1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEV212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS004W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9905244-20

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: 8U124

Level: (low/med) LOW Date Received: 05/08/99

% Moisture: ______ decanted: (Y/N)____ Date Extracted: 05/11/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/18/99

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION	Q	
51-28-5	2,4-dinitrophenol	20.4	U	R G04
132-64-9	dibenzofuran	10.2	U	U
121-14-2	2,4-dinitrotoluene	10.2	U	↓
84-66-2	diethylphthalate	10.2	U	↓
100-02-7	4-nitrophenol	20.4	U	R G04
86-73-7	fluorene	5.0	J	J
7005-72-3	4-chlorophenylphenylether	10.2	U	U
534-52-1	4,6-dinitro-2-methylphenol	10.2	U	R G04
100-01-6	4-nitroaniline	25.5	U	U
101-55-3	4-bromophenylphenylether	10.2	U	↓
118-74-1	hexachlorobenzene	10.2	U	↓
87-86-5	pentachlorophenol	10.2	U	R G04
85-01-8	phenanthrene	8.1	J	J
120-12-7	anthracene	1.4	J	J
84-74-2	di-n-butylphthalate	10.2	U	U
206-44-0	fluoranthene	10.2	U	U
129-00-0	pyrene	1.6	J	J
85-68-7	butylbenzylphthalate	10.2	U	U
56-55-3	benzo(a)anthracene	10.2	U	↓
91-94-1	3,3'-dichlorobenzidine	51.0	U	↓
218-01-9	chrysene	10.2	U	↓
117-81-7	bis(2-ethylhexyl)phthalate	10.2	U	↓
117-84-0	di-n-octylphthalate	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	↓
122-39-4	diphenylamine	10.2	U	↓
86-74-8	Carbazole	10.2	U	↓

FORM I SV-2 OLM03.0

110

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEVW12

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS006W1

Matrix: (soil/water) WATER Lab Sample ID: 9905252-01

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8J608

Level: (low/med) LOW Date Received: 05/09/99

% Moisture: not dec. ______ Date Analyzed: 05/22/99

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

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

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q	
74-87-3	chloromethane	2.0	U	U
74-83-9	bromomethane	2.0	U	↓
75-01-4	vinyl chloride	2.0	U	↓
75-00-3	chloroethane	1.5	J	J C05
75-09-2	methylene chloride	2.0	U	U
67-64-1	acetone	53.1	B	= F08
75-15-0	carbon disulfide	5.0	U	U
75-35-4	1,1-dichloroethene	2.0	U	U
75-34-3	1,1-dichloroethane	8.4		=
67-66-3	chloroform	2.0	U	U
107-06-2	1,2-dichloroethane	2.0	U	
78-93-3	2-butanone	5.0	U	
71-55-6	1,1,1-trichloroethane	2.0	U	
56-23-5	carbon tetrachloride	2.0	U	
75-27-4	bromodichloromethane	5.0	U	
78-87-5	1,2-dichloropropane	2.0	U	
10061-01-5	cis-1,3-dichloropropene	2.0	U	
79-01-6	trichloroethene	2.0	U	
124-48-1	dibromochloromethane	2.0	U	
79-00-5	1,1,2-trichloroethane	2.0	U	
71-43-2	benzene	2.0	U	
10061-02-6	trans-1,3-dichloropropene	2.0	U	
75-25-2	bromoform	2.0	U	
108-10-1	4-methyl-2-pentanone	5.0	U	
591-78-6	2-hexanone	5.0	U	
127-18-4	tetrachloroethene	2.0	U	
79-34-5	1,1,2,2-tetrachloroethane	2.0	U	↓
108-88-3	toluene	0.91	J	J
108-90-7	chlorobenzene	2.0	U	U
100-41-4	ethylbenzene	49.4		=
100-42-5	styrene	2.0	U	U
1330-20-7	xylenes (total)	36.0		=
540-59-0	1,2-dichloroethylene (total)	20.5		=

FORM I VOA OLM03.0

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEVW12

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS006W1

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9905252-01

Sample wt/vol: 900.0 (g/mL) ML Lab File ID: 5U410

Level: (low/med) LOW Date Received: 05/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/13/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/20/99

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	
108-95-2	phenol	11.1	U	R G04
111-44-4	bis(2-chloroethyl)ether	11.1	U	UJ G02
95-57-8	2-chlorophenol	11.1	U	R G04
541-73-1	1,3-dichlorobenzene	11.1	U	UJ G02
106-46-7	1,4-dichlorobenzene	11.1	U	↓ ↓
95-50-1	1,2-dichlorobenzene	11.1	U	
108-60-1	2,2'-Oxybis(1-chloropropane)	11.1	U	
95-48-7	2-methylphenol	11.1	U	R G04
621-64-7	N-nitroso-di-n-propylamine	11.1	U	UJ G02
106-44-5	m,p-cresol	11.1	U	R G04
67-72-1	hexachloroethane	11.1	U	UJ G02
98-95-3	nitrobenzene	11.1	U	↓ ↓
78-59-1	isophorone	11.1	U	
88-75-5	2-nitrophenol	11.1	U	R G04
105-67-9	2,4-dimethylphenol	11.1	U	R G04
111-91-1	bis(2-chloroethoxy)methane	11.1	U	UJ G02
120-83-2	2,4-dichlorophenol	11.1	U	R G04
120-82-1	1,2,4-trichlorobenzene	11.1	U	UJ G02
91-20-3	naphthalene	17.6		J
106-47-8	4-chloroaniline	22.2	U	UJ ↓
87-68-3	hexachlorobutadiene	11.1	U	UJ
59-50-7	4-chloro-3-methylphenol	11.1	U	R G04
91-57-6	2-methylnaphthalene	6.3	J	J G02
77-47-4	hexachlorocyclopentadiene	11.1	U	UJ G02
88-06-2	2,4,6-trichlorophenol	11.1	U	R G04
95-95-4	2,4,5-trichlorophenol	11.1	U	R G04
91-58-7	2-chloronaphthalene	11.1	U	UJ G02
99-09-2	3-nitroaniline	27.8	U	↓ ↓
88-74-4	2-nitroaniline	11.1	U	
131-11-3	dimethylphthalate	11.1	U	
606-20-2	2,6-dinitrotoluene	11.1	U	
208-96-8	acenaphthylene	11.1	U	
83-32-9	acenaphthene	9.2	J	J H02, H04, G

FORM I SV-1 OLM03.0

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEVW12

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS006W1

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9905252-01

Sample wt/vol: 900.0 (g/mL) ML Lab File ID: SU410

Level: (low/med) LOW Date Received: 05/09/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/13/99

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/20/99

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	
51-28-5	2,4-dinitrophenol	27.8	UJ	R G04
132-64-9	dibenzofuran	7.2	J	J G02
121-14-2	2,4-dinitrotoluene	11.1	U	UJ
84-66-2	diethylphthalate	11.1	U	UJ
100-02-7	4-nitrophenol	27.8	U	R G04
86-73-7	fluorene	10.0	J	J G02
7005-72-3	4-chlorophenylphenylether	11.1	U	UJ G02
534-52-1	4,6-dinitro-2-methylphenol	11.1	U	R G04
100-01-6	4-nitroaniline	11.1	U	UJ G02
122-39-4	diphenylamine	11.1	U	
101-55-3	4-bromophenylphenylether	11.1	U	
118-74-1	hexachlorobenzene	11.1	U	
87-86-5	pentachlorophenol	27.8	U	R G04
85-01-8	phenanthrene	32.0		J G02
120-12-7	anthracene	4.4	J	J
84-74-2	di-n-butylphthalate	11.1	U	UJ
206-44-0	fluoranthene	4.8	J	J
129-00-0	pyrene	3.3	J	J H02, H04, G0
85-68-7	butylbenzylphthalate	11.1	U	UJ G02
56-55-3	benzo(a)anthracene	11.1	U	
91-94-1	3,3'-dichlorobenzidine	55.6	U	
218-01-9	chrysene	11.1	U	
117-81-7	bis(2-ethylhexyl)phthalate	11.1	U	
117-84-0	di-n-octylphthalate	11.1	U	
205-99-2	benzo(b)fluoranthene	11.1	U	
207-08-9	benzo(k)fluoranthene	11.1	U	
50-32-8	benzo(a)pyrene	11.1	U	
193-39-5	indeno(1,2,3-cd)pyrene	11.1	U	
53-70-3	dibenz(a,h)anthracene	11.1	U	
191-24-2	benzo(g,h,i)perylene	11.1	U	
86-74-8	Carbazole	54.0		J

FORM I SV-2 OLM03.0

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

CHAIN OF CUSTODY RECORD

COC NO.: HP009

PROJECT NAME: HAAF-Pilot Study

PROJECT NUMBER: 01-0331-04-1829-100

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

	Sample ID	Date Collected	Time Collected	Matrix	BTEX	TPH	Nitrate	Sulfate	Sulfide	Total Iron	Dissolved Iron	Methane	CO2	TOC	SVOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS	
14	AEP214	5/7/99	1720	water		2										2			4cl .5
15	AEP312	5/7/99	1630			2										2			
16	AEP212	5/7/99	1720			2										2			
17	AEP112	5/7/99	1600			2										2			
18	AEP412	5/7/99	1730			2										2			
19	AEV112	5/7/99	345												2	2			10
20	AEV212	5/7/99	1059												2	2			

LL 5/8/99

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 14	Cooler Temperature: 3°C
Laura Lumley	5/8/99 10:40	P. Dauer	5/8/99 15:00	Cooler ID: # 552	FEDEX NUMBER:
COMPANY NAME: SAIC		COMPANY NAME: GEL			
RECEIVED BY: [signature]	Date/Time 5/8/99 10:40	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY: [signature]	Date/Time 5/8/99 1300	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

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9905244

CHAIN OF CUSTODY RECORD

COC NO.: HP010

PROJECT NAME: HAAF-Pilot Study

PROJECT NUMBER: 01-0331-04-1829-100

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

REQUESTED PARAMETERS

	Sample ID	Date Collected	Time Collected	Matrix	BTEX	TPH	Nitrate	Sulfate	Sulfide	Total Iron	Dissolved Iron	Methane	CO2	TOC	Alkalinity	VOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
1/2	AEP11Z	5/7/99	1600	water	2		1	1	1	1	1	2	1				12		
1/4	AEP21Z	5/7/99	1720		2		1	1	1	1	1	2	1		2		12		
1/6	AEP21Y	5/7/99	1720		2		1	1	1	1	1	2	1				10		
1/8	AEP31Z	5/7/99	1430		2		1	1	1	1	1	2	1		1		11		
1/10	AEP41Z	5/7/99	1730		2		1	1	1	1	1	2	1				10		
11/2	AEV21Z	5/7/99	1059													2	2		
12	AEV11Z	5/7/99	845													2	2		
13	HP0004	5/7/99	745	↓	2												2		

5/8/99

4:1 .1 .2 .1 .2 .1 .3 .1

VIII-129

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 59	Cooler Temperature: 3°C
Laura Lumley	5/8/99	P. Nowick	5/8/99	Cooler ID: #716	FEDEX NUMBER:
COMPANY NAME: SAIC	1040	COMPANY NAME: GEL	15:00		
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME:	5/8/99 1040	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:	5/8/99 1520	COMPANY NAME:			

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99052529 52499

CHAIN OF CUSTODY RECORD

COC NO.: HP016

PROJECT NAME: HAAF-Pilot Study

PROJECT NUMBER: 01-0331-04-1829-100

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	TPH	Nitrate	Sulfate	Sulfide	Total Iron	Dissolved Iron	Methane	CO2	TOC	SVOC	Alkalinity	VOC	Silica gel TPH-DRO TPC	TPH-GRO				No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AEVW12	5/6/99	1615	water											2		2						4		99052529
AEP512	5/6/99	1440	↓	2	2	1	1	1	1	1	2	1			1							13		
HP0007	5/6/99	1200	↓													2						2		
AEVW11	5/6/99	1540	Soil													1	1	1				3		
AEP511	5/6/99	1500	Soil	1	1																	2		

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29407

PHONE NO: (843) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	5/6/99 1070	P. Nolen	5/9/99 13:00
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:	5/9/99 1070	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:	5/9/99 1330	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 24

Cooler ID: # 376

Cooler Temperature: 3°C

FEDEX NUMBER:

GROUNDWATER ANALYTICAL RESULTS
FIRST SAMPLING EVENT

JUNE 1999

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE0622

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N436

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/18/99

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	3.7	
108-88-3	toluene	0.56	J
100-41-4	ethylbenzene	3.5	
1330-20-7	xylenes (total)	1.9	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1122

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N415

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

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

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	benzene	114 ~~117~~	E D
108-88-3	toluene	17.2	
100-41-4	ethylbenzene	4.7	
1330-20-7	xylenes (total)	37.1	

MAP 7/22/99

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6022

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-12

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N439

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/18/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	2360	
108-88-3	toluene	180	
100-41-4	ethylbenzene	411	
1330-20-7	xylenes (total)	1900	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6122

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-13

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N409

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

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	5.2		=
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	0.73	J	J
1330-20-7	xylenes (total)	7.6		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6322

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-11

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N438

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/18/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	1960	
108-88-3	toluene	226	
100-41-4	ethylbenzene	245	
1330-20-7	xylenes (total)	1140	

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6932
AEP422e

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N431

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 25.0

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	149	
108-88-3	toluene	183	
100-41-4	ethylbenzene	90.5	
1330-20-7	xylenes (total)	814	

FORM I VOA OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED122

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-16

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N406

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

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	58.5	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	3.7	
1330-20-7	xylenes (total)	16.7	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED322

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-15

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N441

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/18/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	3180	
108-88-3	toluene	1300	
100-41-4	ethylbenzene	1150	
1330-20-7	xylenes (total)	3320	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED422

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N418

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

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

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

USE

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	benzene	104	ED	=
108-88-3	toluene	50.3		
100-41-4	ethylbenzene	25.5		
1330-20-7	xylenes (total)	126		

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED424

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-05

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N417

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

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

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	benzene	104 ~~105~~	~~E~~ D
108-88-3	toluene	51.7	
100-41-4	ethylbenzene	24.8	
1330-20-7	xylenes (total)	130	

MMP 7/22/99

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDM22

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-06

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N416

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

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	9.7	
108-88-3	toluene	1.4	J
100-41-4	ethylbenzene	49.6	
1330-20-7	xylenes (total)	106	

FORM I VOA OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP122

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N430

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	2420	
108-88-3	toluene	4660	
100-41-4	ethylbenzene	523	
1330-20-7	xylenes (total)	2790	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP222

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-01

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N429

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	3370	
108-88-3	toluene	3400	
100-41-4	ethylbenzene	709	
1330-20-7	xylenes (total)	3120	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP322

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-10

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N437

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/18/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
71-43-2	benzene	6720	3200	
108-88-3	toluene		~~6160~~	E D
100-41-4	ethylbenzene		789	
1330-20-7	xylenes (total)		4430	

MAP
7/22/99

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP422

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-08

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N435

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/18/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	benzene	2010	
108-88-3	toluene	4750 ~~5440~~	ED
100-41-4	ethylbenzene	708	
1330-20-7	xylenes (total)	4490	

NMP 7/22/99

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP522

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS012W

Matrix: (soil/water) WATER Lab Sample ID: 9906568-14

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8N408

Level: (low/med) LOW Date Received: 06/16/99

% Moisture: not dec. _____ Date Analyzed: 06/17/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	benzene	3.0	J	J
108-88-3	toluene	10.0	U	U
100-41-4	ethylbenzene	534 ~~538~~	~~E~~ D	=
1330-20-7	xylenes (total)	1720 ~~1580~~	~~E~~ D	=

MAP
7/22/99

FORM I VOA OLM03.0

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

CHAIN OF CUSTODY RECORD

COC NO.: HP025

PROJECT NAME: HAAF-Pilot Study

PROJECT NUMBER: 01-0331-04-1829-~~100~~ 200

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	TPH	Nitrate	Sulfate	Sulfide	Total Iron	Dissolved Iron	Methane	CO2	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AEP2Z2	6/15/99	1005	water	2										2		9906568-01
AEP12Z	6/15/99	1115		2										2		02
~~AER4Z2~~ AE6422	6/15/99	1232		2										2		03
AED42Z	6/16/99	0725		2										2		04
AED424	6/16/99	0725		2										2		05
AEDM2Z	6/15/99	0940		2										2		06
AE112Z	6/15/99	1519		2										2		07
AEP42Z	6/15/99	1024		2										2		08
AED022	6/15/99	1622		2										2		09
AEP32Z	6/15/99	1057		2										2		10
AE1322	6/15/99	1414		2										2		11
AE10Z2	6/15/99	1330		2										2		12
AE121Z	6/15/99	0754	↓	2										2		13

VIII-149

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/16/99	Bonnie Travers	6/16/99
COMPANY NAME: SAIC	12:30	COMPANY NAME: GEL	1545
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
	6-16-99		
COMPANY NAME:	1230	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
	6/16/99		
COMPANY NAME: KAT		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 34

Cooler ID: #74

Cooler Temperature:

FEDEX NUMBER:

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

2042

CHAIN OF CUSTODY RECORD

COC NO.: HP025

PROJECT NAME: HAAF-Pilot Study

PROJECT NUMBER: 01-0331-04-1829-~~100~~ 200

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	TPH	Nitrate	Sulfate	Sulfide	Total Iron	Dissolved Iron	Methane	CO2	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AEP522	6/15/99	0920	water	Z										Z		9906568-14
AED322	6/16/99	0706		Z										Z		-15
AED122	6/16/99	0652		Z										Z		-16
HP0010	6/15/99	745		Z										Z		-17

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29407

PHONE NO: (843) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	6/16/99 1230		6/16/99 1845
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
	6/16/99 1230		
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY:	Date/Time 6/16/99 1545	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS:

Cooler ID: #74

Cooler Temperature:

FEDEX NUMBER:

VIII-150

GROUNDWATER ANALYTICAL RESULTS
SECOND SAMPLING EVENT
JULY 1999

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE0632

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-12

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R412

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/15/99

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	9.6		
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	29.6		
1330-20-7	xylenes (total)	6.0	U	U

DATA VALIDATION COPY

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1132

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-15

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R310

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

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	0.82	J	J
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	2.0	U	U
1330-20-7	xylenes (total)	6.0	U	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6032

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-17

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R320

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0 USL

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	3260 ~~2100~~	E D	=
108-88-3	toluene	197		=
100-41-4	ethylbenzene	531		=
1330-20-7	xylenes (total)	2720 ~~2110~~	E D	=

MMAP
8/3/99

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6132

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-01

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R218

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/13/99

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	1.1	J	J
108-88-3	toluene	0.56	J	J
100-41-4	ethylbenzene	2.0	U	U
1330-20-7	xylenes (total)	1.3	J	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6332

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R312

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

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	648	U
108-88-3	toluene	88.1	U
100-41-4	ethylbenzene	135	U
1330-20-7	xylenes (total)	523	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6432

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-08

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R323

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	85.4	U
108-88-3	toluene	154	U
100-41-4	ethylbenzene	72.3	U
1330-20-7	xylenes (total)	624	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED132

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R219

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/13/99

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	62.7	
108-88-3	toluene	5.0	
100-41-4	ethylbenzene	10.9	
1330-20-7	xylenes (total)	51.3	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED332

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-06

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R414

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/15/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 100.0

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	3430	U
108-88-3	toluene	3830	U
100-41-4	ethylbenzene	1250	U
1330-20-7	xylenes (total)	4460	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED432

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R311

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 100.0

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	111	J	J
108-88-3	toluene	612		
100-41-4	ethylbenzene	533		
1330-20-7	xylenes (total)	3180		

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED434

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-13

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R317

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

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		140	=
108-88-3	toluene		87.5	=
100-41-4	ethylbenzene		123	=
1330-20-7	xylenes (total)		456	=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDM32

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-10

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R307

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

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	U
108-88-3	toluene	0.95	J	J
100-41-4	ethylbenzene	0.87	J	J
1330-20-7	xylenes (total)	3.1	J	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP132

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-05

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R313

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 1 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	benzene	1770 ~~1620~~	~~E~~ D	=
108-88-3	toluene	3820 ~~3580~~	~~E~~ D	=
100-41-4	ethylbenzene	402		=
1330-20-7	xylenes (total)	2050		=

MAP
8/3/99

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP232

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R415

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/15/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	2540	
108-88-3	toluene	1600	
100-41-4	ethylbenzene	565	
1330-20-7	xylenes (total)	2170	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP332

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-14

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R416

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/15/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 100.0

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	3150	
108-88-3	toluene	8020	
100-41-4	ethylbenzene	1030	
1330-20-7	xylenes (total)	5090	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP432

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-16

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R417

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/15/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 100.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		
71-43-2	benzene	1990		=
108-88-3	toluene	6080		=
100-41-4	ethylbenzene	789		=
1330-20-7	xylenes (total)	4610		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP532

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: 97291W

Matrix: (soil/water) WATER Lab Sample ID: 9907291-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8R308

Level: (low/med) LOW Date Received: 07/09/99

% Moisture: not dec. _____ Date Analyzed: 07/14/99

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	U
108-88-3	toluene	0.62	J	J
100-41-4	ethylbenzene	9.2		
1330-20-7	xylenes (total)	27.9		

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1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: HP00040

PROJECT NAME: HAAF ~~Long Term Monitoring~~ Pilot Study Bldg 728

PROJECT NUMBER: 01-0331-04 ~~1784-108~~ 1629-216

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

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AE6132	7/8/99	1047	water	Z		2		9907291-01
AED432	7/8/99	1649		Z		2		-02
AE6332	7/8/99	1125		Z		2		-03
AED132	7/8/99	1438		Z		2		-04
AEP132	7/8/99	1554		Z		2		-05
AED332	7/8/99	1633		Z		2		-06
AEP532	7/8/99	1710		Z		2		-07
AE6432	7/8/99	1225		Z		2		-08
AEP232	7/8/99	1503		Z		2		-09
AEDM32	7/8/99	1725		Z		2		-10
TBA003	7/8/99	745		Z		2		-11
AE0632	7/8/99	1205		Z		2		-12
AED434	7/8/99	1649	↓	Z		2		-13

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
Laura Lumley	7/9/99 1030	Dionne Francois	7/9/99 1415	Cooler ID: # 820	4°C
COMPANY NAME: SAIC		COMPANY NAME: GEL			FEDEX NUMBER:
RECEIVED BY:	Date/Time 7-9-99 1030	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 7-9-99 1415	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

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2012

CHAIN OF CUSTODY RECORD

COC NO.: AP0040

PROJECT NAME: HAAF Long Term Monitoring
Pilot Study Bldg 728

PROJECT NUMBER: 01-0331-04 ~~1764-100~~
1829-216

PROJECT MANAGER: Patty Stoll

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

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
EP332	7/8/99	1534	water	2		2		9907291-14
E1132	7/8/99	1415	↓	2		2		-15
EP432	7/8/99	1516		2		2		-16
E6032	7/8/99	1327		2		2		-17

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: SAIC	7/9/99 1030	COMPANY NAME: GEL	7/9/99 1415
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:	7-9-99 1030	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:	7-9-99 1415	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 34

Cooler ID: # 620

Cooler Temperature: 4°C

FEDEX NUMBER:

GROUNDWATER ANALYTICAL RESULTS
THIRD SAMPLING EVENT
AUGUST 1999

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE0642

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-06

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y227

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

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	U U J J
108-88-3	toluene	2.0	U	
100-41-4	ethylbenzene	9.2		
1330-20-7	xylenes (total)	1.8	J	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1142

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y209

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 08/31/99

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	13.7		
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	1.3	J	J
1330-20-7	xylenes (total)	10.1		

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6042

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-15

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y310

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	257		=
108-88-3	toluene	10.0	U	C
100-41-4	ethylbenzene	69.4		=
1330-20-7	xylenes (total)	335		=

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6044

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-13

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y308

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	278		C
108-88-3	toluene	10.0	U	C
100-41-4	ethylbenzene	81.2		C
1330-20-7	xylenes (total)	384		C

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6142

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y210

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 08/31/99

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	33.1	
108-88-3	toluene	0.56	J
100-41-4	ethylbenzene	4.4	
1330-20-7	xylenes (total)	11.2	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6342

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-05

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y226

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

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	844	
108-88-3	toluene	46.8	
100-41-4	ethylbenzene	124	
1330-20-7	xylenes (total)	542	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6442

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-12

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y230

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

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	19.8		=
108-88-3	toluene	0.71	J	=
100-41-4	ethylbenzene	21.9		=
1330-20-7	xylenes (total)	109		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED142

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-08

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y211

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 08/31/99

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	30.6	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	6.0	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED342

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-16

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y234

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	3460		U
108-88-3	toluene	2330		U
100-41-4	ethylbenzene	1530		U
1330-20-7	xylenes (total)	4550		U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED442

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-14

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y309

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	130	
108-88-3	toluene	10.0	U
100-41-4	ethylbenzene	50.8	
1330-20-7	xylenes (total)	60.1	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDM42

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y212

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 08/31/99

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	U
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	0.62	J	J
1330-20-7	xylenes (total)	0.86	J	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP142

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y216

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 08/31/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		
71-43-2	benzene	1770		=
108-88-3	toluene	3140		=
100-41-4	ethylbenzene	484		=
1330-20-7	xylenes (total)	2430		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP242

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-11

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y229

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	3020	
108-88-3	toluene	960	
100-41-4	ethylbenzene	686	
1330-20-7	xylenes (total)	2440	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP342

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-17

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y311

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 100.0

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	1940		=
108-88-3	toluene	3890		=
100-41-4	ethylbenzene	496		=
1330-20-7	xylenes (total)	2590		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP442

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-18

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y312

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	516	
108-88-3	toluene	1530	
100-41-4	ethylbenzene	309	
1330-20-7	xylenes (total)	2080	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP542

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9908981-10

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8Y228

Level: (low/med) LOW Date Received: 08/26/99

% Moisture: not dec. _____ Date Analyzed: 09/01/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	10.0	U	
108-88-3	toluene	10.0	U	
100-41-4	ethylbenzene	65.4		
1330-20-7	xylenes (total)	185		

FORM I VOA OLM03.0

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CHAIN OF CUSTODY RECORD

COC NO.: HPØ1ØØ

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HP0012	8/25/99	0700	water	2	2		9908981-01
AE 11432	8/25/99	1135	↓	2	2		-02
AE6142	8/25/99	1030	↓	2	2		-03
ABPX12	8/25/99	1300	↓	2	2		-04
AE6342	8/24/99	1659	↓	2	2		-05
AED642	8/25/99	1230	↓	2	2		06
AEP142	8/24/99	1615	↓	2	2		07
AED142	8/24/99	1254	↓	2	2		08
AEDM42	8/24/99	1429	↓	2	2		09
AEP542	8/24/99	1404	↓	2	2		10
AEP242	8/24/99	1503	↓	2	2		11
AE6442	8/24/99	1745	↓	2	2		12
AE6044	8/24/99	1845	↓	2	2		13

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	
[signature]	8/26/99 1200	[signature]	8/26/99 1530	TOTAL NUMBER OF CONTAINERS:
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: Ft. Stewart #2, 4°C
RECEIVED BY: [signature]	Date/Time 8/26/99 1200	RELINQUISHED BY:	Date/Time	Cooler Temperature:
COMPANY NAME: [illegible]		COMPANY NAME:		FEDEX NUMBER:
RELINQUISHED BY: [signature]	Date/Time 8/26/99 1530	RECEIVED BY:	Date/Time	
COMPANY NAME: GEL		COMPANY NAME:		

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CHAIN OF CUSTODY RECORD

COC NO. HP0100

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AED44Z	8/24/99	1347	water	Z	2		9908981-14
AE6042	8/24/99	1845	↓	Z	2		-15
AED34Z	8/24/99	1315	↓	Z	2		-16
AEP342	8/24/99	1539	↓	Z	2		-17
AEP44Z	8/24/99	1527	↓	Z	2		-18
HP0011	8/24/99	0700	↓	Z	2		-19

8/26/99

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	8/26/99 1200	D Franco	8/26/99 1530
COMPANY NAME: SAIC		COMPANY NAME: Gel	
RECEIVED BY: R. Hoch	Date/Time 8/26/99 1200	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: Bob Hoch	Date/Time 8/26/99 1530	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 38

Cooler ID: Ft. Stewart #2, 4°C

Cooler Temperature:

FEDEX NUMBER:

GROUNDWATER ANALYTICAL RESULTS
FOURTH SAMPLING EVENT

SEPTEMBER 1999

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE0652

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-15

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E209

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

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	B	U F01, F06
108-88-3	toluene	2 ~~0.79~~	JB	U F01, F06
100-41-4	ethylbenzene	4.1		=
1330-20-7	xylenes (total)	6 ~~1.4~~	JB	U F01, F06

FORM I VOA OLM03.0

DATA VALIDATION COPY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1152

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-14

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E210

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

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	27.0	B	= F01, F08
108-88-3	toluene	15.5	B	= F01, F08
100-41-4	ethylbenzene	3.8		=
1330-20-7	xylenes (total)	20.1	B	= F01, F08

35

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6052

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E124

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

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	98.2		U
108-88-3	toluene	1.4	J	
100-41-4	ethylbenzene	62.8		U
1330-20-7	xylenes (total)	130		U

FORM I VOA OLM03.0

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6054

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-12

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E128

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

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	93.6		=
108-88-3	toluene	1.3	J	J
100-41-4	ethylbenzene	59.0		=
1330-20-7	xylenes (total)	122		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6152

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-11

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E207

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

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	37.4	B	= F01, F03
108-88-3	toluene	2 ~~1.0~~	JB	✓ F01, F6
100-41-4	ethylbenzene	4.8		=
1330-20-7	xylenes (total)	9.4	B	= F01, F08

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE5352

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E122

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/11/99

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	2.4	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
1330-20-7	xylenes (total)	0.85	J

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6452

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E121

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/11/99

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	4.0	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	3.8	
1330-20-7	xylenes (total)	18.6	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED152

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E123

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

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	2.7		
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	2.0	U	U
1330-20-7	xylenes (total)	6.0	U	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED352

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-13

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E213

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 100.0

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	3710	B	= F01, F08
108-88-3	toluene	1840	B	= F01, F08
100-41-4	ethylbenzene	1910		=
1330-20-7	xylenes (total)	4940	B	= F01, F08

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED452

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-10

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E307

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/13/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 5.0

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	1360 ~~1560~~	~~E~~ D	=
108-88-3	toluene	22.6		=
100-41-4	ethylbenzene	220		=
1330-20-7	xylenes (total)	263	B	= FD1, FD3

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDM52

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-01

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E120

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/11/99

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	UJ
108-88-3	toluene	2.0	U	
100-41-4	ethylbenzene	0.60	J	
1330-20-7	xylenes (total)	0.79	J	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP152

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E211

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 100.0

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	1740	B	=F01, F03
108-88-3	toluene	3360	B	=F01, F03
100-41-4	ethylbenzene	431		=
1330-20-7	xylenes (total)	2470	B	=F01, F03

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP252

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-08

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E214

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 50.0

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	1590	B	= FD1, FD8
108-88-3	toluene	273	B	= FD1, FD7
100-41-4	ethylbenzene	405		=
1330-20-7	xylenes (total)	1390	B	= FD1, FD9

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP352

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-06

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E212

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 100.0

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	2810	B	= F01,F03
108-88-3	toluene	5680	B	= F01,F03
100-41-4	ethylbenzene	838		=
1330-20-7	xylenes (total)	4550	B	= F01,F03

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP452

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-05

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E216

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 10.0

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	682	B	= F01, F08
108-88-3	toluene	443	B	= F01, F08
100-41-4	ethylbenzene	239		=
1330-20-7	xylenes (total)	1110	B	= F01, F08

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP552

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS014W

Matrix: (soil/water) WATER Lab Sample ID: 9909942-16

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1E208

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: not dec. _____ Date Analyzed: 10/12/99

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	2	~~0.82~~	JB	U F01, F06
100-41-4	ethylbenzene		2.6		=
1330-20-7	xylenes (total)		7.6	B	= F01, F03

SAIC An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4500

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CHAIN OF CUSTODY RECORD

COC NO.: GH0004

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AEDM5Z	9/29/99	1025	water	2	2		9909942-01
AE645Z	9/29/99	1356		2	2		-02
AE635Z	9/29/99	1446		2	2		-03
AED15Z	9/29/99	945		2	2		04
AEP45Z	9/29/99	1126		2	2		05
AEP35Z	9/29/99	1115		2	2		06
AE605Z	9/29/99	1312		2	2		07
AEP25Z	9/29/99	1145		2	2		08
AEP15Z	9/29/99	1100		2	2		09
AED45Z	9/29/99	1010		2	2		-10
AE615Z	9/29/99	1621		2	2		-11
AE605Y	9/29/99	1312		2	2		-12
AED35Z	9/29/99	1000	↓	2	2		13

42914

VIII-209

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4@C
Laura Lumley	9/30/99	Francis	9/30/99		
COMPANY NAME: SAIC	1040	COMPANY NAME:	1545	Cooler ID: #76	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME:	9/30/99 1040	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:	9/30/99 1545	COMPANY NAME:			

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

2 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GH0004

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AE1152	9/29/99	1535	water	2	2		9909942-14
AE0652	9/29/99	1710		2	2		-15
AEP552	9/29/99	1040		2	2		-16
APD015	9/29/99	0800		2	2		-17

VIII-210

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 34	Cooler Temperature: 4°C
COMPANY NAME: SAIC	9/30/99 1040	COMPANY NAME: GEL	9/30/99 1545	Cooler ID: #76	FEDEX NUMBER:
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:	9/30/99 1040	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	9/30/99 1545	COMPANY NAME:			

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GROUNDWATER ANALYTICAL RESULTS
FIFTH SAMPLING EVENT

OCTOBER 1999

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE0662

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H335

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (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	3.7		J = C =
108-88-3	toluene	2.0	U	
100-41-4	ethylbenzene	7.5		
1330-20-7	xylenes (total)	1.5	J	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1162

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-08

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H341

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (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	2.0	U	
100-41-4	ethylbenzene	0.55	J	
1330-20-7	xylenes (total)	0.53	J	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6062

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H428

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (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	56.6	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	11.5	
1330-20-7	xylenes (total)	5.5	J

U = J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6162

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H336

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (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	46.9		=
108-88-3	toluene	8.7		=
100-41-4	ethylbenzene	7.0		=
1330-20-7	xylenes (total)	14.6		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6362

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H412

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 25.0

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	715		
108-88-3	toluene	50.0	U	
100-41-4	ethylbenzene	54.7		
1330-20-7	xylenes (total)	154		

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6462

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-10

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H413

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. ____ Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (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	2.2	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.9	
1330-20-7	xylenes (total)	21.0	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED162

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-01

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H334

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. DATA VALIDATION COPY Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 25.0

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	1650	
108-88-3	toluene	928	
100-41-4	ethylbenzene	316	
1330-20-7	xylenes (total)	2140	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED362

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-06

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H431

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. DATA VALIDATION COPY Date Analyzed: 11/05/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	3760	U
108-88-3	toluene	2680	U
100-41-4	ethylbenzene	2070	U
1330-20-7	xylenes (total)	6020	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED462

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-05

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H430

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. DATA VALIDATION COPY Date Analyzed: 11/05/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 25.0

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	2320		=
108-88-3	toluene	50.0	U	<
100-41-4	ethylbenzene	369		=
1330-20-7	xylenes (total)	294		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDM62

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS013W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H337

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. DATA VALIDATION COPY Date Analyzed: 11/04/99

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	1.3	J	J
108-88-3	toluene	1.6	J	J
100-41-4	ethylbenzene	1.9	J	J
1330-20-7	xylenes (total)	3.3	J	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP162

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-13

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H416

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (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	0.78	J	J
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	2.0	U	U
1330-20-7	xylenes (total)	0.84	J	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP262

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-11

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H414

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ DATA VALIDATION COPY Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 25.0

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	977		=
108-88-3	toluene	70.9		=
100-41-4	ethylbenzene	192		=
1330-20-7	xylenes (total)	698		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP362

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-15

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H432

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ DATA VALIDATION COPY Date Analyzed: 11/05/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	2090	
108-88-3	toluene	3180	
100-41-4	ethylbenzene	632	
1330-20-7	xylenes (total)	4120	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP462

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-12

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H429

Level: (low/med) LOW DATA VALIDATION COPY Date Received: 10/28/99

% Moisture: not dec. _____ Date Analyzed: 11/04/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 2.0

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	11.5	
108-88-3	toluene	37.0	
100-41-4	ethylbenzene	40.4	
1330-20-7	xylenes (total)	216	

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP464

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-14

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H417

Level: (low/med) LOW Date Received: 10/28/99

% Moisture: not dec. _____ DATA VALIDATION COPY Date Analyzed: 11/04/99

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	12.6		=
108-88-3	toluene	31.2		=
100-41-4	ethylbenzene	41.4		=
1330-20-7	xylenes (total)	214		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP562

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HPS015W

Matrix: (soil/water) WATER Lab Sample ID: 9910963-16

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8H342

Level: (low/med) LOW DATA VALIDATION Date Received: 10/28/99

% Moisture: not dec. _____ COPY Date Analyzed: 11/04/99

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	1.1	J	J
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	6.6		
1330-20-7	xylenes (total)	17.6		

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4800

10/12

CHAIN OF CUSTODY RECORD

COC NO.: GH0007

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 566-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AED162	10/27/99	1547	water	2	2		9910963-01
AE0662	10/27/99	1850		2	2		02
AE6162	10/27/99	1555		2	2		03
AEDM62	10/27/99	1535		2	2		04
AED462	10/27/99	1505		2	2		05
AED362	10/27/99	1450		2	2		06
AE6062	10/27/99	1725		2	2		07
AE1162	10/27/99	1615		2	2		08
AE6362	10/27/99	1630		2	2		09
AE1462	10/27/99	1605		2	2		10
AEP262	10/27/99	1558		2	2		11
AEP462	10/27/99	1615		2	2		12
AEP162	10/27/99	1640		2	2		13

RELINQUISHED BY: Laura Lumley	Date/Time 10/28/99 1215	RECEIVED BY:	Date/Time 10/28/99 1915	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME:		Cooler ID: #372	FEDEX NUMBER:
RECEIVED BY:	Date/Time 10/28/99 1215	RELINQUISHED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 10/28/99 1515	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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

2 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GH0007

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AEP464	10/27/99	1615	water	Z	2		99109163-14
AEP362	10/27/99	1630		Z	2		-15
AEP562	10/27/99	1520		Z	2		-16
HP0016	10/27/99	0745		Z	2		-17

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	10/28/99 1215	FEDEX	10/28/99 1925
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY:	Date/Time 10/28/99 1215	RELINQUISHED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY:	Date/Time 10/28/99 1545	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 34

Cooler ID: #372

Cooler Temperature: 4°C

FEDEX NUMBER:

GROUNDWATER ANALYTICAL RESULTS
SIXTH SAMPLING EVENT

DECEMBER 1999

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE0672 SCS 1/31/00

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-15

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2N409

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/16/99

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	3.8		5 A03
108-88-3	toluene	2.0	U	5
100-41-4	ethylbenzene	12.2		5
107-02-8	xylenes (total)	2.6	J	5

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1172

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M614

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/11/99

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	5.6	
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	2.0	U
107-02-8	xylenes (total)	0.52	J

DATA VALIDATION COPY

FORM I /VOA

EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

AE6072

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-06

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M517

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. ________ Date Analyzed: 12/10/99

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	40.8		=
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	2.3		=
107-02-8	xylenes (total)	1.2	J	J

FORM I VOA OLM03.0

DATA VALIDATION COPY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6172

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSC16W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-16

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M622

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/11/99

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

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

USP

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	benzene	773 ~~538~~	E D	~~5403~~ =
108-88-3	toluene	18.6		=
100-41-4	ethylbenzene	106 ~~114~~	E D	~~5403~~ =
107-02-8	xylenes (total)	241		=

MAP
1/24/00

DATA VALIDATION COPY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6372

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912033-04

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M615

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/11/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 2.0

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	184	
108-88-3	toluene	4.0	U
100-41-4	ethylbenzene	2.7	J
107-02-8	xylenes (total)	57.8	

FORM I VOA OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6472

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-07

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M518

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. ________ Date Analyzed: 12/10/99

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	1.0	J	J
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	0.74	J	J
107-02-8	xylenes (total)	8.2		=

FORM I VOA CLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED172

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-09

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M618

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/11/99

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	1.2	J	J
108-88-3	toluene	2.0	U	U
100-41-4	ethylbenzene	2.0	U	U
107-02-8	xylenes (total)	0.56	J	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED372

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-14

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M525

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/10/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 100.0

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	3700	
108-88-3	toluene	2950	
100-41-4	ethylbenzene	1770	
107-02-8	xylenes (total)	5710	

FORM I VOA OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED472

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-11

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M620

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/11/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

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	672	
108-88-3	toluene	7.5	J
100-41-4	ethylbenzene	26.9	
107-02-8	xylenes (total)	21.6	J

12/11

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDM72

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-02

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M513

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/10/99

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	1.3	J
108-88-3	toluene	2.0	U
100-41-4	ethylbenzene	3.0	
107-02-8	xylenes (total)	0.52	J

FORM I VOA

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP172

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSC16W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-10

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M619

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/11/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

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	576	
108-88-3	toluene	72.7	
100-41-4	ethylbenzene	103	
107-02-8	xylenes (total)	542	

DUPLICATE

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP174

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-08

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M617

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/11/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	544	E	J ND3
108-88-3	toluene	83.6		=
100-41-4	ethylbenzene	125		=
107-02-8	xylenes (total)	649		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP272

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-05

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M616

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/11/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

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	586	
108-88-3	toluene	97.6	
100-41-4	ethylbenzene	204	
107-02-8	xylenes (total)	766	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP372

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-17

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M623

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. ________ Date Analyzed: 12/12/99

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 25.0

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	523	
108-88-3	toluene	1010	
100-41-4	ethylbenzene	295	
107-02-8	xylenes (total)	2050	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP472

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-12

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M523

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/10/99

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	5.3	
108-88-3	toluene	2.6	
100-41-4	ethylbenzene	10.7	
107-02-8	xylenes (total)	39.3	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP572

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPS016W

Matrix: (soil/water) WATER Lab Sample ID: 9912083-13

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M524

Level: (low/med) LOW Date Received: 12/02/99

% Moisture: not dec. _____ Date Analyzed: 12/10/99

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	3.2	
108-88-3	toluene	0.59	J
100-41-4	ethylbenzene	17.4	
107-02-8	xylenes (total)	62.0	

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9912083/ 1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GH0014

OJECT NAME: HAAF-Pilot Study Bldg. 728

OJECT NUMBER: 01-0331-04-1829-210

OJECT MANAGER: Patty Stoll

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

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

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HP0019	12/1/99	0800	water	2	2		
AEDM72	12/1/99	1505		2	2		
AE1172	12/1/99	1455		2	2		
AE6372	12/1/99	1545		2	2		
AEP272	12/1/99	1120		2	2		
AE6072	12/1/99	1220		2	2		
AE6472	12/1/99	1415		2	2		
AEP174	12/1/99	1710		2	2		
AED172	12/1/99	1200		2	2		
AEP172	12/1/99	1710		2	2		
AED472	12/1/99	1425		2	2		
AEP472	12/1/99	1605		2	2		
AEP572	12/1/99	1535		2	2		

RELINQUISHED BY: Laura Lumley	Date/Time 12/2/99 1210	RECEIVED BY: Patricia Dower	Date/Time 12/2/99 15:10	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: SAIC HAAF #3	FEDEX NUMBER:
RECEIVED BY: Bob [illegible]	Date/Time 12-2-99 1210	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY: Bob [illegible]	Date/Time 12-2-99 1510	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: GH 8014

OJECT NAME: HAAF-Pilot Study Bldg. 728

OJECT NUMBER: 01-0331-04-1829-210

OJECT MANAGER: Patty Stoll

mpler (Signature) Laura Lumley (Printed Name) Laura Lumley

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AED372	12/1/99	1400	water	2	2		
AE0672	12/1/99	1700	↓	2	2		
AE6172	12/1/99	1120	↓	2	2		
AEP372	12/1/99	1635	↓	2	2		

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29407

PHONE NO: (843) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	12/2/99	Patricia Lowe	12/2/99
COMPANY NAME: SAIC	1210	COMPANY NAME: GEL	15:05
RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:	12/2/99 1210	COMPANY NAME:	
RELINQUISHED BY:	Date/Time 12-2-99	RECEIVED BY:	Date/Time
COMPANY NAME:	1505	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 32

Cooler Temperature: 4°

Cooler ID: SAIC HAAF #3

FEDEX NUMBER:

VIII-250

8

GROUNDWATER ANALYTICAL RESULTS
SEVENTH SAMPLING EVENT

JANUARY 2000

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EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

AE0682

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309017

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S121

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. ______ Date Analyzed: 01/17/00

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	25.1		J AP3, A05
108-88-3	Toluene	1.0 ~~0.50~~	J	UJ F05, F
100-41-4	Ethylbenzene	0.88	J	J
1330-20-7	Xylenes (total)	2.2	J	J

MMP
3/2/00

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1182

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309008

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S113

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

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	48.0		=
108-88-3	Toluene	27.3		= FOY, FOB
100-41-4	Ethylbenzene	25.9		=
1330-20-7	Xylenes (total)	144		=

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6082

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309016

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S120

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

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	8.0		U
108-88-3	Toluene	1.0 ~~0.60~~	J	U FOY, FOG
100-41-4	Ethylbenzene	6.7		U
1330-20-7	Xylenes (total)	3.6		U

MAP
3/2/00

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6182

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309012

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S122

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 5.2 (uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	1410 ~~1310~~	E D	=
108-88-3	Toluene	14.8		U FOR, FOR
100-41-4	Ethylbenzene	180		=
1330-20-7	Xylenes (total)	346		=

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6382

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309011

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S116

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

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	78.8		=
108-88-3	Toluene	1.0 ~~0.37~~	J	U FOH, FO6
100-41-4	Ethylbenzene	0.44	J	J
1330-20-7	Xylenes (total)	14.8		=

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3/2/00

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6482

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309009

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S114

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
71-43-2	Benzene	1.0		=
108-88-3	Toluene	0.34	J	J FD4, FD6
100-41-4	Ethylbenzene	0.37	J	J
1330-20-7	Xylenes (total)	8.7		=

1.0

MPP
3/2/00

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED182

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309014

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S118

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. ______ Date Analyzed: 01/17/00

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	7.0		J A03,A05
108-88-3	Toluene	~~0.39~~ 1.0	J	UJ ,F04,F
100-41-4	Ethylbenzene	0.14	J	J
1330-20-7	Xylenes (total)	3.0	U	UJ

MAP
3/21/00

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED362

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S109

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 40.0

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	2210	J
108-88-3	Toluene	1150	
100-41-4	Ethylbenzene	1010	
1330-20-7	Xylenes (total)	3180	

A03, A05, F04, F

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED482

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309015

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S119

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

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

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 5.0 (uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	~~581~~ 821	E D	J A03,A05
108-88-3	Toluene	2.0	U	U
100-41-4	Ethylbenzene	~~126~~ 113	E D	J
1330-20-7	Xylenes (total)	137		J

, F04, F0

MMB 3/2/00

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDM8.2

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309013

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S117

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

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 ~~0.30~~	J	U FOR, FOR
100-41-4	Ethylbenzene	0.47	J	J
1330-20-7	Xylenes (total)	1.0	J	J

MAP
3/2/00

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDM84

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309010

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S115

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

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		0.23	J	J
108-88-3	Toluene	1.0	~~0.29~~	J	U FOR, FOG
100-41-4	Ethylbenzene		0.69	J	J
1330-20-7	Xylenes (total)		1.5	J	J

MAF
3/2/00

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP182

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309004

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S123

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. ________ Date Analyzed: 01/17/00

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

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

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q	
71-43-2	Benzene	146 ~~162~~	~~E~~ D	J A03, A05
108-88-3	Toluene	3.8		J F07, F
100-41-4	Ethylbenzene	40.0		J
1330-20-7	Xylenes (total)	152		J

NMP 3/2/00

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EA

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP282

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S108

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

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	324		J A03, A05
108-88-3	Toluene	~~58.9~~ 100		J, F04, F
100-41-4	Ethylbenzene	120		J
1330-20-7	Xylenes (total)	403		J

MAG 3/2/00

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP382

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309007

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S112

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	168	
108-88-3	Toluene	206	
100-41-4	Ethylbenzene	116	
1330-20-7	Xylenes (total)	573	

J A03, A05, F04, F

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP482

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309006

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S111

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

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	1.2		J A03, A05
108-88-3	Toluene	1.2		J, F24, F
100-41-4	Ethylbenzene	2.2		J
1330-20-7	Xylenes (total)	22.4		J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP582

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA01W

Matrix: (soil/water) WATER Lab Sample ID: 20309005

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 5S110

Level: (low/med) LOW Date Received: 01/07/00

% Moisture: not dec. _____ Date Analyzed: 01/17/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 5.0

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	2.3	J
108-88-3	Toluene	~~2.6~~ 5	J
100-41-4	Ethylbenzene	273	
1330-20-7	Xylenes (total)	679	

J
U F04, F06
=
=

MRF
3/2/00

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1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GH 0015

ROJECT NAME: HAAF-Pilot Study Bldg. 728

ROJECT NUMBER: 01-0331-04-1829-210

ROJECT MANAGER: Patty Stoll

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

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

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HPD013 (LPOUSS VSO 1/11/00)	1/4/00	0600	water	2	2		20309001
AEP282	1/4/00	1447		2	2		002
AED382	1/4/00	1220		2	2		003
AEP182	1/4/00	1630		2	2		004
AEP582	1/4/00	1110		2	2		005
AEP482	1/4/00	1522		2	2		006
AEP382	1/4/00	1600		2	2		007
AE1182	1/4/00	1535		2	2		008
AE6482	1/4/00	1620		2	2		009
AEDM84	1/4/00	1155		2	2		010
AE6382	1/4/00	1720		2	2		011
AE6182	1/4/00	1445		2	2		012
AEDM82	1/4/00	1155		2	2		013

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	
Laura Lumley; COMPANY NAME: SAIC	1/7/00 1030	[signature]; COMPANY NAME: Gel	1/7/00 1420	TOTAL NUMBER OF CONTAINERS: ; Cooler ID: SAIC HAAF#3
RECEIVED BY: Bob Roche; COMPANY NAME: GEL	1/7/00 1030	RELINQUISHED BY: ; COMPANY NAME:	Date/Time	Cooler Temperature: 4°C; FEDEX NUMBER:
RELINQUISHED BY: Bob Roche; COMPANY NAME: GEL	1-7-00 1420	RECEIVED BY: ; COMPANY NAME:	Date/Time	

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CHAIN OF CUSTODY RECORD

2Q2Z

COC NO.: GH 0015

ROJECT NAME: HAAF-Pilot Study Bldg. 728

ROJECT NUMBER: 01-0331-04-1829-210

ROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AED1482	1/4/00	1425	water	2	2		20309014
AED4482	1/4/00	1040	↓	2	2		015
AE6082	1/4/00	1755	↓	2	2		016
AE0682	1/4/00	1835	↓	2	2		017

1/7/00

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	1/7/00 1030	Francos	1/7/00 1420
COMPANY NAME: SAIC		COMPANY NAME: Gel	
RECEIVED BY: [signature]	1/7/00 1030	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY: [signature]	1-7-00 1420	RECEIVED BY:	Date/Time
COMPANY NAME: GEL		COMPANY NAME	

TOTAL NUMBER OF CONTAINERS: 34

Cooler ID: SAIC HAAF #3

Cooler Temperature: 4°C

FEDEX NUMBER:

GROUNDWATER ANALYTICAL RESULTS
EIGHTH SAMPLING EVENT

MARCH 2000

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE0692

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612006

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C436

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

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		2.4		= F04, F08
108-88-3	Toluene	1.0	~~0.70~~	J	U F04, F06
100-41-4	Ethylbenzene		2.5		U F04, F07
1330-20-7	Xylenes (total)		4.0	B	U F01, F07

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1192

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612017

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C506

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

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 ~~0.48~~	J	U F04, F06
108-88-3	Toluene	1.0 ~~0.53~~	J	U F04, F06
100-41-4	Ethylbenzene	1.0 ~~0.45~~	J	U F04, F06
1330-20-7	Xylenes (total)	3.7	B	U F01, F07

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6092

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612009

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C426

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/30/00

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	1.0	U	U
108-88-3	Toluene	1.0	U	U
100-41-4	Ethylbenzene	1.6	B	U FD4, FD8
1330-20-7	Xylenes (total)	4.4	B	U FD1, FD7

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6192

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612013

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8D120

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 04/03/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	1160		= FD4, FD8
108-88-3	Toluene	140		U FD4, FD7
100-41-4	Ethylbenzene	213		U FD4, FD7
1330-20-7	Xylenes (total)	580		U FD4, FD7

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6392

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C337

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/30/00

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

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	198 ~~198~~	E D	= F04, F08
108-88-3	Toluene	1.0 ~~0.40~~	J	U F04, F06
100-41-4	Ethylbenzene	6.8		U F04, F07
1330-20-7	Xylenes (total)	52.2		U F04, F07

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED192

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612011

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C435

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

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	3.7		= FD4, FD8
108-88-3	Toluene	20.6		= FD4, FD8
100-41-4	Ethylbenzene	6.3		U FD4, FD7
1330-20-7	Xylenes (total)	60.7	B	U FD4, FD7

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED392

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612008

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C425

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/30/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 50.0

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	1820		= FO4, FO8
108-88-3	Toluene	1590		= FO4, FO8
100-41-4	Ethylbenzene	1250	B	= FO4, FO8
1330-20-7	Xylenes (total)	5280	B	= FO4, FO8

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED492

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612015

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C447

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

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

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 5 (uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	532 ~~450~~	~~E~~ D	= FD4, FD8
108-88-3	Toluene	9.4		= FD4, FD8
100-41-4	Ethylbenzene	78.2		= FD4, FD8
1330-20-7	Xylenes (total)	2860 ~~936~~	~~EB~~ D	= FD4, FD8

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED494

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612010

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C438

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 25.0

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	521		= FD4, FD8
108-88-3	Toluene	30.2		J FD4, FD7
100-41-4	Ethylbenzene	213		= FD4, FD8
1330-20-7	Xylenes (total)	4100		= FD4, FD8

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED692

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612004

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8D122

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 04/03/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 100.0

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	958		= F04, F08
108-88-3	Toluene	9350		= F04, F08
100-41-4	Ethylbenzene	2510		= F04, F08
1330-20-7	Xylenes (total)	16700		= F04, F08

DATA VALIDATION

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED092

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612007

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C424

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/30/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 100.0

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	538		= F04, F08
108-88-3	Toluene	2820		= F04, F08
100-41-4	Ethylbenzene	578	B	= F04, F08
1330-20-7	Xylenes (total)	5780	B	= F04, F08

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDG92DL

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C440

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 500.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	114	DJ	J FO, FO8
108-88-3	Toluene	1550	D	= FO4, FO8
100-41-4	Ethylbenzene	1320	D	= FO4, FO8
1330-20-7	Xylenes (total)	9840	DB	= FO4, FO8

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP192

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612016

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C448

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

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	85.1			= FD4, FD8
108-88-3	Toluene	1.0 ~~0.80~~		J	U FD4, FD6
100-41-4	Ethylbenzene	4.9			U FD4, FD7
1330-20-7	Xylenes (total)	67.5		B	U FD4, FD7

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP292

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612014

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C446

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

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	41.4		= FO4, FO8
108-88-3	Toluene	4.3		U FO4, FO7
100-41-4	Ethylbenzene	34.2		= FO4, FO8
1330-20-7	Xylenes (total)	191	B	= FO4, FO8

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP392

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C338

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/30/00

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	98.1		= F04, F08
108-88-3	Toluene	1.0		U F04, F0L
100-41-4	Ethylbenzene	12.8		= F04, F08
1330-20-7	Xylenes (total)	198		= F04, F08

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP492

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: TPPS010W

Matrix: (soil/water) WATER Lab Sample ID: 23612012

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 8C444

Level: (low/med) LOW Date Received: 03/29/00

% Moisture: not dec. _____ Date Analyzed: 03/31/00

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 ~~0.69~~	J	U F04,F06
108-88-3	Toluene	1.0 ~~0.58~~	J	U F04,F06
100-41-4	Ethylbenzene	1.0 ~~0.77~~	J	U F04,F06
1330-20-7	Xylenes (total)	7.8	B	U F04,F07

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

CHAIN OF CUSTODY RECORD

COC NO.: HP0020

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HP0030	3/28/00	0745	water	2	2		23612
AE0692	3/28/00	1716		2	2		
AED092	3/28/00	1645		2	2		
AED392	3/28/00	1300		2	2		
AE6092	3/28/00	1242		2	2		
AED494	3/28/00	1415		2	2		
AED192	3/28/00	1200		2	2		
AEP492	3/28/00	1220		2	2		
AE6192	3/28/00	1050		2	2		
AEP292	3/28/00	1100		2	2		
AED492	3/28/00	1415		2	2		
AEP192	3/28/00	1120		2	2		
AE1192	3/28/00	1525		2	2		

RELINQUISHED BY: Laura Lumley	Date/Time 3/28/00 1700	RECEIVED BY: Patricia Sower	Date/Time 3/29/00 10:00	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: 4	FEDEX NUMBER:
RECEIVED BY: 820609380790	Date/Time 3/28/00 1700	RELINQUISHED BY:	Date/Time		
COMPANY NAME: FedEx		COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

2 of 2

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CHAIN OF CUSTODY RECORD

COC NO.: HP0082Ø

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lomley (Printed Name): LAURA LOMLEY

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road, Charleston, SC 29407

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	REQUESTED PARAMETERS: BTEX	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AEDG92	3/24/00	1600	water	N	2		23612%
AE6392	3/24/00	1412		N	2		
AEP392	3/24/00	1515		N	2		
AED692	3/24/00	1600		N	2		

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 34	Cooler Temperature: 4°C
Laura Lomley	3/28/00	Patricia Doulk	3/29/00	Cooler ID: 4	FEDEX NUMBER:
COMPANY NAME: SAIC	1700	COMPANY NAME: GEL	10:00		
RECEIVED BY: 820609380790	Date/Time 3/28/00	RELINQUISHED BY:	Date/Time		
COMPANY NAME: FedEx	1700	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

GROUNDWATER ANALYTICAL RESULTS
NINTH SAMPLING EVENT

MAY 2000

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~AED602~~ AE0602

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: ~~26189014~~ 26189001

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M209

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 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	5.2		=
108-88-3	Toluene	0.43	J	= J
100-41-4	Ethylbenzene	7.1	B	= F01, F08
1330-20-7	Xylenes (total)	3.3		=

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DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AB604

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189002

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M205

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 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	5.0		= J
108-88-3	Toluene	0.36	J	
100-41-4	Ethylbenzene	7.1	B	= FD1, FD8
1330-20-7	Xylenes (total)	2.7	J	J

DATA VALIDATION COPY

35

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE1102

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189003

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M206

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 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	U
108-88-3	Toluene	1.0	U	U
100-41-4	Ethylbenzene	1.0 ~~0.052~~	JB	U F01, F06
1330-20-7	Xylenes (total)	0.23	J	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6002

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189004

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9L708

Level: (low/med) LOW Date Received: 05/24/00

% Moisture: not dec. _____ Date Analyzed: 06/04/00

GC Column: DB624 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	2.3	
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	0.44	J
1330-20-7	Xylenes (total)	1.2	J

DATA VALIDATION COPY

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6102

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189005

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M224

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 ID: 0.25 (mm) Dilution Factor: 20.0

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	2010	E	J N03 =
108-88-3	Toluene	152		= F01, F08
100-41-4	Ethylbenzene	584	B	=
1330-20-7	Xylenes (total)	1640		

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AE6302

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189006

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M207

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 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	53.4		= U
108-88-3	Toluene	1.0	U	
100-41-4	Ethylbenzene	0.69	JB	F01, F08
1330-20-7	Xylenes (total)	13.2		= U

DATA VALIDATION

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED102

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189011

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9L715

Level: (low/med) LOW Date Received: 05/24/00

% Moisture: not dec. _____ Date Analyzed: 06/04/00

GC Column: DB624 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	8.3	
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	0.52	J
1330-20-7	Xylenes (total)	4.1	

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SLM03.0

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED302

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189012

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M217

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 ID: 0.25 (mm) Dilution Factor: 20.0

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	671		=
108-88-3	Toluene	130		=
100-41-4	Ethylbenzene	422	B	= FOL, FOB
1330-20-7	Xylenes (total)	2040		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED402

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189013

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M221

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 ID: 0.25 (mm) Dilution Factor: 5.0

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	541	E
108-88-3	Toluene	18.8	
100-41-4	Ethylbenzene	64.5	B
1330-20-7	Xylenes (total)	277	

J ND3
E FD1, FD8

DATA VALIDATION

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~AE~~602
AED602

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: ~~26189001~~ 26189014

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M223

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 ID: 0.25 (mm) Dilution Factor: 20.0

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	1320		J H02, H04
108-88-3	Toluene	1160		J H02, H04
100-41-4	Ethylbenzene	573	B	= F01, F08
1330-20-7	Xylenes (total)	4300		J H03, H04

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AED002

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189015

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M218

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 ID: 0.25 (mm) Dilution Factor: 20.0

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	460		
108-88-3	Toluene	2160	E	J N03
100-41-4	Ethylbenzene	360	B	= F01, F08
1330-20-7	Xylenes (total)	4110		

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEDG02

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189016

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M222

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 ID: 0.25 (mm) Dilution Factor: 10.0

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	75.4		=
108-88-3	Toluene	814		=
100-41-4	Ethylbenzene	505	EB	J ND3, F01, F8
1330-20-7	Xylenes (total)	2170		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP102

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189007

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9L711

Level: (low/med) LOW Date Received: 05/24/00

% Moisture: not dec. _____ Date Analyzed: 06/04/00

GC Column: DB624 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	88.7		
108-88-3	Toluene	1.0	U	U
100-41-4	Ethylbenzene	7.6		
1330-20-7	Xylenes (total)	83.6		

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP202

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189008

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9M208

Level: (low/med) LOW Date Received: 05/24/00

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

GC Column: DB624 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	68.2		=
108-88-3	Toluene	1.4		=
100-41-4	Ethylbenzene	11.0	B	= FD1, FD8
1330-20-7	Xylenes (total)	91.1		=

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP302

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189009

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9L713

Level: (low/med) LOW Date Received: 05/24/00

% Moisture: not dec. _____ Date Analyzed: 06/04/00

GC Column: DB624 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	74.3		
108-88-3	Toluene	0.31	J	
100-41-4	Ethylbenzene	9.3		
1330-20-7	Xylenes (total)	115		

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AEP402

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: HPSA02W

Matrix: (soil/water) WATER Lab Sample ID: 26189010

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 9L714

Level: (low/med) LOW Date Received: 05/24/00

% Moisture: not dec. _____ Date Analyzed: 06/04/00

GC Column: DB624 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	U
108-88-3	Toluene	1.0	U	U
100-41-4	Ethylbenzene	0.22	J	J
1330-20-7	Xylenes (total)	1.6	J	

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1 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GH8604019

OJECT NAME: HAAF-Pilot Study Bldg. 728

OJECT NUMBER: 01-0331-04-1829-210

OJECT MANAGER: Patty Stoll

pler (Signature) [Printed Name] Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	BTEX	THPC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AED60Z	5/23/00	1551	water	2	1	3		26189 001
AED60H	5/23/00	1551		2	1	3		002
AE11DZ	5/23/00	1247		2	1	3		003
AE60DZ	5/23/00	1044		2	1	3		004
AE161DZ	5/23/00	1446		2	1	3		005
AE63DZ	5/23/00	1146		2	1	3		006
AEP1DZ	5/23/00	1120		2	1	3		007
AEP2DZ	5/23/00	1405		2	1	3		008
AEP3DZ	5/23/00	1210		2	1	3		009
AEP4DZ	5/23/00	1245		2	1	3		010
AED1DZ	5/23/00	1435		2	1	3		011
AED3DZ	5/23/00	1710		2	1	3		012
AED4DZ	5/23/00	1725	↓	2	1	3		013

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29407

PHONE NO: (843) 556-8171

LINQUISHED BY: Laura Lumley	Date/Time 5/24/00 11:10	RECEIVED BY: [illegible]	Date/Time 5/24/00 14:15	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
MPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: #405, 3°C	FEDEX NUMBER:
EIVED BY: [signature]	Date/Time 5/24/00 11:10	RELINQUISHED BY:	Date/Time	THPC - Total Heterotropic Plate Count	
MPANY NAME: SEL		COMPANY NAME:		Holding Time = 48 hrs	
INQUISHED BY: [signature]	Date/Time 5/24/00 14:15	RECEIVED BY:	Date/Time		
MPANY NAME: EL		COMPANY NAM			

VIII-309

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2012

CHAIN OF CUSTODY RECORD

COC NO.: GH0419

PROJECT NAME: HAAF-Pilot Study Bldg. 728

PROJECT NUMBER: 01-0331-04-1829-210

PROJECT MANAGER: Patty Stoll

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

REQUESTED PARAMETERS

LABORATORY NAME:
General Engineering Laboratory

LABORATORY ADDRESS:
2040 Savage Road
Charleston, SC 29407

PHONE NO: (843) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	THPH	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
AED602	5/23/00	1510	water	Z	1	3		014
AED002	5/23/00	1550		Z	1	3		015
AEDG02	5/23/00	1630		Z	1	3		016
HPD031	5/23/00	0745		Z		2		017

5/24/00

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	5/24/00 11:10		5/24/00 11:15
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
	5/24/00 11:10		
COMPANY NAME: GEL		COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
	5/24/00 14:15		
COMPANY NAME: GEL		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 50

Cooler ID: #405, 3°C

Cooler Temperature:

FEDEX NUMBER:

VIII-310

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APPENDIX IX

CONTAMINATED SOIL DISPOSAL

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During UST removal and excavation activities in 1994, all contaminated soil removed during the closure was transported to Laidlaw Environmental Services for incineration. Approximately 2623.91 tons of contaminated soil were excavated from the Former Northern Fuel Battery and Former Building 728 (Metcalf & Eddy 1996).

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APPENDIX X

SITE RANKING FORM

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SITE RANKING FORM

Facility Name: Former Building 728 **Ranked by:** S. Stoller

County: Chatham **Facility ID #:** 9-025049 **Date Ranked:** 7/27/2000

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

** 1997 CAP-Part B sample WB5901 at 4' – 6'*

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

** 1997 CAP-Part B sample WB5901 at 4' – 6'*

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

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

Fill in the blanks: **(A. 50) + (B. 50) = (100) x (C. 10) = (D. 1000)**

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 + 12,000

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

** May 2000 Pilot Study sample (MW61)*

Fill in the blanks: **(E. 500) + (F. 500) = (G. 1000)**

Facility Name: Former Pumphouse #1 Tank Pit Area **Facility ID #:** 9-025085

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. 1000) x (L. 50) = M. 50,000

(M. 50,000) + (D. 1000) = N. 51,000

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. 51,000) x (P. 1) = (51,000) + (Q. 0)

= 51,000 (based on May 2000 groundwater concentration in MW61)

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 provides detailed information relating to the geologic and hydrogeologic conditions at Hunter Army Airfield, which supports HAAF's determination that the water withdrawal point(s) located at HAAF is (are) not hydraulically connected to the surficial aquifer.

1.0 REGIONAL AND LOCAL GEOLOGY

Southeast Georgia is located within the Coastal Plain Physiographic Province of the Southeast United States (Clark and Zisa 1976). In this region, the thickness of southeastward dipping, subsurface strata ranges from 0 feet at the fall line, located approximately 150 miles inland from the Atlantic coast, to approximately 4,200 feet BGS at the coast. Herrick (1961) provides detailed lithologic descriptions of the stratigraphic units encountered during the installation of water and petroleum exploration wells in Chatham County. The well log of Georgia Geologic Survey (GGS) Well 125, located on White Bluff Road, 700 feet west and 0.3 miles north of Buckhalter Road, Savannah, provides one of the more complete lithologic descriptions of upper Eocene, Miocene, and Pliocene to Recent sedimentary strata in Chatham County.

The upper Eocene (Ocala Limestone) section of GGS Well 125 is approximately 225 feet thick and dominated by light-gray to white, fossiliferous limestone. The Miocene section is approximately 250 feet thick and consists of limestone with a 160-feet-thick cap of dark green phosphatic clay. This clay is regionally extensive and is known to occupy the Coosawatchie Formation of the Hawthorn Group (Furlow 1969; Arora 1984). The interval from approximately 80 feet to the surface is Pliocene to Recent in age and composed primarily of sand interbedded with clay and silt. This section is occupied by the Satilla and Cypresshead Formations.

HAAF is located within the Barrier Island Sequence District of the Coastal Plain Physiographic Province of the Southeast United States (Clark and Zisa 1976). The Barrier Island Sequence District in Chatham and Bryan Counties is characterized by the existence of several marine terraces (step-like topographic surfaces that decrease in elevation toward the coast). These marine terraces, and their associated deposits, are the results of sea level fluctuations that occurred during the Pleistocene Epoch. The surficial (Quaternary) deposits in Chatham and Bryan Counties, in decreasing elevation and age, are part of the Okefenokee, Wicomico, Penholoway, Pamlico, and Silver Bluff terrace complexes.

HAAF, as well as most of Chatham County, is underlain by the Pleistocene Pamlico Terrace. The Pleistocene Satilla Formation (formerly known as the Pamlico Formation) consists of deposits of the Pamlico Terrace complex and other terrace complexes in the region. The Satilla Formation is a lithologically heterogeneous unit that consists of variably bedded to non-bedded sand and variably bedded silty to sandy clay. During the Pleistocene, these sand and clay deposits were formed in offshore and inner continental shelf, barrier island, and marsh/lagoonal-type environments. According to the Geologic Map of Georgia (GA EPD 1976), clay beds of marsh origin, which were deposited on the northwest side of the former Pamlico Barrier Island complex, exist in the western quarter of HAAF. Very fine- to coarse-grained sand deposits of barrier island origin are more common throughout the remaining areas of HAAF.

Based on the coring and sampling of unconsolidated strata at HAAF during the CAP-Part A investigations, it is concluded that all former undgerground storage tanks(USTs) were buried within the Satilla Formation, which is overlain by various soil types. Soil groups at HAAF include the Chipley, Leon, Ellabelle, Kershaw, Pelham, Albany, Wahee, and Ogeechee (Wilkes et al. 1974).

2.0 REGIONAL AND LOCAL HYDROGEOLOGY

The hydrogeology in the vicinity of HAAF is mostly influenced by two aquifer systems. These are referred to as the Principal (Floridan) Aquifer and the Surficial Aquifer (Miller 1990). The Principal 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, approximately 800 feet in total thickness, is composed primarily of Tertiary age limestone including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. Groundwater from the Floridan is used primarily for drinking water (Arora 1984). According to Miller (1990), one of the largest cones of depression produced in the Upper Floridan Aquifer exists directly beneath Savannah, Georgia. Net water-level decline in the Floridan system, between the predevelopment period and 1980, exceeded 80 feet beneath Savannah. In addition, according to 1980 estimates, more than 500 million gallons of water per day were withdrawn from the Floridan for public and industrial use in southeast Georgia, more than any other region.

The confining layer for the Principal (Floridan) Aquifer is the phosphatic clay of the Hawthorn Group. Minor occurrences of aquifer material are within the Hawthorn Group; however, they have limited utilization (Miller 1990). The Surficial Aquifer overlies the Hawthorn confining unit.

The Surficial Aquifer consists of widely varying amounts of sand and clay, ranging from 55 to 150 feet in thickness, and is composed primarily of the Satilla and Cypresshead Formations in the Savannah vicinity (Arora 1984). This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 to 10 feet below ground level (Miller 1990). Groundwater in the Surficial Aquifer system is under unconfined, or water table, conditions. However, locally, thin clay beds create confined or semiconfined conditions, as is the case at HAAF where thin, surficial clay beds are present in the west quadrant (GA EPD 1976).

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 HAAF.

3.0 REFERENCES

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Wilkes, R. L., Johnson, J. H., Stoner, H. T., and Bacon, D. D., 1974. *Soil Survey of Bryan and Chatham Counties, Georgia*, U.S. Department of Agriculture Soil Conservation Service, 71 pp.

APPENDIX XI

COPIES OF PUBLIC NOTIFICATION LETTERS AND CERTIFIED RECEIPTS OF NEWSPAPER NOTICE

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The public notice was published as part of the CAP-Part B Report (Metcalf & Eddy 1997).

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ATTACHMENT A

FATE AND TRANSPORT MODELING RESULTS

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Table A.1. Natural Attenuation Modeling Results (Concentration vs. Distance) for the Former Building 728 Site

Distance from the source (ft)	Distance from the source (m)	Predicted Maximum Benzene Concentration in Groundwater[a] (µg/L)	Distance from the source (ft)	Distance from the source (m)	Predicted Maximum Benzene Concentration in Groundwater[a] (µg/L)
0.0	0.0	3250	492.1	150.0	606
3.3	1.0	3300	656.2	200.0	435
9.8	3.0	3370	820.2	250.0	293
16.4	5.0	3410	984.3	300.0	200
26.2	8.0	3410	1148.3	350.0	142
39.4	12.0	3320	1312.3	400.0	98.9
52.5	16.0	3130	1640.4	500.0	49.1
65.6	20.0	2880	1968.5	600.0	24.4
98.4	30.0	2200	2296.6	700.0	12.4
131.2	40.0	1670	2624.7	800.0	6.27
164.0	50.0	1340	2952.8	900.0	3.2
229.7	70.0	1120	3280.8	1000.0	1.6
328.1	100.0	995			

[a] Predicted maximum benzene concentration in groundwater assumes natural attenuation only and does not take into account the enhanced bioremediation occurring due to oxygen injection.

Table A.2. Natural Attenuation Modeling Results (Concentration vs. Time) for the Former Building 728 Site

Time (year)	Predicted Maximum Benzene Concentration in Groundwater[a] (µg/L)			
	Source	MW-60	MW-63	MW-11
0.0	3250	3350	2400	1420.0
1.0	656	774	931	1070.0
2.0	238	283	353	442.0
3.0	95.4	114	144	186.0
4.0	40	47.8	60.9	80.1
5.0	17.2	20.6	26.4	35.0
6.0	7.54	9.02	11.6	15.5
7.0	3.34	4	5.14	6.9
8.0	1.49	1.79	2.3	3.1
9.0	0.67	0.80	1.04	1.41
10.0	0.30	0.36	0.47	0.64
11.0	0.14	0.17	0.21	0.29
12.0	0.06	0.08	0.10	0.13
13.0	0.03	0.03	0.04	0.06
14.0	0.01	0.02	0.02	0.03

[a] Predicted maximum benzene concentration in groundwater assumes natural attenuation only and does not take into account the enhanced bioremediation occurring due to oxygen injection.

Table A.3. AT123D Predicted Maximum Concentrations at the Former Building 728 Monitoring Well Locations

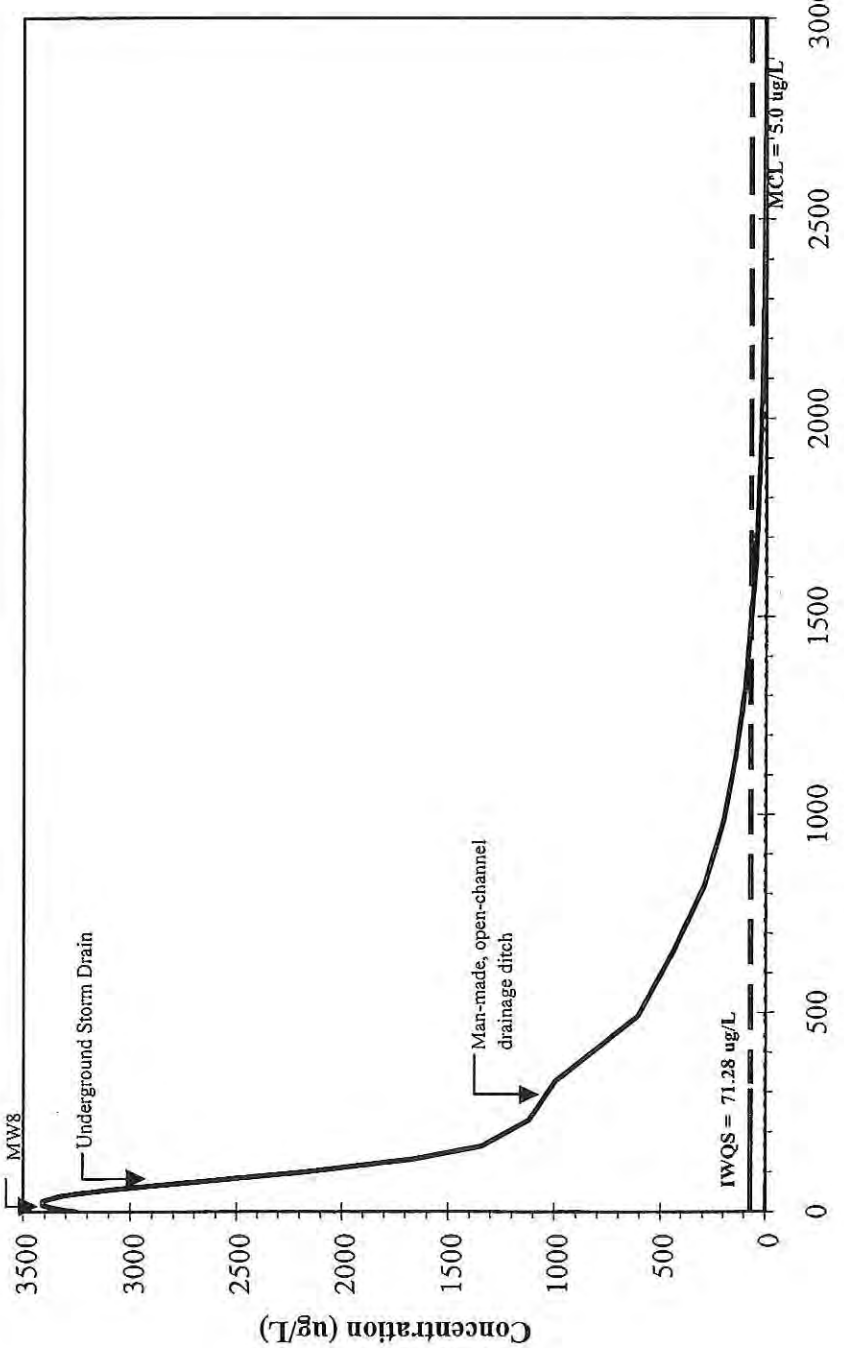
Well	Predicted 2-Year Maximum Benzene Concentration in Groundwater[a] (µg/L)	Observed Benzene Concentration (µg/L)		
		CAP-Part B (1997)	Pre-Pilot Study (May 1999)	Pilot Study (May 2000
MW11	442.0	1700	256	5.2
MW60	283.0	1400	1610	2.3
MW61	202.0	910	612	2010
MW63	353.0	2400	1310	53.4
MW64	86.6	81	107	1[b]
D1	269.0	NA	1460	8.3
D3	220.0	NA	2580	671
D4	189.0	NA	288	541
P1	407.0	NA	1890	88.7
P2	292.0	NA	2510	68.2
P3	353.0	NA	2600	74.3
P4	313.0	NA	823	<1

[a] Predicted maximum benzene concentration in groundwater assumes natural attenuation only and does not take into account the enhanced bioremediation occurring due to oxygen injection.

[b] January 2000 concentration, the well was dropped from the pilot study monitoring program in March 2000.

NA Not applicable

Figure A-1. AT123D modeled maximum concentration of benzene in the groundwater versus downgradient distance from the source (Former Building 728, HAAF)



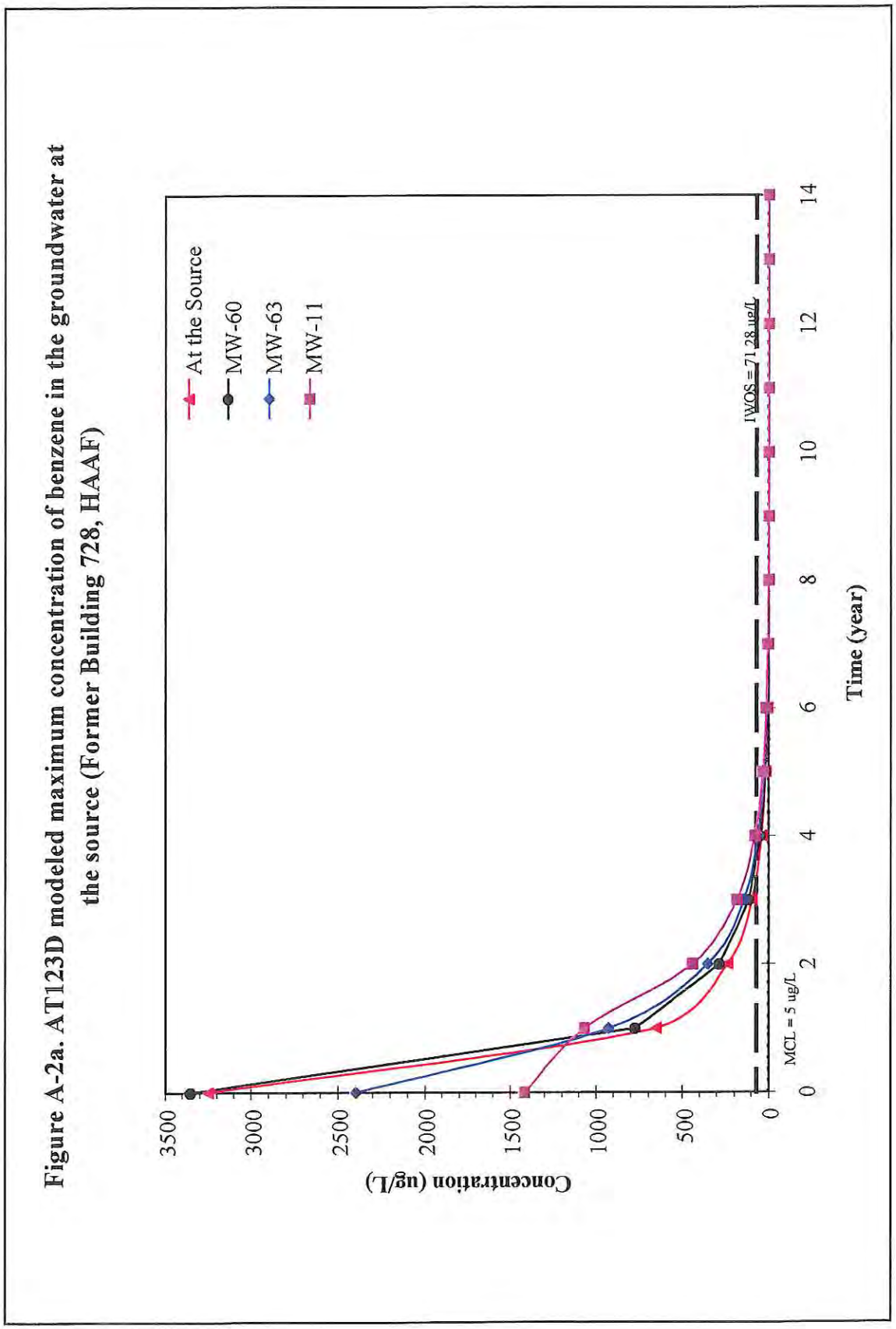


Figure A-2a. AT123D modeled maximum concentration of benzene in the groundwater at the source (Former Building 728, HAAF)

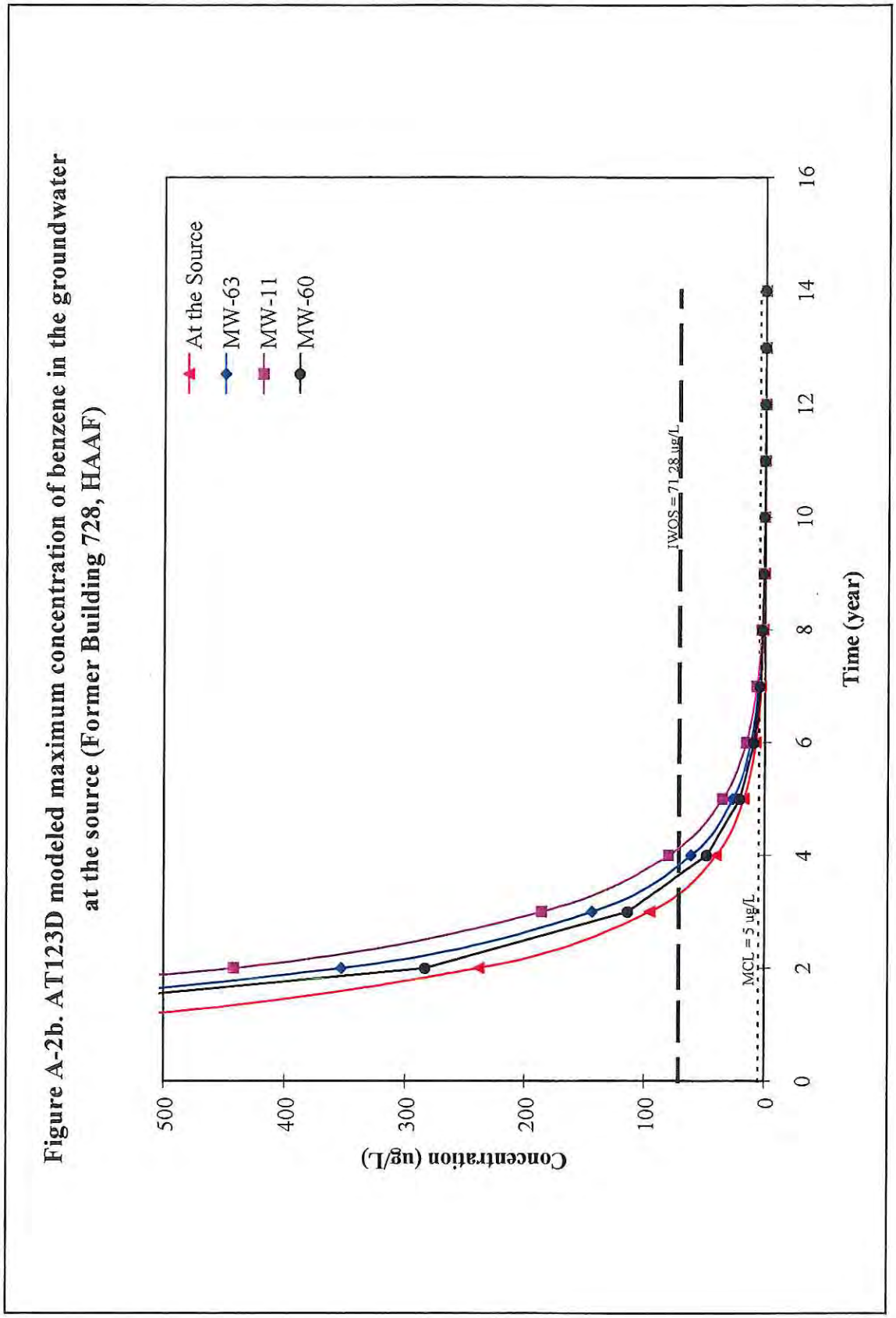


Figure A-2b. AT123D modeled maximum concentration of benzene in the groundwater at the source (Former Building 728, HAAF)

HAAF Former Building 728: Benzene

NO. OF POINTS IN X-DIRECTION	12
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	13
NO. OF ENDING TIME STEP	241
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)	0.1524E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS)	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.1100E+02
END POINT OF X-SOURCE LOCATION (METERS)	0.1100E+02
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.1370E+02
END POINT OF Y-SOURCE LOCATION (METERS)	0.1370E+02
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
POROSITY	0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.2200E+00
HYDRAULIC GRADIENT	0.1100E-01
LONGITUDINAL DISPERSIVITY (METER)	0.3000E+02
LATERAL DISPERSIVITY (METER)	0.1000E+02
VERTICAL DISPERSIVITY (METER)	0.3000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.1620E-03
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)	0.4010E-04
BULK DENSITY OF THE SOIL (KG/M**3)	0.1670E+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)	0.5256E+05
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR)	0.6400E-02
RETARDATION FACTOR	0.2503E+01
RETARDED DARCY VELOCITY (M/HR)	0.5371E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR)	0.1611E+00
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR)	0.5372E-01
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR)	0.1612E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X									
Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
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	0.000E+00
-12.	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	0.000E+00
-15.	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	0.000E+00
-18.	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	0.000E+00
-29.	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	0.000E+00

CONTINUE

	X	
Y	200.	350.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00
-29.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X									
Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.235E+01	0.241E+01	0.299E+01	0.307E+01	0.299E+01	0.295E+01	0.285E+01	0.201E+01	0.871E+00	0.167E+00
-12.	0.172E+01	0.176E+01	0.217E+01	0.223E+01	0.220E+01	0.218E+01	0.211E+01	0.155E+01	0.738E+00	0.151E+00
-15.	0.144E+01	0.147E+01	0.181E+01	0.186E+01	0.185E+01	0.183E+01	0.178E+01	0.135E+01	0.674E+00	0.142E+00
-18.	0.115E+01	0.118E+01	0.144E+01	0.149E+01	0.149E+01	0.148E+01	0.145E+01	0.113E+01	0.605E+00	0.133E+00
-29.	0.426E+00	0.434E+00	0.519E+00	0.536E+00	0.571E+00	0.571E+00	0.569E+00	0.520E+00	0.356E+00	0.925E-01

CONTINUE

	X	
Y	200.	350.
0.	0.127E-02	0.000E+00
-12.	0.117E-02	0.000E+00
-15.	0.112E-02	0.000E+00
-18.	0.106E-02	0.000E+00
-29.	0.792E-03	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X									
Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.251E+01	0.258E+01	0.317E+01	0.326E+01	0.321E+01	0.318E+01	0.308E+01	0.228E+01	0.118E+01	0.440E+00
-12.	0.187E+01	0.192E+01	0.235E+01	0.242E+01	0.241E+01	0.239E+01	0.233E+01	0.181E+01	0.103E+01	0.409E+00
-15.	0.158E+01	0.162E+01	0.198E+01	0.204E+01	0.205E+01	0.204E+01	0.200E+01	0.159E+01	0.960E+00	0.393E+00
-18.	0.130E+01	0.132E+01	0.161E+01	0.166E+01	0.169E+01	0.168E+01	0.165E+01	0.137E+01	0.880E+00	0.375E+00

-29.	0.543E+00	0.552E+00	0.656E+00	0.679E+00	0.736E+00	0.737E+00	0.740E+00	0.715E+00	0.583E+00	0.294E+00

CONTINUE

X

Y	200.	350.
0.	0.434E-01	0.118E-03
-12.	0.414E-01	0.113E-03
-15.	0.403E-01	0.110E-03
-18.	0.390E-01	0.107E-03
-29.	0.330E-01	0.929E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

X

Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.256E+01	0.262E+01	0.323E+01	0.332E+01	0.328E+01	0.324E+01	0.315E+01	0.236E+01	0.128E+01	0.571E+00
-12.	0.192E+01	0.196E+01	0.240E+01	0.247E+01	0.248E+01	0.246E+01	0.240E+01	0.188E+01	0.113E+01	0.536E+00
-15.	0.163E+01	0.166E+01	0.203E+01	0.209E+01	0.211E+01	0.210E+01	0.206E+01	0.167E+01	0.105E+01	0.518E+00
-18.	0.134E+01	0.137E+01	0.166E+01	0.171E+01	0.175E+01	0.174E+01	0.172E+01	0.144E+01	0.973E+00	0.497E+00
-29.	0.580E+00	0.590E+00	0.700E+00	0.724E+00	0.788E+00	0.791E+00	0.795E+00	0.780E+00	0.666E+00	0.403E+00

CONTINUE

X

Y	200.	350.
0.	0.122E+00	0.334E-02
-12.	0.117E+00	0.325E-02
-15.	0.115E+00	0.320E-02
-18.	0.112E+00	0.313E-02
-29.	0.987E-01	0.283E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

X

Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.257E+01	0.264E+01	0.324E+01	0.334E+01	0.330E+01	0.327E+01	0.317E+01	0.238E+01	0.132E+01	0.626E+00
-12.	0.193E+01	0.198E+01	0.242E+01	0.249E+01	0.250E+01	0.248E+01	0.242E+01	0.191E+01	0.116E+01	0.590E+00
-15.	0.164E+01	0.168E+01	0.205E+01	0.211E+01	0.213E+01	0.212E+01	0.208E+01	0.169E+01	0.109E+01	0.572E+00
-18.	0.135E+01	0.138E+01	0.168E+01	0.173E+01	0.177E+01	0.176E+01	0.174E+01	0.147E+01	0.101E+01	0.550E+00
-29.	0.593E+00	0.604E+00	0.715E+00	0.740E+00	0.807E+00	0.810E+00	0.815E+00	0.803E+00	0.698E+00	0.452E+00

CONTINUE

X

Y	200.	350.
0.	0.183E+00	0.148E-01
-12.	0.178E+00	0.145E-01
-15.	0.175E+00	0.143E-01
-18.	0.171E+00	0.141E-01
-29.	0.153E+00	0.130E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.258E+01	0.264E+01	0.325E+01	0.334E+01	0.330E+01	0.327E+01	0.318E+01	0.239E+01	0.133E+01	0.649E+00
-12.	0.194E+01	0.198E+01	0.242E+01	0.250E+01	0.250E+01	0.249E+01	0.243E+01	0.192E+01	0.118E+01	0.613E+00
-15.	0.165E+01	0.168E+01	0.205E+01	0.211E+01	0.214E+01	0.213E+01	0.209E+01	0.170E+01	0.110E+01	0.594E+00
-18.	0.136E+01	0.139E+01	0.168E+01	0.173E+01	0.178E+01	0.177E+01	0.175E+01	0.148E+01	0.102E+01	0.572E+00
-29.	0.598E+00	0.609E+00	0.721E+00	0.746E+00	0.814E+00	0.817E+00	0.822E+00	0.812E+00	0.710E+00	0.472E+00

CONTINUE

Y	X 200.	350.
0.	0.220E+00	0.316E-01
-12.	0.213E+00	0.310E-01
-15.	0.210E+00	0.307E-01
-18.	0.206E+00	0.302E-01
-29.	0.186E+00	0.282E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.258E+01	0.265E+01	0.325E+01	0.335E+01	0.331E+01	0.328E+01	0.318E+01	0.240E+01	0.134E+01	0.658E+00
-12.	0.194E+01	0.198E+01	0.243E+01	0.250E+01	0.251E+01	0.249E+01	0.243E+01	0.192E+01	0.118E+01	0.622E+00
-15.	0.165E+01	0.169E+01	0.205E+01	0.212E+01	0.215E+01	0.213E+01	0.209E+01	0.170E+01	0.111E+01	0.603E+00
-18.	0.136E+01	0.139E+01	0.168E+01	0.174E+01	0.178E+01	0.177E+01	0.175E+01	0.148E+01	0.102E+01	0.581E+00
-29.	0.600E+00	0.611E+00	0.724E+00	0.748E+00	0.817E+00	0.820E+00	0.825E+00	0.815E+00	0.715E+00	0.481E+00

CONTINUE

Y	X 200.	350.
0.	0.239E+00	0.474E-01
-12.	0.232E+00	0.466E-01
-15.	0.229E+00	0.462E-01
-18.	0.224E+00	0.456E-01
-29.	0.203E+00	0.428E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.558E+00	0.566E+00	0.656E+00	0.681E+00	0.786E+00	0.795E+00	0.815E+00	0.931E+00	0.108E+01	0.995E+00
-12.	0.439E+00	0.445E+00	0.515E+00	0.535E+00	0.618E+00	0.625E+00	0.642E+00	0.734E+00	0.863E+00	0.824E+00
-15.	0.384E+00	0.389E+00	0.451E+00	0.468E+00	0.542E+00	0.548E+00	0.562E+00	0.645E+00	0.762E+00	0.745E+00
-18.	0.329E+00	0.333E+00	0.386E+00	0.401E+00	0.464E+00	0.469E+00	0.482E+00	0.553E+00	0.659E+00	0.662E+00

-29.	0.173E+00	0.176E+00	0.203E+00	0.211E+00	0.245E+00	0.248E+00	0.255E+00	0.295E+00	0.363E+00	0.413E+00

CONTINUE

X

Y	200.	350.
0.	0.328E+00	0.671E-01
-12.	0.307E+00	0.656E-01
-15.	0.297E+00	0.648E-01
-18.	0.285E+00	0.638E-01
-29.	0.236E+00	0.590E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

X

Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.203E+00	0.206E+00	0.238E+00	0.247E+00	0.288E+00	0.292E+00	0.300E+00	0.353E+00	0.455E+00	0.610E+00
-12.	0.161E+00	0.163E+00	0.189E+00	0.196E+00	0.228E+00	0.231E+00	0.238E+00	0.280E+00	0.362E+00	0.493E+00
-15.	0.142E+00	0.144E+00	0.166E+00	0.172E+00	0.201E+00	0.204E+00	0.210E+00	0.247E+00	0.320E+00	0.439E+00
-18.	0.122E+00	0.124E+00	0.143E+00	0.149E+00	0.173E+00	0.175E+00	0.181E+00	0.213E+00	0.276E+00	0.384E+00
-29.	0.664E-01	0.672E-01	0.776E-01	0.806E-01	0.942E-01	0.953E-01	0.982E-01	0.116E+00	0.153E+00	0.223E+00

CONTINUE

X

Y	200.	350.
0.	0.435E+00	0.903E-01
-12.	0.375E+00	0.869E-01
-15.	0.347E+00	0.851E-01
-18.	0.317E+00	0.830E-01
-29.	0.222E+00	0.737E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

X

Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.817E-01	0.827E-01	0.954E-01	0.991E-01	0.116E+00	0.117E+00	0.121E+00	0.144E+00	0.193E+00	0.303E+00
-12.	0.650E-01	0.658E-01	0.759E-01	0.789E-01	0.923E-01	0.934E-01	0.963E-01	0.115E+00	0.154E+00	0.243E+00
-15.	0.574E-01	0.581E-01	0.670E-01	0.696E-01	0.814E-01	0.824E-01	0.850E-01	0.101E+00	0.136E+00	0.216E+00
-18.	0.496E-01	0.502E-01	0.579E-01	0.601E-01	0.704E-01	0.712E-01	0.734E-01	0.875E-01	0.118E+00	0.188E+00
-29.	0.273E-01	0.276E-01	0.319E-01	0.331E-01	0.387E-01	0.392E-01	0.405E-01	0.483E-01	0.653E-01	0.108E+00

CONTINUE

X

Y	200.	350.
0.	0.365E+00	0.123E+00
-12.	0.304E+00	0.113E+00
-15.	0.275E+00	0.108E+00
-18.	0.246E+00	0.103E+00
-29.	0.157E+00	0.828E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X									
Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.343E-01	0.347E-01	0.400E-01	0.416E-01	0.487E-01	0.493E-01	0.509E-01	0.609E-01	0.833E-01	0.143E+00
-12.	0.273E-01	0.277E-01	0.319E-01	0.331E-01	0.389E-01	0.393E-01	0.406E-01	0.486E-01	0.665E-01	0.114E+00
-15.	0.242E-01	0.245E-01	0.282E-01	0.293E-01	0.343E-01	0.348E-01	0.359E-01	0.429E-01	0.588E-01	0.101E+00
-18.	0.209E-01	0.212E-01	0.244E-01	0.253E-01	0.297E-01	0.301E-01	0.310E-01	0.372E-01	0.510E-01	0.883E-01
-29.	0.116E-01	0.117E-01	0.135E-01	0.141E-01	0.165E-01	0.167E-01	0.172E-01	0.207E-01	0.284E-01	0.501E-01

CONTINUE

	X	
Y	200.	350.
0.	0.236E+00	0.142E+00
-12.	0.194E+00	0.124E+00
-15.	0.174E+00	0.116E+00
-18.	0.154E+00	0.107E+00
-29.	0.937E-01	0.783E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X									
Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.148E-01	0.149E-01	0.172E-01	0.179E-01	0.210E-01	0.213E-01	0.219E-01	0.264E-01	0.365E-01	0.660E-01
-12.	0.118E-01	0.119E-01	0.138E-01	0.143E-01	0.168E-01	0.170E-01	0.175E-01	0.211E-01	0.292E-01	0.529E-01
-15.	0.104E-01	0.106E-01	0.122E-01	0.126E-01	0.148E-01	0.150E-01	0.155E-01	0.186E-01	0.258E-01	0.469E-01
-18.	0.903E-02	0.914E-02	0.105E-01	0.109E-01	0.128E-01	0.130E-01	0.134E-01	0.161E-01	0.224E-01	0.408E-01
-29.	0.504E-02	0.510E-02	0.588E-02	0.611E-02	0.717E-02	0.726E-02	0.749E-02	0.901E-02	0.125E-01	0.231E-01

CONTINUE

	X	
Y	200.	350.
0.	0.134E+00	0.129E+00
-12.	0.109E+00	0.110E+00
-15.	0.979E-01	0.101E+00
-18.	0.860E-01	0.917E-01
-29.	0.512E-01	0.624E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X									
Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.646E-02	0.654E-02	0.754E-02	0.783E-02	0.919E-02	0.931E-02	0.961E-02	0.116E-01	0.162E-01	0.303E-01
-12.	0.517E-02	0.523E-02	0.602E-02	0.626E-02	0.735E-02	0.744E-02	0.769E-02	0.926E-02	0.129E-01	0.243E-01
-15.	0.457E-02	0.463E-02	0.533E-02	0.554E-02	0.650E-02	0.659E-02	0.680E-02	0.819E-02	0.115E-01	0.216E-01
-18.	0.397E-02	0.401E-02	0.462E-02	0.480E-02	0.564E-02	0.571E-02	0.590E-02	0.711E-02	0.994E-02	0.188E-01

-29.	0.222E-02	0.225E-02	0.259E-02	0.269E-02	0.316E-02	0.320E-02	0.330E-02	0.398E-02	0.559E-02	0.106E-01

CONTINUE

X

Y	200.	350.
0.	0.715E-01	0.986E-01
-12.	0.580E-01	0.824E-01
-15.	0.517E-01	0.750E-01
-18.	0.453E-01	0.672E-01
-29.	0.266E-01	0.437E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

X

Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.286E-02	0.290E-02	0.334E-02	0.347E-02	0.408E-02	0.413E-02	0.426E-02	0.514E-02	0.723E-02	0.139E-01
-12.	0.229E-02	0.232E-02	0.267E-02	0.277E-02	0.326E-02	0.330E-02	0.341E-02	0.411E-02	0.579E-02	0.112E-01
-15.	0.203E-02	0.205E-02	0.236E-02	0.246E-02	0.289E-02	0.292E-02	0.302E-02	0.364E-02	0.513E-02	0.991E-02
-18.	0.176E-02	0.178E-02	0.205E-02	0.213E-02	0.250E-02	0.254E-02	0.262E-02	0.316E-02	0.445E-02	0.862E-02
-29.	0.989E-03	0.100E-02	0.115E-02	0.120E-02	0.141E-02	0.143E-02	0.147E-02	0.178E-02	0.251E-02	0.489E-02

CONTINUE

X

Y	200.	350.
0.	0.366E-01	0.664E-01
-12.	0.296E-01	0.549E-01
-15.	0.263E-01	0.496E-01
-18.	0.230E-01	0.442E-01
-29.	0.134E-01	0.278E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

X

Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.128E-02	0.130E-02	0.149E-02	0.155E-02	0.182E-02	0.185E-02	0.191E-02	0.230E-02	0.326E-02	0.641E-02
-12.	0.102E-02	0.104E-02	0.119E-02	0.124E-02	0.146E-02	0.148E-02	0.153E-02	0.184E-02	0.261E-02	0.514E-02
-15.	0.907E-03	0.918E-03	0.106E-02	0.110E-02	0.129E-02	0.131E-02	0.135E-02	0.163E-02	0.231E-02	0.456E-02
-18.	0.788E-03	0.797E-03	0.918E-03	0.954E-03	0.112E-02	0.114E-02	0.117E-02	0.142E-02	0.201E-02	0.396E-02
-29.	0.444E-03	0.449E-03	0.517E-03	0.537E-03	0.631E-03	0.640E-03	0.661E-03	0.799E-03	0.113E-02	0.225E-02

CONTINUE

X

Y	200.	350.
0.	0.182E-01	0.411E-01
-12.	0.147E-01	0.338E-01
-15.	0.131E-01	0.304E-01
-18.	0.114E-01	0.269E-01
-29.	0.663E-02	0.166E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X: -9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.576E-03	0.583E-03	0.671E-03	0.697E-03	0.820E-03	0.831E-03	0.858E-03	0.104E-02	0.147E-02	0.295E-02
-12.	0.461E-03	0.467E-03	0.538E-03	0.559E-03	0.657E-03	0.665E-03	0.687E-03	0.831E-03	0.118E-02	0.236E-02
-15.	0.409E-03	0.414E-03	0.476E-03	0.495E-03	0.582E-03	0.590E-03	0.609E-03	0.737E-03	0.105E-02	0.210E-02
-18.	0.355E-03	0.359E-03	0.414E-03	0.430E-03	0.505E-03	0.512E-03	0.529E-03	0.640E-03	0.909E-03	0.182E-02
-29.	0.200E-03	0.203E-03	0.233E-03	0.242E-03	0.285E-03	0.289E-03	0.298E-03	0.361E-03	0.513E-03	0.103E-02

CONTINUE

Y	X: 200.	350.
0.	0.895E-02	0.240E-01
-12.	0.722E-02	0.196E-01
-15.	0.642E-02	0.176E-01
-18.	0.560E-02	0.155E-01
-29.	0.324E-02	0.942E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X: -9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.261E-03	0.264E-03	0.304E-03	0.316E-03	0.371E-03	0.376E-03	0.388E-03	0.470E-03	0.670E-03	0.136E-02
-12.	0.209E-03	0.211E-03	0.243E-03	0.253E-03	0.297E-03	0.301E-03	0.311E-03	0.377E-03	0.537E-03	0.109E-02
-15.	0.185E-03	0.187E-03	0.216E-03	0.224E-03	0.264E-03	0.267E-03	0.276E-03	0.334E-03	0.476E-03	0.966E-03
-18.	0.161E-03	0.163E-03	0.187E-03	0.195E-03	0.229E-03	0.232E-03	0.240E-03	0.290E-03	0.413E-03	0.840E-03
-29.	0.908E-04	0.919E-04	0.106E-03	0.110E-03	0.129E-03	0.131E-03	0.135E-03	0.164E-03	0.234E-03	0.477E-03

CONTINUE

Y	X: 200.	350.
0.	0.435E-02	0.134E-01
-12.	0.350E-02	0.109E-01
-15.	0.311E-02	0.978E-02
-18.	0.272E-02	0.861E-02
-29.	0.156E-02	0.517E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X: -9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.119E-03	0.120E-03	0.138E-03	0.143E-03	0.169E-03	0.171E-03	0.177E-03	0.214E-03	0.305E-03	0.626E-03
-12.	0.950E-04	0.961E-04	0.111E-03	0.115E-03	0.135E-03	0.137E-03	0.142E-03	0.172E-03	0.245E-03	0.502E-03
-15.	0.842E-04	0.852E-04	0.981E-04	0.102E-03	0.120E-03	0.121E-03	0.125E-03	0.152E-03	0.217E-03	0.446E-03
-18.	0.732E-04	0.740E-04	0.852E-04	0.886E-04	0.104E-03	0.106E-03	0.109E-03	0.132E-03	0.189E-03	0.388E-03

-29.	0.414E-04	0.419E-04	0.482E-04	0.501E-04	0.589E-04	0.597E-04	0.617E-04	0.748E-04	0.107E-03	0.220E-03

CONTINUE

	X	
Y	200.	350.
0.	0.209E-02	0.726E-02
-12.	0.169E-02	0.590E-02
-15.	0.150E-02	0.528E-02
-18.	0.131E-02	0.464E-02
-29.	0.751E-03	0.276E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

				X						
Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.541E-04	0.547E-04	0.630E-04	0.654E-04	0.770E-04	0.780E-04	0.806E-04	0.977E-04	0.140E-03	0.289E-03
-12.	0.434E-04	0.439E-04	0.505E-04	0.525E-04	0.618E-04	0.626E-04	0.646E-04	0.784E-04	0.112E-03	0.232E-03
-15.	0.384E-04	0.389E-04	0.448E-04	0.465E-04	0.547E-04	0.555E-04	0.573E-04	0.695E-04	0.994E-04	0.206E-03
-18.	0.334E-04	0.338E-04	0.389E-04	0.404E-04	0.476E-04	0.482E-04	0.498E-04	0.604E-04	0.864E-04	0.179E-03
-29.	0.189E-04	0.191E-04	0.220E-04	0.229E-04	0.269E-04	0.273E-04	0.282E-04	0.342E-04	0.490E-04	0.102E-03

CONTINUE

	X	
Y	200.	350.
0.	0.100E-02	0.384E-02
-12.	0.807E-03	0.312E-02
-15.	0.717E-03	0.278E-02
-18.	0.625E-03	0.244E-02
-29.	0.359E-03	0.144E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1664E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

				X						
Y	-9.	-8.	0.	2.	12.	13.	15.	27.	50.	100.
0.	0.248E-04	0.250E-04	0.288E-04	0.300E-04	0.353E-04	0.357E-04	0.369E-04	0.448E-04	0.642E-04	0.134E-03
-12.	0.199E-04	0.201E-04	0.231E-04	0.240E-04	0.283E-04	0.286E-04	0.296E-04	0.359E-04	0.515E-04	0.107E-03
-15.	0.176E-04	0.178E-04	0.205E-04	0.213E-04	0.251E-04	0.254E-04	0.262E-04	0.318E-04	0.456E-04	0.952E-04
-18.	0.153E-04	0.155E-04	0.178E-04	0.185E-04	0.218E-04	0.221E-04	0.228E-04	0.277E-04	0.397E-04	0.829E-04
-29.	0.867E-05	0.877E-05	0.101E-04	0.105E-04	0.124E-04	0.125E-04	0.129E-04	0.157E-04	0.225E-04	0.471E-04

CONTINUE

	X	
Y	200.	350.
0.	0.479E-03	0.199E-02
-12.	0.385E-03	0.162E-02
-15.	0.342E-03	0.144E-02
-18.	0.298E-03	0.126E-02
-29.	0.171E-03	0.743E-03

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	175200.	-8.	0.	2.	X 12.	13.	15.	27.	50.	100.
0.	0.114E-04	0.115E-04	0.132E-04	0.137E-04	0.162E-04	0.164E-04	0.169E-04	0.206E-04	0.295E-04	0.620E-04
-12.	0.911E-05	0.922E-05	0.106E-04	0.110E-04	0.130E-04	0.132E-04	0.136E-04	0.165E-04	0.237E-04	0.497E-04
-15.	0.808E-05	0.818E-05	0.941E-05	0.978E-05	0.115E-04	0.117E-04	0.120E-04	0.146E-04	0.210E-04	0.441E-04
-18.	0.703E-05	0.711E-05	0.818E-05	0.850E-05	0.100E-04	0.101E-04	0.105E-04	0.127E-04	0.183E-04	0.384E-04
-29.	0.398E-05	0.403E-05	0.464E-05	0.482E-05	0.568E-05	0.575E-05	0.594E-05	0.721E-05	0.104E-04	0.218E-04

CONTINUE

Y	200.	350.	X
0.	0.228E-03	0.102E-02	
-12.	0.183E-03	0.826E-03	
-15.	0.163E-03	0.736E-03	
-18.	0.142E-03	0.645E-03	
-29.	0.813E-04	0.378E-03	

Calculation of Alternate Threshold Levels for PAH constituents at Former Building 728 Site

ATL $= (K_{oc})\ (f_{cs})\ (C_{std})\ (DAF_w)$

where K_{oc} = organic carbon partitioning coefficient (GUST CAP–Part A Guidance, Appendix I, Table 1)
f_{cs} = fractional organic carbon content (calculated in Appendix VI of the CAP–Part B Addendum)
C_{std} = applicable water quality standard
DAF_w = dilution attenuation factor for the lateral migration of groundwater

Constituent	K_{oc} (mL/g)	f_{cs}	C_{std} (mg/L)	DAF	Calculated ATL (mg/kg)	Maximum Observed CAP–Part B Concentration (mg/kg)
Benzo(*a*)anthracene	125,719	0.002	3.11×10^{-5} [a]	170.8	1.34	**16**[c] (MW56)
Benzo(*a*)pyrene	282,185	0.002	3.11×10^{-5} [a]	170.8	2.99	**10** (MW56)
Benzo(*b*)fluoranthene	1,148,497	0.002	3.11×10^{-5} [b]	170.8	12.2	**19**[d] (MW56)
Benzo(*k*)fluoranthene	2,020,971	0.002	3.11×10^{-5} [a]	170.8	21.5	**19**[d] (MW56)
Chrysene	426,108	0.002	3.11×10^{-5} [a]	170.8	4.53	**16**[c] (MW56)
Dibenzo(*a,h*)anthracene	1,668,800	0.002	3.11×10^{-5} [a]	170.8	17.7	4.4[e] (MW56)
Indeno(*1,2,3-cd*)pyrene	6,310	0.002	3.11×10^{-5} [a]	170.8	0.07	**4.4**[e] (MW56)

[a] In-Stream Water Quality Standard.
[b] IWQS for benzo(*k*)fluoranthene used.
[c] Benzo(*a*)anthracene and chyrsene co-eluted and could not be individually determined.
[d] Benzo(*b*)fluoranthene and benzo(k)fluoranthene co-eluted and could not be individually determined.
[e] Dibenzo(*a,h*)anthracene and indeno(*1,2,3-cd*)pyrene co-eluted and could not be individually determined.

Bold values exceed the calculated ATL.

MW56 is located in one of the smaller areas of soil contamination located upgradient of the Northern Fuel Battery. Concentrations of the PAH constituents within the area of soil contamination located within the Northern Fuel Battery are significantly lower than the concentrations in MW56. Concentrations of some of these constituents (i.e, benzo(a)anthracene, benzo(a)pyrene, chrysene, and indeno(1,2,3-cd)pyrene) within the Northern Fuel Battery exceed the calculated ATLs.

Fate and Transport Modeling Results for Benzo(a)anthracene

In summary, the Analytical Transient 1-, 2-, 3-Dimensional (AT123D) Model was used to model contaminant migration to potential downgradient receptors: a storm drain located approximately 65 feet north of MW8 and Lamar Canal located approximately 850 feet northwest of the site.

The fate and transport modeling that was performed as part of the CAP–Part B Addendum #1 and First Annual Pilot Study Progress Report 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., 2,400 µg/L well MW63 in April 1997). Modeling of leaching to groundwater by percolating rainwater was not performed because the free product and soil contamination were located at the soil/water interface.

As a result of the comments provided by GA EPD USTMP on the CAP–Part B Addendum #1 and First Annual Pilot Study Progress Report, additional fate and transport modeling has been performed to account for the PAH constituents. Among the PAH compounds detected in groundwater at the Former Building 728 site, benzo(*a*)anthracene was selected as the surrogate chemical to be used in quantitative modeling, so the results apply to all other chemicals of the PAH group that are detected at this site. The model was calibrated assuming that the concentration in the source area of the Northern Fuel Battery was

equal to maximum benzo(*a*)anthracene concentration (i..e., 0.41 µg/L MW56 in March 1997) that was observed at the site during the CAP–Part B investigation. The results of the fate and transport modeling are provided in Tables 1 and 2 and Figures 1 and 2. The estimated dilution attenuation factors (DAFs) for benzo(*a*)anthracene were 170.8 at the drainage ditch and infinity at Lamar Canal. The modeling results indicated that, due to dilution attenuation, benzo(*a*)anthracene would reach the drainage ditch at a concentration of 0.0024 µg/L.

Table 1. Natural Attenuation Modeling Results [Benzo(*a*)anthracene Concentration vs. Distance] for the Former Building 728 Site, Facility ID #9-025049

Distance from the source (feet)	Distance from the source (meters)	Predicted Maximum Benzo(a)anthracene Concentration In Groundwater (µg/L)
0.0	0.0	0.410
3.3	1.0	0.410
9.8	3.0	0.410
16.4	5.0	0.410
23.0	7.0	0.407
26.2	8.0	0.400
29.5	9.0	0.383
32.8	10.0	0.338
36.1	11.0	0.190
39.4	12.0	0.110
42.7	13.0	0.062
45.9	14.0	0.038
49.2	15.0	0.023
52.5	16.0	0.0145
55.8	17.0	0.0092
59.1	18.0	0.0058
62.3	19.0	0.0037
65.6	20.0	0.0024
72.2	22.0	0.00099
82.0	25.0	0.000271
98.4	30.0	0
820.2	250.0	0

Table 2. Natural Attenuation Modeling Results [Benzo(*a*)anthracene Concentration vs. Time] for the Former Building 728 Site, Facility ID #9-025049

Time (year)	Predicted Benzo(a)anthracene Concentration In Groundwater (µg/L)		
	Source Area	MW60	MW63
0.0[a]	0.411	0.0306	0.00E+00
1.0	0.374	0.0442	0.00E+00
2.0	0.341	0.0547	0.00E+00
3.0	0.311	0.0601	1.13E-09
4.0	0.283	0.062	7.31E-09
5.0	0.258	0.0619	2.78E-08
6.0	0.235	0.0605	8.20E-08
7.0	0.214	0.0583	2.03E-07
8.0	0.195	0.0557	4.44E-07
9.0	0.18	0.05	8.80E-07
10.0	0.16	0.05	1.60E-06
11.0	0.15	0.05	2.73E-06
12.0	0.13	0.04	4.36E-06
13.0	0.12	0.04	6.61E-06
14.0	0.11	0.04	9.56E-06
15.0	0.10	0.04	1.32E-05
16.0	0.09	0.03	1.77E-05
17.0	0.08	0.03	2.28E-05
18.0	0.08	0.03	2.86E-05
19.0	0.07	0.03	3.49E-05

NOTE:

[a] Time zero is set at March 1997.

Figure 1. AT123D modeled maximum concentration of benzo(*a*)anthracene in the groundwater versus downgradient distance from the source, Former Building 728 Site

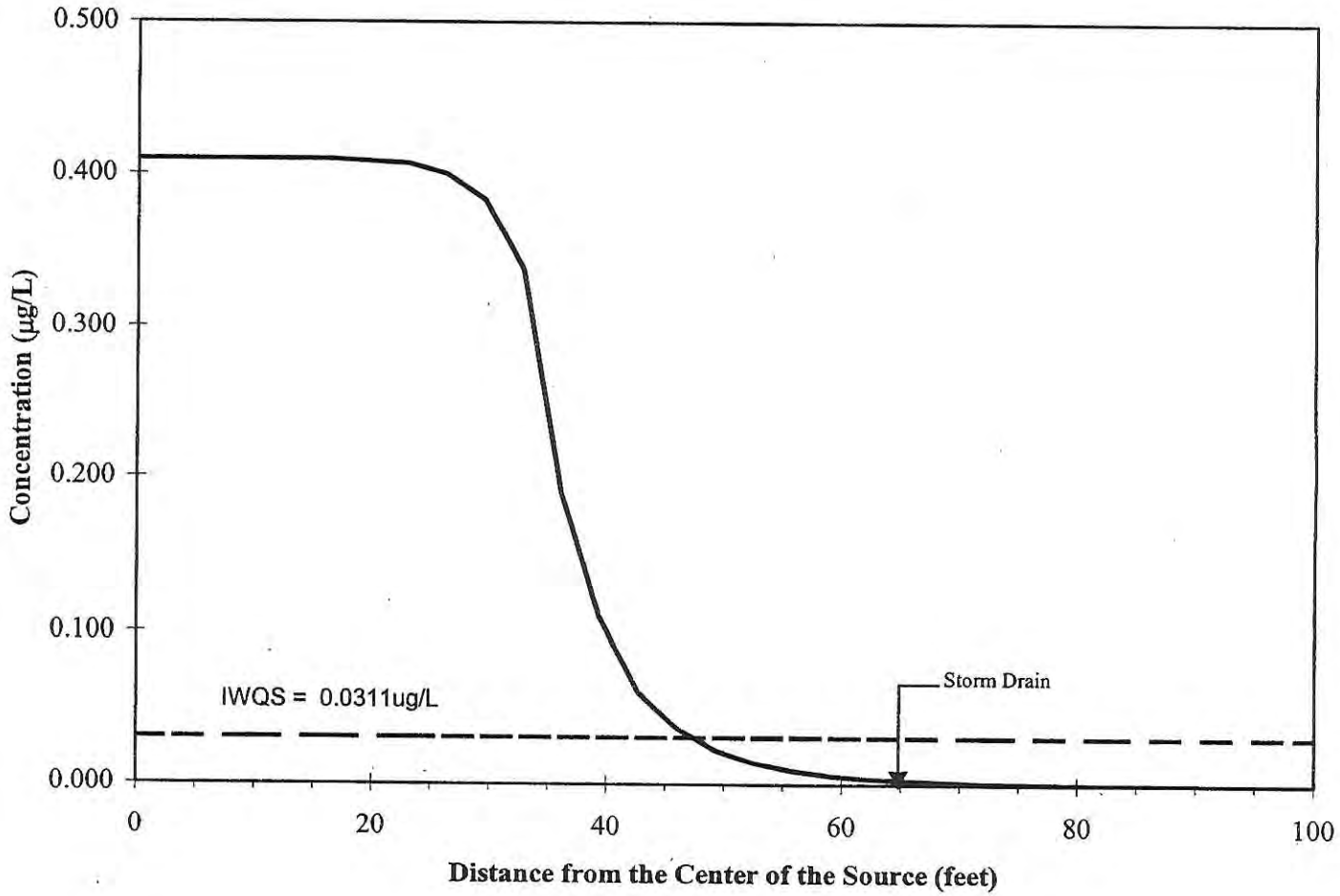
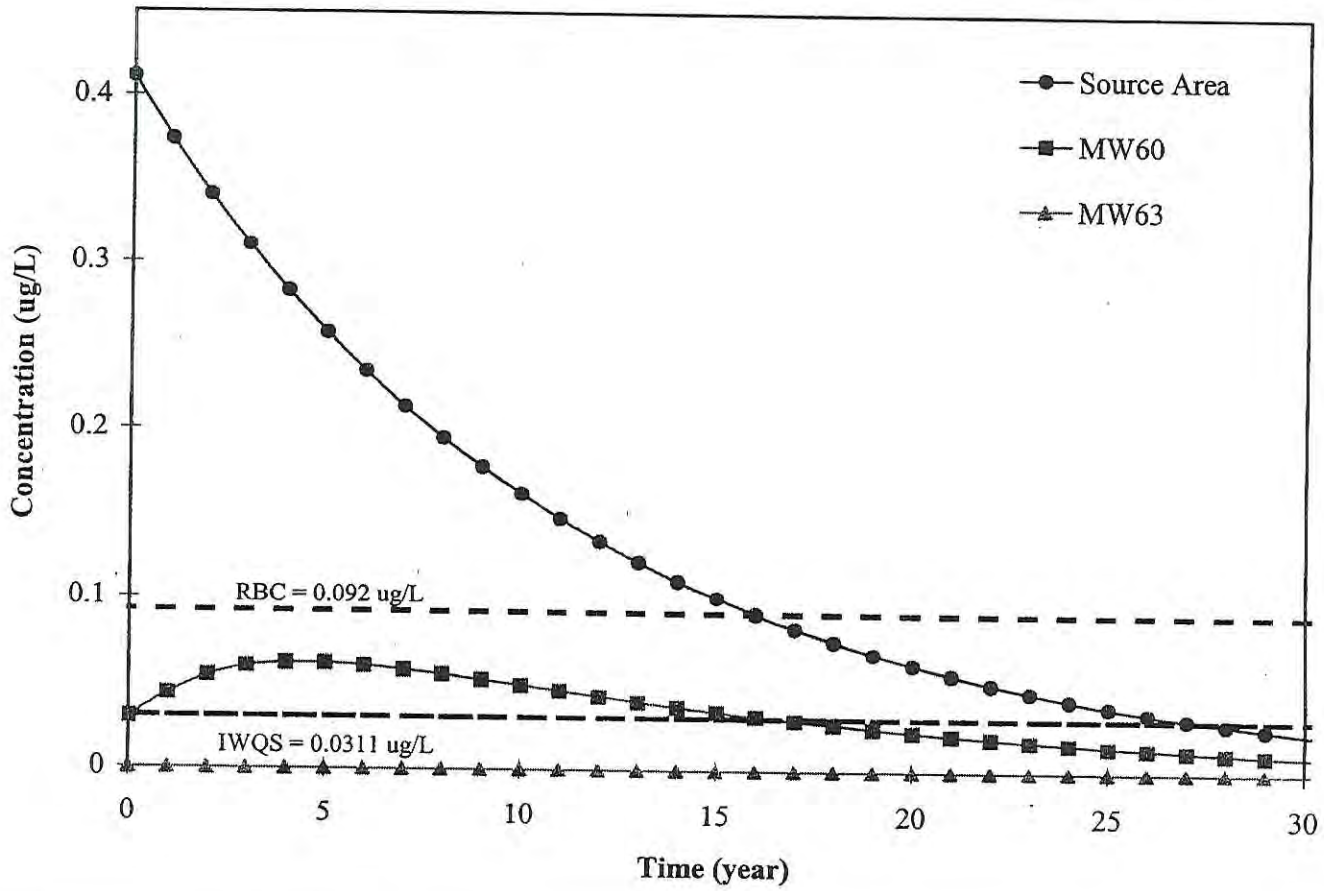


Figure 2. AT123D modeled maximum concentration of benzo(*a*)anthracene in the groundwater at the Former Building 728 Site
(Time 0 represents Year 1997)



HAAF Bldg 728: Benzo(a)anthracene - 2yr

NO. OF POINTS IN X-DIRECTION	12
NO. OF POINTS IN Y-DIRECTION	4
NO. OF POINTS IN Z-DIRECTION	1
NO. OF ROOTS: NO. OF SERIES TERMS	400
NO. OF BEGINNING TIME STEP	73
NO. OF ENDING TIME STEP	301
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)	0.1524E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS)	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.1100E+02
END POINT OF X-SOURCE LOCATION (METERS)	0.1100E+02
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.1370E+02
END POINT OF Y-SOURCE LOCATION (METERS)	0.1370E+02
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
POROSITY	0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.2200E+00
HYDRAULIC GRADIENT	0.1100E-01
LONGITUDINAL DISPERSIVITY (METER)	0.3000E+02
LATERAL DISPERSIVITY (METER)	0.1000E+02
VERTICAL DISPERSIVITY (METER)	0.3000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.7160E+00
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)	0.0000E+00
MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR)	0.3240E-05
DECAY CONSTANT (PER HOUR)	0.1060E-04
BULK DENSITY OF THE SOIL (KG/M**3)	0.1670E+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)	0.5256E+05
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR)	0.3675E-05
RETARDATION FACTOR	0.6644E+04
RETARDED DARCY VELOCITY (M/HR)	0.2024E-05
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR)	0.6071E-04
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR)	0.2024E-04
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR)	0.6073E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
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	0.000E+00
-12.	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	0.000E+00
-15.	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	0.000E+00
-18.	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	0.000E+00

CONTINUE

Y	X = 41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.393E-03	0.411E-03	0.643E-04	0.306E-04	0.157E-04	0.623E-07	0.603E-08	0.000E+00	0.000E+00	0.000E+00
-12.	0.379E-03	0.394E-03	0.598E-04	0.280E-04	0.141E-04	0.540E-07	0.520E-08	0.000E+00	0.000E+00	0.000E+00
-15.	0.147E-04	0.163E-04	0.454E-05	0.264E-05	0.153E-05	0.826E-08	0.827E-09	0.000E+00	0.000E+00	0.000E+00
-18.	0.170E-07	0.198E-07	0.631E-08	0.413E-08	0.266E-08	0.251E-10	0.280E-11	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y	X = 41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.349E-03	0.374E-03	0.873E-04	0.442E-04	0.231E-04	0.150E-06	0.190E-07	0.000E+00	0.000E+00	0.000E+00
-12.	0.336E-03	0.359E-03	0.827E-04	0.413E-04	0.213E-04	0.131E-06	0.165E-07	0.000E+00	0.000E+00	0.000E+00
-15.	0.129E-04	0.149E-04	0.456E-05	0.289E-05	0.181E-05	0.188E-07	0.251E-08	0.000E+00	0.000E+00	0.000E+00
-18.	0.151E-07	0.181E-07	0.606E-08	0.417E-08	0.283E-08	0.502E-10	0.757E-11	0.000E+00	0.000E+00	0.000E+00

CONTINUE

		X	
Y	41.	50.	
0.	0.000E+00	0.000E+00	
-12.	0.000E+00	0.000E+00	
-15.	0.000E+00	0.000E+00	
-18.	0.000E+00	0.000E+00	

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

					X					
Y	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.307E-03	0.341E-03	0.945E-04	0.547E-04	0.314E-04	0.299E-06	0.464E-07	0.000E+00	0.000E+00	0.000E+00
-12.	0.295E-03	0.327E-03	0.901E-04	0.517E-04	0.294E-04	0.264E-06	0.405E-07	0.000E+00	0.000E+00	0.000E+00
-15.	0.114E-04	0.135E-04	0.443E-05	0.298E-05	0.198E-05	0.350E-07	0.582E-08	0.000E+00	0.000E+00	0.000E+00
-18.	0.134E-07	0.165E-07	0.575E-08	0.411E-08	0.291E-08	0.827E-10	0.157E-10	0.000E+00	0.000E+00	0.000E+00

CONTINUE

		X	
Y	41.	50.	
0.	0.000E+00	0.000E+00	
-12.	0.000E+00	0.000E+00	
-15.	0.000E+00	0.000E+00	
-18.	0.000E+00	0.000E+00	

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

					X					
Y	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.271E-03	0.311E-03	0.950E-04	0.601E-04	0.375E-04	0.528E-06	0.950E-07	0.113E-11	0.000E+00	0.000E+00
12.	0.260E-03	0.298E-03	0.908E-04	0.571E-04	0.354E-04	0.472E-06	0.838E-07	0.969E-12	0.000E+00	0.000E+00
-15.	0.102E-04	0.123E-04	0.423E-05	0.297E-05	0.207E-05	0.561E-07	0.112E-07	0.165E-12	0.000E+00	0.000E+00
-18.	0.119E-07	0.150E-07	0.541E-08	0.398E-08	0.291E-08	0.120E-09	0.271E-10	0.691E-15	0.000E+00	0.000E+00

CONTINUE

		X	
Y	41.	50.	
0.	0.000E+00	0.000E+00	
-12.	0.000E+00	0.000E+00	
-15.	0.000E+00	0.000E+00	
-18.	0.000E+00	0.000E+00	

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.239E-03	0.283E-03	0.924E-04	0.620E-04	0.412E-04	0.855E-06	0.173E-06	0.731E-11	0.000E+00	0.000E+00
-12.	0.230E-03	0.272E-03	0.884E-04	0.591E-04	0.391E-04	0.774E-06	0.154E-06	0.628E-11	0.000E+00	0.000E+00
-15.	0.906E-05	0.112E-04	0.400E-05	0.290E-05	0.209E-05	0.808E-07	0.187E-07	0.102E-11	0.000E+00	0.000E+00
-18.	0.107E-07	0.137E-07	0.506E-08	0.381E-08	0.286E-08	0.158E-09	0.412E-10	0.365E-14	0.000E+00	0.000E+00

CONTINUE

Y \ X	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
15.	0.000E+00	0.000E+00
18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.213E-03	0.258E-03	0.883E-04	0.619E-04	0.431E-04	0.128E-05	0.288E-06	0.278E-10	0.000E+00	0.000E+00
-12.	0.205E-03	0.248E-03	0.845E-04	0.591E-04	0.410E-04	0.117E-05	0.260E-06	0.241E-10	0.000E+00	0.000E+00
-15.	0.809E-05	0.102E-04	0.375E-05	0.279E-05	0.207E-05	0.107E-06	0.281E-07	0.376E-11	0.000E+00	0.000E+00
-18.	0.957E-08	0.124E-07	0.472E-08	0.362E-08	0.277E-08	0.194E-09	0.571E-10	0.121E-13	0.000E+00	0.000E+00

CONTINUE

Y \ X	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y \ X	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.189E-03	0.235E-03	0.835E-04	0.605E-04	0.436E-04	0.178E-05	0.443E-06	0.820E-10	0.121E-13	0.000E+00
-12.	0.182E-03	0.226E-03	0.800E-04	0.579E-04	0.416E-04	0.164E-05	0.405E-06	0.714E-10	0.103E-13	0.000E+00
-15.	0.724E-05	0.934E-05	0.350E-05	0.266E-05	0.202E-05	0.133E-06	0.389E-07	0.107E-10	0.184E-14	0.000E+00
-18.	0.859E-08	0.113E-07	0.438E-08	0.342E-08	0.266E-08	0.228E-09	0.738E-10	0.315E-13	0.976E-17	0.000E+00

CONTINUE

	X	
Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X									
Y	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.169E-03	0.214E-03	0.783E-04	0.583E-04	0.433E-04	0.231E-05	0.637E-06	0.203E-09	0.725E-12	0.000E+00
-12.	0.163E-03	0.206E-03	0.751E-04	0.558E-04	0.413E-04	0.215E-05	0.586E-06	0.178E-09	0.621E-12	0.000E+00
-15.	0.649E-05	0.850E-05	0.326E-05	0.252E-05	0.195E-05	0.158E-06	0.506E-07	0.254E-10	0.104E-12	0.000E+00
-18.	0.771E-08	0.103E-07	0.406E-08	0.321E-08	0.254E-08	0.257E-09	0.905E-10	0.693E-13	0.403E-15	0.000E+00

CONTINUE

	X	
Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X									
Y	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.151E-03	0.195E-03	0.732E-04	0.557E-04	0.422E-04	0.285E-05	0.858E-06	0.444E-09	0.306E-11	0.000E+00
-12.	0.146E-03	0.187E-03	0.702E-04	0.533E-04	0.404E-04	0.267E-05	0.796E-06	0.392E-09	0.265E-11	0.000E+00
-15.	0.582E-05	0.774E-05	0.302E-05	0.238E-05	0.187E-05	0.180E-06	0.624E-07	0.527E-10	0.420E-12	0.000E+00
-18.	0.694E-08	0.939E-08	0.376E-08	0.301E-08	0.241E-08	0.282E-09	0.106E-09	0.135E-12	0.139E-14	0.000E+00

CONTINUE

	X	
Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.136E-03	0.178E-03	0.681E-04	0.527E-04	0.408E-04	0.335E-05	0.110E-05	0.880E-09	0.902E-11	0.000E+00
-12.	0.130E-03	0.171E-03	0.653E-04	0.505E-04	0.390E-04	0.315E-05	0.102E-05	0.782E-09	0.783E-11	0.000E+00
-15.	0.524E-05	0.705E-05	0.280E-05	0.223E-05	0.178E-05	0.198E-06	0.739E-07	0.984E-10	0.118E-11	0.000E+00
-18.	0.624E-08	0.855E-08	0.347E-08	0.281E-08	0.227E-08	0.302E-09	0.121E-09	0.236E-12	0.348E-14	0.000E+00

CONTINUE

Y	X 41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.122E-03	0.162E-03	0.632E-04	0.497E-04	0.390E-04	0.380E-05	0.134E-05	0.160E-08	0.222E-10	0.303E-12
-12.	0.117E-03	0.155E-03	0.606E-04	0.476E-04	0.373E-04	0.358E-05	0.125E-05	0.144E-08	0.194E-10	0.259E-12
-15.	0.471E-05	0.642E-05	0.259E-05	0.208E-05	0.168E-05	0.214E-06	0.846E-07	0.169E-09	0.278E-11	0.437E-13
-18.	0.563E-08	0.778E-08	0.320E-08	0.261E-08	0.214E-08	0.317E-09	0.134E-09	0.382E-12	0.754E-14	0.176E-15

CONTINUE

Y	X 41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.109E-03	0.147E-03	0.585E-04	0.466E-04	0.371E-04	0.418E-05	0.158E-05	0.273E-08	0.479E-10	0.128E-11
-12.	0.105E-03	0.142E-03	0.561E-04	0.446E-04	0.355E-04	0.396E-05	0.148E-05	0.246E-08	0.423E-10	0.110E-11
-15.	0.424E-05	0.584E-05	0.239E-05	0.194E-05	0.158E-05	0.226E-06	0.942E-07	0.269E-09	0.569E-11	0.175E-12
-18.	0.507E-08	0.708E-08	0.295E-08	0.243E-08	0.200E-08	0.327E-09	0.145E-09	0.577E-12	0.144E-13	0.577E-15

CONTINUE

Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.985E-04	0.134E-03	0.541E-04	0.435E-04	0.351E-04	0.450E-05	0.179E-05	0.436E-08	0.953E-10	0.356E-11
-12.	0.947E-04	0.129E-03	0.519E-04	0.417E-04	0.336E-04	0.426E-05	0.169E-05	0.396E-08	0.847E-10	0.310E-11
-15.	0.382E-05	0.531E-05	0.220E-05	0.181E-05	0.148E-05	0.234E-06	0.103E-06	0.403E-09	0.106E-10	0.464E-12
-18.	0.458E-08	0.643E-08	0.271E-08	0.225E-08	0.187E-08	0.333E-09	0.154E-09	0.826E-12	0.253E-13	0.134E-14

CONTINUE

Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1664E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.887E 04	0.122E-03	0.499E-04	0.406E-04	0.331E-04	0.474E-05	0.199E-05	0.661E-08	0.174E-09	0.820E-11
-12.	0.852E-04	0.117E-03	0.479E-04	0.389E-04	0.317E-04	0.450E-05	0.188E-05	0.604E-08	0.156E-09	0.719E-11
-15.	0.345E-05	0.483E-05	0.203E-05	0.168E-05	0.139E-05	0.240E-06	0.110E-06	0.574E-09	0.182E-10	0.101E-11
-18.	0.413E-08	0.585E-08	0.250E-08	0.208E-08	0.175E-08	0.336E-09	0.161E-09	0.113E-11	0.415E-13	0.265E-14

CONTINUE

Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.799E-04	0.111E-03	0.460E-04	0.377E-04	0.310E-04	0.491E-05	0.216E-05	0.956E-08	0.298E-09	0.168E-10
-12.	0.768E-04	0.107E-03	0.441E-04	0.362E-04	0.297E-04	0.467E-05	0.205E-05	0.878E-08	0.268E-09	0.148E-10
-15.	0.311E-05	0.439E-05	0.186E-05	0.155E-05	0.130E-05	0.242E-06	0.115E-06	0.781E-09	0.294E-10	0.195E-11
-18.	0.373E-08	0.532E-08	0.229E-08	0.193E-08	0.163E-08	0.335E-09	0.166E-09	0.148E-11	0.640E-13	0.474E-14

CONTINUE

Y	X 41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1840E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.721E-04	0.101E-03	0.424E-04	0.350E-04	0.291E-04	0.503E-05	0.231E-05	0.132E-07	0.482E-09	0.319E-10
-12.	0.693E-04	0.970E-04	0.407E-04	0.336E-04	0.278E-04	0.478E-05	0.219E-05	0.122E-07	0.437E-09	0.284E-10
-15.	0.281E-05	0.399E-05	0.171E-05	0.144E-05	0.121E-05	0.243E-06	0.119E-06	0.102E-08	0.450E-10	0.344E-11
-18.	0.337E-08	0.483E-08	0.211E-08	0.178E-08	0.151E-08	0.331E-09	0.170E-09	0.187E-11	0.939E-13	0.794E-14

CONTINUE

Y	X 41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1927E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X -8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.651E-04	0.918E-04	0.390E-04	0.325E-04	0.271E-04	0.508E-05	0.242E-05	0.177E-07	0.742E-09	0.561E-10
-12.	0.625E-04	0.882E-04	0.374E-04	0.311E-04	0.260E-04	0.484E-05	0.230E-05	0.164E-07	0.676E-09	0.505E-10
-15.	0.254E-05	0.363E-05	0.158E-05	0.133E-05	0.112E-05	0.241E-06	0.122E-06	0.130E-08	0.657E-10	0.566E-11
-18.	0.305E-08	0.439E-08	0.193E-08	0.164E-08	0.140E-08	0.326E-09	0.171E-09	0.230E-11	0.132E-12	0.125E-13

CONTINUE

Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2015E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.588E-04	0.835E-04	0.358E-04	0.300E-04	0.253E-04	0.508E-05	0.250E-05	0.228E-07	0.109E-08	0.928E-10
-12.	0.565E-04	0.802E-04	0.344E-04	0.288E-04	0.242E-04	0.485E-05	0.238E-05	0.212E-07	0.100E-08	0.839E-10
-15.	0.230E-05	0.330E-05	0.145E-05	0.123E-05	0.104E-05	0.237E-06	0.124E-06	0.160E-08	0.920E-10	0.884E-11
-18.	0.276E-08	0.399E-08	0.177E-08	0.151E-08	0.130E-08	0.318E-09	0.172E-09	0.275E-11	0.179E-12	0.188E-13

CONTINUE

Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2102E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	-8.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.531E-04	0.758E-04	0.329E-04	0.278E-04	0.235E-04	0.504E-05	0.256E-05	0.286E-07	0.155E-08	0.146E-09
-12.	0.510E-04	0.729E-04	0.316E-04	0.266E-04	0.225E-04	0.481E-05	0.244E-05	0.267E-07	0.143E-08	0.133E-09
-15.	0.208E-05	0.300E-05	0.133E-05	0.113E-05	0.967E-06	0.232E-06	0.124E-06	0.192E-08	0.124E-09	0.132E-10
-18.	0.250E-08	0.362E-08	0.163E-08	0.140E-08	0.120E-08	0.309E-09	0.171E-09	0.322E-11	0.234E-12	0.270E-13

CONTINUE

Y	41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2190E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7160E+03 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 219000.	0.	12.	13.	14.	18.	20.	27.	31.	33.
0.	0.480E-04	0.689E-04	0.302E-04	0.256E-04	0.218E-04	0.497E-05	0.260E-05	0.349E-07	0.213E-08	0.220E-09
-12.	0.461E-04	0.662E-04	0.290E-04	0.246E-04	0.209E-04	0.474E-05	0.247E-05	0.327E-07	0.197E-08	0.201E-09
-15.	0.188E-05	0.272E-05	0.122E-05	0.104E-05	0.896E-06	0.226E-06	0.124E-06	0.226E-08	0.163E-09	0.189E-10
-18.	0.226E-08	0.329E-08	0.149E-08	0.128E-08	0.111E-08	0.299E-09	0.169E-09	0.370E-11	0.298E-12	0.375E-13

CONTINUE

Y	X = 41.	50.
0.	0.000E+00	0.000E+00
-12.	0.000E+00	0.000E+00
-15.	0.000E+00	0.000E+00
-18.	0.000E+00	0.000E+00

ATTACHMENT B

SUMMARY OF VADOSE ZONE PILOT TEST RESULTS

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Science Applications International Corporation
An Employee-Owned Company

TECHNICAL MEMORANDUM

To: Patricia A. Stall
SAIC, Oak Ridge, TN

From: Peter J. Cagnetta, CPSSc PJC
SAIC, Middletown, PA

Date: June 29, 1999

Re: Vadose Zone Pilot Test Results
Hunter Army Airfield
SAIC 01-1408-04-1829-200

The purpose of this memorandum is to present the results of the soil vapor extraction (SVE) pilot test and the in-situ microbial respiration test that were conducted at the Hunter Army Airfield on May 17 and 18, 1999. This memorandum presents the field methods, pilot testing results, data interpretation, and remediation design parameters for SVE or bioventing technologies.

The original plan was to conduct a SVE step test on well VW-1 and utilize wells AE-V1, AE-V2, and MW-56 as monitoring points. All four points were constructed in the vicinity of former Building 728 with points VW-1, AE-V1, and AE-V2 being installed with either direct push or hollow stem auger techniques. Existing well MW-56 was likely installed with hollow stem augers. The depth to groundwater in the area at the time of the testing was approximately 5.5 feet below ground surface (bgs). Well VW-1 and monitoring points AE-V1 and AE-V2 all contained screened intervals from 2.5 to 12.5 feet bgs.

Pre-Pilot Testing Activities

The pilot testing equipment consisted of a 3-HP rotron regenerative blower equipped with a 300-pound granular-activated carbon unit (GAC) on a discharge. A 55-gallon drum was used as a water knockout tank located between the test well and the blower. A section of 2-inch piping between the knockout drum and the blower contained an atmospheric intake valve for adjusting the vacuum, a pitot tube and temperature gauge

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for flow determination, and a gas sampling port. The wellhead was equipped with a vacuum gauge.

Prior to the actual step test, incremental rates of vacuum were applied to VW-1 and the depth to groundwater was measured in the well at each corresponding vacuum rate. At a vacuum of 63 inches of water column (WC) on the wellhead, a groundwater mound of approximately 3 feet was created which indicated that the depth to water at this vacuum rate was at the uppermost part of the screen. Therefore, the test would need to be conducted at vacuum steps below the 63 inches WC.

During the process of determining the four vacuum steps to conduct the test at, a vacuum of 30 inches WC and also 60 inches WC was applied to the wellhead. At each vacuum rate, the corresponding extraction flow rate from the well was approximately 0.5 standard cubic feet per minute (scfm). The flow rate was calculated using the extraction air velocity and the cross sectional area of the two-inch diameter pipe. At monitoring point AE-V1, located 5 feet from VW-1, a subsurface vacuum was not induced when a vacuum of either 30 inches or 60 inches WC was applied to VW-1. The pretest data indicated that the subsurface soil had a very low permeability or the test well was inadequate for testing.

The blower unit was disconnected from VW-1 and connected to monitoring point AE-V1 to try to utilize this point as a test well. Vacuum rates of 30 inches WC and 60 inches WC were applied at this wellhead and again, the extraction flow rates were approximately 0.5 scfm and no measurable radius of influence. The existing well MW-56 was then tested as a potential test well. The same vacuum rates were applied to MW-56 and again, very limited flow (<0.5 scfm) with no radius of influence were recorded. Upon completion of pre-testing MW-56, it was concluded that all wells and monitoring points in the pilot test area were either not adequately constructed for the performance of the test or the soil was highly impermeable.

To further investigate the reason for the extremely low flow rates from the soil, one new test well and two monitoring points were constructed. A hand auger was used to complete three boreholes to 6 feet bgs (approximately 0.5 feet below the water table).

Soil Conditions

During the completion of the three boreholes, the physical and morphological properties of the soil, which control the subsurface air flow characteristics, were documented. Table 1 presents a summary of the soil descriptions at each of the three locations. The soil generally consisted of an olive yellow silty sand to a depth of approximately 2 feet bgs. From approximately 2 feet to 6 feet bgs, the soil consisted of

very dark gray silty sand (field description) with light greenish-gray mottles and a hydrocarbon odor. The silty sand was generally poorly graded. The presence of the greenish mottles in the soil which generally consist of ferrous sulfate precipitates, suggests that there is limited migration of water through the soil where the greenish mottles are present. The presence of the greenish-gray mottles strongly suggest that highly reduced conditions exist in the soil due to limited oxygen diffusion through the soil. This further suggests that the soil is not highly permeable.

The results of geotechnical analyses performed on the sample collected from the test area indicate the soil is generally a poorly graded sand with silt with approximately 75% fine sand. The dry bulk density of the soil is approximately 112 pounds per cubic foot. The bulk density is high and suggests that the soil in this area was very likely compacted during backfilling of the UST excavation. The hydraulic conductivity was calculated at 2.61 x 10-5 centimeters per second. The geotechnical data indicates the soil is dense and has a low permeability which is consistent with the field observations made during the completion of the soil boreholes and the SVE pre pilot testing activities.

New Well and Piezometer Construction

In each of the three boreholes, ¾-inch diameter PVC wells were constructed. Each well contained a screened interval from 2 to 6 feet bgs with a sand pack from 1.5 to 6 feet bgs. A bentonite seal was placed from grade to 1.5 feet bgs. The first borehole is identified as test well VEW-1. The first piezometer, P-1, is located 3 feet from VEW-1, and P- 2, the second piezometer, is located 5.75 feet from VEW-1. Prior to the construction of the well and piezometer, the sides of the borehole were scraped with a metal hook attached to the bucket auger extension. The purpose of scraping the sidewalls was to remove any surface smearing that may have occurred during the installation of the borehole that would interfere with measuring the actual permeability of the soil.

Initial testing of VEW-1 indicated that an extraction flow rate of up to 4.4 scfm could be achieved with an applied vacuum of 60 inches WC on the wellhead. In addition, a measurable vacuum could be recorded at the nearest monitoring piezometer (P-1). Therefore, the new test well and two piezometers were used to conduct the SVE step test.

Soil Vapor Extraction Step Test

A four-hour SVE step test was conducted on well VEW-1. Four rates of vacuum were applied to the wellhead, each for a one-hour period of time. During each step, the

applied vacuum, the extraction flow rate, the VOC concentration in the extracted gas and the treated discharge, and the concentration of oxygen, carbon dioxide, and methane were determined at the beginning and end of each step. In addition, the induced subsurface vacuum at P-1 and P-2 were recorded at 15-minute intervals within each one-hour step. At the conclusion of the first and fourth step, an extracted soil gas sample was collected for laboratory analysis of VOCs and total petroleum hydrocarbons (TPH).

The results of the SVE step tests are presented in Table 3. Figure 1 presents a plot of the applied vacuum on VEW-1 and the corresponding extraction flow rate. The flow rates are considered to be low; however, there was a linear increase in the flow rate with each incremental increase in the applied vacuum.

The relative concentration of VOCs in the untreated soil gas as determined with an organic vapor analyzer equipped with a photoionization detector (OVA-PID) increased from 41.7 parts per million (ppm) at the start of the test to a maximum of 160 ppm at the beginning of Step 3. The concentration then generally declined to 128 ppm at the end of the test. The concentration of VOCs in the treated effluent remained at 0 ppm throughout the step test.

The oxygen content in the soil gas remained very low throughout the duration of the four-hour step test, and concentrations of carbon dioxide and methane remained elevated. This data strongly suggests that oxygen is being consumed during the aerobic biodegradation of the hydrocarbon in the soil at a rate that is greater than the diffusion of oxygen back into the subsoil thus creating oxygen limiting conditions.

Figure 2 presents a plot of the stabilized subsurface vacuum values at P-1 and P-2 versus distances from VEW-1. The plot indicates that a radius of influence as determined by a subsurface vacuum value of 0.1 inches WC of 5 to 6 feet could be achieved with either Steps 2, 3, or 4.

Table 4 presents the results of the soil gas laboratory analyses and the laboratory reports are in Attachment A. Individual VOC compounds detected in the soil gas include trans-1,2-dichloroethene (t-1,2-DCE), 1,1-dichloroethane (1,1-DCA), and m,p-xylene. Slightly greater concentrations of the VOCs were present in the sample collected at the end of the four vacuum steps when the greatest vacuum was applied to the wellhead. The concentration of TPH (C4 to C12) as hexane was quantified. The majority of the VOCs in the extracted sample was comprised of the TPH. Estimated initial VOC recovery rates are calculated and are presented in Attachment A.

Short-Term Air Injection Test

Based on the field evaluation of the SVE pilot test results, a short-term air injection test was completed. The apparent low permeability of the soil and the shallow depth to groundwater may preclude the efficient operation of an air extraction system. The relatively high vacuum values that would be needed to generate adequate air flow from the subsurface and an adequate radius of influence would likely create groundwater upwelling conditions that would interfere with the efficient operation of an extraction system. Therefore, a short-term air injection test was conducted.

Five different rates of pressure were applied to VEW-1, each for approximately 5 minutes. During each pressure step, the applied pressure, the injection flow rate, and the subsurface pressure values at P-1 and P-2 were recorded. The results are presented in Table 5. Injection flow rates ranged from 1.6 scfm at an applied pressure of 18 inches WC to 4.9 scfm at an applied pressure of 80 inches WC. Figure 3 presents a plot of the injection flow rate versus the applied pressure on VEW-1. Injection flow rates obtained were very similar to the extraction flow rates obtained during the SVE step tests.

Figure 4 presents a plot of the subsurface pressure values versus distance from well VEW-1 during the five steps. A radius of influence of approximately 6 to 7 feet could be obtained at applied pressures of 70 and 80 inches WC. The radius of influence is based on maintaining a subsurface pressure of 0.1 inches WC.

Microbial Respiration Test

At the conclusion of the short-term air injection test, atmospheric air injection into the soil continued for approximately two hours. At the conclusion of the two-hour event, the concentration of oxygen in soil gas from the soil in the immediate vicinity of the test well borehole was 19.6 percent. The concentration of carbon dioxide was 0.8 percent, and the concentration of methane was 1.9 percent. The gas concentrations were measured with a landfill gas monitor. The concentrations of the three gases were measured for a period of six hours from the time the blower was shut off.

The soil gas results are presented in Table 6. Throughout the six-hour test, the concentration of oxygen declined, while the concentration of carbon dioxide and methane increased. Figure 5 presents a plot of the gas concentrations throughout the six-hour test. The consumption of oxygen during the test is attributed to the aerobic biodegradation of the hydrocarbon in the soil by the indigenous microorganisms. Figure 5 indicates that as oxygen was consumed during the aerobic biodegradation of

hydrocarbon carbon dioxide was generated. In addition, the production of methane indicated that anerobic biodegradation was occurring in the heterogenius soil.
The declining oxygen concentration versus time along with the physical properties of the soil were used to calculate a hydrocarbon biodegradation rate. The calculations are presented in Attachment B. The aerobic biodegradation rate is estimated at 36 mg/kg/day. This rate indicates that microbial activity and TPH biodegradation were enhanced as the subsurface was aerated. However, with the continuous operation of a bioventing system this estimated rate would likely decline due to decreasing substrate availability and possible nutrient limiting conditions.

Remediation Design Considerations

The air extraction step test and the air injection tests yielded similar flow rates and radii of influence. Microbial respiration tests indicated that aerating the subsurface will increase the biodegradation of the hydrocarbon contaminants. The relatively shallow depth to groundwater in the area may interfere with the effective operation of a vapor extraction system. In addition, the equipment requirements for an extraction system in comparison to an air injection system are more intensive. An air injection system can be as simplistic as an air injection blower unit equipped with an air filter on the intake and miscellaneous gauges on the discharge. In contrast, an SVE system would require a moisture knockout tank, a discharge receptacle for the collected groundwater, possible treatment for the discharge water, possible off-gas treatment requirements, and a heat exchanger if GAC would be used to treat the off-gas.

Based on the biodegradable nature of the contaminants and the very low contaminant recovery rates in the vapor phase during the extraction test, an air injection system would likely be the most efficient technology to remediate this site. Table 7 presents the possible remedial design parameters for an air injection system (bioventing) or possible air extraction system (SVE), if selected. With the bioventing system, an applied pressure of 70 inches WC on a wellhead can result in a radius of influence of 6 to 7 feet with a well spacing of approximately 11 feet. At 70 inches WC on the wellhead, an injection flow rate of approximately 4.4 scfm could be achieved.

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Table 1
Summary of Field Described Soil Physical and Morphological Properties
Hunter Army Airfield
SAIC Project No. 01-1408-04-1829-200

Location	Depth (Feet)	Soil Description
VEW-1	0 – 0.75	Olive yellow (2.5Y 5/6) silty sand (80% medium sand and 20% fines); <5% subrounded gravel; dry.
	0.75 – 2.0	Brownish yellow (10 YR 6/8) silty sand (85% medium and coarse sand and 15% fines); <5% subrounded gravel; moist.
	2.0 – 6.0	Very dark gray (5Y 3/1) silty sand (80% medium sand and 20% fines) with few faint light greenish-gray (5G 7/1) mottles; <5% subrounded gravel; moist; hydrocarbon odor; glass fragment at 4.5 feet.
P-1	0 – 1.75	Olive yellow (2.5 Y 5/6) silty sand (80% medium sand and 20% fines); <5% subrounded gravel; dry.
	7.15 – 6.0	Very dark gray (5Y 3/1) silty sand (75% medium sand and 25% fines) with few faint light greenish-gray (5G 7/1) mottles; <5% subrounded gravel; moist; hydrocarbon odor.
P-2	0 – 2.0	Olive yellow (2.5 Y 5/6) silty sand (80% medium sand and 20% fines); <5% subrounded gravel; dry.
	2.0 – 5.0	Very dark gray (5Y 3/1) silty sand (75% medium and fine sand and 25% fines) with few faint light greenish mottles; moist; hydrocarbon odor.
	5.0 – 6.0	Pale olive (5Y 6/4) silty sand (75% medium sand and 25% fines) with few faint (5G 7/1) light greenish-gray mottles; wet.

Table 2
Summary of Well and Piezometer Construction Details
Hunter Army Airfield
SAIC Project 01-1408-04-1829-200

Location	Distance to VEW-1 (feet)	Screened Interval (ft. bg)	Sand Pack Interval (ft. bg)	Bentonite Seal (ft. bg)
VEW-1	0	2.0 – 6.0	1.5 – 6.0	0 – 1.5
P-1	3.0	2.0 – 6.0	1.5 – 6.0	0 – 1.5
P-2	5.75	2.0 – 6.0	1.5 – 6.0	0 – 1.5

ft. bg = feet below grade

Table 3
Summary of Results of Soil Vapor Extraction Pilot Test
Hunter Army Airfield
SAIC Project No. 01-1408-00-4008-200

VEW-1 Parameters	Units	Step 1		Step 2		Step 3		Step 4	
		Start	End	Start	End	Start	End	Start	End
Applied Vacuum	" WC	18	18	35	35	52	52	70	70
Extraction Flow Rate	scfm	2.2	2.2	2.7	2.7	3.8	3.8	4.4	4.4
VOCS by PID									
Extracted Soil Gas	ppm	41.7	36.2	145	154	160	139	142	128
Treated Effluent	ppm	0	0	0	0	0	0	0	0
Oxygen	%	0.1	0.3	0.3	0.6	0.7	1.0	1.1	1.3
Carbon Dioxide	%	18.8	18.4	18.3	17.6	17.5	16.9	16.9	16.2
Methane	%	79.4	78.9	78.8	77.7	77.5	76.1	75.8	74.0

Piezometer Location	Distance to VEW-1 (Feet)	Stabilized Subsurface Vacuum (inches of water column)			
		Step 1	Step 2	Step 3	Step 4
P-1	3.0	0.30	0.60	0.82	0.95
P-2	5.75	0.035	0.060	0.065	0.072

" WC = inches of water column
scfm = standard cubic feet per minute
ppm = parts per million
% = percent
Ft (bTOC) = feet below top of casing.

Table 4
Summary of Detected VOCs in the Extracted Soil Gas
Hunter Army Airfield
SAIC Project No. 01-1408-04-1829-200

Compound	VOC Concentration			
	AE-VEW-1-A		AE-VEW-2-A	
	ppmv	µg/L	ppmv	µg/L
Trans-1,2-Dichloroethene	0.06	0.24	0.12	0.48
1,1-Dichloroethane	0.37	1.52	0.62	2.55
m,p-xylene	<0.07	NC	0.13	0.57
TPH (C4-C12)	51.38	183.74	168.52	602.61

ppmv = parts per million-volume basis
µg/L = micrograms per liter
NC = not calculated

Table 5
Results of Short-Term Air Injection Test
Hunter Army Airfield
SAIC Project No. 01-1408-04-1829-200

Monitoring Parameters	Units	Step 1	Step 2	Step 3	Step 4	Step 5
Applied Pressure on VEW-1	"WC	18	35	52	70	80
Injection Flow Rate from VEW-1	scfm	1.6	2.7	3.3	4.4	4.9
Induced Pressure on P-1	"WC	1.0	1.15	1.50	2.20	3.35
Induced Pressure on P-2	"WC	0.11	0.115	0.112	0.160	0.25

"WC = inches of water column
scfm = standard cubic feet per minute

L:\WP\1408\04\1829\1829RESPtest.tbl

Table 6
Results of In-situ Microbial Respiration Test
Hunter Army Airfield
SAIC Project No. 01-1408-04-1829-200

	Concentration (%)		
Elapsed Time (hours)	**O_2**	**CO_2**	**CH_4**
0	19.6	0.8	1.9
0.25	18.9	1.3	2.7
0.50	15.8	2.5	7.5
0.75	13.5	2.9	9.1
1.00	11.7	3.2	10.6
1.25	10.1	3.4	13.5
1.50	8.7	3.6	14.7
1.75	7.9	3.7	15.8
2.00	7.1	3.8	17.4
2.25	6.4	3.9	17.7
2.50	5.9	4.0	18.9
2.75	5.4	4.1	19.4
3.00	4.8	4.2	20.4
3.50	4.0	4.2	21.8
4.00	3.4	4.3	22.7
4.50	3.0	4.3	23.1
5.00	2.6	4.4	24.2
5.50	2.3	4.4	24.4
6.00	1.9	4.5	24.9

L:\WP\1408\04\1829\1829DESIGN.tbl

Table 7
SVE and Bioventing Remedial Design Parameters
Hunter Army Airfield
SAIC Project No. 01-1408-04-1829-200

Design Parameter	Units	SVE Well (extraction)	Bioventing Well (injection)
Applied Vacuum (-) or Pressure (+)	"WC	-35	+70
Flow Rate	scfm	2.7	4.4
Radius of Influence	Ft	5-6	6-7
Well Spacing	Ft	9	11

"WC = inches of water column
scfm = standard cubic foot per minute
Ft = Feet

Figure 1

Applied Vacuum on VEW-1 vs Extraction Flow Rate

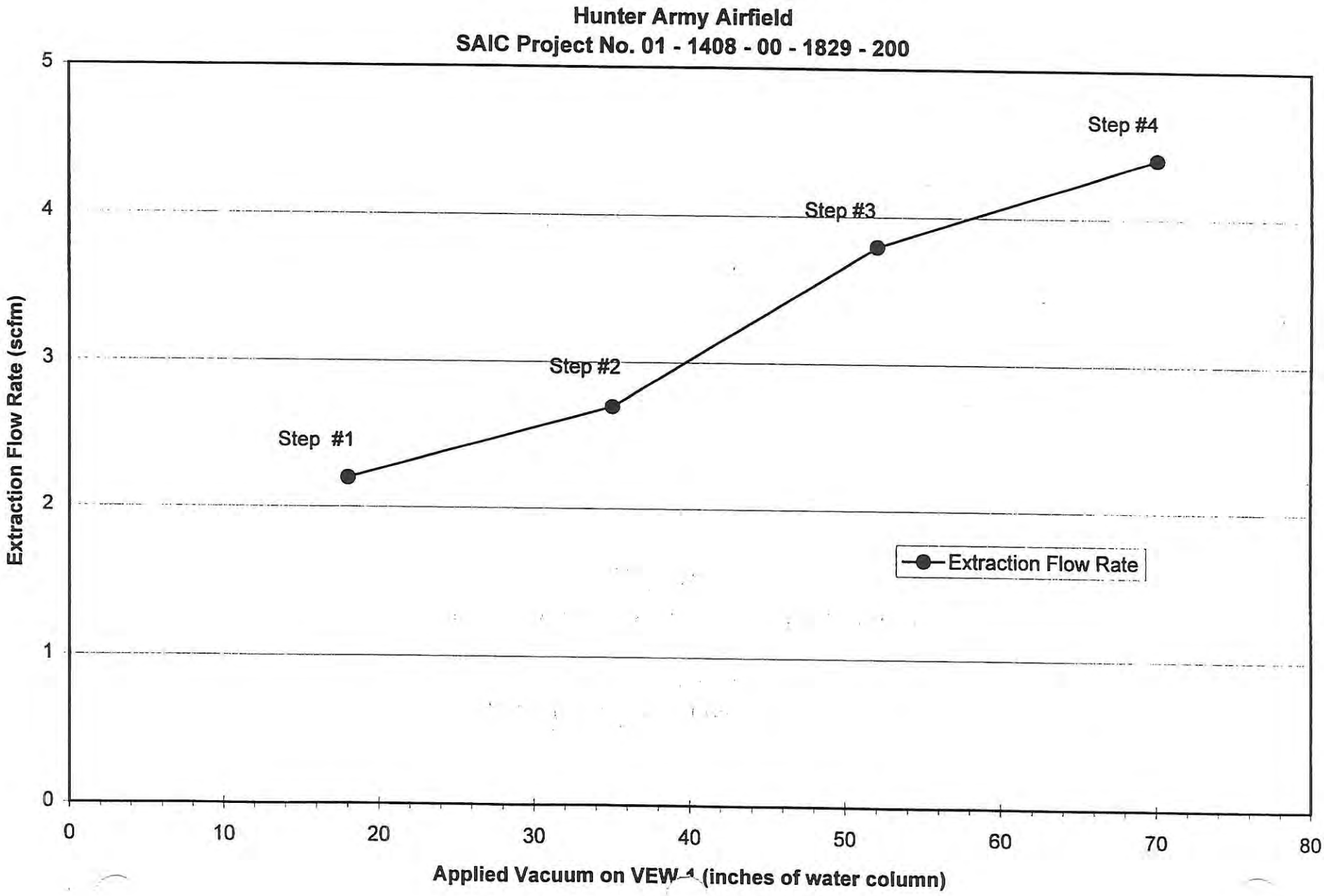


Figure 2

Stabilized Subsurface Vacuum at Monitoring Points vs. Distance from VEW-1

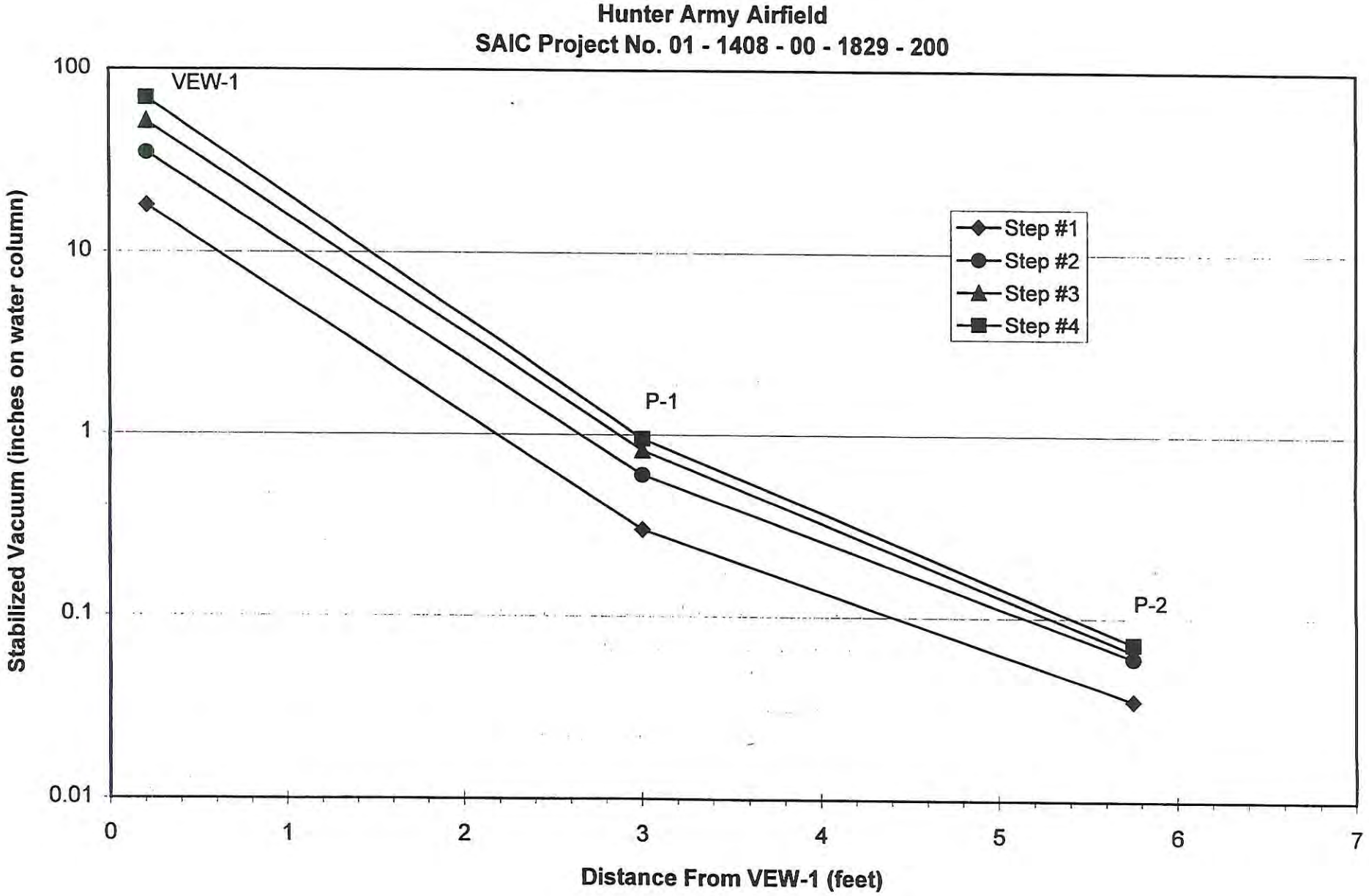


Figure 3

Applied Pressure on VEW-1 vs Injection Flow Rate

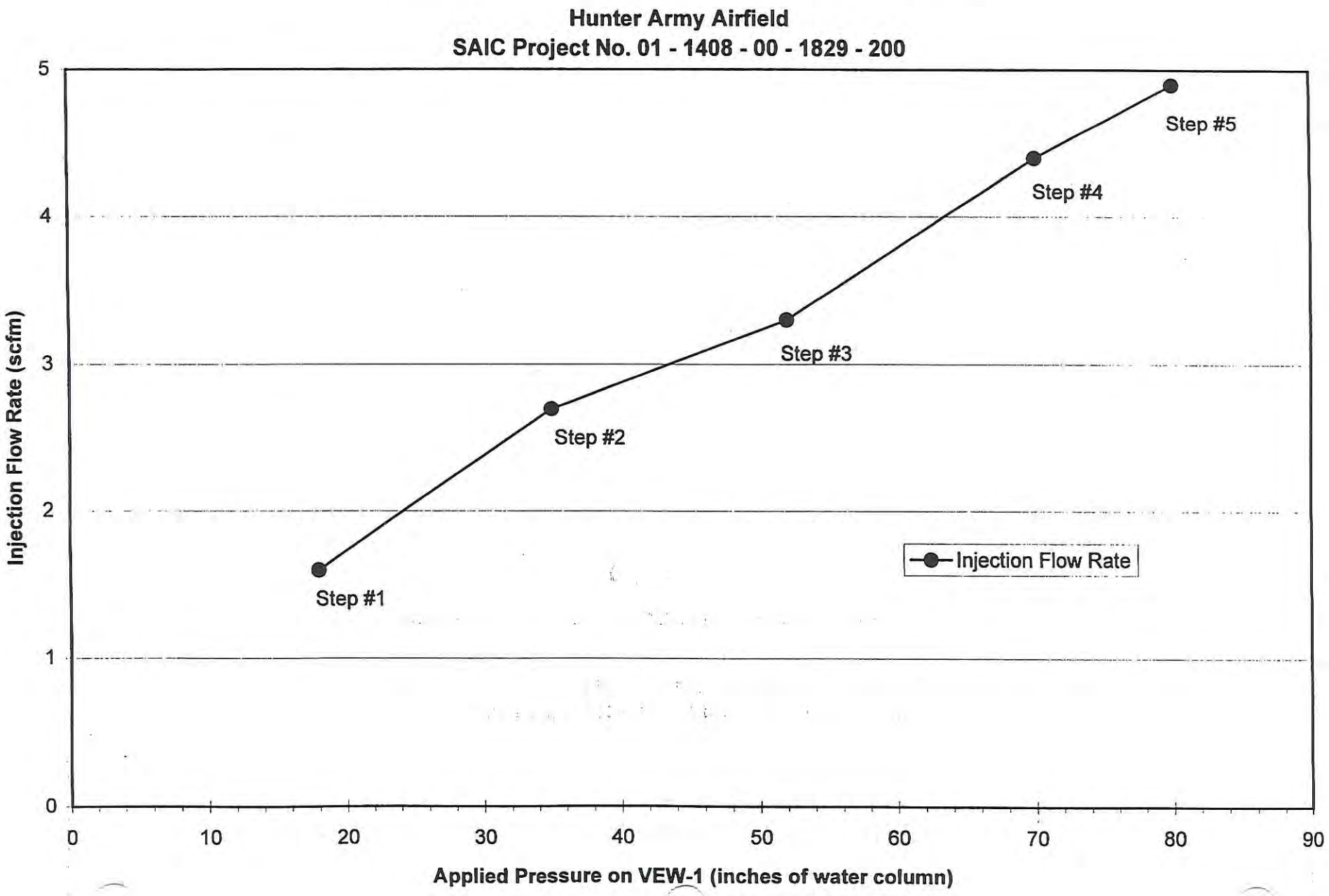


Figure 4

Stabilized Subsurface Pressure at Monitoring Points vs. Distance from VEW-1

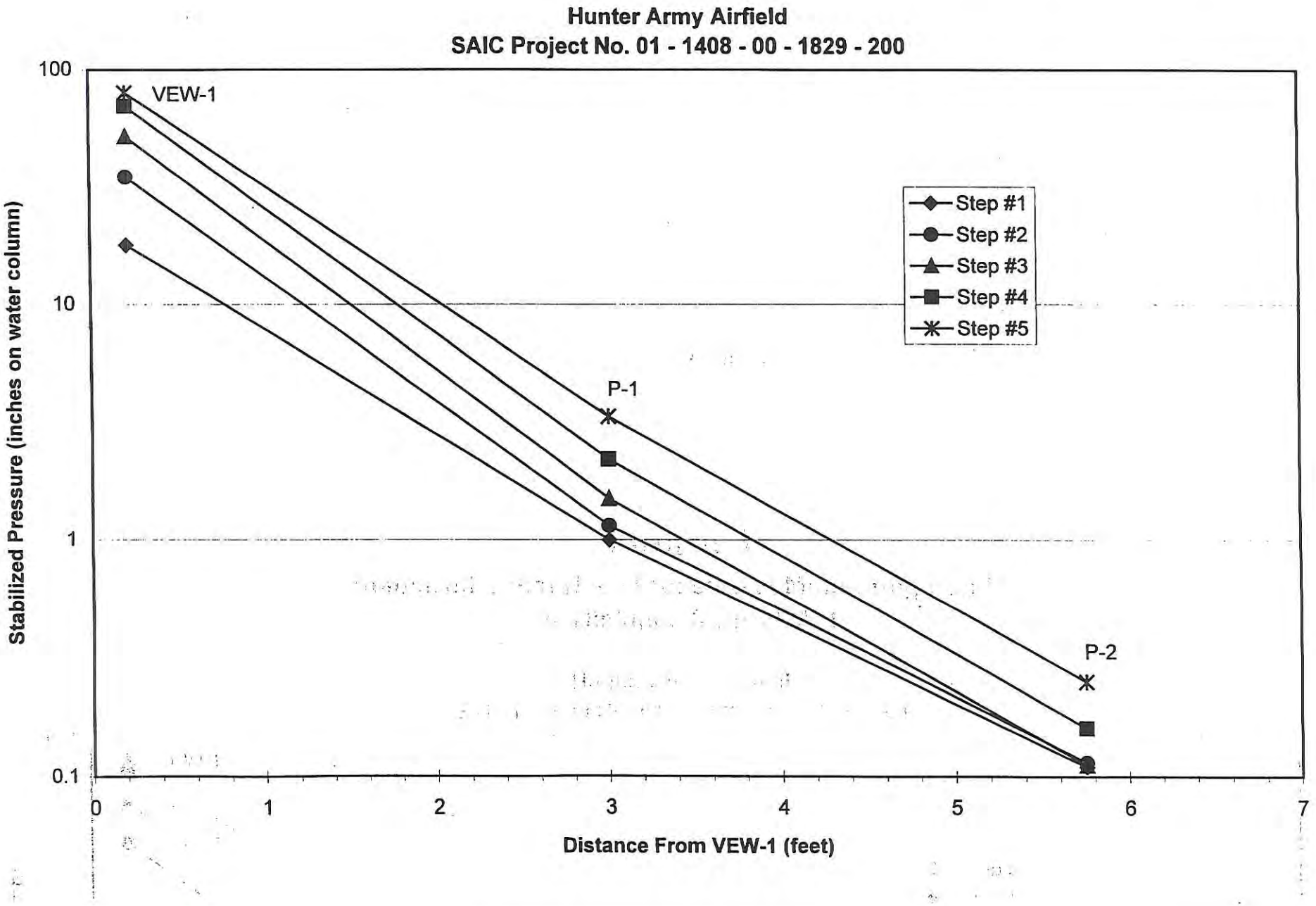
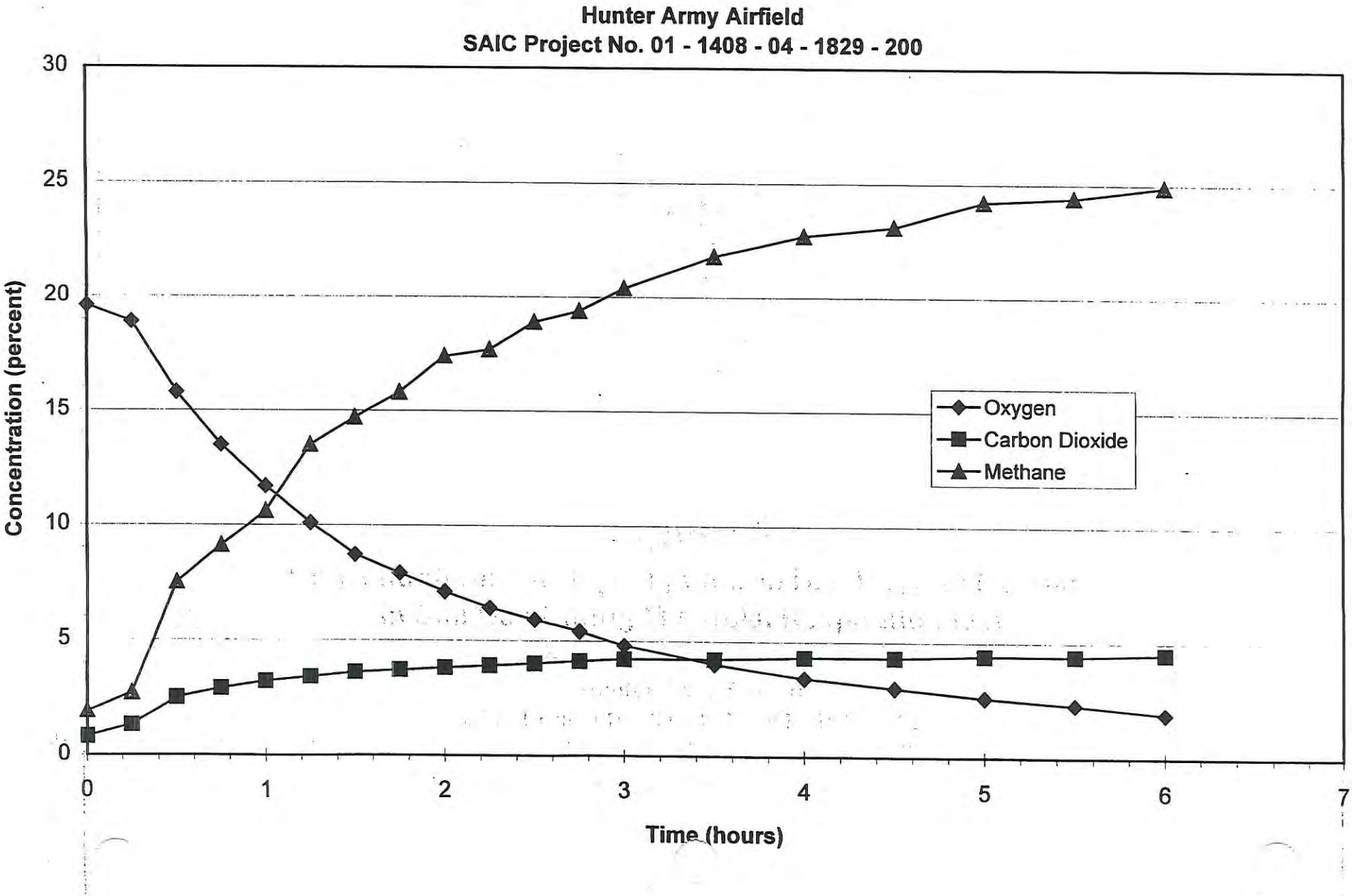


Figure 5

Concentrations on Oxygen, Carbon Dioxide, and Methane in Soil Gas During Microbial Respiration test



ATTACHMENT A

Soil Gas Analysis Results and Contaminant Mass Removal Calculations

Vaportech Services, Inc.

SAC2-992207

Science Applications International Corporation
Project: 01-1408-04-1829-200 Hunter Army Airfield

CONCENTRATIONS IN PPMV

COMPOUND	AE-VEW-1-A	AE-VEW-2-A	MDL
CHLOROMETHANE	ND	ND	1
VINYL CHLORIDE	ND	ND	1
BROMOMETHANE/CHLOROETHANE*	ND	ND	1
FLUOROTRICHLOROMETHANE	ND	ND	0.005
1,1 DICHLOROETHYLENE	ND	ND	0.01
METHYLENE CHLORIDE	ND	0.1	0.1
TRANS-1,2 DICHLOROETHYLENE	0.06	0.12	0.01
1,1 DICHLOROETHANE	0.37	0.62	0.05
CIS-1,2 DICHLOROETHYLENE	ND	ND	0.01
CHLOROFORM	ND	ND	0.005
1,1,1 TRICHLOROETHANE	ND	ND	0.005
CARBON TETRACHLORIDE	ND	ND	0.005
BENZENE	ND	ND	0.07
1,2 DICHLOROETHANE	ND	ND	0.01
TRICHLOROETHYLENE	ND	ND	0.005
1,2 DICHLOROPROPANE	ND	ND	0.01
BROMODICHLOROMETHANE	ND	ND	0.005
CIS-1,3 DICHLOROPROPYLENE	ND	ND	0.01
TOLUENE	ND	ND	0.07
TRANS-1,3 DICHLOROPROPYLENE	ND	ND	0.01
1,1,2 TRICHLOROETHANE	ND	ND	0.005
TETRACHLOROETHYLENE	ND	ND	0.005
CHLORODIBROMOMETHANE	ND	ND	0.005
CHLOROBENZENE	ND	ND	0.07
ETHYL BENZENE	ND	ND	0.07
M&P XYLENE	ND	0.13	0.07
o-XYLENE	ND	ND	0.07
BROMOFORM	ND	ND	0.005
1,1,2,2 TETRACHLOROETHANE	ND	ND	0.005
1,3 DICHLOROBENZENE	ND	ND	0.07
1,4 DICHLOROBENZENE	ND	ND	0.07
1,2 DICHLOROBENZENE	ND	ND	0.07
TOTAL C4-C12**	51.38	168.52	0.07
FILE NAME	V6A/B2.98A	V6A/B2.99A	
DATE SAMPLED	05/17/99	05/17/99	
DATE RECEIVED	05/21/99	05/21/99	
DATE ANALYZED	05/21/99	05/21/99	

MDL - Lower 'Method Detection Limit'
ND - 'Not Detected' above the lower method detection limit
* Compounds elude together on electron capture detector
** Includes the total of all identified and unidentified compounds in the C4-C12 hydrocarbon range, calculated using the sensitivity of hexane

24-May-99

Reviewed by: JM

Vaportech Services, Inc.

C2-992207

Science Applications International Corporation
Project: 01-1408-04-1829-200 Hunter Army Airfield

QUALITY CONTROL

LABORATORY BLANK RESULTS

BLANK: HE IN VIAL
FILE NAME: V6A/B2.92A

COMPOUND	BLANK (PPMV)	METHOD DETECTION LIMIT (PPMV)
CHLOROMETHANE	ND	1
VINYL CHLORIDE	ND	1
BROMOMETHANE/CHLOROETHANE*	ND	1
FLUOROTRICHLOROMETHANE	ND	0.005
1,1 DICHLOROETHYLENE	ND	0.01
METHYLENE CHLORIDE	ND	0.1
TRANS-1,2 DICHLOROETHYLENE	ND	0.01
1,1 DICHLOROETHANE	ND	0.05
CIS-1,2 DICHLOROETHYLENE	ND	0.01
CHLOROFORM	ND	0.005
1,1,1 TRICHLOROETHANE	ND	0.005
CARBON TETRACHLORIDE	ND	0.005
BENZENE	ND	0.07
1,2 DICHLOROETHANE	ND	0.01
TRICHLOROETHYLENE	ND	0.005
1,2 DICHLOROPROPANE	ND	0.01
BROMODICHLOROMETHANE	ND	0.005
CIS-1,3 DICHLOROPROPYLENE	ND	0.01
TOLUENE	ND	0.07
TRANS-1,3 DICHLOROPROPYLENE	ND	0.01
1,1,2 TRICHLOROETHANE	ND	0.005
TETRACHLOROETHYLENE	ND	0.005
CHLORODIBROMOMETHANE	ND	0.005
CHLOROBENZENE	ND	0.07
ETHYL BENZENE	ND	0.07
M&P XYLENE	ND	0.07
o-XYLENE	ND	0.07
BROMOFORM	ND	0.005
1,1,2,2 TETRACHLOROETHANE	ND	0.005
1,3 DICHLOROBENZENE	ND	0.07
1,4 DICHLOROBENZENE	ND	0.07
1,2 DICHLOROBENZENE	ND	0.07
TOTAL C4-C12	ND	0.07

ND - denotes 'Not Detected' above the lower method detection limit
* Compounds elude together on electron capture detector

24-May-99

Reviewed by: _____

Vaportech Services, Inc.

SAC2-992207

Science Applications International Corporation
Project: 01-1408-04-1829-200 Hunter Army Airfield

QUALITY CONTROL

CONTINUING CALIBRATION CHECK

STANDARDS:	V21-R4	624 R2	624 R1	VC-1000
FILE NAME:	V6A/B2.95A	V6A/B2.93A	V6B2.94A	V6A2.96A
	05/18/99			

COMPOUND	KNOWN (PPMV)	RESULT (PPMV)	PERCENT DIFFERENCE
CHLOROMETHANE	2.1	2.4	13.27
VINYL CHLORIDE	1000	1059	5.93
BROMOMETHANE/CHLOROETHANE*	2.7	2.9	6.23
FLUOROTRICHLOROMETHANE	0.765	0.806	5.36
1,1 DICHLOROETHYLENE	1.09	1.15	5.99
METHYLENE CHLORIDE	1.24	1.32	6.46
TRANS-1,2 DICHLOROETHYLENE	1.09	1.16	6.91
1,1 DICHLOROETHANE	1.06	1.16	9.13
CIS-1,2 DICHLOROETHYLENE	1.01	1.05	3.96
CHLOROFORM	0.881	0.927	5.22
1,1,1 TRICHLOROETHANE	0.788	0.830	5.33
CARBON TETRACHLORIDE	0.684	0.718	4.97
BENZENE	1.25	1.17	6.80
1,2 DICHLOROETHANE	1.06	1.15	7.81
TRICHLOROETHYLENE	0.800	0.843	5.37
1,2 DICHLOROPROPANE	0.93	0.98	5.16
BROMODICHLOROMETHANE	0.642	0.673	4.83
CIS-1,3 DICHLOROPROPYLENE	0.95	1.03	8.44
TOLUENE	1.06	1.02	3.49
TRANS-1,3 DICHLOROPROPYLENE	0.95	1.01	6.12
1,1,2 TRICHLOROETHANE	0.788	0.836	6.09
TETRACHLOROETHYLENE	0.634	0.677	6.78
CHLORODIBROMOMETHANE	0.505	0.533	5.54
CHLOROBENZENE	0.93	0.96	3.21
ETHYL BENZENE	0.92	0.89	3.04
M&P XYLENE	1.84	1.78	3.37
o-XYLENE	0.92	0.89	2.93
BROMOFORM	0.416	0.441	6.01
1,1,2,2 TETRACHLOROETHANE	0.626	0.666	6.39
1,3 DICHLOROBENZENE	0.72	0.77	7.55
1,4 DICHLOROBENZENE	0.72	0.77	7.97
1,2 DICHLOROBENZENE	0.72	0.76	6.15

* Compounds elude together on electron capture detector

24-May-99

Reviewed by: B-24

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SUBJECT Hunter Army Airfield SIE Pilot Test — JOB NO. 01408-04-1829-200
PAGE 1 of 4
PREPARED BY D. J. Cosgrove — DATE 6-9-99
CHECKED BY MATTHEW ROOT — DATE 6/28/99
APPROVED BY — DATE

Reference

Calculations to converts Soil Gas concentrations from ppmv to ug/L

$$ug/L = \left(MW/24.05\right) \times ppmv$$ 1

MW = molecular weight

1 - Rong, Y., S.C. Yu., 1996. Conversion unmasked - what is the relationship between ug/L and ppmv? Soil and Groundwater Cleanup, Independence, MO, April.

Compound	Molecular wt. (g/mole)
t-1,2-DCE	96.9
1,1-DCA	98.9
m,p-xylene	106
TPH (as hexane)	86

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SUBJECT H.A.A SVE Pilot Test JOB NO. 01-438-321-320-1

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PREPARED BY P. Cagnetta DATE 6.9.99

CHECKED BY MATTHEW ROOT DATE 6/28/99

APPROVED BY DATE

Reference

t-1,2-DCE (96.9/24.05) × 0.06 = 0.24 ug/L

(96.9/24.05) × 0.12 = 0.48 ug/L

1,1-DCA 98.9/24.05 × 0.37 = 1.52 ug/L

98.9/24.05 × 0.62 = 2.55 ug/L

m,p-xylene 106/24.05 × 0.07 = 0.31 ug/L

106/24.05 × 0.13 = 0.57 ug/L

TPH (as hexane) 86/24.05 × 51.38 = 183.74 ug/L

86/24.05 × 168.52 = 602.61 ug/L

Calculations to Determine VOC Recovery Rates

Using the VOC analysis data (AE-VEW-1-A) and the extraction flow rate from the end of the first step the following VOC recovery rates are exstimated:

1. t-1,2-DCE

$$\frac{0.24\,\mu g}{L} \times \frac{2.2\,ft^3}{min} \times \frac{28.32\,L}{ft^3} \times \frac{60\,mins}{hr} \times \frac{24\,hrs}{day} \times \frac{1g}{10^6\,\mu g} = 0.02\,g/day$$

2. 1,1-DCA

$$\frac{1.52\,\mu g}{L} \times \frac{2.2\,ft^3}{min} \times \frac{28.32\,L}{ft^3} \times \frac{60\,mins}{hr} \times \frac{24\,hrs}{day} \times \frac{1g}{10^6\,\mu g} = 0.14\,g/day$$

3. TPH (as hexane)

$$\frac{183.74\,\mu g}{L} \times \frac{2.2\,ft^3}{min} \times \frac{28.32\,L}{ft^3} \times \frac{60\,mins}{hr} \times \frac{24\,hrs}{day} \times \frac{1g}{10^6\,\mu g} = 16.48\,g/day$$

Using the VOC analysis data (AE-VEW-2-A) and the the extraction flow rate from the end of the 4th step the following VOC recovery rates are estimated:

1. t,1,2-DCE

$$\frac{0.48\,\mu g}{L} \times \frac{4.4\,ft^3}{min} \times \frac{28.32\,L}{ft^3} \times \frac{60\,mins}{hr} \times \frac{24\,hrs}{day} \times \frac{1g}{10^6\,\mu g} = 0.09\,g/day$$

2. 1,1-DCA

$$\frac{2.55\,\mu g}{L} \times \frac{4.4\,ft^3}{min} \times \frac{28.32\,L}{ft^3} \times \frac{60\,mins}{hr} \times \frac{24\,hrs}{day} \times \frac{1g}{10^6\,\mu g} = 0.46\,\frac{g}{day}$$

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SUBJECT H.A.A. SVE Pilot Test JOB NO. 01-1458-04-1820-20
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CHECKED BY MATTHEW ROOT DATE 6/28/99
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Reference

3. m,p-xylene

$$\frac{0.57\ \mu g}{L} \times \frac{4.4\ ft^3}{min} \times \frac{28.32\ L}{ft^3} \times \frac{60\ mins}{hr} \times \frac{24\ hrs}{day} \times \frac{1\ g}{10^6\ \mu g} = 0.10\ g/day$$

4. TPH (as hexane)

$$\frac{602.61\ \mu g}{L} \times \frac{4.4\ ft^3}{min} \times \frac{28.32\ L}{ft^3} \times \frac{60\ mins}{hr} \times \frac{24\ hrs}{day} \times \frac{1\ g}{10^6\ \mu g} = 108.13\ g/day$$

ATTACHMENT B

Microbial Resipiration and Biodegradation Rate Calculation

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SUBJECT Hunter Army Airfield Vadose Zone Pilot Tests JOB NO. 01-1408-04-1829-200
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Reference

Calculations To Determine Biodegradation Rate

A. Determine Soil Air & Soil Water Properties:

Pt = Total Porosity (cm^3/cm^3)

Pw = Water Filled Porosity (cm^3/cm^3)

Pa = Air Filled Porosity (cm^3/cm^3)

M = Field soil Moisture Content (g water / g soil)

BD = Soil Bulk Density (dry g/cm^3)

PD = Soil Particle Density (g/cm^3)

$Pa = Pt - Pw$ 1

$Pw = M (BD/PD)$ 1

1 U.S.EPA. 1995. Bioventing Principles and Practice, Volume I: Bioventing Principles. EPA 540/R-95/534. Washington, D.C.

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Reference

P_t = 0.33 (CATLIN Lab Analysis Result)

PD = 2.65 g/cm³ (CATLIN Lab Analysis Result)

BD = 111.57 lbs/ft³ = 1.79 g/cm³

$$111.57\ \frac{lbs}{ft^3} \times \frac{1\ ft^3}{28.3\ L} \times \frac{1\ L}{1000\ ml} \times \frac{1\ ml}{1\ cm^3} \times \frac{454\ g}{1\ lb} = 1.79\ g/cm^3$$

M = 12% by wt. (CATLIN LAB ANALYSIS RESULT)
= 0.12 g water/g soil

$$P_w = 0.12 \times \frac{1.79\ g/cm^3}{2.65\ g/cm^3} = 0.08$$

P_a = 0.33 − 0.08 = 0.25

B. Determine Biodegradation Rate:

P_a = Air Filled Porosity (cm^3/cm^3)
BD = Soil Bulk Density (g/cm^3)
OD = Oxygen Density (mg/L)
HC:O2 = Hydrocarbon : Oxygen ~~Mole~~ Oxidation Ratio (g/g)
$-K_o$ = Oxygen Utilization Rate (%/day)
K_b = Biodegradation Rate (mg/kg/day)

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Reference

$$Kb = (-Ko)(Pa)(OD)(HC{:}O_2)(0.01)/BD$$ 1

$Pa = 0.25$

$BD = 1.79\ g/cm^3$

$OD = 1,354\ mg/L$ @ 59°F 1

$HC{:}O_2 = 0.29$ (TPH as Hexane) 1

$-Ko = -65.70\ (\%\ O_2/day)$

-Ko is calculated as the slope of the oxygen concentration versus time from Figure 5.

$$Kb = [(-65.70)(0.25)(1,354)(0.29)(0.01)]/1.79$$

$$= -36.0\ mg/kg/day$$