

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

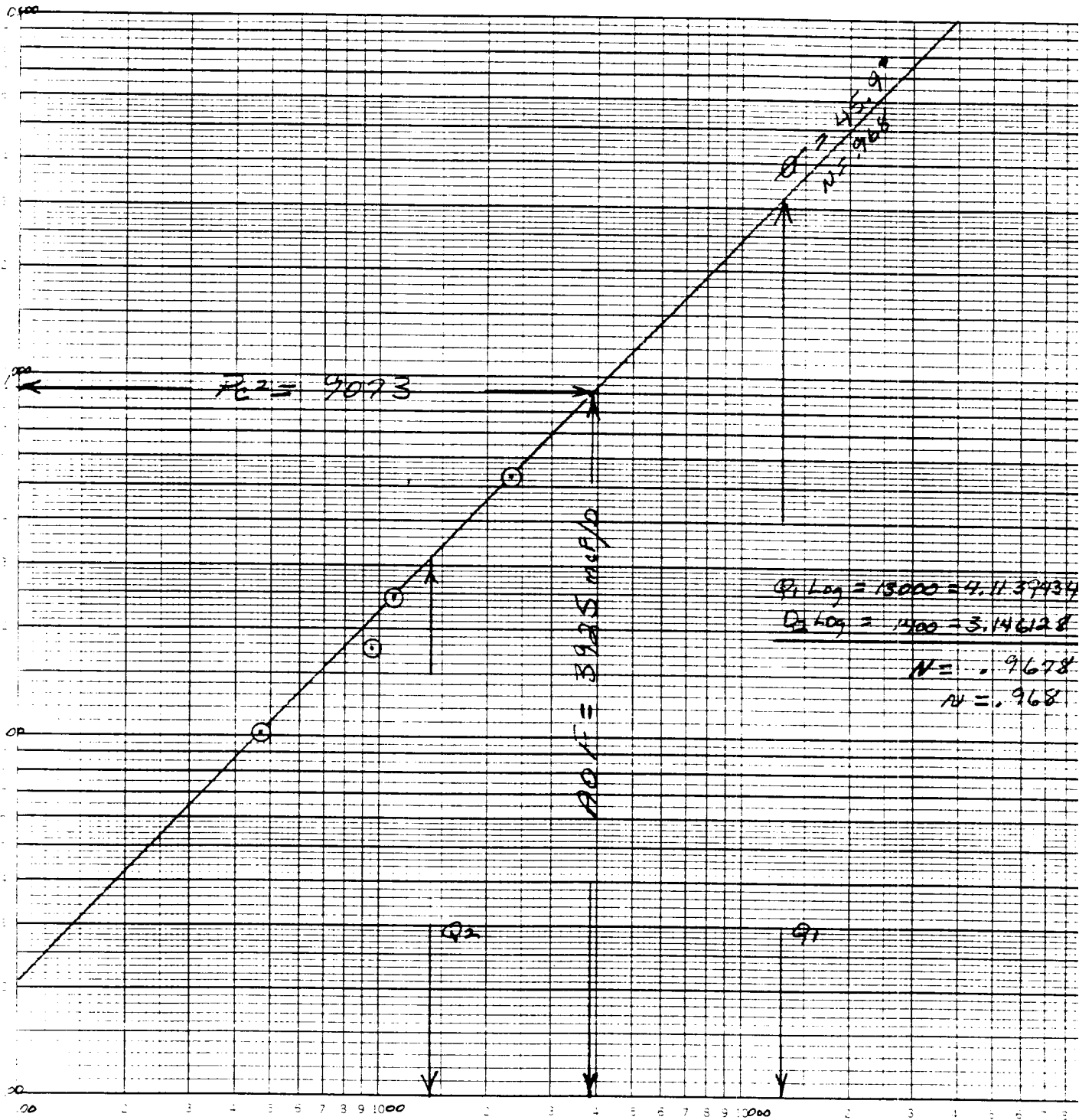
Form C-122
Revised 9-1-65

Type Test ☒ Initial ☐ Annual ☐ Special		Test Date 25-Jul-88	
Company Meridian Oil		Connection El Paso Nat'l Gas Co.	
Pitchfork Ranch		Formation Atoka	
Completion Date 25-Jul-88		Total Depth 14,100'	Plug Back TD 14,000'
Elevation 3361 GL		Farm or Lease Name Pitchfork 4 th Fed	
Csg. Size 4 1/2"	Wt. 15.1	d 3.826	Set At 14,100'
Perforations: From 12956 To 13964		Well No. 2	
Tbg. Size 2 3/4"	Wt. 6.5	d 2.441	Set At 12961
Perforations: From To		Unit K 4 255 34E	
Type Well - Single - Bradenhead - G.G. or G.O. Multiple Single		Packer Set At 12884	County Lea
Producing Thru Tbg	Reservoir Temp. °F 217 @ 12400	Mean Annual Temp. °F 60°	Baro. Press. - P _a 13.2"
State N.M.	Prover 13956		Meter Run 3.068
L 13956	H 13956	G _g .644	Taps F10
% CO ₂ .35%	% N ₂ .75%	% H ₂ S 0	
FLOW DATA			
NO.	Prover Line Size	X	Orifice Size
SI			
1.	3.068 x	1.50	709.3
2.	3.068 x	1.50	709.3
3.	3.068 x	1.50	726.3
4.	3.068 x	1.50	743.6
5.			
TUBING DATA			
NO.	Prover Line Size	X	Orifice Size
SI			
1.	3.068 x	1.50	709.3
2.	3.068 x	1.50	709.3
3.	3.068 x	1.50	726.3
4.	3.068 x	1.50	743.6
5.			
CASING DATA			
NO.	Prover Line Size	X	Orifice Size
SI			
1.	3.068 x	1.50	709.3
2.	3.068 x	1.50	709.3
3.	3.068 x	1.50	726.3
4.	3.068 x	1.50	743.6
5.			
RATE OF FLOW CALCULATIONS			
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m
1	11.13	43.34	722.5
2	11.13	25.75	722.5
3	11.13	12.56	722.6
4	11.13	509.2	956.4
5			
NO.	R	Temp. °R	T _r
1	1.08	554	1.50
2	1.08	544	1.47
3	1.11	540	1.46
4	1.13	538	1.46
5			
Gas Liquid Hydrocarbon Ratio 33.6 Mcf/bbl.			
A.P.I. Gravity of Liquid Hydrocarbons 64.6 @ 60° Deq.			
Specific Gravity Separator Gas .644 XXXXX			
Specific Gravity Flowing Fluid XXXXX .719			
Critical Pressure 667 P.S.I.A. 667 P.S.I.A.			
Critical Temperature 369 R 392 R			
P _c 3012.2	P _c ² 9073		
NO.	P _c ²	P _w	P _w ²
1	2839.8	7053	1020
2	2703.9	7311	1262
3	2568.1	6535	2478
4	1980.1	3725	5348
5			
(1) $\frac{P_c^2}{P_c^2 - P_w^2} = 1.696$			
(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.668$			
ACF = Q $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 3925$			
Absolute Open Flow 3925 Mcf @ 15.025 Angle of Slope @ 45.9 Slope, n .965			
Remarks: made 6.4 bbls concentration - no water during test.			
Approved By Commission:		Conducted By:	Calculated By:
John West Eng. (N.M.)		B. Roe	

Meridian Cul
 Pitcher 4 Fib #2
 Pitcher Atoka
 Lea Co, New Mexico

$R_2 - P_{w2}$ 46 / 400

LOGARITHMIC CORRELATION



$$Q = mcf/d$$

 FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (Pf & Ps)
 COMPANY : MERIDIAN OIL LEASE : PITCHFORK WELL NO. : 4FED2 DATE : 25JUL88
 UNIT : K SECTION : 4 TOWNSHIP : 25S RANGE : 34E
 L : 13956 H : 13956 L/H : 1.0 G/GMIX : 0.644
 CO2 : 0.37 N2 : 0.95 H2S : 0
 d : 2.441 Fr : 0.010763 Qm : 0.476 (L/H)(FrQm)0.000026
 FOR : 669 TCR : 369

LINE	ITEM	SOURCE	1	2	3	4	5	
1	H		0	6978		13956		
2	GH		0	4493.83		8987.66		0 P = 1200.5
3	37.5GH		0	168519		337037		Ps = 4042.7
4	Pc or Pn		2842.2	3436.0	3439.2	4036.6	4036.6	
5	Pn		4.25	5.14	5.14	6.03	6.03	
6	T		534	574.5	574.5	615	615	
7	Tr		1.45	1.56	1.56	1.67	1.67	
8	Z		0.756	0.840	0.840	0.915	0.915	
9	P/ZP/Z	4/8	3761.4	4090.5	4093.3	4413.8	4413.8	
10	P/TZ	9/6	7.0439	7.1200	7.1250	7.1770	7.1770	
11	Ln10 ² /1000	(10)2/100	0.04962	0.05069	0.05077	0.05151	0.05151	
12	L/H(FrQm)2		0.000026	0.000026	0.000026	0.000026	0.000026	
13		11+12	0.049643	0.050721	0.050792	0.051535	0.051535	
14	In	10/13	141.892	140.376	140.278	139.263	139.263	
15	M=Pn-Pn-1			594	597	597	603	
16	N=In+In-1			282.259	282.170	279.542	279.542	
17	M x N	15x16			168460		168577	
18	SUM(MxN)	SUM17			168460		337037	

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FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SURFACE) PRESSURE (Pc & Pw)
COMPANY :MERIDIAN OIL      LEASE :PITCHFORK WELL NO. :4FED2      DATE : 25JUL83
UNIT :K      SECTION :      4      TOWNSHIP :25S      RANGE : 34E
L : 13956      H : 13956      L/H : 1.0      G/GHIX : 0.644
CO2 : 0.37      N2 : 0.95      H2S : 0
d : 2.441      Fr :0.010763      Qm : 0.000 (L/H)(FrQm)0.000000
PCR : 669      TOR : 369

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LINE	ITEM	SOURCE	1	2	3	4	5	6	
1	H		13956	6978		0			
2	GH		8987.664	4493.83		0			
3	37.5GH		337037	168519		0			D P = 1198.8
4	Pc or Pn		4036.6	3431.9	3434.6	2832.2	2838.7	2838.1	Pw = 2937.8
5	Pr		6.03	5.13	5.13	4.23	4.24	4.24	
6	T		615	574.5	574.5	534	534	534	
7	Tr		1.67	1.56	1.56	1.45	1.45	1.45	
8	Z		0.915	0.840	0.840	0.755	0.755	0.755	
9	P/ZP/2	4/8	4413.8	4086.8	4089.2	3750.7	3757.6	3757.0	
10	P/TZ	9/6	7.1770	7.1136	7.1178	7.0237	7.0368	7.0357	
11	Ln10 ⁻² /1000	(10)2/100							
12	L/H(FrQm)2								
13		11+12							
14	In	10/13	139.334	140.575	140.493	142.374	142.110	142.133	
15	M=Pn-Pn-1			605	602	602	596	596	
16	M=In+In-1			279.910	279.827	282.867	282.603	282.626	
17	M x N	15x16			168469			168582	
18	SUM(MxN)	SUM17	337037		168568				

 FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (Pf & Ps)
 COMPANY : MERIDIAN OIL LEASE : PITCHFORK WELL NO. : 4FED2 DATE : 25JUL88
 UNIT : K SECTION : 4 TOWNSHIP : 25S RANGE : 34E
 L : 13956 H : 13956 L/H : 1.0 G/GMIX : 0.644
 CO2 : 0.37 H2 : 0.95 H2S : 0
 d : 2.441 Fr : 0.010763 Qm : 0.951 (L/H)(FrQm)0.000105

PCR : 669 TOR : 369

LINE	ITEM	SOURCE	1	2	3	4	5	
1	H		0	6978		13956		
2	GH		0	4493.83		8987.66		OP = 1160.3
3	37.5GH		0	168519		337037		Ps = 3868.5
4	Pc or Pn		2708.2	3279.7	3284.0	3860.3	3860.3	
5	Pr		4.05	4.90	4.91	5.77	5.77	
6	T		534	574.5	574.5	615	615	
7	Tr		1.45	1.56	1.56	1.67	1.67	
8	Z		0.749	0.831	0.831	0.903	0.903	
9	P/ZP/Z	4/8	3613.5	3946.6	3950.7	4272.6	4272.6	
10	P/TZ	9/6	6.7668	6.8697	6.8767	6.9474	6.9474	
11	Ln10 ⁻² /1000	(10)2/100	0.04579	0.04719	0.04729	0.04827	0.04827	
12	L/H(FrQm)2		0.000105	0.000105	0.000105	0.000105	0.000105	
13		11+12	0.045895	0.047297	0.047394	0.048370	0.048370	
14	In	10/13	147.442	145.245	145.097	143.628	143.628	
15	M=Pn-Pn-1			571	576	576	584	
16	M=In+In-1			292.688	292.539	288.725	288.725	
17	M x N	15x16			168433		168604	
18	SUM(MxN)	SUM17			168433		337037	

FORM D-122E WORKSHEET FOR STEPWISE CALCULATION (SURFACE) PRESSURE (Pc & Pw)

COMPANY : MERIDIAN OIL LEASE : PITCHFORK WELL NO. : DATE : 0

UNIT : K SECTION : 4 TOWNSHIP : 25S RANGE : 34E

L : 13956 H : 13956 L/H : 1.0 3/GMIX : 0.644

CO2 : 0.37 N2 : 0.95 H2S : 0.95

d : 2.441 Fr : 0.010763 Qm : 0.000 (L/H)(FrQm)0.000000

PCR : 669 TCR : 369

LINE	ITEM	SOURCE	1	2	3	4	5	6
1	H		13956	6978		0		
2	GH		8987.664	4493.93		0		
3	27.5GH		337037	168519		0		
4	Fc or Pn		3860.3	3274.9	3278.6	2696.3	2705.0	2704.1
5	Pr		5.77	4.90	4.90	4.03	4.04	4.04
6	T		615	574.5	574.5	534	534	534
7	Tr		1.67	1.56	1.56	1.45	1.45	1.45
8	Z		0.903	0.831	0.831	0.749	0.749	0.749
9	P/ZP/Z	4/8	4272.6	3942.1	3945.6	3599.9	3611.6	3608.8
10	F/TZ	9/6	6.9474	6.8619	6.8678	6.7414	6.7632	6.7580
11	Ln10 ⁻² /1000	(10)2/100						
12	L/H(FrQm) ²							
13		11+12						
14	In	10/13	143.940	145.733	145.607	148.337	147.859	147.972
15	M=Pn-Pn-1			585	582	582	574	574
16	N=In+In-1			289.673	299.546	293.943	293.465	293.579
17	M x N	15x16			168445			168657
18	SUM(MxN)	SUM17	337037		168592			

D P = 1156.6

Pw = 2703.9

 FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (Pf & Ps)
 COMPANY : MERIDIAN OIL LEASE : PITCHFORK WELL NO. : 4FED2 DATE : 25JUL88
 UNIT : K SECTION : 4 TOWNSHIP : 25S RANGE : 34E
 L : 13956 H : 13956 L/H : 1.0 G/GMIX : 0.644
 CO2 : 0.37 N2 : 0.95 H2S : 0
 d : 2.441 Fr : 0.010763 Qm : 1.101 (L/H)(FrQm)0.000140

PCR : 669 TOR : 369

LINE	ITEM	SOURCE	1	2	3	4	5	
1	H		0	6978		13956		
2	GH		0	4493.83		8987.66		D P = 1116.0
3	37.5GH		0	168519		337037		Ps = 3689.2
4	Po on Pn		2573.2	3120.3	3125.7	3678.9	3678.9	
5	Pr		3.85	4.66	4.67	5.50	5.50	
6	T		534	574.5	574.5	615	615	
7	Tr		1.45	1.56	1.56	1.67	1.67	
8	Z		0.745	0.823	0.823	0.893	0.893	
9	P/ZP/Z	4/8	3455.7	3792.1	3797.5	4120.2	4120.2	
10	F/TZ	9/6	6.4714	6.6008	6.6101	6.6995	6.6995	
11	Ln10 ⁻² /1000	(10)2/100	0.04188	0.04357	0.04369	0.04488	0.04488	
12	L/H(FrQm)2		0.000140	0.000140	0.000140	0.000140	0.000140	
13		11+12	0.042020	0.043711	0.043834	0.045023	0.045023	
14	In	10/13	154.009	151.011	150.799	148.800	148.800	
15	M=Pn-Pn-1			547	552	553	563	
16	N=In+In-1			305.019	304.808	299.599	299.599	
17	M x N	15x16			168402		168635	
18	SUM(MxN)	SUM17			168402		337037	

FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SURFACE) PRESSURE (Pc & Pw)

COMPANY : MERIDIAN OIL

LEASE : PITCHFORK WELL NO. : 4FED2

DATE : 25JUL88

UNIT : K

SECTION : 4

TOWNSHIP : 25S

RANGE : 34E

L : 13956

H : 13956

L/H : 1.0

G/GMIX : 0.644

CG2 : 0.37

N2 : 0.95

H2S : 0

d : 2.441

Fr : 0.010763

Qm : 0.000 (L/H)(FrQm)0.000000

PCR : 569

TCR : 369

LINE	ITEM	SOURCE	1	2	3	4	5	6
1	H		13956	6978		0		
2	GH		8987.664	4493.83		0		
3	37.5GH		337037	168519		0		
4	Pc or Pn		3678.9	3114.4	3119.1	2558.5	2569.6	2568.5
5	Pr		5.50	4.66	4.66	3.92	3.94	3.84
6	-		615	574.5	574.5	534	534	534
7	Tr		1.67	1.56	1.56	1.45	1.45	1.45
8	Z		0.893	0.823	0.823	0.744	0.745	0.744
9	P/ZP/Z	4/8	4120.2	3786.3	3790.9	3438.1	3451.4	3450.1
10	P/TZ	9/6	6.6995	6.5906	6.5906	6.4383	6.4633	6.4608
11	Ln10 ² /1000	(10)2/100						
12	L/H(FrQm)2							
13		11+12						
14	In	10/13	149.265	151.731	151.547	155.320	154.720	154.778
15	M=Pn-Pn-1			564	560	561	549	551
16	N=In-In-1			300.996	300.812	306.867	306.267	306.325
17	M x N	15x16			168416			168654
18	SUM(MxN)	SUM17	337037		168622			

FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (Pf & Ps)

COMPANY : MERIDIAN OIL

LEASE : PITCHFORK WELL NO. : 4FED2

DATE : 25JUL88

UNIT : K

SECTION :

4 TOWNSHIP : 25S

RANGE : 34E

L : 13956

H : 13956

L/H : 1.0

G/GMIX : 0.644

CO2 : 0.37

N2 : 0.95

H2S : 0

d : 2.441

Fr : 0.010763

Qm : 2.353 (L/H)(FrQm)0.000641

PCR : 669

TCR : 369

LINE	ITEM	SOURCE	1	2	3	4	5	
1	H		0	6978		13956		
2	GH		0	4493.83		8987.66		D P = 879.8
3	37.5GH		0	168519		337037		Ps = 2808.0
4	Pc or Pn		1928.2	2347.2	2357.2	2788.0	2788.0	
5	Pr		2.88	3.51	3.52	4.17	4.17	
6	T		534	574.5	574.5	615	615	
7	Tr		1.45	1.56	1.56	1.67	1.67	
8	Z		0.746	0.802	0.802	0.856	0.856	
9	P/ZP/Z	4/8	2584.5	2925.0	2937.5	3256.8	3256.8	
10	P/TZ	9/6	4.8399	5.0913	5.1131	5.2956	5.2956	
11	Ln10 ⁻² /1000	(10)2/100	0.02343	0.02592	0.02614	0.02804	0.02804	
12	L/H(FrQm)2		0.000641	0.000641	0.000641	0.000641	0.000641	
13		11+12	0.024066	0.026563	0.026785	0.028685	0.028685	
14	In	10/13	201.107	191.670	190.893	184.613	184.613	
15	M=Pn-Pn-1			419	429	431	450	
16	N=In+In-1			392.777	392.000	375.506	375.506	
17	M x N	15x16			168185		168852	
18	SUM(MxN)	SUM17			168185		337037	

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FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SURFACE) PRESSURE (Pc & Pw)

COMPANY : MERIDIAN OIL

LEASE : PITCHFORK WELL NO. :

DATE : 0

UNIT : K

SECTION : 4

TOWNSHIP : 25S

RANGE : 34E

L : 13956

H : 13956

L/H : 1.0

G/GMIX : 0.644

CO2 : 0.37

N2 : 0.95

H2S : 0.95

d : 2.441

Fr : 0.010763

Qm : 0.000 (L/H)(FrQm)0.000000

PCR : 669

TCR : 369

LINE	ITEM	SOURCE	1	2	3	4	5	6
1	H		13956	6978		0		
2	GH		8987.664	4493.83		0		
3	27.5GH		337037	168519		0		
								OP = 957.3
4	Pc or Pn		2788.0	2341.8	2351.1	1912.4	1933.7	1931.3
5	Pr		4.17	3.50	3.51	2.86	2.89	2.89
6	T		615	574.5	574.5	534	534	534
7	Tr		1.67	1.56	1.56	1.45	1.45	1.45
8	Z		0.856	0.802	0.802	0.747	0.747	0.746
9	P/ZP/Z	4/8	3256.8	2918.3	2929.8	2561.1	2589.6	2589.2
10	P/TZ	9/6	5.2956	5.0797	5.0998	4.7960	4.8495	4.8486
11	Ln10 ² /1000	(10)2/100						
12	L/H(FrQm)2							
13		11+12						
14	In	10/13	188.836	196.864	196.087	208.505	206.206	206.244
15	M=Pn-Pn-1			446	437	439	417	420
16	N=In+In-1			385.700	384.923	404.593	402.293	402.331
17	M x N	15x16			168179			168874
18	SUM(MxN)	SUM17	337037		168858			

GOR/GMIX TEXAS

VOLUME OF FIRST RATE = 476
DURATION OF FLOW IN MIN. = 30

VOLUME OF SECOND RATE = 951
DURATION OF FLOW IN MIN. = 30

VOLUME OF THIRD RATE = 1101
DURATION OF FLOW IN MIN. = 60

VOLUME OF FOURTH RATE = 2353
DURATION OF FLOW IN MIN. = 60

VOLUME OF FIFTH RATE = 1995
DURATION OF FLOW IN MIN. = 30

VOLUME OF SIXTH RATE = 0
DURATION OF FLOW IN MIN. = 1

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TEXAS G.O.R./G. MIX

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NO. OF BBLs PRODUCED = 6.4
API GRAVITY @ 60 DEG. = 64.6

SPECIFIC GRAVITY OF GAS = 0.6440

XX
TOTAL GAS PRODUCED = 215 MCF/D

G.O.R. = 33,626 CF/Bbl.

G.MIX = 0.644

JUL-26-88 TUE 7:27

P. 8

SUGGESTED FIELD DATA SHEET (Not Required To File)									
Type Test	☐ INITIAL ☐ ANNUAL ☐ SPECIAL			Test Date			Lease No. or Serial No.		
Company	MERIDIAN OIL INC.			Connection			Allottee		
Field	Reservoir			Location			Unit		
Completion Date	Total Depth			Plug Back TD			Elevation		
Csg. Size	Wt.	d	Set At	Perforation From			To	Farm or Lease Name "Pitch Fork 4"	
Tbg. Size	Wt.	d	Set At	Perforation From			To	Well No.	#2
Type Completion (Describe)								Packer Set At	County or Parish
Producing Thru	Reservoir Temp. F			Mean Annual Temp. F			Baro. Press. - P _a	State	
C	H	G	% CO ₂	% N ₂	% H ₂ S	Prover		Meter Run	
								3.068	
DATE	ELAP. TIME	Wellhead Working Pressure			METER OR PROVER				REMARKS
Time of Reading	Hrs.	Tbg. Psig	Csg. Psig	Temp F	Pressure Psig	Diff.	Temp F	Orifice	(Include Liquid Production data Type-A.P.I. Gravity-Amount)
10:15		2999		7.6	8.5	1.6		1.500	5/64
10:30		2826		7.6	8.5	1.6		1.500	5/64
10:45		2829		7.9	8.5	1.6		1.500	633.68 MCF/DAY
11:00		2695		7.6	8.5	3.2		1.500	9/64
11:15		2695		7.5	8.5	3.2		1.500	9/64 1267.37 MCF/DAY
11:30		2590		7.35	8.55	3.7		1.500	13/64
11:45		2566		7.25	8.55	3.6		1.500	13/64
12:00		2560		7.30	8.55	3.6		1.500	13/64
12:15		2560		7.30	8.60	3.6		1.500	13/64
12:30		2100		7.00	8.70	8.3		1.500	17/64
12:45		2021		7.25	8.70	7.8		1.500	17/64
1:00		1955		7.20	8.70	7.6		1.500	17/64
1:15		1915		7.20	8.70	7.6		1.500	17/64
1:30		1825		7.20	8.70	6.4		1.750	19/64
1:45				7.30	8.70	4.6		1.750	19/64
2:00		1980		7.30	8.70	4.6		1.750	19/64
									6.44 BARR
									3696 MCF/DAY
									10' 6" in 3rd tank
									2.6
									1.16 per inch
									10.0
									3,000
									7,000
									2.6
									7
									3,000