

NEW MEXICO OIL COMPANY
MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

RECEIVED

Copy to SF
C-122

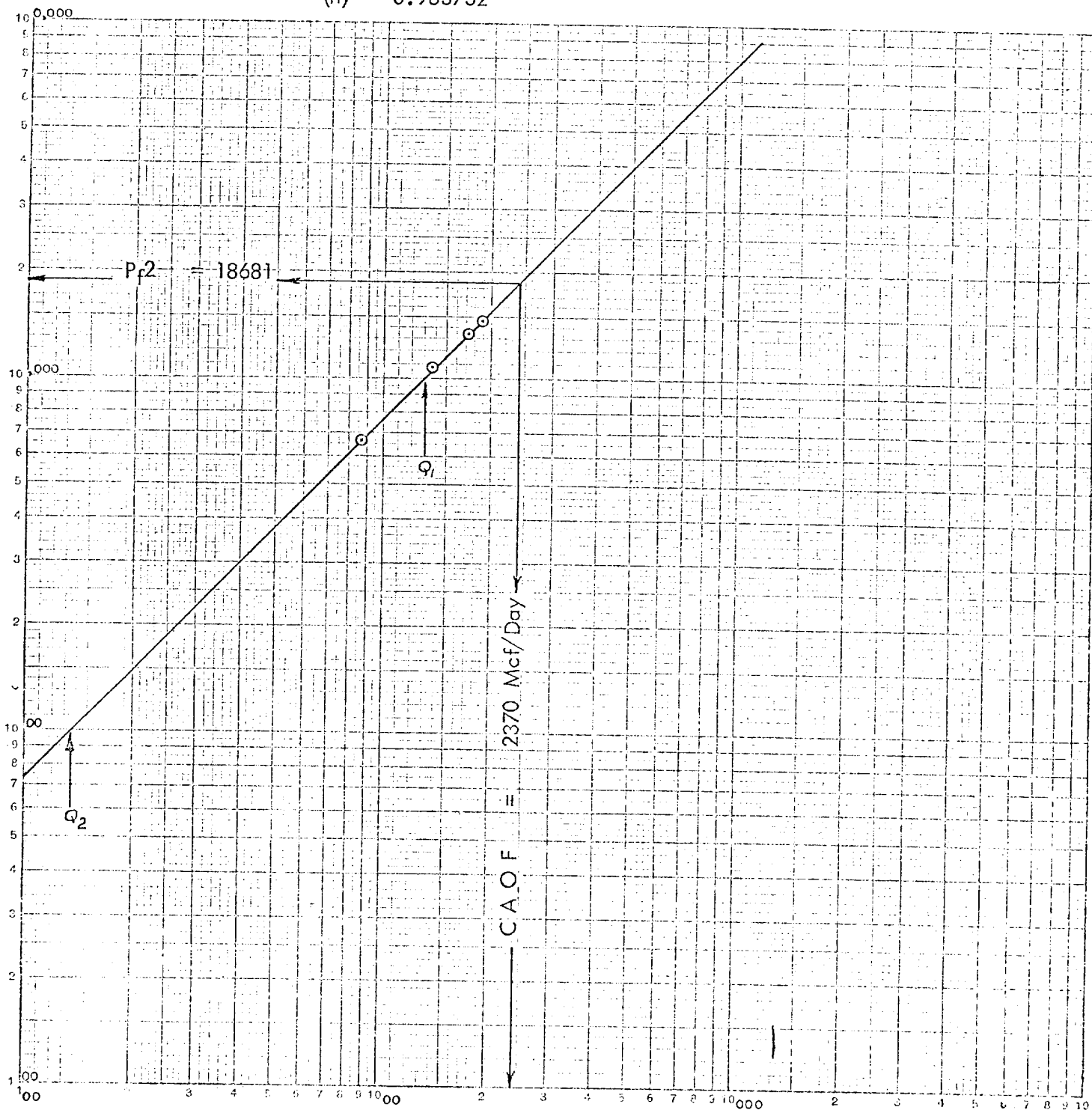
Type Test ☒ Initial ☐ Annual ☐ Special		Test Date 11-20-75		DEC 5 1975							
Company Cities Service Oil Company			Connection To Air								
Pool South Carlsbad <i>Monroe</i>			Formation Morrow								
Completion Date 11-20-75		Total Depth 11,790'		Plug Back TD 11,750'							
		Elevation 3143 Gr.		Farm or Lease Name Colonia "A" <i>Com</i>							
Cas. Size 5 1/2"	Wt. 17# 20#	d 4.892" 4.778"	Set At 11,790'	Perforations: From 11,407' to 11,456'							
Tub. Size 2 7/8"	Wt. 6.5#	d 2.441"	Set At 11,313'	Perforations: From Open Ended							
Type Well - Single - Bradenhead - G.G. or G.O. Multiple Single				Packer Set At 11,309'							
Producing Thru Tubing		Reservoir Temp. °F 191 @ 11,432'		Mean Annual Temp. °F 60							
		Baro. Press. - P _a 13.2		State New Mexico							
L 11432	R 11432	G _g 0.5842	% CO ₂ 1.126	% N ₂ 0.158	% H ₂ S -----						
Prover -----				Meter Run 3"	Pipe -----						
FLOW DATA			TUBING DATA		CASING 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	Press. p.s.i.g.	Temp. °F	Duration of Flow
SI							3425.0		Packer	Choke	70 Mo.
1.	3"	x	1.75"	260.0	4.0	81	2722.0	50		9/64	60 Min
2.	3"	x	1.75"	250.0	10.0	70	2197.0	53		11/64	60 Min
3.	3"	x	1.75"	250.0	16.0	70	1794.0	56		13/64	60 Min
4.	3"	x	1.75"	250.0	19.0	72	1528.0	56		15/64	60 Min
5.											
RATE OF FLOW CALCULATIONS											
NO.	Coefficient (24 Hour)	$\sqrt{q_{wD} p_m}$	Pressure P _m	Flow Temp. Factor Ft.	Gravity Factor F _g	Super. Factor, F _{sp}	Rate of Flow Q, Mscf				
1	20.15	33.06	273.2	.9804	1.309	1.019	871				
2	20.15	51.30	263.2	.9905	1.309	1.020	1367				
3	20.15	64.89	263.2	.9905	1.309	1.020	1729				
4	20.15	70.72	263.2	.9887	1.309	1.020	1881				
5											
T.S.T.M. Mcf/bbl.											
NO.	P _f	Temp. °R	T _f	Z	Gas Liquid Hydrocarbon Ratio						
1	0.40	541	1.55	.963	A.P.I. Gravity of Liquid Hydrocarbons						
2	0.39	530	1.52	.962	Specific Gravity Separator Gas 0.5842						
3	0.39	530	1.52	.962	Specific Gravity Flowing Fluid						
4	0.39	532	1.52	.962	Critical Pressure 676 P.S.I.A.						
5					Critical Temperature 349 °R						
$F_f 4322.2 \quad P_s^2 18681$ $(1) \frac{P_f^2}{P_f^2 - P_s^2} = 1.265 \quad (2) \left[\frac{P_f^2}{P_f^2 - P_s^2} \right]^n = 1.260$											
NO	P _f	P _s	P _f ²	P _s ²	P _f ² - P _s ²						
1	7481	3479.2	12105	6576	5529						
2	4885	2810.2	7897	10784	1719						
3	3266	2307.2	5323	13358	1965						
4	2375	1979.2	3917	14764	2452						
5											
$AOF = C \left[\frac{P_f^2}{P_f^2 - P_s^2} \right]^n = 2370$											
Absolute Open Flow 2370				Mscf @ 15.025				Angle of Slope θ 45.5°		Slope, n 0.984	
Remarks: Bottom hole pressures measured with Amerada Gauge @ 11,432 Feet.											
Approved By: Commissioner			Conducted By: G.J.P.			Calculated By: R.L.W.			Checked By: J.W.W.		

$$C A O F = 1881 \left(\frac{18681}{14764} \right)^{.984} = 2370 \text{ Mcf/Day}$$

$$\begin{aligned} \text{Abs. Slope (n)} &= Q_1 = 1310 = 7.117271 \\ &= Q_2 = 1360 = 6.133539 \\ (n) &= 0.983732 \end{aligned}$$

P_{f2} - P_{s2}

WILLIS TOWERS WATKINS
NORTH OIL & GAS CO.

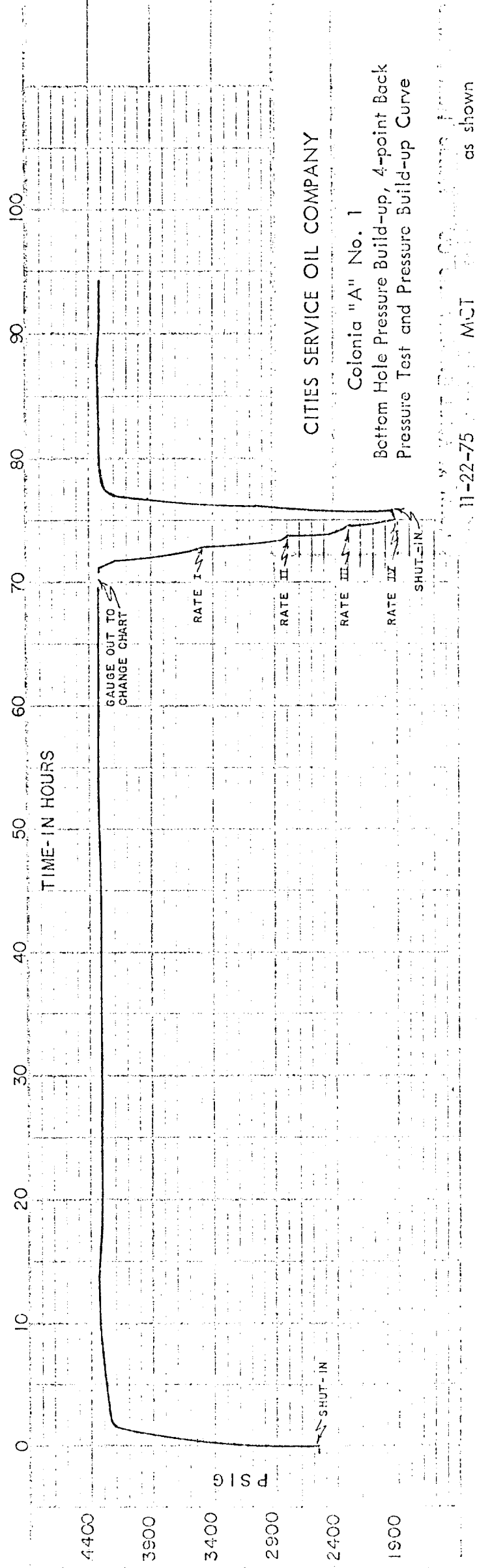


Q = Mcf/Day

Test Date: November 17 to 21, 1975
Test Depth: 11,432 Feet

Element No.: 8534
Range: 0-5600 psi
Clock No.: E-2145
Range: 0-72 Hour
Clock No.: 4052
Range: 0-24 Hour

Note: See tabulation of Pressure and Time on attached sheet.



Cities Service Oil Company
 Colonia "A" No. 1
 Bottom Hole Pressure Build-up and 4-point
 Back Pressure test and Build-up
 Tabulation of Pressure and Time

Test conducted by:
 John West Engineering Company

Test Date: November 17 to 21, 1975
 Test Depth: 11,432 Feet
 Element No.: 8534 (0-5600 psi)
 Oper.: G. Parker

DATE	TIME	CUM. HRS./MIN.		PSIG @ 11,432 FEET
11-17-75	11:50 am			2559 Gauge reached 11,432', flowing
11-17-75	12:05 pm	00 Hrs.	00 Min.	2565 Shut-in, begin build-up
		00	15	3240
		00	30	3554
		00	45	3802
		01	00	4031
		01	15	4148
		01	30	4205
		01	45	4234
		02	00	4256
		02	30	4265
		03	00	4271
		03	30	4274
		04	00	4276
		06	00	4291
		08	00	4311
11-17-75	10:05 pm	10	00	4322
11-18-75	12:05 am	12	00	4333
		14	00	4345 Pressure decrease
		14	30	4339
		15	00	4333
		16	00	4325
		18	00	4313
		20	00	4308
	10:05 am	22	00	4305
11-18-75	12:05 pm	24	00	4305
11-19-75	6:05 am	42	00	4305 Pressure increase
	12:05 pm	48	00	4308
11-19-75	6:05 pm	54	00	4311
11-20-75	12:05 am	60	00	4313
		66	00	4316
11-20-75	9:45 am	69	40	4316 Gauge out to change chart
CHART NO. 2				
11-20-75	11:00 am	70	55	4319 Gauge back to 11,432'
11-20-75	11:00 am	00	00	4319 Open choke to light heater
	11:45 am	00	45	4191 Begin test, 9/64 choke
	12:00 noon	01	00	3963
	12:15 pm	01	15	3658
		01	30	3542
11-20-75	12:45 pm	01	45	3466 End Rate 1

Cities Service Oil Company
Colonia "A" No. 1

<u>DATE</u>	<u>TIME</u>	<u>CUM. HRS./MIN.</u>		<u>PSIG @ 11,432 FEET</u>
11-20-75	1:00 pm	02 Hrs.	00 Min.	3186 Rate II, 11/64 Choke
		02	15	2977
		02	30	2850
	1:45 pm	02	45	2797 End Rate II
	2:00 pm	03	00	2545 Rate III, 13/64 choke
		03	15	2398
		03	30	2311
	2:45 pm	03	45	2294 End Rate III
	3:00 pm	04	00	2048 Rate IV, 15/64 choke
		04	15	1921
		04	30	1927
11-20-75	3:45 pm	04	45	1966 End Rate IV, Shut-in
11-20-75	3:45 pm	00	00	1966 Begin Build-up
		00	15	2489
		00	30	3065
		00	45	3540
		01	00	3924
		01	15	4117
		01	30	4219
		01	45	4271
		02	00	4282
		02	30	4296
		03	00	4299
		03	30	4302
		04	00	4308
		06	00	4316
11-20-75	11:45 pm	08	00	4328
11-21-75	1:45 am	10	00	4339
		12	00	4342 Pressure decrease
		13	00	4336
		14	00	4330
		15	00	4328
		17	00	4325
11-21-75	10:30 am	18 Hrs.	45 Min.	4325 Gauge out, end test



UNITED CHEMICAL CORPORATION

OF NEW MEXICO

P. O. BOX 1499

PHONE (505) 393-7751

HOBBS, NEW MEXICO 88240

No. 4311

Run No.

Date of Run 11-22-75

Date Secured 11-20-75

CERTIFICATE OF ANALYSIS

A Sample of Cities Service Oil Co. Colonia "A" #1
Secured from West Engineering
At 412 N. Dal Paso
Hobbs, New Mexico 88240

Secured by

Time

Date

Sampling conditions

Press

Temp.

FRACTIONAL ANALYSIS

Percentage Composition

MOL % LIQ. % G.P.M.

Carbon Dioxide	1.126	
Air		
Nitrogen	.158	
Oxygen		
Hydrogen sulfide		
Hydrogen		
Methane	95.855	
Ethane	2.275	.607
Propane	.375	.103
Butanes		
Iso-Butane	.046	.015
N-Butane	.052	.016
Pentanes		
Iso-Pentane	.019	.007
N-Pentane	.011	.004
Hexanes	.033	.014
Heptanes	.050	.021
TOTAL	100.000	.787

Calc. Sp. Gr. 0.5842

Calc. A.P.I.

Calc. Vapor Press.

Sp. Gr.

PSIA

Mol. Wt. 16.93

LIQUID CONTENT (GAL./MCF)

Propane Calc. G.P.M.	.103
Butanes Calc. G.P.M.	.031
Pentanes Plus. G.P.M.	.046
Ethane Calc. G.P.M.	.607
RVP Gasoline G.P.M.	

B.T.U./Cu. Ft. @ 14.696 P.S.I.A.

Dry Basis

1026

Wet Basis

1008

Sulfur Analysis by Titration

Gr./100 Cu. Ft.

Hydrogen Sulfide

Mercaptans

Sulfides

Residual Sulfur

Total Sulfur

Anal. by Deane Simpson

Checked by

Approved by

Additional Data and Remarks