FINAL

FIRST ANNUAL MONITORING ONLY 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 0061

Prepared by

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

December 2000

TABLE OF CONTENTS

List of Abbreviations and Acronyms

BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
GA EPD	Georgia Environmental Protection Division
IWQS	In-stream Water Quality Standard
NFAR	No Further Action Required
SAIC	Science Applications International Corporation
UST	underground storage tank
USTMP	Underground Storage Tank Management Program

MONITORING ONLY REPORT

Submittal Date: December 2000 Monitoring Report Number: 1st Annual

For Period Covering: January 2000 to November 2000

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:	Directorate of Public Works, Bldg. 1137	Address:	P.O. Box 2502
	1550 Frank Cochran Drive		
City:	Fort Stewart State: GA	City:	Oak Ridge State: TN
Zip Code:	31314-4927	Zip Code:	37831
Telephone:	(912) 767-2010	Telephone:	(865) 481-8792

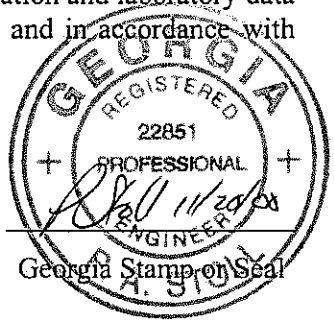
I. REGISTERED PROFESSIONAL ENGINEER OR PROFESSIONAL GEOLOGIST CERTIFICATION

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

Name: Patricia A. Stoll

Signature: Patricia A. Stoll

Date: 11/20/00



Georgia Stamp or Seal

II. PROJECT SUMMARY

(Appendix I, Figure 1: Site Location Map)

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

Former Underground Storage Tank (UST) 38, Facility ID #9-089109 was located near Building 1510 at Fort Stewart, Georgia. The tank was excavated and removed on August 9, 1996, and the associated ancillary piping was closed in place. Science Applications International Corporation (SAIC) performed a Corrective Action Plan (CAP)–Part A investigation in 1998 and 1999 to determine the extent of petroleum contamination at the site. Two vertical-profile borings and seven temporary piezometers were installed during the investigation. The CAP–Part A Report (SAIC 1999) was submitted in August 1999 and recommended monitoring only at the site. As recommended in the Monitoring Only Plan, four shallow monitoring wells (80-10 through 80-13) were installed as part of the first semiannual sampling event in January/February 2000, and groundwater was sampled for benzene, toluene, ethylbenzene, and xylenes (BTEX).

The fate and transport modeling performed as part of the CAP–Part A Report (SAIC 1999) reflected a continuous source of contamination. The results are summarized in Attachment A of this document. As a result of the semiannual monitoring events in January/February and June/July 2000, it was not necessary to revise the fate and transport modeling results.

The purpose of the semiannual monitoring summarized in this report was to confirm the results of the fate and transport modeling and that natural attenuation is taking place at the site. The benzene concentrations during the January/February and June/July 2000 sampling events were below the In-stream Water Quality Standard (IWQS); therefore, a No Further Action Required status is being recommended for the site.

III. ACTIVITIES AND ASSESSMENT OF EXISTING CONDITIONS

A. Potentiometric Data:

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

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

During the first semiannual sampling event in January/February 2000, groundwater elevations were measured in all of the monitoring wells to determine the groundwater flow direction. In February 2000, the groundwater flow direction was toward the south, and the groundwater gradient was approximately 0.0053 foot/foot.

During the second semiannual sampling event in June/July 2000, groundwater elevations were measured in all of the monitoring wells to determine the groundwater flow direction. In July 2000, the groundwater flow direction was toward the south, and the groundwater gradient was approximately 0.0038 foot/foot.

B. Analytical Data:

(Appendix I, Figure 3: Groundwater Quality Map)
(Appendix I, Figure 4: Trend of Contaminant Concentrations)
(Appendix II, Table 2: Groundwater Analytical Results)
(Appendix III: Laboratory Analytical Results)

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

During the first semiannual sampling event in January/February 2000, monitoring wells 80-10, 80-11, 80-12, and 80-13 were sampled for BTEX. Analytical results from the first sampling event showed estimated concentrations below the analytical reporting limits or no detectable BTEX concentrations in wells 80-11, 80-12, and 80-13. BTEX compounds were present in well 80-10; however, none of the constituents exceeded its respective IWQS. Benzene was detected at 20 µg/L in well 80-10 and 0.2J µg/L in well 80-12, both of which concentrations are below the IWQS of 71.28 µg/L. Figure 4 shows the variations in benzene concentrations in groundwater for all the wells.

During the second semiannual sampling event in June/July 2000, monitoring wells 80-10, 80-11, 80-12, and 80-13 were sampled for BTEX. Analytical results from the second sampling event showed estimated concentrations below the analytical reporting limits or no detectable BTEX concentrations in wells 80-11 and 80-13. BTEX compounds were present in wells 80-10 and 80-12; however, none of the constituents exceeded its respective IWQS. Benzene was detected at 40.5 µg/L in well 80-10, 0.25J µg/L in well 80-12, and 0.18J µg/L in well 80-13, all of which concentrations are below the IWQS of 71.28 µg/L. Figure 4 shows the variations in benzene concentrations in groundwater for all the wells.

As recommended in the CAP–Part A Report (SAIC 1999), polynuclear aromatic hydrocarbon analysis was not recommended as part of the Monitoring Only Plan for the site.

IV. SITE RANKING (Note: re-rank site after each monitoring event)

(Appendix IV: Site Ranking Form)

Environmental Site Sensitivity Score:	2,500 (CAP–Part A Report)
(April 1999 version of the Site Ranking Form was used for January 2000 score.)	250 (Jan. 2000 – First Semiannual Monitoring Event)
	250 (June 2000 – First Semiannual Monitoring Event)

V. CONCLUSIONS/RECOMMENDATIONS

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

Fort Stewart respectfully requests that the Georgia Environmental Protection Division (GA EPD) Underground Storage Tank Management Program (USTMP) assign Facility ID #9-089109 a No Further Action Required (NFAR) status for the following reasons:

- The Monitoring Only Plan was conducted in accordance with Section III of the CAP–Part A Report (SAIC 1999) and was submitted to GA EPD USTMP in October 1999 and was approved by GA EPD USTMP in correspondence January 25, 2000 (Logan 2000).

- The site score for the last two rounds of semiannual groundwater sampling has been 250, which GA EPD USTMP representatives have indicated is an acceptable score for requesting an NFAR status (i.e., January 27, 1999, meeting between GA EPD, Fort Stewart, U.S. Army Corps of Engineers, and SAIC representatives).

- The fate and transport modeling conducted during the CAP–Part A Report (SAIC 1999), which used a continuous source of contamination and which is summarized in Attachment A of this report, indicates that benzene will never reach the nearest potential preferential pathway (i.e., a storm drain) at a concentration above the IWQS of 71.28 µg/L.

- The benzene concentrations in all wells were below the IWQS of 71.28 µg/L during the semiannual monitoring events in January/February and June/July 2000.

- The closest surface water bodies are a drainage ditch and Mill Creek, located at 800 feet and 2,500 feet, respectively, downgradient from the site.

- Natural attenuation has continued to take place at the site, as shown by the lower benzene concentrations observed during the semiannual monitoring events in comparison to those observed during the CAP–Part A investigation.

The monitoring only program at this site will be discontinued.

VI. REIMBURSEMENT

Attached _____ N/A __X__

(Appendix V: Reimbursement Application)

Fort Stewart is a federally owned facility and has funded the investigation for the UST 38 site, Building 1510, Facility ID #9-089109 using U.S. Department of Defense Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

APPENDIX I

REPORT FIGURES

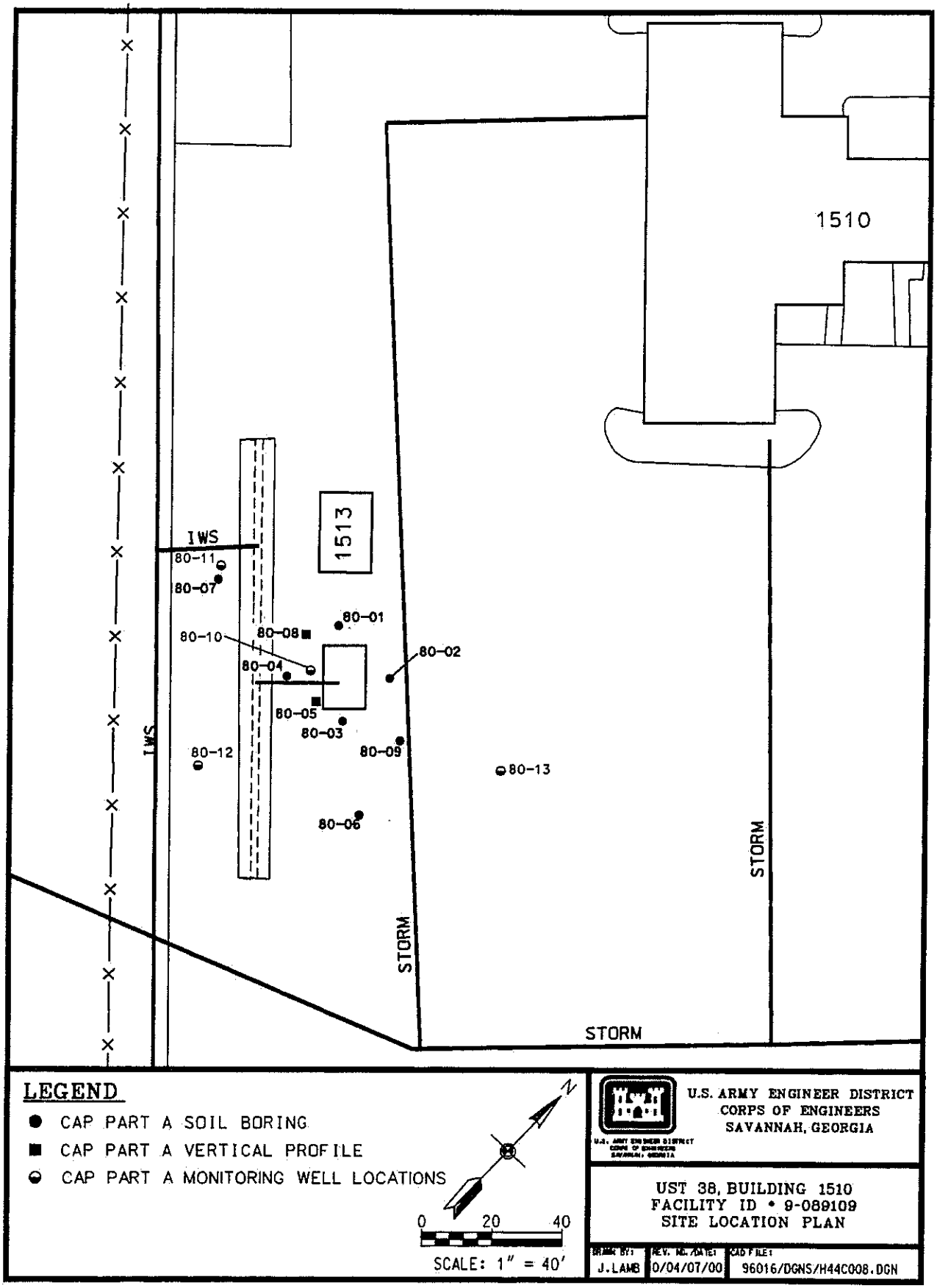


Figure 1. Location Map of UST 38 at Fort Stewart, Liberty County, Georgia

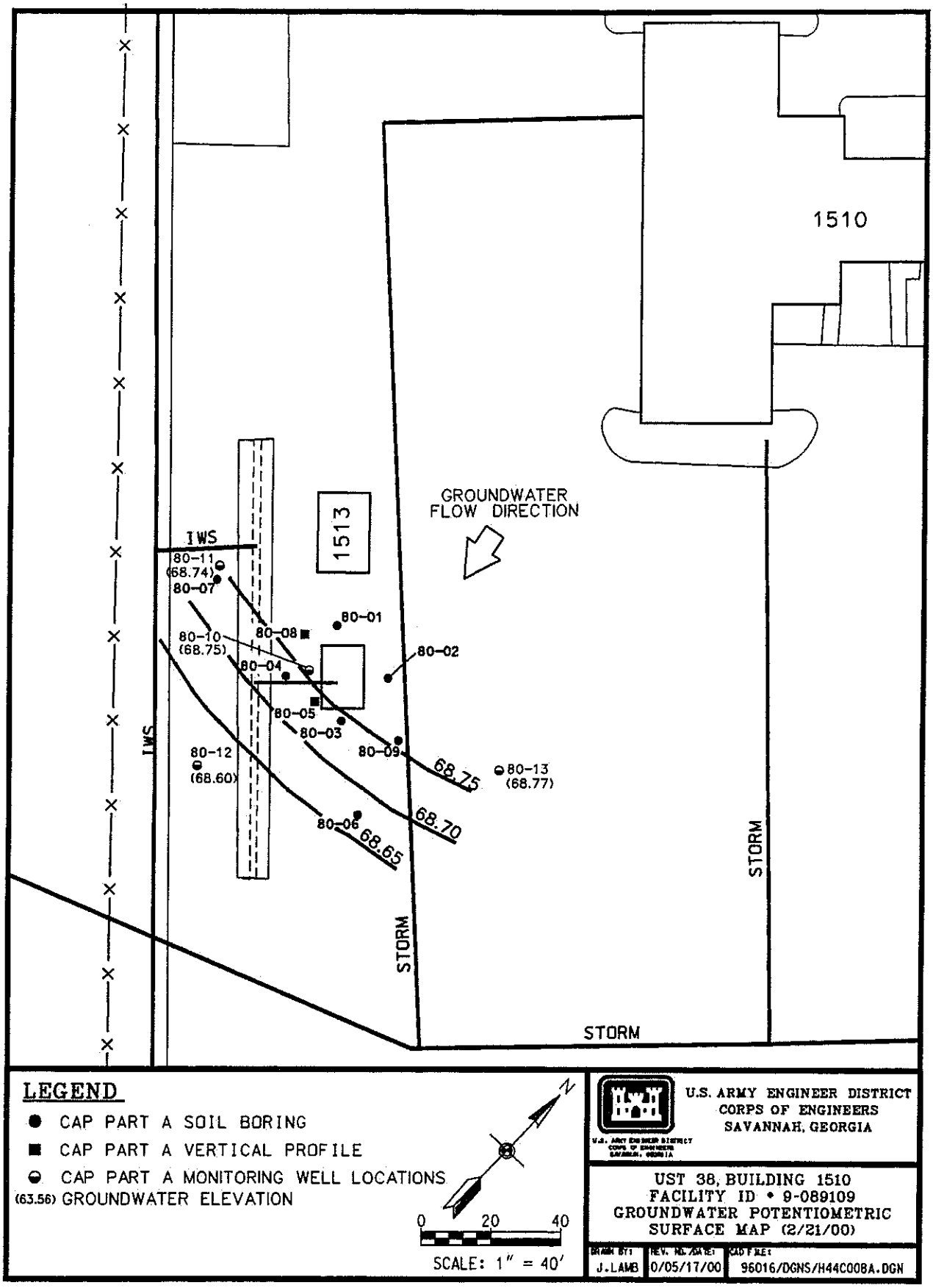


Figure 2a. Potentiometric Surface Map of the UST 38 Site (February 2000)

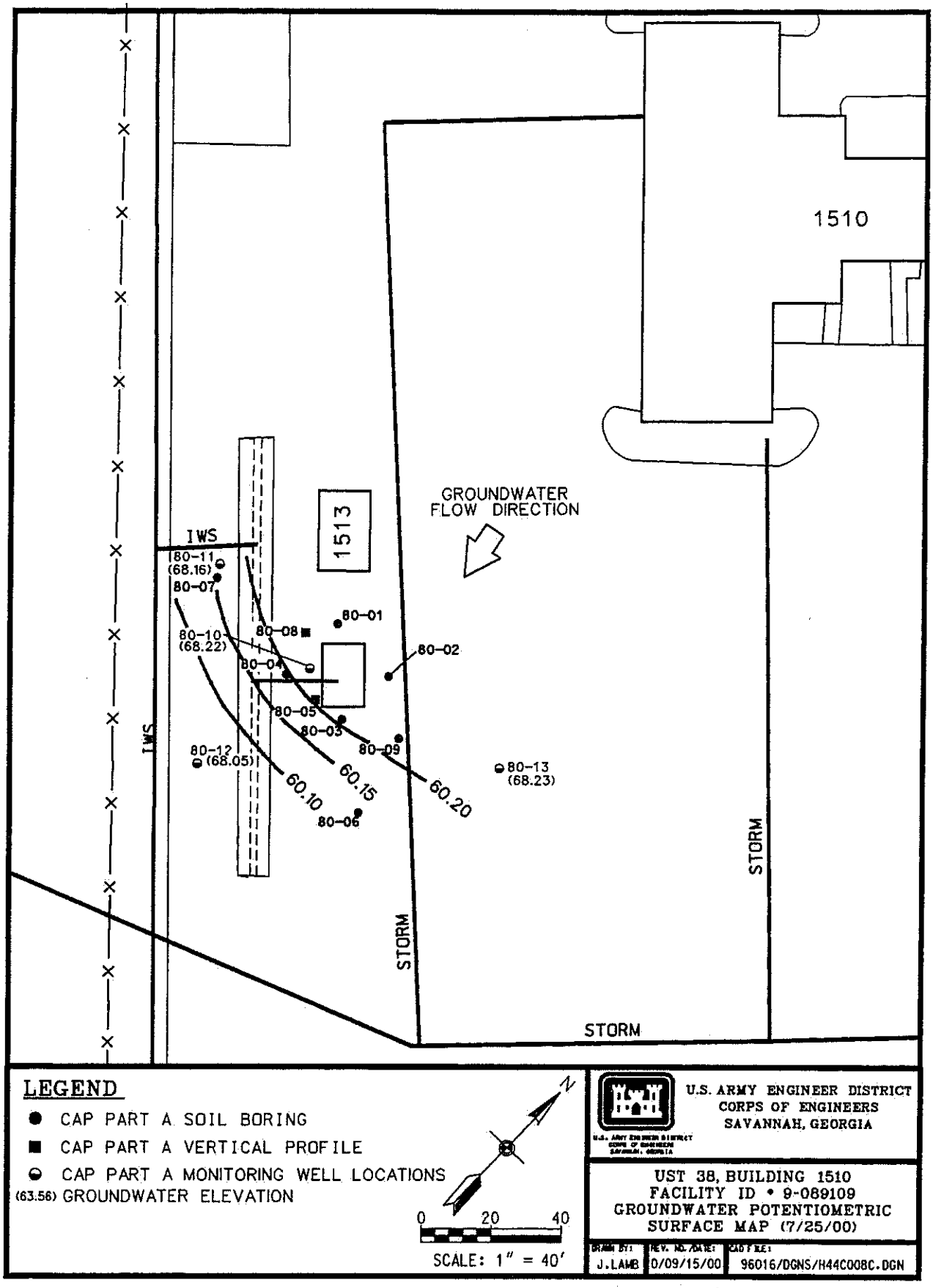


Figure 2b. Potentiometric Surface Map of the UST 38 Site (July 2000)

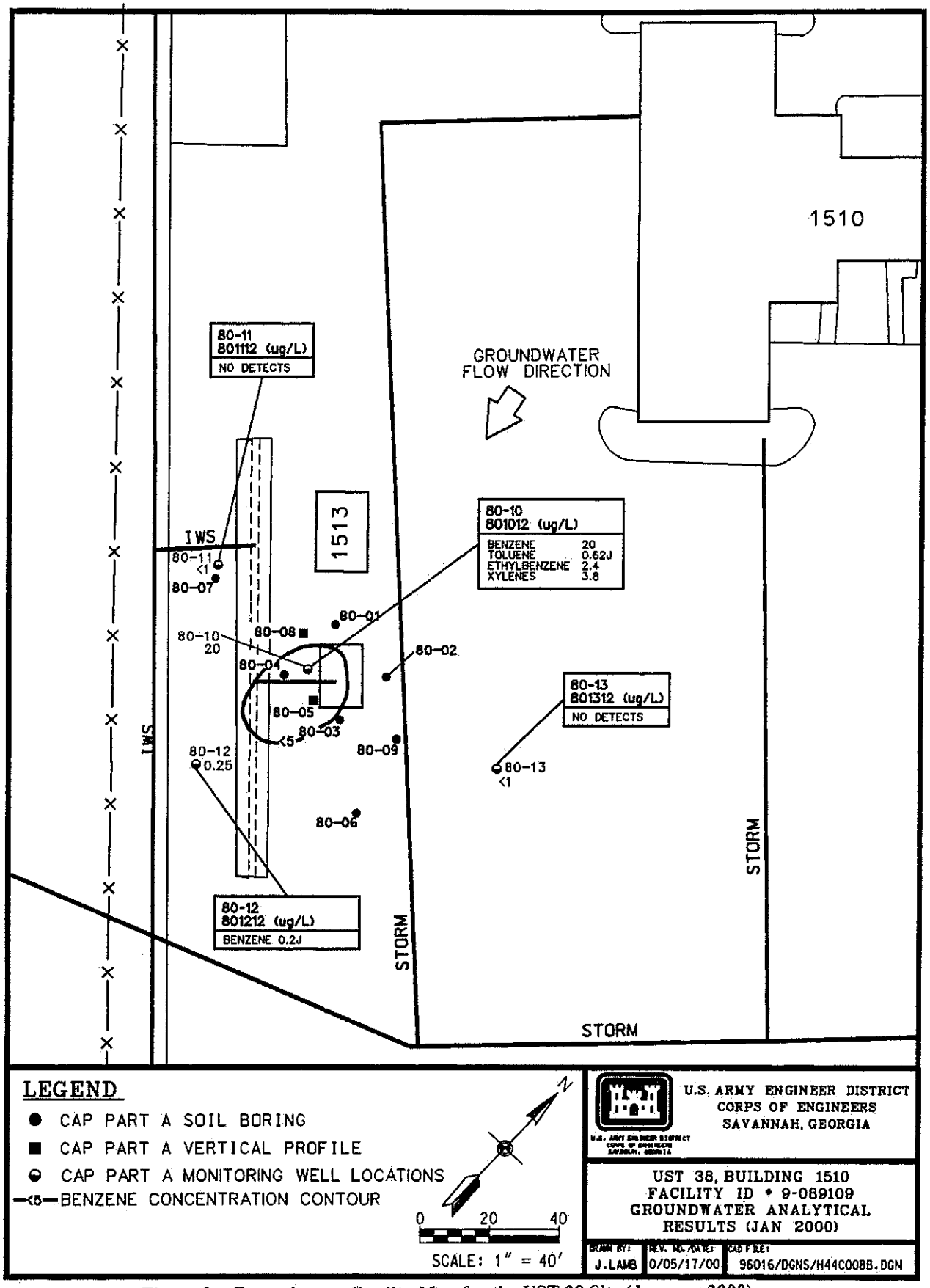


Figure 3a. Groundwater Quality Map for the UST 38 Site (January 2000)

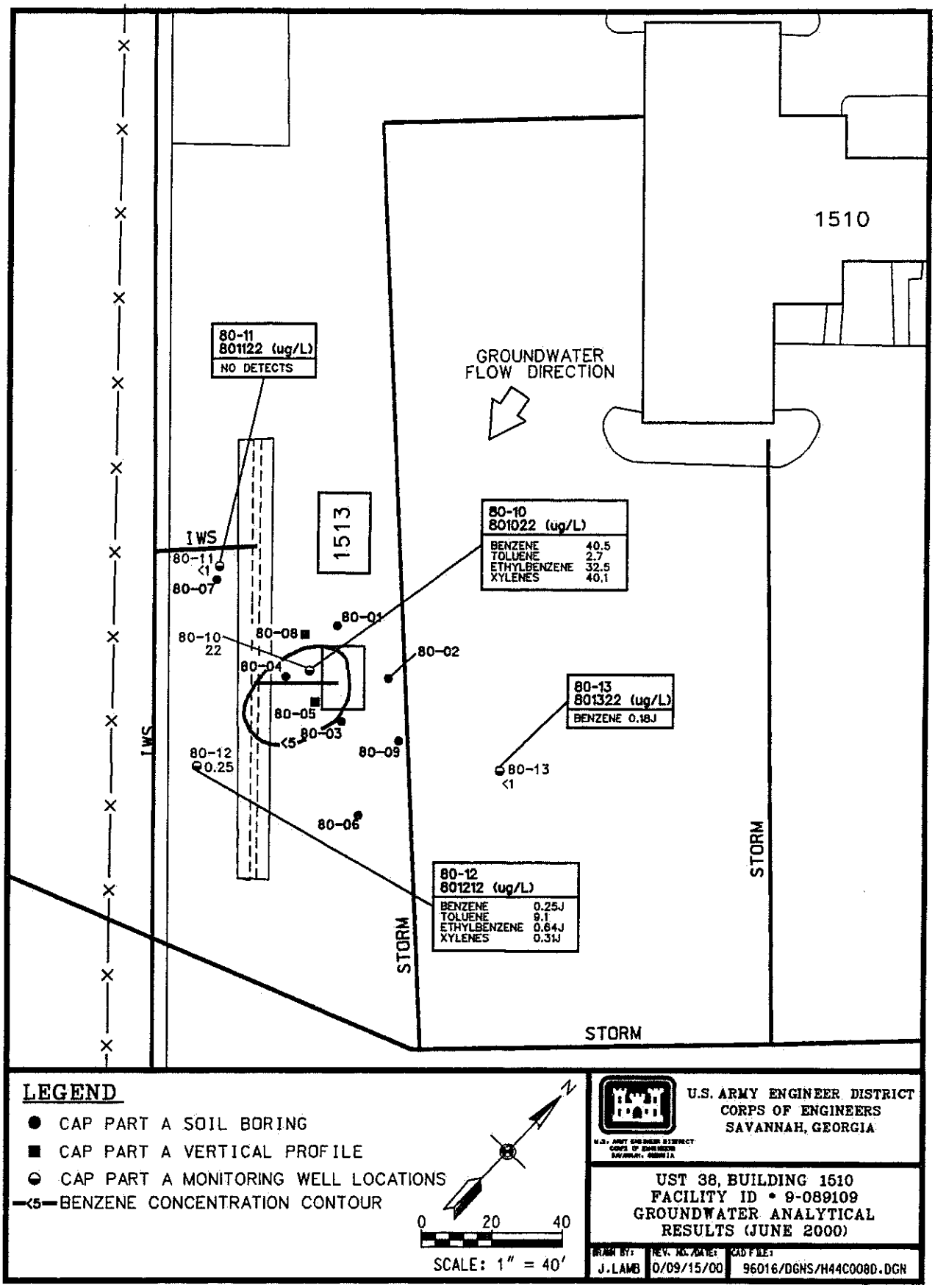


Figure 3b. Groundwater Quality Map for the UST 38 Site (June 2000)

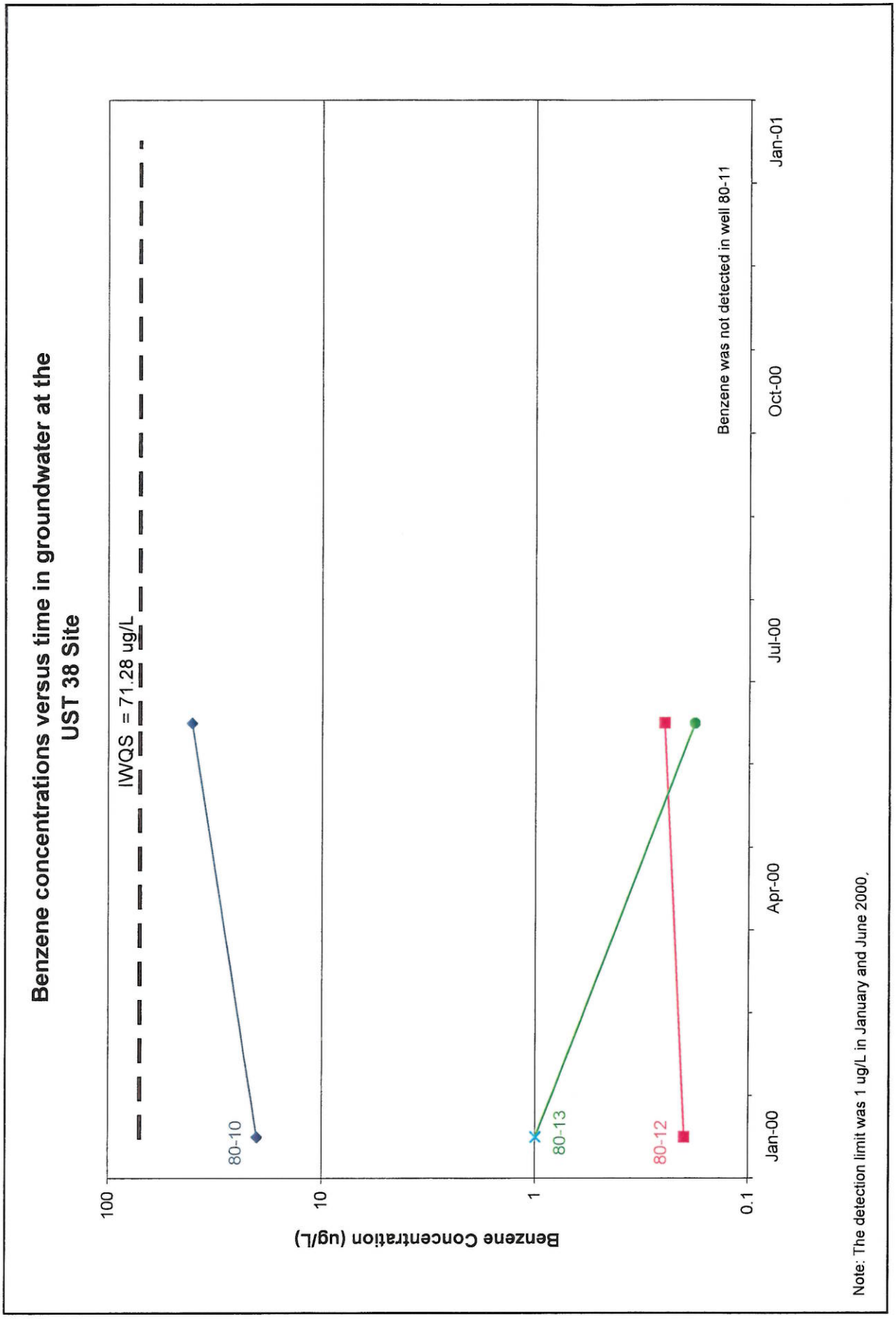


Figure 4. Trend of Contaminant Concentrations for the UST 38 Site

APPENDIX II

REPORT TABLES

Table 1. Groundwater Elevations

Well Number	Date of Measurement	Top of Casing Elevation (feet AMSL)	Screened Interval (feet BGS)	Water Depth (feet BTOC)	Groundwater Elevation (feet AMSL)
First Semiannual Monitoring Event – January/February 2000					
80-10	02/21/00	74.55	3.0 – 12.0	5.80	68.75
80-11	02/21/00	74.60	2.7 – 12.7	5.86	68.74
80-12	02/21/00	74.56	2.7 – 12.7	5.96	68.60
80-13	02/21/00	74.62	2.8 – 12.8	5.85	68.77
Second Semiannual Monitoring Event – June/July 2000					
80-10	07/25/00	74.55	3.0 – 12.0	6.33	68.22
80-11	07/25/00	74.60	2.7 – 12.7	6.44	68.16
80-12	07/25/00	74.56	2.7 – 12.7	6.51	68.05
80-13	07/25/00	74.62	2.8 – 12.8	6.39	68.23

NOTES:

AMSL Above mean sea level
BGS Below ground surface
BTOC Below top of casing

Table 2. Groundwater Analytical Results

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)	Total PAH (µg/L)
First Semiannual Monitoring Event – January/February 2000								
80-10	801012	1/13/00	20 =	0.62 J	2.4 =	3.8 =	26.82	NA
80-11	801112	1/16/00	1 U	1 U	1 U	3 U	ND	NA
80-12	801212	1/16/00	0.2 J	1 U	1 U	3 U	0.2	NA
80-13	801312	1/13/00	1 U	1 U	1 U	3 U	ND	NA
Second Semiannual Monitoring Event – June/July 2000								
80-10	801022	06/25/00	40.5 =	2.7 =	32.5 =	40.1 =	115.8	NA
80-11	801122	06/21/00	1.0 U	1.0 U	1.0 U	3.0 U	ND	NA
80-12	801222	06/27/00	0.25 J	9.1 =	0.64 J	0.31 J	10.3	NA
80-13	801322	06/21/00	0.18 J	1.0 U	1.0 U	3.0 U	0.18	NA
In-stream Water Quality Standard (GA EPD Chapter 391-3-6)			71.28	200,000	28,718	NRC	NRC	NRC
Alternate Concentration Limit			[a]	–	–	–	–	–

NOTES:

Bold values exceed IWQSs.

Italic values exceed .

[a] ACLs were not developed because the dilution attenuation factor for the receptor was infinity.

ACL Alternate concentration limit

BTEX Benzene, toluene, ethylbenzene, and xylenes

NA Not analyzed; PAH compounds were not required as part of the Monitoring Only Plan.

ND Not detected

NRC No regulatory criteria

PAH Polynuclear aromatic hydrocarbon

Laboratory Qualifiers

U Indicates that the compound was not detected at the concentration reported.

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

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

= Indicates that the compound was detected at the concentration reported.

Table 3. Well Construction Details

Boring/Well Number	Date Installed	Boring Depth (feet BGS)	Screened Interval (feet BGS)	Type of Completion	Coordinates (NAD83)		Elevation (NAVD88)	
					Northing	Easting	Ground Surface	Top of Casing
First Semiannual Monitoring Event – January/February 2000								
80-10	1/13/00	12.1	3.0 – 12.0	¾" PVC	678999.6	824814.3	74.87	74.55
80-11	1/16/00	12.8	2.7 – 12.7	¾" PVC	679003.6	824775.3	74.88	74.60
80-12	1/16/00	12.8	2.7 – 12.7	¾" PVC	678958.1	824809.8	74.81	74.56
80-13	1/13/00	13.0	2.8 – 12.8	¾" PVC	679016.2	824873.1	74.83	74.62

NOTES:
BGS Below ground surface

APPENDIX III

LABORATORY ANALYTICAL RESULTS

FIRST SEMIANNUAL MONITORING EVENT

JANUARY/FEBURARY 2000

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

501012

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSAB001W

Matrix: (soil/water) WATER Lab Sample ID: 20655003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: FS418

Level: (low/med) LOW Date Received: 01/14/00

% Moisture: not dec. _____ Date Analyzed: 01/20/00

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	20.0	=
108-88-3	Toluene	0.62	J
100-41-4	Ethylbenzene	2.4	=
1330-20-7	Xylenes (total)	3.8	=

DATA VA

FORM I VOA

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

801014

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSAB001W

Matrix: (soil/water) WATER Lab Sample ID: 20655001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S416

Level: (low/med) LOW Date Received: 01/14/00

% Moisture: not dec. _____ Date Analyzed: 01/20/00

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	24.8		=
108-88-3	Toluene	0.72	J	J
100-41-4	Ethylbenzene	3.2		=
1330-20-7	Xylenes (total)	4.8		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

801112

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSAB005W

Matrix: (soil/water) WATER Lab Sample ID: 20661018

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5T208

Level: (low/med) LOW Date Received: 01/17/00

% Moisture: not dec. _____ Date Analyzed: 01/25/00

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

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

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

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

801212

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSAB0CSW

Matrix: (soil/water) WATER Lab Sample ID: 20661017

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5T207

Level: (low/med) LOW Date Received: 01/17/00

% Moisture: not dec. _____ Date Analyzed: 01/25/00

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
71-43-2	Benzene	0.20	J	J
108-88-3	Toluene	1.0 ~~0.54~~	J	U FD4, FD6
100-41-4	Ethylbenzene	1.0	U	U
1330-20-7	Xylenes (total)	3.0	U	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

801312

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSAB001W

Matrix: (soil/water) WATER Lab Sample ID: 20655002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S417

Level: (low/med) LOW Date Received: 01/14/00

% Moisture: not dec. _____ Date Analyzed: 01/20/00

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		
71-43-2	Benzene	1.0	U	U
108-88-3	Toluene	1.0	U	
100-41-4	Ethylbenzene	1.0	U	
1330-20-7	Xylenes (total)	3.0	U	

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

1062

CHAIN OF CUSTODY RECORD

COC NO.: D0554/

PROJECT NAME: Ft. Stewart USTs D.O. #55

PROJECT NUMBER: 01-1624-04-2352-200

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) 566-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, Lead	Dissolved Iron	TPH	TCLP BTEX	TCLP Lead	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
220712	1/13/00	1005	water	2	2						4	20656001	20656001
220912	1/13/00	1245		2	2						4	002	002
161412	1/13/00	1450		2	2						5	003	003
161312	1/13/00	1540		2	2						5	004	004
801014	1/13/00	1720		2							2		20655001
801312	1/13/00	1635		2							2		002
801012	1/13/00	1720		2							2		003
770912	1/13/00	1440		2							2		004
771012	1/13/00	1550		2							2		1005
771014	1/13/00	1550		2							2		006
771312	1/13/00	1720		2							2		1007
010812	1/13/00	1035		2							2		1008
010912	1/13/00	1325		2							2		1009

RELINQUISHED BY: Laura Lumley	Date/Time 1/14/00 1200	RECEIVED BY: Dionne Francoo	Date/Time 1/14/00 1450	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: # 847	FEDEX NUMBER:
RECEIVED BY: Sarah Lowder	Date/Time 1-14-00 1200	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY: Sarah Lowder	Date/Time 1-14-00 1458	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

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

2 of 2

CHAIN OF CUSTODY RECORD

COC NO.: D055804

PROJECT NAME: Ft. Stewart USTs D.O. #55

PROJECT NUMBER: 01-1624-04-2352-200

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	PAH, Lead	Dissolved Iron	TPH	TCLP BTEX	TCLP Lead	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
370562	1/16/00	0955	water	2							2		20600010
630812	1/15/00	1200		2							2		011
631012	1/15/00	1500		2							2		012
841712	1/16/00	1710		2							2		013
841912	1/16/00	1443		2							2		014
841912	1/16/00	1500		2							2		015
751112	1/16/00	1725		2							2		016
801212	1/16/00	1215		2							2		017
801112	1/16/00	1300		2							2		018
TB5503	1/15/00	0745		2							2		019
TB5504	1/16/00	0745		2							2		020
751011	1/16/00	1525	Soil	1	1						2		20657003

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	1/17/00 1145	[illegible]	1/17/00 1525
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY: [illegible]	Date/Time 1-17-00 1145	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [illegible]	Date/Time 1-17-00 1525	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 56

Cooler ID: #843

Cooler Temperature: 4°C

FEDEX NUMBER:

6-III-9

SECOND SEMIANNUAL MONITORING EVENT

JUNE/JULY 2000

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

801022

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSBLTM13W

Matrix: (soil/water) WATER Lab Sample ID: 27482003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8P414

Level: (low/med) LOW Date Received: 06/26/00

% Moisture: not dec. _____ Date Analyzed: 06/29/00

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	40.5	
108-88-3	Toluene	2.7	
100-41-4	Ethylbenzene	32.5	
1330-20-7	Xylenes (total)	40.1	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

801122

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSBLTM10W

Matrix: (soil/water) WATER Lab Sample ID: 27385001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8P107

Level: (low/med) LOW Date Received: 06/22/00

% Moisture: not dec. _____ Date Analyzed: 06/26/00

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

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

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

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

801222

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSBLTM14W

Matrix: (soil/water) WATER Lab Sample ID: 27566006

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8P518

Level: (low/med) LOW Date Received: 06/27/00

% Moisture: not dec. _____ Date Analyzed: 06/30/00

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.25	J
108-88-3	Toluene	9.1	
100-41-4	Ethylbenzene	0.64	J
1330-20-7	Xylenes (total)	0.31	J

FORM I VOA

DATA VALIDATION COPY

OLM03.0

33

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

801322

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: FSBLTM10W

Matrix: (soil/water) WATER Lab Sample ID: 27385002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8P108

Level: (low/med) LOW Date Received: 06/22/00

% Moisture: not dec. _____ Date Analyzed: 06/26/00

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	0.18	JB	J
108-88-3	Toluene	1.0	U	U
100-41-4	Ethylbenzene	1.0	U	
1330-20-7	Xylenes (total)	3.0	U	

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

1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GLTM15

PROJECT NAME: Fort Stewart CAP B LTM

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

PROJECT MANAGER: Patty Stoll

SAMPLER (Signature): Laura Lumley (Printed Name)

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO													No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
801122	6/21/00	1400	water	Z																2		27385001
801322	6/21/00	1700		Z																2		002
140752	6/21/00	0915		Z																2		003
140852	6/21/00	1205		Z																2		004
140952	6/21/00	0840		Z																2		005
141152	6/21/00	0955		Z																2		006
141252	6/21/00	1120		Z																2		007
141254	6/21/00	1120		Z																2		008
141352	6/21/00	1255		Z																2		009
141452	6/21/00	1035		Z																2		010
600822	6/21/00	1400		Z																2		011
600922	6/21/00	1430		Z																2		012
600924	6/21/00	1430	↓	Z																2		013

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (843) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/22/00 1130	Kristen Chandler	6/22/00 1430
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time
[illegible]	6/22/00 1130		
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
[illegible]	6/22/00 1430		
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #403

Cooler Temperature: 4.2

FEDEX NUMBER:

III-15

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

CHAIN OF CUSTODY RECORD

COC NO.: GLTM19

OJECT NAME: Fort Stewart CAP B LTM

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

OJECT MANAGER: Patty Stoll

pler (Signature) (Printed Name)
Laura Lumley Laura Lumley

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	24482	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
060912	6/25/00	1600	water		N				2	001	3-day turn
551312	6/23/00	1644			N				2	002	"
801022	6/25/00	1245		2					2	003	
430622	6/25/00	1030		2					2	004	
430922	6/25/00	0930		2					2	005	
431022	6/25/00	0940		2					2	006	
764412	6/24/00	1432		2					2	007	
764512	6/24/00	1755		2					2	008	
764612	6/21/00	1432		2					2	009	
300752	6/25/00	0945		2					2	010	7-day turn
300852	6/25/00	0930		2					2	011	
300952	6/25/00	1015		2					2	012	

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (843) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/26/00 1100		
COMPANY NAME: SAIC		COMPANY NAME: GEL	6/26/00 1430
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
	6/26/00 1700		
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
	6/26/00 1430		
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 24

Cooler ID: # 512

Cooler Temperature: 4.3

FEDEX NUMBER:

060912 > Results by Thurs.
551312

200065325

III-16

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

CHAIN OF CUSTODY RECORD

275066

COC NO.: GLTM20

PROJECT NAME: Fort Stewart CAP B LTM

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

PROJECT MANAGER: Patty Stoll

(Signature) [signature] (Printed Name) Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (843) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	No. of Bottles/ Vials	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
751412	6/26/00	1035	water	Z	Z			4	001	
751512	6/26/00	1307	↓	Z	Z			4	008	
931722	6/26/00	1140	↓	Z				2	002	
931622	6/26/00	1100	↓	Z				2	003	
932922	6/26/00	1000	↓	Z				2	004	
933122	6/26/00	1015	↓	Z				2	005	
TB5514	6/26/00	0745	↓	Z				2	007	
801222	6/27/00	1050	↓	Z				2	006	

6/27/00

20000532

RELINQUISHED BY: [signature]	Date/Time 6/27/00 12:15	RECEIVED BY: [signature]	Date/Time	TOTAL NUMBER OF CONTAINERS: 20	Cooler Temperature: 3.8
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: #514	FEDEX NUMBER:
RECEIVED BY: [signature]	Date/Time 6/27/00 1455	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

APPENDIX IV

SITE RANKING FORMS

FIRST SEMIANNUAL MONITORING EVENT

JANUARY/FEBRUARY 2000

SITE RANKING FORM

Facility Name: UST 38, Building 1510 **Ranked by:** S. Stoller

County: Liberty **Facility ID #:** 9-089109 **Date Ranked:** 5/24/2000

SOIL CONTAMINATION

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

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

* *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

* *No benzene detected during CAP-Part A and no soil closure samples.*

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

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

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

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

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

* *LTM sample 801012 (January 2000)*

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

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

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.

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

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

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

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

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

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

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

(M. 250)+ (D. 0) = N. 250

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. 250) x (P. 1) = (250) + (Q. 0)

= 250 (January 2000 - First Semiannual Sampling Event)
ENVIRONMENTAL SENSITIVITY SCORE

SECOND SEMIANNUAL MONITORING EVENT

JUNE/JULY 2000

SITE RANKING FORM

Facility Name: UST 38, Building 1510 **Ranked by:** S. Stoller

County: Liberty **Facility ID #:** 9-089109 **Date Ranked:** 9/26/2000

SOIL CONTAMINATION

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

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

* *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

* *No benzene detected during CAP-Part A and no soil closure samples.*

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

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

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

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

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

* *LTM sample 801022 (June 2000)*

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

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 & VAULTS** (a utility trench may be omitted from ranking if its invert elevation is more than 5 feet above the water table)

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

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

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

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

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

(M. 250)+ (D. 0) = N. 250

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. 250) x (P. 1) = (250) + (Q. 0)**

= 250 (June 2000 - Second Semiannual Sampling Event)
ENVIRONMENTAL SENSITIVITY SCORE

OTHER GEOLOGIC AND HYDROLOGIC DATA

The following information is presented to provide supplemental information to Item H of the Site Ranking Form and details relating to the geologic and hydrogeologic conditions at Fort Stewart to support determinations of groundwater flow pathway(s) or direction(s) and contaminant transport.

1.0 REGIONAL AND LOCAL GEOLOGY

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

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

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

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

2.0 REGIONAL AND LOCAL HYDROGEOLOGY

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

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

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

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

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

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

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

APPENDIX V

REIMBURSEMENT APPLICATION

Fort Stewart is a federally owned facility and has funded the investigation for the UST 38 site, Building 1510, Facility ID #9-089109 using U.S. Department of Defense Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

ATTACHMENT A

SUMMARY OF FATE AND TRANSPORT MODELING RESULTS

A.1. FATE AND TRANSPORT MODELING

The fate and transport modeling that was performed as part of the CAP–Part A Report (SAIC 1999) was based on the assumption of a continuous source of contamination of infinite duration at the site based on the maximum observed benzene concentration in groundwater (i.e., 229 µg/L in vertical profile 80-05 in June 1998). In summary, the Analytical Transient 1-, 2-, 3-Dimensional Model was used to model contaminant migration to two potential downgradient receptors: a drainage ditch located approximately 800 feet west of the site and Mill Creek located approximately 2,500 feet west of the site. The modeling results indicated that, due to dilution attenuation, benzene would not reach the drainage ditch or Mill Creek at detectable concentrations. In February 2000, the groundwater flow direction changed toward the south; therefore, the underground storm drain located approximately 80 feet south of the former tank pit may act as a preferential pathway. Using the results of the modeling performed during the CAP–Part A, the model indicated that benzene would not reach the storm drain at detectable concentrations.

Based on modeling results, the estimated dilution attenuation factor for benzene was 763,000 at the storm drain and infinity at the drainage ditch and at Mill Creek, indicating that the predicted concentrations at these two receptors are zero. During the CAP–Part A, simulations of a 2-year period were not performed to predict the maximum concentrations of benzene in the downgradient wells that will be used for long-term monitoring because permanent wells did not exist at the site. As a result of the semiannual monitoring events in January/February and June/July 2000, it was not necessary to revise the fate and transport modeling results.

Benzene was identified as a contaminant of potential concern during the risk screening performed as part of the CAP–Part A investigation; however, an alternate concentration limit was not developed for benzene because the fate and transport modeling results indicated that the CAP–Part A concentrations at the site were not high enough to result in detectable concentrations at the receptor locations. Benzene concentrations observed during the semiannual sampling events in January/February and June/July 2000 were less than the concentrations observed during the CAP–Part A investigation.

1.1 FATE AND TRANSPORT MODELING CONCLUSIONS

The conclusion below is based on a fate and transport model that assumes 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 at the source during the CAP–Part A investigation.

- Benzene concentrations in groundwater during the semiannual monitoring events did not exceed the IWQS of 71.28 µg/L in any of the wells at the site, indicating that the benzene concentrations at the site are not high enough to reach the storm drain, drainage ditch, or Mill Creek at concentrations above the IWQS.

ATTACHMENT B

REFERENCES

REFERENCES

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

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

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

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

SAIC (Science Applications International Corporation) 1999. *CAP--Part A Report for UST 38, Facility ID #9-089109, Building 1510, Fort Stewart, Georgia*, August.

SAIC 2000. *First Semiannual Monitoring Only Report for UST 38, Facility ID #9-089109, Building 1510, Fort Stewart, Georgia*, June.

ATTACHMENT C

BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

HTRW DRILLING LOG

HOLE NUMBER SB-10

PROJECT: Fort Stewart USTs | INSPECTOR J. Celeste | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0–1	CONCRETE				
	1–2	SAND (SW), fine grained, some silt, soft to very soft (2.5 Y 2.5/1)				
	2–3	SAND (SW), fine grained, some silt, soft to very soft (2.5 Y 6/2)				
	3–4	NO RECOVERY				
	4–5	SAND (SW), fine grained, some silt, moist to wet, light gray to reddish brown (2.5 Y 4/2)				
	5–6					
	6–7					▽ wet below 6.5 ft BGS
	7–8	NO RECOVERY				
	8–9					PUSHED TO 12.1 FT BGS TO SET 3/4" MONITORING POINT SCREENED FROM 3.0 TO 12.0 FT BGS
	9–10					COLLECTED GROUNDWATER SAMPLE SB1012 FROM MONITORING POINT

HTRW DRILLING LOG

HOLE NUMBER 80-11

PROJECT: Fort Stewart USTs | INSPECTOR J. Celeste | 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), fine grained, soft to very soft, dark brown, (7.5 YR 3/2)				
	2					
	3					
	4	NO RECOVERY				
		Silty SAND (SM), fine grained, moist to wet, dark brown, (7.5 YR 3/2)				
	5					▽ wet below 5.5 ft BGS
	6					
		Silty SAND (SM), fine grained, soft to very soft, wet, light gray, (2.5 Y 7/1)				
	7	Sandy CLAY (CH), fine grained, soft to very soft, wet, black (2.5 Y 2.5/1)				COLLECTED GROUNDWATER SAMPLE 80112 FROM MONITORING POINT
		NO RECOVERY				
	8					
	9					PUSHED TO 13.0 FT BGS TO SET 3/4" MONITORING POINT SCREENED FROM 2.7 TO 12.7 FT BGS
	10					

HTRW DRILLING LOG

HOLE NUMBER 80-12

PROJECT: Fort Stewart USTs | INSPECTOR J. Celeste | 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), fine grained, soft to very soft, dark brown, (7.5 YR 3/2)				
	2					
	3	NO RECOVERY				
	4	Silty SAND (SM), fine grained, soft to very soft, dark brown, (7.5 YR 3/2)				
		Silty SAND (SM), fine grained, soft to very soft, brown (7.5 YR 7/2)				
	5	Silty SAND (SM), fine grained, soft to very soft, moist to wet, dark brown, (7.5 YR 3/2)				▽ wet below 5.5 ft BGS
	6					
	7					COLLECTED GROUNDWATER SAMPLE 801212 FROM MONITORING POINT
	8	NO RECOVERY				
	9					PUSHED TO 13.0 FT BGS TO SET 3/4" MONITORING POINT SCREENED FROM 2.7 TO 12.7 FT BGS
	10					

HTRW DRILLING LOG

HOLE NUMBER SB-13

PROJECT: Fort Stewart USTs | INSPECTOR J. Celeste | SHEET 1 OF 1

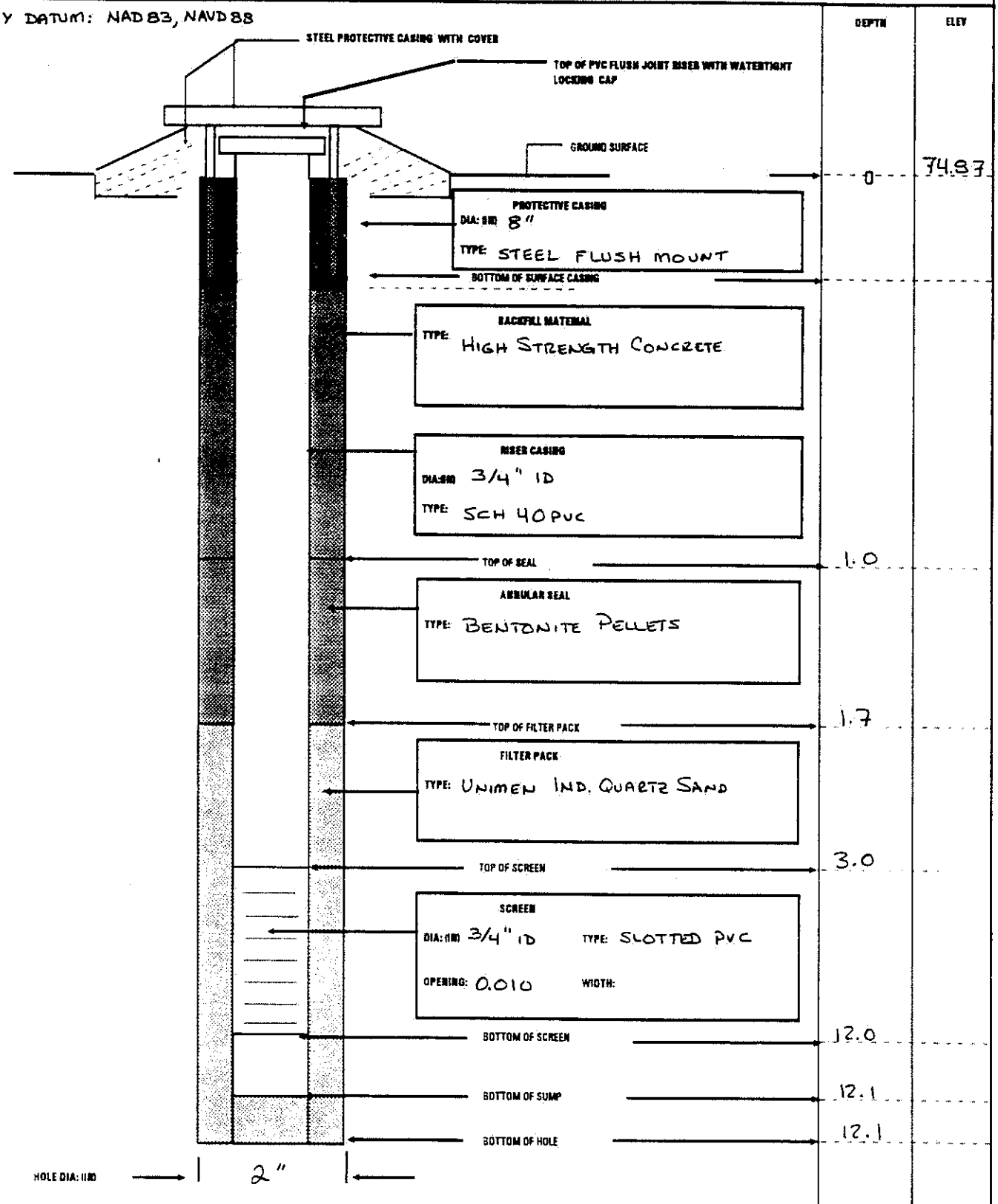
ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		CONCRETE				
	1	SAND (SW), fine grained, some silt, soft to very soft (2.5 Y 2.5/1)				
	2					
	3	SAND W/SILT (SP-SM), fine grained, some silt, soft, moist, well-rounded (2.5 Y 8/1)				
	4	NO RECOVERY				
	5	Silty SAND (SM), fine grained, soft, moist, (2.5 Y 6/2)				▽ wet below = 5.0 FT BGS
	6	Silty SAND (SM), fine grained, soft to firm (2.5 Y 2.5/1)				
	7	Silty SAND (SM), fine grained, firm to hard (5 YR 4/3)				
	8					COLLECTED GROUNDWATER SAMPLE B01312 FROM MONITORING POINT
	9	sandy CLAY (CH) soft to very soft and wet (2.5 Y 2.5/1)				PUSHED TO 13.0 FT BGS TO SET 3/4" MONITORING POINT SCREENED FROM 2.8 TO 12.8 FT BGS
	10					

MONITORING WELL

PROJECT: UST 38

WELL NUMBER: 80-10	**BEGIN:** 1/13/00	**END:** 1/13/00
COORDINATES: N: 678999.6 E: 824814.3	**REFERENCE POINT:** TOP OF CASING	**ELEVATION:** 74.55

SURVEY DATUM: NAD 83, NAVD 88

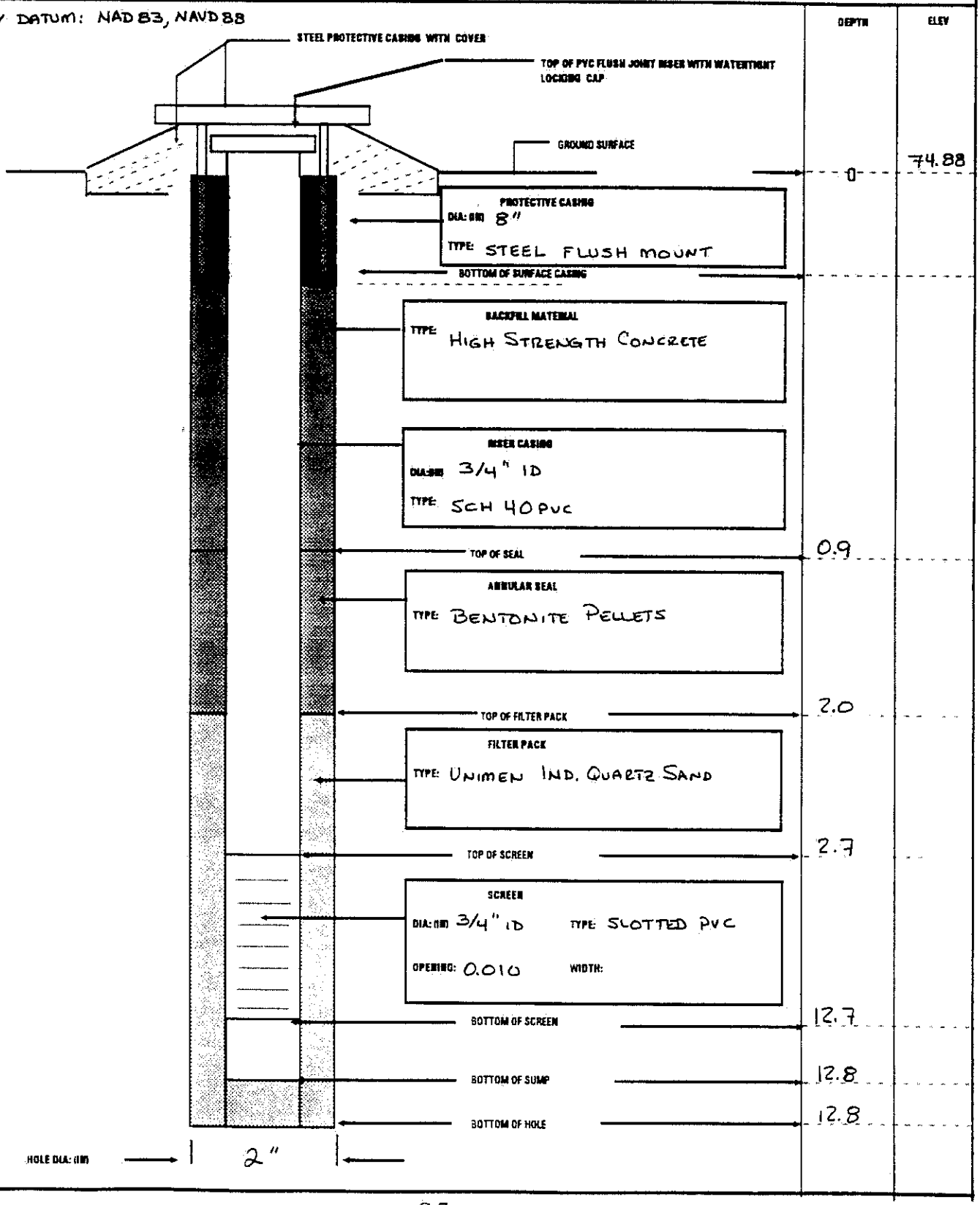


MONITORING WELL

PROJECT: UST 38

WELL NUMBER: 80-11	**BEGIN:** 1/16/00	**END:** 1/16/00
COORDINATES: N: 679003.6 E: 824775.3	**REFERENCE POINT:** TOP OF CASING	**ELEVATION:** 74.60

SURVEY DATUM: NAD 83, NAVD 88

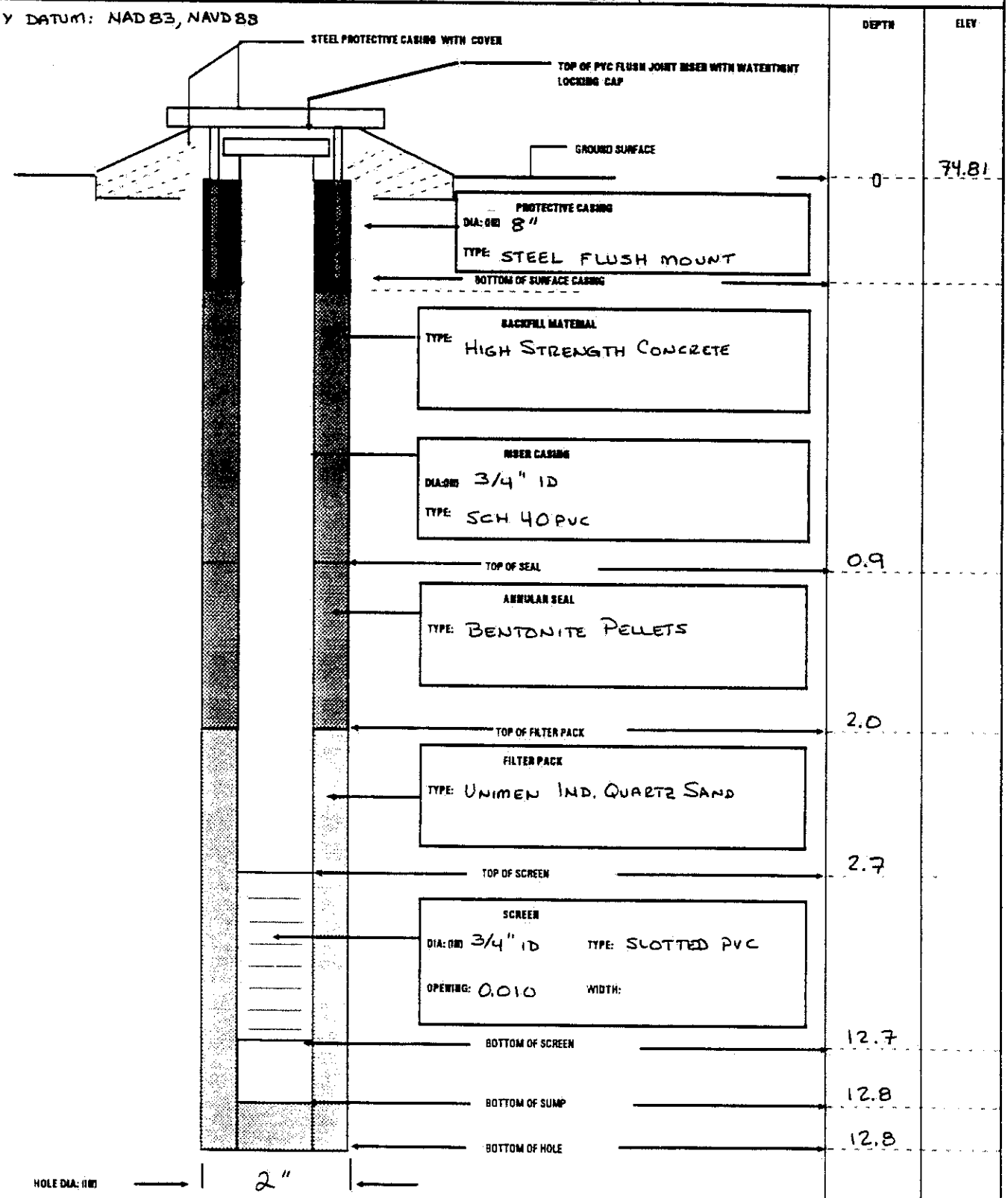


MONITORING WELL

PROJECT: UST 38

WELL NUMBER: 80-12	**BEGIN:** 1/16/00	**END:** 1/16/00
COORDINATES: N: 678958.1 E: 824809.8	**REFERENCE POINT:** TOP OF CASING	**ELEVATION:** 74.56

SURVEY DATUM: NAD 83, NAVD 88

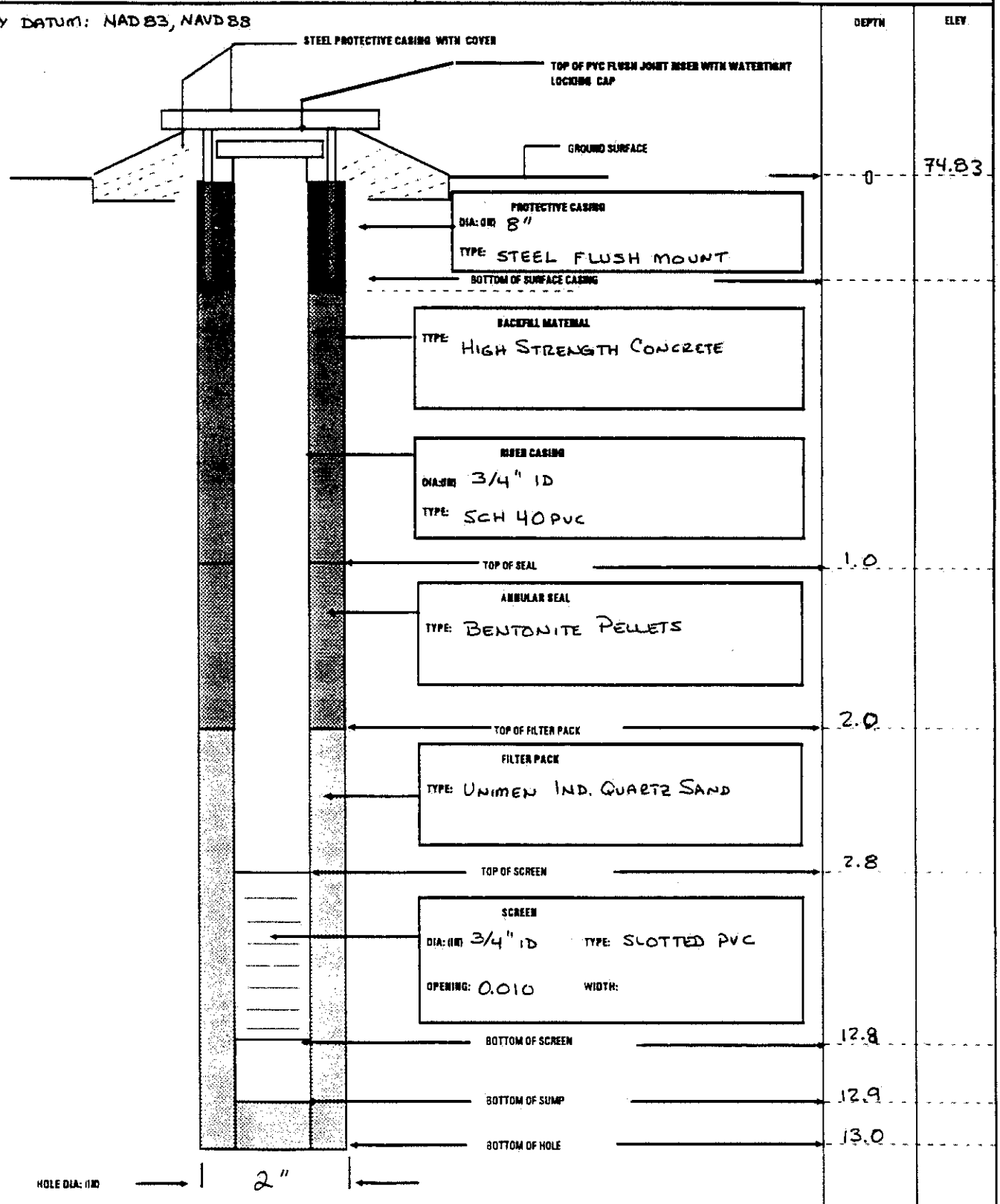


MONITORING WELL

PROJECT: UST 38

WELL NUMBER: B0-13	**BEGIN:** 1/13/00	**END:** 1/13/00
COORDINATES: N: 679016.2 E: 824873.1	**REFERENCE POINT:** TOP OF CASING	**ELEVATION:** 74.62

SURVEY DATUM: NAD 83, NAVD 88



DEPTH	ELEV.
0	74.83
1.0	
2.0	
2.8	
12.8	
12.9	
13.0	