

# KANSAS CORPORATION COMMISSION ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

Type Test:

(See Instructions on Reverse Side)

- Open Flow  
 Deliverability

Test Date:  
7/28/2013

API No. 15  
15-187-21225-00-00

Company Linn Operating Inc.			Lease Russell		Well Number A-5 ATU-70	
County Stanton	Location SW SW SW SW	Section 23	TWP 28S	RNG (E/W) 39W	Acres Attributed 640	
Field Hugoton-Panoma		Reservoir Chase		Gas Gathering Connection Jayhawk Gas Plant		
Completion Date 6/21/2013		Plug Back Total Depth 2600		Packer Set at NA		
Casing Size 5.5	Weight 15.5	Internal Diameter 4.95	Set at 3060	Perforations 2292	To 2510	
Tubing Size NA	Weight NA	Internal Diameter NA	Set at NA	Perforations NA	To NA	
Type Completion (Describe) Single		Type Fluid Production Dry Gas		Pump Unit or Traveling Plunger? Yes / No NO		
Producing Thru (Annulus / Tubing) Annulus		% Carbon Dioxide .075		% Nitrogen 14.597		Gas Gravity - G <sub>g</sub> .7300
Vertical Depth(H) Flange		Pressure Taps			(Meter Run) (Prover) Size 3.068	
Pressure Buildup: Shut in 7/28		20 13 at 11:00 AM		(AM) (PM) Taken 7/31		20 13 at 11:00 AM (AM) (PM)
Well on Line: Started 7/31		20 13 at 11:00 AM		(AM) (PM) Taken 8/1		20 13 at 11:00 AM (AM) (PM)

**OBSERVED SURFACE DATA**

Duration of Shut-in 72 Hours

Static / Dynamic Property	Orifice Size (inches)	Circle one: Meter Prover Pressure psig (P <sub>m</sub> )	Pressure Differential in Inches H <sub>2</sub> O	Flowing Temperature t	Well Head Temperature t	Casing Wellhead Pressure (P <sub>w</sub> ) or (P <sub>i</sub> ) or (P <sub>c</sub> )		Tubing Wellhead Pressure (P <sub>w</sub> ) or (P <sub>i</sub> ) or (P <sub>c</sub> )		Duration (Hours)	Liquid Produced (Barrels)
						psig	psia	psig	psia		
Shut-In	.75	28.7	0	28.7	73	28.7	43.1	NA	NA	72	0
Flow	.75	24.7	35.3	24.7	73	24.7	39.1	NA	NA	24	0

**FLOW STREAM ATTRIBUTES**

Plate Coefficient (F <sub>b</sub> ) (F <sub>p</sub> ) Mcfd	Circle one: Meter or Prover Pressure psia	Press Extension $\sqrt{P_m \times h}$	Gravity Factor F <sub>g</sub>	Flowing Temperature Factor F <sub>tt</sub>	Deviation Factor F <sub>pv</sub>	Metered Flow R (Mcfd)	GOR (Cubic Feet/ Barrel)	Flowing Fluid Gravity G <sub>m</sub>
2.74	9.1	37.151	1.170	.9877	1	117.680	0	0

**(OPEN FLOW) (DELIVERABILITY) CALCULATIONS**

(P<sub>c</sub>)<sup>2</sup> = 1.8576 ; (P<sub>w</sub>)<sup>2</sup> = 1.5288 ; P<sub>a</sub> = \_\_\_\_\_ % (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_ ; (P<sub>a</sub>)<sup>2</sup> = 0.207 ; (P<sub>a</sub>)<sup>2</sup> = \_\_\_\_\_

(P <sub>c</sub> ) <sup>2</sup> - (P <sub>a</sub> ) <sup>2</sup> or (P <sub>c</sub> ) <sup>2</sup> - (P <sub>w</sub> ) <sup>2</sup>	(P <sub>c</sub> ) <sup>2</sup> - (P <sub>w</sub> ) <sup>2</sup>	Choose formula 1 or 2: 1. P <sub>c</sub> <sup>2</sup> - P <sub>a</sub> <sup>2</sup> 2. P <sub>c</sub> <sup>2</sup> - P <sub>w</sub> <sup>2</sup> divided by: P <sub>c</sub> <sup>2</sup> - P <sub>w</sub> <sup>2</sup>	LOG of formula 1. or 2. and divide by: $\left[ \frac{P_c^2 - P_w^2}{P_c^2 - P_a^2} \right]$	Backpressure Curve Slope = "n" ----- Assigned Standard Slope	n x LOG $\left[ \frac{P_c^2 - P_w^2}{P_c^2 - P_a^2} \right]$	Antilog	Open Flow Deliverability Equals R x Antilog (Mcfd)
1.6506	.3288	5.020	.701	.85	.5956	3.941	463.7765

Open Flow Mcfd @ 14.65 psia Deliverability 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 1st day of August, 20 13.

RECEIVED  
KANSAS CORPORATION COMMISSION

Shawn Hildreth *Shawn Hildreth*  
For Company

Witness (if any)

For Commission

**AUG 05 2013**

Checked by