

1R - 124

REPORTS

DATE:

1-17-13



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MOBILE DUAL PHASE EXTRACTION REPORT TNM MONUMENT 18 PIPELINE RELEASE MONUMENT, LEA COUNTY, NEW MEXICO SRS # TNM MONUMENT 18

1R-124

PREPARED FOR:

PLAINS MARKETING, L.P.

333 CLAY STREET

SUITE 1600

HOUSTON, TEXAS 77002

PREPARED BY:

TALON/LPE

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AMARILLO, TEXAS 79107



2/7/13

TALON/LPE
F-6302

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JANUARY 17, 2013

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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 November 13, 2012, to November 14, 2012, at the TNM Monument 18 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-1, MW-3, & MW-4 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 **29.22 equivalent gallons of hydrocarbons (Total)** were removed during the event. The combined volume of hydrocarbons were comprised of approximately **26 gallons of PSH (liquid phase)** and approximately **3.22 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 product 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 61.61 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 influent concentration was recorded as 6,738 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 3,300 gallons of fluid were generated during this event. The fluids were temporarily transferred to an on-site storage tank prior to being transferred to an authorized disposal facility. A copy of the waste ticket can be found in Attachment 4.

II. SYSTEM OPERATION DATA AND MASS RECOVERY CALCULATIONS

Formulae:

$$\text{Concentration (C_mg/l)} = \frac{\text{C_ppmv} \times \text{Mol. wt. in mg(estimated)} \times 1000 \times 0.000001}{0.0821 \times \text{Temp (K)}}$$

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

$$\text{Recovery (lbs)} = (\text{lbs/hr}) \times (\text{hrs})$$

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

$$\frac{8.34 \text{ lbs}}{\text{gallon water}} \times 0.845 \text{ measured specific gravity of light crude} = \frac{7.047 \text{ lbs light crude}}{\text{gallon}}$$

Table 1
System Operation Data and Mass Recovery Calculations

Time	Period (hours)	Influent Temp. (°F)	Vacuum (In. hg)	Vacuum (In. h2O)	Differential pressure (In. h2O)	Flow (SCFM)	FID Readings (ppm)	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)
18:00	0.5	68	16	217.74	6.1	59.04	12695	-	6046.00	0.38	2298	2.69	0.59	0.30	0.30
18:30	0.5	64	16	217.74	6.7	62.11	33403	6046.00	6046.00	1.00	6046	7.12	1.65	0.83	1.12
19:30	1	64	16	217.74	6.5	61.18	29864	-	6046.00	0.89	5405	6.37	1.46	1.46	2.58
20:30	1	60	16.5	224.55	6.9	62.13	30117	-	6046.00	0.90	5451	6.47	1.50	1.50	4.08
21:30	1	58	16.5	224.55	7.1	63.15	25673	-	6046.00	0.77	4647	5.54	1.31	1.31	5.39
22:30	1	56	17	231.35	6.8	60.76	26199	-	6046.00	0.78	4742	5.67	1.29	1.29	6.68
23:30	1	52	17	231.35	7.3	63.20	19946	-	6046.00	0.60	3610	4.35	1.03	1.03	7.71
0:30	1	50	17	231.35	7.1	62.45	22725	-	6738.00	1.71	11523	14.16	3.31	3.31	11.01
1:30	1	48	17	231.35	7.2	63.01	17814	-	6738.00	1.34	9033	11.14	2.62	2.62	13.64
2:30	1	48	17	231.35	6.8	61.23	19632	-	6738.00	1.48	9955	12.28	2.81	2.81	16.45
3:30	1	48	17.5	238.16	6.5	58.70	15985	-	6738.00	1.20	8106	10.00	2.19	2.19	18.64
4:30	1	48	17.5	238.16	7.4	62.63	13288	6738.00	6738.00	1.00	6738	8.31	1.95	1.95	20.59
5:30	1	48	17.5	238.16	7.1	61.35	14563	-	6738.00	1.10	7385	9.11	2.09	2.09	22.68
Averages:		54.77	16.81	228.74	6.88	61.61	21684.92						Total	22.68	

PSH Mass Recovered in Vapor Phase = 3.22 gallons

FID maximum Concentration = 50,000 PPM

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

Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
2298	28.1254	1	0.0821	68	293	2.68660462

Inputs are the green values.

Calculated values are yellow.

Constants are purple values.

Output are the blue values.

Liquid-phase Hydrocarbon Recovery

$\square \cdot r^2 \cdot h$ = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase = 22.68 lbs
3.22 gallons

PSH Mass Recovered in Liquid Phase = 183.22 lbs
26.00 gallons

**TOTAL = 205.90 lbs
29.22 gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons= 26
PSH Mass in Pounds= 183.222

% Vol. Hydrocarbon to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	% Vol	=	ppmv
Methane (CH4)	16.04	0.0301		301.00
Ethane (C2H6)	30.07	0.002		20.00
Propane (C3H8)	44.10	0.0053		53.00
Iso-Butane (C4H10)	58.12	0.0678		678.00
N-Butane (C4H10)	58.12	0.0302		302.00
Iso-Pentane (C5H12)	72.15	0.0253		253.00
N-Pentane (C5H12)	72.15	0.0296		296.00
Hexane+ (C6H14)	97.40	0.4143		4143.00
Total				6046.00
*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966				

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	99.7192
Methane (CH4)	16.0425	0.0196
Carbon Dioxide (CO2)	44.011	0.0943
Ethane (C2H6)	30.069	0.0008
Propane (C3H8)	44.0956	0.0021
Iso-Butane (C4H10)	58.1222	0.0229
N-Butane (C4H10)	58.1222	0.0106
Iso-Pentane (C4H12)	72.1488	0.0076
N-Pentane (C5H12)	72.1488	0.0090
Hexane+	97.3966	0.1138
Total		99.9999
Calculated MW	28.1254	

% Vol. Hydrocarbon to ppmv - Influent 2

Compound	Molecular Weight (g/mol)	% Vol	=	ppmv
Methane (CH4)	16.04	0.5729		5729.00
Ethane (C2H6)	30.07	0.0102		102.00
Propane (C3H8)	44.10	0.0054		54.00
Iso-Butane (C4H10)	58.12	0.0017		17.00
N-Butane (C4H10)	58.12	0.0042		42.00
Iso-Pentane (C4H12)	72.15	0.0128		128.00
N-Pentane (C5H12)	72.15	0.0034		34.00
Hexane+ (C6H14)	97.40	0.0632		632.00
Total				6738.00
*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966				

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	96.0672
Methane (CH4)	16.0425	0.3799
Carbon Dioxide (CO2)	44.011	3.5218
Ethane (C2H6)	30.069	0.0043
Propane (C3H8)	44.0956	0.0022
Iso-Butane (C4H10)	58.1222	0.0006
N-Butane (C4H10)	58.1222	0.0015
Iso-Pentane (C4H12)	72.1488	0.0039
N-Pentane (C5H12)	72.1488	0.0010
Hexane+	97.3966	0.0177
Total		100.0001
Calculated MW	28.5494	

Calculated MW= $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= % Vol x 10,000

ATTACHMENT 1
MDPE Field Logs

MDPE FIELD NOTES				
Site Name:	Monument 18			Event #: 4
Location:	S. of Monument, NM			Arrive at site: 11/13/2012 17:00
Date:	11/13-14/2012			
Job#:	700376.083.04	SRS:	TNM Monument 18	Start Vac: 11/13/2012 17:30
Phase:	MDPE4	Unit:	1107	Stop Vac: 11/14/2012 5:30
Onsite Personnel:	L. Bridges & B. Huntington			Leave Site: 11/14/2012 6:00

WELL#	BEFORE			AFTER			COMMENTS	
	PSH	GW	PSH-T	PSH	GW	PSH-T		
MW-1	32.99	33.12	0.13	-	33.03	-	Stinger set @ 32'	
MW-3	-	32.71	-	-	32.92	-	Stinger set @ 32'	
MW-4	32.25	32.49	0.24	-	32.31	-	Stinger set @ 32'	
MW-7	-	32.71	-	Not Gauged				
MW-8	-	33.61	-	Not Gauged				
MW-5	-	34.52	-	Not Gauged				
MW-6	-	31.80	-	Not Gauged				
MW-9	-	34.37	-	Not Gauged				
MW-10	-	32.32	-	Not Gauged				
WASTE:	H2O:	3274		PSH:	26		TOTAL (GAL):	3300

Notes:	
Instructed to include MW-3 in extraction after no PSH was observed.	

Start Date: 13-Nov-12

MDPE FIELD DATA

		Well Flow						Well Data				
TIME	SAMPLE TAKEN	Influent temp. (°f)	Diff. Pressure (INH2O) 2" Preso	Vac (In.Hg)	FID Composite (PPM)	Propane Tank (%-size) 500 Gal.	EXHAUST TEMP F	COMMENTS:				
								MW-1	MW-4	MW-3		
								VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)
18:00		68	6.1	16	12695	95	1423	27.6	30.8	19.9		
18:30	*	64	6.7	16	33403	94	1415	28.4	31.7	21.7		
19:30		64	6.5	16	29864	92	1410	29.5	33.8	20.4		
20:30		60	6.9	16.5	30117	90	1408	30.3	32.1	25.3		
21:30		58	7.1	16.5	25673	88	1410	29.4	34.6	26.5		
22:30		56	6.8	17	26199	86	1412	28.7	33.8	23.9		
23:30		52	7.3	17	19946	84	1413	30.1	35.2	27.4		
0:30		50	7.1	17	22725	82	1411	29.6	34.9	24.8		
1:30		48	7.2	17	17814	80	1410	27.3	36.1	25.1		
2:30		48	6.8	17	19632	76	1411	25.9	33.6	23.7		
3:30		48	6.5	17.5	15985	74	1408	23.6	31.7	21.6		
4:30	*	48	7.4	17.5	13288	72	1414	20.4	32.8	19.8		
5:30		48	7.1	17.5	14563	70	1412	21.1	30.9	20.3		

Soil Vacuum Influence

Observation Well	MW-8
Extraction Well (EW)	MW-3
Time:	In.H2O
18:30	0
23:30	0
4:30	0

ATTACHMENT 2
Laboratory Analytical Results



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
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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: December 3, 2012

Work Order: 12111622



Project Location: Monument, NM
Project Name: TNM Monument #18
Project Number: 700376.083.04
SRS #: TNM Monument #18

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
314425	Influent #1	air	2012-11-13	18:30	2012-11-16

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 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

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Case Narrative

Samples for project TNM Monument #18 were received by TraceAnalysis, Inc. on 2012-11-16 and assigned to work order 12111622. Samples for work order 12111622 were received intact at a temperature of 23.0 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 12111622 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.

Report Date: December 3, 2012
700376.083.04

Work Order: 12111622
TNM Monument #18

Page Number: 4 of 5
Monument, NM

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

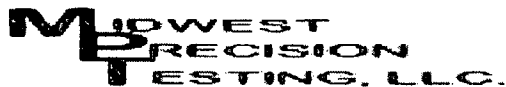
Standard Flags

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 than 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.

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



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 #: 16667-16668

Quality Control #: 2335

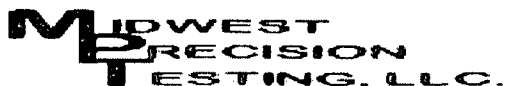
Approved by:

Neil Ray

Neil Ray

Date: 11/29/12

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



615 N. Price Rd.
Pampa, TX 79065

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

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

Sample Id.: Influent Air #1
Trace: 314425-1

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

Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 11/13/12 Time: N/A
Sampled By: N/A
Analysis Date: 11/26/12
Analysis By: Jessica Cabezudo

Lab #: 16667
Quality Control Report: 2335

Analytical Results

<u>Gas Composition</u>					
	<u>Mol %</u>	<u>GPM</u>	<u>Vol %</u>	<u>ppm vol.</u>	<u>Wt. %</u>
Nitrogen (N ₂):	99.7192	10.9118	99.2498	992498	99.3791
Carbon Dioxide (CO ₂):	0.0943	0.0159	0.1456	1456	0.1473
<u>Hydrocarbon Composition</u>					
	<u>Mol %</u>	<u>GPM</u>	<u>Vol. %</u>		<u>Wt. %</u>
Methane (CH ₄):	0.0196	0.0033	0.0301	301	0.0112
Ethane (C ₂ H ₆):	0.0008	0.0002	0.0020	20	0.0009
Propane (C ₃ H ₈):	0.0021	0.0006	0.0053	53	0.0033
Iso-Butane (C ₄ H ₁₀):	0.0229	0.0075	0.0678	678	0.0472
N-Butane (C ₄ H ₁₀):	0.0106	0.0033	0.0302	302	0.0218
Iso-Pentane (C ₅ H ₁₂):	0.0076	0.0028	0.0253	253	0.0195
N-Pentane (C ₅ H ₁₂):	0.0090	0.0033	0.0296	296	0.0231
Hexanes+ (C ₆ H ₁₄):	0.1138	0.0491	0.4143	4143	0.3465
Totals	100.000	10.9978	100.000		100.000

Comments - Additional Data

BTU -dry (BTU/ft ³):	7.8	Z-Comp. Factor-dry:	0.99970
BTU -water vapor sat.(BTU/ft ³):	8.6	Z-Comp. Factor-water vapor sat.:	0.99555
Specific Gravity -dry:	0.9708	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9687	Molecular Weight	28.1255

Office: 806-665-0750
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

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

Sample Id.: Influent Air #2
Trace: 314426-1

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

Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 11/14/12 Time: N/A
Sampled By: N/A
Analysis Date: 11/26/12
Analysis By: Jessica Cabezudo

Lab #: 16668
Quality Control Report: 2335

Analytical Results

<u>Gas Composition</u>					
	<u>Mol %</u>	<u>GPM</u>	<u>Vol %</u>	<u>ppm vol.</u>	<u>Wt. %</u>
Nitrogen (N2):	96.0672	10.5129	93.9822	939822	94.2907
Carbon Dioxide (CO2):	3.5218	0.5939	5.3442	53442	5.4187
<u>Hydrocarbon Composition</u>					
	<u>Mol %</u>	<u>GPM</u>	<u>Vol. %</u>		<u>Wt. %</u>
Methane (CH4):	0.3799	0.0645	0.5729	5729	0.2130
Ethane (C2H6):	0.0043	0.0011	0.0102	102	0.0045
Propane (C3H8):	0.0022	0.0006	0.0054	54	0.0034
Iso-Butane (C4H10):	0.0006	0.0002	0.0017	17	0.0012
N-Butane (C4H10):	0.0015	0.0005	0.0042	42	0.0030
Iso-Pentane (C5H12):	0.0039	0.0014	0.0128	128	0.0099
N-Pentane (C5H12):	0.0010	0.0004	0.0034	34	0.0026
Hexanes+ (C6H14):	0.0177	0.0076	0.0632	632	0.0530
Totals	100.000	11.1830	100.000		100.000

Comments - Additional Data

BTU -dry (BTU/ft ³):	5.1	Z-Comp. Factor-dry:	0.99963
BTU -water vapor sat.(BTU/ft ³):	5.9	Z-Comp. Factor-water vapor sat.:	0.99511
Specific Gravity -dry:	0.9856	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9837	Molecular Weight	28.5493

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



615 N. Price Rd.
 Pampa, TX 79065

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

Sample Id.: DCG
 Reference Std. 53619AW
 Sample Temp.: 120° F
 Analysis Date: 11/26/12
 Analysis By: Jessica Cabezudo

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

Quality Control Report#: 2335

Analytical Results

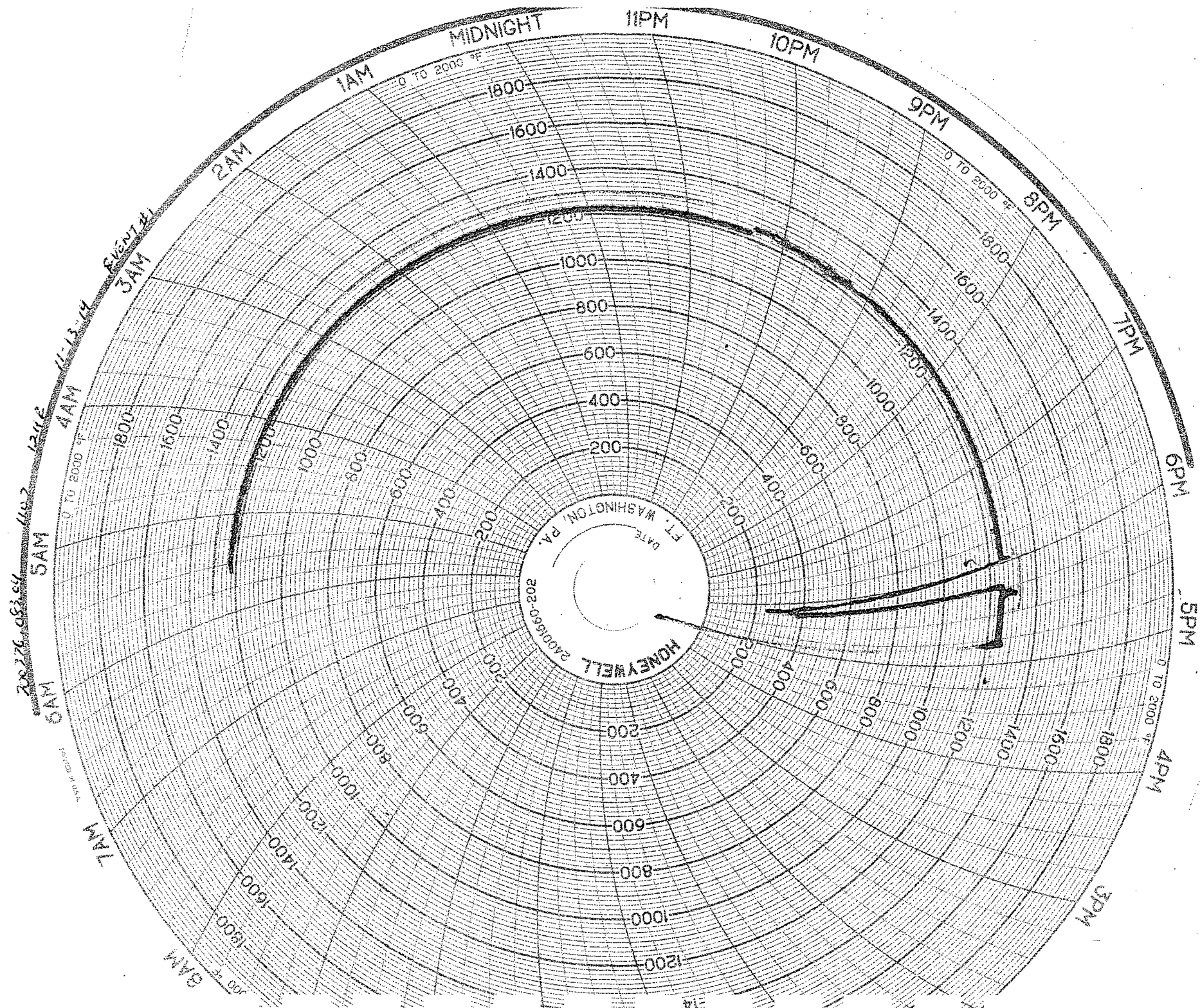
RESULTS	ACTUAL	ANALYSIS			
<u>Gas Composition</u>			MDL	RL	% Deviation
	Mol %	Mol %	Mol %	ppm mol	(90-100%)
Nitrogen (N2):	4.918	4.7667	0.0010	10	96.9
Carbon Dioxide (CO2):	1.499	1.4981	0.0010	10	99.9
			MDL	RL	% Deviation
<u>Hydrocarbon Composition</u>	Mol %	Mol %	Mol %	ppm mol	(90-100%)
Methane (CH4):	69.891	70.1327	0.0001	1	99.7
Ethane (C2H6):	9.111	9.1284	0.0001	1	99.8
Propane (C3H8):	5.984	5.8562	0.0001	1	97.9
Iso-Butane (C4H10):	3.024	2.9837	0.0001	1	98.7
N-Butane (C4H10):	3.040	3.0366	0.0001	1	99.9
Iso-Pentane (C5H12):	1.012	1.0151	0.0001	1	99.7
N-Pentane (C5H12):	1.018	1.0613	0.0001	1	95.7
Hexane+ (C6H14):	0.503	0.5211	0.0001	1	96.4
Totals	100.000	100.000			

Comments - Additional Data

ACTUAL		ANALYSIS	
BTU -dry (BTU/ft3):	1324.0	BTU -dry (BTU/ft ³):	1324.9
BTU -water vapor sat. (BTU/ft3):	1318.4	BTU -water vapor sat. (BTU/ft ³):	1319.3
Specific Gravity -dry:	0.8349	Specific Gravity -dry:	0.8339
Specific Gravity -water vapor sat.:	0.8419	Specific Gravity -water vapor sat.:	0.8408
Z-Comp. Factor -dry:	0.99564	Z-Comp. Factor -dry:	0.99563
Z-Comp. Factor -water vapor sat.:	0.98306	Z-Comp. Factor -water vapor sat.:	0.98306

ATTACHMENT 3

Oxidizer Charts



ATTACHMENT 4
Waste Ticket

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

GANDY CORPORATION

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

207807
P.O. BOX 2140
LOVINGTON, NEW MEXICO 88260

471695

Date 11-14-12 Truck No. 366
Company Plains Pipeline Purchase Order No. _____ Invoice Number _____
From SPS # T-111 Monument #18 Rig No. _____ Location _____
To Lease _____ 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			
			<u>79 bbls</u>		1.10	86.90
Driver, Operator or Pusher <u>Alvan Dominguez</u>						
Helper				5	102.00	510.00
Helper						
Helper						
Other Charges						
Description of Work: <u>Hauled 79 bbls of water & oil to</u>						
<u>"Sprinkle SWD"</u>						
<u>"Stand by at SWD to unload"</u>						
<u>Sprinkle SWD loaded 7 62200</u>						
Sub Total						596.90
Sales Tax						32.83
TOTAL						629.73

Authorized by: _____