

KANSAS CORPORATION COMMISSION ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

Type Test:

- Open Flow
 Deliverability

Test Date: 5/14 to 5/15/12

API No. 15
007-23,441-00-00

Company Hart Energies		Lease Knorp Farms		Well Number 1	
County Barber	Location NWNW	Section 27	TWP 34S	RNG (E/W) 10W	Acres Attributed
Field Knorp		Reservoir Miss.		Gas Gathering Connection none	
Completion Date 8/09		Plug Back Total Depth 5066		Packer Set at none	
Casing Size 5.5	Weight	Internal Diameter	Set at 5086	Perforations 4705	To 4720
Tubing Size 2.875	Weight	Internal Diameter	Set at 4682	Perforations	To
Type Completion (Describe) single		Type Fluid Production none		Pump Unit or Traveling Plunger? Yes / No yes-pump unit	
Producing Thru (Annulus / Tubing) annulus		% Carbon Dioxide .123		% Nitrogen 1.271	Gas Gravity - G _g .644 0.652
Vertical Depth(H)		Pressure Taps FLANGE		(Meter Run) (Prover) Size 2"	
Pressure Buildup: Shut in 5/11		at 12 at 9:00 am		(AM) (PM) Taken 5/14	
Well on Line: Started 5/14		at 12 at 9:15 AM		(AM) (PM) Taken 5/15	

OBSERVED SURFACE DATA

Duration of Shut-in **72** Hours

Static / Dynamic Property	Orifice Size (inches)	Circle one: Meter or Prover Pressure psig (P _m)	Pressure Differential in Inches H ₂ O	Flowing Temperature t	Well Head Temperature t	Casing Wellhead Pressure (P _w) or (P _i) or (P _e)		Tubing Wellhead Pressure (P _w) or (P _i) or (P _e)		Duration (Hours)	Liquid Produced (Barrels)
						psig	psia	psig	psia		
Shut-in						270	284.4			72	
Flow	1.375	20.2	5.6	66		254	268.4			24	

FLOW STREAM ATTRIBUTES

Plate Coefficient (F _b) (F _p) Mcfd	Circle one: Meter or Prover Pressure psia	Press Extension $\sqrt{P_m \times h}$	Gravity Factor F _g	Flowing Temperature Factor F _t	Deviation Factor F _{pv}	Metered Flow R (Mcfd)	GOR (Cubic Feet/ Barrel)	Flowing Fluid Gravity G _m
10.46	34.6	13.92	1.239	.9943	-----	179		.611

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_e)² = **80.883** ; (P_w)² = **72.038** ; P_d = _____ % (P_e - 14.4) + 14.4 = _____ ; (P_w)² = 0.207 ; (P_d)² = _____

(P _e) ² - (P _w) ² or (P _e) ² - (P _d) ²	(P _w) ² - (P _w) ²	Choose formula 1 or 2: 1. P _e ² - P _w ² 2. P _e ² - P _d ² divided by: P _e ² - P _w ²	LOG of formula 1, or 2, and divide by: $\frac{P_e^2 - P_w^2}{P_e^2 - P_w^2}$	Backpressure Curve Slope = "n" or Assigned Standard Slope	n x LOG []	Antilog	Open Flow Deliverability Equals R x Antilog (Mcfd)
80.676	8.845	9.121	.9600	.790	.7584	5.73	1026

Open Flow **1026** Mcfd @ 14.65 psia X .50 = Deliverability **513** Mcfd @ 14.65 psia

The undersigned authority, on behalf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct. Executed this the 21st day of May, 20 12.

Witness (if any)

For Commission

[Signature]

For Company
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MAY 23 2012
Checked by _____

KCC WICHITA

STATE OF KANSAS - CORPORATION COMMISSION
MULTIPOINT BACK PRESSURE TEST

FORM CG-1 Rev.

TYPE TEST: Initial Annual Special TEST DATE: 5/14/12

COMPANY: Hart Energies LEASE: Knorp Farms WELL NO.: 1

COUNTY: Barber LOCATION: NWNW SECTION: 27 TWP: 34S RNG (E/W): 10W ACRES: 1

API WELL NUMBER: 007-23441-00-00 RESERVOIR: Miss PIPELINE CONNECTION: Lumen-WWGG

COMPLETION DATE: 8/09 PLUG BACK TOTAL DEPTH: 5066 PACKER SET AT: none

CASING SIZE: 5.5 WT. ID. SET AT: 5086 PERF. TO: 4705 TO: 4720

TUBING SIZE: 2.875 WT. ID. SET AT: 4682 PERF. TO: 4682

TYPE COMPLETION (Describe): single TYPE FLUID PRODUCTION: Oil/SW

PRODUCING THRU: casing RESERVOIR TEMPERATURE °F: BAR PRESS - P_s: 14.4 Psia

GAS GRAVITY - G_s: 0.652 % CARBON DIOXIDE: .123 % NITROGEN: 1.271 API GRAVITY OF LIQUID: 1.271

VERTICAL DEPTH (H): TYPE METER CONNECTION: flange (METER RUN) (PROVER) SIZE: 2"

REMARKS: Tested into Lumen pipeline (250" EFM)

OBSERVED DATA

DURATION OF SHUT-IN: 72 HR.

RATE NO.	ORIFICE SIZE in.	(METER) (PROVER) PRESSURE Psig	DIFF. (h _s) (h _w)	FLOWING TEMP t	WELL-HEAD TEMP. t	CSG WELLHEAD PRESS. Psig (P _w)(P _i)(P _e) Psia	TBG WELLHEAD PRESS. Psig (P _w)(P _i)(P _e) Psia	FLOW DURATION (HOURS)	LIQUID PROD. Bbls.
SHUT IN									
1	1.375	17.1	1.2	72		270 284.4		72	
2	"	18.0	2.3	72		255 269.4		.75	
3	"	18.6	3.7	74		238 252.4		.75	
4	"	18.8	6.2	77		225 239.4		.75	

RATE OF FLOW CALCULATIONS

RATE NO.	COEFFICIENT (F ₁) (F ₂) Mcfd	(METER) (PROVER) PRESSURE Psia	PRESS EXTENSION $\sqrt{P_w - P_s}$	GRAVITY FACTOR F _g	FLOWING TEMP FACTOR F _t	DEVIATION FACTOR F _v	RATE OF FLOW Q Mcfd	GOR (ft ³ /Bbl)	G _w
1	10.46	31.8	6.18	1.239	.9887	---	79		
2	"	32.4	8.63	"	.9887	---	110		
3	"	33.0	11.04	"	.9868	---	141		
4	"	33.2	14.35	"	.9840	---	183		

PRESSURE CALCULATIONS

RATE NO.	P _i Psia	P _e Psia	P _w Psia	(P _w) ² THOUSANDS	(P _e) ² THOUSANDS	PLOTTING POINTS		% SHUT-IN 100 $\frac{(P_w - P_s)}{(P_e - P_s)}$
						(P _w) ² - (P _e) ² THOUSANDS	Q Mcfd	
1		284.4	269.4	80.9	72.5	8.4	79	94.7
2		"	261.4	"	68.3	12.6	110	91.9
3		"	252.4	"	63.7	17.2	141	88.7
4		"	239.4	"	57.3	23.6	183	84.2

INDICATED WELLHEAD OPEN FLOW 480 Mcfd @ 14.65 Psia

"n" = .790

The undersigned authority, on behalf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated herein, and that said report is true and correct. Executed this the 21st day of May, 2012.

Witness (if any)

For Commission

Gay Allen
For Company
LUM, INC.

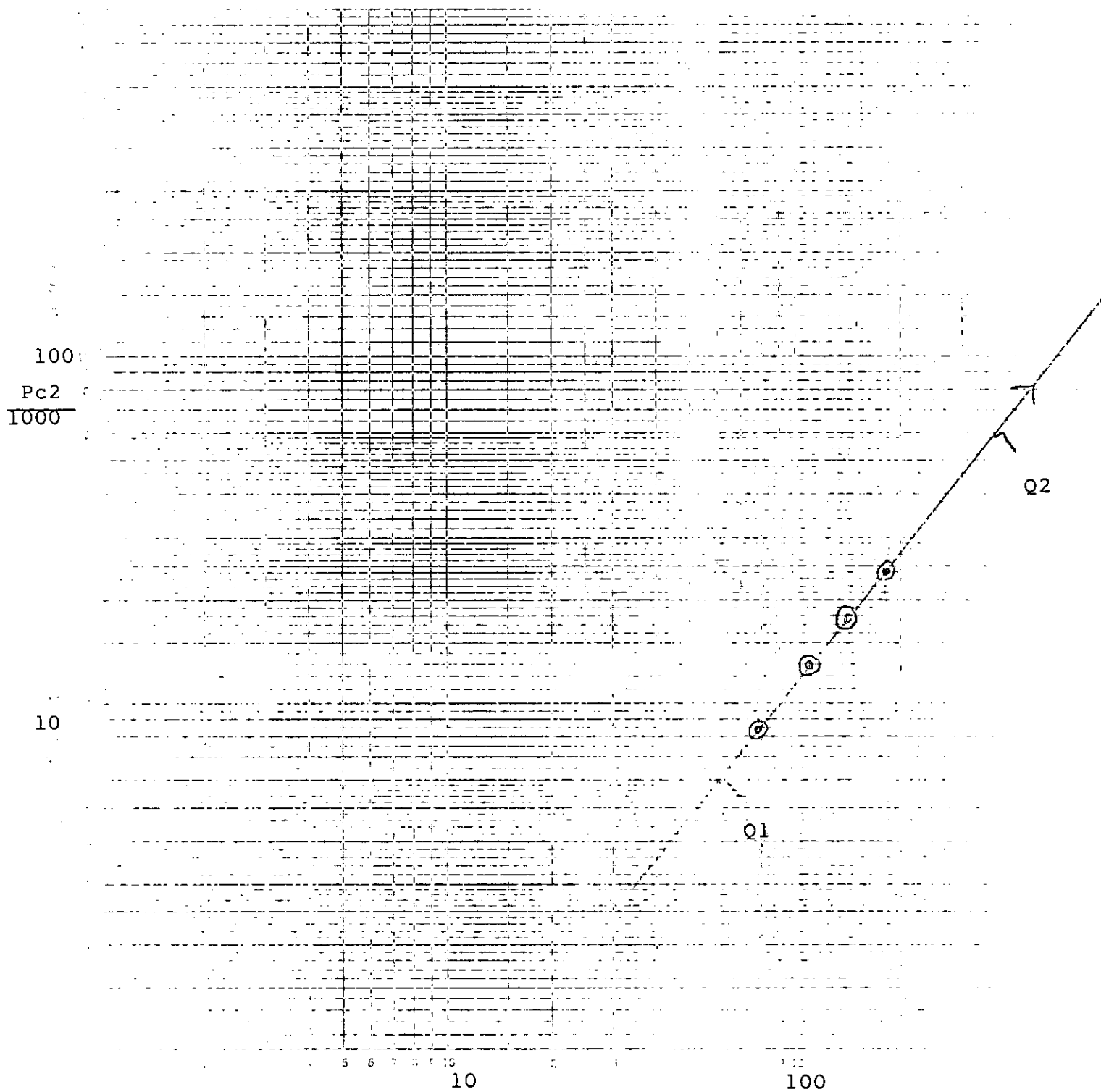
Checked By

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Hart Energies - Knorp Farms #1
NWNW 27-34S-10W
Barber County
Tested 5/14/12



Q2 - 370 - Log: 2.568
Q1 - 60 - Log: 1.778

"n" = .790

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MEASUREMENT SOLUTIONS INC.

6705 East 81st Street Suite 155 Tulsa, OK 74133

Telephone 918-493-2700 Fax 918-493-2704

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3/9/2012

GAS ANALYSIS REPORT

METER NUMBER :	890223	SAMPLE TYPE :	SPOT
METER NAME :	KNORP FARMS	SAMPLE DATE :	02/06/2012
METER ID :	WEST WICHITA	SAMPLE PRES / TEMP :	66 / 58
PRODUCER :	LUMEN ENERGY	SAMPLED BY :	CW
COMPANY :	LUMEN ENERGY	EFFECTIVE DATE :	03/01/2012

<u>COMPONENT</u>	<u>PERCENT</u>	<u>BTU VALUES @ 14.65</u>		<u>BTU VALUES @ 14.73</u>	
Helium He	0.0630	REAL DRY	1134.32	REAL DRY	1140.52
Oxygen O2	0.0000	REAL WET	1114.47	REAL WET	1120.56
Hydrogen Sulfide H2S	0.0000				
Carbon Dioxide CO2	0.1228				
Nitrogen N2	1.2706				
Methane C1	88.3097	<u>GPM VALUES @ 14.65</u>		<u>GPM VALUES @ 14.73</u>	
Ethane C2	5.7056	C2	1.5168	C2	1.5251
Propane C3	2.4629	C3	0.6744	C3	0.6781
I-Butane iC4	0.3331	iC4	0.1084	iC4	0.1090
N-Butane nC4	0.7657	nC4	0.2401	nC4	0.2414
I-Pentane iC5	0.2139	iC5	0.0779	iC5	0.0783
N-Pentane nC5	0.2692	nC5	0.0970	nC5	0.0975
Hexane Plus C6+	0.4835	C6+	0.2098	C6+	0.2109
TOTALS	100.0000		2.9244		2.9403

SPECIFIC GRAVITY

REAL DRY	0.6515
REAL WET	0.6511

COMPRESSIBILITY FACTOR

Z FACTOR DRY	0.9973
Z FACTOR WET	0.9973

GALLONS PER THOUSAND

GPM TOTALS @ 14.65

C2 + GPM	2.9244
C3 + PGM	1.4076
C4 + GPM	0.7332
C5 + GPM	0.3847

GPM TOTALS @ 14.73

C2 + GPM	2.9403
C3 + PGM	1.4152
C4 + GPM	0.7371
C5 + GPM	0.3867

COMMENTS :

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FIELD DATA SHEET

Pumper:

Phone#:

Type Test: Initial Annual Special Test Date 5/14/72

Company Lumen Enterprises Connection Lumen-WW66

Field _____ Reservoir MISS Location NW NW

Completion Date _____ Total Depth _____ Plug Back TD _____ Elevation _____ Form or Lease Name KNOP Farms

Csg. Size _____ Wt. _____ d _____ Set At _____ Perforations: From _____ To _____ Well No. 1

Tbg. Size _____ Wt. _____ d _____ Set At _____ Perforations: From _____ To _____ Sec. 27 Twp - Blk 34S Rge - Swr 10W

Type Completion (Describe) SINGLE Packer Set At NONE County or Parish MAHAR

Producing Thru CASING Reservoir Temp. F _____ Mean Annual Temp. F 60 Dera. Press. - P 14.4 State KS

G_g .651 % CO₂ .123 % N₂ 1.271 % H₂S _____ Prover _____ Meter Run 2 Taps fcc

DATE	ELAP. TIME Time of Reading	WELLHEAD WORKING PRESSURE			METER OR PROVER				REMARKS (Include liquid production data: Type - API Gravity - Amount)
		Tbg. Psig	Csg. Psig	Δ P	Pressure Psig	Diff.	Temp. F	Orifices	
<u>6:00</u>	<u>72</u>		<u>270</u>						
<u>9:15</u>								<u>1.375</u>	<u>CONDUIT TEST</u>
<u>:30</u>			<u>264</u>		<u>16.8</u>	<u>1.1</u>	<u>72</u>		<u>STARTED P. UNIT</u>
<u>:45</u>			<u>259</u>		<u>17.0</u>	<u>1.2</u>	<u>72</u>		
<u>:00</u>			<u>255</u>		<u>17.1</u>	<u>1.2</u>	<u>72</u>		
<u>:15</u>			<u>252</u>		<u>17.5</u>	<u>2.1</u>	<u>72</u>		
<u>:30</u>			<u>249</u>		<u>17.8</u>	<u>2.3</u>	<u>72</u>		
<u>:45</u>			<u>247</u>		<u>18.0</u>	<u>2.3</u>	<u>72</u>		
<u>:00</u>			<u>244</u>		<u>18.2</u>	<u>3.9</u>	<u>73</u>		<u>2.5⁰/0 763</u>
<u>:15</u>			<u>241</u>		<u>18.4</u>	<u>3.6</u>	<u>74</u>		<u>5.0⁰/0 756</u>
<u>:30</u>			<u>238</u>		<u>18.6</u>	<u>3.7</u>	<u>74</u>		<u>7.5⁰/0 250</u>
<u>:45</u>			<u>234</u>		<u>18.7</u>	<u>6.7</u>	<u>75</u>		<u>10.0⁰/0 243</u>
<u>:00</u>			<u>229</u>		<u>18.8</u>	<u>6.3</u>	<u>76</u>		<u>12.5⁰/0 236</u>
<u>:15</u>			<u>225</u>		<u>18.8</u>	<u>6.2</u>	<u>77</u>		<u>15.0⁰/0 229</u>
<u>12:30</u>			<u>237</u>		<u>19.0</u>	<u>4.8</u>	<u>83</u>		<u>17.5⁰/0 223</u>
<u>9:15</u>			<u>254</u>		<u>20.2</u>	<u>5.6</u>	<u>66</u>		<u>20.0⁰/0 216</u>
	<u>0.0</u>								<u>25.0⁰/0 202</u>
	<u>0.5</u>								
	<u>1.0</u>								<u>SET FLOW RATE FOR 1 PT TEST</u>
	<u>1.5</u>								<u>END TEST</u>
	<u>2.0</u>								<u>Begin 30 minute wellhead buildup</u>
	<u>3.0</u>								
	<u>4.0</u>								
	<u>5.0</u>								
	<u>6.0</u>								
	<u>7.0</u>								
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