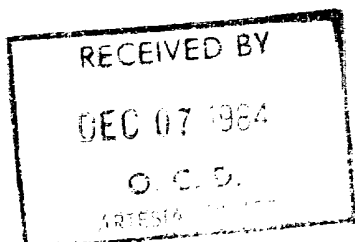


C/SF
File



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

Form C-122
Revised 9-1-63

Type Test ☒ Initial ☐ Annual ☐ Special										Test Date 11-29-84	
Company Cities Service Oil & Gas Corp.						Connection To Air				Unit	
Pool WIC Undesignated Bone Springs						Formation Bone Springs				Farm or Lease Name STATE C P Com	
Completion Date 11-25-84		Total Depth 11,750'		Perforations: 5320' 5089 To 5284		Elevation 3227' GR		Well No. 1			
Casing Size 5" Liner		WT. 23" 18		Set At 10155 9945-11750		Perforations: 5089 To 5284		Unit J		Sec. 9	
Tub. Size 2 7/8"		WT. 6.5		Set At 4945		Perforations: OPEN-ENDED		Twp. 21S		Rge. 27E	
Type Well - Single - Bradenhead - G.G. or G.O. Multiple SINGLE						Packer Set At 4945'		County Eddy			
Producing Thru TUBING		Reservoir Temp. °F 126° 5186'		Mean Annual Temp. °F 60°		Baro. Press. - P _a 13.2		State New Mexico			
L 5186		H 5186		G _g 7043		% CO ₂ 1.437		% N ₂ 2.960		Prover Meter Run 4" Flange	
FLOW DATA						TUBING DATA		CASING DATA		Duration of Flow	
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. hw	Temp. °F	Press. p.s.i.g.	Temp. °F	Press. p.s.i.g.	Temp. °F	Duration of Flow
SI							1650	51°	PKR.	CHOKE	72 Hrs.
1.	4.026	x	1.500	510	5	75°	1578	51		9/64	1 Hr.
2.	4.026	x	1.500	510	10	76	1511	52		11/64	1 Hr.
3.	4.026	x	1.500	520	23	75	1356	53		14/64	1 Hr.
4.	4.026	x	1.500	540	44	75	1242	56		17/64	1 Hr.
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	10.84	51.15	523.2	.9859	1.192	1.054	687				
2	10.84	72.33	523.2	.9850	1.192	1.054	970				
3	10.84	110.74	533.2	.9859	1.192	1.054	1487				
4	10.84	156.02	553.2	.9859	1.192	1.054	2095				
5											
NO.	R	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio 94,909 Mcf/bbl.						
1	.78	535	1.40	.901	A.P.I. Gravity of Liquid Hydrocarbons 68.8 @ 60° Deg.						
2	.78	536	1.40	.901	Specific Gravity Separator Gas .704 XXXXXXXXXX						
3	.80	535	1.40	.901	Specific Gravity Flowing Fluid XXXXX						
4	.83	535	1.40	.901	Critical Pressure 667 P.S.I.A. P.S.I.A.						
5					Critical Temperature 382 R R						
$P_r 1718.0$ $P_c^2 2951.5$ $(1) \frac{P_c^2}{P_c^2 - P_w^2} = 2.453$ $(2) \left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.833$ $n = 3.840$											
NO.	P _r ²	P _w	P _w ²	P _c ² - P _w ²							
1	1666.3	2776.6	174.9								
2	1601.7	2565.4	386.1								
3	1487.3	2212.1	739.4								
4	1322.3	1748.5	1203.0								
5											
Absolute Open Flow 3,840 Mcfd @ 15.025						Angle of Slope 56°		Slope, n .675			
Remarks: Calculated from known bottom hole pressures, measured with Kuster Gauge.											
Well made 2.3 Bbls. water and 2.3 Bbls. of condensate during test.											
Approved By Commission:				Conducted By: R.B.				Calculated By: R.R.			
								Checked By: R.R.			

Post ID-2
1-25-85
Comp BS

$$Q_1 = 1300 = \text{Log } 3.113943$$

$$Q_2 = 275 = \text{Log } 2.438943$$

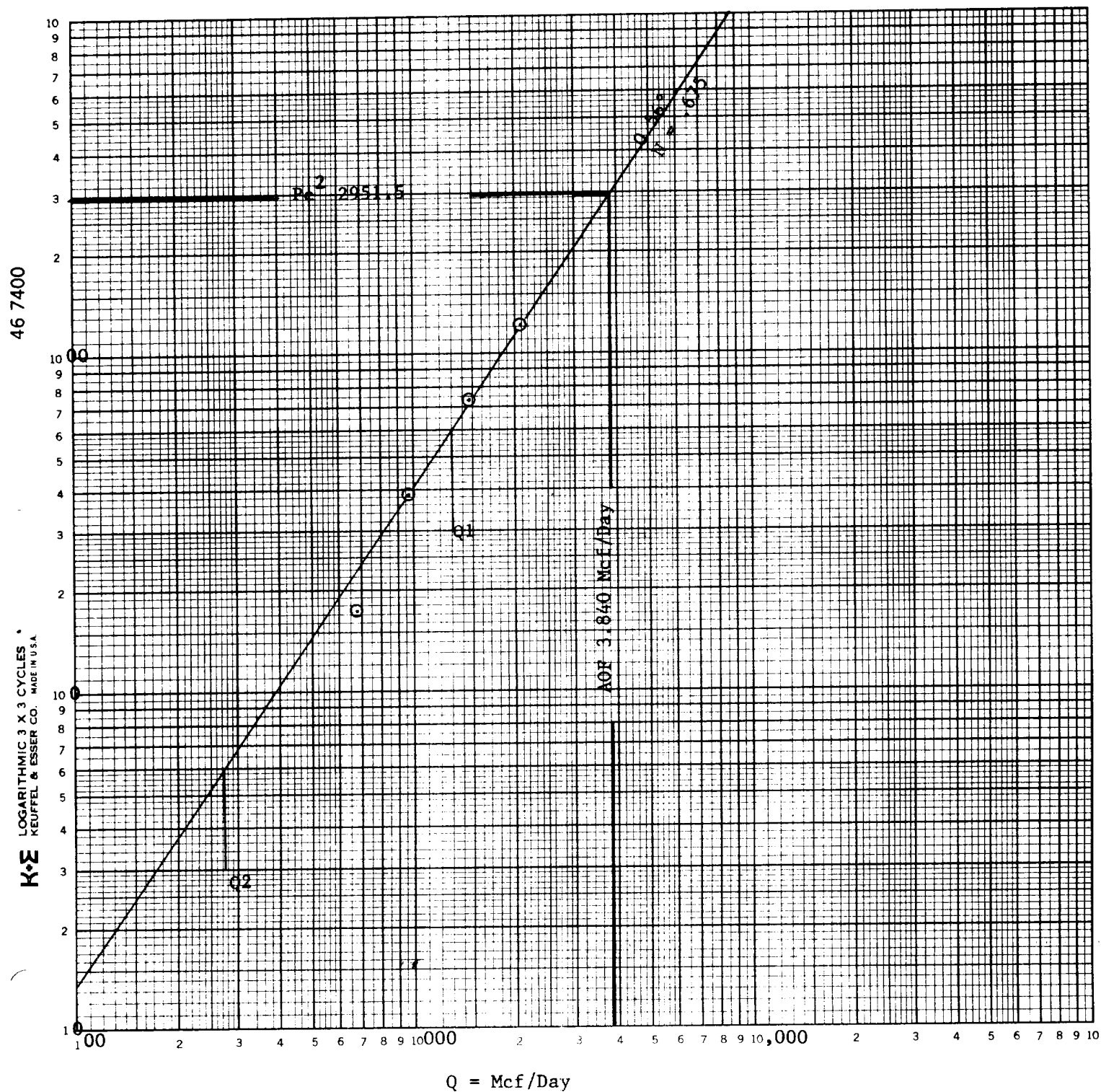
$$N = .675000$$

$$\text{CAOF} = 2095 \frac{(2951.5)^{.675}}{1203.0} = 3,840 \text{ Mcf/Day}$$

CITIES SERVICE OIL & GAS CORP.

STATE C.P. NO. 1

November 29, 1984



WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURES (P_c or P_s)

FROM KNOWN BOTTOM HOLE PRESSURE (P_f or P_s)

COMPANY CITIZEN SERVICE LEASE STATE CP WELL NO. 1 DATE 11-29-84
LOCATION: Unit J Section 9 Township 21S Range 27E
L 5186 H 5186 L/H 1.00 G .204 % CO₂ 1.437 % N₂ 2.960 % H₂S

GH 3651 P_{CT} 667 T_{CT} 382
TABLE IX & X

Shot-1N

LINE		1	2	3	4	5	6	7	8
1	T _w (W.H. °R)	534	534						
2	T _s (B.H. °R)	586	586						
3	T _r = $\frac{(T_w + T_s)}{2}$	560	560						
4	Z (Est.)	.744	.752						
5	TZ	416.6	421.1						
6	GH/TZ	8.763	8.670						
7	e ^s (Table XIV)	1.389	1.384						
8	P _f or P_s	2021.2	2021.2						
9	P _f ² or P_s²	4085.2	4085.2						
10	P _c ² = P _f ² /e ^s or P_w² = P_s²/e^s	2941.1	2951.4						
11	P _c or P_w	1714.9	1718.0						
12	P _r = $\frac{(P_w + P_s)}{2}$ or $\frac{(P_c + P_f)}{2}$	1868.1	1869.6						
13	P _r = (P/P _{CT})	2.80	2.80						
14	T _r = (T/T _{CT})	1.47	1.47						
15	Z (Table XI)	.752	.752						

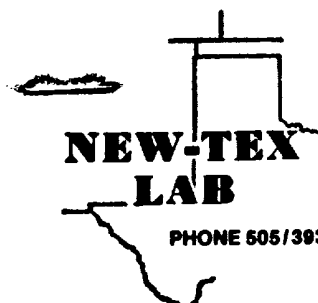
WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURES (For P_w)

FROM KNOWN BOTTOM HOLE PRESSURE (For P_s)

COMPANY Cities Service LEASE State CP WELL NO. 1 DATE 11-29-84
LOCATION: Unit J Section 9 Township 21S Range 27E
L 5186 H 5186 L/H 1.00 G 704 % CO₂ 1.437 % N₂ 2.960 % H₂S

GH 3651 P_{CT} 667 T_{CT} 382
TABLE IX & X

LINE	1	2	3	4	5	6	7	8
1	T _w (W.H. °R)	534	534	534	534	534	534	534
2	T _s (B.H. °R)	586	586	586	586	586	586	586
3	T = (T _w + T _s) / 2	560	560	560	560	560	560	560
4	Z (Est.)	.747	.755	.751	.760	.770	.777	.788
5	TZ	418.3	422.8	420.6	425.6	431.2	435.1	441.3
6	GH/TZ	8.730	8.635	8.681	8.578	8.467	8.391	8.274
7	e ^s (Table XIV)	1.388	1.382	1.385	1.379	1.374	1.369	1.364
8	P _{CT} or P _s	1959.2	1959.2	1881.2	1743.2	1743.2	1544.2	1544.2
9	P _{CT} or P _s 2	3838.5	3838.5	3538.9	3038.7	3038.7	2384.6	2384.6
10	P _C 2 = P _f 2 / e ^s or P _w 2 = P _s 2 / e ^s	2767.0	2776.7	2555.6	2202.8	2212.1	1740.8	1748.5
11	P _C or P _w	1663.4	1666.3	1578.6	1484.2	1487.3	1319.4	1322.3
12	P _r = (P _w + P _s) / 2 or (P _C + P _f) / 2	1811.3	1812.8	1739.9	1613.7	1615.3	1431.8	1433.3
13	P _r = (P _r / P _{CT})	2.72	2.72	2.61	2.42	2.42	2.15	2.15
14	T _r = (T / T _{CT})	1.47	1.47	1.47	1.47	1.47	1.47	1.47
15	Z (Table XI)	.755	.755	.760	.770	.770	.788	.788



PHONE 505/393-3561

P. O. BOX 1161

611 W. SNYDER

HOBBS, NEW MEXICO 88240

ANALYSIS CERTIFICATE

CLIENT: JOHN WEST ENGINEERING
ADDRESS: 412 N DAL PASO
CITY, STATE: HOBBS, NM 88240

ANALYSIS NUMBER: 5093
DATE OF RUN: 11 29 84
DATE SECURED: 11 29 84

SAMPLE IDENT: CITIES SERVICE OIL CO - STATE "CP" #1
SAMPLING PRESS: SAMPLING TEMP:

***** LIQUID ANALYSIS *****

	MOLE PERCENT	LIQUID PERCENT	WEIGHT PERCENT
NITROGEN	0.100	0.031	0.042
CARBON DIOXIDE	0.568	0.275	0.372
METHANE	10.076	4.861	2.406
ETHANE	9.691	7.360	4.337
PROPANE	12.746	9.963	8.365
ISO-BUTANE	2.653	2.464	2.295
NORMAL BUTANE	8.533	7.639	7.381
ISO-PENTANE	4.911	5.105	5.273
NORMAL PENTANE	7.811	8.035	8.387
HEXANES	13.656	15.945	17.514
HEPTANES	29.255	38.322	43.628

CALCULATED SPECIFIC GRAVITY:
CALCULATED VAPOR PRESSURE:

0.5969

~~0.02 0.35~~

MOLECULAR WEIGHT:

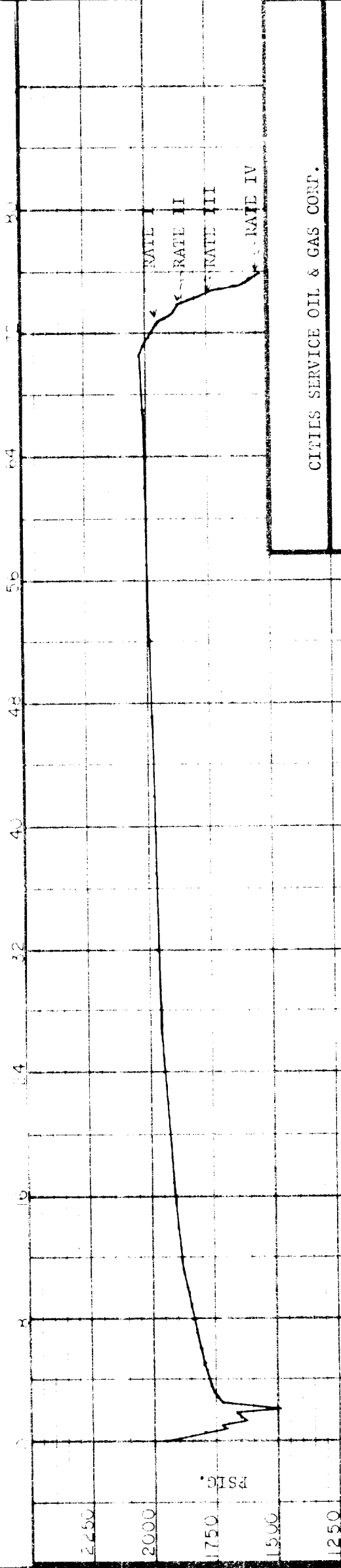
67.19

TEST DATE: NOVEMBER 26 to 29, 1984
TEST DEPTH: 5186 FEET

ELEMENT NO: 28552-N
RANGE: 0-4150 PSI
CLOCK NO: 22507
RANGE: 0-72 Hours

NOTE: See tabulation of times and pressures on attached sheet.

TIME IN HOURS



CITIES SERVICE OIL & GAS CORP.

STATE "CP" NO. 1

BOTTOM HOLE PRESSURE BUILD-UP TEST.
AND 4-POINT TEST.

JOHN W. WEST ENGINEERING CO. HOBBS, NEW MEXICO

Date: 11-29-84 Drawn by: bsm Scale: as shown

CITIES SERVICE OIL & GAS CORP.
 STATE C.P. NO. 1
 BOTTOM HOLE PRESSURE BUILD-UP TEST & 4-POINT TEST.
 TABULATION OF TIMES AND PRESSURES

TEST CONDUCTED BY:
 JOHN WEST ENGINEERING COMPANY

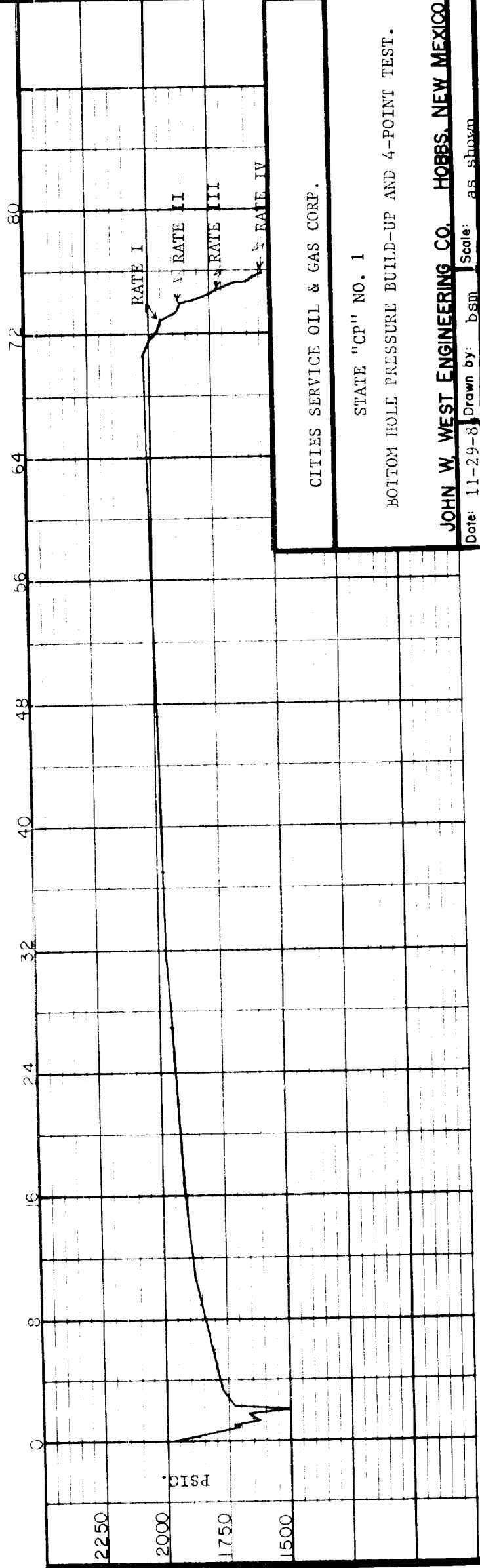
TEST DATE: NOVEMBER 26 to 29, 1984
 TEST DEPTH: 5186 FEET
 ELEMENT NO: 28552-N (0-4150 PSI)
 OPERATOR: R.B.

<u>DATE</u>	<u>TIME</u>	<u>CUM HRS./MIN.</u>	<u>PSIG @ 5186 FEET</u>
11-26-84	9:45 A.M.	00 Hrs. 00 Min.	1958 D.W. 1210 PSI gauge reached 5186'
	10:00 A.M.	00 15	1870
	10:15 A.M.	00 30	1787
	10:30 A.M.	00 45	1711
	10:45 A.M.	01 00	1726
	11:00 A.M.	01 15	1630
	11:15 A.M.	01 30	1651
	11:30 A.M.	01 45	1663
	11:45 A.M.	02 00	1498
	11:45 A.M.	00 Hrs. 00 Min.	1498 D.W. 1622 PSI. Shut-In, begin build-up
11-26-84	12:00 Noon	00 15	1726
	12:15 P.M.	00 30	1736
	12:30 P.M.	00 45	1745
	12:45 P.M.	01 00	1751
	1:15 P.M.	01 30	1766
	1:45 P.M.	02 00	1776
	2:15 P.M.	02 30	1787
	2:45 P.M.	03 00	1793
	3:45 P.M.	04 00	1810
	4:45 P.M.	05 00	1824
11-26-84	5:45 P.M.	06 00	1837
	6:45 P.M.	07 00	1847
	7:45 P.M.	08 00	1858
	8:45 P.M.	09 00	1868
	9:45 P.M.	10 00	1877
11-27-84	2:45 A.M.	15 00	1912
	7:45 A.M.	20 00	1939
	12:45 P.M.	25 00	1954
	5:45 P.M.	30 00	1969
	10:45 P.M.	35 00	1975
11-28-84	3:45 A.M.	40 00	1983
	8:45 A.M.	45 00	1990
	1:45 P.M.	50 00	1994
	6:45 P.M.	55 00	2002
	11:45 P.M.	60 00	2006
11-29-84	4:45 A.M.	65 00	2010
	8:15 A.M.	68 30	2015 Chart out to change charts.
	9:00 A.M.		2008 gauge back to 5186 feet
	9:30 A.M.	00 Hrs. 00 Min.	1992 Begin 4-Point Test.
	9:45 A.M.	00 15	1973
	10:00 A.M.	00 30	1964
	10:15 A.M.	00 45	1954
	10:30 A.M.	01 00	1946 End Rate I
	10:45 A.M.	01 15	1908
	11:00 A.M.	01 30	1891
11-29-84	11:15 A.M.	01 45	1881
	11:30 A.M.	02 00	1868 End Rate II
	11:45 A.M.	02 15	1822
	12:00 Noon	02 30	1772
	12:15 P.M.	02 45	1747
	12:30 P.M.	03 00	1730 End Rate III
	12:45 P.M.	03 15	1644
	1:00 P.M.	03 30	1592
	1:15 P.M.	03 45	1573
	1:30 P.M.	04 00	1531 End Rate IV

TEST DATE: NOVEMBER 26 to 29, 1984
TEST DEPTH: 5186 FEET

ELEMENT NO: 23953
RANGE: 0-4000 PSI
CLOCK NO: 28711
RANGE: 0-72 HOURS

TIME IN HOURS



CITIES SERVICE OIL & GAS CORP.

STATE "CP" NO. 1

BOITOM HOLE PRESSURE BUILD-UP AND 4-POINT TEST.

JOHN W. WEST ENGINEERING CO. HOBBS, NEW MEXICO

Date: 11-29-81 Drawn by: bsm Scale: as shown

CITEIS SERVICE OIL & GAS CORP.
 STATE C.P. NO. 1
 BOTTOM HOLE PRESSURE BUILD-UP TEST & 4-POINT TEST.
 TABULATION OF TIMES AND PRESSURES.

TEST CONDUCTED BY:
 JOHN WEST ENGINEERING COMPANY

TEST DATE: NOVEMBER 26 to 29, 1984
 TEST DEPTH: 5186 FEET
 ELEMENT NO: 23953 (0-4000 PSI)
 OPERATOR: R.B.

<u>DATE</u>	<u>TIME</u>	<u>CUM HRS./MIN.</u>	<u>PSIG @ 5186 FEET</u>
11-26-84	9:45 A.M.	00 Hrs. 00 Min.	1963 gauge reached 5186' Flowing
	10:00 A.M.	00 15	1875
	10:15 A.M.	00 30	1792
	10:30 A.M.	00 45	1716
	10:45 A.M.	01 00	1730
	11:00 A.M.	01 15	1634
	11:15 A.M.	01 30	1656
	11:30 A.M.	01 45	1668
11-26-84	11:45 A.M.	02 00	1502
	11:45 A.M.	00 Hrs. 00 Min.	1502 Shut-In, Begin Build-Up
	12:00 Noon	00 15	1730
	12:15 P.M.	00 30	1740
	12:30 P.M.	00 45	1750
	12:45 P.M.	01 00	1756
	1:15 P.M.	01 30	1770
	1:45 P.M.	02 00	1780
	2:15 P.M.	02 30	1792
	2:45 P.M.	03 00	1798
	3:45 P.M.	04 00	1815
	4:45 P.M.	05 00	1829
	5:45 P.M.	06 00	1841
	6:45 P.M.	07 00	1851
	7:45 P.M.	08 00	1863
	8:45 P.M.	09 00	1873
11-26-84	9:45 P.M.	10 00	1881
11-27-84	2:45 A.M.	15 00	1917
	7:45 A.M.	20 00	1943
	12:45 P.M.	25 00	1957
	5:45 P.M.	30 00	1973
11-27-84	10:45 P.M.	35 00	1979
11-28-84	3:45 A.M.	40 00	1987
	8:45 A.M.	45 00	1995
	1:45 P.M.	50 00	1997
	6:45 P.M.	55 00	2006
11-28-84	11:45 P.M.	60 00	2010
11-29-84	4:45 A.M.	65 00	2014
11-29-84	8:15 A.M.	68 30	2020 Gauge out to change charts.
11-29-84	9:00 A.M.		2012 Gauge back to 5186 feet
	9:30 A.M.	00 Hrs. 00 Min.	1999 Begin 4-Point
	9:45 A.M.	00 15	1977
	10:00 A.M.	00 30	1969
	10:15 A.M.	00 45	1959
	10:30 A.M.	01 00	1951 End Rate I
	10:45 A.M.	01 15	1913
	11:00 A.M.	01 30	1894
	11:15 A.M.	01 45	1885
	11:30 A.M.	02 00	1871 End Rate II
	11:45 A.M.	02 15	1827
	12:00 Noon	02 30	1776
	12:15 P.M.	02 45	1750
	12:30 P.M.	03 00	1734 End Rate III
	12:45 P.M.	03 15	1648
	1:00 P.M.	03 30	1596
	1:15 P.M.	03 45	1578
11-29-84	1:30 P.M.	04 00	1536 End Rate IV