

# KANSAS CORPORATION COMMISSION

## ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

Type Test:

(See Instructions on Reverse Side)

- Open Flow  
 Deliverability

Test Date:  
12/4/2009

API No. 15  
15-199-20368 **1000**

Company Raven Resources, LLC		Lease Gebhards			Well Number #1-35	
County Wallace County	Location NE/4 SE/4	Section 35	TWP 12S R4S	RNG (E/W) 42W	Acres Attributed	
Field Niobrara		Reservoir Niobrara			Gas Gathering Connection Closed gathering system (West Kansas Pipeline)	
Completion Date 8/2008		Plug Back Total Depth 1187.46'		Packer Set at		
Casing Size 4 1/2"	Weight 10.5	Internal Diameter	Set at 1229.53'	Perforations 869' - 901'	To	
Tubing Size 2 3/8"	Weight 4.7	Internal Diameter	Set at 861.16'	Perforations	To	
Type Completion (Describe) CO2 Frac		Type Fluid Production		Pump Unit or Traveling Plunger? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Producing Thru (Annulus / Tubing) Tubing		% Carbon Dioxide		% Nitrogen		Gas Gravity - G <sub>g</sub>
Vertical Depth(H) 1240'		Pressure Taps			(Meter Run) (Prover) Size .500"	
Pressure Buildup:	Shut in 12-4	20 09	at 9 am	(AM) (PM)	Taken 12-5	20 09 at 9 am (AM) (PM)
Well on Line:	Started 12-5	20 09	at 9 am	(AM) (PM)	Taken 12-6	20 09 at 9 am (AM) (PM)

### OBSERVED SURFACE DATA

Duration of Shut-in **24** Hours

Static / Dynamic Property	Orifice Size (inches)	Circle one: Meter or Prover Pressure psig (Pm)	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	.500"	15.8	0			6		6		24	0
Flow	.500"	16.5	6			3		3		24	0

### FLOW STREAM ATTRIBUTES

Plate Coefficient (F <sub>c</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>

### (OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P<sub>c</sub>)<sup>2</sup> = \_\_\_\_\_ : (P<sub>w</sub>)<sup>2</sup> = \_\_\_\_\_ : P<sub>d</sub> = \_\_\_\_\_ % (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_ : (P<sub>a</sub>)<sup>2</sup> = 0.207  
(P<sub>o</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>d</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>d</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: $\left[ \frac{P_c^2 - P_a^2}{P_c^2 - P_w^2} \right]$	Backpressure Curve Slope = "n" ----- Assigned Standard Slope	n x LOG $\left[ \frac{P_c^2 - P_a^2}{P_c^2 - P_w^2} \right]$	Antilog	Open Flow Deliverability Equals R x Antilog (Mcfd)

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 \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

**RECEIVED**  
KANSAS CORPORATION COMMISSION

Witness (if any)

MAY 20 2010

For Company

For Commission

Checked by

CONSERVATION DIVISION  
WICHITA, KS

# KANSAS CORPORATION COMMISSION

## ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

Type Test:

- Open Flow  
 Deliverability

(See Instructions on Reverse Side)

Test Date:

API No. 15

Company		Lease <i>Subhards</i>			Well Number <i>1-35</i>
County <i>Wallace</i>	Location	Section <i>35</i>	TWP <i>11S</i>	RNG (E/W) <i>42W</i>	Across Attributed
Field		Reservoir <i>Nebraska</i>		Gas Gathering Connection	
Completion Date <i>8-6-08</i>		Plug Back Total Depth <i>1187.46'</i>		Packer Set at	
Casing Size <i>4 1/2"</i>	Weight <i>10.5</i>	Internal Diameter	Set at <i>1229.53'</i>	Perforations <i>869'-901'</i>	To
Tubing Size <i>2 3/4"</i>	Weight <i>4.7</i>	Internal Diameter	Set at <i>861.16'</i>	Perforations	To
Type Completion (Describe) <i>CO2 Frac</i>		Type Fluid Production		Pump Unit or Traveling Plunger? Yes / <input checked="" type="checkbox"/> No	
Producing Thru (Annulus / Tubing) <i>Tubing</i>		% Carbon Dioxide		% Nitrogen	Gas Gravity - G <sub>g</sub>
Vertical Depth(H)		Pressure Taps		(Meter Run) (Prover) Size <i>.500</i>	

Pressure Buildup: Shut in *12-4* 20 *09* at *9:00* ( AM) (PM) Taken *12-5* 20 *09* at *9:00* ( AM) (PM)

Well on Line: Started *12-5* 20 *09* at *9:00* ( AM) (PM) Taken *12-6* 20 *09* at *9:00* ( AM) (PM)

### OBSERVED SURFACE DATA

Duration of Shut-in *24* Hours

Static / Dynamic Property	Orifice Size (Inches)	Circs one: Meter or Prover Pressure psig (Pm)	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>1</sub> ) or (P <sub>c</sub> )		Tubing Wellhead Pressure (P <sub>w</sub> ) or (P <sub>1</sub> ) or (P <sub>c</sub> )		Duration (Hours)	Liquid Produced (Barrels)
						psig	psia	psig	psia		
Shut-In	<i>.500</i>	<i>15.8</i>	<i>0</i>			<i>6</i>		<i>6</i>		<i>24</i>	<i>0</i>
Flow	<i>.500</i>	<i>16.5</i>	<i>6</i>			<i>3</i>		<i>3</i>		<i>24</i>	<i>0</i>

### FLOW STREAM ATTRIBUTES

Plate Coefficient (F <sub>b</sub> ) (F <sub>w</sub> ) Mcfd	Circs one: Meter or Prover Pressure psia	Press Extension $\sqrt{P_a \times h}$	Gravity Factor F <sub>g</sub>	Flowing Temperature Factor F <sub>t</sub>	Deviation Factor F <sub>ps</sub>	Metered Flow R (Mcfd)	GOR (Cubic Feet/ Barrel)	Flowing Fluid Gravity G <sub>r</sub>

### (OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P<sub>1</sub>)<sup>2</sup> = \_\_\_\_\_ : (P<sub>2</sub>)<sup>2</sup> = \_\_\_\_\_ : P<sub>1</sub> = \_\_\_\_\_ % (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_ : (P<sub>2</sub>)<sup>2</sup> = 0.207 : (P<sub>2</sub>)<sup>2</sup> = \_\_\_\_\_

(P <sub>1</sub> ) <sup>2</sup> - (P <sub>2</sub> ) <sup>2</sup> or (P <sub>1</sub> ) <sup>2</sup> - (P <sub>2</sub> ) <sup>2</sup>	(P <sub>2</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>w</sub> <sup>2</sup> 2. P <sub>c</sub> <sup>2</sup> - P <sub>1</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: $P_c^2 - P_w^2$	Backpressure Curve Slope = "n" Assigned Standard Slope	n x LOG	Antilog	Open Flow Deliverability Equals R x Antilog (Mcfd)

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 *14* day of *May*, 20 *10*.

Witness (if any)

For Company

For Commission

RECEIVED  
KANSAS CORPORATION COMMISSION

Checked by

MAY 20 2010

CONSERVATION DIVISION  
TOPEKA, KS

I declare under penalty of perjury under the laws of the state of Kansas that I am authorized to request exempt status under Rule K.A.R. 82-3-304 on behalf of the operator Raven Resources, LLC and that the foregoing pressure information and statements contained on this application form are true and correct to the best of my knowledge and belief based upon available production summaries and lease records of equipment installation and/or upon type of completion or upon use being made of the gas well herein named.

I hereby request a one-year exemption from open flow testing for the Gebhards 1-35 gas well on the grounds that said well:

(Check one)

- is a coalbed methane producer
- is cycled on plunger lift due to water
- is a source of natural gas for injection into an oil reservoir undergoing ER
- is on vacuum at the present time; KCC approval Docket No. \_\_\_\_\_
- is not capable of producing at a daily rate in excess of 250 mcf/D

I further agree to supply to the best of my ability any and all supporting documents deemed by Commission staff as necessary to corroborate this claim for exemption from testing.

Date: 5/18/10

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KANSAS CORPORATION COMMISSION

MAY 20 2010

CONSERVATION DIVISION  
WICHITA, KS

Signature: [Handwritten Signature]

Title: Operator

**Instructions:** If a gas well meets one of the eligibility criteria set out in KCC regulation K.A.R. 82-3-304, the operator may complete the statement provided above in order to claim exempt status for the gas well.

At some point during the current calendar year, wellhead shut-in pressure shall have been measured after a minimum of 24 hours shut-in/buildup time and shall be reported on the front side of this form under **OBSERVED SURFACE DATA**. Shut-in pressure shall thereafter be reported yearly in the same manner for so long as the gas well continues to meet the eligibility criterion or until the claim of eligibility for exemption **IS** denied.

The G-2 form conveying the newest shut-in pressure reading shall be filed with the Wichita office no later than December 31 of the year for which it's intended to acquire exempt status for the subject well. The form must be signed and dated on the front side as though it was a verified report of annual test results.