U		10 U	12.5 U	40 U	40 U	10 U
Benzo(a)anthracene	-	0.092	10 U		10 U	12.5 U	40 U	40 U	10 U
Benzo(a)pyrene	0.2	0.0092	**10** U		**10** U	**12.5** U	**40** U	**40** U	**10** U
Benzo(b)fluoranthene	-	0.092	10 U		10 U	12.5 U	40 U	40 U	10 U
Benzo(g,h,i)perylene	-	-	10 U		10 U	12.5 U	40 U	40 U	10 U
Benzo(k)fluoranthene	-	0.92	10 U		10 U	12.5 U	40 U	40 U	10 U
Chrysene	-	9.2	10 U		10 U	12.5 U	40 U	40 U	10 U
Dibenzo(a,h)anthracene	-	0.0092	10 U		10 U	12.5 U	40 U	40 U	10 U
Fluoranthene	-	1500	10 U		10 U	12.5 U	40 U	40 U	10 U
Fluorene	-	1500	10 U		10 U	12.5 U	40 U	40 U	10 U
Indeno(1,2,3-cd)pyrene	-	0.092	10 U		10 U	12.5 U	40 U	40 U	10 U
Naphthalene	-	1500	10 U		10 U	12.5 U	40 U	40 U	10 U
Phenanthrene[c]	-	1100	10 U		10 U	12.5 U	40 U	40 U	10 U
Pyrene	-	1100	10 U		10 U	12.5 U	40 U	40 U	10 U

[a] Protective of tap water ingestion by a resident.
[b] Values based on naphthalene as a surrogate chemical.
[c] Values based on pyrene as a surrogate chemical.
Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.
Underlined values indicate results exceeding risk-based screening levels.

U Indicates that the compound was not detected above the reported sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified.
= Indicates that the compound was detected at the concentration reported.

Table C-2. Comparison of Fort Stewart CAP-Part A UST 38 Groundwater Results to Screening Levels (continued)

Station:	Screening Levels		80-05	80-05	80-06	80-07	80-08	80-09
Sample ID:	Federal		800542	800552	800612	800712	800812	800912
Screened Interval (ft BGS)	SDWA	Risk-	21.0' - 25.0'	26.0' - 30.0'	0.0' - 11.7'	0.0' - 12.0'	13.0' - 15.0'	0.0' - 10.0'
Collection Date:	MCLs	based[a]	28-Jun-98	28-Jun-98	13-Nov-98	13-Nov-98	20-Feb-99	21-Feb-99
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
VOLATILE ORGANIC COMPOUNDS								
Benzene	5	0.36	2 U	**5.8 J**	2 U	2 U	2 U	2 U
Toluene	1000	1300	2 U	2 U	2 U	2 U	3 =	1.8 J
Ethylbenzene	700	750	2 U	4.8 =	2 U	2 U	0.86 J	0.86 J
Xylenes, Total	10000	12000	6 UJ	6 U	3 U	3 U	4.9 =	4.1 J
POLYNUCLEAR AROMATIC HYDROCARBONS								
2-Chloronaphthalene[b]	-	1500	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Acenaphthene	-	2200	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Acenaphthylene	-	1100	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Anthracene	-	11000	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Benzo(a)anthracene	-	0.092	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Benzo(a)pyrene	0.2	0.0092	**10 U**	**10 U**	**10.2 U**	**11.5 U**	**10.2 UJ**	**12.3 U**
Benzo(b)fluoranthene	-	0.092	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Benzo(g,h,i)perylene	-	-	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Benzo(k)fluoranthene	-	0.92	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Chrysene	-	9.2	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Dibenzo(a,h)anthracene	-	0.0092	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Fluoranthene	-	1500	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Fluorene	-	1500	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Indeno(1,2,3-cd)pyrene	-	0.092	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Naphthalene	-	1500	10 U	10 U	10.2 U	11.5 U	10.2 UJ	0.93 J
Phenanthrene[c]	-	1100	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U
Pyrene	-	1100	10 U	10 U	10.2 U	11.5 U	10.2 UJ	12.3 U

[a] Protective of tap water ingestion by a resident.
[b] Values based on naphthalene as a surrogate chemical.
[c] Values based on pyrene as a surrogate chemical.
Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.
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Table C-3. Summary of Geotechnical Results for the UST 38 Site

Site	UST 38
Boring	80-03
Sample ID	800331
Sample Depth Interval (ft BGS)	8.0 – 10.0
Grain Size Analysis - % Fines	9
Grain Size Analysis - % Sand	91
Grain Size Analysis - % Gravel	0
Liquid Limit	NP
Plastic Limit	NP
Plasticity Index	NP
Moisture Content (%)	15.6
Permeability (cm/sec)	3.88×10^{-5}
Porosity	0.38
Specific Gravity	3.00

NP = nonplastic

Table C-4. Natural Attenuation Modeling Results for UST 38

Distance from the source (ft)	Distance from the source (m)	Predicted Maximum Conc. In Groundwater (µg/L)
0.0	0.0	229
6.6	2.0	78.5
9.8	3.0	45.4
13.1	4.0	26.2
16.4	5.0	15.1
19.7	6.0	8.7
23.0	7.0	5
26.2	8.0	2.9
29.5	9.0	1.64
32.8	10.0	0.95
36.1	11.0	0.55
39.4	12.0	0.32
49.2	15.0	0.061
65.6	20.0	0.004
82.0	25.0	0.0003
98.4	30.0	0
800.0	243.8	0
2500.0	762.0	0

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