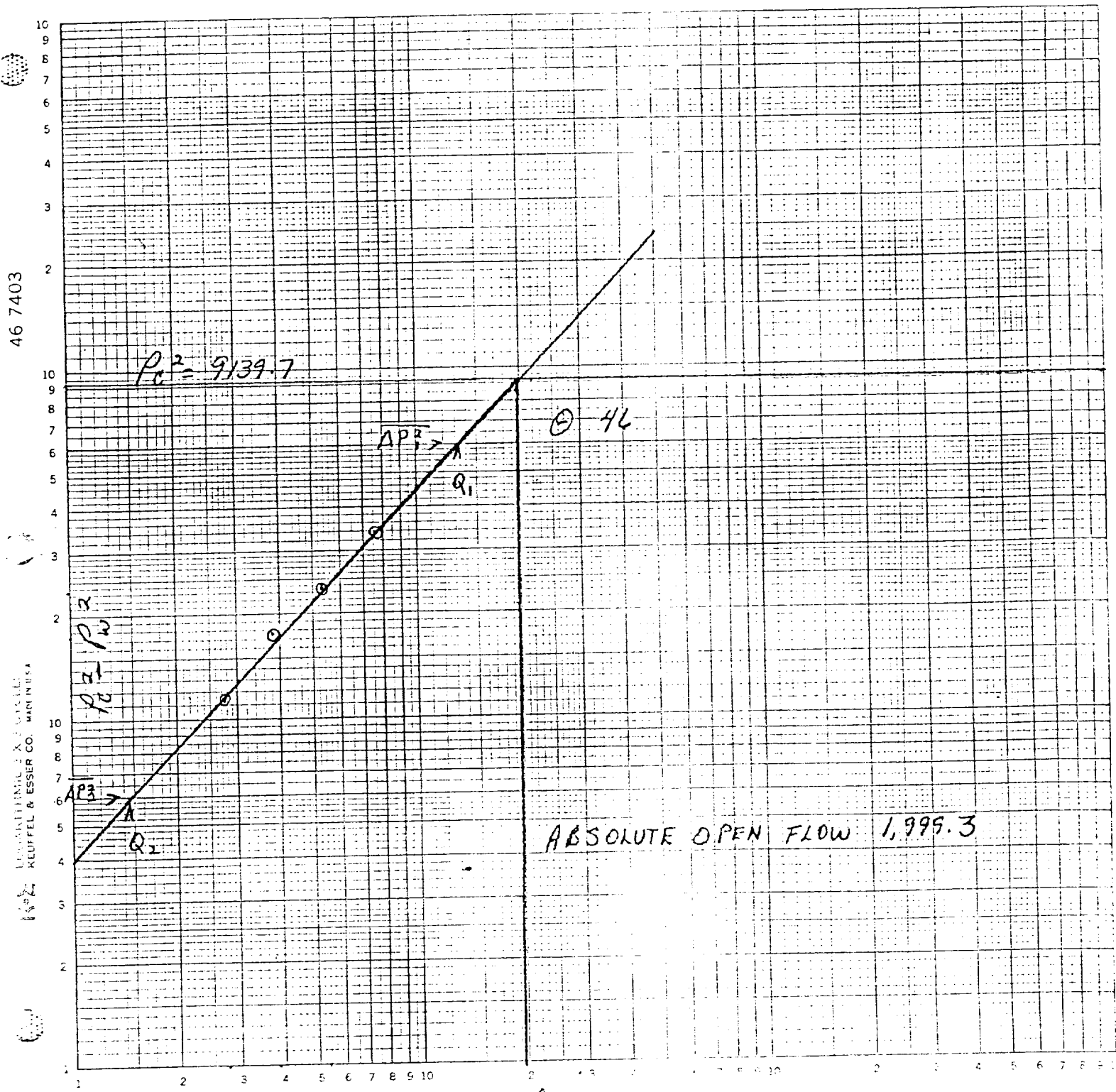


MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

RECEIVED

Type Test ☒ FOUR POINT ☒ Initial ☐ Annual ☐ Special		Test Date 9-11-81		990 FSI DEC 3 1981							
Company READ & STEVENS ✓		Connection AIR NEW WELL		990 FEL O.C.D.							
Pool WILD-CAT <i>Red to 1st clay Penn</i>		Formation ATOKA		Unit P ARTESIA, OFFICE							
Completion Date 9-8-81		Total Depth 9033		Plug Back TD 8775 8840							
Elevation 3520KB		Farm or Lease Name HARRIS FEDERAL		Well No. 4							
Cas. Size 4.5	Wt. 11.6	d 4.00	Set At 9033	Perforations: From 8728 To 8746							
Trg. Size 2.375	Wt. 4.7	d 1.995	Set At 8659	Perforations: From OPEN To ENDED							
Type Well - Single - Brdenhead - G.C. or G.O. Multiple SINGLE				Packer Set At NONE							
Producing Thru TUBING		Reservoir Temp. °F 142 @ 8747		Mean Annual Temp. °F 60							
Baro. Press. - P ₀ 13.2		State NEW MEXICO		County CHAVES							
L 8737	H 8737	G _g .707	% CO ₂ 7.53	% N ₂ 0.74	% H ₂ S -						
Prover -		Meter Run 4"		Taps FLANGE							
FLOW DATA											
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. °F	Press. p.s.i.g.	Temp. °F	BHP	Temp. °F	Duration of Flow
SI							2276	86	3010		68½
1.	4"	X	1.25	442	2.0	94	2099	87	2811		1
2.	4"	X	1.25	430	4.0	98	1994	89	2704		1
3.	4"	X	1.25	425	8.0	100	1861	88	2589		1
4.	4"	X	1.25	420	16.0	89	1724	86	2386		1
5.											
RATE OF FLOW CALCULATIONS											
NO.	Coefficient (24 hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor Ft.	Gravity Factor F _g	Super. Comp. Factor, F _{pv}	Rate of Flow Q, Mcfd				
1	7.6610	30.17	455.2	.9688	1.1893	1.0370	276				
2	7.6610	42.10	443.2	.9653	1.1893	1.0353	383				
3	7.6610	59.21	438.2	.9636	1.1893	1.0342	538				
4	7.6610	83.25	433.2	.9732	1.1893	1.0364	765				
5.											
NO.	P ₁	Temp. °R	T ₁	Z	Gas Liquid Hydrocarbon Ratio _____ Mcf/mbt.						
1	.65	554	1.47	.930	A.P.L. Gravity of Liquid Hydrocarbons _____ Deg.						
2	.63	558	1.48	.933	Specific Gravity Separator Gas .7070 XXXXXXXXXX						
3	.63	560	1.49	.935	Specific Gravity Flowing Fluid XXXXX .7070						
4	.62	549	1.46	.931	Critical Pressure 700 P.S.I.A. P.S.I.A.						
5.					Critical Temperature 377 R R						
P _c 302.2 P _c ² 9139.7											
NO.	P ₁ ²	P _w	P _w ²	P _c ² - P _w ²	(1) $\frac{P_c^2}{P_c^2 - P_w^2} = 2.7009$ (2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 2.6134$						
1		2824.2	7976.1	1164							
2		2717.2	7383.2	1757							
3		2602.2	6771.4	2368							
4		2399.2	5756.2	3384	AOI = 0 $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1999.3$						
5											
Absolute Open Flow 1,999.3 Mcfd @ 15.025					Angle of Slope @ 46		Slope, n 9669				
Remarks: KNOWN BOTTOM HOLE PRESSURE MEASURED WITH AMARADA PRESSURE ELEMENT											
Approved By Division				Conducted By: DON BENNETT				Calculated By: WOHLFORD & JENKINS			
								Checked By:			

HURTS Federal Well No. 1
 V. & P, Sec 26, Twp 15S, Rge 27E
 Chaves County
 September 11, 1981



Q mcf/d

$$\overline{\Delta P}_1 \quad P_c^2 - P_w^2 = 6,000$$

$$\overline{\Delta P}_2 \quad P_c^2 - P_w^2 = 600$$

$$Q_1 = 1,348.0 \text{ mcf/d}$$

$$Q_2 = 145.0 \text{ mcf/d}$$

$$\log Q_1 = 3.1297$$

$$\log Q_2 = 2.1628$$

$$N = .9669$$

**NEW-TEX
LAB**P. O. BOX 1161
HOBBS, N.M. 88240No. 5616
Run No. _____
Date of Run 9-14-81
Date Secured 9-14-81**CERTIFICATE OF ANALYSIS**

A Sample of Reed & Stevens Harris Fed. #4
Secured from Bennett & Cathey
At Box 787 Secured by _____
Artesia, NM 88210 Time _____ Date _____
Sampling conditions _____ Press _____
Temp. _____

FRACTIONAL ANALYSIS**Percentage Composition**

MOL % LIQ. % G.P.M.

Carbon Dioxide	7.530		
Air	.737		
Nitrogen			
Oxygen			
Hydrogen sulfide			
Hydrogen			
Methane	81.810		
Ethane	6.620		1.766
Propane	1.808		.496
Butanes			
Iso-Butane	.242		.079
N-Butane	.514		.162
Pentanes			
Iso-Pentane	.176		.064
N-Pentane	.171		.062
Hexanes	.120		.049
Heptanes	.272		.125
Octanes			
TOTAL	100.000		2.803

Calc. Sp. Gr. — 0.7070
Calc. A.P.I. — _____
Calc. Vapor Press. — _____ PSIA
Sp. Gr. _____
Mol. Wt. 20.49

LIQUID CONTENT (GAL./MCF)

Propane Calc. G.P.M. .496
Butanes Calc. G.P.M. .241
Pentanes Plus. G.P.M. .300
Ethane Calc. G.P.M. 1.766
____ RVP Gasoline G.P.M. _____
B.T.U./Cu. Ft. @ 14.696 P.S.I.A.
Dry Basis 1048
Wet Basis 1030
Sulfur Analysis by Titration
Gr./100 Cu. Ft. _____
Hydrogen Sulfide _____
Mercaptans _____
Sulfides _____
Residual Sulfur _____
Total Sulfur _____

Run by R.H. Hamilton Checked by Deane Simpson Approved by Deane Simpson**Additional Data and Remarks**

Artesia, New Mexico 88210

PAGE 1 OF 1

CHART READINGS AND CALCULATIONS FOR BUILDUP OR DRAWDOWN TEST

RPG3 #9526, 0 - 8,100 LBS., 12 HOUR CLOCK

[illegible]

BENNETT - CATHEY

Artesia, New Mexico 88210

SUBSURFACE PRESSURE MEASUREMENTS

COMPANY READ & STEVENS WELL NAME HARRIS FEDERAL WELL NO. 4
 DATE OF TEST 9-8-81 TO 9-11-81 FORMATION ATOKA PAGE 1 OF 2

CHART READINGS AND CALCULATIONS FOR BUILDUP OR DRAWDOWN TEST

ELEMENT NUMBER RPG3 #41552 RANGE 0 - 6,000 LBS.
 CLOCK NUMBER G17245 RANGE 72 HOURS
 TIME WELL SHUT IN 1730 HOURS 9-8-81
 TIME CLOCK STARTED 1631 HOURS
 DEAD WEIGHT ELEMENT ON SURFACE 113 FLOWING LBS.
 TIME ELEMENT REACHED BOTTOM 1711 HOURS
 DEAD WEIGHT ELEMENT ON BOTTOM 113 FLOWING LBS.
 ELEMENT SET AT 8747 FEET.
 TEMPERATURE 8747 FT. 142 °F.
 2289 PSIA DEAD WEIGHT AT THE END OF 67 HOURS 15 MINUTES.
 RPG3 #9526, 0 - 8,100 LBS., 72 HOUR CLOCK

DATE	HOUR	TIME	DEFLECTION in/inches	CALCULATED PRESSURE psig	CORRECTION P ± PC psig	CORRECTED PRESSURE psia	PRESSURE AT MID-POINT OF PERFORATIONS psia
9-8-81	0	1730		374		13.2	387
	1/4	1745		732		13.2	745
	1/2	1800		1124		13.2	1137
	3/4	1815		1447		13.2	1460
	1	1830		1668		13.2	1681
	1-1/4	1845		1778		13.2	1791
	1-1/2	1900		1975		13.2	1988
	1-3/4	1915		2112		13.2	2125
	2	1930		2212		13.2	2225
	2-1/4	1945		2296		13.2	2309
	2-1/2	2000		2389		13.2	2402
	2-3/4	2015		2467		13.2	2480
	3	2030		2520		13.2	2533
	3-1/4	2045		2564		13.2	2577
	3-1/2	2100		2601		13.2	2614
	3-3/4	2115		2639		13.2	2652
	4	2130		2664		13.2	2677
	4-1/4	2145		2685		13.2	2698
	4-1/2	2200		2701		13.2	2714
	4-3/4	2215		2717		13.2	2730
	5	2230		2734		13.2	2747
	5-1/2	2300		2752		13.2	2765
	6	2330		2773		13.2	2786
	6-1/2	2400		2785		13.2	2798
9-9-81	7	2430		2798		13.2	2811
	7-1/2	0100		2810		13.2	2823
	8	0130		2820		13.2	2833
	8-1/2	0200		2829		13.2	2842
	9	0230		2838		13.2	2851
	9-1/2	0300		2848		13.2	2861
	10	0330		2854		13.2	2867
	11	0430		2863		13.2	2876
	12	0530		2872		13.2	2885
	13	0630		2882		13.2	2895
	14	0730		2888		13.2	2901
	15	0830		2894		13.2	2907
	20	1330		2922		13.2	2935
	25	1830		2941		13.2	2954

REED & STEVENS

HARRIS FEDERAL WELL NO. 4

DATE OF TEST 9-8-81 TO 9-11-81

LOCATION WELL N
ATOKA

PAGE 2 OF 2

CHART READINGS AND CALCULATIONS FOR BUILDUP OR DRAWDOWN TEST

[illegible]