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Form C-122
Revised 9-1-65

N.L. MEXICO OIL CONSERVATION COMMISSION
MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS RECEIVED

NOV 17 1975

Type Test ☒ Initial ☐ Annual ☐ Special						Test Date 11/12/75			
Company Amoco Production Company				Connection None		O.C.C. ARTESIA, OFFICE			
Pool So. Empire (Morrow Gas)				Formation Morrow Sand		Unit South Empire Deep			
Completion Date 9-17-75		Total Depth 11,065'		Plug Back TD 11,020'		Elevation 3664' GL		Farm or Lease Name Empire South Deep Unit	
Csg. Size 5-1/2"	Wt. 15.5-17#	d 4.892	Set At 11,065'	Perforations: From 10,831 To 10,857'		Well No. 6			
Tbg. Size 2-3/8	Wt. 6.5#	d 1.867	Set At 10,778	Perforations: From 10,782 To 10,786		Unit 0	Sec. 1	Twp. 18S	Rge. 28E
Type Well - Single - Bradenhead - G.G. or G.O. Multiple Single				Packer Set At 10,778		County Eddy			
Producing Thru Tubing		Reservoir Temp. *F 160 @ 10,800'		Mean Annual Temp. *F 60		Baro. Press. - P _g 13.2		State New Mexico	
L 10,760	H 10,760	G _g .638	% CO ₂ 0.610	% N ₂ 0.395	% H ₂ S None	Prover	Meter Run 4"	Taps Flange	

FLOW DATA						TUBING DATA		CASING DATA		Duration of Flow	
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. *F	Press. p.s.i.g.	Temp. *F	Press. p.s.i.g.		Temp. *F
SI							2,932		Packer		72 Hrs.
1.	4"		2.5"	790	8.1	92	560				24 Hrs.
2.											
3.											
4.											
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor F _t	Gravity Factor F _g	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1	35.28	80.659	803.2	.9706	1.2281	1.069	3,626
2.							
3.							
4.							
5.							

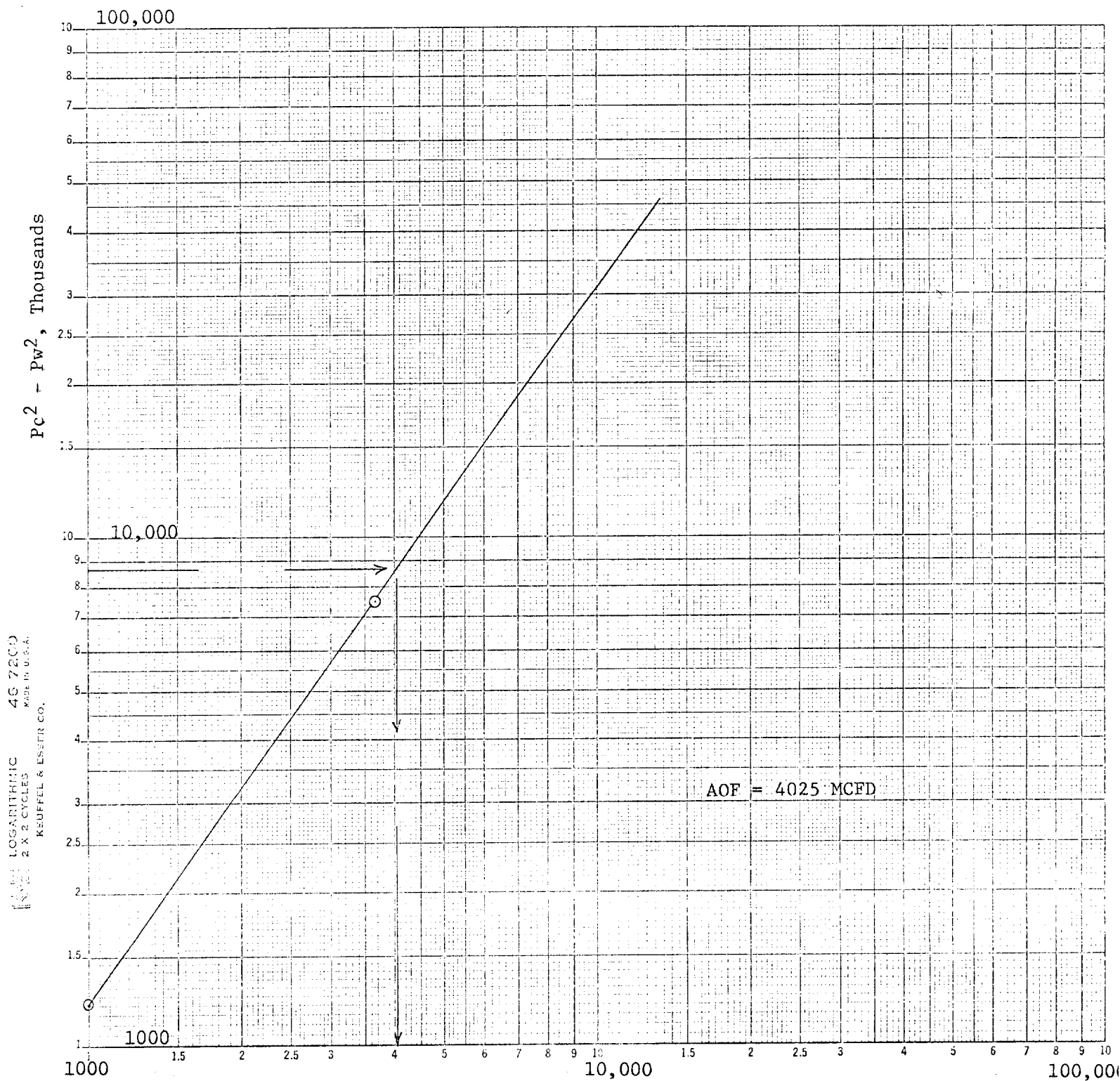
NO.	P _r	Temp. *R	T _r	Z	Gas Liquid Hydrocarbon Ratio 67.148 Mcf/bbl.
1.					A.P.I. Gravity of Liquid Hydrocarbons 57.8 Deg.
2.					Specific Gravity Separator Gas .6383
3.					Specific Gravity Flowing Fluid .686
4.					Critical Pressure 683.7 P.S.I.A.
5.					Critical Temperature 620 R

P _c 2945.2 P _c ² 8674.2		(1) $\frac{P_c^2}{P_c^2 - P_w^2} = \frac{8674.2}{7485.7}$		(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.11$	
NO.	P _t ²	P _w	P _w ²	P _c ² - P _w ²	
1		1090.2	1188.5	7485.7	
2					
3					
4					
5					

Absolute Open Flow 4025 Mcfd @ 15.025		Angle of Slope 35		Slope, n .710	
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Remarks: Well flowed at high rate to clean-up after stimulation. High rate maintained to keep well clear of liquids. To conserve energy & minimize flared gas, AOF calculated from 1 point test. Slope .710 was obtained by Analogs with the closest well in the field producing from the same aged formation					
Approved By Commission:		Conducted By: West ENER		Calculated By: W. L. Laflin, Jr.	
				Checked By: J.A. Deffenick	

COMPANY: Amoco Production Company
 WELL: Empire South Deep Unit No. 6
 LOCATION: 0, 1, 18-S, 28-E
 COUNTY: Eddy
 DATE: November 13, 1975
 VOLUME: 4,025 MCF/24 Hrs. AOF



$$\begin{aligned}
 .710 &= \frac{\log (3.626) - \log (10^3)}{\log (7485.7) - \log (\Delta P^2)} \\
 .710 &= \frac{3.56 - 3.00}{3.87 - \log (\Delta P^2)} \\
 \log (\Delta P^2) &= 3.08127 \\
 P^2 &= 1206
 \end{aligned}$$

NEW MEXICO OIL CONSERVATION COMMISSION
MULTIPOINT AND ONE POINT BACK PRESSURE TEST

R GAS WELL

Form C-122
Revised 9-1-65

RECEIVED

Type Test ☒ Initial ☐ Annual ☐ Special					Test Date 4- 7-77		JUN 1 1977	
Company AMOCO PRODUCTION CO.					Connection EL PASO NATURAL GAS CO.		O. C. C.	
Pool EMPIRE SOUTH DEEP UNIT					Formation MORROW GAS		Unit ARTESIA, OFFICE	
Completion Date 9-17-75		Total Depth 11067.		Plug Back TD 11020.		Elevation 3664.		Form or Lease Name Empire S. Deep Unit
Csg. Size 5.500	Wt. 15.5	d 5.200	Set At 11065.	Perforations: From 10831. To 46.		Well No. 6		
Tbg. Size 2.875	Wt. 6.5	d 2.441	Set At 10783.	Perforations: From 10852. To 57.		Unit Sec. Twp. Rge. 1 18S 28E		
Type Well - Single - Bradenhead - G.G. or G.O. Multiple PERES					Packer Set At 10783.		County EDDY	
Producing Thru TUBING		Reservoir Temp. °F 172.0		Mean Annual Temp. °F 60.0		Baro. Press. - P _a 13.2		State NEW MEXICO
.L 10831.	H 10831.	G _g 0.640	% CO ₂ 0.31	% N ₂ 1.46	% H ₂ S 0.	Proves 0.	Meter Run 4.0	Taps FLANGE

FLOW DATA						TUBING DATA		CASING DATA		Duration of Flow	
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. °F	Press. p.s.i.g.	Temp. °F	Press. p.s.i.g.	Temp. °F	of Flow
SI							2760.				27.0
1.	4.00 X	1.250		660.	7.0	60.	2460.	67.	0.	0.	1.0
2.	4.00 X	1.250		700.	16.0	61.	2272.	68.	0.	0.	1.0
3.	4.00 X	1.250		710.	27.0	55.	2084.	68.	0.	0.	1.0
4.	4.00 X	1.250		720.	37.0	48.	1884.	69.	0.	0.	1.0
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor F _t	Gravity Factor F _g	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1.	7.47	68.65	673.2	1.0000	1.2500	1.0662	683.
2.	7.47	106.82	713.2	0.9990	1.2500	1.0697	1066.
3.	7.47	139.74	723.2	1.0048	1.2500	1.0738	1408.
4.	7.47	164.71	733.2	1.0117	1.2500	1.0794	1680.
5.							

NO.	P _t	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio	A.P.I. Gravity of Liquid Hydrocarbons	Specific Gravity Separator Gas	Specific Gravity Flowing Fluid	Critical Pressure	Critical Temperature
1.	1.01	520.	1.42	0.880	0.	0.	0.640	XXXXXX	669.	366.
2.	1.07	521.	1.42	0.874				XXXXXX		
3.	1.08	515.	1.41	0.867						
4.	1.10	508.	1.39	0.858						
5.										

$P_c = 2761.1 P_c^2 = 1621.$					$(1) \frac{P_c^2}{P_c^2 - P_w^2} = 1.8921$		$(2) \left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.8148$	
NO.	P _t ²	P _w	P _w ²	P _c ² - P _w ²				
1.	6117.	2467.	6086.	1542.				
2.	5222.	2279.	5195.	2432.				
3.	4393.	2095.	4383.	3239.				
4.	3599.	1896.	3596.	4031.				
5.								

$AOF = Q \left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 3048.$				
Absolute Open Flow <u>3048.</u> Mcfd @ 15.025 Angle of Slope θ <u>46.9.</u> Slope, n <u>0.935</u>				
Remarks:				
Approved By Commission:		Conducted By: John West Engineering		Calculated By: Amoco Production Co.
Checked By:				

$$\begin{aligned} \text{ABS SLOPE } (n) &= \log Q_1 = \log 4000 = 3.602 \\ &\quad -\log Q_2 = -\log 465 = -2.667 \\ &\quad \hline &\quad \quad 0.935 \end{aligned}$$

