GW-140

REPORTS

YEAR(S):

6-20-13



MOBILE DUAL PHASE EXTRACTION REPORT

TNM SPS-11 PIPELINE RELEASE

LEA COUNTY, NEW MEXICO

RECEIVED OCD

921 North Bivins Amarillo, Texas 79107 Phone 806.467.0607

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SRS # TNM SPS-11

2013 SEP 20 P 2: 02

TALON/LPE PROJECT # 700376.101.03

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GW-140

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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 April 8th, 2013, to April 9th, 2013, at the TNM SPS-11 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 on MW-1, 7, & 11 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 18.55 equivalent gallons of hydrocarbons (Total) were removed during the event. The combined volume of hydrocarbons were comprised of approximately 13 gallons of PSH (liquid phase) and approximately 5.55 gallons as offgas 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 100.31 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 7,740 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 1,547 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:

Concentration (C_mg/l) = $\frac{\text{C_ppmv x Mol. wt. in mg(estimated) x 1000 x 0.000001}}{0.0821 \text{ x Temp (K)}}$ Recovery Rate (lbs/hr) = $\frac{\text{(C_mg/l) x 2.2 x (Flowrate) x 60 x 28.32}}{1,000,000}$ Recovery (lbs) = (lbs/hr) x (hrs)

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

8.34 lbs x 0.82 average specific gravity of light crude = 6.84 lbs light crude gallon water (estimated) gallon

Table 1
System Operation Data and Mass Recovery Calculations

Time	Period (hours)	Influent Temp. (°n	Vecuum (In. hg)	Vacuum (in. h20)	Differential pressure (in. h20)	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)
18:30	0.5	84	18	244.96	20.3	98.21	50000	-	7740.00	1.00	7740	8.95	3.28	1.64	1.84
19:00	0.5	78	18	244.98	18.2	93.51	50000	7740.00	7740.00	1.00	7740	9.05	3.16	1.58	3.22
20:00	1	76	17.5	238.16	19.3	98.47	50000		7740.00	1.00	7740	9.08	3.34	3.34	6.57
21:00	1	76	17.5	238.16	20.4	101.24	50000		7740.00	1.00	7740	9.08	3.44	3.44	10.00
22:00	1	72	17	231.35	23	110.04	50000	-	7740.00	1.00	7740	9.15	3.76	3.76	13.77
23:00	1	70	18.5	224.55	23.4	113,33	50000	-	7740.00	7740.00 1.00 7740		9.18	3.89	3.89	17.66
0:00	1	70	16.5	224.55	22.7	111.62	50000	-	7740.00	1.00	7740	9.16	3.83	3.83	21.49
1:00	1	68	16,5	224.55	20.1	105.23	50000		6360.00	1.00	6360	7.57	2.98	2.98	24.47
2:00	1	66	17	231.35	18.6	99.52	50000		6360.00	1.00	6360	7.60	2.83	2.83	27.30
3:00	1	62	17	231.35	17.3	96.35	50000		6360.00	1.00	6360	7.66	2.76	2.78	30.06
4:00	1	62	17	231.35	16.8	94.95	50000		6360,00	1.00	6360	7.66	2.72	2.72	32.78
5:00	1	62	17	231.35	15.4	90.90	50000	6360.00	6360.00	1.00	6360	7.86	2.60	2.60	35.38
6:00	1	62	17	231.35	15.3	90.61	50000	-	6360.00	1.00	6360	7.66	2.60	2.60	37.97
erages:		69.85	17.12	232.92	19.29	100.31	50000.00						Total	37.97	
										PSH Mass R	ecovered in Var	or Phase =		5.55	gallons

Total Hydrocarbon Recovery

TOTAL = 126.89 lbs 18.55 gallons

PSH Mass Recovered in Liquid Phase =

FID maximum Concentration = 50,000 PPM

x: Conversi	on from ppmv	to mg/L (infi	uent 1)			
Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
7740	28.6488	1	0.0021	84	301,888889	8.94656679

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

Liquid-phase Hydrocarbon Recovery | * 12 * h = volume

Gallons removed determined at	time of pick up
PSH Volume in Gallons=	13
PSH Mass In Pounds=	88.92

	% Vol. Hydrocarbon to ppn	as Indiana			Molecula	r Weight Calculations	
	6 voi. nyurocarbon to ppn	IA - MILLIAGUE	1		component	Molecular Weight (g/mol)	mol%
Compound	Molecular Weight (g/mol)	% Vol		ppmv	Nitrogen (N2)	28.016	95.788
Methane (CH4)	16.04	0.41		4100.00	Methane (CH4)	16.0425	0.732
Ethane (C2H6)	30.07	0		0.00	Carbon Dioxide (CO2)	44.011	3.116
Propane (C3H8)	44.10	0		0.00	Ethane (C2H6)	30.069	0
Iso-Butane (C4H10)	58.12	0.005		50,00	Propane (C3H8)	44.0956	0
N-Butane (C4H10)	56.12	0.022		220.00	Iso-Butane (C4H10)	58.1222	0.006
Iso-Pentane (C4H12)	72.15	0.037		370.00	N-Butane (C4H10)	58.1222	0.022
N-Pentane (C5H12)	72.15	0.042		420.00	Iso-Pentane (C4H12)	72.1488	0.037
Hexane+ (C6H14)	97.40	0.258		2580.00	N-Pentane (C5H12)	72.1488	0.04
		-1	Total	7740.00	Hexane+	97.3966	0.26
*Hexane+ is treate	ed as 60% hexanes, 30 % heptane	s. and 10 % oc	tanes, as suc	h its		Total	100
	93.1887)+(0.3*100.2019)+(0.1*11		Calculated MW	28.648			

	Wal thedranal to	beforest	•		Molecular Weight Calculations							
	% Vol. Hydrocarbon to ppn	nv - muent	2		component	Molecular Weight (g/mol)	mol%					
Compound	Molecular Weight (g/mol)	% Vol	-	ppmv	Nitrogen (N2)	28.016	95.601					
Methane (CH4)	16.04	0.39		3900.00	Methane (CH4)	16.0425	0.696					
Ethane (C2H6)	30.07	0		0.00	Carbon Dioxide (CO2)	44.011	3.457					
Propane (C3H8)	44.10	0		0.00	Ethane (C2H6)	30.069	0					
Iso-Butane (C4H10)	58.12	0		0.00	Propane (C3H8)	44.0956	0					
N-Butane (C4H10)	58.12	0.003		30.00	iso-Butane (C4H10)	58,1222	0					
Iso-Pentane (C4H12)	72.15	0.011		110,00	N-Butane (C4H10)	56.1222	0.003					
N-Pentane (C5H12)	72.15	0.017		170.00	Iso-Pentane (C4H12)	72.1486	0.011					
Hexane+ (C6H14)	97.40	0.215		2150.00	N-Pentane (C5H12)	72.1488	0.02					
			Total	6360,00	Hexane+	97.3966	0.22					
*Hexane+ is treate	ed as 60% hexanes, 30 % heptane		Total	100								
	*93.1887)+(0.3*100.2019)+(0.1*11		Calculated MW	28.6480								

Calculated MW= sum (individual component MW x their reported mol%)

ppmv= % Vol x 10,000

ATTACHMENT 1 MDPE Field Logs

					MDPE FIE	LD NOTE			
Site Name	e:	TNM SPS						Event #:	3
Location:			V. of Hobbs	s, NM				Arrive at site:	4/8/2013 17:30
Date:		4/8-9/13							
Job#:		700376.10	01.03		SRS#:	TNM SPS		Start Vac:	4/8/2013 18:00
Phase:		MDPE3		,	Unit:	1107		Stop Vac:	4/9/2013 6:00
Onsite Pe	rsonnel:	L. Bridges	& B. Hunti	ngton				Leave Site:	4/9/2013 9:15
<u> </u>		,			GALIGI	NG DATA			
WELL#		BEFORE			AFTER	NO DATA		COMMEI	NTS
VVL_LL#	PSH	GW	PSH-T	PSH	GW	PSH-T	1	OOMINE	1110
MW-1	59.87	62.61	2.74	-	62.41	-	Stinger set @ 63	3'	
MW-11	61.07	63.98	2.91	61.80	61.81	0.01	Stinger set @ 63		
MW-4	60.50	60.72	0.22			- 0.01	Cunger ser @ cr		
MW-7	60.47	61.32	0.85		62.73	-	Stinger set @ 6	1'	
	00.47	01.02	0.00		02.70		Carrigor Society O		

		<u> </u>							
					-				
WASTE:	H2O:	1534		PSH:	13		TOTAL (GAL):	1547	
117.012.	1120.	100-1		1 011.	10		TOTAL (GAL).	1047	
Sample	Name	Ana	lvsis	Date:	Tir	ne:	Comments:	3" "	
INFLU			D 1945	4/8/2013		:00	Commonts.	FID = >5	50k
INFLU			D 1945	4/9/2013		00		FID = >5	
1111 LO		AOTIVI	D 1070	-#3/2013	- 3.			110-70	
							<u> </u>		
				1					
Notes:									
	Total form		IDOLLO 50	E/01/4 E 4 = T	'atal !! :		ellene DOLL		
							allons PSH		
				ed on the th	ree wells v	with the mo	ost PSH		
land baile	d MW-4 a	nd got 5gal	Ions H20						

Start Date: 4/8-9/2013

MDPE FIELD DATA

- 10	TO GIZO TO															
			Well Flow							Well Data						
TIME	SAMPLE	Inflent temp.	Diff.	Vac	FID	Propane	EXHAUST			COMMENTS:						
	TAKEN	(°f)	Pressure	(In.Hg)	Composite	Tank	TEMPF	MW-1	MW-11	MW-7	\geq	$>\!\!<$				
			(INH20)		(PPM)	(%-size)		VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)				
	*		2" Preso			500 Gal.		V/10 (I/1/120)	77.0 (1141.120)	V/(0 (II 11/20)	V/10 (IIV120)	V/10 (IIV/120)				
18:30		84	20.3	18	50000	84	1415	13.7	15.6	14.1	><	$>\!\!<$				
19:00	*	78	18.2	18	50000	82	1405	17.2	14.9	14.8		$>\!\!<$				
20:00		76	19.3	17.5	50000	80	1410	21.1	13.7	14.6	\rightarrow	\gg				
21:00		76	20.4	17.5	50000	78	1409	24.3	11.8	14.1		\rightarrow				
22:00		72	23	17	50000	74	1413	26.8	9.6	14.3	$>\!\!<$	$>\!\!<$				
23:00		70	23.4	16.5	50000	72	1414	32	7.5	14.7		$>\!\!<$				
0:00		70	22.7	16.5	50000	70	1411	32.1	7.6	14.9						
1:00		68	20.1	16.5	50000	68	1406	32.3	7.1	14.7		\searrow				
2:00		66	18.6	17	50000	66	1409	32	6.3	14.6		\searrow				
3:00		62	17.3	17	50000	64	1412	31.9	31.9 6.9		> <					
4:00		62	16.8	17	50000	62	1410	31.5	6.5	14.5						
5:00	*	62	15.4	17	50000	60	1407	31.8	6.2	14.7						
6:00		62	15.3	17	50000	57	1411	31.6	6.1	14.8						

Soil Vacuum Influence

Observation Well	MW-4
Extraction Well (EW)	MW-7
Time:	In. H2O
19:00	0
0:00	0
5:00	0

ATTACHMENT 2

Laboratory Analytical Results



HOUSION LABORATORIES

en authorisemble perse geographic perses class

Certificate of Analysis

Number: 1030-2013040313-001A

Simon I. Walshe, CAPM

Talon/LPE

921 N. Bivins St.

Amarillo Texas 79107

Sample ID:

Station Name:

Influent #1

Station Number: Station Location:

700376.101.03

Sample Point:

Hobbs, NM.

Sampled By:

BH

Sample Of:

Gas

Spot

Sample Date:

04/08/2013 19:00 Sample Conditions: N.G. Pres.,

April 15, 2013

N.G. Temp.

PO / Ref. No:

ANALYTICAL DATA

Components	Mol %	Wt %	GPM at 14.650 psia	Method	Lab Tech.	Date Analyzed
				GPA-2261 M	DK	4/15/2013 3:51:10 AM
Nitrogen	95.788	93.707				
Carbon Dioxide	3.116	4.789				
Methane	0.732	0.410				
Iso Butane	0.005	0.010	0.002			
n-Butane	0.022	0.045	0.007			
Iso Pentane	0.037	0.093	0.013			
n-Pentane	0.042	0.106	0.015			
Hexanes Plus	0.258	0.840	0.112			
	100.000	100.000	0.149			
	C2 +	C3 +	iC5 +			
GPM TOTAL:	0.149	0.149	0.140			
Relative Density	Real Gas			0.9887		
Calculated Molecular	Weight			28.64		
Compressibility Factor	r			0.9996		

GPA 2172-09 Calculation:

Calculated Gross BTU per ft3 @14.650 psia & 60°F

Real Gas:

Dry BTU:

25

Water Sat. Gas_Base BTU:

24

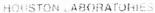
H2O Mol% - 1.75_Wt% - 1.108 Comments:

Stay

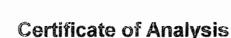
Hydrocarbon Laboratory Manager

Quality Assurance:

The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated







Number: 1030-2013040313-002A

Simon I. Walshe, CAPM

Talon/LPE 921 N. Bivins St.

Amarillo Texas 79107

Sample ID:

Station Name:

Influent #2

Station Number: Station Location: 700376.101.03

H2O Mol% - 1.75_Wt% - 1.108

Sample Point:

Hobbs, NM.

Sampled By: Sample Of:

BH Gas

Spot

Sample Date:

04/09/2013 05:00

April 15, 2013

Sample Conditions: N.G. Pres., N.G. Temp.

PO / Ref. No:

ANALYTICAL DATA

Components	Mol %	Wt %	GPN at 14.650 psia	Method	Lab Tech.	Date Analyzed
				GPA-2261 M	DK	4/15/2013 4:23:30 AM
Nitrogen	95.601	93.520				
Carbon Dioxide	3.457	5.313				
Methane	0.696	0.390				
n-Butane	0.003	0.006	0.001			
Iso Pentane	0.011	0.028	0.004			
n-Pentane	0.017	0.043	0.006			
Hexanes Plus	0.215	0.700	0.093			
	100.000	100.000	0.104			
	C2 +	C3 +	iC5 +			
GPM TOTAL:	0.104	0.104	0.103			
Relative Density	Real Gas			0.9887		
Calculated Molecular \	<i>N</i> eight			28.64		
Compressibility Factor	•			0.9996		
GPA 2172-09 Calculation	on:					
Calculated Gross BT Real Gas: Dry BT		psia & 60°F	19			
,	Sat. Gas_Base BTU	J:	19			

Staly

Hydrocarbon Laboratory Manager

Quality Assurance:

Comments:

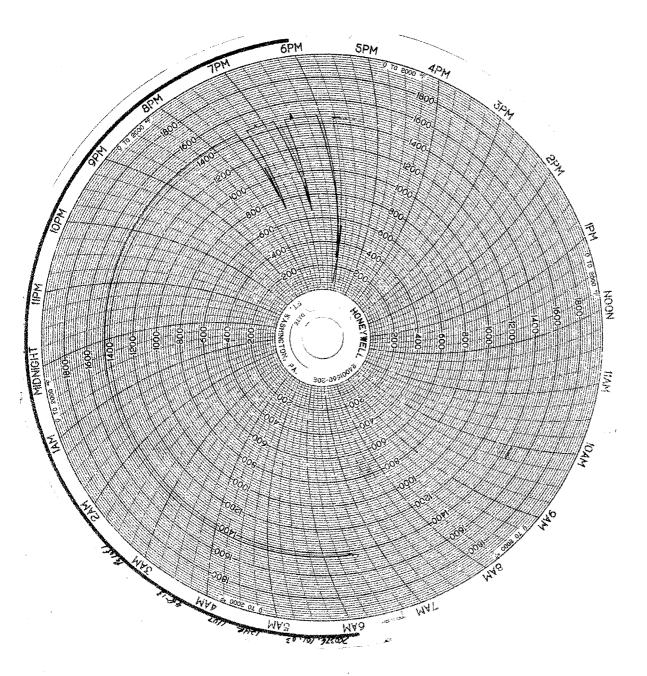
The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated

SPL, Inc. Analysis Request Chain of Custody Record

							SPL Work (Order No.:			Ac	ct. A	Mate (Code.					De	ot Co	de	SPL	
													NE	EDS	CLIE	VT C	DDE					Page 1	of
(Company Name).	Talon/LPE, L						Project/Stat	ion Name	75.11	Projec	/Station	Nu	mber	:	Proje	ct/St	ation L	ocati	ion:			Reque	sted TAT
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City/State/Zip.		2.5					Indicate Bil	ling Type:	11: 00		Check #									10 0021	ness days		
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(Company Name):	Talon/LPE, L	.td.										Pla	ce an				mple		iowi			(See quo	te for details)
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Phone: Client PO# or Ref. No.:	806-467-060 7005/le		Fax:	806-3	72-66	03	will be considered lost and will be billed at current replacement cost.				1		1				i		i		Ì		
Contract/Proposal #:	7000710									1-22		i	!				1	i		ĺ	-	1	
(i.e. SPLQ####;		JFL.	PLQ5270				GPA				-						1	1	!		Ì		
C	Samala	Sample Sample Type 5				-	Cylind	Cylinder Tracking Info					,									·	
Sample ID (used to log/track sample)	Date	Time	(Gas/Liq.	Duplicate	Composite	Spot	Cylinder#	Date Out	Date in				1					1			i	Co	mments
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Choose SPL Facility>>>	Corpor	ate HQ - Hou	ston, TX		Shij	to Ad	dress:	882	0 Intercha	nge Dr	, Hous	ton,	TX 7	7054					Phon	e:		713.660.0	901

ATTACHMENT 3

Oxidizer Charts



ATTACHMENT 4

Waste Ticket