Abbey → GW035

SPILL INCIDENT CLOSURE REPORT

Jal Tank Farm
Booster Pump Release

Jal, New Mexico

H2A ENVIRONMENTAL LTD.

Prepared For:

Shell

Prepared By:

H2A
ENVIRONMENTAL LTD.

November 2003

TABLE OF CONTENTS

FIGURES

APPENDICES

EXECUTIVE SUMMARY

The Shell Pipeline Company LP (Shell, formerly d.b.a. Equilon Pipeline Company, LLC) Jal Basin Station Tank Farm experienced a crude oil release from a failed seal in a booster pump. Immediate corrective actions recovered 95 of the 107 barrels released. In addition, during intial response actions, 150 cubic yards of soil were excavated and removed to a hazardous waste disposal facility. The potential risk to human health from the soil remaining in place at the release site was evaluated by conducting laboratory analysis of samples from that soil and comparing the detected concentrations to risk-based protective concentration levels (PCLs) calculated for this site using equations from the EPA guidance documents listed in the References section. Additional soils were excavated until all concentrations were below the PCLs.

The Jal Basin Station is located approximately 2 miles south of Jal, New Mexico. The facility is not located in an incorporated city or town. A site location map is presented on FIG. 1. Site details are presented on FIG. 2.

The soils on site are predominantly sand, sandy loam, and caliche. Ground water is approximately 90 feet below ground surface. There are no water wells within a one-quarter mile radius of the site, except for one on-site well which is not currently being used. The closest surface water is a pond 0.42 miles from the site.

The Critical PCL for each constituent of concern (COC) is compared to the current maximum detected site concentrations below.

Constituent	Surface Soil (0-5 feet) PCL (mg/kg)	Maximum Concentration in Surface Soil (mg/kg)	Subsurface Soil (>5 feet) PCL (mg/kg)	Maximum Concentration in Subsurface Soil (mg/kg)
Benzene	0.69	0.16	0.69	<0.001
Ethylbenzene	260	4.7	260	<0.001
Toluene	270	0.48	270	<0.004
Xylene	4,400	3.1	4,400	<0.010
TPH	14,000	4,700	25,000	46

No current COC concentrations in soil exceed the respective Critical PCLs.

Evaluation of the site with respect to risk-based standards indicates that no further corrective action is necessary to protect human health and the environment.

INTRODUCTION

This report presents the methodology and results of a risk assessment conducted for the Jal Basin Station Booster Pump Release site near Jal, New Mexico. This risk assessment uses the equations included in the United States Environmental Protection Agency (EPA) guidance documents listed in the Reference section. These documents are intended to provide guidance only and considerable professional judgment must be exercised in applying these guidance documents to site-specific risk assessments. Consequently, this risk assessment incorporates several conservative (protective) assumptions in evaluating potential risks at this site.

The objective of the assessment was to evaluate the actual or reasonable potential for public and environmental exposure to constituents of concern and to evaluate the potential risk from that exposure by comparing detected COC concentrations to risk-based PCLs calculated for this site.

The Shell Jal Basin Station Tank Farm experienced a crude oil release from a failed seal in a booster pump. Immediate corrective actions recovered 95 of the 107 barrels released. In addition, during initial response actions, 150 cubic yards of soil were excavated and removed to a hazardous waste disposal facility.

In the excavated areas, soil samples were taken from the surface and hand augered soil borings were placed to a depth of two feet to determine the COC concentrations remaining after the initial excavation was complete. Two trenches were placed to a depth of 13 feet and a soil boring was placed to a depth of 7 feet to further delineate the vertical extent of COC concentrations.

Additional soils were excavated until all concentrations were below the PCLs.

CHRONOLOGY OF SITE ACTIVITIES

A chronological listing of significant events and activities is presented below.

07/31/02	The leak was discovered and the pump was repaired. Liquid oil on the surface was recovered and impacted soils were excavated and stockpiled on plastic.
08/08/02	Soil samples were collected from the bottom ("Area 1 ExcBot" through "Area 3 ExcBot") and west wall ("Exc West Wall") of the excavation and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by Method 8021 and total petroleum hydrocarbons (TPH) by Method 418.1.
08/30/02	Eight soil borings ("HA-1" through "HA-8") were hand augered to a depth of two feet around the excavated area to delineate the extent of hydrocarbon impacted soils remaining. Soil samples were collected from the borings and analyzed for BTEX by Method 8021 and TPH by Method 418.1.

10/17/02 Two trenches were dug with a backhoe in the areas with the highest TPH concentrations to collect samples from a greater depth. Five soil samples were collected from the trenches and analyzed for BTEX by Method 8021 and TPH by Method 8015 DRO and 8015 GRO. The sample with the highest TPH concentration was also analyzed for PAHs by Method 8270, SPLP BTEX, SPLP TPH (DRO and GRO), SPLP PAHs, and TPH Boiling Point Fractions by Method TX1006. All PAH and all SPLP concentrations were below detection limits. A sample was also collected for analysis of geotechnical parameters such as porosity, volumetric water content, and fraction organic carbon.

01/02/03 One soil boring ("SB-HA-4") was advanced in the area of Hand Auger 4. Soil samples were collected at depths of 3, 5, and 7 feet and analyzed for BTEX by Method 8021 and TPH by Method 8015 DRO and 8015 GRO.

06/12/03 Additional soil was excavated. Surface soils were resampled ("Area 1 Resample" through "Area 3 Resample") and analyzed for BTEX by Method 8021 and TPH by Method 8015 DRO and 8015 GRO.

EXPOSURE ASSESSMENT

Land Use

The Jal Basin Station is located approximately 2 miles south of Jal in the northeast quarter of the northeast quarter of Section 5, Township 26 South, Range 37 East, in Lea County, New Mexico. The station is not located in an incorporated city or town. The affected soil is in the midst of the tank farm for this facility. The site is expected to remain in commercial use for the foreseeable future.

Water Use

Depth to Groundwater

This facility has a groundwater remediation system operating in response to an unrelated release. The depth to groundwater in the recovery wells for that system is approximately 90 feet below ground surface.

Wellhead Protection Area

According to Mr. Ken Frescas with the State of New Mexico's Engineering Department, there are no permitted water wells within one-quarter mile radius of the outside perimeter of the facility. There is one on-site well which is not currently being used.

Distance to Nearest Surface Water Body

A pond is located 0.42 miles to the east-southeast of the subject property. An unnamed intermittent stream/creek is located 1.67 miles to the northwest of the subject property. An aqueduct is located approximately 1.78 miles to the northwest of the subject property.

Soil Characteristics

According to the "Soil Survey of Lea County, New Mexico" the soil type for the majority of the property is the Wink fine sand with 0 to 3 percent slopes. The Wink fine sand is moderately permeable, and the water runoff is very slow. The water intake is rapid and the available water holding capacity is 2 to 4 inches. Roots penetrate to a depth of 20 to 35 inches, and the depth of bedrock or caliche is greater than 5 feet. Soil blowing is a severe hazard. The soil profile of the Wink fine sand is as follows:

- From 0 to 12 inches, the unit consists of a brown fine sand, which is darkish brown when moist. The soil is loose when dry or moist, and non-sticky and non-plastic when wet. This layer is moderately alkaline, slightly calcareous with a gradual boundary to the next profile layer. The permeability ranges from 2.0 to 20.0 inches per hour, the available water capacity ranges from 0.06 to 0.08 inch per inch of soil, and the pH ranges from 7.9 to 8.4.
- From 12 to 23 inches, the unit consists of a brown sandy loam, which is dark brown when moist. The soils are weak, with medium, sub-angular blocky structure. The soils are soft, and very friable when moist, and non-sticky and non-plastic when wet. This layer is moderately alkaline, slightly calcareous with a gradual boundary to the next profile layer. The permeability ranges from 2.0 to 6.3 inches per hour, the available water capacity ranges from 0.11 to 0.13 inch per inch of soil, and the pH ranges from 7.9 to 8.4.
- From 23 to 60 inches, the unit consists of a white, soft caliche of sandy loam texture, which is light gray when moist. The soils are massive, hard, and friable when moist, and slightly sticky and slightly plastic when wet. The upper part of this layer contains a few, fine, weakly cemented lime concretions. This layer is strongly alkaline and strongly calcareous. The permeability ranges from 2.0 to 6.3 inches per hour, and the pH ranges from 8.4 to 9.0.

Complete Exposure Pathways

No COC concentrations were detected below a depth of seven feet and groundwater is approximately 90 feet deep, therefore, exposure pathways based on exposure to groundwater are considered incomplete pathways.

Complete pathways selected for exposure assessment included:

- Ingestion of soil, dermal contact with soil, and inhalation of volatiles and particulates from surface soil (combined soil pathways)
- Inhalation of volatiles from subsurface soil
- Leaching from soil to groundwater

METHODOLOGY TO CALCULATE PCLS FOR TPH

Crude oil is a mixture of numerous hydrocarbons, many of which have no published toxicity factors. Therefore, a surrogate approach, developed by the TPH Criteria Working Group, involving the assignment of conservative toxicity values and chemical property values to mass fraction groups based on their boiling points and structural similarities was implemented in order to estimate the PCLs for crude oil as a whole. The surrogate approach consists of the following process:

1. Identify groups of compounds based on their boiling point and structural similarities and measure the mass fraction of each group in the crude oil sample. The results of this "fingerprinting" analysis are presented in Appendix B.
2. Assign representative toxicity values and chemical property values for the groups of compounds identified above.
3. Calculate the PCL for each mass fraction group using the same equations used for individual COCs.
4. Compute the weighted PCL for the crude oil as a whole by weighting the results for each group on a mass fraction basis:

$$PCL_w = 1 / \Sigma (m_i / PCL_i)$$

where

PCL_w	=	the weighted PCL for Total TPH (mg/kg or mg/L)
m_i	=	the mass fraction of boiling point group 'i' (mg/mg)
PCL_i	=	the PCL for mass fraction group 'i' (mg/kg or mg/L)

RISK CHARACTERIZATION

For each complete pathway, PCLs were calculated for each COC. These PCL calculations are presented in Appendix A.

Then, for each COC, the minimum or "Critical" PCL for each medium is determined as follows:

SURFACE SOIL				
Constituent	PCL for Combined Soil Pathways (mg/kg)	PCL for Soil-to-GW Pathway (mg/kg)	Critical PCL for Surface Soil (mg/kg)	Critical Pathway
Benzene	130	0.69	0.69	SGW
Ethylbenzene	100,000	260	260	SGW
Toluene	200,000	270	270	SGW
Xylene	200,000	4,400	4,400	SGW
TPH	14,000	35,000	14,000	Combined

SUBSURFACE SOIL				
Constituent	PCL for Inhalation of Vapors from Soil (mg/kg)	PCL for Soil-to-GW Pathway (mg/kg)	Critical PCL for Subsurface Soil (mg/kg)	Critical Pathway
Benzene	170	0.69	0.69	SGW
Ethylbenzene	46,000	260	260	SGW
Toluene	18,000	270	270	SGW
Xylene	4,600	4,400	4,400	SGW
TPH	25,000	35,000	25,000	Inhalation

The Critical PCL for each COC is compared to the current maximum detected site concentrations below.

Constituent	Surface Soil (0-5 feet) PCL (mg/kg)	Maximum Concentration in Surface Soil (mg/kg)	Subsurface Soil (>5 feet) PCL (mg/kg)	Maximum Concentration in Subsurface Soil (mg/kg)
Benzene	0.69	0.16	0.69	<0.001
Ethylbenzene	260	4.7	260	<0.001
Toluene	270	0.48	270	<0.004
Xylene	4,400	3.1	4,400	<0.010
TPH	14,000	4,700	25,000	46

CONCLUSIONS

No current COC concentrations in soil exceeded the respective Critical PCLs.

Evaluation of the site with respect to risk-based standards indicates that no further corrective action is necessary to protect human health and the environment.

REFERENCES

U.S. Environmental Protection Agency (EPA) (1988) Superfund Exposure Assessment Manual. EPA/640/1-88/001.

U. S. Environmental Protection Agency (EPA) (1989) Exposure Factors Handbook. Office of Health and Environmental Assessment. U. S. EPA/600/8-89/043.

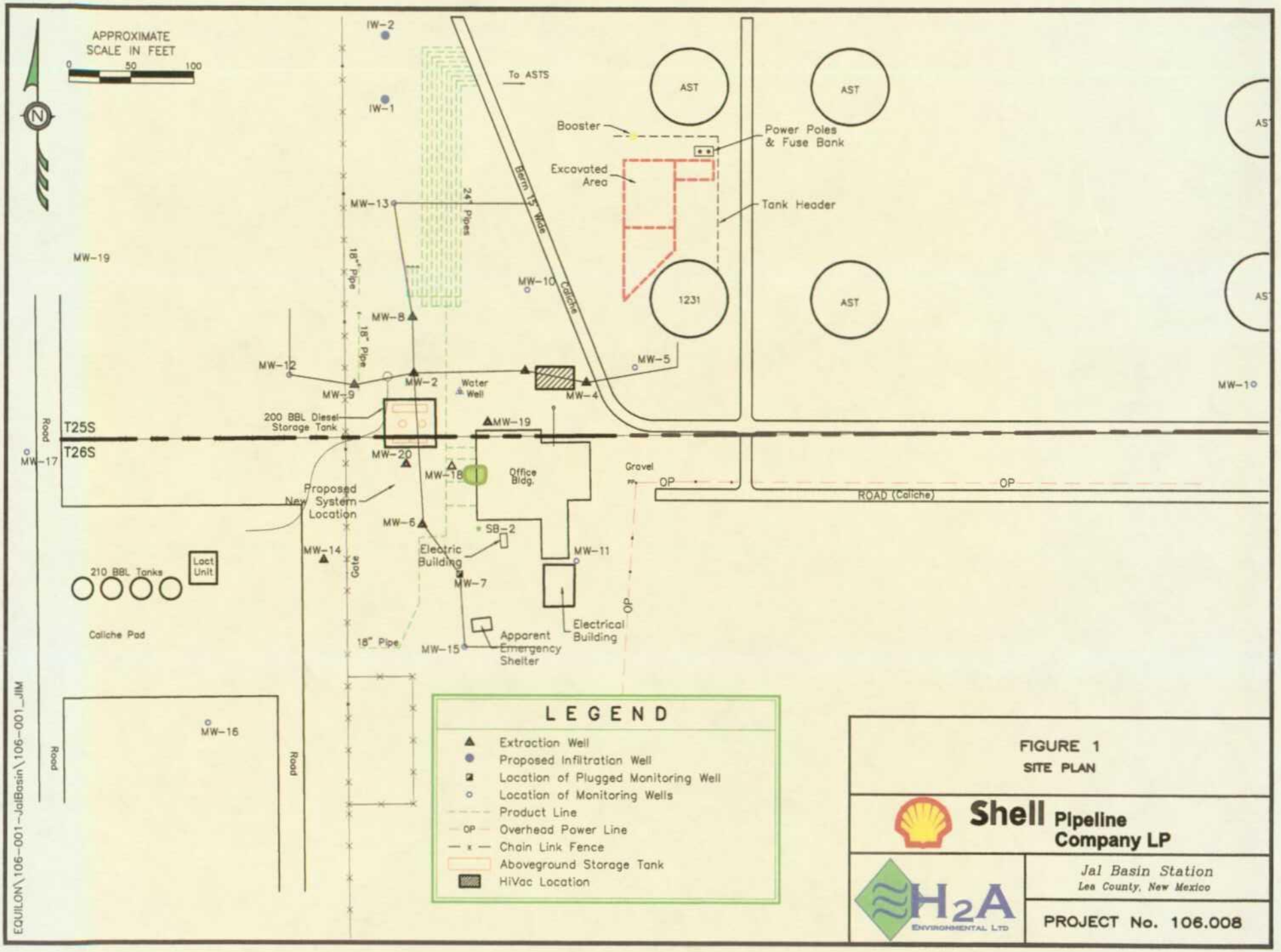
U. S. Environmental Protection Agency (EPA) (1989) Risk Assessment Guidance for Superfund. Vol. I. Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

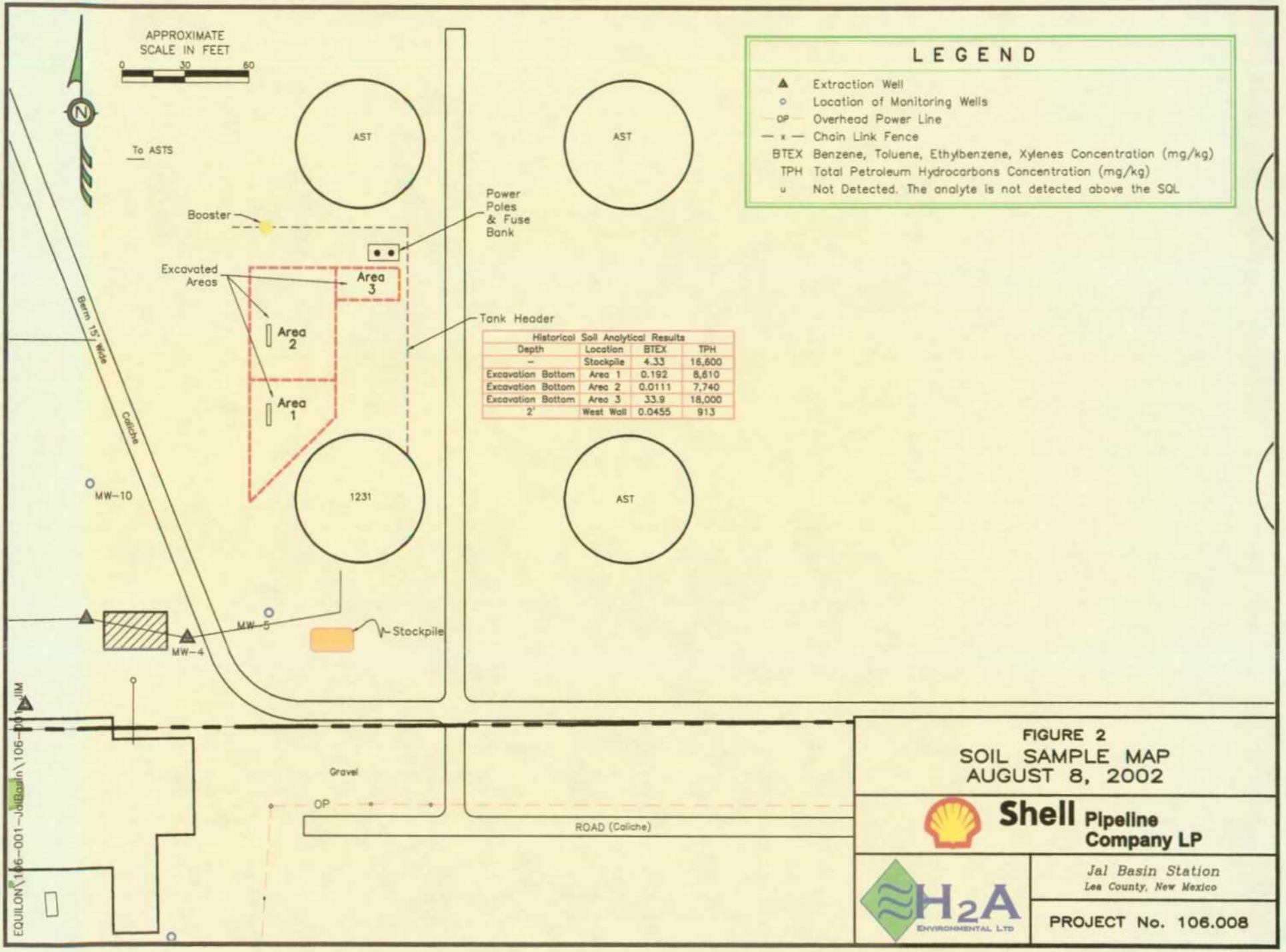
U. S. Environmental Protection Agency (EPA) (1991) Risk Assessment Guidance for Superfund. Vol. I. Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals). 9285.7-01b.

U. S. Environmental Protection Agency (EPA) (1994) Health Effects Assessment Summary Tables (HEAST). Annual FY-1995. OHEA ECAO-CIN-909.

U. S. Environmental Protection Agency (EPA) (1995) Integrated Risk Information System.

Figures


APPROXIMATE SCALE IN FEET
0 50 100
N
IW-2
IW-1
To ASTS
AST
AST
AST
AST
Booster
Power Poles & Fuse Bank
Excavated Area
Tank Header
Berm 15' Wide
24" Pipes
18" Pipe
18" Pipe
MW-13
MW-19
MW-10
Caliche
MW-8
MW-12
MW-9
MW-2
Water Well
MW-4
MW-5
MW-1
1231
200 BBL Diesel Storage Tank
MW-19
T25S
T26S
Road
MW-17
MW-20
MW-18
Office Bldg.
Gravel
OP
ROAD (Caliche)
Proposed New System Location
MW-6
SB-2
MW-14
Electric Building
MW-11
MW-7
210 BBL Tanks
Lact Unit
Caliche Pad
Cole
18" Pipe
MW-15
Apparent Emergency Shelter
Electrical Building
MW-16
Road
Road
LEGEND
Extraction Well
Proposed Infiltration Well
Location of Plugged Monitoring Well
Location of Monitoring Wells
Product Line
OP Overhead Power Line
Chain Link Fence
Aboveground Storage Tank
HiVac Location
FIGURE 1
SITE PLAN
Shell Pipeline Company LP
H2A Environmental Ltd
Jal Basin Station
Lea County, New Mexico
PROJECT No. 106.008
EQUILON\106-001-JalBasin\106-001_JIM



LEGEND

▲	Extraction Well
○	Location of Monitoring Wells
OP	Overhead Power Line
— x —	Chain Link Fence
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes Concentration (mg/kg)
TPH	Total Petroleum Hydrocarbons Concentration (mg/kg)
u	Not Detected. The analyte is not detected above the SQL

Historical Soil Analytical Results

Depth	Location	BTEX	TPH
–	Stockpile	4.33	16,600
Excavation Bottom	Area 1	0.192	8,610
Excavation Bottom	Area 2	0.0111	7,740
Excavation Bottom	Area 3	33.9	18,000
2'	West Wall	0.0455	913

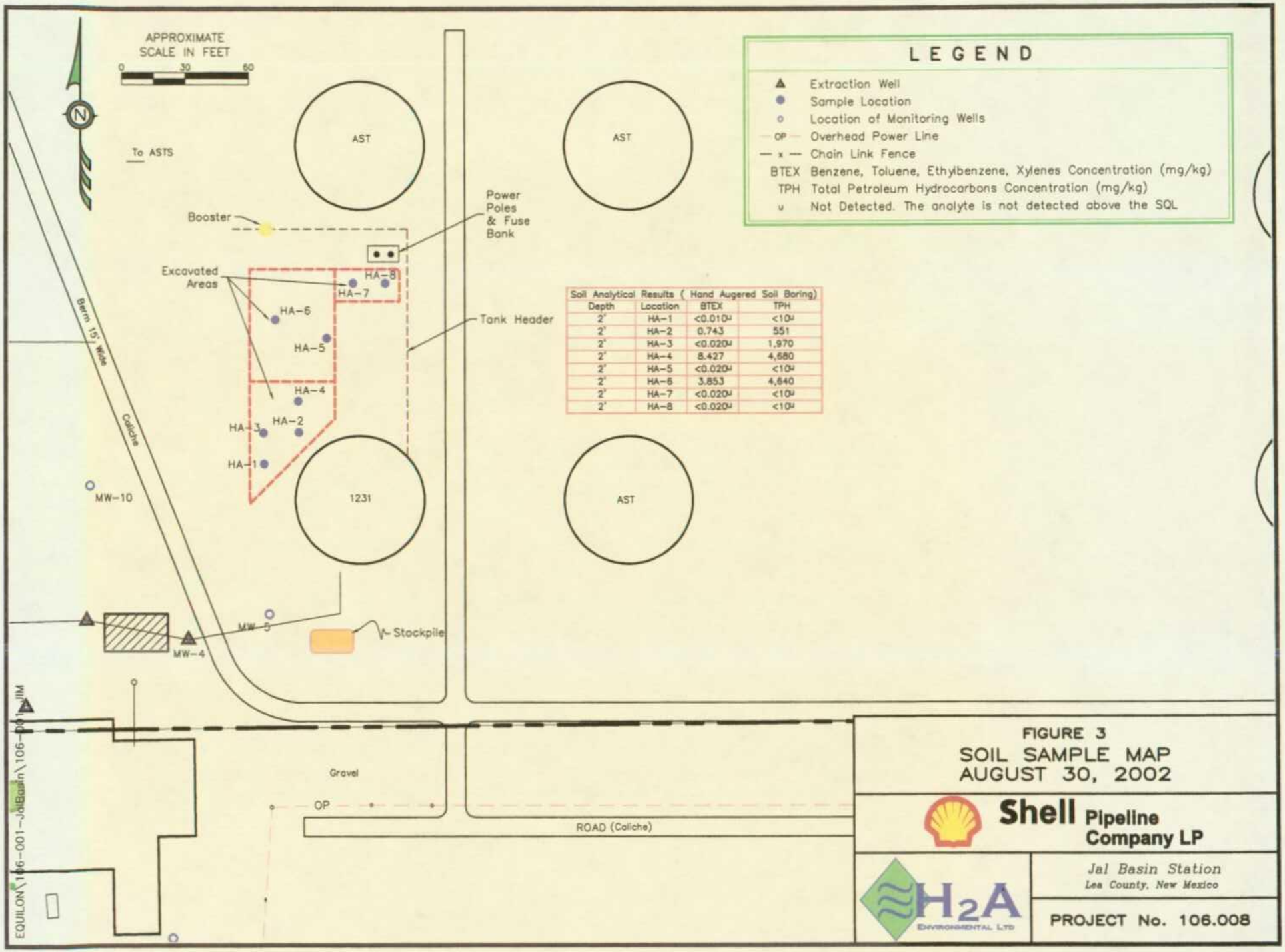
FIGURE 2
SOIL SAMPLE MAP
AUGUST 8, 2002

Shell Pipeline Company LP

H2A ENVIRONMENTAL LTD

Jal Basin Station
Lea County, New Mexico

PROJECT No. 106.008



LEGEND

- ▲ Extraction Well
- ● Sample Location
- ○ Location of Monitoring Wells
- OP Overhead Power Line
- — x — Chain Link Fence
- BTEX Benzene, Toluene, Ethylbenzene, Xylenes Concentration (mg/kg)
- TPH Total Petroleum Hydrocarbons Concentration (mg/kg)
- u Not Detected. The analyte is not detected above the SQL

Soil Analytical Results (Hand Augered Soil Boring)

Depth	Location	BTEX	TPH
2'	HA-1	<0.010^{u}	<10^{u}
2'	HA-2	0.743	551
2'	HA-3	<0.020^{u}	1,970
2'	HA-4	8.427	4,680
2'	HA-5	<0.020^{u}	<10^{u}
2'	HA-6	3.853	4,640
2'	HA-7	<0.020^{u}	<10^{u}
2'	HA-8	<0.020^{u}	<10^{u}

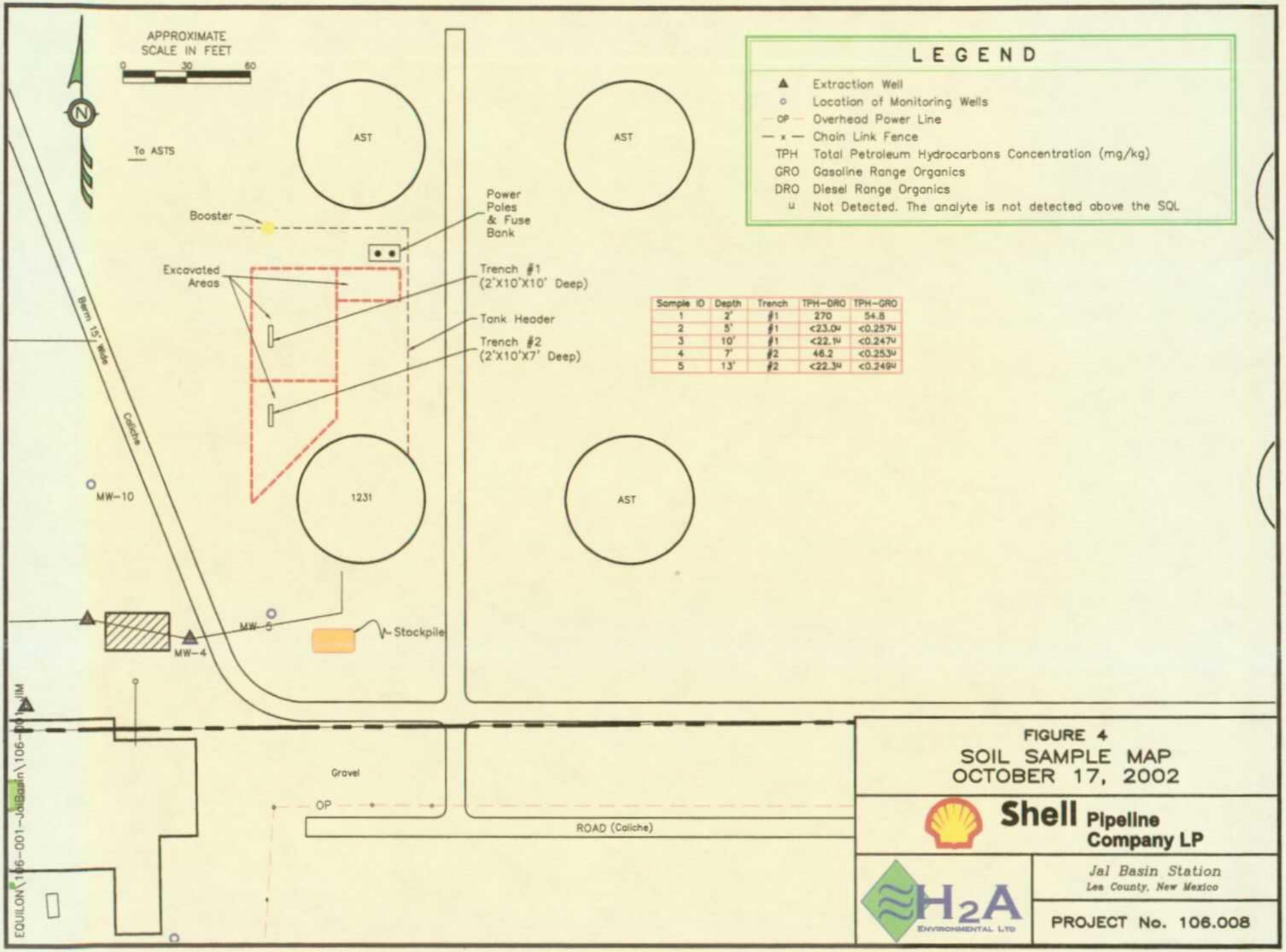
FIGURE 3
SOIL SAMPLE MAP
AUGUST 30, 2002

Shell Pipeline Company LP

H2A Environmental Ltd

Jal Basin Station
Lea County, New Mexico

PROJECT No. 106.008



Sample ID	Depth	Trench	TPH-DRO	TPH-GRO
1	2'	#1	270	54.8
2	5'	#1	<23.0u	<0.257u
3	10'	#1	<22.1u	<0.247u
4	7'	#2	46.2	<0.253u
5	13'	#2	<22.3u	<0.249u

FIGURE 4
SOIL SAMPLE MAP
OCTOBER 17, 2002

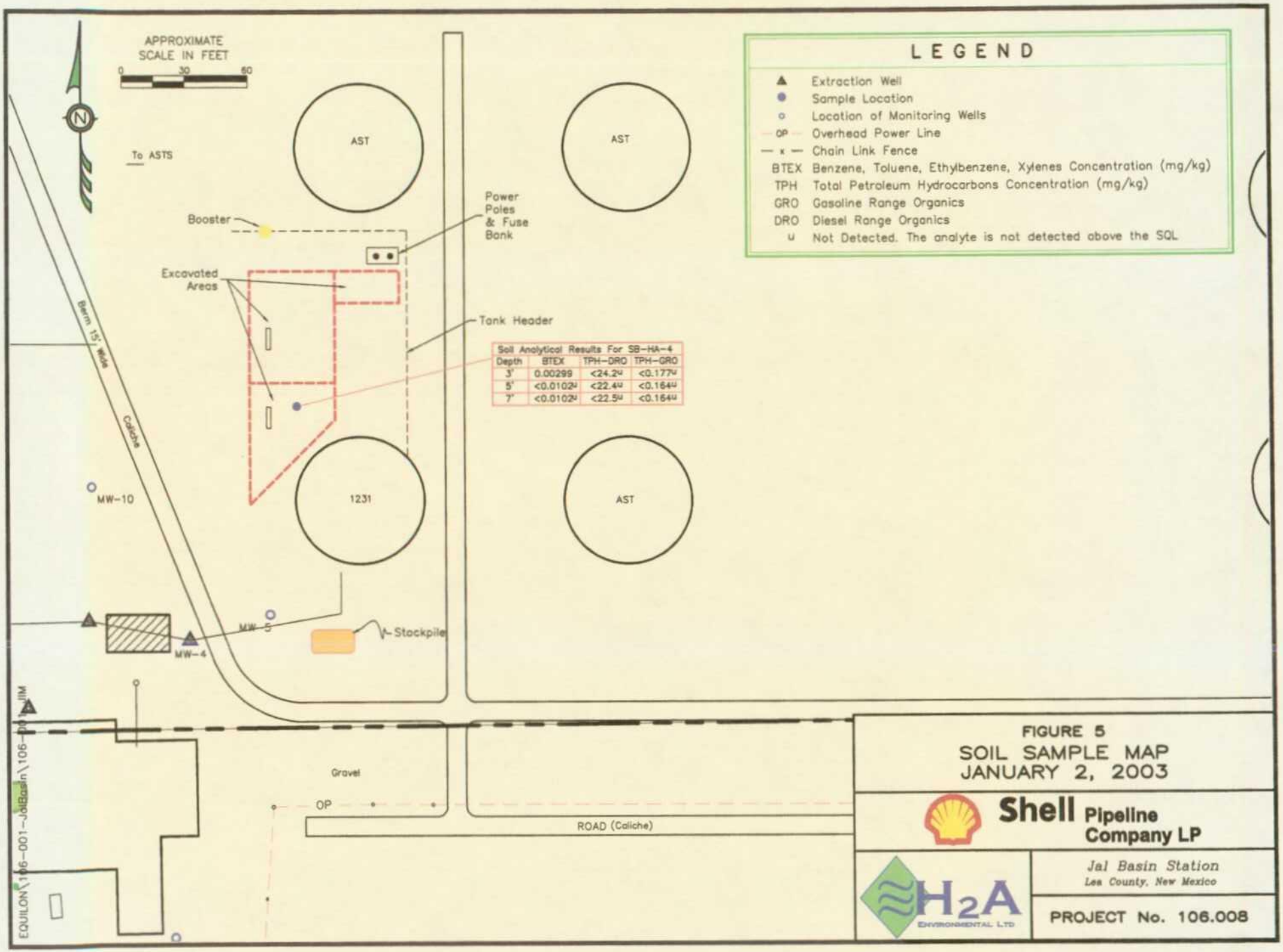
Shell Pipeline Company LP

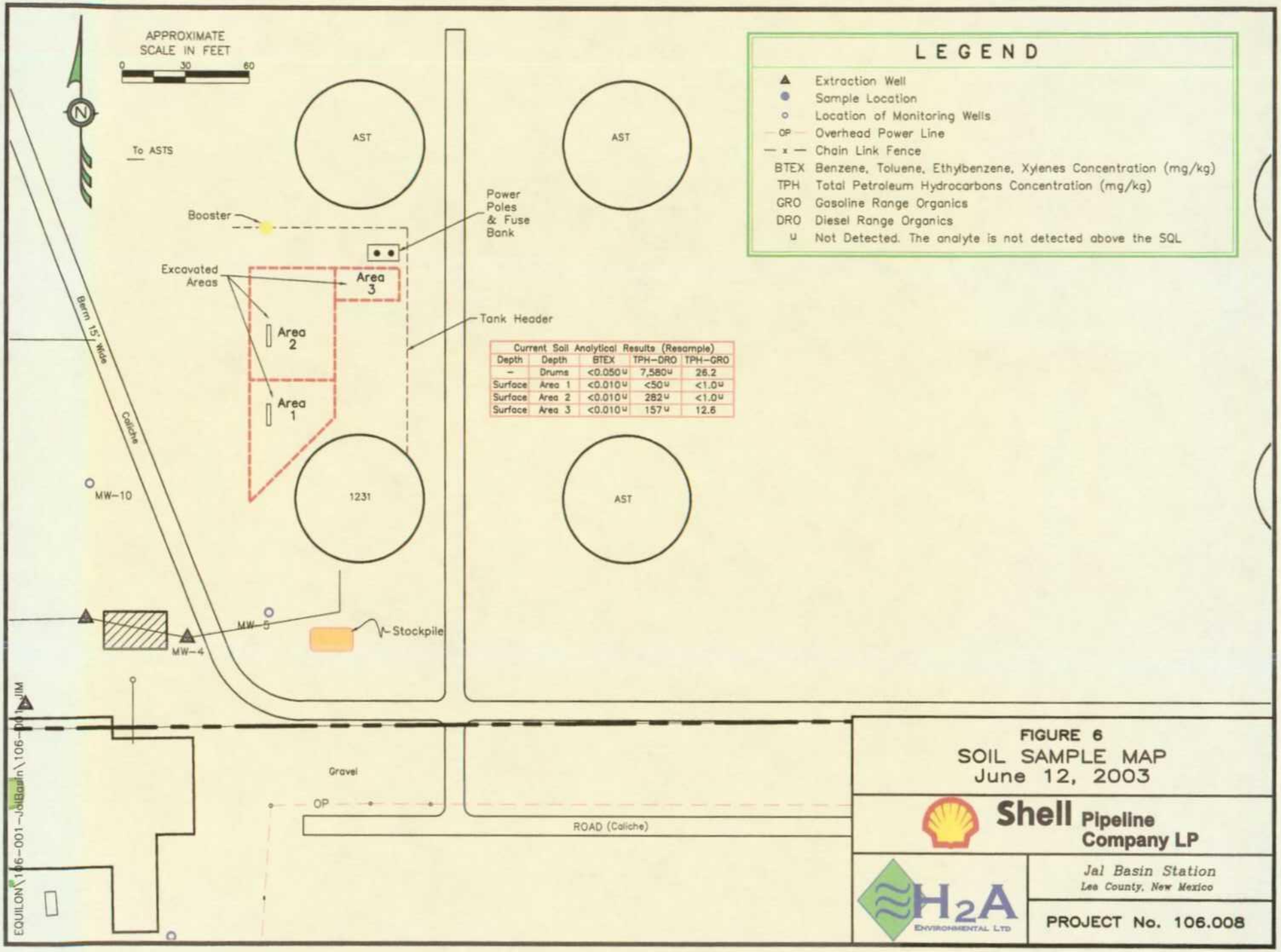
H2A Environmental Ltd

Jal Basin Station
Lea County, New Mexico

PROJECT No. 106.008

EQUILON\106-001-JalBasin\106-00[illegible].JIM


APPROXIMATE
SCALE IN FEET
0
30
60
N
To ASTS
AST
AST
AST
1231
Booster
Power
Poles
& Fuse
Bank
Excavated
Areas
Tank Header
Berm 15' wide
Caliche
MW-10
MW-5
MW-4
Stockpile
Gravel
OP
ROAD (Caliche)
LEGEND
Extraction Well
Sample Location
Location of Monitoring Wells
OP Overhead Power Line
Chain Link Fence
BTEX Benzene, Toluene, Ethylbenzene, Xylenes Concentration (mg/kg)
TPH Total Petroleum Hydrocarbons Concentration (mg/kg)
GRO Gasoline Range Organics
DRO Diesel Range Organics
u Not Detected. The analyte is not detected above the SQL
Soil Analytical Results For SB-HA-4
Depth | BTEX | TPH-DRO | TPH-GRO
3' | 0.00299 | <24.2u | <0.177u
5' | <0.0102u | <22.4u | <0.164u
7' | <0.0102u | <22.5u | <0.164u
EQUILON\106-001-JalBasin\106-008.dwg JIM
FIGURE 5
SOIL SAMPLE MAP
JANUARY 2, 2003
Shell Pipeline Company LP
H2A Environmental Ltd
Jal Basin Station
Lea County, New Mexico
PROJECT No. 106.008



Current Soil Analytical Results (Resample)

Depth	Depth	BTEX	TPH-DRO	TPH-GRO
–	Drums	<0.050u	7,580u	26.2
Surface	Area 1	<0.010u	<50u	<1.0u
Surface	Area 2	<0.010u	282u	<1.0u
Surface	Area 3	<0.010u	157u	12.6

FIGURE 6
SOIL SAMPLE MAP
June 12, 2003

Shell Pipeline Company LP

H2A Environmental Ltd

Jal Basin Station
Lea County, New Mexico

PROJECT No. 106.008

EQUILON\106-001-JalBasin\106-008.JIM

Appendix A

PCL Calculations - Combined Soil Pathways

Surface Soil

ID No. 106.008.002 | Report Date: October 10, 2003

On-Site

Tier 2 Evaluation

Commercial/Industrial Land Use
Is there affected surface soil off-site? No
Off-site PCLs different from on-site PCLs? No
Date of Toxicity & Chem Properties Tables: 03/27/2003

PCL Calculations
Booster Pump Release
Jal Basin Station
Jal, NM

	Soil Bulk Density (g/cc)	Total Porosity (cc/cc)	Vol. Water Content (cc/cc)	Vol. Air Content (cc/cc)	Fraction Organic Carbon (g/g)	Garden Soil foc (g/g)	City used for Q/C Calculation (---)	Fraction Veg. Cover (---)	Windspeed at 7 meters (m/s)	Equivalent Threshold Windspeed (m/s)	Windspeed Function F(x) (---)	Averaging Time AT.w (years)	Exposure Duration ED.w (years)	Exposure Frequency EF.w (days/year)
Tier 1 Defaults	1.67	0.370	0.160	0.210	0.008	0.008	Houston	0.50	4.80	11.32	0.224	25	25	250
Tier 2 Values	1.51	0.430	0.080	0.350	0.007	0.007	Albuquerque	0.50	4.80	11.32	0.224	25	25	250

H2A Environmental, Ltd. RBCA Commander, Version 1.01

Chemical of Concern	Source Area Size	Affected Soil Thickness	Q/C	VFss	PEF	CARCINOGENIC Air RBEL Inh	Soil RBEL Ing	Soil RBEL Derm	AbgVeg RBEL Ing	BgVeg RBEL Ing	Tot SOIL Comb	NON-CARCINOGENIC Air RBEL Inh	Soil RBEL Ing	Soil RBEL Derm	AbgVeg RBEL Ing	BgVeg RBEL Ing	Tot SOIL Comb	Tot SOIL Comb PCL	Surface Soil Conc. Max	Surface Soil Conc. Repr.	>PCL ?
	(acres)	(cm)		(mg/m3/mg/kg)		(mg/m3)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/m3)	(mg/kg)	(mg/kg)	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(Y/N)
Benzene	0.03	213	107.6	3.2E-05	7.9E-10	5.2E-03	5.2E+02				1.3E+02	8.8E-03	3.1E+03				2.5E+02	1.3E+02	1.6E-01	4.2E-02	No
Ethyl benzene	0.03	213	107.6	3.2E-05	7.9E-10							1.5E+00	1.0E+05				1.0E+05	1.0E+05	4.7E+00	1.3E+00	No
Toluene	0.03	213	107.6	3.2E-05	7.9E-10							5.8E-01	2.0E+05				2.0E+05	2.0E+05	4.8E-01	1.6E-01	No
Xylenes	0.03	213	107.6	3.2E-05	7.9E-10							1.5E-01	2.0E+05				2.0E+05	2.0E+05	3.1E+00	6.7E-01	No

1. RL = Risk Level x 1.0E-05; HQ = Hazard Quotient; RBEL = Risk-Based Exposure Limit; PCL = Protective Concentration Level; VFss = Surface Soil Volitization Factor; PEF = Particulate Emittance Factor
2. c = carcinogenic, n = noncarcinogenic, m = primary MCL-based, m2 = secondary MCL-based, a = EPA Action Level-based, >S = PCL exceeds solubility limit.
3. Tot-SOIL-Comb PCL = 1 / ((1 / Air-RBEL-Inh/(VFss+PEF)) + (1 / Soil-RBEL-Ing) + (1 / Soil-RBEL-Derm) + (1 / Veg-SOIL-Ing))
4. Csat = Air-SOIL-Inhal-VP PCL exceeded Theoretical Soil Saturation Limit and was not included in Tot-SOIL-Comb calculation

Calculation of Combined Soil PCLs for TPH using Boiling Point Range Fractions

PCL Calculations
Booster Pump Release
Jal Basin Station
Jal, NM

On-Site Affected Property
Commercial/Industrial Land Use
Upper Water-Bearing Unit
Class 2 (without well) Groundwater

	Soil Bulk Density (vadose zone)	Total Porosity (vadose zone)	Vol. Water Content (vadose zone)	Vadose Zone FOC (---)	Vege. Soil FOC (---)	Aff. Soil Thickness (cm)	City for Q/C Calc (---)	Source Area (acres)	Fraction Veg. Cover (---)	Windspeed at 7 meters (m/s)	Averaging Time - ATw (years)	Exposure Duration (years)	Exposure Frequency (days/year)
Tier 1 Defaults	1.67	0.370	0.160	0.008	0.008	305	Houston	30	0.50	4.80	25	25	250
Tier 2 Values	1.51	0.430	0.080	0.007	0.007		Albuquerque		0.50	4.80	25	25	250

H2A Environmental, Ltd.
RBCA Commander,
Version 1.01

TPH Boiling Point Ranges	Mass Fraction	NON-CARCINOGENIC Air-Inh RBEL (mg/m3)	VFss (mg/m3/mg/kg)	PEF (mg/m3/mg/kg)	Ingest RBEL (mg/kg)	Dermal RBEL (mg/kg)	Vege RBEL (mg/kg)	Tot-Soil-Comb PCL (mg/kg)	note	Mass Fraction divided by PCL (mg/kg)
>8-10 C aromatics	0.028	2.9E-01	3.2E-05	7.9E-10	4.1E+04			7.5E+03	n	3.7E-06
>10-12 C aromatics	0.111	2.9E-01	3.2E-05	7.9E-10	4.1E+04	8.2E+04		6.9E+03	n	1.6E-05
>12-16 C aromatics	0.306	2.9E-01	2.2E-05	7.9E-10	4.1E+04	8.2E+04		9.1E+03	n	3.4E-05
>16-21 C aromatics	0.194		6.0E-06	7.9E-10	3.1E+04	4.7E+04		1.9E+04	n	1.0E-05
>21-35 C aromatics	0.111		4.8E-07	7.9E-10	3.1E+04	4.7E+04		1.9E+04	n	6.0E-06
>10-12 C aliphatics	0.028	1.5E+00	3.2E-05	7.9E-10	1.0E+05	2.0E+05		2.8E+04	n	1.0E-06
>12-16 C aliphatics	0.083	1.5E+00	3.2E-05	7.9E-10	1.0E+05	2.0E+05		2.8E+04	n	3.0E-06
>16-21 C aliphatics	0.056		1.8E-05	7.9E-10	2.0E+06	4.1E+06		1.4E+06	n	4.1E-08
>21-35 C aliphatics	0.083		1.8E-05	7.9E-10	2.0E+06	4.1E+06		1.4E+06	n	6.1E-08

MF = Mass Fraction

Sum of MFs/PCLs : 7.4E-05

The PCL for TPH, Total = 1 / Sum (MF / PCL)

PCL for TPH, Total : 1.4E+04

1. RL = Risk Level x 1.0E-05; HQ = Hazard Quotient; RBEL = Risk-Based Exposure Limit; PCL = Protective Concentration Level; VF = Volitization Factor
2. c = carcinogenic, n = noncarcinogenic, m = primary MCL-based, m2 = secondary MCL-based, a = EPA Action Level-based, >S = PCL exceeds solubility limit.
3. Soil-Combined PCL = 1 / ((1 / Air-Inhal RBEL/(VFss+PEF)) + (1 / Ingest RBEL) + (1 / Dermal RBEL) + (1 / Vege RBEL))

Soil-to-Groundwater PCL Calculations

Soil - All Depths

ID No. 106.008.002

Report Date: October 10, 2003

On-Site

Tier 2 Evaluation

Commercial/Industrial Land Use
Is there affected surface/subsurface soil off-site? No
Off-site PCLs different from on-site PCLs? No
Date of Toxicity & Chem Properties Tables: 03/27/2003

PCL Calculations
Booster Pump Release
Jal Basin Station
Jal, NM

	Soil Bulk Density (g/cc)	Vol. Water Content (cc/cc)	Vol. Air Content (cc/cc)	Fraction Organic Carbon (g/g)	GW Darcy Velocity (m/yr)	Aquifer Thickness (cm)	Ground-water Gradient (m/m)	Sat. Soil Hydraulic Conductivity (m/day)	Average Annual Precipitation (cm/yr)	Net Infiltration Rate (cm/yr)	Saturated Hyd. Cond. of Vadose (cm/s)	Averaging Time AT.w (years)	Exposure Duration ED.w (years)	Exposure Frequency EF.w (days/year)
Tier 1 Defaults	1.67	0.160	0.210	0.002	NA	NA	NA	NA	NA	NA	NA	25	25	250
Tier 2 Values	1.51	0.080	0.350	0.007	NA	NA	NA	NA	NA	NA	NA	25	25	250

Tier1 Lateral Dilution Factor used? Yes

H2A Environmental, Ltd.
RBCA Commander,
Version 1.01

Chemical of Concern	GW_{Crit} PCL (mg/L)	pathway	Source Area Width (cm)	GW Mixing Zone Thickness (cm)	LDF Lateral Dilution Factor (unitless)	Ksw Soil-leachate partition factor (mg/L/mg/kg)	L1 Affected Soil Thickness (cm)	L2 From Top of L1 to GW (cm)	GW_{SOIL} PCL (mg/kg)	Maximum Soil Conc. - All Depths - (mg/kg)	Representative Soil Conc. - All Depths - (mg/kg)	PCL exceeded? (Y/N)
Benzene	5.00E-03	Ing	NA	NA	2.00E+01	1.86E+00	213	2,743	6.9E-01	1.6E-01	3.9E-02	No
Ethyl benzene	7.00E-01	Ing	NA	NA	2.00E+01	6.83E-01	213	2,743	2.6E+02	4.7E+00	1.2E+00	No
Toluene	1.00E+00	Ing	NA	NA	2.00E+01	9.67E-01	213	2,743	2.7E+02	4.8E-01	1.5E-01	No
Xylenes	1.00E+01	Ing	NA	NA	2.00E+01	5.91E-01	213	2,743	4.4E+03	3.1E+00	6.2E-01	No

1. PCL = Protective Concentration Level; Soil-to-GW PCL = Critical GW PCL * (LDF / Ksw) * (L2 / L1)

Calculation of Soil-to-Groundwater PCLs for TPH using Boiling Point Range Fractions

PCL Calculations
Booster Pump Release
Jal Basin Station
Jal, NM

On-Site Affected Property
Commercial/Industrial Land Use
Upper Water-Bearing Unit
Class 2 (without well) Groundwater

	Soil Bulk Density (vadose zone)	Soil-to-GW FOC (—)	Affected Soil L2 / L1 (cm)	Aquifer Thickness (cm)	Width of Source Area (cm)	Groundwater Gradient (m/m)	Hydraulic Conductivity (cm/sec)	Vadose Zone Thickness (cm)	Cap. Fringe Thickness (cm)	Vol. Water Content (—)	Aver. Annual Precipitation (cm/yr)	Averaging Time - ATw (years)	Exposure Duration (years)	Exposure Frequency (days/year)
Tier 1 Defaults	1.67	0.002	1.0	NA	NA	NA	NA	300	5	0.160	NA	25	25	250
Tier 2 Values	1.51	0.007		305		0.010	3.1E-04	2743	5	0.080	26	25	25	250

H2A Environmental, Ltd.
RBCA Commander,
Version L01

TPH Boiling Point Ranges	Mass Fraction	Critical Groundwater PCL (mg/L)	notes		Ksw Soil-leachate partition factor (mg/L/mg/kg)	LDF Lateral Dilution Factor (unitless)	Soil-to-Groundwater PCL (mg/kg)	Mass Fraction divided by PCL (mg/kg)
>8-10 C aromatics	0.028	2.92E+00		lng	9.48E-02	2.00E+01	7.9E+03	3.5E-06
>10-12 C aromatics	0.111	2.92E+00		lng	6.05E-02	2.00E+01	1.2E+04	8.9E-06
>12-16 C aromatics	0.306	2.92E+00		lng	3.04E-02	2.00E+01	2.5E+04	1.2E-05
>16-21 C aromatics	0.194	2.19E+00	>S	lng	9.63E-03	2.00E+01	5.9E+04	3.3E-06
>21-35 C aromatics	0.111	2.19E+00	>S	lng	1.21E-03	2.00E+01	4.7E+05	2.4E-07
>10-12 C aliphatics	0.028	7.30E+00	>S	lng	5.98E-04	2.00E+01	3.1E+06	8.8E-09
>12-16 C aliphatics	0.083	7.30E+00	>S	lng	3.04E-05	2.00E+01	6.2E+07	1.3E-09
>16-21 C aliphatics	0.056	1.46E+02	>S	lng	2.42E-07	2.00E+01	1.6E+11	3.6E-13
>21-35 C aliphatics	0.083	1.46E+02	>S	lng	2.42E-07	2.00E+01	1.6E+11	5.4E-13

MF = Mass Fraction **Sum of MFs/PCLs :** 2.8E-05

The PCL for TPH, Total = 1 / Sum (MF / PCL) **PCL for TPH, Total :** 3.5E+04

1. RL = Risk Level x 1.0E-05; HQ = Hazard Quotient; RBEL = Risk-Based Exposure Limit; PCL = Protective Concentration Level
2. c = carcinogenic, n = noncarcinogenic, m = primary MCL-based, m2 = secondary MCL-based, a = EPA Action Level-based, >S = PCL exceeds solubility limit.
3. Soil-to-GW PCL = Critical GW PCL * LDF / Ksw

Inhalation of Vapors from Soil PCLs

Subsurface Soil |

ID No. 106.008.002 | Report Date: October 10, 2003

On-Site

Tier 2 Evaluation

Commercial/Industrial Land Use
Is there affected subsurface soil off-site? No
Off-site PCLs different from on-site PCLs? No
Date of Toxicity & Chem Properties Tables: 03/27/2003

PCL Calculations
Booster Pump Release
Jal Basin Station
Jal, NM

	Soil Bulk Density (g/cc)	Total Porosity (cc/cc)	Vol. Water Content (cc/cc)	Vol. Air Content (cc/cc)	Vadose Zone FOC (---)	City for Q/C Calc (---)	Averaging Time - ATw (years)	Exposure Duration (years)	Exposure Frequency (days/year)
Tier 1 Defaults	1.67	0.370	0.160	0.210	0.008	Houston	25	25	250
Tier 2 Values	1.51	0.430	0.080	0.350	0.007	Albuquerque	25	25	250

H2A Environmental, Ltd. RBCA Commander, Version 1.01

Chemical of Concern	Source Area Size (acres)	Affected Soil Thickness (cm)	Q/C	VFss (mg/m3/mg/kg)	Carcinogenic: Air RBEL Inh (mg/kg)	Carcinogenic: RL (x1.0E-5)	Carcinogenic: Air SOIL Inh-V (mg/kg)	Noncarcinogenic: Air RBEL Inh (mg/kg)	Noncarcinogenic: HQ (—)	Noncarcinogenic: Air SOIL Inh-V (mg/kg)	Air SOIL Inh-V PCL (mg/kg)	note	Subsurface Soil Concentrations: Maximum (mg/kg)	Subsurface Soil Concentrations: Represent. (mg/kg)	PCL exceeded ? (Y/N)	Csat (mg/kg)
Benzene	0.0	213	107.6	3.16E-05	5.2E-03	1.00	1.7E+02	8.8E-03	1.00	2.8E+02	1.7E+02	c				9.5E+02
Ethyl benzene	0.0	213	107.6	3.16E-05				1.5E+00	1.00	4.6E+04	4.6E+04	n				2.5E+02
Toluene	0.0	213	107.6	3.16E-05				5.8E-01	1.00	1.8E+04	1.8E+04	n				5.5E+02
Xylenes	0.0	213	107.6	3.16E-05				1.5E-01	1.00	4.6E+03	4.6E+03	n				3.4E+02

1. RL = Risk Level x 1.0E-05; HQ = Hazard Quotient; RBEL = Risk-Based Exposure Limit; PCL = Protective Concentration Level; VF = Volitization Factor
2. c = carcinogenic, n = noncarcinogenic, m = primary MCL-based, m2 = secondary MCL-based, a = EPA Action Level-based, >S = PCL exceeds solubility limit.

Calculation of Inhalation of Vapor from Soil PCLs for TPH using Boiling Point Range Fractions

PCL Calculations
Booster Pump Release
Jal Basin Station
Jal, NM

On-Site Affected Property
Commercial/Industrial Land Use
Upper Water-Bearing Unit
Class 2 (without well) Groundwater

	Soil Bulk Density (vadose zone)	Total Porosity (vadose zone)	Vol. Water Content (vadose zone)	Vadose Zone FOC (—)	Affected Soil Thickness (cm)	City for Q/C Calc (—)	Source Area (acres)	Averaging Time - ATw (years)	Exposure Duration (years)	Exposure Frequency (days/year)
Tier 1 Defaults	1.67	0.370	0.160	0.008	305	Houston	30	25	25	250
Tier 2 Values	1.51	0.430	0.080	0.007		Albuquerque		25	25	250

H2A Environmental, Ltd.
RBCA Commander,
Version 1.01

TPH Boiling Point Ranges	Mass Fraction	NON-CARCINOGENIC Air-Inhal RBEL (mg/m3)	VFss (mg/m3/mg/L)	Air-Soil-Inhal-V PCL (mg/kg)	note	Mass Fraction divided by PCL (mg/kg)
>8-10 C aromatics	0.028	2.92E-01	3.16E-05	9.2E+03	n	3.0E-06
>10-12 C aromatics	0.111	2.92E-01	3.16E-05	9.2E+03	n	1.2E-05
>12-16 C aromatics	0.306	2.92E-01	2.15E-05	1.4E+04	n	2.2E-05
>16-21 C aromatics	0.194		5.99E-06			
>21-35 C aromatics	0.111		4.83E-07			
>10-12 C aliphatics	0.028	1.46E+00	3.16E-05	4.6E+04	n	6.0E-07
>12-16 C aliphatics	0.083	1.46E+00	3.16E-05	4.6E+04	n	1.8E-06
>16-21 C aliphatics	0.056		1.84E-05			
>21-35 C aliphatics	0.083		1.84E-05			

MF = Mass Fraction **Sum of MFs/PCLs :** **4.0E-05**

The PCL for TPH, Total = 1 / Sum (MF / PCL) **PCL for TPH, Total :** **2.5E+04**

1. RL = Risk Level x 1.0E-05; HQ = Hazard Quotient; RBEL = Risk-Based Exposure Limit; PCL = Protective Concentration Level; VF = Volitization Factor
2. c = carcinogenic, n = noncarcinogenic, m = primary MCL-based, m2 = secondary MCL-based, a = EPA Action Level-based, >S = PCL exceeds solubility limit.
3. Soil-Inhal-V PCL = Air-Inhalation RBEL / VFss

Appendix B

SUMMARY OF CURRENT, ON-SITE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN FROM SURFACE SOIL (SAMPLING DEPTHS BETWEEN 0 AND 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

Benzene

CAS#: 71-43-2 # of Samples: 14 # of Detections: 1 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	6.9E-01
Area 2 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	6.9E-01
Area 3 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	6.9E-01
Exc West Wall	Yes	No	8021		8/8/2002	2		U	1.0E-02	6.9E-01
Hand Auger 1	Yes	No	8021		8/30/2002	2		U	1.0E-02	6.9E-01
Hand Auger 2	Yes	No	8021		8/30/2002	2		U	2.0E-02	6.9E-01
Hand Auger 3	Yes	No	8021		8/30/2002	2		U	2.0E-02	6.9E-01
Hand Auger 4	Yes	No	8021		8/30/2002	2	1.6E-01			6.9E-01
Hand Auger 5	Yes	No	8021		8/30/2002	2		U	2.0E-02	6.9E-01
Hand Auger 6	Yes	No	8021		8/30/2002	2		U	2.0E-02	6.9E-01
Hand Auger 7	Yes	No	8021		8/30/2002	2		U	2.0E-02	6.9E-01
Hand Auger 8	Yes	No	8021		8/30/2002	2		U	2.0E-02	6.9E-01
SB-HA-4 (3 ft)	Yes	No	8021		1/2/2003	3		U	1.3E-03	6.9E-01
SB-HA-4 (5 ft)	Yes	No	8021		1/2/2003	5		U	1.3E-03	6.9E-01
						Maximums:	1.6E-01		2.0E-02	

Ethyl benzene

CAS#: 100-41-4 # of Samples: 14 # of Detections: 5 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	2.6E+02
Area 2 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	2.6E+02
Area 3 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	2.6E+02
Exc West Wall	Yes	No	8021		8/8/2002	2	2.2E-02			2.6E+02
Hand Auger 1	Yes	No	8021		8/30/2002	2		U	1.0E-02	2.6E+02
Hand Auger 2	Yes	No	8021		8/30/2002	2	1.9E-01			2.6E+02
Hand Auger 3	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.6E+02
Hand Auger 4	Yes	No	8021		8/30/2002	2	4.7E+00			2.6E+02
Hand Auger 5	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.6E+02
Hand Auger 6	Yes	No	8021		8/30/2002	2	3.4E+00			2.6E+02
Hand Auger 7	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.6E+02
Hand Auger 8	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.6E+02
SB-HA-4 (3 ft)	Yes	No	8021		1/2/2003	3	3.0E-03			2.6E+02
SB-HA-4 (5 ft)	Yes	No	8021		1/2/2003	5		U	1.1E-03	2.6E+02
						Maximums:	4.7E+00		2.0E-02	

SUMMARY OF CURRENT, ON-SITE LABORATORY ANALYTICAL RESULTS
FOR CHEMICALS OF CONCERN
FROM SURFACE SOIL (SAMPLING DEPTHS BETWEEN 0 AND 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

Toluene

CAS#: 108-88-3 # of Samples: 14 # of Detections: 2 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	2.7E+02
Area 2 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	2.7E+02
Area 3 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	2.7E+02
Exc West Wall	Yes	No	8021		8/8/2002	2		U	1.0E-02	2.7E+02
Hand Auger 1	Yes	No	8021		8/30/2002	2		U	1.0E-02	2.7E+02
Hand Auger 2	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.7E+02
Hand Auger 3	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.7E+02
Hand Auger 4	Yes	No	8021		8/30/2002	2	4.8E-01			2.7E+02
Hand Auger 5	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.7E+02
Hand Auger 6	Yes	No	8021		8/30/2002	2	4.5E-01			2.7E+02
Hand Auger 7	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.7E+02
Hand Auger 8	Yes	No	8021		8/30/2002	2		U	2.0E-02	2.7E+02
SB-HA-4 (3 ft)	Yes	No	8021		1/2/2003	3		U	3.7E-03	2.7E+02
SB-HA-4 (5 ft)	Yes	No	8021		1/2/2003	5		U	3.7E-03	2.7E+02
						Maximums:	4.8E-01		2.0E-02	

SUMMARY OF CURRENT, ON-SITE LABORATORY ANALYTICAL RESULTS
FOR CHEMICALS OF CONCERN
FROM SURFACE SOIL (SAMPLING DEPTHS BETWEEN 0 AND 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

TPH, Total

CAS#: --- # of Samples: 23 # of Detections: 10 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 Resample	Yes	No	8015 GRO		6/12/2003	0		U	1.0E+00	1.4E+04
Area 1 Resample	Yes	No	8015 DRO		6/12/2003	0		U	5.0E+01	1.4E+04
Area 2 Resample	Yes	No	8015 GRO		6/12/2003	0		U	1.0E+00	1.4E+04
Area 2 Resample	Yes	No	8015 DRO		6/12/2003	0	2.8E+02			1.4E+04
Area 3 Resample	Yes	No	8015 DRO		6/12/2003	0	1.6E+02			1.4E+04
Area 3 Resample	Yes	No	8015 GRO		6/12/2003	0	1.3E+01			1.4E+04
Exc West Wall	Yes	No	418.1		8/8/2002	2	9.1E+02			1.4E+04
Hand Auger 1	Yes	No	418.1		8/30/2002	2		U	1.0E+01	1.4E+04
Hand Auger 2	Yes	No	418.1		8/30/2002	2	5.5E+02			1.4E+04
Hand Auger 3	Yes	No	418.1		8/30/2002	2	2.0E+03			1.4E+04
Hand Auger 4	Yes	No	418.1		8/30/2002	2	4.7E+03			1.4E+04
Hand Auger 5	Yes	No	418.1		8/30/2002	2		U	1.0E+01	1.4E+04
Hand Auger 6	Yes	No	418.1		8/30/2002	2	4.6E+03			1.4E+04
Hand Auger 7	Yes	No	418.1		8/30/2002	2		U	1.0E+01	1.4E+04
Hand Auger 8	Yes	No	418.1		8/30/2002	2		U	1.0E+01	1.4E+04
SB-HA-4 (3 ft)	Yes	No	8015 GRO		1/2/2003	3		U	1.5E-01	1.4E+04
SB-HA-4 (3 ft)	Yes	No	8015 DRO		1/2/2003	3		U	2.1E+01	1.4E+04
SB-HA-4 (5 ft)	Yes	No	8015 DRO		1/2/2003	5		U	2.1E+01	1.4E+04
SB-HA-4 (5 ft)	Yes	No	8015 GRO		1/2/2003	5		U	1.5E-01	1.4E+04
Trench1 S1	Yes	No	8015 GRO		10/17/2002	2	5.5E+01			1.4E+04
Trench1 S1	Yes	No	8015 DRO		10/17/2002	2	2.7E+02			1.4E+04
Trench1 S2	Yes	No	8015 GRO		10/17/2002	5		U	2.4E-01	1.4E+04
Trench1 S2	Yes	No	8015 DRO		10/17/2002	5		U	2.1E+01	1.4E+04
						Maximums:	4.7E+03		5.0E+01	

SUMMARY OF CURRENT, ON-SITE LABORATORY ANALYTICAL RESULTS
FOR CHEMICALS OF CONCERN
FROM SURFACE SOIL (SAMPLING DEPTHS BETWEEN 0 AND 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

Xylenes

CAS#: 1330-20-7 # of Samples: 14 # of Detections: 3 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	4.4E+03
Area 2 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	4.4E+03
Area 3 Resample	Yes	No	8021		6/12/2003	0		U	1.0E-02	4.4E+03
Exc West Wall	Yes	No	8021		8/8/2002	2	2.3E-02			4.4E+03
Hand Auger 1	Yes	No	8021		8/30/2002	2		U	1.0E-02	4.4E+03
Hand Auger 2	Yes	No	8021		8/30/2002	2	5.5E-01			4.4E+03
Hand Auger 3	Yes	No	8021		8/30/2002	2		U	2.0E-02	4.4E+03
Hand Auger 4	Yes	No	8021		8/30/2002	2	3.1E+00			4.4E+03
Hand Auger 5	Yes	No	8021		8/30/2002	2		U	2.0E-02	4.4E+03
Hand Auger 6	Yes	No	8021		8/30/2002	2		U	2.0E-02	4.4E+03
Hand Auger 7	Yes	No	8021		8/30/2002	2		U	2.0E-02	4.4E+03
Hand Auger 8	Yes	No	8021		8/30/2002	2		U	2.0E-02	4.4E+03
SB-HA-4 (3 ft)	Yes	No	8021		1/2/2003	3		U	9.6E-03	4.4E+03
SB-HA-4 (5 ft)	Yes	No	8021		1/2/2003	5		U	9.6E-03	4.4E+03
						Maximums:	3.1E+00		2.0E-02	

SUMMARY OF CURRENT, ON-SITE LABORATORY ANALYTICAL RESULTS
FOR CHEMICALS OF CONCERN
FROM SUBSURFACE SOIL (SAMPLING DEPTHS GREATER THAN 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

Benzene

CAS#: 71-43-2 # of Samples: 1 # of Detections: 0 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
SB-HA-4 (7 ft)	Yes	No	8021		1/2/2003	7		U	1.3E-03	6.9E-01
						Maximums:			1.3E-03	

Ethyl benzene

CAS#: 100-41-4 # of Samples: 1 # of Detections: 0 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
SB-HA-4 (7 ft)	Yes	No	8021		1/2/2003	7		U	1.1E-03	2.6E+02
						Maximums:			1.1E-03	

Toluene

CAS#: 108-88-3 # of Samples: 1 # of Detections: 0 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
SB-HA-4 (7 ft)	Yes	No	8021		1/2/2003	7		U	3.7E-03	2.7E+02
						Maximums:			3.7E-03	

TPH, Total

CAS#: --- # of Samples: 8 # of Detections: 1 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
SB-HA-4 (7 ft)	Yes	No	8015 GRO		1/2/2003	7		U	1.5E-01	2.5E+04
SB-HA-4 (7 ft)	Yes	No	8015 DRO		1/2/2003	7		U	2.1E+01	2.5E+04
Trench1 S3	Yes	No	8015 DRO		10/17/2002	10		U	2.1E+01	2.5E+04
Trench1 S3	Yes	No	8015 GRO		10/17/2002	10		U	2.4E-01	2.5E+04
Trench2 S4	Yes	No	8015 GRO		10/17/2002	7		U	2.4E-01	2.5E+04
Trench2 S4	Yes	No	8015 DRO		10/17/2002	7	4.6E+01	J		2.5E+04
Trench2 S5	Yes	No	8015 GRO		10/17/2002	13		U	2.4E-01	2.5E+04
Trench2 S5	Yes	No	8015 DRO		10/17/2002	13		U	2.1E+01	2.5E+04
						Maximums:	4.6E+01		2.1E+01	

SUMMARY OF CURRENT, ON-SITE LABORATORY ANALYTICAL RESULTS
FOR CHEMICALS OF CONCERN
FROM SUBSURFACE SOIL (SAMPLING DEPTHS GREATER THAN 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

Xylenes

CAS#: 1330-20-7 # of Samples: 1 # of Detections: 0 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
SB-HA-4 (7 ft)	Yes	No	8021		1/2/2003	7		U	9.6E-03	4.4E+03
						Maximums:			9.6E-03	

SUMMARY OF HISTORICAL, ON-SITE LABORATORY ANALYTICAL RESULTS
FOR CHEMICALS OF CONCERN
FROM SURFACE SOIL (SAMPLING DEPTHS BETWEEN 0 AND 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

Benzene

CAS#: 71-43-2 # of Samples: 3 # of Detections: 0 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 ExcBot	No	No	8021		8/8/2002	0		U	1.0E-02	6.9E-01
Area 2 ExcBot	No	No	8021		8/8/2002	0		U	1.0E-02	6.9E-01
Area 3 ExcBot	No	No	8021		8/8/2002	0		U	1.4E-02	6.9E-01
						Maximums:			1.4E-02	

Ethyl benzene

CAS#: 100-41-4 # of Samples: 3 # of Detections: 1 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 ExcBot	No	No	8021		8/8/2002	0		U	1.0E-02	2.6E+02
Area 2 ExcBot	No	No	8021		8/8/2002	0		U	1.0E-02	2.6E+02
Area 3 ExcBot	No	No	8021		8/8/2002	0	1.1E+01			2.6E+02
						Maximums:	1.1E+01		1.0E-02	

Toluene

CAS#: 108-88-3 # of Samples: 3 # of Detections: 1 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 ExcBot	No	No	8021		8/8/2002	0		U	1.0E-02	2.7E+02
Area 2 ExcBot	No	No	8021		8/8/2002	0		U	1.0E-02	2.7E+02
Area 3 ExcBot	No	No	8021		8/8/2002	0	2.9E+00			2.7E+02
						Maximums:	2.9E+00		1.0E-02	

TPH, Total

CAS#: --- # of Samples: 3 # of Detections: 3 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 ExcBot	No	No	418.1		8/8/2002	0	8.6E+03			1.4E+04
Area 2 ExcBot	No	No	418.1		8/8/2002	0	7.7E+03			1.4E+04
Area 3 ExcBot	No	No	418.1		8/8/2002	0	1.8E+04			1.4E+04
						Maximums:	1.8E+04			

SUMMARY OF HISTORICAL, ON-SITE LABORATORY ANALYTICAL RESULTS
FOR CHEMICALS OF CONCERN
FROM SURFACE SOIL (SAMPLING DEPTHS BETWEEN 0 AND 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

Xylenes

CAS#: 1330-20-7 # of Samples: 3 # of Detections: 3 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Area 1 ExcBot	No	No	8021		8/8/2002	0	1.4E-01			4.4E+03
Area 2 ExcBot	No	No	8021		8/8/2002	0	1.1E-02			4.4E+03
Area 3 ExcBot	No	No	8021		8/8/2002	0	2.0E+01			4.4E+03
						Maximums:	2.0E+01			

SUMMARY OF CURRENT, ON-SITE LABORATORY QA/QC RESULTS FOR CHEMICALS OF CONCERN FROM SURFACE SOIL (SAMPLING DEPTHS BETWEEN 0 AND 5 FEET)

Booster Pump Release
Jal Basin Station
Jal, NM

Benzene

CAS#: 71-43-2 # of Samples: 2 # of Detections: 0 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Drums	No	No	8021		6/12/2003	0		U	5.0E-02	6.9E-01
Stockpile	No	No	8021		8/8/2002	0		U	1.2E-02	6.9E-01
						Maximums:			5.0E-02	

Ethyl benzene

CAS#: 100-41-4 # of Samples: 2 # of Detections: 1 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Drums	No	No	8021		6/12/2003	0		U	5.0E-02	2.6E+02
Stockpile	No	No	8021		8/8/2002	0	1.2E+00			2.6E+02
						Maximums:	1.2E+00		5.0E-02	

Toluene

CAS#: 108-88-3 # of Samples: 2 # of Detections: 1 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Drums	No	No	8021		6/12/2003	0		U	5.0E-02	2.7E+02
Stockpile	No	No	8021		8/8/2002	0	4.7E-01			2.7E+02
						Maximums:	4.7E-01		5.0E-02	

TPH, Total

CAS#: --- # of Samples: 3 # of Detections: 3 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Drums	No	No	8015 DRO		6/12/2003	0	7.6E+03			1.4E+04
Drums	No	No	8015 GRO		6/12/2003	0	2.6E+01			1.4E+04
Stockpile	No	No	418.1		8/8/2002	0	1.7E+04			1.4E+04
						Maximums:	1.7E+04			

Xylenes

CAS#: 1330-20-7 # of Samples: 2 # of Detections: 1 Units: mg / Kg

Sample ID	Source Area?	Deline-ation?	Analytical Method	MQL	Sample Date	Sample Depth (ft)	Detected Conc.	Flag	Non-detect SQLs	Critical PCL
Drums	No	No	8021		6/12/2003	0		U	5.0E-02	4.4E+03
Stockpile	No	No	8021		8/8/2002	0	2.6E+00			4.4E+03
						Maximums:	2.6E+00		5.0E-02	

Appendix C

TRACEANALYSIS, INC.

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

Analytical and Quality Control Report

Marc C Oler
Equiva Mark Oler
308 Wilcox #101
Castlerock, Co. 80104

Report Date: August 15, 2002

Order ID Number: A02081236

Project: 106.008
TA Job Code: N/A
Casualty Code: 106.008
Project Location: N/A
H2A Environmental LTD / Portland / Theresa Nix

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
204735	Stockpile	Soil	8/8/02	15:00	8/12/02
204736	Area 1	Soil	8/8/02	11:00	8/12/02
204737	Area 2	Soil	8/8/02	11:10	8/12/02
204738	Area 3	Soil	8/8/02	11:20	8/12/02
204739	West Wall	Soil	8/8/02	11:30	8/12/02

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.
The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 204735 - Stockpile

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC22767	Date Analyzed:	8/14/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21432	Date Prepared:	8/14/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.050	mg/Kg	50	0.001
Toluene		0.468	mg/Kg	50	0.001
Ethylbenzene		1.23	mg/Kg	50	0.001
M,P,O-Xylene		2.63	mg/Kg	50	0.001
Total BTEX		4.33	mg/Kg	50	0.001
Test Comments	[1]	NOTE	mg/Kg	1	

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.740	mg/Kg	50	1	74	70 - 130
4-BFB		1.03	mg/Kg	50	1	103	70 - 130

Sample: 204735 - Stockpile

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC22703	Date Analyzed:	8/13/02
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB21376	Date Prepared:	8/13/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		16600	mg/Kg	20	10

Sample: 204736 - Area 1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC22735	Date Analyzed:	8/13/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21408	Date Prepared:	8/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.010	mg/Kg	10	0.001
Toluene		<0.010	mg/Kg	10	0.001
Ethylbenzene		0.0562	mg/Kg	10	0.001
M,P,O-Xylene		0.136	mg/Kg	10	0.001
Total BTEX		0.192	mg/Kg	10	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.927	mg/Kg	10	1	92	70 - 130
4-BFB		1.02	mg/Kg	10	1	102	70 - 130

[1] Sample diluted due to hydrocarbons beyond xylene. Sample benzene concentration is <0.0118 which is the MDL.

Sample: 204736 - Area 1

Analysis: TPH | Analytical Method: E 418.1 | QC Batch: QC22703 | Date Analyzed: 8/13/02
Analyst: BC | Preparation Method: N/A | Prep Batch: PB21376 | Date Prepared: 8/13/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		8610	mg/Kg	20	10

Sample: 204737 - Area 2

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC22735 | Date Analyzed: 8/13/02
Analyst: CG | Preparation Method: S 5035 | Prep Batch: PB21408 | Date Prepared: 8/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.010	mg/Kg	10	0.001
Toluene		<0.010	mg/Kg	10	0.001
Ethylbenzene		<0.010	mg/Kg	10	0.001
M,P,O-Xylene		0.0111	mg/Kg	10	0.001
Total BTEX		0.0111	mg/Kg	10	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.865	mg/Kg	10	1	86	70 - 130
4-BFB		0.787	mg/Kg	10	1	79	70 - 130

Sample: 204737 - Area 2

Analysis: TPH | Analytical Method: E 418.1 | QC Batch: QC22703 | Date Analyzed: 8/13/02
Analyst: BC | Preparation Method: N/A | Prep Batch: PB21376 | Date Prepared: 8/13/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		7740	mg/Kg	20	10

Sample: 204738 - Area 3

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC22735 | Date Analyzed: 8/13/02
Analyst: CG | Preparation Method: S 5035 | Prep Batch: PB21408 | Date Prepared: 8/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.050	mg/Kg	50	0.001
Toluene		2.87	mg/Kg	50	0.001
Ethylbenzene		11	mg/Kg	50	0.001
M,P,O-Xylene		20	mg/Kg	50	0.001
Total BTEX		33.9	mg/Kg	50	0.001
Test Comments	[2]	*	mg/Kg	1	

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.834	mg/Kg	50	1	83	70 - 130

Continued ...

[2]Sample diluted due to hydrocarbons beyond xylene. Sample has a Benzene concentration of less than 0.0138 which is the MDL.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
4-BFB	[3]	8.41	mg/Kg	50	1	841	70 - 130

Sample: 204738 - Area 3

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC22703	Date Analyzed:	8/13/02
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB21376	Date Prepared:	8/13/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		18000	mg/Kg	20	10

Sample: 204739 - West Wall

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC22735	Date Analyzed:	8/13/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21408	Date Prepared:	8/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.010	mg/Kg	10	0.001
Toluene		<0.010	mg/Kg	10	0.001
Ethylbenzene		0.0227	mg/Kg	10	0.001
M,P,O-Xylene		0.0228	mg/Kg	10	0.001
Total BTEX		0.0455	mg/Kg	10	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.738	mg/Kg	10	1	74	70 - 130
4-BFB	[4]	0.669	mg/Kg	10	1	66	70 - 130

Sample: 204739 - West Wall

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC22703	Date Analyzed:	8/13/02
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB21376	Date Prepared:	8/13/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		913	mg/Kg	10	10

[3]High surrogate recovery due to peak interference.
[4]Low surrogate recovery due to matrix interference. ICV, CCV show the method to be in control.

Quality Control Report
Method Blank

Method Blank

QCBatch: QC22703

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

Method Blank

QCBatch: QC22735

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.918	mg/Kg	10	1	92	70 - 130
4-BFB		0.827	mg/Kg	10	1	83	70 - 130

Method Blank

QCBatch: QC22767

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.931	mg/Kg	10	1	93	70 - 130
4-BFB		0.876	mg/Kg	10	1	88	70 - 130

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC22703

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
TRPHC	219	227	mg/Kg	1	250	<10.0	87	3	74 - 110	20

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

Laboratory Control Spikes

QCBatch: QC22735

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.870	0.861	mg/Kg	10	1	<0.010	87	1	70 - 130	20
Benzene	0.894	0.87	mg/Kg	10	1	<0.010	89	2	70 - 130	20
Toluene	0.86	0.854	mg/Kg	10	1	<0.010	86	0	70 - 130	20
Ethylbenzene	0.856	0.863	mg/Kg	10	1	<0.010	85	0	70 - 130	20
M,P,O-Xylene	2.55	2.58	mg/Kg	10	3	<0.010	85	1	70 - 130	20

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

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.964	.925	mg/Kg	10	1	96	92	70 - 130
4-BFB	0.872	0.888	mg/Kg	10	1	87	88	70 - 130

Laboratory Control Spikes

QCBatch: QC22767

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.979	0.947	mg/Kg	10	1	<0.010	98	3	70 - 130	20
Benzene	1.01	0.962	mg/Kg	10	1	<0.010	101	5	70 - 130	20
Toluene	0.984	0.943	mg/Kg	10	1	<0.010	98	4	70 - 130	20
Ethylbenzene	1.00	0.969	mg/Kg	10	1	<0.010	100	3	70 - 130	20
M,P,O-Xylene	2.99	2.90	mg/Kg	10	3	<0.010	100	3	70 - 130	20

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

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.941	0.908	mg/Kg	10	1	94	91	70 - 130
4-BFB	0.929	0.895	mg/Kg	10	1	93	89	70 - 130

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC22703

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
TRPHC	1430	1390	mg/Kg	1	250	913	206	8	70 - 130	20

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

Matrix Spikes

QCBatch: QC22735

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Benzene	0.784	0.871	mg/Kg	10	1	<0.010	78	10	70 - 130	20
Toluene	0.75	0.84	mg/Kg	10	1	<0.010	75	11	70 - 130	20
Ethylbenzene	0.771	0.865	mg/Kg	10	1	<0.010	77	11	70 - 130	20
M,P,O-Xylene	2.28	2.57	mg/Kg	10	3	<0.010	76	11	70 - 130	20

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

Surrogate	MS Result	MSD Result	Units	Dilution	Spike Amount	MS % Rec	MSD % Rec	Recovery Limits
TFT	0.878	0.914	mg/Kg	10	1	87	91	70 - 130
4-BFB	0.828	0.849	mg/Kg	10	1	82	84	70 - 130

Matrix Spikes

QCBatch: QC22767

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Benzene	0.883	0.890	mg/Kg	10	1	<0.010	88	1	70 - 130	20
Toluene	0.864	0.872	mg/Kg	10	1	<0.010	86	1	70 - 130	20
Ethylbenzene	0.868	0.866	mg/Kg	10	1	<0.010	87	0	70 - 130	20
M,P,O-Xylene	2.54	2.58	mg/Kg	10	3	<0.010	85	2	70 - 130	20

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

Surrogate	MS Result	MSD Result	Units	Dilution	Spike Amount	MS % Rec	MSD % Rec	Recovery Limits
TFT	0.723	0.730	mg/Kg	10	1	72	73	70 - 130
4-BFB	[5] 0.631	[6] 0.622	mg/Kg	10	1	63	62	70 - 130

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC22703

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
TRPHC		mg/Kg	100	99.8	99	80 - 120	8/13/02

[5]Surrogate recovery low due to matrix interference. Quality Control for the sample shows that process is within acceptable limits.
[6]Surrogate recovery low due to matrix interference. Quality Control for the sample shows that process is within acceptable limits.

ICV (1) QCBatch: QC22703

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
TRPHC		mg/Kg	100	101	101	80 - 120	8/13/02

CCV (1) QCBatch: QC22735

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0905	90	85 - 115	8/13/02
Benzene		mg/L	0.10	0.0887	89	85 - 115	8/13/02
Toluene		mg/L	0.10	0.0861	86	85 - 115	8/13/02
Ethylbenzene	[7]	mg/L	0.10	0.0824	82	85 - 115	8/13/02
M,P,O-Xylene	[8]	mg/L	0.30	0.249	83	85 - 115	8/13/02

CCV (2) QCBatch: QC22735

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0976	97	85 - 115	8/13/02
Benzene		mg/L	0.10	0.104	104	85 - 115	8/13/02
Toluene		mg/L	0.10	0.101	101	85 - 115	8/13/02
Ethylbenzene		mg/L	0.10	0.098	98	85 - 115	8/13/02
M,P,O-Xylene		mg/L	0.30	0.29	96	85 - 115	8/13/02

ICV (1) QCBatch: QC22735

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0885	88	85 - 115	8/13/02
Benzene		mg/L	0.10	0.0908	91	85 - 115	8/13/02
Toluene		mg/L	0.10	0.087	87	85 - 115	8/13/02
Ethylbenzene		mg/L	0.10	0.0872	87	85 - 115	8/13/02
M,P,O-Xylene		mg/L	0.30	0.260	87	85 - 115	8/13/02

CCV (1) QCBatch: QC22767

[7]Ethylbenzene outside normal limits. Average (86.1) of CCV components within acceptable range.
[8]Xylene outside normal limits. Average (86.1) of CCV components within acceptable range.

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0978	98	85 - 115	8/14/02
Benzene		mg/L	0.10	0.102	102	85 - 115	8/14/02
Toluene		mg/L	0.10	0.0987	99	85 - 115	8/14/02
Ethylbenzene		mg/L	0.10	0.101	101	85 - 115	8/14/02
M,P,O-Xylene		mg/L	0.30	0.300	100	85 - 115	8/14/02

CCV (2)

QCBatch: QC22767

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	85 - 115	8/14/02
Benzene		mg/L	0.10	0.098	98	85 - 115	8/14/02
Toluene		mg/L	0.10	0.0947	94	85 - 115	8/14/02
Ethylbenzene		mg/L	0.10	0.0957	95	85 - 115	8/14/02
M,P,O-Xylene		mg/L	0.30	0.286	95	85 - 115	8/14/02

ICV (1)

QCBatch: QC22767

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0964	96	85 - 115	8/14/02
Benzene		mg/L	0.10	0.0998	100	85 - 115	8/14/02
Toluene		mg/L	0.10	0.0986	99	85 - 115	8/14/02
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	8/14/02
M,P,O-Xylene		mg/L	0.30	0.308	103	85 - 115	8/14/02

Equiva Services, LLC

A0208123G

TraceAnalysis, Inc.

6701 Aberdeen Ave, Ste 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID #

…sulting Company Name: H2A Environmental

Phone #: 361-777-0860

…sulting Company Address: 418 San Saba Portland TX 78374

Fax #: 361-777-0971

…sulting Contact:

Equiva Contact:

…ation/SAP:

Incident #:

…ation Address:

Project Task:

…sultant Job#: 106.008

Sampler Signature: [signature]

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	MATRIX: SOIL	MATRIX: AIR	MATRIX: SLUDGE	PRESERVATIVE METHOD: HCL	HNO_3	$NaHSO_4$	H_2SO_4	ICE	NONE	SAMPLING: DATE	SAMPLING: TIME	MTBE 8021B/602	BTEX 8021B	TPH 418.1	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC-MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Turn Around Time if different from standard	Hold
	MW-5 201734	2	2(40)	X				X				X		8-8	2:00		X															
	Stockpile 35	↓	4oz		X							X		8-8	3:00		↓	X														
	Area 1 36	↓	↓		↓							↓		8-9	1100		↓	↓														
	Area 2 37	↓	↓		↓							↓		↓	1110		↓	↓														
	Area 3 38	↓	↓		↓							↓		↓	1120		↓	↓														
	West wall 39	↓	↓		↓							↓		↓	1130		↓	↓														

…linquished by: [signature] Date: 8-9-02 Time: 1200

Received by: Date: Time:

…linquished by: Date: Time:

Received by: Vicki [signature] Date: 8-12-02 Time: 10

…linquished by: Date: Time:

Received at Laboratory by: Date: Time:

LAB USE ONLY
Intact Y/N
Headspace Y/N
Temp
Log-in Review

REMARKS:

☐ Check if special reporting limits needed.

8116 F/P

Carrier # Fed Ex 8192 2891 8049

…mittal of samples constitutes agreement to Terms and Conditions listed on reverse side of COC

ORIGINAL COPY

TRACEANALYSIS, INC.

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

Analytical and Quality Control Report

Marc C Oler
Equiva Marc Oler
308 Wilcox #101
Castlerock, Co. 80104

Report Date: September 6, 2002

Order ID Number: A02090309

Project: 106.008
TA Job Code: N/A
Casualty Code: 106.008
Project Location: N/A
H2A Environmental LTD / Portland / Theresa Nix

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
207037	1	Soil	8/30/02	8:00	9/3/02
207038	2	Soil	8/30/02	8:15	9/3/02
207039	3	Soil	8/30/02	8:30	9/3/02
207040	4	Soil	8/30/02	8:45	9/3/02
207041	5	Soil	8/30/02	9:00	9/3/02
207042	6	Soil	8/30/02	9:15	9/3/02
207043	7	Soil	8/30/02	9:30	9/3/02
207044	8	Soil	8/30/02	9:45	9/3/02

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.
The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

Note: Samples will be disposed of 30 days from the report date unless the lab is contacted before the 30 days has past.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 207037 - 1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23298	Date Analyzed:	9/3/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21853	Date Prepared:	9/3/02

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		1.22	mg/Kg	10	1	122	70 - 130
4-BFB	[1]	1.47	mg/Kg	10	1	147	70 - 130

Sample: 207037 - 1

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC23343	Date Analyzed:	9/6/02
Analyst:	RC	Preparation Method:	N/A	Prep Batch:	PB21886	Date Prepared:	9/5/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		<10.0	mg/Kg	1	10

Sample: 207038 - 2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23298	Date Analyzed:	9/3/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21853	Date Prepared:	9/3/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.020	mg/Kg	20	0.001
Toluene		<0.020	mg/Kg	20	0.001
Ethylbenzene		0.193	mg/Kg	20	0.001
M,P,O-Xylene		0.550	mg/Kg	20	0.001
Total BTEX		0.743	mg/Kg	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.872	mg/Kg	20	1	87	70 - 130
4-BFB		0.982	mg/Kg	20	1	98	70 - 130

Sample: 207038 - 2

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC23343	Date Analyzed:	9/6/02
Analyst:	RC	Preparation Method:	N/A	Prep Batch:	PB21886	Date Prepared:	9/5/02

[1] High surrogate recovery due to peak interference.

Param	Flag	Result	Units	Dilution	RDL
TRPHC		551	mg/Kg	1	10

Sample: 207039 - 3

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC23298 Date Analyzed: 9/3/02
Analyst: CG Preparation Method: S 5035 Prep Batch: PB21853 Date Prepared: 9/3/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.020	mg/Kg	20	0.001
Toluene		<0.020	mg/Kg	20	0.001
Ethylbenzene		<0.020	mg/Kg	20	0.001
M,P,O-Xylene		<0.020	mg/Kg	20	0.001
Total BTEX		<0.020	mg/Kg	20	0.001
Test Comments	[2]	*	mg/Kg	1	

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.998	mg/Kg	20	1	100	70 - 130
4-BFB		1.01	mg/Kg	20	1	101	70 - 130

Sample: 207039 - 3

Analysis: TPH Analytical Method: E 418.1 QC Batch: QC23343 Date Analyzed: 9/6/02
Analyst: RC Preparation Method: N/A Prep Batch: PB21886 Date Prepared: 9/5/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		1970	mg/Kg	1	10

Sample: 207040 - 4

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC23298 Date Analyzed: 9/3/02
Analyst: CG Preparation Method: S 5035 Prep Batch: PB21853 Date Prepared: 9/3/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.157	mg/Kg	50	0.001
Toluene		0.480	mg/Kg	50	0.001
Ethylbenzene		4.67	mg/Kg	50	0.001
M,P,O-Xylene		3.12	mg/Kg	50	0.001
Total BTEX		8.43	mg/Kg	50	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		1.06	mg/Kg	50	1	106	70 - 130
4-BFB		0.812	mg/Kg	50	1	81	70 - 130

[2]Sample diluted due to hydrocarbons beyond xylene. Sample has a Benzene concentration of less than 0.00473 which is the MDL.

Sample: 207040 - 4

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC23343	Date Analyzed:	9/6/02
Analyst:	RC	Preparation Method:	N/A	Prep Batch:	PB21886	Date Prepared:	9/5/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		4680	mg/Kg	5	10

Sample: 207041 - 5

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23298	Date Analyzed:	9/3/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21853	Date Prepared:	9/3/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.020	mg/Kg	20	0.001
Toluene		<0.020	mg/Kg	20	0.001
Ethylbenzene		<0.020	mg/Kg	20	0.001
M,P,O-Xylene		<0.020	mg/Kg	20	0.001
Total BTEX		<0.020	mg/Kg	20	0.001
Test Comments	[3]	*	mg/Kg	1	

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		1.03	mg/Kg	20	1	103	70 - 130
4-BFB		1.07	mg/Kg	20	1	107	70 - 130

Sample: 207041 - 5

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC23343	Date Analyzed:	9/6/02
Analyst:	RC	Preparation Method:	N/A	Prep Batch:	PB21886	Date Prepared:	9/5/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		<10.0	mg/Kg	1	10

Sample: 207042 - 6

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23298	Date Analyzed:	9/3/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21853	Date Prepared:	9/3/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.020	mg/Kg	20	0.001
Toluene		0.453	mg/Kg	20	0.001
Ethylbenzene		3.40	mg/Kg	20	0.001
M,P,O-Xylene		<0.020	mg/Kg	20	0.001
Total BTEX		3.85	mg/Kg	20	0.001
Test Comments	[4]	*	mg/Kg	1	

[3]Sample diluted due to turbidity. Sample has a Benzene concentration of less than 0.00473 which is the MDL.
[4]Sample diluted due to hydrocarbons beyond xylene. Sample has a Benzene concentration of less than 0.00473 which is the MDL.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.945	mg/Kg	20	1	94	70 - 130
4-BFB	[5]	1.38	mg/Kg	20	1	138	70 - 130

Sample: 207042 - 6

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC23343	Date Analyzed:	9/6/02
Analyst:	RC	Preparation Method:	N/A	Prep Batch:	PB21886	Date Prepared:	9/5/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		4640	mg/Kg	5	10

Sample: 207043 - 7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23298	Date Analyzed:	9/3/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21853	Date Prepared:	9/3/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.020	mg/Kg	20	0.001
Toluene		<0.020	mg/Kg	20	0.001
Ethylbenzene		<0.020	mg/Kg	20	0.001
M,P,O-Xylene		<0.020	mg/Kg	20	0.001
Total BTEX		<0.020	mg/Kg	20	0.001
Test Comments	[6]	*	mg/Kg	1	

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.804	mg/Kg	20	1	80	70 - 130
4-BFB		0.891	mg/Kg	20	1	89	70 - 130

Sample: 207043 - 7

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC23343	Date Analyzed:	9/6/02
Analyst:	RC	Preparation Method:	N/A	Prep Batch:	PB21886	Date Prepared:	9/5/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		<10.0	mg/Kg	1	10

Sample: 207044 - 8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23298	Date Analyzed:	9/3/02
Analyst:	CG	Preparation Method:	S 5035	Prep Batch:	PB21853	Date Prepared:	9/3/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.020	mg/Kg	20	0.001
Toluene		<0.020	mg/Kg	20	0.001

Continued ...

[5] High surrogate recovery due to peak interference.
[6] Sample diluted due to turbidity. Sample has a Benzene concentration of less than 0.00473 which is the MDL.

... *Continued* Sample: 207044 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Ethylbenzene		<0.020	mg/Kg	20	0.001
M,P,O-Xylene		<0.020	mg/Kg	20	0.001
Total BTEX		<0.020	mg/Kg	20	0.001
Test Comments	[7]	*	mg/Kg	1	

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.814	mg/Kg	20	1	81	70 - 130
4-BFB		0.868	mg/Kg	20	1	87	70 - 130

Sample: 207044 - 8

Analysis:	TPH	Analytical Method:	E 418.1	QC Batch:	QC23343	Date Analyzed:	9/6/02
Analyst:	RC	Preparation Method:	N/A	Prep Batch:	PB21886	Date Prepared:	9/5/02

Param	Flag	Result	Units	Dilution	RDL
TRPHC		<10.0	mg/Kg	1	10

[7]Sample diluted due to turbidity. Sample has a Benzene concentration of less than 0.00473 which is the MDL.

Quality Control Report
Method Blank

Method Blank

QCBatch: QC23298

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.834	mg/Kg	10	1	83	70 - 130
4-BFB		0.747	mg/Kg	10	1	75	70 - 130

Method Blank

QCBatch: QC23343

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

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC23298

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.915	0.902	mg/Kg	10	1	<0.010	91	1	70 - 130	20
Benzene	0.865	0.851	mg/Kg	10	1	<0.010	86	1	70 - 130	20
Toluene	0.879	0.878	mg/Kg	10	1	<0.010	87	0	70 - 130	20
Ethylbenzene	0.886	0.902	mg/Kg	10	1	<0.010	88	1	70 - 130	20
M,P,O-Xylene	2.6	2.63	mg/Kg	10	3	<0.010	86	1	70 - 130	20

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

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.831	0.816	mg/Kg	10	1	83	82	70 - 130
4-BFB	0.846	0.848	mg/Kg	10	1	85	85	70 - 130

Laboratory Control Spikes

QCBatch: QC23343

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
TRPHC	248	255	mg/Kg	1	250	<10.0	99	2	74 - 110	20

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

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC23298

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Benzene	1.18	1.07	mg/Kg	10	1	<0.010	118	9	70 - 130	20
Toluene	1.27	1.19	mg/Kg	10	1	<0.010	127	6	70 - 130	20
Ethylbenzene	1.26	1.16	mg/Kg	10	1	<0.010	126	8	70 - 130	20
M,P,O-Xylene	3.67	3.37	mg/Kg	10	3	<0.010	122	8	70 - 130	20

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

Surrogate	MS Result	MSD Result	Units	Dilution	Spike Amount	MS % Rec	MSD % Rec	Recovery Limits
TFT	0.96	0.878	mg/Kg	10	1	96	87	70 - 130
4-BFB	1.12	0.997	mg/Kg	10	1	112	99	70 - 130

Matrix Spikes

QCBatch: QC23343

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
TRPHC	565	590	mg/Kg	1	250	353	84	11	70 - 130	20

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

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC23298

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.111	111	85 - 115	9/3/02
Benzene		mg/L	0.10	0.105	105	85 - 115	9/3/02
Toluene		mg/L	0.10	0.106	106	85 - 115	9/3/02
Ethylbenzene		mg/L	0.10	0.106	106	85 - 115	9/3/02
M,P,O-Xylene		mg/L	0.30	0.313	104	85 - 115	9/3/02

CCV (2) QCBatch: QC23298

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0923	92	85 - 115	9/3/02
Benzene		mg/L	0.10	0.0912	91	85 - 115	9/3/02
Toluene		mg/L	0.10	0.0899	89	85 - 115	9/3/02
Ethylbenzene		mg/L	0.10	0.0914	91	85 - 115	9/3/02
M,P,O-Xylene		mg/L	0.30	0.275	91	85 - 115	9/3/02

ICV (1) QCBatch: QC23298

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0992	99	85 - 115	9/3/02
Benzene		mg/L	0.10	0.0973	97	85 - 115	9/3/02
Toluene		mg/L	0.10	0.102	102	85 - 115	9/3/02
Ethylbenzene		mg/L	0.10	0.103	103	85 - 115	9/3/02
M,P,O-Xylene		mg/L	0.30	0.296	99	85 - 115	9/3/02

CCV (1) QCBatch: QC23343

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
TRPHC		mg/Kg	100	100	100	80 - 120	9/6/02

CCV (2) QCBatch: QC23343

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
TRPHC		mg/Kg	100	100	100	80 - 120	9/6/02

CCV (3) QCBatch: QC23343

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
TRPHC		mg/Kg	100	99.4	99	80 - 120	9/6/02

ICV (1) QCBatch: QC23343

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
TRPHC		mg/Kg	100	101	101	80 - 120	9/6/02

Equiva Services, LLC

Page____of____

TraceAnalysis, Inc.

6701 Aberdeen Ave, Ste 9
Lubbock,Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A0209Q309

sulting Company Name: H2A Env.

Phone #: 361-777-0860

sulting Company Address: 418 San Saba Portland TX 78374

Fax #: 361-777-0471

sulting Contact: Theresa Nix

Equiva Contact:

ation/SAP:

Incident #

ation Address: Jal NM

Project Task:

sultant Job#: 106.009

Sampler Signature: [signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # LAB USE ONLY	FIELD CODE	# CONTAINERS	Volume/Amount	WATER	SOIL	AIR	SLUDGE	HCL	HNO_3	$NaHSO_4$	H_2SO_4	ICE	NONE	DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/[illegible]	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC-MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH								Turn Around Time if different from standard	Hold
[illegible]	1	1	4oz		X							✓		8-30	800	[illegible]	X	X																					
[illegible]	2														815																								
[illegible]	3														830																								
[illegible]	4														845																								
[illegible]	5														900																								
[illegible]	6														915																								
[illegible]	7														930																								
[illegible]	8														945																								

linquished by: [signature] Date: 8-30-02 Time: 1200

Received by: Date: Time:

linquished by: Date: Time:

Received by: Date: Time:

linquished by: Date: Time:

Received at Laboratory by: [illegible] Date: 9-3-02 Time: 10:00

LAB USE ONLY
Intact Y/N
Headspace Y/N
Temp 28
Log-in Review [initials]

REMARKS:

☐ Check if special reporting limits needed.

P&F 9/6/02

Carrier # Fed Ex 819228918050

ORIGINAL COPY

TRACEANALYSIS, INC.

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

Analytical and Quality Control Report

Thresa Nix
H2A Environmental
418 San Saba
Portland, TX 78374

Report Date: November 20, 2002

Work Order: 2110502

Project Location: Jal,NM
Project Name: Booster Release
Project Number: 106.009

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
1135	#1	soil	2002-10-17	09:00	2002-10-18
1136	#2	soil	2002-10-17	09:15	2002-10-18
1137	#3	soil	2002-10-17	09:30	2002-10-18
1138	#4	soil	2002-10-17	09:45	2002-10-18
1139	#5	soil	2002-10-17	10:00	2002-10-18

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

Notes:
All sample results are reported on a dry weight basis.
For inorganic analyses, the term MQL should actually read PQL.

Standard Flags

U - Not detected. The analyte is not detected above the SQL.
J - Estimated. The analyte is positively identified and the value is approximated between the SQL and MQL.
B - The sample contains less than ten times the concentration found in the method blank.
JB - The analyte is positively identified and the value is approximated between the SQL and MQL. The sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SQL.

Dr. Blair Leftwich, Director

Analytical Report

Note: *All sample results are reported on a dry weight basis.*

Sample: 1135 - #1

Analysis:	Moisture Content	Analytical Method:	SM D2974-87	Prep Method:	N/A
Prep Batch:	45	Date Prepared:	2002-10-23	Prepared By:	JW
QC Batch:	56	Date Analyzed:	2002-11-13	Analyzed By:	JW

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Moisture		11.5	11.5	-	%	1			

Sample: 1135 - #1

Analysis:	PAH	Analytical Method:	S 8270C	Prep Method:	S 3510C
Prep Batch:	128	Date Prepared:	2002-11-26	Prepared By:	JH
QC Batch:	138	Date Analyzed:	2002-11-27	Analyzed By:	RC

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Naphthalene	U1	<0.0508	0.000	<0.0508	mg/Kg	1	0.0508		0.045
Acenaphthylene	U	<0.0429	0.000	<0.0429	mg/Kg	1	0.0429		0.038
Acenaphthene	U	<0.0429	0.000	<0.0429	mg/Kg	1	0.0429		0.038
Fluorene	U	<0.0452	0.000	<0.0452	mg/Kg	1	0.0452		0.040
Phenanthrene	U	<0.0226	0.000	<0.0226	mg/Kg	1	0.0226		0.020
Anthracene	U	<0.0271	0.000	<0.0271	mg/Kg	1	0.0271		0.024
Fluoranthene	U	<0.0395	0.000	<0.0395	mg/Kg	1	0.0395		0.035
Pyrene	U	<0.129	0.000	<0.129	mg/Kg	1	0.129		0.114
Benzo(a)anthracene	U	<0.0305	0.000	<0.0305	mg/Kg	1	0.0305		0.027
Chrysene	U	<0.0294	0.000	<0.0294	mg/Kg	1	0.0294		0.026
Benzo(b)fluoranthene	U	<0.026	0.000	<0.026	mg/Kg	1	0.026		0.023
Benzo(k)fluoranthene	U	<0.0316	0.000	<0.0316	mg/Kg	1	0.0316		0.028
Benzo(a)pyrene	U	<0.0316	0.000	<0.0316	mg/Kg	1	0.0316		0.028
Indeno(1,2,3-cd)pyrene	U	<0.0542	0.000	<0.0542	mg/Kg	1	0.0542		0.048
Dibenzo(a,h)anthracene	U	<0.0565	0.000	<0.0565	mg/Kg	1	0.0565		0.050
Benzo(g,h,i)perylene	U	<0.0938	0.000	<0.0938	mg/Kg	1	0.0938		0.083

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
2-Fluorobiphenyl		49.3	mg/Kg	1	80.0	61	43 - 116
Nitrobenzene-d5		45.3	mg/Kg	1	80.0	56	35 - 114
Terphenyl-d14		48	mg/Kg	1	80.0	60	33 - 141

Sample: 1135 - #1

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	S 3550
Prep Batch:	70	Date Prepared:	2002-10-23	Prepared By:	WG
QC Batch:	81	Date Analyzed:	2002-10-23	Analyzed By:	BP

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
DRO		270	270	4.97	mg/Kg	1	23.8	50.0	21.1

[1]Sample was extracted and analyzed beyond hold time.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		121	mg/Kg	1	150	80	45 - 152

Sample: 1135 - #1

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
Prep Batch:	89	Date Prepared:	2002-10-21	Prepared By:	DN
QC Batch:	100	Date Analyzed:	2002-10-21	Analyzed By:	CG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
GRO		54.8	54.8	0.000	mg/Kg	2	0.267	1.00	0.236

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		1.02	mg/Kg	2	0.500	102	73 - 120
4-Bromofluorobenzene (4-BFB)	[2]	3.49	mg/Kg	2	0.500	349	78 - 120

Sample: 1136 - #2

Analysis:	Moisture Content	Analytical Method:	SM D2974-87	Prep Method:	N/A
Prep Batch:	45	Date Prepared:	2002-10-23	Prepared By:	JW
QC Batch:	56	Date Analyzed:	2002-11-13	Analyzed By:	JW

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Moisture		8.30	8.30	-	%	1			

Sample: 1136 - #2

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	S 3550
Prep Batch:	70	Date Prepared:	2002-10-23	Prepared By:	WG
QC Batch:	81	Date Analyzed:	2002-10-23	Analyzed By:	BP

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	<23.0	<54.5	<23.0	mg/Kg	1	23.0	50.0	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		113	mg/Kg	1	150	75	45 - 152

Sample: 1136 - #2

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
Prep Batch:	89	Date Prepared:	2002-10-21	Prepared By:	DN
QC Batch:	100	Date Analyzed:	2002-10-21	Analyzed By:	CG

[2]Surrogate % recovery above acceptable limits due to peak interference. LCS/LCSD show analysis in control.

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	U	<0.257	<1.09	<0.257	mg/Kg	1	0.257	1.00	0.236

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		1.09	mg/Kg	1	1.00	109	73 - 120
4-Bromofluorobenzene (4-BFB)		1.14	mg/Kg	1	1.00	114	78 - 120

Sample: 1137 - #3

Analysis:	Moisture Content	Analytical Method:	SM D2974-87	Prep Method:	N/A
Prep Batch:	45	Date Prepared:	2002-10-23	Prepared By:	JW
QC Batch:	56	Date Analyzed:	2002-11-13	Analyzed By:	JW

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Moisture		4.40	4.40	-	%	1			

Sample: 1137 - #3

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	S 3550
Prep Batch:	70	Date Prepared:	2002-10-23	Prepared By:	WG
QC Batch:	81	Date Analyzed:	2002-10-23	Analyzed By:	BP

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	<22.1	<52.3	<22.1	mg/Kg	1	22.1	50.0	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		116	mg/Kg	1	150	77	45 - 152

Sample: 1137 - #3

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
Prep Batch:	89	Date Prepared:	2002-10-21	Prepared By:	DN
QC Batch:	100	Date Analyzed:	2002-10-21	Analyzed By:	CG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	U	<0.247	<1.05	<0.247	mg/Kg	1	0.247	1.00	0.236

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		1.1	mg/Kg	1	1.00	109	73 - 120
4-Bromofluorobenzene (4-BFB)		1.08	mg/Kg	1	1.00	108	78 - 120

Sample: 1138 - #4

Analysis:	Moisture Content	Analytical Method:	SM D2974-87	Prep Method:	N/A
Prep Batch:	45	Date Prepared:	2002-10-23	Prepared By:	JW

QC Batch: 56 | Date Analyzed: 2002-11-13 | Analyzed By: JW

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Moisture		6.70	6.70	-	%	1			

Sample: 1138 - #4

Analysis: TPH DRO | Analytical Method: Mod. 8015B | Prep Method: S 3550
Prep Batch: 70 | Date Prepared: 2002-10-23 | Prepared By: WG
QC Batch: 81 | Date Analyzed: 2002-10-23 | Analyzed By: BP

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	JB	46.2	<53.6	4.72	mg/Kg	1	22.6	50.0	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		120	mg/Kg	1	150	80	45 - 152

Sample: 1138 - #4

Analysis: TPH GRO | Analytical Method: S 8015B | Prep Method: S 5035
Prep Batch: 89 | Date Prepared: 2002-10-21 | Prepared By: DN
QC Batch: 100 | Date Analyzed: 2002-10-21 | Analyzed By: CG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	U	<0.253	<1.07	<0.253	mg/Kg	1	0.253	1.00	0.236

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		1.1	mg/Kg	1	1.00	110	73 - 120
4-Bromofluorobenzene (4-BFB)		1.06	mg/Kg	1	1.00	106	78 - 120

Sample: 1139 - #5

Analysis: Moisture Content | Analytical Method: SM D2974-87 | Prep Method: N/A
Prep Batch: 45 | Date Prepared: 2002-10-23 | Prepared By: JW
QC Batch: 56 | Date Analyzed: 2002-11-13 | Analyzed By: JW

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Moisture		5.30	5.30	-	%	1			

Sample: 1139 - #5

Analysis: TPH DRO | Analytical Method: Mod. 8015B | Prep Method: S 3550
Prep Batch: 70 | Date Prepared: 2002-10-23 | Prepared By: WG
QC Batch: 81 | Date Analyzed: 2002-10-23 | Analyzed By: BP

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	<22.3	<52.8	<22.3	mg/Kg	1	22.3	50.0	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		108	mg/Kg	1	150	72	45 - 152

Sample: 1139 - #5

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
Prep Batch:	89	Date Prepared:	2002-10-21	Prepared By:	DN
QC Batch:	100	Date Analyzed:	2002-10-21	Analyzed By:	CG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	U	<0.249	<1.06	<0.249	mg/Kg	1	0.249	1.00	0.236

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		1.16	mg/Kg	1	1.00	116	73 - 120
4-Bromofluorobenzene (4-BFB)		1.04	mg/Kg	1	1.00	104	78 - 120

Quality Control Report

Method Blank QC Batch: 81

Parameter	Flag	Result	Units	Reporting Limits
DRO		<21.1	mg/Kg	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		130	mg/Kg	1	150	86	45 - 152

Method Blank QC Batch: 138

Parameter	Flag	Result	Units	Reporting Limits
Naphthalene		<0.045	mg/Kg	0.045
Acenaphthylene		<0.038	mg/Kg	0.038
Acenaphthene		<0.038	mg/Kg	0.038
Fluorene		<0.040	mg/Kg	0.040
Phenanthrene		<0.020	mg/Kg	0.020
Anthracene		<0.024	mg/Kg	0.024
Fluoranthene		<0.035	mg/Kg	0.035
Pyrene		<0.114	mg/Kg	0.114
Benzo(a)anthracene		<0.027	mg/Kg	0.027
Chrysene		<0.026	mg/Kg	0.026
Benzo(b)fluoranthene		<0.023	mg/Kg	0.023
Benzo(k)fluoranthene		<0.028	mg/Kg	0.028
Benzo(a)pyrene		<0.028	mg/Kg	0.028
Indeno(1,2,3-cd)pyrene		<0.048	mg/Kg	0.048
Dibenzo(a,h)anthracene		<0.050	mg/Kg	0.050
Benzo(g,h,i)perylene		<0.083	mg/Kg	0.083

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
2-Fluorobiphenyl		48.8	mg/Kg	1	80.0	61	43 - 116
Nitrobenzene-d5		46.4	mg/Kg	1	80.0	58	35 - 114
Terphenyl-d14		47.5	mg/Kg	1	80.0	59	33 - 141

Method Blank QC Batch: 100

Parameter	Flag	Result	Units	Reporting Limits
GRO		<0.236	mg/Kg	0.236

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.845	mg/Kg	1	1.00	84	73 - 120
4-Bromofluorobenzene (4-BFB)		0.839	mg/Kg	1	1.00	83	78 - 120

Duplicate QC Batch: 56

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Moisture	4.9	5.3	%	1	4	11.6

Laboratory Control Spikes QC Batch: 100

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	9	10.5	mg/Kg	1	10.0	<0.236	90	8	82 - 115	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorothymidine (TFT)	0.864	1.16	mg/Kg	1	1.00	86	116	73 - 120
4-Bromofluorobenzene (4-BFB)	0.989	1.13	mg/Kg	1	1.00	98	113	78 - 120

Laboratory Control Spikes QC Batch: 138

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Naphthalene	58.5	57.1	mg/Kg	1	80.0	<0.045	73	1	17 - 80	20
Acenaphthylene	56.8	54.6	mg/Kg	1	80.0	<0.038	70	2	20 - 89	20
Acenaphthene	60.9	60.9	mg/Kg	1	80.0	<0.038	76	0	19 - 86	20
Fluorene	60.5	59.8	mg/Kg	1	80.0	<0.040	75	1	24 - 83	20
Phenanthrene	67	65.1	mg/Kg	1	80.0	<0.020	83	1	30 - 85	20
Anthracene	63.7	60.8	mg/Kg	1	80.0	<0.024	79	2	30 - 80	20
Fluoranthene	73.9	76.4	mg/Kg	1	80.0	<0.035	92	2	26 - 97	20
Pyrene	59.5	65	mg/Kg	1	80.0	<0.114	74	4	24 - 87	20
Benzo(a)anthracene	71.6	69.3	mg/Kg	1	80.0	<0.027	89	2	35 - 92	20
Chrysene	50.1	48.9	mg/Kg	1	80.0	<0.026	62	1	10 - 108	20
Benzo(b)fluoranthene	80.4	73.5	mg/Kg	1	80.0	<0.023	100	4	27 - 102	20
Benzo(k)fluoranthene	71.1	71.9	mg/Kg	1	80.0	<0.028	88	0	34 - 92	20
Benzo(a)pyrene	72.3	70.1	mg/Kg	1	80.0	<0.028	90	2	31 - 93	20
Indeno(1,2,3-cd)pyrene	70.8	67.5	mg/Kg	1	80.0	<0.048	88	2	28 - 101	20
Dibenzo(a,h)anthracene	65.6	64	mg/Kg	1	80.0	<0.050	81	1	17 - 82	20
Benzo(g,h,i)perylene	68.9	68.7	mg/Kg	1	80.0	<0.083	86	0	32 - 96	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
2-Fluorobiphenyl	64.9	61.7	mg/Kg	1	80.0	81	77	43 - 116
Nitrobenzene-d5	61.5	62	mg/Kg	1	80.0	76	77	35 - 114
Terphenyl-d14	60.8	66.1	mg/Kg	1	80.0	76	82	33 - 141

Laboratory Control Spikes QC Batch: 81

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	259	272	mg/Kg	1	250	<21.1	101	2	115 - 369	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	136	142	mg/Kg	1	150	90	94	45 - 152

Matrix Spikes QC Batch: 100

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	9.85	10.8	mg/Kg	1	10.0	<0.236	98	5	0 - 296	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorothymidine (TFT)	1.08	1.1	mg/Kg	1	1.00	108	110	73 - 120
4-Bromofluorobenzene (4-BFB)	1.23	1.19	mg/Kg	1	1.00	123	119	78 - 120

Standard ICV (1) QC Batch: 100

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	1.02	101	85 - 115	2002-10-21

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
Trifluorothymidine (TFT)		0.0916	mg/Kg	1	0.100	91	73 - 120
4-Bromofluorobenzene (4-BFB)		0.107	mg/Kg	1	0.100	107	78 - 120

Standard CCV (1) QC Batch: 100

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	1.07	107	85 - 115	2002-10-21

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
Trifluorothymidine (TFT)		0.115	mg/Kg	1	0.100	115	73 - 120
4-Bromofluorobenzene (4-BFB)		0.115	mg/Kg	1	0.100	115	78 - 120

Standard CCV (1) QC Batch: 138

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Naphthalene		mg/Kg	60.0	56	93	80 - 120	2002-11-27
Acenaphthylene		mg/Kg	60.0	57.4	95	80 - 120	2002-11-27
Acenaphthene		mg/Kg	60.0	55.9	93	80 - 120	2002-11-27
Fluorene		mg/Kg	60.0	51.8	86	80 - 120	2002-11-27
Phenanthrene		mg/Kg	60.0	59.1	98	80 - 120	2002-11-27
Anthracene		mg/Kg	60.0	59.1	98	80 - 120	2002-11-27
Fluoranthene		mg/Kg	60.0	64.2	107	80 - 120	2002-11-27
Pyrene		mg/Kg	60.0	54.9	91	80 - 120	2002-11-27
Benzo(a)anthracene		mg/Kg	60.0	60.9	101	80 - 120	2002-11-27
Chrysene		mg/Kg	60.0	60.6	101	80 - 120	2002-11-27
Benzo(b)fluoranthene		mg/Kg	60.0	66.9	111	80 - 120	2002-11-27
Benzo(k)fluoranthene		mg/Kg	60.0	64.2	107	80 - 120	2002-11-27
Benzo(a)pyrene		mg/Kg	60.0	59.8	99	80 - 120	2002-11-27
Indeno(1,2,3-cd)pyrene		mg/Kg	60.0	58.1	96	80 - 120	2002-11-27
Dibenzo(a,h)anthracene		mg/Kg	60.0	59.4	99	80 - 120	2002-11-27
Benzo(g,h,i)perylene		mg/Kg	60.0	59.1	98	80 - 120	2002-11-27

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
2-Fluorobiphenyl		68.3	mg/Kg	1	80.0	85	43 - 116
Nitrobenzene-d5		62.4	mg/Kg	1	80.0	78	35 - 114
Terphenyl-d14		55	mg/Kg	1	80.0	68	33 - 141

Standard ICV (1) QC Batch: 81

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	223	89	75 - 125	2002-10-23

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
n-Triacontane		0	mg/Kg	1	150	0	75 - 125

Standard CCV (1) QC Batch: 81

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	260	104	75 - 125	2002-10-23

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
n-Triacontane		0	mg/Kg	1	150	0	45 - 152

TRACEANALYSIS, INC.

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

Analytical and Quality Control Report

Theresa Nix
H2A Environmental LTD
418 San Saba
Portland, Tx. 78374

Report Date: November 21, 2002

Order ID Number: A02101806

Project Number: 106.009
Project Name: Booster Release
Project Location: Jal,NM

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
210910	#1	Soil	10/17/02	9:00	10/18/02
210914	#5	Soil	10/17/02	10:00	10/18/02

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.
The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

Note: Samples will be disposed of 30 days from the report date unless the lab is contacted before the 30 days has past.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 210910 - #1

Analysis:	SPLP BTEX	Analytical Method:	S 8021B	QC Batch:	QC24550	Date Analyzed:	10/29/02
Analyst:	CG	Preparation Method:	1312	Prep Batch:	PB22882	Date Prepared:	10/29/02

Param	Flag	Result	Units	Dilution	RDL
SPLP Benzene		<0.005	mg/L	5	0.001
SPLP Toluene		<0.005	mg/L	5	0.001
SPLP Ethylbenzene		<0.005	mg/L	5	0.001
SPLP M,P,O-Xylene		<0.005	mg/L	5	0.001
SPLP Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.099	mg/Kg	5	0.10	98	70 - 130
4-BFB		0.096	mg/Kg	5	0.10	96	70 - 130

Sample: 210910 - #1

Analysis:	SPLP DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC24640	Date Analyzed:	11/2/02
Analyst:	BP	Preparation Method:	1312	Prep Batch:	PB22958	Date Prepared:	10/30/02

Param	Flag	Result	Units	Dilution	RDL
SPLP DRO		<5.00	mg/L	1	50

Sample: 210910 - #1

Analysis:	SPLP GRO	Analytical Method:	Mod. 602	QC Batch:	QC24551	Date Analyzed:	10/29/02
Analyst:	CG	Preparation Method:	1312	Prep Batch:	PB22882	Date Prepared:	10/29/02

Param	Flag	Result	Units	Dilution	RDL
SPLP GRO		<0.5	mg/L	5	0.10

Sample: 210910 - #1

Analysis:	SPLP PAH	Analytical Method:	S 8270C	QC Batch:	QC24797	Date Analyzed:	11/5/02
Analyst:	RC	Preparation Method:	1312	Prep Batch:	PB23048	Date Prepared:	10/31/02

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.0002	mg/L	1	0.0002
Acenaphthylene		<0.0002	mg/L	1	0.0002
Acenaphthene		<0.0002	mg/L	1	0.0002
Fluorene		< 0.006	mg/L	1	0.006
Phenanthrene		< 0.006	mg/L	1	0.006
Anthracene		<0.0002	mg/L	1	0.0002
Fluoranthene		<0.0002	mg/L	1	0.0002
Pyrene		<0.0002	mg/L	1	0.0002
Benzo(a)anthracene		<0.0002	mg/L	1	0.0002

Continued ...

... Continued Sample: 210910 Analysis: SPLP PAH

Param	Flag	Result	Units	Dilution	RDL
Chrysene		<0.0002	mg/L	1	0.0002
Benzo(b)fluoranthene		<0.0002	mg/L	1	0.0002
Benzo(k)fluoranthene		<0.0002	mg/L	1	0.0002
Benzo(a)pyrene		<0.0002	mg/L	1	0.0002
Indeno(1,2,3-cd)pyrene		<0.0002	mg/L	1	0.0002
Dibenzo(a,h)anthracene		<0.0002	mg/L	1	0.0002

Sample: 210914 - #5

Analysis:	FOC	Analytical Method:	D2974-87	QC Batch:	QC24336	Date Analyzed:	10/24/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB22695	Date Prepared:	10/22/02

Param	Flag	Result	Units	Dilution	RDL
FOC		0.62	%	1	0.10

Quality Control Report
Method Blank

Method Blank

QCBatch: QC24550

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

Method Blank

QCBatch: QC24551

Param	Flag	Results	Units	Reporting Limit
SPLP GRO		<0.1	mg/L	0.10

Method Blank

QCBatch: QC24640

Param	Flag	Results	Units	Reporting Limit
SPLP DRO		<5.0	mg/L	50

Method Blank

QCBatch: QC24797

Param	Flag	Results	Units	Reporting Limit
Naphthalene		<0.0002	mg/L	0.0002
Acenaphthylene		<0.0002	mg/L	0.0002
Acenaphthene		<0.0002	mg/L	0.0002
Fluorene		<0.0002	mg/L	0.006
Phenanthrene		<0.0002	mg/L	0.006
Anthracene		<0.0002	mg/L	0.0002
Fluoranthene		<0.0002	mg/L	0.0002
Pyrene		<0.0002	mg/L	0.0002
Benzo(a)anthracene		<0.0002	mg/L	0.0002
Chrysene		<0.0002	mg/L	0.0002
Benzo(b)fluoranthene		<0.0002	mg/L	0.0002
Benzo(k)fluoranthene		<0.0002	mg/L	0.0002
Benzo(a)pyrene		<0.0002	mg/L	0.0002
Indeno(1,2,3-cd)pyrene		<0.0002	mg/L	0.0002
Dibenzo(a,h)anthracene		<0.0002	mg/L	0.0002

Quality Control Report

Duplicate Samples

Duplicate

QCBatch: QC24336

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
FOC		0.65	0.62	%	1	4	72

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC24550

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
SPLP MTBE	0.103	0.103	mg/L	1	0.10	<0.001	103	0	70 - 130	20
SPLP Benzene	0.102	0.102	mg/L	1	0.10	<0.001	102	0	70 - 130	20
SPLP Toluene	0.102	0.102	mg/L	1	0.10	<0.001	102	0	70 - 130	20
SPLP Ethylbenzene	0.102	0.102	mg/L	1	0.10	<0.001	102	0	70 - 130	20
SPLP M,P,O-Xylene	0.303	0.303	mg/L	1	0.30	<0.001	101	0	70 - 130	20

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

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.1	0.0997	mg/Kg	1	0.10	100	99	70 - 130
4-BFB	0.0992	0.0996	mg/Kg	1	0.10	99	99	70 - 130

Laboratory Control Spikes

QCBatch: QC24551

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
SPLP GRO	1.06	1.04	mg/L	1	1	<0.1	106	1	70 - 130	20

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

Laboratory Control Spikes

QCBatch: QC24640

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
SPLP DRO	< 50	< 50	mg/L	1	25	<5.0	83	3	70 - 130	20

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

Laboratory Control Spikes

QCBatch: QC24797

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Naphthalene	63.19	66.22	mg/L	1	100	<0.0002	63	4	21 - 133	20
Acenaphthylene	60.14	62.38	mg/L	1	100	<0.0002	60	3	33 - 145	20
Acenaphthene	63.42	69.57	mg/L	1	100	<0.0002	63	9	47 - 145	20
Fluorene	62.82	69.17	mg/L	1	100	<0.0002	62	9	59 - 121	20
Phenanthrene	66.74	69.3	mg/L	1	100	<0.0002	66	2	54 - 120	20
Anthracene	66.94	72.78	mg/L	1	100	<0.0002	66	8	27 - 133	20
Fluoranthene	67.71	78.17	mg/L	1	100	<0.0002	67	15	26 - 137	20
Pyrene	80.29	83.83	mg/L	1	100	<0.0002	80	4	52 - 115	20
Benzo(a)anthracene	72.05	75.56	mg/L	1	100	<0.0002	72	4	80 - 120	20
Chrysene	50.88	54.26	mg/L	1	100	<0.0002	50	6	80 - 120	20
Benzo(b)fluoranthene	78.21	83.58	mg/L	1	100	<0.0002	78	6	33 - 143	20
Benzo(k)fluoranthene	66.49	75.55	mg/L	1	100	<0.0002	66	12	17 - 168	20
Benzo(a)pyrene	73.04	78.24	mg/L	1	100	<0.0002	73	6	24 - 159	20
Indeno(1,2,3-cd)pyrene	67.77	71.69	mg/L	1	100	<0.0002	67	5	0 - 171	20
Dibenzo(a,h)anthracene	65.32	69.38	mg/L	1	100	<0.0002	65	6	0 - 227	20
Benzo(g,h,i)perylene	67.64	71.51	mg/L	1	100	<0.0002	67	5	0 - 219	20

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

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
Nitrobenzene-d5	67.81	70.95	mg/L	1	100	67	70	23 - 120
2-Fluorobiphenyl	73.27	73.41	mg/L	1	100	73	73	30 - 115
Terphenyl-d14	85.29	91.06	mg/L	1	100	85	91	28 - 137

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC24550

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
SPLP MTBE		mg/L	0.10	0.104	104	70 - 130	10/29/02
SPLP Benzene		mg/L	0.10	0.101	101	70 - 130	10/29/02
SPLP Toluene		mg/L	0.10	0.102	102	70 - 130	10/29/02
SPLP Ethylbenzene		mg/L	0.10	0.102	102	70 - 130	10/29/02
SPLP M,P,O-Xylene		mg/L	0.30	0.302	100	70 - 130	10/29/02

ICV (1)

QCBatch: QC24550

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
SPLP MTBE		mg/L	0.10	0.0987	98	70 - 130	10/29/02
SPLP Benzene		mg/L	0.10	0.101	101	70 - 130	10/29/02
SPLP Toluene		mg/L	0.10	0.102	102	70 - 130	10/29/02
SPLP Ethylbenzene		mg/L	0.10	0.102	102	70 - 130	10/29/02
SPLP M,P,O-Xylene		mg/L	0.30	0.303	101	70 - 130	10/29/02

CCV (1) QCBatch: QC24551

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
SPLP GRO		mg/L	1	1.03	103	85 - 115	10/29/02

ICV (1) QCBatch: QC24551

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
SPLP GRO		mg/L	1	1.04	104	85 - 115	10/29/02

CCV (1) QCBatch: QC24640

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
SPLP DRO		mg/L	250	220	88	75 - 125	11/2/02

ICV (1) QCBatch: QC24640

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
SPLP DRO		mg/L	250	206	82	75 - 125	11/2/02

CCV (1) QCBatch: QC24797

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Naphthalene		mg/L	80	62.16	77	80 - 120	11/5/02
Acenaphthylene		mg/L	80	62.02	77	80 - 120	11/5/02
Acenaphthene		mg/L	80	62.47	78	80 - 120	11/5/02
Fluorene		mg/L	80	62.12	77	80 - 120	11/5/02
Phenanthrene		mg/L	80	61.05	76	80 - 120	11/5/02
Anthracene		mg/L	80	67.69	84	80 - 120	11/5/02
Fluoranthene		mg/L	80	69.06	86	80 - 120	11/5/02
Pyrene		mg/L	80	64.2	80	80 - 120	11/5/02
Benzo(a)anthracene		mg/L	80	62.09	77	80 - 120	11/5/02
Chrysene		mg/L	80	62.00	77	80 - 120	11/5/02
Benzo(b)fluoranthene		mg/L	80	71.94	89	80 - 120	11/5/02
Benzo(k)fluoranthene		mg/L	80	63.81	79	80 - 120	11/5/02
Benzo(a)pyrene		mg/L	80	63.07	78	80 - 120	11/5/02

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Indeno(1,2,3-cd)pyrene		mg/L	80	63.37	79	80 - 120	11/5/02
Dibenzo(a,h)anthracene		mg/L	80	62.08	77	80 - 120	11/5/02
Benzo(g,h,i)perylene		mg/L	80	63.22	79	80 - 120	11/5/02

TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

H2A Job No: 106.009
November 06, 2002
Receiving Date: 10/18/2002
Sample Type: Soil
Location Address: Jal, NM
Project Name: Booster Release
TA Job No: NA
Incident No: NA
H2A Environmental, Ltd./Portland/Theresa Nix

ANALYTICAL RESULTS FOR
EQUIVA - Marc Oler
Attention: Marc Oler
308 Wilcox #101
Castlerock, CO 80104

Lab Receiving #: A02101806
Equiva Location Code: NA
Equiva Casualty Loss No: NA
Prep Date: 10/24/2002
Analysis Date: 11/04/2002
Sampling Date: 10/17/2002
Sample Condition: Intact & Cool
Sample Received by: VH

T210910 - #1

Sample ID	(mg/Kg) Unfractionated C6-C35	(mg/Kg) Aliphatic C6	>C6-8	>C8-10	>C10-12	>C12-16	>C16-21	>C21-35	(mg/Kg) Aromatic >C7-C8	>C8-10	>C10-12	>C12-16	>C16-21	>C21-35	Aliphatic + Aromatic (mg/Kg)	% Recovery
210910	34	<1	<1	<1	1	3	2	3	<1	1	4	11	7	4	36	105

Avg. CV	481
% Extraction Accuracy	104
% Instrument Accuracy	96
RPD	4.30
CV T.V.	500
SPIKE T.V.	500

METHOD: TX1006
CHEMIST: BP

11-6-02
Date

Director, Dr. Blair Leftwich

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1] (θ, ρ_d, ϕ)	Saturated Hydraulic Conductivity[2]		Moisture Characteristics[3]					Unsaturated Hydraulic Conductivity	Particle Size[4]			Effective Porosity	Particle Density	Air Permeability	1/3, 15 Bar Points and Water Holding Capacity	Atterberg Limits	Proctor Compaction
		CH	FH	HC	PP	TH	WP	RH		DS	WS	H						
210914	X	X											X					

[1] θ = Initial moisture content, ρ_d = Dry bulk density, ϕ = Calculated porosity

[2] CH = Constant head, FH = falling head

[3] HC = Hanging column, PP = Pressure plate, TH = Thermocouple psychrometer, WP = Water activity meter, RH = Relative humidity box

[4] DS = Dry sieve, WS = Wet sieve, H = Hydrometer

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Initial Moisture Content		Dry Bulk Density	Wet Bulk Density	Calculated Porosity
	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	(g/cm^3)	(g/cm^3)	(%)
210914	5.3	8.0	1.51	1.59	43.0

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Trace Analysis
Job Number: WR02.0041.00
Sample Number: 210914
Ring Number: NA
Depth: NA

Test Date: 23-Oct-02

Field weight of sample* (g): 80.77
Tare weight, ring (g): 24.33
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 53.59
Sample volume (cm^3): 35.51
Assumed particle density: 2.65

Initial Volumetric Moisture Content (% vol): 8.0
Initial Gravimetric Moisture Content (% g/g): 5.3
Dry bulk density (g/cm^3): 1.51
Wet bulk density (g/cm^3): 1.59
Calculated Porosity (% vol): 43.0
Percent Saturation: 18.6

Comments:

* Weight including tares

Laboratory analysis by: M. Devine
Data entered by: D. ODowd
Checked by: D. ODowd

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Method of Analysis	
		Constant Head	Falling Head
210914	3.1E-04	X	

Saturated Hydraulic Conductivity
Constant Head Method

Job name: Trace Analysis
Job number: WR02.0041.00
Sample number: 210914
Ring number: NA
Depth: NA

Type of water used: TAP
Collection vessel tare (g): 11.92
Sample length (cm): 3.36
Sample diameter (cm): 3.67
Sample x-sectional area (cm^2): 10.56

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
31-Oct-02	08:46:45	22.5	6.2	14.9	3.0	318	4.8E-04	4.6E-04
31-Oct-02	08:52:03							
Test # 2:								
01-Nov-02	08:25:20	20.0	6.2	17.1	5.2	1079	2.5E-04	2.5E-04
01-Nov-02	08:43:19							
Test # 3:								
04-Nov-02	10:30:04	20.0	13.1	12.7	0.8	82	2.4E-04	2.4E-04
04-Nov-02	10:31:26							

***Average Ksat* (cm/sec):** **3.1E-04**

Comments:

Laboratory analysis by: M. Devine
Data entered by: D. ODowd
Checked by: D. ODowd

Summary of Effective Porosity Tests

Sample Number	Effective Porosity (% cm^3/cm^3)
210914	35.0

Effective Porosity Data

Job Name: Trace Analysis
Job Number: WR02.0041.00
Sample Number: 210914
Ring Number: NA
Depth: NA

Test Date: 11-Nov-02

*Sample Dry Weight** (g): 305.69
Tare Weight (g): 293.34
Bulk Density (g/cm^3): 1.51
Calculated Porosity (% cm^3/cm^3): 43.0

Pressure plate potential (-bars): 15.0
Sample weight at -15.0 bars (g):* 306.4

Moisture content (% g/g): 5.3
Moisture content (% cm^3/cm^3): 8.1
Matric potential (-cm): 15,297

***Moisture content at -15 bars* (% cm^3/cm^3): 8.1**

***Effective porosity* (% cm^3/cm^3): 35.0**

Comments:

* Weight including tares

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: D. O'Dowd

Attachment 1

Laboratory Review Checklist

This signature page and the following Reportable Data:

R1 Field Chain-of-Custody:
R2 Cross Reference by Field ID # to Laboratory ID # in alphanumeric order;
R3 Test Reports (Analytical Data Sheets) for each environmental sample that includes:
- a) all items listed in NELAC 5.13,
- b) dilution factors,
- c) preparation methods,
- d) cleanup methods, and
- e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate Recovery Data including:
- a) surrogate spiking amounts,
- b) concentration of surrogate measured in sample,
- c) calculated %R, and
- d) the laboratory's surrogate QC acceptance criteria.

R5 Test Reports for Blank Samples;
R6 Laboratory Control Sample (LCS) Data including:
- a) LCS spiking amounts,
- b) concentration of each analyte measured in LCS,
- c) calculated %R for each analyte, and
- d) the laboratory's LCS QC acceptance criteria

R7 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Data including:
- a) samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) concentration of each MS/MSD analyte measured in sample,
- d) calculated %Rs and %RPDs, and
- e) the laboratory's MS/MSD QC acceptance criteria

R8 Analytical Duplicate Recovery and Precision, if applicable, including:
- a) the amount of analyte measured in the duplicate,
- b) the calculated %RPD, and
- c) the laboratory's QC acceptance criteria for analytical duplicates.

R9 Method Quantitation Limit (MQL) for each analyte;
R10 If required for the project, the validation results for non-reference methods;

the completed Laboratory Review Checklist; and

an Exception Report for each item in the Laboratory Review Checklist noted with "No" or "Not Reviewed (NR)".

Release Statement: "I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. I affirm that this data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached Exception Report. I further affirm to the best of my knowledge that all problems/anomalies observed by this laboratory, or if applicable, any and all subcontracted laboratories, that might affect the quality of the data have been identified in the Laboratory Review Checklist, and no information or data has been withheld that would affect the quality of the data."

Marc Stroope
Name (printed)

Signature

11/20/02
Date

Production Manager
Official Title (printed)

TNRCC
LAB REVIEW CHECKLIST (continued): SUPPORTING DATA

Laboratory Name: TraceAnalysis	Report Date: 11/20/02
Project Name: Booster Release	Laboratory Job Number: 2110502
Reviewer Name: Marc Stroope	Batch Number(s): N/A

#[1]	Analysis[2]	Description	Yes	No	NA[3]	NR[4]	ER #[5]
S1	OI	INITIAL CALIBRATION (ICAL) and ICAL VERIFICATION(ICV):					
		1) Were response factors (RFs) and/or relative response factors (RRFs) within the method-required QC acceptance criteria?	✓				
		2) Were percent RSDs or correlation coefficient criteria met?	✓				
		3) Were the number of standards recommended in the method used for all analytes?	✓				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
		5) Are ICV data available for all instruments used?	✓				
		6) Has the calibration curve been verified using a NIST-traceable second source?	✓				
S2	OI	CONTINUING CALIBRATION VERIFICATION (CCV):					
		1) Was the CCV analyzed at the method-required frequency?	✓				
		2) Were percent differences within the method-required QC acceptance criteria?	✓				
		3) Was the ICAL curve verified for each analyte of interest?	✓				
S3	O	MASS SPECTRAL TUNING:					
		1) Was the appropriate compound for the method used for tuning?	✓				
		2) Were ion abundance data within the method-required QC acceptance criteria?	✓				
S4	O	INTERNAL STANDARD (IS):					
		1) Were IS area counts within the method-required QC acceptance criteria?			✓		
		2) Were IS retention times within the method-required QC acceptance criteria?			✓		
S5	OI	RAW DATA (NELAC Section 1 Appendix A Glossary, and Section 5.12):					
		1) Were the raw data (e.g., chromatograms, spectral data) reviewed by an analyst?	✓				
		2) Were all data associated with manual integrations flagged?	✓				
S6	O	DUAL COLUMN CONFIRMATION:					
		1) Did dual column confirmation results meet the method-required QC acceptance criteria?			✓		
		2) Were all percent differences less than 25%?			✓		
S7	O	TENTATIVELY IDENTIFIED COMPOUNDS (TICs):					
		If TICs were requested, were the mass spectra and TIC data reviewed?			✓		
S8	I	ICS RESULTS:					
		1) Were percent recoveries within method acceptance criteria?			✓		
		2) Were the absolute values for all analytes less than the IDL?			✓		
S9	I	SERIAL DILUTIONS, POST DIGESTION SPIKES, AND METHOD OF STANDARD ADDITIONS: Were percent differences, recoveries, and linearity within the QC acceptance criteria specified in the method?			✓		
S10	OI	VALIDATION RESULTS FOR NON-REFERENCE METHODS: Are all non-Reference Methods documented and validated (NELAC 5.10.2.1)?	✓				
S11	OI	METHOD DETECTION LIMIT (MDL) STUDIES: Are MDL studies for each analyte in a given matrix current, on file, less than a year old?	✓				
S12	OI	STANDARDS TRACEABILITY: Are all standards used in the analyses NIST-traceable?	✓				
S13	OI	DOCUMENTATION OF WATER AND REAGENTS QUALITY: Is documentation of the quality of water and reagents used in the analyses on file?	✓				
S14	OI	COMPOUND/ANALYTE IDENTIFICATION PROCEDURES: Are the procedures for compound identification documented?	✓				
S15	OI	DEMONSTRATION OF ANALYST CAPABILITY:					
		1) Was demonstration of capability conducted according to NELAC Appendix 5C?	✓				
		2) Is documentation of the analyst's demonstration of capability on file?	✓				
		3) Is documentation of the analyst's proficiency up-to-date and on file?	✓				
S16	OI	PROFICIENCY TEST REPORTS (NELAC 5.4.2): Are proficiency testing or interlaboratory comparison results on file?	✓				
S17	OI	LABORATORY STANDARD OPERATING PROCEDURES (SOPs): Are laboratory SOPs current and on file for each method performed?	✓				

1 Items identified by the letter "R" should be submitted to TNRCC in the *Data Package*. Items identified by the letter "S" should be retained and made available to the TNRCC upon request for a period of three years after the data are submitted.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3 NA = Not applicable;
4 NR = Not Reviewed;
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked.

TNRCC
LABORATORY REVIEW CHECKLIST: REPORTABLE DATA

Laboratory Name: TraceAnalysis	Date: 11/20/02
Project Name: Booster Release	Laboratory Job Number: 211050-2
Reviewer Name: Marc Stroope	Batch Number(s): N/A

#[1]	Analysis[2]	Description	Yes	No	NA[3]	NR[4]	ER #[5]
R1	OI	**CHAIN-OF-CUSTODY (C-O-C):**					
		1) Were all samples included on a completed C-O-C?	✓				
		2) Did the samples requiring chemical preservation arrive at the laboratory preserved?	✓				
		3) Were samples requiring thermal preservation within temperature specs at log-in?	✓				
		4) Were the samples in the appropriate containers?	✓				
R2	OI	**SAMPLE AND QUALITY CONTROL (QC) IDENTIFICATION:**					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
R3	OI	**TEST REPORTS:**					
		1) Were samples prepared and analyzed within holding times?	✓				1
		2) Were reported results within calibration range?	✓				
		3) Were all calculations verified?	✓				
		4) Were all analyte identifications verified?	✓				
		5) Were sample quantitation limits reported for all analytes not detected?	✓				
		6) If required for the project, were the tentatively identified compounds reported?			✓		
		7) Were results reported on a dry weight basis?	✓				
R4	O	**SURROGATE RECOVERY DATA:**					
		1) Were surrogates added prior to extraction?	✓				
		2) Were surrogate percent recoveries in all samples within the laboratory QC acceptance criteria?					2
R5	OI	**TEST REPORTS FOR BLANK SAMPLES:**					
		1) Were appropriate type(s) of blanks analyzed?	✓				
		2) Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
		3) Were blanks free of detected compounds?	✓				
R6	OI	**LABORATORY CONTROL SAMPLES (LCSs):**					
		1) Was each LCS prepared from a source external to the calibration standards?	✓				
		2) Were all project-required analytes included in the LCS?	✓				
		3) Was each LCS taken through the entire analytical procedure, including preparation and, if applicable, cleanup procedures?	✓				
		4) Were LCSs analyzed at the required frequency?	✓				
		5) Were LCS percent recoveries within the laboratory QC acceptance criteria?	✓				
R7	OI	**MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD) DATA:**					
		1) Were all project-required analytes included in the MS and MSD?	✓				
		2) Were MS/MSD analyzed at the appropriate frequency?	✓				
		3) Were MS percent recoveries within the laboratory QC acceptance criteria?	✓				
		4) Were MSD percent recoveries and relative percent differences (RPDs) within the laboratory QC acceptance criteria?	✓				
R8	OI	**ANALYTICAL DUPLICATE DATA:**					
		1) Were appropriate analytical duplicates analyzed for each matrix?	✓				
		2) Were analytical duplicates analyzed at the appropriate frequency?	✓				
		3) Were RPDs or relative standard deviations within the laboratory QC acceptance criteria?	✓				
R9	OI	**METHOD QUANTITATION LIMITS (MQLs):**					
		Is the concentration of the lowest non-zero calibration standard in the calibration curve reported?	✓				
R10	OI	**VALIDATION RESULTS FOR NON-REFERENCE METHODS**					
		Were all samples prepared and analyzed using a Reference Method?	✓				
R11	OI	**OTHER PROBLEMS/ANOMALIES:**					
		Are all known problems, anomalies or special conditions (e.g., use of minimum analytical limits) associated with the data noted in the Laboratory Review Checklist and Exception Reports?	✓				

TNRCC LAB REVIEW CHECKLIST (continued): Exception Reports	
Laboratory Name: TraceAnalysis	Report Date: 11/20/02
Project Name: Booster Release	Laboratory Job Number: 211050Z
Reviewer Name: Marc Stroope	Batch Number(s): N/A

ER #	Description
1	Sample 1135 was extracted & analyzed for PAH beyond hold time.
2	Surrogate 4-BFB for GRO sample 1135 was out of limits due to peak interference. LCS/LCSD show Analysis in control.

Page 1 of 1

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A02101806 / 2110502

Company Name: H2A Environmental
Phone #: 361-777-0860

Address: (Street, City, Zip) 418 San Saba Portland TX 78374
Fax #: 361-777-0971

Contact Person: Theresa Nix

Invoice to: (If different from above)

Project #: 106.009
Project Name: Booster Release

Project Location: Jal NM
Sampler Signature: [signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE		PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 8015 DRO + GRO	TX 1006	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	High TPH!! PAH - TX1006	SPLP PAH, BTEX + TPH Gro Dro	Volumetric water content	Bulk Density - FOC - Porosity	Turn Around Time if different from standard	% Moisture
210910	#1 1135	1	9oz		X								X		10-17-02	0900			X	X												X	X				X
11	#2 1136	↓	↓		↓								↓		↓	0915			↓																		X
12	#3 1137	↓	↓		↓								↓		↓	0930			↓																		X
13	#4 1138	↓	↓		↓								↓		↓	0945			↓																		X
14	#5 1139	↓	↓		↓								↓		↓	1000			↓															X	X		X

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	10-17-02	1400			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
			Vicki Quiroz	10-18-02	10:00

LAB USE ONLY
Intact (Y) / N
Headspace Y / N
Temp 1°
Log-in Review [initials]

REMARKS:
Run PAH, TX1006, SPLP PAH, SPLP BTEX + SPLP TPH on sample with highest TPH
Call Theresa w/ questions
TRR Report 11/27

☐ Check If Special Reporting Limits Are Needed

Carrier # FedEx 819228918093

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

ORIGINAL COPY

TRACEANALYSIS, INC.

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

Analytical and Quality Control Report

Thresa Nix
H2A Environmental
418 San Saba
Portland, TX 78374

Report Date: January 21, 2003

Work Order: 3010601

Project Location: Jal,NM
Project Name: Booster Release
Project Number: 106.008

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
1656	Area 4-3	soil	2003-01-02	09:00	2003-01-06
1657	Area 4-5	soil	2003-01-02	09:10	2003-01-06
1658	Area 4-7	soil	2003-01-02	09:20	2003-01-06

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

This report consists of a total of 10 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Notes:
All sample results are reported on a dry weight basis.
For inorganic analyses, the term MQL should actually read PQL.

Standard Flags

U - Not detected. The analyte is not detected above the SQL.
J - Estimated. The analyte is positively identified and the value is approximated between the SQL and MQL.
B - The sample contains less than ten times the concentration found in the method blank.
JB - The analyte is positively identified and the value is approximated between the SQL and MQL. The sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SQL.

Dr. Blair Leftwich, Director

Analytical Report

Note: *All sample results are reported on a dry weight basis.*

Sample: 1656 - Area 4-3

Analysis:	BTEX (TRRP)	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	263	Date Analyzed:	2003-01-07	Analyzed By:	CG
Prep Batch:	238	Date Prepared:	2003-01-07	Prepared By:	DN

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	<0.00149	0.00	<0.00149	mg/Kg	1	0.00149	0.00	0.001299
Toluene	U	<0.00423	0.00	<0.00423	mg/Kg	1	0.00423	0.00	0.00368
Ethylbenzene		0.00299	0.00299	<0.00128	mg/Kg	1	0.00128	0.00	0.00111
Xylene (isomers)	U	<0.0110	0.00	<0.0110	mg/Kg	1	0.0110	0.00	0.0096

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.929	mg/Kg	1	1.00	93	72 - 115
4-Bromofluorobenzene (4-BFB)		1.01	mg/Kg	1	1.00	101	72 - 113

Sample: 1656 - Area 4-3

Analysis:	Moisture Content	Analytical Method:	SM D2974-87	Prep Method:	N/A
QC Batch:	218	Date Analyzed:	2003-01-10	Analyzed By:	JW
Prep Batch:	199	Date Prepared:	2003-01-10	Prepared By:	JW

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Moisture		13.0	13.0	0.00	%	1	0.00	0.00	

Sample: 1656 - Area 4-3

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	258	Date Analyzed:	2003-01-08	Analyzed By:	BP
Prep Batch:	233	Date Prepared:	2003-01-07	Prepared By:	WG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	<24.2	<57.5	<24.2	mg/Kg	1	24.2	57.5	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		89.6	mg/Kg	1	150	60	45 - 152

Sample: 1656 - Area 4-3

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	265	Date Analyzed:	2003-01-07	Analyzed By:	CG
Prep Batch:	240	Date Prepared:	2003-01-07	Prepared By:	DN

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	U	<0.177	<1.15	<0.177	mg/Kg	1	0.177	1.15	0.15435

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.887	mg/Kg	1	1.00	89	70 - 130
4-Bromofluorobenzene (4-BFB)		0.826	mg/Kg	1	1.00	83	70 - 130

Sample: 1656 - Area 4-3

Analysis:	TX1005 (TRRP)	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	259	Date Analyzed:	2003-01-08	Analyzed By:	BP
Prep Batch:	234	Date Prepared:	2003-01-07	Prepared By:	WG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
C6-C12	U	<14.9	<57.5	<14.9	mg/Kg	1	14.9	57.5	13
>C12-C28	U	<24.2	<57.5	<24.2	mg/Kg	1	24.2	57.5	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		89.6	mg/Kg	1	150	60	58 - 118

Sample: 1657 - Area 4-5

Analysis:	BTEX (TRRP)	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	263	Date Analyzed:	2003-01-07	Analyzed By:	CG
Prep Batch:	238	Date Prepared:	2003-01-07	Prepared By:	DN

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	<0.00138	0.00	<0.00138	mg/Kg	1	0.00138	0.00	0.001299
Toluene	U	<0.00391	0.00	<0.00391	mg/Kg	1	0.00391	0.00	0.00368
Ethylbenzene	U	<0.00118	0.00	<0.00118	mg/Kg	1	0.00118	0.00	0.00111
Xylene (isomers)	U	<0.0102	0.00	<0.0102	mg/Kg	1	0.0102	0.00	0.0096

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.86	mg/Kg	1	1.00	86	72 - 115
4-Bromofluorobenzene (4-BFB)		1.02	mg/Kg	1	1.00	102	72 - 113

Sample: 1657 - Area 4-5

Analysis:	Moisture Content	Analytical Method:	SM D2974-87	Prep Method:	N/A
QC Batch:	218	Date Analyzed:	2003-01-10	Analyzed By:	JW
Prep Batch:	199	Date Prepared:	2003-01-10	Prepared By:	JW

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Moisture		5.80	5.80	0.00	%	1	0.00	0.00	

Sample: 1657 - Area 4-5

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	258	Date Analyzed:	2003-01-08	Analyzed By:	BP
Prep Batch:	233	Date Prepared:	2003-01-07	Prepared By:	WG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	<22.4	<53.1	<22.4	mg/Kg	1	22.4	53.1	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		90.5	mg/Kg	1	150	60	45 - 152

Sample: 1657 - Area 4-5

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	265	Date Analyzed:	2003-01-07	Analyzed By:	CG
Prep Batch:	240	Date Prepared:	2003-01-07	Prepared By:	DN

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	U	<0.164	<1.06	<0.164	mg/Kg	1	0.164	1.06	0.15435

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.823	mg/Kg	1	1.00	82	70 - 130
4-Bromofluorobenzene (4-BFB)		0.82	mg/Kg	1	1.00	82	70 - 130

Sample: 1657 - Area 4-5

Analysis:	TX1005 (TRRP)	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	259	Date Analyzed:	2003-01-08	Analyzed By:	BP
Prep Batch:	234	Date Prepared:	2003-01-07	Prepared By:	WG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
C6-C12	U	<13.8	<53.1	<13.8	mg/Kg	1	13.8	53.1	13
>C12-C28	U	<22.4	<53.1	<22.4	mg/Kg	1	22.4	53.1	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		90.5	mg/Kg	1	150	60	58 - 118

Sample: 1658 - Area 4-7

Analysis:	BTEX (TRRP)	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	263	Date Analyzed:	2003-01-07	Analyzed By:	CG
Prep Batch:	238	Date Prepared:	2003-01-07	Prepared By:	DN

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	<0.00138	0.00	<0.00138	mg/Kg	1	0.00138	0.00	0.001299

continued ...

sample 1658 continued ...

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Toluene	U	<0.00392	0.00	<0.00392	mg/Kg	1	0.00392	0.00	0.00368
Ethylbenzene	U	<0.00118	0.00	<0.00118	mg/Kg	1	0.00118	0.00	0.00111
Xylene (isomers)	U	<0.0102	0.00	<0.0102	mg/Kg	1	0.0102	0.00	0.0096

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.976	mg/Kg	1	1.00	98	72 - 115
4-Bromofluorobenzene (4-BFB)		1.12	mg/Kg	1	1.00	112	72 - 113

Sample: 1658 - Area 4-7

Analysis:	Moisture Content	Analytical Method:	SM D2974-87	Prep Method:	N/A
QC Batch:	218	Date Analyzed:	2003-01-10	Analyzed By:	JW
Prep Batch:	199	Date Prepared:	2003-01-10	Prepared By:	JW

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
Moisture		6.09	6.09	0.00	%	1	0.00	0.00	

Sample: 1658 - Area 4-7

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	258	Date Analyzed:	2003-01-08	Analyzed By:	BP
Prep Batch:	233	Date Prepared:	2003-01-07	Prepared By:	WG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	<22.5	<53.2	<22.5	mg/Kg	1	22.5	53.2	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		90.1	mg/Kg	1	150	60	45 - 152

Sample: 1658 - Area 4-7

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	265	Date Analyzed:	2003-01-07	Analyzed By:	CG
Prep Batch:	240	Date Prepared:	2003-01-07	Prepared By:	DN

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	U	<0.164	<1.06	<0.164	mg/Kg	1	0.164	1.06	0.15435

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.909	mg/Kg	1	1.00	91	70 - 130
4-Bromofluorobenzene (4-BFB)		0.894	mg/Kg	1	1.00	89	70 - 130

Sample: 1658 - Area 4-7

Analysis:	TX1005 (TRRP)	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	259	Date Analyzed:	2003-01-08	Analyzed By:	BP
Prep Batch:	234	Date Prepared:	2003-01-07	Prepared By:	WG

Parameter	Flag	SQL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SQL	MQL (Unadjusted)	MDL (Unadjusted)
C6-C12	U	<13.8	<53.2	<13.8	mg/Kg	1	13.8	53.2	13
>C12-C28	U	<22.5	<53.2	<22.5	mg/Kg	1	22.5	53.2	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		90.1	mg/Kg	1	150	60	58 - 118

Method Blank (1) QC Batch: 258

Parameter	Flag	Result	Units	Reporting Limits
DRO		<21.1	mg/Kg	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		96.3	mg/Kg	1	150	64	45 - 152

Method Blank (1) QC Batch: 259

Parameter	Flag	Result	Units	Reporting Limits
C6-C12		<13.0	mg/Kg	13
>C12-C28		<21.1	mg/Kg	21.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		96.3	mg/Kg	1	150	64	58 - 118

Method Blank (1) QC Batch: 263

Parameter	Flag	Result	Units	Reporting Limits
Benzene		<0.00130	mg/Kg	0.001299
Toluene		<0.00368	mg/Kg	0.00368
Ethylbenzene		<0.00111	mg/Kg	0.00111
Xylene (isomers)		<0.00960	mg/Kg	0.0096

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.952	mg/Kg	1	1.00	95	72 - 115
4-Bromofluorobenzene (4-BFB)		1.04	mg/Kg	1	1.00	104	72 - 113

Method Blank (1) QC Batch: 265

Parameter	Flag	Result	Units	Reporting Limits
GRO		<0.154	mg/Kg	0.15435

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorothymidine (TFT)		0.933	mg/Kg	1	1.00	93	70 - 130
4-Bromofluorobenzene (4-BFB)		0.902	mg/Kg	1	1.00	90	70 - 130

Duplicate (1) QC Batch: 218

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Moisture	5.79	6.09	%	1	2	11.6

Laboratory Control Spike (LCS-1) QC Batch: 258

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	209	202	mg/Kg	1	250	<21.1	82	2	46 - 148	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	95.7	98.1	mg/Kg	1	150	64	65	45 - 152

Laboratory Control Spike (LCS-1) QC Batch: 259

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
C6-C12	208	212	mg/Kg	1	250	<13.0	83	1	68.5 - 128	20
>C12-C28	195	198	mg/Kg	1	250	<21.1	76	1	66.6 - 132	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	95.7	98.1	mg/Kg	1	150	64	65	58 - 118

Laboratory Control Spike (LCS-1) QC Batch: 263

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.898	0.951	mg/Kg	1	1.00	<0.00130	90	3	64 - 132	17
Toluene	0.884	0.928	mg/Kg	1	1.00	<0.00368	88	2	50 - 129	19
Ethylbenzene	0.901	0.940	mg/Kg	1	1.00	<0.00111	90	2	48 - 129	21
Xylene (isomers)	2.73	2.82	mg/Kg	1	3.00	<0.00960	91	2	51 - 129	23

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorothymidine (TFT)	0.905	0.928	mg/Kg	1	1.00	90	93	72 - 115
4-Bromofluorobenzene (4-BFB)	0.933	0.947	mg/Kg	1	1.00	93	95	72 - 113

Laboratory Control Spike (LCS-1) QC Batch: 265

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	10.2	10.0	mg/Kg	1	10.0	<0.154	102	1	72 - 129	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorothymidine (TFT)	0.999	0.964	mg/Kg	1	1.00	100	96	70 - 130
4-Bromofluorobenzene (4-BFB)	0.980	0.967	mg/Kg	1	1.00	98	97	70 - 130

Matrix Spike (MS-1) QC Batch: 258

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	187	184	mg/Kg	1	250	<21.1	73	1	4.4 - 195	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacontane	88.2	88.2	mg/Kg	1	150	59	59	45 - 152

Matrix Spike (MS-1) QC Batch: 259

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
C6-C12	182	181	mg/Kg	1	250	<13.0	72	0	57.8 - 133	20
>C12-C28	175	172	mg/Kg	1	250	<21.1	68	1	57.8 - 137	20

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

Surrogate		MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacontane	[1]	88.2	88.3	mg/Kg	1	150	59	59	71 - 202

Matrix Spike (MS-1) QC Batch: 265

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	8.78	8.61	mg/Kg	1	10.0	<0.154	88	1	0 - 277	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorothymidine (TFT)	0.899	0.902	mg/Kg	1	1	90	90	70 - 130
4-Bromofluorobenzene (4-BFB)	0.898	0.915	mg/Kg	1	1	90	92	70 - 130

Standard (ICV-1) QC Batch: 258

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	211	84	75 - 125	2003-01-08

[1]Surrogate recovery out of range due to peak interference. LCS/LCSD show the analysis is in control.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
n-Triacontane		94	mg/Kg	1	150	63	45 - 152

Standard (CCV-1) QC Batch: 258

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	211	84	75 - 125	2003-01-08

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
n-Triacontane		96	mg/Kg	1	150	64	45 - 152

Standard (ICV-1) QC Batch: 259

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12		mg/Kg	250	210	84	75 - 125	2003-01-08
>C12-C28		mg/Kg	250	197	79	75 - 125	2003-01-08

Standard (CCV-1) QC Batch: 259

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12		mg/Kg	250	202	81	75 - 125	2003-01-08
>C12-C28		mg/Kg	250	198	79	75 - 125	2003-01-08

Standard (ICV-1) QC Batch: 263

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.0980	98	85 - 115	2003-01-07
Toluene		mg/Kg	0.100	0.0960	96	85 - 115	2003-01-07
Ethylbenzene		mg/Kg	0.100	0.0960	96	85 - 115	2003-01-07
Xylene (isomers)		mg/Kg	0.300	0.290	97	85 - 115	2003-01-07

Standard (CCV-1) QC Batch: 263

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.102	102	85 - 115	2003-01-07
Toluene		mg/Kg	0.100	0.103	103	85 - 115	2003-01-07
Ethylbenzene		mg/Kg	0.100	0.102	102	85 - 115	2003-01-07
Xylene (isomers)		mg/Kg	0.300	0.300	100	85 - 115	2003-01-07

Standard (ICV-1) QC Batch: 265

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	1.02	102	85 - 115	2003-01-07

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
Trifluorothymidine (TFT)		0.1	mg/Kg	1	0.100	100	70 - 130
4-Bromofluorobenzene (4-BFB)		0.099	mg/Kg	1	0.100	99	70 - 130

Standard (CCV-1) QC Batch: 265

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	0.966	97	85 - 115	2003-01-07

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
Trifluorothymidine (TFT)		0.098	mg/Kg	1	0.100	98	70 - 130
4-Bromofluorobenzene (4-BFB)		0.095	mg/Kg	1	0.100	95	70 - 130

217734-36

Page ___ of ___

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A03010620/30106O1

Company Name: H2A Environmental
Phone #: 361-777-0860
Address: (Street, City, Zip) 418 San Saba Portland TX 78374
Fax #: 361-777-0971
Contact Person: Theresa Nix
Invoice to: (If different from above)
Project #: 106.008
Project Name: Booster Release
Project Location: Jal NM
Sampler Signature:

ANALYSIS REQUEST

(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE		# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
217734	Area 4 - 3'	1656	1	402		X							X		1-2-3	0900
35	Area 4 - 5'	1657	↓	↓		↓							↓		↓	0910
36	Area 4 - 7'	1658	↓	↓		↓							↓		↓	0920

MTBE 8021B/602	BTEX 8021B/602	TPH ~~418.1/TX1005~~ DRO - GRO	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	TX 1005	Moisture Content	Turn Around Time if different from standard	Hold
	X	X													X	✓		
	↓	↓													↓	✓		
	↓	↓													↓	✓		

	Relinquished by:	Date:	Time:	Received by:	Date:	Time:
		1-3-02	1200			
	Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
					1-6-02	9:00

LAB USE ONLY

Intact (Y) / N
Headspace Y / N
Temp 5° °
Log-in Review MM

REMARKS:

used 1-24-02

☐ Check If Special Reporting Limits Are Needed

Carrier # Fed Ex 834679784296

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

ORIGINAL COPY

TRACEANALYSIS, INC.

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

Analytical and Quality Control Report

Jena Henry
Shell Pipeline Co.
777 Walker Street
Houston, TX 77252

Report Date: June 23, 2003

Work Order: 3061618

Project Location: Jal,NM
Project Name: Booster Release
Project Number: 106.009

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
10286	Area 1	soil	2003-06-12	09:00	2003-06-16
10287	Area 2	soil	2003-06-12	09:10	2003-06-16
10288	Area 3	soil	2003-06-12	09:20	2003-06-16
10289	Drums	soil	2003-06-12	09:30	2003-06-16

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

This report consists of a total of 10 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 10286 - Area 1

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	2358	Date Analyzed:	2003-06-20	Analyzed By:	BS
Prep Batch:	2082	Date Prepared:	2003-06-16	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0100	mg/Kg	10	0.00100
Toluene		<0.0100	mg/Kg	10	0.00100
Ethylbenzene		<0.0100	mg/Kg	10	0.00100
Xylene (isomers)		<0.0100	mg/Kg	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.764	mg/Kg	10	0.100	76	58.9 - 129
4-Bromofluorobenzene (4-BFB)		0.751	mg/Kg	10	0.100	75	44.4 - 133

Sample: 10286 - Area 1

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	2321	Date Analyzed:	2003-06-18	Analyzed By:	BP
Prep Batch:	2116	Date Prepared:	2003-06-18	Prepared By:	BP

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		210	mg/Kg	1	150	140	83 - 174

Sample: 10286 - Area 1

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	2362	Date Analyzed:	2003-06-20	Analyzed By:	BS
Prep Batch:	2150	Date Prepared:	2003-06-20	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<1.00	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.962	mg/Kg	10	0.100	96	73 - 120
4-Bromofluorobenzene (4-BFB)		0.969	mg/Kg	10	0.100	97	78 - 120

Sample: 10287 - Area 2

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	2358	Date Analyzed:	2003-06-20	Analyzed By:	BS

Prep Batch: 2082 | Date Prepared: 2003-06-16 | Prepared By: BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0100	mg/Kg	10	0.00100
Toluene		<0.0100	mg/Kg	10	0.00100
Ethylbenzene		<0.0100	mg/Kg	10	0.00100
Xylene (isomers)		<0.0100	mg/Kg	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.763	mg/Kg	10	0.100	76	58.9 - 129
4-Bromofluorobenzene (4-BFB)		0.708	mg/Kg	10	0.100	71	44.4 - 133

Sample: 10287 - Area 2

Analysis: TPH DRO | Analytical Method: Mod. 8015B | Prep Method: N/A
QC Batch: 2321 | Date Analyzed: 2003-06-18 | Analyzed By: BP
Prep Batch: 2116 | Date Prepared: 2003-06-18 | Prepared By: BP

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		282	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		213	mg/Kg	1	150	142	83 - 174

Sample: 10287 - Area 2

Analysis: TPH GRO | Analytical Method: S 8015B | Prep Method: S 5035
QC Batch: 2362 | Date Analyzed: 2003-06-20 | Analyzed By: BS
Prep Batch: 2150 | Date Prepared: 2003-06-20 | Prepared By: BS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<1.00	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.868	mg/Kg	10	0.100	87	73 - 120
4-Bromofluorobenzene (4-BFB)		0.847	mg/Kg	10	0.100	85	78 - 120

Sample: 10288 - Area 3

Analysis: BTEX | Analytical Method: S 8021B | Prep Method: S 5035
QC Batch: 2290 | Date Analyzed: 2003-06-16 | Analyzed By: BS
Prep Batch: 2082 | Date Prepared: 2003-06-16 | Prepared By: BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0100	mg/Kg	10	0.00100

continued ...

sample 10288 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Toluene		<0.0100	mg/Kg	10	0.00100
Ethylbenzene		<0.0100	mg/Kg	10	0.00100
Xylene (isomers)		<0.0100	mg/Kg	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.818	mg/Kg	10	0.100	82	58.9 - 129
4-Bromofluorobenzene (4-BFB)		0.804	mg/Kg	10	0.100	80	44.4 - 133

Sample: 10288 - Area 3

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	2321	Date Analyzed:	2003-06-18	Analyzed By:	BP
Prep Batch:	2116	Date Prepared:	2003-06-18	Prepared By:	BP

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		157	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		179	mg/Kg	1	150	119	83 - 174

Sample: 10288 - Area 3

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	2362	Date Analyzed:	2003-06-20	Analyzed By:	BS
Prep Batch:	2150	Date Prepared:	2003-06-20	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		12.6	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.04	mg/Kg	10	0.100	104	73 - 120
4-Bromofluorobenzene (4-BFB)		0.942	mg/Kg	10	0.100	94	78 - 120

Sample: 10289 - Drums

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	2358	Date Analyzed:	2003-06-20	Analyzed By:	BS
Prep Batch:	2082	Date Prepared:	2003-06-16	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene	[1]	<0.0500	mg/Kg	50	0.00100

continued ...

[1]Diluted to excess hydrocarbons after xylene.

sample 10289 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Toluene		<0.0500	mg/Kg	50	0.00100
Ethylbenzene		<0.0500	mg/Kg	50	0.00100
Xylene (isomers)		<0.0500	mg/Kg	50	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	[2]	1.03	mg/Kg	50	0.0200	103	58.9 - 129
4-Bromofluorobenzene (4-BFB)	[3]	0.988	mg/Kg	50	0.0200	99	44.4 - 133

Sample: 10289 - Drums

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	2321	Date Analyzed:	2003-06-18	Analyzed By:	BP
Prep Batch:	2116	Date Prepared:	2003-06-18	Prepared By:	BP

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		7580	mg/Kg	10	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	[4]	998	mg/Kg	10	150	66	83 - 174

Sample: 10289 - Drums

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	2362	Date Analyzed:	2003-06-20	Analyzed By:	BS
Prep Batch:	2150	Date Prepared:	2003-06-20	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		26.2	mg/Kg	50	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.11	mg/Kg	10	0.100	111	73 - 120
4-Bromofluorobenzene (4-BFB)		1.13	mg/Kg	10	0.100	113	78 - 120

Method Blank (1) QC Batch: 2290

Parameter	Flag	Result	Units	RL
Benzene		<0.0100	mg/Kg	0.001
Toluene		<0.0100	mg/Kg	0.001
Ethylbenzene		<0.0100	mg/Kg	0.001

continued ...

[2]Changed spike amount from 0.1 to 0.02 due to dilution
[3]Changed spike amount from 0.1 to 0.02 due to dilution
[4]Surrogate recovery out of range due to matrix effects. QC show the process within control.

method blank continued ...

Parameter	Flag	Result	Units	RL
Xylene (isomers)		<0.0100	mg/Kg	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.984	mg/Kg	10	0.100	98	58.9 - 129
4-Bromofluorobenzene (4-BFB)		0.910	mg/Kg	10	0.100	91	44.4 - 133

Method Blank (1) QC Batch: 2321

Parameter	Flag	Result	Units	RL
DRO		<50.0	mg/Kg	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		133	mg/Kg	1	150	89	83 - 174

Method Blank (1) QC Batch: 2358

Parameter	Flag	Result	Units	RL
Benzene		<0.0100	mg/Kg	0.001
Toluene		<0.0100	mg/Kg	0.001
Ethylbenzene		<0.0100	mg/Kg	0.001
Xylene (isomers)		<0.0100	mg/Kg	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.910	mg/Kg	10	0.100	91	58.9 - 129
4-Bromofluorobenzene (4-BFB)		0.794	mg/Kg	10	0.100	79	44.4 - 133

Method Blank (1) QC Batch: 2362

Parameter	Flag	Result	Units	RL
GRO		1.31	mg/Kg	0.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.07	mg/Kg	10	0.100	107	73 - 120
4-Bromofluorobenzene (4-BFB)		1.02	mg/Kg	10	0.100	102	78 - 120

Laboratory Control Spike (LCS-1) QC Batch: 2290

continued ...

control spikes continued ...

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.993	1.01	mg/Kg	10	0.100	<0.0131	99	2	83.4 - 112	35
Toluene	1.00	1.02	mg/Kg	10	0.100	<0.0365	100	2	82.6 - 112	36
Ethylbenzene	0.989	1.00	mg/Kg	10	0.100	<0.0492	99	1	80.3 - 114	40
Xylene (isomers)	2.99	3.03	mg/Kg	10	0.300	<0.0941	100	1	78.9 - 114	39

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.868	0.921	mg/Kg	10	0.100	87	92	74.7 - 114
4-Bromofluorobenzene (4-BFB)	0.893	0.946	mg/Kg	10	0.100	89	94	76.2 - 110

Laboratory Control Spike (LCS-1) QC Batch: 2321

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	265	266	mg/Kg	1	250	25	96	0	68.5 - 124	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	129	130	mg/Kg	1	150	86	86	83 - 174

Laboratory Control Spike (LCS-1) QC Batch: 2358

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.971	0.980	mg/Kg	10	0.100	<0.0131	97	1	83.4 - 112	35
Toluene	0.973	0.981	mg/Kg	10	0.100	<0.0365	97	1	82.6 - 112	36
Ethylbenzene	0.961	0.968	mg/Kg	10	0.100	<0.0492	96	1	80.3 - 114	40
Xylene (isomers)	2.88	2.92	mg/Kg	10	0.300	<0.0941	96	1	78.9 - 114	39

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.886	0.915	mg/Kg	10	0.100	88	91	74.7 - 114
4-Bromofluorobenzene (4-BFB)	0.860	0.923	mg/Kg	10	0.100	86	92	76.2 - 110

Laboratory Control Spike (LCS-1) QC Batch: 2362

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	0.926	0.953	mg/Kg	1	1.00	<0.0381	93	3	76.3 - 125	20

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

Surrogate		LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	[5,6]	0.122	0.121	mg/Kg	1	0.100	122	121	73.7 - 114
4-Bromofluorobenzene (4-BFB)	[7,8]	0.122	0.120	mg/Kg	1	0.100	122	120	76.2 - 110

Matrix Spike (MS-1) QC Batch: 2290

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.856	0.913	mg/Kg	10	0.100	<0.0131	86	6	58 - 107	22
Toluene	0.874	0.919	mg/Kg	10	0.100	<0.0365	87	5	59 - 110	20
Ethylbenzene	0.874	0.919	mg/Kg	10	0.100	<0.0492	87	5	58.4 - 113	15
Xylene (isomers)	2.65	2.78	mg/Kg	10	0.300	<0.0941	88	5	54.3 - 114	19

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.886	0.893	mg/Kg	10	0.1	89	89	50.6 - 114
4-Bromofluorobenzene (4-BFB)	0.906	0.885	mg/Kg	10	0.1	91	88	52 - 110

Matrix Spike (MS-1) QC Batch: 2321

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	194	229	mg/Kg	1	250	0	78	16	37.5 - 147	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacontane	151	154	mg/Kg	1	150	101	102	83 - 174

Matrix Spike (MS-1) QC Batch: 2358

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.766	0.798	mg/Kg	10	0.100	<0.0131	77	4	58 - 107	22
Toluene	0.775	0.804	mg/Kg	10	0.100	<0.0365	78	4	59 - 110	20
Ethylbenzene	0.777	0.810	mg/Kg	10	0.100	<0.0492	78	4	58.4 - 113	15
Xylene (isomers)	2.33	2.43	mg/Kg	10	0.300	<0.0941	78	4	54.3 - 114	19

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.739	0.738	mg/Kg	10	0.1	74	74	50.6 - 114
4-Bromofluorobenzene (4-BFB)	0.703	0.757	mg/Kg	10	0.1	70	76	52 - 110

Matrix Spike (MS-1) QC Batch: 2362

[5]High surrogate recovery due to prep. ICV, CCV show the method to be in control.
[6]High surrogate recovery due to prep. ICV, CCV show the method to be in control.
[7]High surrogate recovery due to prep. ICV, CCV show the method to be in control.
[8]High surrogate recovery due to prep. ICV, CCV show the method to be in control.

Param		MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	[9]	13.1	6.16	mg/Kg	10	1.00	<0.381	131	72	32.9 - 152	20

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

Surrogate		MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	[10]	0.718	0.857	mg/Kg	10	0.1	72	86	50.6 - 114
4-Bromofluorobenzene (4-BFB)	[11]	0.899	0.988	mg/Kg	10	0.1	90	99	52 - 110

Standard (ICV-1) QC Batch: 2290

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.103	103	85 - 115	2003-06-16
Toluene		mg/L	0.100	0.104	104	85 - 115	2003-06-16
Ethylbenzene		mg/L	0.100	0.103	103	85 - 115	2003-06-16
Xylene (isomers)		mg/L	0.300	0.310	103	85 - 115	2003-06-16

Standard (CCV-1) QC Batch: 2290

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0972	97	85 - 115	2003-06-16
Toluene		mg/L	0.100	0.0983	98	85 - 115	2003-06-16
Ethylbenzene		mg/L	0.100	0.0971	97	85 - 115	2003-06-16
Xylene (isomers)		mg/L	0.300	0.292	97	85 - 115	2003-06-16

Standard (ICV-1) QC Batch: 2321

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	264	106	83 - 174	2003-06-18

Standard (CCV-1) QC Batch: 2321

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	288	115	83 - 174	2003-06-18

Standard (ICV-1) QC Batch: 2358

[9] RPD is outside normal limits. LCS, LCSD show the method to be in control.
[10] Surrogate is within limits 32.9 - 152.
[11] Surrogate is within limits 32.9 - 152.

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0942	94	85 - 115	2003-06-20
Toluene		mg/L	0.100	0.0950	95	85 - 115	2003-06-20
Ethylbenzene		mg/L	0.100	0.0968	97	85 - 115	2003-06-20
Xylene (isomers)		mg/L	0.300	0.287	96	85 - 115	2003-06-20

Standard (CCV-1) QC Batch: 2358

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0916	92	85 - 115	2003-06-20
Toluene		mg/L	0.100	0.0961	96	85 - 115	2003-06-20
Ethylbenzene		mg/L	0.100	0.101	101	85 - 115	2003-06-20
Xylene (isomers)		mg/L	0.300	0.293	98	85 - 115	2003-06-20

Standard (ICV-1) QC Batch: 2362

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.866	87	85 - 115	2003-06-20

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
Trifluorotoluene (TFT)		0.114	mg/L	1	0.100	114	73 - 120
4-Bromofluorobenzene (4-BFB)		0.105	mg/L	1	0.100	105	78 - 120

Standard (CCV-1) QC Batch: 2362

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.978	98	85 - 115	2003-06-20

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
Trifluorotoluene (TFT)		0.111	mg/L	1	0.100	111	73 - 120
4-Bromofluorobenzene (4-BFB)		0.115	mg/L	1	0.100	115	78 - 120

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # 3061618

Company Name: HJA Environmental — Phone #: 361-777-0860

Address: (Street, City, Zip) 418 San Saba Portland TX 78374 — Fax #: 361-777-0971

Contact Person: Jenna Henry Eagle LLC CRMT P.O. Box 2648 Houston, TX 77252

Invoice to: (If different from above) Phone 713-241-0236 Fax 713-214-4119

Project #: 106.009 — Project Name: Booster

Project Location: Jal NM — Sampler Signature:

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	TPH DRO + GRO						Turn Around Time if different from standard
10286	Area 1	2	9oz		X							X		6-12	0900		X														X						
10287	Area 2	↓	↓		↓							↓		↓	0910		↓														↓						
10288	Area 3														0920																						
10289	Drums	↓	↓		↓							↓		↓	0930		↓														↓						

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	6-13-03	12:00			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by: Brenda Ward	Date: 6/16/03	Time: 11:48

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

LAB USE ONLY

Intact (Y) N

Headspace Y / N

Temp 4c °

Log-in Review [initials]

REMARKS:

P + F 6/23/03

☐ Check If Special Reporting Limits Are Needed

Carrier # Fed Ex 834679802027