

Phone
713-790-9132

LYNES, INC.

Box 12486
Houston, TX 77017

Contractor Resource Drilling
Rig No. 23
Spot 2180' FSL & 660' FEL
Sec. 27
Twp. 15 S
Rng. 30 E
Field Wildcat
County Chaves
State New Mexico
Elevation 4,085 Ft. K.B.
Formation Morrow

Top Choke 1/2"
Bottom Choke 1"
Size Hole 7 7/8"
Size Rat Hole --
Size & Wt. D. P. 4 1/2" XH
Size Wt. Pipe --
I. D. of D. C. 2 1/4"
Length of D. C. 615 Ft.
Total Depth 11,420 Ft.
Interval Tested 10,614-10,644'
Type of Test Inflate
Straddle

Flow No. 1 30 Min.
Shut-in No. 1 120 Min.
Flow No. 2 120 Min.
Shut-in No. 2 480 Min.
Flow No. 3 -- Min.
Shut-in No. 3 -- Min.

Bottom
Hole Temp. 175° F
Mud Weight 9.3
Gravity 44.4 @ 60° F
Viscosity 39

Tool opened @ 8:40 AM

Outside Recorder

PRD Make Kuster K-3
No. 20173 Cap. 6100 @ 10,618'
Press Corrected
Initial Hydrostatic A 5151
Final Hydrostatic K *
Initial Flow B 1347
Final Initial Flow C 1658
Initial Shut-in D 3805
Second Initial Flow E 1785
Second Final Flow F 2710
Second Shut-in G 3798
Third Initial Flow H --
Third Final Flow I --
Third Shut-in J --
Extrapolated ISI 3812.5
Extrapolated FSI 3810.9

Lynes Dist. Hobbs, New Mexico
Our Tester Steve McKinney
Witnessed By R. DeLa Moriniere

Did Well Flow - Gas Yes Oil Yes Water No

RECOVERY IN PIPE:

[Ran 2,500 Ft. water cushion]

75 bbls. Total fluid [Test was reverse circulated]

Blow Description:

1st Flow:

Tool opened with a fair blow, increased to 3 PSI in 25 minutes and remained thru flow period. After shut-in blow slightly increased throughout shut-in period.

2nd Flow:

Tool opened with 30 PSI, on a 1/2" choke; gas to surface in 5 minutes, [See Gas Volume Report]. After shut-in, slight oil & gas cut water cushion to surface in 15 minutes, flowed oil for 50 minutes, gas thru the remainder of the test.

*Recorder completed 24 hr. chart cycle at conclusion of

Address See Distribution

Operator Hilliard Oil & Gas, Inc.

Well Name and No. McClellan Federal # 1

Ticket No. 40907

Date 1/23/83

No. Final Copies 15

DST No. 5

LYNES, INC.

Hilliard Oil & Gas
Operator

McClellan Federal #1
Well Name and No.

5
DST No.

Comments relative to DST #5 run on McClellan Federal #1, 27-15S-30E for Hilliard Oil & Gas in Chaves County, New Mexico.

The following calculations were performed using the Horner method of analysis and the appropriate gas calculations. The gas calculations were used because the oil that flowed to surface diminished and the recovery appeared to be predominately gas for the remainder of the test.

The parameters used were estimated:

ie: μ 0.026 cp, Z 0.88, Reservoir Temp. 635° R., pay thickness 10 Ft.

1. The initial shut-in was extrapolated to 3812.5 PSI and had a slope of 634520 PSI² /cycle. The final shut-in extrapolated to 3810.9 PSI and had a slope of 847130 PSI² /cycle. This is equivalent to a subsurface pressure gradient of 0.359 PSI/Ft. at the recorder depth of 10,618 feet. The comparison of the two extrapolated pressures indicates that no depletion occurred.
2. The production rate used in this analysis was the last measured gas rate during the test 658 MCF/D.
3. The calculated effective transmissibility of 710.5 md-ft./cp indicates an average effective permeability of 1.847 md over the estimated 10 ft. of effective porosity.
4. The calculated damage ratio of 2.89 indicates the presence of well bore damage during the test. This indicates that the well should produce 2.89 times greater if the damage was removed from the zone. It should be noted that this calculated damage ratio could be erroneous due to the fact that there was a large volume of fluid produced. This could have caused a choking effect within the flow passages since the well flowed fluid resulting in the high final flow pressures.
5. The evaluation criteria used in this test analysis should be reliable within reasonable limits considering the fact that a large amount of fluid was produced and the assumptions that were made.



T.H. Adams C.E.T.

GAS PRODUCTION

$$R(T_f) = 635^\circ$$

ESTIMATED GAS PROPERTIES

Estimated Bottom Hole Temperature 175 °

Gravity @ 60° F 0.68

Viscosity (Res.) .026 cp.

Compressibility Factor (Z) .88

TRANSMISSIBILITY

Measured D.S.T. Gas Rate = 658. mcf/d.

$$\frac{kh}{\mu} = \frac{1637 Q_g Z T_f}{m} = \frac{1637 (658) (0.88) (635)}{(847130)} = 710.5 \frac{\text{md.-ft.}}{\text{cp.}}$$

IN SITU CAPACITY

$$kh = (710.5) (0.026) = 18.47 \text{ md.-ft.}$$

AVERAGE EFFECTIVE PERMEABILITY

Estimated Pay Thickness 10 Ft.

Actual Pay Thickness Ft.

$$k = \frac{(18.47)}{(10)} = 1.847 \text{ md.}$$

APPROXIMATE RADIUS OF INVESTIGATION

$$b = 0.02 \sqrt{kt_o P_o} = 0.02 \sqrt{(1.847) (150) (3810.9)} = 20.55 \text{ ft.}$$

ACTUAL CAPACITY

$$kh = \frac{3270 Q_g \mu Z T_f \log(0.472 \frac{b}{r_w})}{P_o^2 - P_i^2} = \frac{3270 (658) (.026) (0.88) (635) (1.47)}{(3810.9)^2 - (2710)^2} = 6.40 \text{ md.-ft.}$$

DAMAGE RATIO

$$E.D.R. = \frac{(P_o^2 - P_i^2)}{m (\log T_o + 2.65)}$$

$$D.R. = \frac{\text{In Situ Capacity}}{\text{Actual Capacity}} = \frac{(18.47)}{(6.40)} = 2.89$$

$$E.D.R. =$$

ESTIMATED RANGE OF AOF POTENTIAL

$$\text{Max. AOF} = \frac{Q_g P_o^2}{P_o^2 - P_i^2} = \frac{(658) (3810.9)^2}{[(3810.9)^2 - (2710)^2]} = 133 \text{ MCF/D}$$

$$\text{Min. AOF} = \frac{Q_g P_o}{\sqrt{P_o^2 - P_i^2}} = \frac{(658) (3810.9)}{\sqrt{[(3810.9)^2 - (2710)^2]}} = 935.8 \text{ MCF/D}$$

ESTIMATED RANGE OF AOF POTENTIAL, DAMAGE REMOVED

$$\text{Max. AOF}_t = (\text{Max. AOF}) (D.R.) = (133) (2.89) = 3847 \text{ MCF/D}$$

$$\text{Min. AOF}_t = (\text{Min. AOF}) (D.R.) = (935.8) (2.89) = 2704 \text{ MCF/D}$$

$$\text{Drawdown Factor} = \frac{\text{ISIP} - \text{FSIP}}{\text{ISIP}} \times 100 = \frac{(\text{--}) - (\text{--})}{(\text{--})} \times 100 = \text{--} \%$$

4% to 5% is considered serious or substantial

$$\text{Potentiometric Surface} = H_s = Z + \frac{P_o}{W} \quad H_w = \text{--} + \frac{(\text{--})}{(\text{--})} = \text{--} \pm \text{--} \text{ ft.}$$

INTERPRETATION CALCULATIONS (GAS)

WELL NAME: MCCLELLAN FEDERAL 1

DST NUMBER: 005

RECORDER NUMBER: 020173

INTERVAL TESTED: 10614FT TO 10644FT

RECORDER DEPTH: 10618.000FT

TOTAL FLOW TIME: 30.0MIN

FIRST SHUT IN PRESSURE (GAS)

TIME (MIN)	(T+PHI) /PHI	PRESSURE (PSI)	PRESSURE (PSI ²)/10 ⁶
.0	.0000	1658.0	2.74896
1.0	31.0000	3103.0	9.62861
2.0	16.0000	3690.0	13.61610
3.0	11.0000	3728.0	13.89798
4.0	8.5000	3744.0	14.01753
5.0	7.0000	3751.0	14.07000
6.0	6.0000	3756.0	14.10753
7.0	5.2857	3760.0	14.13760
8.0	4.7500	3764.0	14.16769
9.0	4.3333	3767.0	14.19029
10.0	4.0000	3769.0	14.20536
12.0	3.5000	3774.0	14.24307
14.0	3.1429	3777.0	14.26573
16.0	2.8750	3779.0	14.28084
18.0	2.6667	3781.0	14.29596
20.0	2.5000	3783.0	14.31109
22.0	2.3636	3785.0	14.32622
24.0	2.2500	3787.0	14.34136
26.0	2.1538	3789.0	14.35652
28.0	2.0714	3790.0	14.36409
30.0	2.0000	3790.0	14.36409
40.0	1.7500	3793.0	14.38685
50.0	1.6000	3796.0	14.40961
60.0	1.5000	3798.0	14.42480 *
70.0	1.4286	3800.0	14.44000 *
90.0	1.3333	3801.0	14.44760 *
100.0	1.3000	3803.0	14.46280 *
110.0	1.2727	3804.0	14.47041 *
120.0	1.2500	3805.0	14.47802 *

* VALUES USED IN HORNER ANALYSIS

SLOPE: .63452 (PSI²/10⁶)/CYCLE

EXTRAPOLATED PRESSURE: 3812.5 PSI

HORNER PLOT

TEST DATE: 01 23 82

WELL NAME: MCCLELLAN FEDERAL 1

LOCATION:

DST NO: 005

REC NO: 020173

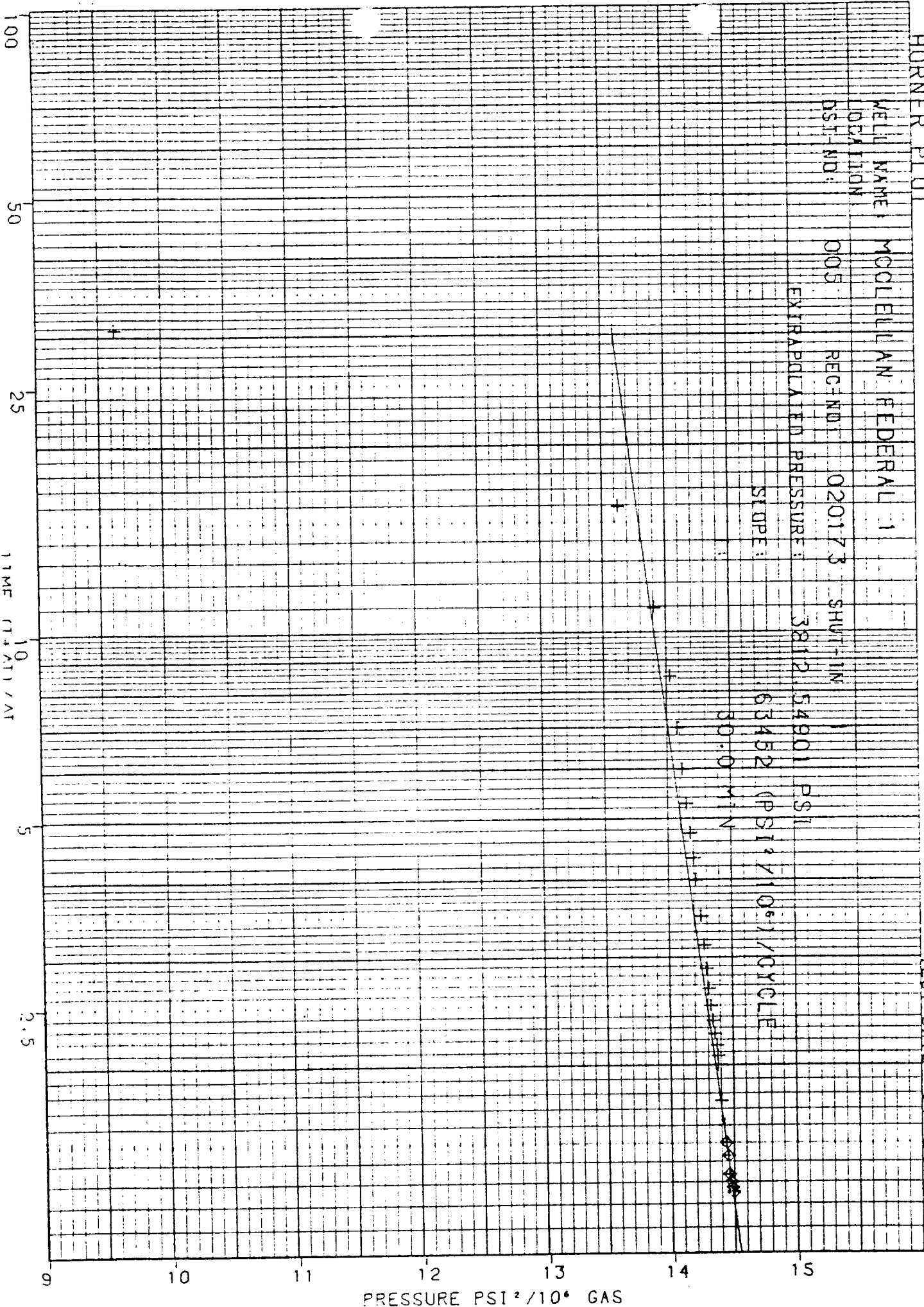
SHUT-IN

EXTRAPOLATED PRESSURE: 3812.54901 PSI

63452 (PSI²/10⁶)/CYCLE

80.0 MIN

SLOPE:



WELL NAME: MCCLELLAN FEDERAL 1

DST NUMBER: 005

RECORDER NUMBER: 020173

INTERVAL TESTED: 10614FT TO 10644FT

RECORDER DEPTH: 10618.000FT

TOTAL FLOW TIME: 150.0MIN

SECOND SHUT IN PRESSURE (GAS)

TIME (MIN)	(T+PHI)	PRESSURE	PRESSURE
PHI	/PHI	(PSI)	(PSI ²)/10 ⁶
.0	.0000	2710.0	7.34410
1.0	151.0000	3685.0	13.57922
2.0	76.0000	3715.0	13.80122
3.0	51.0000	3727.0	13.89053
4.0	38.5000	3733.0	13.93529
5.0	31.0000	3737.0	13.96516
6.0	26.0000	3740.0	13.98759
7.0	22.4286	3743.0	14.01005
8.0	19.7500	3745.0	14.02502
9.0	17.6667	3746.0	14.03251
10.0	16.0000	3747.0	14.04001
12.0	13.5000	3750.0	14.06250
14.0	11.7143	3752.0	14.07750
16.0	10.3750	3754.0	14.09251
18.0	9.3333	3755.0	14.10002
20.0	8.5000	3756.0	14.10753
22.0	7.8182	3756.0	14.10753
24.0	7.2500	3757.0	14.11504
26.0	6.7692	3757.0	14.11504
28.0	6.3571	3758.0	14.12256
30.0	6.0000	3758.0	14.12256
40.0	4.7500	3761.0	14.14512
50.0	4.0000	3764.0	14.16769
60.0	3.5000	3767.0	14.19029
90.0	2.6667	3772.0	14.22798
120.0	2.2500	3774.0	14.24307
150.0	2.0000	3776.0	14.25817
180.0	1.8333	3779.0	14.28084
210.0	1.7143	3782.0	14.30352
240.0	1.6250	3785.0	14.32622
270.0	1.5556	3788.0	14.34894
300.0	1.5000	3791.0	14.37168
330.0	1.4545	3793.0	14.38685 *
360.0	1.4167	3794.0	14.39443 *
390.0	1.3846	3795.0	14.40202 *
420.0	1.3571	3796.0	14.40961 *

CONTINUED ON NEXT PAGE

SECOND SHUT IN PRESSURE (GAS)

TIME (MIN) PHI	(T+PHI) /PHI	PRESSURE (PSI)	PRESSURE (PSI ²)/10 ⁶
450.0	1.3333	3797.0	14.41721 *
480.0	1.3125	3798.0	14.42480 *

* VALUES USED IN HORNER ANALYSIS

SLOPE: .84713 (PSI²/10⁶)/CYCLE

EXTRAPOLATED PRESSURE: 3810.9 PSI

HORNER PLOT

IESI DATE: 01 23 82

WELL NAME: MCCLELLAN FEDERAL 1

LOCATION:

DST-NO:

005

REC-NO:

020173

SHUT-IN:

2

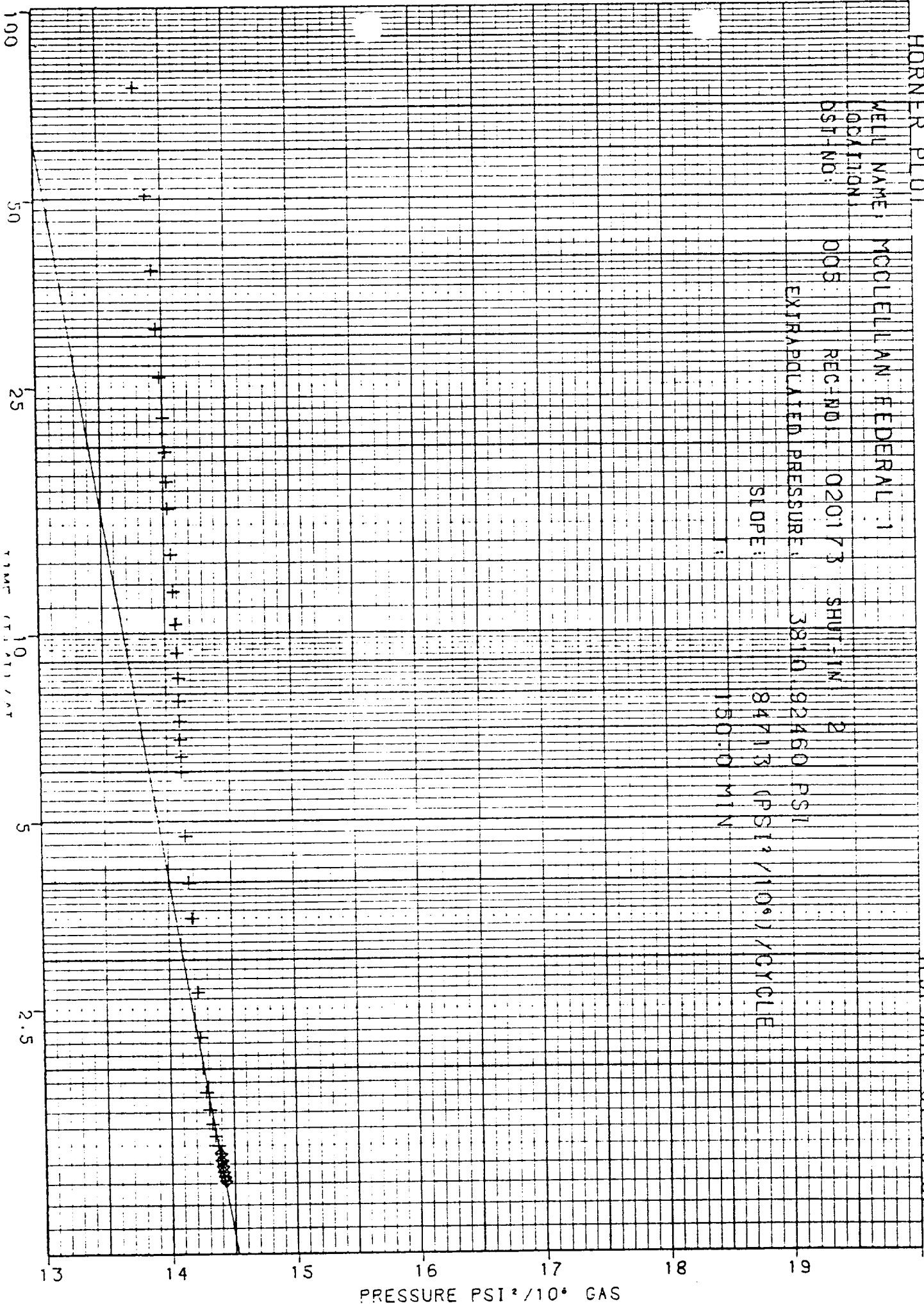
EXTRAPOLATED PRESSURE:

3810.92460 PSI

SLOPE:

84713 (PSI²/10⁶)/CYCLE

150.0 MIN



LYNES, INC.

Gas Volume Report

Hilliard Oil & Gas, Inc.
Operator

McClellan Federal #1
Well Name and No.

5
DST No.

Final flow period:

Min.	PSIG	Orifice Size	MCF/D	Min.	PSIG	Orifice Size	MCF/D
5	35	1/2"	Gas to Surface 313.1				
15	33	"	300.6				
30	28	"	269.3				
35	23	"	238.0				
40	14	"	181.6				
45	8	"	144.0				
50	4	"	119.0				
55	3	"	112.7				
60	3	"	112.7				
65	3	"	112.7				
90	8	"	144.0				
115	15	"	187.9				
Water to surface							
Oil to surface							
200	90	"	658.0				
215	90	"	658.0				
230	90	"	658.0				

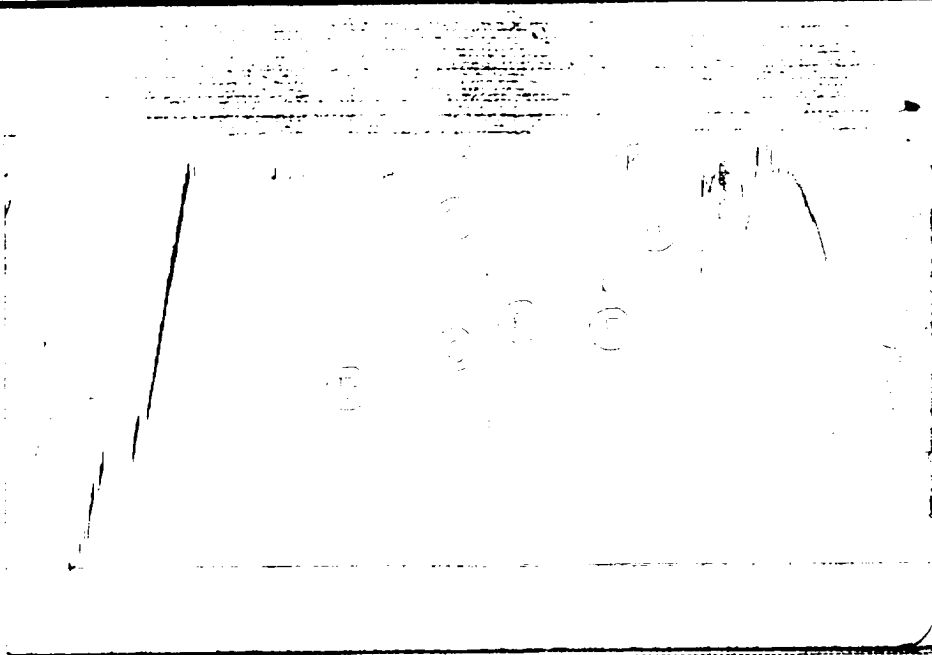
Remarks:

LYNES, INC.

Hilliard Oil & Gas, Inc.
Operator

McClellan Federal #1
Well Name and No.

5
DST No.



Outside Recorder		
PRD Make	Kuster K-3	
No. 20178	Cap. 6100	@ 10,618'
Press		Corrected
Initial Hydrostatic	A	5147
Final Hydrostatic	K	5114
Initial Flow	B	1363
Final Initial Flow	C	1668
Initial Shut-in	D	3786
Second Initial Flow	E	1792
Second Final Flow	F	2705
Second Shut-in	G	3765*
Third Initial Flow	H	--
Third Final Flow	I	--
Third Shut-in	J	--

Pressure Below Bottom
Packer Bled To

*Clock stopped 293 minutes
into Final shut-in period.

PRD Make		
No.	Cap.	@
Press		Corrected
Initial Hydrostatic	A	
Final Hydrostatic	K	
Initial Flow	B	
Final Initial Flow	C	
Initial Shut-in	D	
Second Initial Flow	E	
Second Final Flow	F	
Second Shut-in	G	
Third Initial Flow	H	
Third Final Flow	I	
Third Shut-in	J	

Pressure Below Bottom
Packer Bled To

LYNES, INC.

Sampler Report

Company Hilliard Oil & Gas, Inc. Date 1-23-83
Well Name & No. McClellan Federal #1 Ticket No. 40907
County Chaves State New Mexico
Test Interval 10,614-10,644' DST No. 5

Total Volume of Sampler: 2000 cc.
Total Volume of Sample: .700 cc.
Pressure in Sampler: 1600 psig
Oil: 700 Distillate cc.
Water: None cc.
Mud: None cc.
Gas: 9.3 cu. ft.
Other: None

Resistivity

Make Up Water _____ @ _____ Salinity Content _____ ppm.
Mud Pit Sample _____ @ _____ Salinity Content _____ ppm.
Gas/Oil Ratio _____ Gravity 59.4 °API @ 60 °F
Where was sample drained On location

Remarks: Recovery:

Top Sample R.W.: .04 @ 52° F = 200,000+ ppm. cl.