

Case 1161: Application of Northwest  
Production Corporation for a triple gas  
completion of the Jicarilla "W" 1-7 Well.

Case No.

1161

Application, Transcript,  
Small Exhibits, Etc.

34 1161  
**NORTHWEST PRODUCTION CORPORATION**

ALBUQUERQUE, NEW MEXICO

March 21, 1957

REPLY TO:  
520 SIMMS-BUILDING  
ALBUQUERQUE, NEW MEXICO

Case #

Oil Conservation Commission  
P. O. Box 871  
Santa Fe, New Mexico

Attention: Mr. A. L. Porter

Gentlemen:

On November 13, 1956, the Oil Conservation Commission issued Order No. R-917, Case No. 1161, granting approval for the completion of Northwest Production Corporation's Well "W" 1-7 in the Pictured Cliffs, Mesaverde and Dakota formations.

In accordance with the provisions of Order R-917, attached in duplicate are:

1. Diagrammatic sketch of the Triple Completion.
2. Packer Setting Affidavits.
3. Initial Tests for each completion.
4. Packer Leakage Tests.

Should you desire additional information regarding the completion of Well "W" 1-7, please advise.

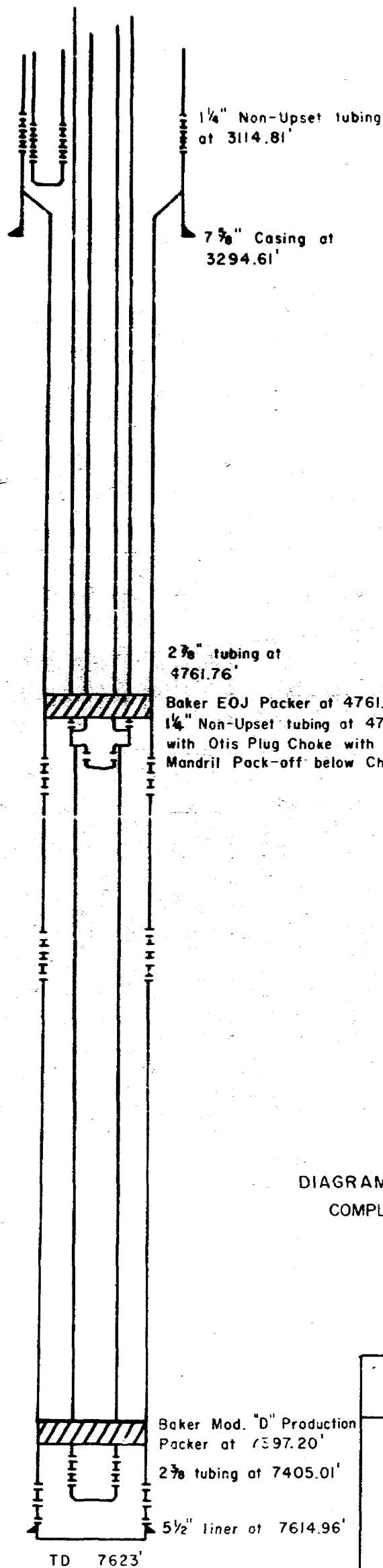
Very truly yours,

NORTHWEST PRODUCTION CORPORATION

*W. R. Johnston*  
W. R. Johnston, Manager  
Production Operations

WRJ/RP/nt  
In duplicate

cc: NMOCC, Aztec, New Mexico, less encls.  
USGS, Farmington, New Mexico, less encls.



# PICTURED CLIFFS DATA:

Top of Pictured Cliffs 3054'  
 Bottom of Pictured Cliffs 3146'  
 Perforations: 3060-3092, 3110-3126

## MESAVERDE DATA:

Top of Mesaverde 4800'  
 Bottom of Mesaverde 5480'  
 Perforation: 4808-4832, 5018-5028  
 5042-5052, 5208-5216  
 5286-5336, 5382-5388  
 5404-5408

## DAKOTA DATA:

Top of Dakota 7420'  
 Dakota to TD of 7623'  
 Perforations: 7432-7442, 7470-7480  
 7504-7524, 7568-7576  
 7598-7607, OH 7615-7623

DIAGRAMATIC SKETCH OF TRIPLE GAS  
 COMPLETION FOR "W" WELL 1-7

NORTHWEST PRODUCTION CORPORATION  
 ALBUQUERQUE, NEW MEXICO

APPLICATION FOR TRIPLE GAS COMPLETION  
 OF "W" WELL 1-7 IN PICTURED CLIFFS,  
 MESAVERDE AND DAKOTA FORMATION

RIO ARriba COUNTY  
 NEW MEXICO

CONTRACT \* 152

Drawn: W.H. McGahey  
 Approved: Roy Phillips

Scale: 400' = 1"  
 Date: 3-12-57

NORTHWEST PRODUCTION CORPORATION

"W" Well No. 1-7

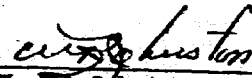
PACKER SETTING AFFIDAVIT

On December 10, 1956, a Baker Model "D" production packer was set at 7397.20 feet to separate the Mesaverde and Dakota formations in "W" Well No. 1-7. Top of the casing perforations for producing the Dakota formation is 7432 feet and the bottom perforation for producing the Mesaverde formation is 7623 feet.

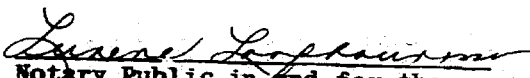
A three hour test of the Dakota formation was taken on February 25, 1957 with the Mesaverde shut in. The shut-in pressure on the Mesaverde was 1153#, the pressure increased to a maximum of 1161# at the beginning of the test, and was 1156# at the end of the test.

The Mesaverde formation was tested for three hours on March 11, 1957 with the Dakota shut in. The shut-in pressure on the Dakota was 2561# and increased to a maximum of 2566# at the end of the test.

Results of the packer leakage test indicates there is no commingling of gases between the Mesaverde and Dakota formations.

  
W. R. Johnston, Manager  
Production Operations  
NORTHWEST PRODUCTION CORPORATION

Subscribed and sworn to this 24th day of March 1957.

  
Notary Public in and for the  
County of Bernalillo, New Mexico

My commission expires July 15, 1959.

NORTHWEST PRODUCTION CORPORATION

"W" Well No. 1-7

PACKER SETTING AFFIDAVIT

On December 10, 1956, a Baker "EOJ" production packer was set at 4761.76 feet to separate the Pictured Cliffs and Mesaverde formations in "W" Well No. 1-7. Top of the casing perforations for producing the Mesaverde formation is 4808 feet and the bottom perforations for producing the Pictured Cliffs formation is 3126 feet.

A three hour test of the Pictured Cliffs formation was taken on March 4, 1957, with the Mesaverde shut in. The shut-in pressure on the Mesaverde was 1158# at the beginning of the test and was 1155# at the end of the test.

The Mesaverde formation was tested for three hours on March 11, 1957 with the Pictured Cliffs shut in. The shut-in pressure on the Pictured Cliffs was 1015# and increased to a maximum of 1017# at the end of the test.

Results of the packer leakage test indicate there is no commingling of gases between the Pictured Cliffs and Mesaverde formations.

*W. R. Johnston*

W. R. Johnston, Manager  
Production Operations  
NORTHWEST PRODUCTION CORPORATION

Subscribed and sworn to this 24th day of March, 1957.

*Lucretia L. Thompson*  
Notary Public in and for the  
County of Bernalillo, New Mexico

My commission expires July 15, 1959.

NM 000-3 ✓  
Geo Pappin-1  
L.G. Truby-1  
File-1

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-122

Revision 12-1-55

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Pool South Blanco Formation Pictured Cliffs County Rio Arriba  
Initial SE Annual \_\_\_\_\_ Special \_\_\_\_\_ Date of Test 3-4-57  
Company Northeast Production Corp. Lease "W" Well No. 1-7  
Unit "W" Sec. 7 Twp. 22N Rge. 2W Purchaser Not connected  
Casing 7-5/8 Wt. 24.00 I.D. \_\_\_\_\_ Set at 3200 Perf. 3000 To 3125  
Tubing 1-1/4 Wt. 2.30 I.D. \_\_\_\_\_ Set at 3115 Perf. \_\_\_\_\_ To \_\_\_\_\_  
Gas Pay: From 3000 To 3125 L \_\_\_\_\_ xG .650 -GL 2000 Bar.Press. 12  
Producing Thru: Casing SE Tubing \_\_\_\_\_ Type Well Triple - G-G-G  
Single-Bradenhead-G. G. or G.O. Dual  
Date of Completion: 12-15-56 Packer \_\_\_\_\_ Reservoir Temp. \_\_\_\_\_

OBSERVED DATA

Tested Through (1111111) (Choke) (111111)

Type Taps \_\_\_\_\_

No.	Flow Data					Tubing Data		Casing Data		Duration of Flow Hr.
	(Prover) (Line) Size	(Choke) (1111111) Size	Press. psig	Diff. h <sub>w</sub>	Temp. °F.	Press. psig	Temp. °F.	Press. psig	Temp. °F.	
SI								<u>1002</u>		<u>SE</u>
1.		<u>1/4</u>	<u>31</u>		<u>53</u>			<u>31</u>	<u>53</u>	<u>3 hours</u>
2.										
3.										
4.										
5.										

FLOW CALCULATIONS

No.	Coefficient (24-Hour)	$\sqrt{h_w P_f}$	Pressure psia	Flow Temp. Factor F <sub>t</sub>	Gravity Factor F <sub>g</sub>	Compress. Factor F <sub>pv</sub>	Rate of Flow Q-MCFPD @ 15.025 psia
1.	<u>14.1005</u>		<u>43</u>	<u>1.0000</u>	<u>.9000</u>	<u>1.000</u>	<u>300</u>
2.							
3.							
4.							
5.							

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio \_\_\_\_\_ cf/bbl.  
Gravity of Liquid Hydrocarbons \_\_\_\_\_ deg.  
F<sub>c</sub> .327 (1-e<sup>-s</sup>) .137

Specific Gravity Separator Gas \_\_\_\_\_  
Specific Gravity Flowing Fluid \_\_\_\_\_  
P<sub>c</sub> 1004 P<sub>c</sub> 1,000,136

No.	P <sub>w</sub> P <sub>t</sub> (psia)	P <sub>t</sub> <sup>2</sup>	F <sub>c</sub> Q	(F <sub>c</sub> Q) <sup>2</sup>	(F <sub>c</sub> Q) <sup>2</sup> (1-e <sup>-s</sup> )	P <sub>w</sub> <sup>2</sup>	P <sub>c</sub> <sup>2</sup> -P <sub>w</sub> <sup>2</sup>	Cal. P <sub>w</sub>	P <sub>w</sub> /P <sub>c</sub>
1.	<u>43</u>	<u>1849</u>	<u>310.4</u>	<u>963</u>	<u>132</u>	<u>1801</u>	<u>1,000,136</u>		<u>1.0001</u>
2.									
3.									
4.									
5.									

Absolute Potential: 300 MCFPD: n .85/1.0001

COMPANY Pacific Northwest Pipeline Corp.  
ADDRESS 402 West Broadway, Farmington, New Mexico  
AGENT and TITLE C.L. Wagner, Well Test Engineer  
WITNESSED \_\_\_\_\_  
COMPANY \_\_\_\_\_

REMARKS

**DRILLING DEPARTMENT**

DATE OF TEST **3-4-57**

SIZE BLOW NIPPLE 3/4" O.D.

FLOW THROUGH      PG. ONE      WORKING PRESSURES FROM

TIME		PG	Q (MCFD)	WELLHEAD WORKING	
HOURS	MINUTES	PRESSURE	15.025 PSIA & 60°F	PRESSURE (PSIG)	TEMP
	34.5	40	1196 MW	2534 DK	36
	41.5	47	1196	2533	37
	50	44	1196	2533	37
1	0	42	1196	2536	38
	12	41	1196	2536	38
	20.5	39	1196	2537	38
	29	37	1196	2537	38
1	3	35	1196	2538	34
	30	33	1196	2538	34
2	0	31	1196	2538	33

START TEST AT            12:50 pm                      END TEST AT            3:50 pm

REMARKS: Opened 12" tub - thru "TV", gas died in approx 1 min - left open for 25  
mins. Still down

HEART (PC) test valve (P Valve) with 3/4" choke at 12:30 pm

TESTED BY **C. R. Wagner**



### INSTRUCTIONS

This form is to be used for reporting multi-point back pressure tests on gas wells in the State, except those on which special orders are applicable. Three copies of this form and the back pressure curve shall be filed with the Commission at Box 871, Santa Fe.

The log log paper used for plotting the back pressure curve shall be of at least three inch cycles.

### NOMENCLATURE

- $Q$  = Actual rate of flow at end of flow period at W. H. working pressure ( $P_w$ ).  
MCF/ds. @ 15.025 psia and 60° F.
- $P_c$  = 72 hour wellhead shut-in casing (or tubing) pressure whichever is greater.  
psia
- $P_w$  = Static wellhead working pressure as determined at the end of flow period.  
(Casing if flowing thru tubing, tubing if flowing thru casing.) psia
- $P_t$  = Flowing wellhead pressure (tubing if flowing through tubing, casing if  
flowing through casing.) psia
- $P_f$  = Meter pressure, psia.
- $h_w$  = Differential meter pressure, inches water.
- $F_g$  = Gravity correction factor.
- $F_t$  = Flowing temperature correction factor.
- $F_{pv}$  = Supercompressibility factor.
- $n$  = Slope of back pressure curve.

Note: If  $P_w$  cannot be taken because of manner of completion or condition of well, then  $P_w$  must be calculated by adding the pressure drop due to friction within the flow string to  $P_t$ .

MM 600-3  
Gas Poppin-1  
L.G. Truby-1  
File-1

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-122

Revised 12-1-55

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Pool Wildcat Formation Sabota County Rio Arriba  
Initial X Annual \_\_\_\_\_ Special \_\_\_\_\_ Date of Test 2-25-57  
Company Northwest Production Corp. Lease 7 Well No. 1-7  
Unit 7 Sec. 7 Twp. 20N Rge. 2E Purchaser Not connected  
Casing 2 1/2 Wt. 12.50 I.D. \_\_\_\_\_ Set at 7615 Perf. 7632 To 7690  
Tubing 2 1/2 Wt. 8.75 I.D. \_\_\_\_\_ Set at 7605 Perf. \_\_\_\_\_ To \_\_\_\_\_  
Gas Pay: From 7632 To 7633 L 7600 xG .630 -GL 4610 Bar. Press. 12  
Producing Thru: Casing \_\_\_\_\_ Tubing XX Type Well Trials - G-G-G  
Date of Completion: 12-20-56 Packer Yes Single-Bradenhead-G. G. or G.O. Dual  
Reservoir Temp. \_\_\_\_\_

OBSERVED DATA

Tested Through (Pressure) (Choke) (Flow) Type Taps \_\_\_\_\_

No.	Flow Data					Tubing Data		Casing Data		Duration of Flow Hr.
	(Prover) (Line) Size	(Choke) (Line) Size	Press. psig	Diff. h <sub>w</sub>	Temp. °F.	Press. psig	Temp. °F.	Press. psig	Temp. °F.	
1.		3/4"	36		52	36	52			3 hours
2.										
3.										
4.										
5.										

FLOW CALCULATIONS

No.	Coefficient (24-Hour)	$\sqrt{h_w p_f}$	Pressure psia	Flow Temp. Factor F <sub>t</sub>	Gravity Factor F <sub>g</sub>	Compress. Factor F <sub>pv</sub>	Rate of Flow Q-MCFPD @ 15.025 psia
1.	14.1403		48	1.0075	.9403	1.000	638
2.							
3.							
4.							
5.							

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio \_\_\_\_\_ cf/bbl.  
Gravity of Liquid Hydrocarbons \_\_\_\_\_ deg.  
F<sub>c</sub> 24.62 (1-e<sup>-8</sup>) .295  
Specific Gravity Separator Gas \_\_\_\_\_  
Specific Gravity Flowing Fluid \_\_\_\_\_  
P<sub>c</sub> 2376 P<sub>c</sub> 4636

No.	P <sub>w</sub> P <sub>t</sub> (psia)	P <sub>t</sub> <sup>2</sup>	F <sub>c</sub> Q	(F <sub>c</sub> Q) <sup>2</sup>	(F <sub>c</sub> Q) <sup>2</sup> (1-e <sup>-s</sup> )	P <sub>w</sub> <sup>2</sup>	P <sub>c</sub> <sup>2</sup> -P <sub>w</sub> <sup>2</sup>	Cal. P <sub>w</sub>	P <sub>w</sub> P <sub>c</sub>
1.	48	2.3	12.21	149.2	14.1	23.4	6990		1.00376
2.									
3.									
4.									
5.									

Absolute Potential: 661 MCFPD; n .75 1.00418

COMPANY Pacific Northwest Pipeline Corp.

ADDRESS 400 West Broadway, Farmington, New Mexico

AGENT and TITLE C. R. Wagner, Well Test Engineer

WITNESSED \_\_\_\_\_

COMPANY \_\_\_\_\_

REMARKS \_\_\_\_\_

### INSTRUCTIONS

This form is to be used for reporting multi-point back pressure tests on gas wells in the State, except those on which special orders are applicable. Three copies of this form and the back pressure curve shall be filed with the Commission at Box 871, Santa Fe.

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### NOMENCLATURE

$Q$  = Actual rate of flow at end of flow period at W. H. working pressure ( $P_w$ ).  
MCF/da. @ 15.025 psia and 60° F.

$P_c$  = 72 hour wellhead shut-in casing (or tubing) pressure whichever is greater.  
psia

$P_w$  = Static wellhead working pressure as determined at the end of flow period.  
(Casing if flowing thru tubing, tubing if flowing thru casing.) psia

$P_t$  = Flowing wellhead pressure (tubing if flowing through tubing, casing if flowing through casing.) psia

$P_f$  = Meter pressure, psia.

$h_w$  = Differential meter pressure, inches water.

$F_g$  = Gravity correction factor.

$F_t$  = Flowing temperature correction factor.

$F_{pv}$  = Supercompressibility factor.

$n$  = Slope of back pressure curve.

Note: If  $P_w$  cannot be taken because of manner of completion or condition of well, then  $P_w$  must be calculated by adding the pressure drop due to friction within the flow string to  $P_t$ .

PACIFIC NORTHWEST PIPELINE CORPORATION

DRILLING DEPARTMENT

COMPANY Northwest Production Corp.

LEASE        WELL NO. 1-7

DATE OF TEST 2-23-57

SHUT IN PRESSURE (PSIG): TUBING 2364 CASING 1015 S.I. PERIOD 7 DAYS

SIZE BLOW NIPPLE 3/4" 2364

FLOW THROUGH 2364 WORKING PRESSURES FROM       

TIME		BK PRESSURE	Q (MCFD) 15.025 PSIA & 60°F	WELLHEAD WORKING PRESSURE (PSIG)	TEMP
HOURS	MINUTES				
	34.5	40	1014	1101	40
	41.5	46	1017	1101	39
	50	43	1022	1102	39
1	0	42	1022	1102	39
	12	42	1022	1102	39
	25.5	41	1019	1102	39
	44	40	1019	1102	39
2	5	38	1019	1102	39
	30	37	1020	1102	39
3	0	36	1020	1102	39

START TEST AT 11:30 pm END TEST AT 3:30 pm

REMARKS: Very wet with H<sub>2</sub>O

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TESTED BY C. R. Wagner

[REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]

LEASE                      WELL NO.           

DATE OF TEST                     

SIZE BLOW NIPPLE 2 1/2" Male G. of Brass

FLOW THROUGH \_\_\_\_\_ WORKING PRESSURES FROM \_\_\_\_\_

TIME		TEMP	Q (MCFD)	WELLHEAD WORKING	
HOURS	MINUTES	PRESSURE	15.025 PSIA & 60°F	PRESSURE (PSIG)	TEMP
	00	20	15.025	15.025	60
	05	20	15.025	15.025	60
	10	20	15.025	15.025	60
1	15	20	15.025	15.025	60
	20	20	15.025	15.025	60
1	25	20	15.025	15.025	60
	30	20	15.025	15.025	60
1	35	20	15.025	15.025	60
	40	20	15.025	15.025	60
1	45	20	15.025	15.025	60
	50	20	15.025	15.025	60
	55	20	15.025	15.025	60
	00	20	15.025	15.025	60
	05	20	15.025	15.025	60
	10	20	15.025	15.025	60
	15	20	15.025	15.025	60
	20	20	15.025	15.025	60
	25	20	15.025	15.025	60
	30	20	15.025	15.025	60
	35	20	15.025	15.025	60
	40	20	15.025	15.025	60
	45	20	15.025	15.025	60
	50	20	15.025	15.025	60
	55	20	15.025	15.025	60
	00	20	15.025	15.025	60
	05	20	15.025	15.025	60
	10	20	15.025	15.025	60
	15	20	15.025	15.025	60
	20	20	15.025	15.025	60
	25	20	15.025	15.025	60
	30	20	15.025	15.025	60
	35	20	15.025	15.025	60
	40	20	15.025	15.025	60
	45	20	15.025	15.025	60
	50	20	15.025	15.025	60
	55	20	15.025	15.025	60
	00	20	15.025	15.025	60
	05	20	15.025	15.025	60
	10	20	15.025	15.025	60
	15	20	15.025	15.025	60
	20	20	15.025	15.025	60
	25	20	15.025	15.025	60
	30	20	15.025	15.025	60
	35	20	15.025	15.025	60
	40	20	15.025	15.025	60
	45	20	15.025	15.025	60
	50	20	15.025	15.025	60
	55	20	15.025	15.025	60
	00	20	15.025	15.025	60
	05	20	15.025	15.025	60
	10	20	15.025	15.025	60
	15	20	15.025	15.025	60
	20	20	15.025	15.025	60
	25	20	15.025	15.025	60
	30	20	15.025	15.025	60
	35	20	15.025	15.025	60
	40	20	15.025	15.025	60
	45	20	15.025	15.025	60
	50	20	15.025	15.025	60
	55	20	15.025	15.025	60
	00	20	15.025	15.025	60
	05	20	15.025	15.025	60
	10	20	15.025	15.025	60
	15	20	15.025	15.025	60
	20	20	15.025	15.025	60
	25	20	15.025	15.025	60

START AT 1:00 PM END TEST AT 1:45 PM

REMARKS: Dist. of 1000 ft. from shore. Remains of 240 ft. at 2 hours and 40  
min. 1000 ft. from shore.

TESTED BY A. L. Wagner  
 SIGNATURE: A. L. Wagner, JR. (S)

**NEW MEXICO OIL CONSERVATION COMMISSION  
INITIAL POTENTIAL TEST-DATA SHEET**

This form must be used for reporting all pitot tube tests made in the State. It is particularly important that it be used for reporting Initial Potential Tests in the San Juan Basin as prescribed by Order No. R-333 and by the New Mexico Oil Conservation Commission Manual of Tables and Procedure for Initial Potential (Pitot Tube) Tests.

POOL Wash FORMATION Washakie  
COUNTY Sandoz DATE WELL TESTED 3-22-57  


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Operator Pacific Northwest Pipeline Lease W Well No. 2-9  
1/4 Section SW Unit Letter B Sec. 7 Twp. 22N Rge. 2E  
Casing: 2 1/2 "O.D. Set At 7000 Tubing 2 1/2 "WT. 25 Set At 7000  
Pay Zone: From 6000 to 8000 Gas Gravity: Meas.          Est. 0.80  
Tested Through: Casing 2 1/2 Tubing           
Test Nipple 2 1/2 I.D. Type of Gauge Used 2 1/2 - 2 1/2  
(Spring) (Monometer)

## OBSERVED DATA

Shut In Pressure: Casing 2000 2000 Tubing: 2000 S.I. Period 7  
Time Well Opened: 2000 Time Well Gauged: 2:00pm  
Impact Pressure 1200  
Volume (Table I) 272.4 (a)  
Multiplier for Pipe or Casing (Table II) 1.000 (b)  
Multiplier for Flowing Temp. (Table III) 1.000 (c)  
Multiplier for SP. Gravity (Table IV) 1.000 (d)  
Ave. Barometer Pressure at Wellhead (Table V) 21.5  
Multiplier for Barometric Pressure (Table VI) .900 (e)  
Initial Potential, Mcf/24 hrs. (a) x (b) x (c) x (d) x (e) = 200 - 200 Mcf

Witnessed by A. A. Hendrich Tested by: C. R. Hager  
Company: SW CO Company: Pacific Northwest Pipeline Corp.  
Title: Engineer Title: Well Test Engineer

NY 880-3  
Poppin-1  
Truby-1  
File-1

NEW MEXICO  
OIL CONSERVATION COMMISSION

Sheet 1 of 2  
8-15-56

PACKER LEAKAGE TEST (SAN JUAN BASIN)

Operator Northwest Production Pool (Upper Completion) So. Blanco FC  
Lease " " Pool (Lower Completion) Wildcat - Macoverde  
Location: Unit M, S. 7, T. 24N R. 5W, Elc Arriba County, N. Mex. Wildcat - Dakota

Pre-Test Shut-In

	Upper Completion	Lower Completion
Shut-in (date) . . . . .	--	2-18-57
Pressure Measured (Dwt.) (date) . . . . .	--	2-23-57

Flow Test No. 1

Test commenced at (hour, date) 12:30 PM 2-25-57 Choke size 3/4"  
Completion producing Dakota Completion shut-in Macoverde & FC

	Upper Completion	Lower Completion
Pressure at beginning of test. . . . .	1013 psi	2384 psi
Maximum pressure during test . . . . .	1100 psi	44 psi
Minimum pressure during test . . . . .	1010 psi	36 psi
Pressure at end of test. . . . .	1010 psi	36 psi
Maximum pressure change during test. . . . .	5 psi	2348 psi
Oil flow rate during test: -- BOPD based on -- BO in -- hours		
Gas flow rate during test:		

Choke volume 658 MCFD; Meter volume 651 MCFD.

Mid-Test Shut-In

	Upper Completion	Lower Completion
Shut-in (date) . . . . .	2-25-57	--
Pressure measured (Dwt) (date) . . . . .	3-4-57	--

Flow Test No. 2

Test commenced at (hour, date) 12:30 PM 2-4-57 Choke size 3/4"  
Completion producing Pictured Cliffs Completion shut-in FC & FC

	Upper Completion	Lower Completion
Pressure at beginning of test. . . . .	1042 psi	2353 psi
Maximum pressure during test . . . . .	48 psi	2348 psi
Minimum pressure during test . . . . .	31 psi	2334 psi
Pressure at end of test . . . . .	31 psi	2338 psi
Maximum pressure change during test . . . . .	991 psi	7 psi
Oil flow rate during test: -- BOPD based on -- BO in -- hours		
Gas flow rate during test:		

Choke Volume 589 MCFD; Meter volume 589 MCFD.

Test performed by C.E. Wagner Title Well test Engineer  
Witnessed by \_\_\_\_\_ Title \_\_\_\_\_

REMARKS: See sheet #2

NOTE: Recording gauge pressure charts, test data sheet, and a graphic depiction of all phases of the test shall be submitted with this report.

AFFIDAVIT:

I HEREBY CERTIFY that all conditions prescribed by the Oil Conservation Commission of the State of New Mexico for this packer leakage test were complied with and carried out in full, and that all dates and facts set forth in this form and all attached material are true and correct.

C.E. Wagner For Pacific Northwest Pipeline Corp.  
(Representative of Company making test) (Company Making Test)

## INSTRUCTIONS

(NORTHWEST NEW MEXICO ONLY)

1. At least seventy-two hours prior to the commencement of this test, the operator shall have notified the Aztec Office of the Oil Conservation Commission in writing of the exact time said test is to be commenced.
2. The packer leakage test shall commence with both sides of the completion shut-in. Both sides of the completion must be shut-in at least seven days. This shut-in must show on the charts of the pressure recorder and also must appear on the data sheets.
3. For Flow Test No. 1, one side of the dual completion shall be produced with the other side shut-in. Such test shall be continued for seven days, and shall be at a rate of flow approximating the normal rate of flow for the zone being produced. Note: Where gas is flowed to the atmosphere in taking the initial packer test, the well shall be flowed for three hours.
4. Following the completion of flow test No. 1, the well will again be shut-in for seven days.
5. Flow Test No. 2 shall be performed with the previously shut-in side of the dual completion flowing and with the flowing side of the completion used in Flow Test No. 1 remaining shut-in. This test shall be conducted exactly as outlined under Flow Test No. 1, and must be performed even though no leak was indicated by Flow Test No. 1.
6. All pressures, throughout the entire test, must be continuously measured and recorded with recording pressure gauges.
7. The accuracy of the recording gauges shall be checked at regular intervals throughout the test with a dead weight test gauge (Dwt), and such readings shall be recorded on the test data sheet provided.
8. This form must be completed and filed in duplicate with the Aztec Office of the Oil Conservation Commission within 15 days following the completion of the testing, and must be accompanied by:
  - a. all of the charts, or copies thereof, used on the pressure recorders during the test.
  - b. The test data-sheet (s), or copies thereof, required under paragraph 7 above.
  - c. a graph depicting the pressures and their changes, for both sides of the completion over the entire test.
9. This packer leakage test shall be performed upon the dual completion of any new wells so approved by the Commission. This test shall also be required each year during the annual deliverability test on gas wells. This test shall be required until such time as the Commission has sufficient information on testing dual completions in San Juan Basin on which to base a simplified packer leakage test. The Commission may also request packer leakage tests at any time they feel that a new test is desirable.



NEW MEXICO  
OIL CONSERVATION COMMISSION

Sheet 2 of #2  
8-15-56

PACKER LEAKAGE TEST (SAN JUAN BASIN)

Operator Northwest Production Corp. Pool (Upper Completion)  
Lease "M" Pool (Lower Completion)  
Location: Unit M, S. 7, T. 26N R. 5W, Rio Arriba

South Blanco PC  
Wildcat - Mesaverde  
Wildcat - Dakota  
County, N. Mex.

Pre-Test Shut-In

Upper Completion Lower Completion  
Shut-in (date) . . . . . 3-4-57  
Pressure Measured (Dwt.) (date) . . . . . 3-11-57

Flow Test No. 1

Mesaverde  
Test commenced at (hour, date) \_\_\_\_\_ Choke size 3/4"  
Completion producing Mesaverde Completion shut-in PC & MK  

	Upper Completion		Lower Completion
	PC	MV	MK
Pressure at beginning of test. SI. . . . .	1013	1139	2361
		psi	psi
Maximum pressure during test . . . . .	1017	73	2366
		psi	psi
Minimum pressure during test . . . . .	1013	12	2363
		psi	psi
Pressure at end of test. . . . .	1017	12	2366
		psi	psi
Maximum pressure change during test. . . . .	1	1147	3
		psi	psi
Oil flow rate during test: _____	BOPD based on	BO in	hours
Gas flow rate during test: _____			

Choke volume 372 MCFD; Meter volume \_\_\_\_\_ MCFD.

Mid-Test Shut-In

Upper Completion Lower Completion  
Shut-in (date) . . . . .  
Pressure measured (Dwt) (date) . . . . .

Flow Test No. 2

Test commenced at (hour, date) \_\_\_\_\_ .Choke size \_\_\_\_\_  
Completion producing \_\_\_\_\_ Completion shut-in \_\_\_\_\_  

	Upper Completion		Lower Completion
Pressure at beginning of test. . . . .		psi	psi
Maximum pressure during test . . . . .		psi	psi
Minimum pressure during test . . . . .		psi	psi
Pressure at end of test . . . . .		psi	psi
Maximum pressure change during test . . . . .		psi	psi
Oil flow rate during test: _____	BOPD based on	BO in	hours
Gas flow rate during test: _____			

Choke Volume \_\_\_\_\_ MCFD; Meter volume \_\_\_\_\_ MCFD.

Test performed by C. R. Wagner Title Well Test Engineer  
Witnessed by A. R. Kendrick Title N.M. Oil Conservation Commission  
REMARKS: Mesaverde test witnessed

NOTE: Recording gauge pressure charts, test data sheet, and a graphic depiction of all phases of the test shall be submitted with this report.

AFFIDAVIT:

I HEREBY CERTIFY that all conditions prescribed by the Oil Conservation Commission of the State of New Mexico for this packer leakage test were complied with and carried out in full, and that all dates and facts set forth in this form and all attached material are true and correct.

C. R. Wagner For Pacific Northwest Pipeline Corp.  
(Representative of Company making test) (Company Making Test)

## INSTRUCTIONS

(NORTHWEST NEW MEXICO ONLY)

1. At least seventy-two hours prior to the commencement of this test, the operator shall have notified the Aztec Office of the Oil Conservation Commission in writing of the exact time said test is to be commenced.
2. The packer leakage test shall commence with both sides of the completion shut-in. Both sides of the completion must be shut-in at least seven days. This shut-in must show on the charts of the pressure recorder and also must appear on the data sheets.
3. For Flow Test No. 1, one side of the dual completion shall be produced with the other side shut-in. Such test shall be continued for seven days, and shall be at a rate of flow approximating the normal rate of flow for the zone being produced. Note: Where gas is flowed to the atmosphere in taking the initial packer test, the well shall be flowed for three hours.
4. Following the completion of flow test No. 1, the well will again be shut-in for seven days.
5. Flow Test No. 2 shall be performed with the previously shut-in side of the dual completion flowing and with the flowing side of the completion used in Flow Test No. 1 remaining shut-in. This test shall be conducted exactly as outlined under Flow Test No. 1, and must be performed even though no leak was indicated by Flow Test No. 1.
6. All pressures, throughout the entire test, must be continuously measured and recorded with recording pressure gauges.
7. The accuracy of the recording gauges shall be checked at regular intervals throughout the test with a dead weight test gauge (Dwt), and such readings shall be recorded on the test data sheet provided.
8. This form must be completed and filed in duplicate with the Aztec Office of the Oil Conservation Commission within 15 days following the completion of the testing, and must be accompanied by:
  - a. all of the charts, or copies thereof, used on the pressure recorders during the test.
  - b. The test data-sheet (s), or copies thereof, required under paragraph 7 above.
  - c. a graph depicting the pressures and their changes, for both sides of the completion over the entire test.
9. This packer leakage test shall be performed upon the dual completion of any new wells so approved by the Commission. This test shall also be required each year during the annual deliverability test on gas wells. This test shall be required until such time as the Commission has sufficient information on testing dual completions in San Juan Basin on which to base a simplified packer leakage test. The Commission may also request packer leakage tests at any time they feel that a new test is desirable.

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO

CASE NO. 1161 AND CASE NO. 1162

TRANSCRIPT OF HEARING

OCTOBER 17, 1956  
DEARNLEY-MEIER AND ASSOCIATES  
COURT REPORTERS  
605 SIMMS BUILDING  
TELEPHONE 3-6691  
ALBUQUERQUE, NEW MEXICO

BEFORE THE  
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO  
OCTOBER 17, 1956

IN THE MATTER OF:

CASE 1161: Application of Northwest Production Corporation for: an order authorizing a triple gas completion in the: SW/4 of Section 7, Township 26 North, Range 5 West,: Rio Arriba County, New Mexico, in exception to Rule: 112-A of the New Mexico Oil Conservation Commission: Rules and Regulations. Applicant, in the above- : styled cause seeks an order granting permission to : effect a triple gas completion of its Jicarilla "W": 1-7 Well located 800 feet from the South line and : 920 feet from the West line of Section 7, Township : 26 North, Range 5 West, Rio Arriba County, New Mex-: ico. The proposed producing horizons are the South: Blanco-Pictured Cliffs Gas Pool and the Mesaverde : and Dakota formations of two presently undesignated: gas pools in the SW/4 of said Section 7. Applicant: proposes to produce Pictured Cliffs gas through one: small string of tubing, Dakota gas through another : small string of tubing inside one larger string of : tubing and Mesaverde gas through the tubing-tubing : annulus.

CASE 1162: Application of Northwest Production Corporation for: an order authorizing a triple gas completion in the: NE/4 of Section 5, Township 26 North, Range 5 West,: Rio Arriba County, New Mexico, in exception to Rule: 112-A of the New Mexico Oil Conservation Commission: Rules and Regulations. Applicant, in the above- : styled cause, seeks an order granting permission to: effect a triple gas completion of its Jicarilla "W": 2-5 Well located 990 feet from the North line and : 1650 feet from the East line of Section 5, Township: 26 North, Range 5 West, Rio Arriba County, New Mex-: ico. The proposed producing horizons are the Pic- : tured Cliffs, Mesaverde and Dakota formation of : three presently undesignated gas pools in the NE/4 : of said Section 5. Applicant proposes to produce : Pictured Cliffs gas through one small string of tub-: ing, Dakota gas through another small string of tub-: ing inside one larger string of tubing and Mesa- : verde gas through the tubing-tubing annulus.

3  
BEFORE:

Mr. A. L. Porter  
Mr. E. S. (Johnny) Walker

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: The meeting will come to order, please. Next case on the docket is Case No. 1161, and I believe the representative for Northwest Production Corporation has a request in relation to consolidating the two cases.

MR. JOHNSTON: Yes, sir. These two wells, if approved, will be completed in an identical manner, and they are located approximately one mile apart. I would like to take them up as one case.

MR. PORTER: For the reason of taking testimony in Cases 1161 and 1162, is there any objection to consolidation? If not, let the record show that the two cases will be consolidated for the purpose of --

MR. GURLEY: 1161, 1162, Application of Northwest Production Corporation for an order authorizing a triple gas completion in the SW/4 of Section 7, and the NE/4 of Section 5, Township 26 North, Range 5 West, Rio Arriba County, New Mexico, in exception to Rule 112-A of the New Mexico Oil Conservation Commission Rules and Regulations.

MR. PORTER: All right, Case No. 1162, would you read that?

MR. GURLEY: I combined the two, one was in SW of 7, and the other was in the NE of 5.

MR. PORTER: Will you swear the witness?

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MR. WALKER: I would like the record to show that Mr. Johnston is being sworn in on both cases, 1161 and 1162.

(Whereupon, Mr. Johnston was sworn as a witness and testified as follows:)

MR. PORTER: You may proceed with your testimony.

MR. JOHNSTON: Northwest Production has found that --

MR. WALKER: For the sake of the record, identify yourself.

MR. JOHNSTON: I am W. R. Johnston, manager of production operations, Northwest Production Corporation. Northwest Production has determined that there is a sizeable Dakota gas reservoir extending over a major portion of the southeastern San Juan Basin, the wells that we have drilled are of quite low volume producing capacities; for that reason, it's not economically feasible to triple and produce this gas from the Dakota formation alone. Therefore, we are requesting authority to attempt two drill zone completions. I would like to introduce as Exhibits, first, --

MR. GURLEY: Excuse me just a moment, for your own purpose there, would you wish to qualify yourself as an expert witness for your engineering testimony?

MR. JOHNSTON: Yes, I would.

MR. GURLEY: Would you then give the Commission your educational background? You have not appeared before the Commission before?

MR. JOHNSTON: No, sir, I have not.

MR. GURLEY: Would you give the Commission your educational background and experience so you could qualify?

MR. JOHNSTON: I am a graduate petroleum engineer from the University of Texas, graduated in 1942, after the Service, I worked for Humble Oil and Refining Company for 7 years in various engineering capacities both in drilling and production until I resigned from Humble in 1955 and worked as manager of Production Operations for Pacific Northwest Pipeline Corporation until Northwest Production Corporation was initiated at which time I became manager of Production Operations for that Corporation. I have been active in field operations all of my professional life since graduation from college. I feel well qualified to testify on any completion work in the oil field.

MR. GURLEY: Has most of your experience been in the State of New Mexico?

MR. JOHNSTON: No, sir, it has not. I have been permanently in New Mexico only the past year and a half, four years prior to that I worked with Humble in Midland, Texas and did have supervision of operations in Lea County, but I was based in Midland.

MR. PORTER: Has your experience in New Mexico been mostly in the San Juan Basin?

MR. JOHNSTON: That's right, sir.

MR. PORTER: The witness' qualifications are acceptable to the Commission. You may proceed with your testimony.

MR. JOHNSTON: As Exhibit No. 1, location and ownership

plat for the well with 107 located in Section 7, Township 26 North, Range 5 West --

MR. PORTER: Do you have extra copies of that Exhibit?

MR. JOHNSTON: I do. Exhibit 2 is a diagramatic sketch of the manner in which we propose to perform the triple completion in the "W" 1-7 Well. Exhibit 3, location and ownership plat for the Well "W" 2-5 in Section 5 of 26 North, Range 5 West. Exhibit 4 is a diagramatic sketch of the equipment proposed to be used in the completion of the "W" 2-5 Well. Exhibit 5, manufacturer's drawing of the well head assembly which we propose to use for the triple completion. I referred to the Dakota reservoir which we feel is not economically feasible to produce by itself, I would like to point out that with our methods of gas drilling when we have reached the base of the Mesaverde formation providing the hole remains dry, which it did in these two wells, only three more days rig time is necessary to penetrate the Dakota formation. It makes explorations for the Dakota quite inexpensive if you are going to drill the Mesaverde anyway, and our thought on it is in any area where we have this low volume Dakota and have a Mesaverde well, we would drill on to the Dakota and effect a triple completion or a dual, which has been previously authorized for this. There is, in addition to this cost of drilling, there is a great aid in the pipe line companies in the cost of gathering affected by the triple completion. It is estimated that each well head gathering line head requires an investment of around \$30,000.00. If we had to have three separate wells in the



place of this, we would have effected a gathering dehydration cost of approximately \$90,000.00, where with three zones in one well we figure it could be handled for \$45,000.00, it would be more than a single, because you would have to have separations and measuring facilities for each zone. The manner in which we propose to make the triple completion as shown on either one of the diagrammatic sketches, we plan to use a Baker Model DA Production Packer in the Dakota formation; we will have two-inch tubing from there to the top of the Mesaverde formation an interval of approximately 25- or 26-hundred feet, the packer used at this point would be an anchor type packer, that is one that sets on direct weight. From there to the surface, we will use 2 and 7/8 OD tubing, we will run an Otis Side Door Choke directly below the upper packer; we will then run a string of one and a quarter inch non-upset tubing with a pack of assembly made by the Otis Company to pack off below the Side Door Choke. Lastly, we will run a string of one-quarter inch tubing in the 7 and 5/8, 2 and 7/8 tubing annulus to produce. In this manner, the Dakota will be produced up the 2-inch and will enter the inch and a quarter approximately opposite the Mesaverde perforations; the Mesaverde formation will be produced through the Side Door Choke and then into the annulus of the inch and a quarter; The Pictured Cliff formation will be produced through the inch and a quarter hanging between the 2 and 7/8 and 7 and 5/8. I did not point out, but this well and most any one like it is equipped with a liner so that we have 7 and 5/8 inch casing down through the Pictured Cliffs formation. If you

will refer to the manufacturer's drawing of the well head, we will be able to obtain pressures of all three zones, bottom pressures can be taken of the Pictured Cliff and Dakota formations with the present hookup; to take a bottom hole of the Mesaverde, it would be necessary to pull the inch and a quarter tubing, set a tubing choke, shutting off the Dakota and then the bottom hole could be taken of the Mesaverde. However, for our uses, we feel we can obtain satisfactory surface pressures and calculate bottom hole pressures. I think that is all my testimony.

MR. PORTER: Does anyone have a question of Mr. Johnston?

MR. GURLEY: Has your company had any experience in triple completions in any other area?

MR. JOHNSTON: No, sir, we have not. We have done considerable duals in the San Juan Basin, this essentially is a dual completion, other than -- it's the same mechanical means; I am familiar with cases of running two strings of tubing and producing in the annulus, that has worked satisfactorily with this same Packoff.

MR. GURLEY: Have you had any personal experience with triple completions?

MR. JOHNSTON: No.

MR. MANKIN: Mr. Johnston, do you anticipate considerable liquids being produced from either of these three formations?

MR. JOHNSTON: Not considerable liquids, I feel that the Dakota formation will produce a small amount of distillate and water; actually, the inch and quarter that will be handling the Dakota should

help us keep the well clean, we tested the Dakota in both of these wells, and they will produce one of them about 300,000 cubic feet a day, along with four or five barrels of mixed distillate and water; the inch and quarter would be a much better method of keeping the Dakota clean than would be the two-inch. It is a typical small volume deal. I do not anticipate any appreciable liquid production from either the Pictured Cliffs or the Mesaverde formation.

MR. MANKIN: It is possible, is it not, that in the Pictured Cliffs there will be water production?

MR. JOHNSTON: It is entirely.

MR. MANKIN: But you don't anticipate any distillate of any consequence from the Mesaverde?

MR. JOHNSTON: I don't know, we have not completed, or produced, we have completed several in the area, but have not produced them to any extent to determine how much distillate production we will get. It is, I suppose, normal to assume that it will be similar to the wells in the Basin, they will produce about three barrels per million.

MR. MANKIN: Was there any test made on these as they were drilled?

MR. JOHNSTON: No.

MR. MANKIN: You have no knowledge of --

MR. JOHNSTON: We have electric logs, they are near enough to known Pictured Cliffs Horizons, that we believe it will be producing, but we have not tested the well.

MR. MANKIN: You have no knowledge of whether they are large or small or average wells?

MR. JOHNSTON: The offset are in range of million to a million and a half, which is quite small. However, they are old.

MR. MANKIN: Mesaverde, do you have any knowledge of volumes there?

MR. JOHNSTON: Yes, on one well, one well is testing in the Mesaverde now, on the "W" 2-5, we plugged it off pending our hearing and fracked the Mesaverde; it's cleaning up water now. It looks like it has a potential producing capacity of something like 400,000 cubic feet a day, which is a small well.

MR. MANKIN: So none of these three zones would be large wells in your estimation?

MR. JOHNSTON: Our feeling is that by the triple completion we can possibly deliver from the well in the range of a million two hundred thousand a day, they are all in the range of something like 400,000 per zone. That is the primary reason we were asking for the triple, had we a 30 million well in one zone, we would undoubtedly take that and be very happy with it.

MR. MANKIN: I believe that is all.

MR. UTZ: Mr. Johnston, can you tell me what the formation pressures are for these three zones in this particular area?

MR. JOHNSTON: Yes, the Dakota will have about 2900 pounds bottom hole pressure, the Mesaverde formation around 1200 and the Pictured Cliff 1100.

MR. UTZ: So that between the Mesaverde and the Dakota, you will have a pressure differential of around 1600 pounds?

MR. JOHNSTON: That's right.

MR. UTZ: Actually, the packer between the Mesaverde and the Dakota is set in such a manner that there will be an accumulation of liquids on top of the packer, is that correct, --

MR. JOHNSTON: Yes.

MR. UTZ: -- which would tend to decrease that pressure differential?

MR. JOHNSTON: It will cross the packer.

MR. UTZ: And there is only possibly a hundred pounds between the Pictured Cliff and Mesaverde?

MR. JOHNSTON: That's right.

MR. UTZ: That is all I have.

MR. MANKIN: I have one question. Mr. Johnston, will the production from the Pictured Cliff be through the tubing or will it be a combination of the tubing and casing tubing annulus?

MR. JOHNSTON: Depends entirely on the volume, Mr. Mankin. I anticipate it will be through the tubing only. In the event we made a well that would deliver in excess of a million cubic feet a day, your friction loss in your inch quarter gets high, and to handle the well, we would want to produce it through the casing.

MR. UTZ: Can you tell me, Mr. Johnston, what the interval is between the Mesaverde perforations and the Dakota Mesaverde packer?

MR. JOHNSTON: Yes. The bottom perforation, 5336 in the Mesaverde, this is the "W" 1-7, the top of the Dakota at 7442, that is 2100 feet, and we would set that packer probably 50 feet above the top of the Dakota, so it would be around 2,500.

MR. UTZ: That is all.

MR. NUTTER: I am not sure if I follow the scheme for producing this completely, your Dakota comes into the 2-inch tubing?

MR. JOHNSTON: Right.

MR. NUTTER: Below the lower packer?

MR. JOHNSTON: Yes.

MR. NUTTER: Sometimes up through this side door choke and produced through in what size tubing?

MR. JOHNSTON: It is packed over at the side door choking and enters the inside of the inch quarter.

MR. NUTTER: That is an inch quarter inside the 2 and 7/8.

MR. JOHNSTON: That's right. This is a standard sized door choke that is used everywhere in the Basin for duals, except that you delete the upper packing element, you have only the lower below the choke which allows your Mesaverde gas to come in through the choke.

MR. NUTTER: And your Pictured Cliff is going to be produced through inch and a quarter?

MR. JOHNSTON: That's right.

MR. NUTTER: And above the side door choke the Dakota will be produced in inch and a quarter?

MR. JOHNSTON: Right.

MR. NUTTER: And Mesaverde in the annulus between 2 and 7/8 tubing and inch and a quarter?

MR. JOHNSTON: That's right.

MR. NUTTER: How does the hydraulic radius of the annular space between those tubing spaces compare with the rating between inch and a quarter?

MR. JOHNSTON: Strangely enough, inch and a quarter is the smallest producing area in the well, the area -- cross sectional area -- which is your producing capacity of the inside of the inch and a quarter area is 1.496 square inches. The area in the annulus the 2 and 7/8 inch quarter pipe body is 2.516 square inches and the tightest area at the shoulders, 1.545 inches, so our minimum hydraulic radius of producing capacity, are the identity test of the inch and a quarter which is the standard producing.

MR. NUTTER: What is the inside diameter of the inch and a quarter?

MR. JOHNSTON: 1.380.

MR. NUTTER: And what is the outside diameter of inch and a quarter?

MR. JOHNSTON: 1.660, if I remember correctly.

MR. NUTTER: I believe that is all I have.

MR. MANKIN: One last question, you have not as yet run a packer leakage test on one of these?

MR. JOHNSTON: No, sir, we have not completed --

MR. MANKIN: Upon the favorable approval of this you would

run packer leakage test and submit an affidavit?

MR. JOHNSTON: Yes, I presume we would follow the same procedure as on the dual a week apart with the recording pressures.

MR. MANKIE: In which case the charts and schematic diagram would be submitted along with that?

MR. JOHNSTON: That's right.

MR. PORTER: Mr. Arnold, do you have any questions?

MR. ARNOLD: No, I have no questions.

MR. PORTER: Does anyone else have a question of the witness? You wish to offer your Exhibits 1 through 5 in evidence, Mr. Johnston?

MR. JOHNSTON: Yes, I would like to offer Exhibits 1 through 5 in evidence.

MR. PORTER: Were these Exhibits prepared by you or under your supervision?

MR. JOHNSTON: Four were, one is a manufacturer's drawing which I specified.

MR. PORTER: Yes, sir. Is there any objection to the admittance of these exhibits? They will be admitted. The witness may be excused.

(Witness excused.)

MR. PORTER: Does anyone have anything further in this case, any statements to make; these cases, rather. If not, the cases will be taken under advisement.

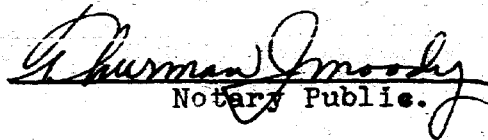


C E R T I F I C A T E

STATE OF NEW MEXICO )  
: ss  
COUNTY OF BERNALILLO )

I, THURMAN J. MOODY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript by me and/or under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal, this, the 31st day of October 1956, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

  
Notary Public.

My Commission Expires:

April 3, 1960.

**BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO**

**IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
COMMISSION OF THE STATE OF NEW  
MEXICO FOR THE PURPOSE OF  
CONSIDERING:**

CASE NO. 1181  
Order No. R-917

**IN THE MATTER OF THE APPLICATION  
OF HERRINGTON PRODUCTION CORPORATION  
FOR AN ORDER AUTHORIZING A TRIPLE  
GAS COMPLETION OF ITS JICARILLA "W"  
WELL NO. 1-7 LOCATED IN THE SW/4 NW/4  
OF SECTION 7, TOWNSHIP 28 NORTH, RANGE  
5 WEST, HENRI, RIO ARriba COUNTY, NEW  
MEXICO.**

**ORDER OF THE COMMISSION**

**BY THE COMMISSION:**

This cause came on for hearing at 9:00 o'clock a.m. on October 17, 1936, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 13<sup>th</sup> day of November 1936, the Commission, a quorum being present, having considered the application, the evidence adduced, and being fully advised in the premises,

**FINDS:**

(1) That due notice of the time and place of hearing and the purpose thereof having been given as required by law, the Commission has jurisdiction of this case and the subject matter thereof.

(2) That the applicant is the operator of the Jicarilla "W" Well No. 1-7, located 800 feet from the south line and 920 feet from the west line of Section 7, Township 28 North, Range 5 West, HENRI, Rio Arriba County, New Mexico.

(3) That the said Jicarilla "W" Well No. 1-7 has been completed to a total depth of 7,623 feet.

(4) That the said Jicarilla "W" Well No. 1-7 is located within the present horizontal boundaries of the South Blanco-Pictured Cliffs Pool and is classified as a wildcat for both the Mesaverde and Dakota formations.

(5) That the applicant proposes to complete the said Jicarilla "W" Well No. 1-7 in the Pictured Cliffs, Mesaverde and Dakota formations in the manner outlined in the application.

(6) That the mechanics of the proposed triple completion are feasible and in good practice.

(7) That the applicant will recover gas by means of the proposed triple completion that would not otherwise be recovered since it might not be commercially feasible to make a single completion in any of the three producing horizons.

IT IS THEREFORE ORDERED:

(1) That the applicant, Northwest Production Corporation, be and the same is hereby authorized to complete its Jicarilla "W" Well No. 1-7 located in the SW/4 SE/4 Section 7, Township 26 North, Range 3 West, NMPW, in the following manner:

(a) Perforate the liner opposite the Dakota Formation and produce the gas therefrom through 2 7/8 inch diameter tubing to the top of the Mesaverde formation and thence through a cross-over assembly into 1 1/4 inch diameter tubing which is inside the 2 7/8 inch diameter tubing to the surface;

(b) Perforate the liner opposite the Mesaverde formation and produce the gas therefrom through the tubing-tubing annulus to the surface;

(c) Perforate the casing opposite the Pictured Cliffs formation and produce the gas therefrom through 1 1/4 inch diameter tubing to the surface;

(d) Production packers shall be set near the top of the Mesaverde formation and near the top of the Dakota formation.

PROVIDED HOWEVER: That upon the actual triple completion of said subject well, applicant shall submit to the district office of the Commission in which the subject well is located, Form C-104, Form C-110 and Form C-122 for each pool, outlining the information required on these forms by existing Rules and Regulations.

PROVIDED HOWEVER: That subject well shall be completed and thereafter produced in such a manner that there will be no commingling of gas within the well bore, either within or outside the casing, from any of the separate strata, and

PROVIDED FURTHER: That the gas produced from each zone or stratum shall be metered and reported separately.

PROVIDED FURTHER: That the subject well shall be equipped in such a way that reservoir pressures may be determined separately for each of the three specified strata and further be equipped with all necessary connections required to permit recording meters to be installed and used at any time as may be required by the Commission or its representatives in order that the natural gas from each separate stratum may be accurately measured and the gas-distillate ratio thereof be determined, and

PROVIDED FURTHER: That the operator-applicant, shall make any and all tests, including segregation tests and packer leakage tests on completion and annually thereafter during the annual Deliverability Test of the South Blanco-Pictured Cliffs Pool, but not excluding other tests and/or determinations at any convenient time and in such manner as deemed necessary by the Commission; the

-3-

Case No. 1161  
Order No. R-317

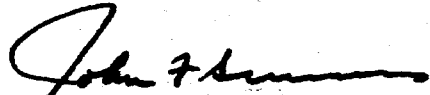
original and all subsequent tests shall be witnessed by representatives of offset operators if any there be at their election, and the results of each test properly attested to by the applicant herein and all witnesses, and shall be filed with the Commission within fifteen (15) days after the completion of such tests and, that the operator shall submit a packer-setting affidavit within fifteen (15) days after completion, after remedial work, or whenever the packer is disturbed, and,

**PROVIDE FURTHER:** That upon the actual triple completion of the subject well, applicant shall submit to the Commission, a diagrammatic sketch of the mechanical installation which was actually used to complete and produce the seal between the strata and a special report of production gas-distillate and reservoir pressure determination of each producing zone or stratum immediately following completion.


**IT IS FURTHER ORDERED:** That jurisdiction of this cause is hereby retained by the Commission for such further order or orders as may seem necessary or convenient for the prevention of waste and/or protection of correlative rights. Upon failure of applicant to comply with any requirement of this order after proper notice and hearing, the Commission may terminate the authority hereby granted and require applicant or its successors and assigns to limit its activities to regular single-zone production in the interests of conservation.

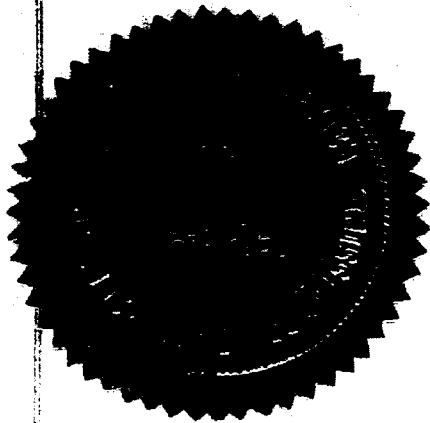
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

  
JOHN F. SIMS, Chairman

  
E. S. WALKER, Member

  
A. L. PORTER, Jr., Member & Secretary



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**OIL CONSERVATION COMMISSION**

**P. O. BOX 671**

**SANTA FE, NEW MEXICO**

**November 20, 1956**

**Mr. W. R. Johnston  
Northwest Production Corporation  
320 Simms Building  
Albuquerque, New Mexico**

**Dear Sir:**

**We enclose two copies each of Orders R-917 and R-918  
issued November 13, 1956, by the Oil Conservation Commission in  
Cases 1161 and 1162, which were heard on October 17, 1956.**

**Very truly yours,**

**A. L. Porter, Jr.  
Secretary-Director**

**jh  
encls.**

C  
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OCC  
NORTHWEST PRODUCTION CORPORATION  
MAIN OFFICE OCC  
ALBUQUERQUE, NEW MEXICO

September 17, 1956 10:12:50

REPLY TO:  
350 SIMMS BUILDING  
ALBUQUERQUE, NEW MEXICO

Tel. 70211

Exc to File 112 (A)

sent copy  
3  
Docket  
to  
Bill  
Johnston  
on  
10/1/56

Oil Conservation Commission  
P. O. Box 871  
Santa Fe, New Mexico

Attention: Mr. A. L. Porter

Gentlemen:

By letter dated September 13, 1956, request was made to Mr. Emory Arnold of the Aztec Office of the New Mexico Oil Conservation Commission for tentative approval to complete Northwest Production Corporation's Well W 1-7 in the Pictured Cliffs, Mesaverde and Dakota formations. Copy of this request is attached for your ready reference.

It is respectfully requested that this matter be brought before the New Mexico Oil Conservation Commission at the regular monthly hearing to be held October 17, 1956.

Very truly yours,

NORTHWEST PRODUCTION CORPORATION

*W. R. Johnston*  
W. R. Johnston, Manager  
Production Operations

WRJ/RP/nt

In triplicate  
Mr. Emory Arnold, Aztec, N.M.  
U.S.G.S., Farmington, N.M.  
Delhi-Taylor Oil Corp., Dallas, Texas  
Lowry Oil Co., Albuquerque, N.M.  
Atlantic Refining Co., Dallas, Texas

**NORTHWEST PRODUCTION CORPORATION**

ALBUQUERQUE, NEW MEXICO

September 13, 1956

REPLY TO:  
520 SIMMS BUILDING  
ALBUQUERQUE, NEW MEXICO

Oil Conservation Commission  
State of New Mexico  
100 East Glenn  
Albuquerque, New Mexico

Attention: Mr. Harry Arnold

Gentlemen:

Northwest Production Corporation requests permission to complete well "T" 1-7 in the Piedmont Shale, Mancoshe and Santa Fe formations.

Jicarilla well "T" 1-7 is located 500' NW and 500' NE, Section 7, T 26 N, R 5 E, the Santa Fe, New Mexico. The well is located within the boundaries of the Santa Fe National Wildlife game park and is classified as a wildcat for both the Mancoshe and Santa Fe formations.

As indicated in the attached ownership plot, owners of mineral rights to offset savings are:

~~The Atlantic Refining Company, Inc. 50%, Dallas, Texas.~~

Ball-Corbin Oil Corporation, 505 Corbin Tower, Dallas, Texas.

Lowry Oil Company, Inc. 50%, Albuquerque, New Mexico.

Copy of this application has been furnished each of these operators by registered mail.

Well "T" 1-7 has been drilled to a total depth of 7000' with 7-1/8" casing cemented at 5340' and 5" casing cemented at 7000'. The 5" casing was perforated from 7000-00, 7000-00, 7000-00, 7000-75 and 7000-700'. The Santa Fe formation was fractured through the perforation and an open hole section from 7000-00.

Our procedure for completing the well to produce the three formations would be as follows:

1. Set a temporary bridge plug at 5340', selectively perforate the 5" casing and fracture the Mancoshe formation in two zones.

September 13, 1956

2. Set a temporary bridge plug at 3155', cut and recover the 5 1/2" casing above the bridge plug. Square cement the top of the 5 1/2" liner with 100 lb cement. Test the 5 1/2" x 7-5/8" casing-casing annulus.
3. Perforate the 7-5/8" casing and fracture the Pictured Cliffs Formation.
4. Drill out temporary bridge plugs and clean out to total depth.
5. Set string packer on wire line above the Pictured Cliffs Formation at approximately 7450'.
6. Run 2-7/8" OD BBL tubing out at approximately 7450' with another type packer set above the Pictured Cliffs Formation at approximately 7750'. As this stringer starts will be run below the string packer at approximately 7850'.
7. 1 1/2" OD non-sag tubing will be run inside the 2-7/8" tubing and set in the well below surface at 7850' with a pack-off to separate the 1 1/2" tubing from the 2-7/8" tubing-casing annulus, thereby allowing the Pictured Cliffs water to flow through the 1 1/2" tubing and the annulus to flow through the 1 1/2" x 2-7/8" tubing-casing annulus.
8. A second string of 1 1/2" OD non-sag tubing will be run inside the 2-7/8" tubing at 7-5/8" casing annulus to a depth of approximately 7950' to produce the Pictured Cliffs Formation.
9. It is planned to use a dual-string tree which is so arranged to obtain pressures on all three formations.

The completion of well "V" L-7 in the manner outlined will permit Northwest Production Corporation to produce the three formations from one well, thereby obtaining a considerable production in drilling costs. Tests after completion of the Pictured Cliffs in this well will tell us that it would not be practical from an economic standpoint to produce the "V" L-7 well from the Pictured Cliffs only.

Yours very truly,

WILLIAM H. JOHNSON, PRESIDENT

ORIGINAL SIGNED BY  
W. R. JOHNSON

W. R. Johnston, Manager  
Production Operations

WJH:ph  
In triplicate  
Enclosure

CC to: The Atlantic Refining Company  
Baker-Taylor Oil Corporation  
Lewy Oil Company  
U. S. Geological Survey - Farmington



R 6 W		R 5 W	
Pubco	Lowry	NWP	NWP 2-5 O
		6	5
Lowry	NWP	NWP	
12 2-14-189 ☼	7 Jicarilla "W" 1-7 O	8	
Lowry	Delhi & Atlantic	Delhi & Atlantic	
13 1-c Scott ☼	18	17	

T  
26  
N

LOCATION AND OWNERSHIP PLAT FOR  
"W" WELL 1-7 IN SECTION 7 OF  
T 26 N AND R 5 W WITH WORKING  
INTEREST RIGHTS TO BASE OF  
DAKOTA FORMATION

**NORTHWEST PRODUCTION CORPORATION**  
**ALBUQUERQUE, NEW MEXICO**

APPLICATION FOR TRIPLE GAS COMPLETION  
OF "W" WELL 1-7 IN PICTURED CLIFFS,  
MESAVERDE AND DAKOTA FORMATIONS

RIO ARriba COUNTY  
NEW MEXICO

CONTRACT # 152

DRAWN: W.H. MCGAHEY  
APPROVED: RAY PHILLIPS

SCALE " " = 3000'  
DATE: 9-13-56

1

OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO

Date 10/24/56

CASE 1161

Hearing Date 10/17/56

My recommendations for an order in the above numbered cases are as follows:

OK to write approval  
of fuel completion.

*Asst. Secy*  
S. Blaylock PC  
*12/1/56*

Warren M. Mauken  
Staff Member

Cases 1161 and 1162  
Northern Production # 1

R 6 W		R 5 W	
Pubco	Lowry	NWP	NWP 2-5
		6	5
Lowry	NWP	NWP	
12 2-14-189 ☼	7 1-7 ○	8	
Lowry	Delhi & Atlantic	Delhi & Atlantic	
13 1-c Scott ☼	18	17	

T  
26  
N

LOCATION AND OWNERSHIP PLAT FOR  
"W" WELL 1-7 IN SECTION 7 OF  
T 26 N AND R 5 W WITH WORKING  
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NORTHWEST PRODUCTION CORPORATION  
ALBUQUERQUE, NEW MEXICO

APPLICATION FOR TRIPLE GAS COMPLETION  
OF "W" WELL 1-7 IN PICTURED CLIFFS,  
MESAVERDE AND DAKOTA FORMATIONS

RIO ARriba COUNTY  
NEW MEXICO

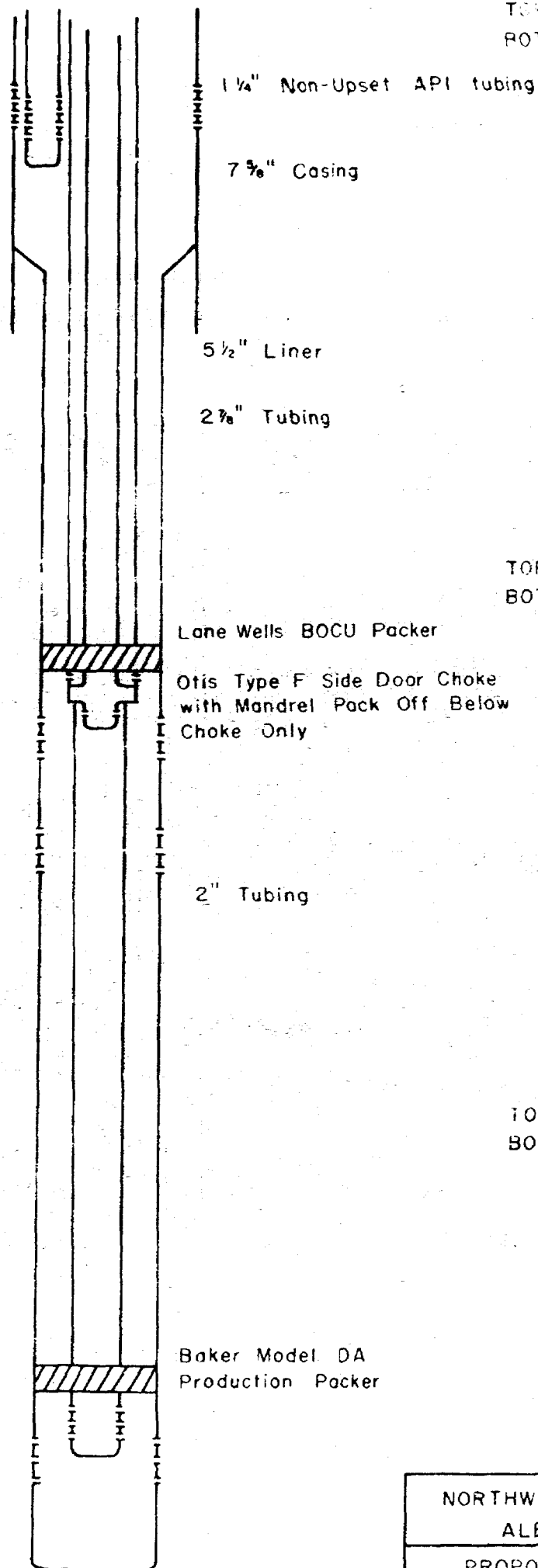
CONTRACT # 152

DRAWN: W.H. MCGAHEY  
APPROVED: RAY PHILLIPS

SCALE 1" = 3000'  
DATE: 9-13-56

# PICTURED CLIFFS DATA:

TOP OF PICTURED CLIFFS - 3060'  
BOTTOM OF PICTURED CLIFFS - 3092'



## MESAVERDE DATA:

TOP OF MESAVERDE - 4808'  
BOTTOM OF MESAVERDE - 5336'

Lane Wells BOCU Packer  
Otis Type F Side Door Choke  
with Mandrel Pack Off Below  
Choke Only

2" Tubing

## DAKOTA DATA:

TOP OF DAKOTA - 7442'  
BOTTOM OF DAKOTA - 7625'

Baker Model DA  
Production Packer

EX #2  
1161

NORTHWEST PRODUCTION CORPORATION  
ALBUQUERQUE, NEW MEXICO

PROPOSED TRIPLE GAS COMPLETION  
OF "W" WELL 1-7 IN SECTION 7  
T 26 N AND R 5 W OF PICTURED CLIFFS,  
MESAVERDE AND DAKOTA FORMATIONS

RIO ARriba COUNTY  
NEW MEXICO

CONTRACT # 152

DRAWN W H MEGAHEY  
APPROVED W R JOHNSON

SCALE 1/8" = 1"  
DATE 10-12-56