1R - 409

REPORTS

DATE:

8/3/2004

PLAINS
ALL AMERICAN

SITE CLOSURE DOCUMENTATION

MESCALERO RIDGE

LINK REF: 2001-10917 1R-409

NE¼ OF THE SE¼ OF SECTION 17, TOWNSHIP 19 SOUTH, RANGE 35 EAST
LEA COUNTY, NEW MEXICO

~21 MILES WEST (254°) OF
HOBBS, LEA COUNTY, NEW MEXICO
LATITUDE: N32° 39' 25" LONGITUDE: W103° 28' 21"

AUGUST 3, 2004

PREPARED BY:

Environmental Plus, Inc.
2100 Avenue O
P.O. Box 1558
Eunice, NM 88231
Phone: (505)394-3481
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STANDARD OF CARE

Site Closure Documentation

Mescalero Ridge
Ref. # 2001-10917

The information provided in this report was collected consistent with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993), the NMOCD Unlined Surface Impoundment Closure Guidelines (February 1993), and the Environmental Plus, Inc. (EPI) Standard Operating Procedures and Quality Assurance/Quality Control Plan. The conclusions are based on field observations and laboratory analytical reports as presented in the report. Recommendations follow NMOCD guidance and represent the professional opinions of EPI staff. These opinions were arrived at with currently accepted geologic, hydrogeologic and engineering practices at this time and location. The report was prepared or reviewed by a certified or registered EPI professional with a background in engineering, environmental, and/or the natural sciences.

This report was prepared by:

Iain A. Olness, P.G.
Hydrogeologist

4 August 2004
Date

This report was reviewed by:

Patrick W. McCasland

8.4.04
Date

Table of Contents

Figures

Tables

Attachments

1.0 Introduction and Background

The "Mescalero Ridge" (2001-10917) release site is located approximately 21 miles west of Hobbs in Lea County, New Mexico, at an elevation of approximately 3,829 feet above mean sea level (reference Figures 1 and 2). The site is located in the northeast quarter of the southeast quarter of section 17, range 35 east, township 19 south. There are no residences or surface water bodies within a 1,000-foot radius of the leak site.

On March 15, 2001, approximately 25 barrels of crude oil were released from the E.O.T.T. Energy Pipeline (EOTT) Scarb 8-inch steel pipeline at the Mescalero Ridge Station. The release is believed to have been due to internal corrosion of the pipeline. The release covered approximately 6,024 square feet of pipeline right-of-way and pasture land owned by Mr. Sam Bruton, with a small encroachment onto land owned by the State of New Mexico. The Mescalero Ridge Station is no longer active and has been decommissioned.

Initial response activities, completed on March 15, 2001, included excavating the line, installation of a pipe repair clamp, removal of saturated surface soil and fencing the excavation and associated stockpile.

2.0 Delineation and Monitoring

Upon completion of these activities, eight soil borings were advanced in the release area from April 16-18, 2001, to delineate the extent and magnitude of the release (reference Figure 3). The soil borings were advanced to depths of 20 to 25 feet below ground surface (bgs). Analytical results for soil samples collected during the advancement of the soil borings indicated contaminant concentrations above the New Mexico Oil Conservation Division (NMOCD) remedial thresholds at depths up to 20 feet bgs.

On April 24, 2001, a temporary groundwater sampling well was completed to determine the depth to groundwater and collect a groundwater sample to determine if groundwater had been impacted as a result of the release. Groundwater was encountered at a depth of 37.3 feet bgs, resulting in a NMOCD site ranking of 20 points. Analytical results for the groundwater sample collected from the temporary well indicated contaminant concentrations above the NMOCD remedial thresholds. In addition, during the development of the well, an oil sheen was observed.

Excavation of hydrocarbon-impacted soil above the NMOCD remedial thresholds commenced on January 16, 2002 and continued through April 8, 2002. The excavated soil was stockpiled on site within a fenced, bermed area. The excavation basin was backfilled and the excavated, stockpiled soil was landfarmed in May 2002.

On June 7, 2002, a groundwater monitoring well (MW) was installed, with consensus from the NMOCD, approximately 50 feet down gradient from the point of release to monitor the natural attenuation of the contaminants. The groundwater monitoring well was sampled on June 10, 2002 and the sample submitted for quantification of benzene, toluene, ethylbenzene and total xylenes (BTEX) via EPA Method 8260b. Analytical results for the

sample indicated the presence of benzene at 1.55 micrograms per liter (µg/L) and toluene at 1.54 µg/L. Ethylbenzene and total xylenes were not detected at or above each analytes respective method detection limit (MDL).

On June 25, 2002, the landfarm was sampled to monitor the attenuation of contaminants. Analytical results indicated contaminant concentrations remaining in excess of the NMOCD remedial thresholds.

A *Groundwater Monitoring Report* was submitted in February 2003 documenting the results of the groundwater monitoring through June 10, 2002.

The groundwater monitoring well was sampled on March 19 and September 18, 2003, and the samples submitted to an independent laboratory for the quantification of BTEX. In addition, the groundwater sample collected on September 18, 2003 was submitted for quantification of total petroleum hydrocarbons as gasoline (TPH as gasoline) and total petroleum hydrocarbons as diesel (TPH as diesel). Analytical results for the samples collected on March 19 and September 18, 2003, were below the laboratory method detection limits (MDL).

In addition to the sampling event, a site visit was made on June 19, 2003 to collect and analyze representative soil samples from the landfarm. Analytical results for the soil samples collected from the landfarm indicated the soil was being remediated. Total TPH concentrations were above the NMOCD remedial threshold of 100 milligrams per kilogram (mg/Kg), ranging from 158 mg/Kg to 500 mg/Kg, with an average concentration of approximately 340 mg/Kg.

A *Groundwater Monitoring Report* was submitted in April 2004 documenting the results of the groundwater monitoring through September 18, 2003. Based on field monitoring and analytical results collected during 2003 and analyzed in conjunction with data collected during the initial investigation, it was recommended that the groundwater monitoring well be sampled one more time. If analytical results continued to indicate no impact to the groundwater, it was recommended that the groundwater monitoring well be sealed and the groundwater investigation at the site be terminated.

3.0 Remediation Activities

Remediation of the site commenced on January 16, 2002 and continued through April 8, 2002. Remediation activities included the excavation and treatment of 6,831 cubic yards of contaminated soil from the excavation (reference Figure 3). Analytical data obtained during the advancement of the soil borings was utilized to delineate the size of the excavation, which extended to a depth of approximately 40 feet below ground surface (bgs) and intersected the water table. Soil samples were collected from the excavation in areas which were not delineated by the soil borings (reference Figure 3). These areas included the northwest sidewall of the excavation (SEMR31302NSW) and the ramp leading down into the excavation (SEMR31302RAMP). The samples were submitted for quantification of total petroleum hydrocarbons as gasoline (TPH-Gasoline), total petroleum hydrocarbons as

diesel (TPH-Diesel) and BTEX. Analytical results for the sample obtained from the northwest sidewall indicated contaminants remaining above the NMOCD remedial thresholds (reference Table 4). However, this sample was also analyzed utilizing the synthetic precipitation leaching procedure (SPLP) via EPA SW 846 Method 1312. Analytical results for the sample via this method indicated concentrations below the NMOCD remedial thresholds (reference Table 4). Analytical results for the sample obtained from the ramp were non-detectable (ND) for all analytes at or above each analytes respective method detection limit (MDL).

The excavated soil was stockpiled on site within a fenced, bermed area, until approval was obtained from the NMOCD to treat the soil on site. A land treatment area was constructed on site and the soil spread over an area of approximately 137,530 square feet. Clean fill material (caliche) was purchased from the property owner (Sam Bruton) and the site restored to pre-release conditions and contoured for proper drainage.

The land treatment area (reference Figure 4) has been tilled and sampled several times (reference Table 5). Analytical results for the last sampling event on January 15, 2004, were ND for BTEX and TPH-Gasoline. TPH-Diesel concentrations were reported ranging from 119 to 314 milligrams per kilogram (mg/Kg) for this sampling event.

4.0 Closure Justification

The information provided in this report documents the delineation of a release of approximately 25 barrels of crude oil at the Mescalero Ridge release site located in UL-I, section 17, range 35 east, township 19 south, Lea County, New Mexico and the successful remediation of said release. Contaminated soil above the NMOCD remedial threshold of 100 ppm TPH was excavated (≈6,831 cubic yards) and treated on-site per NMOCD and land owner approval. The excavation was backfilled with clean caliche and topsoil and properly contoured to provide adequate drainage. Based on the data presented in this report, Environmental Plus, Inc., on behalf of Link Energy, requests that the NMOCD issue a "*No Further Action*" letter regarding the release of crude oil at this site based on the soil and groundwater monitoring results.

FIGURES

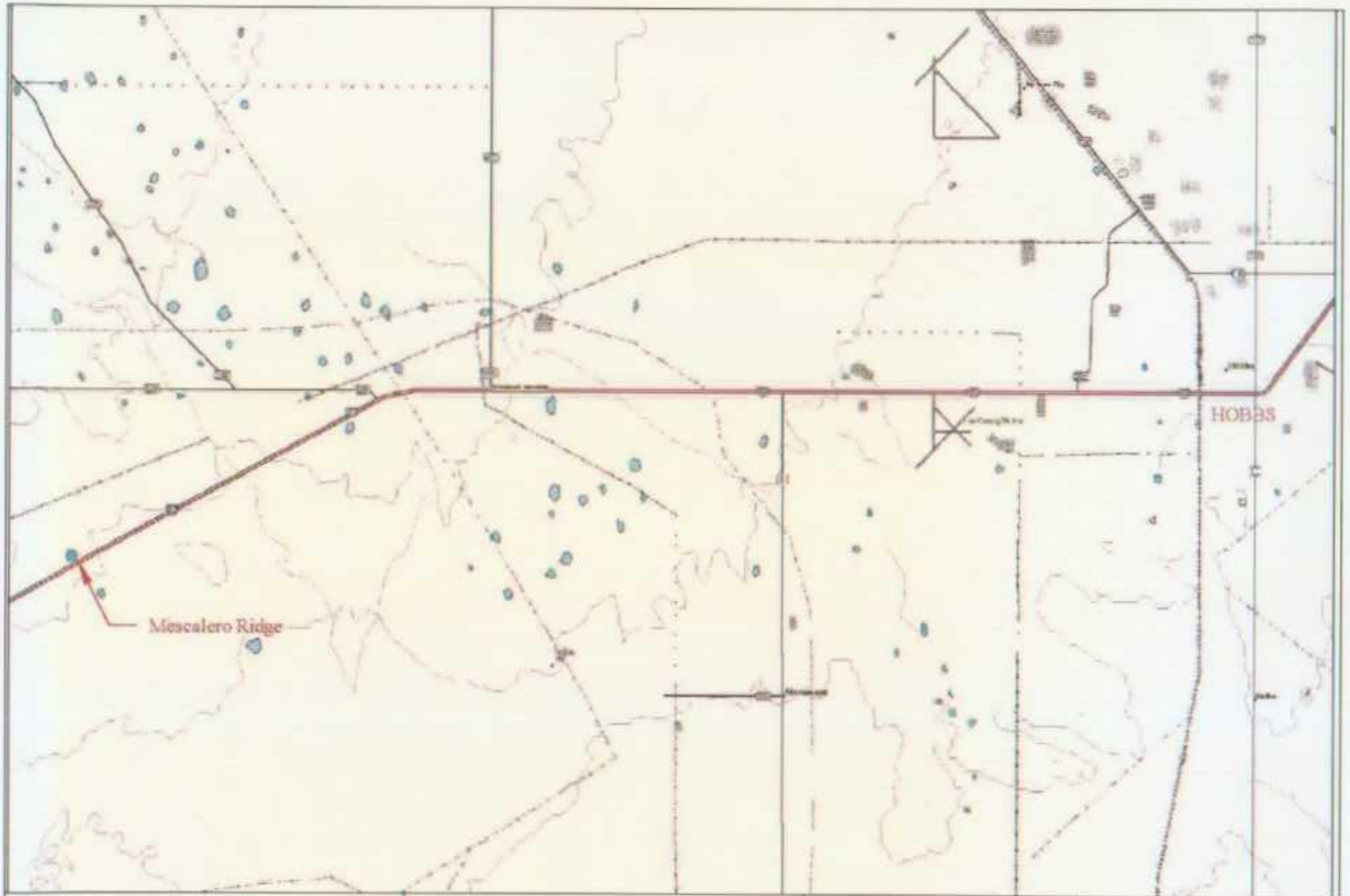


Figure 1 Area Map Plains All American Pipeline, LP Mescalero Ridge	Lea County, New Mexico NE 1/4 of the SE 1/4, Sec. 17, T19S, R35E N 32° 39' 25.0" W 103 °28' 21.0" Elevation: 3,829 feet amsl	DWG By: Iain Olness March 2004	REVISED: July 2004	N
		0 12,000 24,000 Feet	SHEET 1 of 1	

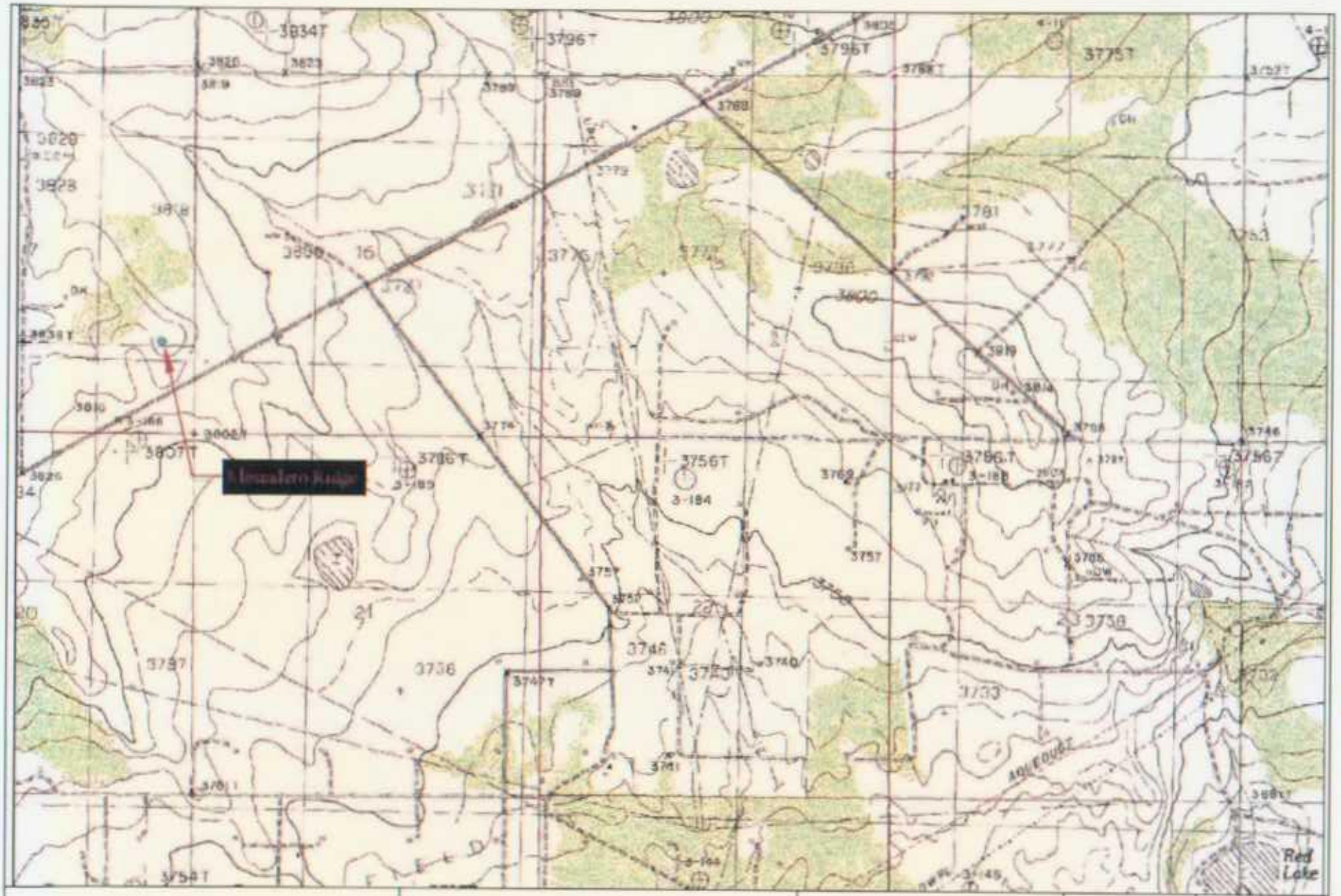


Figure 2 Site Location Map Plains All American Pipeline, LP Mescalero Ridge	Lea County, New Mexico NE 1/4 of the SE 1/4, Sec. 17, T19S, R35E N 32°39' 25.0" W 103°28' 21.0" Elevation: 3,829 feet amsl	DWG By: Iain Olness March 2004	REVISED: July 2004	N
		0 2,000 4,000 Feet	SHEET 1 of 1	

Figure 3 Site Map Plains All American Pipeline, LP Mescalero Ridge	Lea County, New Mexico NE 1/4 of the SE 1/4, Sec. 17, T19S, R35E N 32° 39' 25.0" W 103 °28' 21.0" Elevation: 3,829 feet amsl	DWG By: Iain Olness March 2004	REVISED: July 2004	SHEET 1 of 1

Figure 4
Landfarm Location Map
Plains All American Pipeline, LP
Mescalero Ridge

Lea County, New Mexico
NE 1/4 of the SE 1/4, Sec. 17, T19S, R35E
N 32° 39' 25.0" W 103° 28' 21.0"
Elevation: 3,829 feet amsl

DWG By: Iain Olness
March 2004

REVISED:
July 2004

0 130 260
Feet

SHEET
1 of 1

N

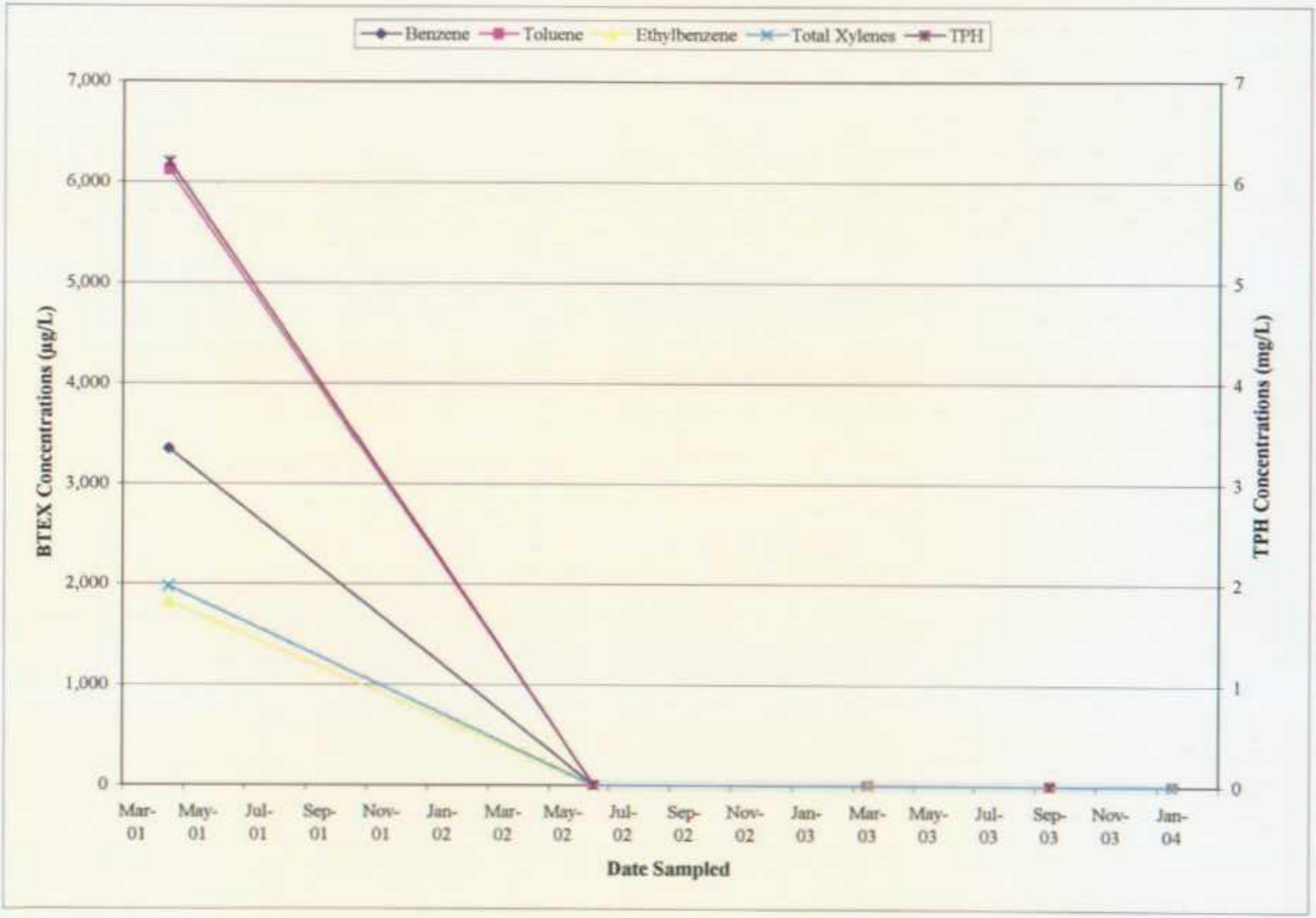


Figure 5: TPH and BTEX Concentrations in the Temporary Well/Groundwater Monitoring Well MW from 03/24/01 through 01/15/04, Plains All American Pipeline Mescalero Ridge, Lea County, New Mexico.

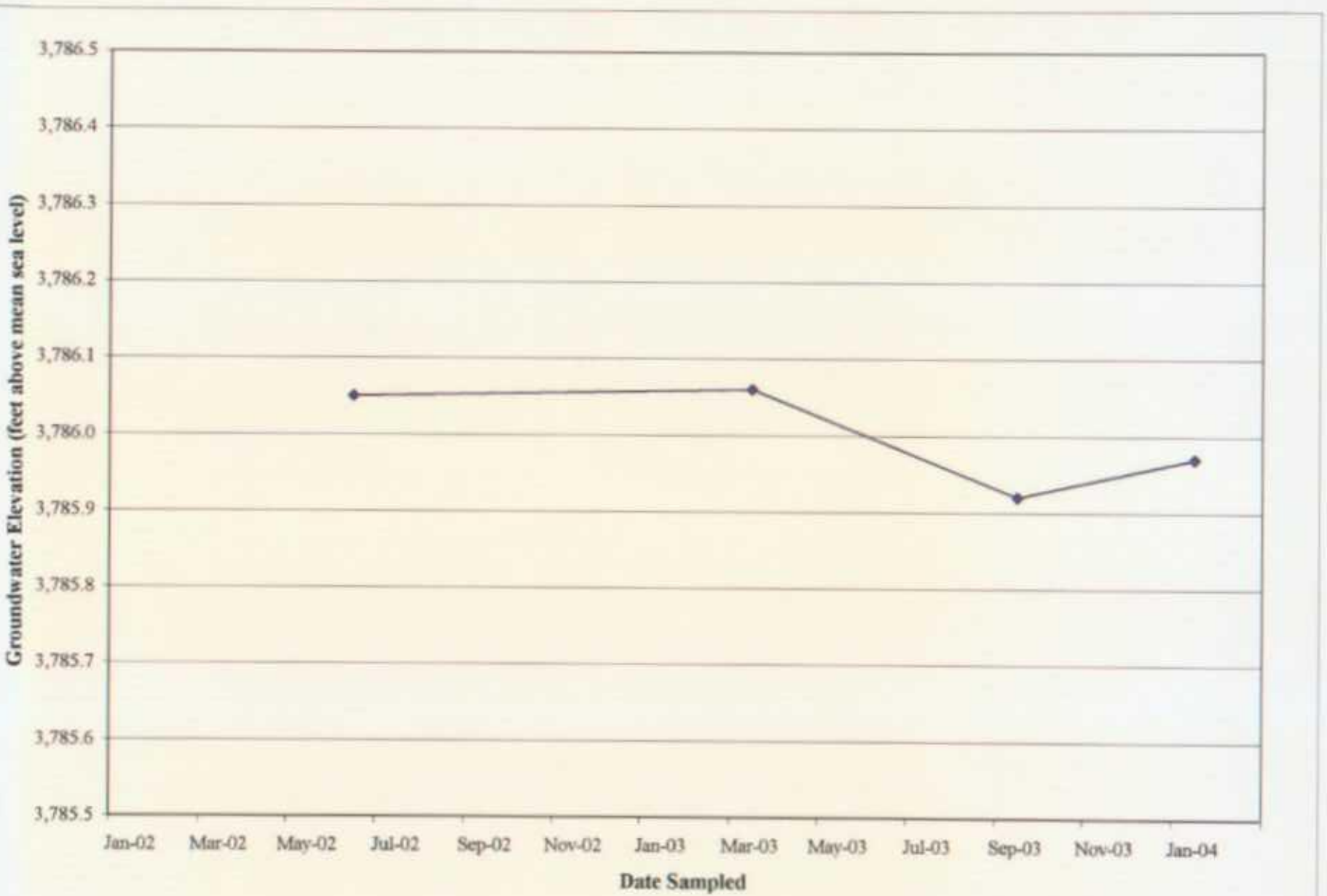


Figure 6: Hydrograph for Monitoring Well MW, Plains All American Pipeline Mescalero Ridge, Lea County, New Mexico from 06/10/02 through 01/15/04.

TABLES

TABLE 1

RELATIVE GROUNDWATER ELEVATIONS AND PHASE SEPARATED HYDROCARBON THICKNESSES

Mescalero Ridge - Ref #2001-10917

Monitor Well	Date Gauged	Relative Top of Casing Elevation (feet)*	Depth to PSH Below Top of Casing (feet)	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase Separated Hydrocarbon Thickness (feet)
MW	10-Jun-02	3,825	--	38.95	3,786.05	--
	19-Mar-03		--	38.94	3,786.06	--
	18-Sep-03		--	39.08	3,785.92	--
	15-Jan-04		--	39.03	3,785.97	--

* = Top of casing elevation set from USGS Topographical map

** Corrected Groundwater Elevation = Top of Casing Elevation - (Depth to Water Below Top of Casing - (SG)(PSH Thickness)

-- = Not detected

TABLE 2

Summary of Groundwater Analytical Results

Mescalero Ridge - Ref #2001-10917

Monitor Well Location	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m,p-Xylenes (µg/L)	o-Xylene (µg/L)	Total Xylenes (µg/L)	Chloride (mg/L)	Total Dissolved Solids (mg/L)	Total TPH (mg/L)
Temporay Well	24-Apr-01	**3,350**	**6,120**	**1,820**	1,330	647	**1,977**	41	434	6.2
MW	10-Jun-02	1.55	1.54	<1	<1	<1	<2			
	19-Mar-03	<1	<1	<1	<1	<1	<2			
	18-Sep-03	<1	<1	<1	<1	<1	<2			<1
	15-Jan-04	<1	<1	<1	<2	<1	<3			
NMOCD Remedial Thresholds		10	750	750			620	250	1,000	

Bolded values are in excess of the NMOCD Remediation Thresholds or Other Standards for Domestic Water Supply.

If cell is blank, then that parameter was not analyzed

NS : Not Sampled

TABLE 3

Summary of Soil Boring Analytical Results

Mescalero Ridge - Ref #2001-10917

Soil Boring ID	Depth (feet)	Sample ID	Sample Date	PID Reading (ppm)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethylbenzene (µg/Kg)	m,p-Xylenes (µg/Kg)	o-Xylene (µg/Kg)	Total BTEX (µg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	Total TPH (mg/Kg)
BH-1	2	EMRSS41601BH1-2	16-Apr-01	8.2	<25	<25	<25	<25	<25	<125	<10	<10	<20
	5	EMRSS41601BH1-5	16-Apr-01	8.1	<25	<25	<25	<25	<25	<125	<10	<10	<20
	10	EMRSS41601BH1-10	16-Apr-01	9.3	<25	<25	<25	<25	<25	<125	<10	<10	<20
	15	EMRSS41601BH1-15	16-Apr-01	6.3	<25	<25	<25	<25	<25	<125	<10	<10	<20
	20	EMRSS41601BH1-20	16-Apr-01	5.9	<25	<25	<25	<25	<25	<125	<10	<10	<20
BH-2	2	EMRSS41601BH2-2	16-Apr-01	6.3	<25	<25	<25	<25	<25	<125	<10	<10	<20
	5	EMRSS41601BH2-5	16-Apr-01	4.8	<25	<25	<25	<25	<25	<125	<10	<10	<20
	10	EMRSS41601BH2-10	16-Apr-01	7.0	<25	<25	<25	<25	<25	<125	<10	<10	<20
	15	EMRSS41601BH2-15	16-Apr-01	6.8	<25	<25	<25	<25	<25	<125	<10	<10	<20
	20	EMRSS41601BH2-20	16-Apr-01	5.4	<25	<25	<25	<25	<25	<125	<10	<10	<20
BH-3	2	EMRSS41601BH3-2	16-Apr-01	194	<25	54	108	364	171	697	75	615	**690**
	5	EMRSS41601BH3-5	16-Apr-01	190	<25	<25	74	101	<25	175	37	533	**570**
	10	EMRSS41601BH3-10	16-Apr-01	12.8	<25	<25	<25	<25	<25	<125	<10	<10	<20
	15	EMRSS41601BH3-15	16-Apr-01	6.6	<25	<25	<25	<25	<25	<125	<10	<10	<20
	20	EMRSS41601BH3-20	16-Apr-01	4.6	<25	<25	<25	<25	<25	<125	<10	<10	<20
BH-4	2	EMRSS41601BH4-2	16-Apr-01	178	<25	40	183	345	141	709	45	460	**505**
	5	EMRSS41601BH4-5	16-Apr-01	14.1	<25	<25	<25	<25	<25	<125	<10	<10	<20
	10	EMRSS41601BH4-10	16-Apr-01	42.2	<25	<25	<25	<25	<25	<125	<10	83	83
	15	EMRSS41601BH4-15	16-Apr-01	8.9	<25	<25	<25	<25	<25	<125	<10	<10	<20
	20	EMRSS41601BH4-20	16-Apr-01	5.9	<25	<25	<25	<25	<25	<125	<10	<10	<20
BH-5	2	EMRSS41701BH5-2	17-Apr-01	2.9	<25	<25	<25	<25	<25	<125	<10	<10	<20
	5	EMRSS41701BH5-5	17-Apr-01	7.6	<25	<25	<25	<25	<25	<125	<10	115	**115**
	10	EMRSS41701BH5-10	17-Apr-01	2.2	<25	<25	<25	<25	<25	<125	<10	<10	<20
	15	EMRSS41701BH5-15	17-Apr-01	1.9	<25	<25	<25	<25	<25	<125	<10	<10	<20
	20	EMRSS41701BH5-20	17-Apr-01	0.7	<25	<25	<25	<25	<25	<125	<10	<10	<20
BH-6	2	EMRSS41701BH6-2	17-Apr-01	1.3	<25	<25	<25	<25	<25	<125	<10	<10	<20
	5	EMRSS41701BH6-5	17-Apr-01	6.6	<25	<25	<25	<25	<25	<125	<10	<10	<20
	10	EMRSS41701BH6-10	17-Apr-01	2.3	<25	<25	<25	<25	<25	<125	<10	<10	<20
	15	EMRSS41701BH6-15	17-Apr-01	2.2	<25	<25	<25	<25	<25	<125	<10	<10	<20
	20	EMRSS41701BH6-20	17-Apr-01	0.6	<25	<25	<25	<25	<25	<125	<10	<10	<20
BH-7	2	EMRSS41701BH7-2	17-Apr-01	670	610	10,800	10,000	20,100	5,660	47,170	2110	5797	**7,907**
	5	EMRSS41701BH7-5	17-Apr-01	497	<25	32	153	385	143	713	62	499	**561**
	10	EMRSS41701BH7-10	17-Apr-01	290	<25	945	820	1,970	912	4,647	157	512	**669**
	15	EMRSS41701BH7-15	17-Apr-01	32.7	<25	<25	<25	<25	<25	<125	<10	<10	<20
	20	EMRSS41701BH7-20	17-Apr-01	6.8	<25	<25	<25	<25	<25	<125	<10	<10	<20
BH-8	2	EMRSS41701BH8-2	17-Apr-01	407	179	1,190	1,020	2,530	2,720	7,639	1384	8553	**9,937**
	5	EMRSS41701BH8-5	17-Apr-01	883	<25	1,480	1,990	6,050	4,080	13,600	1077	3975	**5,052**
	10	EMRSS41701BH8-10	17-Apr-01	355	<25	146	187	612	262	1,207	58	348	**406**
	15	EMRSS41701BH8-15	17-Apr-01	203	<25	<25	<25	<25	<25	<125	<10	102	**102**
	20	EMRSS41701BH8-20	17-Apr-01	170	<25	396	440	909	824	2,569	501	3429	**3,930**
	25	EMRSS41701BH8-25	17-Apr-01	8.7	<25	<25	<25	<25	<25	<125	<10	<10	<20
NMOCD Remedial Thresholds					**10,000**					**50,000**			**100**

[1] *Bolded values are in excess of the NMOCD Remediation Thresholds*

[2] *NA : Not Analyzed*

[3] *NS : Not Sampled*

TABLE 4

Summary of Excavation Analytical Results (Soil)

Mescalero Ridge - Ref #2001-10917

Sample ID	Sample Date	Sample Location	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethylbenzene (µg/Kg)	m,p-Xylenes (µg/Kg)	o-Xylene (µg/Kg)	Total BTEX (µg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	Total TPH (mg/Kg)
SEMR31302NSW	13-Mar-02	North Sidewall	<25	937	3,590	4,410	2,140	11,077	224	545	769
SPLP Analyses			<1.00	<1.00	<1.00	1.35	10.8	12.2	<3	8.65	8.65
SEMR31302RAMP	13-Mar-02	Ramp	<25	<25	<25	<25	<25	<125	<10	<10	<10
SPLP Analyses			<1.00	<1.00	<1.00	<1.00	<1.00	<5.00	<3	<3	<3
SEMR51302SP	13-May-02	Stockpile	<1	<1	<1	<1	<1	NA	NA	NA	NA
SEMR51702BCC3'	17-May-02	3' Below Center of Landfarm Area	<25	<25	<25	<25	<25	<125	<10	<10	<10
NMOCD Remedial Thresholds			**10,000**					**50,000**			**100**

[1] *Bolded values are in excess of the NMOCD Remediation Thresholds*

[2] *NA : Not Analyzed*

[3] *NS : Not Sampled*

TABLE 5

Summary of Landfarm Analytical Results

Mescalero Ridge - Ref #2001-10917

Sample ID	Sample Date	Sample Location	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethylbenzene (µg/Kg)	m,p-Xylenes (µg/Kg)	o-Xylene (µg/Kg)	Total BTEX (µg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	Total TPH (mg/Kg)
SEMR62502NE1'	25-Jun-02	NE Quarter	<20	<20	<20	<20	<20	<100	<5	16.9	16.9
SEMR62502NW1'	25-Jun-02	NW Quarter	<20	<20	<20	<20	<20	<100	16.5	403	**420**
SEMR62502SE1'	25-Jun-02	SE Quarter	<20	<20	<20	<20	<20	<100	<5	165	**165**
SEMR62502SW1'	25-Jun-02	SW Quarter	<20	<20	<20	<20	<20	<100	7.5	257	**265**
SEMR61903NWQC	19-Jun-03	NW Quarter	<25	29	45	122	33	229	<10	158	**158**
SEMR61903NEQC	19-Jun-03	NE Quarter	<25	65	66	196	56	383	<10	194	**194**
SEMR61903SWQC	19-Jun-03	SW Quarter	<25	126	56	113	30	325	<10	439	**439**
SEMR61903SEQC	19-Jun-03	SE Quarter	181	656	535	1,470	583	3,425	<20	403	**403**
SEMR61903CG	19-Jun-03	Center	<25	101	70	167	46	384	<10	500	**500**
SLEMR11504LFNEQ	15-Jan-04	NE Quarter	<20	<20	<20	<40	<20	<100	<5	140	**140**
SLEMR11504LFSEQ	15-Jan-04	SE Quarter	<20	<20	<20	<40	<20	<100	<5	119	**119**
SLEMR11504LFNWQ	15-Jan-04	NW Quarter	<20	<20	<20	<40	<20	<100	<5	314	**314**
SLEMR11504LFSWQ	15-Jan-04	SW Quarter	<20	<20	<20	<40	<20	<100	<5	123	**123**
NMOCD Remedial Thresholds			**10,000**					**50,000**			**100**

[1] *Bolded values are in excess of the NMOCD Remediation Thresholds*

[2] *NA : Not Analyzed*

[3] *NS : Not Sampled*

ATTACHMENT I

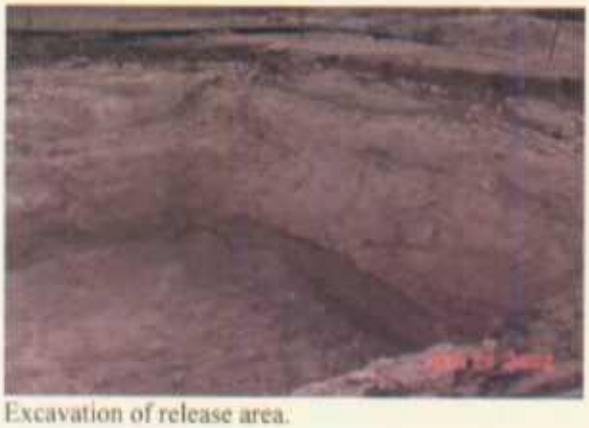
SITE PHOTOGRAPHS

Initial surface evidence of release, looking west.

Initial surface evidence of release.

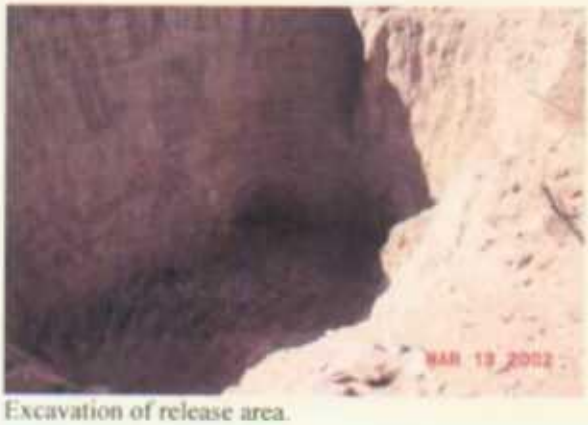
Initial excavation activities.

Excavation of release area, looking southwesterly.



Excavation of release area.

Excavation of release area.



Excavation of release area.

Excavation of release area.

Site contoured and completed.

Site contoured and completed.

Land treatment area.

Site contoured and completed.

ATTACHMENT II

ANALYTICAL RESULTS
AND
CHAIN-OF-CUSTODY FORMS

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

EOTT ENERGY
ATTN: MR. WAYNE BRUNETTE
P.O. BOX 1660
MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R35E

Sampling Date: 04/16/01
Receiving Date: 04/17/01
Analysis Date: 04/18/01

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
39238	EMRSS41601BH1-2	<10	<10
39239	EMRSS41601BH1-5	<10	<10
39240	EMRSS41601BH1-10	<10	<10
39241	EMRSS41601BH1-15	<10	<10
39242	EMRSS41601BH1-20	<10	<10
	%IA	85	103
	%EA	99	99
	BLANK	<10	<10

METHODS: EPA SW 846-8015m

Raland K. Tuttle

4-24-01
Date

ENVIRONMENTAL
LAB OF TEXAS, INC.
"Don't Treat Your Soil Like Dirt!"

EOTT ENERGY
ATTN: MR. WAYNE BRUNETTE
P.O. BOX 1660
MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R35E

Sampling Date: 04/16/01
Receiving Date: 04/17/01
Analysis Date: 04/19/01

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
39243	EMRSS41601BH2-2	<10	<10
39244	EMRSS41601BH2-5	<10	<10
39245	EMRSS41601BH2-10	<10	<10
39246	EMRSS41601BH2-15	<10	<10
39247	EMRSS41601BH2-20	<10	<10
	%IA	88	99
	%EA	115	113
	BLANK	<10	<10

METHODS: EPA SW 846-8015m

Raland K. Tuttle

4-24-01
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

EOTT ENERGY
ATTN: MR. WAYNE BRUNETTE
P.O. BOX 1660
MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R37E

Sampling Date: 04/16/01
Receiving Date: 04/17/01
Analysis Date: 04/20/01

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
39248	EMRSS41601BH3-2	75	615
39249	EMRSS41601BH3-5	37	533
39250	EMRSS41601BH3-10	<10	<10
39251	EMRSS41601BH3-15	<10	<10
39252	EMRSS41601BH3-20	<10	<10
39253	EMRSS41601BH4-2	45	460
39254	EMRSS41601BH4-5	<10	<10
39255	EMRSS41601BH4-10	<10	83
39256	EMRSS41601BH4-15	<10	<10
39257	EMRSS41601BH4-20	<10	<10
	%IA	87	107
	%EA	112	107
	BLANK	<10	<10

METHODS: EPA SW 846-8015m

Raland K. Tuttle

4-24-01
Date

12600 West I-20 East • Odessa, Texas 79765 • (915) 563-1800 • Fax (915) 563-1713

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

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ATTN: MR. WAYNE BRUNETTE
P.O. BOX 1660
MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R35E

Sampling Date: 04/16/01
Receiving Date: 04/17/01
Analysis Date: 04/17/01

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg
39238	EMRSS41601BH1-2	<0.025	<0.025	<0.025	<0.025	<0.025
39239	EMRSS41601BH1-5	<0.025	<0.025	<0.025	<0.025	<0.025
39240	EMRSS41601BH1-10	<0.025	<0.025	<0.025	<0.025	<0.025
39241	EMRSS41601BH1-15	<0.025	<0.025	<0.025	<0.025	<0.025
39242	EMRSS41601BH1-20	<0.025	<0.025	<0.025	<0.025	<0.025
39243	EMRSS41601BH2-2	<0.025	<0.025	<0.025	<0.025	<0.025
39244	EMRSS41601BH2-5	<0.025	<0.025	<0.025	<0.025	<0.025
39245	EMRSS41601BH2-10	<0.025	<0.025	<0.025	<0.025	<0.025
39246	EMRSS41601BH2-15	<0.025	<0.025	<0.025	<0.025	<0.025
39247	EMRSS41601BH2-20	<0.025	<0.025	<0.025	<0.025	<0.025
	%IA	94	98	106	114	108
	%EA	92	94	97	110	98
	BLANK	<0.025	<0.025	<0.025	<0.025	<0.025

METHODS: EPA SW 846-8021B ,5030

Raland K. Tuttle

4-24-01
Date

ENVIRONMENTAL LAB OF , INC.

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ATTN: MR. WAYNE BRUNETTE
P.O. BOX 1660
MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R37E

Sampling Date: 04/16/01
Receiving Date: 04/17/01
Analysis Date: 04/17/01

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg
39248	EMRSS41601BH3-2	<0.025	0.054	0.108	0.364	0.171
39249	EMRSS41601BH3-5	<0.025	<0.025	0.074	0.101	<0.025
39250	EMRSS41601BH3-10	<0.025	<0.025	<0.025	<0.025	<0.025
39251	EMRSS41601BH3-15	<0.025	<0.025	<0.025	<0.025	<0.025
39252	EMRSS41601BH3-20	<0.025	<0.025	<0.025	<0.025	<0.025
39253	EMRSS41601BH4-2	<0.025	0.040	0.183	0.345	0.141
39254	EMRSS41601BH4-5	<0.025	<0.025	<0.025	<0.025	<0.025
39255	EMRSS41601BH4-10	<0.025	<0.025	<0.025	<0.025	<0.025
39256	EMRSS41601BH4-15	<0.025	<0.025	<0.025	<0.025	<0.025
39257	EMRSS41601BH4-20	<0.025	<0.025	<0.025	<0.025	<0.025
	%IA	89	95	99	100	101
	%EA	87	95	96	96	103
	BLANK	<0.025	<0.025	<0.025	<0.025	<0.025

METHODS: EPA SW 846-8021B ,5030

Raland K. Tuttle

4-24-01
Date

12600 West I-20 East • Odessa, Texas 79765 • (915) 563-1800 • Fax (915) 563-1713

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Wayne Bruinette EOTT	Phone #: 915 · 556 · 0140 FAX #: 915 · 674 · 3456
Company Name & Address: E.O.T.T.	
Project #: 2001 - 10917	Project Name: Mescalero Ridge Station
Project Location: Sec 16 T19S R35E	Sampler Signature: Bradley Blevins

ANALYSIS REQUEST — 1 of 2

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	BTEX 8021B/5030	TPH 8015m	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
39238	EMRSS41601BH1-2	1			X						X			4-16-01	9:45	X	X						
39239	EMRSS41601BH1-5	1			X						X			4-16-01	8:00	X	X						
39240	EMRSS41601BH1-10	1			X						X			4-16-01	8:15	X	X						
39241	EMRSS41601BH1-15	1			X						X			4-16-01	8:35	X	X						
39242	EMRSS41601BH1-20	1			X						X			4-16-01	8:50	X	X						
39243	EMRSS41601BH2-2	1			X						X			4-16-01	9:10	X	X						
39244	EMRSS41601BH2-5	1			X						X			4-16-01	9:25	X	X						
39245	EMRSS41601BH2-10	1			X						X			4-16-01	10:00	X	X						
39246	EMRSS41601BH2-15	1			X						X			4-16-01	11:00	X	X						
39247	EMRSS41601BH2-20	1			X						X			4-16-01	11:25	X	X						
														4-16-01									

	Date:	Time:	Received by:
Relinquished by: Bradley Blevins	4-17-01	0600	
Relinquished by:	4-17-01	0948H	Received by:
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS

Original to W. Bruinette & P. McCasland EPI.

FAX & or E-mail to W. Bruinette & P. McCasland 394-2601

ENVIRONMENTAL [illegible]

915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

2 of 2

Project Manager: Wayne Bruinette EOTT

Phone #: 915 · 556 · 0190

FAX #: 915 · 684 · 3456

Company Name & Address: E.O.T.T.

Project #: 2001 - 10912

Project Name: Mescalero Ridge Station

Project Location: Sec 16 T19S R32E

Sampler Signature: Bradley Blevins

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	H2O2	OTHER	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX 8021B/5030	TPH 418.1 / 8015M	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	NO3
39248	EMRSS41601BH3-2	1			X						X			4-16-01	11:40	X	X						
39249	EMRSS41601BH3-5	1			X						X			4-16-01	11:50	X	X						
39250	EMRSS41601BH3-10	1			X						X			4-16-01	12:05	X	X						
39251	EMRSS41601BH3-15	1			X						X			4-16-01	12:20	X	X						
39252	EMRSS41601BH3-20	1			X						X			4-16-01	12:35	X	X						
39253	EMRSS41601BH4-2	1			X						X			4-16-01	1:30	X	X						
39254	EMRSS41601BH4-5	1			X						X			4-16-01	2:00	X	X						
39255	EMRSS41601BH4-10	1			X						X			4-16-01	2:30	X	X						
39256	EMRSS41601BH4-15	1			X						X			4-16-01	2:55	X	X						
39257	EMRSS41601BH4-20	1			X						X			4-16-01	3:30	X	X						

Relinquished by:	Date:	Time:	Received by:
BT signed	4-17-01	0600	
Relinquished by:	Date:	Time:	Received by:
	4-17-01	0948	
Relinquished by:	Date:	Time:	Received by Laboratory:

REMARKS:

Original to W. Bruinette & P. McCasland EPI.

FAX + 600 E-mail to W. Bruinette + P. McCasland 394-2601

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

EOTT ENERGY
ATTN: MR. WAYNE BRUNETTE
P.O. BOX 1660
MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R35E

Sampling Date: 04/17/01
Receiving Date: 04/20/01
Analysis Date: 04/21/01

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg
39444	EMRSS41701BH5-2	<10	<10
39445	EMRSS41701BH5-5	<10	115
39446	EMRSS41701BH5-10	<10	<10
39447	EMRSS41701BH5-15	<10	<10
39448	EMRSS41701BH5-20	<10	<10
39449	EMRSS41701BH6-2	<10	<10
39450	EMRSS41701BH6-5	<10	<10
39451	EMRSS41701BH6-10	<10	<10
39452	EMRSS41701BH6-15	<10	<10
39453	EMRSS41701BH6-20	<10	<10
39454	EMRSS41701BH7-2	2110	5797
39455	EMRSS41701BH7-5	62	499
39456	EMRSS41701BH7-10	157	512
	%IA	93	86
	%EA	107	110
	BLANK	<10	<10

METHODS: EPA SW 846-8015m

Celey Keene

Celey Keene

04/24/01
Date

12600 West I-20 East • Odessa, Texas 79765 • (915) 563-1800 • Fax (915) 563-1713

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

EOTT ENERGY
ATTN: MR. WAYNE BRUNETTE
P.O. BOX 1660
MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R35E

Sampling Date: See Below
Receiving Date: 04/20/01
Analysis Date: 04/21/01

ELT#	FIELD CODE	GRO C6-C10 mg/kg	DRO >C10-C28 mg/kg	SAMPLE DATE
39457	EMRSS41701BH7-15	<10	<10	04-17-01
39458	EMRSS41701BH7-20	<10	<10	04-17-01
39459	EMRSS41801BH8-2	1384	8553	04-18-01
39460	EMRSS41801BH8-5	1077	3975	04-18-01
39461	EMRSS41801BH8-10	58	348	04-18-01
39462	EMRSS41801BH8-15	<10	102	04-18-01
39463	EMRSS41801BH8-20	501	3429	04-18-01
39464	EMRSS41801BH8-25	<10	<10	04-18-01
	%IA	85	90	
	%EA	116	110	
	BLANK	<10	<10	

METHODS: EPA SW 846-8015m

Celey Keene

Celey Keene

04/24/01
Date

ENVIRONMENTAL
LAB OF TEXAS, INC.
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MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R35E

Sampling Date: 04/17/01
Receiving Date: 04/20/01
Analysis Date: 04/20/01

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg
39444	EMRSS41701BH5-2	<0.025	<0.025	<0.025	<0.025	<0.025
39445	EMRSS41701BH5-5	<0.025	<0.025	<0.025	<0.025	<0.025
39446	EMRSS41701BH5-10	<0.025	<0.025	<0.025	<0.025	<0.025
39447	EMRSS41701BH5-15	<0.025	<0.025	<0.025	<0.025	<0.025
39448	EMRSS41701BH5-20	<0.025	<0.025	<0.025	<0.025	<0.025
39449	EMRSS41701BH6-2	<0.025	<0.025	<0.025	<0.025	<0.025
39450	EMRSS41701BH6-5	<0.025	<0.025	<0.025	<0.025	<0.025
39451	EMRSS41701BH6-10	<0.025	<0.025	<0.025	<0.025	<0.025
39452	EMRSS41701BH6-15	<0.025	<0.025	<0.025	<0.025	<0.025
39453	EMRSS41701BH6-20	<0.025	<0.025	<0.025	<0.025	<0.025
39454	EMRSS41701BH7-2	0.610	10.8	10.0	20.1	5.66
39455	EMRSS41701BH7-5	<0.025	0.032	0.153	0.385	0.143
	%IA	86	92	97	96	100
	%EA	90	96	101	102	103
	BLANK	<0.025	<0.025	<0.025	<0.025	<0.025

METHODS: EPA SW 846-8021B ,5030

Celey Keene

Celey Keene

04/24/01
Date

ENVIRONMENTAL LAB OF , INC.

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ATTN: MR. WAYNE BRUNETTE
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MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R35E

Sampling Date: 04/17/01
Receiving Date: 04/20/01
Analysis Date: 04/20/01

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg
39456	EMRSS41701BH7-10	<0.025	0.945	0.820	1.970	0.912
39457	EMRSS41701BH7-15	<0.025	<0.025	<0.025	<0.025	<0.025
39458	EMRSS41701BH7-20	<0.025	<0.025	<0..025	<0.025	<0.025
	%IA	91	94	98	106	98
	%EA	91	95	97	106	99
	BLANK	<0.025	<0.025	<0.025	<0.025	<0.025

METHODS: EPA SW 846-8021B ,5030

Celey Keene

Celey Keene

04/24/01
Date

12600 West I-20 East • Odessa, Texas 79765 • (915) 563-1800 • Fax (915) 563-1713

ENVIRONMENTAL LAB OF , INC.

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MIDLAND, TEXAS 79701
FAX: 684-3456
FAX: 505-394-2601 (Pat McCasland)

Sample Type: Soil
Sample Condition: Intact/ Iced
Project #: 2001-10917
Project Name: Mescalero Ridge Station
Project Location: Sec16 T19S R35E

Sampling Date: 04/18/01
Receiving Date: 04/20/01
Analysis Date: 04/20/01

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg
39459	EMRSS41801BH8-2	0.179	1.19	1.02	2.53	2.72
39460	EMRSS41801BH8-5	<0.025	1.48	1.99	6.05	4.080
39461	EMRSS41801BH8-10	<0.025	0.146	0.187	0.612	0.262
39462	EMRSS41801BH8-15	<0.025	<0.025	<0.025	<0.025	<0.025
39463	EMRSS41801BH8-20	<0.025	0.396	0.440	0.909	0.824
39464	EMRSS41801BH8-25	<0.025	<0.025	<0.025	<0.025	<0.025
	%IA	91	94	98	106	98
	%EA	91	95	97	106	99
	BLANK	<0.025	<0.025	<0.025	<0.025	<0.025

METHODS: EPA SW 846-8021B ,5030

Celey Keene

Celey Keene

04/24/01
Date

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

1 of 2

Project Manager: Wayne Brunette EOTT

Phone #: 915 · 556 · 0140

FAX #: 915 · 694 · 3456

Company Name & Address: E.O.T.T.

Project #: 2001-10917

Project Name: Mescalero Ridge Station

Project Location: Sec 16 T-19S R-35E

Sampler Signature: Bradley Blevins

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	H2SO4	OTHER	SAMPLING: DATE	TIME	BTEX 8021B/5030	TPH 418.1 / 8015	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	HCl
39444	EMRSS41701BH5-2	1			X						X			4-17-01	7:30	X	X						
39445	EMRSS41701BH5-5	1			X						X			4-17-01	7:45	X	X						
39446	EMRSS41701BH5-10	1			X						X			4-17-01	8:15	X	X						
39447	EMRSS41701BH5-15	1			X						X			4-17-01	8:35	X	X						
39448	EMRSS41701BH5-20	1			X						X			4-17-01	8:50	X	X						
39449	EMRSS41701BH6-2	1			X						X			4-17-01	10:00	X	X						
39450	EMRSS41701BH6-5	1			X						X			4-17-01	10:30	X	X						
39451	EMRSS41701BH6-10	1			X						X			4-17-01	11:00	X	X						
39452	EMRSS41701BH6-15	1			X						X			4-17-01	11:30	X	X						
39453	EMRSS41701BH6-20	1			X						X			4-17-01	12:00	X	X						

Relinquished by:	Date:	Time:	Received by:
Bradley Blevins	4-17-01	4:30	Roger Boone
Roger Boone	4-20-01	0915	
	4-20-01	0915	Received by Laboratory:

REMARKS

Originals to W. Brunette & P. McCasland EPI.

FAX & Hard Copy E-mail to W. Brunette & P. McCasland 394-2601

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Wayne Brunette EOTT

Phone #: 915 · 556 · 0140

FAX #: 915 · 674 · 3456

ANALYSIS REQUEST

2 of 2

Company Name & Address: E.O.T.T.

Project #: 2001-10917

Project Name: Mescalero Ridge Station

Project Location: Sec 16 T 19S R 35E

Sampler Signature: Bradley Blevins

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	HOLD	OTHER	SAMPLING: DATE	TIME	BTEX 8021B/5030	TPH 418.1 Josey	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	HCl
39454	EMR5541701BH7-2	1			X						X			4-17-01	1:00	X	X						
39455	EMR5541701BH7-5	1			X						X			4-17-01	1:30	X	X						
39456	EMR5541701BH7-10	1			X						X			4-17-01	2:00	X	X						
39457	EMR5541701BH7-15	1			X						X			4-17-01	2:30	X	X						
39458	EMR5541701BH7-20	1			X						X			4-17-01	3:00	X	X						

Relinquished by:	Date:	Time:	Received by:
Bradley Blevins	4-17-01	4:30 pm	Rogn Boore
Rogn Boore	4-20-01	0915	
	4-20-01	0915	Received by Laboratory:

REMARKS

Original to W. Brunette & P. McCasland EPI.

FAX & or E-mail to W. Brunette & P. McCasland 394-2601

Environmental Lab of Texas, Inc.

12600 West I-20 East Odessa, Texas 79763
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

1 of 1

Project Manager: Wayne Bruinette EOTT

Phone #: 915 · 556 · 0190

FAX #: 915 · 674 · 3456

Company Name & Address: E.O.T.T.

Project #: 2001 - 10917

Project Name: Mescalero Ridge Station

Project Location: Sec 16 T19S R35E

Sampler Signature: Bradley Blevins

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	OTHER	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX 8021B/5030	TPH 418.1 / 8015	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	Total Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	TDS	RCI
39459	EMRSS41801BH8-2	1			X						X			4-18-01	8:00	X	X						
39460	EMRSS41801BH8-5	1			X						X			4-18-01	8:20	X	X						
39461	EMRSS41801BH8-10	1			X						X			4-18-01	8:42	X	X						
39462	EMRSS41801BH8-15	1			X						X			4-18-01	9:15	X	X						
39463	EMRSS41801BH8-20	1			X						X			4-18-01	9:35	X	X						
39464	EMRSS41801BH8-25	1			X						X			4-18-01	10:00	X	X						

Relinquished by:	Date:	Time:	Received by:
Bradley Blevins	4-18-01	4:20	Roger Boone
Roger Boone	4-20	0915	
	4-20	0915	Received by Laboratory:

REMARKS

Original to W. Bruinette & P. McCasland EPI.

FAX & E-mail to W. Bruinette & P. McCasland 394-2601

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

ENRON TRANSPORTATION SYSTEMS
5805 E. HWY. 80
MIDLAND, TX 79706
915-684-3456

Order#: G0202817
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0202817-01	SEMR31302NSW	SOIL	03/13/2002 8:50	03/13/2002 15:35	4 oz glass	Ice

Lab Testing: Rejected: No Temp: 3.5 C

8015m SPLP
8015M TPH GRO/DRO
8021B/5030 BTEX
SPLP BTEX 8021B,1312
SPLP Organic Extraction

0202817-02	SEMB31302RAMP	SOIL	03/13/2002 8:52	03/13/2002 15:35	4 oz glass	Ice

Lab Testing: Rejected: No Temp: 3.5 C

8015m SPLP
8015M TPH GRO/DRO
8021B/5030 BTEX
SPLP BTEX 8021B,1312
SPLP Organic Extraction

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK HERNANDEZ
ENRON TRANSPORTATION SYSTEMS
5805 E. HWY. 80
MIDLAND, TX 79706

Order#: G0202817
Project: 2001-10217
Project Name: Mesquitern Ridge
Location: None Given

Lab ID: 0202817-03
Sample ID: SEMR31302NSW

8015m SPLP

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		03/22/2002 17:47	1	1	CK	1005EXT

Parameter	Result mg/L	RL
DRO, >C12-C35	8.65	3
GRO, C6-C12	<3	3
TOTAL, C6-C35	8.65	3

8015M TPH GRO/DRO

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		03/15/2002 16:06	1	5	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	224	50.0
DRO, >C12-C28	545	50.0
Total C6-C28	769	50.0

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0000910-02		03/18/2002 9:33	1	1	CK	8021B

Parameter	Result µg/kg	RL
Benzene	<25	25.0
Ethylbenzene	3590	25.0
Toluene	937	25.0
p/m-Xylene	4410	25.0
o-Xylene	2140	25.0

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK FERNANDEZ
ENRON TRANSPORTATION SYSTEMS
5805 E. HWY. 80
MIDLAND, TX 79706

Order#: G0202817
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

Lab ID: 0202817-01
Sample ID: SEMR31302NSW

SPLP BTEX 8021B,1312

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0000931-02		03/20/2002 9:33	1	1	CK	8021B

Parameter	Result µg/L	RL
Benzene	<1.00	1.00
Ethylbenzene	<1.00	1.00
Toluene	<1.00	1.00
p/m-Xylene	1.35	1.00
o-Xylene	10.8	1.00

Lab ID: 0202817-02
Sample ID: SEMB31302RAMP

8015m SPLP

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		03/22/2002 18:00	1	1	CK	1005EXT

Parameter	Result mg/L	RL
DRO, >C12-C35	<3	3
GRO, C6-C12	<3	3
TOTAL, C6-C35	<3	3

8015M TPH GRO/DRO

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		03/15/2002 16:17	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10	10.0
DRO, >C12-C28	<10	10.0
Total C6-C28	<10	10.0

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK HERNANDEZ
ENRON TRANSPORTATION SYSTEMS
5805 E. HWY. 80
MIDLAND, TX 79706

Order#: G0202817
Project: 2001-30937
Project Name: Mescalero Ridge
Location: None Given

Lab ID: 0202817-02
Sample ID: SEMB31302RAMP

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0000910-02		03/18/2002 23:36	1	1	CK	8021B

Parameter	Result µg/kg	RL
Benzene	<25	25.0
Ethylbenzene	<25	25.0
Toluene	<25	25.0
p/m-Xylene	<25	25.0
o-Xylene	<25	25.0

SPLP BTEX 8021B,1312

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0000931-02		03/19/2002 23:36	1	1	CK	8021B

Parameter	Result µg/L	RL
Benzene	<1.00	1.00
Ethylbenzene	<1.00	1.00
Toluene	<1.00	1.00
p/m-Xylene	<1.00	1.00
o-Xylene	<1.00	1.00

Approval: Raland K Tuttle 3-27-02
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Irene Perry, QA Assistant
Sandra Biezugbe, Lab Tech.
Curt Crowdrey, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK HERNANDEZ		Order#:	G0202817
ENRON TRANSPORTATION SYSTEMS		Project:	2001-10917
5805 E. HWY. 80		Project Name:	Mescalero Ridge
MIDLAND, TX 79706		Location:	None Given

Lab ID: 0202817-01
Sample ID: SEMR31302NSW

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
SPLP Organic Extraction	N/A	None	1	N/A	1312	03/18/2002	CC

Lab ID: 0202817-02
Sample ID: SEMR31302RAMP

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
SPLP Organic Extraction	N/A	None	1	N/A	1312	03/18/2002	CC

Approval: [signature] 3-27-02
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Irene Perry, QA Assistant
Sandra Biezugbe, Lab Tech.
Curt Cowdrey, Lab Tech.
Sara Molina, Lab Tech.

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8015m SPLP

Order#: G0202617

BLANK	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/L	0000968-02			<3		
CONTROL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/L	0000968-03		1000	916	91.6%	
CONTROL DUP	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/L	0000968-04		1000	972	97.2%	5.9%
SRM	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/L	0000968-05		1000	1139	113.9%	0.%

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8015M TPH GRO/DRO

Order#: C0202817

BLANK	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Total C6-C28-mg/kg	0000904-02			<10		
MS	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Total C6-C28-mg/kg	0202817-02	0	952	947	99.5%	
MSD	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Total C6-C28-mg/kg	0202817-02	0	952	982	103.2%	3.6%
SRM	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Total C6-C28-mg/kg	0000904-05		1000	872	87.2%	0.%

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8021B/5030 BTEX

Order#: G0202817

BLANK	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/kg	0000910-02			<25.0		
Ethylbenzene-µg/kg	0000910-02			<25.0		
Toluene-µg/kg	0000910-02			<25.0		
p/m-Xylene-µg/kg	0000910-02			<25.0		
o-Xylene-µg/kg	0000910-02			<25.0		
MS	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/kg	0202823-02	0	100	99.5	99.5%	
Ethylbenzene-µg/kg	0202823-02	0	100	102	102.%	
Toluene-µg/kg	0202823-02	0	100	102	102.%	
p/m-Xylene-µg/kg	0202823-02	0	200	211	105.5%	
o-Xylene-µg/kg	0202823-02	0	100	100	100.%	
MSD	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/kg	0202823-02	0	100	96.7	96.7%	2.9%
Ethylbenzene-µg/kg	0202823-02	0	100	98.6	98.6%	3.4%
Toluene-µg/kg	0202823-02	0	100	98.6	98.6%	3.4%
p/m-Xylene-µg/kg	0202823-02	0	200	205	102.5%	2.9%
o-Xylene-µg/kg	0202823-02	0	100	98	98.%	2.%
SRM	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/kg	0000910-05		100	98.8	98.8%	0.%
Ethylbenzene-µg/kg	0000910-05		100	102	102.%	0.%
Toluene-µg/kg	0000910-05		100	102	102.%	0.%
p/m-Xylene-µg/kg	0000910-05		200	210	105.%	0.%
o-Xylene-µg/kg	0000910-05		100	100	100.%	0.%

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

SPLP BTEX 8021B,1312

Order#: G0202617

BLANK	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/L	0000931-02			<1		
Ethylbenzene-µg/L	0000931-02			<1		
Toluene-µg/L	0000931-02			<1		
p/m-Xylene-µg/L	0000931-02			<1		
o-Xylene-µg/L	0000931-02			<1		
CONTROL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/L	0000931-03		100	104	104.%	
Ethylbenzene-µg/L	0000931-03		100	109	109.%	
Toluene-µg/L	0000931-03		100	115	115.%	
p/m-Xylene-µg/L	0000931-03		200	219	109.5%	
o-Xylene-µg/L	0000931-03		100	108	108.%	
CONTROL DUP	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/L	0000931-04		100	109	109.%	4.7%
Ethylbenzene-µg/L	0000931-04		100	109	109.%	0.%
Toluene-µg/L	0000931-04		100	110	110.%	4.4%
p/m-Xylene-µg/L	0000931-04		200	222	111.%	1.4%
o-Xylene-µg/L	0000931-04		100	108	108.%	0.%
SRM	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/L	0000931-05		100	102	102.%	0.%
Ethylbenzene-µg/L	0000931-05		100	104	104.%	0.%
Toluene-µg/L	0000931-05		100	104	104.%	0.%
p/m-Xylene-µg/L	0000931-05		200	216	108.%	0.%
o-Xylene-µg/L	0000931-05		100	104	104.%	0.%

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

Project Manager: FRANK HERNANDEZ

Company Name: EOTT ENERGY PIPELINE

Company Address: 5805 E. HIGHWAY 80

City/State/Zip: MIDLAND TX 79701

Telephone No: 915-556-0190

Sampler Signature: [signature]

Project Name: Mescalero Ridge

Project #: 2001-10917

Project Loc:

PO#:

Analyze For (as per RJ ME)

Lab #	Sample ID	Date Sampled	Time Sampled	No. of Containers	ICE	HNO	HCl	NaOH	HSO	None	Other (Specify)	Water	Sludge	Soil	Other (Specify)
	SEMR31302NSW	3/13/2002	8:50		X									X	
	SEMR31302RAMP	3/13/2002	8:52		X									X	

Sample ID	TDS/CL/SAR/EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	Metals	Volatiles	Semivolatiles	btex 8021B/5030	BTEX SPLP	TPH 8015M SPLP					RUSH TAT	Standard TAT
SEMR31302NSW				X				X	X	X						
SEMR31302RAMP				X				X	X	X						

TCLP / TOTAL

Special Instructions

FAX RESULTS TO PAT MCCASLAND ASAP 505.394.2601

Relinquished:	Date	Time	Received by:	Date	Time
[signature]	3/14/02	1330	[signature]	3-14-02	13:35
[signature]	3-14-02	16:00	Jane McMurrey	3-14-2	1600

Sample Containers Intact? (Y) N

Temperature Upon Request

Laboratory Comments: 3.5°C

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

EOTT ENERGY	Order#: G0203349
BOX 5050	Project: 2001-10917
HOBBS, NM 88240	Project Name: Mescalero Ridge
505-392-2946	Location: None Given

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0203349-01	SEMR513025P	SOIL	5/13/02 15:00	5/14/02 16:20	1 L Glass Amber	Ice

Lab Testing: **Rejected: No** **Temp: -0.5C**

RCI

TCLP BTEX 8021B,1311

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

Frank Hernandez
ZOTT ENERGY
BOX 5050
HOBBS, NM 88240

Order#: G0203349
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

Lab ID: 0203349-01
Sample ID: SEMR51302SP

TCLP BTEX 8021B,1311

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0001716-02	5/14/02	5/15/02 15:05	1	1	CK	1311/80218

Parameter	Result µg/L	RL
Benzene	<1.00	1.00
Ethylbenzene	<1.00	1.00
Toluene	<1.00	1.00
p/m-Xylene	<1.00	1.00
o-Xylene	<1.00	1.00

Approval: Roland K Tuttle 5-16-02
Date

Roland K. Tuttle, Lab Director, QA Officer
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

Frank Hernandez		Order#:	G0203349
XOTT ENERGY		Project:	2001-10917
BOX 5050		Project Name:	Mescalero Ridge
HOBBS, NM 88240		Location:	None Given

Lab ID: 0203349-01
Sample ID: SEMRS1302SP

RCI

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Ignitability	>100	C	1	NA	1010	5/15/02	SB
pH	7.89	pH Units	1	N/A	9045C	5/14/02	SB
Reactive Cyanide	<0.09	mg/kg	1	0.090	SW846 CH.7	5/15/02	CC
Reactive Sulfide	20.4	mg/kg	1	5.0	SW846 CH.7	5/15/02	CC

Approval: Raland K Tuttle 5-16-02
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

TCLP BTEX 8021B,1311

Order#: G0203349

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/L	0001716-02			<1.00		
Ethylbenzene-µg/L	0001716-02			<1.00		
Toluene-µg/L	0001716-02			<1.00		
p/m-Xylene-µg/L	0001716-02			<1.00		
o-Xylene-µg/L	0001716-02			<1.00		
CONTROL SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/L	0001716-03		100	115	115%	
Ethylbenzene-µg/L	0001716-03		100	114	114%	
Toluene-µg/L	0001716-03		100	112	112%	
p/m-Xylene-µg/L	0001716-03		200	225	112.5%	
o-Xylene-µg/L	0001716-03		100	113	113%	
CONTROL DUP SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/L	0001716-04		100	114	114%	0.9%
Ethylbenzene-µg/L	0001716-04		100	110	110%	3.6%
Toluene-µg/L	0001716-04		100	109	109%	2.7%
p/m-Xylene-µg/L	0001716-04		200	225	112.5%	0.0%
o-Xylene-µg/L	0001716-04		100	112	112%	0.9%
SRM SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/L	0001716-05		100	115	115%	
Ethylbenzene-µg/L	0001716-05		100	113	113%	
Toluene-µg/L	0001716-05		100	111	111%	
p/m-Xylene-µg/L	0001716-05		200	230	115%	
o-Xylene-µg/L	0001716-05		100	111	111%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

RCI

Order#: G0203349

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
pH-pH Units	0001701-01			4.96		
Reactive Cyanide-mg/kg	0001727-01			<0.09		
Reactive Sulfide-mg/kg	0001728-01			<5.0		
CONTROL SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Reactive Cyanide-mg/kg	0001727-02		0.1	0.087	87.%	
Reactive Sulfide-mg/kg	0001728-02		13.6	8.832	64.9%	
CONTROL DUP SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Reactive Cyanide-mg/kg	0001727-03		0.1	0.087	87.%	0.%
Reactive Sulfide-mg/kg	0001728-03		13.6	8.880	65.3%	0.5%
DUPLICATE SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Ignitability-C	0203349-01	0		>100		0.%
pH-pH Units	0203349-01	7.89		8		1.4%
Reactive Cyanide-mg/kg	0203349-01	0		<0.09		0.%
Reactive Sulfide-mg/kg	0203349-01	20.4		21.6		5.7%
SRM SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
pH-pH Units	0001701-04		7	7.06	100.9%	
Reactive Cyanide-mg/kg	0001727-04		1	0.87	87.%	
Reactive Sulfide-mg/kg	0001728-04		680	454	66.8%	

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

Project Manager: FRANK HERNANDEZ
Company Name: EOTT ENERGY PIPELINE
Company Address: 5805 E. HIGHWAY 80
City/State/Zip: MIDLAND TX 79701
Telephone No: 915-568-0190
Sampler Signature: Roger Boone

Project Name: Mescalero Ridge
Project #: 2001-10817
Project Loc:
PO#:

		Date Sampled	Time Sampled	No. of Containers	ICE	HNO	HCl	NaOH	HSO	None	Other (Specify)	Water	Sludge	Soil	Other (Specify)	Analyze For: TDS/CL/SAR/EC	TPH 418.1	TPH TX 1005/1005	TPH 8015M GRO/DRO	Metals	Volatiles	Semivolatiles	btex 8021B/5030	Reactivity	Corrosivity	Ignitability			RUSH TAT	Standard TAT
																TCLP							x							
																TOTAL														
1	SEMR51302SP	5/13/2002	3:00	1	x									x									x	x	x	x			x	

Special Instructions
FAX RESULTS TO PAT MCCASLAND ASAP

Sample Containers Intact? Y N
Temperature Upon Request
Laboratory Comments:
-0.5°C

Relinquished:	Date	Time	Received by:	Date	Time
Roger Boone	5-14-02	1300 hrs	Matt Cox	5-14-02	1:05
Relinquished:	Date	Time	Received by:	Date	Time
Matt Cox	5-14-02	1620	Sandra Bingham	5/14/02	16:20

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

EOTT Energy Pipeline
5805 E. Hwy. 80
Midland, TX 79701
915-684-3456

Order#: G0203416
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0203416-01	SEMR51702BCC 3'	SOIL	5/17/02 10:15	5/23/02 13:25	8 oz. amber glass	Ice

Lab Testing:
8015M
8021B/5030 BTEX

Rejected: No Temp: -1.5 C

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

Frank Hernandez
EOFT Energy Pipeline
5805 E. Hwy. 80
Midland, TX 79701

Order#: G0203416
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

Lab ID: 0203416-01
Sample ID: SEMRS17028CC 3'

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		5/23/02	1	1	CK	8015M

Parameter	Result mg/kg	RL
DRO, >C12-C35	<10.0	10.0
GRO, C6-C12	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0001789-02		5/23/02 15:48	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Ethylbenzene	<0.025	0.025
Toluene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Approval: Raland K Tuttle 5-24-02
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8015M

Order#: G0203416

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0001787-02			<10.0		
MS SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/kg	0203416-01	0	952	1044	109.7%	
MSD SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/kg	0203416-01	0	952	909	95.5%	13.8%
SRM SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
TOTAL, C6-C35-mg/kg	0001787-05		1000	902	90.2%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8021B/5030 BTEX

Order#: G0203416

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0001789-02			<0.025		
Ethylbenzene-mg/kg	0001789-02			<0.025		
Toluene-mg/kg	0001789-02			<0.025		
p/m-Xylene-mg/kg	0001789-02			<0.025		
o-Xylene-mg/kg	0001789-02			<0.025		
MS SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0203416-01	0	0.1	0.105	105.%	
Ethylbenzene-mg/kg	0203416-01	0	0.1	0.106	106.%	
Toluene-mg/kg	0203416-01	0	0.1	0.108	108.%	
p/m-Xylene-mg/kg	0203416-01	0	0.2	0.216	108.%	
o-Xylene-mg/kg	0203416-01	0	0.1	0.106	106.%	
MSD SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0203416-01	0	0.1	0.107	107.%	1.9%
Ethylbenzene-mg/kg	0203416-01	0	0.1	0.108	108.%	1.9%
Toluene-mg/kg	0203416-01	0	0.1	0.110	110.%	1.8%
p/m-Xylene-mg/kg	0203416-01	0	0.2	0.219	109.5%	1.4%
o-Xylene-mg/kg	0203416-01	0	0.1	0.109	109.%	2.8%
SRM SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0001789-05		0.1	0.106	106.%	
Ethylbenzene-mg/kg	0001789-05		0.1	0.106	106.%	
Toluene-mg/kg	0001789-05		0.1	0.107	107.%	
p/m-Xylene-mg/kg	0001789-05		0.2	0.217	108.5%	
o-Xylene-mg/kg	0001789-05		0.1	0.107	107.%	

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa Texas 79763
Phone 915-563-1800
Fax 915-563-1713

Project Manager: FRANK HERNANDEZ
Company Name: EOTT ENERGY PIPELINE
Company Address: 5805 E. HIGHWAY 80
City/State/Zip: MIDLAND TX 79701
Telephone No: 915-556-0190
Sampler Signature: Mavis Bunkett

Project Name: Mesa Verde Ridge
Project #: 2001 - 10917
Project Loc:
PO#:

		Date Sampled	Time Sampled	No. of Containers	ICE	HNO	HCl	NaOH	H2SO	None	Other (Specify)	Water	Sludge	Soil	Other (Specify)	Analyze For: TCLP / TOTAL: TDS/Cl/SAR/EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	Metals	Volatiles	Semivolatiles	btex 8021B/5030	RUSH TAT	Standard TAT
2001-16-01	SEM R51702 Bcc 5'	5-17	10:15	4	X									X					X				X		

Special Instructions
FAX RESULTS TO PAT MCCASLAND ASAP

Sample Containers Intact (Y) N
Temperature Upon Request
Laboratory Comments ~15°C

Relinquished:	Date	Time	Received by:	Date	Time
Mavis Bunkett	5-23	10:00	Mavis Cy	5-23	10:30
Relinquished	Date	Time	Received by	Date	Time
Mavis Cy	5-23	13:25	Jeanne McMurrey	5-23-2	1325

ANALYSYS INC.

4221 Freidrich Lane, Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 1324 M.St Po Box
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 130631 **Report Date:** 06/21/02
Project ID: 2001-10917 Mescal
Sample Name: WEMR61002MW
Sample Matrix: water
Date Received: 06/14/2002 **Time:** 10:35
Date Sampled: 06/10/2002 **Time:** 15:00

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
Volatile organics-8260b/BTEX	---		---		06/19/02	8260b	---	--	---	---	---
Benzene	1.55	µg/L	1	<1	06/19/02	8260b	---	2.3	108.9	110.8	120.3
Ethylbenzene	<1	µg/L	1	<1	06/19/02	8260b	---	0.6	117	119.6	113.4
m,p-Xylenes	<1	µg/L	1	<1	06/19/02	8260b	---	0.4	113.7	115.1	111.1
o Xylene	<1	µg/L	1	<1	06/19/02	8260b	---	0.6	116.3	117.5	113.5
Toluene	1.54	µg/L	1	<1	06/19/02	8260b	---	2.1	111.1	108.4	123.9

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Lester

Richard Lester

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J = analyte potentially present between the PQL and the MDL. B = Analyte detected in associated method blank(s). S1 =MS and/or MSD recovery exceed advisory limits. S2 =Post digestion spike (PDS) recovery exceeds advisory limit. S3 =MS and/or MSD and PDS recoveries exceed advisory limits. P =Precision higher than advisory limit. M =Matrix interference.

ANALYSYS INC.

4221 Freidrich Lane,Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc.	**Project ID:** 2001-10917 Mescal	**Report#/Lab ID#:** 130631
Attn: Pat McCasland	**Sample Name:** WEMR61002MW	**Sample Matrix:** water

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
1,2-Dichloroethane-d4	8260b	100	80-120	---
Toluene-d8	8260b	106	88-110	---

Data Qualifiers: D= Surrogates diluted and X= Surrogates outside advisory recovery limits.

CHAIN-OF-CUSTODY

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, TX 78744
(512) 444-5896

Send Report To:
Company Name [illegible]
Address [illegible]
City [illegible] State [illegible] Zip [illegible]
ATTN: [illegible]
Phone [illegible] Fax [illegible]

Bill to (if different):
Company Name [illegible]
Address
City [illegible] State [illegible] Zip [illegible]
ATTN: [illegible]
Phone Fax

Rush Status (must be confirmed with lab mgr.):
Project Name/PO#: [illegible] Sampler: [illegible]

Analyses Requested (1)
Please attach explanatory information as required

Client Sample No. Description/Identification	Date Sampled	Time Sampled	No. of Containers	Soil	Water	Waste	Lab I.D. # (Lab only)	BTEX 8020								Comments
[illegible]	6-10-02	[illegible]	2		X		130631	X								

(1)Unless specifically requested otherwise on this Chain-of-custody and/or attached documentation, all analyses will be conducted using ASI's method of choice and all data will be reported to ASI's normal reporting limits (MDL/PQL). For GC/MS volatiles and extractables, unless specific analytical parameter lists are specified on this chain-of-custody or attached to this chain-of-custody, ASI will default to Priority Pollutants or ASI's HSL list at ASI's option. Specific compound lists must be supplied for all GC procedures.

Temp: 0.0°C

Sample Relinquished By				Sample Received By			
Name	Affiliation	Date	Time	Name	Affiliation	Date	Time
[illegible]	[illegible]	[illegible]		[illegible]	ASI	6/11/02	1035

[Tendering of above described samples to AnalySys, Inc. for analytical testing constitutes agreement by buyer/sampler to AnalySys, Inc.'s standard terms.]

ANALYSYS INC.

4221 Freidrich Lane, Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 1324 M.St Po Box
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 130963 **Report Date:** 07/08/02
Project ID: Mescalero Ridge 2002-10917
Sample Name: SEMR62502NE1'
Sample Matrix: soil
Date Received: 06/27/2002 **Time:** 10:30
Date Sampled: 06/25/2002 **Time:** 03:00

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
TPH by GC (as diesel)	16.9	mg/Kg	5	<5	06/28/02	8015 mod.	---	6.6	118.9	78.6	86.1
TPH by GC (as diesel-ext)	---	---	---	---	06/28/02	3540	---	---	---	---	---
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	06/28/02	8015 mod.	---	3.8	100	77.6	78.1
Volatile organics-8260b/BTEX	---		---		07/03/02	8260b	---	---	---	---	---
Benzene	<20	µg/Kg	20	<20	07/03/02	8260b	J	18.4	100.2	83.7	86.9
Ethylbenzene	<20	µg/Kg	20	<20	07/03/02	8260b	---	0	127	119	128.1
m,p-Xylenes	<20	µg/Kg	20	<20	07/03/02	8260b	---	0	115	107.6	116.9
o-Xylene	<20	µg/Kg	20	<20	07/03/02	8260b	---	0.4	106.3	102.1	111
Toluene	<20	µg/Kg	20	<20	07/03/02	8260b	---	11.2	84.4	80.2	81.1

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Laster

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J = analyte potentially present between the PQL and the MDL., B = Analyte detected in associated method blank(s). S1 = MS and/or MSD recovery exceed advisory limits. S2 = Post digestion spike (PDS) recovery exceeds advisory limit. S3 = MS and/or MSD and PDS recoveries exceed advisory limits. P = Precision higher than advisory limit. M = Matrix interference.

ANALYSYS INC.

4221 Freidrich Lane,Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc.	**Project ID:** Mescalero Ridge 2002-10917	**Report#/Lab ID#:** 130963
Attn: Pat McCasland	**Sample Name:** SEMR62502NE1'	**Sample Matrix:** soil

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
Nitrobenzene-d5	8015 mod.	72.7	50-150	---
p-Terphenyl	8015 mod.	63.9	50-150	---
1,2-Dichloroethane-d4	8260b	100	65-115	---
Toluene-d8	8260b	105	50-120	---

Data Qualifiers: D= Surrogate diluted and X= Surrogate outside advisory recovery limits.

Exceptions Report:

Report #/Lab ID#: 130963 **Matrix:** soil
Client: Environmental Plus, Inc. **Attn:** Pat McCasland
Project ID: Mescalero Ridge 2002-10917
Sample Name: SEMR62502NE1'

Sample Temperature/Condition <=6°C

The typical sample temperature criteria (except for metals by ICP, GFAA and AA and a very few other tests) is <= 6°C. Possible exceptions include samples submitted to laboratory within such a short time after sampling that cooling measures used in the field and during transport had insufficient time to achieve desired temperatures in the samples (see sample collection and sample receipt times) and samples where the temperature could not be measured due to sample submission in a manner precluding temperature measurement without impacting sample integrity (ex. in a bottle with no cooler).

Sample Bottles & Preservation

- ☒ Sample received in appropriate container(s) and appear to be appropriately preserved.
- ☐ Sample received in appropriate container(s). State of sample preservation unknown.
- ☐ Sample received in inappropriate container(s) and/or with unknown state of preservation.

J flag Discussion

A J flag data qualifier indicates (as required under TNRCC-TRRP reporting requirements) that the raw calculated analyte concentration in the sample (uncorrected for background levels/blanks and other potential sources of sampling and analytical contamination), though less than the Reported Quantitation Limit (RQL) is greater than the Detection Limit. Because the reported result is below the quantitation limit for this project/sample (or test procedure), GC/MS organics results may or MAY NOT have been verified as to the presence and relative ratio of target ions (eg. the material causing the J flag "hit" in such situations may be nothing more than background ion-fragment noise.)

Comments pertaining to Data Qualifiers and QC data:

Parameter	Qualif	Comment
Benzene	J	See J-flag discussion above.

Notes:

ANALYSYS INC.

4221 Freidrich Lane, Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 1324 M.St Po Box
Eunice NM 88231
Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 130964 **Report Date:** 07/08/02
Project ID: Mescalero Ridge 2002-10917
Sample Name: SEMR62502NW1'
Sample Matrix: soil
Date Received: 06/27/2002 **Time:** 10:30
Date Sampled: 06/25/2002 **Time:** 03:10

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
TPH by GC (as diesel)	403	mg/Kg	5	<5	07/01/02	8015 mod.	---	6.6	118.9	78.6	86.1
TPH by GC (as diesel-ext)	---	---	---	---	06/28/02	3540	---	---	---	---	---
TPH by GC (as gasoline)	16.5	mg/Kg	5	<5	07/01/02	8015 mod.	---	3.8	100	77.6	78.1
Volatile organics-8260b/BTEX	---		---		07/05/02	8260b	---	---	---	---	---
Benzene	<20	µg/Kg	20	<20	07/05/02	8260b	---	18.4	100.2	83.7	86.9
Ethylbenzene	<20	µg/Kg	20	<20	07/05/02	8260b	---	0	127	119	128.1
m,p-Xylenes	<20	µg/Kg	20	<20	07/05/02	8260b	J	0	115	107.6	116.9
o-Xylene	<20	µg/Kg	20	<20	07/05/02	8260b	---	0.4	106.3	102.1	111
Toluene	<20	µg/Kg	20	<20	07/05/02	8260b	J	11.2	84.4	80.2	81.1

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Laster

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J = analyte potentially present between the PQL and the MDL, B = Analyte detected in associated method blank(s), S1 = MS and/or MSD recovery exceed advisory limits. S2 = Post digestion spike (PDS) recovery exceeds advisory limit. S3 = MS and/or MSD and PDS recoveries exceed advisory limits. P = Precision higher than advisory limit. M = Matrix interference.

ANALYSYS INC.

4221 Freidrich Lane,Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** Mescalero Ridge 2002-10917 **Sample Name:** SEMR62502NW1'	**Report#/Lab ID#:** 130964 **Sample Matrix:** soil

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
Nitrobenzene-d5	8015 mod.	66.8	50-150	---
p-Terphenyl	8015 mod.	83.9	50-150	---
1,2-Dichloroethane-d4	8260b	88.2	65-115	---
Toluene-d8	8260b	112	50-120	---

Data Qualifiers: D= Surrogates diluted and X= Surrogates outside advisory recovery limits.

Exceptions Report:

Report #/Lab ID#: 130964 **Matrix:** soil
Client: Environmental Plus, Inc. **Attn:** Pat McCasland
Project ID: Mescalero Ridge 2002-10917
Sample Name: SEMR62502NW1'

Sample Temperature/Condition <=6°C

The typical sample temperature criteria (except for metals by ICP, GFAA and AA and a very few other tests) is <= 6°C. Possible exceptions include samples submitted to laboratory within such a short time after sampling that cooling measures used in the field and during transport had insufficient time to achieve desired temperatures in the samples (see sample collection and sample receipt times) and samples where the temperature could not be measured due to sample submission in a manner precluding temperature measurement without impacting sample integrity (ex. in a bottle with no cooler).

Sample Bottles & Preservation

- ☒ Sample received in appropriate container(s) and appear to be appropriately preserved.
- ☐ Sample received in appropriate container(s). State of sample preservation unknown.
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J flag Discussion

A J flag data qualifier indicates (as required under TNRCC-TRRP reporting requirements) that the raw calculated analyte concentration in the sample (uncorrected for background levels/blanks and other potential sources of sampling and analytical contamination), though less than the Reported Quantitation Limit (RQL) is greater than the Detection Limit. Because the reported result is below the quantitation limit for this project/sample (or test procedure), GC/MS organics results may or MAY NOT have been verified as to the presence and relative ratio of target ions (eg. the material causing the J flag "hit" in such situations may be nothing more than background ion-fragment noise.)

Comments pertaining to Data Qualifiers and QC data:

Parameter	Qualif	Comment
m,p-Xylenes	J	See J-flag discussion above.
Toluene	J	See J-flag discussion above.

Notes: _____

ANALYSYS INC.

4221 Freidrich Lane, Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 1324 M.St Po Box
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 130965 **Report Date:** 07/08/02
Project ID: Mescalero Ridge 2002-10917
Sample Name: SEMR62502SE1'
Sample Matrix: soil
Date Received: 06/27/2002 **Time:** 10:30
Date Sampled: 06/25/2002 **Time:** 03:20

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
TPH by GC (as diesel)	165	mg/Kg	5	<5	06/28/02	8015 mod.	---	6.6	118.9	78.6	86.1
TPH by GC (as diesel-ext)	---	---	---	---	06/28/02	3540	---	---	---	---	---
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	06/28/02	8015 mod.	J	3.8	100	77.6	78.1
Volatile organics-8260b/BTEX	---		---		07/03/02	8260b	---	---	---	---	---
Benzene	<20	µg/Kg	20	<20	07/03/02	8260b	---	18.4	100.2	83.7	86.9
Ethylbenzene	<20	µg/Kg	20	<20	07/03/02	8260b	---	0	127	119	128.1
m,p-Xylenes	<20	µg/Kg	20	<20	07/03/02	8260b	---	0	115	107.6	116.9
o-Xylene	<20	µg/Kg	20	<20	07/03/02	8260b	---	0.4	106.3	102.1	111
Toluene	<20	µg/Kg	20	<20	07/03/02	8260b	---	11.2	84.4	80.2	81.1

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Laster

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J = analyte potentially present between the PQL and the MDL, B = Analyte detected in associated method blank(s), S1 = MS and/or MSD recovery exceed advisory limits, S2 = Post digestion spike (PDS) recovery exceeds advisory limit, S3 = MS and/or MSD and PDS recoveries exceed advisory limits, P = Precision higher than advisory limit, M = Matrix interference.

ANALYSYS INC.

4221 Freidrich Lane,Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** Mescalero Ridge 2002-10917 **Sample Name:** SEMR62502SE1'	**Report#/Lab ID#:** 130965 **Sample Matrix:** soil

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
Nitrobenzene-d5	8015 mod.	75.3	50-150	---
p-Terphenyl	8015 mod.	102	50-150	---
1,2-Dichloroethane-d4	8260b	90.1	65-115	---
Toluene-d8	8260b	103	50-120	---

Data Qualifiers: D= Surrogates diluted and X= Surrogates outside advisory recovery limits.

Exceptions Report:

Report #/Lab ID#: 130965 **Matrix:** soil
Client: Environmental Plus, Inc. **Attn:** Pat McCasland
Project ID: Mescalero Ridge 2002-10917
Sample Name: SEMR62502SE1'

Sample Temperature/Condition <=6°C

The typical sample temperature criteria (except for metals by ICP, GFAA and AA and a very few other tests) is <= 6°C. Possible exceptions include samples submitted to laboratory within such a short time after sampling that cooling measures used in the field and during transport had insufficient time to achieve desired temperatures in the samples (see sample collection and sample receipt times) and samples where the temperature could not be measured due to sample submission in a manner precluding temperature measurement without impacting sample integrity (ex. in a bottle with no cooler).

Sample Bottles & Preservation

- ☒ Sample received in appropriate container(s) and appear to be appropriately preserved.
- ☐ Sample received in appropriate container(s). State of sample preservation unknown.
- ☐ Sample received in inappropriate container(s) and/or with unknown state of preservation.

J flag Discussion

A J flag data qualifier indicates (as required under TNRCC-TRRP reporting requirements) that the raw calculated analyte concentration in the sample (uncorrected for background levels/blanks and other potential sources of sampling and analytical contamination), though less than the Reported Quantitation Limit (RQL) is greater than the Detection Limit. Because the reported result is below the quantitation limit for this project/sample (or test procedure), GC/MS organics results may or MAY NOT have been verified as to the presence and relative ratio of target ions (eg. the material causing the J flag "hit" in such situations may be nothing more than background ion-fragment noise.)

Comments pertaining to Data Qualifiers and QC data:

Parameter	Qualif	Comment
TPH by GC (as gasoline)	J	See J-flag discussion above.

Notes:

ANALYSYS INC.

4221 Freidrich Lane, Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 1324 M.St Po Box
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 130966 **Report Date:** 07/08/02
Project ID: Mescalero Ridge 2002-10917
Sample Name: SEMR62502SW1'
Sample Matrix: soil
Date Received: 06/27/2002 **Time:** 10:30
Date Sampled: 06/25/2002 **Time:** 03:30

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
TPH by GC (as diesel)	257	mg/Kg	5	<5	06/28/02	8015 mod.	---	6.6	118.9	78.6	86.1
TPH by GC (as diesel-ext)	---	---	---	---	06/28/02	3540	---	---	---	---	---
TPH by GC (as gasoline)	7.5	mg/Kg	5	<5	06/28/02	8015 mod.	---	3.8	100	77.6	78.1
Volatile organics-8260b/BTEX	---		---		07/03/02	8260b	---	---	---	---	---
Benzene	<20	µg/Kg	20	<20	07/03/02	8260b	---	18.4	100.2	83.7	86.9
Ethylbenzene	<20	µg/Kg	20	<20	07/03/02	8260b	---	0	127	119	128.1
m,p-Xylenes	<20	µg/Kg	20	<20	07/03/02	8260b	---	0	115	107.6	116.9
o-Xylene	<20	µg/Kg	20	<20	07/03/02	8260b	---	0.4	106.3	102.1	111
Toluene	<20	µg/Kg	20	<20	07/03/02	8260b	---	11.2	84.4	80.2	81.1

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Laster

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J = analyte potentially present between the PQL and the MDL. B = Analyte detected in associated method blank(s). S1 = MS and/or MSD recovery exceed advisory limits. S2 = Post digestion spike (PDS) recovery exceeds advisory limit. S3 = MS and/or MSD and PDS recoveries exceed advisory limits. P = Precision higher than advisory limit. M = Matrix interference.

ANALYSYS INC.

4221 Freidrich Lane,Suite 190, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 444-5896 • FAX (512) 447-4766

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** Mescalero Ridge 2002-10917 **Sample Name:** SEMR62502SW1'	**Report#/Lab ID#:** 130966 **Sample Matrix:** soil

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
Nitrobenzene-d5	8015 mod.	84.2	50-150	---
p-Terphenyl	8015 mod.	114	50-150	---
1,2-Dichloroethane-d4	8260b	113	65-115	---
Toluene-d8	8260b	116	50-120	---

Data Qualifiers: D= Surrogates diluted and X= Surrogates outside advisory recovery limits.

CHAIN-OF-CUSTODY

Send Reports To:

Environmental Plus Inc.
PO Box 1558
Eunice NM 88231
Attn: Pat McCasland
Phone (505)-394-3481 Fax (505)-394-2601
enviplus1@aol.com cmmg142@aol.com

Bill to (if different):

E.O.T.T. Energy
PO Box 1660
Midland TX 79702
Attn. Frank Hernandez

ANALYSYS Inc.
4221 Freidrich Lane, Suite 190, Austin, TX 78744
Phone: (512) 444-5896
Fax: (512) 447-4766

Rush Status (must be confirmed with lab mgr.): ____________

Project Name/PO#: ~~[illegible]~~ [illegible] 2002-10917 Sampler: Cody Miller

Client Sample No. Description/Identification	Date Sampled	Time Sampled	No. of Containers	Soil	Water	Waste	Lab I.D. # (Lab only)	BTEX 8021B	TPH 8015M						Comments
Sem [illegible] 5023 NE 1'	[illegible]	300	1	✓			1309963	✓	✓						
Sem [illegible] NW 1'	6/25/02	310	1	✓			1309964	✓	✓						
Sem [illegible] 02 SE 1'	6/25/02	320	1	✓			1309965	✓	✓						
Sem [illegible] 02 SW 1'	6/25/02	330	1	✓			1309966	✓	✓						

Analyses Requested (1)
Please attach explanatory information as required

(1)Unless specifically requested otherwise on this Chain-of-custody and/or attached documentation, all analyses will be conducted using ASI's method of choice and all data will be reported to ASI's normal reporting limits (MDL/PQL). For GC/MS volatiles and extractables, unless specific analytical parameter lists are specified on this chain-of-custody or attached to this chain-of-custody, ASI will default to Priority Pollutants or ASI's HSL list at ASI's option. Specific compound lists must be supplied for all GC procedures.

Temp: 4.0°C

Sample Relinquished By				Sample Received By			
Name	Affiliation	Date	Time	Name	Affiliation	Date	Time
Cody Miller	EPI	[illegible]		[illegible]	ASI	6/27/02	10:30

[Tendering of above described samples to AnalySys, Inc. for analytical testing constitutes agreement by buyer/sampler to AnalySys, Inc.'s standard terms.]

ANALYSYS INC.
3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 2100 Ave. O
Eunice NM 88231
Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 140824 **Report Date:** 04/02/03
Project ID: 2001-10917
Sample Name: WEMR31903MW
Sample Matrix: water
Date Received: 03/27/2003 **Time:** 10:20
Date Sampled: 03/19/2003 **Time:** 11:40

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA [1]

Parameter	Result	Units	RQL [5]	Blank	Date	Method [6]	Data Qual [7]	Prec. [2]	Recov. [3]	CCV [4]	LCS [4]
Volatile organics-8260b/BTEX	---		---		03/31/03	8260b	---	---	---	---	---
Benzene	<1	µg/L	1	<1	03/31/03	8260b	---	9.9	91	97.3	83.3
Ethylbenzene	<1	µg/L	1	<1	03/31/03	8260b	---	6.6	106.5	105.2	105.5
m,p-Xylenes	<1	µg/L	1	<1	03/31/03	8260b	---	5.8	113.4	106.3	109.1
o-Xylene	<1	µg/L	1	<1	03/31/03	8260b	---	6.2	112.2	104	108.9
Toluene	<1	µg/L	1	<1	03/31/03	8260b	---	10.8	98.7	101.7	88.9

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Laster

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. "Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J = analyte potentially present between the PQL and the MDL, B = Analyte detected in associated method blank(s), S1 = MS and/or MSD recovery exceed advisory limits. S2 = Post digestion spike (PDS) recovery exceeds advisory limit. S3 = MS and/or MSD and PDS recoveries exceed advisory limits. P = Precision higher than advisory limit. M = Matrix interference.

ANALYSYS Inc.
3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** 2001-10917 **Sample Name:** WEMR31903MW	**Report#/Lab ID#:** 140824 **Sample Matrix:** water

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
1,2-Dichloroethane-d4	8260b	102	80-120	---
Toluene-d8	8260b	108	88-110	---

Data Qualifiers: D= Surrogates diluted and X= Surrogates outside advisory recovery limits.

inc.

4221 Freidrich Lane, Suite 190, Austin, TX 7874
(512) 441-5896

Send Repo To:
Company Name Environmental Plus
Address 2100 Ave O
City Eunice State NM Zip 88231
ATTN: Pat McCasland
Phone 505-394-3481 Fax 505-394-2601

Bill to (if diff ıt):
Company Name Enron Energy
Address 5805 Hwy 80
City Midland State TX Zip 79701
ATTN: Frank Hernandez
Phone 915-638-3793 Fax

Rush Status (must be confirmed with lab mgr.):
Project Name/PO#: 2001-10977 Sampler: Bradley Blevins

Analyses Requested (1)
Please attach explanatory information as required

Client Sample No. Description/Identification	Date Sampled	Time Sampled	No. of Containers	Soil	Water	Waste	Lab I.D. # (Lab only)	BTEX 8021B								Comments
MW MR 31903 MW	3-19-03	11:40	2		X		140824	X								

(1)Unless specifically requested otherwise on this Chain-of-custody and/or attached documentation, all analyses will be conducted using ASI's method of choice and all data will be reported to ASI's normal reportin limits (MDL/PQL). For GC/MS volatiles and extractables, unless specific analytical parameter lists are specified on this chain-of-custody or attached to this chain-of-custody, ASI will default to Priority Pollutants ASI's HSL list at ASI's option. Specific compound lists must be supplied for all GC procedures.

T=4.3°C

Sample Relinquished By				Sample Received By			
Name	Affiliation	Date	Time	Name	Affiliation	Date	Time
Bradley Blevins	EP	3/19/03		Melanie Humphries	ASI	3/27/03	10:20

[Tendering of above described samples to AnalySys, Inc. for analytical testing constitutes agreement by buyer/sampler to AnalySys, Inc.'s standard terms.]

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

EOTT ENERGY PIPELINE
P.O. BOX 1660
Midland, TX 79702
687-2713

Order#: G0306866
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0306866-01	SEMR61903NWQC	SOIL	6/19/03 11:20	6/30/03 11:45	4 oz glass	ice
	Lab Testing: 8015M 8021B/5030 BTEX	Rejected: No		Temp: 0.5 C		
0306866-02	SEMR61903NEQC	SOIL	6/19/03 11:30	6/30/03 11:45	4 oz glass	ice
	Lab Testing: 8015M 8021B/5030 BTEX	Rejected: No		Temp: 0.5 C		
0306866-03	SEMR61903SWQC	SOIL	6/19/03 11:40	6/30/03 11:45	4 oz glass	ice
	Lab Testing: 8015M 8021B/5030 BTEX	Rejected: No		Temp: 0.5 C		
0306866-04	SEMR61903SEQC	SOIL	6/19/03 11:50	6/30/03 11:45	4 oz glass	ice
	Lab Testing: 8015M 8021B/5030 BTEX	Rejected: No		Temp: 0.5 C		
0306866-05	SEMR61903CG	SOIL	6/19/03 12:00	6/30/03 11:45	4 oz glass	ice
	Lab Testing: 8015M 8021B/5030 BTEX	Rejected: No		Temp: 0.5 C		

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK HERNANDEZ
EOTT ENERGY PIPELINE
P.O. BOX 1660
Midland, TX 79702

Order#: G0306866
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

Lab ID: 0306866-01
Sample ID: SEMR61903NWQC

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		7/1/03	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	158	10.0
TOTAL, C6-C35	158	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	107%	70	130
1-Chlorooctadecane	93%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0006053-02		7/1/03 14:22	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	0.029	0.025
Ethylbenzene	0.045	0.025
p/m-Xylene	0.122	0.025
o-Xylene	0.033	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	88%	80	120
Bromofluorobenzene	96%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK HERNANDEZ
EOTT ENERGY PIPELINE
P.O. BOX 1660
Midland, TX 79702

Order#: G0306866
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

Lab ID: 0306866-02
Sample ID: SEMR61903NEQC

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		7/1/03	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	194	10.0
TOTAL, C6-C35	194	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	101%	70	130
1-Chlorooctadecane	94%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0006053-02		7/1/03 14:43	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	0.065	0.025
Ethylbenzene	0.066	0.025
p/m-Xylene	0.196	0.025
o-Xylene	0.056	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	96%	80	120
Bromofluorobenzene	107%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK HERNANDEZ		Order#:	G0306866
EOTT ENERGY PIPELINE		Project:	2001-10917
P.O. BOX 1660		Project Name:	Mescalero Ridge
Midland, TX 79702		Location:	None Given

Lab ID: 0306866-03
Sample ID: SEAIR61903SWQC

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		7/1/03	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	439	10.0
TOTAL, C6-C35	439	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	138%	70	130
1-Chlorooctadecane	173%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0006053-02		7/1/03 15:04	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	0.126	0.025
Ethylbenzene	0.056	0.025
p/m-Xylene	0.113	0.025
o-Xylene	0.030	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	94%	80	120
Bromofluorobenzene	95%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK HERNANDEZ
EOTT ENERGY PIPELINE
P.O. BOX 1660
Midland, TX 79702

Order#: G0306866
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

Lab ID: 0306866-04
Sample ID: SEAIR61903SEQC

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		7/1/03	1	2	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<20.0	20.0
DRO, >C12-C35	403	20.0
TOTAL, C6-C35	403	20.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	52%	70	130
1-Chlorooctadecane	52%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0006053-02		7/1/03 15:26	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	0.181	0.025
Toluene	0.656	0.025
Ethylbenzene	0.535	0.025
p/m-Xylene	1.47	0.025
o-Xylene	0.583	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	99%	80	120
Bromofluorobenzene	110%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

FRANK HERNANDEZ
EOTT ENERGY PIPELINE
P.O. BOX 1660
Midland, TX 79702

Order#: G0306866
Project: 2001-10917
Project Name: Mescalero Ridge
Location: None Given

Lab ID: 0306866-05
Sample ID: SEMR61903CG

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		7/1/03	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	500	10.0
TOTAL, C6-C35	500	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	103%	70	130
1-Chlorooctadecane	93%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0006053-02		7/1/03 15:47	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	0.101	0.025
Ethylbenzene	0.070	0.025
p/m-Xylene	0.167	0.025
o-Xylene	0.046	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	92%	80	120
Bromofluorobenzene	95%	80	120

Approval: Jeanne McMurrey 07-02-03
Date

Raland K. Tuttle, Lab Director, QA Officer
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Bizzugbe, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8015M

Order#: G0306866

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0006058-02			<10.0		
CONTROL SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0006058-03		952	1040	109.2%	
CONTROL DUP SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0006058-04		952	1140	119.7%	9.2%
SRM SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0006058-05		1000	1140	114.%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8021B/5030 BTEX

Order#: G0306866

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0006053-02			<0.025		
Toluene-mg/kg	0006053-02			<0.025		
Ethylbenzene-mg/kg	0006053-02			<0.025		
p/m-Xylene-mg/kg	0006053-02			<0.025		
o-Xylene-mg/kg	0006053-02			<0.025		
MS SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0306868-01	0	0.1	0.095	95.%	
Toluene-mg/kg	0306868-01	0	0.1	0.095	95.%	
Ethylbenzene-mg/kg	0306868-01	0	0.1	0.096	96.%	
p/m-Xylene-mg/kg	0306868-01	0	0.2	0.198	99.%	
o-Xylene-mg/kg	0306868-01	0	0.1	0.097	97.%	
MSD SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0306868-01	0	0.1	0.090	90.%	5.4%
Toluene-mg/kg	0306868-01	0	0.1	0.091	91.%	4.3%
Ethylbenzene-mg/kg	0306868-01	0	0.1	0.092	92.%	4.3%
p/m-Xylene-mg/kg	0306868-01	0	0.2	0.188	94.%	5.2%
o-Xylene-mg/kg	0306868-01	0	0.1	0.092	92.%	5.3%
SRM SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0006053-05		0.1	0.092	92.%	
Toluene-mg/kg	0006053-05		0.1	0.093	93.%	
Ethylbenzene-mg/kg	0006053-05		0.1	0.094	94.%	
p/m-Xylene-mg/kg	0006053-05		0.2	0.193	96.5%	
o-Xylene-mg/kg	0006053-05		0.1	0.094	94.%	

CASE NARRATIVE

ENVIRONMENTAL LAB OF TEXAS

Prepared for:

EOTT ENERGY PIPELINE
P.O. BOX 1660
Midland, TX 79702

Order#: G0306866

Project: Mescalero Ridge

The following samples were received as indicated below and on the attached Chain of Custody record. All analyses were performed within the holding time and with acceptable quality control results unless otherwise noted.

SAMPLE ID	LAB ID	MATRIX	Date Collected	Date Received
SEMR61903NWQC	0306866-01	SOIL	06/19/2003	06/30/2003
SEMR61903NEQC	0306866-02	SOIL	06/19/2003	06/30/2003
SEMR61903SWQC	0306866-03	SOIL	06/19/2003	06/30/2003
SEMR61903SEQC	0306866-04	SOIL	06/19/2003	06/30/2003
SEMR61903CG	0306866-05	SOIL	06/19/2003	06/30/2003

Surrogate recoveries on the 8015M TPH are outside control limits due to matrix interference. (0306866-03)

Surrogate recoveries on the 8015M TPH are outside of control limits due to dilution. (0306866-04)

The enclosed results of analyses are representative of the samples as received by the laboratory. Environmental Lab of Texas makes no representations or certifications as to the methods of sample collection, sample identification, or transportation handling procedures used prior to our receipt of samples. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved By: Jeanne McMurrey Date: 07-02-03
Environmental Lab of Texas I, Ltd.

Environmental Lab of Texas, Inc.

12600 West I-20 East Phone: 915-563-1800
Odessa Texas 79763 Fax: 915-563-1713

Project Manager: FRANK HERNANDEZ

Company Name: EOTT ENERGY PIPELINE

Company Address: 5805 E. HIGHWAY 80

City/State/Zip: MIDLAND TX 79701

Telephone No: 713-253-7006

Sampler Signature: Bradley Blevins

Project Name: Mescalero Ridge

Project #: 2001-10917

Project Loc:

PO#:

		Date Sampled	Time Sampled	No. of Containers	Preservative: ICE	HNO	HCl	NaOH	HSO	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (Specify)	Analyze For: TCLP TDS/CL/SAR/EC	TPH 4.1.8.1	TPH TX 1005/1005	TOTAL TPH 1005/1005	Metals	Volatiles	Semivolatiles	BTEX 8021B/5030	Reactivity	Corrosivity	Ignitability			RUSH TAT	Standard TAT
01	SEMR61903NWQC	06/19/2003	11:20	1	X									X					X				X							
02	SEMR61903NEQC	06/19/2003	11:30	1	X									X					X				X							
03	SEMR61903SWQC	06/19/2003	11:40	1	X									X					X				X							
04	SEMR61903SEQC	06/19/2003	11:50	1	X									X					X				X							
05	SEMR61903CC	06/19/2003	12:00	1	X									X					X				X							

Special Instructions

FAX RESULTS TO PAT McCASLAND ASAP

Sample Containers: Y N

Temperature Upon Request

Laboratory Comments:

402 6/0.5

Relinquished:	Date	Time	Received by:	Date	Time
Bradley Blevins	6/30/03	8:40		6/30/03	840
Relinquished:	Date	Time	Received by:	Date	Time
	6/30/03	1145	Tina Anderson	6/30/03	1145

0.5°C

AnalySys Inc.
3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 2100 Ave. O
Eunice NM 88231
Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 147528 **Report Date:** 09/29/03
Project ID: 2001-10917
Sample Name: WEMR91803MW
Sample Matrix: water
Date Received: 09/23/2003 **Time:** 09:30
Date Sampled: 09/18/2003 **Time:** 09:00

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA [1]

Parameter	Result	Units	RQL [5]	Blank	Date	Method [6]	Data Qual [7]	Prec. [2]	Recov. [3]	CCV [4]	LCS [4]
TPH by GC (as diesel)	<0.5	mg/L	0.5	<0.5	09/26/03	8015 mod.	---	9.9	78.1	90.6	86.7
TPH by GC (as diesel-ext)	---	---	---	---	09/24/03	3510	---	---	---	---	---
TPH by GC (as gasoline)	<0.5	mg/L	0.5	<0.5	09/26/03	8015 mod.	---	10.7	71.6	85.4	80.9
Volatile organics-8260b:BTEX	---		---		09/24/03	8260b(5030/5035)	---	---	---	---	---
Benzene	<1	µg/L	1	<1	09/24/03	8260b	---	10.1	95.4	83.7	90.9
Ethylbenzene	<1	µg/L	1	<1	09/24/03	8260b	---	0.4	101.3	108.6	100.5
m,p-Xylenes	<1	µg/L	1	<1	09/24/03	8260b	---	0.6	99.2	107.9	99.3
o-Xylene	<1	µg/L	1	<1	09/24/03	8260b	---	1.4	101.2	108.7	100.3
Toluene	<1	µg/L	1	<1	09/24/03	8260b	---	9.9	97.9	87.1	95.6

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Laster

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J = analyte potentially present between the PQL and the MDL, B = Analyte detected in associated method blank(s), S1 = MS and/or MSD recovery exceed advisory limits, S2 = Post digestion spike (PDS) recovery exceeds advisory limit, S3 = MS and/or MSD and PDS recoveries exceed advisory limits, P = Precision higher than advisory limit, M = Matrix interference.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** 2001-10917 **Sample Name:** WEMR91803MW	**Report#/Lab ID#:** 147528 **Sample Matrix:** water

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
1-Chlorooctane	8015 mod.	74.5	50-150	---
p-Terphenyl	8015 mod.	76.7	50-150	---
1,2-Dichloroethane-d4	8260b	94.6	80-120	---
Toluene-d8	8260b	107	88-110	---

Data Qualifiers: D= Surrogates diluted and X= Surrogates outside advisory recovery limits.

Send Repo To:

Company Name Environmental Plus

Address 2100 Ave O

City Eunice State NM Zip 88231

ATTN: Pat McCasland

Phone 505-394-3481 Fax 505-394-2601

Bill to (if diff. t):

Company Name East Energy

Address 5305 Hwy 80

City Midland State TX Zip 797..

ATTN: Frank Hernandez

Phone 915-638-3... Fax

inc.
4221 Freidrich Lane, Suite 190, Austin, TX 7874..
(512) 444-5896

Rush Status (must be confirmed with lab mgr.):

Project Name/PO#: 2001-10917 Sampler: Bradley Blevins

Analyses Requested (1)
Please attach explanatory information as require

Client Sample No. Description/Identification	Date Sampled	Time Sampled	No. of Containers	Soil	Water	Waste	Lab I.D. # (Lab only)	TPH 8015M	BTEX 8021							Comments
LOE MR9B03MW	9-18-03	9:00	4		X		147528	X	X							

(1)Unless specifically requested otherwise on this Chain-of-custody and/or attached documentation, all analyses will be conducted using ASI's method of choice and all data will be reported to ASI's normal reportin limits (MDL/PQL). For GC/MS volatiles and extractables, unless specific analytical parameter lists are specified on this chain-of-custody or attached to this chain-of-custody, ASI will default to Priority Pollutants ASI's HSL list at ASI's option. Specific compound lists must be supplied for all GC procedures.

Sample Relinquished By				Sample Received By			
Name	Affiliation	Date	Time	Name	Affiliation	Date	Time
Bradley Blevins	Environmental Plus	9-18-03		Melanie Humphries	ASI	9/23/03	0930

[Tendering of above described samples to AnalySys, Inc. for analytical testing constitutes agreement by buyer/sampler to AnalySys, Inc.'s standard terms.]

ANALYSYS INC.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 2100 Ave. O
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 152030 **Report Date:** 01/29/04
Project ID: 2001-10917
Sample Name: SLEMR11504LFNEQ
Sample Matrix: soil
Date Received: 01/22/2004 **Time:** 09:50
Date Sampled: 01/15/2004 **Time:** 13:15

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
TPH by GC (as diesel)	**140**	mg/Kg	2.5	<2.5	01/26/04	8015 mod.	S,M	10.6	Mt.Intf.	88.6	91.2
TPH by GC (as diesel-ext)	---	---	---	---	01/26/04	3570m	---	---	---	---	---
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	01/26/04	8015 mod.	---	10.4	85.7	86.2	79.3
Volatile organics-8260b/BTEX	---		---		01/27/04	8260b(5030/5035)	---	---	---	---	---
Benzene	<20	µg/Kg	20	<20	01/27/04	8260b	---	0.7	93.9	104	101.6
Ethylbenzene	<20	µg/Kg	20	<20	01/27/04	8260b	---	1.4	96.7	102.4	107.6
m,p-Xylenes	<40	µg/Kg	40	<40	01/27/04	8260b	---	1.5	97.9	102.1	108.7
o-Xylene	<20	µg/Kg	20	<20	01/27/04	8260b	---	1.4	96.2	103.6	109.1
Toluene	<20	µg/Kg	20	<20	01/27/04	8260b	---	1.4	95.3	104.7	106.2

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Elton

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J – analyte potentially present between the PQL and the MDL. B – Analyte detected in associated method blank(s). S1 – MS and/or MSD recovery exceed advisory limits. S2 – Post digestion spike (PDS) recovery exceeds advisory limit. S3 – MS and/or MSD and PDS recoveries exceed advisory limits. P – Precision higher than advisory limit. M – Matrix interference.

ANALYSIS INC
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2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** 2001-10917 **Sample Name:** SLEMR11504LFNEQ	**Report#/Lab ID#:** 152030 **Sample Matrix:** soil

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
1-Chlorooctane	8015 mod.	75.5	36-140	---
p-Terphenyl	8015 mod.	90.7	40-121	---
1,2-Dichloroethane-d4	8260b	91.9	56-120	---
Toluene-d8	8260b	97.6	71-116	---

Data Qualifiers: D– Surrogates diluted and X– Surrogates outside advisory recovery limits.

Exceptions Report:

Report #/Lab ID#: 152030 **Matrix:** soil
Client: Environmental Plus, Inc. **Attn:** Pat McCasland
Project ID: 2001-10917
Sample Name: SLEMR11504LFNEQ

Sample Temperature/Condition <=6°C

The typical sample temperature criteria (except for metals by ICP, GFAA and AA and a very few other tests) is <= 6°C. Possible exceptions include samples submitted to laboratory within such a short time after sampling that cooling measures used in the field and during transport had insufficient time to achieve desired temperatures in the samples (see sample collection and sample receipt times) and samples where the temperature could not be measured due to sample submission in a manner precluding temperature measurement without impacting sample integrity (ex. in a bottle with no cooler).

Sample Bottles & Preservation

☒ Sample received in appropriate container(s) and appear to be appropriately preserved.
☐ Sample received in appropriate container(s). State of sample preservation unknown.
☐ Sample received in inappropriate container(s) and/or with unknown state of preservation.

J flag Discussion

A J flag data qualifier indicates (as required under TCEQ-TRRP reporting requirements) that the raw calculated analyte concentration in the sample (uncorrected for background levels/blanks and other potential sources of sampling and analytical contamination), though less than the Reported Quantitation Limit (RQL) is greater than the Detection Limit. Because the reported result is below the quantitation limit for this project/sample (or test procedure), GC/MS organics results may or MAY NOT have been verified as to the presence and relative ratio of target ions (eg. the material causing the J flag "hit" in such situations may be nothing more than background ion-fragment noise.)

Comments pertaining to Data Qualifiers and QC data:

Parameter	Qualif	Comment
TPH by GC (as diesel)	S,M	MS and/or MSD recoveries outside advisory/acceptance limits. LCS recovery in-limits; indicative of matrix interference as evidenced by M-flag.

Notes:

AnalySys inc.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 2100 Ave. O
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 152031 **Report Date:** 01/29/04
Project ID: 2001-10917
Sample Name: SLEMR11504LFSEQ
Sample Matrix: soil
Date Received: 01/22/2004 **Time:** 09:50
Date Sampled: 01/15/2004 **Time:** 14:00

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
TPH by GC (as diesel)	119	mg/Kg	2.5	<2.5	01/26/04	8015 mod.	S,M	10.6	Mt.Intf.	88.6	91.2
TPH by GC (as diesel-ext)	---	---	---	---	01/26/04	3570m	---	---	---	---	---
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	01/26/04	8015 mod.	---	10.4	85.7	86.2	79.3
Volatile organics-8260b/BTEX	---		---		01/28/04	8260b(5030/5035)	---	---	---	---	---
Benzene	<20	µg/Kg	20	<20	01/28/04	8260b	---	5.3	91	110.6	98
Ethylbenzene	<20	µg/Kg	20	<20	01/28/04	8260b	---	3.6	89.6	108.9	108.5
m,p-Xylenes	<40	µg/Kg	40	<40	01/28/04	8260b	---	3.6	90.9	109	110.7
o-Xylene	<20	µg/Kg	20	<20	01/28/04	8260b	---	5.3	88	108.7	110.1
Toluene	<20	µg/Kg	20	<20	01/28/04	8260b	---	4.3	92.1	110.9	103.6

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Elton

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J – analyte potentially present between the PQL and the MDL. B – Analyte detected in associated method blank(s). S1 – MS and/or MSD recovery exceed advisory limits. S2 – Post digestion spike (PDS) recovery exceeds advisory limit. S3 – MS and/or MSD and PDS recoveries exceed advisory limits. P – Precision higher than advisory limit. M – Matrix interference.

ANALYSYS Inc.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** 2001-10917 **Sample Name:** SLEMR11504LFSEQ	**Report#/Lab ID#:** 152031 **Sample Matrix:** soil

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
1-Chlorooctane	8015 mod.	69.9	36-140	---
p-Terphenyl	8015 mod.	83.7	40-121	---
1,2-Dichloroethane-d4	8260b	94	56-120	---
Toluene-d8	8260b	106	71-116	---

Data Qualifiers: D– Surrogates diluted and X– Surrogates outside advisory recovery limits.

Exceptions Report:

Report #/Lab ID#: 152031 **Matrix:** soil
Client: Environmental Plus, Inc. **Attn:** Pat McCasland
Project ID: 2001-10917
Sample Name: SLEMR11504LFSEQ

Sample Temperature/Condition <=6°C

The typical sample temperature criteria (except for metals by ICP, GFAA and AA and a very few other tests) is <= 6°C. Possible exceptions include samples submitted to laboratory within such a short time after sampling that cooling measures used in the field and during transport had insufficient time to achieve desired temperatures in the samples (see sample collection and sample receipt times) and samples where the temperature could not be measured due to sample submission in a manner precluding temperature measurement without impacting sample integrity (ex. in a bottle with no cooler).

Sample Bottles & Preservation

☒ Sample received in appropriate container(s) and appear to be appropriately preserved.
☐ Sample received in appropriate container(s). State of sample preservation unknown.
☐ Sample received in inappropriate container(s) and/or with unknown state of preservation.

J flag Discussion

A J flag data qualifier indicates (as required under TCEQ-TRRP reporting requirements) that the raw calculated analyte concentration in the sample (uncorrected for background levels/blanks and other potential sources of sampling and analytical contamination), though less than the Reported Quantitation Limit (RQL) is greater than the Detection Limit. Because the reported result is below the quantitation limit for this project/sample (or test procedure), GC/MS organics results may or MAY NOT have been verified as to the presence and relative ratio of target ions (eg. the material causing the J flag "hit" in such situations may be nothing more than background ion-fragment noise.)

Comments pertaining to Data Qualifiers and QC data:

Parameter	Qualif	Comment
TPH by GC (as diesel)	S,M	MS and/or MSD recoveries outside advisory/acceptance limits. LCS recovery in-limits; indicative of matrix interference as evidenced by M-flag.

Notes: _____

ANALYSYS INC.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 2100 Ave. O
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 152032 **Report Date:** 01/29/04
Project ID: 2001-10917
Sample Name: SLEMR11504LFNWQ
Sample Matrix: soil
Date Received: 01/22/2004 **Time:** 09:50
Date Sampled: 01/15/2004 **Time:** 14:10

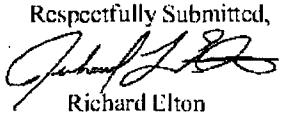
REPORT OF ANALYSIS

QUALITY ASSURANCE DATA [1]

Parameter	Result	Units	RQL [5]	Blank	Date	Method [6]	Data Qual [7]	Prec. [2]	Recov. [3]	CCV [4]	LCS [4]
TPH by GC (as diesel)	**314**	mg/Kg	2.5	<2.5	01/26/04	8015 mod.	S,M	10.6	Mt.Intf.	88.6	91.2
TPH by GC (as diesel-ext)	---	---	---	---	01/26/04	3570m	---	---	---	---	---
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	01/26/04	8015 mod.	---	10.4	85.7	86.2	79.3
Volatile organics-8260b/BTEX	---		---		01/26/04	8260b(5030/5035)	---	---	---	---	---
Benzene	<20	µg/Kg	20	<20	01/26/04	8260b	---	1.6	95.1	115.3	104.8
Ethylbenzene	<20	µg/Kg	20	<20	01/26/04	8260b	---	8.8	93.1	107.8	105.7
m,p-Xylenes	<40	µg/Kg	40	<40	01/26/04	8260b	---	8.7	95.6	106.4	107.8
o-Xylene	<20	µg/Kg	20	<20	01/26/04	8260b	---	8.1	94.4	108	107.7
Toluene	<20	µg/Kg	20	<20	01/26/04	8260b	---	2.4	94.7	117	109.4

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,



Richard Elton

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J – analyte potentially present between the PQL and the MDL. B – Analyte detected in associated method blank(s). S1 – MS and/or MSD recovery exceed advisory limits. S2 – Post digestion spike (PDS) recovery exceeds advisory limit. S3 – MS and/or MSD and PDS recoveries exceed advisory limits. P – Precision higher than advisory limit. M – Matrix interference.

ANALYSIS Inc.
3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc.	**Project ID:** 2001-10917	**Report#/Lab ID#:** 152032
Attn: Pat McCasland	**Sample Name:** SLEMR11504LFNWQ	**Sample Matrix:** soil

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
1-Chlorooctane	8015 mod.	81	36-140	---
p-Terphenyl	8015 mod.	100	40-121	---
1,2-Dichloroethane-d4	8260b	99.2	56-120	---
Toluene-d8	8260b	106	71-116	---

Data Qualifiers: D– Surrogates diluted and X– Surrogates outside advisory recovery limits.

Exceptions Report:

Report #/Lab ID#: 152032 **Matrix:** soil
Client: Environmental Plus, Inc. **Attn:** Pat McCasland
Project ID: 2001-10917
Sample Name: SLEMR11504LFNWQ

Sample Temperature/Condition <=6°C

The typical sample temperature criteria (except for metals by ICP, GFAA and AA and a very few other tests) is <= 6°C. Possible exceptions include samples submitted to laboratory within such a short time after sampling that cooling measures used in the field and during transport had insufficient time to achieve desired temperatures in the samples (see sample collection and sample receipt times) and samples where the temperature could not be measured due to sample submission in a manner precluding temperature measurement without impacting sample integrity (ex. in a bottle with no cooler).

Sample Bottles & Preservation

☒ Sample received in appropriate container(s) and appear to be appropriately preserved.
☐ Sample received in appropriate container(s). State of sample preservation unknown.
☐ Sample received in inappropriate container(s) and/or with unknown state of preservation.

J flag Discussion

A J flag data qualifier indicates (as required under TCEQ-TRRP reporting requirements) that the raw calculated analyte concentration in the sample (uncorrected for background levels/blanks and other potential sources of sampling and analytical contamination), though less than the Reported Quantitation Limit (RQL) is greater than the Detection Limit. Because the reported result is below the quantitation limit for this project/sample (or test procedure), GC/MS organics results may or MAY NOT have been verified as to the presence and relative ratio of target ions (eg. the material causing the J flag "hit" in such situations may be nothing more than background ion-fragment noise.)

Comments pertaining to Data Qualifiers and QC data:

Parameter	Qualif	Comment
TPH by GC (as diesel)	S,M	MS and/or MSD recoveries outside advisory/acceptance limits. LCS recovery in-limits; indicative of matrix interference as evidenced by M-flag.

Notes:

AnalySys Inc.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 2100 Ave. O
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 152033 **Report Date:** 01/29/04
Project ID: 2001-10917
Sample Name: SLEMR11504LFSWQ
Sample Matrix: soil
Date Received: 01/22/2004 **Time:** 09:50
Date Sampled: 01/15/2004 **Time:** 14:20

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
TPH by GC (as diesel)	**123**	mg/Kg	2.5	<2.5	01/26/04	8015 mod.	S,M	10.6	Mt.Intf.	88.6	91.2
TPH by GC (as diesel-ext)	---	---	---	---	01/26/04	3570m	---	---	---	---	---
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	01/26/04	8015 mod.	---	10.4	85.7	86.2	79.3
Volatile organics-8260b/BTEX	---		---		01/26/04	8260b(5030/5035)	---	---	---	---	---
Benzene	<20	µg/Kg	20	<20	01/26/04	8260b	---	1.6	95.1	115.3	104.8
Ethylbenzene	<20	µg/Kg	20	<20	01/26/04	8260b	---	8.8	93.1	107.8	105.7
m,p-Xylenes	<40	µg/Kg	40	<40	01/26/04	8260b	---	8.7	95.6	106.4	107.8
o-Xylene	<20	µg/Kg	20	<20	01/26/04	8260b	---	8.1	94.4	108	107.7
Toluene	<20	µg/Kg	20	<20	01/26/04	8260b	---	2.4	94.7	117	109.4

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Elton

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J – analyte potentially present between the PQL and the MDL. B – Analyte detected in associated method blank(s). S1 – MS and/or MSD recovery exceed advisory limits. S2 – Post digestion spike (PDS) recovery exceeds advisory limit. S3 – MS and/or MSD and PDS recoveries exceed advisory limits. P – Precision higher than advisory limit. M – Matrix interference.

ANALYSYS Inc.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** 2001-10917 **Sample Name:** SLEMR11504LFSWQ	**Report#/Lab ID#:** 152033 **Sample Matrix:** soil

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
1-Chlorooctane	8015 mod.	69.3	36-140	---
p-Terphenyl	8015 mod.	78.8	40-121	---
1,2-Dichloroethane-d4	8260b	93	56-120	---
Toluene-d8	8260b	101	71-116	---

Data Qualifiers: D– Surrogates diluted and X– Surrogates outside advisory recovery limits.

Exceptions Report:

Report #/Lab ID#: 152033 **Matrix:** soil
Client: Environmental Plus, Inc. **Attn:** Pat McCasland
Project ID: 2001-10917
Sample Name: SLEMR11504LFSWQ

Sample Temperature/Condition <=6°C

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Comments pertaining to Data Qualifiers and QC data:

Parameter	Qualif	Comment
TPH by GC (as diesel)	S,M	MS and/or MSD recoveries outside advisory/acceptance limits. LCS recovery in-limits; indicative of matrix interference as evidenced by M-flag.

Notes: _____

8484

CHAIN-OF-CUSTODY

ANALYSYS INC.
4221 Freidrich Lane, Suite 190, Austin, TX 78744
(512) 444-5896

Send Report to:
Company Name: Environmental Plus
Address: 200 Ave O
City: Eunice State: N.M. Zip: 88231
ATTN: Pat McCasland
Phone: 505-394-3481 Fax: 505-394-2601

Bill to (if different):
Company Name: Linn Energy
Address: 5805 Hwy 80
City: Midland State: Tx Zip: 79701
ATTN: Frank Hernandez
Phone: 505-397-3095 Fax: 505-397-2754

Rush Status (must be confirmed with lab mgr.): _____
Project Name/PO#: 2001-10917 Sampler: Bobby Blevins

Analyses Requested (1)
Please attach explanatory information as required

Client Sample No. Description/Identification	Date Sampled	Time Sampled	No. of Containers	Soil	Water	Waste	Lab I.D. # (Lab only)	TPH 418.1	BTEX 8021b	Comments
SLEMR1504LNEQ	1-15-04	1115	1	X			152030	X	X	
SLEMR1504LFSEQ	1-15-04	2:00	1	X			152031	X	X	
SLEMR1504LFALQ	1-15-04	2:10	1	X			152032	X	X	
SLEMR1504LFSWQ	1-15-04	2:20	1	X			152033	X	X	

1)Unless specifically requested otherwise on this Chain-of-custody and/or attached documentation, all analyses will be conducted using ASI's method of choice and all data will be reported to ASI's normal reporting limits (MDL/PQL). For GC/MS volatiles and extractables, unless specific analytical parameter lists are specified on this chain-of-custody or attached to this chain-of-custody, ASI will default to Priority Pollutants or ASI's HSL list at ASI's option. Specific compound lists must be supplied for all GC procedures.

T: 5.2°C

Sample Relinquished By				Sample Received By			
Name	Affiliation	Date	Time	Name	Affiliation	Date	Time
Bobby Blevins	Environmental Plus	1-15	1900	[signature]	ASI	1/22/04	0950

Tendering of above described samples to AnalySys, Inc. for analytical testing constitutes agreement by buyer/sampler to AnalySys, Inc.'s standard terms.]

ANALYSYS inc.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc.
Attn: Pat McCasland
Address: 2100 Ave. O
Eunice NM 88231

Phone: (505) 394-3481 **FAX:** (505) 394-2601

Report#/Lab ID#: 152029 **Report Date:** 01/28/04
Project ID: 2001-10917
Sample Name: WLEMR11504MW
Sample Matrix: water
Date Received: 01/22/2004 **Time:** 09:50
Date Sampled: 01/15/2004 **Time:** 11:45

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA[1]

Parameter	Result	Units	RQL[5]	Blank	Date	Method[6]	Data Qual[7]	Prec.[2]	Recov.[3]	CCV[4]	LCS[4]
Volatile organics-8260b/BTEX	---		---		01/27/04	8260b(5030/5035)	---	---	---	---	---
Benzene	<1	µg/L	1	<1	01/27/04	8260b	---	7.4	105	103.7	103.3
Ethylbenzene	<1	µg/L	1	<1	01/27/04	8260b	---	6.9	109.5	109.1	105.5
m,p-Xylenes	<2	µg/L	2	<2	01/27/04	8260b	---	6.5	110.9	109	107.1
o-Xylene	<1	µg/L	1	<1	01/27/04	8260b	---	7.3	112.2	108.9	108.5
Toluene	<1	µg/L	1	<1	01/27/04	8260b	---	4.7	107.2	104.3	108.6

This analytical report is respectfully submitted by AnalySys, Inc. The enclosed results have been carefully reviewed and, to the best of my knowledge, the analytical results are consistent with AnalySys, Inc.'s Quality Assurance/Quality Control Program.

Respectfully Submitted,

Richard Elton

1. Quality assurance data is for the sample batch which included this sample. 2. Precision (PREC) is the absolute value of the relative percent (%) difference between duplicate measurements. 3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample. 4. Calibration Verification (CCV) and Laboratory Control Sample (LCS) results are expressed as the percent (%) recovery of analyte from a known standard or matrix. 5. Reporting Quantitation Limits (RQL), typically at or above the Practical Quantitation Limit (PQL) of the analytical method. 6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect nominal quantitation limits adjusted for any required dilutions. 7. Data Qualifiers are J – analyte potentially present between the PQL and the MDL. B –Analyte detected in associated method blank(s). S1 –MS and/or MSD recovery exceed advisory limits. S2 –Post digestion spike (PDS) recovery exceeds advisory limit. S3 –MS and/or MSD and PDS recoveries exceed advisory limits. P –Precision higher than advisory limit. M –Matrix interference.

ANALYSYS INC.

3512 Montopolis Drive, Austin, TX 78744 &
2209 N. Padre Island Dr., Corpus Christi, TX 78408
(512) 385-5886 • FAX (512) 385-7411

Client: Environmental Plus, Inc. **Attn:** Pat McCasland	**Project ID:** 2001-10917 **Sample Name:** WLEMR11504MW	**Report#/Lab ID#:** 152029 **Sample Matrix:** water

REPORT OF SURROGATE RECOVERY

Surrogate Compound	Method	Recovery	Recovery Limit	Data Qualifiers
1,2-Dichloroethane-d4	8260b	101	74-124	---
Toluene-d8	8260b	106	89-115	---

Data Qualifiers: D– Surrogates diluted and X– Surrogates outside advisory recovery limits.

CHAIN-OF-CUSTODY

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, TX 78744
(512) 444-5896

Send Report To:
Company Name Environmental Plus
Address 2100 Ave O
City Eunice State N.M. Zip 88231
ATTN: Pat McCasland
Phone 505-394-3481 Fax 505-394-2601

Bill to (if different)
Company Name Link Energy
Address 5805 Hwy 80
City Midland State Tx Zip 79701
ATTN: Frank Hernandez
Phone 505-631-3015 Fax 505-396-2754

Rush Status (must be confirmed with lab mgr.):
Project Name/PO#: 2001-10917 Sampler: Bradley Bl...

Client Sample No. Description/Identification	Date Sampled	Time Sampled	No. of Containers	Soil	Water	Waste	Lab I.D. # (Lab only)	Analyses Requested (1): BTEX 8021								Comments
LLLEMBRUSO4MW	1-15-04	11:45	2		X		152029	X								

Analyses Requested (1): Please attach explanatory information as required

1)Unless specifically requested otherwise on this Chain-of-custody and/or attached documentation, all analyses will be conducted using ASI's method of choice and all data will be reported to ASI's normal reporting limits (MDL/PQL). For GC/MS volatiles and extractables, unless specific analytical parameter lists are specified on this chain-of-custody or attached to this chain-of-custody, ASI will default to Priority Pollutants or ASI's HSL list at ASI's option. Specific compound lists must be supplied for all GC procedures.

T: 5.2°C

Sample Relinquished By				Sample Received By			
Name	Affiliation	Date	Time	Name	Affiliation	Date	Time
Bradley Bl...	Environmental Plus	1-15-04	1400	[illegible signature]	ASI	1/22/04	0950

Tendering of above described samples to AnalySys, Inc. for analytical testing constitutes agreement by buyer/sampler to AnalySys, Inc.'s standard terms.]

ATTACHMENT III

FINAL C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised March 17, 1999

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company	Contact
Plains All American Pipeline	**Jimmy Bryant**
Address	Telephone No.
PO Box 1660 5805 East Highway 80 Midland, Texas 79702	505.631.3095
Facility Name	Facility Type
Mescalero Ridge Station	Steel Pipeline

Surface Owner	Mineral Owner	Lease No.
Sam Bruton		

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	
I	17	T19S	R35E					County: Lea Lat. N 32° 39' 25.09" Lon. W 103° 28' 21.54"

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Crude Oil	25 bbls barrels	0 bbls barrels
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
Crude Oil Pipeline	Unknown	15 March 2001
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Sylvia Dickie	
By Whom? Wayne Brunette	Date and Hour 15 March 2001	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. NA	

If a Watercourse was Impacted, Describe Fully.*
Groundwater impacted, notified NMOCD on 24 April 2001.

Describe Cause of Problem and Remedial Action Taken.*
Internal corrosion. Line repair clamp installed and the contaminated soil stockpiled on site.

Describe Area Affected and Cleanup Action Taken.*
5,250 ft^2; 210'x25'; The site was delineated <100 mg/Kg TPH, <50 mg/Kg total BTEX and <10 mg/Kg benzene. The excavated soil was land farmed on-site with contaminant concentrations achieving an average of 174 mg/Kg TPH, <0.1 mg/Kg total BTEX and <0.02 mg/Kg benzene. The excavation was backfilled with clean material purchased from the property owner. The site was restored to pre-release conditions and contoured for proper drainage.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: Camille Reynolds	**OIL CONSERVATION DIVISION**	
E-mail Address: cjreynolds@paalp.com		
Printed Name: Camille Reynolds	Approved by District Supervisor:	
Title: District Environmental Supervisor	Approval Date:	Expiration Date:
Date: 8/5/04 Phone:	Conditions of Approval:	Attached ☐

* Attach Additional Sheets If Necessary

ATTACHMENT IV

SPLP METHOD

METHOD 1312

SYNTHETIC PRECIPITATION LEACHING PROCEDURE

1.0 SCOPE AND APPLICATION

1.1 Method 1312 is designed to determine the mobility of both organic and inorganic analytes present in liquids, soils, and wastes.

2.0 SUMMARY OF METHOD

2.1 For liquid samples (i.e., those containing less than 0.5 % dry solid material), the sample, after filtration through a 0.6 to 0.8 µm glass fiber filter, is defined as the 1312 extract.

2.2 For samples containing greater than 0.5 % solids, the liquid phase, if any, is separated from the solid phase and stored for later analysis; the particle size of the solid phase is reduced, if necessary. The solid phase is extracted with an amount of extraction fluid equal to 20 times the weight of the solid phase. The extraction fluid employed is a function of the region of the country where the sample site is located if the sample is a soil. If the sample is a waste or wastewater, the extraction fluid employed is a pH 4.2 solution. A special extractor vessel is used when testing for volatile analytes (see Table 1 for a list of volatile compounds). Following extraction, the liquid extract is separated from the solid phase by filtration through a 0.6 to 0.8 µm glass fiber filter.

2.3 If compatible (i.e., multiple phases will not form on combination), the initial liquid phase of the waste is added to the liquid extract, and these are analyzed together. If incompatible, the liquids are analyzed separately and the results are mathematically combined to yield a volume-weighted average concentration.

3.0 INTERFERENCES

3.1 Potential interferences that may be encountered during analysis are discussed in the individual analytical methods.

4.0 APPARATUS AND MATERIALS

4.1 Agitation apparatus: The agitation apparatus must be capable of rotating the extraction vessel in an end-over-end fashion (see Figure 1) at 30 ± 2 rpm. Suitable devices known to EPA are identified in Table 2.

4.2 Extraction Vessels

4.2.1 Zero Headspace Extraction Vessel (ZHE). This device is for use only when the sample is being tested for the mobility of volatile analytes (i.e., those listed in Table 1). The ZHE (depicted in Figure 2) allows for liquid/solid separation within the device and effectively precludes headspace. This type of vessel allows for initial liquid/solid

separation, extraction, and final extract filtration without opening the vessel (see Step 4.3.1). These vessels shall have an irternal volume of 500-600 mL and be equipped to accommodate a 90-110 mm filter. The devices contain VITON®[1] O-rings which should be replaced frequently. Suitable ZHE devices known to EPA are identified in Table 3.

For the ZHE to be acceptable for use, the piston within the ZHE should be able to be moved with approximately 15 psig or less. If it takes more pressure to move the piston, the O-rings in the device should be replaced. If this does not solve the problem, the ZHE is unacceptable for 1312 analyses and the manufacturer should be contacted.

The ZHE should be checked for leaks after every extraction. If the device contains a built-in pressure gauge, pressurize the device to 50 psig, allow it to stand unattended for 1 hour, and recheck the pressure. If the device does not have a built-in pressure gauge, pressurize the device to 50 psig, submerge it in water, and check for the presence of air bubbles escaping from any of the fittings. If pressure is lost, check all fittings and inspect and replace O-rings, if necessary. Retest the device. If leakage problems cannot be solved, the manufacturer should be contacted.

Some ZHEs use gas pressure to actuate the ZHE piston, while others use mechanical pressure (see Table 3). Whereas the volatiles procedure (see Step 7.3) refers to pounds-per-square-inch (psig), for the mechanically actuated piston, the pressure applied is measured in torque-inch-pounds. Refer to the manufacturer's instructions as to the proper conversion.

4.2.2 Bottle Extraction Vessel. When the sample is being evaluated using the nonvolatile extraction, a jar with sufficient capacity to hold the sample and the extraction fluid is needed. Headspace is allowed in this vessel.

The extraction bottles may be constructed from various materials, depending on the analytes to be analyzed and the nature of the waste (see Step 4.3.3). It is recommended that borosilicate glass bottles be used instead of other types of glass, especially when inorganics are of concern. Plastic bottles, other than polytetrafluoroethylene, shall not be used if organics are to be investigated. Bottles are available from a number of laboratory suppliers. When this type of extraction vessel is used, the filtration device discussed in Step 4.3.2 is used for initial liquid/solid separation and final extract filtration.

4.3 Filtration Devices: It is recommended that all filtrations be performed in a hood.

4.3.1 Zero-Headspace Extraction Vessel (ZHE): When the sample is evaluated for volatiles, the zero-headspace extraction vessel described

---

[1]VITON® is a trademark of Du Pont.

in Step 4.2.1 is used for filtration. The device shall be capable of supporting and keeping in place the glass fiber filter and be able to withstand the pressure needed to accomplish separation (50 psig).

NOTE: When it is suspected that the glass fiber filter has been ruptured, an in-line glass fiber filter may be used to filter the material within the ZHE.

4.3.2 Filter Holder: When the sample is evaluated for other than volatile analytes, a filter holder capable of supporting a glass fiber filter and able to withstand the pressure needed to accomplish separation may be used. Suitable filter holders range from simple vacuum units to relatively complex systems capable of exerting pressures of up to 50 psig or more. The type of filter holder used depends on the properties of the material to be filtered (see Step 4.3.3). These devices shall have a minimum internal volume of 300 mL and be equipped to accommodate a minimum filter size of 47 mm (filter holders having an internal capacity of 1.5 L or greater, and equipped to accommodate a 142 mm diameter filter, are recommended). Vacuum filtration can only be used for wastes with low solids content (<10 %) and for highly granular, liquid-containing wastes. All other types of wastes should be filtered using positive pressure filtration. Suitable filter holders known to EPA are listed in Table 4.

4.3.3 Materials of Construction: Extraction vessels and filtration devices shall be made of inert materials which will not leach or absorb sample components of interest. Glass, polytetrafluoroethylene (PTFE), or type 316 stainless steel equipment may be used when evaluating the mobility of both organic and inorganic components. Devices made of high-density polyethylene (HDPE), polypropylene (PP), or polyvinyl chloride (PVC) may be used only when evaluating the mobility of metals. Borosilicate glass bottles are recommended for use over other types of glass bottles, especially when inorganics are analytes of concern.

4.4 Filters: Filters shall be made of borosilicate glass fiber, shall contain no binder materials, and shall have an effective pore size of 0.6 to 0.8-μm . Filters known to EPA which meet these specifications are identified in Table 5. Pre-filters must not be used. When evaluating the mobility of metals, filters shall be acid-washed prior to use by rinsing with 1N nitric acid followed by three consecutive rinses with reagent water (a minimum of 1-L per rinse is recommended). Glass fiber filters are fragile and should be handled with care.

4.5 pH Meters: The meter should be accurate to ± 0.05 units at 25□C.

4.6 ZHE Extract Collection Devices: TEDLAR®[2] bags or glass, stainless steel or PTFE gas-tight syringes are used to collect the initial liquid phase and the final extract when using the ZHE device. These devices listed are recommended for use under the following conditions:

[2]TEDLAR® is a registered trademark of Du Pont.

4.6.1 If a waste contains an aqueous liquid phase or if a waste does not contain a significant amount of nonaqueous liquid (i.e., <1 % of total waste), the TEDLAR® bag or a 600 mL syringe should be used to collect and combine the initial liquid and solid extract.

4.6.2 If a waste contains a significant amount of nonaqueous liquid in the initial liquid phase (i.e., >1 % of total waste), the syringe or the TEDLAR® bag may be used for both the initial solid/liquid separation and the final extract filtration. However, analysts should use one or the other, not both.

4.6.3 If the waste contains no initial liquid phase (is 100 % solid) or has no significant solid phase (is <0.5% solid) , either the TEDLAR® bag or the syringe may be used. If the syringe is used, discard the first 5 mL of liquid expressed from the device. The remaining aliquots are used for analysis.

4.7 ZHE Extraction Fluid Transfer Devices: Any device capable of transferring the extraction fluid into the ZHE without changing the nature of the extraction fluid is acceptable (e.g., a positive displacement or peristaltic pump, a gas-tight syringe, pressure filtration unit (see Step 4.3.2), or other ZHE device).

4.8 Laboratory Balance: Any laboratory balance accurate to within ± 0.01 grams may be used (all weight measurements are to be within ± 0.1 grams).

4.9 Beaker or Erlenmeyer flask, glass, 500 mL.

4.10 Watchglass, appropriate diameter to cover beaker or Erlenmeyer flask.

4.11 Magnetic stirrer.

5.0 REAGENTS

5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.2 Reagent Water. Reagent water is defined as water in which an interferant is not observed at or above the method's detection limit of the analyte(s) of interest. For nonvolatile extractions, ASTM Type II water or equivalent meets the definition of reagent water. For volatile extractions, it is recommended that reagent water be generated by any of the following methods. Reagent water should be monitored periodically for impurities.

5.2.1 Reagent water for volatile extractions may be generated by passing tap water through a carbon filter bed containing about 500 grams of activated carbon (Calgon Corp., Filtrasorb-300 or equivalent).

5.2.2 A water purification system (Millipore Super-Q or equivalent) may also be used to generate reagent water for volatile extractions.

5.2.3 Reagent water for volatile extractions may also be prepared by boiling water for 15 minutes. Subsequently, while maintaining the water temperature at 90 ± 5 degrees C, bubble a contaminant-free inert gas (e.g. nitrogen) through the water for 1 hour. While still hot, transfer the water to a narrow mouth screw-cap bottle under zero-headspace and seal with a Teflon-lined septum and cap.

5.3 Sulfuric acid/nitric acid (60/40 weight percent mixture) H_2SO_4/HNO_3. Cautiously mix 60 g of concentrated sulfuric acid with 40 g of concentrated nitric acid. If preferred, a more dilute H_2SO_4/HNO_3 acid mixture may be prepared and used in steps 5.4.1 and 5.4.2 making it easier to adjust the pH of the extraction fluids.

5.4 Extraction fluids.

5.4.1 Extraction fluid #1: This fluid is made by adding the 60/40 weight percent mixture of sulfuric and nitric acids (or a suitable dilution) to reagent water (Step 5.2) until the pH is 4.20 ± 0.05. The fluid is used to determine the leachability of soil from a site that is east of the Mississippi River, and the leachability of wastes and wastewaters.

NOTE: Solutions are unbuffered and exact pH may not be attained.

5.4.2 Extraction fluid #2: This fluid is made by adding the 60/40 weight percent mixture of sulfuric and nitric acids (or a suitable dilution) to reagent water (Step 5.2) until the pH is 5.00 ± 0.05. The fluid is used to determine the leachability of soil from a site that is west of the Mississippi River.

5.4.3 Extraction fluid #3: This fluid is reagent water (Step 5.2) and is used to determine cyanide and volatiles leachability.

NOTE: These extraction fluids should be monitored frequently for impurities. The pH should be checked prior to use to ensure that these fluids are made up accurately. If impurities are found or the pH is not within the above specifications, the fluid shall be discarded and fresh extraction fluid prepared.

5.5 Analytical standards shall be prepared according to the appropriate analytical method.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.1 All samples shall be collected using an appropriate sampling plan.

6.2 There may be requirements on the minimal size of the field sample depending upon the physical state or states of the waste and the analytes of concern. An aliquot is needed for the preliminary evaluations of the percent

solids and the particle size. An aliquot may be needed to conduct the nonvolatile analyte extraction procedure. If volatile organics are of concern, another aliquot may be needed. Quality control measures may require additional aliquots. Further, it is always wise to collect more sample just in case something goes wrong with the initial attempt to conduct the test.

6.3 Preservatives shall not be added to samples before extraction.

6.4 Samples may be refrigerated unless refrigeration results in irreversible physical change to the waste. If precipitation occurs, the entire sample (including precipitate) should be extracted.

6.5 When the sample is to be evaluated for volatile analytes, care shall be taken to minimize the loss of volatiles. Samples shall be collected and stored in a manner intended to prevent the loss of volatile analytes (e.g., samples should be collected in Teflon-lined septum capped vials and stored at 4□C. Samples should be opened only immediately prior to extraction).

6.6 1312 extracts should be prepared for analysis and analyzed as soon as possible following extraction. Extracts or portions of extracts for metallic analyte determinations must be acidified with nitric acid to a pH < 2, unless precipitation occurs (see Step 7.2.14 if precipitation occurs). Extracts should be preserved for other analytes according to the guidance given in the individual analysis methods. Extracts or portions of extracts for organic analyte determinations shall not be allowed to come into contact with the atmosphere (i.e., no headspace) to prevent losses. See Step 8.0 (Quality Control) for acceptable sample and extract holding times.

7.0 PROCEDURE

7.1 Preliminary Evaluations

Perform preliminary 1312 evaluations on a minimum 100 gram aliquot of sample. This aliquot may not actually undergo 1312 extraction. These preliminary evaluations include: (1) determination of the percent solids (Step 7.1.1); (2) determination of whether the waste contains insignificant solids and is, therefore, its own extract after filtration (Step 7.1.2); and (3) determination of whether the solid portion of the waste requires particle size reduction (Step 7.1.3).

7.1.1 Preliminary determination of percent solids: Percent solids is defined as that fraction of a waste sample (as a percentage of the total sample) from which no liquid may be forced out by an applied pressure, as described below.

7.1.1.1 If the sample will obviously yield no free liquid when subjected to pressure filtration (i.e., is 100% solid), weigh out a representative subsample (100 g minimum) and proceed to Step 7.1.3.

7.1.1.2 If the sample is liquid or multiphasic, liquid/solid separation to make a preliminary determination of percent solids is required. This involves the filtration device

discussed in Step 4.3.2, and is outlined in Steps 7.1.1.3 through 7.1.1.9.

7.1.1.3 Pre-weigh the filter and the container that will receive the filtrate.

7.1.1.4 Assemble filter holder and filter following the manufacturer's instructions. Place the filter on the support screen and secure.

7.1.1.5 Weigh out a subsample of the waste (100 gram minimum) and record the weight.

7.1.1.6 Allow slurries to stand to permit the solid phase to settle. Samples that settle slowly may be centrifuged prior to filtration. Centrifugation is to be used only as an aid to filtration. If used, the liquid should be decanted and filtered followed by filtration of the solid portion of the waste through the same filtration system.

7.1.1.7 Quantitatively transfer the sample to the filter holder (liquid and solid phases). Spread the sample evenly over the surface of the filter. If filtration of the waste at 4°C reduces the amount of expressed liquid over what would be expressed at room temperature, then allow the sample to warm up to room temperature in the device before filtering.

Gradually apply vacuum or gentle pressure of 1-10 psig, until air or pressurizing gas moves through the filter. If this point is not reached under 10 psig, and if no additional liquid has passed through the filter in any 2-minute interval, slowly increase the pressure in 10 psig increments to a maximum of 50 psig. After each incremental increase of 10 psig, if the pressurizing gas has not moved through the filter, and if no additional liquid has passed through the filter in any 2-minute interval, proceed to the next 10-psig increment. When the pressurizing gas begins to move through the filter, or when liquid flow has ceased at 50 psig (i.e., filtration does not result in any additional filtrate within any 2-minute period), stop the filtration.

NOTE: If sample material (>1 % of original sample weight) has obviously adhered to the container used to transfer the sample to the filtration apparatus, determine the weight of this residue and subtract it from the sample weight determined in Step 7.1.1.5 to determine the weight of the sample that will be filtered.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.1.1.8 The material in the filter holder is defined as the solid phase of the sample, and the filtrate is defined as the liquid phase.

NOTE: Some samples, such as oily wastes and some paint wastes, will obviously contain some material that appears to be a liquid, but even after applying vacuum or pressure filtration, as outlined in Step 7.1.1.7, this material may not filter. If this is the case, the material within the filtration device is cefined as a solid. Do not replace the original filter with a fresh filter under any circumstances. Use only one filter.

7.1.1.9 Determine the weight of the liquid phase by subtracting the weight of the filtrate container (see Step 7.1.1.3) from the total weight of the filtrate-filled container. Determine the weight of the solid phase of the sample by subtracting the weight of the liquid phase from the weight of the total sample, as determined in Step 7.1.1.5 or 7.1.1.7.

Record the weight of the liquid and solid phases. Calculate the percent solids as follows:

$$\text{Percent solids} = \frac{\text{Weight of solid (Step 7.1.1.9)}}{\text{Total weight of waste (Step 7.1.1.5 or 7.1.1.7)}} \times 100$$

7.1.2 If the percent solids determined in Step 7.1.1.9 is equal to or greater than 0.5%, then proceed either to Step 7.1.3 to determine whether the solid material requires particle size reduction or to Step 7.1.2.1 if it is noticed that a small amount of the filtrate is entrained in wetting of the filter. If the percent solids determined in Step 7.1.1.9 is less than 0.5%, then proceed to Step 7.2.9 if the nonvolatile 1312 analysis is to be performed, and to Step 7.3 with a fresh portion of the waste if the volatile 1312 analysis is to be performed.

7.1.2.1 Remove the solid phase and filter from the filtration apparatus.

7.1.2.2 Dry the filter and solid phase at 100 ± 20°C until two successive weighings yield the same value within ± 1 %. Record the final weight.

Caution: The drying oven should be vented to a hood or other appropriate device to eliminate the possibility of fumes from the sample escaping into the laboratory. Care should be taken to ensure that the sample will not flash or violently react upon heating.

7.1.2.3 Calculate the percent dry solids as follows:

$$\text{Percent dry solids} = \frac{\text{(Weight of dry sample + filter) - tared weight of filter}}{\text{Initial weight of sample (Step 7.1.1.5 or 7.1.1.7)}} \times 100$$

7.1.2.4 If the percent dry solids is less than 0.5%, then proceed to Step 7.2.9 if the nonvolatile 1312 analysis is to be performed, and to Step 7.3 if the volatile 1312 analysis is to be performed. If the percent dry solids is greater than or equal to 0.5%, and if the nonvolatile 1312 analysis is to be performed, return to the beginning of this Step (7.1) and, with a fresh portion of sample, determine whether particle size reduction is necessary (Step 7.1.3).

7.1.3 Determination of whether the sample requires particle-size reduction (particle-size is reduced during this step): Using the solid portion of the sample, evaluate the solid for particle size. Particle-size reduction is required, unless the solid has a surface area per gram of material equal to or greater than 3.1 cm^2, or is smaller than 1 cm in its narrowest dimension (i.e., is capable of passing through a 9.5 mm (0.375 inch) standard sieve). If the surface area is smaller or the particle size larger than described above, prepare the solid portion of the sample for extraction by crushing, cutting, or grinding the waste to a surface area or particle size as described above. If the solids are prepared for organic volatiles extraction, special precautions must be taken (see Step 7.3.6).

NOTE: Surface area criteria are meant for filamentous (e.g., paper, cloth, and similar) waste materials. Actual measurement of surface area is not required, nor is it recommended. For materials that do not obviously meet the criteria, sample-specific methods would need to be developed and employed to measure the surface area. Such methodology is currently not available.

7.1.4 Determination of appropriate extraction fluid:

7.1.4.1 For soils, if the sample is from a site that is east of the Mississippi River, extraction fluid #1 should be used. If the sample is from a site that is west of the Mississippi River, extraction fluid #2 should be used.

7.1.4.2 For wastes and wastewater, extraction fluid #1 should be used.

7.1.4.3 For cyanide-containing wastes and/or soils, extraction fluid #3 (reagent water) must be used because leaching of cyanide-containing samples under acidic conditions may result in the formation of hydrogen cyanide gas.

7.1.5 If the aliquot of the sample used for the preliminary evaluation (Steps 7.1.1 - 7.1.4) was determined to be 100% solid at Step 7.1.1.1, then it can be used for the Step 7.2 extraction (assuming at least 100 grams remain), and the Step 7.3 extraction (assuming at least 25 grams remain). If the aliquot was subjected to the procedure in Step 7.1.1.7, then another aliquot shall be used for the volatile extraction procedure in Step 7.3. The aliquot of the waste subjected to the procedure in Step 7.1.1.7 might be appropriate for use for the Step 7.2 extraction if an adequate amount of solid (as determined by Step 7.1.1.9)

was obtained. The amount of solid necessary is dependent upon whether a sufficient amount of extract will be produced to support the analyses. If an adequate amount of solid remains, proceed to Step 7.2.10 of the nonvolatile 1312 extraction.

7.2 Procedure When Volatiles Are Not Involved

A minimum sample size of 100 grams (solid and liquid phases) is recommended. In some cases, a larger sample size may be appropriate, depending on the solids content of the waste sample (percent solids, See Step 7.1.1), whether the initial liquid phase of the waste will be miscible with the aqueous extract of the solid, and whether inorganics, semivolatile organics, pesticides, and herbicides are all analytes of concern. Enough solids should be generated for extraction such that the volume of 1312 extract will be sufficient to support all of the analyses required. If the amount of extract generated by a single 1312 extraction will not be sufficient to perform all of the analyses, more than one extraction may be performed and the extracts from each combined and aliquoted for analysis.

7.2.1 If the sample will obviously yield no liquid when subjected to pressure filtration (i.e., is 100 % solid, see Step 7.1.1), weigh out a subsample of the sample (100 gram minimum) and proceed to Step 7.2.9.

7.2.2 If the sample is liquid or multiphasic, liquid/solid separation is required. This involves the filtration device described in Step 4.3.2 and is outlined in Steps 7.2.3 to 7.2.8.

7.2.3 Pre-weigh the container that will receive the filtrate.

7.2.4 Assemble the filter holder and filter following the manufacturer's instructions. Place the filter on the support screen and secure. Acid wash the filter if evaluating the mobility of metals (see Step 4.4).

NOTE: Acid washed filters may be used for all nonvolatile extractions even when metals are not of concern.

7.2.5 Weigh out a subsample of the sample (100 gram minimum) and record the weight. If the waste contains <0.5 % dry solids (Step 7.1.2), the liquid portion of the waste, after filtration, is defined as the 1312 extract. Therefore, enough of the sample should be filtered so that the amount of filtered liquid will support all of the analyses required of the 1312 extract. For wastes containing >0.5 % dry solids (Steps 7.1.1 or 7.1.2), use the percent solids information obtained in Step 7.1.1 to determine the optimum sample size (100 gram minimum) for filtration. Enough solids should be generated by filtration to support the analyses to be performed on the 1312 extract.

7.2.6 Allow slurries to stand to permit the solid phase to settle. Samples that settle slowly may be centrifuged prior to filtration. Use centrifugation only as an aid to filtration. If the sample is centrifuged, the liquid should be decanted and filtered followed by

filtration of the solid portion of the waste through the same filtration system.

7.2.7 Quantitatively transfer the sample (liquid and solid phases) to the filter holder (see Step 4.3.2). Spread the waste sample evenly over the surface of the filter. If filtration of the waste at 4□C reduces the amount of expressed liquid over what would be expressed at room temperature, then allow the sample to warm up to room temperature in the device before filtering.

Gradually apply vacuum or gentle pressure of 1-10 psig, until air or pressurizing gas moves through the filter. If this point if not reached under 10 psig, and if no additional liquid has passed through the filter in any 2-minute interval, slowly increase the pressure in 10-psig increments to maximum of 50 psig. After each incremental increase of 10 psig, if the pressurizing gas has not moved through the filter, and if no additional liquid has passed through the filter in any 2-minute interval, proceed to the next 10-psig increment. When the pressurizing gas begins to move through the filter, or when the liquid flow has ceased at 50 psig (i.e., filtration does not result in any additional filtrate within a 2-minute period), stop the filtration.

NOTE: If waste material (>1 % of the original sample weight) has obviously adhered to the container used to transfer the sample to the filtration apparatus, determine the weight of this residue and subtract it from the sample weight determined in Step 7.2.5, to determine the weight of the waste sample that will be filtered.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.2.8 The material in the filter holder is defined as the solid phase of the sample, and the filtrate is defined as the liquid phase. Weigh the filtrate. The liquid phase may now be either analyzed (see Step 7.2.12) or stored at 4□C until time of analysis.

NOTE: Some wastes, such as oily wastes and some paint wastes, will obviously contain some material which appears to be a liquid. Even after applying vacuum or pressure filtration, as outlined in Step 7.2.7, this material may not filter. If this is the case, the material within the filtration device is defined as a solid, and is carried through the extraction as a solid. Do not replace the original filter with a fresh filter under any circumstances. Use only one filter.

7.2.9 If the sample contains <0.5% dry solids (see Step 7.1.2), proceed to Step 7.2.13. If the sample contains >0.5 % dry solids (see Step 7.1.1 or 7.1.2), and if particle-size reduction of the solid was needed in Step 7.1.3, proceed to Step 7.2.10. If the sample as received passes a 9.5 mm sieve, quantitatively transfer the solid material into the extractor bottle along with the filter used to separate the initial liquid from the solid phase, and proceed to Step 7.2.11.

7.2.10 Prepare the solid portion of the sample for extraction by crushing, cutting, or grinding the waste to a surface area or particle-size as described in Step 7.1.3. When the surface area or particle-size has been appropriately altered, quantitatively transfer the solid material into an extractor bottle. Include the filter used to separate the initial liquid from the solid phase.

NOTE: Sieving of the waste is not normally required. Surface area requirements are meant for filamentous (e.g., paper, cloth) and similar waste materials. Actual measurement of surface area is not recommended. If sieving is necessary, a Teflon-coated sieve should be used to avoid contamination of the sample.

7.2.11 Determine the amount of extraction fluid to add to the extractor vessel as follows:

$$\text{Weight of extraction fluid} = \frac{20 \times \%\ \text{solids (Step 7.1.1)} \times \text{weight of waste filtered (Step 7.2.5 or 7.2.7)}}{100}$$

Slowly add this amount of appropriate extraction fluid (see Step 7.1.4) to the extractor vessel. Close the extractor bottle tightly (it is recommended that Teflon tape be used to ensure a tight seal), secure in rotary extractor device, and rotate at 30 ± 2 rpm for 18 ± 2 hours. Ambient temperature (i.e., temperature of room in which extraction takes place) shall be maintained at 23 ± 2°C during the extraction period.

NOTE: As agitation continues, pressure may build up within the extractor bottle for some types of sample (e.g., limed or calcium carbonate-containing sample may evolve gases such as carbon dioxide). To relieve excess pressure, the extractor bottle may be periodically opened (e.g., after 15 minutes, 30 minutes, and 1 hour) and vented into a hood.

7.2.12 Following the 18 ± 2 hour extraction, separate the material in the extractor vessel into its component liquid and solid phases by filtering through a new glass fiber filter, as outlined in Step 7.2.7. For final filtration of the 1312 extract, the glass fiber filter may be changed, if necessary, to facilitate filtration. Filter(s) shall be acid-washed (see Step 4.4) if evaluating the mobility of metals.

7.2.13 Prepare the 1312 extract as follows:

7.2.13.1 If the sample contained no initial liquid phase, the filtered liquid material obtained from Step 7.2.12 is defined as the 1312 extract. Proceed to Step 7.2.14.

7.2.13.2 If compatible (e.g., multiple phases will not result on combination), combine the filtered liquid resulting from Step 7.2.12 with the initial liquid phase of the sample obtained

in Step 7.2.7. This combined liquid is defined as the 1312 extract. Proceed to Step 7.2.14.

7.2.13.3 If the initial liquid phase of the waste, as obtained from Step 7.2.7, is not or may not be compatible with the filtered liquid resulting from Step 7.2.12, do not combine these liquids. Analyze these liquids, collectively defined as the 1312 extract, and combine the results mathematically, as described in Step 7.2.14.

7.2.14 Following collection of the 1312 extract, the pH of the extract should be recorded. Immediately aliquot and preserve the extract for analysis. Metals aliquots must be acidified with nitric acid to pH < 2. If precipitation is observed upon addition of nitric acid to a small aliquot of the extract, then the remaining portion of the extract for metals analyses shall not be acidified and the extract shall be analyzed as soon as possible. All other aliquots must be stored under refrigeration (4°C) until analyzed. The 1312 extract shall be prepared and analyzed according to appropriate analytical methods. 1312 extracts to be analyzed for metals shall be acid digested except in those instances where digestion causes loss of metallic analytes. If an analysis of the undigested extract shows that the concentration of any regulated metallic analyte exceeds the regulatory level, then the waste is hazardous and digestion of the extract is not necessary. However, data on undigested extracts alone cannot be used to demonstrate that the waste is not hazardous. If the individual phases are to be analyzed separately, determine the volume of the individual phases (to $\pm$ 0.5 %), conduct the appropriate analyses, and combine the results mathematically by using a simple volume-weighted average:

$$\text{Final Analyte Concentration} = \frac{(V_1)\ (C_1) + (V_2)\ (C_2)}{V_1 + V_2}$$

where:

V_1 = The volume of the first phase (L).
C_1 = The concentration of the analyte of concern in the first phase (mg/L).
V_2 = The volume of the second phase (L).
C_2 = The concentration of the analyte of concern in the second phase (mg/L).

7.2.15 Compare the analyte concentrations in the 1312 extract with the levels identified in the appropriate regulations. Refer to Section 8.0 for quality assurance requirements.

7.3 Procedure When Volatiles Are Involved

Use the ZHE device to obtain 1312 extract for analysis of volatile compounds only. Extract resulting from the use of the ZHE shall not be used to evaluate the mobility of non-volatile analytes (e.g., metals, pesticides, etc.).

The ZHE device has approximately a 500 mL internal capacity. The ZHE can thus accommodate a maximum of 25 grams of solid (defined as that fraction of a sample from which no additional liquid may be forced out by an applied pressure of 50 psig), due to the need to add an amount of extraction fluid equal to 20 times the weight of the solid phase.

Charge the ZHE with sample only once and do not open the device until the final extract (of the solid) has been collected. Repeated filling of the ZHE to obtain 25 grams of solid is not permitted.

Do not allow the sample, the initial liquid phase, or the extract to be exposed to the atmosphere for any more time than is absolutely necessary. Any manipulation of these materials should be done when cold (4□C) to minimize loss of volatiles.

7.3.1 Pre-weigh the (evacuated) filtrate collection container (see Step 4.6) and set aside. If using a TEDLAR® bag, express all liquid from the ZHE device into the bag, whether for the initial or final liquid/solid separation, and take an aliquot from the liquid in the bag for analysis. The containers listed in Step 4.6 are recommended for use under the conditions stated in Steps 4.6.1-4.6.3.

7.3.2 Place the ZHE piston within the body of the ZHE (it may be helpful first to moisten the piston O-rings slightly with extraction fluid). Adjust the piston within the ZHE body to a height that will minimize the distance the piston will have to move once the ZHE is charged with sample (based upon sample size requirements determined from Step 7.3, Step 7.1.1 and/or 7.1.2). Secure the gas inlet/outlet flange (bottom flange) onto the ZHE body in accordance with the manufacturer's instructions. Secure the glass fiber filter between the support screens and set aside. Set liquid inlet/outlet flange (top flange) aside.

7.3.3 If the sample is 100% solid (see Step 7.1.1), weigh out a subsample (25 gram maximum) of the waste, record weight, and proceed to Step 7.3.5.

7.3.4 If the sample contains <0.5% dry solids (Step 7.1.2), the liquid portion of waste, after filtration, is defined as the 1312 extract. Filter enough of the sample so that the amount of filtered liquid will support all of the volatile analyses required. For samples containing $\geq$0.5% dry solids (Steps 7.1.1 and/or 7.1.2), use the percent solids information obtained in Step 7.1.1 to determine the optimum sample size to charge into the ZHE. The recommended sample size is as follows:

7.3.4.1 For samples containing <5% solids (see Step 7.1.1), weigh out a 500 gram subsample of waste and record the weight.

7.3.4.2 For wastes containing >5% solids (see Step 7.1.1), determine the amount of waste to charge into the ZHE as follows:

$$\text{Weight of waste to charge ZHE} = \frac{25}{\text{percent solids (Step 7.1.1)}} \times 100$$

Weigh out a subsample of the waste of the appropriate size and record the weight.

7.3.5 If particle-size reduction of the solid portion of the sample was required in Step 7.1.3, proceed to Step 7.3.6. If particle-size reduction was not required in Step 7.1.3, proceed to Step 7.3.7.

7.3.6 Prepare the sample for extraction by crushing, cutting, or grinding the solid portion of the waste to a surface area or particle size as described in Step 7.1.3.1. Wastes and appropriate reduction equipment should be refrigerated, if possible, to 4°C prior to particle-size reduction. The means used to effect particle-size reduction must not generate heat in and of itself. If reduction of the solid phase of the waste is necessary, exposure of the waste to the atmosphere should be avoided to the extent possible.

> NOTE: Sieving of the waste is not recommended due to the possibility that volatiles may be lost. The use of an appropriately graduated ruler is recommended as an acceptable alternative. Surface area requirements are meant for filamentous (e.g., paper, cloth) and similar waste materials. Actual measurement of surface area is not recommended.

When the surface area or particle-size has been appropriately altered, proceed to Step 7.3.7.

7.3.7 Waste slurries need not be allowed to stand to permit the solid phase to settle. Do not centrifuge samples prior to filtration.

7.3.8 Quantitatively transfer the entire sample (liquid and solid phases) quickly to the ZHE. Secure the filter and support screens into the top flange of the device and secure the top flange to the ZHE body in accordance with the manufacturer's instructions. Tighten all ZHE fittings and place the device in the vertical position (gas inlet/outlet flange on the bottom). Do not attach the extraction collection device to the top plate.

> Note: If sample material (>1% of original sample weight) has obviously adhered to the container used to transfer the sample to the ZHE, determine the weight of this residue and subtract it from the sample weight determined in Step 7.3.4 to determine the weight of the waste sample that will be filtered.

Attach a gas line to the gas inlet/outlet valve (bottom flange) and, with the liquid inlet/outlet valve (top flange) open, begin applying gentle pressure of 1-10 psig (or more if necessary) to force all headspace slowly out of the ZHE device into a hood. At the first appearance of liquid from the liquid inlet/outlet valve, quickly close the valve and discontinue pressure. If filtration of the waste at 4°C reduces the

amount of expressed liquid over what would be expressed at room temperature, then allow the sample to warm up to room temperature in the device before filtering. If the waste is 100 % solid (see Step 7.1.1), slowly increase the pressure to a maximum of 50 psig to force most of the headspace out of the device and proceed to Step 7.3.12.

7.3.9 Attach the evacuated pre-weighed filtrate collection container to the liquid inlet/outlet valve and open the valve. Begin applying gentle pressure of 1-10 psig to force the liquid phase of the sample into the filtrate collection container. If no additional liquid has passed through the filter in any 2-minute interval, slowly increase the pressure in 10-psig increments to a maximum of 50 psig. After each incremental increase of 10 psig, if no additional liquid has passed through the filter in any 2-minute interval, proceed to the next 10-psig increment. When liquid flow has ceased such that continued pressure filtration at 50 psig does not result in any additional filtrate within a 2-minute period, stop the filtration. Close the liquid inlet/outlet valve, discontinue pressure to the piston, and disconnect ard weigh the filtrate collection container.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.3.10 The material in the ZHE is defined as the solid phase of the sample and the filtrate is defined as the liquid phase.

NOTE: Some samples, such as oily wastes and some paint wastes, will obviously contain some material which appears to be a liquid. Even after applying pressure filtration, this material will not filter. If this is the case, the material within the filtration device is defined as a solid, and is carried through the 1312 extraction as a solid.

If the original waste contained <0.5 % dry solids (see Step 7.1.2), this filtrate is defined as the 1312 extract and is analyzed directly. Proceed to Step 7.3.15.

7.3.11 The liquid phase may now be either analyzed immediately (see Steps 7.3.13 through 7.3.15) or stored at 4□C under minimal headspace conditions until time of analysis. Determine the weight of extraction fluid #3 to add to the ZHE as follows:

$$\text{Weight of extraction fluid} = \frac{20 \times \%\ \text{solids (Step 7.1.1)} \times \text{weight of waste filtered (Step 7.3.4 or 7.3.8)}}{100}$$

7.3.12 The following steps detail how to add the appropriate amount of extraction fluid to the solid material within the ZHE and agitation of the ZHE vessel. Extraction fluid #3 is used in all cases (see Step 5.4.3).

7.3.12.1 With the ZHE in the vertical position, attach a line from the extraction fluid reservoir to the liquid inlet/outlet valve. The line used shall contain fresh extraction fluid and should be preflushed with fluid to eliminate any air pockets in the line. Release gas pressure on the ZHE piston (from the gas inlet/outlet valve), open the liquid inlet/outlet valve, and begin transferring extraction fluid (by pumping or similar means) into the ZHE. Continue pumping extraction fluid into the ZHE until the appropriate amount of fluid has been introduced into the device.

7.3.12.2 After the extraction fluid has been added, immediately close the liquid inlet/outlet valve and disconnect the extraction fluid line. Check the ZHE to ensure that all valves are in their closed positions. Manually rotate the device in an end-over-end fashion 2 or 3 times. Reposition the ZHE in the vertical position with the liquid inlet/outlet valve on top. Pressurize the ZHE to 5-10 psig (if necessary) and slowly open the liquid inlet/outlet valve to bleed out any headspace (into a hood) that may have been introduced due to the addition of extraction fluid. This bleeding shall be done quickly and shall be stopped at the first appearance of liquid from the valve. Re-pressurize the ZHE with 5-10 psig and check all ZHE fittings to ensure that they are closed.

7.3.12.3 Place the ZHE in the rotary extractor apparatus (if it is not already there) and rotate at 30 ± 2 rpm for 18 ± 2 hours. Ambient temperature (i.e., temperature of room in which extraction occurs) shall be maintained at 23 ± 2□C during agitation.

7.3.13 Following the 18 ± 2 hour agitation period, check the pressure behind the ZHE piston by quickly opening and closing the gas inlet/outlet valve and noting the escape of gas. If the pressure has not been maintained (i.e., no gas release observed), the ZHE is leaking. Check the ZHE for leaking as specified in Step 4.2.1, and perform the extraction again with a new sample of waste. If the pressure within the device has been maintained, the material in the extractor vessel is once again separated into its component liquid and solid phases. If the waste contained an initial liquid phase, the liquid may be filtered directly into the same filtrate collection container (i.e., TEDLAR® bag) holding the initial liquid phase of the waste. A separate filtrate collection container must be used if combining would create multiple phases, or there is not enough volume left within the filtrate collection container. Filter through the glass fiber filter, using the ZHE device as discussed in Step 7.3.9. All extracts shall be filtered and collected if the TEDLAR® bag is used, if the extract is multiphasic, or if the waste contained an initial liquid phase (see Steps 4.6 and 7.3.1).

NOTE: An in-line glass fiber filter may be used to filter the material within the ZHE if it is suspected that the glass fiber filter has been ruptured

7.3.14 If the original sample contained no initial liquid phase, the filtered liquid material obtained from Step 7.3.13 is defined as the 1312 extract. If the sample contained an initial liquid phase, the filtered liquid material obtained from Step 7.3.13 and the initial liquid phase (Step 7.3.9) are collectively defined as the 1312 extract.

7.3.15 Following collection of the 1312 extract, immediately prepare the extract for analysis and store with minimal headspace at 4□C until analyzed. Analyze the 1312 extract according to the appropriate analytical methods. If the individual phases are to be analyzed separately (i.e., are not miscible), determine the volume of the individual phases (to 0.5%), conduct the appropriate analyses, and combine the results mathematically by using a simple volume- weighted average:

$$\text{Final Analyte Concentration} = \frac{(V_1)\ (C_1) + (V_2)\ (C_2)}{V_1 + V_2}$$

where:

V_1 = The volume of the first phases (L).
C_1 = The concentration of the analyte of concern in the first phase (mg/L).
V_2 = The volume of the second phase (L).
C_2 = The concentration of the analyte of concern in the second phase (mg/L).

7.3.16 Compare the analyte concentrations in the 1312 extract with the levels identified in the appropriate regulations. Refer to Step 8.0 for quality assurance requirements.

8.0 QUALITY CONTROL

8.1 A minimum of one blank (using the same extraction fluid as used for the samples) for every 20 extractions that have been conducted in an extraction vessel. Refer to Chapter One for additional quality control protocols.

8.2 A matrix spike shall be performed for each waste type (e.g., wastewater treatment sludge, contaminated soil, etc.) unless the result exceeds the regulatory level and the data is being used solely to demonstrate that the waste property exceeds the regulatory level. A minimum of one matrix spike must be analyzed for each analytical batch. As a minimum, follow the matrix spike addition guidance provided in each analytical method.

8.2.1 Matrix spikes are to be added after filtration of the 1312 extract and before preservation. Matrix spikes should not be added prior to 1312 extraction of the sample.

8.2.2 In most cases, matrix spike levels should be added at a concentration equivalent to the corresponding regulatory level. If the analyte concentration is less than one half the regulatory level, the

spike concentration may be as low as one half of the analyte concentration, but may not be less than five times the method detection limit. In order to avoid differences in matrix effects, the matrix spikes must be added to the same nominal volume of 1312 extract as that which was analyzed for the unspiked sample.

8.2.3 The purpose of the matrix spike is to monitor the performance of the analytical methods used, and to determine whether matrix interferences exist. Use of other internal calibration methods, modification of the analytical methods, or use of alternate analytical methods may be needed to accurately measure the analyte concentration in the 1312 extract when the recovery of the matrix spike is below the expected analytical method performance.

8.2.4 Matrix spike recoveries are calculated by the following formula:

$$\%R\ (\%\ \text{Recovery}) = 100\ (X_s - X_u) / K$$

where:

X_s = measured value for the spiked sample
X_u = measured value for the unspiked sample, and
K = known value of the spike in the sample.

8.3 All quality control measures described in the appropriate analytical methods shall be followed.

8.4 The use of internal calibration quantitation methods shall be employed for a metallic contaminant if: (1) Recovery of the contaminant from the 1312 extract is not at least 50% and the concentration does not exceed the appropriate regulatory level, and (2) The concentration of the contaminant measured in the extract is within 20% of the appropriate regulatory level.

8.4.1. The method of standard additions shall be employed as the internal calibration quantitation method for each metallic contaminant.

8.4.2 The method of standard additions requires preparing calibration standards in the sample matrix rather than reagent water or blank solution. It requires taking four identical aliquots of the solution and adding known amounts of standard to three of these aliquots. The forth aliquot is the unknown. Preferably, the first addition should be prepared so that the resulting concentration is approximately 50% of the expected concentration of the sample. The second and third additions should be prepared so that the concentrations are approximately 100% and 150% of the expected concentration of the sample. All four aliquots are maintained at the same final volume by adding reagent water or a blank solution, and may need dilution adjustment to maintain the signals in the linear range of the instrument technique. All four aliquots are analyzed.

8.4.3 Prepare a plot, or subject data to linear regression, of instrument signals or external-calibration-derived concentrations as the dependant variable (y-axis) versus concentrations of the additions of standards as the independent variable (x-axis). Solve for the intercept

of the abscissa (the independent variable, x-axis) which is the concentration in the unknown.

8.4.4 Alternately, subtract the instrumental signal or external-calibration-derived concentration of the unknown (unspiked) sample from the instrumental signals or external-calibration-derived concentrations of the standard additions. Plot or subject to linear regression of the corrected instrument signals or external-calibration-derived concentrations as the dependant variable versus the independent variable. Derive concentrations for the unknowns using the internal calibration curve as if it were an external calibration curve.

8.5 Samples must undergo 1312 extraction within the following time periods:

SAMPLE MAXIMUM HOLDING TIMES (days)

	From: Field Collection To: 1312 extraction	From: 1312 extraction To: Preparative extraction	From: Preparative extraction To: Determinative analysis	Total Elapsed Time
Volatiles	14	NA	14	28
Semi-volatiles	14	7	40	61
Mercury	28	NA	28	56
Metals, except mercury	180	NA	180	360
NA = Not Applicable				

If sample holding times are exceeded, the values obtained will be considered minimal concentrations. Exceeding the holding time is not acceptable in establishing that a waste does not exceed the regulatory level. Exceeding the holding time will not invalidate characterization if the waste exceeds the regulatory level.

9.0 METHOD PERFORMANCE

9.1 Precision results for semi-volatiles and metals: An eastern soil with high organic content and a western soil with low organic contert were used for the semi-volatile and metal leaching experiments. Both types of soil were analyzed prior to contaminant spiking. The results are shown in Table 6. The concentration of contaminants leached from the soils were reproducible, as shown

by the moderate relative standard deviations (RSDs) of the recoveries (averaging 29% for the compounds and elements analyzed).

9.2 Precision results for volatiles: Four different soils were spiked and tested for the extraction of volatiles. Soils One and Two were from western and eastern Superfund sites. Soils Three and Four were mixtures of a western soil with low organic content and two different municipal sludges. The results are shown in Table 7. Extract concentrations of volatile organics from the eastern soil were lower than from the western soil. Replicate leachings of Soils Three and Four showed lower precision than the leachates from the Superfund soils.

10.0 REFERENCES

1. Environmental Monitoring Systems Laboratory, "Performance Testing of Method 1312; QA Support for RCRA Testing: Project Report". EPA/600/4-89/022. EPA Contract 68-03-3249 to Lockheed Engineering and Sciences Company, June 1989.

2. Research Triangle Institute, "Interlaboratory Comparison of Methods 1310, 1311, and 1312 for Lead in Soil". U.S. EPA Contract 68-01-7075, November 1988.

Table 1. Volatile Analytes[1]

Compound	CAS No.
Acetone	67-64-1
Benzene	71-43-2
n-Butyl alcohol	71-36-3
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlorobenzene	108-90-7
Chloroform	67-66-3
1,2-Dichloroethane	107-06-2
1,1-Dichloroethylene	75-35-4
Ethyl acetate	141-78-6
Ethyl benzene	100-41-4
Ethyl ether	60-29-7
Isobutanol	78-83-1
Methanol	67-56-1
Methylene chloride	75-09-2
Methyl ethyl ketone	78-93-3
Methyl isobutyl ketone	108-10-1
Tetrachloroethylene	127-18-4
Toluene	108-88-3
1,1,1,-Trichloroethane	71-55-6
Trichloroethylene	79-01-6
Trichlorofluoromethane	75-69-4
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1
Vinyl chloride	75-01-4
Xylene	1330-20-7

[1] When testing for any or all of these analytes, the zero-headspace extractor vessel shall be used instead of the bottle extractor.

Table 2. Suitable Rotary Agitation Apparatus[1]

Company	Location	Model No.
Analytical Testing and Consulting Services, Inc.	Warrington, PA (215) 343-4490	4-vessel extractor (DC20S); 8-vessel extractor (DC20); 12-vessel extractor (DC20B)
Associated Design and Manufacturing Company	Alexandria, VA (703) 549-5999	2-vessel (3740-2); 4-vessel (3740-4); 6-vessel (3740-6); 8-vessel (3740-8); 12-vessel (3740-12); 24-vessel (3740-24)
Environmental Machine and Design, Inc.	Lynchburg, VA (804) 845-6424	8-vessel (08-00-00) 4-vessel (04-00-00)
IRA Machine Shop and Laboratory	Santurce, PR (809) 752-4004	8-vessel (011001)
Lars Lande Manufacturing	Whitmore Lake, MI (313) 449-4116	10-vessel (10VRE) 5-vessel (5VRE)
Millipore Corp.	Bedford, MA (800) 225-3384	4-ZHE or 4 1-liter bottle extractor (YT300RAHW)

[1] Any device that rotates the extraction vessel in an end-over-end fashion at 30 ±2 rpm is acceptable.

Table 3. Suitable Zero-Headspace Extractor Vessels[1]

Company	Location	Model No.
Analytical Testing & Consulting Services, Inc.	Warrington, PA (215) 343-4490	C102, Mechanical Pressure Device
Associated Design and Manufacturing Company	Alexandria, VA (703) 549-5999	3745-ZHE, Gas Pressure Device
Lars Lande Manufacturing[2]	Whitmore Lake, MI (313) 449-4116	ZHE-11, Gas Pressure Device
Millipore Corporation	Bedford, MA (800) 225-3384	YT30090HW, Gas Pressure Device
Environmental Machine and Design, Inc.	Lynchburg, VA (804) 845-6424	VOLA-TOX1, Gas Pressure Device

[1] Any device that meets the specifications listed in Step 4.2.1 of the method is suitable.

[2] This device uses a 110 mm filter.

Table 4. Suitable Filter Holders

Company	Location	Model/ Catalogue #	Size
Nucleopore Corporation	Pleasanton, CA (800) 882-7711	425910 410400	142 mm 47 mm
Micro Filtration Systems	Dublin, CA (800) 334-7132 (415) 828-6010	302400 311400	142 mm 47 mm
Millipore Corporation	Bedford, MA (800) 225-3384	YT30142HW XX1004700	142 mm 47 mm

[1] Any device capable of separating the liquid from the solid phase of the waste is suitable, providing that it is chemically compatible with the waste and the constituents to be analyzed. Plastic devices (not listed above) may be used when only inorganic analytes are of concern. The 142 mm size filter holder is recommended.

Table 5. Suitable Filter Media[1]

Company	Location	Model	Pore Size (μm)
Millipore Corporation	Bedford, MA (800) 225-3384	AP40	0.7
Nucleopore Corporation	Pleasanton, CA (415) 463-2530	211625	0.7
Whatman Laboratory Products, Inc.	Clifton, NJ (201) 773-5800	GFF	0.7
Micro Filtration Systems	Dublin, CA (800) 334-7132 (415) 828-6010	GF75	0.7

[1] Any filter that meets the specifications in Step 4.4 of the Method is suitable.

TABLE 6 - METHOD 1312 PRECISION RESULTS FOR SEMI-VOLATILES AND METALS

		Eastern Soil (pH 4.2)		Western Soil (pH 5.0)	
	Amount Spiked (µg)	Amount Recovered* (µg)	% RSD	Amount Recovered* (µg)	% RSD
FORTIFIED ANALYTES					
bis(2-chloroethyl)-ether	1040	834	12.5	616	14.2
2-Chlorophenol	1620	1010	6.8	525	54.9
1,4-Dichlorobenzene	2000	344	12.3	272	34.6
1,2-Dichlorobenzene	8920	1010	8.0	1520	28.4
2-Methylphenol	3940	1860	7.7	1130	32.6
Nitrobenzene	1010	812	10.0	457	21.3
2,4-Dimethylphenol	1460	200	18.4	18	87.6
Hexachlorobutadiene	6300	95	12.9	280	22.8
Acenaphthene	3640	210	8.1	310**	7.7
2,4-Dinitrophenol	1300	896**	6.1	23**	15.7
2,4-Dinitrotoluene	1900	1150	5.4	585	54.4
Hexachlorobenzene	1840	3.7	12.0	10	173.2
gamma BHC (Lindane)	7440	230	16.3	1240	55.2
beta BHC	640	35	13.3	65.3	51.7
METALS					
Lead	5000	70	4.3	10	51.7
Cadmium	1000	387	2.3	91	71.3

* = Triplicate analyses.
** = Duplicate analyses; one value was rejected as an outlier at the 90% confidence level using the Dixon Q test.

TABLE 7 METHOD 1312 PRECISION RESULTS FOR VOLATILES

Compound Name	Soil No. 1 (Western) Avg. %Rec.*	%RSD	Soil No. 2 (Eastern) Avg. %Rec.*	%RSD	Soil No. 3 (Western and Sludge) Avg. %Rec.**	%RSD	Soil No. 4 (Western and Sludge) Avg. %Rec.***	%RSD
Acetone	44.0	12.4	43.8	2.25	116.0	11.5	21.3	71.4
Acrylonitrile	52.5	68.4	50.5	70.0	49.3	44.9	51.8	4.6
Benzene	47.8	8.29	34.8	16.3	49.8	36.7	33.4	41.1
n-Butyl Alcohol (1-Butanol)	55.5	2.91	49.2	14.6	65.5	37.2	73.0	13.9
Carbon disulfide	21.4	16.4	12.9	49.5	36.5	51.5	21.3	31.5
Carbon tetrachloride	40.6	18.6	22.3	29.1	36.2	41.4	24.0	34.0
Chlorobenzene	64.4	6.76	41.5	13.1	44.2	32.0	33.0	24.9
Chloroform	61.3	8.04	54.8	16.4	61.8	29.1	45.8	38.6
1,2-Dichloroethane	73.4	4.59	68.7	11.3	58.3	33.3	41.2	37.8
1,1-Dichloroethane	31.4	14.5	22.9	39.3	32.0	54.4	16.8	26.4
Ethyl acetate	76.4	9.65	75.4	4.02	23.0	119.8	11.0	115.5
Ethylbenzene	56.2	9.22	23.2	11.5	37.5	36.1	27.2	28.6
Ethyl ether	48.0	16.4	55.1	9.72	37.3	31.2	42.0	17.6
Isobutanol (4-Methyl -1-propanol)	0.0	ND	0.0	ND	61.8	37.7	76.0	12.2
Methylene chloride	47.5	30.3	42.2	42.9	52.0	37.4	37.3	16.6
Methyl ethyl ketone (2-Butanone)	56.7	5.94	61.9	3.94	73.7	31.3	40.6	39.0
Methyl isobutyl ketone	81.1	10.3	88.9	2.99	58.3	32.6	39.8	40.3
1,1,1,2-Tetrachloroethane	69.0	6.73	41.1	11.3	50.8	31.5	36.8	23.8
1,1,2,2-Tetrachloroethane	85.3	7.04	58.9	4.15	64.0	25.7	53.6	15.8
Tetrachloroethene	45.1	12.7	15.2	17.4	26.2	44.0	18.6	24.2
Toluene	59.2	8.06	49.3	10.5	45.7	35.2	31.4	37.2
1,1,1-Trichloroethane	47.2	16.0	33.8	22.8	40.7	40.6	26.2	38.8
1,1,2-Trichloroethane	76.2	5.72	67.3	8.43	61.7	28.0	46.4	25.4
Trichloroethene	54.5	11.1	39.4	19.5	38.8	40.9	25.6	34.1
Trichlorofluoromethane	20.7	24.5	12.6	60.1	28.5	34.0	19.8	33.9
1,1,2-Trichlorotrifluoroethane	18.1	26.7	6.95	58.0	21.5	67.8	15.3	24.8
Vinyl chloride	10.2	20.3	7.17	72.8	25.0	61.0	11.8	25.4

* Triplicate analyses
** Six replicate analyses
*** Five replicate analyses

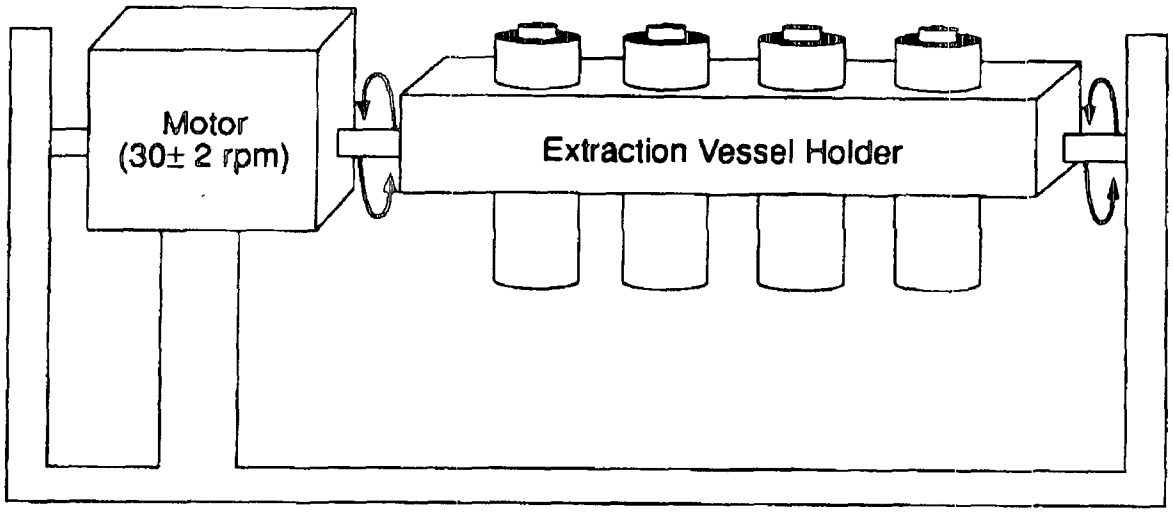


Figure 1. Rotary Agitation Apparatus

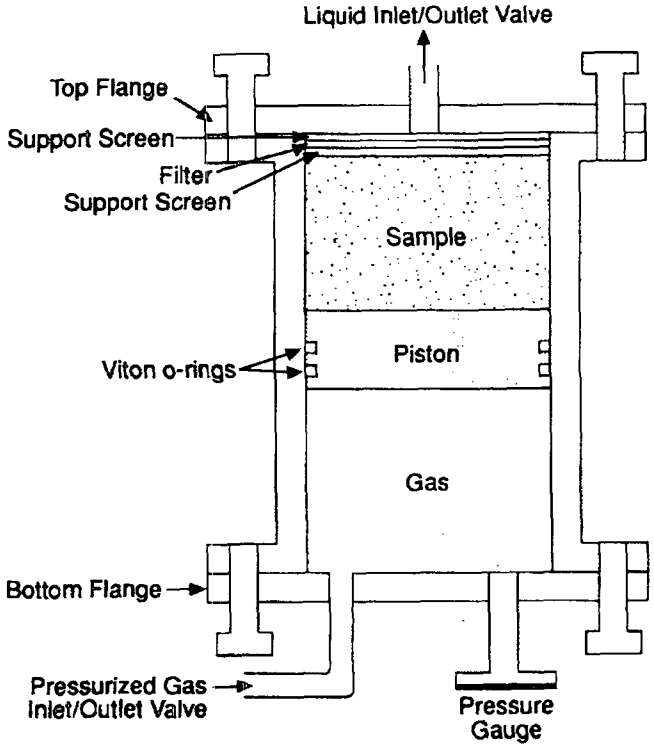
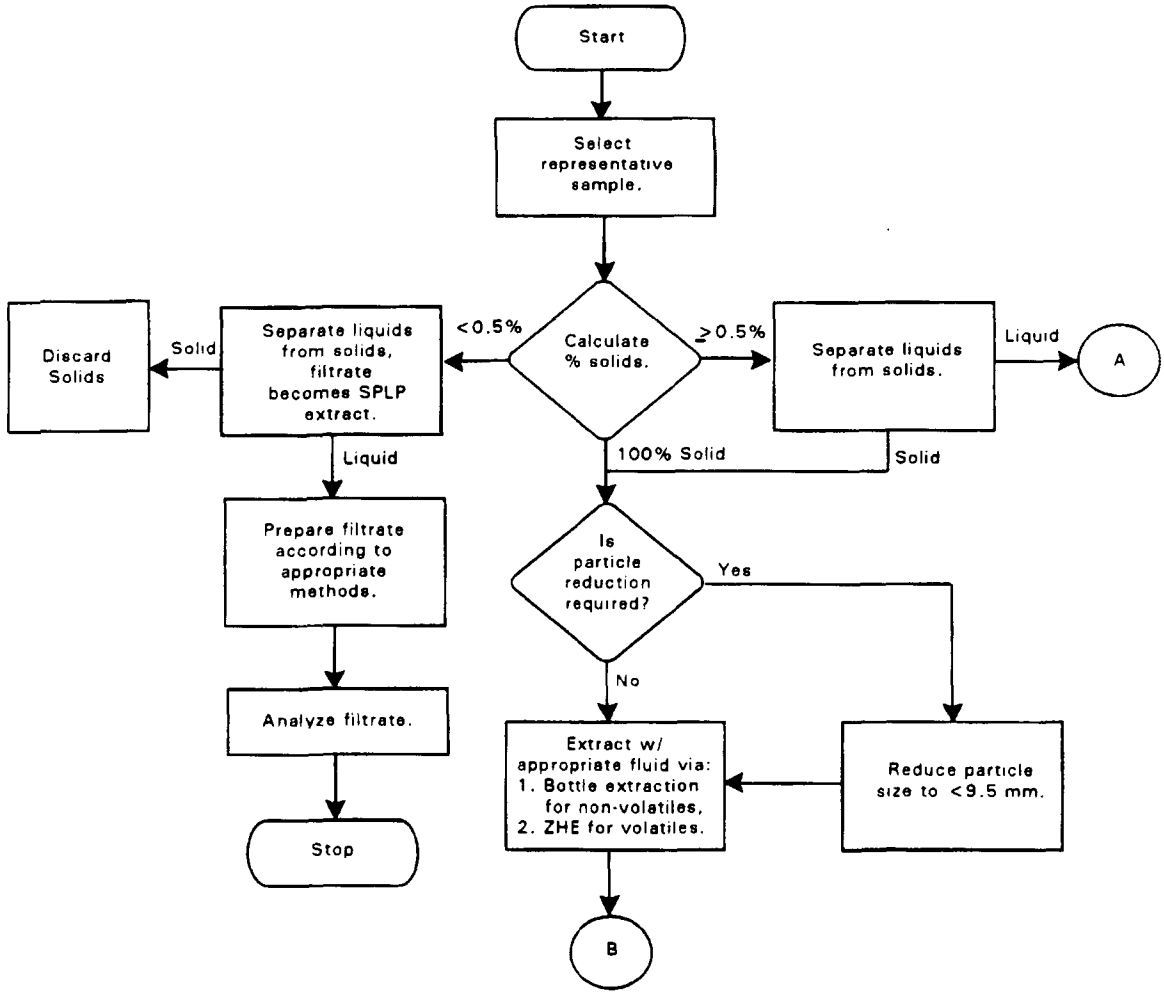


Figure 2. Zero-Headspace Extractor (ZHE)

SYNTHETIC PRECIPITATION LEACHING PROCEDURE



SYNTHETIC PRECIPITATION LEACHING PROCEDURE (continued)