

KANSAS CORPORATION COMMISSION ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

Type Test:

- Open Flow
 Deliverability

(See Instructions on Reverse Side)

Test Date:
8/22 to 8/23/13

API No. 15
007-23,083-00-00

Company Rains & Williamson Oil Company, Inc.			Lease Hagan		Well Number 3-23
County Barber	Location CNW	Section 23	TWP 32S	RNG (E/W) 10W	Acres Attributed
Field McGuire-Goemann		Reservoir Miss Chert	Gas Gathering Connection Lumen/WWGG		
Completion Date 11/13/06		Plug Back Total Depth 4450	Packer Set at none		
Casing Size 5.5	Weight	Internal Diameter	Set at 4467	Perforations 4364	To 4383
Tubing Size 2.375	Weight	Internal Diameter	Set at 4390	Perforations	To
Type Completion (Describe) single		Type Fluid Production Oil/SW	Pump Unit or Traveling Plunger? Yes / No Yes - pump unit		
Producing Thru (Annulus / Tubing) annulus		% Carbon Dioxide .207	% Nitrogen .858	Gas Gravity - G _g .742	
Vertical Depth(H)		Pressure Taps flange		(Meter Run) (Prover) Size 2"	
Pressure Buildup: Shut in		8/19	20	13	at 8:45 am (AM) (PM)
Well on Line: Started		8/22	20	13	at 8:45 am (AM) (PM)
					8/23
					20
					13
					at 8:45 am (AM) (PM)

OBSERVED SURFACE DATA

Duration of Shut-in 72 Hours

Static / Dynamic Property	Orifice Size (inches)	Circle one: Meter or Prover Pressure psig (Pm)	Pressure Differential in Inches H ₂ O	Flowing Temperature t	Well Head Temperature t	Casing Wellhead Pressure (P _w) or (P _i) or (P _c)		Tubing Wellhead Pressure (P _w) or (P _i) or (P _c)		Duration (Hours)	Liquid Produced (Barrels)
						psig	psia	psig	psia		
Shut-In						181	195.4			72	
Flow	1.250	32	24.2	71		152	166.4			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
8.329	46.4	33.51	1.161	.9896	-----	320		.742

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_c)² = 38.181 ; (P_w)² = 27.688 ; P_d = _____ % (P_c - 14.4) + 14.4 = _____ ; (P_a)² = 0.207
(P_d)² = _____

(P _c) ² - (P _a) ² or (P _c) ² - (P _d) ²	(P _c) ² - (P _w) ²	Choose formula 1 or 2: 1. P _c ² - P _a ² 2. P _c ² - P _d ² divided by: P _c ² - P _w ²	LOG of formula 1. or 2. and divide by: $\frac{P_c^2 - P_w^2}{P_c^2 - P_a^2}$	Backpressure Curve Slope = "n" ----- Assigned Standard Slope	n x LOG []	Antilog	Open Flow Deliverability Equals R x Antilog (Mcfd)
37.974	10.493	3.619	.5586	.690	.3854	2.43	778

Open Flow **778** Mcfd @ 14.65 psia X .50 = Deliverability **389** 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 28th day of August, 2013.

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Witness (if any)

For Commission

[Signature]

For Company

Checked by
CONSERVATION DIVISION
WICHITA, KS

SEP 03 2013

STATE OF KANSAS - CORPORATION COMMISSION
MULTIPOINT BACK PRESSURE TEST

FORM CG-1 Rev.

TYPE TEST: Initial Annual Special **TEST DATE:** 8/22/13
COMPANY: Rains & Williamson Oil Company, Inc **LEASE:** Hagan **WELL NO.:** 3-23
COUNTY: Barber **LOCATION:** CNW **SECTION:** 23 **TWP:** 32S **RNG (E/W):** 10W **ACRES:**
API WELL NUMBER: 15-007-23,083-00-00 **RESERVOIR:** Miss Chert **PIPELINE CONNECTION:** Lumen/WWGG
COMPLETION DATE: 11/13/06 **PLUG BACK:** **PACKER SET AT:**
CASING SIZE: 5.5 **WT.:** **ID.:** **SET AT:** 4467 **PERF.:** **TO:**
TUBING SIZE: 2.375 **WT.:** **ID.:** **SET AT:** 4390 **PERF.:** 4364 **TO:** 4383
TYPE COMPLETION (Describe): single **TYPE FLUID PRODUCTION:** Oil/SW
PRODUCING THRU: annulus **RESERVOIR TEMPERATURE °F:** **BAR PRESS - P_s:** 14.4 Psia
GAS GRAVITY - G_s: .742 **% CARBON DIOXIDE:** .207 **% NITROGEN:** .858 **API GRAVITY OF LIQUID:**
VERTICAL DEPTH (H): **TYPE METER CONNECTION:** flange **(METER RUN) (PROVER) SIZE:** 2"

REMARKS
Tested into Lumen pipeline

RATE NO.	ORIFICE SIZE in	(METER) (PROVER) PRESSURE Psig	DIFF. (h _w) (h _d)	FLOWING TEMP t	WELL-HEAD TEMP. t	CSG WELLHEAD PRESS.		TBG WELLHEAD PRESS.		FLOW DURATION (HOURS)	LIQUID PROD. Bbls.
						Psig	(P _w)(P _f)(P _s) Psia	Psig	(P _w)(P _f)(P _s) Psia		
SHUT IN											
1	.750	36	207.6	75		181	195.4			72	
2	1.250	42	35.6	72		173	187.4			.75	
3	"	45	51.9	71		167	181.4			.75	
4						163	177.4			.75	
5						End test - Lumen compressor problem					

RATE NO.	COEFFICIENT (F ₁)(F ₂) Mcfd	(METER) (PROVER) PRESSURE Psia	PRESS EXTENSION $\sqrt{P_w \cdot h_w}$	GRAVITY FACTOR F _g	FLOWING TEMP FACTOR F _t	DEVIATION FACTOR F _{pv}	RATE OF FLOW Q Mcfd	GOR (ft ³ /Bbl)	G _m
2	8.329	56.4	44.80	"	.9887	---	428		
3	"	59.4	55.52	"	.9896	---	534		
4									
5									

RATE NO.	P _i Psia	P _c Psia	P _w Psia	(P _i) ² THOUSANDS	(P _w) ² THOUSANDS	PLOTTING POINTS		% SHUT-IN $\frac{(P_w - P_c)}{(P_c - P_i)}$
						(P _i) ² - (P _w) ² THOUSANDS	Q Mcfd	
1		195.4	187.4	38.2	35.1	3.1	325	95.5
2		"	181.4	"	32.9	5.3	428	92.8
3		"	177.4	"	31.5	6.7	531	90.7
4								
5								

INDICATED WELLHEAD OPEN FLOW 1810 Mcfd @ 14.65 Psia "n" = .690

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 28th day of August 2013.

Witness (if any)
For Commission

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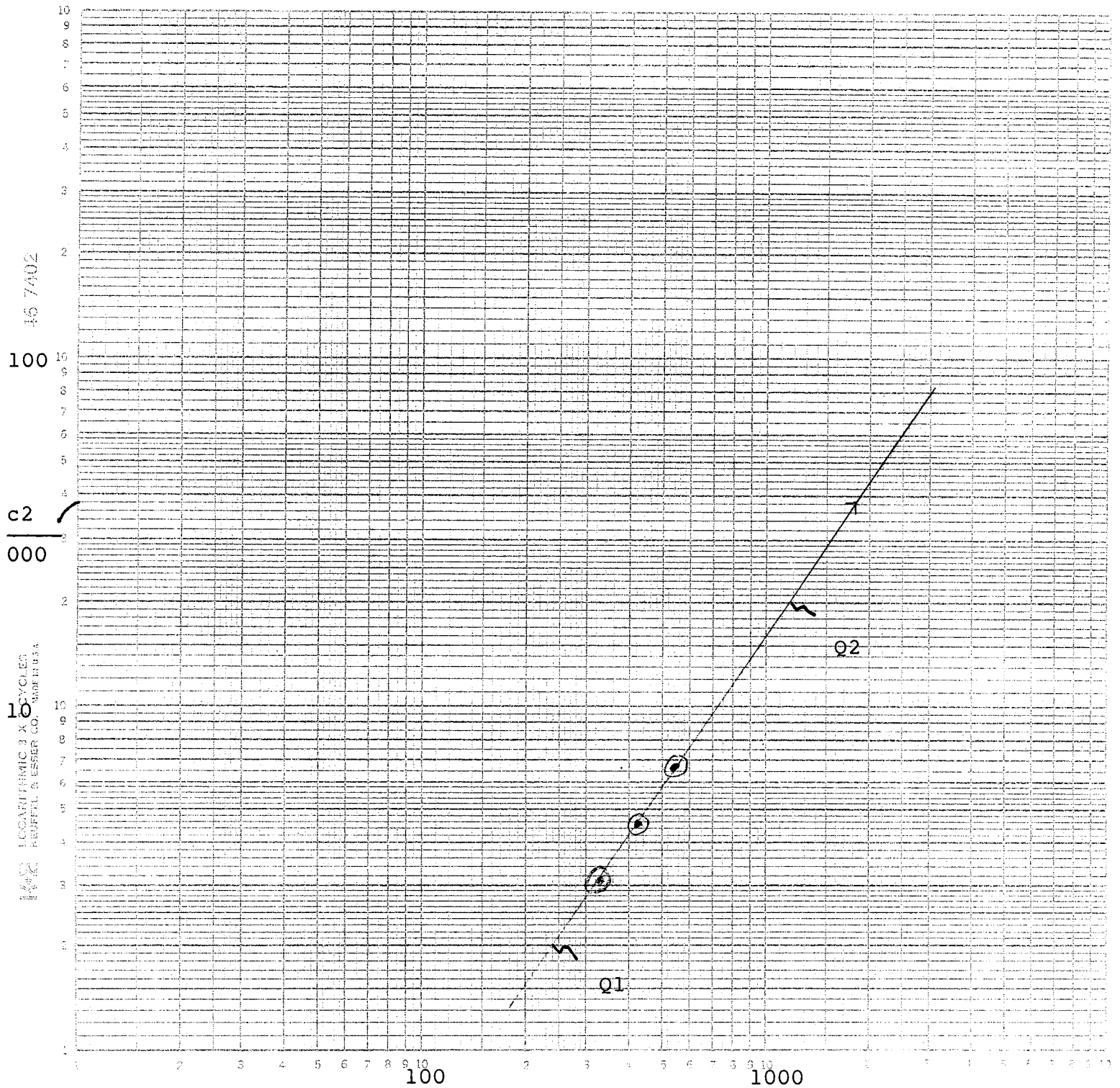
Gary Allen
For Company
Comm, INC.

SEP 03 2013

CONSERVATION DIVISION
WICHITA, KS

Checked By (Rev.10/96)

Rains' & Williamson Oil Company, Inc. - Hagan 3-23
 CNW 23- 32S-10W
 Barber County
 Tested 8/22/13



Q2 - 1175 - Log: 3.070
 Q1 - 240 - Log: 2.380

"n" = .690

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FIELD DATA SHEET

Pumper: **MANN THIMESCH**
 Phone#:

Type Test: Initial Annual Special Test Date **8/22 - 8/23/13**

Company **RAMS & WILLIAMSON** Connection

Field Reservoir Location

Completion Date Total Depth Plug Back TD Elevation Form of Lease None **HABAN**

Csg. Size Wt. d Set At Perforations: From To Well No. **3-23**

Tbg. Size Wt. d Set At Perforations: From To Sec. Top - Blk Rge - Sur

Type Completion (Describe) **SINGLE** Packer Set At County **BANBEN** Parish

Producing Thru **ANNULUS** Reservoir Temp. F Mean Annual Temp. F **60** Bore. Press. - P **14.4** a State

G_v **.734** % CO₂ **1.939** % H₂ **1.5459** % H₂S Prover Motor Run Tests

DATE	ELAP. TIME		WELLHEAD WORKING PRESSURE			METER OR PROVER				REMARKS		
	Time of Reading	Hrs.	Tbg. Psig	Csg. Psig	Δ P	Pressure Psig	Diff.	Temp. F	Orifice	(Include liquid production data: Type - API Gravity - Amount)		
8:45	72		181									
8:45								750		COMMENCE TEST		
:00			179			24	101.5	75				
:15			175			34	216.6	76				
:30			173			36	207.6	75				
:45			171			39	35.3	73	1.250	ORF. CHG.	2.5970 177	
:00			169			41	38.2	72			5.0970 172	
:15			167			42	35.6	72			7.5970 168	
:30			166			43	52.3	72			10.0970 163	
:45			165			44	51.7	71			12.5970 159	
:00			163			45	51.9	71			15.0970 154	
											17.5970 150	
											20.0970 145	
											25.0970 136	
			LUMEN COMPRESSOR PROBLEM COULD NOT MAINTAIN RATE									
11:15			166			36	30.6	77			SET FLOW RATE FOR 1 PT TEST	
8:45	24		152			32	24.2	71				
	0.0											
	0.5										Begin 30 minute wellhead buildup	
	1.0											
	1.5											
	2.0											
	3.0											
	4.0											
	5.0											
	6.0											
	7.0											
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CONSERVATION DIVISION
WICHITA, KS

MEASUREMENT SOLUTIONS INC.

6705 East 81st Street Suite 155 Tulsa, OK 74133

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

890106

HAGAN 3-23

RAINS & WILLIAMSON

WEST WICHITA GAS GATHERING LLC

Gas Volume Statement

PRODUCTION MONTH : JULY 2013

Line Size	2.069	Static Range	500	Type Connect	FLANGE	Cont Atmo Base	13.960
Orifice Size	0.750	Diffrl Range	250	Type Locn	UP	Cont Pres Base	14.650
Clock	24	Temp Range	420	Type Meter	EFR	Cont Temp Base	60.000
				Type Static:	A		

Date On	Ave Diff	PSIA	Temp	Gravity	Orifice	INTG	C' Prime	Flow Hrs	VOLUME	BTU	MMBTU	
07/01	07/02	106.57	50.95	76.64	0.7416	0.750	0	0.12980	24.00	226	1256.490	284
07/02	07/03	111.66	51.43	79.04	0.7416	0.750	0	0.12930	24.00	230	1256.490	289
07/03	07/04	120.03	48.16	79.32	0.7416	0.750	0	0.12880	24.00	232	1256.490	292
07/04	07/05	121.12	47.63	82.70	0.7416	0.750	0	0.12850	24.00	234	1256.490	294
07/05	07/06	125.27	46.66	83.72	0.7416	0.750	0	0.12810	24.00	235	1256.490	295
07/06	07/07	125.48	46.69	83.30	0.7416	0.750	0	0.12810	24.00	235	1256.490	296
07/07	07/08	113.95	52.09	87.59	0.7416	0.750	0	0.12840	24.00	236	1256.490	297
07/08	07/09	125.73	47.55	88.80	0.7416	0.750	0	0.12750	24.00	236	1256.490	297
07/09	07/10	124.80	50.61	90.27	0.7416	0.750	0	0.12740	24.00	235	1256.490	295
07/10	07/11	119.48	55.19	88.28	0.7416	0.750	0	0.12800	24.00	239	1256.490	301
07/11	07/12	139.63	45.48	85.28	0.7416	0.750	0	0.12730	24.00	243	1256.490	306
07/12	07/13	139.04	48.60	89.09	0.7416	0.750	0	0.12710	24.00	248	1256.490	312
07/13	07/14	150.30	45.80	89.46	0.7416	0.750	0	0.12650	24.00	252	1256.490	316
07/14	07/15	144.73	46.31	72.05	0.7416	0.750	0	0.12880	24.00	253	1256.490	318
07/15	07/16	141.46	47.54	72.84	0.7416	0.750	0	0.12900	24.00	254	1256.490	319
07/16	07/17	144.98	47.45	77.84	0.7416	0.750	0	0.12820	24.00	255	1256.490	321
07/17	07/18	147.78	47.09	80.12	0.7416	0.750	0	0.12780	24.00	256	1256.490	322
07/18	07/19	150.37	46.65	82.77	0.7416	0.750	0	0.12740	24.00	256	1256.490	322
07/19	07/20	156.85	45.41	84.85	0.7416	0.750	0	0.12680	24.00	257	1256.490	323
07/20	07/21	154.06	45.89	79.82	0.7416	0.750	0	0.12750	24.00	257	1256.490	323
07/21	07/22	148.81	47.26	81.15	0.7416	0.750	0	0.12770	24.00	257	1256.490	323
07/22	07/23	152.07	46.76	84.65	0.7416	0.750	0	0.12710	24.00	257	1256.490	323
07/23	07/24	141.94	51.35	87.30	0.7416	0.750	0	0.12750	24.00	258	1256.490	324
07/24	07/25	125.71	57.24	84.46	0.7416	0.750	0	0.12870	24.00	258	1256.490	324
07/25	07/26	142.38	49.34	79.33	0.7416	0.750	0	0.12830	24.00	257	1256.490	323
07/26	07/27	150.19	46.70	78.16	0.7416	0.750	0	0.12790	24.00	257	1256.490	323
07/27	07/28	151.65	46.28	77.71	0.7416	0.750	0	0.12790	24.00	257	1256.490	323
07/28	07/29	151.65	45.89	73.54	0.7416	0.750	0	0.12830	24.00	257	1256.490	323
07/29	07/30	153.90	45.73	77.23	0.7416	0.750	0	0.12780	24.00	257	1256.490	323
07/30	07/31	153.32	45.88	75.56	0.7416	0.750	0	0.12800	24.00	258	1256.490	324
07/31	08/01	150.15	46.81	79.67	0.7416	0.750	0	0.12780	24.00	257	1256.490	323

Average/Totals	138.23	48.14	81.69					744.00	7,699	9,678
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CO2	N2	C1	C2	C3	iC4	nC4	iC5	nC5	C6	He	O2	H2S	Sp Grav	Wet BTU	Dry BTU
0.207	0.858	78.720	10.240	5.659	0.786	1.870	0.402	0.493	0.723	0.043	0.000	0.000	0.7416	1256.490	1278.870

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