AP - 9

STAGE 2 REPORT

Date 10-5-12

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MOBILE DUAL PHASE EXTRACTION REPORT
HDO 90-23 PIPELINE RELEASE
LEA COUNTY, NEW MEXICO
SRS # HDO 90-23
NMOCD ID# AP-009
TALON/LPE PROJECT # 700376.099.02

RECEIVED OCD
2012 NOV 15 P 1:52

PREPARED FOR:

PLAINS MARKETING, L.P.
333 CLAY STREET
SUITE 1600
HOUSTON, TEXAS 77002

PREPARED BY:

TALON/LPE
921 N. BIVINS
AMARILLO, TEXAS 79107

STATE OF TEXAS
PAUL A. SANTOS
95526
LICENSED
PROFESSIONAL ENGINEER
10/5/12
TALON/LPE (F-6862)

DISTRIBUTION:

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COPY 5 - TALON/LPE

OCTOBER 5, 2012

TABLE OF CONTENTS

Section Page

Attachments:

I. MDPE SUMMARY REPORT AND WASTE DISPOSITION

A. MDPE Results

The following report summarizes data collected during the 12-hour High Vacuum Multi-Phase Extraction (MDPE) event conducted from August 8th to August 9th, 2012 at the HDO 90-23 Pipeline release site, located in Lea County, New Mexico. The objective of the MDPE treatment was to remove both vapor and liquid phase separated hydrocarbons (PSH) from onsite groundwater wells. Talon/LPE utilized an MDPE unit which consisted of an SVE extraction pump capable of generating vacuum up to 25" hg. Off gas vapors extracted from the extraction wells were destroyed using a propane-fired 1000-SCFM thermal oxidizer capable of processing 172.96 lbs/hr of gasoline.

A total of 12 hours (0.5 days) of PSH recovery was performed. (MW-2 and MW-6 for 12 hours)

Prior to and immediately following the event, the groundwater wells were gauged for groundwater elevation and PSH. Depth to groundwater ranges were measured in feet below the top of casing. Refer to Attachment 1 for a summary of data collected during the MDPE event.

The volume of PSH removed during the MDPE event is shown to reflect the portions of PSH in the liquid phase and as off-gas vapor. Air removal rates were calculated from velocity measurements recorded at the influent manifold prior to entry into the MDPE unit. PSH recovery and air flow data has been detailed and is contained in Table 1. Two influent air samples were collected over the course of the event. These samples were submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. Both influent samples were tested for Total-Gas Analysis (Hydrocarbon Composition) by ASTM method D 1945. Laboratory analytical results can be found in Attachment 2.

Based on a combination of field vapor screening and collected laboratory samples, a combined estimated total of **71.49 equivalent gallons of hydrocarbons (Total)** were removed during the event. The combined volume of hydrocarbons were comprised of approximately **67 gallons of PSH (liquid phase)** and approximately **4.49 gallons as off-gas vapor**. The calculations used to estimate the off-gas vapor mass recovered reflect the mass of total hydrocarbons recovered and does not necessarily equate to an equal mass of the product released. The mass recovery calculations may be affected by variations in the specific gravity of hydrocarbon released, age of release, activity of aerobic and/or anaerobic processes, and site specific geochemical factors.

The cumulative air flow measurements for the MDPE event were calculated using a combination of field data measurements and Preso® B+ manufacturer provided formulas. **Air flow rates extracted from the recovery wells averaged 87.07 SCFM** during the event.

A portion of the extracted air flow rates measured is attributable to compressed air, which was "injected" into the extraction wells. This "injected" air is introduced into the

extraction wells for the purpose of enhancing liquid recovery rates.

B. Air Quality

Two influent air samples were collected during the event. These samples were submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. The maximum concentration in air influent was recorded as 6,498 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 2,798 gallons of fluid were generated during this event. The fluids were transferred to an on-site storage tank prior to being hauled to an authorized disposal facility. A copy of the disposal ticket can be found in Attachment 4.

II. SYSTEM OPERATION DATA AND MASS RECOVERY CALCULATIONS

Formulae:

$$\text{Concentration (C\_mg/l)} = \frac{\text{C\_ppmv x Mol. wt. in mg(estimated) x 1000 x 0.000001}}{\text{0.0821 x Temp (K)}}$$

$$\text{Recovery Rate (lbs/hr)} = \frac{\text{(C\_mg/l) x 2.2 x (Flowrate) x 60 x 28.32}}{\text{1,000,000}}$$

Recovery (lbs) = (lbs/hr) x (hrs)

$$\text{Correction Factor (CF)} = \frac{\text{PID Reading(ppmv)}}{\text{PID Reading at Time of Laboratory Analysis}}$$

$$\frac{\text{8.34 lbs}}{\text{gallon water}} \times \text{0.82 average specific gravity of light crude (estimated)} = \frac{\text{6.84 lbs light crude}}{\text{gallon}}$$

Table 1
System Operation Data and Mass Recovery Calculations

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h20)	Differential pressure (In. h20)	Flow (SCFM)	PID Readings (ppmv)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
12:30	0.5	78	18.5	251.77	24.1	105.33	421.5	-	6498.00	3.22	20956	47.90	18.86	9.43	9.43
13:00	0.5	80	18.5	251.77	15.3	83.77	130.7	6498.00	6498.00	1.00	6498	14.80	4.63	2.32	11.75
14:00	1	84	18.5	251.77	17.1	88.24	145.3	-	6498.00	1.11	7224	16.33	5.39	5.39	17.13
15:00	1	90	18.5	251.77	16.8	86.98	108.9	-	6498.00	0.83	5414	12.11	3.94	3.94	21.07
16:00	1	94	18.5	251.77	17.7	88.96	63.3	-	6498.00	0.48	3147	6.99	2.32	2.32	23.39
17:00	1	104	18.5	251.77	16.5	85.12	48.8	-	6498.00	0.37	2426	5.29	1.68	1.68	25.08
18:00	1	104	18.5	251.77	15.7	83.03	38	-	6498.00	0.29	1889	4.12	1.28	1.28	26.35
19:00	1	102	18.5	251.77	16.5	85.27	25.7	-	1907.00	0.27	514	1.42	0.45	0.45	26.81
20:00	1	98	18.5	251.77	17.2	87.38	23.9	-	1907.00	0.25	478	1.33	0.43	0.43	27.24
21:00	1	92	18.5	251.77	17.8	89.37	20.6	-	1907.00	0.22	412	1.15	0.39	0.39	27.62
22:00	1	88	18.5	251.77	14.9	82.06	38	-	1907.00	0.40	760	2.15	0.66	0.66	28.28
23:00	1	84	18.5	251.77	16.1	85.62	95.3	1907.00	1907.00	1.00	1907	5.42	1.74	1.74	30.02
0:00	1	82	18.5	251.77	14.3	80.84	38.9	-	1907.00	0.41	778	2.22	0.67	0.67	30.69
Averages:		90.77	18.50	251.77	16.92	87.07	92.22						Total	30.69	

PSH Mass Recovered in Vapor Phase = 4.49 gallons

PID maximum Concentration = 15,000 PPM

Ex: Conversion from ppmv to mg/L (influent 1)

Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(C_ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
20956	56.02752539	1	0.0821	78	298.5555556	47.89992411

Inputs are the green values.
Calculated values are yellow.
Constants are purple values.
Outpus are the blue values.

Liquid-phase Hydrocarbon Recovery

(assumes gasoline product)

$\prod * r^2 * h$ = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	30.69	lbs
	4.49	gallons
PSH Mass Recovered in Liquid Phase =	458.28	lbs
	67.00	gallons
TOTAL =	**488.97**	**lbs**
	71.49	**gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons=	67
PSH Mass in Pounds=	458.28

% Total Hydrocarbon to mg/m³ to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	0.2402		2402.00
Ethane (C2H6)	30.07	0.009		90.00
Propane (C3H8)	44.10	0.0131		131.00
Iso-Butane (C4H10)	58.12	0.0071		71.00
N-Butane (C4H10)	58.12	0.0232		232.00
Iso-Pentane (C4H12)	72.15	0.0233		233.00
N-Pentane (C5H12)	72.15	0.0365		365.00
Hexane+ (C6H14)	86.18	0.2974		2974.00
			Total	**6498.00**

Molecular Weight Calculations

Total Hydrocarbon %=	0.6498
g of Methane (CH4) =	5.929221299
g of Ethane (C2H6) =	0.416481994
g of Propane (C3H8) =	0.889058172
g of Iso-Butane (C4H10) =	0.635044629
g of N-Butane (C4H10) =	2.075075408
g of Iso-Pentane (C4H12) =	2.58709603
g of N-Pentane (C5H12) =	4.052746999
g of Hexane+ (C6H14) =	39.44280086
Calculated MW (Grams)	**56.02752539**

% Total Hydrocarbon to mg/m³ to ppmv - Influent 2

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	0.0318		318.00
Ethane (C2H6)	30.07	0.0009		9.00
Propane (C3H8)	44.10	0.0007		7.00
Iso-Butane (C4H10)	58.12	0.0034		34.00
N-Butane (C4H10)	58.12	0.0103		103.00
Iso-Pentane (C4H12)	72.15	0.0128		128.00
N-Pentane (C5H12)	72.15	0.0087		87.00
Hexane+ (C6H14)	86.18	0.1221		1221.00
			Total	**1907.00**

Molecular Weight Calculations

Total Hydrocarbon %=	0.1907
g of Methane (CH4) =	2.674735186
g of Ethane (C2H6) =	0.141914001
g of Propane (C3H8) =	0.161877294
g of Iso-Butane (C4H10) =	1.036224436
g of N-Butane (C4H10) =	3.139150498
g of Iso-Pentane (C4H12) =	4.842789722
g of N-Pentane (C5H12) =	3.291583639
g of Hexane+ (C6H14) =	55.17869953
Calculated MW (Grams)	**70.46697431**

ATTACHMENT 1
MDPE Field Logs

MDPE FIELD NOTES						
Site Name:	HDO 90-23				Event #:	2
Location:	NW of Eunice, NM				Arrive at site:	8/8/2012 11:00
Date:	8/8-9/2012					
Job#:	700376.099.02		SRS:	HDO 90-23	Start Vac:	8/8/2012 12:00
Phase:	MDPE2		Unit:	1107	Stop Vac:	8/9/2012 0:00
Onsite Personnel:	L. Bridges & B. Huntington				Leave Site:	8/9/2012 0:45

GAUGING DATA							
WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
MW-2	45.90	46.12	0.22	-	46.24	-	Stinger set @ 47'
MW-6	45.65	47.70	2.05	-	46.13	-	Stinger set @ 47'
RW-1	-	45.80	-	Not Gauged			
RW-2	-	46.01	-	Not Gauged			
WASTE:	H2O:	2731		PSH:	67		TOTAL (GAL): 2798

Sample Name	Analysis	Date:	Time:	Comments:
INFLUENT	ASTM D1945	8-Aug-12	13:00	PID = 130.7 ppm
INFLUENT	ASTM D1945	8-Aug-12	23:00	PID = 95.3 ppm
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Notes:
Tank #1 - Total 53" with no PSH = Total 1359 gallons
Tank #2 - Total 56 1/8" with PSH at 53 1/2" = Total 1439 gallons with 67 gallons of PSH

Start Date: 8-Aug-12

MDPE FIELD DATA

		Well Flow						Well Data				
TIME	SAMPLE TAKEN *	Inflent temp. (°f)	Diff. Pressure (INH20) 2" Preso	Vac (In.Hg)	PID Composite (PPM)	Propane Tank (%-size) 500 Gal.	EXHAUST TEMP F	COMMENTS: MW2 VAC (INH2O)	MW6 VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)
12:30		78	24.1	18.5	421.5	55	1406	31.8	16.2			
13:00	*	80	15.3	18.5	130.7	53	1412	31.5	16.6			
14:00		84	17.1	18.5	145.3	52	1413	26.8	14.7			
15:00		90	16.8	18.5	108.9	50	1414	29.8	12.8			
16:00		94	17.7	18.5	63.3	48	1415	25.7	7.3			
17:00		104	16.5	18.5	48.8	46	1410	28.6	7.7			
18:00		104	15.7	18.5	38	45	1411	30.6	6.7			
19:00		102	16.5	18.5	25.7	44	1409	29.9	7.1			
20:00		98	17.2	18.5	23.9	42	1410	30.2	7.5			
21:00		92	17.8	18.5	20.6	40	1415	30.9	7.7			
22:00		88	14.9	18.5	38	39	1408	25	7.9			
23:00	*	84	16.1	18.5	95.3	38	1408	27.2	8.3			
0:00		82	14.3	18.5	38.9	36	1413	25.4	7.6			

Soil Vacuum Influence

Observation Well	RW1
Extraction Well (EW)	MW2
Time:	In.H2O
13:00	0
23:00	0

ATTACHMENT 2

Laboratory Analytical Results

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Simon Walshe
Talon LPE-Amarillo
921 North Bivins
Amarillo, TX, 79107

Report Date: August 21, 2012

Work Order: 12081310

Project Location: NW of Eunice, NM
Project Name: HDO 90-23
Project Number: 700376.099.02
SRS #: HDO 90-23

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
306608	Influent #1	air	2012-08-08	13:00	2012-08-11

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 5 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director
Dr. Michael Abel, Project Manager

Report Contents

Case Narrative

Samples for project HDO 90-23 were received by TraceAnalysis, Inc. on 2012-08-11 and assigned to work order 12081310. Samples for work order 12081310 were received intact at a temperature of 25.3 C.

Samples were analyzed for the following tests using their respective methods.

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 12081310 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704219-12-8	Lubbock

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

LAB Order ID # 12.081310

Page 1 of 1

TraceAnalysis, Inc.

email: lab@traceanalysis.com

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Lubbock, Texas 79424
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1 (800) 378-1296

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200 East Sunset Rd., Suite E
El Paso, Texas 79922
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

BioAquatic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750

Company Name: Talon LPE	**Phone #:** 9064670607
Address: (Street, City, Zip) 921 N. Bivins Amarillo Tx	**Fax #:**
Contact Person: Simon Walshe	**E-mail:**
Invoice to: (If different from above) Plains (Jason Henry) SRS # HDO 90-23	
Project #: 203726.099.02	**Project Name:** HDO 90-23
Project Location (including state): NW of Eunice, 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
30608	Inlet #1	1	1			✓							✓	8-8-12	1300
609	Inlet #2	1	1			✓							✓	8-8-12	2300

MTBE 8021 / 602 / 8260 / 624	BTEX 8021 / 602 / 8260 / 624	TPH 418.1 / TX1005 / TX1005 Ext(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270 / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260 / 624	GC/MS Semi. Vol. 8270 / 625	PCB's 8082 / 608	Pesticides 8081 / 608	BOD, TSS, pH	Moisture Content	Cl, F, SO_4, NO_3-N, NO_2-N, PO_4-P, Alkalinity	Na, Ca, Mg, K, TDS, EC	ASTM D 1945				Turn Around Time if different from standard	Hold
																				✓					
																				✓					

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
	Talon	8-10-12						INST ____ °C
								OBS ____ °C
								COR ____ °C
								INST ____ °C
								OBS ____ °C
								COR ____ °C
				Brenda Ward	Trace Lubbock	8/11/12	10:20	INST IR 7 °C
								OBS 25.1 °C
								COR 25.3 °C

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

REMARKS:

- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

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

Carrier # UPS A554959916

ORIGINAL COPY

Office: 806-665-0750
Fax: 806-665-0745

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

The following analytical results were produced using the strictest quality control and most current methods:

COC #: N/A

Lab #: 13188-13189

Quality Control #: 2145

Approved by:

Neil Ray

Neil Ray

Date: 8/17/12

Office: 806-665-0790
Fax: 806-665-0745

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

Sample Matrix: Gas
Sample Type: Spot
Preservative: N/A
Sample Container: Tedlar Bag

Method(s): ASTM D 1945
Gas Analysis by Gas Chromatography

Client: Trace Analysis, Inc.
Project Location: N/A

Sample Id.: Influent Air #1
Trace: 306608-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 8/08/12 Time: N/A
Sampled By: N/A
Analysis Date: 8/16/12
Analysis By: Neil Ray

Lab #: 13188
Quality Control Report: 2145

Analytical Results

Gas Composition					
	Mol %	GPM	Vol %	ppm vol.	Wt. %
Nitrogen (N2):	99.6240	10.9014	99.1955	991955	99.4246
Carbon Dioxide (CO2):	0.1002	0.0169	0.1547	1547	0.1567
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**		**Wt. %**
Methane (CH4):	0.1565	0.0266	0.2402	2402	0.0892
Ethane (C2H6):	0.0037	0.0010	0.0090	90	0.0040
Propane (C3H8):	0.0053	0.0014	0.0131	131	0.0082
Iso-Butane (C4H10):	0.0024	0.0008	0.0071	71	0.0049
N-Butane (C4H10):	0.0081	0.0025	0.0232	232	0.0168
Iso-Pentane (C5H12):	0.0071	0.0026	0.0233	233	0.0181
N-Pentane (C5H12):	0.0111	0.0040	0.0365	365	0.0285
Hexanes+ (C6H14):	0.0817	0.0352	0.2974	2974	0.2489
Totals	100.000	10.9924	100.000		100.000

Comments - Additional Data

BTU -dry (BTU/ft^3):	7.0	Z-Comp. Factor-dry:	0.99970
BTU -water vapor sat.(BTU/ft^3):	7.8	Z-Comp. Factor-water vapor sat.:	0.99557
Specific Gravity -dry:	0.9693	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9673		

Office: 806-665-0790
Fax: 806-665-0745

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

Sample Matrix: Gas
Sample Type: Spot
Preservative: N/A
Sample Container: Tedlar Bag

Method(s): ASTM D 1945
Gas Analysis by Gas Chromatography

Client: Trace Analysis, Inc.
Project Location: N/A

Sample Id.: Influent Air #2
Trace: 306609-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 8/08/12 Time: N/A
Sampled By: N/A
Analysis Date: 8/16/12
Analysis By: Neil Ray

Lab #: 13189
Quality Control Report: 2145

Analytical Results

Gas Composition					
	Mol %	**GPM**	**Vol %**	**ppm vol.**	**Wt. %**
Nitrogen (N2):	99.8276	10.9236	99.6446	996446	99.6923
Carbon Dioxide (CO2):	0.1064	0.0179	0.1647	1647	0.1665
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**		**Wt. %**
Methane (CH4):	0.0207	0.0035	0.0318	318	0.0118
Ethane (C2H6):	0.0004	0.0001	0.0009	9	0.0004
Propane (C3H8):	0.0003	0.0001	0.0007	7	0.0004
Iso-Butane (C4H10):	0.0011	0.0004	0.0034	34	0.0023
N-Butane (C4H10):	0.0036	0.0011	0.0103	103	0.0074
Iso-Pentane (C5H12):	0.0039	0.0014	0.0128	128	0.0099
N-Pentane (C5H12):	0.0026	0.0010	0.0087	87	0.0068
Hexanes+ (C6H14):	0.0334	0.0144	0.1221	1221	0.1020
Totals	100.000	10.9635	100.000		100.000

Comments - Additional Data

BTU -dry (BTU/ft^3):	2.3	Z-Comp. Factor-dry:	0.99971
BTU -water vapor sat.(BTU/ft^3):	3.2	Z-Comp. Factor-water vapor sat.:	0.99563
Specific Gravity -dry:	0.9686	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9665		

Office: 806-665-0790
Fax: 806-665-0745

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

Sample Type: Standard
Preservative: N/A
Sample Container: Industrial Cylinder

Method(s): ASTM D 1945 Gas Analysis by Gas Chromatography

Sample Id.: DCG
Reference Std. 53619AW
Sample Temp.: 120° F
Analysis Date: 8/16/12
Analysis By: Neil Ray

Quality Control Report#: 2145

Analytical Results

RESULTS	ACTUAL	ANALYSIS			
Gas Composition			**MDL**	**RL**	**% Deviation**
	Mol %	**Mol %**	**Mol %**	**ppm mol**	**(90-100%)**
Nitrogen (N2):	4.918	4.9306	0.0010	10	99.7
Carbon Dioxide (CO2):	1.499	1.4890	0.0010	10	99.3
			MDL	**RL**	**% Deviation**
Hydrocarbon Composition	**Mol %**	**Mol %**	**Mol %**	**ppm mol**	**(90-100%)**
Methane (CH4):	69.891	69.8312	0.0001	1	99.9
Ethane (C2H6):	9.111	9.1379	0.0001	1	99.7
Propane (C3H8):	5.984	5.9888	0.0001	1	99.9
Iso-Butane (C4H10):	3.024	2.9980	0.0001	1	99.1
N-Butane (C4H10):	3.040	3.0928	0.0001	1	98.3
Iso-Pentane (C5H12):	1.012	1.0635	0.0001	1	94.9
N-Pentane (C5H12):	1.018	1.0077	0.0001	1	99.0
Hexane+ (C6H14):	0.503	0.4605	0.0001	1	91.6
Totals	100.000	100.000			

Comments - Additional Data

ACTUAL		ANALYSIS	
BTU -dry (BTU/ft3):	1324.0	BTU -dry (BTU/ft^3):	1324.4
BTU -water vapor sat. (BTU/ft3):	1318.4	BTU -water vapor sat. (BTU/ft^3):	1318.7
Specific Gravity -dry:	0.8349	Specific Gravity -dry:	0.8351
Specific Gravity -water vapor sat.:	0.8419	Specific Gravity -water vapor sat.:	0.8420
Z-Comp. Factor -dry:	0.99564	Z-Comp. Factor -dry:	0.99564
Z-Comp. Factor -water vapor sat.:	0.98306	Z-Comp. Factor -water vapor sat.:	0.98306

LAB Order ID #_____ Page_____ of _____

TraceAnalysis, Inc.

email: lab@traceanalysis.com

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

5002 Basin Street, Suite A1
Midland, Texas 79703
Tel (432) 689-6301
Fax (432) 689-6313

200 East Sunset Rd., Suite E
El Paso, Texas 79922
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

BioAquatic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750

Company Name: _____ **Phone #:** _____

Address: (Street, City, Zip) _____ **Fax #:** _____

Contact Person: _____ **E-mail:** _____

Invoice to: _____

(If different from above) _____

Project #: _____ **Project Name:** _____

Project Location (including state): _____ **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
13188	306608	1				X								8/8/12	1300
13189	306609	1				X								"	2300

MTBE 8021 / 602 / 8260 / 624	BTEX 8021 / 602 / 8260 / 624	TPH 418.1 / TX1005 / TX1005 Ext(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270 / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260 / 624	GC/MS Semi. Vol. 8270 / 625	PCB's 8082 / 608	Pesticides 8081 / 608	BOD, TSS, pH	Moisture Content	Cl, F, SO_4, NO_3-N, NO_2-N, PO_4-P, Alkalinity	Na, Ca, Mg, K, TDS, EC	ASTM D 1945				Turn Around Time if different from standard	Hold
																		X	X				

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
								INST ____ °C
								OBS ____ °C
								COR ____ °C
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
								INST ____ °C
								OBS ____ °C
								COR ____ °C
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
Brenda Ward	Trace Lubbock	8/13/12	4:30					INST ____ °C
								OBS ____ °C
								COR ____ °C

LAB USE ONLY

Intact Y / N

Headspace Y / N / NA

Log-in-Review ____

REMARKS:

12081310 Midwest

- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

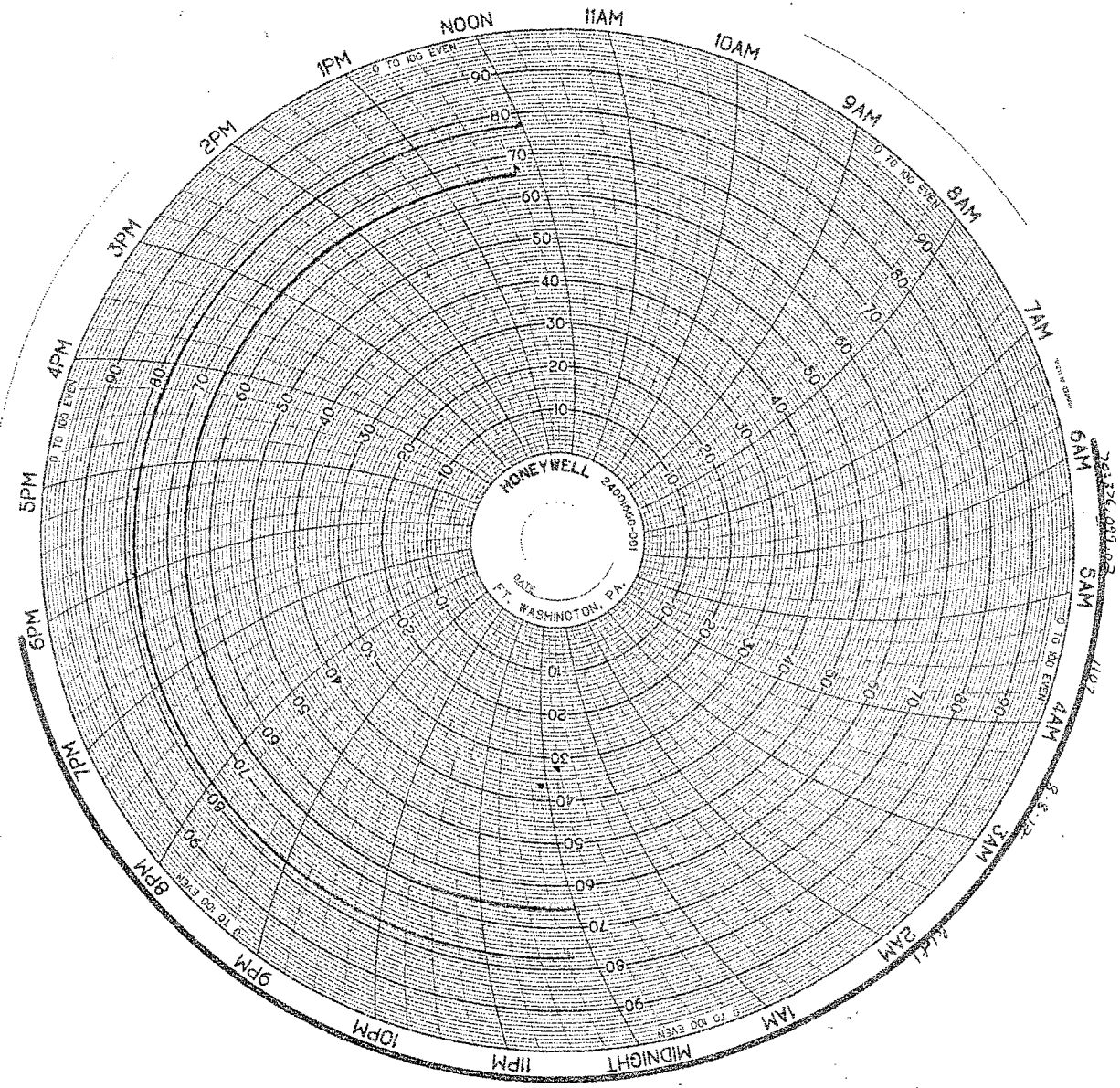
Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # _____

ORIGINAL COPY

ATTACHMENT 3

Oxidizer Charts


NOON
11AM
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4AM
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MIDNIGHT
11PM
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2PM
1PM
0 TO 100 EVEN
HONEYWELL
DATE
FT. WASHINGTON, PA.

ATTACHMENT 4

Waste Tickets

206362

24-HOUR SERVICE, CALL
LOVINGTON 396-4948
TATUM 398-4960

GANDY CORPORATION

KILL TRUCKS - VACUUM TRUCKS - WINCH TRUCKS
TANK CLEANING - ROUSTABOUTING
PRC #14225

P.O. BOX 2140
LOVINGTON, NEW MEXICO 88260

467249

Date 8-9-12 Truck No. 369

Company PLAINE PIPELINE Purchase Order No. Invoice Number

From ~~HOBBS~~ TOWNSEND Rig No. Location

To Lease SPRINKLE Well No. Location

Time Out A.M. P.M.	Time In A.M. P.M.			TIME	RATE	AMOUNT
Diesel	Brine Water	Fresh Water				
Crude Oil	Salt Water	Acid	Bbls. Hauled 67		1.10	73.70
Driver, Operator or Pusher DENNIS HARGROVE				5.5	102.00	561.00
Helper						
Helper						
Helper						
Other Charges						

Description of Work:

EMPTY OUT POLY TANK TOOK TO DISPOSAL

	Sub Total	634.70
Sprinkle SWD ticket # 62191	Sales Tax	34.91
Authorized by:	TOTAL	669.61

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