

Highlander Environmental Corp.

Midland, Texas

May 23, 2002.

Mr. Paul Sheeley Environmental Bureau Oil Conservation Division 1625 N. French Drive P.O. Box 1980 Hobbs, New Mexico 88240



RE: Project 1712, Assessment and Work Plan for the Pipeline Leak located at the Duke NMR Regional Pipeline, San Simon, Section 27, Township 21 South, Range 35 East Lea County, New Mexico.

Dear Mr. Sheeley,

Highlander Environmental Corp. (Highlander) was contacted by Duke Energy Field Services, LP (Duke) to assess a pipeline spill, which occurred at the Duke NMR Regional Pipeline, San Simon, in Lea County, New Mexico. The Site is located in Section 27, Township 21 South, Range 35 East at location 32° 26' 45.1"N, 103° 21' 22.8"W. The Site location is shown in Figure 1.

According to published data, one well is shown in Section 27, Township 21 South, Range 35 East, with a water level of 22' below surface. In addition, the New Mexico State Engineers Office Well Reports indicated a water well located in Section 27, Township 21 South, Range 35 East. This well appears to be a windmill located approximately 1,000 feet northwest of the spill area and indicated a total well depth of 31 feet below surface. During the installation of the boreholes, groundwater was encountered at approximately 23' below ground surface.

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remediation action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene and xylene). Based upon on the regional groundwater data, the proposed RRAL for TPH is 100 mg/kg.

Background

On January 5, 2001, a leak occurred from a gas gathering line and released pipeline liquids into the surrounding soils. The leak released approximately 840 gallons (20 barrels) of petroleum oils and liquids. No liquids were recovered at the Site. Once the leak was discovered, the pipeline leak was immediately repaired. No remediation activity on the soil has been performed at the Site.

application -pPAC 0608129059

Midland, Texas 79705

(915) 682-4559

Site Inspection and Assessment

Augerhole Installation and Analysis

On September 6, 2001, Highlander inspected the leak area. The aerial extent of the impact is shown on Figure 2. The impacted area measured approximately 35' x 45'. Soil samples were collected using a stainless steel, bucket-type, hand auger. A total of five (5) auger holes (AH) were installed near the release point. Due to a shallow dense caliche encountered at approximately 2.0 feet below surface, the impact was not vertically defined. The soil sample results are shown in Table 1. Based on the results of AH-1 and AH-5, Duke proposed to further investigate the release area by installing air rotary-drilled boreholes in the area of the release.

Borehole Installation and Analysis

On February 15, 2002, Highlander Environmental Corp. (Highlander) supervised the installation of six (6) air rotary-drilled boreholes. The borehole locations are shown in Figure 2. Selected boreholes were installed to a total depth of 16' to 26' below surface. Split spoon or core samples were collected at 5 feet intervals for field screening using a Thermo Environmental Equipment Model 580B, Organic Vapor Meter (OVM). At least two soil samples from each borehole were analyzed for chloride, total petroleum hydrocarbons (TPH) by EPA method 418.1 and benzene, toluene, ethylbenzene and xylene (BTEX) by EPA method 602/8021B. Chloride samples were analyzed by using an EPA standard method. The soil sample results are summarized in Table 2.

The perimeter boreholes (BH-2, BH-4, BH-5 and BH-6), installed to define the horizontal extent of the impact, appear to show lateral confinement to the immediate area measuring approximately 35' x 45'. The heaviest impact appears to be in the shallow soils to a depth of approximately 5-6' below surface. On selected boreholes, the TPH levels significantly decreased at a point below 5' below surface, however, the deeper samples in some boreholes did show TPH levels above the RRAL of 100 mg/kg.

Boreholes (BH-1 and BH-3) were installed near the pipeline to assess the vertical extent of the impact. Soil samples collected from the boreholes were all above the RRAL of 100 mg/kg. In the area of BH-1 and BH-3, the heaviest impact was found to a depth of approximately 5' and 15' below surface, respectively. BH-1 had a TPH level of 29,600 mg/kg and total BTEX of 193 mg/kg at 5-6' below surface. The TPH level decreases with depth to 110 mg/kg (15-16'), 412 mg/kg (20-21') and 109 mg/kg (24-25'), however, levels exceeded the RRAL of 100 mg/kg. The traces of BTEX detected at these depths were all below the RRAL for BTEX. BH-3 had TPH levels ranging from 5,960 mg/kg to 28,100 mg/kg to a depth of 15' below surface. The TPH significantly decreased with depth to 170 mg/kg (20-21') and 436 mg/kg (25-26'), however, levels still exceeded the RRAL. Based on the OVM readings and analytical data, the total BTEX levels exceeding the RRAL appears to extend to a depth of 10-11' below surface. The chloride levels detected in BH-1 and BH-3 do not appear to be an environmental concern.

Recommendation/Work Plan

Based on the shallow groundwater, the heaviest soil impact will need to be excavated at the Site. However, Duke proposes to evaluate the groundwater quality for potential impact. Once the groundwater has been evaluated, the extent of impacted soil will be removal and proper disposal.

The groundwater evaluation will consist of the installation of four (4) monitor wells. The locations of the proposed wells are shown in the Figure 3. The monitoring wells will be drilled using air or water rotary drilling techniques, and constructed using two-(2) inch diameter schedule 40 PVC threaded casing and factory slotted screen. The wells will be constructed with approximately fifteen (15) feet of well screen. The wells will be drilled to a depth of approximately 30-35' below ground surface (BGS), and the well screen will be installed with about five (5) feet of screen above and ten (10) feet below the groundwater, to evaluate groundwater quality for light hydrocarbons compounds. The well screens will be surrounded with graded silica sand to a depth approximately 2 feet above the screen. A layer of bentonite pellets, approximately 2 feet thick, will be placed in the borehole above the sand. The remainder of the borehole will be filled with cement and bentonite grout to about one (1) foot below ground. The wells will be secured with locking steel protectors anchored in a concrete pad measuring approximately 3 feet by 3 feet. A land surveyor licensed in the State of New Mexico will survey the wells for location and elevation.

Following installation, the wells will be developed by bailing with a rig or hand bailer, or pumped with an electric submersible pump to remove fine grained sediment disturbed during drilling and to ensure collection of representative groundwater samples. Water removed from the wells will be placed in appropriate containers (i.e., 55-gallon drums, portable tank, etc.) and retained at the Site until disposal is arranged. Groundwater samples will be collected following well development and analyzed for BTEX by EPA method 602/8021B.

Each well will be inspected for the presence of phase-separated hydrocarbons (PSH) and, if present, a sample will be collected and analyzed by gas chromatography (GC) to determine composition and origin. If PSH is detected in a monitor well, groundwater samples will not be collected from that well. All samples will be delivered to the laboratory via overnight delivery and under chain of custody control.

All downhole equipment (i.e., drill rods, drill bits, etc.) will be thoroughly decontaminated between each use with a high-pressure hot water wash and rinse. Soil cuttings from drilling will be stockpiled adjacent to the well until disposal is arranged. All equipment coming in contact with groundwater has the potential for cross contamination if not properly decontaminated, therefore, all such equipment (i.e., water level indicator, interface probe, submersible pump, etc.) will be thoroughly cleaned between wells by washing with laboratory grade detergent and potable water.

Upon receipt of analytical data, the excavation will be performed and Highlander will prepare a detail report that discusses the activities performed at the Site. If you require any additional information or have any questions or comments concerning the assessment report and work plan, please call.

Veryanily yours, Ike Tavarez

Project Manager Geologist

cc:

Stan Shaver Steve Weathers

Highlander Environmental Corp.

4







Duke Energy Field Services San Simon - Pipeline Spill Lea County, New Mexico Table 1

Sample ID	Date	Depth	MVO	TPH	8			×	Total	Chloride
	Sampled	(ft)	(mdd)	(mg/kg)		(mg	/Kg)		BTEX	(mg/kg)
AH-1	9/6/01	0-1	697	18000	0.356	3.49	0.660	13.7	18.2	6157.7
	9/6/01	1.5-2.0	435	•	•	•	•	1	1	5902.80
	9/6/01	2.0	666	16000	<0.010	1.480	5.39	29	35.9	•
AH-2	9/6/01	2.0	1	<10	<0.010	<0.010	0.026	0.016	0.042	-
AH-3	9/6/01	2-2.5	148	855	<0.010	0.053	0.017	0.093	0.163	,
AH-4	9/6/01	2.0	<10	<10	•		•		,	•
AH-5	9/6/01	2-2.5	666	19300	4.49	21.40	7.76	54.00	87.7	,

•

- HA -)

(augerhole) Not Analyzed

Duke Energy Field Services San Simon - Pipeline Spill Lea County, New Mexico Table 2

•

e									Π										[
Chlorid	(mg/kg	375	,	<10	•	<10	,	1	1	1090	•	36.9	17.2	-	-	,	,	•	•		-	•	-	
Total	BTEX	193.0	•	0.998	•	0.605	1	1	•	122.0	•	46.60	0.817	1	0.861	1		10.2	ı	-	0.615	1	•	
×		116.0	-	0.629	•	0.337	-		•	77.80		31.40	0.512	•	0.550	-	-	7.54	1	-	0.385	1	1	
E	kg)	24.1	1	0.171	-	0.119	•	•	•	11.60	•	5.67	0.154	•	0.153		-	1.16	•	•	0.124		•	
Solutions.	(mg/	52.50		0.158	• ;	0.108	•	•	,	30.50	•	8.44	0.112	,	0.118	•	-	1.45	•	-	0.106	•	-	
8		<0.005		0.0398	•	0.0407	•	,	,	1.73	,	1.13	0.0391	1	0.0396		•	0.0551	,	•	<0.010	•	•	
HdT	(mg/kg)	29600		110	412	109	<10	-	<10	28100	-	0965	170	436	222	1	14.9	1060	28.6	156	127	120	120	
MVO	(ppm)	426	100	107	96	37	20	13	18	577	568	460	136	80	60	20	18	400	30	20	90	50	30	
Depth	(ft)	5-6	10-11	15-16	20-21	24-25	5-6	10-11	15-16	5-6	10-11	15-16	20-21	25-26	5-6	10-11	15-16	5-6	10-11	15-16	5-6	10-11	15-16	
Date	Sampled	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	2/15/02	
Sample ID		BH-1					BH-2			BH-3					BH-4			BH-5			BH-6			

н. - Н

(boreholes) Not Analyzed

Report Date: September 21, 2001 Order Number: A01091002 1712 Duke/San Simon Spill Area

Summary Report

Ike Tavarez Highlander Environmental Services 1910 N. Big Spring St. Midland, TX 79705 Report Date: September 21, 2001

Order ID Number: A01091002

Project Number:1712Project Name:Duke/San Simon Spill AreaProject Location:N/A

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
178845	AH-1 (0-1')	Soil	9/6/01	•	9/8/01
178846	AH-1 (1.5-2.0')	Soil	9/6/01	:	9/8/01
178847	AH-1 (2.0')	Soil	9/6/01	:	9/8/01
178849	AH-2 (2-0')	Soil	9/6/01	:	9/8/01
178851	AH-3 (2-2.5')	Soil	9/6/01	:	9/8/01
178853	AH-4 (2.0)	Soil	9/6/01	:	9/8/01
178855	AH-5 (2-2.5')	Soil	9/6/01	:	9/8/01

This report consists of a total of 1 page(s) and is intended only as a summary of results for the sample(s) listed above.

			BTEX			TPH
	Benzene	Toluene	Ethylbenzene	M,P,O-Xylene	Total BTEX	TRPHC
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
178845 - AH-1 (0-1')	0.356	3.49	0.669	13.7	18.2	18000
178847 - AH-1 (2.0')	< 0.010	1.48	5.39	29^{-1}	35.9	16700
178849 - AH-2 (2-0')	< 0.010	< 0.010	0.026	0.016	0.042	<10.0
178851 - AH-3 (2-2.5')	< 0.010	0.053	0.017	0.093	0.163	855
178853 - AH-4 (2.0)	-	-	-	-	-	<10.0
178855 - AH-5 (2-2.5')	4.49	21.4^{-2}	7.76	54	87.7 ³	19300

Sample:	178845 - AH-1 (0-1')		
Param	Flag	Result	Units
CL		6157.74	mg/Kg

Sample: 178846 - AH-1 (1.5-2.0')

Param	Flag	Result	Units
CL		5902.82	mg/Kg

 $^{^1\}ensuremath{\mathsf{Estimated}}$ concentration value greater than the standard value.

²Estimated concentration value greater than the standard range.

³Estimated concentration value greater than the standard range.

MULLING TRACEANALYSIS, INC. MULLING MULLING

6701 Aberdeen Avenue, Suite 9 155 McCutcheon, Suite H Lubbock, Texas 79424 800•378•1296 El Paso, Texas 79932 888•588•3443 E-Mail: lab@traceanalysis.com 806•794•1296 FAX 806•794•1298 915•585•3443 FAX 915•585•4944

Analytical and Quality Control Report

Ike Tavarez Highlander Environmental Services 1910 N. Big Spring St. Midland, TX 79705 Report Date: September 21, 2001

Order ID Number: A01091002

Project Number:1712Project Name:Duke/San Simon Spill AreaProject Location:N/A

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
178845	AH-1 (0-1')	Soil	9/6/01	•	9/8/01
178846	AH-1 (1.5-2.0')	Soil	9/6/01	:	9/8/01
178847	AH-1 (2.0')	Soil	9/6/01	:	9/8/01
178849	AH-2 (2-0')	Soil	9/6/01	:	9/8/01
178851	AH-3 (2-2.5')	Soil	9/6/01	:	9/8/01
178853	AH-4 (2.0)	Soil	9/6/01	:	9/8/01
178855	AH-5 (2-2.5')	Soil	9/6/01	:	9/8/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 10 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 178845 - AH-1 (0-1')

Analysis: Analyst:	BTEX CG	Analytical Method: Preparation Method	S 8021B E 5035	QC Batch: Prep Batch:	QC13904 PB11864	Date Analyzed: Date Prepared:	9/10/01 9/10/01
Param		Flag	Result	Units	Di	lution	RDL
Benzene			0.356	mg/Kg		10	0.001
Toluene			3.49	mg/Kg		10	0.001
Ethylbenze	ne		0.669	mg/Kg		10	0.001
M,P,O-Xyle	ene		13.7	mg/Kg		10	0.001
Total BTE	X		18.2	mg/Kg		10	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.892	mg/Kg	10	0.10	89	72 - 128
4-BFB	1	3.82	mg/Kg	10	0.10	382	72 - 128

Sample: 178845 - AH-1 (0-1')

Analysis:	Ion Chromato	graphy (IC)) Analytical Method:	E 300.	0 QC Batch:	QC14087 Date Analyzed: 9/16/01
Analyst:	JSW		Preparation Method:	N/A	Prep Batch:	PB12011 Date Prepared: 9/13/01
-			-		-	
Param	Flag	Result	Units	Diluti	on	RDL
CL		6157.74	mg/Kg	1000)	0.50

Sample: 178845 - AH-1 (0-1')

Analysis: Analyst:	TPH JJ	Analytic Preparat	al Method: tion Method:	E 418.1 E 3550B	QC Batch: Prep Batch:	QC14002 PB11952	Date Analyzed: Date Prepared:	9/17/01 9/14/01
Param		Flag	Result	t	Units	Dilutio	on	RDL
TRPHC			18000)	mg/Kg	1	and the second se	10

Sample: 178846 - AH-1 (1.5-2.0')

Analysis:	Ion Chromatography (IC) Analytical Method:	E 300.0	QC Batch:	QC14087 Date Analyzed: 9/16/01
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB12011 Date Prepared: 9/13/01

Param	Flag	Result	Units	Dilution	RDL
CL		5902.82	mg/Kg	1000	0.50

Sample: 178847 - AH-1 (2.0')

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13904	Date Analyzed:	9/10/01
Analyst:	CG	Preparation Method:	E 5035	Prep Batch:	PB11864	Date Prepared:	9/10/01

¹High surrogate recovery due to peak interference.

Report Dat 1712	te: Septemb	er 21, 2001	Orde: Duke,	r Number: A010 /San Simon Spill	91002 Area	Page Nun	mber: 3 of 10 N/A	
Param	······	Flag	Result	Units		Dilution	RDI.	
Benzene	····	1 1000	<0.010	mg/Kg	······	10	0.001	
Toluene			1 48	mg/Kg		10	0.001	
Ethylbenzer	ne		5 39	mg/Kg		10	0.001	
M P O-Xvle	ne	2	29	mg/Kg		10	0.001	
Total BTEX	χ.		35.9	mg/Kg		10	0.001	
	<u> </u>						0.001	
a		- ·			Spike	Percent	Recovery	
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits	
TFT	2	0.859	mg/Kg	10	0.10	86	72 - 128	
4-BFB		6.85	mg/Kg	10	0.10	685	72 - 128	
Sample: Analysis: Analyst:	178847 TPH JJ	' - AH-1 (2.0' Analytical Metho Preparation Meth	?) od: E 418.1 hod: E 3550B	QC Batch: Prep Batch:	QC14002 PB11952	Date Analyzed: Date Prepared:	9/17/01 9/14/01	
				TT •.	D:1 (DDI	
P	am Flag I			Units	Diluti	on	RDL	
Param	F	'lag l	Result	17/	1			
Param TRPHC Sample: Analysis:	F 178849 BTEX	'lag I - AH-2 (2-0) Analytical Meth	7) nod: S 8021B	mg/Kg QC Batch:	1 QC13904	Date Analyzed:	9/10/01	
Param TRPHC Sample: Analysis: Analyst:	F 178849 BTEX CG	'lag 1 - AH-2 (2-0) Analytical Meth Preparation Me	2) nod: S 8021B thod: E 5035	mg/Kg QC Batch: Prep Batch:	1 QC13904 PB11864	Date Analyzed: Date Prepared:	9/10/01 9/10/01	
Param TRPHC Sample: Analysis: Analyst: Param	F 178849 BTEX CG	lag l - AH-2 (2-0 Analytical Meth Preparation Me Flag	r) nod: S 8021B thod: E 5035 Result	mg/Kg QC Batch: Prep Batch: Units	1 QC13904 PB11864 I	Date Analyzed: Date Prepared: Dilution	9/10/01 9/10/01 RDL	
Param TRPHC Sample: Analysis: Analyst: Param Benzene	F 178849 BTEX CG	'lag 1 - AH-2 (2-0) Analytical Meth Preparation Me Flag	$\frac{16700}{16700}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$	mg/Kg QC Batch: Prep Batch: Units mg/Kg	1 QC13904 PB11864 I	Date Analyzed: Date Prepared: Dilution 10	9/10/01 9/10/01 RDL 0.001	
Param TRPHC Sample: Analysis: Analyst: Param Benzene Toluene	F 178849 BTEX CG	'lag 1 - AH-2 (2-0) Analytical Meth Preparation Me Flag	$\frac{\text{Result}}{16700}$ ') nod: S 8021B thod: E 5035 $\frac{\text{Result}}{<0.010}$ <0.010	mg/Kg QC Batch: Prep Batch: Units mg/Kg mg/Kg	1 QC13904 PB11864 I	Date Analyzed: Date Prepared: Dilution 10 10	9/10/01 9/10/01 RDL 0.001 0.001	
Param TRPHC Sample: Analysis: Analyst: Param Benzene Toluene Ethylbenzer	F 178849 BTEX CG	lag l - AH-2 (2-0 Analytical Meth Preparation Me Flag	$\frac{16700}{16700}$ 2) nod: S 8021B thod: E 5035 Result <0.010 <0.010 0.026	mg/Kg QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I	Date Analyzed: Date Prepared: Dilution 10 10	9/10/01 9/10/01 RDL 0.001 0.001	
Param TRPHC Sample: Analysis: Analyst: Param Benzene Toluene Ethylbenzen M,P,O-Xyle	F 178849 BTEX CG ne	'lag l - AH-2 (2-0 Analytical Meth Preparation Me Flag	$\frac{16700}{16700}$ 2) hod: S 8021B thod: E 5035 Result <0.010 <0.010 0.026 0.016 0.016	mg/Kg QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I	Date Analyzed: Date Prepared: Dilution 10 10 10	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001	
Param TRPHC Sample: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTEX	F 178849 BTEX CG me	lag l - AH-2 (2-0 Analytical Meth Preparation Me Flag	$\frac{\text{Result}}{16700}$ $\frac{16700}{16700}$ $\frac{1}{16700}$	mg/Kg QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I	Date Analyzed: Date Prepared: Dilution 10 10 10 10 10	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001	
Param TRPHC Sample: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTEX	F 178849 BTEX CG me	lag l - AH-2 (2-0 Analytical Meth Preparation Me Flag	$\frac{\text{Result}}{16700}$ $\frac{16700}{16700}$ $\frac{1}{16700}$ $$	mg/Kg QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I Spike	Date Analyzed: Date Prepared: Dilution 10 10 10 10 10 10	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001 0.001 Recovery	
Param TRPHC Sample: Analysis: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTEX Surrogate	F 178849 BTEX CG ne K Flag	'lag l - AH-2 (2-0' Analytical Meth Preparation Me Flag Result	$\frac{16700}{16700}$ 2) nod: S 8021B thod: E 5035 Result <0.010 <0.010 0.026 0.016 0.042 Units	mg/Kg QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I Spike Amount	Date Analyzed: Date Prepared: Dilution 10 10 10 10 10 10	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001 0.001 Recovery Limits	
Param TRPHC Sample: Analysis: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTE> Surrogate TFT	F 178849 BTEX CG ne me K	'lag 1 - AH-2 (2-0) Analytical Meth Preparation Me Flag Result 1.19 1.00	Result 16700 16700 nod: S 8021B thod: E 5035 Result <0.010	mg/Kg QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I Spike Amount 0.10	Date Analyzed: Date Prepared: Dilution 10 10 10 10 10 10 10 10 20 20 20 20 20 20 20 20 20 20 20 20 20	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001 0.001 Recovery Limits 72 - 128	
Param TRPHC Sample: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTE2 Surrogate TFT 4-BFB	F 178849 BTEX CG me K Flag	'lag 1 - AH-2 (2-0) Analytical Meth Preparation Me Flag Result 1.19 1.02	Result 16700 16700 nod: S 8021B thod: E 5035 Result <0.010	mg/Kg QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg 10 10	1 QC13904 PB11864 I Spike Amount 0.10 0.10	Date Analyzed: Date Prepared: Dilution 10 10 10 10 10 10 10 10 10 10 10 10 10	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001 0.001 0.001 Recovery Limits 72 - 128 72 - 128	
Param TRPHC Sample: Analysis: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTEX Surrogate TFT 4-BFB Sample: Analysis: Analysis: Analysis:	F 178849 BTEX CG ne flag 178849 TPH MS	'lag 1 - AH-2 (2-0' Analytical Meth Preparation Me Flag Result 1.19 1.02 - AH-2 (2-0' Analytical Meth	Result 16700 16700 nod: S 8021B thod: E 5035 Result <0.010	QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I Spike Amount 0.10 0.10 0.10	Date Analyzed: Date Prepared: Dilution 10 10 10 10 10 10 10 10 10 10 10 2 2 2 2	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001 0.001 Recovery Limits 72 - 128 72 - 128 72 - 128	
Param TRPHC Sample: Analysis: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTE2 Surrogate TFT 4-BFB Sample: Analysis: Analysis: Analysis:	Flag	'lag 1 - AH-2 (2-0) Analytical Meth Preparation Me Flag Result 1.19 1.02 - AH-2 (2-0) Analytical Meth Preparation Meth	Result 16700 16700 nod: S 8021B thod: E 5035 Result <0.010	QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I Spike Amount 0.10 0.10 0.10 QC14144 PB12061	Date Analyzed: Date Prepared: Dilution 10 10 10 10 10 10 10 2 Percent Recovery 119 102 Date Analyzed: Date Prepared:	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001 0.001 0.001 0.001 8 ccovery Limits 72 - 128 72 - 128 72 - 128 72 - 128 9/20/01 9/18/01	
Param TRPHC Sample: Analysis: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTEX Surrogate TFT 4-BFB Sample: Analysis: Analysis: Analysis:	F 178849 BTEX CG he me K Flag 178849 TPH MS F	'lag 1 - AH-2 (2-0' Analytical Meth Preparation Me Flag Result 1.19 1.02 - AH-2 (2-0' Analytical Methor Preparation Methor 1.19 1.02	Result 16700 16700 nod: S 8021B thod: E 5035 Result <0.010	QC Batch: Prep Batch: Units mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	1 QC13904 PB11864 I Spike Amount 0.10 0.10 0.10 QC14144 PB12061 Diluti	Date Analyzed: Date Prepared: Dilution 10 10 10 10 10 10 10 10 2 Percent Recovery 119 102 Date Analyzed: Date Prepared: on	9/10/01 9/10/01 RDL 0.001 0.001 0.001 0.001 0.001 0.001 0.001 Recovery Limits 72 - 128 72 - 128 72 - 128 72 - 128 72 - 128 72 - 128 72 - 128	

Sample:178851 - AH-3 (2-2.5')Analysis:BTEXAnalyst:CGPreparation Method:E 5035

QC Batch:	QC13904	Date Analyzed:	9/10/01
Prep Batch:	PB11864	Date Prepared:	9/10/01

²Estimated concentration value greater than the standard value. ³High surrogate recovery due to peak interference.

Report	Date:	September	21,	2001
1712				

Order Number: A01091002 Duke/San Simon Spill Area

Param	Flag	Result	Units	Dilution	RDL
Benzene		< 0.010	mg/Kg	10	0.001
Toluene		0.053	mg/Kg	10	0.001
Ethylbenzene		0.017	mg/Kg	10	0.001
M,P,O-Xylene	•	0.093	mg/Kg	10	0.001
Total BTEX		0.163	mg/Kg	10	0.001

					Spike	Percent	Recovery
Surrogate	Flag	\mathbf{Result}	Units	Dilution	Amount	Recovery	Limits
TFT		1.15	mg/Kg	10	0.10	115	72 - 128
4-BFB		0.998	mg/Kg	10	0.10	100	72 - 128

Sample:	1788	51 - AH-	3(2-2.5')					
Analysis:	\mathbf{TPH}	Analytic	al Method:	E 418.1	QC Batch:	QC14002	Date Analyzed:	9/17/01
Analyst:	JJ	Preparat	ion Method:	E 3550B	Prep Batch:	PB11952	Date Prepared:	9/14/01
Param		Flag	Resul	t	Units	Dilutio	on	RDL
TRPHC			85	5	mg/Kg	1		10

Sample: 178853 - AH-4 (2.0)

Analysis: Analyst:	TPH JJ	Analytica Preparat	al Method: ion Method:	E 418.1 E 3550B	QC Batch: Prep Batch:	QC14002 PB11952	Date Analyzed: Date Prepared:	9/17/01 9/14/01
Param		Flag	Resul	t	Units	Dilutio	on	RDL
TRPHC		·····	<10.	0	mg/Kg	1		10

Sample: 178855 - AH-5 (2-2.5')

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13904	Date Analyzed:	9/10/01
Analyst:	CG	Preparation Method	: E 5035	Prep Batch:	PB11864	Date Prepared:	9/10/01
Param		Flag	Result	Units	Dilu	ition	RDL
Benzene		· · · · · · · · · · · · · · · · · · ·	4.49	mg/Kg	2	20	0.001
Toluene		4	21.4	mg/Kg	2	20	0.001
Ethylbenze	ne		7.76	mg/Kg	2	20	0.001
M,P,O-Xyle	ene		54	mg/Kg	2	20	0.001
Total BTE	X	5	87.7	mg/Kg	2	20	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT	6	0.912	mg/Kg	20	0.10	45	72 - 128
4-BFB	7	5.2	mg/Kg	20	0.10	260	72 - 128

⁴Estimated concentration value greater than the standard range.

⁵Estimated concentration value greater than the standard range.

⁶Low surrogate recovery due to matrix difficulties.

⁷High surrogate recovery due to peak interference.

Report Date: September 21, 2001 1712			Orde Duke	r Number: A010 /San Simon Spil	ber: A01091002 Page Nun Simon Spill Area			
Sample: Analysis:	1788 TPH	55 - AH-: Analytica	5 (2-2.5') I Method:	E 418.1	QC Batch:	QC14002	Date Analyzed:	9/17/01
Analyst:	JJ	Preparati	on Method:	E 3550B	Prep Batch:	PB11952	Date Prepared:	9/14/01
Param	Flag Res		Resul	t	Units	Diluti	on	RDL
TRPHC	1930		0	mg/Kg	1		10	

QCBatch:

Method Blank

Quality Control Report Method Blank

QC13904

Danama		Flor		Populto	Unita		Reporting
Param		r lag			Units		
Toluona				< 0.010	mg/Kg		0.001
Ethylbenzene				<0.010	mg/Kg	5 r	0.001
M P O ₋ Xylene	þ			< 0.010	mg/Kg	9 F	0.001
Total BTEX	0			< 0.010	mg/Kg	5 5	0.001
			· · · · · · · · · · · · · · · · ·)	
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		1.2	mg/Kg	10	0.10	116	72 - 128
4-BFB		0.990	mg/Kg	10	0.10	99	72 - 128
Method I	Blank	QCBatch:	QC14002				
Param		Flag	Re	sults	Units		Reporting Limit
TRPHC			<	<10.0	mg/Kg		10
Method I	Blank	QCBatch:	QC14087				
Domana		Flor	Da	lto	Ilmita		Reporting
		r lag		<u>1 01</u>	Units		
		t	2	1.91	ing/ Kg		0.00
Method I	Blank	QCBatch:	QC14144				
Param		Flag	Re	esults	Units		Reporting Limit
TRPHC			<	<10.0	mg/Kg		10

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laborator	y Contro	l Spikes	Q	CBatch:	QC13904					
Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.993	1.02	mg/Kg	10	0.10	< 0.010	99	2	80 - 120	20
									Conti	nued

$\dots Continued$

	LCS	LCSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	Limit
Benzene	1.01	1.05	mg/Kg	10	0.10	< 0.010	101	3	80 - 120	20
Toluene	1.02	1.06	mg/Kg	10	0.10	< 0.010	102	3	80 - 120	20
Ethylbenzene	1.02	1.06	mg/Kg	10	0.10	< 0.010	102	3	80 - 120	20
M,P,O-Xylene	3.1	3.19	mg/Kg	10	0.30	< 0.010	106	2	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	Recovery
Surrogate	Result	Result	Units	Dilution	Amount	% Rec	$\% { m Rec}$	Limits
TFT	1.14	1.16	mg/Kg	10	0.10	114	116	72 - 128
4-BFB	1.05	1.06	mg/Kg	10	0.10	105	106	72 - 128

Laboratory Control Spikes

QCBatch: QC14002

					Spike					
	LCS	LCSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	Limit
TRPHC	210	225	mg/Kg	1	250	<10.0	84	6	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes QCBatch: QC14087

					Spike					
	LCS	LCSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
CL	⁸ 33.15	33.31	mg/Kg	1	12.50	21.91	265	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes QCBatch: QC14144

					Spike					
	LCS	LCSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% \mathrm{Rec}$	RPD	Limit	Limit
TRPHC	249	253	mg/Kg	1	250	<10.0	99	1	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC13904

⁸When soil blank is subtracted, LCS %EA is 90

Order Number: A01091002 Duke/San Simon Spill Area

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Benzene	⁹ <0.010	10 <0.010	mg/Kg	10	0.10	< 0.010	0	0	80 - 120	20
Toluene	11 <0.010	12 <0.010	mg/Kg	10	0.10	< 0.010	0	0	80 - 120	20
Ethylbenzene	13 <0.010	14 <0.010	mg/Kg	10	0.10	< 0.010	0	0	80 - 120	20
M,P,O-Xylene	15 <0.010	16 <0.010	mg/Kg	10	0.30	< 0.010	0	0	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	MS	MSD			Spike	MS	MSD	Recovery
Surrogate	\mathbf{Result}	Result	Units	Dilution	Amount	$\% { m Rec}$	$\% { m Rec}$	Limits
TFT	1.08	1.04	mg/Kg	10	0.10	108	104	72 - 128
4-BFB	0.976	0.941	mg/Kg	10	0.10	97	94	72 - 128

Matrix	Spikes	QCBatch:	QC14002
	~ ~ ~ ~ ~ ~	Q.0.2000000	

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	Limit
TRPHC	229	236	mg/Kg	1	250	<10.0	91	3	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC14087

					Spike					
	MS	MSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	Limit
CL	¹⁷ 227.2	231.41	mg/Kg	1	625	175.66	8	-278	69 - 121	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC14144

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	\mathbf{Limit}	Limit
TRPHC	280	287	mg/Kg	1	250	<10.0	112	2	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report Continuing Calibration Verification Standards

⁹No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹⁰No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹¹No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹²No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹³No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹⁴No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹⁵No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹⁶No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹⁶No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹⁶No purgeable in MS/MSD. LCS/LCSD show the method to be in control. ¹⁷Matrix %EA is 82 Order Number: A01091002 Duke/San Simon Spill Area

CCV (1) QCBatch: QC13904

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/Kg	0.10	0.092	92	85 - 115	9/10/01
Benzene		mg/Kg	0.10	0.098	98	85 - 115	9/10/01
Toluene		mg/Kg	0.10	0.099	99	85 - 115	9/10/01
Ethylbenzene		mg/Kg	0.10	0.098	98	85 - 115	9/10/01
M,P,O-Xylene		mg/Kg	0.30	0.295	98	85 - 115	9/10/01

CCV(2)	QCBatch:	QC13904

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/Kg	0.10	0.091	91	85 - 115	9/10/01
Benzene		mg/Kg	0.10	0.091	91	85 - 115	9/10/01
Toluene		mg/Kg	0.10	0.092	92	85 - 115	9/10/01
Ethylbenzene		mg/Kg	0.10	0.091	91	85 - 115	9/10/01
M,P,O-Xylene		mg/Kg	0.30	0.276	92	85 - 115	9/10/01

ICV (1)

QCBatch: QC13904

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/Kg	0.10	0.100	100	85 - 115	9/10/01
Benzene		mg/Kg	0.10	0.097	97	85 - 115	9/10/01
Toluene		mg/Kg	0.10	0.097	97	85 - 115	9/10/01
Ethylbenzene		mg/Kg	0.10	0.097	97	85 - 115	9/10/01
M,P,O-Xylene		mg/Kg	0.30	0.292	97	85 - 115	9/10/01

CCV (1) QCBatch: QC14002

			CCVs	CCVs	\mathbf{CCVs}	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	106	106	75 - 125	9/17/01

CCV (2) QCBatch: QC14002

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	102	102	75 - 125	9/17/01

Report Date: 1712	September	21, 2001	Ord Duk	ler Number: A(æ/San Simon S	01091002 Spill Area	Page Nu	mber: 10 of 10 N/A
ICV (1)	QC	CBatch: QC	14002				
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	105	105	75 - 125	9/17/01
CCV (1)	Q	CBatch: Q0	C14087				
. ,			CCVa	COVA	CCVa	Democrat	
			CUVS	Eound	Boreent	Percent	Data
Domana	Flor	TInita	Irue	Cono	Percent	Limita	Applymod
Param	Flag	Units	Conc.				Analyzed
Bromide		mg/L	2.30	2.40	99	90 - 110	9/10/01
		mg/L	12.50	11.81	94	90 - 110	9/16/01
Fiuoride		mg/L	2.50	2.33	93	90 - 110	9/16/01
Nitrate-IN		mg/L	2.00	2.30 11.60	94	90 - 110	9/16/01
		mg/L	12.50	11.00			5/10/01
ICV (1)	00	Batch OC	14087				
10 (1)		Datcii. QC	14001				
			CCVs	\mathbf{CCVs}	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
Bromide		mg/L	2.50	2.50	100	90 - 110	9/16/01
CL		m mg/L	12.50	11.53	92	90 - 110	9/16/01
Fluoride		mg/L	2.50	2.37	94	90 - 110	9/16/01
Nitrate-N		m mg/L	2.50	2.31	92	90 - 110	9/16/01
Sulfate		mg/L	12.50	11.78	94	90 - 110	9/16/01
CCV (1)	Q	CBatch: Q0	C14144				
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc	Conc	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	102	102	75 - 125	9/20/01
		0, 0					
ICV (1)	QC	CBatch: QC	14144				
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	Analyzed

YAY . - Accounting receives Gold copy. C A Browcord 167 506 6395 $\dot{\mathbf{x}}$ X ŝ Æ M ON- out of the Russes (801 MId 50 (-**T**Y) 919*0*7 vqdjy AIRBILL | Date: Time: OTHER: Circle or Specify Method No. ,Щq obicoldo '811 'ESI **'008** ANALYSIS REQUEST 809/809 300 909/0909 = 93-AOT 8570/625 TOZOC STOP Sing HIGHLANDER CONTACT PERSON: ager retains pink copy - HS -PAGE: 8240/8260/624 TOA SWDE / andre De SAMPLE SHIPPED BY: ana Amra) FEDEX HAND DELIVERED Volatiles d Di भूद्र भूव मुख Cq Cr 5q मुद्दे हुद sivion d Da SAMPLED TON ag BH 1KG CA CF Pb tels Ag As Ba HVd 07.88 (Hai X 200 TXL OTE NOD **(181** ~ 7 × × Please Fill out all copies - Laboratory retains yellow copy - Return original copy to Highlander Environmental Corp. - Project Man 809/0309 SELF j)) Ň え 209/0201 X319 \prec X ad gl ŝ PRESERVATIVE 10 NONE METHOD Fax (915) 682-3946 Request and Chain of Custody Record 1 Ð 1 Ν REMARKS. Date: Time: 00:11 HIGHLANDER ENVIRONMENTAL CORP. GONH Date: Time: Date: TOH (N/X) OFFICIA 14 14 ÿĽ NUMBER OF CONTAINERS and SD-Solid O-Other BUTTED BY: (Sumature) RECEIVED BY: (Signature) RECEPTED BY: (Suggeture) 0/6/01 Ter-SL-Sludge SITE MANAGER: COURT CV Ś SAMPLE IDENTIFICATION ² 1910 N. Big Spring St. Midland, Texas 79705 4-4-(1.5-2.0 ر کی کھ - کی ک (2:0:)-1-0 (0-) (1-0) DATE Lan Y いまん 10 (1 - 0)2.0 14-2(Z.0 F-Tater S-Soll 60 MATRIX 2-H8 ġ AH-4 オーナケート 14-3 QH-3 1-H V DU-1 dH-Date: . Date: _____ PROJECT NAME AH 7me: Date: c k 5 7 5 5 > 5 GRAB 2 5 STATE: PHONE: R COMP. SAMPLE CONDITION WHEN RECEIVED: XINTALX 5 2 - \sim 5 5 TING BUTTER PY: (Starke) an By (Sumature) (915) 682 - 4559(Sugnature) ? Analysis RECEIVING LABORATORY: ADDRESS: CLIENT WAVE 10/9 DATE RELINQUISHED BY: PROJECT NO .: 18842Y 46 <u>S</u>3 67 B LAB I.D. NUMBER 49 CB 6 S RELINGOUS CONTACT Ë Rig K

																			1				[
	┝																					Ņ	
0																			Ş			ÿ	
	╞	· · · · · · · · · · · · · · · · · · ·				(80)	səqsy) Mid				<u> </u>								5	4	8		
0	्रो	·				(//-/) 90'	oten annab						-					33	2 I		KUS	Aut	
Н.				əpi	Calori	'Sal 'H	BOD, TSS, p													Elo			
	4					909 909/	9/808 '789d 5-59 8 808/9											10	¥.				
REO(A A			9	39/0LZ	9 TOA .	CCTRE Semi						1					a.	28	p.	:NC		
C.E.				,	79/09 2	8/0729	CCTRE APT											E S	討	5	NERS(Ň	
PA N	<u>ы</u>					ADIVIDA	BCI ICITA SERIO						<u> </u>					きて	е Ц		5	2	
N	8 8					89)	ICED AOTOM			<u>†</u>				<u> </u>				診	R ON		TENO 1	Ś	
		98	₿ _H p	4-10	PO VE	EV 87	TCLP Metals											13	ddH	IVER		3	
	2	98 1	PH Q.	4-10	छ च्य	ay 	BCHY Neren			+									8 8 8	DEI	EAND	11	
	ŀ	9	00 170	I (10 M 91	08 €		·×										死	AMP	HANT	HIGH	R	
	F					809,	MLBE 8050			<u> </u>					[Ť		1
	┰─┶					809,	/0208_0118	×										ad					
					DIVE		INONE			+				+				<u>F</u> g				3	
Ld Ld				946	THO		ICE			+	\square			\square				24				2	ġ
00		•		2-3	NE		GONH				1	1	1	1	\square	-		 	55	 	8	0	TAAR
š		T		682	PF		НСГ												Det 17m	Det	!		122
	C	5		5)		(N/.	LITLESED (A				L											T T	
$\left \hat{\mathbf{A}} \right $	15	د		(91	SHEN	CONTAL	SO SECTOR	_	<u> </u>		<u> </u>	<u> </u>		<u> </u>				{					
ē		ב		ах		9														2	· <		-Solic Other
1S.		Ľ		F		2												atur	atur	atur			65
5	15	7				2	¥											3	(Sign			_	2
4	G	3 #	ي ي	2		C d	ZNO	$\left \gamma \right $										Ä	ä	BY:	1	E	-11 P
l °	N.	N L	1 C 2 C	-	2		CAT	n l											AED	N		6	48
<u>E</u> .			32	-	2	く	N.E.	d'										RECE	RCE	RCE		Ë	1.
Ja.	12	<u>ן</u> נ	ad a				V B											-				1 4	
U				A 2		۲ ۲	LE C	1.0										时	ল				• ¢
-77	5	≻ ä		4		10	SAME											FR	173				i i i i i i i i i i i i i i i i i i i
ğ	G	3.	י ב		2			$\langle \dot{v} \rangle$									-	67	2	`	R		KAT
0			I AT	101		AMP 3		17												i i	H		<u> </u>
st			n la la			N - 3		V										a fi	Z Z	4	!\		
le		3 -		X T		5	CRAB	X	<u> </u>		ļ								12		2	1	
5						H H H H H H H H H H H H H H H H H H H	XINTAX	N											LB	F	N	PHO	ë
Re		Ę		8		2	E											(e,	赵	E	11	الم	RCE!
l m				455		11	E											K	奭	matu	 S:		N N
Si	5	5		32-	16	·	TE	6									\square	愿	8		LTOR		Ha A
14		77		88		Y0.:	Va	6	+								X	NA C	E E	HI C	BOR		OLLI
na		۲		15)		E	0 Å	Ry.	1		1				1	1	4		屘	ISHE	10		CONT
A				6)	IEN	ROLE		88											团	INOU	NIAL		PLE
					ธ	đ	38	12										REAL	RK	RE	REC	168	SAM

TraceAnalysis, Inc.

(806) 794-1296

Report Date: February 28, 2002 Order Number: A02022021 1712 Duke/San Simon Spill Area Page Number: 1 of 2 N/A

Summary Report

Ike Tavarez Highlander Environmental Services 1910 N. Big Spring St. Midland, TX 79705 Report Date:

February 28, 2002

Order ID Number: A02022021

Project Number:1712Project Name:Duke/San Simon Spill AreaProject Location:N/A

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
191296	BH-1 (5-6')	Soil	2/15/02	•	2/20/02
191298	BH-1 (15-16)	Soil	2/15/02	:	2/20/02
191299	BH-1 (20-21)	Soil	2/15/02	:	2/20/02
191300	BH-1 (24-25')	Soil	2/15/02	:	2/20/02
191301	BH-2 (5-6)	Soil	2/15/02	:	2/20/02
191303	BH-2 (15-16)	Soil	2/15/02	:	2/20/02
191304	BH-3 (5-6)	Soil	2/15/02	:	2/20/02
191306	BH-3 (15-16)	Soil	2/15/02	:	2/20/02
191307	BH-3 (20-21')	Soil	2/15/02	:	2/20/02
191308	BH-3 (25-26')	Soil	2/15/02	:	2/20/02
191309	BH-4 (5-6)	Soil	2/15/02	:	2/20/02
191311	BH-4 (15-16)	Soil	2/15/02	:	2/20/02
191312	BH-5 (5-6)	Soil	2/15/02	:	2/20/02
191313	BH-5 (10-11)	Soil	2/15/02	:	2/20/02
191314	BH-5 (15-16)	Soil	2/15/02	:	2/20/02
191315	BH-6 (5-7)	Soil	2/15/02	:	2/20/02
191316	BH-6 (10-11)	Soil	2/15/02	:	2/20/02
191317	BH-6 (15-16)	Soil	2/15/02	:	2/20/02

0 This report consists of a total of 2 page(s) and is intended only as a summary of results for the sample(s) listed above.

				H	BTEX			TPH
	MTBE	Benzene	Toluene	Ethylbenzene	M,P,O-Xylene	Total BTEX	Test Comments	TRPHC
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
191296 - BH-1 (5-6')	< 0.500	< 0.500	52.5	24.1	116	193	* 1	29600
191298 - BH-1 (15-16)	-	0.0398	0.158	0.171	0.629	0.998	-	110
191299 - BH-1 (20-21)	-	-	-	-	-,	-	-	412
191300 - BH-1 (24-25')	-	0.0407	0.108	0.119	0.337	0.605	-	109
191301 - BH-2 (5-6)	-	-	-	-	-	-	-	<10.0
191303 - BH-2 (15-16)	-	-	-	-	-	-	-	<10.0
191304 - BH-3 (5-6)	< 0.200	1.73	30.5	11.6	77.8	122	-	28100
191306 - BH-3 (15-16)	-	1.13	8.44	5.67	31.4	46.6	-	5960
191307 - BH-3 (20-21')	-	0.0391	0.112	0.154	0.512	0.817	-	170
191308 - BH-3 (25-26')	-	-	-	-	-	-	-	436
191309 - BH-4 (5-6)	-	0.0396	0.118	0.153	0.550	0.861	-	222
191311 - BH-4 (15-16)	-	-	-	-	-	-	-	14.9
191312 - BH-5 (5-6)	-	0.0551	1.45	1.16	7.54	10.2	-	1060
191313 - BH-5 (10-11)	-	-	-	-	-	-	-	28.6
Continued								

ommueu ...

¹Sample ran at a dilution due to hydrocarbons beyond xylene.

(806) 794-1296

Report Date: February 28, 2002 Order Number: A02022021 1712 Duke/San Simon Spill Area Page Number: 2 of 2 N/A

Commuea													
		BTEX											
	MTBE Benzene Toluene Ethylbenzene M,P,O-Xylene Total BTEX Test Comments												
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)					
191314 - BH-5 (15-16)	-	-	-	-	-	-	-	156					
191315 - BH-6 (5-7)	-	< 0.010	0.106	0.124	0.385	0.615	-	127					
191316 - BH-6 (10-11)	-	-	-	-	-	-	-	120					
191317 - BH-6 (15-16)	-	-	-	- '	-	-	-	120					

Sample: 191296 - BH-1 (5-6')

Param	Flag	Result	Units
Chloride		375	mg/Kg

Sample: 191298 - BH-1 (15-16)

Param	Flag	Result	Units
Chloride		<10.0	mg/Kg

Sample: 191300 - BH-1 (24-25')

Param	Flag	Result	Units
Chloride		<10.0	mg/Kg

Sample: 19	91304 - BH-3 (5-6)		
Param	Flag	Result	Units
Chloride		1090	mg/Kg

Sample: 191306 - BH-3 (15-16)

Param	Flag	Result	Units
Chloride		36.9	mg/Kg

Sample: 191307 - BH-3 (20-21')

Param	Flag	Result	Units
Chloride		17.2	mg/Kg

6701 Aberdeen Avenue, Suite 9 155 McCutcheon, Suite H

Lubbock, Texas 79424 800•378•1296 El Paso, Texas 79932

888•588•3443

806 • 794 • 1296 FAX 806 • 794 • 1298

E-Mail: lab@traceanalysis.com

915 • 585 • 3443 FAX 915 • 585 • 4944

Analytical and Quality Control Report

Ike Tavarez Highlander Environmental Services 1910 N. Big Spring St. Midland, TX 79705

Report Date: February 28, 2002

Order ID Number: A02022021

Project Number: 1712 **Project Name:** Duke/San Simon Spill Area Project Location: N/A

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
191296	BH-1 (5-6')	Soil	2/15/02	:	2/20/02
191298	BH-1 (15-16)	Soil	2/15/02	:	2/20/02
191299	BH-1 (20-21)	Soil	2/15/02	:	2/20/02
191300	BH-1 (24-25')	Soil	2/15/02	:	2/20/02
191301	BH-2 (5-6)	Soil	2/15/02	:	2/20/02
191303	BH-2 (15-16)	Soil	2/15/02	:	2/20/02
191304	BH-3 (5-6)	Soil	2/15/02	:	2/20/02
191306	BH-3 (15-16)	Soil	2/15/02	:	2/20/02
191307	BH-3 (20-21')	Soil	2/15/02	:	2/20/02
191308	BH-3 (25-26')	Soil	2/15/02	:	2/20/02
191309	BH-4 (5-6)	Soil	2/15/02	:	2/20/02
191311	BH-4 (15-16)	Soil	2/15/02	:	2/20/02
191312	BH-5 (5-6)	Soil	2/15/02	:	2/20/02
191313	BH-5 (10-11)	Soil	2/15/02	:	2/20/02
191314	BH-5 (15-16)	Soil	2/15/02	:	2/20/02
191315	BH-6 (5-7)	Soil	2/15/02	:	2/20/02
191316	BH-6 (10-11)	Soil 6	2/15/02	:	2/20/02
191317	BH-6 (15-16)	Soil	2/15/02	•	2/20/02

0

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.

This report consists of a total of 16 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 191296 - BH-1 (5-6')

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18415	Date Analyzed:	2/25/02
Analyst:	\mathbf{CG}	Preparation Method:	S 5035	Prep Batch:	PB17896	Date Prepared:	2/25/02
Param		Flag	Result	Units		Dilution	RDL
MTBE			< 0.500	mg/Kg		500	0.001
Benzene			< 0.500	mg/Kg		500	0.001
Toluene			52.5	mg/Kg		500	0.001
Ethylbenze	ne		24.1	mg/Kg		500	0.001
M,P,O-Xyle	ene		116	mg/Kg		500	0.001
Total BTE	Х		193	mg/Kg		500	0.001
Test Comm	ents	1	*	mg/Kg		1	

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	2	1.89	mg/Kg	500	1	189	70 - 130
4-BFB	3	9.24	mg/Kg	500	1	924	70 - 130

Sample: 191296 - BH-1 (5-6')

Analysis:	Ion Chromatography (IC	C) Analytical Method:	E 300.0	QC Batch:	QC18455 Date Analyzed: 2/25/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB17928 Date Prepared: 2/25/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		375	mg/Kg	10	0.50

Sample: 191296 - BH-1 (5-6')

Analysis: Analyst:	ТРН КМ	Analytic Preparat	al Method: tion Method:	E 418.1 E 3550B	QC Batch: Prep Batch:	QC18426 PB17905	Date Analyzed: Date Prepared:	$\frac{2}{25}/02}{2}/22/02}$
Param		Flag	Resul	t	Units	Dilutio	n	RDL
TRPHC			2960	0	mg/Kg	1		10

Sample: 191298 - BH-1 (15-16)

Analysis: Analyst:	BTEX CG	Analytical Method: Preparation Method	S 8021B : S 5035	QC Batch: Prep Batch:	QC18291 PB17799	Date Analyzed: Date Prepared:	2/20/02 2/20/02
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.0398	mg/Kg		10	0.001
Toluene			0.158	mg/Kg	-	10	0.001
Ethylbenze	ene		0.171	mg/Kg		10	0.001
M,P,O-Xyl	ene		0.629	mg/Kg	:	10	0.001
Total BTE	Х		0.998	mg/Kg		10	0.001

¹Sample ran at a dilution due to hydrocarbons beyond xylene.

²High surrogate recovery due to peak interference.

³High surrogate recovery due to peak interference.

Report Da 1712	Report Date: February 28, 2002 Order Number: A02022021 Page Number 712 Duke/San Simon Spill Area				ber: 3 of 1 N/A		
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	0	0.899	mg/Kg	10	1		70 - 130
4-BFB		1.17	mg/Kg	10	1	, 117	70 - 130
Sample: Analysis: Analyst:	191298 Ion Chror JS	8 - BH-1 (15- matography (IC) A H	16) Analytical Meth Preparation Me	nod: E 300.0 Q thod: N/A Pr	C Batch: ep Batch:	QC18455 Date Analyz PB17928 Date Prepar	ed: 2/25/0 ed: 2/25/0
Param	Flag	Result	Units	Dilution			RDI
Chloride		<10.0	mg/Kg	1			0.50
Sample: Analysis: Analyst:	191298 ТРН КМ	3 - BH-1 (15- Analytical Metho Preparation Met	16) od: E 418.1 hod: E 3550B	QC Batch: Prep Batch:	QC18426 PB17905	Date Analyzed: Date Prepared:	2/25/02 2/22/02
Param	1	lag	Result	Units		ltion	RDI
Sample: Analysis: Analyst:	19129 9 TPH KM	9 - BH-1 (20- Analytical Methor Preparation Met	21) od: E 418.1 hod: E 3550B	QC Batch: Prep Batch:	QC18426 PB17905	Date Analyzed: Date Prepared:	2/25/0 2/22/0
Param	I	Flag	Result	Units	Dih	ution	RDI
TRPHC		105	412	mg/Kg	2.11	1	1,
Sample: Analysis: Analyst:	19130(BTEX CG) - BH-1 (24- Analytical Meth Preparation Mether	25') hod: S 80211 :thod: S 5035	B QC Batch: Prep Batch	QC18291 : PB17799	Date Analyzed: Date Prepared:	2/20/0 2/20/0
Param		Flag	Result	Units		Dilution	RD
Benzene	· · · · · · · · · · · · · · · · · · ·	ÿ	0.0407	mg/Kg		10	0.00
Toluene			0.108	mg/Kg		10	0.00
Ethylbenze	ene		0.119	mg/Kg		10	0.00
M,P,O-Xyle	ene		0.337	mg/Kg		10	0.00
Total BTE	X		0.605	mg/Kg		10	0.00
		Popult	Units	Dilution	Spike Amount	Percent Recovery	Recover Limits
Surrogate	Flag		mg/Kg	10	1	88	70 - 130
Surrogate FFT LBFR	Flag	0.877 1.02	mg/Kg mg/Kg	10	1	88 102	70 - 13 70 - 13

٠

•

Sample: 191300 - BH-1 (24-25')

Analysis: Analyst:

JS

Ion Chromatography (IC) Analytical Method: Preparation Method: N/A

E 300.0 QC Batch:

QC18455 Date Analyzed: 2/25/02 Prep Batch: PB17928 Date Prepared: 2/25/02

Report Dat 1712	e: February	28, 2002	Order Duke/	Number: A0202 San Simon Spill	2021 Area	Page Nun	nber: 4 of 16 N/A
Param	Flag	Result	Units	Dilution			RDL
Chloride		<10.0	mg/Kg	1			0.50
Sample: Analysis: Analyst:	191300 TPH A KM F	- BH-1 (24-25') Analytical Method: Preparation Method:	E 418.1 E 3550B	QC Batch: Prep Batch:	QC18426 PB17905	Date Analyzed: Date Prepared:	2/25/02 2/22/02
Param	Fl	ag Resul	lt	Units	Diluti	on	RDL
TRPHC		10	9	mg/Kg	1		10
Sample: Analysis: Analyst:	191301 TPH A KM F	- BH-2 (5-6) Analytical Method: Preparation Method:	E 418.1 E 3550B	QC Batch: Prep Batch:	QC18426 PB17905	Date Analyzed: Date Prepared:	2/25/02 2/22/02
Param	Fla	ag Resul	t	Units	Diluti	on	RDL
TRPHC		<10.	0	mg/Kg	1	· · · · · · · · · · · · · · · · · · ·	10
Analysis: Analyst: Param	TPH A KM F Fla	Analytical Method: Preparation Method: ag Resul	E 418.1 E 3550B	QC Batch: Prep Batch: Units	QC18426 PB17905 Diluti	Date Analyzed: Date Prepared: on	2/25/02 2/22/02 RDL
TRPHU		<10.	0	mg/Kg	1		10
Sample: Analysis: Analyst:	191304 - BTEX CG	- BH-3 (5-6) Analytical Method: Preparation Method:	S 8021B S 5035	QC Batch: Prep Batch:	QC18415 PB17896	Date Analyzed: Date Prepared:	2/25/02 2/25/02
Param		Flag	Result	Units	Ι	Dilution	RDL
MTBE		· · · · · · · · · · · · · · · · · · ·	< 0.200	mg/Kg		200	0.001
Benzene			1.73	mg/Kg		200	0.001
Toluene			30.5	mg/Kg		200	0.001
Etnylbenzen M.R.O. Yulai	ne			mg/Kg		200	0.001
Total BTEX	пе С		122	mg/Kg		200	0.001
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	А	1.28 n	ng/Kg	200	1	128	70 - 130
4-BFB	4	<u>6.69</u> n	ng/Kg	200	1	669	70 - 130

•

.

Sample: 191304 - BH-3 (5-6)

Analysis:Ion Chromatography (IC) Analytical Method:E 300.0 QC Batch:QC18455 Date Analyzed: 2/25/02Analyst:JSPreparation Method:N/APrep Batch:PB17928 Date Prepared: 2/25/02

⁴High surrogate recovery due to peak interference.

Report Da 1712	te: Februa	ry 28, 2002	Order Duke/	Number: A0202 San Simon Spill	2021 Area	Page Num	ber: 5 of 16 N/A
Param	Fla	g Result	Units	Dilution			RDL
Chloride		1090	mg/Kg	50			0.50
Sample: Analysis:	19130 TPH	94 - BH-3 (5-6) Analytical Method:	E 418.1	QC Batch:	QC18426	Date Analyzed:	2/25/02

Analyst.	IVI	Tiepatat	Ion Method. E 3000D	T tep Daten.	1 D11900	Date I Tepareu.	2/22/02
Param		Flag	Result	Units	Dilutior	1	RDL
TRPHC			28100	mg/Kg	1		10

Sample: 191306 - BH-3 (15-16)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18291	Date Analyzed:	2/20/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB17799	Date Prepared:	2/20/02
Param		Flag	Result	Units	Dilu	ition	RDL
Benzene			1.13	mg/Kg	1	10	0.001
Toluene			8.44	mg/Kg	1	0	0.001
Ethylbenze	ene		5.67	mg/Kg	1	10	0.001
M,P,O-Xyl	ene		31.4	mg/Kg	1	10	0.001
Total BTE	Х		46.6	mg/Kg	1	10	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.912	mg/Kg	10	1	91	70 - 130
4-BFB	5	2.61	mg/Kg	10	1	261	70 - 130

Sample: 191306 - BH-3 (15-16) Analysis: Jon Chromatography (IC) Analytic

Analysis: Analyst:	Ion Chromato JS	graphy (IC) Ana Pre	alytical Method: paration Method:	E 300.0 N/A	QC Batch: Prep Batch:	QC18455 Date Analyz PB17928 Date Prepare	ed: 2/25/02 ed: 2/25/02
Param	Flag	Result	Units	Dilutio	on		RDL
Chloride		36.9	mg/Kg	1			0.50
Sample	191306 - 1	BH-3 (15-16)				
sample.			J		0.010400		0/05/00

Analysis: Analyst:	ТРН КМ	Analytica Preparati	l Method: on Method:	E 418.1 E 3550B	QC Batch: Prep Batch:	QC18426 PB17905	Date Analyzed: Date Prepared:	$\frac{2}{25}/02}{2}/22/02}$
Param		Flag	Resul	t	Units	Diluti	on	RDL
TRPHC			596	00	mg/Kg	1		10

Sample: 191307 - BH-3 (20-21')

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18291	Date Analyzed:	2/20/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB17799	Date Prepared:	2/20/02

⁵High surrogate recovery due to peak interference.

Report Dat 1712	te: Februar	ry 28, 2002	Orde Duke	er Number: A0202 /San Simon Spill	2021 Area	Page Num	nber: 6 of 16 N/A
Param		Flag	Result	Units	D	ilution	RDL
Benzene			0.0391	mg/Kg		10	0.001
Toluene			0.112	mg/Kg		10	0.001
Ethylbenzei	ne		0.154	mg/Kg		10	0.001
M,P,O-Xyle	ene		0.512	mg/Kg		10	0.001
Total BTE	X		0.817	mg/Kg		10	0.001
Sumagete	Flor		Unite	Dilution	Spike A mount	Percent	Recovery
	Flag	<u> </u>	ma/Ka			<u>necovery</u>	70 120
		0.899	mg/Kg	10	1	90 109	70 - 130
4-DF D		1.08	mg/ K g	10	I	108	70 - 150
Sample: Analysis: Analyst:	19130 Ion Chro JS	7 - BH-3 (20-1 matography (IC) A H	21') Analytical Meth Preparation Met	od: E 300.0 QC hod: N/A Pre	Batch: Q p Batch: Pl	C18455 Date Analyz B17928 Date Prepar	zed: 2/25/02 red: 2/25/02
Param	Flag	g Result	Units	Dilution			RDL
		170	mg/Kg	1			0.50
Chloride Sample: Analysis:	19130 TPH	7 - BH-3 (20- Analytical Metho	21') od: E 418.1	QC Batch:	QC18426	Date Analyzed:	2/25/02
Chloride Sample: Analysis: Analyst:	19130 TPH KM	7 - BH-3 (20- Analytical Metho Preparation Met	21') od: E 418.1 hod: E 3550B	QC Batch: Prep Batch:	QC18426 PB17905	Date Analyzed: Date Prepared:	2/25/02 2/22/02
Chloride Sample: Analysis: Analyst: Param	19130 TPH KM	7 - BH-3 (20- Analytical Metho Preparation Met	21') od: E 418.1 hod: E 3550B Result	QC Batch: Prep Batch: Units	QC18426 PB17905 Dilutio	Date Analyzed: Date Prepared: on	2/25/02 2/22/02 RDL
Chloride Sample: Analysis: Analyst: Param TRPHC	19130 ТРН КМ	7 - BH-3 (20- Analytical Metho Preparation Met	21') od: E 418.1 hod: E 3550B Result 170	QC Batch: Prep Batch: Units mg/Kg	QC18426 PB17905 Dilutio 1	Date Analyzed: Date Prepared: on	2/25/02 2/22/02 RDL 10
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analyst:	19130 ТРН КМ 19130 ТРН КМ	7 - BH-3 (20- Analytical Metho Preparation Met Flag 8 - BH-3 (25- Analytical Metho Preparation Met	21') od: E 418.1 hod: E 3550B Result 170 26') od: E 418.1 hod: E 3550B	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch:	QC18426 PB17905 Dilutio 1 QC18437 PB17914	Date Analyzed: Date Prepared: on Date Analyzed: Date Prepared:	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analysis: Param	19130 ТРН КМ 19130 ТРН КМ	7 - BH-3 (20- Analytical Metho Preparation Met Flag 8 - BH-3 (25- Analytical Metho Preparation Met Flag	21') pd: E 418.1 hod: E 3550B Result 170 26') pd: E 418.1 hod: E 3550B Result	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio	Date Analyzed: Date Prepared: on Date Analyzed: Date Prepared: on	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analysis: Analysis: Param TRPHC	19130 ТРН КМ 19130 ТРН КМ	7 - BH-3 (20- Analytical Metho Preparation Met Flag 8 - BH-3 (25- Analytical Metho Preparation Met Flag	21') pd: E 418.1 hod: E 3550B Result 170 26') pd: E 418.1 hod: E 3550B Result 436	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units mg/Kg	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio	Date Analyzed: Date Prepared: on Date Analyzed: Date Prepared: on	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL
Chloride Sample: Analysis: Analysis: Param TRPHC Sample: Analysis: Param TRPHC Sample: Analysis:	19130 ТРН КМ 19130 ТРН КМ 19130 ВТЕХ СG	7 - BH-3 (20- Analytical Metho Preparation Met Flag 8 - BH-3 (25- Analytical Metho Preparation Met Flag 9 - BH-4 (5-6 Analytical Metho Preparation Met	21') pd: E 418.1 hod: E 3550B Result 170 26') pd: E 418.1 hod: E 3550B Result 436) nod: S 8021B thod: S 5035	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch:	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio 1 QC18291 PB17799	Date Analyzed: Date Prepared: on Date Analyzed: Date Prepared: on Date Analyzed: Date Analyzed:	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL 10 2/20/02 2/20/02 2/20/02
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: A	19130 ТРН КМ 19130 ТРН КМ 19130 ВТЕХ СG	7 - BH-3 (20- Analytical Metho Preparation Met Flag 8 - BH-3 (25- Analytical Metho Preparation Met Flag 9 - BH-4 (5-6 Analytical Metho Preparation Met	21') pd: E 418.1 hod: E 3550B Result 170 26') pd: E 418.1 hod: E 3550B Result 436) nod: S 8021B thod: S 5035	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch:	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio 1 QC18291 PB17799	Date Analyzed: Date Prepared: on Date Analyzed: Date Prepared: on Date Analyzed: Date Prepared:	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL 10 2/20/02 2/20/02
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analysis: Param TRPHC Sample: Analysis:	19130 ТРН КМ 19130 ТРН КМ 19130 ВТЕХ СG	7 - BH-3 (20- Analytical Metho Preparation Met Flag 8 - BH-3 (25- Analytical Metho Preparation Met Flag 9 - BH-4 (5-6 Analytical Metho Preparation Met Flag	21') pd: E 418.1 hod: E 3550B Result 170 26') pd: E 418.1 hod: E 3550B Result 436) nod: S 8021B thod: S 5035 Result 0	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Prep Batch: Prep Batch:	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio 1 QC18291 PB17799 D	Date Analyzed: Date Prepared: Date Analyzed: Date Prepared: Date Prepared: Date Analyzed: Date Prepared: ilution	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL 10 2/20/02 2/20/02 2/20/02 RDL
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analysis: Param TRPHC Sample: Analysis: Analysis: Analysis: Analysis: Analyst: Param Benzene	19130 ТРН КМ 19130 ТРН КМ 19130 ВТЕХ СG	 7 - BH-3 (20- Analytical Methor Preparation Met Flag 8 - BH-3 (25- Analytical Methor Preparation Methor Flag 9 - BH-4 (5-6 Analytical Methor Preparation Methor Flag 	21') pd: E 418.1 hod: E 3550B Result 170 26') pd: E 418.1 hod: E 3550B Result 436) nod: S 8021B thod: S 5035 Result 0.0396 0.0150	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Prep Batch: Prep Batch: Mits	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio 1 QC18291 PB17799 D	Date Analyzed: Date Prepared: on Date Analyzed: Date Prepared: on Date Analyzed: Date Prepared: ilution	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL 10 2/20/02 2/20/02 2/20/02 RDL 0.001
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analysis: Param TRPHC Sample: Analysis: Param TRPHC Sample: Param Benzene Toluene	19130 ТРН КМ 19130 ТРН КМ 19130 ВТЕХ СG	 7 - BH-3 (20- Analytical Methor Preparation Met Flag 8 - BH-3 (25- Analytical Methor Preparation Met Flag 9 - BH-4 (5-6) Analytical Methor Preparation Methor Flag 	21') pd: E 418.1 hod: E 3550B Result 170 26') pd: E 418.1 hod: E 3550B Result 436) nod: S 8021B thod: S 5035 Result 0.0396 0.118	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Prep Batch: Prep Batch: Mits Mg/Kg	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio 1 QC18291 PB17799 D	Date Analyzed: Date Prepared: Date Analyzed: Date Prepared: Date Prepared: Date Prepared: ilution 10	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL 10 2/20/02 2/20/02 2/20/02 RDL 0.001 0.001
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analysis: Analysis: Param TRPHC Sample: Analysis: Analysis: Analysis: Analyst: Param Benzene Toluene Ethylbenzer	19130 ТРН КМ 19130 ТРН КМ 19130 ВТЕХ СG	 7 - BH-3 (20- Analytical Methor Preparation Met Flag 8 - BH-3 (25- Analytical Methor Preparation Met Flag 9 - BH-4 (5-6 Analytical Methor Preparation Methor Flag 	$\begin{array}{r} \textbf{21')} \\ \textbf{pd:} & \text{E 418.1} \\ \textbf{hod:} & \text{E 3550B} \\ \hline \textbf{Result} \\ \hline 170 \\ \textbf{26')} \\ \textbf{pd:} & \text{E 418.1} \\ \textbf{hod:} & \text{E 3550B} \\ \hline \textbf{Result} \\ \hline \textbf{436} \\ \hline \textbf{0} \\ \textbf{cold:} & \text{S 8021B} \\ \hline \textbf{thod:} & \text{S 5035} \\ \hline \textbf{Result} \\ \hline \textbf{0.0396} \\ \hline \textbf{0.118} \\ \hline \textbf{0.153} \\ \hline \end{array}$	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Prep Batch: Prep Batch: Mits Mg/Kg Mg/Kg	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio 1 QC18291 PB17799 D	Date Analyzed: Date Prepared: Date Analyzed: Date Prepared: Date Prepared: Date Prepared: ilution 10 10	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL 10 2/20/02 2/20/02 2/20/02 RDL 0.001 0.001 0.001
Chloride Sample: Analysis: Analyst: Param TRPHC Sample: Analysis: Analysis: Analysis: Analysis: Analysis: Analysis: Analysis: Analysis: Param Benzene Toluene Ethylbenzer M,P,O-Xyle	19130 ТРН КМ 19130 ТРН КМ 19130 ВТЕХ ССС пе те те	 7 - BH-3 (20- Analytical Methor Preparation Met Flag 8 - BH-3 (25- Analytical Methor Preparation Met Flag 9 - BH-4 (5-6 Analytical Methor Preparation Methor Flag 	$\begin{array}{r} \textbf{21')} \\ \textbf{pd:} & \text{E } 418.1 \\ \textbf{hod:} & \text{E } 3550\text{B} \\ \hline \textbf{Result} \\ \hline 170 \\ \hline \textbf{26')} \\ \textbf{pd:} & \text{E } 418.1 \\ \textbf{hod:} & \text{E } 3550\text{B} \\ \hline \textbf{Result} \\ \hline 436 \\ \hline \textbf{mod:} & \text{E } 8021\text{B} \\ \hline \textbf{thod:} & \text{S } 8021\text{B} \\ \hline \textbf{thod:} & \text{S } 5035 \\ \hline \textbf{Result} \\ \hline 0.0396 \\ 0.118 \\ 0.153 \\ 0.550 \\ \hline \textbf{c} \\ \textbf{sc} \\ $	QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Units mg/Kg QC Batch: Prep Batch: Prep Batch: Prep Batch: Mg/Kg mg/Kg	QC18426 PB17905 Dilutio 1 QC18437 PB17914 Dilutio 1 QC18291 PB17799 D	Date Analyzed: Date Prepared: Date Analyzed: Date Prepared: Date Prepared: Date Prepared: ilution 10 10	2/25/02 2/22/02 RDL 10 2/26/02 2/22/02 RDL 10 2/20/02 2/20/02 RDL 0.001 0.001 0.001 0.001

Continued ...

.

Report Date: February 28, 2002 1712 Order Number: A02022021 Duke/San Simon Spill Area .

			· · · · · · · · · · · · · · · · · · ·				· · · · ·
					Spike	Percent	Recover
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
					Snike	Percent	Recover
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TET	1 145	0.001	Kg	10	1	00	70 - 130
A BEB		1 17	mg/Kg	10	1	33 117	70 - 130
		1.11					10 10
Sample:	191309	9 - BH-4 (5-6)					
Analysis:	\mathbf{TPH}	Analytical Method:	E 418.1	QC Batch:	QC18437	Date Analyzed:	2/26/0
Analyst:	KM	Preparation Metho	d: E 3550B	Prep Batch:	PB17914	Date Prepared:	2/22/0
Param	F	Flag Re	sult	Units	Diluti	on	RD
TRPHC			222	mg/Kg	1		1
Analysis: Analyst:	ТРН КМ	Analytical Method: Preparation Metho	E 418.1 d: E 3550B	QC Batch: Prep Batch:	QC18437 PB17914	Date Analyzed: Date Prepared:	2/26/0 2/22/0
Param	F	Flag Re	sult	Units	Diluti	on	RD
TRPHC			14.9	mg/Kg	1	·····	1
Sample: Analysis: Analyst:	191312 BTEX CG	2 - BH-5 (5-6) Analytical Method Preparation Meth	d: S 8021B od: S 5035	QC Batch: Prep Batch:	QC18291 PB17799	Date Analyzed: Date Prepared:	2/20/0 2/20/0
Param		Flag	Result	Units	D	Pilution	RD
Benzene			0.0551	mg/Kg		10	0.00
Toluene			1.45	mg/Kg		10	0.00
Ethylbenze	ene		1.16	mg/Kg		10	0.00
M,P,O-Xyl	ene		7.54	mg/Kg		10	0.00
Total BTE	X		10.2	mg/Kg	·····	10	0.00
					Spike	Percent	Recover
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.808	mg/Kg	10	1	81	70 - 130
4-BFB	6	0.558	mg/Kg	10	1	55	70 - 130
Sample:	191312	2 - BH-5 (5-6)					
Analysis:	TPH	Analytical Method	E 418.1	QC Batch:	QC18437	Date Analyzed:	2/26/0
Analyst:	KM	Preparation Metho	d: E 3550B	Prep Batch:	PB17914	Date Prepared:	2/22/0
Domos							2/22/0
raram	F	Flag Re	sult	Units	Diluti	on	RD
FRPHC	F	Flag Re	sult 060	Units mg/Kg	Dilution 1	on	RD

⁶Low surrogate recovery due to matrix difficulties.

Report Date: February 28, 2002 1712				Order Duke/S	Number: A0202 San Simon Spill	Page Num	Page Number: 8 of 16 N/A		
Sample: Analysis: Analyst:	1913 TPH KM	1 3 - BH-5 (Analytical M Preparation	(10-11) Method: Method:	E 418.1 E 3550B	QC Batch: Prep Batch:	QC18437 PB17914	Date Analyzed: Date Prepared:	2/26/02 2/22/02	
Param		Flag	Resul	lt	Units	Diluti	on	RDL	
TRPHC			28.	6	mg/Kg	1		10	
Sample:	19131	14 - BH-5 ((15-16)	D 410 1		0010495		0 100 100	
Analysis:	TPH KM	Analytical M	Method:	E 418.1 E 3550B	QC Batch: Prop. Batch:	QC18437 PR17014	Date Analyzed:	2/26/02	
Analyst:	I. MI	гтерагасіон	method:	E 2220D	r lep Dateil.	1 D17914	Date Prepared.	2/22/02	
Param	Flag Re		Resu	lt	Units	Diluti	on	RDL	
TRPHC			15	6	mg/Kg	1		10	
Sample: Analysis: Analyst:	1913 BTEX CG	l 5 - BH-6 (Analytical Preparatio	(5-7) Method: n Method	S 8021B : S 5035	QC Batch: Prep Batch:	QC18291 PB17799	Date Analyzed: Date Prepared:	2/20/02 2/20/02	
Param		Flag		Result	Units]	Dilution	RDL	
Benzene				<0.010	mg/Kg		10	0.001	
Toluene				0.106	mg/Kg		10	0.001	
Ethylbenzer M P O Yulo	1e 10			0.124	mg/Kg		10	0.001	
Total BTEX	ζ			0.615	mg/Kg		10	0.001	
_			_			Spike	Percent	Recovery	
Surrogate	Fla	g Resu		Units	Dilution	Amount	Recovery	Limits	
4-BFB		0.95	1 1	mg/Kg	10	1	95	70 - 130	
Sample:	19131	15 - BH-6 ((5-7)						
Analysis:	TPH	Analytical M	Aethod:	E 418.1	QC Batch:	QC18437	Date Analyzed:	2/26/02	
Analyst:	КМ	Preparation	Method:	E 3550B	Prep Batch:	PB17914	Date Prepared:	2/22/02	
Param		Flag	Resul	lt	Units	Diluti	on	RDL	
<u>FRPHC</u>	,		12	7	mg/Kg	1		10	
Sample	19131	6 - BH-6 ((10- 11)						
Analysis:	TPH	Analytical N	Aethod:	E 418.1	QC Batch:	QC18437	Date Analvzed:	2/26/02	
Analyst:	KM	Preparation	Method:	E 3550B	Prep Batch:	PB17914	Date Prepared:	2/22/02	
Param		Flag	Resul	t	Units	Diluti	on	RDL	

Report Date: February 28, 2002 1712			Order Duke/	Number: A0202 San Simon Spill	2021 Area	Page Number: 9 of 16 N/A		
Sample: Analysis: Analyst:	1913 TPH KM	17 - BH-6 Analytica Preparati	6 (15-16) l Method: on Method:	E 418.1 E 3550B	QC Batch: Prep Batch:	QC18437 PB17914	Date Analyzed: Date Prepared:	2/26/02 2/22/02
Param		Flag	Resul	t	Units	Diluti	on	RDL
TRPHC			12	0	mg/Kg	1		10

I

Quality Control Report Method Blank

Method Blank

QCBatch: QC18291

				Reporting
Param	Flag	Results	Units	Limit
Benzene		<0.010	mg/Kg	0.001
Toluene		< 0.010	mg/Kg	0.001
Ethylbenzene		< 0.010	mg/Kg	0.001
M,P,O-Xylene		<0.010	mg/Kg	0.001
Total BTEX		< 0.010	mg/Kg	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.924	mg/Kg	10	1	92	70 - 130
4-BFB		0.814	mg/Kg	10	1	81	70 - 130

Method Blank QCBatch: QC18415

				Reporting
Param	Flag	Results	Units	Limit
MTBE		<0.010	mg/Kg	0.001
Benzene		<0.010	mg/Kg	0.001
Toluene		< 0.010	mg/Kg	0.001
Ethylbenzene		<0.010	mg/Kg	0.001
M,P,O-Xylene		< 0.010	mg/Kg	0.001
Total BTEX		<0.010	mg/Kg	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.924	mg/Kg	10	1	92	70 - 130
4-BFB		0.871	mg/Kg	10	1	87	70 - 130

Method Blank	QCBatch:	QC18426

				Reporting
Param	Flag	Results	Units	Limit
TRPHC		<10.0	mg/Kg	10

Method Blank

QCBatch: QC18437

				Reporting
Param	Flag	Results	Units	Limit
TRPHC		<10.0	mg/Kg	10

Report Date: February 1712	28, 2002	Order Number: A02 Duke/San Simon Sp	Page Number: 11 of 16 N/A	
Method Blank	QCBatch:	QC18455		
Param	Flag	Results	Units	Reporting Limit
Chloride		11.85	mg/Kg	0.50

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC18291

				Spike						
	LCS	LCSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
MTBE	0.912	0.922	mg/Kg	10	1	< 0.010	91	1	79 - 113	20
Benzene	0.910	0.915	mg/Kg	10	1	< 0.010	91	0	88 - 107	20
Toluene	0.923	0.934	mg/Kg	10	1	< 0.010	92	1	86 - 110	20
Ethylbenzene	0.926	0.934	mg/Kg	10	1	< 0.010	93	1	85 - 110	20
M,P,O-Xylene	2.80	2.80	mg/Kg	10	3	< 0.010	93	0	86 - 112	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.940	0.937	mg/Kg	10	1	94	94	70 - 130
4-BFB	0.940	0.920	mg/Kg	10	1	94	92	70 - 130

Laboratory Control Spikes

QCBatch: QC1

QC18415

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.923	0.916	mg/Kg	10	1	< 0.010	92	1	79 - 113	20
Benzene	0.982	0.962	mg/Kg	10	1	< 0.010	98	2	88 - 107	20
Toluene	0.947	0.935	mg/Kg	10	1	< 0.010	95	1	86 - 110	20
Ethylbenzene	0.959	0.945	mg/Kg	10	1	< 0.010	96	1	85 - 110	20
M,P,O-Xylene	2.76	2.72	mg/Kg	10	3	< 0.010	92	1	86 - 112	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.927	0.933	mg/Kg	10	1	93	93	70 - 130
4-BFB	0.874	0.878	mg/Kg	10	1	87	88	70 - 130

Laboratory Control Spikes

QCBatch: QC18426

					Spike					
	LCS	LCSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
TRPHC	206	214	mg/Kg	1	250	<10.0	82	3	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laborat	tory Con	trol Spil	kes	QCBatch	: QC1843	37				
					Spike					
	LCS	LCSD			Amount	Matrix			$\% \ Rec$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	Limit
TRPHC	204	211	mg/Kg	1	250	<10.0	81	3	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes				QCBatch:	QC1845	5				
					Spike					
	LCS	LCSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% \ \text{Rec}$	RPD	Limit	Limit
Chloride	23.23	23.19	mg/Kg	1	12.50	11.85	91	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC18291

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
Benzene	1.01	0.978	mg/Kg	10	1	0.0398	101	3	68 - 102	20
Toluene	1.24	1.19	mg/Kg	10	1	0.154	124	4	69 - 105	20
Ethylbenzene	1.20	1.13	mg/Kg	10	1	0.190	120	6	65 - 108	20
M,P,O-Xylene	3.38	3.18	mg/Kg	10	3	< 0.010	113	6	63 - 114	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	MS	MSD			Spike	MS	MSD	Recovery
Surrogate	Result	Result	Units	Dilution	Amount	% Rec	$\% { m Rec}$	Limits
TFT	0.801	0.873	mg/Kg	10	1	80	87	70 - 130
4-BFB	0.956	1.05	mg/Kg	10	1	96	105	70 - 130

Matrix Spikes

QCBatch: QC18415

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
MTBE	0.816	0.792	mg/Kg	10	1		82	3	47 - 138	20
Benzene	0.915	0.898	mg/Kg	10	1	< 0.010	91	2	68 - 102	20
Toluene	0.931	0.912	mg/Kg	10	1	< 0.010	93	2	69 - 105	20
Ethylbenzene	0.893	0.872	mg/Kg	10	1	< 0.010	89	2	65 - 108	20
M,P,O-Xylene	2.72	2.73	mg/Kg	10	3	< 0.010	91	0	63 - 114	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dilution	Spike Amount	MS % Rec	MSD % Rec	Recovery Limits
TFT	7 0.678	8 0.630	mg/Kg	10	1	68	63	70 - 130
4-BFB	0.709	⁹ 0.644	mg/Kg	10	1	71	64	70 - 130

Matrix Spikes QCBatch: QC18426

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	Limit
TRPHC	248	258	mg/Kg	1	250	<10.0	99	3	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC18437

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
TRPHC	¹⁰ 462	599	mg/Kg	1	250	436	10	144	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC18455

Spike											
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD	
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	Limit	
Chloride	28.50	28.64	mg/Kg	1	12.50	17.2	90	0	69 - 121	20	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC18291

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/L	0.10	0.115	115	85 - 115	2/20/02
Benzene		mg/L	0.10	0.101	101	85 - 115	2/20/02
Toluene		mg/L	0.10	0.115	115	85 - 115	2/20/02
Ethylbenzene		mg/L	0.10	0.117	117	. 85 - 115	2/20/02
M,P,O-Xylene		mg/L	0.30	0.336	112	85 - 115	2/20/02

⁷Low surrogate recovery due to prep. LCS/LCSD show the method to be in control.

⁸Low surrogate recovery due to prep. LCS/LCSD show the method to be in control.

⁹Low surrogate recovery due to prep. LCS/LCSD show the method to be in control.

¹⁰Poor spike recovery due to high TPH in sample. LCS / LCSD show analysis in control.

CCV (2)	QCBa	tch: QC18	3291				
			CCVs	CCVs Found	CCVs Percent	Percent	Data
Param	Flag	Units	Conc.	Conc.	Recoverv	Limits	Analyzed
MTBE		mg/L	0.10	0.096	96	85 - 115	2/20/02
Benzene		mg/L	0.10	0.092	92	85 - 115	2/20/02
Toluene		mg/L	0.10	0.099	99	85 - 115	2/20/02
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	2/20/02
M,P,O-Xylene		mg/L	0.30	0.304	101	85 - 115	2/20/02

ICV (1) QCBatch: QC18291

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/L	0.10	0.103	103	85 - 115	2/20/02
Benzene		mg/L	0.10	0.102	102	85 - 115	2/20/02
Toluene		$\mathrm{mg/L}$	0.10	0.11	110	85 - 115	2/20/02
Ethylbenzene		$\mathrm{mg/L}$	0.10	0.107	107	85 - 115	2/20/02
M,P,O-Xylene		mg/L	0.30	0.266	88	85 - 115	2/20/02

CCV (1) QCBatch: QC18415

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/L	0.10	0.095	95	85 - 115	2/25/02
Benzene		mg/L	0.10	0.0986	99	85 - 115	2/25/02
Toluene		mg/L	0.10	0.0991	99	85 - 115	2/25/02
Ethylbenzene		mg/L	0.10	0.0947	95	85 - 115	2/25/02
M,P,O-Xylene		mg/L	0.30	0.311	104	85 - 115	2/25/02

CCV (2) QCBatch: QC18415

			\mathbf{CCVs}	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE	11	mg/L	0.10	0.084	84	85 - 115	2/25/02
Benzene		m mg/L	0.10	0.094	94	85 - 115	2/25/02
Toluene		mg/L	0.10	0.095	95	85 - 115	2/25/02
Ethylbenzene		mg/L	0.10	0.091	91	85 - 115	2/25/02
M,P,O-Xylene		mg/L	0.30	0.268	89	85 - 115	2/25/02

ICV (1) QCBatch: QC18415

¹¹MTBE outside normal limits. Average of CCV components within acceptable limits.

Report Date: 1 1712	February 28,	2002	Order Duke/	r Number: A02 /San Simon Sp	022021 ill Area	Page Nu	mber: 15 of 16 N/A
Porom	Flor	Unite	CCVs True Conc	CCVs Found	CCVs Percent Becovery	Percent Recovery Limits	Date Analyzed
	Plag	mg/L	0.10	0.0984	98	85 - 115	2/25/02
Renzene		mg/L	0.10	0.105	105	85 - 115	$\frac{2}{20}$
Toluene		mg/L	0.10	0.102	102	85 - 115	$\frac{2}{25}/02$
Ethylbenzene		8, – mg/L	0.10	0.102	102	85 - 115	2/25/02
M,P,O-Xylene		mg/L	0.30	0.290	97	85 - 115	2/25/02
CCV (1)	QC	Batch: QC	18426				
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	102	102	75 - 125	2/25/02
CCV (2)	QC	Batch: QC	18426				
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	102	102	75 - 125	2/25/02
ICV (1)	QCE	Batch: QC1	8426 CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	103	103	75 - 125	2/25/02
CCV (1)	QC	Batch: QC	18437				
			CCVs	CCVs	\mathbf{CCVs}	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	102	102	75 - 125	2/26/02
ICV (1)	QCE	Batch: QC18	8437				
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
TRPHC		mg/Kg	100	101	101	75 - 125	2/26/02

.

Report Date: 1712	February 2	28, 2002	Ord Duk	er Number: A0 e/San Simon S)2022021 pill Area	Page Nu	mber: 16 of 16 N/A
CCV (1)	C	QCBatch:	QC18455				
			CCVs True	CCVs Found	CCVs Porcont	Percent	Data
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/L	12.50	11.36	90	90 - 110	2/25/02
ICV (1)	Q	CBatch:	QC18455				
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/L	12.50	11.27	90	90 - 110	2/25/02

I

√ 30	d No.)			ep	Chlorid Chlorid	(sor) (sor) (471-) NG 'SQL' 'H'	BOD, 732, p Gennus Spe Alpha Beta PLM (Asbes PLM (Asbes	×		X		4				Ň N		Date:	AND LING	OTHER: OTHER: Results by:	RUSH Charges	Authorised: Yes No	
ANALYSIS REOLEST	(Circle or Specify Metho		з ^р н 1 ^р н 9 900 П	2 24 -22 24 -22 24 -24 24 -22 24 -24 -24 -24 -24 -24 -24 -24 -24 -	510/655 660/654 BV CQ BV CQ	008 (909 2 Aor 6 2 Aor 6 2 Aor 9 2 Aor 10 9 Yor 9 9 Yo	ьеег 808/8 ьсв. 8080 ссла 2000 ссла 2000 цста 2000 цста 2000 цста 2000 цста 200 цста 200 вси керо цста 200 вси керо цста 200 ксто ксто ксто ксто ксто ксто ксто ксто		teld.	×	ķ	······································	×	4/d(d.	×	×	1 (d	saugraper: Print & Sign	SAMPLE SHIPPED BY: (Clouds) Adv	HAND DELIVERED UPS	HIGHLANDER CONTACT PERSON:	1 KE INULIE	
Kecord	nuc	UKF.		5) 682-3946	PRESERVATIVE	209	илие 9050/ ВЦЕХ 9050/ ICE HNO3 HCT ЫТЦЕНЕВ (A	×		×	<u>\</u>	•×	\ \ 			·×		Date: 21 71 02- Time: /5 0 0	Date: 2:00	Date:		, in the second s	A . A . Saraway
Chain of Custody		VIRUIVIMENIAL C	lig Spring St. Towns 70705	read ratud Fax (91	F MANAGER	4 Sman-Diclouelle	LE CULT I HIL OF	(2-6)	(11-0/)	12-16/	Ju-21)	1 (55-78;	(2-6)	10-11)	(12-16)	(2-6)	(11-01)	2.62 Acar and a canter of the	2 C REGERVED BY: (Slephtrate)	RECEIVED BY: (Signature)	RECEIVED BY: (Signature)		X: Frinter A-Air SD-Solid
vsis kequest and		UNLAINDER EIV	1910 N. B Widlend	182-4559 MILUIAILU,	Dulee B	1712 PROJECT NAME: C	EV (CONTE INVLISIX	1. 5 1BH-1	1 5 24/0	5 1-H2/ S) 1-HU- S	5 BH-1 (Z-H2, 5	5 24-2 (1242	1 2H-3 (E-H21 1 4	k: (Signature) Date: 2/	Martin Date: 115	Y: (Mgnature) Date: //	WTORY: / row Con.	PHONE: ZIP:	IN WHEN RECEIVED: MATRI
Analy		Ш		(815) 6	CLIENT NAME	PROJECT NO .:	LAB I.D. NUMBER DI	1SNC DISNE	97	98	99	300	108	303	303	304	Kor	la masangura	A CONTRACT IN	ALINQUISHED BY	DDRESS:	UNTACT:	AMPLE CONDITIO

rd PAGE: 2 OF: 5	I U ANALYSIS REQUEST	(Circle or Specify Method No.)		рн ре Вн Ре Вн Qa	1948	CJ7]014 SAVIIAN BF CQ BF CQ FR ROD	(so; (so; (so; (vr)) (so) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)) (vr)	PLM (Asbest PLM (Asbest Apple Both Reci CC.MS Semi PCB's 8080/ Pest 8000/ Pest 8000/ Pest 8000/ Pes		X X X	·×	×	//////	×	XX			1502 SAMPLEN (Print & Stand Date:	10:00 ALLE SHIPPED BY: (GIPALA) HAUNALAUAU	HAND DELIVERED UPS OTHER:	HIGHLANDER CONTACT PERSON:	1/1 / Janar autorised:	Ly aller - 7 els. 28, 2002
t and Chain of Custody Band	e and chann of custous neco	R ENVIRONMENTAL CORP.	O N Rig Spring St	dland. Texas 79705	Fax (915) 682-3	SITE MANAGER: RA PRESE	Nates / Noi - Dillaile 88	HINO3 HCT KITLESED (K) KONHEE OL KONHEE OL SYMPLE	PH-3 (15-16) 1	1- (1C-vC) S-H	11-3 (35-26') 1	1-4 (5-6) - 1-	11-4 (10-11) 1 ·	1 (7/2-17) 1	H-S (2-6)	11-5 (10-11) i	HS (15/C) 1	ate: 2/17/02 [startaryan BY: (suggature)	ate: <u>2/1 (10 2 Abodurad)</u> BY, (Supplue) Date: 2 me: 13 20 1/1/2 (Supplue) 70me: 2	hate:RECREVED BY: (Signature) Date:	25. I RECEIVED BY: (Signature)		MATRIX: W-Mater A-Air SD-Solid REMAR
Anglysis Peanes	Allalysis heques	HIGHLANDE		Mi	(915) 682-4559	CLENT NAME:	PROJECT NO.: 7/2 PROJECT	LAB I.D. DATE THER I.D. NUMBER DATE	191304/01	307 1	308	304	310	118	312	3(3)		ELINQUERED BY: (Stimature)	MAGURIARD BY (() A C C C C C C C C C C C C C C C C C C	ELINQUISHED BY: (Signature)	ECERVING LABORATORY: // CCC C	DDRESS:	AMPLE CONDITION THEN RECEIVED:

rd PAGE: 15 OF: 5	(Circle or Specify Method No.)		5H Pd 5H Qd 7H Qd	0468 		608 (603) (603) (604) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606) (606	PLM (Asbes Mipha Bols, Teshes Pest, 606/6 Pest, 606/6 Pest, 606/6 Pest, 806/6 Pest, 806/6								10 10 2 SAMPLED BY (Brint & Sun) Date:	2.3.2.2 SAMPLE STEPPED BY: (CIPALA) A VALUE A	HAND DELIVERED UPS OTHER:	HIGHLANDER CONTACT PERSON: RUEH Charges	/// /and c & Authorized: You No	Aly Iluna - 4ebr. 28, 2002
ist and Chain of Ciistody Ran		ER ENVIRONMENTAL CORP.	didland, Texas 79705	Fax (915) 682-	SITTE MANAGER: PRE: Januar C B	ct nave: Sin Simon-Sail and &	HIOJ HICT LILEBER OL SAMPLE DENTIFICATION	BH-6 (5-7)	34 2 (15-11)	RH-6 (15-16)				- links	Date: 1 of 0 Recentrate BY: (Sumature) Date: -	Date: 3-110 102 RecentRED BY: Bigmarking) Date:	Date: Date: REVED BY: (Signature) Date:	CC: RECEIVED BY: (Signature)	ZZP: ZZP: DATE: TDAE:	MATROX: W-Weter A-Air 20-Sould RELU B-304) 31-Studge 0-Other A
Anglysis Redit	nhour creditation	HIGHLAND.		(915) 682-4559	CLIENT TAME;	PROJECT NO .: /7/2 PROF	LAB I.D. DATE TIME IX NUMBER NUMBER	1913152/1/2 5 '	3/2/12/18	3/2/1/2/12				J J	RELINQUISTING BY: (SEgrature)	RELIVENTION BY (Sume Kell)	RELINQUISHED BY: (Signature)	RECEIVING LABORATORY: / HCC	ADDRESS:	SAMPLE CONDITION WHEN RECEIVED:

.

.