

El Paso Natural Gas Company

El Paso, Texas

December 30, 1957

DIRECT REPLY TO:
P. O. BOX 887
FARMINGTON, NEW MEXICO

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

Dear Sir:

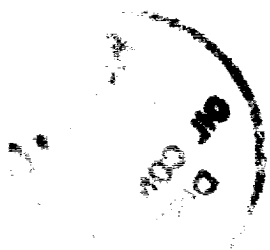
This is a request for administrative approval for a well dually completed in the Aztec Pictured Cliffs Extension Pool and in the Blanco Mesa Verde Pool. The El Paso Natural Gas Company Warren No. 3(EM) is located 1550 feet from the South line and 1090 feet from the West line of Section 13, Township 28 North, Range 9 West, N.M.P.M., San Juan County, New Mexico.

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

1. 10 3/4" surface casing set at 253 feet with 200 sacks of cement circulated to the surface.
2. 7 5/8" intermediate casing set at 2393 feet with 250 sacks of cement. Top of the cement is at 1175 feet which is above the top of the Pictured Cliffs at 1223 feet.
3. 5 1/2" liner set from 2259 feet to 4719 feet with 300 sacks of cement.
4. The casing and liner were tested for leaks before perforating.
5. The Point Lookout section was perforated in five intervals and fractured with water and sand.
6. The Pictured Cliffs formation was perforated in one interval 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 2377 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



6. 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.
7. 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 W/2 of Section 13, Township 26 North, Range 9 West to the Mesa Verde formation and the SW/4 of Section 13, Township 26 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.

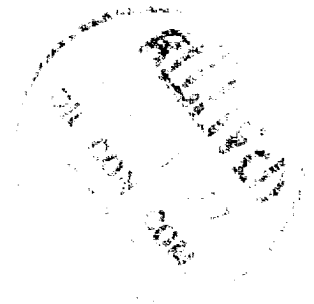
Yours very truly,

ORIGINAL SIGNED E. S. Oberly
E. S. Oberly
Division Petroleum Engineer

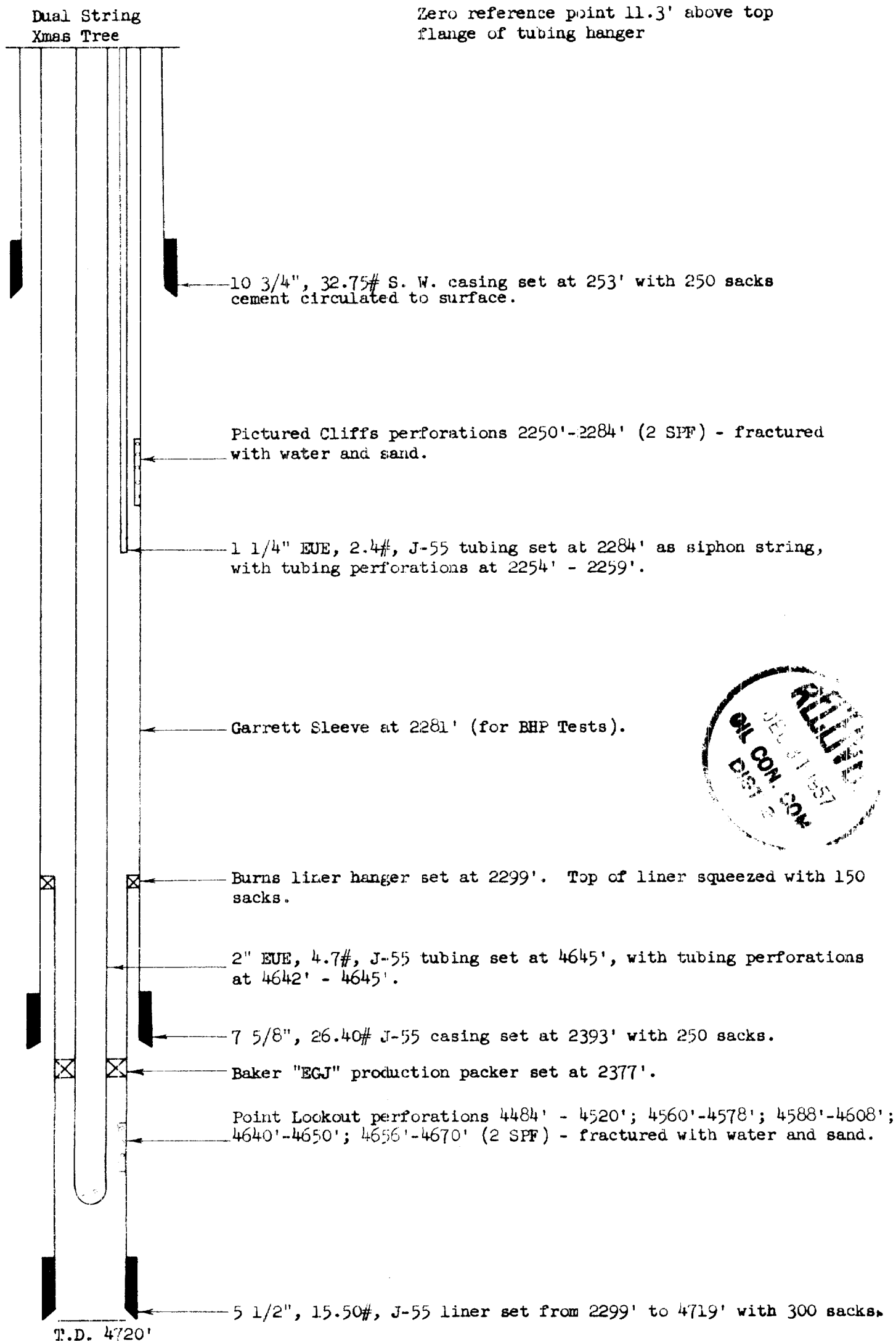
ESO:dgb

Encl.

cc: - NMUCC (Emery Arnold)
Sam Smith
USGS (Phil McGrath)



SCHEMATIC DIAGRAM OF DUAL COMPLETION
EL PASO NATURAL GAS COMPANY WARREN NO. 3 (PM)
SW/4 Section 13, T-28-N, R-9-W



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 8, 1957, I was called to the location of the El Paso Natural Gas Company Warren No. 3 (FM) Well located in the NWSW/4 of Section 13, 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 2377 feet in accordance with the usual practices and customs of the industry.

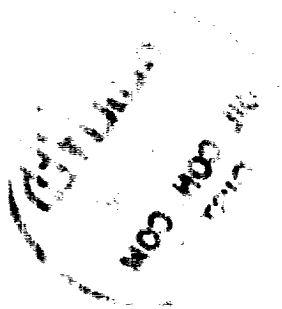
Mack M. Mahaffey

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

John A. MacLennan
Notary Public in and for San Juan
County, New Mexico

My commission expires February 24, 1960.





EL PASO NATURAL GAS COMPANY

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

November 26, 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. 3 (PM), 1550'S,
1090'W, Sec. 13-28-9, San Juan County, N.M.

Dear Mr. Arnold:

The subject well was dually completed in the Pictured Cliffs and Mesa Verde zones and a packer was set at 2377 feet. The Mesa Verde zone was tested through a 3/4" choke for three hours November 15, 1957 with the following data obtained:

Pictured Cliffs SIPC 854 psig; shut-in 7 days
Pictured Cliffs SIPT 854 psig

Mesa Verde SIPT 987 psig; shut-in 7 days

<u>Time</u> <u>Minutes</u>	<u>MV Flowing Pressure</u> <u>Tubing Psig</u>	<u>PC SIPC Psig</u>	<u>MV Working</u> <u>Pressure, Psig</u>	<u>Temp ° F</u>
0				
15	442	854		64
30	402	854		65
45	372	854		65
60	357	854		65
120	319	855		65
180	295	855	Calculated 855	66

The choke volume for the Mesa Verde was 3595 MCF/D with an A.O.F. of 4893 MCF/Day.

The Pictured Cliffs zone was tested November 22, 1957 with a 3/4" choke for three hours with the following data obtained:

Pictured Cliffs SIPC 870 psig; shut-in 14 days
Pictured Cliffs SIPT 870 psig

Mesa Verde SIPT 1004 psig; shut-in 7 days



<u>Time Minutes</u>	<u>PC Flowing Pressure Casing Psig</u>	<u>MV SIPT Psig</u>	<u>PC Working Pressure, Psig</u>	<u>Temp ° F</u>
0				
15	365	1004		58
30	282	1004	285	58
45	250	1005		59
60	232	1005	235	60
120	195	1005	199	60
180	179	1005	182	61

The choke volume for the Pictured Cliffs test was 2323 MCF/D with an A.O.F. of 2423 MCF/D.

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

Very truly yours,

R R Davis
R. R. Davis
Gas Engineer

RRD/jla

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

EL PASO NATURAL GAS COMPANY
GAS WELL TEST

To: Mr. Ed E. Alsup

Date: November 15, 1957

From: Gas Engineering Department

Place: Farmington, New Mexico

DUAL COMPLETION

Subject: Test data on the El Paso Natural Gas Company Well,
WARREN NO. 3 (M), San Juan County, New Mexico.

Tested By: R. R. Davis

Location Sec. 13 T. 28 R. 9 1550'S, 1090'W

Shut-In Pressure P.C. SIPC 854 psig ; (Shut-in 7 days)
 P.C. SIPT 854 psig
 M.V. SIPT 987 psig

0.750" Choke Volume 3595 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:..... 4893 MCF/D

Working Pressure On **Calculated** = **568** Psig

Producing Formation Mesa Verde

Stimulation Method..... Sand Water Frac.

Total Depth 4720 - c/o 4680

Field Blanco

H₂S Sweet to lead acetate.

Initial SIPC (PC) - 854. Final - 855 psig. Packer at 2377, sleeve at 2281.

cc: D. H. Tucker

Bill Parrish

~~4 R, 4 W, 3 H, 1 S~~

Dean Rittmann

+++++

Samuel Smith

++ C-8. M-10-11-12-13

+ E. S. Oberly (6)

W. M. Rodgers

Wayne Cheek

Drilling Department

B. D. Adams

++ Richard H. Harnett ++

Jack Purvis

+++++.

C. C. Kennedy

E. J. Coal, Jr.

A. J. Dudenhoeffer

File

Lewis D. Galloway
L. D. Galloway

L. D. Galloway

Medium fog of distillate and water entire test period.



EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATA

DUAL COMPLETION

DATE November 15, 1957

Operator El Paso Natural Gas		Lease Warren No. 3 (M)	
Location 1550'S, 1090'W, Sec. 13-28-9		County San Juan	State New Mexico
Formation Mesa Verde		Pool Blanco	
Casing: Diameter 7-5/8	Set At: Feet 2393	Tubing: Diameter 2"	Set At: Feet 4633
Pay Zone: From 5-1/2 liner	To 2299 - 4719	Total Depth: 4720 - c/o 4680	
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: PC 854	PSIG - 12 - PSIA 866	Days Shut-In 7	Shut-In Pressure, Tubing MV 987	PSIG - 12 - PSIA 999
Flowing Pressure: F 295	PSIG - 12 - PSIA 307		Working Pressure: Pw Calculated	PSIG - 12 - PSIA 580
Temperature: T 66	F - n - 1 .750		Fpv (From Tables) 1.036	Gravity .710

Initial SIPC (PC) 854 psig. Final SIPC (PC) 855 psig. Packer at 2377, sleeve at 2281

CHOKE VOLUME $Q = C \times P_1 \times F_c \times F_g \times F_{pv}$

$Q = 12.365 \times 307 \times .9943 \times .9193 \times 1.036 = 3595$ MCF/D

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

$A_{of} = \left(\frac{998,001}{661,601} \right)^n \quad 1.5084^{.75} \times 3595 = 1.3610 \times 3595$

$A_{of} = 4893$ MCF/D

TESTED BY R. R. Davis

WITNESSED BY

cc: E. S. Oberly (6)

Medium fog of distillate and water entire test period.

L. D. Galloway
L. D. Galloway



EL PASO NATURAL GAS COMPANY
GAS WELL TESTTo: Mr. Ed E. Alsup
From: Gas Engineering DepartmentDate: November 22, 1957
Place: Farmington, New MexicoDUAL COMPLETIONSubject: Test data on the El Paso Natural Gas Company Well,
WARREN NO. 3 (P), San Juan County, New Mexico.

Tested By: R. R. Davis

Location Sec. 13 T. 28 R. 9 1550'S, 1090'W

Shut-In Pressure P.C. SIPC 870 psig ; (Shut-in 14 days)
P.C. SIPT 870 psig
M.V. SIPT 1004 psig - shut-in 7 days3.750" Choke Volume 2323 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 2423 MCF/D

Working Pressure On tubing = 182 Psig

Producing Formation Pictured Cliffs

Stimulation Method Sand Water Frac.

Total Depth 4720 - c/o 4680

Field Aztec

H₂S Sweet to lead acetate.

Final SIPT (MV) - 1005 psig

cc: D. H. Tucker Bill Parrish
~~W. M. Rodgers~~ Dean Rittmann
~~W. M. Rodgers~~ Samuel Smith
~~W. M. Rodgers~~ E. S. Oberly (C)*Lewis D. Galloway*
L. D. GallowayW. M. Rodgers
Wayne Cheek
Drilling Department
B. D. Adams
~~W. M. Rodgers~~
Jack Purvis
~~W. M. Rodgers~~
C. C. Kennedy
E. J. Coel, Jr.
A. J. Dudenhoeffer
File

EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATADUAL COMPLETIONDATE November 22, 1957

Operator El Paso Natural Gas		Lease Warren No. 3 (P)	
Location 1550'S, 1090'W, Sec. 13-28-9		County San Juan	State New Mexico
Formation Pictured Cliffs		Pool Aztec	
Casing: Diameter 7-5/8 5-1/2"	Set At: Feet 2393 2299 - 4719	Tubing: Diameter 1-1/4	Set At: Feet 2273
Pay Zone: From 2226	To 2284	Total Depth: 4720 - c/o 4680	
Simulation Method: Sand Water Frac.		Flow Through Casing X	Flow Through Tubing

Choke Size, Inches .750		Choke Constant: C 12.365			
Shut-In Pressure, Casing, PC 870	PSIG	- 12 = PSIA 882	Days Shut-In 14	Shut-In Pressure, Tubing PC 870	PSIG - 12 = PSIA 882
Flowing Pressure: P 179	PSIG	- 12 = PSIA 191		Working Pressure: P _w 182	PSIG - 12 = PSIA 194
Temperature: T 61	°F	n = .850		F _{pv} (From Tables) 1.017	Gravity .640

Final SIPT (MV) - 1005 psig. 2" at 4633'. Packer at 2377'. Sleeve at 2281'CHOKE VOLUME = Q C x P_i x F_i x F_g x F_{pv}C 12.365 x 191 x .9990 x .9682 x 1.017 = 2323 MCF/D

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

$$A_{of} = \left(\frac{777,924}{740,288} \right)^n \quad 1.0508^{.85} \times 2323 = 1.0451 \times 2323$$

A_{of} = 2423 MCF/DTESTED BY R. R. Davis

WITNESSED BY _____

cc: E. S. Oberly (6)

Lewis D. Galloway
L. D. Galloway