

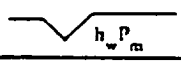
OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Operator GRUV MANAGEMENT					Lease or Unit Name RHODES FED UNIT				
Type Test ☒ Initial ☐ Annual ☐ Special					Test Date 7/28/98		Well No. 415		
Completion Date 7/28/98		Total Depth 3005		Plug Back TD 2975		Elevation 2984		Unit Loc. - Sec. - TWP - Rge. 4-26S-37E	
Log. Size 5 1/2	Wt. 15.5	d 4.950	Set At	Perforations: From: To:			County LEA		
Log. Size 2-3/8	Wt. 4.7	d 1.995	Set At 2759	Perforations: From: To:			Pool		
Type Well - Single - Bradenhead - G.G. or G.G. Multiple single					Packer Set At none		Formation VATES/7-Rivers		
Producing Thru tbq		Reservoir Temp. °F 85°		Mean Annual Temp. °F 60°		Baro. Press. - P _a 13.2		Connection AIR	
L 2759	IL 2759	Gg .896	% CO ₂ 24.879	% N ₂ 1.146	% IL ₂ S	Prover 6" Poss. choke	Meter Run none	Taps	

FLOW DATA						TUBING DATA		CASING DATA		Duration of Flow	
NO.	Prover Line Size	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	6" Poss Choke					120				N/A	
1.	24/64 "					62	92°	78		60min	
2.	20/64 "					75	90°	85		60min	
3.	18/64 "					81	90°	87		60min	
4.	16/64 "					86	89°	92		60min	
5.											

RATE OF FLOW CALCULATIONS							
NO.	COEFFICIENT (24 HOUR)		Pressure P _m	Flow Temp. Factor F _t	Gravity Factor F _g	Super Compress. Factor, F _{sp}	Rate of Flow Q, Mcfd
1.	2.591		75.2	.9706	1.056	1.064	212
2.	1.771		88.2	.9723	1.056	1.056	169
3.	1.422		94.2	.9723	1.056	1.056	145
4.	1.112		99.2	.9752	1.056	1.056	119
5.							

NO.	P _r	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio	Mc/bbl
1.	.67	522	1.28	.884	N/A	
2.	.71	550	1.35	.896	N/A	
3.	.71	550	1.35	.896		XXXXXXXXXX
4.	.71	549	1.35	.896		XXXXXX
5.						

P _c 120.1 P _e 14.42				
NO.	P _i ²	P _w	P _w ²	P _e ² - P _w ²
1.		68.9	6.81	7.61
2.		80.8	6.52	7.90
3.		86.2	7.43	6.99
4.		90.8	8.24	7.43
5.				

1) $\frac{P_c^2}{P_c^2 - P_w^2} = 1.89$

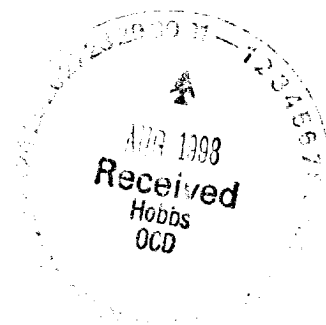
AOF = Q $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 400.7$

2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.89$

Absolute Open Flow 400.7 Mcfd @ 15.025	Angle of Slope θ 45°	Slope, n 1.000
---	------------------------------------	-----------------------

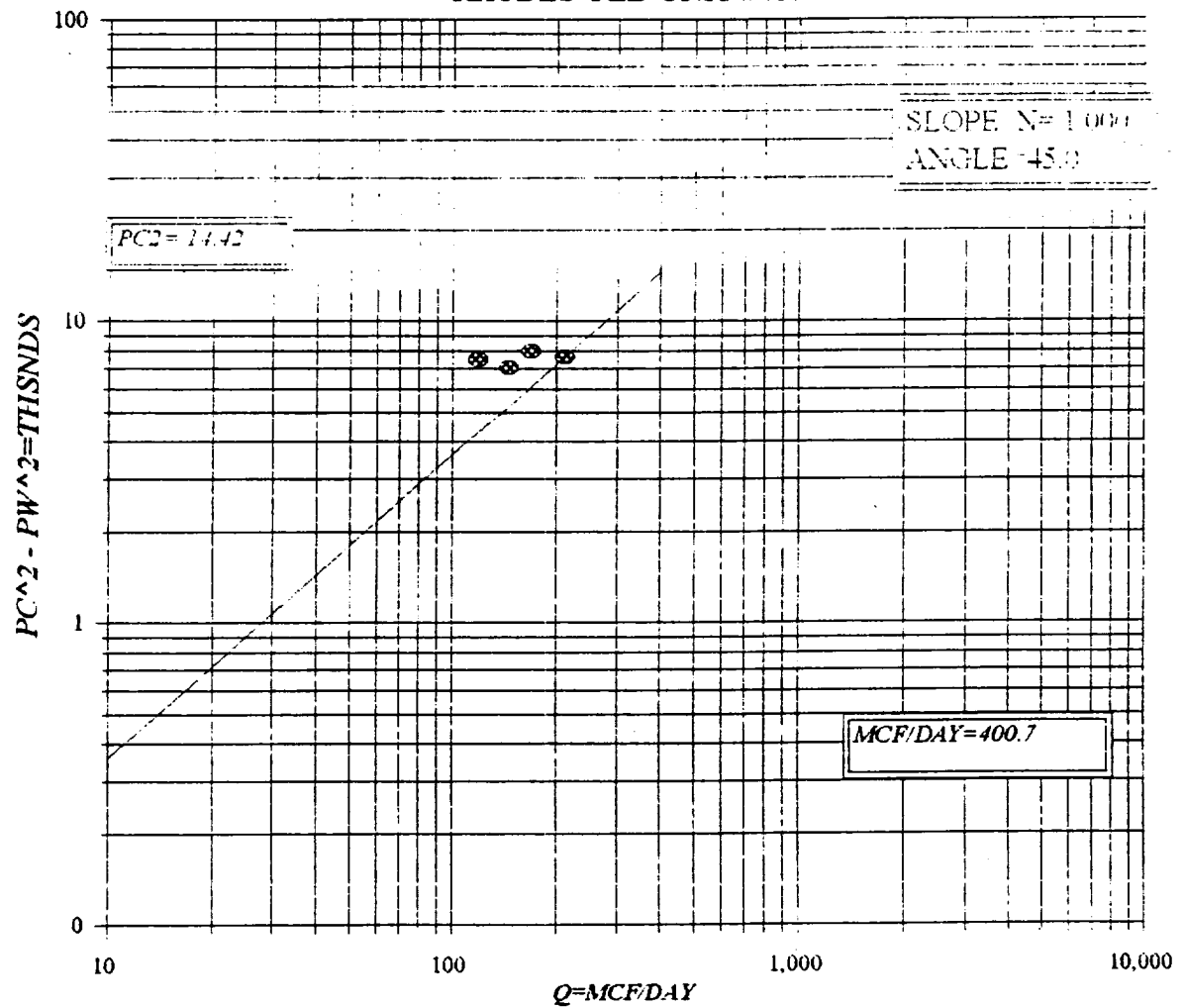
Remarks: ***CALCULATED FROM KNOWN BOTTOM PRESSURES**
*** NO LIQUID MADE DURING TEST**

Approved By Division	Conducted By: PRO WELL TESTING	Calculated By: MB	Checked By: BM
----------------------	--	-----------------------------	--------------------------



GRUY MANAGEMENT

RHODES FED UNIT #415



WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURE (Pc or Pw)
FROM KNOWN BOTTOM HOLE PRESSURE (Pf or Ps)

FORM C-122F

COMPANY GRUY MAN.

LEASE : RHODS FED WELL NO. : 415

DATE 7/28/93

UNIT

SECTION : 4

TWNSHP : 26

RANGE : 37

L

2759

H : 2759

L/H : 1

G/GMIX : 0.8960

CO2 : 24.879

N2 : 1.146

H2S :

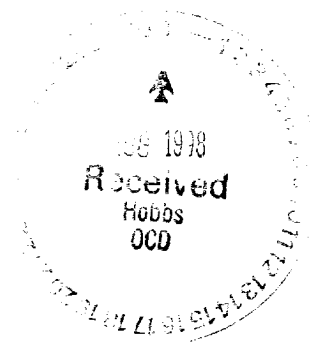
GH : 2472.1

PCR : 768

TCR : 406

LINE		1	2	3	4	5	6	7	8
1	TW(W.H. R)	534	534	534	534	534	534	534	534
2	Ts(B.H. R)	561.6	561.6	561.6	561.6	561.6	561.6	561.6	561.6
3	T=(Tw+Ts/2)	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8
4	Z (EST.)	1.033	0.963	0.960	0.960	0.959	0.959	0.958	0.959
5	TZ	566	527	526	526	525	526	525	525
6	GH/TZ	4.370	4.699	4.702	4.698	4.707	4.703	4.711	4.708
7	eS(TABLE XIV)	1.178	1.192	1.193	1.193	1.193	1.193	1.193	1.193
8	Pf or Ps	75.2	75.2	88.2	88.2	94.2	94.2	99.2	99.2
9	Pf2 or Ps2	5.7	5.7	7.8	7.3	8.9	8.9	9.8	9.3
10	Pc2=Pf/eS or Pw2=Ps2/eS	4.8	4.7	6.5	6.5	7.4	7.4	8.2	8.2
11	Pc or Pw	59	69	81	81	86	86	91	91
12	P=(Pw+Ps/2)or(Pc+Pf/2)	72	72	84	84	90	90	95	95
13	Pr=(P/PCR)	0.09	0.09	0.11	0.11	0.12	0.12	0.12	0.12
14	Tr(T/TCR)	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
15	Z (TABLE XI)	0.963	0.963	0.960	0.960	0.959	0.959	0.959	0.959

PW 1 : 68.9 PW 2 : 80.8 PW 3 : 86.2 PW 4 : 90.8



WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURE (Pc or Pw)
FROM KNOWN BOTTOM HOLE PRESSURE (Pf or Ps)

FORM C-122F

COMPANY GRUY MAN.

LEASE : RHODS FED WELL NO. : 415

DATE 7/28/98

UNIT

SECTION : 4

TWNSHP : 26

RANGE : 37

L

2759

H : 2759

L/H : 1

G/GMIX : 0.8960

CO2 : 24.879

N2 : 1.146

H2S :

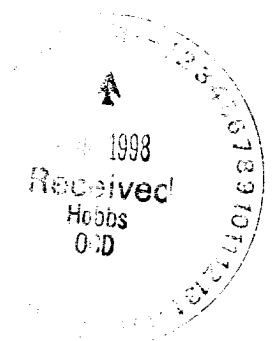
GH : 2472.1

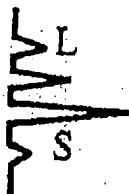
PCR : 768

TCR : 406

LINE		1	2	3	4	5	6	7	8
1	TW(W.H. R)	534	534	534	534	534	534	534	534
2	Ts(B.H. R)	561.6	561.6	561.6	561.6	561.6	561.6	561.6	561.6
3	T=(Tw+Ts/2)	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8
4	Z (EST.)	1.022	0.953	ERR	ERR	ERR	ERR	ERR	ERR
5	TZ	560	522	ERR	ERR	ERR	ERR	ERR	ERR
6	GH/TZ	4.416	4.735	ERR	ERR	ERR	ERR	ERR	ERR
7	eS(TABLE XIV)	1.180	1.194	ERR	ERR	ERR	ERR	ERR	ERR
8	Pf or Ps	131.2	131.2	0	0	0	0	0	0
9	Pf2 or Ps2	17.2	17.2	0.0	0.0	0.0	0.0	0.0	0.0
10	Pc2=Pf/eS or Pw2=Ps2/eS	14.6	14.4	ERR	ERR	ERR	ERR	ERR	ERR
11	Pc or Pw	121	120	ERR	ERR	ERR	ERR	ERR	ERR
12	P=(Pw+Ps/2)or(Pc+Pf/2)	126	126	ERR	ERR	ERR	ERR	ERR	ERR
13	Pr=(P/PCR)	0.16	0.16	ERR	ERR	ERR	ERR	ERR	ERR
14	Tr(T/TCr)	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
15	Z (TABLE XI)	0.953	0.953	ERR	ERR	ERR	ERR	ERR	ERR

PC PW 1 : 120.1 PW 2 : ERR PW 3 : ERR PW 4 : ERR





Laboratory Services, Inc.

1331 Tasker Drive
Hobbs, New Mexico 88240

Telephone: (505) 397-3713

FOR: Pro Well Testing & Wireline
Attention: Mr. Ray Ables
P. O. Box 791
Hobbs, New Mexico 88241

SAMPLE
IDENTIFICATION: Rhodes Fed. Unit #415
COMPANY: Gruy Management
LEASE:
PLANT:

SAMPLE DATA: DATE SAMPLED: 7/28/98 12:15 PM
ANALYSIS DATE: 7/29/98
PRESSURE - PSIG 81
SAMPLE TEMP. °F
ATMOS. TEMP. °F

GAS (XX) LIQUID ()
SAMPLED BY: Ray Ables
ANALYSIS BY: Vickie Walker

REMARKS: Sample taken at the well head.

COMPONENT ANALYSIS

COMPONENT	MOL PERCENT	GPM
Hydrogen Sulfide (H2S)		
Nitrogen (N2)	1.146	
Carbon Dioxide (CO2)	24.879	
Methane (C1)	63.337	
Ethane (C2)	5.185	1.383
Propane (C3)	2.879	0.791
I-Butane (IC4)	0.511	0.167
N-Butane (NC4)	1.064	0.335
I-Pentane (IC5)	0.330	0.120
N-Pentane (NC5)	0.250	0.090
Hexane Plus (C6+)	0.419	0.172

100.000

3.058

BTU/CU.FT. - DRY 898
AT 14.650 DRY 896
AT 14.650 WET 880
AT 14.73 DRY 900
AT 14.73 WET 885

MOLECULAR WT. 25.9532

SPECIFIC GRAVITY -
CALCULATED 0.896
MEASURED

