El Paso Natural Gas Company

El Paso, Texas

December 13, 1957

DIRECT REPLY TO:
P. O. BOX 997
FARMINGTON, NEW MEXICO

Mr. A. L. Porter
Secretary and Director
Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Dear Sir:

This is a request for administrative approval for a well dually completed in the Aztec Pictured Cliffs Extension Pool and in the Blanco Mesa Verde Pool. The El Paso Natural Gas Company Warren No. 2-A (PM) is located 917 feet from the North line and 1125 feet from the East line of Section 23, Township 28 North, Range 9 West, N.M.P.M., San Juan County, New Mexico.

This well has been completed in the Point Lookout and Menefee sections of the Mesa Verde and in the Pictured Cliffs formation. Completion has been accomplished in the following manner:

1. 10 3/4" surface casing set at 174 feet with 150 sacks of cement circulated to the surface.
2. 7 5/8" intermediate casing set at 2576 feet with 250 sacks of cement. Top of the cement is at 1300 feet, which is above the top of the Pictured Cliffs at 2401 feet.
3. 5 1/2" liner set from 2521 feet to 4919 feet with 300 sacks of cement.
4. The casing and liner were tested for leaks before perforating.
5. The Point Lookout and Menefee sections were perforated in eight intervals and fractured with water and sand.
6. The Pictured Cliffs formation was perforated in two intervals and fractured with water and sand.
7. All perforations were cleaned after treatment and completion was accomplished by setting a Baker Model "EGJ" production packer on 2" EUE tubing at 2606 feet with the tubing perforations set opposite the Point Lookout perforations. 1 1/4" EUE tubing was run, with the tubing perforations set opposite the Pictured Cliffs perforations, as a siphon string. The Point Lookout gas will be produced through the 2" tubing and the Pictured Cliffs gas through the casing.

COPY

8. A Garrett circulating sleeve was installed in the 2" EUE tubing string just below the Pictured Cliffs perforations. This will enable the bottom hole pressure tests to be taken at a future date if so required.
9. Initial potential tests have been run and commercial production has been found in both zones. A packer leakage test has been run and witnessed by a member of the Aztec office of the Oil Conservation Commission. This test shows no communication in the well bore between the two producing formations.

Administrative approval is requested for the dual completion to allow production from both known producing formations, eliminating the high initial cost of drilling two separate wells.

Since El Paso Natural Gas Company holds all leases immediately adjacent to the dedicated acreage, approval has not been sought from any other operator to dually complete this well. Enclosed are:

(a) Two copies of the schematic diagram of the mechanical installations.
(b) Two copies of the affidavit from the packer setting company stating that the packer used was set at the depth shown.
(c) Two copies of the packer leakage test as observed by a member of the Oil Conservation Commission.
(d) Two copies of the initial potential test showing commercial production from the two formations.

It is intended to dedicate the E/2 of Section 23, Township 28 North, Range 9 West to the Mesa Verde formation and the NE/4 of Section 23, Township 28 North, Range 9 West to the Pictured Cliffs formation.

Any further information required will be furnished upon your request. Thank you for your consideration in this matter.

Yours very truly,

ORIGINAL SIGNED E.S. OBERLY

E. S. Oberly
Division Petroleum Engineer

ESO:dgb
Encl.
cc: Emery Arnold
Sam Smith
Phil McGrath

STATE OF NEW MEXICO)
)
COUNTY OF SAN JUAN)

I, Mack M. Mahaffey, being first duly sworn upon my oath depose and say as follows:

I am an employee of Baker Oil Tools, Inc., and that on November 2, 1957, I was called to the location of the El Paso Natural Gas Company Warren No. 2-A (PM) Well located in the NENE/4 of Section 23, Township 28 North, Range 9 West, N.M.P.M., for advisory service in connection with installation of a production packer. In my presence, a Baker Model "EGJ" Production Packer was set in this well at 2635 feet in accordance with the usual practices and customs of the industry.

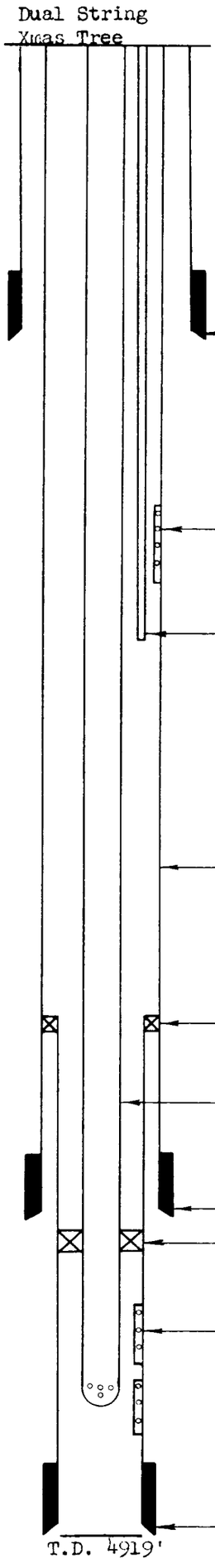
Mack M. Mahaffey

Subscribed and sworn to before me, a Notary Public in and for San Juan County, New Mexico, the 10 day of DEC, 1957.

Dan A. Machado
Notary Public in and for San Juan County, New Mexico

My commission expires February 24, 1960.

SCHEMATIC DIAGRAM OF DUAL COMPLETION
EL PASO NATURAL GAS COMPANY WARREN NO. 2-A (PM)
NE/4 Section 23, T-28-N, R-9-W



Zero reference point 10.0' above tubing hanger flange

10 3/4", 32.75# S. W. casing set at 174' w/150 sacks circulated to surface.

Pictured Cliffs perforations 2416'-40' and 2448'-68' (2 SPF) fractured with water and sand.

1 1/4" EUE, 2.4# J-55 tubing landed at 2494' as siphon string, with perforations at 2464'-2469'.

Garrett circulating sleeve at 2477' (for BHP tests).

Burns liner hanger set at 2521'. Top of liner squeezed with 150 sacks.

2" EUE, 4.7# J-55 tubing landed at 4766', with tubing perforations at 4732'-4735'.

7 5/8", 26.40# J-55 casing set at 2576' with 250 sacks.

Baker Model "EGJ" production packer set at 2606'.

Point Lookout and Menefee perforations 4422-38', 4480'-88'; 4572'-94', 4641'-60', 4684'-4709', 4717'-27', 4750'-64', and 4787'-4801' (2 SPF) - fractured with water and sand.

5 1/2", 15.50#, J-55 liner set from 2521' to 4919' with 300 sacks.

EL PASO NATURAL GAS COMPANY

P. O. Box 997
Farmington, N.M.

November 20, 1957

Mr. E. C. Arnold
Oil Conservation Commission
120 East Chaco
Aztec, New Mexico

Re: Packer Leakage Test on the El Paso Natural Gas Company Well, Warren No. 2-A (PM), 917'N, 1125'E, Sec. 23-28-9, San Juan County, New Mexico.

Dear Mr. Arnold:

The subject well was dually completed in the Pictured Cliffs and Mesa Verde zones and a packer was set at 2635 feet. The Pictured Cliffs zone was tested through a 3/4" choke for three hours November 12, 1957, with the following data obtained:

Pictured Cliffs SIPC 804 psig; shut-in 10 days
Pictured Cliffs SIPT 804 psig

Mesa Verde SIPT 1015 psig; shut-in 10 days

Time Minutes	PC Flowing Pressure Casing Psig	MV SIPT Psig	PC Working Pressure, Psig	Temp ° F
0				
15	345	1015		49
30	307	1016	307	52
45	262	1017		53
60	245	1017	249	54
120	215	1017	219	58
180	202	1019	205	58

The choke volume for the Pictured Cliffs was 2629 MCF/D with an A.O.F. of 2798 MCF/D.

The Mesa Verde zone was tested November 19, 1957 with a 3/4" choke for 3 hours with the following data obtained:

Pictured Cliffs SIPC 824 psig; shut-in 7 days
Pictured Cliffs SIPT 824 psig

Mesa Verde SIPT 1032 psig; shut-in 17 days

Time Minutes	MV Flowing Pressure Tubing Psig	PC SIPC Psig	MV Working Pressure, Psig	Temp ^{o} F
0				
15	484	827		64
30	427	827		64
45	387	827		65
60	370	827		65
120	340	828		67
180	320	828	Calculated 621	67

The choke volume for the Mesa Verde test was 3885 MCF/D with an A.O.F. of 5482 MCF/D.

The results of the above tests indicate there is no packer leakage.

Very truly yours,

S. V. Roberts

S. V. Roberts
Gas Engineer

SVR/jla

cc: W. M. Rodgers
E. S. Oberly (6)
File

Form 23-24 (Rev. 5-56)

EL PASO NATURAL GAS COMPANY
GAS WELL TEST

To: Mr. Ed E. Alsup

From: Gas Engineering Department

Date: November 19, 1957

Place: Farmington, New Mexico

DUAL COMPLETION

Subject: Test data on the El Paso Natural Gas Company Well, WARREN NO. 2-A (M), San Juan County, New Mexico.

Tested By: R. R. Davis

Location ..... Sec. 23 T. 28 R. 9 917'N, 1125'E

Shut-In Pressure ..... P.C. SIPC 824 psig; P.C. SIPT 824 psig; (Shut-in 7 days)
M.V. SIPT 1032 psig

0.750" Choke Volume ..... 3885 MCF/D @ 14.7 psia and 60° F. for 0.6 gravity gas. Flow through tubing for 3 hours.

Calculated 3 Hour Absolute Open Flow ..... 5482 MCF/D

Working Pressure On Calculated ..... = 621 Psig

Producing Formation ..... Mesa Verde

Stimulation Method ..... Sand Water Frac.

Total Depth ..... 4917 - c/o 4875

Field ..... Blanco

H_2S ..... Sweet to lead acetate.

Final SIPC (PC) - 828 psig. Packer at 2635. Sleeve at 2477.

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Lewis D. Galloway
L. D. Galloway

cc: D. H. Tucker
~~R. M. Harris~~
~~W. H. Hollis~~
~~J. J. Walker~~
W. M. Rodgers
Wayne Cheek
Drilling Department
B. D. Adams
~~Roland Hoskins~~
Jack Purvis
~~W. M. Dabbs~~
C. C. Kennedy
E. J. Coel, Jr.
A. J. Dudenhoeffer
File

Bill Parrish
Dean Rittmann
Samuel Smith
E. S. Oberly (6)

Medium fog first 2-1/2 hours of test period. Heavy fog last 1/2 hour of test period.

FORM 23-78 (6-56)

EL PASO NATURAL GAS COMPANY

DUAL COMPLETION

OPEN FLOW TEST DATA

DATE November 19, 1957

Operator: El Paso Natural Gas		Lease: Warren No. 2-A (M)	
Location: 917'N, 1125'E, Sec. 23-28-9		County: San Juan	State: New Mexico
Formation: Mesa Verde		Pool: Blanco	
Casing: Diameter 7-5/8, 5-1/2" liner	Set At: Feet 4875, 2521 - 4919	Tubing: Diameter 2"	Set At: Feet 4756
Pay Zone: From 4422	To 4801	Total Depth: 4917 - c/o 4875	
Stimulation Method: Sand Water Frac.		Flow Through Casing	Flow Through Tubing X

Choke Size, Inches: .750	Choke Constant: C 12.365		
Shut-In Pressure, Casing, PSIG: PC 824	+ 12 = PSIA 836	Days Shut-In 7	Shut-In Pressure, Tubing PSIG: MV 1032	+ 12 = PSIA 1044
Flowing Pressure: P PSIG: 320	+ 12 = PSIA 332		Working Pressure: P_w PSIG: Calculated	+ 12 = PSIA 633
Temperature: T °F: 67	n = .750		Fpv (From Tables): 1.040	Gravity: .715

Final SIPC (PC) - 828 psig. Packer at 2635. Sleeve at 2477

CHOKE VOLUME = Q = C x P_t x F_t x F_g x F_{pv}

Q = 12.365 x 332 x .9933 x .9161 x 1.040 = 3885 MCF/D

OPEN FLOW Aof = Q $\left(\frac{P_c^2}{P_c^2 - P_w^2} \right)^n$

Aof = $\left(\frac{1,089,936}{689,247} \right)^n$ = $1.5813^{.75}$ x 3885 = 1.4110 x 3885

Aof = 5482 MCF/D

TESTED BY R. R. Davis

WITNESSED BY

cc: E. S. Oberly (6)

Medium fog first 2-1/2 hours of test period.
Heavy fog last 1/2 hour of test period.

L. D. Galloway

Form 23-24 (Rev. 5-56)

EL PASO NATURAL GAS COMPANY
GAS WELL TEST

To: Mr. Ed E. Alsup

From: Gas Engineering Department

Date: November 12, 1957

Place: Farmington, New Mexico

DUAL COMPLETION

Subject: Test data on the El Paso Natural Gas Company Well, WARREN NO. 2A (P), San Juan County, New Mexico.

Tested By: Robert R. Davis

Location ..... Sec. 23 T. 28 R. 9 , 917'N, 1125'E

Shut-In Pressure ..... P.C. SIPC 804 psig ; (Shut-in 10 days)
P.C. SIPT 804 psig
M.V. SIPT 1015

0.750" Choke Volume ..... 2629 MCF/D @ 14.7 psia and 60° F. for 0.6 gravity gas. Flow through casing for 3 hours.

Calculated 3 Hour Absolute Open Flow ..... 2798 MCF/D

Working Pressure On tubing ..... = 205 Psig

Producing Formation ..... Pictured Cliffs

Stimulation Method ..... Sand Water Frac.

Total Depth ..... 4917 - c/o 4875

Field ..... Undesignated

H_2S ..... Sweet to lead acetate.

Initial SIPT (MV) - 1015 psig. Final SIPT (MV) - 1019 psig

Lewis D. Galloway
L. D. Galloway

cc: D. H. Tucker
~~R. Williams~~
~~N. Williams~~
~~E. O. Walker~~
W. M. Rodgers
Wayne Cheek
Drilling Department
B. D. Adams
~~R. Richardson~~
Jack Purvis
~~W. Whitehurst~~
C. C. Kennedy
E. J. Coel, Jr.
A. J. Dudenhoeffer
File

Bill Parrish
Dean Rittmann
Samuel Smith
E. S. Oberly (6)

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FORM 214-15 (Rev.)

EL PASO NATURAL GAS COMPANY

OPEN FLOW TEST DATA

DUAL COMPLETION

DATE November 12, 1957

Operator: El Paso Natural Gas		Lease: Warren No. 2A (P)	
Location: 917'N, 1125'E, Sec. 23-28-9		County: San Juan	State: New Mexico
Formation: Pictured Cliffs		Pool: Undesignated	
Casing: Diameter 7-5/8	Set At: Feet 4375	Tubing: Diameter 1-1/4	Set At: Feet 2484
Tubing: Diameter 5-1/2	2521 - 4919		
Pay Zone: From 2416	To 2468	Total Depth: 4917 - c/o 4875	
Stimulation Method: Sand Water Frac.		Flow Through Casing: X	Flow Through Tubing:

Choke Size, Inches: .750	Choke Constant: C 12.365		
Shut-In Pressure, Casing, PSIG: PC 804	+ 12 = PSIA: 816	Days Shut-In: 10	Shut-In Pressure, Tubing PSIG: PC 804 + 12 = PSIA: 816
Flowing Pressure: P PSIG: 202	+ 12 = PSIA: 214		Working Pressure: Pw PSIG: 205 + 12 = PSIA: 217
Temperature: T °F: 58	n: .850		Fpv (From Tables): 1.020 Gravity: .635

Initial SIPT (MV) - 1015 psig. Final SIPC (MV) - 1019 psig

CHOKE VOLUME: $Q = C \times P_t \times F_t \times F_g \times F_{pv}$

$Q = 12.365 \times 214 \times 1.0019 \times .9721 \times 1.020 = 2629$ MCF/D

OPEN FLOW Aof $Q \left(\frac{P_c^2}{P_c^2 - P_w^2} \right)^n$

Aof $\left(\frac{665,856}{618,767} \right)^n = 1.0761^{.35} \times 2629 = 1.0643 \times 2629$

Aof 2798 MCF/D

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TESTED BY Robert R. Davis

WITNESSED BY

cc: E. S. Oberly (6)

L. D. Galloway