

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Type Test ☒ Initial ☐ Annual ☐ Special		Test Date 7-5-91	
Company GREAT WESTERN DRILLING COMPANY		Connection VENTED	
Pool PECOS SLOPE		Formation ABO	
Completion Date 5-15-91		Total Depth 4,100' RTM	Plug Back TD 4,043' RTM
		Elevation 3,998' RT	Form or Lease Name OJAIL FEDERAL "COM"
Csg. Size 4 1/2	Wt. 11.6	Set At 4,100' RT	Perforations: From 3818' To 3906'
Tbg. Size 2 3/8	Wt. 4.7	Set At 3,928' RT	Perforations: From To
Type Well - Single - Dragshead - G.C. or G.O. Multiple SINGLE		Packer Set At NONE	County CHAVES
Producing Thru TBG	Reservoir Temp. °F 111° 3862	Mean Annual Temp. °F 60	Baro. Press. - P _a 13.2
L * 3862	H * 3862	G _g .672	% CO ₂ -0-
		% N ₂ 5.09	% H ₂ S
		Prover 2"	Meter Run Taps

FLOW DATA						TUBING DATA		CASING DATA		Duration of Flow	
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
SI							950		1000		2 1/2 Months
1.	2 X 1/8			924		75	924		975		1 Hour
2.	2 X 3/16			818		72	818		860		1 Hour
3.	2 X 7/32			718		70	718		760		1 Hour
4.	2 X 1/4			626		69	626		685		1 Hour
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor Ft.	Gravity Factor F _g	Super Compress. Factor, F _{sp}	Rate of Flow Q, Mscf
1	.2648		937.2	.9859	1.220	1.086	324
2	.6082		831.2	.9887	1.220	1.088	663
3	.8393		731.2	.9905	1.220	1.077	799
4	1.087		639.2	.9915	1.220	1.066	896
5.							

NO.	P _r	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio	DRY GAS	Mcf/bbl.
1.	1.42	535	1.45	.848	A.P.L. Gravity of Liquid Hydrocarbons	DRY	Deq.
2.	1.25	532	1.44	.845	Specific Gravity Separator Gas	.672	XXXXXXXXXX
3.	1.10	530	1.44	.862	Specific Gravity Flowing Fluid	XXXXXX	
4.	.96	529	1.43	.880	Critical Pressure ** 660	P.S.I.A.	P.S.I.A.
5.					Critical Temperature ** 368	R	R

P _c 1013.2	P _c ² 1026.6	(1) $\frac{P_c^2}{P_c^2 - P_w^2} = 1.789$	(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.338$
NO. 1	P ₁ ² 944.6	P _w 892.3	P _c ² - P _w ² 133.7
2	842.5	709.8	316.8
3	746.3	557.0	469.6
4	673.0	452.9	573.7
5			

AOF = 0 $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.199$

Post ID-2
8-9-91
comp & BK

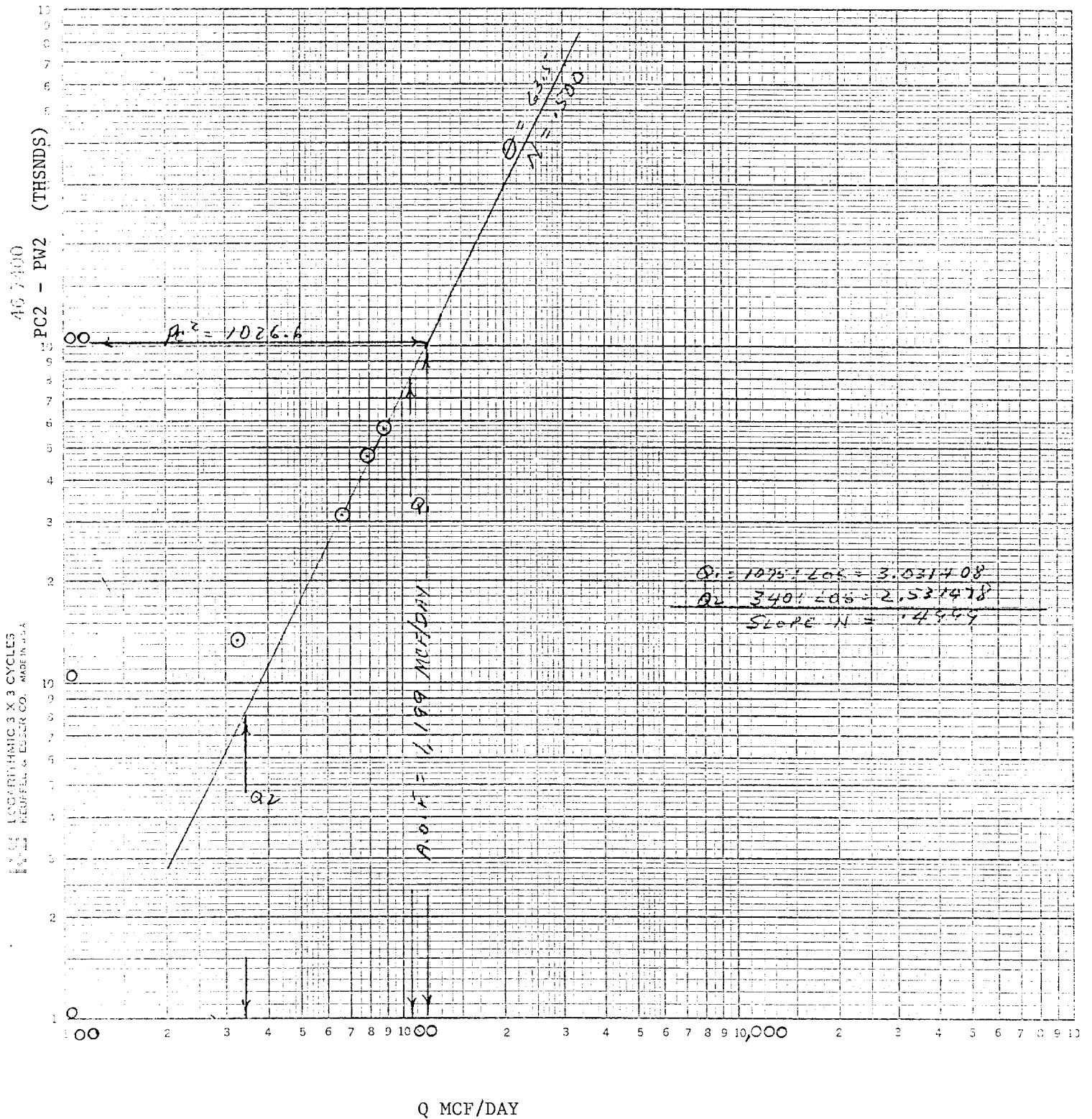
Absolute Open Flow	1,199	Mcf @ 15.025	Angle of Slope @	63.5	Slope, n	500
--------------------	-------	--------------	------------------	------	----------	-----

Remarks: * BHP INSTRUMENT SET @ THIS DEPTH
** CORRECTED TO 5.09% N₂

NO FLUID PRODUCED DURING TEST

Approved By Division	JOHN WEST ENGINEERING	Calculated By:	BM	Checked By:	BM
----------------------	-----------------------	----------------	----	-------------	----

GREAT WESTERN DRILLING COMP.
QUAIL FEDERAL WELL NO. 9 2011
- 21 - 6 - 25
CHAVES COUNTY, NEW MEXICO
7-5-91



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

FORM C-122F

COMPANY GREAT WESTERN DR CO
UNIT L
LEASE : QUAIL FED WELL NO. : 9
SECTION : 21 TOWNSHIP : 6
H : 3862 L/H : 1
CO2 : 0 N2 : 5.09
GH : 2595.3 PCR : 660
DATE 7 5 91
RANGE : 25
G/GMIX : 0.6720
H2S :
TCR : 368

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)	572.6	572.6	572.6	572.6	572.6	572.6	572.6	572.6
3	T=(Tw+Ts/2)	553.3	553.3	553.3	553.3	553.3	553.3	553.3	553.3
4	Z (EST.)	0.891	0.836	ERR	ERR	ERR	ERR	ERR	ERR
5	TZ	493	463	ERR	ERR	ERR	ERR	ERR	ERR
6	GH/TZ	5.263	5.609	ERR	ERR	ERR	ERR	ERR	ERR
7	eS(TABLE XIV)	1.218	1.234	ERR	ERR	ERR	ERR	ERR	ERR
8	Pf or Ps	1059.2	1059.2	0	0	0	0	0	0
9	Pf2 or Ps2	1121.9	1121.9	0.0	0.0	0.0	0.0	0.0	0.0
10	Pc2=Pf/eS or Pw2=Ps2/eS	921.0	909.1	ERR	ERR	ERR	ERR	ERR	ERR
11	Pc or Pw	960	953	ERR	ERR	ERR	ERR	ERR	ERR
12	P=(Pw+Ps/2) or (Pc+Pf/2)	1009	1006	ERR	ERR	ERR	ERR	ERR	ERR
13	Pr=(P/Pcr)	1.53	1.52	ERR	ERR	ERR	ERR	ERR	ERR
14	Tr(T/Tcr)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
15	Z (TABLE XI)	0.836	0.837	ERR	ERR	ERR	ERR	ERR	ERR

PW 1 : 953.5 PW 2 : ERR PW 3 : ERR PW 4 : ERR

WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURE (Pc or Pw)

FORM C-122F

FROM KNOWN BOTTOM HOLE PRESSURE (Pf or Ps)

COMPANY GREAT WESTERN DR CO LEASE :QUAIL FED WELL NO. : 9 DATE 7 5 91
 UNIT SECTION : 21 TOWNSHIP : 6 RANGE : 25
 L 3862 H : 3862 L/H : 1 G/GMIX : 0.6720
 CO2 : 0 N2 : 5.09 H2S :
 GH : 2595.3 PCR : 660 TCR : 368

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)	572.6	572.6	572.6	572.6	572.6	572.6	572.6	572.6
3	T=(Tw+Ts/2)	553.3	553.3	553.3	553.3	553.3	553.3	553.3	553.3
4	Z (EST.)	0.892	0.837	0.845	0.851	0.859	0.864	0.870	0.875
5	TZ	494	463	468	471	475	478	481	484
6	GH/TZ	5.256	5.602	5.548	5.510	5.459	5.426	5.392	5.362
7	eS(TABLE XIV)	1.218	1.234	1.231	1.230	1.227	1.226	1.224	1.223
8	Pf or Ps	1049.2	1049.2	934.2	934.2	826.2	826.2	744.2	744.2
9	Pf2 or Ps2	1100.8	1100.8	872.7	872.7	682.6	682.6	553.8	553.8
10	Pc2=Pf/eS or Pw2=Ps2/eS	903.9	892.3	708.8	709.8	556.2	556.9	452.5	453.0
11	Pc or Pw	951	945	842	843	746	746	673	673
12	P=(Pw+Ps/2)or(Pc+Pf/2)	1000	997	888	888	786	786	708	709
13	Pr=(P/Pcr)	1.52	1.51	1.35	1.35	1.19	1.19	1.07	1.07
14	Tr(T/Tcr)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
15	Z (TABLE XI)	0.837	0.838	0.851	0.851	0.864	0.864	0.875	0.875

PW 1 : 944.6 PW 2 : 842.5 PW 3 : 746.3 PW 4 : 673.0

GREAT WESTERN DRILLING COMPANY

P cont
QUAIL FEDERAL WELL NO. 9

B H P TO USE FOR CALCULATING A O F TEST

SHEET

OURS

3 4

Rate III

Rate IV

JOHN W. WEST ENGINEERING CO. HOBBS, NEW MEXICO

Date 7-8-91

Drawn by: MCT

Scale: AS SHOWN

GREAT WESTERN DRILLING COMPANY
 QUAIL FEDERAL WELL NO. 9 *cont*
 B H P TO USE FOR CALCULATING A O F TEST
 TABULATIONS OF TIMES AND PRESSURES

TEST CONDUCTED BY
 JOHN WEST ENGINEERING CO., INC.

TEST DATE: 7/5-8/91
 TEST DEPTH: 3,862 FEET
 ELEMENT NO.: 56493 (0-1500 PSI)
 CLOCK NO.: 24005 (0-12 HR)

<u>DATE</u>	<u>TIME</u>	<u>CUM. HRS. / MINS.</u>		<u>PSIG @ 3,862 FEET</u>
7-5-91	9:45 AM			1046, GAUGE REACHED 3,862'
	10:00 AM	00	00	1046
	10:15 AM	00	15	1045
	10:30 AM	00	30	1043
	10:45 AM	00	45	1039
	11:00 AM	01	00	1036, END RATE I
7-5-91	11:15 AM	01	15	991
	11:30 AM	01	30	961
	11:45 AM	01	45	937
	12:00 PM	02	00	921, END RATE II
7-5-91	12:15 PM	02	15	880
	12:30 PM	02	30	853
	12:45 PM	02	45	829
	1:00 PM	03	00	813, END RATE III
7-5-91	1:15 PM	03	15	786
	1:30 PM	03	30	761
	1:45 PM	03	45	742
	2:00 PM	04	00	731, END RATE IV

GREAT WESTERN DRILLING COMPANY

QUAIL FEDERAL WELL NO. 9

→ *cont*

BOTTOM HOLE PRESSURE BUILD-UP CURVE

7/5-8/91

3,862 FEET

56493

0-1500 PSI

E6532

0-72 HR

TEST DATE:

TEST DEPTH:

ELEMENT NO.:

RANGE:

CLOCK NO.:

RANGE:

NOTE: SEE TABULATION OF PRESSURE AND TIME ON ATTACHED SHEET.

TIME-IN HOURS

72

64

56

48

40

32

24

16

8

0

1050

1000

950

900

PSI

850

800

750

700

JOHN W. WEST ENGINEERING CO. HOBBES, NEW MEXICO

Date: 7-10-91 Drawn by: MCT Scale: AS SHOWN

GREAT WESTERN DRILLING COMPANY
 QUAIL FEDERAL WELL NO. 9 *corr.*
 BOTTOM HOLE PRESSURE BUILD-UP TEST
 TABULATION OF PRESSURE AND TIME

TEST CONDUCTED BY
 JOHN WEST ENGINEERING CO., INC.

TEST DATE: 7/5-8/91
 TEST DEPTH: 3,862 FEET
 ELEMENT NO.: 56493 (0-1500 PSI)
 CLOCK NO.: E6532 (0-72 HR)

<u>DATE</u>	<u>TIME</u>	<u>CUM. HRS. / MINS.</u>		<u>PSIG @ 3,862 FEET</u>
7-5-91	10:00 AM	00	00	1046, Gauge Reached 3,862'
	11:00 AM	01	00	1036
	12:00 PM	02	00	921
	1:00 PM	03	00	813
7-5-91	2:00 PM	04	00	731
7-5-91	3:00 PM	05	00	885
	3:15 PM	05	15	900
7-5-91	4:00 PM	06	00	924
	5:00 PM	07	00	942
	6:00 PM	08	00	957
	7:00 PM	09	00	967
	8:00 PM	10	00	975
	9:00 PM	11	00	980
	10:00 PM	12	00	984
7-5-91	11:00 PM	13	00	988
7-6-91	12:00 AM	14	00	991
	2:00 AM	16	00	997
	5:00 AM	19	00	1002
	10:00 AM	24	00	1008
	3:00 PM	29	00	1012
7-6-91 \	8:00 PM	34	00	1014
7-7-91	1:00 AM	39	00	1018
	6:00 AM	44	00	1019
7-7-91	4:00 PM	54	00	1022
7-8-91	2:00 AM	64	00	1025
	12:00 PM	74	00	1027
7-8-91	2:00 PM	76	00	1028, Chart Ran Down, End Test