

Second Groundwater Sampling Letter Report for the Former Building 133 Remedial Action Hunter Army Airfield, Savannah, Georgia



3d Inf Div (Mech)

December 2005



Submitted to: U.S. Army Corps of Engineers Savannah District Contract No. W912HN-04-D-0019 Delivery Order No. 0004



Prepared by: Solutions To Environmental Problems, Inc. 1006 Floyd Culler Court Oak Ridge, Tennessee 37830

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Facility ID #9-000653



SOLUTIONS TO ENVIRONMENTAL PROBLEMS 1006 Floyd Culler Court • Oak Ridge, Tennessee 37830 Telephone 865/481-7837 • Fax 865/481-0290

September 12, 2005

Commander U.S. Army Engineer District, Savannah CESAS-PM-H (Ana Vergara) 100 West Oglethorpe Avenue Savannah, GA 31401-3604

Subject: Contract No. W912HN-04-D-0019, Delivery Order No. 0004 Second Groundwater Sampling Letter Report for the Former Building 133 Remedial Action, Hunter Army Airfield, Savannah, Georgia

Dear Ms. Vergara:

Solutions To Environmental Problems, Inc. (STEP) has been contracted to perform groundwater monitoring at the former Building 133 site at Hunter Army Airfield. Under a previous remedial action at the site, remediation of a plume of contaminated groundwater was accomplished using an air sparging system. During air sparging activities, groundwater was monitored, and the analytical results indicated that benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations had been progressively reduced and were below the remediation cleanup goals. The air sparging system was shutdown on August 16, 2004; however, groundwater monitoring continued in order to confirm the effectiveness of the treatment. STEP performed groundwater monitoring at the former Building 133 site in August 2004, February 2005, and April 2005. This letter report presents the groundwater monitoring results for these three monitoring events. Attachment 1 contains the figures referenced in this letter report, Attachment 2 contains the laboratory analytical data sheets for the three events, and Attachment 3 contains the data validation report.

Due to a construction project at the site, the air sparging system was removed and all air sparging points along with affected groundwater monitoring wells were plugged and abandoned in late April and early May of 2005.

Remediation Goal

The remediation goal for this site was to reduce the benzene concentration in the groundwater to an acceptable limit. For this site, the cleanup goal for benzene is 71 micrograms per liter (μ g/L).



Groundwater Sampling

Since the air sparging system was shut down, groundwater monitoring has been conducted to evaluate the effectiveness of the air sparging system at the former Building 133 site. During each sampling event, groundwater samples were collected from 10 monitoring wells (133MW-02, 133MW-04, 133MW-05, 133MW-08, 133MW-09, 133MW-10, 133MW-11, 133MW-12, 133MW-13, and 133MW-14) using the low-flow method described in the U.S. Environmental Protection Agency publication, *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*, EPA/540/S-95/505 (April 1996). Figure 1 is a site map showing the location of the monitoring wells.

The groundwater samples were submitted for laboratory analysis of BTEX, methyl tertiary-butyl ether (MTBE), and the natural attenuation parameters nitrate, sulfate, methane, and alkalinity. A summary of the analytical methods and number of samples that were collected during each sampling event is presented in Table 1.

Parameter	Analytical Method	Field Samples	Duplicate Samples	MS/MSD Samples	Source Water
BTEX	8260B ⁽¹⁾	10	1	1	1
MTBE	8260B	10	1	1	1
Nitrate	353.2 ⁽²⁾	10	0	0	0
Sulfate	375.4	10	0	0	0
Methane	8015 ⁽ⁱ⁾	10	0	0	0
Alkalinity	310.1	10	0	0	0

Table 1 Laboratory Methods and Analytes Summary

⁽¹⁾Method 8260B and Method 8015 found in US EPA SW846, *Test Methods for Evaluating Solid Wastes – Physical and Chemical Methods 3rd Ed.* (EPA, November 1986).

⁽²⁾300 series methods found in Methods for Chemical Analysis of Waters and Wastes (EPA, March 1983).

BTEX = benzene, toluene, ethylbenzene, and xylenes MS = matrix spike MSD = matrix spike duplicate MTBE = methyl tertiary-butyl ether

Seven water quality parameters [ferrous iron, pH, dissolved oxygen (DO), conductivity, temperature, oxidation-reduction potential (ORP), and turbidity] were measured in the field during purging of the wells. Tables 2, 3, and 4 present the water quality parameter measurements from each well just prior to collection of the groundwater sample for laboratory analyses.



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Well No.	Date	Time (Hours)	Depth to Water (feet)	рН	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	Temp (deg C)	Oxidation Reduction Potential (mV)	Turbidity (NTU)	Ferrous Iron (mg/L)
133MW-02	8/25/04	9:30	5.00	3.50	2.67	0.546	28.0	253	35.5	5.0
133MW-04	8/26/04	8:30	5.93	3.71	2.44	0.675	26.9	316	0.7	4.8
133MW-05	8/26/04	9:45	5.91	5.54	0.68	0.134	26 .6	-106	0.3	2.4
133MW-08	8/25/04	13:20	6.00	3.24	3.37	1.370	33.4	398	1.0	5.2
133MW-09	8/25/04	15:10	5.83	2.82	2.88	2.820	33.0	257	11.8	6 .6
133MW-10	8/24/04	16:00	5.42	2.17	2.43	5.280	33.5	267	35.6	>10
133MW-11	8/24/04	14:40	6.00	2.13	2.77	4.710	30.8	280	24.7	>10
133MW-12	8/24/04	11:25	4.95	5.01	0.87	0. 097	24.8	29	11.2	4.0
133MW-13	8/24/04	9:46	4.70	4.63	2.45	0.070	24.4	177	10.8	3.2
133MW-14	8/25/04	10:50	5.95	4.37	2.84	0.392	28.9	168	3.0	6.4

Table 2 Groundwater Quality (Field Measured Parameters) August 2004

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deg C = degrees Centigrade mg/L = milligrams per liter mS/cm = milliSiemens per centimeter mV = milliVolts

NTU = nephelometric turbidity units

Well No.	Date	Time (Hours)	Depth To Water (feet)	рН	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	Temp (deg C)	Oxidation Reduction Potential (mV)	Turbidity (NTU)	Ferrous Iron (mg/L)
133MW-13	02/01/05	09:45	5.19	4.99	8.1	0.66	12.6	181	225	0.2
133MW-12	02/01/05	11:00	5.99	4.94	.53	0.89	15.4	8	.2	3.0
133MW-11	02/01/05	13:55	6.10	2.95	.23	2.83	18.7	230	5.0	3.4
133MW-10	02/01/05	15:00	5.67	2.32	.30	5.18	19.1	367	1.0	4.4
133MW-02	02/02/05	08:45	5.60	3.84	.36	.282	17.2	315	.6	2.8
133MW-14	02/02/05	09:55	6.72	3.74	.49	.715	16.9	258	.9	2.8
133MW-08	02/02/05	11:08	6.56	3.46	.44	2.21	17.6	335	7.9	3.4
133MW-09	02/02/05	14:15	6.44	3.327	.74	2.80	16.8	240	1.5	4.2
133MW-04	02/02/05	15:45	6.84	4.41	.80	.255	16.3	324	1.2	2.8
133MW-05	02/03/05	10:20	6.90	6.01	.28	.391	17.9	34	24.0	3.0

Table 3 Groundwater Quality (Field Measured Parameters) February 2005

deg C = degrees Celsius

mg/L = milligrams per liter mS/cm = milliSiemens per centimeter mV = milliVolts

NTU = nephelometric turbidity units

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			Depth							
÷.			TO		Dissolved			Oxidation		Ferrous
		Time	Water		Oxygen 🗉	Conductivity	Temp	Reduction	Turbidity	Iron
Well No.	Date	(Hours)	(feet)	рН	(mg/L)	(mS/cm)	(deg C)	Potential (mV)	(NTU)	(mg/L)
133MW-12	04/26/05	08:25	5.59	5.12	4.31	0.99	18.25	-129	4.3	1.0
133MW-13	04/26/05	10:00	4.96	5.12	1.62	0.063	18.36	8	25.2	2.6
133MW-11	04/26/05	12:35	5.97	3.27	1.84	1.71	20.76	1 92	36.7	2.8
133MW-10	04/26/05	13:50	5.52	3.04	1.87	4.18	21.95	304	20.0	3.2
133MW-09	04/26/05	15:35	6.12	3.45	1.78	3.94	21.22	163	41.8	5.6
133MW-08	04/27/05	07:45	6.32	3.39	2.40	2.30	21.90	319	9.7	1.6
133MW-14	04/27/05	09:20	6.42	4.30	2.14	0.089	21.02	284	4.5	2.2
133MW-04	04/27/05	10:20	6.58	4.37	2.01	0.319	22.0	321	1.8	2.8
133MW-05	04/27/05	12:30	6.61	5.78	2.38	0.192	22.48	-100	16.5	2.2
133MW-02	04/27/05	14:00	5.32	6.18	2.44	0.227	23.02	-97	26.2	1.8

Table 4 Groundwater Quality (Field Measured Parameters) April 2005

deg C = degrees Celsius mg/L = milligrams per liter mS/cm = milliSiemens per centimeter mV = milliVolts NTU = nephelometric turbidity units

The samples collected were delivered to General Engineering Labs, Charleston, South Carolina, for analysis; and laboratory results were validated by a third party validator (Data Chek). Tables 5, 6, and 7 present the validated data.

				P	arameter				
	이 집 같은 것			Xylenes					
Well Number	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (μg/L)	(total) (µg/L)	MTBE (µg/L)	Methane (µg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Alkalinity (mg/L)
133MW-02	0.55 J	<1.0 U	0.51 J	<1.0 U	<1.0 U	<14.0 U	0.00 U	249	0.00 U
133MW-04	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<14.0 U	0.00 U	338	0.00 U
133MW-05	63.1	0.55 J	60.2	30.8	0.97 J	104	0.00 U	56.2	9.44
133MW-05 DUP	53.2	0.59 J	41.3	24.4	0.69 J	NM	NM	NM	NM
133MW-08	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<14.0 U	0.148	1,350	0.00 U
133MW-09	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<14.0 U	0.172	3,190	0.00 U
133MW-10	0.71 J	1.40	2.1	13.2	<1.0 U	37.10	2.24	13,800	0.00 U
133MW-11	<1.0 U	0.87 J	0.24 J	2.3	<1.0 U	<20.0 U	0.00 U	13,100	0.00 U
133MW-12	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	53.8	0.00 U	25.7	0.00 U
133MW-13	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	30.3	0.00 U	18.4	0.00 U
133MW-14	14.8	0.53 J	8.7	5.0	0.66 J	53.1	0.00 U	185	0.00 U

Table 5	Groundwater	Analytic	al Results	August 2004

Note: The remediation cleanup level for benzene is 71 μ g/L.

DUP = duplicate sample

J = estimated value

 μ g/L = micrograms per liter

mg/L = milligrams per liter

MTBE = methyl tertiary-butyl etherNM = not measuredU = not detected



		1997 - 1993 			Parame	ter			
Well Number	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (µg/L)	Xylenes (total) (µg/L)	MTBE (μg/L)	Methane (µg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Alkalinity (mg/L)
133MW-02	25.0	1.0 U	4.8	0. 46 J	0. 90 J	275	0.1 U	138	2.0 U
133MW-04	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	14.0 U	0.79	142	2 .0 U
133MW-05	2.5	1.0 U	0.22 J	1.0 U	1.0 U	20.8	0.1 U	412	2.0 U
133MW-08	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	14.0 U	0.1 U	1680	2.0 U
133MW-09	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	14.0 U	0.192	1040	2.0 U
133MW-10	1.0 U	0.50 J	3.0	7.7	1.0 U	14.3	0.1 U	3120	2.0 U
133MW-11	1.0 U	1.0 U	0. 70 J	1.2	1.0 U	1 4.0 U	0.1 U	2160	2.0 U
133MW-12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	37.6	0.1 U	22.8	2.0 U
133MW-13	1.0 U	1.0 U	1.0 U	1.0 U	1. 0 U	14.0 U	0.1 U	17.8	2.0 U
133MW-14	1.0 U	1.0 U	0.32 J	1.0 U	1.0 U	14.0 U	0.1 U	1420	2.0 U

Table 6 Groundwater Analytical Results February 2005

Note: The remediation cleanup level for benzene is 71 μ g/L.

J = estimated value

 $\mu g/L = micrograms per liter$

mg/L = milligrams per liter

MTBE = methyl tertiary-butyl etherU = not detected above detection limit

					Parame	ter			
Well Number	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (µg/L)	Xylenes (total) (µg/L)	MTBE (µg/L)	Methane (µg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Alkalinity (mg/L)
133MW-02	30.8	1.0 U	25.6	.48 J	1.0 U	975	0.1 U	49.6	2.13
133MW-04	1.0 U	1.0 U	1.0 U	1 .0 U	0.54 J	7.19 J	0.27	110	2.0 U
133MW-05	1.9	1.0 U	0.91 J	1.0 U	1.0 U	42.3	0.1 U	90.4	2.0 U
133MW-08	1. 0 U	1.0 U	1.0 U	1.0 U	1.0 U	14.0 U	0.102	647	2.0 U
133MW-09	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.1 J	0.192	4270 J	2.0 U
133MW-10	0.43 J	1.0 U	2.0	3.9	1.0 U	116	0.1 U	374 J	2.0 U
133MW-11	1.0 U	1.0 U	1.0 U	1.1	.33 UJ	14.0 U	0.1 U	374 J	2.0 U
133MW-12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	46.7	0.1 U	22.1	2.0 U
133MW-13	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	27.2	0.1 U	13.7 J	2.0 U
133MW-14	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	71.8	0.1 U	37.6	2.0 U

Table 7 Groundwater Analytical Results April 2005

Note: The remediation cleanup level for benzene is 71 μ g/L.

J = estimated value

 $\mu g/L = \text{micrograms per liter}$ mg/L = milligrams per liter MTBE = methyl tertiary-butyl ether U = not detected above detection limit

Review of the analytical results for the three sampling events shows that none of the monitoring wells reported concentrations of benzene equaling or exceeding the remediation goal of 71 μ g/L.



Investigation Derived Waste

At the conclusion of each sampling event, all tubing, paper products, and other solid wastes were placed in a dumpster on site. All well purge water was considered investigation derived waste; therefore, it was placed in 55-gallon drums and properly labeled, characterized, and disposed.

Summary

As stated previously, benzene concentrations for all three groundwater sampling events were reported at levels consistently below the cleanup goal of 71 μ g/L. Since the benzene concentrations in the groundwater are consistently below the cleanup goal, it is concluded that the air sparging system was successful in remediating the groundwater at the site, and no further action is recommended. Due to a construction project at the site, the air sparging system was removed and all air sparging points along with their associated groundwater monitoring wells were plugged and abandoned in late April and early May of 2005.

If you have any questions regarding the information presented in this report, please call me at 865-481-7837, extension 266.

Sincerely,

STEP, Inc y Home

Jim Madai, PG **Project Manager**

Attachments (as noted)

C/encl: Algeana Stevenson, Environmental Branch Directorate of Public Works D. Becker, U.S. Army Corps of Engineers Richard O'Donnell, U.S. Army Environmental Center S. Marks, Environmental Branch Directorate of Public Works T. Rutland, Environmental Branch Directorate of Public Works (3 copies) **Project Files**

Reader File cc:

Attachment 1

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Figures



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Attachment 2

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Laboratory Analytical Data Sheets

August 2004

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GENERAL ENGINEERING LABORATORIES, LLC a Member of THE GEL GRADUPNAGRATIVE Meeting Today's Needs with a Vision for Taggarrow STEP, Inc. Hunter Army Airfield SWMU 133 SDG# 120193

September 14, 2004

Laboratory Identification: General Engineering Laboratories, LLC.

Mailing Address: P.O. Box 30712 Charleston, South Carolina 29417

Express Mail Delivery and Shipping Address:

2040 Savage Road Charleston, South Carolina 29414

<u>Telephone Number:</u> (843) 556-8171

Summary:

Sample receipt

The samples were logged-in at General Engineering Laboratories, Inc., (GEL) in Charleston, South Carolina on August 27, 2004 for Environmental Analyses.

Laboratory	Sample
Identification	Description
120193001	133MW004
120193002	133MW005
120193003	133MW004M
120193004	133MW905
120193005	SW04
120193006	TB03

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

Theeting Today's Needs with a Vision for Tomorrow

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, and Cooler Receipt Checklist.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

en signing too Sarah Kozlik Project Manager

Enclosure

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CASE NARRATIVE for STEP, Inc. Hunter Army Airfield SWMU 133 SDG# 119996

September 14, 2004

Laboratory Identification: General Engineering Laboratories, LLC.

Mailing Address:

P.O. Box 30712 Charleston, South Carolina 29417

Express Mail Delivery and Shipping Address: 2040 Savage Road

Charleston, South Carolina 29414

<u>Telephone Number:</u> (843) 556-8171

Summary:

Sample receipt

The samples were logged-in at General Engineering Laboratories, Inc., (GEL) in Charleston, South Carolina on August 26, 2004 for Environmental Analyses.

Laboratory	Sample
Identification	Description
119996001	133MW002
119996002	133MW014
119996003	133MW008
119996004	133MW009
119996005	TB02

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

GENERAL ENGINEERING LABORATORIES, LLC a Member of THE GEL GROUP, INC. P.O. Box 30712 • Charleston, SC 29417 • 2040 Savage Road (29407) Phone (843) 556-8171 • Fax (843) 766-1178 • www.gel.com

Internal Chain of Custody:

Custody was maintained for all samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, and Cooler Receipt Checklist.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Paula Sleep storing for S.K. Sarah Kozlik Sarah Kozlik

Project Manager

Enclosure

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CASE NARRATIVE for STEP, Inc. Hunter Army Airfield SWMU 133 SDG# 119861

September 14, 2004

Laboratory Identification: General Engineering Laboratories, LLC.

Mailing Address:

P.O. Box 30712 Charleston, South Carolina 29417

Express Mail Delivery and Shipping Address: 2040 Savage Road Charleston, South Carolina 29414

<u>Telephone Number:</u> (843) 556-8171

Summary:

Sample receipt

The samples were logged-in at General Engineering Laboratories, Inc., (GEL) in Charleston, South Carolina on August 25, 2004 for Environmental Analyses. Per client request on August 25, 2004, samples were analyzed for Methane, although this parameter was not listed on the chain of custody.

Laboratory	Sample
Identification	Description
119861001	133MW013
119861002	133MW012
119861003	133MW011
119861004	133MW010
119861005	TB01

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

GENERAL ENGINEERING LABORATORIES, LLC a Member of THE GEL GROUP, INC. P.O. Box 30712 • Charleston, SC 29417 • 2040 Savage Road (29407) Phone (843) 556-8171 • Fax (843) 766-1178 • www.gel.com



Internal Chain of Custody:

Custody was maintained for all samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, and Cooler Receipt Checklist.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Designing for S.K. Sarah Kozlik Project Manager

Enclosure

GENERAL ENGINEERING LABORATORIES, LLC a Member of THE GEL GROUP, INC. P.O. Box 30712 • Charleston, SC 29417 • 2040 Savage Road (29407) Phone (843) 556-8171 • Fax (843) 766-1178 • www.gel.com



VOLATILE	EPA SAMPLE NO.		
Lab Name: GEL, LLC.		Contract: N/A	133MW002
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 119996
Matrix: (soil/water)	WATER	Lab Sample ID:	: 119996001
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	7 27 16
Level: (low/med)	LOW	Date Received	: 08/26/04
% Moisture: not dec.		Date Analyzed:	: 09/05/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot N	/olume:(uL)

	CAS NO.	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/	: L Q	Revoluci
1					1.
1	1634-04-4	tert-Butyl me	thyl ether/	1.00	, a
Ì	71-43-2	Benzene		0.55 J	1 5
L	108-88-3	Toluene		1.010	1 u
Ĺ	100-41-4	Ethylbenzene_		0.51 J	J
1	1330-20-7	Xylenes (tota.	1)/	1.0 0	l u
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1A VOLATILE ORGANICS ANALYSIS DATA SHEET			EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW005
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 120193
Matrix: (soil/water)	WATER	Lab Sample ID:	120193002
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	72732
Level: (low/med)	LOW	Date Received:	: 08/27/04
% Moisture: not dec.		Date Analyzed:	09/06/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	/olume:(uL)

CAS NO.	COMPOUND	CONCENTRATION UN (ug/L or ug/Kg)	NITS: UG/L	. Q	Rw a
1634-04-4 71-43-2 108-88-3	tert-Butyl me Benzene	thyl ether	0.97 63.1	J	ব
100-41-4 1330-20-7	Ethylbenzene_ Xylenes (tota	1)	60.2 30.8		7

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1A VOLATILE ORGANICS ANALYSIS DATA SHEET			EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW905
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 120193
Matrix: (soil/water)	WATER	Lab Sample ID:	120193004
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	72734
Level: (low/med)	LOW	Date Received:	08/27/04
% Moisture: not dec.	· · · · · · · · · · · · · · · · · · ·	Date Analyzed:	09/06/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	Volume:(uL)

CAS NO.	COMPOUND	(ug/L or ug/Kg)	UG/L	Q	Ra Qual
1634-04-4	tert-Butyl me	thyl ether	0.69	J	Ł
108-88-3	Toluene		0.59	J	3
1330-20-7	Xylenes (tota	1)	24.4		

FORM I VOA

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VOLATILE	la ORGANICS ANALYSI	S DATA SHEET	EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW008
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 119996
Matrix: (soil/water)	WATER	Lab Sample ID	: 119996003
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	72718
Level: (low/med)	LOW	Date Received	: 08/26/04
<pre>% Moisture: not dec.</pre>		Date Analyzed	: 09/06/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Fact	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot	Volume:(uL)

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CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q	Rev Qual
1634-04-4 71-43-2 108-88-3 100-41-4 1330-20-7	-tert-Butyl methy -Benzene -Toluene -Ethylbenzene -Xylenes (total)	l ether	1.0 U 1.0 U 1.0 U 1.0 U 1.0 U		

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1A VOLATILE ORGANICS ANALYSI	EPA SAMPLE NO.
Lab Name: GEL, LLC.	
Lab Code: N/A Case No.: N/A	SAS No.: N/A SDG No.: 119996
Matrix: (soil/water) WATER	Lab Sample ID: 119996004
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 72719
Level: (low/med) LOW	Date Received: 08/26/04
% Moisture: not dec.	Date Analyzed: 09/06/04
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)

	CAS NO. COMPOUND	CONCENTRATION U (ug/L or ug/Kg)	NITS: UG/L Q	Revoluci
1		<u> </u>		- `
Ì	1634-04-4tert-Buty	/l methyl ether!	1.0 U	IL
Ť.	71-43-2Benzene		1.0 0	
1	108-88-3Toluene		1.0 U	
1	100-41-4Ethylbenz	ene	1.00	
Ì	1330-20-7Xylenes ((total)	1.000	
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VOLATILE	1A ORGANICS ANALYSI	S DATA SHEET	EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW010
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 119861
Matrix: (soil/water)	WATER	Lab Sample ID:	119861004
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	7¥337
Level: (low/med)	LOW	Date Received:	08/25/04
% Moisture: not dec.		Date Analyzed:	08/26/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	olume:(uL)

CAS NO.	COMPOUND	CONCENTRATION UNI' (ug/L or ug/Kg) U	rs: g/l	Q	Ren Quel
1634-04-4 71-43-2 108-88-3 100-41-4 1330-20-7	tert-Butyl me Benzene Toluene Ethylbenzene_ Xylenes (tota	ethyl ether	1.0 0.71 J 1.4 2.1 13.2	J r	น 5

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VOLATILE	1A ORGANICS ANALYSI	S DATA SHEET	EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW011
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 119861
Matrix: (soil/water)	WATER	Lab Sample ID:	119861003
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	7¥336
Level: (low/med)	LOW	Date Received:	08/25/04
% Moisture: not dec.	<u> </u>	Date Analyzed:	08/26/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	olume:(uL)



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VOLATILE	1A ORGANICS ANALYSI	S DATA SHEET	EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW012
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 119861
Matrix: (soil/water)	WATER	Lab Sample ID:	119861002
Sample wt/vol:	5,000 (g/ml) ML	Lab File ID:	7¥335
Level: (low/med)	LOW	Date Received:	08/25/04
<pre>% Moisture: not dec.</pre>		Date Analyzed:	08/26/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	olume:(uL)



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VOLATILE	1A ORGANICS ANALYSI	S DATA SHEET	EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW013
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 119861
Matrix: (soil/water)	WATER	Lab Sample ID:	119861001
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	7¥334
Level: (low/med)	LOW	Date Received:	08/25/04
% Moisture: not dec.		Date Analyzed:	08/26/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	Volume:(uL)

CAS NO.	COMPOUND	CONCENTRATION UN (ug/L or ug/Kg)	ITS: UG/L	Q	Rev Qual
1634-04-4	tert-Butyl me	thyl ether	1.0	U	- K
108-88-3	Toluene		1.0	υ υ	
1330-20-7	Xylenes (tota	1)	1.0	U	_ ⊼

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VOLATILE	lA ORGANICS ANALYSI	S DATA SHEET	EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW014
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 119996
Matrix: (soil/water)	WATER	Lab Sample ID	: 119996002
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	72717
Level: (low/med)	LOW	Date Received	: 08/26/04
% Moisture: not dec.	· · · · · · · · · · · · · · · · · · ·	Date Analyzed	: 09/05/04
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot	Volume:(uL)

	CAS NO.	COMPOUND	CONCENTRATION UN (ug/L or ug/Kg) [ITS: UG/L	Q	Rev Jual
ļ	1674 04 4					
1	71-42-2	tert-Butyl me	thyl ether	0.66		
	108-88-3-~	Toluene	 	14.0].		1 3
í	100-41-4	Ethylbenzene	/	8.71	-	
Ì	1330-20-7-	Xylenes (tota	1)	5.01		l
Ι.						ł



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1B FID ORGANICS ANALYSIS DATA SHE	EPA SAMPLE NO.
Lab Name: GENERAL ENCINEERING LABOR Contract	133MW002
Lab Code: N/A Case No.: N/A SAS No.	.: N/A SDG No.: 119996
Matrix: (soil/water) GROUND WAT	Lab Sample ID: 119996001
Sample wt/vol: 1.000 (g/mL) ML	Lab File ID: 018B1801
Level: (low/med) LOW	Date Received: 08/26/04
<pre>% Moisture: decanted: (Y/N)</pre>	Date Extracted:08/31/04
Concentrated Extract Volume: 1.00(mL)	Date Analyzed: 08/31/04
Injection Volume: 1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N	

 CAS NO.
 COMPOUND
 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L
 Q
 Rw gnf

 74-82-8-----Methane
 14.0
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FID OR		EPA 	SAMPLE NO.
Lab Name: GENERAL EN	GINEERING LABOR Contract	: N/A	33MW004
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.:	120193
Matrix: (soil/water)	GROUND WATER	Lab Sample ID: 120	193001
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 023	B2301
Level: (low/med)	LOW	Date Received: 08/	27/04
<pre>% Moisture:</pre>	decanted: (Y/N)	Date Extracted:08/	31/04
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 08/	31/04
Injection Volume:	1.0(uL)	Dilution Factor: 1	.0
GPC Cleanup: (Y/N)	N		
CAS NO.	CONCE COMPOUND (ug/L	NTRATION UNITS: or ug/Kg} UG/L	e Ronzine
74-82-8	Methane	14.	o u u

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FID ORG	1B GANICS ANALYSIS DATA	SHEET	EPA SAMPLE NO)
Lab Name: GENERAL EN	SINEERING LABOR Con	tract: N/A	133MW005	
Lab Code: N/A (Case No.: N/A SA	SNO.: N/A SDG	No.: 120193	
Matrix: (soil/water)	GROUND WATER	Lab Sample II): 120193002	
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	024B2401	· .
Level: (low/med)	LOW	Date Received	I: 08/27/04	•
% Moisture:	decanted: (Y/N)	Date Extracte	ed:08/31/04	
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed	l: 08/31/04	
Injection Volume:	1.0(uL)	Dilution Fact	or: 1.0	
GPC Cleanup: (Y/N)	N			
CAS NO.	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/	² . <u> </u>	w Qual
74-82-8	Methane		104	

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FID ORG	IB GANICS ANALYSIS DATA SHEE	r,	EPA SAMPLE NO
Lab Name: GENERAL ENG Lab Code: N/A ()	NINEERING LABOR Contract	: N/A : N/A : SD3	133MW008
Matrik: (soil/water)	GROUND WAT	Lab Sample ID:	119996003
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	021B2101
Level: (low/med)	LOW	Date Received:	08/26/04
% Moisture:	decanted: (Y/N)	Date Extracted	:08/31/04
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed:	08/31/04
Injection Volume:	1.0(uL)	Dilution Facto	r: 1.0
GPC Cleanup: (Y/N)	N		
	CONCR	MOANTING INTEST	

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q	Revolud
74-82-8	Methane		14.0	 ប	n

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FID ORG	1B JANICS ANALYSIS DATA SHEE	EPA SAMPLE NO.
Lab Name: GENERAL EN	INEERING LABOR Contract	: N/A
Lab Code: N/A 0	Case No.: N/A SAS No.	: N/A SDG No.: 119996
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 119996004
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 022B2201
Level: (low/med)	LOW	Date Received: 08/26/04
% Moisture:	decanted: (Y/N)	Date Extracted:08/31/04
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 08/31/04
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	
	CONCE	NTRATION UNITS:

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CAS NO.	COMPOUND	(ug/L or ug/Kg)	UG/L	Q	Rwqud
74-82-3	Methane		14.0	U	u.

FORM I SV-1

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1B FID ORGANICS ANALYSIS DATA SHEET		EPA SAMPLE NO.	
Lab Name: GENERAL ENG	SINEERING LABOR Contract	: N/A	133MW010
Lab Code: N/A	Case No.: N/A SAS No.	N/A SDG	No.: 119861
Matrix: (soil/water)	GROUND WATER	Lab Sample ID:	119861004
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	027B2701
Level: (low/med)	LOW	Date Received:	08/25/04
% Moisture:	decanted: (Y/N)	Date Extracted	:08/27/04
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed:	08/27/04
Injection Volume:	1.0(uL)	Dilution Facto	r: 1.0
GPC Cleanup: (Y/N)	N		

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q Rw Quel 74-82-8-----Methane______ 37.1

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יוס מדק	1B	EPA SAMPLE NO.
Lab Name: GENERAL ENG	GINEERING LABOR Contract	133MW011
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.: 119861
Matrix: (soil/water)	GROUND WATER	Lab Sample ID: 119861003
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 026B2601
Level: (low/med)	LOW	Date Received: 08/25/04
% Moisture:	decanted: (Y/N)	Date Extracted:08/27/04
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 08/27/04
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	
	CONCEN	

CAS NO.	COMPOUND	(ug/L or ug,	/Kg) UG/L	Q	Revaul
74-82-8	Methane		20.0	U	lu

FORM I SV-1

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1B FID ORGANICS ANALYSIS DATA SHEE	EPA SAMPLE NO.
Lab Name: GENERAL ENGINEERING LABOR Contract	133MW012
Lab Code: N/A Case No.: N/A SAS No.	: N/A SDG No.: 119861
Matrix: (soil/water) GROUND WATER	Lab Sample ID: 119861002
Sample wt/vol: 1.000 (g/mL) ML	Lab File ID: 025B2501
Level: (low/med) LOW	Date Received: 08/25/04
<pre>% Moisture: decanted: (Y/N)</pre>	Date Extracted:08/27/04
Concentrated Extract Volume: 1.00(mL)	Date Analyzed: 08/27/04
Injection Volume: 1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N	
CONCE CAS NO. COMPOUND (ug/L	NTRATION UNITS: or ug/Kg) UG/L Q Rev Quel

(ug/L or UG/L ug/Kg) Q 53.8 74-82-8----Methane

FORM I SV-1

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FID ORG	1B GANICS ANALYSIS DATA SHEE	EPA SAMPLE NO.
Lab Name: GENERAL ENG	SINEERING LABOR Contract	133MW013
Lab Code: N/A C	Case No.: N/A SAS No.:	: N/A SDG No.: 119861
Matrix: (soil/water)	GROUND WATER	Lab Sample ID: 119861001
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 023B2301
Level: (low/med)	LOW	Date Received: 08/25/04
% Moisture:	decanted: (Y/N)	Date Extracted:08/27/04
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 08/27/04
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	
	CONCEN	WTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg	J) UG/L	Q	Rev Quad
74-82-8	Methane		30.3		

FORM I SV-1

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FID ORC	1B GANICS ANALYSIS DATA SHEE	г 	EPA SAMPLE NO.
Lab Name: GENERAL ENG	INEERING LABOR Contract	: N/A	133MW014
Lab Code: N/A (Case No.: N/A SAS No.	N/A SDG N	o.: 119996
Matrix: (soil/water)	GROUND WAT	Lab Sample ID:	119996002
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	02082001
Level: (low/med)	LOW	Date Received:	08/26/04
<pre>% Moisture:</pre>	decanted: (Y/N)	Date Extracted:	08/31/04
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed:	08/31/04
Injection Volume:	1.0(uL)	Dilution Factor	: 1.0
GPC Cleanup: (Y/N)	N		

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

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74-82-8----- Methane______ 53.1

COMPOUND

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CAS NO.

FORM I SV-1

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Step, Inc. 1006 Floyd Culler Ct. Address 1 Oak Ridge, Tennessee 37830 Report Date: September 15, 2004 Contact: Mr. Doug Hawn Project: Hunter Army Airfield SWMU 133 Page 1 of 2 Client Sample ID: 133MW002 Project: STEP00104 Client ID: 119996001 STEP001 Sample ID: Ground Water Matrix: Coffect Date: 25-AUG-04-09:40 Receive Date: 26-AUG-04 Collector: Client Parameter Qualifier Result RL. Units AnalystDate Time Batch Method ու ton Chromatography Federal EPA 300.0 Anions Liquid 0.0341 1 MAR108/27/04 0017 360871 П 0.00 0.100 mg/L Nitrate-N u. 1 Sulfate 249 8.00 20 MAR109/06/04 0848 360871 3.86 mg/L 2 **Titration Analysis Federal** EPA 310.1 Total Alkalinity Federal Alkalinity, Total as CaCO3 Ð 0.00 1.45 2.00 mg/L BEP2 09/07/04 1307 363498 - 3 u The following Analytical Methods were performed Method Description Analyst Comments EPA 300.0 8PA 300.0 EPA 310,1 Notes:

The Qualifiers in this report are defined as follows :

< Result is less than amount reported.

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Result is greater than amount reported. ≻

R Target analyte was detected in the sample as well as the associated blank.

Ε Concentration of the target analyte exceeds the instrument calibration range.

Н Analytical holding time exceeded,

Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit. Т

P The response between the confirmation column and the primary column is >10%D.

11 Indicates the target analyte was analyzed for but not detected above the detection limit.

х Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.

Y QC Samples were not spiked with this compound.

h Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

60

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Address : Contact: Project:	Step, Inc. 1006 Floyd Culle: Oak Ridge, Tenne Mr. Doug Hawn Hunter Army Ai	r Ct. essee 378 rfield SV	130 YMTU 133				R	eport Date: Septe Page	ember e l	16, 2004 of	2
	Client Sample I Sample ID: Matrix: Collect Date: Receive Date: Collector:	D:	133MW004 120193001 Ground Water 26-AUG-04 08:50 27-AUG-04 Client		Pi C	roiect: lient ID Rw):	STEP00104 STEP001			
Parameter	Qualifier	Result	DL	RL	Units	QHAI)F	AnalystDate	Time	Batch	Method
ion Chromatography Fed	leral										<u></u>
EPA 300.0 Anions Liquid Nitrate-N Sulfate Fitration Analysis Federa EPA 310.1 Total Alkalini	l U ilv Federal	0.118 338	0.0341 9.65	0.100 20.0	mg/L mg/L	u	ן 50	MAR1 08/28/04 VH1 09/09/04	0638 0716	361409 361409	1 2
Alkalinity, Total as CaCO	03 U	0.00	1,45	2.00	mg/L	и		EXN1 09/08/04	1601	363852	3
The following Analytical	Methods were p	erformed									·
Method	Description				Analyst Com	ments					
2	EPA 300.0										
2	EPA 300.0										
3	EPA 310.1										

Notes:

The Qualifiers in this report are defined as follows :

< Result is less than amount reported.

Result is greater than amount reported.

B Target analyte was detected in the sample as well as the associated blank.

E Concentration of the target analyte exceeds the instrument calibration range.

H Analytical holding time exceeded.

J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.

P The response between the confirmation column and the primary column is >40%D.

U Indicates the target analyte was analyzed for but not detected above the detection limit.

X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.

Y QC Samples were not spiked with this compound.

h Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

41

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gei.com

Certificate of Analysis

Company :	Step, Inc.										2
Address :	1006 Floyd Culler (Ct									
	Oak Ridge, Tennes:	see 37830									
Contact	Mr. Doug Hawn						Repo	rt Date: Sept	ember	16,2004	
Project:	Hunten tung tin	Fald SMALTI 1	77					Page	a 1	of	1
r toject.	namer Army Airi	ieiu Smirio i	35					1 45	• •	Q1	•
	Client Sample ID Sample ID: Matrix: Collect Date: Receive Date:	9: 133M 12019 Groue 26-Al 27-A	(W005 03002 nd Water UG-04 09:50 UG-04		Pe Cl	oject: lient ID:	S S	FEP00104 FEP001			
	Collector:	Clien	1			Rev					
Parameter	Qualifier	Result	DL	RL	Units	Jud DI	5 A	nalystDate	Time	Batch	Method
Ion Chromatography F	ederal		<u> </u>			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
EPA 300.0 Anions Lig	uid										
Nitrate-N	U	0.00	0.0341	0.100	mg/L	L	1 M	ARI 08/28/04	0734	361409	1 :
Sulfate		56.2	0.386	0.800	mg/L		2 V	HI 09/09/04	0814	361409	2
Titration Analysis Fede	ral										
EPA 310 I Total Alkal	inity Federal										
Alkalinity, Total as Ca	CO3	9.44	1.45	2.00	mg/L		E	XNI 09/08/04	1602	363852	3
The following Analytic	al Methods were per	formed									
Method	Description			A	nalyst Com	ments					
I	EPA 300.0			<u> </u>							
2	EPA 300.0										
3	EPA 310,1										

Notes:

The Qualifiers in this report are defined as follows :

- < Result is less than amount reported.
- > Result is greater than amount reported.
- B Target analyte was detected in the sample as well as the associated blank.
- Ε Concentration of the target analyte exceeds the instrument calibration range.
- Н Analytical holding time exceeded.
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- Р The response between the confirmation column and the primary column is >40%D.
- υ Indicates the target analyte was analyzed for but not detected above the detection limit.
- Х Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

-2la.B Reviewed by

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.get.com

Certificate of Analysis

Com Aitdr	pany : S ess : I C	itep, In 000 Fb Jak Ric	e. oyd Culler Ige, Tenne:	Ct. ssee 378	30				n			10.000	
Cont	oet: N	dr. Doi	ug Hawn						Ke	eport Date: Sept	enner	15, 2004	
Proje	et: }	lunter	- Army Aiı	field SV	VMU 133					Pag	e l	of	1
		Client Sample Matrix Collect Receiv	Sample II e ID: :: t Date: re Date: tor:):	133MW008 119996003 Ground Wat 25-AUG-04 26-AUG-04	er 13:20		Proi Clie Re	iect: int ID:	STEP00104 STEP001			
Parameter		Qui	allier	Result	Client	DL.	RL	Units	አዳ DF	AnalystDate	Time	Batch	Method
lon Chromatogra	phy Fede	rat								-			
EPA 300.0 Anion	s Liquid												
Nimue-N				0.148	•	0.0341	0.100	mg/L	1	MAR108/27/04	0131	360871	1
Sulfare				1350		19.3	40.0	mg/Ł	100	MAR L 09/06/04	1006	360871	2
Titration Analysis	federal	. .											
EPA 310.1 Total	Alkalinity	i Feder	ral	0.00		1.45	2.00			D.C.D	1.2.10	242.00	
Autoriniuy, rodu	as caco	.,	0	0.00		1.45	2.00	ጠያገር	u	BEP2 09/07/04	1210	303498	2
The following Au	nlytical l	Methor	ds were pe	rformed									
Method		Descri	iption				Ê	Analyst Counu	ients				
I		EPA 3	00.0										
1		EPA 3	00.0										
۶,		вра з	10.1										
Notes: The Qualifiers	in this re	port a	we defined	l as folte	ows :								

< > Result is greater than amount reported.

٠.

- B Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- Н Analytical holding time exceeded.
- 1 Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- P The response between the confirmation column and the primary column is >40%D.
- Indicates the target analyte was analyzed for but not detected above the detection limit. U
- Lab-specific qualifier-glease see case nurrative, data summary package or contact your project manager for details. Х
- Y QC Samples were not spiked with this compound.
- Sample preparation or preservation holding time exceeded. 'n

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

Reviewed by

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Step, Inc. Address 1006 Floyd Culler Ci. Oak Ridge, Tennessee 37830 Report Date: September 15, 2004 Contact: Mr. Dong Hawn Project: Hunter Army Airfield SWMU 133 Page Т ΰf 133MW009 STEP00104 Client Sample ID: Project: Client ID: STEP001 119996004 Sample ID: Matrix: Ground Water Collect Date: 25-AUG-04 15:10 Rev Receive Date: 26-AUG-04 Collector: Client Qud Oualifier Result RL Unite DF Time Batch Method Parameter AnalystDate DL. Ion Chromatography Federal EPA 300.0 Anious Liquid 0.0341 MAR108/27/04 0149 360871 0.172 0.100Nitrate-N mg/L 1 1 Suffate 3190 19.3 40.0 mg/L 100 MAR109/06/04 1025 360871 2 **Titrution Analysis Federal** EPA 310.1 Total Alkalinity Federal Alkalinity, Total as CaCO3 U 0.00 1.45 2.00u BEP2 09/07/04 1310 363498 3 me/L The following Analytical Methods were performed Analyst Comments Method Description EPA 300.0 EPA 300.0 EPA 310.1 Notes: The Qualifiers in this report are defined as follows : Result is less than amount reported. Result is greater than amount reported. Target analyte was detected in the sample as well as the associated blank. Concentration of the target analyte exceeds the instrument calibration range. Analytical holding time exceeded. Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit. The response between the confirmation column and the primary column is >40%D.

11 Indicates the target analyte was analyzed for but not detected above the detection limit.

Х Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.

QC Samples were not spiked with this compound. Y

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h Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

Reviewed b

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Compar Address	iy : Step, Inc. : 1006 Floyd Culler Oak Ridge, Tennes	C1. see 378	30										
C	Mr. Davie Hause							Re	port D	ate: Sept	eniber	14, 2004	1
Contact	Mr. Doug Hawn												
Project:	Hunter Army Air	field SY	YMU 133							Pag	e l	of	1
	Client Sample ID Sample ID: Matrix: Collect Date: Receive Date: Collector:):	133MW010 119861004 Ground Wate 24-AUG-04 1 25-AUG-04 Client	r 16:00	Ĩ	2 Dural	Pro Cli	oject: ent ID:	STEP STEP	00104 001			
Parameter	Qualifier	Result		DL.	RL	<u></u>	Units	DF	Anal	stDate	Time	Batch	Method
Ion Chromatography	y Federal												
EPA 300.0 Anions L Nitrate-N Sulfate Titration Analysis Fo	<i>iquid</i> deral	2.24 13800		0.0341 3860	0.100 8000		mg/L mg/L	ا 20000	VHI VHI	08/26/04 08/31/04	1103 1056	360471 360471	1 2
EPA 310.1 Total All Alkalinity, Total as	calinity Federal CaCO3 U	0.00		1.45	2.00	u	mg/L		BEP2	09/07/04	1111	363498	3
The following Analy	tical Methods were per	formed			<u></u> .	<u> </u>							
Method	Description					Anal	yst Comn	nents		<u></u>			
1	EPA 300.0												
2	ÉPA 300.0												
J	EPA 310.1												
Notes: The Qualifiers in	this report are defined	as follo	ows :										
 Result is less the Result is greated Result is greated Target analyte Concentration Analytical hole Indicates an est 	han amount reported. In than amount reported was detected in the sa of the target analyte ex- ding time exceeded.	d. mple as cceeds t	well as the as he instrument	sociated b calibration	lank. n range. n linnit b	ut lee	s than the	e reportin	a limit				

- J Р The response between the confirmation column and the primary column is >40%D.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- Х Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

n Bc Reviewed by

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Comç Addre Conta Proies	oany : ess : iet: et:	Step, Inc. 1006 Floy Oak Ridg Mr. Doug Hunter A	d Culler e, Tenne Hawn	Ct. ssee 378 field SV	330 VMU 133					R	eport D	ate: Septo Page	ember	14, 2004 of	
		Client Sample I Matrix: Collect I Receive Collecto	ample [] [D: Date: Date: []	D:	133MW011 119861003 Ground Water 24-AUG-04 14 25-AUG-04 Client	4:45	م م	ev Incl	Pro Cli	biect: ent ID:	STEP STEP	00104 001			
Paranieter		Quali	fier	Result		DL	RL		Units	DF	Anal	ystDate	Time	Batch	Method
Ion Chromatograp	ohy Fec	leral					· // // // // // // // // // // // /			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
EPA 300.0 Anion:	s Liquia	1													
Nitrate-N Sulfate Titration Analysis	Federa	ı	ប	0.00 13100		0.0341 3860	0.100 8000	ч	mg/L, mg/L	1 20000	VH1 VH1	08/26/04 08/31/04	1044 1037	360471 360471	1 2
FPA 310 Total	Alkalini	 its Federal	,												
Alkalinity, Total a	as CaC(03	U	0.00		1.45	2.00	и	mg/L		BEP2	09/07/04	1110	363498	3
The following An	alytical	Methods	were pe	rformed											
Method		Descript	ion					Anal	yst Com	nents					
1		EPA 300	.0		,										
2		EPA 300	.0												
3		EPA 310	.1												

Notes:

The Qualifiers in this report are defined as follows :

- < Result is less than amount reported.
- Result is greater than amount reported. >
- В Target analyte was detected in the sample as well as the associated blank.
- Concentration of the target analyte exceeds the instrument calibration range. Έ
- Н Analytical holding time exceeded.
- Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit. J.
- Ρ The response between the confirmation column and the primary column is >40%D.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details. Х
- Y QC Samples were not spiked with this compound.
- Sample preparation or preservation holding time exceeded. h

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

Reviewed by

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Step, Inc. Address : 1006 Floyd Culler Ct. Oak Ridge, Tennessee 37830 Report Date: September 14, 2004 Contact: Mr. Doug Hawn Project: Hunter Army Airfield SWMU 133 Page I of 1 133MW012 Client Sample ID: STEP00104 Project: Sample ID: 119861002 Client ID: STEP001 Matrix: Ground Water Collect Date: 24-AUG-04 11:30 Receive Date: 25-AUG-04 Collector: <u>Client</u> Parameter Qualifier Result DL RL Units DF AnalystDate Time Batch Method Ion Chromatography Federal EPA 300.0 Anions Liquid Nitrate-N U 0.00 0.0341 0.100 u 08/26/04 1025 360471 mg/L VHI 1 Sulfate 08/31/04 1017 360471 25.7 0.193 0.400 mg/L VH1 2 **Titration Analysis Federal** EPA 310.1 Total Alkalinity Federal Alkalinity, Total as CaCO3 U 0.00 1.45 2.00 и mg/L BEP2 09/07/04 1108 363498 3 The following Analytical Methods were performed Method Description Analyst Comments EPA 300.0 EPA 300.0 EPA 310.1

Notes:

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The Qualifiers in this report are defined as follows :

- < Result is less than amount reported.
- Result is greater than amount reported. >
- В Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- Н Analytical holding time exceeded.
- Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit. ſ
- р The response between the confirmation column and the primary column is >40%D.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- Х Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Ŷ QC Samples were not spiked with this compound.
- 12 Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

Reviewed by

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Step, Inc. 1006 Floyd Culler Ct. Address : Oak Ridge, Tennessee 37830 Report Date: September 14, 2004 Contact: Mr. Doug Hawn Project: Hunter Army Airfield SWMU 133 Page Ι of 2 133MW013 STEP00104 Client Sample ID: Project: Sample ID: 119861001 Client ID: STEP001 Matrix: Ground Water Collect Date: 24-AUG-04 09:50 Receive Date: Rev 25-AUG-04 Collector: Client Qualifier Result Units Parameter DL RL DF AnalystDate Time Batch Method Ion Chromatography Federal EPA 300.0 Anions Liquid ĸ VH1 08/26/04 0926 360471 Nitrate-N U 0.0341 0.100 0.00 mg/L t 1 Sulfate 18.4 0.193 0.400 mg/L $\nabla H1$ 08/31/04 0919 360471 2 **Titration Analysis Federal** EPA 310.1 Total Alkalinity Federal 1.45 BEP2 09/07/04 1107 363498 Alkalinity, Total as CaCO3 IJ 0.00 2.00U mg/L 3 The following Analytical Methods were performed Analyst Comments Method Description EPA 300.0 EPA 300.0 EPA 310.1

Notes:

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The Qualifiers in this report are defined as follows :

- < Result is less than amount reported.
- Result is greater than amount reported. >
- в Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- Н Analytical holding time exceeded.
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- Ρ The response between the confirmation column and the primary column is >40%D.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- Х Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- Sample preparation or preservation holding time exceeded. h

The above sample is reported on an "as received" basis.

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

	Company :	Step. Inc.											
	Address :	1006 Floyd Culle	a Ca										
		Oak Ridge, Tenn	essee 378	30									
	Control	Mr. Doug Manua							R	eport Date: Septe	mber	15, 2004	l
	Contact:	Mr. Long nami											
	Project:	Hunter Army A	irfield SV	/MU 133						Page	: 1	of	l
		Client Sample Sample ID: Matrix: Collect Date: Receive Date:	ID:	133MW014 119996002 Ground Wate 25-AUG-04 26-AUG-04	er 10:55		Pn Cl	oiect: ient II	D:	STEP00104 STEP001			
		Collector:		Client			Ę	w.					
Paramet	er,	Qualifier	Result	•	DL	RL	Units	Jud	ÐF	AnalystDate	Time	Batch	Method
Ion Citrons	atography Fe	deral											
EFA 300.0) Aaio <mark>ns Liqu</mark> i	d											
Nitrate-N		IJ	0.00		0.0341	0.100	nig/L	u	1	MAR108/27/04	0113	360871	1
Sulfate			185		1.93	4.00	mg/L		10	MAR109/06/04	0946	360871	2
Titration A	nalysis Feder	al											
EFA 310.1	Total Alkalin	ity Federal											
Alkalinity	. Total as CaC	U CO	0.00		1.45	2.00	mg/L	и		BEP2 09/07/04	1308	363498	3
The follow	ing Analytica	ll Methods were p	erformed										
Method	· · ·	Description				A	unalyst Corn	ments					
1		EPA 300.0											
2		EPA 300.0											
3		EPA 310.1											
Notes: The Qua	litiers in this	report are define	ed as folio)ws :									
< Result > Result B Targe E Conce H Analy I Indica P The re U Indica	t is less than t is greater th t analyte was intration of t stical holding tes an estima esponse betw ates the targe	amount reported ian amount report s detected in the he target analyte time exceeded, ted value. The re een the confirma- t analyte was and	ted. sample as exceeds i esult was ition colu ilyzed for	well as the a the instrument greater than t mn and the pr r hut not detec	ssociated t t calibratio he detectio imary colu- tted above	blank. n range. on limit, but imn is >409 the detectic	t less than the 7D. 20 limit.	ie rep	ortin	g limit.			

Х Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.

Y QC Samples were not spiked with this compound.

h Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

Reviewed by

February 2005

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Receipt Narrative for STEP, Inc. Work Order: 130039

February 23, 2005

Laboratory Identification:

General Engineering Laboratories, LLC 2040 Savage Road Charleston, South Carolina 29407 (843) 556-8171

Summary:

Sample receipt The sample arrived at General Engineering Laboratories, LLC, Charleston, South Carolina on February 04, 2005 for analysis.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
130039001	TB-03
130039002	RS-01
130039003	EQ-01
130039004	133MW005

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package: The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Flame Ionization Detector, General Chemistry and Volatile.

Project Manager

GENERAL ENGINEERING LABORATORIES, LLC a Member of THE GEL GROUP, INC. P.O. Box 30712 • Charleston, SC 29417 • 2040 Savage Road (29407) Phone (843) 556-8171 • Fax (843) 766-1178 • www.gel.com Receipt Narrative for STEP, Inc. Work Order: 129892 12

February 22, 2005

Laboratory Identification:

General Engineering Laboratories, LLC 2040 Savage Road Charleston, South Carolina 29407 (843) 556-8171

Summary:

Sample receipt The sample arrived at General Engineering Laboratories, LLC, Charleston, South Carolina on February 02, 2005 for analysis.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
129892001	TB-01
129892002	133MW013
1 2989200 3	133MW012
129892004	133MW912
129892005	133MW011
129892006	133MW010
129892007	133MW010M

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package: The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Flame Ionization Detector, General Chemistry and Volatile.

Sarah Kozlijk Project Manager

GENERAL ENGINEERING LABORATORIES, LLC a Member of THE GEL GROUP, INC. P.O. Box 30712 • Charleston, SC 29417 • 2040 Savage Road (29407) Phone (843) 556-8171 • Fax (843) 766-1178 • www.gel.com Receipt Narrative for STEP, Inc. Work Order: 129948

February 22, 2005

Laboratory Identification:

General Engineering Laboratories, LLC 2040 Savage Road Charleston, South Carolina 29407 (843) 556-8171

Summary:

Sample receipt The sample arrived at General Engineering Laboratories, LLC, Charleston, South Carolina on February 03, 2005 for analysis.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
129948001	TB-02
129948002	133MW002
129948003	133MW014
129948004	133MW008
129948005	133MW009
129948006	133MW004

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package: The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Flame Ionization Detector, General Chemistry and Volatile.

Project Manager

GENERAL ENGINEERING LABORATORIES, LLC a Member of THE GEL GROUP, INC. P.O. Box 30712 • Charleston, SC 29417 • 2040 Savage Road (29407) Phone (843) 556-8171 • Fax (843) 766-1178 • www.gel.com





OLM03.0

1A VOLATILE ORGANICS ANALYSIS DATA SHEET		EPA SAMPLE NO.	
Lab Name: GEL, LLC.		Contract: N/A	133MW004
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 129948
Matrix: (soil/water)	WATER	Lab Sample ID:	: 129948006
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	3X120
Level: (low/med)	LOW	Date Received:	: 02/03/05
% Moisture: not dec.		Date Analyzed:	02/14/05
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	Volume:(uL)

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1A VOLATILE ORGANICS ANALYSIS DATA SHEET			EPA SAMPLE NO.
Lab Name: GEL, LLC.	(Contract: N/A	133MW005
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 130039
Matrix: (soil/water)	WATER	Lab Sample ID:	130039004
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	3X215
Level: (low/med)	LOW	Date Received:	02/03/05
% Moisture: not dec.		Date Analyzed:	02/15/05
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	r: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	olume:(uL)

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1A VOLATILE ORGANICS ANALYSIS DATA SHEET		EPA SAMPLE NO.	
Lab Name: GEL, LLC.		Contract: N/A	133MW008
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 129948
Matrix: (soil/water)	WATER	Lab Sample ID	: 129948004
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	3X118
Level: (low/med)	LOW	Date Received	: 02/03/05
% Moisture: not dec.	<u> </u>	Date Analyzed	: 02/14/05
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	/olume:(uL)

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1A VOLATILE ORGANICS ANALYS	EPA SAMPLE NO.
Lab Name: GEL, LLC.	Contract: N/A
Lab Code: N/A Case No.: N/A	SAS No.: N/A SDG No.: 129948
Matrix: (soil/water) WATER	Lab Sample ID: 129948005
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 3X119
Level: (low/med) LOW	Date Received: 02/03/05
% Moisture: not dec.	Date Analyzed: 02/14/05
GC Column: DB-624 ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)



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1A VOLATILE ORGANICS ANALYSIS DATA SHEET			EPA SAMPLE NO.
Lab Name: GEL, LLC.	c	Contract: N/A	133MW010
Lab Code: N/A C	ase No.: N/A	SAS No.: N/A SDG	No.: 129892
Matrix: (soil/water)	WATER	Lab Sample ID	: 129892006
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	3X212
Level: (low/med)	LOW	Date Received:	: 02/15/05
% Moisture: not dec.		Date Analyzed:	02/15/05
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:_	(uL)	Soil Aliquot V	/olume:(uL)

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CAS NO.	COMPOUND	CONCENTRATION UN (ug/L or ug/Kg) 1	ITS: UG/L	Q	Rew Qued
1634-04-4 71-43-2 108-88-3 100-41-4 1330-20-7	tert-Butyl me Benzene Toluene Ethylbenzene_ Xylenes (tota	ethyl ether	1.0 1.0 0.50 3.0 7.7	U U J	4 5 2

FORM I VOA

1A VOLATILE ORGANICS ANALYSIS DATA SHEET		EPA SAMPLE NO.	
Lab Name: GEL, LLC.		Contract: N/A	133MW011
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 129892
Matrix: (soil/water)	WATER	Lab Sample ID	: 129892005
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	3X112
Level: (low/med)	LOW	Date Received	: 02/02/05
% Moisture: not dec.		Date Analyzed	: 02/14/05
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	/olume:(uL)

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CAS NO.	COMPOUND	CONCENTRATION UNIT (ug/L or ug/Kg) UC	rs: 3/L	Q	Rwdud
1634-04-4 71-43-2 108-88-3 100-41-4 1330-20-7	tert-Butyl me Benzene Toluene Ethylbenzene_ Xylenes (tota	thyl ether	1.0 1.0 0.70 1.2	บ บ บ J	1 1 1 1 1

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1A VOLATILE ORGANICS ANALYSIS DATA SHEET		EPA SAMPLE NO.	
Lab Name: GEL, LLC.		Contract: N/A	133MW012
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 129892
Matrix: (soil/water)	WATER	Lab Sample ID	: 129892003
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	3 X1 10
Level: (low/med)	LOW	Date Received	: 02/02/05
% Moisture: not dec.		Date Analyzed:	: 02/14/05
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	/olume:(uL)

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VOLATILE	1A ORGANICS ANALYSI	S DATA SHEET	EPA SAMPLE NO.
Lab Name: GEL, LLC.		Contract: N/A	133MW013
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 129892
Matrix: (soil/water)	WATER	Lab Sample ID	: 129 892002
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	3x109
Level: (low/med)	LOW	Date Received	: 02/02/05
% Moisture: not dec.	·····	Date Analyzed	: 02/14/05
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot	/olume:(uL)

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CAS NO.	COMPOUND	CONCENTRATION UNIT (ug/L or ug/Kg) UG	'S: //L	Q	RevQuel
1634-04-4 71-43-2 108-88-3 100-41-4 1330-20-7	tert-Butyl me Benzene Toluene Ethylbenzene_ Xylenes (tota	thyl ether	1.0 1.0 1.0 1.0 1.0	U U U U U	x J

OLM03.0

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1A VOLATILE ORGANICS ANALYSIS DATA SHEET		EPA SAMPLE NO.	
Lab Name: GEL, LLC.		Contract: N/A	133MW014
Lab Code: N/A	Case No.: N/A	SAS No.: N/A SDG	No.: 129948
Matrix: (soil/water)	WATER	Lab Sample ID:	129948003
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	3X214
Level: (low/med)	LOW	Date Received:	02/03/05
% Moisture: not dec.		Date Analyzed:	02/15/05
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	olume:(uL)

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CAS NO.	COMPOUND	CONCENTRATION	UNITS: J) UG/L	Q	Rudud
1634-04-4	tert-Butyl me	thyl ether	1.0	U	u
108-88-3	Toluene		1.0	U J	4
1330-20-7	Xylenes (tota	1)	1.0	Ū	6

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FORM I VOA

FID OR	1B GANICS ANALYSIS DATA SHEE	EPA SAMPLE NO.	
Lab Name: GENERAL EN	GINEERING LABOR Contract	133MW002	
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.: 129948	
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 129948002	
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 022B2201	
Level: (low/med)	LOW	Date Received: 02/03/05	
% Moisture:	decanted: (Y/N)	Date Extracted:02/09/05	
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 02/09/05	
Injection Volume:	1.0(uL)	Dilution Factor: 1.0	
GPC Cleanup: (Y/N)	N		
CAS NO.	CONCE COMPOUND (ug/L	INTRATION UNITS: or ug/Kg) UG/L Q $\mathcal{R}_{\mathcal{W}}$	ynal

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74-82-8Methane	275	
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OLM03.0

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FID OR	1B GANICS ANALYSIS DATA SHEE	EPA SAMPLE	E NO.
Lab Name: GENERAL EN	GINEERING LABOR Contract	: N/A	
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.: 129948	3
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 129948006	
Sample wt/vol:	1,000 (g/mL) ML	Lab File ID: 027B2701	
Level: (low/med)	LOW	Date Received: 02/03/05	
% Moisture:	decanted: (Y/N)	Date Extracted:02/09/05	
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 02/09/05	
Injection Volume:	1.0(uL)	Dilution Factor: 1.0	
GPC Cleanup: (Y/N)	N		
CAS NO.	CONCER COMPOUND (ug/L	NTRATION UNITS; or ug/Kg) UG/L Q	RwQnu
74-82-8	Methane	14.0 U	l u

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FID OR	1B SANICS ANALYSIS DATA SHEE	EPA SAMPLE NO.
Lab Name: GENERAL EN	GINEERING LABOR Contract	133MW005
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.: 130039
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 130039004
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 032B3201
Level: (low/med)	LOW	Date Received: 02/04/05
% Moisture:	decanted: (Y/N)	Date Extracted:02/09/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 02/09/05
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	
	20108	

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q Rev Qual 74-82-8-----Methane _____ 20.8 ____

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FID OR	1B GANICS ANALYSIS DATA SHEE	EPA SAMPLE NO.
Lab Name: GENERAL ENG	GINEERING LABOR Contract	: N/A
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.: 129948
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 129948004
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 025B2501
Level: (low/med)	LOW	Date Received: 02/03/05
<pre>% Moisture:</pre>	decanted: (Y/N)	Date Extracted:02/09/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 02/09/05
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	
CAS NO.	CONCER COMPOUND (ug/L	NTRATION UNITS: or ug/Kg) UG/L Q Rev Qud

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74-82-8Methane	14.0	υ	ц
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FORM I SV-1

FID OR	1B GANICS ANALYSIS DATA SHEE	r	EPA SAMPLE NO.
Lab Name: GENERAL ENG	GINEERING LABOR Contract	: N/A	133MW009
Lab Code: N/A	Case No.: N/A SAS No.	N/A SDG	No.: 129948
Matrix: (soil/water)	GROUND WAT	Lab Sample ID:	129948005
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	026B2601
Level: (low/med)	LOW	Date Received:	02/03/05
% Moisture:	decanted: (Y/N)	Date Extracted	:02/09/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed:	02/09/05
Injection Volume:	1.0(uL)	Dilution Facto	r: 1.0
GPC Cleanup: (Y/N)	N		
CAS NO.	CONCER COMPOUND (ug/L	VTRATION UNITS: or ug/Kg) UG/L	e Rev Zurd
74-82-8	Methane		14.0 U U



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1B FID ORGANICS ANALYSIS DATA SH	EPA SAMPLE NO.
Lab Name: GENERAL ENGINEERING LABOR Contra	133MW010
Lab Code: N/A Case No.: N/A SAS N	o.: N/A SDG No.: 129892
Matrix: (soil/water) GROUND WAT	Lab Sample ID: 129892006
Sample wt/vol: 1.000 (g/mL) ML	Lab File ID: 01581501
Level: (low/med) LOW	Date Received: 02/02/05
<pre>% Moisture: decanted: (Y/N)</pre>	Date Extracted:02/09/05
Concentrated Extract Volume: 1.00(mL)	Date Analyzed: 02/09/05
Injection Volume: 1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N	
CON CAS NO. COMPOUND (ug	CENTRATION UNITS: /Lor ug/Kg) UG/L Q Rev Qual

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CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q	Rev &
74-82-8	Methane		14.3		

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FID ORGANIC:	1B 'S ANALYSIS DATA SHEE'	T	PA SAMPLE NO.
Lab Name: GENERAL ENGINEE	RING LABOR Contract	: N/A	133MW011
Lab Code: N/A Case N	NO.: N/A SAS NO.	N/A SDG No	.: 129892
Matrix: (soil/water) GROUN	ND WAT	Lab Sample ID: 1	29892005
Sample wt/vol: 1.000	0 (g/mL) ML	Lab File ID: 0	14B1401
Level: (low/med) LOW		Date Received: 0	2/02/05
% Moisture: decar	nted: (Y/N)	Date Extracted:0	2/09/05
Concentrated Extract Volum	me: 1.00(mL)	Date Analyzed: 0	2/09/05
Injection Volume: 1.0	(uL)	Dilution Factor:	1.0
GPC Cleanup: (Y/N) N			
CAS NO. CON	CONCEN MPOUND (ug/L	NTRATION UNITS: or ug/Kg) UG/L	e Rwqud
74-82-8Met	thane		4.0 U U

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1B FID ORGANICS ANALYSIS DATA SHEP	EPA SAMPLE NO.
Lab Name: GENERAL ENGINEERING LABOR Contract	133MW012
Lab Code: N/A Case No.: N/A SAS No.	: N/A SDG No.: 129892
Matrix: (soil/water) GROUND WAT	Lab Sample ID: 129892003
Sample wt/vol: 1.000 (g/mL) ML	Lab File ID: 012B1201
Level: (low/med) LOW	Date Received: 02/02/05
<pre>% Moisture: decanted: (Y/N)</pre>	Date Extracted:02/09/05
Concentrated Extract Volume: 1.00(mL)	Date Analyzed: 02/09/05
Injection Volume: 1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N	
CONCE CAS NO. COMPOUND (ug/L	ntration UNITS: or ug/Kg) UG/L Q Rev Quel
74-82-8Methane	37.6

OLM03.0

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1B FID ORGANICS ANALYSIS DA	EPA SAMPLE NO.
Lab Name: GENERAL ENGINEERING LABOR C	Contract: N/A
Lab Code: N/A Case No.; N/A	SAS No.: N/A SEG No.: 129892
Matrix: (soil/water) GROUND WAT	Lab Sample ID: 129892002
Sample wt/vol: 1.000 (g/mL) ML	Lab File ID: 011B1101
Level: (low/med) LOW	Date Received: 02/02/05
% Moisture: decanted: (Y/N)	Date Extracted:02/09/05
Concentrated Extract Volume: 1.00(m	L) Date Analyzed: 02/09/05
Injection Volume: 1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N	
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q Rwqud
74-82-8Methane	14.0 U K

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OLM03.0

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FID OR	1B GANICS ANALYSIS DATA SHEE	r	NPA SAMPLE NO.
Lab Name: GENERAL EN	GINEERING LABOR Contract	: N/A	133MW014
Lab Code: N/A	Case No.: N/A SAS No.	N/A SDG NG	o.: 129948
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 1	29948003
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 0	2482401
Level: (low/med)	LOW	Date Received: 0	2/03/05
% Moisture:	decanted: (Y/N)	Date Extracted:(2/09/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 0	2/09/05
Injection Volume:	1.0(uL)	Dilution Factor:	1.0
GPC Cleanup: (Y/N)	N		
CAS NO.	CONCEN COMPOUND (ug/L	VTRATION UNITS: or ug/Kg) UG/L	Rev Quel
74-82-8	Methane	1	4.0 U K


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Certificate of Analysis

company.	Step, Inc.										
Address :	1006 Floyd Culle	r Ct.									
	Oak Ridge, Tenn	essee 378	330				ס	anori Datai – Eshi		7 2005	
Contact:	Mr. Doug Hawn						R.	epore Date: reol	uary i	7, 2005	
Project:	Hunter Army A	irfield SV	YMU 133					Pag	e l	of	2
	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:	ID:	133MW002 129948002 Ground W2 02-FEB-05 03-FEB-05 Clisut	2 Ner 08:45		Proj Clie	ect: nt ID:	STEP00104 STEP001			
Parameter	Qualifier	Result	Ewar	L DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography F	ederal										
EPA 300.0 Anions Liqi	ud										
Nitrate-N	U	0.00	ĸ	0.0341	0.100	mg/L	1	MAR102/04/05	0249	399166	1
Sulfate		138		1.93	4.00	mg/L	10	MAR102/05/05	0408	399166	2
Titration Analysis Fede	ral										
EPA 310.1 Total Alkali	inity Federal										
Alkalinity, Total as Ca	CO3 U	0.00	u	1.45	2.00	mg/L		KXM 02/03/05 2	1721	399088	3
The following Analytic	al Methods were p	erformed	1								
Method	Description				A	nalyst Comm	ents				
1	EPA 300.0							· · · · · · · · · · · · · · · · · · ·			
2	EPA 300.0										
3	EPA 310.1										
Notes: The Qualifiers in thi	s report are define	d as foll	ows :								

** Indicates the analyte is a surrogate compound.

- < Result is less than amount reported.
- Result is greater than amount reported.
- B Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- P The response between the confirmation column and the primary column is >40%D.
- R Sample results are rejected due to sample preservation with HCl.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

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Certificate of Analysis

Company :	Step, Inc.											
Address :	1006 Floyd Culle	r Ct.										
	Qak Ridge, Tenno	essee 3783	30				_	_				
Control	Mr. Doug Unico						R	eport Dat	e: Febr	uary E	7, 2005	
Comact:	Mi Doug nawa	e							Dag		-f	2
Project:	Hunter Army A	rnela Sw	WU 133						Lafe	- 1	01	2
	Client Sample I Sample ID: Matrix: Collect Date: Receive Date:	D:	133MW004 129948006 Ground Water 02-FEB-05 15 03-FEB-05	i:45		Proi Clie	ect: nt ID:	STEPO STEPO	0104 01			
	Collector:		Client					<u> </u>				
Parameter	Qualifier	Result	Re Jud	DL	RL	Units	DF	Analys	tDate	Time	Batch	Method
Ion Chromatography F	ederal											
EPA 300.0 Anions Liq Nitrate-N Sulfate	uid	0.791 142		0.0341 1.93	0.100 4.00	mg/L. mg/L	1 01	MARI (MARI ()2/04/05)2/05/05	0441 0600	399166 399166	1 2
Titration Analysis Fede	ral					-						
EPA 310.1 Total Alkal	inity Federal											
Alkalinity, Total as Ca	CO3 U	0.00	К	1.45	2.00	mg/L		КХМ (2)2/03/05	1729	399088	3
The following Analytic	al Methods were p	rformed										
Method	Description				Å	nalyst Comm	ents					
1	EPA 300.0											
2	EPA 300.0											
3	EPA 310.1											
Notes: The Qualitiers in thi	s report are defined	d as follo	ws :									
 Indicates that a qu Indicates the anal Result is less than Result is greater t B Target analyte wa E Concentration of H Analytical holdin 	ahity control analy lyte is a surrogate of amount reported. han amount report us detected in the s the target analyte e g time exceeded.	te recove compound ed. ample as exceeds th	ry is outside o d. well as the ass ne instrument o	f specifie ociated b calibratio	d acceptance lank. n range.	e criteria.						

J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.

P The response between the confirmation column and the primary column is >40%D.

R Sample results are rejected due to sample preservation with HCl.

U Indicates the target analyte was analyzed for but not detected above the detection limit.

X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.

Y QC Samples were not spiked with this compound.

h Sample preparation or preservation holding time exceeded.

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Certificate of Analysis

Company :	Step, Inc.
Address :	1006 Floyd Culler Ct.
	Oak Ridge, Tennessee 37830

Contact: Mr. Doug Hawn Project: Hunter Army Airfield SWMU 133 Report Date: February 18, 2005

Page 1 of 2

Client Sample ID:133MW005Sample ID:130039004Matrix:Ground WaterCollect Date:03-FEB-05 10:20Receive Date:04-FEB-05Collector:Client											
Parameter	Qualifier	Result	Rwd	nd DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Fe	deral		·	······································						-	
EPA 300.0 Anions Liqui Nitrate-N Sulfate Titration Analysis Feder	d U	0.00 412	u	0.0341 9.65	0.100 20.0	mg/L mg/L	1 50	MAR102/04/05 VH1 02/07/05	2135 : 1745 :	399470 399470	1 2
EPA 310.1 Total Alkalin Alkalinity, Total as CaC	nity Federal 103	6.23	u ec,	6c 1.45	2.00	mg/L		KXM 02/04/05	2127 :	399657	3

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 310.1	

Notes:

The Qualifiers in this report are defined as follows :

- * Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
- ** Indicates the analyte is a surrogate compound.
- < Result is less than amount reported.
- > Result is greater than amount reported.
- B Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- P The response between the confirmation column and the primary column is >40%D.
- R Sample results are rejected due to sample preservation with HCl.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

Page 1 of 2

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Certificate of Analysis

1006 Floyd Culler Ct. Address : Oak Ridge, Tennessee 37830 Report Date: February 17, 2005 Contact: Mr. Doug Hawn Project: Hunter Army Airfield SWMU 133

	Client Sample II Sample ID: Matrix: Collect Date: Receive Date: Collector:	D: 1 1 0 0 0	33MW008 29948004 Ground Wa 2-FEB-05 3-FEB-05 Client	ter 11:05		Project: Client ID:		STEP00104 STEP001			
Parameter	Qualifier	Result	Rwa	und DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Fede	erat										
EPA 300.0 Anions Liquid Nitrate-N Sulfate	U	0.00 1680	u	0.0341 19.3	0.100 40.0	ուց/Լ. ուց/Լ	1 100	MAR 1 02/04/05 MAR 1 02/05/05	0404 0523	399166 399166	 2
Titration Analysis Federal	ł										
<i>EPA 310.1 Total Alkalinit</i> Alkalinity, Total as CaCO	ty Federal)3 U	0.00	Ν	1.45	2.00	mg/L		KXM 02/03/05	1723	399088	3

The following Analytical Methods were performed

Company : Step, Inc.

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 310.1	

Notes:

The Qualifiers in this report are defined as follows :

- * Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
- ** Indicates the analyte is a surrogate compound.
- Result is less than amount reported. <
- Result is greater than amount reported. >
- ₿ Target analyte was detected in the sample as well as the associated blank.
- Ε Concentration of the target analyte exceeds the instrument calibration range.
- Н Analytical holding time exceeded.
- I. Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- Р The response between the confirmation column and the primary column is >40%D.
- R Sample results are rejected due to sample preservation with HCl.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details. Х
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

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GENERAL ENGINEERING LABORATORIES, LLC

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Certificate of Analysis

Çompun	y . otep, me.										
Address	: 1006 Floyd Culle	r C≀.									
	Oak Ridge, Tean	essee 378	330				p.	nort Dates - Eabr		7 2005	
Contact:	Mr. Doug Hawn						K	cpon Date. rebi	uaty 1	7, 2003	
Project:	Hunter Army A	irfield SV	YMU 133					Pag	e l	of	2
	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:	ID:	133MIW009 129948005 Ground Water 02-FEB-05 14 03-FEB-05 Client	r 1:15		Proj Clie	ect: nt ID:	STEP00104 STEP001			
Parameter	Qualifier	Result	Ru Jud	DL	RL.	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography	/ Federal										
EPA 300.0 Anions L	iquid					-					
Nitrate-N		0.192		0.0341	0.100	mg/L	1	MAR102/04/05	0422	399166	1
Suifate Titrotion Analysis Fo	danal	1040		9.65	20.0	mg/L	50	MAR102/05/05	0542	399166	2
Con 310 rm (-1.14											
EPA 310.1 Total Aik	calinity Federal	0.00	**	1.45	2.00	mall		KXXA MOINTINS	1702	200000	-
Aikanniky, rotai as t	CaCO3 0	0.00		1.45	2.00	шgл		2	1725	399000	3
The following Analy	tical Methods were p	erformed	ł								
Method	Description				A	nalyst Commo	ents				
1	EPA 300.0										
2	EPA 300.0										
3	EPA 310.1										
Notes:											

The Qualifiers in this report are defined as follows :

- * Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
- ** Indicates the analyte is a surrogate compound.
- < Result is less than amount reported.
- > Result is greater than amount reported.

Company : Step Inc

- B Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- P The response between the confirmation column and the primary column is >40%D.
- R Sample results are rejected due to sample preservation with HCl.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

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Certificate of Analysis

Company : Step, Inc. 1006 Floyd Culler Ct. Address : Oak Ridge, Tennessee 37830 Report Date: February 17, 2005 Contact: Mr. Doug Hawn Project: Hunter Army Airfield SWMU 133 of 2 Page t Client Sample ID: 133MW010 Project: STEP00104 Client ID: STEP001 Sample ID: 129892006 Matrix: Ground Water Collect Date: 01-FEB-05 15:00 Receive Date: 02-FEB-05 Collector: <u>Client</u> Parameter Qualifier Result Revaul RL Units DF D1. AnalystDate Time Batch Method Ion Chromatography Federal EPA 300.0 Anions Liquid u Nitrate-N U 0.00 0.0341 0.100 mg/L 1 VH1 02/03/05 0026 398908 1 Sulfate 3120 96.5 200 02/07/05 1900 398908 2 mg/L 500 VHI Titration Analysis Federal EPA 310.1 Total Alkalinity Federal Alkalinity, Total as CaCO3 H 0.00 Ц 1.45 2.00 mg/L BEP2 02/11/05 1316 399011 3 The following Analytical Methods were performed Method Description Analyst Comments EPA 300.0 1 2 EPA 300.0 3 EPA 310.1

Notes:

The Qualifiers in this report are defined as follows :

- * Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
- ** Indicates the analyte is a surrogate compound.
- < Result is less than amount reported.
- > Result is greater than amount reported.
- B Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- P The response between the confirmation column and the primary column is >40%D.
- R Sample results are rejected due to sample preservation with HCI.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

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Certificate of Analysis

Report Date: February 17, 2005 Contact: Mr. Doug Hawn Project: Page 1 of 2 Hunter Army Airfield SWMU 133 133MW011 STEP00104 Client Sample ID: Project: 129892005 Client ID: STEP001 Sample ID: Matrix: Ground Water Collect Date: 01-FEB-05 13:55 **Receive Date:** 02-FEB-05 Collector: Client_ Qualifier Parameter Result RWQUA DL RL Units DF AnalystDate Time Batch Method Ion Chromatography Federal EPA 300.0 Anions Liquid U Nitrate-N U 0.00 0.0341 0.100 mg/L VH1 02/02/05 2330 398908 1 Ì 02/07/05 1804 398908 Sulfate 2160 19.3 40.0 100 VHI mg/L 2 Titration Analysis Federal EPA 310.1 Total Alkalinity Federal и 1,45 2.00 BEP2 02/11/05 1313 399011 3 Alkalinity, Total as CaCO3 U 0.00 mg/L The following Analytical Methods were performed Analyst Comments Method Description 1 EPA 300.0 2 EPA 300.0 3 EPA 310.1

Notes:

The Qualifiers in this report are defined as follows :

* Indicates that a quality control analyte recovery is outside of specified acceptance criteria.

- ** Indicates the analyte is a surrogate compound.
- < Result is less than amount reported.
- > Result is greater than amount reported.

Company : Step, Inc.

Address :

1006 Floyd Culler Ct.

Oak Ridge, Tennessee 37830

- B Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- P The response between the confirmation column and the primary column is >40%D.
- R Sample results are rejected due to sample preservation with HCl.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

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Certificate of Analysis

Company : Address :	Step, Inc. 1006 Floyd Culler Oak Ridge, Tenne	CL ssee 378	30				R	eport Date: Febr	uary I	7, 2005	
Contact:	Mr. Doug Hawn							•	-		
Project:	Hunter Army Ai	rfield SW	YMU 133				Pag	ə I	of	2	
	Client Sample I Sample ID: Matrix: Collect Date: Receive Date: Collector:	D:	133M[W012 129892003 Ground Wate 01-FEB-05 1 02-FEB-05 Client	r 1:00		Proi Clie	ect: nt ID:	STEP00104 STEP001			
Parameter	Qualifier	Result	Rwqual	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Fed	leral							<u>-</u>			
EPA 300.0 Anions Liquid	ŧ										
Nitrate-N	U	0.00	ч	0.0341	0.100	mg/L	I.	VH1 02/02/05	2252	398908	1
Sulfate Titration Analysis Federa	il i	22.8		0.193	0.400	mg/L	1	MAR102/05/05	0753	398908	2
EPA 310.1 Total Alkalini	ity Federal										
Alkalinity, Total as CaCo	D3 U	0.00	K	1.45	2.00	mg/L		BEP2 02/11/05	1308	399011	3
The following Analytical	Methods were pe	rformed				_					
Method	Description				A	nalyst Commu	ents				
1	EPA 300.0		· .								····
2	EPA 300.0										
3	EPA 310.1										

Notes:

The Qualifiers in this report are defined as follows :

- * Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
- ** Indicates the analyte is a surrogate compound.
- < Result is less than amount reported.
- > Result is greater than amount reported.
- B Target analyte was detected in the sample as well as the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- P The response between the confirmation column and the primary column is >40%D.
- R Sample results are rejected due to sample preservation with HCl.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Step, Inc. Address : 1006 Floyd Culler Ct. Oak Ridge, Tennessee 37830 Contact: Mr. Doug Hawn

Project: Hunter Army Airfield SWMU 133

Report Date: February 17, 2005

Page 1 of 2

	Client Sample II Sample ID: Matrix: Collect Date: Receive Date: Collector:):	133MW013 129892002 Ground Wate 01-FEB-05 0 02-FEB-05 Client	r 9:45		Proie Clien	et: t ID;	STEP00104 STEP001			
Parameter	Qualifier	Result	Rev Quil	DL	RL.	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Fe	derat		······								
EPA 300.0 Anions Liqui Nitrate-N Sulfate Titration Analysis Federa	d U	0.00 17.8	и	0.0341 0.193	0.100 0.400	ng/L mg/L	 1	VH1 02/02/05 MAR102/05/05	2234 3 0734 3	198908 198908	1 2
EPA 310.1 Total Alkalin	ity Federal										
Alkalinity, Total as CaC	O3 U	0.00	и	1.45	2.00	mg/L		BEP2 02/11/05	1303-3	99011	3
The following Analytica	l Methods were per	formed									
Method	Description				Á	nalyst Comme	nts				

1 EPA 300.0 2 EPA 300.0

EPA 310.1

Notes:

3

The Qualifiers in this report are defined as follows :

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- P The response between the confirmation column and the primary column is >40%D.
- R Sample results are rejected due to sample preservation with HCl.
- U Indicates the target analyte was analyzed for but not detected above the detection limit.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

The above sample is reported on an "as received" basis.

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Certificate of Analysis

Step, Inc. Company : 1006 Floyd Culler Ct. Address : Oak Ridge, Tennessee 37830 Report Date: February 17, 2005 Contact: Mr. Doug Hawn of 2 Project: Hunter Army Airfield SWMU 133 Page 1 133MW014 STEP00104 Client Sample ID: Project: Client ID: STEP001 129948003 Sample ID: Matrix: Ground Water Collect Date: 02-FEB-05 09:55 Receive Date: 03-FEB-05 Collector: Client_ Parameter Oualifier Result Rw Dud Units DL RL DF AnalystDate Time Batch Method Ion Chromatography Federal EPA 300.0 Anions Liquid ų 0.0341 0.100 nıg/L Nitrate-N U 0.00 1 MAR102/04/05 0345 399166 1 Sulfate 1420 19.3 40.0 100 MAR102/05/05 0504 399166 mg/L 2 **Titration Analysis Federal** EPA 310.1 Total Alkalinity Federal mg/L KXM 02/03/05 1722 399088 Alkalinity, Total as CaCO3 H 0.00 u 1.45 2.003 2 The following Analytical Methods were performed Analyst Comments Method Description ł EPA 300.0 2 EPA 300.0 3 EPA 310.1

Notes:

The Qualifiers in this report are defined as follows :

- * Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
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- < Result is less than amount reported.
- Result is greater than amount reported.
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- H Analytical holding time exceeded.
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- Y QC Samples were not spiked with this compound.
- h Sample preparation or preservation holding time exceeded.

April 2005

STEP, Inc. Hunter Army Airfield SWMU 133 SDG # 135202

for

May 13, 2005

Laboratory Identification:

General Engineering Laboratories, LLC

Mailing Address:

P.O. Box 30712 Charleston, South Carolina 29417

Express Mail Delivery and Shipping Address:

2040 Savage Road Charleston, South Carolina 29414

Telephone Number: (843) 556-8171

Summary:

Sample receipt

The samples were logged-in at General Engineering Laboratories, LLC, (GEL) in Charleston, South Carolina on April 27, 2005 for Environmental Analyses.

Laboratory	Sample
Identification	Description
135202001	133MW012
135202002	133MW013
135202003	133MW011
135202004	1 33MW0 10
135202005	133MW009
135202006	133MW912
135202007	TB-01

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

Internal Chain of Custody:

Custody was maintained for all samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Flame Ionization Detector, General Chemistry and Volatile.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Laura Sluss

Project Manager

GENERAL ENGINEERING LABORATORIES, LLC a Member of THE GEL GROUP, INC. P.O. Box 30712 • Charleston, SC 29417 • 2040 Savage Road (29407) Phone (843) 556-8171 • Fax (843) 766-1178 • www.gel.com May 13, 2005

Laboratory Identification:

General Engineering Laboratories, LLC

Mailing Address:

P.O. Box 30712 Charleston, South Carolina 29417

Express Mail Delivery and Shipping Address:

2040 Savage Road Charleston, South Carolina 29414

<u>Telephone Number:</u> (843) 556-8171

Summary:

Sample receipt

The samples were logged-in at General Engineering Laboratories, LLC, (GEL) in Charleston, South Carolina on April 28, 2005 for Environmental Analyses.

Laboratory	Sample
<u>Identification</u>	Description
135327001	TB-02
135327002	TB-03
135327003	RS-01
135327004	FS-01
135327005	133MW004M
135327006	133MW008
135327007	133MW014
135327008	133MW004
135327009	133MW005
135327010	133MW002

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Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

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The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Flame Ionization Detector, General Chemistry and Volatile.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Laura Sluss

Project Manager



1330-20-7-----Xylenes (total)

OLM03.0

0.48 J

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1A VOLATILE ORGANICS ANALYSIS DATA S	EPA SAMPLE NO.
Lab Name: GEL, LLC. Contract	: N/A
Lab Code: N/A Case No.: N/A SAS No.	: N/A SDG No.: 135327
Matrix: (soil/water) WATER	Lab Sample ID: 135327008
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 1J149
Level: (low/med) LOW	Date Received: 04/28/05
<pre>% Moisture: not dec</pre>	Date Analyzed: 05/10/05
GC Column: RTX-VOLATILES ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)

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	CAS NO.	COMPOUND	CONCENTRATION (ug/L or ug/Kg	UNITS:) UG/L Q	Rwquel
	1634-04-4	tert-Butyl me	thyl ether	0.54 J	_ <u>-</u> _
	71-43-2	Benzene		1.0 U 1.0 U	1 4
	100-41-4 1330-20-7	Ethylbenzene_ Xylenes (tota	1)	1.0 U 1.0 U	L L

FORM I VOA

OLM03.0

1A VOLATILE ORGANICS ANALYSIS DATA	EPA SAMPLE NO. SHEET
Lab Name: GEL, LLC. Contrac	t: N/A
Lab Code: N/A Case No.: N/A SAS No	.: N/A SDG No.: 135327
Matrix: (soil/water) WATER	Lab Sample ID: 135327009
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 1J150
Level: (low/med) LOW	Date Received: 04/28/05
% Moisture: not dec.	Date Analyzed: 05/10/05
GC Column: RTX-VOLATILES ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)



FORM I VOA

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1A VOLATILE ORGANICS ANALYSIS DATA S	EPA SAMPLE NO.
Lab Name: GEL, LLC. Contract	133MW008
Lab Code: N/A Case No.: N/A SAS No.	: N/A SDG No.: 135327
Matrix: (soil/water) WATER	Lab Sample ID: 135327006
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 1J147
Level: (low/med) LOW	Date Received: 04/28/05
% Moisture: not dec.	Date Analyzed: 05/10/05
GC Column: RTX-VOLATILES ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)



FORM I VOA

OLM03.0

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1A VOLATILE ORGANICS ANALYSIS DAT	EPA SAMPLE NO.
Lab Name: GEL, LLC. Contr	act: N/A
Lab Code: N/A Case No.: N/A SAS	No.: N/A SDG No.: 135202
Matrix: (soil/water) WATER	Lab Sample ID: 135202005
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 1J139
Level: (low/med) LOW	Date Received: 04/27/05
<pre>% Moisture: not dec.</pre>	Date Analyzed: 05/10/05
GC Column: RTX-VOLATILES ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)

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OLM03.0

VOLATILE	1A ORGANICS ANALYSIS DATA S	HEET	EPA SAMPLE NO.
Lab Name: GEL, LLC.	Contract	: N/A	133MW010
Lab Code: N/A C	ase No.: N/A SAS No.	: N/A SDG	No.: 135202
Matrix: (soil/water)	WATER	Lab Sample ID:	: 135202004
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID:	1J138
Level: (low/med)	LOW	Date Received:	: 04/27/05
% Moisture: not dec.	<u></u>	Date Analyzed:	: 05/10/05
GC Column: RTX-VOLATI	LES ID: 0.25 (mm)	Dilution H	Factor: 1.0
Soil Extract Volume:_	(uL)	Soil Aliquot N	/olume:(uL)





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1A VOLATILE ORGANICS ANALYSIS DATA S	EPA SAMPLE NO. HEET
Lab Name: GEL, LLC. Contract	: N/A
Lab Code: N/A Case No.: N/A SAS No.	: N/A SDG No.: 135202
Matrix: (soil/water) WATER	Lab Sample ID: 135202003
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 1J137
Level: (low/med) LOW	Date Received: 04/27/05
% Moisture: not dec.	Date Analyzed: 05/10/05
GC Column: RTX-VOLATILES ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)

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CAS NO.	COMPOUND	CONCENTRATION ((ug/L or ug/Kg)	UG/L Q	Rev Qual
1634-04-4 71-43-2 108-88-3 100-41-4 1330-20-7	tert-Butyl me Toluene Ethylbenzene Xylenes (tota	L)	0.33 J 1.0 U 1.0 U 1.0 U 1.0 U 1.1	hy

FORM I VOA

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1A VOLATILE ORGANICS ANALY	EPA SAMPLE NO. SIS DATA SHEET
Lab Name: GEL, LLC.	Contract: N/A
Lab Code: N/A Case No.: N/A	SAS No.: N/A SDG No.: 135202
Matrix: (soil/water) WATER	Lab Sample ID: 135202001
Sample wt/vol: 5.000 (g/ml) M	L Lab File ID: 1J135
Level: (low/med) LOW	Date Received: 04/27/05
% Moisture: not dec.	Date Analyzed: 05/10/05
GC Column: RTX-VOLATILES ID: 0.25	(mm) Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)

1

CAS NO.	COMPOUND	CONCENTRATION UNIT: (ug/L or ug/Kg) UG,	S: /L Q	Rev Jun
1634-04-4 71-43-2 108-88-3 100-41-4 1330-20-7	tert-Butyl me Benzene Toluene Ethylbenzene Xylenes (tota	ethyl ether	 1.0 U 1.0 U 1.0 U 1.0 U 1.0 U	

OLM03.0

1A VOLATILE ORGANICS ANALYSIS DATA	EPA SAMPLE NO. SHEET
Lab Name: GEL, LLC. Contrac	t: N/A
Lab Code: N/A Case No.: N/A SAS No	D.: N/A SDG No.: 135202
Matrix: (soil/water) WATER	Lab Sample ID: 135202002
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 1J136
Level: (low/med) LOW	Date Received: 04/27/05
% Moisture: not dec.	Date Analyzed: 05/10/05
GC Column: RTX-VOLATILES ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume: (uL)





OLM03.0

1A VOLATILE ORGANICS ANALYSIS DATA S	EPA SAMPLE NO.
Lab Name: GEL, LLC. Contract	133MW014
Lab Code: N/A Case No.: N/A SAS No.	.: N/A SDG No.: 135327
Matrix: (soil/water) WATER	Lab Sample ID: 135327007
Sample wt/vol: 5.000 (g/ml) ML	Lab File ID: 1J148
Level: (low/med) LOW	Date Received: 04/28/05
% Moisture: not dec.	Date Analyzed: 05/10/05
GC Column: RTX-VOLATILES ID: 0.25 (mm)	Dilution Factor: 1.0
Soil Extract Volume:(uL)	Soil Aliquot Volume:(uL)

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	CAS NO.	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/I	ç Q	Revolut
T			<u> </u>	1	_
	1634-04-4	tert-Butyl me	thyl ether	1.0 U	
	71-43-2	Benzene		1.010	
	108-88-3	Toluene		1.0 0	
1	100-41-4	Ethylbenzene	· <u>· · · · · · · · · · · · · · · · · · </u>	1,0 0	i 1
i	1330-20-7	Xylenes (tota	1)	1.010	i J
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OLM03.0

FID ORG	1B GANICS ANALYSIS DATA SHEE'	<u>د</u>	EPA SAMPLE NO.
Lab Name: GENERAL ENG	HINEERING LABOR Contract	N/A	133MW002
Lab Code: N/A	Case No.: N/A SAS No.	N/A SDG N	lo.: 135327
Matrix: (soil/water)	GROUND WAT	Lab Sample ID:	135327010
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	027B2701
Level: (low/med)	LOW	Date Received:	04/28/05
% Moisture:	decanted: (Y/N)	Date Extracted	05/03/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed:	05/03/05
Injection Volume:	1.0(uL)	Dilution Factor	r: 5.0
GPC Cleanup: (Y/N)	N		

CAS NO.	COMPOUND	CONCENTRATION UNIT (ug/L or ug/Kg) UG	PS: 4/L	Q	Rendual
74-82-8	Methane		975		
					1

OLM03.0

FID OR	1B GANICS ANALYSIS DATA SHEE	EPA SAMPLE NO.
Lab Name: GENERAL EN	GINEERING LABOR Contract	: N/A
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.: 135327
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 135327008
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 022B2201
Level: (low/med)	LOW	Date Received: 04/28/05
% Moisture:	decanted: (Y/N)	Date Extracted:05/03/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 05/03/05
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	
CAS NO.	CONCE COMPOUND (ug/L	NTRATION UNITS: or ug/Kg) ug/L Q R_{ev} γ_{uc}
74-82-8	Methane	7,19,1 J

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FORM I SV-1

OLM03.0

FID ORG	1B ANICS ANALYSIS DATA SHEET	P	EPA SAMPLE	NO.
Lab Name: GENERAL ENG	INEERING LABOR Contract:	N/A	133MW005	
Lab Code: N/A C	ase No.: N/A SAS No.:	N/A SDG	No.: 135327	
Matrix: (soil/water)	GROUND WAT	Lab Sample ID:	135327009	
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	023B2301	
Level: (low/med)	LOW	Date Received:	04/28/05	
<pre>% Moisture:</pre>	decanted: (Y/N)	Date Extracted	:05/03/05	
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed:	05/03/05	
Injection Volume:	1.0(uL)	Dilution Facto	r: 1.0	
GPC Cleanup: (Y/N)	N			
CAS NO.	CONCEN COMPOUND (ug/L	TRATION UNITS: or ug/Kg) UG/L	Q	Rev Quel

	74-82-8Methane	42.3	
İ			



OLM03.0

FID ORGANICS	1B ANALYSIS DATA SHEET	E1	PA SAMPLE NO.
Lab Name: GENERAL ENGINEERI	NG LABOR Contract	: N/A	133MW008
Lab Code: N/A Case No	.: N/A SAS No.	N/A SDG NO	.: 135327
Matrix: (soil/water) GROUND	WAT	Lab Sample ID: 13	35327006
Sample wt/vol: 1.000	(g/mL) ML	Lab File ID: 01	2082001
Level: (low/med) LOW		Date Received: 04	4/28/05
% Moisture: decant	ed: (Y/N)	Date Extracted:09	5/03/05
Concentrated Extract Volume	:: 1.00(mL)	Date Analyzed: 09	5/03/05
Injection Volume: 1.0(u	L)	Dilution Factor:	1.0
GPC Cleanup: (Y/N) N			
CAS NO. COMP	CONCEN OUND (ug/L	VTRATION UNITS: or ug/Kg) UG/L	Ru Znel



FORM I SV-1

OLM03.0

101

FID ORG	1B ANICS ANALYSIS DATA SHEE'	ŗ	EPA SAMPLE NO.
Lab Name: GENERAL ENG	INEERING LABOR Contract	: N/A	133MW009
Lab Code: N/A Ca	ase No.: N/A SAS No.	: N/A SDG	No.: 135202
Matrix: (soil/water) G	GROUND WAT	Lab Sample ID:	135202005
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	016B1601
Level: (low/med) I	LOW	Date Received:	04/27/05
% Moisture: 0	decanted: (Y/N)	Date Extracted	1:05/03/05
Concentrated Extract V	Volume: 1.00(mL)	Date Analyzed:	05/03/05
Injection Volume:	1.0(uL)	Dilution Facto	or: 1.0
GPC Cleanup: (Y/N) M	N		
	6 43 4 G B		

CAS NO.	COMPOUND	CONCENTRATIO (ug/L or ug/	N UNITS: Kg) UG/L	Q	Rev Jul
74-82-8	Methane		10.1	J	τ

FORM I SV-1

OLM03.0

FID ORG	1B JANICS ANALYSIS DATA SHEE	EPA SAMPLE NO.
		133MW010
Lab Name: GENERAL ENG	GINEERING LABOR CONTRACT	: N/A
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.: 135202
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 135202004
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 015B1501
Level: (low/med)	LOW	Date Received: 04/27/05
% Moisture:	decanted: (Y/N)	Date Extracted:05/03/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 05/03/05
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	

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CAS NO.	COMPOUND	CONCENTRATIO	ON UNITS: 'Kg) UG/L	Q	Rev Jul
74-82-8	Methane		116		

FORM I SV-1

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OLM03.0

103

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1B FID ORGANICS ANALYSIS DATA SHE	EPA SAMPLE NO.
Lab Name: GENERAL ENGINEERING LABOR Contract	133MW011
Lab Code: N/A Case No.: N/A SAS No.	.: N/A SDG No.: 135202
Matrix: (soil/water) GROUND WAT	Lab Sample ID: 135202003
Sample wt/vol: 1.000 (g/mL) ML	Lab File ID: 014B1401
Level: (low/med) LOW	Date Received: 04/27/05
<pre>% Moisture: decanted: (Y/N)</pre>	Date Extracted:05/03/05
Concentrated Extract Volume: 1.00(mL)	Date Analyzed: 05/03/05
Injection Volume: 1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N) N	

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CAS NO.	COMPOUND	CONCENTRATIO	Q	Rw Qual	
74-82-8	Methane		14.0	U	u

FORM I SV-1

OLM03.0

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FID ORG	EPA SAMPLE NO.		
Lab Name: GENERAL ENG	INEERING LABOR Contract	: N/A	133MW012
Lab Code: N/A C	Case No.: N/A SAS No.:	N/A SDG	No.: 135202
Matrix: (soil/water)	GROUND WAT	Lab Sample ID:	135202001
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID:	011B1101
Level: (low/med)	LOW	Date Received:	04/27/05
% Moisture:	decanted: (Y/N)	Date Extracted	:05/03/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed:	05/03/05
Injection Volume:	1.0(uL)	Dilution Facto	r: 1.0
GPC Cleanup: (Y/N)	N		

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CAS NO.		COMPOUND	CONCENTRATION (ug/L or ug/Kg	UNITS: J) UG/L	Q	Renduch
	74-82-8	Methane		46.7		

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OLM03.0

FID OR	EPA SAMPLE NO.	
I ab Nama (GENERAL VM	133MW013	
Dad Home: GENERAL EN	JINSSIING DADON CONCINCE	
Lab Code: N/A	Case No.: N/A SAS No.	: N/A SDG No.: 135202
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 135202002
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 013B1301
Level: (low/med)	LOW	Date Received: 04/27/05
% Moisture:	decanted: (Y/N)	Date Extracted:05/03/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 05/03/05
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	

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CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q	Rev Qud
74-82-8	Methane	27.	2		

FORM I SV-1

OLM03.0

FID OR	1B GANICS ANALYSIS DATA SH	EPA SAMPLE NO.
Lab Name: GENERAL ENG	HINEERING LABOR Contra	133MW014
Lab Code: N/A C	Case No.: N/A SAS N	0.: N/A SDG No.: 135327
Matrix: (soil/water)	GROUND WAT	Lab Sample ID: 135327007
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: 021B2101
Level: (low/med)	LOW	Date Received: 04/28/05
% Moisture:	decanted: (Y/N)	Date Extracted:05/03/05
Concentrated Extract	Volume: 1.00(mL)	Date Analyzed: 05/03/05
Injection Volume:	1.0(uL)	Dilution Factor: 1.0
GPC Cleanup: (Y/N)	N	
CAS NO.	CON COMPOUND (ug	CENTRATION UNITS: /Lorug/Kg) UG/L Q RwQua

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LAS NO.	CONFOUND	(ug/b or u			×	ved
74-82-8	Methane	<u></u>]	71.8		

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Company : Address :	Step, Inc. 1006 Floyd Culler Oak Ridge, Tennes	Ct. see 378	7830						M				
Contact:	Mr. Doug Hawn							K	epon D	ate: May	13, 20	05	
Project:	Hunter Army Airfield SWMU 133												
	Client Sample II Sample ID: Matcix: Collect Date: Receive Date:):	133MW002 135327010 Ground Water 27-APR-05 14: 28-APR-05	55			Project: Client IE):	STEP STEP	00104 001			
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2 .	EPA 300.0												
3	EPA 310.1		·										
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Company : Step, Inc. Address : 1006 Floyd Culler Ct. Oak Ridge, Tennessee 37830 Contact: Mr. Doug Hawn

EPA 310,1

Hunter Army Airfield SWMU 133

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Report Date: May 13, 2005

	Client Sample Il Sample ID: Matrix: Collect Date: Receive Date:	D:	133MW004 135327008 Ground Water 27-APR-05 10:50 28-APR-05		P C P	roject: lient I	D:	STEP STEP	00104 001			
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Company : Step, Inc. 1006 Floyd Culler Ct. Address : Oak Ridge, Tennessee 37830 Report Date: May 13, 2005 Contact: Mr. Doug Hawn Project: Hunter Army Airfield SWMU 133 STEP00104 STEP001 Project: Client ID: Client Sample ID: 133MW005 Sample ID: 135327009 Matrix: Ground Water Collect Date: 27-APR-05 13:50 Receive Date: 28-APR-05 Re Collector: Client Parameter Qualifier Result RL Units Que DF AnalystDate Time Batch Method DL Ion Chromatography Federal EPA 300.0 Anions Liquid Nitrate-N U 0.00 0.020 0.100 u 1 VH1 04/28/05 2148 420844 mg/L 1 Sulfate 90.4 0.570 4.00 10 VH1 05/03/05 2355 420844 2 mg/L **Titration Analysis Federal** EPA 310.1 Total Alkalinity Federal Alkalinity, Total as CaCO3 0.00 1.45 2.00 BEP2 05/11/05 1250 424535 U mg/L U 3 The following Analytical Methods were performed Method Description **Analyst Comments** EPA 300.0 . EPA 300.0 EPA 310.1

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Client Sample ID: 133MW008 Project: STEP00104 Sample ID: 135327006 Client ID: STEP001 Matrix: Ground Water Client ID: STEP001 Collect Date: 27-APR-05 08:50 Receive Date: 28-APR-05 Collector: Client Rw Rw DL RL Units Qwel DF AnalystDate Time Batch Method Ion Chromatography Federal EPA 300.0 Anions Liquid Nitrate-N 0.102 0.020 0.100 mg/L 1 VH1 04/28/05 2014 420844 1 Sulfate 647 5.70 40.0 mg/L 100 VH1 05/03/05 2240 420844 2 Titration Analysis Federal EPA 310.1 Total Alkalinity Federal Alkalinity. Alkalinity Federal Alkalinity. BEP2 05/11/05 1244 424535 3 The following Analytical Methods were performed Method Description Analyst Comments I EPA 300.0 2 EPA 300.0 3 EPA 310.1 I I EPA 310.1 I I I I I	Project:	Hunter Army Ai	rfield SV	YMU 133										
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3	EPA 310.1												

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Company :	step, inc.										
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	Oak Ridge, Tenne	essee 378	30			D		16	11 20	ine.	
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110j000	Hunter Army A										
	Client Samole I	ID:	133MW010		Projec	et:	STEP0()104			
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Address :	 1006 Floyd Culler Oak Ridge, Tennes 	Ct. see 379	30						
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Contact:	Mr. Doug Hawn						. ,		
Project:	Hunter Army Air	field SV	YMU 133						
	Client Sample IE Sample ID: Matrix: Collect Date:);	133MW011 135202003 Ground Water 26-APR-05 13:25		H C	Project: Client ID:	STEP00104 STEP001		
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2 .	EPA 300.0								
3	EPA 310.1								

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Company : Address :	Step, Inc. 1006 Floyd Culler C Oak Ridge, Tenness	t. 20 378	30		Ð	aport Date: May	11 2005	نو
Contact:	Mr. Doug Hawn				IN I	port Date. May	11, 2005	
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	Client Sample ID: Sample ID: Matrix: Collect Date:		133MW012 135202001 Ground Water 26-APR-05 09:30		Project: Client ID:	STEP00104 STEP001		
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2	EPA 310.1 -							

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Company :	Step, Inc.										
Address :	1006 Floyd Culler	Ct,									و
	Oak Ridge, Tennes	see 378	30								
Contract	Ma Dava Hawa						R	eport Date: May	11, 20	05	
Contact;	Mr. Doug Hawn										
Project:	Hunter Army Air	field SV	VMU 133								
	Client Sample IE Sample ID:):	133MW013 135202002			Proj Clie	ect: nt ID:	STEP00104 STEP001			
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EPA 300.0 Anions Liquid	l										
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2	EPA 310.1							-			

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Company : Step, Inc. Address : 1006 Floyd Culler Ct. Oak Ridge, Tennessee 37830 Contact: Mr. Doug Hawn

Hunter Army Airfield SWMU 133

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Report Date: May 13, 2005

	Client Sample I Sample ID: Matrix:	D:	133MW014 135327007 Ground Water		P C	roject: lient I	D:	STEP STEP	00104 001			
	Collect Date: Receive Date: Collector:		27-APR-05 09:50 28-APR-05 Client			Rw						
Parameter	Qualifier	Result	DL	RL	Units	gud	DF	Analy	ystDate	Time	Batch	Method
Ion Chromatography Fed	leral											
EPA 300.0 Anions Liquic	1											
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Titration Analysis Federa	e)											
EPA 310.1 Total Alkalini	ity Federal											
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2	EPA 310.1											5

ATTACHMENT 3

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Validation Report for the Former Building 133 Remedial Action Hunter Army Airfield Savannah, Georgia

August 2005

Prepared by DataCheck

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Table 5-1 Data Validation Reason Codes	. 6

ACRONYMS AND ABBREVIATIONS

%	percent
%D	percent difference
BFB	bromofluorobenzene
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCAL	continuing calibration
CCB	continuing calibration blank
DFTPP	decafluorotriphenylphosphine
EPA	U.S. Environmental Protection Agency
ER	equipment rinseate
FB	field blank
FD	field duplicate
GFAA	graphite furnace atomic absorption
HAAF	Hunter Army Airfield
ICAL	initial calibration
ICB	initial calibration blank
LCS	laboratory control sample
MS	matrix spike
MSD	matrix spike duplicate
MTBE	methyl tert butyl ether
QC	quality control
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
SDG	sample delivery group
TB	trip blank

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1. INTRODUCTION

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The data validation of 36 water samples in eight sample delivery groups (SDGs) from the former Building 133 site at Hunter Army Airfield (HAAF) in Savannah, Georgia was completed in September 2004, March 2005, and May 2005. Level III data validation was performed on 100 percent of the environmental samples. General Engineering Labs of Charleston, South Carolina, analyzed all samples for the following parameters using the analytical method indicated for each:

- methyl tertbutyl ether (MTBE)/benzene, toluene, ethylbenzene, and xylenes (BTEX) by GC/MS SW846 8260B;
- methane by SW846 8015 A/B-FID; and
- wet chemistry (sulfate, nitrate, and alkalinity) by U.S. Environmental Protection Agency (EPA) methods 300.0A and 310.1.

The number of samples for each analyte group is shown below.

Parameter (Method)	Media	No. of Samples	SDGs
MTBE/BTEX	Water	36	8
Methane	Water	32	8
Wet Chem	Water	32	8

Table 1-1 Number of Samples per Analyte Group

BTEX = benzene, toluene, ethylbenzene, and xylenes MTBE = methyl tertbutyl ether

SDG = sample delivery group

Wet Chem = nitrate, sulfate, alkalinity

2. PROCEDURES

The sample data were validated following the logic identified in USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA-540/R-99-008) (EPA, October 1999) and method specific criteria.

3. SUMMARY OF DATA VALIDATION FINDINGS

This data validation report reflects the data validation findings for samples associated with the investigation of the former Building 133 site at HAAF in Savannah, Georgia. The validated data set consisted of 36 samples that had been analyzed for MTBE/BTEX, methane and wet chemistry. Overall the data was of excellent quality, and all measurements required to satisfy the project quality control (QC) objectives (precision, accuracy, representativeness, comparability, and completeness) were met. Each of these measures and specific data qualifications are discussed below.

Precision: Precision is a measure of the agreement between duplicate sample measurements of the same quantity and is reflected in the relative percent difference (RPD) between spikes and the RPD for the field duplicate analysis. Precision for the former Building 133 site was measured at 97.6 percent.

Accuracy: Accuracy is measured by the results from the recovery of known amounts of compounds or elements from laboratory control samples (LCS), matrix spikes (MS), and surrogate recoveries. The overall measure of accuracy for the former Building 133 site was calculated by comparing the number of spike recoveries that exceeded the laboratory limits by the total number of LCS, MS and surrogate spikes. For all analyte groups, accuracy was measured 98.7 percent.

Representativeness: The measures of representativeness – sample handling, analytical blank analysis, field blanks – were met for all sites. Designated analytical protocols were followed. Holding times were met. Overall, no major problems were identified resulting from analytical failure.

Comparability: All data were analyzed using appropriate approved methods of analysis. All data results were reported correctly and in standard units.

Completeness: Completeness is the amount of valid data compared to the planned amount and is expressed as a percent of the usable data points divided by the total number of analytes for each parameter analyzed. Out of a total of 308 data points, no data points were rejected (designated by an "R" qualifier), resulting in a completeness of 100.0 percent.

Several sample results for the organic compounds were assigned "J" qualifiers by the laboratory, which is standard practice for these methods, because they were quantitated between the method detection limit

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and the reporting limit. Due to the uncertainty associated with this region of quantitation, the validation reviewer retained the "J" qualifiers assigned by the laboratory to indicate an estimated quantity.

Data validation summaries, which function as worksheets for the validation task, are included for each parameter in each data package. The following section highlights the key findings of the data validation for each analysis.

4. ANALYSIS-SPECIFIC DATA VALIDATION SUMMARIES

4.1 MTBE/BTEX BY SW846 8260B

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Thirty-six water samples were analyzed for MTBE/BTEX compounds. Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times/Sample Condition. Holding times were met for all sample analyses. All samples were received in acceptable condition.

Initial Calibration and Continuing Calibration. All initial calibrations (ICALs) and continuing calibrations (CCALs) associated with the project samples met QC criteria.

Blanks. Toluene was found in the associated field and rinsate blanks, and a "U" qualifier was added to the toluene result for sample 133MW002 (SDG135327). No contaminants were noted in any of the other blanks and no other qualifiers were required.

Surrogate Recoveries. All surrogate recoveries were within the QC limits.

Matrix Spike/Matrix Spike Duplicate. The MS analysis for SDGs 129892,129948, and 130039 was from sample 133MW010 in SDG 129892. All results were within the QC limits. The MS analyses were within the QC limits for SDGs 119861, 119996, and 120193. The MS/matrix spike duplicate (MSD) analysis for SDG 119996 was shared with SDG120193. The MS analysis for SDGs 135327 and 135202 was from sample 133MW012 in SDG 135202. All results were within the QC limits.

Laboratory Control Sample. LCS analyses were performed for all eight SDGs, and all QC criteria were met.

Internal Standard. All area count recoveries and compound retention times were within the QC criteria.

Field Duplicates. No field duplicate (FD) analyses results were performed except for SDG 120195, and those results were within the QC limits.

Quantitation. All sample results were acceptable as qualified.

4.2 METHANE BY SW 846 8015 A/B-FID

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Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times/Sample Condition. Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

Initial and Continuing Calibration. All the ICAL analyses and CCAL analyses were within QC limits.

Blanks. All blank results were nondetects.

Matrix Spike/Matrix Spike Duplicates. No MS/MSD analyses were performed with any of the SDGs. A duplicate analysis was performed for each SDG, and the results were within the QC limits.

Laboratory Control Sample. No qualifiers were required since all LCS recoveries were within the QC limits.

Field Duplicates. No field duplicate analyses were performed.

Quantitation. All sample results were acceptable as reported.

4.3 WET CHEMISTRY - SULFATE AND NITRATE BY EPA 300.0A; ALKALINITY BY EPA 310.1

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times/Sample Condition. The technical holding time criteria were met for all samples. All samples were received in acceptable condition.

Initial and Continuing Calibration. All ICAL and CCAL verification results were within acceptable limits.

Blanks. Sulfate and alkalinity were present in the equipment and rinsate blanks associated with SDG 130039. The sulfate result was greater than 5x the blank, so no qualifier was required. The alkalinity value was qualified as "U" since the sample value was less than the blank amount. No contaminants were noted in the blanks associated with any of the other of the SDGs.

Matrix Spike/Matrix Spike Duplicates. The recoveries for sulfate in SDGs 120193, 129948, 129892, and 135202 were above the QC limit, but no qualifications were required since all of the LCS recoveries were acceptable. The MS/MSD analyzed for SDG 129948 was outside the QC limits for alkalinity. The pH of the analysis never reached the 4.5 value required by the analysis. The results of the MS/MSD were not used in validating the data.

Laboratory Control Sample. No qualifiers were required since all LCS recoveries were within the QC limits.

Field Duplicates. No FD analyses were performed.

Quantitation. All results were acceptable as reported.

5. ASSIGNMENT OF DATA QUALIFIERS

5.1 DATA QUALIFIER DEFINITIONS

Qualifier Definition

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit or the reported analyte value was not detected above 5x or 10x the level reported in laboratory or field blanks.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
- **R** The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.

5.2 DATA VALIDATION REASON CODES

During the review process, a data validation reason code was added to each of the reviewer's qualifiers to allow the user to identify which results were qualified and the reason(s) for the qualifiers. Reason codes are listed and defined in Table 5-1.

Reason Code	Definition
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria

Table 5-1 Data Validation Reason Codes

Reason Code	Definition
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	ТВ
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgment was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings
% = percent	LCS = laboratory control sample

Table 5-1 Data Validation Reason Codes (continued)

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%D = percent difference BFB = bromofluorobenzene CCB = continuing calibration blank DFTPP = decafluorotriphenylphosphine ER = equipment rinseate FB = field blank GFAA = graphite furnace atomic absorption ICB = initial calibration blank

MS = matrix spikeMSD = matrix spike duplicate QC = quality control RPD = relative percent difference RRF = relative response factor RSD = relative standard deviation TB = trip blank

6. **REFERENCES**

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EPA (U.S. Environmental Protection Agency), October 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA-540/R-99-008).