Case Number

5994

Application

Transcripts.

Small Exhibits

ETC.

De Novo 11-10-77

Blackwood + Nichols
Ex 1-12
Complete set (1st set)

Exhibit 1

Exhibit 1

APPLICATION FOR APPROVAL
OF
DEFINITION OF "MESAVERDE"
AS USED IN DESIGNATION OF
MESAVERDE PARTICIPATING AREA
FOR
THE NORTHEAST BLANCO UNIT, I-SEC. NO. 929
SAN JUAN AND RIO ARRIBA COUNTIES, NEW MEXICO
AND IN SUBSEQUENT ENLARGEMENTS THEREOF

TO: The Director of The United States Geological Survey
Roswell, New Mexico

Commissioner of Public Lands
State of New Mexico
Santa Fe, New Mexico

Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 1
Submitted by B + N
Hearing Date 11-10-77

Pursuant to the provisions of Section 11 of the Unit Agreement approved by the Director of the Geological Survey on April 16, 1952, by the Commissioner of Public Lands of the State of New Mexico on October 23, 1951, and by the Oil Conservation Commission of the State of New Mexico on October 31, 1951, and pursuant to a resolution duly adopted by the Advisory Committee under the Unit Operating Agreement under Unit Agreement for the Development and Operation of the Northeast Blanco Unit Area, San Juan and Rio Arriba Counties, New Mexico, Blackwood & Nichols Company, as Unit Operator, hereby submits for your approval a definition of the term "Mesaverde" as used in the Application for Approval of Mesaverde Participating Area for the Northeast Blanco Unit, I-Sec. No. 929, San Juan and Rio Arriba Counties, New Mexico, and in subsequent enlargements thereof. In support of this Application, Operator states as follows:

1. The Application for Approval of Mesaverde Participating Area was approved by the Geological Survey on November 20, 1952. The original Participating Area was subsequently enlarged five times, with your approval, so that the Mesaverde Participating Area now covers the entire Unit Area. In the original Application and in subsequent enlargements, the term "Mesaverde" was used, and was sometimes followed by the term "zone," "formation," "horizon," "group," or the like, but was never otherwise defined.

2. Pursuant to the Plan of Development for 1976, on June 26, 1976, the Unit Operator commenced drilling of its Northeast Blanco Well No. 64 located in the SE/4 of Section 24, Township 30 North, Range 8 West, Rio Arriba County, New Mexico. The well was drilled for the purpose of protecting against drainage from the traditional producing intervals; however, the Operator encountered gas production at a level above the traditional producing interval. The details of the drilling and completion of this well are set forth on Exhibit "A", "Geological and Engineering Memorandum." After the completion of the well, Tenneco Oil Company and Continental Oil Company, owners of the lease upon which this well was drilled, took the position that the production encountered in the well was not within the vertical limits of the Mesaverde Participating Area.

3. In view of the questions which had been raised concerning the vertical extent of the Participating Area, the Advisory Committee under the Unit Operating Agreement met on October 12, 1976, for purposes of considering the matter, and other Unit business, pursuant to the Advisory Committee's duty under Section 6 of the Unit Operating Agreement to approve or disapprove any Participating Area or amendments thereof. In that meeting, the Advisory Committee duly adopted the definition of "Mesaverde" set forth in the Geological and Engineering Memorandum. The Unit owners, and their respective interests, voting in favor of the adoption of the definition were as follows:

Amoco Production Company	.32975933
Blackwood & Nichols Co., Ltd.	.29805862
Jacqulyn M. Williams	.00260911
Westland Oil Development Corp.	.04940999
Total	.67983705

Those voting not to adopt the definition were as follows:

El Paso Natural Gas Company	.21199416
Tenneco Oil Company	.01440596
Continental Oil Company	.01440595
Total	.24080607

Mr. F. G. Blackwood was authorized by letter to represent the .00492448 Thayer H. Laurie and .00310743 T. H. Laurie and D. N. Mills, Tr. interests; although not present at the meeting due to illness has approved the definition of Mesaverde as presented by the Advisory Committee. This makes the total authorized approval .68786896.

Continental Oil Company has not yet furnished written authority for their .01440595 "no" vote. Therefore the authorized "no" vote is .22640012.

The definition therefore was adopted by the required affirmative vote of 65% of the voting power of the Advisory Committee, as provided in Section 5 of the Unit Operating Agreement.

4. The Geological and Engineering Memorandum discusses evidence that the accumulation found in the No. 64 Well is part of the same accumulation found in the traditional producing interval. The Memorandum also points out that the definition of Mesaverde adopted by the Advisory Committee is consistent with that term as used in geologic literature dating back to the creation of the Unit.

The Operator respectfully requests that the Director, the Commissioner and the Commission approve this Application.

DATED this 15th day of November, 1976.

BLACKWOOD & NICHOLS COMPANY

By _____
General Partner

OPERATOR

STATE OF OKLAHOMA)
) ss
COUNTY OF OKLAHOMA)

Before me, the undersigned, a notary public in and for said County and State, on the 15th day of November, 1976, personally appeared F. G. Blackwood, General Partner of Blackwood & Nichols Company, a General Partnership, to me known to be the identical person who executed the within and foregoing instrument on behalf of the partnership.

_____
Notary Public

My commission expires:

October 12, 1980

EXHIBIT "A"
NORTHEAST BLANCO UNIT, I-SEC. NO. 929
SAN JUAN AND RIO ARRIBA COUNTIES, NEW MEXICO
SIXTH ENLARGED PARTICIPATING AREA

GEOLOGICAL AND ENGINEERING MEMORANDUM

Northeast Blanco Well #64 (originally called 105A) was completed on July 10, 1976, with an open flow potential of 9,900 MCF per day. The well is located in the SE/4 of Section 24-T30N-R8W Rio Arriba County, New Mexico.

Well #64 (105A) is completed in open hole from 4,252' to 4,278' in a fractured sand and shale portion of the Mesaverde group above the top of the "Massive Sandstone Member" of the Cliff House sandstone. As the well was being drilled from 4,258' to 4,262' the well started making gas and the 4' interval was penetrated in two minutes. A copy of the Totco time vs. depth chart for this section is attached. The drill pipe was raised off bottom and the rams were closed. The shut in pressure rose to 550 psig in 15 minutes. The valve was opened allowing gas to flow up the drill pipe and the gas flow rate estimated by use of a pitot tube at 15,000 MCF per day. The valve was closed and an immediate shut in pressure of 550 psig was recorded.

The well was killed with 200 bbls of 35 vis. gel-water, and 4 1/2 K-55 10.5# ST & C casing was run to 4,252'.

A Lynes external casing to formation packer was set @ 4,119' and 50 sacks of class B cement with 2% $CaCl_2$ was pumped thru a stage collar at 4,085', plug down at 12:30 p.m. July 8, 1976. On July 10 the hole was drilled out and deepened to 4,278'. The well began blowing gas at 4,251' and upon reaching 4,278' (T.D.) was allowed to blow to clean up for 10 hrs. After nippling up the tree the tubing was perforated with 10, 3/8" holes from 4,240'-4,245'. A shut in csg. pressure of 640 psig and a shut in tbg pressure of 640 psig was recorded July 12, 1976 along with a AOF of 9,900 MCFPD. The well has been connected to El Paso Natural Gas Company's line and is shut in at present.

On August 9, 1976, Blackwood and Nichols filed Well Completion Forms (9-330) and Request for Allowable Forms (C-104). These forms were returned approved but with the Pool or Field name changed from Blanco Mesaverde to Chacra Undesignated Unit. However, the 4,252' to 4,278' interval in Well #64 (105A) does not correlate with any designated producing reservoir in the San Juan Basin. This interval is approximately 500' above the top of the "Massive Sandstone Member" of the Cliff House and 250' below the Chacra producing interval as recognized in the area.

We believe that any gas which might be produced from the #64 (105A) well would be gas which was originally in the Massive Cliff House or deeper beds and has migrated to a higher level in this very small area for the following reasons:

PRESSURE

1. The measured surface pressure of 640 psig which is correlative with newly completed Mesaverde wells in the area, and the nearby producing well #2-43. If this were a new reservoir the pressure should be much higher.

OFF-SETS

2. When the offset wells were drilled they did not encounter gas in this interval.

GAS CHARACTER

3. The chemical characteristics of the gas from Well #64 (105A) and offsetting Mesaverde wells are very similar as shown in the attached gas analyses.

FRACTURE

4. The very high natural flow rates are not usual in normal unfractured reservoirs.

5. The high penetration rate of the 4,258-4,262' interval.

Definition of Mesaverde

The completion of a gas well in a fractured sand and shale zone which is approximately 500' above the top of the "Massive Cliff House sandstone" has brought about the need to define the term Mesaverde insofar as the Northeast Blanco Unit I-Sec. 929 is concerned. The Advisory Committee of the Northeast Blanco Unit met October 12, 1976 and passed a Resolution defining Mesaverde as follows:

"RESOLVED, that the term "Mesaverde" as used in the "Application for Approval of Mesaverde Participating Area for the Northeast Blanco Unit,

I-Sec. No. 929, San Juan and Rio Arriba Counties, New Mexico", and in subsequent applications for enlargements thereof (and sometimes followed by the term "Zone", "Formation", "Horizon" or the like), all such applications duly approved by the Director of the United States Geological Survey, the Commissioner of Public Lands, State of New Mexico and the Oil Conservation Commission, State of New Mexico, is hereby defined as the stratigraphic equivalent of the interval between (i) the base of the Green Shale Marker, which occurs at a depth of 4,054 feet on the Gamma Ray-Neutron Log, dated May 31, 1957, of the Blackwood & Nichols Northeast Blanco Unit No. 34-19 Well, Section 19, Township 30 North, Range 7 West, Rio Arriba County, New Mexico, and (ii) 300 feet below the base of the Point Lookout Formation, which base occurs at a depth of 5,565 feet on the log of the foregoing well." A copy of the above referred to log is attached.

This definition is to apply to the Northeast Blanco Unit only and has no effect on any area outside the area of the Northeast Blanco Unit.

This definition will allow a reasonable and prudent development and production of hydrocarbons from the Mesaverde group. It will allow for and encourage drilling 300' below the base of the Massive Sandstone member of the Point Lookout portion of the Mesaverde group to search for an elusive, seldom present oil accumulation which could not economically be tested if a definition which limited the interval to the base of the Massive Sandstone member of the Point Lookout were adopted.

This definition also protects the ownership of presently developed Mesaverde reservoirs from thieving by fractures, etc., to intervals above the Massive Cliff House sandstone of the Mesaverde group. We believe the gas which would be produced from the #64 (105A) well is actually gas from the currently producing Mesaverde reservoir of the Northeast Blanco Unit which has migrated 500' above the Cliff House sandstone, as enumerated.

The published literature on the Mesaverde group in the San Juan Basin supports the definition adopted by the Northeast Blanco Unit Advisory Committee.

In the "Guidebook of the San Juan Basin New Mexico and Colorado" published by the New Mexico Geological Society November, 1950, a paper by Caswell Silver "The Occurrence of Gas in Cretaceous Rocks of the San Juan

Basin New Mexico and Colorado" shows clearly that the Mesaverde group is not limited to the "Massive Sandstone Members" of the Point Lookout or Cliff House. A cross section Figure 1, shows that benches of the Point Lookout extend 200'-500' below the "Massive Sandstone Member". Benches also extend 600'-800' above the top of the "Massive Sandstone Member" of the Cliff House. In A.A.P.G. Bulletin Vol. 40, No. 9, September, 1956, a paper by Beaumont, Dane and Sears, of the U.S.G.S., entitled "Revised Nomenclature of Mesaverde Group, San Juan Basin on page 2159 states that "In view of the continuity of the massive sandstone unit through this area the name Cliff House sandstone of the Mesaverde group will replace Chacra sandstone member throughout the former extent of that unit."

In U.S.G.S. Professional Paper 400-B 1960, entitled "New Information on the Areal Extent of Some Upper Cretaceous Units in Northwestern New Mexico", C. H. Dane refers to "The Hosta sandstone, a lower tongue of the Point Lookout sandstone of the Mesaverde Group." This points out the problem with limiting the lower limits to the base of the thick easily identified thick "Massive Sandstone Member" of Point Lookout Sandstone.

A cross section reproduced from A.A.P.G. Bulletin, Vol. 44, No. 1, 1960, "Upper Cretaceous Stratigraphy, Rocky Mountains" by R. J. Weimer is shown below which illustrates the continuity of deposition and transgressive/regressive relationship.

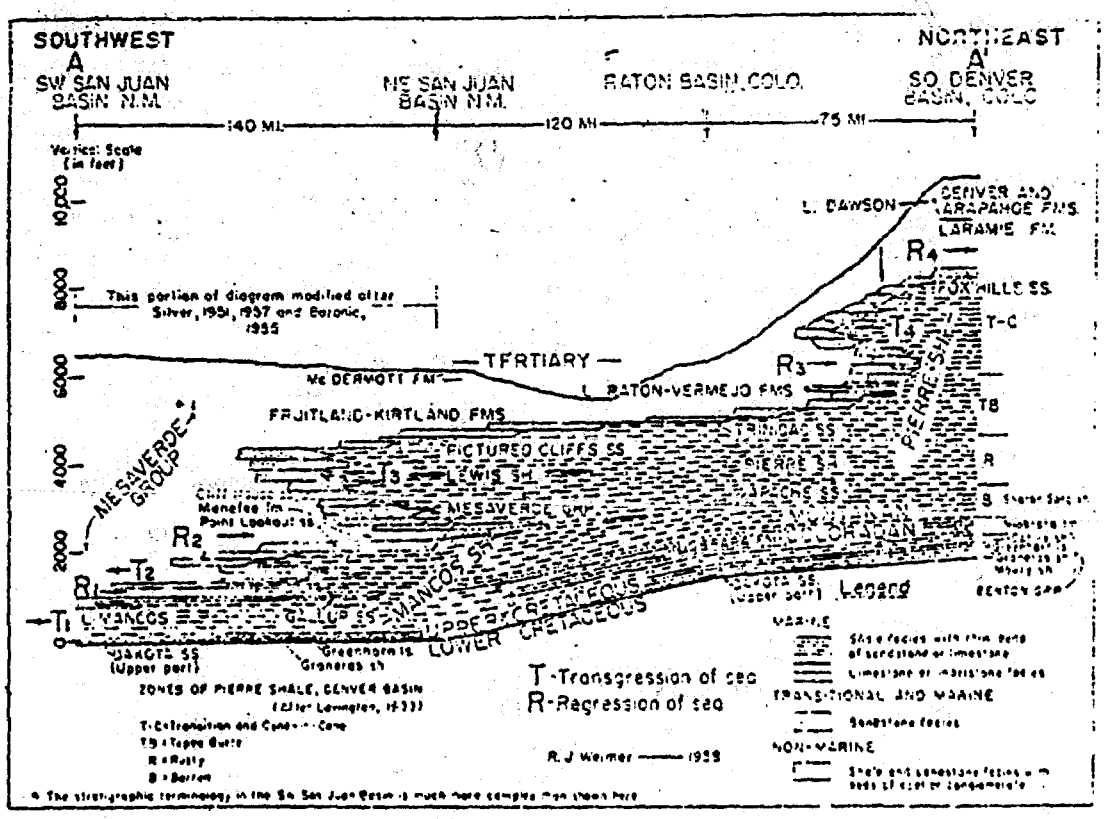


FIG. 2.—Diagrammatic restored section of Upper Cretaceous rocks extending from southwest San Juan Basin of New Mexico to south part of Denver Basin, Colorado. Tertiary rocks regionally cover erosional surface of Cretaceous strata. Diagram structurally distorts this surface.

In the 1961 A.A.P.G. Book, "Geometry of Sandstone Bodies", a paper by Charles T. Hollenshead and Roy L. Pritchard entitled "Geometry of Producing Mesaverde Sandstones, San Juan Basin" in describing the "Green Marker Horizon" on page 106 stated "It is believed to represent approximate contemporaneity and therefore can be used to delineate accurately major vertical steps in the regressive Point Lookout and transgressive Cliff House Strand lines." Various benches of the Cliff House and Point Lookout sandstone are shown and mapped in the paper. We believe that the interval in which gas was encountered in Well #64 (105A) is equivalent to Bench "B" of the Cliff House sandstone as defined and mapped in this paper.

In the "Geologic Atlas of the Rocky Mountain" published in 1972 by the Rocky Mountain Association of Geologists Figure 35, taken from work by R. J. Weimer, shows the Mesaverde group from the San Juan Basin to Wyoming. The vertical limits vary greatly from one area to another.

The Mesaverde group has been described in the literature as extending from the base of the regressive Point Lookout to the top of the Cliff House sandstones. Massive Sandstone Members occur in both the Point Lookout and the Cliff House intervals. Several sandstone benches are known and mapped below the base of the "Massive Sandstone Member" of the Point Lookout and above the "Massive Sandstone Member" of the Cliff House. This definition recognizes that the system of transgressive/regressive shorelines in the Mesaverde group in the San Juan Basin is a continuam having a vertical producing column in excess of 1,400'. The definition of Mesaverde Group as adopted by the Advisory Committee of the Northeast Blanco Unit I-Sec. 929 will allow orderly development and production of hydrocarbon reserves from the Mesaverde group in the area of the Unit.

12 HOUR

12 HOUR

OPERATOR: BLACK WOOD + NICHOLS CO. RIG NO: 105 A

LOCATION: NEBU STATE: NM

COUNTY: RIO ARRIBA T.D. OFF: 4262

DATE ON: 7-7-76 T.D. ON: 3862

TIME ON: ☐ 8:00 A.M. ☐ 8:00 P.M. FT. DRLD.

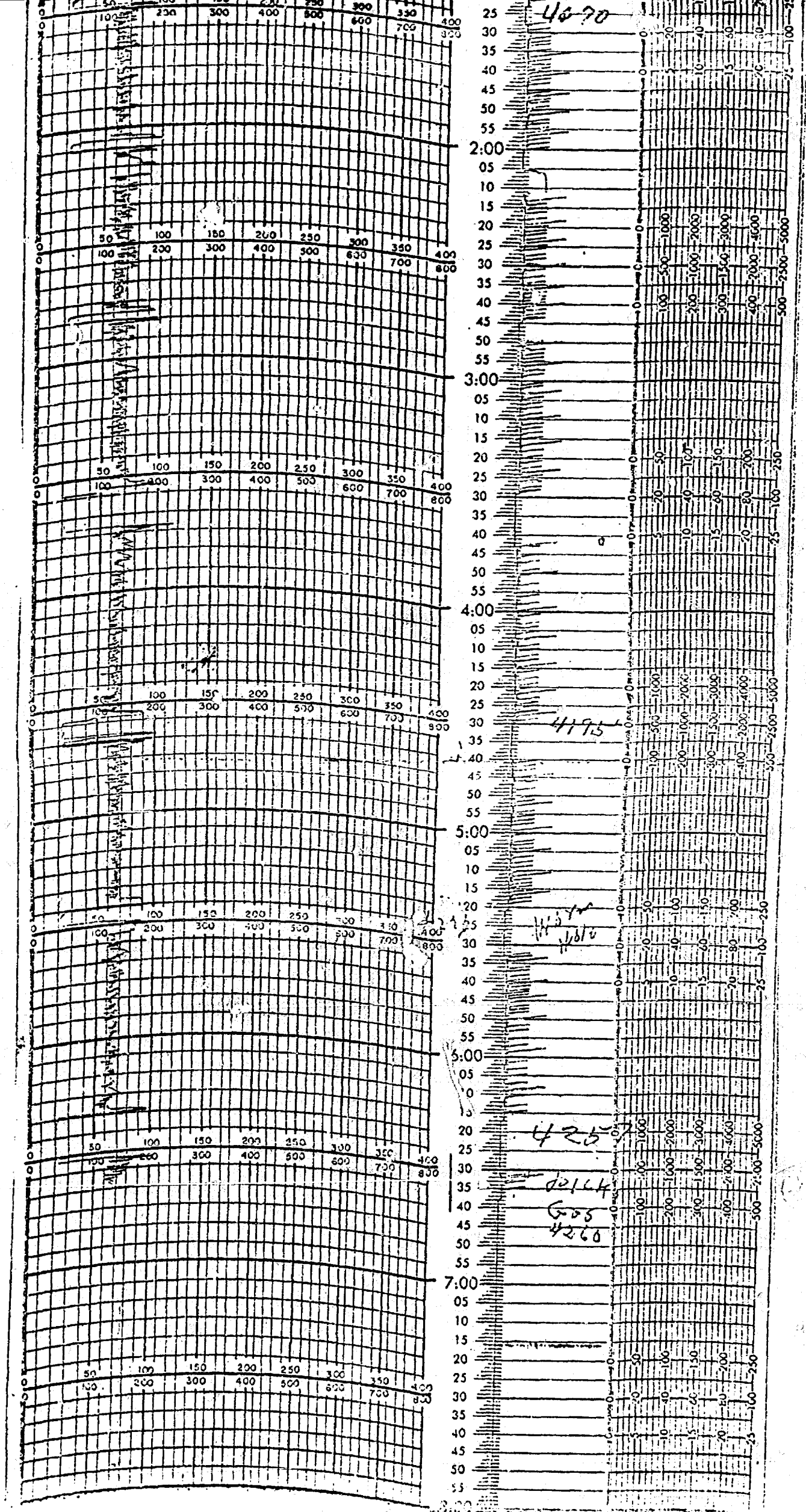
- ☐ FLUID PRESSURE
- ☐ PUMP STROKES
- ☐ TORQUE
- ☐ RPM
- ☐ % MUD FLOW
- ☐ % PIT LEVEL

WEIGHT IN 1000 POUNDS

PENETRATION

8:00
9:00
10:00
11:00
12:00
1:00

40'


2:00
3:00
4:00
5:00
7:00
4070
4195
4250
4260

(Rev. 5-63)

Ex. #2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

Form approved. Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☒ DRY ☐ Other

b. TYPE OF COMPLETION: NEW WELL ☒ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ Other

2. NAME OF OPERATOR: Tenneco Oil Company

3. ADDRESS OF OPERATOR: 1860 Lincoln, Suite 1200 Lincoln Twr. Bldg, Denver, CO 80203

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*
At surface: 1850 FNL & 1850 FWL
At top prod. interval reported below
At total depth

SEP 8 1975
U. S. GEOLOGICAL SURVEY
FARMINGTON, N. M.

RECEIVED
SEP 9 1975
OIL CON. COM.
DIST. 3

5. LEASE DESIGNATION AND SERIAL NO.: SF- 078385
6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
7. UNIT AGREEMENT NAME:
8. FARM OR LEASE NAME: Florance
9. WELL NO.: 29A
10. FIELD AND POOL, OR WILDCAT: Blanco Mesa Verde
11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec. 25, T30N, R8W
12. COUNTY OR PARISH: San Juan
13. STATE: New Mexico

14. PERMIT NO.:
DATE ISSUED:

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (Ready to prod.)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
8/5/75	8/14/75	8/16/75	6283	

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
TD 4503'	Open Hole		→	Yes	No

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*
4410 - 4503 (Lewis)

25. WAS DIRECTIONAL SURVEY MADE: Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN
Comp Density log, Induction Electric log

27. WAS WELL CORED: No

23. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
9 5/8"	36# K-55	204'	12¼"	200 sx. CIB + 3% CaCl	None
7"	20# K-55	3458	8 3/4"	475 sx.	None
4½"	10.5# K-55	4410'	6 1/8"	200 sx.	None

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
	4378	

31. PERFORATION RECORD (Interval, size and number)
Open Hole Completion

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
None	

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)	WELL STATUS (Producing or shut-in)
8/20/75	Flowing	Shut-In

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
8/20/75	24	3/4		NA	501	NA	

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
230	Packer		NA	372	NA	

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)
To be sold

TEST WITNESSED BY:

35. LIST OF ATTACHMENTS

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED: [signature] TITLE: Production Clerk DATE: 9/8/75

*(See Instructions and Spaces for Additional Data on Reverse Side)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

Kirkland
Fruitland
Pictured Cliffs
Lewis

Open Hole Completion

Gas

Open Hole
5203' - 6134' (Lewis)

INSTRUCTIONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be listed on this form, see item 35.

Item 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

Item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

Items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

Item 29: "Sacks Cement": Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool.

Item 33: Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

34. SUMMARY OF POROUS ZONES:
SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND RECOVERIES

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.	NAME	MEAS. DEPTH	TRUE VERT. DEPTH
Kirtland	2192'	2830'				
Fruitland	2830'	3088'				
Pictured Cliffs	3088'	3118'				
Lewis	3118'	4503'				

35. GEOLOGIC MARKERS

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records.

SIGNED [illegible] TITLE Drilling Clerk DATE 5/22/80

*(See instructions and spaces for additional data on reverse side)

FORM NO. 9-330

NO. OF COPIES RECEIVED	
DISTRIBUTION	
SANTA FE	/
FILE	/
U.S.G.S.	
LAND OFFICE	
TRANSPORTER OIL	/
TRANSPORTER GAS	/
OPERATOR	
PRORATION OFFICE	/

NEW MEXICO OIL CONSERVATION COMMISSION
REQUEST FOR ALLOWABLE
AND
AUTHORIZATION TO TRANSPORT OIL AND NATURAL GAS

Form C-104
Supersedes Old C-104 and ...
Effective 1-1-65

Exhibit #3

I.

Operator
TENNECO OIL COMPANY

Address
1860 Lincoln, Suite 1200 Lincoln Twr. Bldg., Denver, Colorado 80203

Reason(s) for filing (Check proper box)
New Well [X]
Recompletion [ ]
Change in Ownership [ ]

Change in Transporter of:
Oil [ ] Dry Gas [ ]
Casinghead Gas [ ] Condensate [ ]

Other (Please explain)

If change of ownership give name and address of previous owner _____

II. DESCRIPTION OF WELL AND LEASE

Lease Name	Well No.	Pool Name, Including Formation	Kind of Lease (State, Federal or Fee)	Lease No.
Florance	29A	Mesa Verde ✓	Fed.	SF078385

Location
Unit Letter F ; 1850 Feet From The North Line and 1850 Feet From The West

Line of Section 25 Township 30N Range 8W , NMPM, San Juan County

III. DESIGNATION OF TRANSPORTER OF OIL AND NATURAL GAS

Name of Authorized Transporter of Oil [ ] or Condensate [X]: Plateau Refining
Address (Give address to which approved copy of this form is to be sent): P. O. Box 108, Farmington, New Mexico 87401

Name of Authorized Transporter of Casinghead Gas [ ] or Dry Gas [X]: Southern Union Gas Co.
Address (Give address to which approved copy of this form is to be sent): Fidelity Union Twr., Dallas, Texas 75201

If well produces oil or liquids, give location of tanks.	Unit	Sec.	Twp.	Rge.	Is gas actually connected?	When
	F	25	30N	8W	no	

If this production is commingled with that from any other lease or pool, give commingling order number: _____

IV. COMPLETION DATA

Designate Type of Completion – (X)	Oil Well	Gas Well	New Well	Workover	Deepen	Plug Back	Same Res'v.	Diff. Res'v.
		X	X					

Date Spudded	Date Compl. Ready to Prod.	Total Depth	P.B.T.D.
8/5/75	8/16/75	4503	Open hole Packer 4378

Elevations (DF, RKB, RT, GR, etc.)	Name of Producing Formation	Top Oil/Gas Pay	Tubing Depth
6263 GL	Mesa Verde	4410	None

Perforations	Depth Casing Sh
None Open Hole - Completion	4410'

TUBING, CASING, AND CEMENTING RECORD

HOLE SIZE	CASING & TUBING SIZE	DEPTH SET	SACKS CEMENT
12½"	9 5/8"	204'	200 sx
8 3/4"	7"	3458'	475 sx
	4½"	4410'	200 sx

V. TEST DATA AND REQUEST FOR ALLOWABLE

(Test must be after recovery of total volume of load oil and must be equal to or exceed top allowable for this depth or be for full 24 hours)

OIL WELL

Date First New Oil Run To Tanks	Date of Test	Producing Method (Flow, pump, gas lift, etc.)	

Length of Test	Tubing Pressure	Casing Pressure	Choke Size

Actual Prod. During Test	Oil - Bbls.	Water - Bbls.	Gas - MCF

RECEIVED SEP 29 1975 OIL CON. COM. DIST. 3

RECEIVED SEP 8 1975 OIL CON. COM. DIST. 3

GAS WELL

Actual Prod. Test - MCF/D	Length of Test	Bbls. Condensate/MMCF	Gravity of Condensate
5062	3 hrs.	NA	NA

Testing Method (pitot, back pr.)	Tubing Pressure (Shut-in)	Casing Pressure (Shut-in)	Choke Size
Back pressure	NA	580	3/4"

VI. CERTIFICATE OF COMPLIANCE

I hereby certify that the rules and regulations of the Oil Conservation Commission have been complied with and that the information given above is true and complete to the best of my knowledge and belief.

(Signature)

(Title)

(Date)

OIL CONSERVATION COMMISSION

APPROVED SEP 29, 1975

BY Original Signed by A. R. Kendrick

TITLE SUPERVISOR DIST. #3

This form is to be filed in compliance with RULE 1104.

If this is a request for allowable for a newly drilled or deepened well, this form must be accompanied by a tabulation of the deviation tests taken on the well in accordance with RULE 111.

All sections of this form must be filled out completely for allowable on new and recompleted wells.

Fill out only Sections I, II, III, and VI for changes of owner, well name or number, or transporter, or other such change of condition.

Separate Forms C-104 must be filed for each pool in mul...

BLACKWOOD & NICHOLS COMPANY
2013 FIRST NATIONAL CENTER WEST • OKLAHOMA CITY, OKLAHOMA 73102

December 29, 1975

RECEIVED
JAN 2 1976
U. S. GEOLOGICAL SURVEY
ROSWELL, NEW MEXICO

Address Reply To:
P. O. Box 1237
Durango, Colorado 81301
Telephone: (303) 247-0728

The Oil and Gas Supervisor
United Stater Geological Survey
P. O. Box 1857
Roswell, New Mexico 88201

Commissioner of Public Lands
State of New Mexico
P. O. Box 1148
Santa Fe, New Mexico 87501

Oil Conservation Commission
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 4
Submitted by Blackwood + Nichols
Hearing Date 11/10/77

Re: Northeast Blanco Unit
No. 1, Sec. 929
San Juan and Rio Arriba
Counties, New Mexico

Gentlemen:

Blackwood & Nichols Company, as Unit Operator, on behalf of itself and all other owners of oil and gas leases within the Northeast Blanco Unit, hereby submits a Plan of Development of the Mesaverde Formation for the calendar year 1976.

The total number of wells in the Northeast Blanco Unit is as follows:

Mesaverde (Producing)	58
Mesaverde (Incapable of Production)	3
Mesaverde (Plugged and Abandoned)	5
Dakota-Mesaverde (Dual)	4
Dakota	1

Total Mesaverde Cumulative Production through October 31, 1975 - 196,896,767 MCF.
Total Dakota Cumulative Production through October 31, 1975 - 3,812,762 MCF.
Total Condensate Production through October 31, 1975 - 62,333.08 Barrels.

Unit Operator does not propose any development wells during the calendar year 1976. However, we have requested and received approval from a majority of the Working Interest Owners, to plug and abandon Northeast Blanco Unit Wells Number 21, SW/4, Sec. 36, T-31N, R7W, and Number 22, NE/4, Sec. 36, T-31N, R7W, Rio Arriba County, New Mexico. As a replacement of the wells to be abandoned, we plan to drill a new Mesaverde well in:

TOWNSHIP 31 NORTH, RANGE 7 WEST, N.M.P.M., Rio Arriba County, New Mexico

Sec. 36: SE 1/4

Pursuant to Section 17 of the Northeast Blanco Unit Agreement, we propose to drill the following Mesaverde wells to meet offset obligations:

TOWNSHIP 31 NORTH, RANGE 7 WEST, N.M.P.M., San Juan County, New Mexico

Sec. 1: SW 1/4

TOWNSHIP 30 NORTH, RANGE 8 WEST, N.M.P.M., San Juan County, New Mexico

Sec. 13: NW 1/4
Sec. 24: SE 1/4

In addition to the above, Blackwood & Nichols Company as Unit Operator, will drill any other offset wells that may be required to prevent drainage of unitized substances and any other wells subsequently deemed necessary or desired by the Unit Operator and the Working Interest Owners.

Blackwood & Nichols Company as Unit Operator, believes that all current obligations have been satisfied.

All acreage within the Northeast Blanco Unit boundaries is now participating in the Mesaverde Formation.

If this plan is acceptable, please signify your approval as required under Section 10 of the Unit Agreement, in the space provided on the attached form and return two approved copies to Blackwood & Nichols Company.

The effective date of the Plan of Development shall be January 1, 1976.

Yours very truly,

BLACKWOOD & NICHOLS COMPANY

By D. Loos
D. Loos, District Manager

DL:lw

Four copies to each addressee

Approved: _____ Date: MAR 11 1976

Acting
The Oil and Gas Supervisor
United States Geological Survey
Subject to like approval by The Commissioner of Public Lands and
Oil Conservation Commission.

Approved: _____ Date: _____

Commissioner of Public Lands
State of New Mexico
Subject to like approval by the United States Geological Survey
and Oil Conservation Commission.

Approved: _____ Date: _____

Oil Conservation Commission
State of New Mexico
Subject to like approval by the United States Geological Survey
and Commissioner of Public Lands.

The above approvals are for the Northeast Blanco Unit Agreement No. 1,
Section 929, San Juan and Rio Arriba Counties, New Mexico,
1976 Plan of Development.

United States Department of the Interior

GEOLOGICAL SURVEY
Drawer 1857
Roswell, New Mexico 88201

March 11, 1976

Poson for well H
105A - 64
Exhibit #

Blackwood & Nichols Company
Attention: Mr. D. Loos
2013 First National Center West
Oklahoma City, Oklahoma 73102

Gentlemen:

Your 1976 plan of development for the Northeast Blanco unit area, San Juan and Rio Arriba Counties, New Mexico, has been reviewed by this office.

Such plan proposes the drilling of 4 Mesaverde wells to be located as follows: 1) SE¼ sec. 36, T. 31N., R. 7W., as a replacement well for the two wells in such section which are to be plugged and abandoned; 2) SW¼ sec. 1, T. 31N., R. 7W., as an offset obligation to Northwest Pipeline Corporation San Juan 32-7 well No. 27, located in the SW¼ sec. 36, T. 32N., R. 7W.; 3) NW¼ sec. 13, T. 30N., R. 8W., as an offset obligation to El Paso Natural Gas Company's well Howell E No. 2A, located in the SE¼ sec. 14, T. 30N., R. 8W.; and 4) SE¼ sec. 24, T. 30N., R. 8W., as an offset obligation to Tenneco Oil Company's well Florance 29A, located in the NW¼ sec. 25, T. 30N., R. 8W.

Mesaverde offset obligation

The proposed wells described in 2) through 4) above conform with the intent of those provisions contained in Section 17 of the unit agreement which states that the unit area will be protected from drainage of unitized substances by wells on land not subject to the unit agreement. Accordingly, your 1976 plan of development is hereby approved on this date and two approved copies are enclosed.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 5
Submitted by Blackwood + Nichols
Hearing Date 11/10/77

This approval is subject to like approval by the appropriate State officials.

Sincerely yours,

Carl C. Traywick

CARL C. TRAYWICK
Acting Area Oil and Gas Supervisor

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO ON ITS OWN MOTION TO CONSIDER REDEFINITION OF THE VERTICAL LIMITS OF THE BLANCO-MESAVERDE POOL, RIO ARRIBA AND SAN JUAN COUNTIES, NEW MEXICO.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 6
Submitted by Blackwood & Nichols
Hearing Date 11-10-77

CASE NO. 5893
Order No. R-5459

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 23, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 14th day of June, 1977, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the Blanco-Mesaverde Pool, located in Rio Arriba and San Juan Counties, New Mexico, was created by Commission Order No. 799, dated February 25, 1949.

(3) That Section (2) of said Order No. 799 defined the vertical limits of said Blanco-Mesaverde Pool as the "4200-5100 feet productive horizon where the productive sands are contained between the top of the Cliff House Sand and the base of the Point Lookout Sand of the Mesaverde."

(4) That said definition of the vertical limits of said Blanco-Mesaverde Pool has proved inadequate for the following reasons:

A. The definition does not take into account variations in surface elevations and formation dip which can cause the "Mesaverde" productive horizon to occur above or below the 4200 feet to 5100 feet interval.

B. The definition does not adequately take into account the transgressive, regressive, gradational nature of formations composing the "Mesaverde" productive horizon.

(5) That because of the imprecise nature of said vertical limits definition, Mesaverde productive zones above or below the 4200 foot to 5100 foot interval in any particular well might not be completed in said well.

(6) That failure to complete such zones could result in waste of gas in the ground.

(7) That the current infill drilling program within said Blanco-Mesaverde Pool has increased the need for a more precise definition of the vertical limits of such pool.

(8) That in December, 1975, the Commission appointed an industry-government study committee to examine the problem and report its findings to the Commission.

(9) That, based on geological evidence, the study committee recommended that the vertical limits of said Blanco-Mesaverde Pool be redefined as that interval from the Huerfanito bentonite marker to a point 500 feet below the top Point Lookout formation.

(10) That the Induction-Electrical Log of the El Paso Natural Gas Company Johnston State Well No. 1 located in Unit A of Section 32, Township 26 North, Range 6 West, NMPM, Rio Arriba County, New Mexico, should be the type log for said Blanco-Mesaverde Pool.

(11) That the Huerfanito bentonite marker and the top of the Point Lookout formation are found at depths of 3255 feet and 5100 feet, respectively, on said type log.

(12) That such definition should permit maximum development of productive horizons within the Blanco-Mesaverde Pool, thereby preventing waste.

(13) That there are several Chacra Sand gas pools developed along the Southwest flank of the Blanco-Mesaverde Pool which have been separately drilled and developed which would be included within the revised definition of the vertical limits of the Blanco-Mesaverde Pool.

(14) That such pools are completed in porous Chacra sands.

(15) That such porous Chacra sands lie South and West of a line generally running from the Northwest corner of Township 31 North, Range 13 West, NMPM, San Juan County, New Mexico, to the Southwest Corner of Township 24 North, Range 1 East, NMPM, Rio Arriba County, New Mexico, as more fully described on Exhibit "A" of this order.

(16) That to protect the correlative rights of the owners in said Chacra pools, the top vertical limit of said Blanco-Mesaverde Pool should be lowered to a point 750 feet below the Huerfanito bentonite marker within the area South and West of the line defined in Finding No. (15) above and Exhibit "A".

(17) That there are 4 wells North and East of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool.

(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission.

(19) That with the safeguards provided in Finding No. (16) and No. (18) above, the proposed redefinition of the vertical limits of the Blanco-Mesaverde Pool will not violate correlative rights.

(20) That to prevent waste, the vertical limits of said Blanco-Mesaverde Pool should be redefined in accordance with the study committee recommendation as adjusted to protect Chacra gas pools as set out in Finding No. (14) above.

IT IS THEREFORE ORDERED:

(1) That effective August 1, 1977, the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico, as previously described and defined by the Commission are hereby redefined as follows:

A. That North and East of a line generally running from the Northwest corner of Township 31 North, Range 13 West, San Juan County, New Mexico, to the Southwest corner of Township 24 North, Range 1 East, NMPM, Rio Arriba County, New Mexico, as fully described on Exhibit "A" attached to this order, and incorporated herein by reference the vertical limits of the Blanco-Mesaverde Pool shall be from the Huerfanito bentonite marker to a point 500 feet below the top of the Point Lookout Sandstone.

B. That South and West of the line described under A above, the vertical limits of the Blanco-Mesaverde Pool shall be from a point 750 feet below said Huerfanito bentonite marker to a point 500 feet below the top of the Point Lookout Sandstone.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

EXHIBIT "A"

COMMISSION ORDER NO. R-5459

This exhibit defines the Northwest-Southeast trending line that divides the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico, for purposes of defining the vertical limits for said pool. Said line traverses the South side or west side of the sections listed below:

TOWNSHIP 31 NORTH, RANGE 14 WEST, NMPM
Section 12: South

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM
Sections 7 and 8: South
Section 16: West and South
Sections 15 and 14: South
Section 24: West and South

TOWNSHIP 31 NORTH, RANGE 12 WEST, NMPM
Section 19: South
Section 29: West and South
Sections 28 and 27: South
Section 35: West and South
Section 36: South

TOWNSHIP 30 NORTH, RANGE 11 WEST, NMPM
Section 6: West and South
Section 5: South
Section 9: West and South
Sections 10 and 11: South
Section 13: West and South

TOWNSHIP 30 NORTH, RANGE 10 WEST, NMPM
Section 18: South
Section 20: West and South
Sections 21 and 22: South
Section 26: West and South
Section 25: South

TOWNSHIP 30 NORTH, RANGE 9 WEST, NMPM
Section 31: West and South
Section 32: South

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM
Section 4: West and South
Section 3: South
Section 11: West and South
Section 12: South

TOWNSHIP 29 NORTH, RANGE 8 WEST, NMPM
Section 18: West and South
Section 17: South
Section 21: West and South
Section 22: South
Section 26: West and South
Section 25: South

TOWNSHIP 29 NORTH, RANGE 7 WEST, NMPM
Section 31: West and South
Sections 32 through 36: South

TOWNSHIP 28 NORTH, RANGE 6 WEST, NMPM
Sections 7, 18, 19, 30, and 31: West

TOWNSHIP 27 NORTH, RANGE 6 WEST, NMPM
Section 6: West
Section 7: West and South
Sections 8 and 9: South
Section 15: West and South
Section 14: South
Section 24: West
Section 25: West and South

TOWNSHIP 27 NORTH, RANGE 5 WEST, NMPM
Section 31: West and South
Sections 32 through 36: South

TOWNSHIP 27 NORTH, RANGE 4 WEST, NMPM
Sections 31 through 36: South

TOWNSHIP 27 NORTH, RANGE 3 WEST, NMPM
Sections 31 and 32: South

TOWNSHIP 26 NORTH, RANGE 3 WEST, NMPM
Section 4: West and South
Sections 3 and 2: South
Section 12: West and South

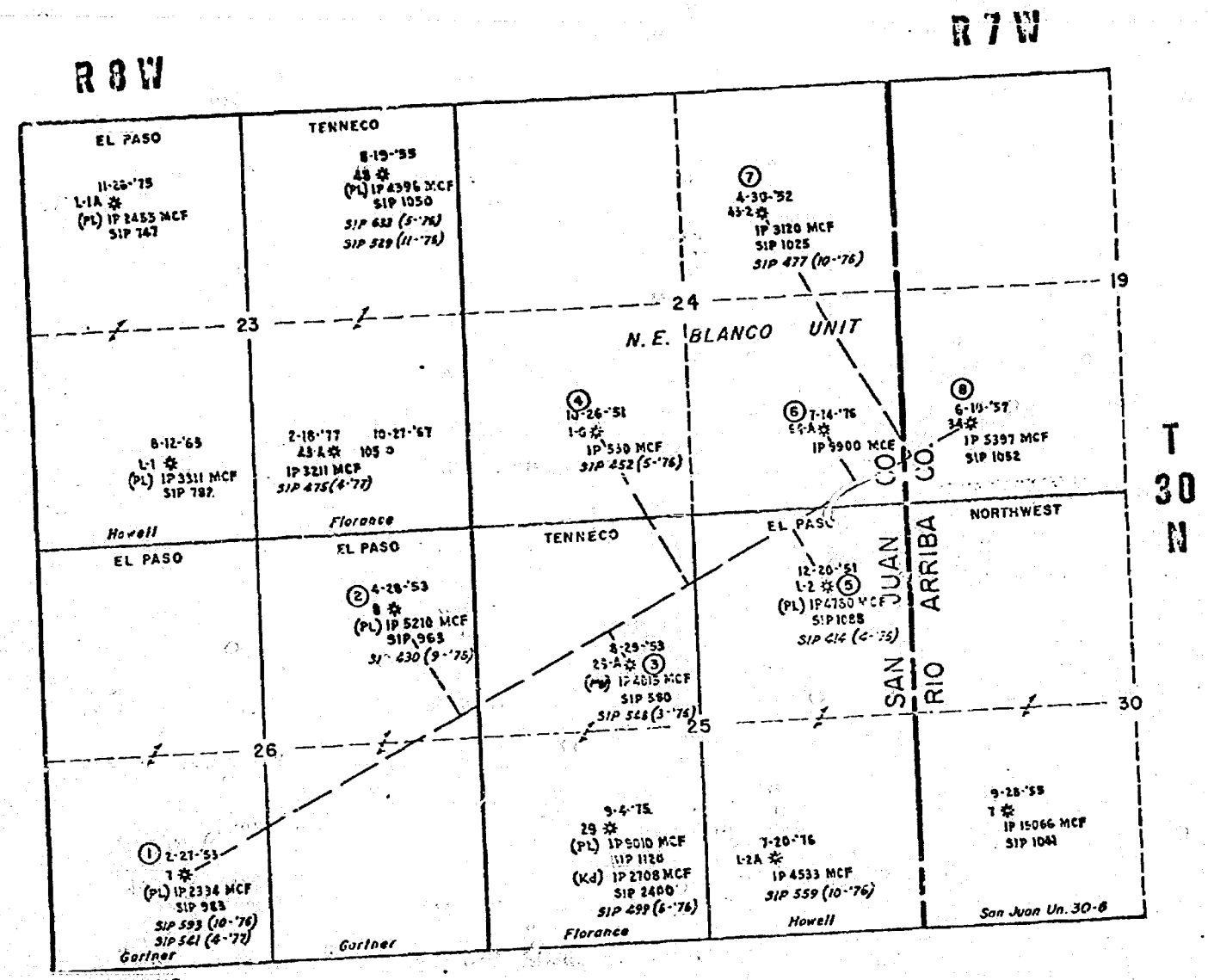
TOWNSHIP 26 NORTH, RANGE 2 WEST, NMPM
Sections 7 and 8: South
Sections 16 and 22: West and South
Section 26: West
Section 35: West and South

TOWNSHIP 25 NORTH, RANGE 2 WEST, NMPM
Section 1: West and South

TOWNSHIP 25 NORTH, RANGE 1 WEST, NMPM
Section 7: West
Sections 18 and 20: West and South
Section 28: West
Section 33: West and South

TOWNSHIP 24 NORTH, RANGE 1 WEST, NMPM
Section 3: West
Sections 10 and 14: West and South
Section 24: West
Section 25: West and South

TOWNSHIP 24 NORTH, RANGE 1 EAST, NMPM
Section 31: West



— LEGEND —

COMPLETION DATE
✲ INITIAL PRODUCTION
ORIGINAL SHUT-IN CASING PRESS.
RECENT SHUT-IN PRESS. (DATE TAKEN)

T — T — TRACE OF CROSS SECTION

N.E. BLANCO UNIT BOUNDARY

BLACKWOOD & NICHOLS CO., LTD.

LOCATION & PRESSURE DATA MAP

SCALE
0 MILES

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 8-A
Submitted by: Blackwood & Nichols
Hearing Date: 11-10-77

Exhibit # 8-A

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
1000 RIO BRAZOS RD. - AZTEC
87410

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

MEMORANDUM

2-24-77

TO: INTERESTED PARTIES
FROM: N. E. MAXWELL, JR., ENGINEER, DIST. #3
PROJECT: CURRENT MESAVERDE INFILL WELL DATA

Attached is a compilation of data on the Mesaverde infill completion program thru 2-22-77. Operator, well name and location are given. The initial shut-in is tabulated and CAOF where available. The average 1976 pressure of the four wells offset to each infill well has been tabulated and the latest 1976 shut-in pressure (P_c) and Q rate for the infill well is shown.

Test data for 50 wells, received since 11-4-76 show that these infill wells had an average shut-in pressure (P_c) of 593 psia while their offsets only had 481 psia. A difference of 112 psia. The average P_c on the 1976 latest tests on all infill wells is 553 psia while the average pressure of their offsets is 450 psia. Our records show 113 infill wells were completed during 1976. There were 249 total infill completions as of 2-22-77. There have been 345 locations applied for with 96 locations to be drilled.

The asterisk following an infill initial pressure denotes wells completed during 1976. Where no infill tests are shown, the wells have either not been connected or tests are in progress.

The offset pressure shown will hold thru the 1978 testing schedule. Infill well data will be added both on new completions and revised deliverability tests as they are received.

		AVERAGE			INFILL WELL	
WELLS COMPLETED	NO. WELLS	INITIAL SIP	CAOF MCF	OFFSET P_c	AVE. P_c	AVE. Q
1975 Report	104	696	9846	502 (1974)		1098 (1975)
1976 Thru 11-4-76	68	722	7074	470 (1976)	539 (1976)	732 (1976)
INFILL WELLS COMPLETED 11-4-76 to 2-22-77	77	742	7962	481 (1976)	593 (1976)	1240 (1976)
INFILL WELL STATUS						
TOTAL TESTED 1976	168				553	989
TESTS IN PROGRESS	42					
NOT TIED IN	39					
TOTAL INFILL WELLS	249		8508	450		

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 10
Submitted by: Blackwood & Nichols
Hearing Date: 11-10-77

Exhibit #10

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
1000 RIO BRAZOS RD. - AZTEC
87410

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

MEMORANDUM

5-25-77

TO: INTERESTED PARTIES
FROM: N. E. MAXWELL, JR., ENGINEER, DIST. #3
PROJECT: MESAVERDE INFILL WELL DATA, REPORT #4

Attached is a compilation of data on the Mesaverde infill completion program thru 5-20-77. Operator, well name and location are given. The initial shut-in is tabulated and CAOF where available. The average 1976 pressure of the four wells offset to each infill well has been tabulated and the latest shut-in pressure (P_c) and Q rate for the infill well is shown.

Test data for 53 wells, received since 2-22-77 show that these infill wells had an average initial shut-in pressure (P_c) of 777# while their offsets only had 461#. A difference of 316#.

Sixteen of the new completions or 30% were in Township 26 North, Range 3 West; Township 26 North, Range 7 West; Township 27 North, Range 3 West and Township 29 North, Range 6 West. The 16 infill wells had an average P_c of 978#. The remaining 37 new infill wells only had an average P_c of 689#.

503 infill locations have appeared on our scout letter. As of 5-20-77, 306 infill wells have been completed.

All infill wells have been numbered according to the dates they appeared on the scout letter.

#1 - #105 appeared during 1975
#106- #214 appeared during 1976
#215- #306 have been shown on the scout letters for 1977.

Our records show Mesa Petroleum Corporation, State Com #10-A located in O-29N-8W to be the first infill completion on 1-16-75, carried on scout letter 2-27-75.

MESAVERDE INFILL WELLS

COMPLETIONS	NO. OF WELLS	INITIAL AVE. SIP	LATEST TEST P_c	LATEST TEST Q	1976 OFFSET P_c
1975	105	678	510	905	474
1976	109	758	636	1114	479
1977 thru May	92	764	588*	838*	461
TOTAL	306	732	571	993	452

*1977 test data available on 20 infill wells completed in 1977 thru May 20.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 11
Submitted by Blackwood & Nichol
Hearing Date 11-10-77

Exhibit #11

Form 23-118T (Rev. 5-62)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29586

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 34 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.14		
Hydrogen Sulfide	.00		
Nitrogen	.32		
Methane	87.93		
Ethane	6.96		
Propane	2.73	.7493	
I-Butane	.55	.1794	
N-Butane	.72	.2263	
I-Pentane	.23	.0839	
N-Pentane	.16	.0578	
Hexane	.26	.1131	
TOTALS	100.00	1.410	

Run By Ross Checked By James

Remarks

R L Ahrens
H. L. Holder
R. Ulrich
R. E. Johnson
R. B. Herr
M. E. Blakely
R. E. Lemon
J. E. Ashworth
Don Adams
File

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 12
Submitted by Blackwood & Nichols
Hearing Date 11-10-77

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1150

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F. .650
Calculated from % Composition

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AE&MS

Calculation By
NGPA

Carbon Dioxide
NGPA

Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 19 T. 30 N. R. 7 W.
County
Rio Arriba
State
New Mexico
Formation
Mesa Verde
Bomb Pressure
Estimated 1/2

Form 23-116A (Rev. 5-68)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29687

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 105 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.87		
Hydrogen Sulfide	.00		
Nitrogen	.28		
Methane	88.33		
Ethane	6.31		
Propane	2.46	.6752	
I-Butane	.48	.1565	
N-Butane	.64	.2012	
I-Pentane	.20	.0730	
N-Pentane	.13	.0469	
Hexane	.30	.1305	
TOTALS	100.00	1.284	

Run By Ross Checked By James

Remarks
R. L. Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don Adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1131

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .649

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AE&MS
Calculation By
NGPA

Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 24 T. 30 N. R. 8 W.
County
San Juan
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29588

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit #64-B Secured By McLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.92		
Hydrogen Sulfide	.00		
Nitrogen	.20		
Methane	89.95		
Ethane	5.60		
Propane	2.06	.5654	
I-Butane	.34	.1109	
N-Butane	.47	.1477	
I-Pentane	.13	.0474	
N-Pentane	.09	.0325	
Hexane	.24	.1044	
TOTALS	100.00	1.009	

Run By Koss Checked By Janes

Remarks
R L Ahrens
H. L. Holder
R. U. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1107

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .633

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AE&MS
Calculation By
NGPA

Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 24 T. 30 N. R. 8 W.
County
San Juan
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

Form 23-118T (Rev. 5-62)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29588

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit #64 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.92		
Hydrogen Sulfide	.00		
Nitrogen	.20		
Methane	89.95		
Ethane	5.60		
Propane	2.06	.5654	
I-Butane	.34	.1109	
N-Butane	.47	.1477	
I-Pentane	.13	.0474	
N-Pentane	.09	.0325	
Hexane	.24	.1044	
TOTALS	100.00	1.009	

Run By Ross Checked By James

Remarks
R L Ahrens
H. L. Holder
R. U. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1107

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .633

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Columns Used
AEGMS
Calculation By
NGPA

Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA
Sec. 24 T. 30 N. R. 8 W.
County
San Juan
State
New Mexico
Formation
Mesa Verde
Some Pressure

Form 23-116T (Rev. 5-62)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29586

Sample From Blackwood Nichols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 34 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.14		
Hydrogen Sulfide	.00		
Nitrogen	.32		
Methane	87.93		
Ethane	6.96		
Propane	2.73	.7493	
I-Butane	.55	.1794	
N-Butane	.72	.2263	
I-Pentane	.23	.0839	
N-Pentane	.16	.0578	
Hexane	.26	.1131	
TOTALS	100.00	1.410	

Run By Ross Checked By James

Remarks

R L Ahrens
H. L. Holder
R. Ulrich
R. E. Johnson
R. B. Nerr
M. E. Blakely
R. F. Lemon
J. E. Ashworth
Don Adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1150

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F. .650
Calculated from % Composition

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
ADAMS

Calculation By
NGPA

Carbon Dioxide
NGPA

Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 10 T. 30 N. R. 7 W.

County
Rio Arriba

State
New Mexico

Formation
Mesa Verde

Bomb Pressure

Form 23-115T (Rev. 5-62)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29687

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 105 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.87		
Hydrogen Sulfide	.00		
Nitrogen	.28		
Methane	88.33		
Ethane	6.31		
Propane	2.46	.6752	
I-Butane	.48	.1565	
N-Butane	.64	.2012	
I-Pentane	.20	.0730	
N-Pentane	.13	.0469	
Hexane	.30	.1305	
TOTALS	100.00	1.264	

Run By Ross Checked By James

Remarks
R. L. Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don Adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1131

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .649

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AE&IS
Calculation By
NGPA

Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA
Sec. 24 T. 30 N. R. 8 W.
County
San Juan
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

orm 23-118T (Rev. 5-62)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29588

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit #64 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.92		
Hydrogen Sulfide	.00		
Nitrogen	.20		
Methane	89.95		
Ethane	5.60		
Propane	2.06	.5654	
I-Butane	.34	.1109	
N-Butane	.47	.1477	
I-Pentane	.13	.0474	
N-Pentane	.09	.0325	
Hexane	.24	.1044	
TOTALS	100.00	1.009	

Run By Ross Checked By James

Remarks
R L Ahrens
H. L. Holder
R. U. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1107

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .633

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AEGMS
Calculation By
NGPA

Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA
Sec. 24 T. 30 N. R. 8 W.
County
San Juan
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

Form 23-116C (Rev. 5-63)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29586

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 34 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.14		
Hydrogen Sulfide	.00		
Nitrogen	.32		
Methane	87.93		
Ethane	6.96		
Propane	2.73	.7493	
I-Butane	.55	.1794	
N-Butane	.72	.2253	
I-Pentane	.23	.0839	
N-Pentane	.16	.0578	
Hexane	.26	.1131	
TOTALS	100.00	1.410	

Run By Ross Checke By James

Remarks

R L Ahrens
H. L. Holder
R. Ulrich
R. E. Johnson
R. B. Herr
M. E. Blakely
P. F. Lemon
J. E. Ashworth
Don Adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1150

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F. .650
Calculated from % Composition

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column's Used
AE&MS

Calculation By
NGPA

Carbon Dioxide
NGPA

Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 10 T. 30 N. R. 7 W.

County
Rio Arriba

State
New Mexico

Formation
Mesa Verde

Bomb Pressure

Form 33-1157 (Rev. 5-61)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☒

Date of Run 10-5-76 Analysis No. VF29607

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 105 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.87		
Hydrogen Sulfide	.00		
Nitrogen	.28		
Methane	88.33		
Ethane	6.31		
Propane	2.46	.6752	
I-Butane	.48	.1565	
N-Butane	.64	.2012	
I-Pentane	.20	.0730	
N-Pentane	.13	.0469	
Hexane	.30	.1305	
TOTALS	100.00	1.284	

Run By Ross Checked By James

Remarks
R. L. Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don Adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1131

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .649

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column's Used
AEGIS
Calculation By
NGPA

Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA
Sec. 24 T. 30 N. R. 8 W.
County
San Juan
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date NOVEMBER 10, 1977 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
William F. Carr	Gallon, Gilbert and Greer	Santa Fe
Tom Kellahin	Kellahin & Fox	Santa Fe
Victor T. Lyon	Conoco	Hobbs
E. L. Osmo	Conoco	Hobbs
Millard F. Carr	Tenneco	Denver
Donald Barnes	Tenneco	Denver
R N Castle	Tenneco Oil Co	Denver
J M Morgan	Yates Petroleum Corp	Artesia
Jack M McClure	Yates Pet Corp.	"
Scott Wilson	Yates Pet. Corp.	Artesia
Fletcher L. Catron	Catron, Catron & Sawtell	Santa Fe
Ewell H Walker	Walker Engineering for Blackwood & Nichols	Farmington
Charles F. Blackwood	Blackwood Engineering for Blackwood & Nichols Co. Inc	Oklahoma City
A R Kendrick	OCC	Artesia
R. M. Williams	Morris R. Antweil	Hobbs
R Huber	NM Capitol Observer	Santa Fe

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 10, 1977

COMMISSION HEARING

IN THE MATTER OF:

Application of Tenneco Oil Company for an exception to the provisions of Order No. R-5459, San Juan County, New Mexico.

Case 5994

BEFORE: Joe D. Ramey, Secretary-Director
Phil R. Lucero, Member
Emery C. Arnold, Member

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: Lynn Teschendorf, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For Tenneco Oil Company: W. Thomas Kellahin, Esq.
KELLAHIN & FOX
Attorneys at Law
500 Don Gaspar
Santa Fe, New Mexico

For Blackwood & Nichols: William F. Carr, Esq.
CATRON, CATRON & SAWTELL
Attorneys at Law
P. O. Box 788
Santa Fe, New Mexico

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General Court Reporting Service
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Phone (505) 982-9212

I N D E X

		Page
1.	Appearances	1
2.	Opening Statement by Mr. Carr	5
3.	Opening Statement by Mr. Kellahin	7
4.	The Witness, Mr. Donald Barnes	
	Direct Examination by Mr. Kellahin	10
	Cross Examination by Mr. Carr	14
	Witness Excused	15
5.	The Witness, Mr. R. N. Castle	
	Direct Examination by Mr. Kellahin	16
	Cross Examination by Mr. Carr	35
	Redirect Examination by Mr. Kellahin	44
	Recross Examination by Mr. Carr	46
	Cross Examination by Mr. Kendrick	46
	Cross Examination by Mr. Stamets	50
	Cross Examination by Mr. Arnold	52
	Witness Excused	53
6	The Witness, Mr. Charles F. Blackwood	
	Direct Examination by Mr. Carr	54
	Cross Examination by Mr. Kellahin	71
	Cross Examination by Mr. Arnold	77
	Cross Examination by Mr. Ramey	79
	Witness Excused	80
7.	The Witness, Mr. E. N. Walsh	

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INDEX CONTINUED

		Page
	Direct Examination by Mr. Carr	80
	Cross Examination by Mr. Kellahin	99
	Redirect Examination by Mr. Carr	107
	Recross Examination by Mr. Kellahin	109
	Witness excused	110
8.	The Witness, Mr. Victor T. Lyon	
	Direct Examination by Mr. Kellahin	110
	Cross Examination by Mr. Carr	114
	Cross Examination by Mr. Ramey	114
	Witness Excused	115
9.	Closing Statement by Mr. Kellahin	115
10.	Closing Statement by Mr. Carr	117
11.	Reporter's Certificate	121

EXHIBIT INDEX

	Page
Tenneco's Exhibit No. 1, Map	17
Tenneco's Exhibit No. 2, Map	18
Tenneco's Exhibit No. 3, Cross Section	19
Tenneco's Exhibit No. 4, Decline Curve	20
Tenneco's Exhibit No. 5, Shut in Pressures	22
Tenneco's Exhibit No. 6, Cross Section	21
Tenneco's Exhibit No. 7, Structural Map	25
Tenneco's Exhibit No. 8, Structural Map	25

EXHIBIT INDEX CONTINUED

	Page
Tenneco's Exhibit No. 9, Graph	26
Tenneco's Exhibit No. 10, Shut in Pressures	28
Tenneco's Exhibit No. 11, Completion Report	34
Exhibits No. 1 thru No. 11 Admitted	35
Blackwood & Nichols' Exhibit No. 1, Definition	63
Blackwood & Nichols' Exhibit No. 2, Completion Report	58
Blackwood & Nichols' Exhibit No. 3, Completion Report	58
Blackwood & Nichols' Exhibit No. 4, Plan of Development	60
Blackwood & Nichols' Exhibit No. 5, Letter	60
Blackwood & Nichols' Exhibit No. 6, Order R-5459	68
Exhibits No. 1 thru No. 6 Admitted	71
Tenneco's Exhibit No. 12, Letter	74
Exhibit No. 12 Admitted	74
Blackwood & Nichols' Exhibit No. 7, Map	81
Blackwood & Nichols' Exhibit No. 8, Cross Section	82
Blackwood & Nichols' Exhibit No. 8A, Cross Section	83
Blackwood & Nichols' Exhibit No. 9, Pressure Test	86
Blackwood & Nichols' Exhibit No. 10, Memorandum	88
Blackwood & Nichols' Exhibit No. 11, Memorandum	88
Blackwood & Nichols' Exhibit No. 12, Chromatograph	93
Exhibits No. 7 thru No. 12 Admitted	98
Tenneco's Exhibit No. 13, Analysis	111

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MR. RAMEY: The hearing will come to order. I will call Case 5994.

MS. TESCHENDORF: Case 5994, application of Tenneco Oil Company for an exception to the provision of Order No. R-5459, San Juan County, New Mexico.

MR. RAMEY: Ask for appearances at this time.

MR. KELLAHIN: Tom Kellahin, Kellahin and Fox, Santa Fe, New Mexico, appearing on behalf of Tenneco Oil Company.

MR. CARR: William F. Carr; Catron, Catron and Sawtell, appearing on behalf of Blackwood & Nichols.

MR. RAMEY: Any other appearances? I would ask that all witnesses please stand at this time and be sworn.

(THEREUPON, the witnesses were sworn.)

MR. RAMEY: Mr. Kellahin, you may proceed.

MR. KELLAHIN: Thank you.

MR. CARR: I would like to make a brief opening statement.

May it please the Commission, we are appearing here today in opposition to the application of Tenneco for an exception to the provisions of Order Number R-5459.

We intend to present evidence that will show that following the drilling and completion of the Florance Well 29A that Blackwood and Nichols as unit operators of the Northeast Blanco Unit were compelled to drill its No. 64

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unit well to protect the unit from drainage when a production was encountered, as the Commission is aware, was encountered higher in an interval higher than was originally anticipated.

This triggered a series of events which culminated in the Commission redefining the Blanco-Mesaverde Pool.

Sometime during this process Tenneco also treated as Florance 29A well as a -- well, other than a Chacra well -- and that they are here today in an effort to take the well from the people who not only drilled it but who paid for it.

We would submit that there is an error in the advertisement where it refers to the Northeast Blanco Well No. 64 as Tenneco's well, it says the Northeast Blanco Unit Well No. 64, and we would submit that this is the only evidence to date of any ownership of this well in Tenneco.

We will present evidence by way of background showing what eventually led up to the -- a new definition or an adoption of a new definition of the Mesaverde -- and we will also show the Northeast Blanco Well No. 64 is a Mesaverde Well and that it could not be a separate Chacra reservoir and that it is in communication with the Mesaverde and therefore part of a common source of supply.

We will also show that granting the application would not only authorize waste but would impair correlative rights.

At the outset we think it is important to call

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to the Commission's attention that this hearing arises under finding 17 and 18 of Order Number 5459 and under these findings Tenneco may come forward and show the Commission that, one, they have a Chacra well and that it is not connected or in a common source of supply with other Mesaverde wells in the area.

They also must show that granting their application will not authorize waste and will not impair correlative rights.

We want it understood at the outset that the burden is on Tenneco to show all four of these matters.

MR. RAMEY: Thank you, Mr. Carr.

MR. KELLAHIN: If the Commission please, I would like to give you copies of the two orders involved in this case to refresh your recollection.

You will recall that back in March of '77, we had a hearing before the full Commission upon motion of Blackwood and Nichols to redefine the vertical limits of the Blanco-Mesaverde Pool.

That redefinition is set forth in Order R-5459. And I will give you my copy of that order.

Finding 17 and 18 of that order as you probably will recall said that there are four wells north and east of the line defined by finding 15. That is separated -- the definition in the Blanco Mesaverde Pool.

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Above that line were the four wells and set forth in Exhibit A of the order, which may, the order said, may be producing from fractured shale or siltstone zones equivalent to said Chacra sands which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool.

Eighteen said that to protect the correlative rights of the owners of said four wells the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool shall be delayed to provide such owners with the opportunity to bring a case for exception before the Commission.

As of this date the owners of all four of those wells have applied for an exception. You will recall that Lively had an application to exclude one of their wells which was one of the four.

That application for exclusion from the Blanco-Mesaverde Pool rules was granted.

The Commission heard, I believe last month, Ker's application for exclusion of their well. I understand that an order is pending and perhaps to be signed sometime this week.

The other two wells are the ones in which Tenneco and Conoco have the interest, the Florance 29A Well and the Blanco Unit 64 Well.

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Now, Mr. Carr has indicated that the 64 Well is owned by the unit and operated by Blackwood and Nichols. The record in Case 5994, which was Tenneco's application for the exception, has contained in it copies of portions of the unit agreement and the unit operating agreement which very clearly shows that although Blackwood and Nichols as the unit operator drilled this well that if it is to be completed in a formation other than the vertical limits of the redefined Blanco-Mesaverde Pool, that well becomes the property of Tenneco and Conoco.

There is no misunderstanding about the advertisement that -- that does not have to be readvertised. The proper parties have been noticed and they are here.

At this point, Mr. Ramey, I would like to incorporate the record in Case 5994 which resulted in Order Number R-5531 from which we have asked a hearing de novo. If we may do that at this time I would appreciate it.

MR. CARR: May it please the Commission, we have no objection to incorporating the prior record.

We would also just like to point out to the Commission that the Mesaverde was redefined in the hearing not on the motion of Blackwood and Nichols but it was called on the Commission's own motion.

MR. KELLAHIN: I will call my first witness, Don Barnes.

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DONALD BARNES

was called as a witness by the applicant, and having been first duly sworn, testified upon his oath as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Barnes, would you please state your name and by whom you are employed?

A. Don Barnes and I am employed by Tenneco Oil Company.

Q. How do you spell your last name?

A. B-a-r-n-e-s.

Q. Mr. Barnes, in what capacity are you employed by Tenneco?

A. I am the division drilling engineer.

Q. How long have you been employed in that capacity?

A. Two months.

Q. And prior to being the drilling supervisor what was your job description?

A. Senior drilling foreman.

Q. Also for Tenneco?

A. Yes, sir.

Q. How long have you been employed by Tenneco?

A. A year and a half.

Q. Prior to your employment by Tenneco who were you employed by?

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A. Minerals Management.

Q. In what capacity, sir?

A. I was the drilling manager.

Q. And prior to that who were you employed by?

A. Amoco Production Company.

Q. How long were you employed by Amoco?

A. From '61, fourteen years.

Q. And in what capacity did you work for Amoco?

A. I was a field foreman and drilling supervisor.

Q. In your capacity as a drilling supervisor, Mr. Barnes, what experience have you had in drilling Mesaverde wells?

A. Well --

Q. In the San Juan Basin, New Mexico?

A. I have supervised the drilling of approximately one hundred wells.

Q. Since you have become employed by Tenneco how many Mesaverde wells have you supervised the drilling of?

A. Over fifty-five.

Q. Over what period of time has that taken place?

A. Eleven months.

Q. What is the general area where these fifty-five wells have been drilled?

A. In and around Farmington in the Northeast Blanco Pool by Blanco and towards Aztec and Navajo Dam.

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MR. KELLAHIN: If the Commission, please, I believe we have laid a proper foundation for Mr. Barnes to testify as an expert witness with regards to the describing to the Commission the normal drilling techniques for drilling a Mesaverde well which we believe will be relevant and significant.

MR. RAMEY: Okay.

MR. KELLAHIN: May we consider Mr. Barnes qualified?

MR. RAMEY: Yes.

Q (Mr. Kellahin continuing.) Mr. Barnes, would you explain for the Commission what are the normal procedures in drilling a Mesaverde well in the San Juan Basin?

A. You drill your surface hole and set your surface pipe to approximately two hundred feet and this is mud drilled.

You drill your intermediate sections and it is also mud drilled. You drill through the Picture Cliffs zone and approximately two hundred feet into the Louis shale.

At that time you run your intermediate casing and cement it preferably back to the surface. You go in, blowing down with gas or nitrogen, and you unload your fluids from the annulus and the remainder of the hole is drilled with gas.

You drill to T.D. which is in the Mancus shale through your Mesaverde interval and you log the well and run

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usually a liner and cement it back and move the drilling rig off.

Q. Okay. How would you complete the well in the Mesaverde?

A. The perforations would be set up to what intervals and there would be a sand-water frack.

Q. Okay. Is this the normal way in which Mesaverde wells are normally completed in the San Juan Basin?

A. To my knowledge, yes, sir.

Q. Is there any risk of a blowout in completing a Mesaverde well in this fashion?

A. I have never been on a well that blew out in the Mesaverde section to where we had to kill it in the last fifty-five that we have drilled.

Q. Why don't you have to kill the Mesaverde to run the pipe through it?

A. Well, it is accepted that you can strip in through a rotating head rubber and let your gas out through a blewey line and keep the oil under control with no gas escaping out for hazard of fire. It is controlled through a blewey line.

Q. Would this be a natural flow completion?

A. Yes.

Q. What kind of volumes of gas do you normally encounter in the Mesaverde?

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A. I would say a quarter of a million.

Q. When we talk in terms of the Mesaverde in your mind, Mr. Barnes, what specific members of that formation are you referring to?

A. Usually in three sections and the upper section being the Cliff House, the Menafee and the Point Lookout.

MR. KELLAHIN: I have no further questions of this witness, thank you, Mr. Ramey.

MR. RAMEY: Any questions of the witness, Mr. Carr?

MR. CARR: I have a couple.

CROSS EXAMINATION

BY MR. CARR:

Q. Mr. Barnes, why is in completing a Mesaverde well you -- in part of your completion you fracture the well?

A. A sand-water frack?

Q. Why do you do that?

A. To open up the tight sandstone to allow your gas to enter the well bore.

Q. Are you familiar with wells that have been drilled in the Hart Canyon Area?

A. Vaguely, yes.

Q. Are you familiar if any of those have encountered a high natural flow rate?

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A. What do you mean by a high natural flow rate?

Q. Well, the flow rate without fracturing -- that makes it unnecessary to fracture the well?

A. I have never been on such a well. Possibly there has been.

Q. But you wouldn't know from your own experience?

A. No, sir, not from my own experience.

Q. If you encountered a high flow rate in these Mesaverde wells what factor in your own mind might justify that?

A. To complete?

Q. If you are completing a well in the Mesaverde?

A. While drilling?

Q. Yes, what things might explain that?

A. It would be the entry of gas in the well bore. I am not sure that I understand your question.

Q. Would a fracture account for a high flow rate?

A. Possibly.

MR. CARR: I have no further questions.

MR. RAMEY: Any other questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. KELLAHIN: I call Mr. Bob Castle.

R. N. CASTLE

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was called as a witness by the applicant, and having been first duly sworn, testified upon his oath as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Castle, would you please state your name and by whom you are employed and in what capacity?

A. My name is R. N. Castle and I am employed by Tenneco Oil Company of the Geological Division Engineers, Rocky Mountain Division.

Q. Mr. Castle, have you previously testified before the New Mexico Oil Conservation Commission?

A. No, sir.

Q. When and where did you obtain your degree?

A. I graduated from Michigan Technological University in 1959.

Q. What kind of a degree did you obtain?

A. Bachelor of Science in Geological Engineering.

Q. Since obtaining that degree do you have any further education or employment experience?

A. I worked for Halliburton Oil Well Cementing Company for five years and I joined Tenneco in 1964.

Q. Since working for Tenneco commencing in 1964, in what capacities have you been employed?

A. I have been a Geological Engineer; and I have been

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a Geological Engineering supervisor and currently I am the Division Geological Engineer.

Q. Have you made a study of and are you familiar with the facts surrounding this particular application?

A. Yes, sir.

Q. Have you qualified as an expert witness and provided expert testimony before any other Oil Conservation Commissions?

A. Yes, I have.

Q. In what states?

A. Oklahoma, primarily.

MR. KELLAHIN: If the Commission please, may we consider Mr. Castle's qualifications as an expert acceptable?

MR. RAMEY: Yes, proceed.

Q. (Mr. Kellahin continuing.) Mr. Castle, I ask you to refer to what I have marked as Tenneco's Exhibit Number One, and ask you to identify it and explain what information it contains?

A. This is a one to four thousand scale map that includes Townships 29 North and 30 North, Range 8 and 9 West.

The four townships in this specific question are outlined by this red line.

You will note that the acreage colored in red is acreage that is operated jointly by Tenneco and Conoco on a fifty-fifty percent.

The acreage that is colored in green is lease-sale

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acreage in which Tenneco and Conoco have an override. That acreage is operated by El Paso.

The large yellow dots are Mesaverde infill wells which have been drilled by Tenneco in the last three years.

The small yellow dots shown here are infill wells that have been drilled by other people, primarily, El Paso.

The red dots shown here and here and the blue arrows are the wells that we will be talking about -- specifically about -- in the next few minutes.

Q. Okay. Mr. Castle, I show you what I have marked as Tenneco's Exhibit Number Two and ask you to identify it and state what information it contains?

A. Exhibit Number Two is a reproduction off of our Exhibit Number One, specifically, Township 30 North, Range 8 West, and the acreage color schemes are the same as I have indicated previously.

Q. What is the significance of the blue arrows?

A. The blue arrows refer to the two wells in question with regard to this hearing. The northern most well located in the southeast quarter of Section 24, being the Northeast Blanco No. 64; and the well located in the northwest quarter of Section 25, being the Tenneco Oil Company's Florance 29A.

Q. What is the significance of the small yellow circles as compared to the larger yellow circles?

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A. The small yellow circles are Mesaverde infill wells that have been drilled by other operators, principally, El Paso.

Q. What is the significance of the blue line connecting the three wells in the center of the plat?

A. The blue line connecting the Florance No. 40 is in the northeast quarter of Section 21. The El Paso Howell 2A located in the northwest quarter of Section 22, and on the extreme right the Tenneco Oil Company's Florance 45 are three wells that we have used and included in a cross section which we would like to discuss.

Q. All right. Mr. Castle, would you please refer to what I have marked as Tenneco's Exhibit Number Three and identify it and state what information it contains?

A. Exhibit Number Three is a structural cross section shown again on Exhibit Number Two that I have prepared that includes the three wells that I just discussed.

In previous testimony it has been eluded to that there were four wells that did not get to the Massive Cliff House north of the line. Actually, there are more than four.

One well that has not been discussed previously is the El Paso Howell 2A. That well T.D.'d at forty-two ninety-five. The well blew out while it was drilling and casing was run and it was subsequently perforated from forty-two

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seventy-five to forty-two eighty-three.

That well was completed in natural for one hundred and sixty-eight million cubic feet of gas a day. In my experience this is probably the biggest well in the San Juan Basin.

By comparison, again, this is the structural cross section of approximately fifteen hundred feet, subsea, Tenneco interprets the Mesaverde to be the top of the Cliff House and this would be the top of the Menefee and this would be the top of the Point Lookout.

The red indications here are where the wells are perforated and in both cases we had to hydraulically fracture our wells.

The cross section simply shows that the El Paso well is completed out of something that is distinct and different from the Massive Cliff House and Menefee or the Point Lookout.

Q. Mr. Castle, I show you what I have marked as Tenneco's Exhibit Number Four and ask you to identify it and state what information it contains?

A. Exhibit Number Four is a graph that can be defined as a rate decline curve. What I have done here is plotted semi-annual production in M.M.C.F. versus time.

The first page is a production curve of the El Paso Natural Gas Company's Howell K2A which is the well that

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is located in the center of the cross section marked Exhibit Three.

You will note that the well was completed in early 1975, and was put on the line in April of 1975. The well has been producing approximately twenty-seven months and it has cummed five point eight B.C.F. or an average of approximately seven million cubic feet of gas a day since it has been producing.

For reference the last half of 1975, that well made over sixteen hundred M.M.C.F. in the six-month period or approximately one point six billion.

Again, the cumulative is five point eight -- an absolutely an outstanding well under anybody's standards.

Q. Please refer to page two of Exhibit Number Four and identify it?

A. Page two is a similar rate decline curve for the immediate west offset which is the Tenneco Oil Company's Florance No. 40 located in Unit G of Section 21.

What this curve shows is the production records for the last five years for the Mesaverde formation. You will note that the curve is declining -- it is declining at a natural rate of approximately ten percent.

Above the curve you will note that the cumulative production for that well to June of 1975, was approximately three billion cubic feet of gas.

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Cumulative to date is approximately three point three billion. It produced two hundred and eighty-one million cubic feet of gas during the same period of time that the El Paso well did.

Q. Please refer to page three of Exhibit Four and identify it?

A. Page three is the direct one hundred and sixty acre north offset to the El Paso 2A. It happens to be the Tenneco Oil Company's Florance 32.

Again, the well demonstrates the normal production decline over the last four to five years. During the comparable period of time that the El Paso well has been producing our well produced eight hundred thirty-six million cubic feet of gas.

Q. Please identify page four of Exhibit Four?

A. Page four is the direct one hundred sixty acre east offset to the El Paso well. This would be our Florance 45.

You will note that it has demonstrated a normal production record and no significant decline and during the same period of time it has produced six hundred sixty-three million cubic feet of gas.

Q. Mr. Castle, I show you what I have marked as Tenneco's Exhibit Number Five and ask you to identify it?

A. Exhibit Number Five is a graph in which I have

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plotted well head shut in pressures versus cumulative production. It is a graphic description of a material balance, in essence.

The first page is the El Paso well, the Howell K2A. If you look above the curve you will note again that the cumulative to 7/77 is five point eight B.C.F.

Furthermore, the line that I have drawn through the last two pressure points suggest that this well will recover somewhere between fourteen to sixteen billion cubic feet of gas.

Q. Page two of Exhibit Five, would you identify that?

A. Page two is a similar plot of well head shut in pressures versus cumulative production for the Florance No. 40.

Remember that the Florance 40 is the direct one hundred and sixty acre offset to the El Paso well. The curve simply deomonstrates that the Florance 40 will probably recover somewhere between nine and ten billion cubic feet of gas depending on what the shut in pressure is at the time of abandonment.

Q. Identify page three of Exhibit Five?

A. Page three is a similar graph for the north offset or the Florance 32 and you can see from the extrapolation of the curve that I have drawn through the pressure points that that well will probably recover over twenty billion cubic

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feet of gas.

Q. Identify page four for us?

A. Page four is the east offset to the El Paso well, the Florance 45, and this particular well in our opinion will recover somewhat over nine B.C.F., again, depending on what the pressure is at the time of abandonment.

Q. What conclusions can you draw from the information supplied on Exhibits Four and Five, Mr. Castle?

A. In my opinion, production from the El Paso Natural Gas Company's Howell K2A, the five point eight B.C.F. that that well has produced has in no way affected the well performance or the production history of the three closest offsets which are operated by Tenneco Oil Company.

In my opinion the El Paso well is producing from a distinct and separate common source of supply from that of the three Florance wells.

Q. In your opinion, Mr. Castle, is there any communication between the Howell K2A Well and the offsetting Mesaverde wells?

A. All three of the Tenneco operated Florance wells are completed in the Cliff House, Menafee, and the Point Lookout.

The El Paso well, as the cross section demonstrates, is completed above the Cliff House formation.

The rate decline curves and the pressure versus

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cumulative production curves certainly in my opinion suggests that there is a separate common source of supply and that production from the El Paso well is in no way affecting our well.

Q. Mr. Castle, would you refer to what I have marked as Tenneco's Exhibit Number Six and identify it?

A. Exhibit Number Six is a cross section that is hung on stratigraphic marker, the Workman-Neal Bentonite Marker, and the cross section includes wells in the southwest quarter of Section 34 on your extreme left. The Lively well, the 7Y, located in the northwest quarter of Section 35, a well located in the southwest quarter of Section 26, the Gartner No. 8 located in the northeast quarter of 26, we have projected in the Tenneco Florance 29A. We have included the El Paso Howell 2L.

We have projected in the Northeast Blanco 64 and the well on the extreme northeast right is the Blanco 34-19 in the southwest quarter of 19.

The cross section demonstrates, again, the top of the Cliff House and the top of the Menefee and the Point Lookout and the bottom of the Mancos Shale.

What we have colored in yellow is the Cliff House, Menafee and Point Lookout and what we consider to be productive sands.

The Florance 29A you will note in this position did

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not get to the Cliff House formation and it encountered a strong natural gas flow and was subsequently completed above the Cliff House formation.

The Northeast Blanco 64 Well was drilled by Blackwood & Nichols in a similar fashion and did not get to the Cliff House. It was completed in the Lewis Shale interval above the Cliff House.

Q. Mr. Castle, I show you what I have marked as Tenneco's Exhibit Number Seven and ask you to identify it?

A. Exhibit Number Seven is a structural map. The structural data that we have mapped here is the top of the Cliff House sands as we have indicated on the cross section on the previous exhibit.

It simply shows the structural style of the top of the Cliff House formation in the immediate area of the two wells in question.

Q. I show you what I have marked as Tenneco's Exhibit Number Eight and ask you to identify that and explain what information it contains?

A. Exhibit Number Eight is a companion exhibit to Number Two. In this case I have a blue arrow pointing to the El Paso Howell 2A which we have previously discussed.

In this case we are talking about the orange dots, the wells offsetting the Florance 29A, those being the Gardner No. 8 located in the northeast corner of Section 26.

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The Blackwood & Nichols Northeast Blanco Unit No. 3 located in the southwest quarter of Section 24 and finally the Howell 2A located in the northeast quarter of Section 25.

Q. Mr. Castle, I show you what I have marked as Tenneco's Exhibit Number Nine and ask you to identify page one of that exhibit?

A. Exhibit Number Nine, again, is a graph of the semi-annual production plotted versus time.

The scale on the left is in M.M.C.F. for six months and that would refer to the curve colored in red.

The curve that is colored in green refers to the scale on the right which is the M.C.F. a day.

The first page is the Florance 29A and you will note that the well began producing in February of 1976. Cumulative production to 7/1/77 is approximately one point two B.C.F.

Q. Okay. Please identify page two?

A. Page two is the east offset to the Florance 29A which is the Gardner No. 8. Again, the red curve or the upper curve refers to M.M.C.F. for six months.

The lower curve is plotted in M.C.F. a day and refers to the right-hand scale. You will note above the curves that the Gardner No. 8 has produced four hundred fifty-two million cubic feet of gas in the same period of time as the Florance

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29A.

You will also note that there is a very flat decline and nothing abnormal or unnatural about its decline rate. It's approximately eight percent.

Q. Please refer to page three of Exhibit Nine?

A. Page three is Blackwood and Nichols Northeast Blanco Unit No. 103 located in Unit M of Section 24 referring to the red curve you will note that it is declining at approximately ten percent a year and in the same period of time it has produced approximately eighty-eight million cubic feet of gas a day.

There is absolutely nothing abnormal about that decline rate.

Q. Please refer to page four of Exhibit Nine and identify it?

A. Page four is the Howell 2L located in Unit A of Section 25 and this is the immediate one hundred sixty acre east offset to the Florance 29.

Again, you will note a very level natural decline of approximately six percent and this well has produced approximately five hundred sixteen million cubic feet of gas during the same period of time as the Tenneco's Florance 29.

Q. Mr. Castle, would you refer to what I have marked as Tenneco's Exhibit Number Ten and identify it?

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A. Exhibit Number Ten, again, is a well head shut in pressure versus cumulative production for the Florance 29A.

You will note that we have three pressure points -- we had the initial and then we had two subsequent pressure points that have been taken since the well has been producing.

I have indicated above the curve the cumulative production and it is one point two B.C.F. and ultimately that well will make somewhere between four and five billion cubic feet of gas as I have interpreted the initial pressure data.

Q. Please refer to page two of Exhibit Ten and identify it?

A. Page two of Exhibit Number Ten is a well head shut in pressure versus cumulative production to the west offset to the Florance 29A, this being the El Paso Natural Gas Gartner No. 8.

In this particular case we have significant pressure and production history and we can very confidently project the ultimate reserves will probably be in the neighborhood of ten billion cubic feet of gas.

Above the curve I have indicated what the cumulative was to 1/76, that being six point four B.C.F. and during the comparable period of time that the Florance 29A was producing this well made four hundred and fifty-two million cubic feet

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of gas.

Q. Please identify page three of the Exhibit Ten?

A. Page three is the Northeast Blanco Unit 103 and again we have significant pressure and production history and we can very confidently project that this well will probably make from around four and a half to five billion cubic feet of gas a day.

MR. RAMEY: You didn't mean per day did you, Bill?

A. Ultimately, I am sorry, it will recover. I wish it were so -- page four is a similar graph for the east offset to the Howell 2 Well and that simply shows that that well will ultimately make between nine and ten B.C.F.

Q. How does the anticipated total recovery of the Florance 29A Well compare to the total recovery of the other three offsetting wells?

A. Well, as I have indicated here, Mr. Kellahin, the initial pressure data for the Florance 29A suggests that it will ultimately make somewhere between four and five B.C.F.

The other wells -- I would say that it appears like the other wells will probably make in excess of twenty billion cubic feet of gas, total, between the three of them versus the four to five billion for the Tenneco well, alone.

Q. What is the significance of Exhibits Nine and Ten?

A. The significance of Exhibits Nine and Ten I think can be related back to our previous exhibits with respect

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to the big El Paso well.

If we remember that the El Paso well had cummed five point eight B.C.F. that happens to be three times the amount of production for all three of the Tenneco wells combined.

In a similar fashion the cumulative production from the Florance 29A is one point two B.C.F. and that happens to be more than the total production of the three offsets that I have just discussed.

In both cases it is my opinion that production from the El Paso well and in the cases that we are talking about here, Exhibits Nine and Ten, the Florance 29A, it is my opinion that this well is producing from a separate common source of supply which in no way has affected either the rate decline or the pressure versus cumulative and suggesting that if, in fact, there was any communication you would have seen some alteration or something abnormal in those curves which you do not.

Again, I see no evidence to support communication.

Q. Based upon your study, Mr. Castle, do you have any opinion with regard to whether there may be fracturing occurring between the producing formation in the Florance 29A Well and the offsetting Mesaverde wells?

A. If you refer to Exhibit Number One which we have diligently covered up -- in the four townships that we are

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discussing here, Townships 29 and 30 North, Range 8 and 9 West, there were originally two hundred and eighty-eight Mesaverde wells producing in that area.

Subsequent to the order which established infill drilling or allowing a second well to be drilled on each three hundred and twenty acre spacing unit, other operators, that being primarily El Paso, have drilled an additional eighty wells.

Tenneco has drilled sixty-three wells. There are currently four hundred and thirty-one wells that have been drilled in that four-township area.

With the exclusion of the three wells that I have been discussing that did not get to the Cliff House there are four hundred and twenty-eight wells that completely penetrated the Cliff House, Menafee, and the Point Lookout.

Now, I would suggest to the Commission that if the Cliff House and if the Menafee or if the Point Lookout were anyway fractured, that one of those four hundred and twenty-eight wells that penetrated those three zones -- if the rocks were fractured one of those wells would have blown out.

In reviewing almost each and every one of those wells in that area we find no evidence to suggest that there was any abnormal natural flow prior to completion.

What this suggests to me is that the Mesaverde is

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tight as has been testified to and furthermore it is not fractured, naturally.

The three wells that did not penetrate the Cliff House formation, however, all encountered substantial gas flows out of the Lewis Shale, Chacra equivalent. They were completed natural. All three wells are significant producers.

Q. Based on your studies, Mr. Castle, have you formed an opinion with regard to whether or not the Northeast Blanco Unit Well No. 64 is producing from a separate and distinct source of supply from those offsetting Mesaverde wells?

A. I base my opinions on hard facts, that being production which goes down the pipeline.

That is a figure that we pay very close attention to. We receive revenue from it and we pay taxes on it and we don't very often make mistakes in recording production data.

Of the three wells that were completed out of the Lewis-Chacra equivalent, two of those wells' production history very strongly in my opinion suggests that they are producing from a separate common source of supply.

I would suggest to the Commission that the Northeast Blanco Unit is very similar to the Howell 2A and the Florance 29A.

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Q. Mr. Castle, would you explain for the Commission what, if any, affect the pipeline takes may have had upon your study of information contained in Exhibits Nine and Ten?

A. The El Paso well, the big well that has cummed five point eight B.C.F., produces into the El Paso line.

The three offsets to the El Paso well, the Florance 32, the Florance 40 and the Florance 45, produce into a Southern Union line.

Furthermore, the Florance 29A produces into the same loop as the other three Florance wells. The El Paso well is a low pressure line, approximately three hundred pounds and is rather consistent, yearly, primarily because there is a great demand for gas in California.

By comparison, the Southern Union line which supplies most of the gas to the City of Albuquerque, is quite seasonal.

Early in 1975, before many of the infill wells were put on stream the average pipeline pressure was approximately three hundred and twenty-five pounds.

Now, the demand for gas from Southern Union has not increased that much but we have, in essence, doubled the number of wells on the same existing line.

The net result is that the line pressure is in the vicinity of -- the Florance 29A is currently in access of five

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hundred pounds. That is pretty close to the shut in pressure of the well, itself.

We are actually having a harder time producing our wells than the El Paso well.

Q. What affect will the differences in pipeline pressures or the pipeline takes have with regards to the conclusions that you have made based upon your studies?

A. The offset wells to the Florance 29A that I discussed, that being the Gartner No. 8, the Northeast Blanco 103, and the Howell 2A, those wells produce into the El Paso line.

Again, that's a low pressure line. Now, if production from the Florance 29A, if production from that particular well were in anyway in communication with the zones that are completed in those three wells, then, surely you would have seen it on those production curves, but you don't.

Q. I show you what I have marked as Tenneco's Exhibit Number Eleven and ask you to identify that?

A. Exhibit Number Eleven is the well completion report that we supplied to the U.S.G.S. and what I would like to point out is item number twenty-four, producing interval, quote, intervals, forty-four ten to forty-five oh three, we call this a Lewis completion, initially.

Q. In your opinion, Mr. Castle, will approval of

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Tennoco's requested exception for the Florance 29A Well and the Blanco Mesaverde Unit 64 Well, be in the best interests of conservation, prevention of waste, and the protection of correlative rights?

A. Yes, sir.

Q. Were Exhibits One through Eleven prepared by you directly or compiled under your direction and supervision?

A. Yes, sir.

MR. KELLAHIN: We move the introduction of those exhibits.

MR. RAMEY: They will be admitted.

MR. KELLAHIN: That concludes my direct examination of Mr. Castle.

MR. RAMEY: Any questions of the witness -- Mr. Carr?

CROSS EXAMINATION

BY MR. CARR:

Q. Mr. Castle, you have been discussing the El Paso, I believe the Howell 2A -- or the Florance 2A, the good El Paso well that's located somewhat to the west of the wells in question in this hearing --

A. That would be the El Paso Howell K2A.

Q. Howell No. K2A -- what was the initial shut in pressure on this well?

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A. As indicated on Exhibit Number Five, approximately seven hundred and forty-three pounds, I believe.

Q. What sort of a pressure would you expect to encounter if you had with this well encountered a new reservoir at this depth?

A. Seven hundred and forty-three pounds.

Q. You wouldn't expect something in the neighborhood of a thousand?

A. No.

Q. What was the pressure that was first encountered when the wells were first drilled into the Mesaverde?

A. I believe they were in excess of eleven hundred.

Q. What causes the pressure in a formation? What factors come to bear?

A. I can think of a number of things, Mr. Carr. Certainly, you would want to consider the possibility of overburden. You might want to consider some hydrodynamic implications.

Q. But looking at the pressure data alone it would indicate to you a new reservoir?

A. I am not sure that I would say that, no.

Q. What sort of a flow rate did you say you encountered initially, what sort of a flow rate, natural flow rate?

A. In the Florance 29A?

Q. Yes, sir?

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A. We estimated up to forty million.

Q. If you have encountered a fracture, or El Paso has at this location, could that explain the high flow rate?

A. I misunderstood your question.

Q. Well, we have encountered, as you have testified, a high flow rate in this well?

A. Yes.

Q. And there are a number of possible reasons for this. Could one of those be encountering a fracture?

A. Yes.

Q. Were logs run on this well?

A. No.

Q. We are discussing the El Paso Howell K2A and there were no logs?

A. No.

Q. I would like to direct your attention to Exhibit Number Four. I would like to ask you to tell me when the Florance No. 40 was first completed? That's the second page of the exhibit, Mr. Castle.

A. 5/31/1965.

Q. '65, and I would like the same information on the next well, the Florance 32?

A. 10/6/1955.

Q. '55, and on the third page of your exhibit when

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was this well completed, the Florance 45?

A. February 15, 1954.

Q. 1954.

A. That information happens to be on the pressure versus cumulation curves.

Q. Okay. Fine, thank you. Now, as I look at these you are comparing the initial decline on the El Paso Natural Gas Howell K2 with the decline curves very much later in the life of the subsequent wells, is that true?

A. Yes.

Q. Now, as I look at the subsequent decline curves they seem to me to be certainly level except I would like for you to took at the third page of the exhibit, the Florance No. 32, and I would ask you to look at the decline prior to June of 1975.

Does that appear to you to be a fairly level decline curve to you -- sloping slightly down to the right?

A. After --

Q. Prior to --

A. Prior to '75?

Q. Yes.

A. I would say that it is probably in the neighborhood of six to eight percent decline if you interpreted only those two years.

Q. Well, if you would interpret '73 through '75, that

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is what you are saying?

A. Yes.

Q. What sort of a decline would you project if you interpret the decline from June of '75 to June of '77?

A. About twenty percent.

Q. So, it is a much steeper decline at that point?

A. Definitely.

Q. Let's do the same thing for the Florance 45. What sort of a decline would you compute from January of '73 to June of '75?

A. Oh, that would be about six percent, I would estimate.

Q. And what sort of a decline would you compute from June of '75 through June of '77?

A. Taking into account the first half of 1977, I would estimate probably around ten percent there.

Q. So, that is substantially a greater decline following the time that the El Paso Natural Gas Howell K2A Well was put on stream?

A. You could infer that if you would like.

Q. If you inferred that there was an increase in the decline following putting the El Paso well on stream couldn't you also infer communication?

A. I don't believe so, Mr. Carr.

Q. This wouldn't be evidence of that?

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A. No, sir.

Q. Would a flat decline be evidence of anything else?

A. Yes, I believe that would.

Q. Okay, what would it be evidence of?

A. The decline rate as I have demonstrated and discussed in my opinion indicates five point eight B.C.F. that has been produced from the El Paso well. That particular figure happens to be three times the total amount of production that we have produced from our three wells.

We were very concerned about the El Paso well but I can you tell you that I am reasonably comfortable with the situation.

We do not feel like we are being drained by that well. Those numbers are of such magnitude that if there was absolutely any communication at all it would have shown up dramatically in the three offset wells we are discussing.

Q. Now, when we talk about the Mesaverde formation we are talking about, as I understand it, a very tight formation?

How quickly do you encounter a response in an offsetting well?

In this case where you are producing the El Paso, how quickly would you anticipate seeing a response in an offsetting well?

A. I would think that the flow rates from the El Paso well would certainly suggest that there is absolutely out-

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standing permeability and transmissibility.

If that were true, and I believe it to be true, if it were in anyway hooked up either by a crack or by a fracture or by magic with the Cliff House, Menefee, or Point Lookout, it would have shown up immediately in one or more of the Florance wells. But it has not.

Q. And you do not believe that page three of Exhibit Four shows an immediate response to an offsetting well?

A. No, sir, Mr. Carr. If you recall --

Q. Thank you very much. I would like you to look at Exhibit Number Six which, I believe, is a cross section.

Whereabouts would the Lively well fall in respect to this if you were trying to place it on this -- off to the left? I know that is --

A. The Lively well is the second well from the left, Mr. Carr.

Q. Okay. Thank you. Where is it completed?

A. It is completed about, I would say, a hundred feet below the Bentonite Marker.

Q. That is below the top of the Cliff House?

A. I beg your pardon, sir?

Q. Is that within the Mesaverde as defined by the Oil Commission in Order Number R-5459?

A. I believe that it would be.

Q. Now, looking at this cross section could you point

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out to the Commission any evidence of a reservoir that could be the source of the volumes of gas that have been encountered in the Northeast Blanco Well Unit No. 69?

A. I am not familiar with a well No. 69.

Q. I am sorry, Well No. 64?

A. 64, because no logs were run on the Northeast Blanco No. 64, I feel somewhat of a loss to explain where it is coming from.

Q. Okay. Can you find any evidence of the source of the gas in the Florance 29A?

A. I would answer you in a similar fashion.

Q. And the Lively well the same?

A. No, I think the Lively well -- I think there is evidence to suggest on their logs there may be some sands there.

Q. There may be?

A. Uh-huh.

Q. Are you positive of that?

A. That is just an opinion.

Q. That's just your opinion? I direct your attention to your Exhibit Number Ten, that's the decline curve, and page one is the Tenneco Oil Company's Florance 29A.

What is the initial pressure that you reported there, about what, five fifty?

A. The initial pressure when the well was completed

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was in excess of five eighty.

Q. And after approximately a year's production, the second triangle on this, what was the pressure at that time?

A. Approximately five forty.

Q. Now, I would like -- five forty?

A. You will notice that the scale is two, four, six --

Q. So, it looks to me about four twenty -- but would you like to give the actual pressure you encountered there -- I am asking you about the second triangle from the right, what does that indicate?

A. The third pressure point that we have is four twenty, yes.

Q. Is four hundred and twenty. Now, I would like to go to the next page and ask you if you would indicate what the pressure is, the lowest most recent pressure, you indicated for the El Paso Natural Gas Company's Gartner No. 8?

A. Approximately four twenty-five.

Q. Four twenty-five. The same question on the Blackwood and Nichols Northeast Blanco Unit Well No. 103?

A. About four fifty.

Q. And the same on the last, El Paso Natural Gas Howell?

A. It looks like about four forty.

Q. Now, the last three wells that were referred to in

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this exhibit, these are Mesaverde wells?

A. Yes.

Q. Do you attach any significance to the fact that after being on production for one year the Florance pressures fall in line with the other Mesaverde wells?

A. No.

Q. You wouldn't. I direct your attention to your Exhibit Number Eleven. This is Tenneco's report, I believe, to the U.S.G.S., is that correct, on the well completion of the Florance 29A?

A. Yes, sir.

Q. What field or pool do you indicate you are producing from?

A. The Blanco-Mesaverde.

MR. CARR: I have no further questions of this witness.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Castle, referring back to Exhibit Number Ten, Mr. Carr asked you about a decline curve and he asked you whether you attached any significance to the fact that the pressures for the 29A Well appeared to have fallen in line with the other three Mesaverde wells and you said you attached no significance to it, why not?

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A. I believe that this is a natural phenomenon of this particular well. I don't think there is anything astonishing or significant about the similarities.

Q. In your opinion, Mr. Castle, based upon pressure information alone can you conclude as an expert witness that there is communication between the Florance 29A Well and the offsetting Mesaverde wells?

A. I would be the last person to tell you that.

Q. Why not?

A. There are too many things that can affect a pressure measurement without very stringent controls over the ways the pressure measurement is taken. The result can be very questionable.

It can depend on the amount of time the well has been left shut in. It could be very dependent on the type of gauge or measuring device that is used. It is very dependent on the natural permeability and transmissibility of the formation.

To take only a surface pressure without regard to possibly having fluid in the hole or other things, I would be reluctant to base much of a case on pressure, alone.

MR. KELLAHIN: I have no further questions of Mr. Castle.

MR. CARR: I have one more.

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RECROSS EXAMINATION

BY MR. CARR:

Q. I just want to be sure that I understand you. You said that because the Florance 29A had dropped in a year to about four twenty that you just felt that this was a natural phenomenon of the well?

A. Yes, I believe that's what I said.

Q. Isn't that a natural phenomenon of most of the Mesaverde wells, now?

A. Uh-huh.

MR. CARR: That's all.

MR. RAMEY: Any other questions -- Mr. Kendrick?

CROSS EXAMINATION

BY MR. KENDRICK:

Q. As a Geological Engineer, is it your -- or do you follow the theory that directions of fractures in a fractured reservoir would be at right angles to the axis of the major fold in a situation similar to the San Juan Basin?

A. I am not sure that I can answer you, Mr. Kendrick, I don't know.

Q. In your studies of this area have you found any indication that there might be fractures oriented in any directions?

A. No, sir, I don't think I have found that.

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Q. Assuming that the three wells that we have discussed today, being the El Paso Howell K2A and the Tenneco Florance 29A and the Northeast Blanco Unit No. 64, are encountering fractures, is there any way known at this time to measure the length of those fractures horizontally?

A. Well, we are presuming there are fractures and I don't know that I would agree with that.

Secondly, I don't know how in the world you would measure them to be honest with you.

Q. With an unknown amount of reservoir available to a fracture would it be possible for the effective thickness of pay to be several miles in a fracture system?

A. A single fracture?

Q. Yes.

A. It would probably have to be quite extensive if it were one single fracture.

Q. Is it possible for a fracture to extend for a mile or more?

A. I guess so.

Q. In that case, then, the affect of drainage of gas from a well in that fracture would not necessarily be to the immediate offset well but it could be to a well two or more rows of wells distant, couldn't it?

A. I would answer you in that perhaps the decline in pressure from the Northeast Blanco 64 Well which has not

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produced, you might be able to infer that production from the Florance 29A is depleting that -- to that extent.

Q. And not affect the wells to the immediate west or south or east or north from that same location?

A. Certainly doesn't appear to, in my opinion.

Q. You indicated that you studied the wells in the four townships here and have not found any reasonable indications of fractures in the Mesaverde, itself.

Have you studied Tenneco's Prichard 2 Well over in Section 1 of Township 30 North, Range 9 West?

A. I believe w. have looked at it, Mr. Kendrick, yes, sir.

Q. And its cumulative production as of the first of the year was approximately forty-four billion cubic feet?

A. Yes, sir, that's correct.

Q. And this is coming from a tight reservoir?

A. No, sir, Mr. Kendrick, that well did not get to the Cliff House. It is another well that is completed out of the Lewis-Chacra equivalent.

Q. I believe if you will study the records that Tenneco deepened that well to beyond the Cliff House --

Also, in that same township I think you will find that El Paso's Shaw 1R in Unit A of Section 13 which in about four years has produced twenty-four and a half billion cubic feet -- would that well be producing from a tight formation?

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A. If my memory serves me correctly that particular well is perforated below the Point Lookout, only.

Q. I am not sure what the interval is that it was drilled through -- the Mesaverde interval -- it was completed in the Mesaverde Pool and generally, too, this doesn't represent --

MR. RAMEY: Are you testifying, Mr. Kendrick?

MR. KENDRICK: It seems that I was testifying.

MR. KELLAHIN: For purposes of the record, Mr. Commissioner, I would move that Mr. Kendrick's testimony be stricken.

MR. RAMEY: I think if you would like to rephrase your testimony in the form a question we would permit it into the record, Mr. Kendrick.

Q. (Mr. Kendrick continuing.) On your exhibit -- the first cross section that was shown in the area of the El Paso Natural Gas Company's Howell K2A, do you have anything on the logs on each side of that well that would imply a reservoir or a portion of a reservoir at a depth equivalent to the Howell K2A that would contribute gas to that well?

A. No, sir, and we have looked awfully hard for it, I'll guarantee you.

Q. And on your cross section that is currently exhibited on the board do you have any evidence of reservoir in any of the logs surrounding the Florance 29A and the Blanco -- the Northeast Blanco Unit No. 64 Well which would indicate

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a reservoir or a portion of a reservoir that would supply gas at that interval?

A. No, sir. I don't see anything.

MR. KENDRICK: That's all of the questions that I have.

MR. STAMETS: Mr. Commissioner, I have some questions.

MR. RAMEY: Mr. Stamets.

CROSS EXAMINATION

BY MR. STAMETS:

Q. I don't have the number of the exhibit -- this is the one that has the pressure decline curves starting with the Florance 29A.

A. It is Number Ten.

Q. Okay. Number Ten, I went through there and it looks to me as though the pressure decline rate on three of the four wells shown on that exhibit is about one billion per one hundred pounds pressure drop.

If that is correct is there any significance to that?

A. No. That is the purpose of the graph to demonstrate that --- graphically showing what you have just described.

Q. If you have got this Florance 29A well producing about the same amount of gas per every one hundred pounds of

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drop, as two of the other three wells surrounding it, is there any significance to that? Would that be indicative that they are a part of the same pool or not in the same pool?

A. I would not see any significance to that.

Q. Then, why did you present this exhibit?

A. My purpose for presenting this particular exhibit was to show that, first of all, what the ultimate production of each of the wells would be.

Secondly, with regard to the three offsets to this particular well, the production from the Florance 29A is approximately one point two B.C.F.

That figure is more than the total production for the three offsets.

Now, if the one point two B.C.F. that has been produced in a little over a year out of the Florance 29A, if that well were in any way connected to the Cliff House, Menafee or Point Lookout as the three offsets are completed in, certainly it would have shown up on one or more of these curves.

The purpose of these exhibits to show that that is not the case. Production from the Florance 29A is in no way affecting the performance of the three immediate offsets.

Q. What you are saying is the fact that the pressures on 29A is falling in line with the pressures on the offset

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wells and the production rate is falling in line with the production rate of the offset wells and that has no significance whatsoever?

A. You made a statement that the production rate has fallen in line with the other three wells. I don't believe that is the case.

Q. Excuse me. Two of the other three wells.

A. Maybe -- no, I don't attach any significance to that.

MR. STAMETS: That's all.

MR. RAMEY: Any other questions of the witness? Mr. Arnold?

CROSS EXAMINATION

BY MR. ARNOLD:

Q. Mr. Castle, the Howell K2A has produced about, what, five point eight billion cubic feet of gas which indicates that there is the existence of a real good reservoir, I think.

What in your mind is your opinion of what the nature of this reservoir is?

A. I would think, Mr. Arnold, in this case, and this again is just a personal opinion, but I could envision a volume of Lewis Shale that is highly fractured.

The volume would be sufficient to contain approximately sixteen billion cubic feet of gas.

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I would envision, furthermore, that because we do not see any interference from this well that jumbled-up pile of fracture Lewis Shale is completely enclosed by a non-porous, non-permeable, non-fractured shale.

Q. Isn't it rather difficult to conjure up a set of mechanics which would arrive at that conclusion in a reservoir?

A. Well, I like to think that I am creative. I don't know how in the world --

MR. ARNOLD: That's all.

MR. RAMEY: Any other questions of the witness? He may be excused and we will take a fifteen minute break.

(THEREUPON, the hearing was in recess and the witness was excused.)

MR. RAMEY: The hearing will come to order. Mr. Carr, would you like to proceed?

MR. CARR: I would call Mr. Charles Blackwood.

CHARLES F. BLACKWOOD

was called as a witness by the protestants, and having been first duly sworn, testified upon his oath as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

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Q. Would you please state your full name for the record?

A. Charles F. Blackwood.

Q. Mr. Blackwood where do you reside?

A. Oklahoma City, Oklahoma.

Q. By whom are you employed?

A. I am an independent engineer and one of my employers is Blackwood & Nichols Company.

Q. Have you previously testified before this Commission and had your credentials accepted and made a matter of record.

A. Yes.

Q. What is Blackwood and Nichols' interest in this case?

A. Blackwood and Nichols is the operator of the North-east Blanco Unit, approximately a thirty-three thousand five hundred acre area, in the San Juan and Rio Arriba Counties, New Mexico.

As operator, we drilled the Well 64 which started all of the controversy.

Q. And you are familiar with the Northeast Blanco Unit and the general area?

A. Yes.

MR. CARR: I would tender Mr. Blackwood as an expert in Geological Engineering in addition as a witness that is

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knowledgeable as an agent-operator.

MR. RAMEY: We will consider Mr. Blackwood qualified.

Q. (Mr. Carr continuing.) Mr. Blackwood, I would like to direct your attention to the Northeast Blanco Unit and I have a couple of brief background questions.

When was the Northeast Blanco Unit created?

A. It was created in July of 1951.

Q. And has the Mesaverde participating area been extended since the initial creation?

A. Yes. There have been -- first of all, the participating area for the Mesaverde was formed and there have been five extensions in the area of the Mesaverde participating area up until the entire thirty-three thousand five hundred acres, which was in the original operating agreement, was included.

The final enlargement occurred in August of 1961, when the whole area was covered.

Q. In the application for enlargement of the participating area how was the term "Mesaverde" defined?

A. Well, no definition of Mesaverde was included in the original operating agreement or in the original application to form a Mesaverde participating area.

I could say that -- I will give you the details of what modifiers have been used after the term "Mesaverde"

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throughout the application for the unit.

When the original Mesaverde participating area was formed the term "Mesaverde zone" was used in the body of the application.

Each of these applications had, also, a geological report or memorandum and in the geological report the term "Mesaverde formation" was used in the initial application, when the Mesaverde was first formed.

Now, in the first enlargement, again, there was no definition of the term but the term "Mesaverde zone" was used in the body of the application. The term "Mesaverde group" was used in the geological report.

In the second enlargement, again, no definition. The terms "Mesaverde zone" and "Mesaverde formation" was used in the body of the application.

The terms "Mesaverde horizon" and "Mesaverde group" were used in the geological reports attached thereto.

In the third enlargement the term -- again, no definition was given. The term "Mesaverde zone" and the term "Mesaverde formation" was used in the body of the application.

The term "Mesaverde group" was used in the geological reports.

In the fourth enlargement, again, no definition but the term "Mesaverde zone" and the term "Mesaverde formation"

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was used in the body of the application. The term "Mesaverde group" was used in the geological memorandum.

In the fifth and final enlargement still no definition. The terms "Mesaverde zone" and "Mesaverde formation" were used in the body of the application and the terms "Mesaverde series" and "Mesaverde zone" and "Mesaverde horizon" were used in the geological memorandum.

Q. What was the point of using all of these various modifiers for the term "Mesaverde"?

A. The point in using all of the different modifiers to the term "Mesaverde" is that the unit operators and the unit participants did not have in mind limiting the term "Mesaverde" to something less than the entire Mesaverde group.

With the use of all of these terms we intended that the broadest and most inclusive definitions would be applicable.

Q. What interest does Blackwood and Nichols have in the Northeast Blanco Unit?

A. Blackwood and Nichols, Co., Ltd., control approximately thirty-one percent of the acreage in the unit.

Q. Do you happen to know what interest Tenneco and Conoco have in the unit?

A. Tenneco and Conoco, each, control approximately one point four percent interest in the unit.

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Q. Do you happen to know how Tenneco's and Conoco's interest was acquired?

A. Yes. Tenneco and Conoco bought out the interst of Delhi-Taylor Oil Company. This occurred some thirteen years after the unit was formed and I can find the date of that purchase. It was approximately in 1965, when Tenneco and Conoco purchased the Delhi-Taylor interest.

Q. Mr. Blackwood, when was the Florance 29A well drilled and completed?

A. It was drilled in August of 1975, completed in August of 1975.

Q. And was this an infill well?

A. Yes, it was drilled as an infill Mesaverde well.

Q. And has this well been producing?

A. Yes. The well has been producing for about a year and a half, now. I think its first production was February of '76.

Q. I would direct your attention to what has been marked for identification as Blackwood and Nichols' Exhibits Two and Three and ask you to explain to the Commission what they are and what they show?

A. The exhibit marked Exhibit Two is a copy of the completion or reccmpletion report on the Tenneco 29A well.

I believe Tenneco has already entered a copy of this same completion report into evidence.

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Q. And on these official forms how was the production reported to the Oil Conservation Commission, under what formation?

A. It is under Section 10, Field or Pool, and it is reported as the Blanco-Mesaverde Field.

Q. When was the Northeast Blanco Unit 64 Well drilled?

A. That's on Exhibit Two. On Exhibit Three, we should also under the name of the producing formation, under Section 4, the name of the producing formation is given as Mesaverde.

Q. Would you identify what has been marked as Exhibit Three, what form is it?

A. Exhibit Three is the request for allowable authorization to transport oil and natural gas, Form C-104.

Q. When was the Northeast Blanco Unit Well 64 drilled and completed?

A. It was drilled in August of 1976.

Q. Was this an infill well?

A. Yes, this was a required offset to the Florance 29A, Mesaverde infill well.

Q. Who drilled the well?

A. Blackwood and Nichols as the unit operator drilled it on behalf of the unit.

Q. Who paid for the well?

A. The well was paid for by each of the various owners

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of the Northeast Blanco Unit in proporation to their ownership.

Q. I ask you to refer to what has been marked for identification as Blackwood and Nichols' Exhibits Four and Five and explain to the Commission what they are and what they show?

A. Exhibit Four is the Blackwood and Nichols Company plan of development for the calendar year 1976.

Each year as unit operator Blackwood and Nichols is required to submit -- first required -- agreed with the various owners of the unit on what new wells would be drilled in the following year.

Prior to the first of that year submit a plan of development for the entire thirty-three thousand five hundred acre unit.

This is Blackwood and Nichols' plan of development for 1976.

Q. What is Exhibit Number Five?

A. Exhibit Number Five is the letter from the United States Department of Interior Geological Survey approving of the Northeast Blanco Unit's 1976 Plan of Development and setting out therein that the Well 64 is and I quote from the second paragraph, "An offset obligation to Tenneco Oil Company's well, Florance 29A, located in the northwest quarter of Section 25, Township 30 North, Range 8 West."

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Q. So, is it fair to say that the unit was compelled to drill an offset well to protect from drainage in the Mesaverde which would result from the completion of the Florance 29A?

A. Yes.

Q. When did you first encounter a problem with the definition of the Mesaverde?

A. We first encountered our problem upon our filing our completion reports on the No. 64 Well.

Q. How did that problem come about?

A. We filed a completion report stating that the well was completed as a Blanco-Mesaverde infill well. We received, then, returned from the Oil Conservation Commission with a line drawn through the Blanco-Mesaverde Field and a redesignation, actually, it said in that same black pen "Chacra undesignated". This started the problem.

Q. How did Blackwood and Nichols respond to this action of the Oil Conservation Commission?

A. We first researched all of our previous applications to see if we did not have a definition of Mesaverde anywhere in the application.

Our research proved that we, indeed, did not have a definition in any of the applications for the unit or the Mesaverde participating area.

Q. Did Tenneco respond to this situation?

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A. Yes. Shortly after we had received the completion form back from the Oil Conservation Commission we received a letter from Tenneco stating that they believed the well to be a Chacra well and that it was not a part of the Mesaverde and therefore they requested that we form a one hundred sixty acre Chacra participating area and give the well to Tenneco and Conoco.

Q. Did you follow their request in their letter?

A. No. Our response was to try to write a proper definition of the term "Mesaverde" and we employed myself and a Mr. W. J. Hildwick, an eminent geologist and researched the literature and came up with what we felt was a reasonable definition of the term "Mesaverde" to be used for the Northeast Blanco Unit so that confusion like this would not occur again in the future.

After having written this definition we called a meeting of the Northeast Blanco Unit advisory committee which is all of the various owners and at that meeting we informed Tenneco that we did not agree that the well was not a Mesaverde well.

We believed that it was, indeed, producing from an interval within the confines of the Mesaverde group.

We adopted a definition for Mesaverde at that time by a vote which was more than adequate by the unit rules to bind that definition to be used for the Northeast Blanco

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Unit.

Q. What percentage vote is required to take an action for the unit?

A. Sixty-five percent.

Q. And who consented to the resolution?

A. Essentially all of the owners. If you want to know precisely I can get the minutes and tell you.

Q. That's not necessary.

A. Blackwood and Nichols and Amoco and Westland Oil and a few other minor owners consented at that point.

Q. Who did not consent, do you know?

A. The main persons not consenting were Tenneco and Conoco and El Paso at that time.

Q. Has El Paso since consented to the action?

A. Yes, El Paso has since consented.

Q. What did you do with the resolution or the recommendation that you adopted at the advisory committee meeting?

A. We forwarded copies of our definition to the U.S.G.S. and to the Oil Conservation Commission asking for their approval.

Q. And a copy of what you forwarded is marked as Exhibit Number One, is that correct?

A. Yes, this is a copy of the definition that we adopted at that advisory committee meeting.

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Q. On receiving your recommendation what action did the Oil Conservation Commission take?

A. The Oil Conservation Commission called for a study committee to be formed to study what a proper definition of the Mesaverde should be and wrote letters to most of the major operators in the San Juan Basin who, indeed, were active and had Mesaverde producing wells and formed a study committee to study this problem.

Q. Did you serve on this special committee?

A. Yes, I did.

Q. And what efforts did this advisory committee undertake for the Commission?

A. Well they, again, researched the literature for the meaning of Mesaverde. They used the combined talents of the geologists from many companies. I might read off the list of companies if anybody is interested but various companies participated and cross sections were drawn across the basin showing that an upper sandstone called the Chacra pinched out as it went northeast and a line was established saying that there was no Chacra sandstone north of that certain line.

A top was chosen and a base and in effect the study committee after meeting several times from December through March -- December '76 through March '77, wrote a definition and on the Commission's motion a hearing was held

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on March 23rd, and the evidence was presented by various people showing what a proper definition of the Mesaverde should be.

That definition was later adopted by order.

Q. That was Order R-5459, is that correct?

A. That's correct.

Q. Following the Commission's actions did the Northeast Blanco Advisory Committee take any action concerning the new definition of the Mesaverde?

A. Yes. After Order R-5459 -- or after the hearing -- after the order was issued, after the Order R-5459 was issued, we compared it with the definition which we had previously submitted and found that it was very similar and the advisory committee adopted the definition in Order R-5459 to be the definition used in the Northeast Blanco Unit.

Q. I would like to direct your attention for a moment to definitions used for the Mesaverde. How did the Oil Conservation Commission originally define the Mersaverde prior to the time of this controversy?

A. Well, the definition was in Order No. 799, and the definition -- well, I am quoting from the abstract of that order which came out of the Order 5459.

The vertical limits of the Blanco Mesaverde Pool as the "forty-two hundred to fifty-one hundred feet productive

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horizon where the productive sands are contained between the top of the Cliff House sand and the base of the Point Lookout sand of the Mesaverde."

Q. What was the definition adopted by the unit advisory committee as to the definition of the Mesaverde?

A. The original definition or the definition of Order 5459?

Q. No, the original definition?

A. Of course, the first definition was that which we made in our application and it was -- do you want me to read this whole thing?

Q. No, I do not.

A. Okay, I am not sure what you are asking for, then. Do you want me to read a lengthy definition or --

Q. Did the advisory committee adopt, initially, a definition for the Mesaverde that they proposed to regulatory agencies?

A. Yes.

Q. And did that include certain depths that they recommended to be included in the Mesaverde?

A. We asked for approval of a definition which used a Green Marker horizon as the top of the Mesaverde and that was shown at a specified depth on a certain log. The log of the Northeast Blanco Unit Well 34-19.

We used a Green Marker horizon for the top which

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occurred at a point of about four thousand and sixty feet -- no, let's see, where is it -- yeah, approximately four thousand and sixty feet.

Then, I see that more precisely it is four thousand fifty-four feet, the base of the Green Shale Marker.

Then, we used as the base of the Mesaverde two hundred feet below the base of the Massive Point Lookout sandstone member. Again, on this same log that occurred at six thousand and seventeen feet on the Well 34-19.

Q. What definition of the Mesaverde was adopted, generally, in Commission Order Number R-5459?

A. 5459 adopted as the top of the Mesaverde the Huerfanito Marker which as a point of explanation, the Huerfanito Marker is a time marker which is recognized in the literature as being approximately occurring at the same time throughout the basin.

The upper portion of the Mesaverde is a series of transgressive-regressive sands that are somewhat difficult to pin down so this Huerfanito Marker is one of the best markers which can been seen throughout.

Our marker which we had used in the northeast area, the Green Shale Marker, which occurs approximately a hundred feet deeper than the Huerfanito Marker. But, again, it is a localized time marker which occurs in the area of the Northeast Blanco Unit.

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So, that on the top of the Mesaverde the study committee included approximately one hundred feet of interval above the top that we had planned using in our previous definitions.

Now, on the base we had recommended that the base be called two hundred feet below the base of the Massive Point Lookout sandstone member.

It was pointed out during this study committee meetings that an easier definition, easier to find, would be five hundred feet below the top of the Massive Point Lookout standstone member -- the top being easier to define than the base -- because of the same transgressive-regressive nature of the sandstone.

The base of the Point Lookout sandstone is not as easy to find as the top. But again, this generally covers the entire area that our definition would have covered.

Q. Now, a copy of Oil Conservation Commission Order R-5459 has been marked for introduction into this case as Blackwood and Nichols Exhibit Number Six, is that correct?

A. Yes.

Q. At what interval was the Northeast Blanco Well No. 64 completed?

A. It was completed at approximately four thousand two hundred and fifty feet.

Q. Were all of the definitions that you have testified

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to previously -- in what formation was this well completed?

A. In the Mesaverde formation.

Q. Mr. Blackwood, you have testified that you are familiar with this application of Tenneco's?

If the application is granted what effect would it have on Blackwood and Nichols as the unit operator?

A. Well, there would be two immediate effects. Tenneco and Conoco would become the owners of the No. 64 Well. It would cause the creation of a reservoir where we think no reservoir exists and that would bring up the probability, if not certainty, of demand offsets to a non-existing reservoir which we think would cause great economic hardship and waste.

Q. Do you belive that any of these offsets would produce in commercial quantities?

A. My study would indicate that there is a fracture system that runs southwest-northeast above the top of the Massive Cliff House sandstone member and the wells -- all wells off of this southwest-northeast line would likely be dry holes.

The only possible location we have which might encounter this same fracture system is under water at the Navajo Reservoir.

Q. In your opinion are these unnecessary wells?

A. Yes.

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Q. Would this result in economic waste?

A. Yes.

Q. If you did encounter production would you be drilling to a new source of supply or a common source of supply?

A. We would be drilling, in my opinion, to the Mesaverde -- the same source of supply.

Q. If this application is denied in your opinion what effect will it have on Tenneco and Conoco?

Will they share in production from the unit well?

A. Yes. There would be no ownership changes involved. Tenneco and Conoco would own their same interest in both of the wells as they were drilled.

Q. If the application is denied will the unit well, No. 64, be produced under the -- under what pool rules?

A. Under the Blanco Mesaverde Pool rules.

Q. If the application is granted what rules would it be produced under?

A. Some new pool would have to be established and new rules made.

Q. If you have a common source of supply is it fair to say that different wells would be produced under different rules?

A. Yes. In my belief this is all one common source of supply and if another pool were created by administrative

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action we would have created approval for a non-existing reservoir.

Q. In your opinion would this impair correlative rights?

A. Yes.

Q. In your opinion would the denying of the application impair correlative rights?

A. Denying the application would be good for correlative rights -- it would protect correlative rights.

MR. CARR: At this time I would offer Blackwood and Nichols' Exhibits One through Six.

MR. RAMEY: They will be admitted. Are there any questions of the witness?

MR. KELLAHIN: If the Commission, please --

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. The Blanco-Mesaverde No. 64 Well was being drilled during what period of time, Mr. Blackwood?

A. During August of 1976.

Q. While drilling of this well it is my recollection that you experienced a blowout, did you not?

A. Not really a blowout.

Q. High volume --

A. Experienced a high volume gas flow, yes.

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Q. At about what point of the drilling of the well did you experience the high volume gas flow?

A. Approximately forty-two fifty.

Q. Okay. At the time that that occurred did you or any employee or agent of Blackwood and Nichols, to your knowledge, contact the Oil Conservation Commission or any of its employees with regards to what zone or formation you were experiencing the high gas flow?

A. To my knowledge we did not.

Q. Okay. You said earlier under direct examination that at the time the well was drilled or was being drilled the Oil Commission informed you that this was a Chacra formation?

A. No, after.

Q. All right. At what point did the Oil Commission inform you, to your knowledge, that they believed this to be a Chacra completion?

A. My understanding of this is that when we filed our completion report.

Q. Do you recall when that was filed?

A. Let me look -- the date will be here -- just a minute, let's see -- I will have to look through this and find it --

The date was approximately the last part of August or September in '76 --

MR. RAMEY: Would that be sufficient for you, Mr.

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Kellahin?

MR. KELLAHIN: No, sir, I would like to know what date -- when it was filed.

A. Okay. I don't know if I have a copy of that particular form here. We could probably go to the Commission's records -- or maybe Mr. Welch has one --

Q. (Mr. Kellahin continuing.) If I understand you correctly, towards the end of August of 1976, at whatever date you filed the completion report, that it was after that date that you became aware that under --

A. Excuse me, I have found the date -- the date was August 9th. The well completion was filed, 9330, it was filed on August 9th.

Q. All right. That after August 9th, 1976, you became aware that under the existing definitions for the Blanco-Mesaverde Pool rules, and that was Order No. R-799, that the completion of this well was in a zone other than the Blanco-Mesaverde Pool?

A. We received the information that that was an interpretation.

Q. That is what the Commission told you?

A. That was the Commission's interpretation at that time.

Q. And that prior to August 9th, 1976, you had no knowledge that the well completed at a depth of forty-two

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hundred and fifty feet would not be in the Chacra formation? That was your testimony earlier, I believe.

A. Would you repeat that?

Q. I asked you when you first became aware that the Commission felt this to be a Chacra completion and you told me only after filing the completion report on August 9, 1976?

A. Correct.

Q. So, I can conclude then that prior to that date you had no knowledge that the Commission believed this to be a Chacra completion?

A. Right.

Q. All right. At the time this was filed and subsequently you indicated under direct examination that you received a letter from Tenneco Oil Company.

I show you what I have marked as Tenneco's Exhibit Number Twelve, which is a letter, Tenneco letter, dated September 20, 1976, and ask you if you can identify that letter?

A. This is the letter that I referred to previously as having been received from Tenneco.

MR. KELLAHIN: If the Commission please, I move the introduction of Tenneco's Exhibit Number Twleve.

MR. RAMEY: It will be admitted.

Q. (Mr. Kellahin continuing.) You indicated that the

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unit paid for the No. 64 Well.

At what point did the unit participants pay for the well?

A. Well, when were they billed -- I believe, actually, some of the casing was purchased prior to drilling and the rest of the payments were made shortly after the well was completed and the bills were received from the various third party contractors.

Q. Do you know if those bills went out before or after you received notice from Tenneco that they believed this to be a Chacra well?

A. I would have to go to our accounting and see. I am sure some bills went out prior and some went out later depending on when they were received from the various third party services.

Q. I understood from your direct examination that in response to Tenneco's letter of September 20, 1976, your action was to seek a rewriting of the definition of the Blanco-Mesaverde Pool as to the definition for the vertical limits?

A. Our response was to define the Mesaverde because we had not -- no definitions for it were in our agreement.

Q. You had a definition for it under the existing Oil Commission rules as to what the Blanco-Mesaverde Pool was?

A. Yes, they had a definition. That definition or

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any other hadn't been adopted on behalf of the unit.

Q. Did you make a direct response on behalf of Blackwood and Nichols to Tenneco's letter of September 20, 1976?

A. We made no written response. We talked with Tenneco's representatives at the advisory committee meetings. But we did not write anything to Tenneco in response to that letter.

Q. Mr. Carr asked you some questions about the extent of the Blanco-Mesaverde Pool in terms of vertical feet.

I believe you said that it was the zone between forty-two hundred feet and fifty-one hundred feet?

A. That was the Order 799.

Q. Okay.

A. That definition was written, to my understanding, when only four or five wells had been completed in the Mesaverde back in 1951. That's one of the reasons it has been found to be totally inadequate.

Q. In your opinion are there Blanco-Mesaverde wells at depths above the forty-two hundred foot interval and below the fifty-one hundred foot interval?

A. Yes.

MR. KELLAHIN: I have no futher questions. Thank you.

MR. RAMEY: Any other questions of the witness?

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CROSS EXAMINATION

BY MR. ARNOLD:

Q. Mr. Blackwood, I take it it is your opinion that the resolution of the problem at hand is really more of a legal problem than an engineering and geological problem?

A. No. It is that, of course, because if a new reservoir is created we think that would be just that, it will be an administrative creation of a reservoir.

Our study and the study group who studied the Mesaverde found that there is no major thick, porous, gas-containing sandstone up in this interval above the top of the massive sandstone member of the Cliff House.

That it is basically shale with thin sand and siltstone stringers and that none of us have been able to discover a large tick porous sandstone which might contain the volumes of gases which have been produced.

It is our belief and we will offer some more engineering testimony, Mr. Walsh, will offer more engineering and geologic testimony and I may be back on later.

We will offer that later to show that we believe the pressures conclusively show that the Florance 29A Well is in pressure communication with the surrounding wells and we believe that we can show by Tenneco's own exhibit that the pressures indicate that that El Paso well is in pressure communication with us.

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We believe that the pressures definitely prove that there is communication between all of these wells. But I am not going to do that right at this moment. That would be Mr. Walsh's testimony.

Q. I wasn't intending to draw you out on engineering testimony at the moment.

Let me ask you another question, just a little different. What if it could be definitely proven that separate sources of supply exists within whatever the vertical limits are defined to be -- do you still think that no separate pool should be established if that was done?

A. I think that that would likely cause the establishment of separate pools -- would like cause economic waste in that -- to take this area as an example.

If we created -- if the Commission would create a two-well pool and write different rules for it, then, you expand the problem of offset.

It appears to me that it would be most likely that if not an operator a landowner would come in and demand that he would have an offset well drilled to this new pool which has been created.

In most instances this area has already been surrounded by holes and gas was not encountered at this interval.

What is likely to occur in my opinion is the drilling

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of a bunch of dry holes.

I think that that would be economic waste.

MR. ARNOLD: Thank you. That's all I have.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Blackwood, the Commission has redefined the Mesaverde to include this zone?

A. Yes, sir.

Q. So, if a new pool were created wouldn't it, in fact, the pool would only cover this area and any drilling outside the area would be Mesaverde, so that, in effect, there would not be any offsets?

A. I don't know. I suppose that would be in the way the order would be drawn or written. But I would assume, for example, that if I was an offset acreage holder and I was told that these two wells are separate pools and that separate rules be made, it seems logical to me that the landowner adjacent would demand an offset well be drilled.

I can't speak with any authority on that but certainly it seems to be a likelihood.

Q. I would think that that would not be so. I would think you would not have any offset obligations and these zones would be covered in new wells in the Mesaverde?

A. I suppose an order could be written in that manner

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saying that all wells in the future would be considered as a part of the Mesaverde and if an order were so written that might alleviate that problem.

Q. I think an order has been written that says that.

A. Well, those are the two wells that have gained exceptions, the Lively well or something --

Q. Yes.

A. Yes, that's good. I have not seen that order.

Q. I think our Order R-5459 does, in effect, state that -- that any future wells that will be drilled will be -- Mesaverde wells will be -- the upper fracks and the lower fracks.

A. Well, if that's everyone's interpretation I think that is good.

MR. RAMEY: Any other questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. CARR: I would call Mr. E. M. Walsh.

EWELL N. WALSH

was called as a witness by the protestants, and having been first duly sworn, testified upon his oath as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

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Q. Would you tell us your full name?

A. My name is Ewell N. Walsh.

Q. And where do you reside?

A. 925 East Navajo, Farmington, New Mexico.

Q. By whom are you employed?

A. Walsh Engineering and Production Corporation as President.

Q. Mr. Walsh, have you previously testified before this Commission and had your credentials accepted and made a matter of record?

A. Yes, I have.

Q. Are you familiar with the Northeast Blanco Unit?

A. Yes, I am.

Q. Are you familiar with the subject matter of this case?

A. Yes.

MR. CARR: I would tender Mr. Walsh as an expert witness as a Petroleum Engineer.

MR. RAMEY: You may proceed. We consider Mr. Walsh qualified.

Q. (Mr. Carr continuing.) Mr. Walsh, would you please refer to what has been marked for identification as Exhibit Number Seven and explain to the Commission what it is and what it shows?

A. Exhibit Number Seven is a map indicating the wells

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within portions of Township 30 North, Range 8 West.

The symbols on the map indicate a Mesaverde gas well and the information above the symbol is the completion date and the information below the symbol is the I.P. and whatever M.C.F. that is reported is the initial potential and the calculated absolute open flow.

On this map located in the southwest quarter of Section 24, Township 30 North, is the Blanco -- the Northeast Blanco Unit Number 64A Well.

Also, within this section in the southwest quarter is a well indicated there by the No. 1G. This is now the Northeast Blanco Unit Well No. 103.

The well located in the northeast quarter of 24 of the same section indicated by the No. 43-2 is now the Northeast Blanco No. 105.

Bordering this section you will note a shaded line and this is the boundary of the Northeast Blanco Unit.

Also, on this map the other subject well, the Tenneco 29, Florance 29A, is located in the northwest quarter of Section 25, Township 30 North, Range 8 West.

Q. Would you now refer to what has been marked as Exhibit Number Eight and explain to the Commission what it is and what it shows?

A. Exhibit Eight is a cross section prepared by Blackwood and Nichols personnel and along with Exhibit Eight

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there is Exhibit Eight A which indicates the wells from which this cross section was prepared.

These wells are, starting with Well No. 1, the furtherest southwest well, the E.P.&G. Gartner No. 7, located in the southwest quarter of Section 26, Township 30 North, Range 8 West.

Well No. 2, the E.P.&G. Gartner No. 8, located in the northeast quarter of Section 26, Township 30 North, Range 8 West.

Well No. 3, the Tenneco Florance 29A, located in the northwest of Section 25, Township 30 North, Range 8 West.

Well No. 4, the Blackwood and Nichols northeast Blanco Unit No. 103, located in the southwest quarter of Section 24, Township 30 North, Range 8 West.

Well No. 5, the E.P.&G. Howell No. 2L, located in the northeast quarter of Section 25, Township 30 North, Range 8 West.

Well No. 6, the Blackwood and Nichols Northeast Blanco Unit No. 64A, located in the southeast quarter of Section 24, Township 30 North, Range 8 West.

Well No. 7, the Blackwood and Nichols Northeast Blanco Unit No. 105, located in the northeast quarter of Section 24, Township 30 North, Range 8 West.

The last well No. 8, the Blackwood and Nichols Northeast Blanco Unit No. 34, located in the southwest quarter

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of Section 19, Township 30 North, Range 7 West.

This map was prepared basically for correlation purposes.

The datum that was used in the preparation of this map was the Huerfanito-Bentonite Marker.

Also, above this datum is indicated the top of the Pictured Cliffs sandstone. Below is indicated the top of the Point Lookout sandstone and off to the right and left you will see an interval there underlined in red which is marked the Mesaverde producing interval.

This is as per the Commission's Order 5459 and these intervals are included.

On each of the logs or the schematics of these wells in the places where the logs were not run are indicated the producing interval underlined in green.

The reason for not having the logs especially for the Northeast Blanco Unit No. 64A and the Tenneco 29A was due to these wells encountering a high rate of flow gas while drilling and production casing was run without attempting to run logs.

The Northeast Blanco Unit No. 64A, there is a plot of drilling time which was utilized to correlate the well bore to the offset logs.

I would like for you to note that, in general, these intervals in this short distance of two and a half miles

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are relatively the same between the wells from one end to the other.

The high rate of flow of gas is encountered in the Northeast Blanco Unit No. 64A. In my opinion this has to come from a fracture system.

I have examined these offset logs and there is no indication in these offset logs which are our only tool in this case to try to determine where this gas came from.

There is a quality of a reservoir with the permeability of a sandstone reservoir with the permeability as high as can give these flow rates of gas in the San Juan Basin and the cretaceous interval -- production with the exception of where you have fracturing coming from these sands is low -- initially or under natural flow conditions.

The wells, these producing intervals, throughout the basin have to be stimulated, now, by hydraulic fracturing and creating an artificial fracture in order to effectively produce the gas in the reservoir.

Fractures, using this term fracture, I would say could occur anywhere within the redefinition of the vertical limits of the Mesaverde.

I don't believe you can correlate -- you can find that you can go from one well to the next with respect to the fracture and it will be in the same place.

This is probably a matter of tectonics in which

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fractures were originated.

This is evidence due to the structure datum or the difference in depth between which the Northeast Blanco No. 64A encountered this fracture and the Tenneco Florance 29A and this is why structurally-wise the Tenneco well encountered this high rate of flow some two hundred and eighty feet deeper than the Northeast Blanco Unit well.

Using the production and vertical limits redefined by the Commission even using the old definition of Order R-799, in which the limits of the Blanco-Mesaverde were to occur between the depths of forty-two hundred feet and fifty-one hundred feet would even fit.

So, these two wells were in production showing it in the Mersaverde formation.

Q. Will you please refer to what has been marked for identification as Exhibit Number Nine and tell the Commission what it is and what it shows?

A. Exhibit Nine is a pressure datum map on which are indicated four of these Mesaverde wells in the same portions of Township 30 North, Range 7 and 8 West, and the 1976 shut in pressures from the deliverability tests.

Now, this is what pressure is called PC and on the test this is the highest pressure of either the tubing or casing whichever is recorded the highest.

You will note that in the southeast quarter of

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Section 24, Township 30 North, Range 8 West, there is a circle. This is the location of the Northeast Blanco Unit No. 64A.

The pressure is not indicated for this well because it has not been tied in or produced to obtain the deliverability test.

However, the shut in pressure, the surface shut in pressure of this well was measured on September 8, 1977, and was six hundred and two P.S.I.G.

I would -- to me this pressure is not excessively above the surrounding pressures of the offset wells for a shut in pressure.

In my opinion the deliverability shut in pressure after the well was produced and under the same conditions measures as the other wells will -- probably be slightly higher but similar.

I would like for you to note that in the Tenneco Florance 29A which is located in the northwest quarter of Section 25, Township 30 North, Range 8 West, that they have a P.C. shut in pressure of five hundred and forty-eight.

This pressure is higher than some of the wells surrounding it and, in fact, two of the wells to the southeast a little lower.

I would, of course, rounding the wells, I would consider this normal for a new well and with only full

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production periods that it has.

Overall, I interpret the pressures on the map to indicate that it is very probable that there is a degree of communication within the producing -- the Blanco-Mesaverde intervals among the wells.

In my opinion for a well such as the Northeast Blanco 64A, if this well was producing from a reservoir completely separated from anything else, any other producing reservoir, I would estimate that the shut in pressure initially for this well to be at least one thousand pounds or greater.

The Blanco original shut in pressure on the Blano-Mesaverde wells were in the neighborhood ranging from eleven hundred to twelve hundred.

Q. Mr. Walsh, if the Northeast Blanco Well No. 64 were placed on production would you anticipate the pressure to climb to similar to that indicated in the Florance 29A of Tenneco's in the prior case?

A. Yes, I would.

Q. Would you please refer to what has been marked for identification as Exhibit Ten and Eleven and explain to the Commission what they are and what they show?

MR. KELLAHIN: If it please the Commission, I am going to object to the introduction of Exhibits Ten and Eleven unless a proper foundation can be laid by this

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witness and his counsel.

It appears to be information tabulated by a M. E. Maxwell, Junior, and he is not present here and subject to cross examination.

MR. CARR: If it please the Commission, the Commission is empowered to take notice of its own records. I would submit that this falls within that category and I would also remind opposing counsel that it was on his motion that the prior record be incorporated which contained the exhibits and so technically they are already in evidence at this time.

MR. KELLAHIN: I renew my objection, if the Commission please, to this witness testifying to something which he did not participate in the preparation of.

MR. CARR: I would submit to you that the records of the Commission are public records and you may take notice of them as may members of the public and I may call this information to your attention.

MR. RAMEY: These are already in the record from previous cases?

MR. CARR: Number Ten definitely is and Number Eleven is a revised statement.

MR. RAMEY: What are you going to do with these, Mr. Carr?

MR. CARR: We are going to use these to show that

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infill wells when drilled characteristically have an initial shut in pressure of approximately two hundred and fifty pounds above that pressure of the old wells and that is a condition that has been encountered since they initially have taken the pressures on the two wells in question in this case.

MR. RAMEY: I think this is a public record and public records are an exception to the hearsay rule. So, I think these can be admitted. So, I am going to overrule your objection, Mr. Kellahin.

Q. (Mr. Carr continuing.) Will you proceed, Mr. Walsh?

A. Exhibit Ten, which is a memorandum prepared by Norman Maxwell with the New Mexico Oil Commission in Aztec, this was prepared to generally indicate the affects of drilling the infill wells on the Blanco-Mesaverde Pool a[illegible] how the pressures were in relation to the offset wells.

I am utilizing the information from Exhibit Ten under the column, Offset P.C., which is the shut in pressure on the deliverability tests.

He has a number there for 1976 of four hundred and seventy pounds.

Under the column, Average P.C. for Infill Well, he has a pressure of five hundred and thirty-nine pounds.

This is indicated and basically an average of those

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sixty-eight wells is a difference of sixty-nine pounds.

Just below that is the -- under the offset P.C. is a pressure reading of four hundred and eighty pounds -- four hundred and eighty-one pounds -- and an infill well average P.C. of five hundred and ninety-three pounds, indicating the P.C. for the infill wells is an average of one hundred and three pounds above --

MR. RAMEY: I can't find any of these figures --

A. This is the memorandum of 2/24/77 --

MR. RAMEY: I have got one 5/25/77 -- both of my exhibits are the same --

A. Well, that is in error -- does anyone else have problems --

MR. RAMEY: 2/24/77 is Exhibit Number Eleven?

A. Yes. I was using it as Ten --

Q. (Mr. Carr continuing.) That's fine and what is the date of Exhibit Number Eleven?

A. 5/25/77.

MR. RAMEY: Okay, thank you, proceed.

A. Well, Mr. Ramey since you didn't have that and I didn't know it -- I would like to, again, point out -- the pressures that I was utilizing from this memorandum at the bottom of the page.

Under offset P.C., the fourth column from the left, for 1976, there is a pressure of four hundred and seventy

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P.S.I.G.

The next to it, to the right, under infill well the average P.C. of five hundred thirty-nine. This is a difference of sixty-nine pounds with the infill well being on the higher side.

Just below, the next line, for infill wells completed starting in November there -- for the offset P.C. is the number four hundred and eighty-one and the infill average P.C. five hundred and ninety-three. That is a difference of one hundred and two pounds -- one twelve, excuse me.

Now, for Exhibit Eleven, which is a memorandum dated 5/25/77, the Mesaverde infill wells there is an average for three years there. The latest test for the infill wells which is the P.C. column, P.C., indicates an average of five hundred and seventy-one P.S.I.G.

The 1976 offset P.C. for the same period of time would be four hundred and fifty-two giving one hundred and nineteen pounds difference with the infill wells being higher.

I am using this in relationship back to Exhibit Number Nine in which the Northeast Blanco Unit Well No. 64A located in the southeast quarter of Section 24, Township 30 North, Range 8 West, had an initial shut in pressure of six hundred and two pounds.

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I would note that the four surrounding wells on there, their P.C. shut in pressure had an average of four hundred and seventy pounds among the four. Excuse me, not an average but the range of difference between the 64A and the surrounding four wells, the range is one hundred and twenty-five to one hundred and eighty-three P.S.I.G.

For the Tenneco Florance 29A located in the northwest quarter of Section 25, Township 30 North, Range 8 West, the shut in P.C. pressure for that well in relation to the four surrounding wells ranges from forty-nine to one hundred twenty-nine P.S.I.G. This is still not a tremendous amount of difference for a well that is supposedly in a new reservoir.

I have used this and in my interpretation that the producing intervals in both of these wells are in some type of communication within the redefinition of the Blanco-Mesaverde vertical limits.

Q. Will you please refer to what has been marked for identification as Exhibit Number Twelve and explain to the Commission what it is and what it shows?

A. Exhibit Number Twelve includes three gas chromatographic analysis. These analysis are performed by the El Paso Natural Gas Company on their chromatograph machine which they use for analyzing all of their gas samples in the field area.

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These analysis, one, is the Northeast Blanco -- Blackwood and Nichols Northeast Blanco Unit No. 34 located in the southwest quarter of Section 19, Township 30 North, Range 7 West.

Also, the Blackwood and Nichols Northeast Blanco Unit No. 105 located in the northwest quarter of Section 24, Township 30 North, Range 8 West.

And a gas sample from the non-produced Blackwood and Nichols Northeast Blanco Unit No. 64A located in the southeast quarter of Section 24, Township 30 North, Range 8 West.

I would first like to bring your attention to -- under components, methane, the low percent between the three wells ranges from eighty-seven point nine-three to eighty-nine point nine-five, a very small difference.

Again, I would bring your attention to the heating value, the B.T.U. per cubic foot, this ranges from eleven hundred and seven to eleven hundred and fifty. Again, this is below that specific gravity which ranges from point six three-three to point six five-ch.

These are presented, one, the subject well completed high in the Mesaverde interval and, two, lower produced wells produce lower to show that there is a similarity in gases, almost identical. But in my experience you can take gas analysis from offset wells in identically the same producing

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horizon and they will differ.

You can take gas analysis from the same well at different producing periods in time and they will differ.

So, I would consider this -- these gases -- to be if not identical very very similar to come from a common source.

Q. At this time, Mr. Walsh, I would like to direct your attention to what was previously introduced into evidence in this case as Tenneco's Exhibit Number Four.

I would ask you to explain to the Commission how you interpret the data contained therein?

A. This Exhibit Four is production history, plotted, production M.C.F. average for six months against time.

It was my understanding that the El Paso well was tied into the El Paso system and the other three wells were tied into the Southern Union gathering system.

I would like for you to look at the Florance 40 and, in general, this well is experiencing a most gradual decline. I [illegible] representative for probably the age and time for the well.

But for the Florance 32, they are in a period as indicated from January 1973 to approximately June of 1975, and the decline is very gradual. I would say normal and maybe in the neighborhood of four to five percent.

After that period of time starting in June of 1975,

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there is a steeper decline in the production and in the neighborhood of around twenty-five percent.

The Florance 45A, we have about the same or similar situation as the Florance No. 32 in that the production up from January 1st, 1973 through 1975, seems to be somewhat gradual and in the neighborhood of around six to seven percent a year.

Then, we go into a steeper decline which after January 1st, 1976, was in the neighborhood of twenty to twenty-two percent.

The period of decline does coincide with the -- shortly after the El Paso Natural Gas Howell No. K2A was put on production.

I did hear their witness state that some of this decline they thought was due to the operation of the Southern Union pipeline.

To me, if it was going to affect those two wells in that degree by Southern Union's operating condition, then the Florance 40 I would say would be affected, if not more, because it is a lower rate producing well, so, it would have probably less of a chance of recovery against high line pressure.

To me, utilizing the production data from this I would say that in all probability that the Howell K2A is in communication in some manner with the lower portion of

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producing horizons in the Blanco-Mesaverde Pool.

Q. I would now like to direct your attention to Exhibit Number Ten, Tenneco's Exhibit Number Ten, and ask you to explain what it shows to you?

A. Exhibit Number Ten is a plot of well head shut in pressure against cumulative production which is one of the tools used in the industry to estimate reserves.

Unfortunately, I would say in this area we do have to rely on well head shut in pressures.

However, this is all we have. It would be very preferable every year or every other year to have a bottom hole pressure but that is not feasible and not economical.

So, we have to use the well head shut in pressures. I would say that I would agree with the way he has plotted the curve there.

One thing it does indicate for the Tenneco Florance 29A that this well shut in pressure, well head shut in pressure, initially was considerably below the initial well head shut in pressure of the other three wells indicated here.

This is going to be somewhere in the neighborhood of a little over five hundred pounds, different, lower, than the other wells.

The third point -- I believe it is the third point -- the last point is your third pressure reading on here --

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indicates a pressure of approximately, from the graph, of approximately four hundred twenty pounds.

This is very similar to a pressure point taken within the same year on the offset wells.

If this well, to me, was not in some type of communication, one, the initial well head shut in pressure would have been higher, two, a pressure point reading, say, at this period of time would also be higher.

Q. Mr. Walsh, based on your experience in the area and the study you have made of the particular wells involved in this case what conclusions can you reach?

A. I would conclude that the wells, the intervals in which the wells are completed, within the defined Blanco-Mesaverde group, are in communication some way with the other lower producing horizons in the Blanco-Mesaverde Pool.

Q. And you are talking about the Florance 29A and the Northeast Blanco Unit No. 64?

A. I am referring to those two wells.

Q. In your opinion, Mr. Walsh, would granting the application of Tenneco be in the interest of the protection of correlative rights and the prevention of waste?

A. No.

MR. CARR: At this time I would offer Blackwood and Nichols' Exhibits Seven through Twelve.

MR. RAMEY: They will be admitted and we will recess

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until one-thirty, promptly at one-thirty.

(THEREUPON, the hearing was in recess.)

MR. RAMEY: The hearing will come to order. Are there any questions of the witness?

MR. KELLAHIN: Yes, sir.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Walsh, let me direct your attention back to your Exhibit Number Twelve, which was the three-page gas analysis.

This is information complied by Mr. Luce on behalf of Blackwood and Nichols was it not?

A. He did obtain the gas samples which were given to El Paso for analysis. He did not perform the analysis, though.

Q. I see. Have you compared this gas analysis of these three wells with other formations in the San Juan Basin?

A. Other formations?

Q. Yes, sir?

A. No, sir.

Q. All right. And we can simply disregard Exhibit Twelve, Mr. Walsh, as inconclusive evidence of communication between the subject well and the offsetting Mesaverde wells?

A. No, I don't think we can disregard it on an

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inconclusive basis.

Q. Why not, Mr. Walsh?

A. I don't understand your question.

Q. All right, sir. Isn't the gas composition of most of the producing formations in the San Juan Basin reasonably compatible?

A. Yes.

Q. And the fact that you had a gas analysis from the Blanco Unit 64 Well and the offsetting wells that were similar, you wouldn't want to conclude from that little examination alone that these were the same common source of supply would you?

A. I am utilizing that with other information which I presented here, Mr. Kellahin, to help me in my decision.

I don't think we can take any one of these pieces of information and say one way or the other. I think we have to use them all.

Q. All right. So, based on a gas analysis, alone, that is not enough information upon which you can conclude whether or not there is communication?

A. No.

Q. Let's look at some of the other factors that you have used in reaching your opinion.

Mr. Carr asked you about an opinion with regards to fracturing and you said that you had such an opinion.

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Did you examine any hard-geological evidence that there was a fracture system communicating the two subject wells in the offsetting Mesaverde production?

A. There is no hard-geological evidence available.

Q. By hard-geological information we would look to log information that would show fractures, if we had that?

A. That would be one of the tools, yes.

Q. All right. But we don't have those kinds of tools available?

A. They are available but they were not utilized in these wells.

Q. The information you used in compiling Exhibit Number Nine -- is the pressure information -- and this, I believe, is the basic information, the crux of your argument, that there is communication between the subject wells and the Mesaverde wells -- is this gas information on pressures, is that correct?

A. This is one of the better supporting evidences, yes.

Q. All right. In addition to the pressure information on Exhibit Nine and the gas analysis is there any other hard evidence that you used to reach your opinion?

A. That there is fracturing or that there is communication by fracturing?

Q. Yes, sir, to reach that opinion?

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A. To reach that opinion?

Q. Is based on what factual information?

A. It is based on, one, pressure and two, analysis of offset logs which are in the cross section.

Q. I thought we just talked about the log information and you said you could not conclude from the log information available to you that a fracture system occurred?

A. True, for a fracture system.

Q. Let's look at --

A. Additional --

Q. Yes, sir --

A. I -- what was it, your Exhibit Four -- I believe to me this is supportive evidence to possibly conclude communication by fractures.

Q. You are in basic disagreement with Mr. Castle who takes the same information and reads it in an opposite conclusion?

A. That's right.

Q. Let's talk about Exhibit Number Nine, here, and you said in discussing Number Nine, which is your pressure datum map, you admitted quite frankly that you would rather have had bottom hole pressure data from which to make your analysis of this area, is that not true?

A. In working with any pressure, pressures of any type into a reservoir, the bottom hole pressure is always the best

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information you are able to obtain.

Q. And we did not have the bottom hole pressure information and so you used something that was not as good?

A. True, but used because this is all we had to work with.

Q. I understand. You used the shut in pressures that were used to determine the deliverability tests for 1976, I believe that is correct?

A. That's correct.

Q. What are some of the shortcomings of using the shut in pressure information that was used in the '76 deliverability tests?

A. If you are going to utilize it in actually reservoir work, the shortcoming is that the well has not built up to maximum pressure for that period of time.

You are using a pressure relative to that data and for that period of time.

Q. The Mesaverde is, in fact, a tight formation?

A. Yes.

Q. And the normal shut in pressure time is a seven-day period, is it?

A. Normally, yes.

Q. And that quite often is not a sufficient length of time in which to allow the pressure to build up where it is stablized?

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A. Oh, it definitely is not.

Q. In running these shut in pressure tests for the deliverability how are those tests conducted?

A. Well -- the whole deliverability test?

Q. Yes, sir, just summarize for me how that works?

A. The purchasing pipeline company will set forth a schedule in which, one, given a period of time which the well is considered under conditioning, which is a two-week or a sixteen-day period with our chart changes up there -- then, it goes into a one -- well, an eight-day flow period for one chart revolution.

During this period of time the pressures are obtained at the well head on the casing, pressure on the casing, and pressure on the tubing and pressure on the meter run and the static reading is taken off of the chart and calculated to a pressure.

Q. Let me ask you at this point, what kind of device is used to test the pressure?

A. Under the rules of the Oil Conservation Commission a dead-weight type shall be used or -- and they have for the past few years accepted a certain pressure gauge which is a highly calibrated gauge.

Q. All right. In compiling your data sheet here --

A. I didn't continue the test.

Q. I understand that you didn't conduct the test, itself --

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A. I didn't go through the complete flow --

Q. All right, please do.

A. After the flow pressures -- what we call flowing pressures of the thing -- then, the well is shut in for the specified seven-day period.

At the end of that shut in period, then, the well head pressures, again, are obtained at the -- on the casing and tubing for the shut in pressures.

This information is utilitized along with the volumes and specific gravity to determine the deliverability of the well.

Q. Did you prepare Exhibit Number Nine, yourself?

A. I did not.

Q. Who prepared that?

A. That was prepared by Blackwood and Nichols with me reviewing the data utilized in the preparation.

Q. You did not appear and provide testimony on behalf of Blackwood and Nichols on the first hearing of this case back in July of 1977, did you sir?

A. No, sir.

Q. When were you retained by Blackwood and Nichols to make an examination of the information for this hearing?

A. Oh, initially, it was either six weeks or two months ago.

Q. Okay. Let's look at the area around the No. 64

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Well on Exhibit Nine?

A. That is the circle -- indicated by the circle, in the southwest of 24, 30 North, 7?

Q. Well, what I am looking at is this one.

A. Oh, I see.

Q. We are looking at the same one?

A. Same one.

Q. All right. There are plotted on your map north-south and east-west Mesaverde offset wells?

A. Yes.

Q. And along with each well spot is the pressure test information?

A. Yes, P.C.

Q. All right. Now, if we draw a circle through all four of those Mesaverde wells, what is the approximate average of those four wells?

A. Approximate average?

Q. Yes, sir?

A. It's somewhere --

Q. It is somewhere between four hundred and four hundred and fifty, I guess?

A. I would say in the neighborhood of four-forty.

Q. All right. Now, in looking at the 64 Well, would it not also be reasonable to expect a pressure in that well of somewhere in the neighborhood of four hundred to four

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hundred and fifty pounds?

A. No, sir.

Q. The No. 64 well is some hundred and ninety pounds more than the average for those other four wells, is it not?

A. Approximately one hundred and sixty -- going from four-forty to six oh-two.

MR. KELLAHIN: Okay. I have no further questions.

MR. RAMEY: Any other questions of the witness? Mr. Carr?

REDIRECT EXAMINATION

BY MR. CARR:

Q. I have a few questions on redirect. First of all, Mr. Walsh, so that we don't have any misunderstandings on this point, is it your opinion that the gas analysis should be considered?

A. As one of the tools, yes.

Q. How did you reach the conclusion that there is a likelihood of a fracture in this area?

A. In my experience in the San Juan Basin which is almost twenty-five years, now, any production that comes within the cretaceous period, the sands, basically, comes from a very low permeability formation.

Q. Isn't that very fact the reason an infill program

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was instituted?

A. This is part of the reason for having the infill program.

Only in exceptional cases where a -- like the 64A, where you are drilling like that and all of a sudden you can -- your drilling rate increases tremendously -- I don't consider that there are voids in these formations.

Therefore, they have to be fractured. In other words, so that the drill bit can penetrate at a fast rate of speed.

Q. In that situation what sort of a flow rate do you encounter?

A. Due to the natural fracturing in the formation your actual flow rate of gas from the formation will be considerably higher than it would be as a natural flow.

Q. Is that what was experienced in this case?

A. Yes.

Q. Now, you don't have logs that would indicate the facture?

A. Not in this well.

Q. Do they indicate any other possible source of this gas?

A. Well, we do not have logs on basically the two wells that we are talking about here.

Therefore, the next best two that you can use is an

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offset well and correlate.

Q. Now, in regard to Exhibit Number Nine you did not prepare that. Have you reviewed it?

A. I have reviewed the data that it was prepared from and the exhibit, itself.

Q. And can you testify to its accuracy?

A. Yes, and in agreeing with it.

Q. Now, when we talk about the pressure encountered in the No. 64 Well, it is, I believe, Mr. Kellahin stated, one hundred ninety pounds more than the pressure in the offsetting wells?

A. Approximately one hundred sixty, overall average.

Q. What do you think would happen to the pressure if this well was produced like the offsetting wells?

A. If it was produced and the initial or annual deliverability tests were run on the well the shut in pressure would be lower.

MR. CARR: I have no further questions.

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Walsh, talking about this fracture, would you indicate on my copy of Exhibit Number Nine the general direction of the fracture?

A. No, I cannot. There is no way with the evidence we

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have to orient the fracture.

Q. Can you orient the fracture by using the pressure trends located on your map?

A. No.

Q. You cannot?

A. No.

MR. KELLAHIN: Okay. No further questions.

MR. RAMEY: Any other questions of the witness? He may be excused. Anything further, Mr. Carr?

MR. CARR: I have nothing further.

MR. KELLAHIN: I have some rebuttal witnesses to call, Mr. Ramey.

MR. RAMEY: All right, Mr. Kellahin.

MR. KELLAHIN: I'll call Vic Lyon.

VICTOR T. LYON

was called as a witness by the applicant, and having been first duly sworn, testified upon his oath as follows, to-wit:

DIRECT EXAMINATION

BY MR. LYON:

Q. Mr. Lyon, would you please state your name and by whom you are employed and in what capacity?

A. I am Victor T. Lyon, and I am employed by Continental Oil Company as conservation coordinator in the Hobbs Division

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Office located in Hobbs, New Mexico.

Q. Mr. Lyon, have you made a study of and are you familiar with the facts surrounding this particular application by Tenneco?

A. Yes, at least certain aspects of it.

Q. Have you made a comparison of the gas analysis in the San Juan Basin for the different formations?

A. I have made a comparison of gas analyses which were available in the Division Office at Hobbs.

Q. Mr. Lyon have you previously testified and had your qualifications as an expert witness accepted and made a matter of record before the Commission?

A. Yes, I have.

MR. KELLAHIN: If the Commission please, are Mr. Lyon's qualifications acceptable?

MR. RAMEY: Yes.

Q. (Mr. Kellahin continuing.) Mr. Lyon, would you refer to what I have marked as Tenneco's Exhibit Number Thirteen and identify it and tell me what information it contains?

A. This is the one headed comparative gas samples --

Q. And the second sheet that shows the key --

A. Okay. Let me talk about the first one, first. This is a tabulation of components shown on gas analyses of twenty-four different samples which were available in the Hobbs Division Office, showing a breakdown of carbon dioxide and

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nitrogen and methane, ethane, propane, Iso-butane, Normal-butane, Iso-pentane, and Normal-pentane.

I think that the, a close scrutiny of this exhibit will show that all of these samples are reasonably within the ranges of all of the components which were introduced as evidence showing that the gas from Well No. 64 is a Mesa-verde gas.

I do not believe there is anybody in this room who can select the samples on this list which are Mesaverde.

The second sheet is the key to the gas samples which identifies the wells from which these samples were taken and a number of them are from the San Juan Basin. There are five samples in there which are from the Mesaverde and there are three wells from the Chacra and there are three wells from the Pictured Cliffs and there is one well from the Dakota and there are a number of wells from southeast New Mexico, in the Blinebry and the Jalmat and the Eumont the Bell Lake Morrow and I don't think that anybody could reasonably identify any of those samples as being produced from anyone of those formations.

Q. In your opinion, Mr. Lyon, is the use of the comparative gas analysis method a sound engineering tool from which to conclude if there is communication between one or more formations within the San Juan Basin?

A. Obviously, from this list there is not.

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Q. Mr. Lyon, I would like to direct your attention to a slightly different subject.

Mr. Blackwood concluded awhile ago that if Tenneco's application were granted that it would infringe upon the correlative rights of Blackwood and Nichols as the unit operator and also constitute economic waste.

I would like for you to express an opinion on that subject and give me your reasons for that opinion?

A. I think there is a difference of opinion here in that regard just as there is a difference of opinion as to where this gas comes from.

I think that if you accept their assumption that this gas is being produced from the Lewis Shale interval, which is equivalent to the Chacra in other parts of the basin and has been designated as Chacra in this part of the basin, too, until recently, that if you conclude that that is actually producing from the Mesaverde then I think there is good reason to say that there might be economic waste.

Provided, that the Mesaverde wells in there are capable of draining the gas which has accumulated in this interval. I am not convinced of that even assuming that the gas is coming from the Mesaverde.

I have seen nothing in this hearing or the previous hearings or the hearing where the Commission was requested to redefine the Mesaverde that shows a strong probability that

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this is coming from the Mesaverde.

I am not convinced that the Lewis Shale interval which has been encountered in these wells are not a separate common source of supply.

MR. KELLAHIN: That concludes my examination of Mr. Lyon.

MR. RAMEY: Any questions? Mr. Carr --

CROSS EXAMINATION

BY MR. CARR:

Q. I have one very short question. Mr. Lyon, in your study did you uncover anything that would indicate that the gas that was being produced from the 64 is substantially different from the Mesaverde gas?

A. No, and neither have I found any great difference in the other twenty-three samples.

MR. CARR: I have no further questions.

CROSS EXAMINATION

BY MR. RAMEY:

Q. You don't feel, Mr. Lyon, that you could separate the Bell Lake Morrow gas from that well?

A. Well, it's probably a little light in the heavier components but it is not -- well, if you look at the methane, which is -- I think that is the number nine sample --

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Q Nine, twenty and twenty-one.

A. Okay, nine is ninety point oh two percent methane but sample nineteen which is the No. 64 well is eighty-nine point ninety-five percent methane.

Now, the sample twenty --

Q. Twenty and twenty-one --

A. Well, twenty is the most extreme is the reason I picked it and it has ninety-five point seven-six and I think that it does not fit too well the pattern of the Mesaverde.

But it isn't any farther apart than some of the Mesaverde wells from one extreme to the other.

MR. RAMEY: Okay. Any other questions of this witness? He may be excused.

MR. KELLAHIN: I have nothing further, Mr. Ramey.

(THEREUPON, the witness was excused.)

MR. RAMEY: Do you have anything further, Mr. Carr?

MR. CARR: I have a closing statement, that's all.

MR. RAMEY: Okay -- whoever wants to go first --

MR. KELLAHIN: If the Commission please, I think you have heard this case about three times and I'll be very brief.

We believe the evidence has shown that there is substantial evidence that the Florance 29A Well and the Unit 64 Well ought to be granted the exception as set forth in paragraph seventeen and eighteen of the previous order.

That just as Lively presented and obtained an

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exception for their particular well that Tenneco ought to receive the same exception for these two wells.

The fact that the well was drilled and completed at a time when the Commission rules under Order R-799 were such that this was a Chacra completion seems to me to be very significant and that subsequent to this being completed under Commission rules as a Chacra well the rules of the game were changed.

We believe that in changing those rules that if you don't grant exceptions for these two wells in light of the exceptions already granted to Lively that it would be arbitrary and capricious not to do so.

That we have proven beyond a reasonable doubt that the magic fracture does not exist by any hard geological evidence.

That the pressure information used by the Blackwood and Nichols witnesses is suspect. That the conclusions that we have reached based upon the production information supplied by Mr. Castle is a legitimate and reasonable way to conclude that the two subject wells are producing from a separate source of supply than the offsetting Mesaverde wells.

We believe that the entire case presented by Blackwood and Nichols is simply a subjective interpretation of an indirect measurement that may or may not represent the true facts.

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On the contrary, we believe that the evidence supplied by our witness proves that we are entitled to the exception.

The fact of waste, economic waste, that has been testified to by both the witnesses for Tenneco and the witness for Blackwood and Nichols and supports the proposition that economic waste will occur if the exception is not granted.

Now, Blackwood and Nichols insists that it will be waste because they will have to drill additional infill Mesaverde wells.

I am prepared to tell you on the record that Tenneco will drill those infill wells if granted this exception. Blackwood and Nichols have got no complaints about economic waste.

If granted the exception we will drill the Mesaverde infill wells that will come under the existing order.

Thank you.

MR. RAMEY: Mr. Carr?

MR. CARR: It is important, as you know, in deciding this case to keep in mind that we are here today because of two findings in Order Number R-5459. I will read just a portion of that.

There are four wells that maybe produced from fracture shale or siltstone zones equivalent to said Chacra sand and which may or may not be connected to other producing zones

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in the Blanco Mesaverde Pool.

When you read this phrase in conjunction with the rest of the Order any reasonable reading shows that what must be proven to obtain an exception is that you must show a separate reservoir that is not in communication with the Mesaverde formation.

Now, in showing this the burden is not on Blackwood and Nichols. The burden is on Tenneco and Tenneco has failed to meet this burden.

The record is replete with pressure data that would indicate that they did not encounter a new reservoir. The pressures are close enough that it clearly shows that what we have here are new wells in the Mesaverde formation.

In addition to showing a separate source of supply that is not in communiciation with other Mesaverde wells they must also show that correlative rights will not be impaired and that waste will not result.

I would submit that no matter who drills the unnecessary wells, that, in and of itself, is economic waste because that well could be drilled elswhere where it would be a necessary well.

We have presented evidence at this hearing that clearly shows that Tenneco drilled its Florance 29A and it was classified as a Mesaverde well. We were, then, placed in a position where we had to drill and pay for a forced

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offset to prevent drainage in the Mesaverde.

Then, we had this question arise as to the definition and somewhere along the line Tenneco decided to change its attitude and classify the Florance 29A Well as something other than a Mesaverde that it had originally been classified.

What we have presented here today is evidence which shows that the 64 Well based on pressure data is evidence of fracture and the only evidence that we have and the high flow rate and the absence or loss of any other explanation for gas being encountered in this quantity and also the gas characteristics is not inconsistent with the conclusion that what we have here is that the Northeast Blanco Unit Well No. 64 is a Mesaverde well.

We would submit to you that in granting the application of Tenneco's you will require the drilling of additional wells, no matter who drills them, and this is economic waste and inconsistent with your statutory charge.

If you grant their application you will have wells producing from one source of supply and that are operated under different rules and here, again, you run into your statutory charge because you will be impairing correlative rights.

Denying the application of Tenneco will mean that they will have to share in the production of the well in a

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fashion consistent with the terms of the unit agreement under which the well was drilled.

We submit to you that this is the only reasonable conclusion that the Commission can reach, that, being the denying of the application of Tenneco.

MR. RAMEY: Thank you, Mr. Carr. One question of Mr. Blackwood, if the Commission decided in favor of Tenneco would Tenneco be obligated to repay the price of the well?

MR. BLACKWOOD: Yes.

MR. RAMEY: Thank you. The Commission will take the case under advisement and we will have a five minute recess.

(THEREUPON, the hearing was concluded.)

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REPORTER'S CERTIFICATE

I, SIDNEY F. MORRISH, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Sidney F. Morrish, C.S.R.

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
20 July 1977

EXAMINER HEARING

IN THE MATTER OF:

Application of Tenneco Oil Company for an exception to the provisions of Order Number R-5459, San Juan County, New Mexico.

CASE 5994

BEFORE: Richard L. Stamets

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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I N D E X

VICTOR T. LYON

Direct Examination by Mr. Kellahin 4

Cross Examination by Mr. Carr 18

Cross Examination by Mr. Stamets 21

GARY RAPP

Direct Examination by Mr. Kellahin 22

Cross Examination by Mr. Carr 39

Cross Examination by Mr. Stamets 45

Cross Examination by Mr. Kendrick 48

CHARLES BLACKWOOD

Direct Examination by Mr. Carr 53

Cross Examination by Mr. Kellahin 68

DE LASSO LOOS

Direct Examination by Mr. Carr 77

Cross Examination by Mr. Kellahin 81

Redirect Examination by Mr. Carr 84

Cross Examination by Mr. Stamets 84

Recross Examination by Mr. Kellahin 86

GARY RAPP RECALLED

Redirect Examination by Mr. Kellahin 87

Recross Examination by Mr. Carr 89

Recross Examination by Mr. Stamets 91

Recross Examination by Mr. Kendrick 94

E X H I B I T S

Tenneco Exhibit Number One, Plat	39
Tenneco Exhibit Number Two, Letter	39
Tenneco Exhibit Number Three, Notice of Meeting	39
Tenneco Exhibit Number Four, Document	39
Tenneco Exhibit Number Five, Unit Agreement Pages	39
Tenneco Exhibit Number Six, Unit Operating Agreement	39
Tenneco Exhibit Number Seven, Diagram	39
Tenneco Exhibit Number Eight, Cross Section	39
Tenneco Exhibit Number Nine, Structure Map	39
Tenneco Exhibit Number Ten, Isobaric Map	39
Tenneco Exhibit Number Eleven,	
Blackwood and Nichols Exhibit Number One, Document	68
Blackwood and Nichols Exhibit Number Two, Memo	68
Blackwood and Nichols Exhibit Number Three, Document	68
Blackwood and Nichols Exhibit Number Four, Log	81
Blackwood and Nichols Exhibit Number Five, Document	81

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MR. STAMETS: Call the next case, 5994.

MR. STECHENDORF: Case 5994. Application of Tenneco Oil Company for an exception to the provisions of Order R-5459, San Juan County, New Mexico.

(Thereupon a short recess was taken.)

MR. STAMETS: The hearing will come to order, please.

MR. KELLAHIN: Tom Kellahin of Kellahin and Fox, appearing on behalf of Tenneco Oil Company and Continental Oil Company, and I have two witnesses to be sworn.

MR. CARR: William F. Carr, appearing on behalf of Blackwood and Nichols. I have two witnesses and five exhibits.

MR. STAMETS: Will all the witnesses stand and be sworn, please?

(Witnesses sworn.)

MR. KELLAHIN: Call Mr. Vick Lyon first.

VICTOR T. LYON

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name, by whom you're

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employed, and in what capacity?

A. My name is Victor T. Lyon, L-Y-O-N. I'm employed by Continental Oil Company as Conservation Coordinator in the Hobbs Division Office, located in Hobbs, New Mexico.

Q. Mr. Lyon, have you previously testified before the Commission and had your qualifications accepted as an expert witness and made a matter of record?

A. Yes, I have.

Q. Have you made a study of and are you familiar with the facts surrounding this particular application?

A. As to certain aspects in regard to the unit agreement and overall aspects of conservation.

MR. KELLAHIN: If the Examiner please, are the witness' qualifications acceptable?

MR. STAMETS: They are.

Q. (Mr. Kellahin continuing.) Mr. Lyon, would you please refer to what has been marked as Exhibit Number One and identify it for us?

A. Yes, sir. Case Number 5994 is the application of Tenneco Oil Company, in which Continental Oil Company joins, for an exception to the provisions of Order Number R-5459, so as to exclude Tenneco's Florence Well Number 29-A in Unit F of Section 25, and the Northeast Blanco Unit Well Number 64 in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico.

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Exhibit One is a plat showing the Northeast Blanco Unit, which is operated by Blackwood and Nichols. The Unit covers parts of five townships, in Township 30 North, Ranges 7 and 8 West, and in Township 31 North, Ranges 6, 7, and 8 West.

The unit contains approximately 32,000 acres. Northeast Blanco Unit Well Number 64 -- well, let me point out first that the acreage which is colored yellow on the plat is the acreage which is owned jointly by Tenneco Oil Company and Continental Oil Company.

Well Number 64, which is shown circled in red, was originally drilled as --

MR. STAMETS: Which one of the two circled in red wells?

MR. KELLAHIN: 64.

A. 64 is the one in the southeast quarter southeast quarter of Section 24. It was originally drilled as Northeast Blanco Unit Well Number 105-A at the extreme southern boundary of the unit. There was considerable testimony about this well in Case Number 5893, and I will not attempt to duplicate that testimony except to state that the well was projected as a Mesaverde infill well and encountered a strong gas flow in the Chacra formation.

The well was completed in that formation, the Chacra, with an excellent initial potential.

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The Florence 29-A has essentially the same experience, and that well is shown by the other circle just to the south of Section 24, and is located in the -- I believe that's the southwest quarter of the northwest quarter -- southeast quarter northwest quarter of Section 25 of the same township.

A third well encountered Chacra production in Unit E of Section 35 of 30 North, 8 West, by Lively Exploration Company, and this well was the subject of Case Number 5993, just preceding.

As we see the situation, these three wells are producing from a common reservoir outside of the Mesaverde Formation.

The problem with correlative rights was described in the previous case as to that well. We feel that there will be further problems of correlative rights if the two wells which are the subject of this case are not treated in the same manner as is the Lively well.

As to the Florence 29-A well, there is no difference in ownership between the Chacra Formation and the Mesaverde. As to Northeast Blanco Unit Well Number 64, there is an ownership problem. This problem is probably best illustrated by introducing into the record a letter, dated September 20th, 1976, from Tenneco Oil Company to Blackwood and Nichols, and I'd like to read that letter into the record.

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Q That Exhibit is marked as Applicant Exhibit Number Two, is it not?

A. Yes, it is.

This is a letter from Tenneco addressed to Blackwood and Nichols on the subject, Northeast Blanco Unit Number 64 Well, Southeast Quarter Southeast Quarter, Section 24, 30 North, 8 West, et cetera.

"Gentlemen: Last spring Tenneco approved your AFE for the drilling of the Northeast Blanco Unit 105-A, intended as an infill Mesaverde development well with costs to be borne by the Mesaverde participating working interest owners.

We have had no completion report on this well from Blackwood and Nichols, but Oil Conservation Commission records show that the well was completed July 10th, 1976, as a producer from the Chacra formation, and redesignated the Unit Number 64 Well.

A 3,240 Mcf IP and 9000 open flow were reported. Article XI of the unit agreement requires that the operator, upon completion of the commercial unit well, submit for approval by the Geological Survey, the Commission of Public Lands, and the NMOCC, a schedule of land constituting the initial participating area for such well.

The commercial test of the unit agreement is certainly met since the reported initial potential at open flow, there can be no question that the well is productive of

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unitized substances in paying quantities. However, although the well has been completed for over two months and should be ready for pipeline connection, Blackwood and Nichols has taken no steps towards filing for an initial Chacra participating area.

Tenneco Oil Company and Continental Oil Company are equal owners of all the working interests in Unit Tract 2-B, the east half of Section 24, Township 30 North, Range 8 West, and it appears that the initial Chacra participating area should comprise the southeast quarter of Section 24, within such Tract 2-B.

Article XI of the unit agreement requires that a new participating area be effective with first production and unit operating agreements clearly recognize the ownership of newly established production by the working interest owners in the new participating area.

Accordingly, Tenneco hereby notifies you that any sales of production from the Northeast Blanco Unit Number 64 Well must be made for the sole benefit of the working interest owners in the initial Chacra participating area, regardless of when formally established.

Tenneco Oil Company hereby makes demand that Blackwood and Nichols immediately submit a schedule of unitized lands within its initial Chacra participating area for approval by the necessary authorities. We also request that you furnish

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Tenneco with an itemization of drilling and completion costs for the Number 64 Well.

Since the well was actually drilled outside any participating area, we believe it proper to bill the Chacra participating owners for this expense directly and not through adjustments with the Mesaverde participating area, simply because of their approval of the original AFE.

Please advise immediately if you do not concur with our conclusions." Signed B. D. Myers for Tenneco.

Q. Mr. Lyon, to your knowledge what, if any, response did Blackwood and Nichols Company make to the letter set forth in Exhibit Two?

A. Well, the only response that I'm aware of is the notice of the meeting of the advisory committee of the Northeast Blanco Unit in Oklahoma City, called on April -- October 12th, 1976.

Q. That is marked as Applicant Exhibit Number Three?

A. Correct.

Q. All right, sir.

A. Please note that Item Two calls for proposing a change in the definition of Mesaverde, and at that meeting a resolution was offered and was adopted by the advisory committee, which is Exhibit Four, which in effect serves to -- for whatever purposes it may be worth -- to redefine the Mesaverde.

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Q. I show you what has been marked as Exhibit Number Five, Mr. Lyon, and ask you to identify it, if you would, please?

A. Well, Exhibit Number Five are pages showing pertinent portions of the unit agreement for the Northeast Blanco Unit.

The first page is Page One of the agreement; just identifies it as the unit agreement for the Northeast Blanco Unit area.

The second page of the exhibit is Page Four of that agreement, and it -- I have underlined the sections I consider to be pertinent, and I have here the definitions of unitized land and unitized substances.

The third page of the exhibit is Page Nine of the unit agreement, and it provides that a separate participating area shall be established for each separate pool or deposit of unitized substances, or for any group thereof produced as a single pool or zone.

The next page is Page Ten, and it shows or it expresses the intent of the section in creating the participating area. The last paragraph expresses the status of a well that is not capable of producing in paying quantities, or until such time as the well is shown to be capable of producing in paying quantities. Clearly such a well is owned by the owners of the tract on which the well is located.

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Q. In this case that would be whom?

A. That would be Tenneco and Conoco.

Q. All right.

A. Section Twelve discusses allocation of production and, again, it shows that the production from a well is to be distributed to the owners of the participating area.

The fifth page is Page Eleven of the agreement, which states that an uneconomic well would be operated by the party drilling the same. This probably contemplates that whoever -- that the well would have been drilled by the party owning the tract.

The last page is Page Thirteen. Section Seventeen provides that the unit operator will take appropriate measures to prevent drainage of unitized substances from the unitized land by wells on land not subject to the agreement.

My point is, that if an exception is granted for the Florence 29-A and no exception is granted for the North-east Blanco Number 64, the unit operator will not be able to comply with that provision. The unit will be subject to drainage from a well located immediately adjacent to the unit area.

MR. STAMETS: Run that by again. I'd like to be --

MR. KELLAHIN: Say it again.

MR. STAMETS: -- perfectly clear on that. Did you say that if the Commission grants an exception for Well Number

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29-A, then the unit operator would not be able to protect the unit from drainage?

A. Not unless an exception is given to Number 64, or unless they can drill another Chacra well.

MR. STAMETS: Okay.

Q. (Mr. Kellahin continuing.) Please refer to what has been marked as Applicant Exhibit Number Six and identify that.

A. Exhibit Number Six are copies of certain pages of the unit operating agreement.

The first page merely identifies it as the operating agreement for the Northeast Blanco Unit Area.

The second page is Page Four of the agreement, wherein it creates an advisory committee, and at the bottom of the page it begins to enumerate the powers of the advisory committee.

The next page is Page Five, where the powers of the advisory committee continue to be described, and it states that one of the powers of the advisory committee is to approve or disapprove any proposed plan of development for development of any participating area or proposed expansion or contraction of the unit area, or the enlargement of participating area.

The fourth page is Page Six, and the paragraph, the language I have underlined says, "It is specifically understood that if the working interest owners" -- "that if the

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interest in the initial participating area or any subsequent participating area or areas is owned by one party, such party shall alone control the action of the unit operator in all matters referred to above in respect thereto until such area or areas may be enlarged to include the additional working interest owners or areas therein.

Now, Tenneco and Conoco own that tract in equal proportions and I would think that that language certainly would -- would apply to the tract on which Well Number 64 is located.

The next page is Page Nine, which discusses the retroactive adjustment of the cost of drilling, et cetera, of a well when a new participating area is established, and this carries over to Page Ten, which continues that discussion.

Q. Could you summarize for us, Mr. Lyon, the points you're making with regards to these exhibits?

A. Well, Northeast Blanco Unit Well Number 105 was drilled as an infill Mesaverde well. The well did not reach the Mesaverde but instead was completed as a Chacra well.

Since there is no Chacra participating area and the lease on which the well was located belongs to Tenneco and Conoco, the production from the formation in which the well is completed under the terms of the unit agreement belongs to Tenneco and Conoco, or the working interest owners in the participating area for the Chacra. The unit agreement is quite

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clear on this point.

Instead of consulting with Tenneco and Conoco on the disposition of this well for the formation of a participating area, the unit operator called a meeting of all of the working interest owners to attempt to change the contract. Since Tenneco and Conoco together own less than three percent of the unit, it was not very difficult to get a vote to override our objection to the change of the contract.

Also, since any change in the contract requires approval of the USGS, the State Land Commissioner, and the Oil Conservation Commission, the vote of the working interest owners was not binding. It was pointed out to Blackwood and Nichols and the other working interest owners at the October 12th meeting that the Oil Conservation Commission's definition of Mesaverde would override the proposed resolution.

The unit operator then set about getting the definition of the Mesaverde changed by the Oil Conservation Commission. And I don't believe that the Commission knew at that time that this matter -- that this matter was under consideration, that they were being made a party to the confiscation of Tenneco's and Conoco's rights in this unit, and I certainly don't believe that it was the Commission's intention to be a party to the taking of an owner's rights -- under this property without due compensation.

To put this situation in perspective, we have

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farmed -- we, Continental Oil Company, have farmed out the Drinkard rights -- now I'm going back to areas that I'm more familiar with -- to parties in southeast New Mexico. And if one of those farmoutees should get a good gas flow in the Blinebry, I don't think this Commission would, on their request, redefine the Drinkard to include the Blinebry. Or perhaps a better illustration would be if there was a waterflood unit that was created for the San Andres, and the unit operator drilled a well and got a good well in the Queen, that the Commission would redefine the San Andres to include the Queen.

But I think that's the situation of what is being done in this case. To my knowledge, Blackwood and Nichols has at no time come to Tenneco or Conoco asking for advice as to how this well should be operated or what we would recommend as a participating area. They're clearly required to do so under the unit operating agreement.

The action of Tenneco and Conoco may be rather unpopular with the other working interest owners in this unit, but I would point out that the well is not located on their lease; it's located on our lease. And if the well were drilled on one of their leases, I think they would vote the same way as Continental and Tenneco have.

I'd also point out that there has not been a statement rendered as to cost of drilling and completing the

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well. The well has not been placed on production to offset the cost of drilling and completing the well, or to gather data, which is necessary to support an application for a participating unit. It would appear that Blackwood and Nichols has never even considered creating a participation area for the Chacra formation, as is required by the unit agreement.

At the time of completion of Northeast Blanco Unit Number 105-A, now, remember, it's Number 64; as of the date of the working interest owners meeting, or the advisory committee meeting; as of the date of the committee deliberations, where the re-definition of the Mesaverde was considered; as of the date of the March 23rd hearing; as of today and until August 1st, the Chacra is still a separate formation under the Commission's nomenclature.

The Lively well was drilled in good faith and completed in the Chacra, and El Paso in good faith drilled another Mesaverde well in the same quarter section. In my opinion, the Lively well is entitled to an exception to Order Number 5459.

Tenneco's and Conoco's Florence 29-A -- to be redesignated by another number, I would assume -- was completed in the Chacra and if not given an exception to Order R-5459 will suffer drainage from the Lively well.

The Northeast Blanco Unit Well Number 64 was drilled in good faith and completed in the Chacra, and if

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no exception is granted for it, then that well will be subject to drainage from both the Lively well and the Florence 29-A.

Thus, it appears to me that all three of these wells constitute legitimate exceptions to Order 5459.

Q. In your opinion, Mr. Lyon, what effect would it have upon Tenneco and Continental if this application for an exception to the order is not granted?

A. Well, we would denied the right to protect ourselves from drainage from the wells in the tract that the Lively well is located in, and of course, our ownership in the Chacra formation in the Northeast Blanco Unit would be confiscated.

MR. KELLAHIN: That concludes my examination of Mr. Lyon.

MR. STAMETS: Are there any questions of the witness?

CROSS EXAMINATION

BY MR. CARR:

Q. Mr. Lyon, do you happen to know what the definition of the Mesaverde was at the time the well was completed?

A. Yes.

Q. And what would that be?

A. Well, it's from an old order, as I understand it, that defines it from the top of the Cliff House to the base

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of the Point Lookout, within a certain depth range.

Q. Within a certain footage; would that be, say, 4100 to 5200 feet?

A. That sounds about right.

Q. Would it surprise you to learn that this well was completed within that interval?

A. It wasn't completed below the top of the Cliff House, though, and --

Q. But it was within the footage definition used by the Commission at that time?

A. Well, I think those two go as kind of a pair, and as I read that order -- it's been awhile since I read it, but it inferred to me that that was the depth that those formations had been encountered in the area that had been developed at that time.

Q. Did you attend the October 12 meeting of the advisory committee?

A. No, I did not.

Q. So you would not know what sort of a response was given to Tonneco's letter by Blackwood and Nichols at that meeting?

A. We had a representative there.

Q. But you do not know?

A. I was not there.

Q. What did your representative tell you?

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A. He told me that he didn't get much of an audience.

Q. Well, what does that mean?

A. Well, he said that even though the people who attended the meeting -- I don't know whether this is admissible, it's hearsay -- that those who were at the meeting were told that the advisory committee doesn't have this authority; that this has to be --

Q. My question is, are you aware of what kind of an answer was tendered?

A. I don't have a transcript of that meeting, no.

Q. Okay. Now, you've indicated you've not received a cost statement from Blackwood and Nichols.

A. Right.

Q. Is it not true that you've not only received but you've paid your 1.5 percent of the cost of drilling this well as a Mesaverde well?

A. Yeah, we probably have.

Q. Does Continental pay without cost statements?

A. Sir?

Q. Does your company pay without receiving cost statements?

A. No.

MR. CARR: I have no further questions.

MR. STAMETS: Any other questions of the witness?

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CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Lyon, were you at the hearing which resulted in the redefinition of the vertical limits of the Mesaverde Pool, which will become effective August 1st?

A. Yes, I was there for most of it. I had to leave a little bit early.

Q. Did you make Continental's feelings on the potential confiscation of property, if such redefinition were employed, known at that time?

A. Well, I had prepared a statement to be read into the record at the conclusion of the hearing, and I learned just last week that that statement was not read into the record; that the Commission kind of discouraged statements at that time, and had I known that, I would have mailed that statement to the Commission.

I had thought that it went into the record.

Q. You presented no evidence on that?

A. No, no, we didn't.

Q. Now, I don't know if you saw the exhibit that Lively presented in the last case, their area map.

In any event, what their map showed, if you will recall, was three wells in the west half of Section 35, and their testimony, as you recall, was to the effect that if the

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Commission didn't grant some sort of relief, two of those wells would suffer some sort of a decrease in allowable. Is that the way you recall it?

A. Well, I wasn't there when Mr. Shryack -- are you talking about the case just today? Yes, I heard that.

Q. Okay. Now, does that same sort of a situation exist as relates to the Number 29-A and the Number 64 well?

A. As to those two locations, the Mesaverde well, the well that's drilled to and completed in the Mesaverde, have not been drilled; those locations are still open.

Q. So at the present time there's only a single well on each 160-acre tract?

A. Yes.

MR. STAMETS: Any other questions of the witness? He may be excused.

MR. KELLAHIN: Call Gary Rapp.

GARY RAPP

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name, by whom you're employed, and in what capacity?

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A. My name is Gary Rapp and I'm employed by Tenneco Oil Company as a Geological Engineer in the Rocky Mountain Division Office in Denver.

Q. You have not previously testified before the Commission, have you, Mr. Rapp?

A. No, I haven't.

Q. When and where did you obtain your degree?

A. I obtained my degree in 1974 from Princeton University, a B.S.E. in Geological and Civil Engineering.

Q. Dince graduation where have you been employed and in what capacity?

A. I've been employed with Tenneco since that time.

Q. Have you made a study of the Blanco-Mesaverde area in the San Juan Basin of New Mexico?

A. Yes, I have.

Q. What other studies -- what other studies and analysis of the San Juan Basin of New Mexico have you conducted?

A. Since the time that I've been working for Tenneco, I have conducted studies of the Mesaverde formation, of the Pictured Cliffs regional geology, of the Dakota formation in the area of the San Juan 28-7 Unit, and particularly of the Dakota formation in the Diegos Canyon area.

Q. Have you made a study of and are you familiar with the geological data surrounding this particular application by Tenneco Oil Company?

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A. Yes, I have.

MR. KELLAHIN: If the Examiner please, we tender the witness as an expert geological engineer.

MR. STAMETS: The witness is considered qualified.

Q. (Mr. Kellahin continuing.) Mr. Rapp, would you refer to what we have marked as Tenneco Exhibit Number Seven, identify it, and explain the significance of the exhibit.

A. Yes. Exhibit Number Seven defines the geologic and geographic context of the remarks that I will be making, and this exhibit has been chosen to allow the greatest clarity of expression of geologic terms. At the outset, I will say that Tenneco is aware of the redefinition of the Mesaverde by the New Mexico Oil Conservation Commission recently.

The exhibit here was taken from a Geologic Atlas of the Rocky Mountain Region, published by the Rocky Mountain Association of Geologists in Denver in 1972, and the figure consists of a restored diagrammatic section in the upper cretaceous rocks, which is --

Q. Let me ask you about the atlas from which this document is taken. Is that a recognized and accepted authority for geological purposes?

A. Yes, it is.

Q. All right, please continue.

A. The diagram is taken after Mr. R. J. Wymer, who is a recognized authority on geology of the upper cretaceous

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in the Rocky Mountain Province.

The particular section that I will be confining my remarks to today is shaded in in yellow on the exhibit. You can see that this section that is shaded in in yellow contains the Mesaverde Group tight area, as defined in southwestern Colorado. It also contains the Lewis Shale tight area, as defined in southwestern Colorado, and it is correlative with the northeast portion of the San Juan Basin, which we will be discussing in our remarks here.

The Mesaverde Group tight area on this diagram consists of the Cliff House Sandstone member, the Menefee member, and the Point Lookout Sandstone member, and these were defined in an article from which this diagram was taken, by Mr. Wymer, and I would just cite this reference. It's from the Bulletin of the American Association of Petroleum Geologists, January, 1950. The article is, Upper Cretaceous Stratigraphy of the Rocky Mountain Area.

Reading from Page Five, "The Mesaverde, as now described," referring to the San Juan Basin, "has a Group status consisting of (1) a lower marine sandstone to Point Lookout, 120 feet thick; (2) a middle non-marine coal-bearing formation, the Menefee, 500 to 1000 feet thick; and (3) an upper marine sandstone, the Cliff House, 190 feet or more in thickness.

Overlying the Mesaverde Group is 1500 to 2000 feet of marine Lewis Shale.

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As you can see on this diagram, the Mesaverde, geologically speaking -- the Mesaverde Group in this area, from a geologic standpoint does consist of these three members. The Lewis Formation, as you can see on the diagram, then would extend from the base of the Pictured Cliffs Formation down to the top of the Cliff House Sand. The Chacra interval would be contained within this Lewis tight section -- interval.

We have three reasons, basically, for using this definition. First of all, it specifically relates to the area of the San Juan Basin under consideration and it is an authoritative geologic source for this area.

Secondly, its terminology allows for geologic preciseness of expression in the particular problems which we will be discussing today.

And third, this definition is the one that has been used for more than twenty-five years in establishing the ownership of the interval between the Pictured Cliffs and the Mesaverde, and within the Mesaverde, and this is true and has been true both in the common understanding of operators in the San Juan Basin, and it was expressed formally in Order 799, which was cited previously, but I would like to cite it again, and I'll be citing it from Order Number R-5459 of the Commission, which did quote part of this definition. The said limits of the Blanco-Mesaverde Pool are 4200 to 5100 feet productive horizon where the productive

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sands are contained between the top of the Cliff House Sands and the base of the Point Lookout Sands of the Mesaverde.

I might just emphasis the wording that was used there does emphasize where the interval is clearly in the Cliff House Sands, between that and between the base of the Point Lookout Sands. It is much more than just a depth interval and admittedly that depth interval was not applicable basin wide; however, the top of the Cliff House Sand and the base of the Point Lookout Sand are geologic horizons that are correlative over the entire San Juan Basin.

I felt, just to augment my statement a little bit, that this was not particularly brought out in the testimony from the hearing pertaining to Order R-5459 and I think that due recognition should be made that the original definition was an understandable one and that it did deal with a clearly defined geologic interval though the depth restrictions were not advantageous.

Q. Mr. Rapp, would you go to the cross section which we've placed on the wall, which I've labeled as Tenneco's Exhibit Number Eight, identify it, and state what information it contains?

A. Exhibit Number Eight is a stratigraphic cross section which extends from the southeast quarter of Section 34, Township 30 North, 8 West, and progresses into Section 35 of the same township, across Section 26 of that township,

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across 25 of that township, and terminates at the Northeast Blanco Well Number 34 - 19, which is in the southwest quarter of Section 19 in Township 30 North, Range 7 West.

The vertical interval that is displayed on this cross section extends from slightly above the Huerfanito Bentonite marker down to slightly below the main part of the Point Lookout Sandstone.

The different members that are contained on this cross section, then, starting from the bottom up, are the Mancos Shale interval at the very bottom, with the regressive Point Lookout Sandstone lying above that, the non-marine Menefee interval in between it and the Cliff House Sand, which overlies the Menefee, and then we enter a thick section of the Lewis Shale and progress on upwards to the Huerfanito Bentonite marker, as shown on the cross section.

I have several observations about this cross section that should be noted.

First of all,there is a marked lithologic change as evidenced from logged character here between the main Cliff House interval and the Lewis Shale, which overlies it.

Secondly, though there are no logs that were run in either the Florence 29-A Well or in the Blackwood and Nichols Number 64, or the Northeast Blanco Number 64 Well, it's evident that in the Florence 29-A Well, the open hole completed interval is approximately 300 feet above the top of

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the Cliff House Sandstone, as interpolated from the operators' plots in the El Paso Gardner Number 8 Well and the Howell Number 2-L Well in Section 25 of 30 North, 8 West.

Moving on across the section, the Northeast Blanco Unit Number 64 Well has been projected a short distance into this interval between the Howell Number 2 Well and the Northeast Blanco Unit Number 34-19 Well.

Based, again, on the operators' definitions of the top of the Cliff House, it's roughly 670 feet between the perforated interval in the Northeast Blanco Number 64 and the top of the Cliff House Sandstone. This interval consists predominately of the massive Lewis Shale section.

I might point out on this section the common understanding of what has been construed as what has consisted of the top of the Mesaverde Formation among operators for over twenty-five years, the top of the Cliff House Formation has been considered the top of the Mesaverde and above that we can see an interval of well over 900 feet up to the Huerfanito Bentonite. This interval consists of a tangible zone of rock which may or may not have productive capacity therein, and in looking at this cross section we can clearly see that a redefinition of the Mesaverde in changing the common understanding of the top of the Cliff House as the top of the Mesaverde will confiscate this much section of tangible possibly productive rock from those who would own

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interests that would be, for example, between the Pictured Cliffs and the top of the Mesaverde; they would lose this much section.

MR. STAMETS: Excuse me, that word "confiscate", that bothered me. I've heard that several times and I'd like to have a clarification of precisely what you're talking about when you mean "confiscate".

A. Okay. Admittedly, that is a strong word, but the fact is simply that a person, and I will cite just a possible example, a person who owned the rights between, for example, Pictured Cliffs and the top of the Mesaverde Formation, and that person, if they had production coming from this interval between the top of the Cliff House and the Huerfanito Bentonite at the time they acquired that lease, and because of the understanding that has been involved about the Mesaverde Formation, it would have been the accepted understanding that they owned the productive rights by the former definition above the top of the Cliff House, because the Mesaverde was defined as those sands occurring between the top of the Cliff House and the base of the Point Lookout. So by this redefinition, that person who had established production in this zone would no longer own the rights to a zone that they previously owned the rights to. And that's operationally what I mean by that word "confiscates".

MR. STAMETS: In fact, is that the common way to

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get leases in the San Juan Basin, to have them by formation names or is it common to acquire them by depths?

A. I am not an expert witness on this, but I have had enough contact with our own leases to know that a great bulk of them, Tenneco's leases, are defined as between the base of the Pictured Cliffs and the top of the Mesaverde.

MR. STAMETS: It sounds to me as though Tenneco had a tremendous interest in the case the Commission held concerning the redefinition of the vertical limits of the Blanco-Mesaverde Pool. I wonder why they did not choose to make all of this a part of that record.

A. A part of the record at which time?

MR. STAMETS: Of the case called before the Commission to set a redefinition of the vertical limits of the entire pool.

A. Well, Tenneco was represented at the hearing and Tenneco attended the initial meeting where these proposals were considered at the time, on December 19th.

MR. STAMETS: Did Tenneco present any evidence toward this confiscation at that hearing?

A. At that hearing, I didn't attend that hearing so I can't testify to exactly what was presented. I have -- in fact, I have -- no, I couldn't make a positive statement on that.

MR. STAMETS: So you don't know if Tenneco chose

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to protect their rights at the early hearing or not.

A. What I can say is that at this time the context of my argument here are not with regard to the initial hearing they're not with regard to the initial redefinition. They are simply with regard to the fact that in established wells which were drilled under the old definition where we did acquire -- we did own these rights at that time, that we now request an exception, under the circumstances for these two.

MR. STAMETS: Okay, thank you.

A. In addition to the distance of these two wells, we have to consider the fact that we're talking about a basically impermeable shale over an extremely thick distance in terms of any type of vertical permeability through the rock matrix itself in both of the wells we're looking at here.

Q. (Mr. Kellahin continuing.) Let me ask you, Mr. Rapp, about whether you find any evidence of communication between the Chacra and the Mesaverde?

A. I do not find any evidence of communication between the Chacra and the Mesaverde. Perhaps we could just look at the orientation of these completions with respect to the Mesaverde as a whole.

You can see that in the Florence Number 29-A Well the distance to the top of the Cliff House is approximately 300 feet, but the distance to the top of the Menefee is approximately 500 feet; to the Point Lookout, approximately 800

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feet, and to what might be called the lower Fu[redacted]y zone were developed, it would be probably greater than 900 feet.

In the Northeast Blanco Unit Number 64 Well, whereas, maybe 670 feet, which is a significant interval, to the top of the Cliff House, but it's more like 800 feet to the top of the Menefee; approximately 1100 feet to the top of the Point Lookout, and perhaps might be 1300 feet to the lower Fu[redacted]y interval or any stringers that would exist down below the Point Lookout.

So we can see that there's a tremendous interval here to talk about any sort of vertical communication to a single wellbore that is situated in impermeable rock this far above the Mesaverde Formation.

Q. Along those lines, Mr. Rapp, do you find any evidence of vertical fracturing occurring outside of the Chacra Formation?

A. In terms of evidence that I've personally see, no, I have not seen evidence of vertical fracturing outside of the Chacra Formation. High angle fractures may exist in sand intervals in the Cliff House; that interval had been cored; no one has ever, to my knowledge, offered any substantive information regarding actual concrete evidence of fracturing above that area.

Q. Is horizontal fracturing occurring within the Chacra Formation itself?

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A. I couldn't make a definitive statement on whether it is or not.

Q. What conclusions do you reach from this exhibit, Mr. Rapp?

A. Well, my conclusions are tied up in the reasons, specifically, why, according to the testimony offered at the hearing, the Northeast Blanco Unit Number 64 was drilled.

I'd like to enter a certain part of the testimony, if I may, into the record, because it will help clarify our considerations of the impact of this.

The portion of the testimony that I'm referring to is -- begins on Page 59 on Line 21, where the question was asked under cross examination of the expert witness, why was the Northeast Blanco Unit Number 64 Well drilled; the answer, the Section 24 contained two Mesaverde wells and the offsetting section to the south contains three Mesaverde wells and we were requested by the governmental agencies, specifically the USGS, to drill a third Mesaverde well to protect the unit from offset drainage, and we included that in our plan of development and drilled the well.

So now, based on this testimony, then, the primary purpose was to protect correlative rights in the Mesaverde, which would include the Cliff House, the Menefee, the Point Lookout, and my conclusion is that the wellbore, particularly in the Number 64 here, which was drilled for that purpose, is

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not in communication with the Cliff House, with the Menefee, with the Point Lookout, or with anything below that, for which purpose the well was supposed to be drilled.

Q. In your opinion, Mr. Rapp, from what formation is the Number 64 Well producing?

A. I believe that it's producing from a fractured Chacra interval, a fractured interval within the Lewis Shale, tight section interval, as we have defined it.

Q. In your expert opinion, Mr. Rapp, from where does the Florence 29-A Well produce?

A. The Florence 29-A Well also produces from fractured Chacra interval in the overall tight section of the Lewis Shale.

Q. In your opinion, Mr. Rapp, are both these wells producing from a separate and distinct reservoir apart from the Mesaverde Formation?

A. Yes, in my opinion of the geologic definition of the Mesaverde they are -- let me say that they are producing from a distinct interval from the Cliff House or anything below that.

Q. Do you have anything else you'd like to add with regard to this exhibit?

A. No, that would conclude my remarks.

Q. All right, sir.

Would you please refer to what has been marked as

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Applicant Exhibit Number Nine, identify it, and state what information it contains?

A. Yes, Exhibit Number Nine is a structure map on top of the Cliff House Sand. The elevations of the Cliff House Sand top have been claculated from operators reported tops, wherever available. You can see from the contours on top of the Cliff House Sand the area picture of what we saw in vertical relief on the previous cross section.

My observations regarding this exhibit are, again, that it is clearly evident that the three wells with red triangles on them, the Northeast Blanco Unit Number 64, the Florence 29-A, and the Lively 7-Y, have their base of their bottom producing intervals significantly above a very consistent and low relief top of the Cliff House Formation, and we can see from this that there is no radical anomaly whatsoever in the top of the Cliff House producing sand in this area.

Q. I show you what has been marked as Applicant Exhibit Number Ten and ask you to identify it.

A. Exhibit Number Ten is an isobaric map of the Blanco-Mesaverde Formation, compiled from wellhead shut-in pressures from 1976 deliverability tests as reported in the report of the Oil and Gas Engineering Committee, and with one or two exceptions where an initial wellhead shut-in pressure was used when a deliverability test was not reported in the report of

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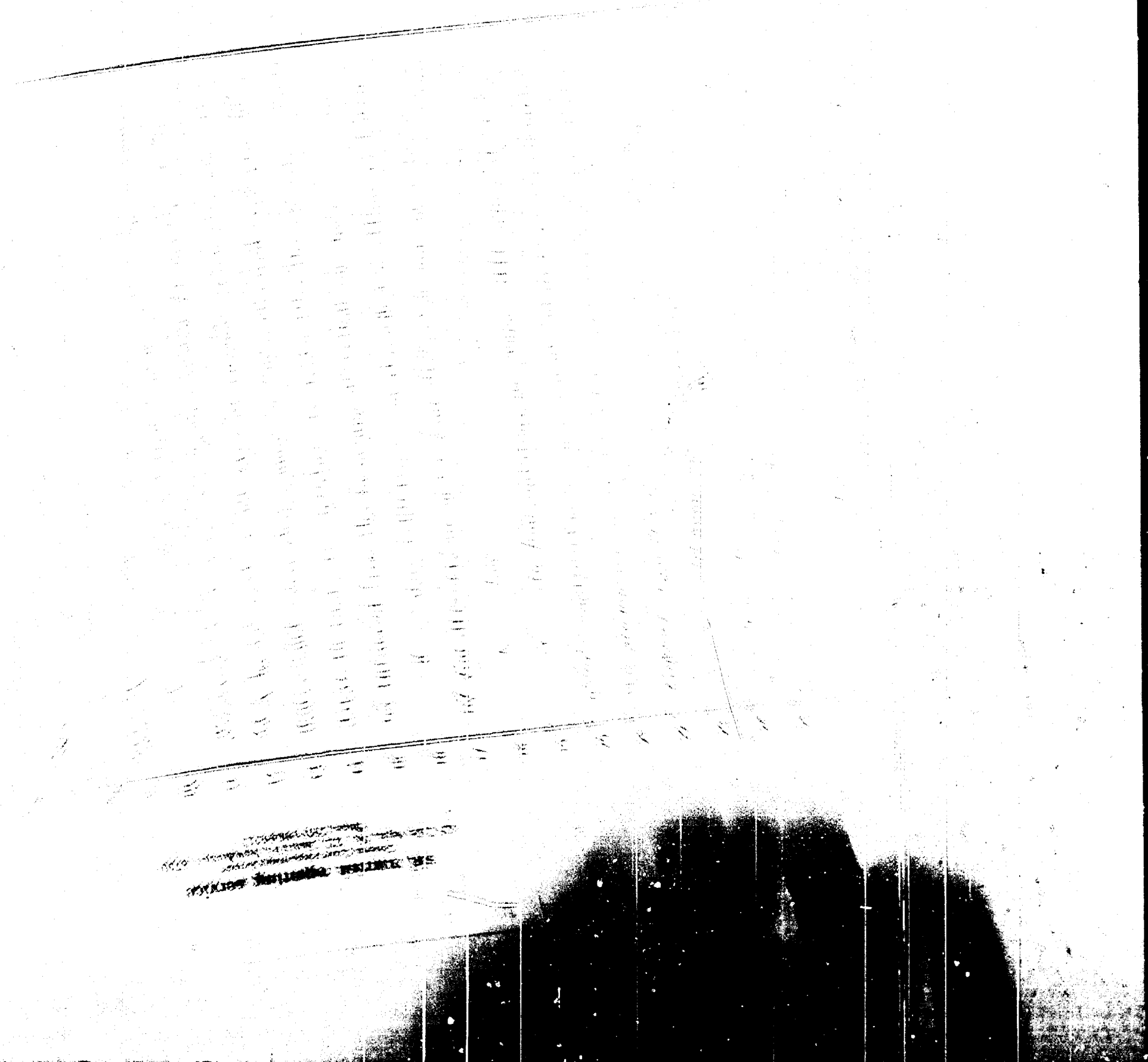
the committee, you can see from the data posted on this map that there are a number of distinct pressure trends evident in this localized area that surrounds the three anomalous wells that we are considering today. It was apparent from the trends that could be observed in this shut-in pressures measurements that there was a consisten pattern involved; that there was a pattern that could lend itself to contouring; that could also lend itself to prediction in specific areas of the pressure that might be expected were a new well drilled into the Mesaverde Formation.

You can see extending through Section 30 of Township 30 North, 7 West, and on northwestward, a pronounced low pressure trend. It's a localized trend through this area, and you can see the position in which the two wells that we're particularly concerned with, the Northeast Blanco Number 64 and the Florence 29-A, you can see how those fall with respect to these pressure trends.

It might be expected that in the Northeast Blanco Unit Number 64 Well, that a pressure somewhere more in the vicinity of 400 pounds would be expected; however, the shut-in pressure that was measured on July 14th of 1976 was 640 pounds, or roughly 240 pounds greater.

In the Florence 29-A Well, you can see that a pressure on the order of 450 pounds might be expected here, and the latest deliverability test that was reported in March

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MR. KELLAHIN: If the Examiner please, we move the introduction of Tenneco Exhibits One through Ten.

MR. STAMETS: These exhibits will be admitted.

MR. KELLAHIN: That concludes our direct examination.

MR. STAMETS: We'll take a fifteen minute recess.

(Thereupon a recess was taken.)

MR. STAMETS: Are there any questions of this witness? Mr. Carr, do you have some?

MR. CARR: Yes.

CROSS EXAMINATION

BY MR. CARR:

Q. Mr. Rapp, as I understand this, there was some confusion as to what constituted the vertical limits of the Mesaverde prior to the time that the limits were redefined by the Oil Conservation Commission, is that correct? Some were using formation names and others were using actual footages and depths to define the Mesaverde?

A. You're talking about in terms of how a well would be designated when it's completed?

Q. Right. Right, what the vertical limits were. There seems to be some confusion from -- prior to this last effort --

A. With the exception of these Lewis fracture wells,

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I don't think that would be an accurate statement to say that there was any sort of general confusion. I think that it's --

Q. But when these Lewis fracture wells were drilled all of a sudden there was confusion?

A. At that time I felt the confusion was with regard to the fact that they were classified as Chacra and then unclassified.

Q. Some people were talking about the Mesaverde being from 4100 feet to 5200; others were talking about to the top of the Cliff House, or something like this, is that correct?

A. Well, I personally never had heard anyone in common practice talk about the Mesaverde by the depth limitation only by the geologic names.

Q. But those figures were being used, probably?

A. They probably -- well, no, I don't believe that they were, because there were probably wells that did not fall within that depth interval that were classified --

Q. (Interrupting) There were no wells that fell within that depth interval, but that depth interval -- but the depth interval was still being used --

A. (Interrupting) The depth interval that was used was confusing.

Q. All right. Now, when both the Florence 29-A and the Northeast Blanco Unit Number 64 were drilled and encountered production, they both fell within this previously used footage

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definition, is that not --

A. They fell within that footage, yes.

Q. To your knowledge, I think you may have already answered this, was production encountered in the Mesaverde above the massive Cliff House Sandstones in any wells other than the Florence 29-A and the Northeast Blanco Unit Well Number 64?

A. In this area here?

Q. Right.

A. Not in this area here, to my knowledge.

Q. Now, were you aware that when the Northeast Blanco Unit Well Number 64 was drilled, it was drilled by the unit operator to prevent drainage from three wells, and one of those -- when the Well Number 64 was drilled it was drilled to prevent drainage, and one of the three wells that was supposed to be draining was in the Mesaverde, was the Florence 29-A Well?

A. I was aware that it was one of the three wells in the adjacent section.

Q. Could you give me any reason why the Florence 29-A was produced and gas sold as a Mesaverde well for a year and a half by Tenneco?

A. Yes, I can. I was the person who filled out the completion report for the state on that well, and you will note that on that form the word Mesaverde never occurs. We

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classified that well as being completed in the Lewis. The TD was in the Lewis. The completed interval was in the Lewis, and it was only when forms were sent on a clerical basis for authorization to transport oil and gas that Mesaverde classification was used, and primarily, because that was the way the Commission at that time was --

Q. (Interrupting) Was defining Mesaverde, is that right?

A. Pardon me?

Q. That's because the Commission at that time was defining Mesaverde in that fashion?

A. It was at that time convenient to classify it as Mesaverde. Geologically it was not.

Q. But that's how the Commission was classifying it, is that correct?

A. I'm not -- I'm not actually positive. I couldn't testify for sure.

Q. But you couldn't dispute that, either?

A. No. I only know our own classification of it.

Q. Now, suppose you were drilling a well to protect correlative rights in the Mesaverde and you encountered a vertical fracture coming from a lower zone, it would be -- it would be possible that you could encounter production above traditional Mesaverde depths, is that not true?

A. Only if there was a fracture that was --

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Q. (Interrupting) Okay, there was a fracture.

A. -- clearly in communication.

Q. Now, refer to your Exhibit Ten. I have just a couple points there that I'm not real clear on.

You talk about the Cliff House. Don't you mean the massive Cliff House Sandstone member? The Cliff House, in other words, isn't that what your structure map is on?

A. Exhibit Number Nine, you mean, the structure map here?

Q. Right; right, that's right.

A. Exhibit Number Nine employs the operators reported tops for the Cliff House, where it reports it.

Q. You're talking about the massive sandstone member of the Cliff House?

A. Generally speaking.

Q. Now, in referring to your Exhibit Number Ten, you show great pressure differentials between offsetting wells, sometimes as much as 350 pounds, is that correct?

A. I haven't taken the maximum difference, but there are pressure differentials.

Q. And they're fairly substantial?

A. I guess you could say that.

Q. 300 pound range?

A. Uh-huh.

Q. The Mesaverde, now, is a tight reservoir, is it

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not, and slow producing reservoir?

A. That, I don't think you could make a general statement on that. The Mesaverde consists of three producing intervals over a broad area in the Blanco-Mesaverde Field. I wouldn't want to make a general statement.

Q. Your exhibit does show, however, that you have some great pressure variations between offsetting wells?

A. There are those pressure variations, yes.

Q. And the pressure variations in the Mesaverde itself may be greater than the pressures that you may be relying on to show different -- to show different formations, is that true?

A. I'm not sure I understand your question.

Q. Well, you're talking about the pressure variations within the Mesaverde were 350 pounds.

A. Laterally.

Q. Laterally. You're also -- but that's between offset wells.

A. Uh-huh.

Q. And that's a greater differential than you may be using in other instances to show the pressure differential indicates separate reservoirs.

A. Not in the area that we consider representative of a representative sample of the formation, that's not true. The area that we focused in on was the area, Sections 24 and

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25, right around that area, in 30 North, 8 West, and those two wells are -- all around the circumference of them are this low pressures zone, consistently.

MR. CARR: I have no further questions.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Rapp, did you indicate that the Number 29-A Well and 64-A Well are producing out of the fractured shale?

A. It would appear that there is some type of a fractured rock in the immediate vicinity of that wellbore, both wellbores.

Q. Where does the gas come from that is in those fractures?

A. Are you asking for my personal opinion?

Q. Your opinion as a geological engineer.

A. My opinion as a geological engineer is that there isn't substantive proof to show where those fractures extend.

My personal opinion is that they are confined, probably between clastic, more clastic zones, in the Lewis Shale that did not fracture, and that there is a fractured Lewis Shale reservoir that would be one possibility.

Q. Have you made any calculations how big that reservoir would have to be, say, in the case of the Lively well, in order to supply the volume of gas that's been producing

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from that well since '75?

A. I haven't made a calculation about that.

Q. That well's made nearly two billion cubic feet a day. Wouldn't that be a pretty good size fractured shale reservoir?

A. Two billion cubic feet is a lot of gas, and I think it's all relative as to how big it is.

Q. Getting back to your Exhibit Number Ten, you indicated that because the Number 64 Well did not find pressures in the range of 400 pounds, that that was proof that it was not in communication with the Blanco-Mesaverde Pool, is that correct?

A. I believe my statement was that it certainly indicated that you could not substantiate pressure communication, and, if anything, it appeared to be opposite, because there was such a significant pressure differential.

Q. Okay. Let's move now north and west of there, Section 23, and for the moment let's take out those two infill wells that have been drilled in there, one in the northwest quarter and one in the southeast quarter, and go back to the situation we had before those two wells were drilled, where you had a well in the southwest with 441 pounds, a well in the northeast with 529 pounds. Does that mean that when these two wells were drilled in between that came up with higher pressures, that they're not connected to the Mesaverde

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pay?

A. That they are not connected to the -- like the Cliff House, Point Lookout pool?

Q. That's right.

A. I don't think that you could base on that data alone conclusions one way or the other.

Q. So pressure is not the sole indication of whether they are or are not connected.

A. I don't feel that you could argue pressure as a sole basis.

Q. Mr. Rapp, is it possible that there is vertical communication between the Cliff House Sand and the fractured shales that are producing in the Number 29-A and 64 Wells?

A. In my opinion it's very unlikely over that great a distance.

Q. But is it possible?

A. It's possible but not substantiated. It's only -- if I might qualify, I think it's only possible if there are no zones that could impede a fracture; it would have to be a very, very perfectly drilled continuous material.

MR. STAMETS: Any other questions of this witness?

MR. KENDRICK: Yes, sir.

MR. STAMETS: Mr. Kendrick.

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CROSS EXAMINATION

BY MR. KENDRICK:

Q. The depth that you referred to in the definition of the -- the old definition of vertical limits of the Mesa-verde Pool, were those numbers 4200 to 5100 feet?

A. The numbers I read you off of the Order there. I don't recall offhand, but they were taken from the Order that I did cite. Here it is. Yes, that's correct.

Q. And this would be essentially about 900 feet?

A. Yes.

Q. And on your definition of the cross section that's on the wall here, which is, I believe, Exhibit Number Eight, you testified that the Tenneco Florence 29-A was somewhere in the range of 1100 feet from the bottom of that completion to the base of the Point Lookout, is that correct?

A. I believe that's what I testified. You can see it on that section; it could be measured right off of the -- it's one inch to a hundred feet there.

Q. Well, is approximately 1100 feet somewhere in the ballpark of what you testified to for the Florence 29-A?

A. Yes.

Q. And Number 64, I believe you testified something like 1300 feet from the bottom of that completion to the base of the Point Lookout?

A. Yes, those are approximate numbers. If you can see,

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the interval is displayed on the cross section.

Q. Are those distances appreciably different from 900 feet as defined in the old definition?

A. From where those are completed is the 900 -- is 900 feet --

Q. (Interrupting) Is the 900 feet appreciably different from --

A. (Interrupting) From 1100 feet?

Q. --1100 feet or 1300 feet?

A. If you're just talking about those two numbers out of context, no, they're pretty close to each other.

Q. Does the thickness of the Mesaverde producing interval, as defined by your definition from the top of the Cliff House to the base of the Point Lookout, does it fluctuate a little bit from location to location?

A. That interval thickness?

Q. Yes.

A. Yes, it would.

Q. Would it fluctuate as much as two or three hundred feet from well to well?

A. It would certainly depend on localized an area you were looking at.

Q. Okay. On your cross section exhibit you took from the Rocky Mountain Geologic Atlas, or excuse me, Geologic Atlas of the Rocky Mountain Region, across the top of the page

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between Point A and Point Y, there are some locale definitions the first being the southwest of the San Juan Basin and the next being the northeast of the San Juan Basin, and that's about where you colored in the yellow part, is under the identification of northeast San Juan Basin. Approximately where between those two points of the southwest part of the San Juan Basin and the northeast part of the San Juan Basin would your area of locale be here for the southeast quarter of Township 30 North, Range 8 West?

A. It would be reasonably close -- well, let's say it would be much closer to the northeast than Point A, southwest.

Q. Well, could it be, say, somewhere under the "T" identifying the point up in the Lewis Shale area, somewhere in that proximity?

A. That far over where there's --

Q. Where the "T" identifying the transgressive phase of that division is.

A. I couldn't say offhand.

Q. If it were that far over, the top of the Cliff House would then be approximately what percent higher than the total thickness as shown where you colored it yellow?

A. Could you repeat that once more?

Q. Well, where you colored the Mesaverde Formation yellow --

A. Right.

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Q -- there is a thickness. Now, what percent of that would -- what percent of that thickness would be represented if this area is under the "T" for the transgressive phase of deposition, some quarter to three-eighths of an inch to the left of where you colored in on this? Would it have --

A. It would be quite a bit thicker over there.

Q. In a range one and a half to two times as thick?

A. Probably. Probably one and a half to two times.

Q. Would that compare favorably between 900 feet and 1300 feet for thicknesses varying in parts of the field?

A. I don't know. For one thing, this cross section here is such a small scale that I don't feel that I can speak from it as -- as to measure fine distances like that. That's not the purpose of it. I could look at more accurate figures but I don't have those on hand, but I don't really feel that I can make valid statements off of something this small; that wasn't the intention of this exhibit.

Q. On this exhibit on the wall, the cross section exhibit, is that Exhibit Eight?

A. Yes, I believe it is.

Q. Is there any log for any of the wells you've selected, or the logs that you've selected, that shows a reservoir of substantial character where the two wells in this case might be obtaining gas to produce at the depth of completion?

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A. Could you clarify "reservoir" in terms of log parameters, what you mean there?

Q. Well, I would let you do that; you're classified as the geological engineer.

A. Okay, well, if I have the liberty to do that, I would say from the logs which are available, that you could not determine whether or not -- conclusively whether or not there was a fracture reservoir there. There certainly could be one there.

Q. Are there any permeability, porosity reservoirs indicated at that completion depth, or those completion depths? In any of these wells?

A. From the log data you can't determine permeability. If there is effective porosity there, then, you could conceivably have permeability that would produce it. From those logs alone I couldn't make a positive determination if there is a sand-type of interval there, though.

Q. Thank you.

MR. STAMETS: Any other questions of the witness?

MR. KELLAHIN: No, sir.

MR. STAMETS: He may be excused.

MR. KELLAHIN: That concludes our direct case.

MR. CARR: I'll call Mr. Charles Blackwood.

I would like the record to reflect that Mr. Blackwood has previously been sworn this afternoon and is still under oath.

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CHARLES BLACKWOOD

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your name and place of residence?

A. Charles Blackwood, Oklahoma City, Oklahoma.

Q. By whom are you employed and in what capacity?

A. By Blackwood and Nichols Company as a Consultant Geological Engineer.

Q. Okay, Mr. Blackwood, have you previously testified before the Commission and had your credentials accepted and made a matter of record?

A. Yes, I have.

Q. Are you familiar with what the applicant seeks in this case?

A. Yes, I am.

Q. What is Blackwood and Nichols interest in this case?

A. Blackwood and Nichols is the operator of a thirty-two thousand five hundred acre Mesaverde participating area unit, called the Northeast Blanco Unit, and as the operator, why, we drill the wells and produce them, and that's how we're involved in this case.

Q. Are you familiar with the area surrounding the unit

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as well as with the unit itself?

A. Yes.

MR. CARR: Are the witness' qualifications accepted?

MR. STAMETS: For the record, is Mr. Blackwood appearing only as the operator or as an engineer or as a geologist?

MR. CARR: Mr. Blackwood is appearing both as an --

A. I'm a Geological Engineer and have a Masters degree and have been qualified.

MR. STAMETS: I just wanted the record to reflect exactly what you were qualified as.

Yes, the witness is considered qualified.

Q. (Mr. Carr continuing.) Mr. Blackwood, I'd like to direct your attention for a moment to the Northeast Blanco Well Number 64, and weould like to briefly get a background on the well for the Examiner.

When was the well drilled?

A. It was drilled back in the summer of 1966.

Q. And why was it drilled?

A. It was drilled as a necessary offset. There were three producing Mesaverde wells in the section to the south and we had only two wells producing in the unit area at that time, and so it was a required offset that we drill another Mesaverde well.

Q. And it was drilled pursuant to your unit plan for

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development?

A. Yes. We submitted a plan of development and it was approved by all the working interest owners in the unit and was approved by all the governmental agencies involved.

Q. Now, I would ask you to refer to what has been marked as Blackwood and Nichols Exhibit Number One, and explain to the Examiner what this shows.

A. This shows the wells in the area of the southwest corner of the Northeast Blanco Unit, pressures, and dates of completion are given on the various wells. A line is shown from which a cross section has been prepared, which is very similar, I might add, to the cross section already on the board over there.

Q. Now again I'd like you to direct your attention to the Northeast Blanco Unit Well Number 64. There is a figure indicated with that well, 9,900 Mcf. What is that figure?

A. That's the calculated absolute open flow potential of the well. That was taken shortly after the well was completed.

Q. Okay. And what was the initial shut-in pressure on this well?

A. The initial shut-in pressure by the gauge on the wellhead was 640 pounds. We later had a pressure bomb run to show the more exact pressures, and it indicated 619 pounds on the surface.

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Q. Now, how does that pressure correspond with other Mesaverde pressures in the area?

A. That pressure is somewhat higher than the old Mesaverde wells in the area. I would intend to introduce something about the variance in pressure between the old Mesaverde wells, which have been producing for a number of years, and the new infill wells, and this pressure is slightly higher.

Q. Do you have any recent shut-in pressures on the well in question?

A. Yes. The same gauge which has been on the well since the well was completed and showed 640 pounds initially now shows 615 pounds, indicating that the well has had a 25 pound pressure loss while it's been shut-in.

Q. And what conclusion do you draw from that?

A. Well this well is being drained by offsetting Mesaverde wells.

Q. Now, referring to Exhibit One, I direct your attention to the Northeast Blanco Unit Well Number 2-43. What is the shut-in pressure on that particular well?

A. The shut-in pressure was 400 --

Q. This is the Blanco Unit Well Number 2-43?

A. It's the north offset well. It was 477 pounds.

Q. And do you consider this to be a normal shut-in pressure for a Mesaverde well?

A. Yes.

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Q. I'd like to direct your attention now on Exhibit One to the Florence Number 29-A Well. What shut-in pressure is encountered there?

A. Well, it had an initial shut-in pressure of 580 pounds and the most recent one I have any information on is 548 pounds in March of '76.

Q. Now, based just on this pressure date, would the Florence 29-A Well appear to be a Mesaverde completion or a completion in the new reservoir?

A. Well, to me it's quite obvious that this is not a completion in a new reservoir. If you will note on our Exhibit One, the wells which were -- the small letters "sip" on a number of these wells indicate the initial shut-in pressure of newly drilled Measverde wills back twenty-some years ago when the reservoir was near its virgin pressure, and we can refer to some specific wells. This one, the 2-43, had 1025 pound shut-in pressure; the offset to Well 64, Well 34-19 had initial shut-in pressure of 1052 pounds. The well direct -- the direct south offset in the northeast quarter of Section 25 had an initial shut-in pressure of 1088 pounds. The west -- well, let's see. You just look all over the map, the initial pressure of the Mesaverde Reservoir when it was new before it was drained, was in excess of 1000 pounds.

Q. Now, in your opinion if either the Florence 29-A or the Northeast Blanco Unit Well Number 64 were completed in the

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new reservoir, what kind of a pressure would you have expected to encounter?

A. Well, it should have -- any new reservoir undrained by fractures to some other level, should have had a pressure in excess of 1000 pounds.

Q. And in your opinion do the shut-in pressures on both the Florence 29-A and the Northeast Blanco Unit Well Number 64 correspond with the current Mesaverde pressures in the offsetting wells?

A. Yes, they do. I'd like to report -- and I'd like to submit in evidence, if you would, this letter of Mr. Norman Maxwell.

Q. That's been marked for identification as Exhibit Number Two. If you would refer to that and briefly summarize for the examiner what it shows.

A. This memorandum from Norman Maxwell, who's an engineer for the Oil Conservation Commission, shows the number of infill Mesaverde wells which have been drilled over the last two and a half years.

And I'll try to be brief. In 1975 there were 105 infill Mesaverde wells drilled. Their average shut-in pressure was 678 pounds; somewhat higher than either of the wells in question. It can also be noted that the offsetting pressures for the wells offsetting those 105 infill wells had only a pressure of 474 pounds; there being over 200 pounds pressure

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difference between the infill wells and the old offset wells.

The same is generally true for 1976. There were 109 Mesaverde infill wells drilled with an average initial shut-in pressure of 758 pounds. The offsets to those 109 wells had an average pressure of 479 pounds. In this instance the pressure difference is approximately 280 pounds difference between the new infill wells and the offsets in the same reservoir.

In 1977 the figures show 92 wells drilled through May, for an average pressure of 764 pounds in the Mesaverde Reservoir. The offsetting wells had an average pressure of 461 pounds, or again, in this instance a 300 pound pressure differential between new infill Mesaverde wells and offset, old, long-producing Mesaverde wells.

We feel that the pressure differences between Well 64 and its offset are certainly much less than the pressure differences indicated by the statistical data throughout the entire field, and therefore, we probably are in slightly better pressure communication with the Mesaverde than the average field well and the infill offset. The same is true of the Tenneco Florence 29-A. It's shut-in pressure difference between it and the offsets is less than the average within the Mesaverde Field, which would indicate to me there may be slightly better pressure communication between this borehole and the Mesaverde Reservoir than the average throughout the field.

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Q. Mr. Blackwood, I'd like you to refer to what has been marked for identification as Blackwood and Nichols Exhibit Number Three. I'd ask you to explain to the Examiner what it shows.

A. This is a cross section of wells that's shown on the Exhibit One, the dotted line. It goes from southwest to northeast from an El Paso Gardner Well, an El Paso Gardner 7; and El Paso Gardner 8; Well Three is a Tenneco Florence 29-A; Well Four I can't quite read, it's so tiny; San Juan Producing Company Howell 2-1 is Number Five; Well Six is Blackwood and Nichols 64 Well; Well Seven is DelHi Oil Florence 4-23, which is now Blackwood and Nichols Northeast Blanco Well; Well Eight is Blackwood and Nichols 34-19

What it shows is the top and bottom of the Mesaverde producing interval as defined by the Oil and Gas Commission in their recent order. It also shows the producing interval of each well. It shows the top of the Pictured Cliffs, just as a reference point, and generally provides a geologic information for the Commission.

Q. Mr. Blackwood, where is the Northeast Blanco Unit Well Number 64 completed in respect to the definition adopted by the Oil Conservation Commission of the Mesaverde Formation?

A. Well, it's completed at about a 4250 foot level, which is some 350 feet down into the Mesaverde as defined by the Oil and Gas Commission. It is some five or six hundred

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feet above the top of the massive sandstone member of the Cliff House; however, I'd like to make something clear. The massive sandstone member of the Cliff House is not the top of the Cliff House sandstone or is not the top of the Cliff House sandstones as appears in the publication, and later in my testimony I'd like to read to you from some papers which were used in defining the Mesaverde.

Q. Where is the Florence Number 29-A completed in regard to the definition of the Oil Conservation Commission of the Mesaverde?

A. The Florence 29-A is completed approximately 600 feet below the top of the Mesaverde as defined by the Oil and Gas Commission.

Q. Prior to the adoption of the new definition of the Mesaverde by the Oil Commission, what definition in terms of footage depth was used?

A. Well, the only published definition, which admittedly was ambiguous and which caused the necessity for redoing -- rewriting the definition, was 4200 to 5100 feet, and both of these wells are completed within 4200 to 5100 feet interval.

Q. Now, I'd like to refer back to your Exhibit Number One and ask you if the absolute open flow rate in the Northeast Blanco Well Number 64 is a normal flow rate for a Blanco Mesaverde well?

A. No, this -- the Number 64 well encountered a strong

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gas blow during the drilling, and it was so strong that it was necessary to actually run pipe and complete the well at this point, and it --

Q. (Interrupting) Would it be normal to encounter this in an unfractured reservoir?

A. No, this is -- most of the Mesaverde wells require large hydraulic fracture jobs before any kind of commercial flow rate is established, so we think that this is an indication of encountering fractures.

Q. In your opinion, based on the evidence of the high flow rate, in what pool would you conclude that the Northeast Blanco Unit Well Number 64 is completed?

A. I think that the gas which flowed to the surface in the Number 64 well came from the Mesaverde Reservoir. I think that fractures in the rocks allowed the gas from the Mesaverde Reservoir to migrate up to this higher level and be tapped by this well.

Q. Mr. Blackwood, earlier this afternoon a letter to Blackwood and Nichols from Tenneco Oil Company was admitted into evidence. The testimony that followed indicated that there might not have been a response to this letter. Were you in attendance at the October 12 meeting of the Advisory Committee Meeting?

A. Yes, I was.

Q. Do you have the minutes with you of that meeting?

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A. Yes, I do have a copy of the minutes, which were mailed to all the working interest owners of the Northeast Blanco Unit.

Q. Would you refer to those minutes and summarize Blackwood and Nichols response to the Tenneco letter?

A. Well, let's see, other items of business were also included.

Q. Well, would you just generally summarize what the response was?

A. Well, our response was that the newly completed 64 Well was within the Mesaverde Group, as recognized in the literature, and that therefore Tenneco's point of saying that the 64 Well was not within the Mesaverde was, we thought, pointless. We -- we went ahead and at the meeting submitted a definition of Mesaverde Group, which Mr. W. J. Hillswick and I had worked on and prepared. That was voted on and passed by an adequate majority that by the unit rules, that we were planning on using our definition of Mesaverde.

Q. Do you have Blackwood and Nichols proposal as to what the definition of the Mesaverde should contain with you?

A. Yes, I do have a copy of that.

Q. Would you refer to that, please, and would you summarize for the Examiner the geological data that you proposed at that time?

A. Let me begin with just summarizing the top and bot-

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tom.

The Blackwood and Nichols definition recognized a Green Shale marker as the top of the Mesaverde Group and because of the practice of drilling slightly below the massive sandstone member of the Point Lookout in order to find an oil zone, which sometimes occurs below the massive sandstone member of the Point Lookout, we defined the Mesaverde as from the Green Shale marker to the -- from the top of the Green Shale marker to 200 feet below the massive sandstone member of the Point Lookout. I can show that on a log, if you like, but that has been made slightly moot by the fact that the State has redefined Mesaverde using an even thicker and broader definition.

The definition which the State adopted uses the Huerfanito Bentonite marker, which is approximately 50 feet higher in the section than the Green marker, which we used in our definition, and the State uses a definition of 500 feet below the top of the Point Lookout Sandstone member, whereas we used a point 200 feet below the base of the Point Lookout Sandstone member.

In each case the State definition is thought to be easier to find on a basin-wide area. In other words, these markers are thought to be more easily correlatable and findable on the logs.

Now, I would like to -- I hate to do this. I'd first

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like to apologize for having to take your time for doing this, but the Blackwood and Nichols definition of Mesaverde has been entered into evidence in previous hearings; in fact, both the previous hearings pertaining to disallowing the Chacra Field and I'll try to make this just as brief as possible.

We included a cross section on Page Four of our hearing, which is by the same esteemed Dr. Robert Wymer, who is a personal friend of Mr. Hillswick's and mine when we made this definition in the first place, instead of using this very generalized cross section which Tenneco has set in as Exhibit One, which goes from the San Juan Basin to Montana, we used a more detailed cross section of Dr. Wymer's pertaining almost entirely to the San Juan Basin. It clearly shows that the Cliff House Sandstone are a transgressive group of sandstones in instances over a thousand feet thick, and are continuous, and the industry committee, I think, went to more of the -- well, obviously, went to the definition something like we had proposed.

I would just like to read a couple of things. In AAPG Bulletin, Volume 40, Number 9, of September, 1956, a paper by Beaumont, Dane, and Sears of the USGS, entitled Revised Nomenclature of the Mesaverde Group, San Juan Basin, on Page 2159, states, quote, "In view of the continuity of the massive sandstone unit through this area, the name Cliff House Sandstone of the Mesaverde Group will replace Chacra Sandstone

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member throughout the former extent of that unit."

Thusly, for the record, the USGS did away with the name Chacra twenty-one years ago.

Another quote, U. S. Professional Paper 400-B, published in 1960, entitled New Information on the Area Extent of some Upper Cretaceous Units in Northwestern New Mexico, by C. H. Dane, refers to, quote, "The Hostah Sandstone, a lower tongue of the Point Lookout Sandstone of the Mesaverde Group," and this points out the limits -- the problem with limiting the lower part of the Mesaverde to the thick, easily identified massive sandstone member of the Point Lookout.

Then I have referred to the cross section, which appeared in AAPG Bulletin, Volume 44, Upper Cretaceous Stratigraphy of the Rocky Mountains, by R. J. Wymer, and it is included in past -- as evidence in the past hearings and it can be included again, if you so desire.

Then, I'd just like to point out that in papers by Charles T. Hollingshead and Roy L. Pritchard, The Geometry of Producing Mesaverde Sandstones in the San Juan Basin, it says that the Green marker horizon on Page 106 is believed to represent -- and this is a quote, "It is believed to represent approximate contemporanity and therefore can be used to delineate accurately major vertical steps in the regressive Point Lookout and transgressive Cliff House strand lines."

Various benches of the Cliff House Sandstone appear

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above the massive sandstone member of the Cliff House, as well as numerous benches below the massive Point Lookout Sandstone member of the Point Lookout, and we just would like that to be in the record.

Q. Mr. Blackwood, in your opinion, would granting the application of Tenneco in this case protect correlative rights?

A. No, as a matter of fact, we believe that it would destroy the correlative rights of the working interest owners of the Mesaverde -- of the Northeast Blanco Mesaverde Unit, which have drilled and paid for the well.

Tenneco at this point has paid 1.4 percent of the cost of the well and is claiming 100 percent of it.

Q. Do you have anything further to add to your testimony at this time?

A. I don't believe so.

Q. Were Exhibits One and Three prepared by you or under your direction and supervision?

A. They were prepared by Mr. Loos with my knowledge.

Q. Have you reviewed them?

A. Yes, I've reviewed them.

Q. And are they correct of your own knowledge?

A. Yes.

Q. And Exhibit Number Two is a copy of the memorandum from the Oil Conservation Commission, is that correct?

A. Yes.

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MR. CARR: At this time I would offer Blackwood and Nichols Exhibits One through Three.

MR. STAMETS: These exhibits will be admitted.

MR. CARR: I have no further questions on direct.

MR. STAMETS: Are there questions of this witness? Mr. Kellahin?

MR. KELLAHIN: If the Examiner please.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Blackwood, how many Mesaverde wells have you participated in the drilling?

A. In the unit?

Q. No, sir, just Mesaverde wells.

A. There are some 65 Mesaverde wells in the Northeast Blanco Unit.

Q. And has Blackwood and Nichols drilled all 65 of those wells?

A. No, certain of those wells were drilled prior to the establishment of the unit and the participating area.

Q. How many Mesaverde wells, to your knowledge, have you personally participated in the drilling?

A. No, what -- me personally?

Q. Yes, sir, supervised on behalf of Blackwood and Nichols?

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A. Only about the last two or three.

Mr. Loos is here who has personally supervised, probably, over fifty of these wells, however.

Q. How many of the Mesaverde wells have you done the geology?

A. Have I done the geology on, I'd like to have another definition of what you mean by that.

Q. In the drilling of the Mesaverde wells, how many of them did you construct and interpret the geology for the location of drilling those wells?

A. I had nothing to do with actually picking the location of any of these wells. I started studying the Mesaverde Unit, however, back in 1957, and prepared an exhaustive paper on the Mesaverde Unit at that time, at which time I made cross sections and studied the geology of the entire unit and I've been familiar with it ever since.

Q. This is the Mesaverde formation in San Juan Basin?

A. This is the Mesaverde Unit area that Blackwood and Nichols operates; a 32,500 acre, approximate, area.

Q. In discussing the general averaging of the pressures in the Mesaverde for the San Juan Basin, you made reference to Mr. Maxwell's summary of all those wells; has your study -- well, have you in the course of your study plotted out those pressures on all these wells to see if there was a specific localization of pressures, as Mr. Rapp has testified?

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A. No.

Q. You have not done that kind of study?

A. No.

Q. Mr. Carr asked you if in the Number 64 Well, if you felt that it was producing from the Mesaverde through a system of fracturing, and you said you believed it was; that was your conclusion.

A. It's not producing that gas which -- the well has been shut-in ever since the well was completed; however, it did produce a small amount of gas during the initial testing, and I believe I said that gas, I believe, came from the Mesaverde Reservoir through a series of fractures.

Q. Okay, all right. What geological evidence do you have that there is fracturing between this well to connect it by way of communication with the Mesaverde?

A. The evidence is based on several things. One is the pressure data, which I believe indicates that the new 64 Well and 29-A cannot possibly be a new virgin, undrained reservoir.

The next evidence is when the well was being drilled a -- actually, Mr. Loos is going to prepare this -- present this evidence later, but there was a four-foot interval which drilled with essentially no weight on the bit, and is physical evidence that we were drilling a fracture.

Other evidence that Mr. Loos has, which I guess I

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should let him do, pertains to the gas analysis of the well, which we believe indicates Mesaverde gas.

Q. What's the vertical distance between the producing interval in the Unit 64 Well and the Mesaverde Formation where you say this gas is coming from?

A. Well, there is no distance, because it's coming from the Mesaverde Formation as defined by the State. The well is completed in the Mesaverde Formation.

MR. STAMETS: I believe at this point we've got to have some clarification of what we're talking about here.

I believe in Order Number R-5459 what the Commission did was describe, or define the vertical limits of the Blanco-Mesaverde Pool, and not define the vertical limits of the Mesaverde Formation, and these are two different things; they -- those are not necessarily the same thing, and I think it should be clear when we're talking about the vertical limits of the Blanco-Mesaverde Pool and the quote Blanco-Mesaverde Formation.

MR. KELLAHIN: I was asking him with regard to the formation, Mr. Examiner.

A. Well, again, I'll have to make quite a geologic reference here. The two cross sections which have already been presented, the Tenneco Cross Section Number Seven, by Dr. Wymer, and the other cross section by Dr. Wymer, which we have in our definition, indicate fantastic differences of thickness in the Mesaverde Formation, and the -- if you'll refer to the

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Tenneco, let's use theirs since that's the one that has been put into evidence, Tenneco's Exhibit Seven, I believe it is, yes. If you take something where they've colored in in yellow on the Tenneco cross section, then our well is approximately 600 feet to 700 feet above the colored in yellow on the Tenneco cross section, or the top of the massive member of the Cliff House Sandstone.

I want to also refer, however, that the massive member of the Cliff House Sandstone is not the top of the Cliff House Sandstones as defined by Dr. Wymer or by the Oil and Gas Commission. So when you start talking about the Mesaverde Formation, you include a thicker interval than you do when you talk about the upper part of the massive member of the Cliff House Sandstone. Those are two completely separate things.

Q. I'm confused. We've got, obviously, several references to Wymer studies.

A. Uh-huh.

Q. What is the date on the one you're talking about?

A. Well, let's see, yours shows 1960. Let me see what --

Q. I have not had the benefit of looking at yours. What is the one you're specifically looking at?

A. Just a minute. It's from the -- probably from the USGS Professional Paper 400B -- no, wait a minute. AAPG Bulletin, Volume 44, Number 1, 1960. They're from the same

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date.

Q. May I take a look at that, please?

A. Surely. This is just -- this is a more detailed section by Dr. Wymer of most of the San Juan Basin.

Q. Earlier, Mr. Blackwood, you indicated that if the Well 64 was in fact drilled in a separate reservoir, you would expect an original pressure of 100 -- I'm sorry, of a 1000 psi?

A. Yeah, or greater.

Q. Or greater?

A. Yes.

Q. Why would you expect that? On what do you base that?

A. The pressures at which oil and gas are trapped in unproduced reservoirs is generally related to the thickness of the overburden of rock. It therefore normally follows that there is a correlation between the depth of the rock and the pressure of the reservoir. In a normal situation this pressure gradient is about .43 pounds per foot. Unfortunately, things are not quite that simple in the San Juan Basin. There are some areas in which we have abnormally high pressures shallower than we would expect, but the Mesaverde Reservoir, which has been drilled and produced all these years, indicated initially that it had pressures of around 1200 pounds initially and if we come up 400 feet higher than that, then we should have pressures on the order of a 1000 pounds initially.

That's just a simple calculation based on depth. In

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reality, certain of the Fruitland Formations and higher than the Mesaverde, actually are over-pressured and have even higher pressures than this, so I think the 1000 pounds would be a minimum expected pressure. It might -- perhaps it should have had 1400 pounds as a normal undrained reservoir, but certainly no less than 1000.

Q. You reached a conclusion earlier, Mr. Blackwood, that you believed the 64 well was drilled and completed in the Mesaverde Formation based upon the pressure, based upon the other information that you say Mr. Loos will testify to shortly.

I show you what I have marked as Tenneco Exhibit Number Eleven, Mr. Blackwood, and ask you to explain to me what this is.

A. This is the drilling and completion report on the Northeast Blanco Well 64, or 105.

Q. This well was completed in the Mesaverde Formation, Mr. Blackwood, how do you account for the fact that there's an entry dated 7-8-76, which states that the well was drilled to a total depth of 4262 feet, drilled with 4-inch into the Chacra Formation? How do you account for that?

A. Well, at the time that this drilling report was written by Mr. Loos, he was unaware of the definition of the Mesaverde Formation that the USGS had been using for the last twenty-some years, that there wasn't -- the Chacra Formation name was to be dropped, and so he was using a name which had

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been used in the area but which should have been dropped from the nomenclature many years ago.

And this interval is equivalent to what's known as the Chacra in the far southwest part of the basin. This is equivalent to that. There's no argument on that point.

Q. You made reference to something I don't understand, Mr. Blackwood; something about a Green marker. You're going to have to tell me again because I didn't understand that. What's the Green marker?

A. I'll have to show you a log in order to -- any of these logs the cross sections will do.

Q. I'd appreciate that.

A. The Green marker is a shale which in the closest offset well to Number 64, the offset well is the Number 19-34. 34-19. This Green marker is used as the top of the Mesaverde Group in several geologic publications.

Q. Which ones, Mr. Blackwood?

A. Well, --

MR. STAMETS: How does that relate to the Huerfanito Bentonite marker? How many feet above or below that?

A. It's about 100 feet ~~before~~ below the Huerfanito Bentonite marker. In our marking -- defining the Mesaverde Group, Mr. Hillswick and I read the literature, studied it, and in our area the Geen marker was an easy thing to find, in the area of the Northeast Blanco Unit. So we chose the Green marker because

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it is referred to in the literature and because it is a very definite, easy to find marker, as the top of the Mesaverde in our area, and that is the definition which we proposed; however we --

Q. (Interrupting) Yeah, go ahead, I was going to ask you at what depth do you find the Green marker?

A. The Green marker in the Northeast Blanco Unit Well Number 34-19 occurs at 4055 feet, about 4055 feet.

Q. Now, would you check for me and tell me what literature you used to determine the location of the Green marker?

A. Yeah, I think I loaned you my paper, so if you'll hand it back.

Q. Oh, I'm sorry.

A. This has already been entered into evidence once today, but let me find it. Okay. Okay, it's in the 1961 AAPG book, Geometry of Sandstone Bodies by Charles T. Hollingshead and Roy L. Pritchard, and the article is titled Geometry of Producing Mesaverde Sandstones in the San Juan Basin.

And they describe a Green marker horizon on Page 106, and I quote, "It is believed to represent approximate contemporanity and therefore can be used to delineate accurately major vertical steps in the regressive Point Lookout and transgressive Cliff House strand lines." This Green marker is used in that paper to indicate the top of the Mesaverde Group.

Q. And you've located that Green marker at 4055 in that

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Northeast 34-19 Well?

A. I think our paper says 4054.

Q. Have you -- I haven't looked at your cross section very carefully, Mr. Blackwood. Is your cross section constructed to correlate this Green marker --

A. No. I attended the meetings, industry meetings, in which the numerous industry representatives met and after many months defined the Mesaverde-Blanco Pool limits, and it appeared that there was a marker slightly higher in the section, called the Huerfanito Bentonite marker, which was present over a greater area extent of the entire San Juan Basin, and easier to find than the Green marker, and rather than argue the point I deferred to the USGS representatives and most of the people there who felt that that would make a better marker for the top of the Mesaverde.

MR. KELLAHIN: I have no further questions. Thank you.

MR. STAMETS: Any other questions of the witness? He may be excused.

MR. CARR: I call Mr. DeLasso Loos.

DE LASSO LOOS

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

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DIRECT EXAMINATION

BY MR. CARR:

Q. Mr. Loos, by whom are you employed and in what position?

A. Blackwood and Nichols Company as District Manager of the Northeast Blanco Unit.

Q. Have you previously testified before the Oil Conservation Commission, and had your credentials accepted and made a matter of record?

A. Yes.

Q. Are you familiar with the subject matter of this hearing?

A. Yes.

MR. CARR: Are the witness' qualifications accepted?

MR. STAMETS: Again, as manager, I'm not certain, is he being qualified as an engineer or --

MR. CARR: He has previously been qualified as a Petroleum Engineer.

MR. STAMETS: Thank you, that clarifies the record. The witness is considered qualified.

Q. (Mr. Carr continuing.) Will you please refer to what has been marked as Blackwood and Nichols Exhibit Number Four, and explain to the Examiner what it shows?

A. Is this Exhibit Four?

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Q. Yes, it is.

A. This is the driller's log of when the well was drilled at this interval.

Q. What does it show?

A. It shows at 42 -- this shows at 4257 to 4260 that the bit encountered no measureable weight at the surface.

MR. KELLAHIN: Excuse me, what was the distance again?

A. This shows 4257 to 4260, but this was written down by the driller, and after calculating it out, it should have been 4258 to 4262. I might add --

Q. (Mr. Carr continuing.) What happened when you got to that depth?

A. When this interval was encountered almost immediately gas came to the surface. And, of course, we had the 7-5/8, what we call the blow line, et cetera, and immediately after the gas came to the surface we closed the pipe rams and shut it in.

Q. How long did it take you to penetrate this four-foot interval?

A. Well, almost immediately.

Q. What conclusions can you draw from this high penetration rate?

A. There's a void in the formation.

Q. Is it your opinion you encountered a fracture?

A. Yeah, a fracture.

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Q. Now, I would direct your attention to the Northeast Blanco Well Number 64. Have you had gas from that particular well analyzed?

A. Yes, sir.

Q. Now, I ask you to refer to what has been marked for identification as Exhibit Number Five, and ask you to show the Examiner how gas from the Northeast Blanco Unit Number 64 compares to the gas from another Mesaverde well?

A. We had the Number 64 Well analyzed, the Number 34 Well analyzed, and the Northeast Blanco Unit Number 105 analyzed, which in some previous testimony, it was referred to as the old 2-43 Well, Florence 2-43 Well, and on the 64 well the methane content, molecular percent of methane was 89.95; the 34 well was 87.93; and the 105, or 2-43, was 88.33. This was the methane, that's the main -- main gas.

Q. What conclusions can you draw from this analysis?

A. To me it's the same, same molecular gas.

Q. In your opinion, from what formation is the gas in the Northeast Blanco Well Number 64 being produced?

A. Mesaverde gas.

Q. In your opinion, would granting of the application in this case impair correlative rights?

A. No.

Q. It would not impair correlative rights?

A. I don't think so. Yes.

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Q. Let me restate the question. In your opinion would granting the application of Tenneco in this case impair correlative rights?

A. Yes.

Q. Do you have anything further to add to your testimony?

A. No.

Q. Have you reviewed Exhibits Number Four and Five and from your own personal knowledge know them to be accurate and correct?

A. Yes.

MR. CARR: At this time we would offer Blackwood and Nichols Exhibits Four and Five.

MR. STAMETS: These exhibits will be admitted.

MR. CARR: I have nothing further on direct.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Loos, I'm interested in the void you found during drilling. If you'll look at that exhibit, it's numbered Four, I believe.

At 4257 or 4258 it appears, does it not, that weight has been taken off the bit at about that point?

A. Yes.

Q. Can you identify for me the depth at which the last connection was made?

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A. Well, it looks like at 4257.

Q. The last connection was at 4257?

A. That's what I'd say.

Q. Okay. And the weight was off the bit, then, at about 4257, also?

A. Yes, until they touched down.

Q. And then the weight was back on?

A. No. The weight was back on at -- there's four little blips, see there?

Q. Yes, uh-huh.

A. That indicates when they slack off on the brake; when they're that close together there's no weight on the bit. All right, right under there is another little blip; that's where it hit weight again. You can see the connection immediately above there, the drilling rate; that's normal drilling rate, and then we made a connection at 4257, and then no weight on those four little kicks.

Q. Prior to that connection what was the last connection before that?

A. Oh, at 4195.

Q. The recorder records the same kind of blip in there, does it not?

A. Yes.

Q. You've attributed the log entry at 4257 to a four-foot interval that you call a void, and you've concluded for

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Mr. Carr that that is evidence of a fracture.

A. Right.

Q. Would not that be equally indication of simply a cavern that you're drilling through?

A. Possible.

Q. So the only thing you're certain of is that you encountered a four-foot void?

A. Correct.

Q. Your gas analysis, Mr. Loos, showed comparisons of three wells, was it?

A. Yes, sir.

Q. And these are all wells that you tell me are in the Mesaverde Formation?

A. Correct.

Q. Have you run gas analysis for comparison with the Mesaverde and other formations in this area?

A. No, sir.

Q. You have not?

A. Not -- well, years ago we ran some Dakota but that's all.

Q. You haven't taken the gas analysis with the Mesaverde, as you provided here by way of exhibit, and compared it to gas analyses from other formations in this producing area?

A. I haven't compared them, no.

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MR. KELLAHIN: I have no further questions.

REDIRECT EXAMINATION

BY MR. CARR:

Q. Mr. Loos, you indicated that you encountered a four-foot void. How much gas have you produced out of that void?

A. How much -- beg pardon?

Q. How much gas do you believe can be produced out of that void? Based on your flow tests.

A. Out of this void I would predict, from knowledge of these wells around there, that this well would be capable of delivering in the neighborhood between 2-1/2 and 3 million cubic feet per day.

Q. And when you encountered this void, did you also immediately encounter gas?

A. Yes.

Q. And you have had that gas analyzed?

A. Yes, sir.

Q. And it had the same characteristics as Mesaverde gas?

A. Yes, sir.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Loos, I'm looking at Exhibit Number Four, and in the center of this exhibit, or a little right of center,

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is a time scale, like 6:00 o'clock, 7:00 o'clock -- a time column in the center, is that correct?

A. Yeah.

Q. Okay. So that if I interpret this correctly, at about 6:17 you picked the bit up to stab on a new joint of pipe?

A. Right.

Q. And at about 6:31 --

A. Yeah, 31.

Q. -- you set that pipe back down and started to drill again?

A. Correct.

Q. And then that is when you had that -- the drilling break with the, looks like about one, two, three, nearly four two-foot intervals there --

A. Right.

Q. -- drill very, very quickly.

A. Right.

Q. Okay. Now, if we move over to the lefthand side of the chart, I don't see where you had no drilling weight at all. It looks to me like once you set the bit back down, 6:31, you continued to have weight on the bit.

A. Of course we had the weight of the string.

Q. Is that what's recorded there?

A. Yes, but not weight on the bit; the weight of the

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drilling string is always registered at the surface.

Q. Okay, so what -- what I'm reading there is an increase in the weight of the drilling string as reflected by the fact that there was no resistance --

A. Correct; correct.

Q. -- at the bottom of the hole. Okay.

MR. STAMETS: Any other questions?

MR. KELLAHIN: I'd like to ask one more about this exhibit.

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q. The entry at 4257, where you say it's a four-foot void, how does that register on the chart -- that registration on the chart any different from the other registrations when another connection is made?

MR. STAMETS: Let's go off the record.

(There followed a discussion off the record.)

MR. KELLAHIN: No further questions. Thank you.

MR. STAMETS: Anything further of Mr. Loos? You may be excused. Does anyone have anything further they wish to offer in this case?

MR. KELLAHIN: Just a minute, let me see if he has anything he wants to say.

I have one short question to ask on redirect. May

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I recall one of my witnesses?

GARY RAPP

being recalled as a witness and having been previously sworn upon his oath, testified as follows, to-wit:

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Rapp, I'd like to direct your attention to the testimony of Mr. Blackwood. He stated earlier in his testimony that there was initial pressure taken on Well 64, and I believe, correct me if I'm wrong, I believe it was 640 pounds and that it was shut-in and taken again at some time later, and there was either a drop in pressure, the next test being 619 psi, or maybe it was 615 psi, something like that. The difference Mr. Blackwood attributed to drainage, I believe, from the off-setting Mesaverde wells.

If you'll direct your comments to that portion of the testimony, how would you explain the drop in pressure on Well Number 64?

A. The drop in pressure, we'd say, could be due to communication through a fracture system entirely contained within the Chacra-Lewis interval. The inference would seem, perhaps, was made that it was proof of pressure communication vertically downward and that inference, I feel, can be sub-

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stantiated to the exclusion of any other inference.

MR. STAMETS: I'd like to have that clarified now. The drainage that you're referring to, now, would be drainage wholly within the Chacra, is that correct?

A. That's right, that would be another possibility for an observed pressure drop in a shut-in well.

MR. STAMETS: Okay, now what well could have taken the production that would cause the decline in pressure in the Number 64 well?

A. Well, the other wells in that vicinity that are completed above the Cliff House are the Tenneco Florence 29-A, which is in closest proximity, and the Lively 7-Y is completed in the Chacra zone.

MR. STAMETS: Okay. Now the Tenneco well has a pressure of 548 pounds, so that is a lower pressure well, and the pressure could drain from the Blackwood and Nichols well toward the Tenneco well in the Chacra?

A. Conceivably.

MR. STAMETS: The Lively well has 650 pounds. You probably would not expect very much drainage there, is that correct?

A. That would be correct, yes.

MR. STAMETS: Yes, okay.

MR. KELLAHIN: That's all I had, thank you.

MR. STAMETS: Okay, Mr. Carr.

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RECROSS EXAMINATION

BY MR. CARR:

Q. I just want to be sure and understand what you were saying. You were saying that you believe that it's possible what we have here is actually a horizontal fracturing in the Chacra, is that correct?

A. Yes, I think that's a possibility. The inference that I saw made was in support of vertical fracturing and I don't feel that that's valid.

Q. Yes. Now, for this to be a vertical fracture, it would have to be a vertical fracture of something like 700 feet, I guess.

A. In order to get down to the Cliff House.

Q. Right, in the 64-A.

A. A vertical fracture, right, through that much.

Q. Now, if it was to fracture over to the Florence Well Number 29-A, how much of a horizontal fracture would you have to have, two miles?

A. Over to the 29-A?

Q. Uh-huh.

A. No, not two miles; they aren't that far apart.

Q. Okay, well, what distance?

A. I believe they're about 5000 feet apart, something in that vicinity.

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Q. 5000 feet and also vertical fracture of 200 feet.

A. Upwards in distance between those.

Q. Right, to have communication?

A. Correct.

Q. I believe what Mr. Blackwood was alluding to was not that this was conclusive proof of a vertical fracture, but that it was evidence of such a fracture; that it would be more likely that it would be a 700 foot fracture than a fracture to another Chacra well.

A. Am I allowed to make a statement?

MR. KELLAHIN: Would you like to respond to that statement by Mr. Carr?

A. I would like to respond. In shale formation generally, you can have lithologic variations where shale zones horizontally could be more ductile, and you could have a brittle--more brittle shale layer, a limey layer deposit over tremendous area extent, but vertically on both sides, for that matter, you could have non-fracturable shales th[illegible] would be ductile.

That's the reason that I feel that there is as much validity in the inference that it could be a Chacra communication.

Q. But you're not saying that it's impossible that a vertical fracture could cause a reduction in pressure in the 64-A well?

A. I'm only saying that there's not conclusive proof

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either way.

Q. But that this is not conclusive proof?

A. That's right.

MR. CARR. I have no further questions.

RECROSS EXAMINATION

BY MR. STAMETS:

Q. If the Commission denies Tenneco's application, will Tenneco still recover, or share in the production, from the quote "Chacra" zone in the Number 29-A well and the Number 64 well?

A. We would assume the Mesaverde working interest proportion, not the Chacra working interest proportion which we had at the time the well was drilled.

Q. Now, supposing the Commission approves the application of Tenneco, and let's restrict the comments first to Section 25, if we approve Tenneco's application, what will happen?

A. Then the Florence 29-A will be classified as a Chacra well.

Q. Okay. Will Tenneco then have to drill a Mesaverde well in the northwest quarter of [illegible] section?

A. Under legal obligation, you mean?

Q. Yes.

A. I'm not sure; I can't answer that authoritatively at

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all.

Q. In any event, there would no longer -- there would not be a Mesaverde infill well, then, in the northwest quarter of Section 25?

A. That's right.

Q. And there very well could be a drilling obligation there.

In Section 24, then, if we approve Tenneco's application, again this would be the case; there would no longer be an infill well in the southeast quarter of Section 24, and another well would have to be drilled in that quarter section for there to be a Mesaverde infill well.

A. Correct.

Q. If the Commission denies Tenneco's application, will the wells in Section 25 and Section 24 be governed by the gas proration rules of the Blanco-Mesaverde Pool?

A. I assume that if the exception is denied that they fall under the new definition of the Blanco-Mesaverde and consequently, they'd have that allowable even though they might not be producing the Point Lookout gas or the Menefee gas, but only the Cliff House gas.

Q. If we approve your application and additional infill wells are drilled and, in fact, the quote "Chacra" is in communication with the Point Lookout, the Commission would then be in the position of assigning an additional allowable over

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and above what would be assigned on offsetting tracts to the wells in Sections 25 and 24, is that correct?

A. I'm sorry, I thought I could catch on if I kept listening to you, but I lost you about halfway through.

Q. Okay, it gets a little complicated. Let me see if I can rephrase it.

Let's just go right down. Let's say that the west half of Section 25 is currently being dedicated to Blanco-Mesaverde. If we deny your application then Well Number 3, 29, and 29-A would have a common Blanco-Mesaverde allowable. All right, if we approve your application and an infill well is drilled in the northwest quarter, will the result be that the more gas would be produced out of the west half of Section 25 than if your application is denied?

A. Not out of the Mesaverde.

Q. Out of the west half of Section 25?

A. Including all formations, Chacra, Mesaverde, and everything?

Q. From the Chacra, Point Lookout, Menefee, Cliff House?

A. I think that depends on how the Commission defines allowables. The Chacra is not Mesaverde if an exception is granted, then I assume that Chacra gas, which we do not feel is in communication with the Cliff House or anything below, would be a separate entity of production.

Q. It would then appear to finally boil down to whether

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or not there is sufficient evidence to determine that the quote "Chacra" wells are in communication with the Cliff House, Menefee, Point Lookout.

A. With the full section, yes.

MR. STAMETS: Any other questions?

RECROSS EXAMINATION

BY MR. KENDRICK:

Q. If the application is denied and a new well is drilled in the northwest quarter of Section 25 and proves that these two zones are in fact connected, how would you choose which of those wells to recomplete in a different zone, so that you would only have two wells completed in the Mesaverde?

A. That would be a management decision.

MR. KENDRICK: That's all.

MR. STAMETS: Any other questions of this witness? He may be excused.

Is there anything else in this case? Any closing statements?

MR. KELLAHIN: I have a brief statement.

MR. CARR: I'll make a brief statement.

What it appears to us that we have here is a situation where Blackwood and Nichols, as the unit operator for the Northeast Blanco Unit, drilled a development well pursuant to their development plan; that the well was paid for by the working

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interest owners paying their respective shares; and that the well was drilled and encountered production at a zone higher than what was anticipated, but at a point which was within the Mesaverde in the prior definition and in the present definition.

We believe there is evidence which shows that they encountered a fracture. Not only did they encounter a four-foot drop when they were drilling, but they immediately encountered high flow rates which are not characteristic for the Mesaverde absent fractures, and they also, when they had the gas analyzed, found that the gas corresponded very closely in characteristics to other Mesaverde gas.

We've also put on evidence which shows that the pressures are such that they -- the pressures show that there is communication in the reservoir and probably communication between the Northeast Blanco Unit Well Number 64 and other Mesaverde wells in the area.

We ask that the exception not be granted simply because the well was drilled by Blackwood and Nichols as a Mesaverde well, it was completed in the Mesaverde. It always has been, and it is, in fact, a Mesaverde well.

MR. STAMETS: Mr. Kellahin?

MR. KELLAHIN: If the Examiner please, there's been some confusion about -- at least upon Blackwood and Nichols part -- about the definition of the Blanco-Mesaverde Pool as provided in the original order, Number 799.

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To make reference to the vertical limits portion of the definition, but the definition must be read in its entirety we're talking in terms of 4200 feet to 5100 feet productive horizon, where, as our witness has stressed, where the productive sands are contained between the top of the Cliff House Sand and the base of the Point Lookout Sands in the Mesaverde.

We are here today seeking an exception to the new definition in accordance with Order Number R-5459, which provides in Findings 17 and 18 that there are four wells north and east of the magic line that was provided in that other order, which may be producing from fractured shale or silt stone zones equivalent to said Chacra Sands, which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool, and that in order to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of the said Blanco-Mesaverde Pool shall be delayed in order to give us an opportunity to bring our case, and that's what we've done.

Continental and Tenneco are quite concerned about the implications of the proposed exception. We're concerned first of all, that the ownership of the one well in question, specifically, the 64 Well, may be carrying too much weight in the determinations that will affect the entire basin. We believe that we can decide this case very efficiently and in accordance with law based upon the testimony that has been

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presented to you today, and that is, there has been no definite connection established by testimony between the Chacra and Mesaverde Formations. The connection, I contend, is indicated by the inference of certain things that Blackwood and Nichols found in the drilling of that 64 Well.

One of them was the pressure problem and we've discussed that ad infinitum.

The other one was the four-foot drop, and the expert witness, Mr. Loos, quite frankly admitted it could have been a cavernous zone in the formation, it may be a fracture; the only thing he could say for sure is that it was his testimony that there was a void encountered.

Well, there's substantial difference, I contend, between a void and a fracture that's going to connect what we contend is a Chacra Formation with the Mesaverde Formation.

On the other hand, we believe we've provided evidence by way of Mr. Rapp that there is a clear showing by his data that there are distinct and separate reservoirs here.

We've also pointed out through Mr. Lyon's testimony that it has not been advantageous to any party, other than the working owners of that Northeast Blanco Unit, to combine the Mesaverde and Chacra. On the other hand, his testimony has shown that it adversely affects Tenneco's and Continental's interests. We are very concerned that insufficient data will be used to show a connection between the Chacra and Mesaverde,

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that we think doesn't exist.

It's equally possible that the Chacra is a reservoir with fractures within itself, without effective communication with the Mesaverde.

We believe that you can make your decision based upon the sound practices of conservation and the principles therein, and we contend we've established those today and we request that the exception be granted.

MR. STAMETS: Thank you both very much.

(Hearing concluded.)

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REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill, and ability.

Sally Walton Boyd

Sally Walton Boyd, C. S. R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5994, heard by me on August 30, 1977.

Richard L. Stamets, Examiner

New Mexico Oil Conservation Commission

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I. Agree with Statement of Facts?

II. Scope of review

A. Continental

1. arbitrary and capricious decision

2. substantial evidence

a. Grace - such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.

b. only most favorable considered - 84 N.M. 114

B. Special weight to OCC - Grace

III. Common source of supply

A. Reservoir characteristics - pressures

1. undrained - 1100 lbs.

2. after production - 440 lbs.

3. infill - 590 lbs.

B. Florance 29-A

1. Initial pressure - 580 lbs.

2. after production - 420 lbs.

C. NE Blanco 64

1. Initial - 602 lbs.

D. Conclusions

1. Communication

E. Tenneco's comparison of Florance 29-A and surrounding wells

1. Production decline curves normal, i.e., 29-A had no effect
2. 29-A produced 1.196 BCF, while other three produced only 1.056 BCF (Ex. 9 and 10)
3. Therefore, separate reservoir

F. Rebuttal

1. Steeper decline did occur - line pressure not the reason
2. Pressures falling off to correspond to offsets
3. Comparison of production nonsensical - different time periods
4. No evidence of separate reservoir.

IV. Economic waste

A. Reclassification of 64 as Chacra

1. B & N must drill replacement to MV
2. 64 is part of MV already
3. Drilling replacement to non-existant separate reservoir is unnecessary
4. 65-3-14(b) - Commission must prevent economic loss caused by drilling of unnecessary wells

V. Correlative rights

A. Tenneco's position

1. Unless reclassified as Chacra, Tenneco's share reduced

2. correlative rights violated

B. Definition 65-3-29(H)

C. 64 and 29-A in common source of supply - MV

1. Tenneco must share production of 64 with B & N

2. Gets its just share of MV gas

3. If 64 reclassified as Chacra in a non-existant, separate reservoir, B & N would not get its share of production from the 64 in a pool where they are interest owners

4. Conclusion - violation of correlative rights

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

C E R T I F I C A T I O N

TO WHOM IT MAY CONCERN:

I, JOE D. RAMEY, Director of the Oil Conservation Division of the New Mexico Energy & Minerals Department, do hereby certify that the attached is a true and correct copy of the Transcript from the Commission Hearing held on November 10, 1977, in Case No. 5994.

JOE D. RAMEY, Director

July 20, 1978

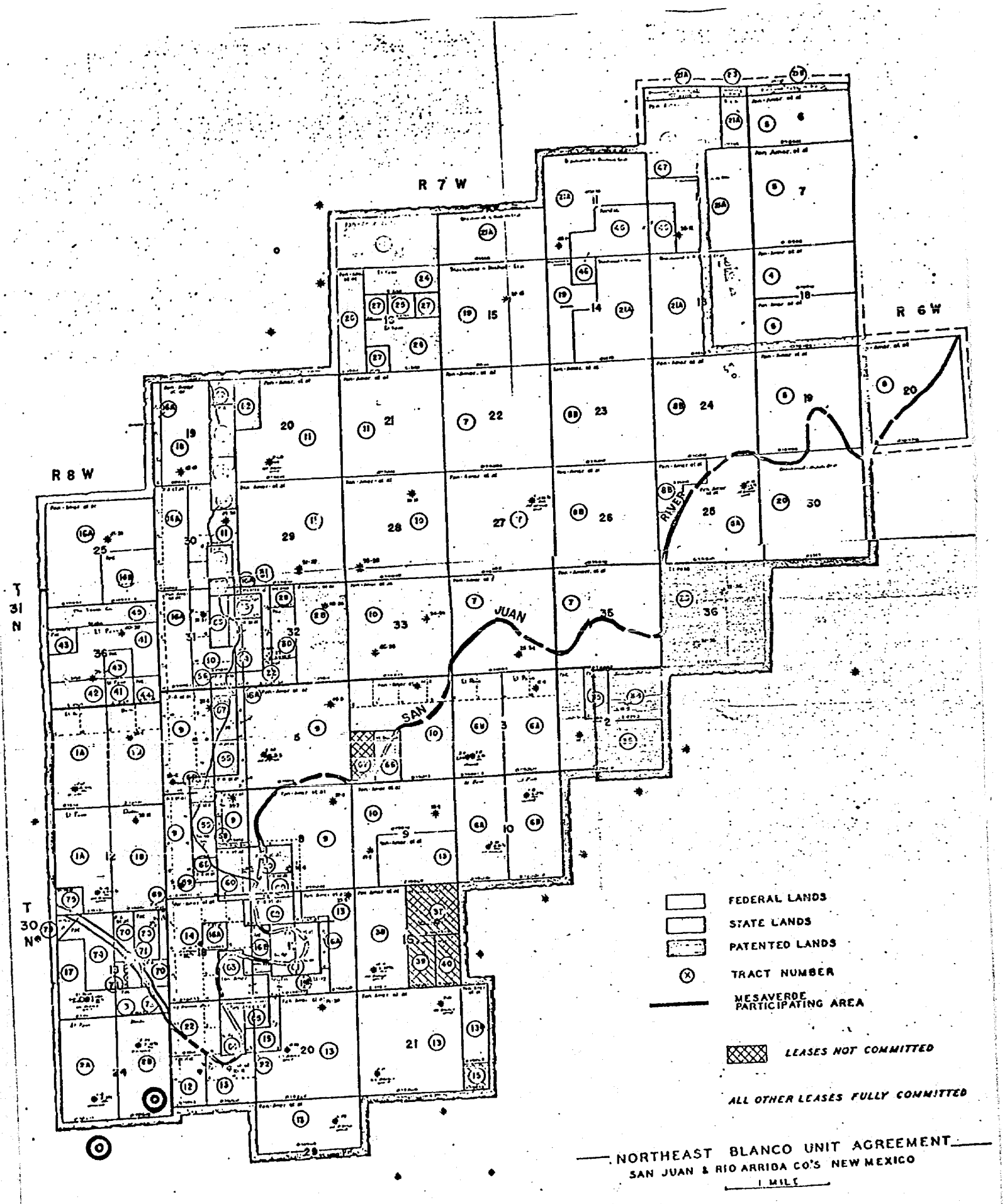
STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

The foregoing instrument was acknowledged before me this 20th day of July, 1978.

Notary Public

My Commission Expires:

_____



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 1
CASE NO. 5994
Submitted by Jenneco
Hearing Date 7-20-77

EXHIBIT NO. 1
Case 5994

CONTINENTAL OIL COMPANY

Tenneco Oil Company
A Tenneco Company

1200 Lincoln Tower Bldg.
1860 Lincoln Street
Denver, Colorado 80203
(303) 292-9920

September 20, 1976

Blackwood & Nichols Company
2013 First National Center
Oklahoma City, Oklahoma 73102

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 5994
Submitted by Tenneco
Hearing Date 7-20-77

Re: Northeast Blanco Unit #64 Well
SE/4SE/4 Section 24, T30N-R8W
Northeast Blanco Unit I - Sec. No.929
San Juan & Rio Arriba Counties, New Mexico
PA-4224

Gentlemen:

Last spring Tenneco approved your AFE for the drilling of the Northeast Blanco Unit #105-A, intended as an infill Mesaverde development well with costs to be borne by the Mesaverde participating working interest owners. We have had no completion report on this well from Blackwood & Nichols, but Oil Conservation Commission records show that the well was completed July 10, 1976 as a producer from the Chacra formation and redesignated the Unit #64 well. A 3240 MCF/day IP and a 9900 MCF open flow were reported.

Article 11 of the Unit Agreement requires that the Operator, upon completion of a commercial unit well, submit for approval by the Geological Survey, the Commissioner of Public Lands and the NMOCC a schedule of lands constituting the initial participating area for such well. The "commercial" test of the Unit Agreement is certainly met since from the reported initial potential and open flow there can be no question but that the well is "productive of unitized substances in paying quantities". However, although the well has been completed for over two months and should be ready for pipeline connection, Blackwood & Nichols has taken no steps toward filing for an initial Chacra participating area.

Tenneco Oil Company and Continental Oil Company are equal owners of all the working interest in unit tract 2-B, the E/2 of Section 24, T-30-N, R-8-W, and it appears the initial Chacra participating area should comprise the SE/4 of Section 24, within such tract 2-B. Article 11 of the Unit Agreement requires that a new participating area be effective with first production and the Unit and Unit Operating Agreements clearly recognize the ownership of newly established production by the working interest owners in the new participating area. Accordingly Tenneco hereby notifies you that any sales of production from the Northeast Blanco Unit #64 well must be made for the sole benefit of the working interest owners in the initial Chacra participating area, regardless of when formally established.

Tenneco Oil Company hereby makes demand that Blackwood & Nichols immediately submit a schedule of unitized lands within the initial Chacra participating

Case 5994
EXHIBIT NO. 2

Blackwood & Nichols Company September 20, 1976

area for approval by the necessary authorities. We also request that you furnish Tenneco with an itemization of drilling and completion costs for the #64 well. Since the well was actually drilled outside any existing participating area we believe it proper to bill the Chacra participating owners for this expense directly and not through adjustments with the Mesaverde participating owners simply because of their approval of the original AFE.

Please advise immediately if you do not concur with our conclusions.

Yours very truly,

TENNECO OIL COMPANY

By: D. D. Myers

D. D. Myers
Division Production Manager.

DDM/MFC:mt

cc: Continental Oil Company
U.S. Geological Survey
New Mexico Oil Conservation Commission

NW

OCT 1 '76

	Note Routed	Note Returned	
Div. Manager	✓	✓	✓
Div. Engr.	✓	—	—
Cons'v. Coord.	✓	—	—
Sup. Prod. Eng.	—	—	—
Sup. Resv. Eng.	✓	✓	X
Prod. Supt.	—	—	—
Adm. Supv.	✓	—	—
Sys. Supv.	—	—	—
Coord. Env. Afr	—	—	—
Div. O.f. Mgr.	—	—	—
	—	—	—
	—	—	—

NOTICE OF MEETING OF ADVISORY COMMITTEE
OF
NORTHEAST BLANCO UNIT
SAN JUAN AND RIO ARRIBA COUNTIES
NEW MEXICO

TO: THE WORKING INTEREST OWNERS:

Pursuant to applicable provisions of the Unit Operating Agreement under Unit Agreement for the Development and Operation of the Northeast Blanco Unit Area, dated July 16, 1951, notice is hereby given of a meeting of the Advisory Committee at 10:00 a.m. on the 12th day of October, 1976, in the large conference room, Second Floor, Liberty National Bank Building, Oklahoma City, Oklahoma, for purposes of considering and acting upon matters as follows:

1. The admission of Tract 23 to the Northeast Blanco Unit.

2. Clarifying or amending the definition of "Mesaverde", as used in previous designations of participating areas. In this connection, attention is directed to the Northeast Blanco No. 105-A Well (now redesignated Northeast Blanco No. 64 Well) which the Unit Operator has recently completed.

3. Such other matters as may properly come before the meeting.

Since it has now been several years since Advisory Committee action has been taken other than by written consent, each of the working interest owners is requested to present for our files, at or before the meeting, a designation of representative to the Advisory Committee, in writing, according to Paragraph 5 of the Unit Operating Agreement.

The Unit Operator believes the foregoing matters deserve your attention, and therefore urges your attendance at the meeting.

DATED this 28th day of September, 1976.

BLACKWOOD & NICHOLS COMPANY

By _____
Partner

"Unit Operator"

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 5994
Submitted by Tenneco
Hearing Date 7-20-77

Case 5994
EXHIBIT NO. 3

1425

R E S O L U T I O N

RESOLVED, that the term "Mesaverde" as used in the "Application for Approval of Mesaverde Participating Area for the Northeast Blanco Unit, I-Sec. No. 929, San Juan and Rio Arriba Counties, New Mexico", and in subsequent applications for enlargements thereof, (and sometimes followed by the term "Zone", "Formation", "Horizon" or the like), all such applications duly approved by the Director of the United States Geological Survey, the Commissioner of Public Lnads, State of New Mexico and the Oil Conservation Commission, State of New Mexico, is hereby defined as the stratigraphic equivalent of the interval between (i) the base of the Green Shale Marker, which occurs at a depth of 4,054 feet on the Gamma Ray-Neutron Log, dated May 31, 1957, of the Blackwood & Nichols Northeast Blanco Unit No. 34-19 Well, Section 19, Township 30 North, Range 7 West, Rio Arriba County, New Mexico, and (ii) 300 feet below the base of the Point Lookout Formation, which base occurs at a depth of 5,565 feet on the foregoing log of the foregoing well.

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 4
CASE NO. 5994
Submitted by Dennecs
Hearing Date 2-20-77

Case 5994
EXHIBIT NO. 4

November, 1950

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. 5994
Submitted by Jennesco
Hearing Date 2-20-57

UNIT AGREEMENT FOR THE DEVELOPMENT AND OPERATION OF THE NORTHEAST BLANCO UNIT AREA COUNTIES OF SAN JUAN AND RIO ARRIBA STATE OF NEW MEXICO

I - Sec. No. 929

THIS AGREEMENT, entered into as of the 16th day of July, 1957, by and between the parties subscribing, ratifying, or consenting hereto, and herein referred to as the "parties hereto";

WITNESSETH:

WHEREAS, the parties hereto are the owners of working, royalty, or other oil or gas interests in the unit area subject to this agreement; and

WHEREAS, the act of February 25, 1920, 41 Stat. 437, as amended by the act of August 8, 1946, 60 Stat. 950, 30 U.S.C. Secs. 181, et seq., authorizes Federal lessees and their representatives to unite with each other, or jointly or separately with others, in collectively adopting and operating under a cooperative or unit plan of development or operation of any oil or gas pool, field, or like area, or any part thereof, for the purpose of more properly conserving the natural resources thereof whenever determined and certified by the Secretary of the Interior to be necessary or advisable in the public interest; and

WHEREAS, the Commissioner of Public Lands of the State of New Mexico is authorized by an Act of the Legislature (Chap. 88, Laws 1943) to consent to or approve this agreement on behalf of the State of New Mexico, insofar as it covers and includes lands and mineral interests of the State of New Mexico; and

WHEREAS, the Oil Conservation Commission of the State of New Mexico is authorized by an Act of the Legislature (Chap. 72, Laws 1935) to approve this agreement and the conservation provisions hereof; and

WHEREAS, the parties hereto hold sufficient interests in the Northeast Blanco Unit Area covering the land hereinafter described to give reasonably effective control of operations therein; and

WHEREAS, it is the purpose of the parties hereto to conserve natural resources, prevent waste, and secure other benefits obtainable through development and operation of the area subject to this agreement under the terms, conditions, and limitations herein set forth;

NOW, THEREFORE, in consideration of the premises and the promises herein contained, the parties hereto commit to this agreement their respective interests in the below defined Unit Area and agree severally among themselves as follows:

Case 5994
EXHIBIT NO. 5

advisable for the purposes of this agreement, or shall be contracted to exclude lands not within any participating area whenever such expansion or contraction is necessary or advisable to conform with the purposes of this agreement. Such expansion or contraction shall be effected in the following manner:

(a) Unit Operator, on its own motion or on demand of the Director of the Geological Survey, hereinafter referred to as "Director", or on demand of the Commissioner, shall prepare a notice of proposed expansion or contraction describing the contemplated changes in the boundaries of the Unit Area, the reasons therefor, and the proposed effective date thereof;

(b) Said notice shall be delivered to the Supervisor and Commissioner, and copies thereof mailed to the last known address of each working interest owner, lessee, and lessor whose interests are affected, advising that 30 days will be allowed for submission to the Unit Operator of any objections;

(c) Upon expiration of the 30-day period provided in the preceding item (b) hereof, Unit Operator shall file with the Supervisor and Commissioner evidence of mailing of the notice of expansion or contraction and a copy of any objections thereto which have been filed with the Unit Operator;

(d) After due consideration of all pertinent information, the expansion or contraction shall, upon approval by the Director and Commissioner, become effective as of the date prescribed in the notice thereof.

All land committed to this agreement shall constitute land referred to herein as "unitized land" or "land subject to this agreement".

3. UNITIZED SUBSTANCES: All oil and gas in any and all formations of the unitized land are unitized under the terms of this agreement and herein are called "unitized substances".

4. UNIT OPERATOR: BLACKWOOD AND NICHOLS COMPANY, a partnership composed of F. C. Blackwood, Dola Blackwood, John W. Nichols, Mary D. Nichols, W. J. Hilseweck, Helen Hilseweck and John W. Fisher, is hereby designated as Unit Operator, and by signature hereto as Unit Operator agrees and consents to accept the duties and obligations of Unit Operator for the discovery, development and production of unitized substances as herein provided. Whenever reference is made herein to the Unit Operator, such reference means the Unit Operator acting in that capacity and not as owner of interests in unitized substances, and the term "working interest owner" when used herein shall include or refer to Unit Operator as the owner of a working interest when such an interest is owned by it.

Separate plans may be submitted for separate productive zones, subject to the approval of the Supervisor, the Commissioner and the Commission. Said plan or plans shall be modified or supplemented when necessary to meet changed conditions or to protect the interests of all parties to this agreement. Reasonable diligence shall be exercised in complying with the obligations of the approved plan of development. The Supervisor and Commissioner are authorized to grant a reasonable extension of the 6-month period herein prescribed for submission of an initial plan of development where such action is justified because of unusual conditions or circumstances. After completion hereunder of a well capable of producing oil and gas in paying quantities, no further wells, except such as may be necessary to afford protection against operations not under this agreement or such as may be specifically approved by the Supervisor and the Commissioner, shall be drilled except in accordance with a plan of development approved as herein provided.

11. PARTICIPATION AFTER DISCOVERY: Upon completion of a well capable of producing unitized substances in paying quantities, or as soon thereafter as required by the Supervisor and Commissioner, the Unit Operator shall submit for approval by the Director, the Commissioner, and the Commission, a schedule based on subdivisions of the public-land survey or aliquot parts thereof, of all unitized land then regarded as reasonably proved to be productive of unitized substances in paying quantities; all land in said schedule on approval of the Director, the Commissioner, and the Commission to constitute a participating area, effective as of the date of first production. Said schedule also shall set forth the percentage of unitized substances to be allocated as herein provided to each unitized tract in the participating area so established, and shall govern the allocation of production from and after the date the participating area becomes effective.

A separate participating area shall be established in like manner for each separate pool or deposit of unitized substances or for any group thereof produced as a single pool or zone, and any two or more participating areas so established may be combined into one with the consent of the owners of all working interests in the lands within the participating areas so to be combined, and approval of the Director, the Commissioner, and the Commission. The participating area or areas so established shall be revised from time to time, subject to like approval, whenever such action appears proper as a result of further drilling operations or otherwise, to include additional land then regarded as reasonably proved to be productive in paying quantities and the percentage of allocation shall also be revised accordingly.

The effective date of any revision shall be the first of the month in which is obtained the knowledge or information on which such revision is predicated, unless a more appropriate effective date is specified in the schedule. No land shall be excluded from a participating area on account of depletion of the unitized substances.

It is the intent of this section that a participating area shall represent the area known or reasonably estimated to be productive in paying quantities; but, regardless of any revision of the participating area, nothing herein contained shall be construed as requiring any retroactive adjustment for production obtained prior to the effective date of revision of the participating area.

In the absence of agreement at any time between the Unit Operator and the Director, the Commissioner, and the Commission as to the proper definition or redefinition of a participating area, or until a participating area has, or areas have, been established as provided herein, the portion of all payments affected thereby may be impounded in a manner mutually acceptable to the owners of working interests, except royalties due the United States and the State of New Mexico, which shall be determined by the Supervisor and the Commissioner and the amount thereof deposited as directed by the Supervisor and the Commissioner, respectively, to be held as unearned money until a participating area is finally approved and then applied as earned or returned in accordance with a determination of the sum due as Federal and State Royalty on the basis of such approved participating area.

Whenever it is determined, subject to the approval of the Supervisor, as to wells on Federal land, the Commissioner as to wells on State land, and the Commission as to patented land, that a well drilled under this agreement is not capable of production in paying quantities and inclusion of the land on which it is situated in a participating area is unwarranted, production from such well shall be allocated to the land on which the well is located so long as that well in not within a participating area established for the pool or deposit from which such production is obtained

12. ALLOCATION OF PRODUCTION: All unitized substances produced from each participating area established under this agreement, except any part thereof used in conformity with good operating practices within the unitized area for drilling, operating, camp and other production or development purposes, for repressuring or recycling in accordance with a plan of development approved by the Supervisor, the Commissioner, and the Commission, or unavoidably lost, shall be deemed to be produced equally on an acreage basis from the several tracts of unitized land of the participating area established for such production and, for the purpose of determin

any benefits accruing under this agreement, each such tract of unitized land shall have allocated to it such percentage of said production as the number of acres of such tract included in said participating area bears to the total acres of unitized land in said participating area. It is hereby agreed that production of unitized substances from a participating area shall be allocated as provided herein regardless of whether any wells are drilled on any particular part or tract of said participating area. If any gas produced from one participating area is used for repressuring or recycling purposes in another participating area, the first gas withdrawn from such last mentioned participating area for sale during the life of this agreement shall be considered to be the gas so transferred until an amount equal to that transferred shall be so produced for sale and such gas shall be allocated to the participating area from which initially produced as constituted at the time of such final production.

13. DEVELOPMENT OR OPERATION OF NON-PARTICIPATING LAND OR FORMATIONS: Any party hereto owning or controlling the working interest in any unitized land having thereon a regular well location may, with the approval of the Supervisor, the Commissioner, and the Commission at such party's sole risk, cost and expense drill a well to test any formation for which a participating area has not been established or to test any formation for which a participating area has been established if such location is not within said participating area, unless within 90 days of receipt of notice from said party of his intention to drill the well, the Unit Operator elects and commences to drill such well in like manner as other wells are drilled by the Unit Operator under this agreement.

If any well drilled as aforesaid by a working interest owner results in production such that the land upon which it is situated may properly be included in a participating area, such participating area shall be established or enlarged as provided in this agreement and the well shall thereafter be transferred to and operated by Unit Operator in accordance with the terms of this agreement and the unit operating agreement.

If any well drilled as aforesaid by a working interest owner obtains production in quantities insufficient to justify the inclusion in a participating area of land upon which such well is situated, such well may be operated and produced by the party drilling the same subject to the conservation requirements of this agreement. The royalties in amount or value of production from any such well shall be paid as specified in the underlying lease and agreements affected.

hereto shall be paid by working interest owners responsible therefor under existing contracts, laws, and regulations, provided that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any rental or minimum royalty in lieu thereof due under their leases. Rental or minimum royalty for lands of the United States subject to this agreement shall be paid at the rate specified in the respective leases from the United States, unless such rental or minimum royalty is waived, suspended, or reduced by law or by approval of the Secretary. Rentals on State of New Mexico lands subject to this agreement shall be paid at the rates specified in the respective leases, or may be reduced and suspended upon the order of the Commissioner of Public Lands of the State of New Mexico pursuant to applicable laws and regulations.

With respect to any lease on non-Federal land containing provisions which would terminate such lease unless drilling operations were within the time therein specified commenced upon the land covered thereby or rentals paid for the privilege of deferring such drilling operations, the rentals required thereby shall, notwithstanding any other provision of this agreement, be deemed to accrue and become payable during the term thereof as extended by this agreement and thereafter until the required drilling operations are commenced upon the land covered thereby or some portion of such land is included within a participating area.

16. CONSERVATION: Operations hereunder and production of unitized substances shall be conducted to provide for the most economical and efficient recovery of said substances without waste, as defined by or pursuant to State or Federal law or regulation.

17. DRAINAGE: The Unit Operator shall take appropriate and adequate measures to prevent drainage of unitized substances from unitized land by wells on land not subject to this agreement or pursuant to applicable regulations pay a fair and reasonable compensatory royalty as determined by the Supervisor for Federal land or as approved by the Commissioner as to State land.

18. LEASES AND CONTRACTS CONFORMED AND EXTENDED: The terms, conditions and provisions of all leases, subleases, and other contracts relating to exploration, drilling, development or operation for oil or gas of lands committed to this agreement are hereby expressly modified and amended to the extent necessary to make the same conform to the provisions hereof, but otherwise to remain in full force and effect, and the parties hereto holding interests in leases embracing unitized land of the United States or of the State of New Mexico hereby consent that the Secretary

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6
CASE NO. 5994
Submitted by Tennreco
Hearing Date 7-20-77

UNIT OPERATING AGREEMENT UNDER
UNIT AGREEMENT FOR THE DEVELOPMENT AND OPERATION
OF THE NORTHEAST BLANCO UNIT AREA, COUNTY OF SAN JUAN
STATE OF NEW MEXICO

THIS AGREEMENT, made and entered into, as of the 16th day of July, 1951, by and between BLACKWOOD & NICHOLS COMPANY, a partnership composed of F. G. Blackwood, Dola Blackwood, W. J. Hilseweck, Helen Hilseweck, John W. Nichols, Mary D. Nichols and John W. Fisher, hereinafter designated as "Unit Operator" and the undersigned as owners of working interests in the unitized substances within the Unit Area subject to the Unit Agreement herein below described, as ma, subscribe this agreement and become parties hereto, which owners are hereinafter sometimes referred to individually as "Working Interest Owner" and collectively as "Working Interest Owners";

WITNESSETH: THAT,

WHEREAS, the parties hereto have executed, as of the date hereof, a certain Unit Agreement for the Development and Operation of the Northeast Blanco Unit Area, County of San Juan, State of New Mexico, hereinafter sometimes referred to as "Unit Agreement"; and

WHEREAS, the term "working interest owner" as used herein relating to the subject lands shall mean and refer only to such an interest committed hereto as may be obligated to bear or share, either in cash or out of production a portion or all of the costs or expenses of developing, equipping or operating any land within the Unit Area subject to this agreement. If the working interest in any tract is or shall hereafter be owned by more than one party, the term "working interest owner," when used with respect to such tract, shall refer to all such parties owning the working interest therein; and

WHEREAS, Section 7 of the Unit Agreement provides for a separate Unit Operating Agreement to be executed by the parties hereto, wherein and whereby such parties shall agree among themselves with respect to certain matters and things relating to the development and operation of the said area.

NOW, THEREFORE, in consideration of the premises and the covenants and agreements herein contained, it is mutally agreed by and between the parties as follows:

1. UNIT PLAN CONFIRMED: The Unit Agreement for the Development and Operation of the Northeast Blanco Unit Area and all exhibits attached thereto are hereby confirmed and made a part of this agreement and, in the event of any conflict between the provisions of the Unit Agreement and the provisions of this agreement, the provisions of the Unit Agreement shall prevail.

Exhibit by Instrument Dated 1-1-62

Case 5994
EXHIBIT NO. 6

well and other engineering data pertaining to unit operations and samples from the cores and cuttings encountered in drilling wells, provided that such Working Interest Owner gives Unit Operator written notice of its desire to have such samples prior to the commencement of the well;

(g) comply with all valid applicable Federal and State laws and regulations; and

(h) keep the land in the unit area free from liens and encumbrances occasioned by its operations, save only the lien granted the Unit Operator under this agreement.

5. ADVISORY COMMITTEE CREATED: An "Advisory Committee" is hereby created consisting of one representative of each Working Interest Owner signatory hereto, and its assigns, to be designated in writing by each party. The representative of the Unit Operator shall be chairman of the Committee. Each member shall have a vote equal to the proportionate or fractional acreage interest in the working interest owned by his principal in the participating area involved in any determination to be made by the Committee, or in the Unit Area where the determination concerns any matter affecting the Unit Area as a whole. Except as otherwise specified herein or in the Unit Agreement, an affirmative vote of 65% of the voting power of the Committee, taken in the manner to be determined by the Committee, referred to hereinafter, upon any matters upon which such Committee is authorized to act shall constitute the decision of the Committee and be binding on the Committee and upon each of the parties hereto; provided, however, that should any party own as much as 65% voting interest in the Unit Area or in a participating area, as the case may be, its vote must be supported by the affirmative vote of at least one additional party to bind all the parties hereto; and provided further that if one party owns 30% or more voting interest, the vote of such party shall not serve to defeat or disapprove any matter approved by the majority (over 50%) unless supported by at least one additional voting interest but in case the foregoing provisions would either carry or defeat both the affirmative and negative vote on any issue, such issue shall be determined by the larger vote. The Committee is authorized to adopt a rule providing that where any action is agreed to in writing by all members of the Committee, it shall be part of the Committee's records and shall have the same force and effect as if adopted at a regular meeting at which a quorum was present.

6. POWERS AND DUTIES OF ADVISORY COMMITTEE: The Advisory Committee shall be charged, subject to the provisions of this agreement, with compliance with the terms and conditions of the Unit Agreement and the leases and necessary contracts affecting

the development and operation of the lands covered hereby as long as the same shall be owned and held by the parties hereto, and shall have, among other powers, the power and authority:

(a) to exercise the powers of the Working Interest Owners set forth in the Unit Agreement and this agreement;

(b) to adopt such rules and regulations as it may deem advisable for its proper functioning including the selection of the time and place for holding regular meetings, calling of special meetings, and the manner of taking votes on any question.

(c) to approve or disapprove the location, drilling, and letting of contracts for drilling or recompletion of any and all wells. The approval of the drilling or recompletion of any well shall be construed to mean and include the approval of any necessary expenditures for the drilling, completing and equipping of such well, including the necessary lines, separators, and necessary tankage if a producer, and if a dry hole the plugging and abandonment thereof, except as otherwise provided in Section 9 and 17 hereof.

(d) to approve or disapprove any single expenditure in excess of $5,000.00 other than normal operating expenses.

(e) to approve or disapprove the use of facilities owned by one participating area for purposes of operation and development outside of said area, and to determine the amount of any charges therefor, unless otherwise provided for in this agreement or in the Unit Agreement.

(f) to approve or disapprove any expenditure for expert technical advice including any extra services rendered by Unit Operator's technical staff not contemplated by the provisions of the Accounting Procedure, hereto attached, marked "Exhibit 1," and not covered by the overhead, district, and camp expenses therein authorized, which overhead in said Accounting Procedure is intended to only cover normal development and operations.

(g) to approve or disapprove any partial relinquishment of the rights of the Unit Operator.

(h) to approve or disapprove the abandonment of any well or wells or the disposal of any major items of surplus material or equipment other than junk, having an original cost of $1,000.00 or more (any such item or items of less cost may be disposed of without such approval), except as otherwise provided in Section 17 hereof.

(i) to approve or disapprove any proposed plan for development of the Unit Area or any participating area or amendment thereof, or any proposed expansion or contraction of the Unit Area or any designation or enlargement of a participating

area, unless otherwise required by Public Authority.

(j) to determine the basis of investment adjustment and the adjusted basis of prorated future development and operating costs and to readjust percentages of participation upon enlargement or reduction of the Unit Area or enlargement of any participating area or upon elimination of acreage for failure of title.

(k) to approve or disapprove any arrangements for repressuring or cycling and to approve or disapprove any change in the existing method of operation.

In case of blow-out, explosion, fire, flood, or other sudden emergency, Unit Operator may take such steps, and incur such expense, as in its opinion are required to deal with the emergency and to safeguard life and property; provided that Unit Operator shall, as promptly as possible, report the emergency to the other parties and shall endeavor to secure any sanction which might otherwise have been required.

Subject to the provisions hereof, Unit Operator shall have full control of the premises subjected hereto and shall conduct and manage the development and operation of unitized lands for the production of unitized substances therefrom for the account of the parties hereto.

It is specifically understood, that if the Working Interest in the initial participating area or any subsequent participating area or areas is owned by one party, such party shall alone control the action of the Unit Operator in all matters referred to above in respect thereto until such area or areas may be enlarged to include an additional Working Interest Owner or Owners therein.

7. INSURANCE: Unit Operator agrees that Contractors or Subcontractors will carry insurance as follows, to cover drilling and development operations on all lands subject to this agreement:

(a) Workmen's Compensation Insurance as required by the laws of the State of New Mexico.

(b) Contractor's Public Liability Insurance in amounts of $100,000 for injuries for one person and $300,000 for injuries in one accident.

(c) Automobile Public Liability and Property Damage Insurance in amounts of $100,000 for injuries to one person, $200,000 for injuries in one accident and $10,000 for property damage.

With respect to production operations on all lands subject to this agreement, Unit Operator shall carry with a reputable insurance carrier, Workmen's Compensation Insurance, Contractor's Public Liability Insurance with limits of $50,000 for one person and $100,000 for one accident, and Automobile Public Liability Insurance with limits of $100,000 for one person, $200,000 for one accident and $10,000 for property damage.

Unit Operator, at its election, may request each Working Interest Owner hereto to advance its respective proportion of the development and operating costs hereunder in accordance with an estimate by Unit Operator to be made not less than ten days in advance of the month in which the costs and expenses are to be incurred. The costs and expenses actually incurred in such month shall be billed to each party as herein otherwise provided, and the advances made by each party under the provisions of this Section, less any delinquencies of such party in the payment of his operating expenses, shall constitute a credit against estimates thereafter made by Unit Operator under the provisions of this Section. Each month adjustments shall be made between Unit Operator and each party in order that the advances to the credit of each party shall equal his share of the estimated expenses to be incurred in the succeeding month.

9. TEST WELL: The cost of drilling, equipping and completing the Dakota test well provided for in Section 9 of the Unit Agreement, and the cost of plugging and abandoning same if a dry hole shall be paid (and advanced if required by Unit Operator) by all the Working Interest Owners hereto in the proportion that the ownership of working interests on an acreage basis within the Unit Area of each party hereto bears to the total working interests on an acreage basis in the Unit Area owned by all parties hereto, except that the obligations of Stanolind Oil and Gas Company with respect to said test well shall be only as contained in that 'Farmout Contract' dated March 8, 1951, between said company, and Blackwood & Nichols, et al, reference to which is made for greater particularity.

In the event it is decided to drill any additional Dakota test wells prior to establishing a Dakota participating area, or prior to the establishment of an additional participating area, or any additional test wells to test heretofore untested formations, such wells shall be drilled by the Unit Operator except as otherwise may be provided by this agreement. The basis of contribution to the cost of such wells and the final adjustment of disposition of such costs shall be made the subject of a special agreement between the Unit Operator and the Working Interest Owners.

10. ESTABLISHMENT OF NEW PARTICIPATING AREAS OR ENLARGEMENT OF EXISTING PARTICIPATING AREAS: In the event any test well drilled shall encounter the unitized substances in quantity sufficient to justify the establishment of a new and separate participating area or the enlargement of an existing participating area for the formation encountered, such participating area or enlargement shall be formed as provided in Section 11 of the said Unit Agreement. Upon the establishment of any participating area, there shall be a retroactive adjustment of the cost of drilling, completing, equipping for production and operating the said test well from the commencement of

operations on said well until the effective date of the establishment to the end that the owners of working interests in the participating area newly established shall reimburse without interest the party or parties who paid for the cost and expense of drilling, completing, equipping for production, and operating the well, less any income derived by the last named party or parties up to the date of settlement, and thereafter the costs incurred and benefits derived from the operation of the well shall be borne by and inure to the benefit of the Working Interest Owners in the participating area or areas, and the working interests attributable to the non-participating portion of the Unit Area shall thereafter be liable for no part of the costs and entitled to no part of the benefits derived therefrom.

11. FUTURE WELLS DRILLED BY UNIT OPERATOR: All wells drilled in the Unit Area by Unit Operator after the effective date of this agreement shall be drilled on a competitive contract basis at the usual rates prevailing in the region of the Unit Area. Unit Operator, if it so desires, may employ its own tools and equipment in the drilling of such wells, but in such event the charge therefor shall not exceed the competitive prevailing rate charged by independent contractors doing work of a similar nature. Before the commencement of the drilling of any well by the Unit Operator, the Unit Operator and the other affected Working Interest Owners shall agree upon the then competitive prevailing rate and upon the contract under which Unit Operator will drill such well.

12. WELLS DRILLED OUTSIDE PARTICIPATING AREA: The Unit Operator, upon obtaining the approval, where necessary of Federal or State authority, may drill any test well within the Unit Area but outside the boundaries of any established participating area, for the account, and at the sole cost, risk and expense of the Working Interest Owners within any participating area, but such participating area shall be committed to the drilling of such a well only by the consent of the parties owning an interest in the same as provided in Section 5 and 6 hereof. In the alternative such wells may be drilled as provided in Section 13 of the Unit Agreement.

13. CHANGE OF PARTICIPATING AREA - INVESTMENT ADJUSTMENT: Separate participating areas for different formations may be established and any participating area may be diminished on account of failure of title or may be enlarged, all as provided by the said Unit Agreement and this agreement. On the enlargement of any participating area there shall be an investment adjustment between the owners of working interest in the enlarged participating area who are parties hereto and the Working Interest Owners in the former participating area who are parties hereto, to the end that the investment in wells, well equipment, facilities, and all other property within the enlarged participating area shall be paid for by the affected Working Interest Owners in the en-

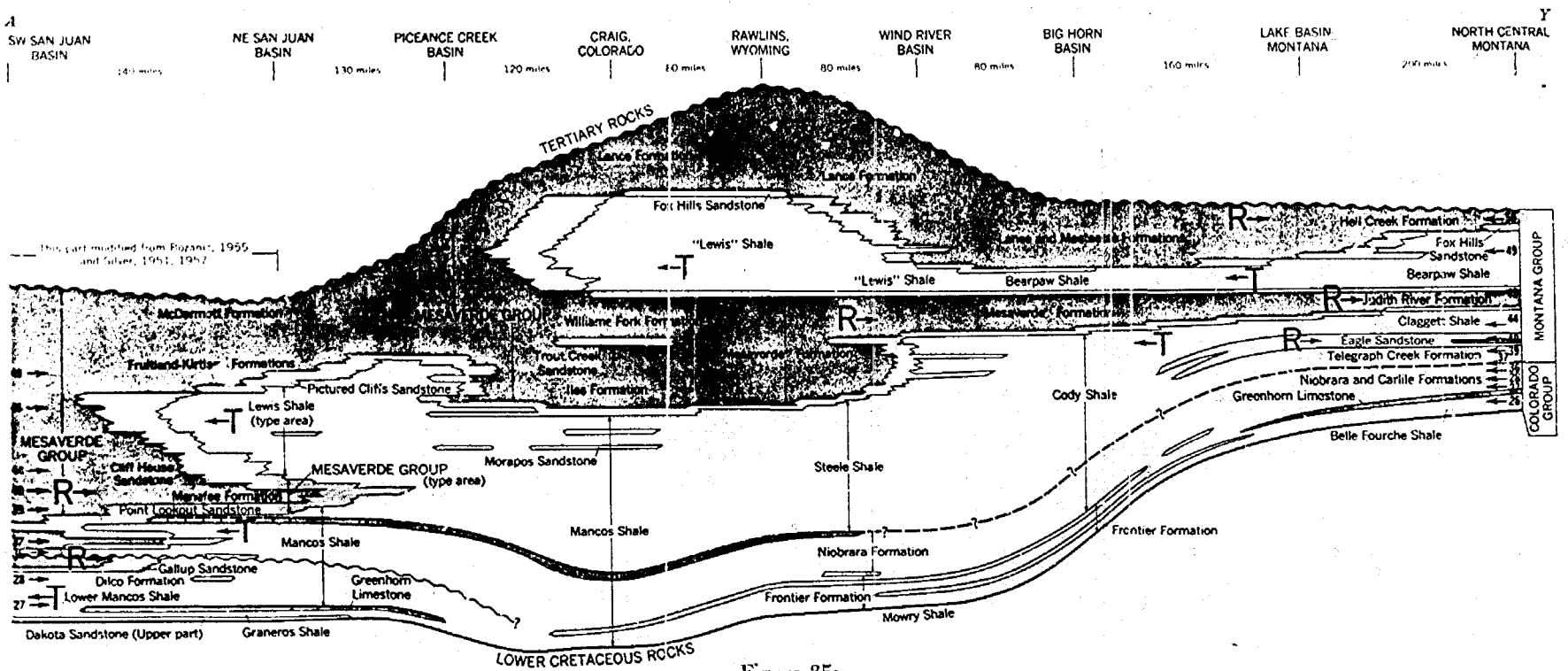


Figure 35:
NORTH-CENTRAL MONTANA TO SAN JUAN BASIN.

RESTORED DIAGRAMMATIC SECTION IN UPPER CRETACEOUS ROCKS
After R. J. Weimer, 1960

GEOLOGIC ATLAS of THE ROCKY MOUNTAIN REGION
Rocky Mountain Association of Geologists
Denver, Colorado 1972 p.214

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO. 5994
Submitted by Tenneco
Hearing Date 7-20-77

TENNECO Exhibit 7
Case 5994

JASON W. KELLAHIN
ROBERT E. FOX
W. THOMAS KELLAHIN

SEP 30 1977
CONSERVATION COMM
Santa Fe

KELLAHIN and FOX
ATTORNEYS AT LAW
500 DON GASPAR AVENUE
P. O. BOX 1769
SANTA FE, NEW MEXICO 87501

TELEPHONE 982-4315
AREA CODE 505

September 27, 1977

Mr. Joe Ramey
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Tenneco Oil Company
OCC Case No. 5994
Order No. R-5531

Dear Mr. Ramey:

On behalf of Tenneco Oil Company, please find enclosed our application for a hearing de novo in the above case.

Very truly yours,

W. Thomas Kellahin

CC: Mr. Bill Carr
Mr. Millard Carr
Mr. Paul Thompson

WTK:kfm

Enclosure

SEP 30 1977
CONSERVATION COMM
Santa Fe

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF TENNECO OIL COMPANY FOR AN EXCEPTION TO THE PROVISIONS OF ORDER NO. R-5459, SAN JUAN COUNTY, NEW MEXICO.

CASE No. 5994
ORDER No. R-5531

APPLICATION FOR HEARING DE NOVO

COMES NOW TENNECO OIL COMPANY, by and through its attorneys, Kellahin & Fox, and pursuant to Commission Rule 1220 hereby applies to the Commission for a Hearing De Novo in the above captioned case.

KELLAHIN & FOX

By W. T. Kellahin

W. THOMAS KELLAHIN
P. O. Box 1769
Santa Fe, New Mexico 87501

Amoco Production Company
Security Life Building
Denver, Colorado 80202

NOV - 9 1977
CONSERVATION

November 5, 1977

Joe D. Ramey, Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, NM 87501

File

File: VDP-1439-986.511

Case 5994
(De Novo)
November 10, 1977

Amoco Production Company, as a Working Interest Owner in The Northeast Blanco Unit, San Juan and Rio Arriba Counties, New Mexico, opposes the application of Tenneco Oil Company for an exception to the provisions of Order 5459, San Juan County, New Mexico, as it pertains to Northeast Blanco Unit Well No. 64 in Unit P of Section 24-T30N-R8W.

Amoco participated in the drilling of Well No. 64 as an infill well on a pre-existing Blanco Mesaverde Pool Proration Unit. We fully support the evidence to be presented by Northeast Blanco Unit Operator, Blackwood and Nichols Company, Ltd., on November 10, 1977, that Well No. 64 is currently completed in the Blanco-Mesaverde common source of supply. This position is consistent with and supported by previous Commission Orders R-5459 entered on June 14, 1977 and R-5994 entered on September 6, 1977.

R. B. Giles

R. B. Giles

CJB:ps
BC546

cc:
Blackwood & Nichols Company, Ltd.
2013 First National Center West
Oklahoma City, OK 73102

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5994
Order No. R-5531

APPLICATION OF TENNECO OIL COMPANY
FOR AN EXCEPTION TO THE PROVISIONS
OF ORDER NO. R-5459, SAN JUAN COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 20, 1977, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 6th day of September, 1977, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That by its Order No. R-5459, entered on June 14, 1977, the Commission redefined the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico.

(3) That such redefinition resulted in the inclusion of "Chacra" equivalent fractured shales or siltstone zones within the vertical limits of said pool in approximately one-half of said pool North and East of a certain line traversing the pool.

(4) That in said Order No. R-5459 the Commission found:

> "(17) That there are 4 wells North and East of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool." and

"(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission."

(5) That the applicant, Tenneco Oil Company, is the operator of one and an interest owner in another of the wells referenced in Findings Nos. (17) and (18) of said Order No. R-5459, the wells being, respectively, its Florance Well No. 29A located in Unit F of Section 25 and the Blackwood and Nichols Northeast Blanco Unit Well No. 64 located in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico.

(6) That the applicant seeks an exclusion from the vertical limits of said Blanco-Mesaverde Pool for said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 as an exception to said Order No. R-5459.

(7) That an owner of interest offsetting said Florance Well No. 29A and in said Northeast Blanco Unit Well No. 64 appeared and presented testimony in opposition to the subject application.

(8) That the evidence presented demonstrated that the initial pressures encountered in the "Chacra" equivalent producing zones in said two wells were lower than should be expected in an undrained reservoir in this area.

(9) That the evidence presented demonstrated that such pressures do not vary in any significant degree from pressures encountered in other Blanco-Mesaverde Pool infill wells in the area.

(10) That the pressure evidence presented demonstrated that the "Chacra" equivalent zones in said two wells are in communication with other pay zones in said Blanco-Mesaverde Pool and are a part of the same common source of supply.

(11) That said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 are currently classified as infill wells drilled on pre-existing Blanco-Mesaverde Pool proration units in accordance with applicable special pool rules and regulations.

(12) That if the subject application is approved said wells would no longer be classified as infill wells in the W/2 of Section 25 and the E/2 of Section 24, respectively, of Township 30 North, Range 8 West, of said Blanco-Mesaverde Pool.

(13) That the evidence presented demonstrated that if the application should be approved, the protestant, Blackwood and Nichols Company, would be required to drill another Blanco-Mesaverde Pool infill well in the SE/4 of said Section 24.

(14) That since said Northeast Blanco Unit Well No. 64 is already completed in the SE/4 of said Section 24 and is capable of producing gas from a zone that is a part of the common source of supply being said Blanco-Mesaverde Pool, the additional infill well described in Finding No. (13) above is an unnecessary well.

(15) That the drilling of unnecessary wells constitutes economic waste.

(16) That if the subject application is denied, the owners of interest under said Florance Well No. 29A in the W/2 of said Section 25 and under said Northeast Blanco Unit Well No. 64 in the E/2 of said Section 24 will be able to recover their just and equitable share of the production from said Blanco-Mesaverde Pool underlying said half sections.

(17) That approval of the subject application would result in said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 being spaced, prorated, and produced under rules differing from the special rules and regulations for wells producing from the same common source of supply being said Blanco-Mesaverde Pool.

(18) That such differences in spacing, prorationing, and producing within the same common source of supply could result in the violation of the correlative rights of the owners of interest in offsetting tracts.

(19) That denial of the subject application will not result in violation of correlative rights but will instead serve to protect the same and will prevent the economic waste which would result from the drilling of unnecessary wells.

(20) That the subject application should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Tenneco Oil Company for an exception to Commission Order No. R-5459 to exclude its Florance Well No. 29A in Unit F of Section 25, and the Blackwood and Nichols Company Northeast Blanco Unit Well No. 64 in Unit P of Section 24, both in Township 30 North, Range 8 West, from the vertical limits of the Blanco-Mesaverde Pool, San Juan County, New Mexico, is hereby denied.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5994 De Novo
Order No. R-5531-A

APPLICATION OF TENNECO OIL COMPANY
FOR AN EXCEPTION TO THE PROVISIONS
OF ORDER NO. R-5459, SAN JUAN COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on ~~April 23~~, November 10, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this ~~23rd~~ day of ~~April, 1974~~, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That by its Order No. R-5459, entered on June 14, 1977, the Commission redefined the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico.

(3) That such redefinition resulted in the inclusion of "Chacra" equivalent fractured shales or siltstone zones within the vertical limits of said pool in approximately one-half of said pool North and East of a certain line traversing the pool.

(4) That in said Order No. R-5459 the Commission found:

"(17) That there are 4 wells North and East of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool." and

"(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission."

(5) That the applicant, Tenneco Oil Company, is the operator of one and an interest owner in another of the wells referenced in Findings Nos. (17) and (18) of said Order No. R-5459, the wells being, respectively, its Florance Well No. 29A located in Unit F of Section 25 and the Blackwood and Nichols Northeast Blanco Unit Well No. 64 located in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico.

(6) That the applicant seeks an exclusion from the vertical limits of said Blanco-Mesaverde Pool for said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 as an exception to said Order No. R-5459.

(7) That this matter came on for hearing at 9:00 a.m. on July 20, 1977 at Santa Fe, New Mexico, before Examiner Richard L. Stamets, and, pursuant to this hearing, Order No. R-5531 was issued denying the exclusion sought.

(8) That on September 30, 1977, application for Hearing De Novo was made by Tenneco Oil Company and the matter was set for hearing before the Commission.

(9) That the matter came on for hearing de novo on November 10, 1977.

(10) That the evidence adduced at said hearing fully supports the findings in Order No. R-5531 and confirms the action ~~xxxxxx~~ denying the application.

(11) That Commission Order No. R-5531 entered September 6, 1977, should be affirmed and adopted.

IT IS THEREFORE ORDERED:

(1) That Commission Order No. R-5531, entered September 6, 1977, is hereby affirmed. and adopted.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

Commission Hearing
Place - OCC Conf Room
Time - 9 am
Date - Nov. 10, 1977

Newspapers SF
Farmington

CASE 5994: Application of Tenneco Oil Company for an exception to the provisions of Order No. R-5459, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the provisions of Order No. R-5459 to exclude its Florance Well No. 29-A in Unit F of Section 25, and its Northeast Blanco Unit Well No. 64 in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico, from the vertical limits of the Blanco-Mesaverde Pool.

upon application of Tenneco Oil Company, this case will be heard De Novo pursuant to the provisions of Rule 1220.

Docket No. 35-77

Dockets Nos. 37-77 and 38-77 are tentatively set for hearing on November 16 and 30, 1977. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - WEDNESDAY - NOVEMBER 9, 1977

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

CASE 6077: Application of Bass Enterprises Production Company for a drilling permit in the Potash-Oil Area, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its Big Eddy Unit Well No. 52 and its Rodke Federal Well No. 3 located, respectively, in Units I and F of Section 27, Township 20 South, Range 31 East, Eddy County, New Mexico, said location being within the boundaries of the Potash-Oil Area as defined by Commission Order No. R-111-A and having been objected to by the owners of potash leases in the area.

****

Docket No. 36-77

DOCKET: COMMISSION HEARING - THURSDAY - NOVEMBER 10, 1977

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

CASE 5994: (DE NOVO)

Application of Tenneco Oil Company for an exception to the provisions of Order No. R-5459, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the provisions of Order No. R-5459 to exclude its Florance Well No. 29-A in Unit F of Section 25, and its Northeast Blanco Unit Well No. 64 in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico, from the vertical limits of the Blanco-Mesaverde Pool.

Upon application of Tenneco Oil Company, this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 6009: (DE NOVO)

Application of Morris R. Antweil for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the S/2 of Section 29, Township 18 South, Range 25 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

Upon application of Yates Petroleum Corporation, this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 6078: Application of Yates Petroleum Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp and older formations underlying the S/2 of Section 29, Township 18 South, Range 25 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

Western Union Telegram

IPMFEKA SANA
2-029472E313 11/09/77
ICS IPMMT77 CSP
 3036239303 TDMT DENVER CO 26 11-09 0102P EST
PMS JOE RANEY, DLR
OIL CONSERVATION COMMISSION STATE OF NEW MEXICO LAND OFFICE BLDG
OLD SANTA FE TRAIL RM 206
SANTA FE NM 87401
REGARDING DENOVO 9994. WE HAVE A LETTER ADDRESSED TO THE COMMISSION
IN THE MAIL OPPOSING TENNECO'S APPLICATION FOR DESIGNATION OF THESE
 TWO WELLS AS CHACRA
  NORTHWEST PIPELINE CORP K C BOWMAN

1303 EST

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NOV - 9 1977
L CONSERVATION COMM.
Santa Fe

NORTHWEST PIPELINE CORPORATION

ONE PARK CENTRAL, SUITE 1485
DENVER, COLORADO 80202
303-623-9303

November 9, 1977

Oil Conservation Commission
State of New Mexico
Attention: Mr. Joe Ramey
Post Office Box 2088
Santa Fe, New Mexico 87401

RE: Denovo Case 9994

To the Commission:

You are considering application by Tenneco to except the following wells from classification as Mesaverde wells. The wells are:

1) Tenneco Florance #29-A, NW/4 Section 25, Township 30 North, Range 8 West;

2) Blackwood & Nichols Northeast Blanco Unit #64 (#105A), SE/4 Section 24, Township 30 North, Range 8 West, San Juan County, New Mexico.

Both wells were completed in a zone now defined within the vertical limits of the Mesaverde Producing Interval in Order R-5459 (Case No. 5983). It's our understanding that the Tenneco well was originally classified and is producing as a Blanco Mesaverde well.

Northwest Pipeline Corporation was the Applicant in Case No. 5983, and there recognized the possible need to grant exceptions from the defined vertical limits of the Blanco Mesaverde producing interval; such exceptions would be considered for those producing wells classified as "Chacra" wells. However, we feel the above-mentioned wells should not be excepted from classification as Mesaverde wells.

To prevent waste of natural resources, in line with prudent conservation practices, and to promote efficient production of gas from intervals within the now defined Blanco Mesaverde Pool, this Commission should deny Tenneco's application to change the designation and except the said wells from classification as Mesaverde wells.

Respectfully submitted on behalf of:

NORTHWEST PIPELINE CORPORATION

K. C. Bowman

KCB:tks

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

December 27, 1977

Re: CASE NO. 5994
ORDER NO. R-5531-A

Mr. William F. Carr
Catron, Catron, & Sawtell
Attorneys at Law
Post Office Box 788
Santa Fe, New Mexico

Applicant:

Tenneco Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC x

Other

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5994 DE NOVO
Order No. R-5531-A

APPLICATION OF TENNECO OIL COMPANY
FOR AN EXCEPTION TO THE PROVISIONS
OF ORDER NO. R-5459, SAN JUAN COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on November 10, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 27th day of December, 1977, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That by its Order No. R-5459, entered on June 14, 1977, the Commission redefined the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico.

(3) That such redefinition resulted in the inclusion of "Chacra" equivalent fractured shales or siltstone zones within the vertical limits of said pool in approximately one-half of said pool North and East of a certain line traversing the pool.

(4) That in said Order No. R-5459 the Commission found:

"(17) That there are 4 wells north and east of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool." and

"(18) That to protect the correlative rights of the owners of said four wells, the effective date

of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission."

(5) That the applicant, Tenneco Oil Company, is the operator of one and an interest owner in another of the wells referenced in Findings Nos. (17) and (18) of said Order No. R-5459, the wells being, respectively, its Florance Well No. 29A located in Unit F of Section 25 and the Blackwood and Nichols Northeast Blanco Unit Well No. 64 located in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico.

(6) That the applicant seeks an exclusion from the vertical limits of said Blanco-Mesaverde Pool for said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 as an exception to said Order No. R-5459.

(7) That this matter came on for hearing at 9:00 a.m. on July 20, 1977 at Santa Fe, New Mexico, before Examiner Richard L. Stamets, and, pursuant to this hearing, Order No. R-5531 was issued denying the exclusion sought.

(8) That on September 30, 1977, application for hearing De Novo was made by Tenneco Oil Company and the matter was set for hearing before the Commission.

(9) That the matter came on for hearing De Novo on November 10, 1977.

(10) That the evidence adduced at said hearing fully supports the findings in Order No. R-5531 and confirms the action denying the application.

(11) That Commission Order No. R-5531 entered September 6, 1977, should be affirmed and adopted.

IT IS THEREFORE ORDERED:

(1) That Commission Order No. R-5531, entered September 6, 1977, is hereby affirmed and adopted.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

Exhibit 1

APPLICATION FOR APPROVAL
OF
DEFINITION OF "MESAVERDE"
AS USED IN DESIGNATION OF
MESAVERDE PARTICIPATING AREA
FOR
THE NORTHEAST BLANCO UNIT, I-SEC. NO. 929
SAN JUAN AND RIO ARRIBA COUNTIES, NEW MEXICO
AND IN SUBSEQUENT ENLARGEMENTS THEREOF

TO: The Director of The United States Geological Survey
Roswell, New Mexico

Commissioner of Public Lands
State of New Mexico
Santa Fe, New Mexico

Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 1
Submitted by Blackwood + Nichols
Hearing Date 11/10/77

Pursuant to the provisions of Section 11 of the Unit Agreement approved by the Director of the Geological Survey on April 16, 1952, by the Commissioner of Public Lands of the State of New Mexico on October 23, 1951, and by tne Oil Conservation Commission of the State of New Mexico on October 31, 1951, and pursuant to a resolution duly adopted by the Advisory Committee under the Unit Operating Agreement under Unit Agreement for the Development and Operation of the Northeast Blanco Unit Area, San Juan and Rio Arriba Counties, New Mexico, Blackwood & Nichols Company, as Unit Operator, hereby submits for your approval a definition of the term "Mesaverde" as used in the Application for Approval of Mesaverde Participating Area for the Northeast Blanco Unit, I-Sec. No. 929, San Juan and Rio Arriba Counties, New Mexico, and in subsequent enlargements thereof. In support of this Application, Operator states as follows:

1. The Application for Approval of Mesaverde Participating Area was approved by the Geological Survey on November 20, 1952. The original Participating Area was subsequently enlarged five times, with your approval, so that the Mesaverde Participating Area now covers the entire Unit Area. In the original Application and in subsequent enlargements, the term "Mesaverde" was used, and was sometimes followed by the term "zone," "formation," "horizon," "group," or the like, but was never otherwise defined.

2. Pursuant to the Plan of Development for 1976, on June 26, 1976, the Unit Operator commenced drilling of its Northeast Blanco Well No. 64 located in the SE/4 of Section 24, Township 30 North, Range 8 West, Rio Arriba County, New Mexico. The well was drilled for the purpose of protecting against drainage from the traditional producing intervals; however, the Operator encountered gas production at a level above the traditional producing interval. The details of the drilling and completion of this well are set forth on Exhibit "A", "Geological and Engineering Memorandum." After the completion of the well, Tenneco Oil Company and Continental Oil Company, owners of the lease upon which this well was drilled, took the position that the production encountered in the well was not within the vertical limits of the Mesaverde Participating Area.

3. In view of the questions which had been raised concerning the vertical extent of the Participating Area, the Advisory Committee under the Unit Operating Agreement met on October 12, 1976, for purposes of considering the matter, and other Unit business, pursuant to the Advisory Committee's duty under Section 6 of the Unit Operating Agreement to approve or disapprove any Participating Area or amendments thereof. In that meeting, the Advisory Committee duly adopted the definition of "Mesaverde" set forth in the Geological and Engineering Memorandum. The Unit owners, and their respective interests, voting in favor of the adoption of the definition were as follows:

Amoco Production Company	.32975933
Blackwood & Nichols Co., Ltd.	.29805862
Jacqulyn M. Williams	.00260911
Westland Oil Development Corp.	.04940999
Total	.67983705

Those voting not to adopt the definition were as follows:

El Paso Natural Gas Company	.21199416
Tenneco Oil Company	.01440596
Continental Oil Company	.01440595
Total	.24080607

Mr. F. G. Blackwood was authorized by letter to represent the .00492448 Thayer H. Laurie and .00310743 T. H. Laurie and D. N. Mills, Tr. interests; although not present at the meeting due to illness has approved the definition of Mesaverde as presented by the Advisory Committee. This makes the total authorized approval .68786896.

Continental Oil Company has not yet furnished written authority for their .01440595 "no" vote. Therefore the authorized "no" vote is .22640012.

The definition therefore was adopted by the required affirmative vote of 65% of the voting power of the Advisory Committee, as provided in Section 5 of the Unit Operating Agreement.

4. The Geological and Engineering Memorandum discusses evidence that the accumulation found in the No. 64 Well is part of the same accumulation found in the traditional producing interval. The Memorandum also points out that the definition of Mesaverde adopted by the Advisory Committee is consistent with that term as used in geologic literature dating back to the creation of the Unit.

The Operator respectfully requests that the Director, the Commissioner and the Commission approve this Application.

DATED this 15th day of November, 1976.

BLACKWOOD & NICHOLS COMPANY

By _____
General Partner

OPERATOR

STATE OF OKLAHOMA)
) ss
COUNTY OF OKLAHOMA)

Before me, the undersigned, a notary public in and for said County and State, on the 15th day of November, 1976, personally appeared F. G. Blackwood, General Partner of Blackwood & Nichols Company, a General Partnership, to me known to be the identical person who executed the within and foregoing instrument on behalf of the partnership.

_____
Notary Public

My commission expires:

October 12, 1980

EXHIBIT "A"
NORTHEAST BLANCO UNIT, I-SEC. NO. 929
SAN JUAN AND RIO ARRIBA COUNTIES, NEW MEXICO
SIXTH ENLARGED PARTICIPATING AREA

GEOLOGICAL AND ENGINEERING MEMORANDUM

Northeast Blanco Well #64 (originally called 105A) was completed on July 10, 1976, with an open flow potential of 9,900 MCF per day. The well is located in the SE/4 of Section 24-T30N-R8W Rio Arriba County, New Mexico.

Well #64 (105A) is completed in open hole from 4,252' to 4,278' in a fractured sand and shale portion of the Mesaverde group above the top of the "Massive Sandstone Member" of the Cliff House sandstone. As the well was being drilled from 4,258' to 4,262' the well started making gas and the 4' interval was penetrated in two minutes. A copy of the Totco time vs. depth chart for this section is attached. The drill pipe was raised off bottom and the rams were closed. The shut in pressure rose to 550 psig in 15 minutes. The valve was opened allowing gas to flow up the drill pipe and the gas flow rate estimated by use of a pitot tube at 15,000 MCF per day. The valve was closed and an immediate shut in pressure of 550 psig was recorded.

The well was killed with 200 bbls of 35 vis. gel-water, and 4 1/2 K-55 10.5# ST & C casing was run to 4,252'.

A Lynes external casing to formation packer was set @ 4,119' and 50 sacks of class B cement with 2% $CaCl_2$ was pumped thru a stage collar at 4,085', plug down at 12:30 p.m. July 8, 1976. On July 10 the hole was drilled out and deepened to 4,278'. The well began blowing gas at 4,251' and upon reaching 4,278' (T.D.) was allowed to blow to clean up for 10 hrs. After nippling up the tree the tubing was perforated with 10, 3/8" holes from 4,240'-4,245'. A shut in csg. pressure of 640 psig and a shut in tbg pressure of 640 psig was recorded July 12, 1976 along with a AOF of 9,900 MCFPD. The well has been connected to El Paso Natural Gas Company's line and is shut in at present.

On August 9, 1976, Blackwood and Nichols filed Well Completion Forms (9-330) and Request for Allowable Forms (C-104). These forms were returned approved but with the Pool or Field name changed from Blanco Mesaverde to Chacra Undesignated Unit. However, the 4,252' to 4,278' interval in Well #64 (105A) does not correlate with any designated producing reservoir in the San Juan Basin. This interval is approximately 500' above the top of the "Massive Sandstone Member" of the Cliff House and 250' below the Chacra producing interval as recognized in the area.

We believe that any gas which might be produced from the #64 (105A) well would be gas which was originally in the Massive Cliff House or deeper beds and has migrated to a higher level in this very small area for the following reasons:

1. The measured surface pressure of 640 psig which is correlative with newly completed Mesaverde wells in the area, and the nearby producing well #2-43. If this were a new reservoir the pressure should be much higher.
2. When the offset wells were drilled they did not encounter gas in this interval.
3. The chemical characteristics of the gas from Well #64 (105A) and offsetting Mesaverde wells are very similar as shown in the attached gas analyses.
4. The very high natural flow rates are not usual in normal unfractured reservoirs.
5. The high penetration rate of the 4,256-4,262' interval.

Definition of Mesaverde

The completion of a gas well in a fractured sand and shale zone which is approximately 500' above the top of the "Massive Cliff House sandstone" has brought about the need to define the term Mesaverde insofar as the Northeast Blanco Unit I-Sec. 929 is concerned. The Advisory Committee of the Northeast Blanco Unit met October 12, 1976 and passed a Resolution defining Mesaverde as follows:

"RESOLVED, that the term "Mesaverde" as used in the "Application for Approval of Mesaverde Participating Area for the Northeast Blanco Unit,

I-Sec. No. 929, San Juan and Rio Arriba Counties, New Mexico", and in subsequent applications for enlargements thereof (and sometimes followed by the term "Zone", "Formation", "Horizon" or the like), all such applications duly approved by the Director of the United States Geological Survey, the Commissioner of Public Lands, State of New Mexico and the Oil Conservation Commission, State of New Mexico, is hereby defined as the stratigraphic equivalent of the interval between (i) the base of the Green Shale Marker, which occurs at a depth of 4,054 feet on the Gamma Ray-Neutron Log, dated May 31, 1957, of the Blackwood & Nichols Northeast Blanco Unit No. 34-19 Well, Section 19, Township 30 North, Range 7 West, Rio Arriba County, New Mexico, and (ii) 300 feet below the base of the Point Lookout Formation, which base occurs at a depth of 5,565 feet on the log of the foregoing well." A copy of the above referred to log is attached.

This definition is to apply to the Northeast Blanco Unit only and has no effect on any area outside the area of the Northeast Blanco Unit.

This definition will allow a reasonable and prudent development and production of hydrocarbons from the Mesaverde group. It will allow for and encourage drilling 300' below the base of the Massive Sandstone member of the Point Lookout portion of the Mesaverde group to search for an elusive, seldom present oil accumulation which could not economically be tested if a definition which limited the interval to the base of the Massive Sandstone member of the Point Lookout were adopted.

This definition also protects the ownership of presently developed Mesaverde reservoirs from thieving by fractures, etc., to intervals above the Massive Cliff House sandstone of the Mesaverde group. We believe the gas which would be produced from the #64 (105A) well is actually gas from the currently producing Mesaverde reservoir of the Northeast Blanco Unit which has migrated 500' above the Cliff House sandstone, as enumerated.

The published literature on the Mesaverde group in the San Juan Basin supports the definition adopted by the Northeast Blanco Unit Advisory Committee.

In the "Guidebook of the San Juan Basin New Mexico and Colorado" published by the New Mexico Geological Society November, 1950, a paper by Caswell Silver "The Occurrence of Gas in Cretaceous Rocks of the San Juan

Basin New Mexico and Colorado" shows clearly that the Mesaverde group is not limited to the "Massive Sandstone Members" of the Point Lookout or Cliff House. A cross section Figure 1, shows that benches of the Point Lookout extend 200'-500' below the "Massive Sandstone Member". Benches also extend 600'-800' above the top of the "Massive Sandstone Member" of the Cliff House. In A.A.P.G. Bulletin Vol. 40, No. 9, September, 1956, a paper by Beaumont, Dane and Sears, of the U.S.G.S., entitled "Revised Nomenclature of Mesaverde Group, San Juan Basin on page 2159 states that "In view of the continuity of the massive sandstone unit through this area the name Cliff House sandstone of the Mesaverde group will replace Chacra sandstone member throughout the former extent of that unit."

In U.S.G.S. Professional Paper 400-B 1960, entitled "New Information on the Areal Extent of Some Upper Cretaceous Units in Northwestern New Mexico", C. H. Dane refers to "The Hosta sandstone, a lower tongue of the Point Lookout sandstone of the Mesaverde Group." This points out the problem with limiting the lower limits to the base of the thick easily identified thick "Massive Sandstone Member" of Point Lookout Sandstone.

A cross section reproduced from A.A.P.G. Bulletin, Vol. 44, No. 1, 1960, "Upper Cretaceous Stratigraphy, Rocky Mountains" by R. J. Weimer is shown below which illustrates the continuity of deposition and transgressive/regressive relationship.

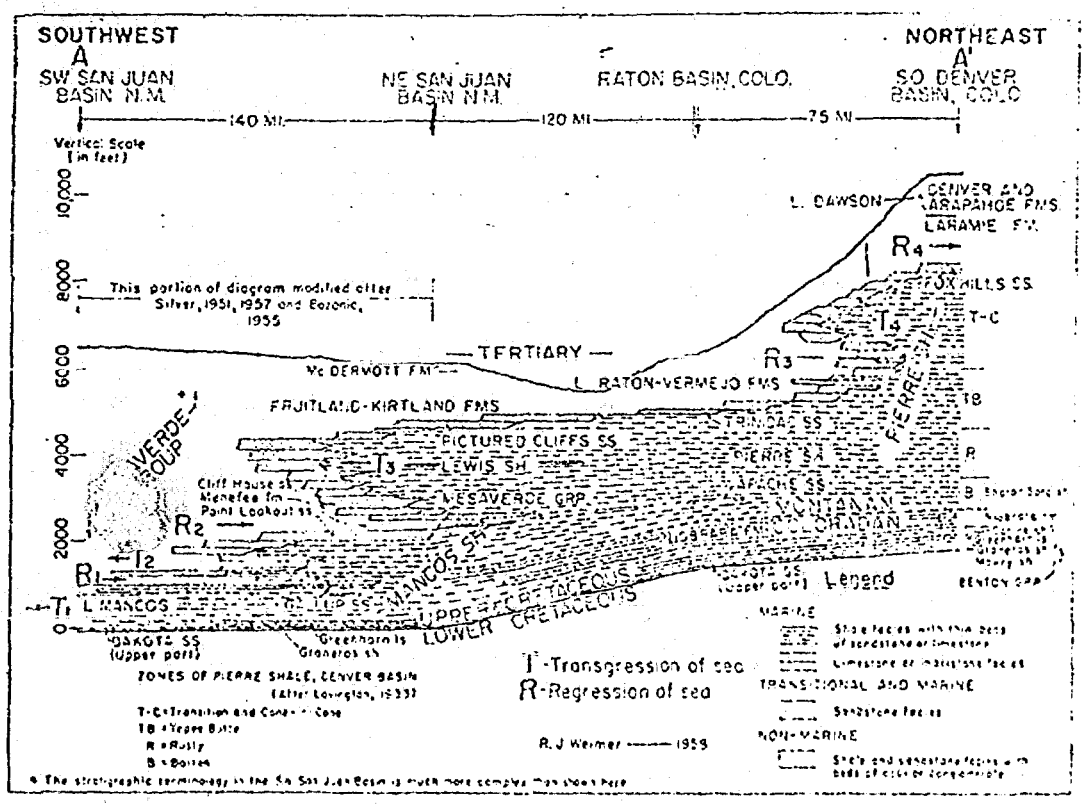


FIG. 2.—Diagrammatic restored section of Upper Cretaceous rocks extending from southwest San Juan Basin of New Mexico to south part of Denver Basin, Colorado. Tertiary rocks regionally cover erosional surface of Cretaceous strata. Diagram structurally distorts this surface.

In the 1961 A.A.P.G. Book, "Geometry of Sandstone Bodies", a paper by Charles T. Hollenshead and Roy L. Pritchard entitled "Geometry of Producing Mesaverde Sandstones, San Juan Basin" in describing the "Green Marker Horizon" on page 106 stated "It is believed to represent approximate contemporaneity and therefore can be used to delineate accurately major vertical steps in the regressive Point Lookout and transgressive Cliff House Strand lines." Various benches of the Cliff House and Point Lookout sandstone are shown and mapped in the paper. We believe that the interval in which gas was encountered in Well #64 (105A) is equivalent to Bench "B" of the Cliff House sandstone as defined and mapped in this paper.

In the "Geologic Atlas of the Rocky Mountain" published in 1972 by the Rocky Mountain Association of Geologists Figure 35, taken from work by R. J. Weimer, shows the Mesaverde group from the San Juan Basin to Wyoming. The vertical limits vary greatly from one area to another.

The Mesaverde group has been described in the literature as extending from the base of the regressive Point Lookout to the top of the Cliff House sandstones. Massive Sandstone Members occur in both the Point Lookout and the Cliff House intervals. Several sandstone benches are known and mapped below the base of the "Massive Sandstone Member" of the Point Lookout and above the "Massive Sandstone Member" of the Cliff House. This definition recognizes that the system of transgressive/regressive shorelines in the Mesaverde group in the San Juan Basin is a continuam having a vertical producing column in excess of 1,400'. The definition of Mesaverde Group as adopted by the Advisory Committee of the Northeast Blanco Unit I-Sec. 929 will allow orderly development and production of hydrocarbon reserves from the Mesaverde group in the area of the Unit.

12 HOUR

SOTCO

12 HOUR

OPERATOR: Black Wood + Nichols CO. LEASE NO: 105 A

LOCATION: NEBU STATE: NM

COUNTY: Rio ARRIBA T.D. OFF: 4262

DATE ON: 7-7-76 T.D. ON: 3862

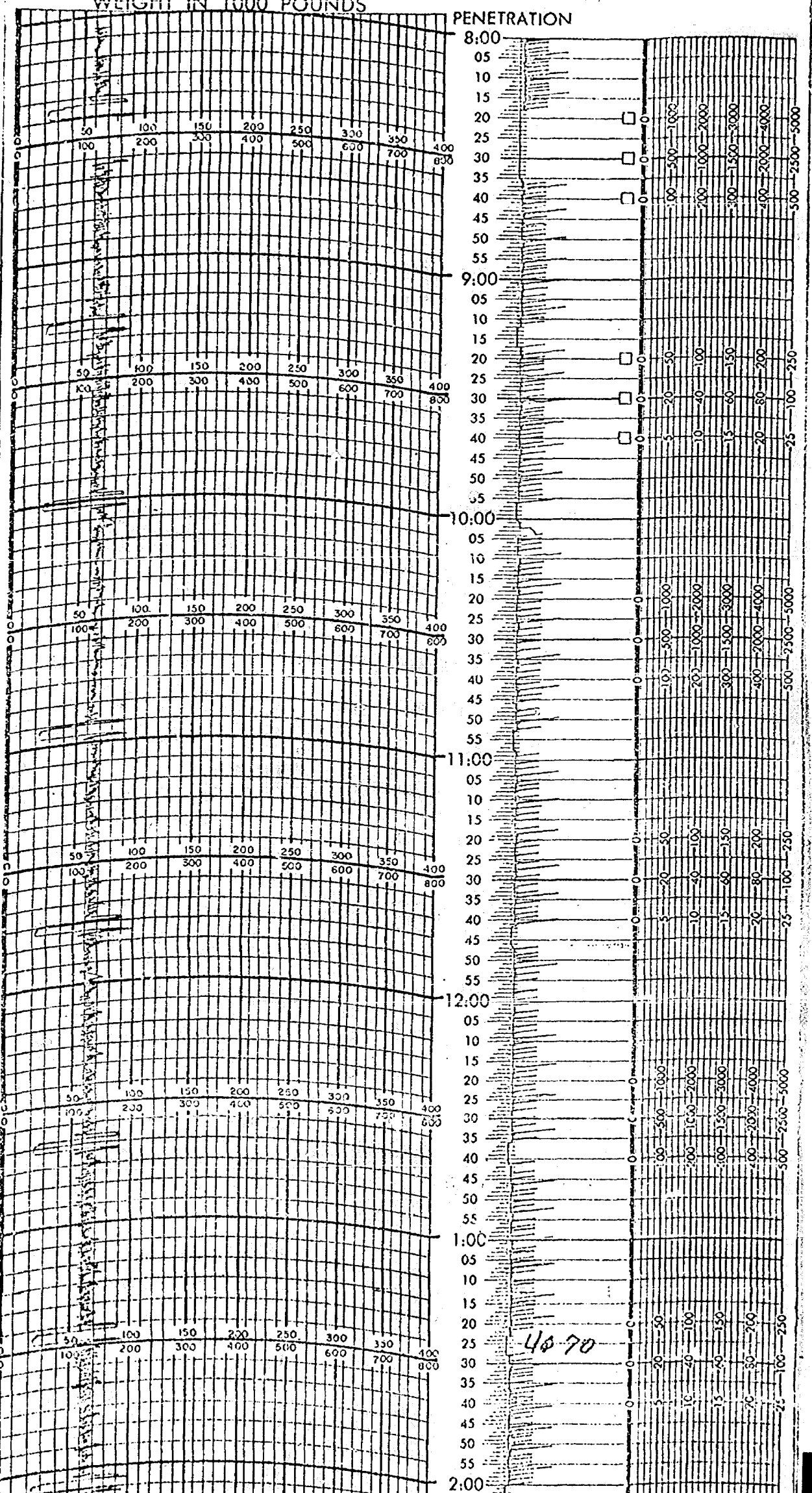
TIME ON: ☐ 8:00 A.M. ☐ 8:00 P.M. FT. DRLD.

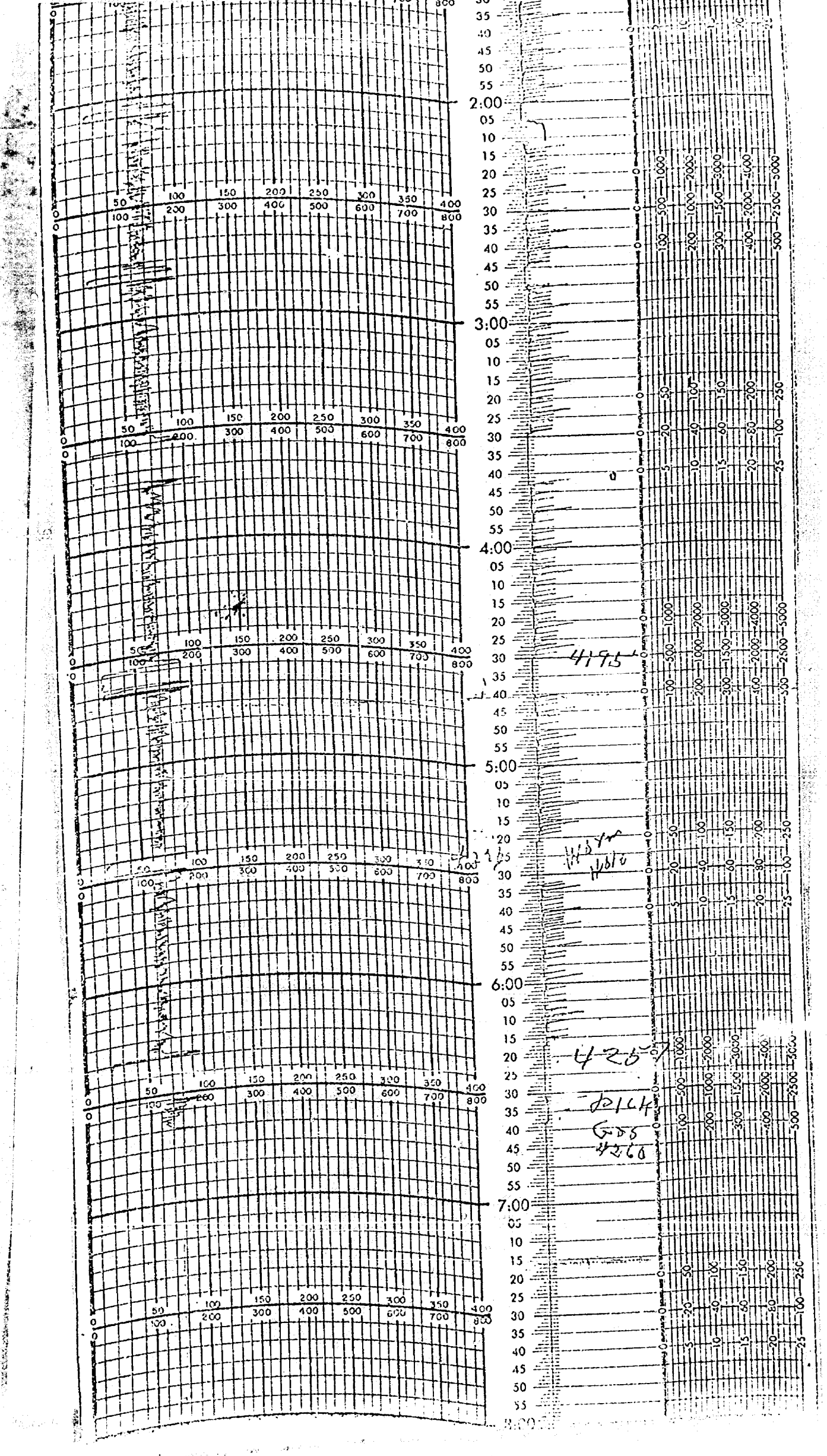
Bit #6

- ☐ FLUID PRESSURE
- ☐ PUMP STROKES
- ☐ TORQUE
- ☐ RPM
- ☐ % MUD FLOW
- ☐ % PIT LEVEL

WEIGHT IN 1000 POUNDS

PENETRATION




2:00
3:00
4:00
5:00
6:00
7:00
4195
4250
4260

KELLAHIN and FOX
ATTORNEYS AT LAW
500 DON GASPAR AVENUE
P. O. BOX 1769
SANTA FE, NEW MEXICO 87501

JASON W. KELLAHIN
ROBERT E. FOX
W. THOMAS KELLAHIN

TELEPHONE 982-4315
AREA CODE 505

January 13, 1978

Mr. Joe Ramey
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: NMOCC Case No. 5994
Order No. R-5531

Dear Mr. Ramey:

Please find enclosed for consideration an application on behalf of Tenneco and Continental Oil Companies for rehearing on the above referenced case.

Very truly yours,

W. Thomas Kellahin

CC: Mr. Millard Carr
Mr. Paul Thompson

WTK:kfm

Enclosure

HAND DELIVERED January 13, 1978

3. The Commission by its Order No. R-5459, entered on June 14, 1977, redefined the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico.

4. That such redefinition resulted in the inclusion of the "Chacra" equivalent fractured shales or siltstone zones within the vertical limits of said pool in approximately one-half of said pool North and East of a certain line traversing the pool, but excluded said zone in the remainder of the pool area.

5. That in said Order No. R-5459, the Commission found:

> "(17) That there are 4 wells north and east of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool." and
>
> "(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission."

6. That the four wells in question are as follows:

	OPERATOR	WELL
(a)	Tenneco Oil Company	Florence Well No. 29-A Unit F, Sec. 25, T30N, R8W
(b)	Blackwood & Nichols	Northeast Blanco Unit Well No. 64 Unit P, Sec. 24, T30N, R8W
(c)	Mesa Petroleum Company	Primo Well No. 1-A Unit D, Sec. 6, T31N, R10W
(d)	Lively Exploration	Chacra Well No. 7Y Unit E, Sec. 35, T30N, R8W

7. That Lively Exploration Company, in Oil Conservation Commission Case No. 5993 sought an exception for its Chacra Well No. 7Y and was granted said exception by Commission Order No. R-5531 dated September 1977, attached hereto as Exhibt A and incorporated by reference.

8. That Mesa Petroleum Company, in Oil Commission Case No. 6001 sought an exception for its Primo Well No. 1-A and was granted said exception by Commission Order No. R-5575 dated November 15, 1977, attached hereto as Exhibit B and incorporated by reference.

9. That Tenneco Oil Company, in Commission Case No. 5994 sought an exception from the vertical limits of said Blanco-Mesaverde Pool for said Florence Well No. 29-A and said Northeast Blanco Unit Well No. 64 at an examiner hearing held on July 20, 1977; said exception being denied by Commission Order No. R-5531.

10. Pursuant to said denial, Tenneco Oil Company, applied for and received a Hearing De Novo before the Commission on November 10, 1977 and by Commission Order No. R-5531-A entered on December 27, 1977 was again denied the requested exception.

GROUNDS FOR REHEARING:

1. That certain Commission findings are not supported by substantial evidence, to-wit:

(a) Finding No. (8)

> "That the evidence presented demonstrated that the initial pressures encountered in the "Chacra" equivalent producing zones in said two wells were lower than should be expected in an undrained reservoir in this area."

While Blackwood & Nichols, an operator appearing in opposition to the Tenneco application, presented some "pressure evidence testimony", the substantial evidence was to the contrary and demonstrated:

(1) That the pressures in the two subject wells are not lower than expected in an undrained reservoir in this area;

(2) That the two subject wells are completed in the Chacra zone at least 300 feet above the Cliff House marker and separated from the offset Mesaverde producing wells by at least 300 feet of impermeable shale and siltstone;

(3) That the two subject wells are producing from a source of supply separate from the offsetting Mesaverde wells.

(b) Finding No. (9)

"That the evidence presented demonstrated that such pressures do not vary in any significant degree from pressures encountered in other Blanco-Mesaverde Pool infill wells in the area.

The substantial evidence was to the contrary and demonstrated that:

(1) The available pressure data presented by Blackwood-Nichols was incomplete, unreliable in this case, and insufficient data from which to base a finding that there was communication between the two subject wells and the Blanco-Mesaverde Pool;

(2) The pressure information presented by Tenneco demonstrated that drainage was not taking place between the two subject wells and the offset Blanco Mesaverde pool wells.

(3) Pressures encountered in the 4 wells listed in Statement of Facts No. 5 are similar to each other.

(c) Finding No. (10)

"That the pressure evidence presented demonstrated that the "Chacra" equivalent zones in said two wells are in communication with other pay zones in said Blanco-Mesaverde Pool and are a part of the same common source of supply."

The substantial evidence was to the contrary and demonstrated:

(1) That for the Northeast Blanco Unit Well No. 64, one of the subject wells, the characteristics of said well observed during drilling were compatable with those characteristics of the Chacra well and not a Mesaverde well.

(2) That the Northeast Blanco Unit Well No. 64 is completed some 670 feet above the Cliff House Marker and the Florence 29-A well is completed some 300 feet above the Cliff House marker.

(3) That the offsetting Mesaverde wells are all completed below the Cliff House marker;

(4) That the two subject wells are separated from the Mesaverde producing wells by impermeable shale and siltstone interval which forms a

plastic and extremely effective seal between the Chacra and Mesaverde zones of production.

(5) That there is no substantial evidence of fracturing between the Chacra and Mesaverde zone whereby communication could be established.

(6) That the Mesaverde formation, before Order 5459, was defined as including the Cliffhouse, Menefee and Point Lookout zones, an interval 1000 to 1200 feet in thickness underlying the Cliffhouse marker, most of which interval between the named members consisting of dense impermeable rock.

(d) Finding No. (11)

"That said Florence Well No. 29A and said Northeast Blanco Unit Well No. 64 are currently classified as infill wells drilled on pre-existing Blanco-Mesaverde Pool proration units in accordance with applicable special pool rules and regulations.

The substantial evidence was to the contrary and demonstrated that:

(1) The Florence Well No. 29-A was projected as a Mesaverde infill well but encountered gas in the Chacra zone and was completed on August 16, 1975, as a well in that interval.

(2) The Northeast Blanco Unit Well No. 64 was intended to be drilled as a Blanco Mesaverde well but was completed on July 10, 1977 in the Chacra formation prior to reaching the Mesaverde formation as a result of encountering an extremely high gas flow typical of Chacra completions.

(3) That at the time both wells were completed the rules and regulations of the New Mexico Oil Conservation Commission would have classified and did so classify both No. 64 Well and the Lively well as Chacra wells;

(4) That subsequent to completion of both wells, Blackwood Nichols, the operator of the Blanco Mesaverde Unit, sought and obtained a redefinition of the vertical limits of the Blanco Mesaverde Pool to allow the Unit Well No. 64 to be reclassified from a Chacra well to a Mesaverde well as set forth in Commission Order No. R-5459.

(e) Finding No. (12)

"That if the subject application is approved said wells would no longer be classified as infill wells in the W/2 of Section 25, and the E/2 of Section 24, respectively, of T30N, R8W, of said Blanco-Mesaverde Pool."

The substantial evidence supports a conclusion opposite to Finding (12), above, and demonstrated that:

(1) The two subject wells were completed prior to the redefinition of the vertical limits for the Blanco Mesaverde Pool and exceptions being timely requested should not be classified as infill wells in the first place.

(f) Finding No. (13), (14) and (15)

"That the evidence presented demonstrated that if the application should be approved, the protestant, Blackwood and Nichols Company, would be required to drill another Blanco Mesaverde Pool infill well in the SE/4 of Section 24."

"That since said Northeast Blanco Unit Well No. 64 is already completed in the SE/4 of said Section 24 and is capable of producing gas from a zone that is a part of the common sources of supply being said Blanco-Mesaverde Pool, the additional infill well described in Finding No. (13) above is an unnecessary well."

"That the drilling of unnecessary wells constitutes economic waste."

The above Findings (13), (14) and (15) are predicated upon the early erroneous findings that the two subject wells are part of a common source of supply with the offsetting Mesaverde wells.

The substantial evidence is contrary to the conclusions made in Findings (13, (14) and (15) and demonstrated:

(1) There was no substantial evidence to show a "Chacra" completion would drain the Mesaverde which consists of three separate members;

(2) That physical waste would occur if the exception was not granted Tenneco;

(3) That there is no evidence showing the completion of Florence 29-A and N.E. Blanco #64 in the Chacra equivalent zone will adequately drain the Cliffhouse, Menefee and Point Lookout zones, a total interval 1500 to 1800 feet below the total depth of the wells and that failure to drain said intervals constitutes physical waste and violates applicants correlative rights. A well drilled to those intervals is necessary to prevent physical waste and to protect correlative rights.

(g) Finding Nos. (16), (17), (18), (19) and (20)

"That if the subject application is denied, the owners of interest under said Florence Well No. 29-A in the W/2 of said Section 25 and under said Northeast Blanco Unit Well No. 64 in the E/2 of said Section 24 will be able to recover their just and equitable share of the production from said Blanco-Mesaverde Pool underlying said half sections."

"That approval of the subject application would result in said Florence Well No. 29-A and said Northeast Blanco Unit Well No. 64 being spaced, prorated, and produced under rules differing from the special rules and regulations for wells producing from the same common source of supply being said Blanco-Mesaverde Pool."

"That such differences in spacing, prorationing, and producing with the same common source of supply could result in the violation of the correlative rights of the owners of interest in offsetting tracts."

That denial of the subject application will not result in violation of correlative rights but will instead serve to protect the same and will prevent the economic waste which would result from the drilling of unnecessary wells."

"That the subject application should be denied."

The substantial evidence is to the contrary and demonstrated that:

(1) That if the Blanco Mesaverde Unit Well No. 64 is classified as a Chacra Well and granted an exception from the new Blanco Mesaverde Pool Rules then 100% of the production will be owned by Tenneco and Continental;

(2) That if said well is not granted said exception then Blackwood & Nichols would be credited with 30% of the production from said well and Tenneco and Continental share would be reduced to 3%.

(3) That to redefine the vertical limits of the Blanco Mesaverde Pool and then not grant an exception from said pool rules for a previously existing Chacra well (Unit well No. 64) would violate the correlative rights of Tenneco and Continental by reducing their ownership of production from said well.

(4) That both subject wells are producing from a source of supply separate and distinct from the Blanco Mesaverde Pool.

2. That to grant Lively and Mesa exception for their wells and to deny Tenneco an exception on the subject wells based upon similar evidence is discriminatory, arbitrary and

capricious.

3. That Order No. R-5531 is arbitrary and capricious and is therefore unlawful, invalid and void.

4. That Order No. R-5531 is not supported by substantial evidence, and is therefore unlawful, invalid and void.

5. That the Commission has disregarded its own rules and regulations and exceeded its statutory authority by attempting to make findings concerning "economic waste" and ignoring physical waste which it is charged to prevent by the statutes.

WHEREFORE Applicants pray that the Commission grant a re-hearing in the above captioned cause, and that after re-hearing as provided by law, the Commission vacate and set aside its Order Nos. R-5531, R-5531-A, and enter its order approving an exception for the Florence Well No. 29-A and the Blanco Mesa-verde Unit Well No. 64 as originally requested by applicants.

Respectfully submitted:

TENNECO OIL COMPANY
CONTINENTAL OIL COMPANY

By _____

Kellahin & Fox
P. O. Box 1769
Santa Fe, New Mexico 87501

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5993
Order No. R-5512

THE APPLICATION OF LIVELY EXPLORATION
COMPANY FOR AN EXCEPTION TO THE
PROVISIONS OF ORDER NO. R-5459,
SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 20, 1977, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 30th day of August, 1977, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That by its Order No. R-5459, entered on June 14, 1977, the Commission redefined the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico.

(3) That such redefinition resulted in the inclusion of "Chacra" equivalent fractured shales or siltstone zones within the vertical limits of said pool in approximately one-half of said pool north and east of a certain line traversing the pool.

(4) That in said Order No. R-5459 the Commission found:

> "(17) That there are 4 wells north and east of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool." and
>
> "(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission."

Exhibit A

(5) That the applicant, Lively Exploration Company, is the operator of one of the wells referenced in Findings Nos. (17) and (18) of said Order No. R-5459, the well being its Chacra Well No. 7Y located in Unit E of Section 35, Township 30 North, Range 8 West, San Juan County, New Mexico.

(6) That the applicant seeks an exclusion from the vertical limits of said Blanco Mesaverde Pool for said Chacra Well No. 7Y as an exception to said Order No. R-5459.

(7) That said Chacra Well No. 7Y was completed as a gas producer on April 20, 1974, through "Chacra" perforations from 3,685 feet to 3,700 feet.

(8) That said Chacra Well No. 7Y first delivered gas into the pipeline on June 7, 1974.

(9) That on April 12, 1976, El Paso Natural Gas Company completed its Howell L Well No. 3A as an infill well in said Blanco-Mesaverde Pool through perforations from 4,564 feet to 5,435 feet on the same quarter section with said Chacra Well No. 7Y.

(10) That there are differences in ownership between said Chacra Well No. 7Y and said Howell L Well No. 3A.

(11) That the applicant only has operating rights to the interval from 3,650 feet to 3,750 feet of depth in the NW/4 of said Section 35.

(12) That there was no testimony in opposition to said application.

(13) That approval of said application will not result in waste nor violate correlative rights.

(14) That the application should be approved.

IT IS THEREFORE ORDERED:

(1) That effective August 1, 1977, the Lively Exploration Company Chacra Well No. 7Y located in Unit E of Section 35, Township 30 North, Range 8 West, NMPM, San Juan County, New Mexico, is hereby excluded from the Blanco-Mesaverde Pool as an exception to Commission Order No. R-5459.

PROVIDED HOWEVER, that such exclusion and exception shall apply only to such zone or zones producing in said well from within the interval from 3,650 feet to 3,750 feet of depth.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 6001
Order No. R-5575

APPLICATION OF MESA PETROLEUM CO.
FOR AN EXCEPTION TO ORDER NO. R-5459,
SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 28, 1977, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 15th day of November, 1977, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That by its Order No. R-5459, entered on June 14, 1977, the Commission redefined the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico.

(3) That such redefinition resulted in the inclusion of "Chacra" equivalent fractured shales or siltstone zones within the vertical limits of said pool in approximately one-half of said pool north and east of a certain line traversing the pool.

(4) That in said Order No. R-5459 the Commission found:

"(17) That there are 4 wells north and east of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool." and

"(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission."

Exhibit B

(5) That the applicant herein, Mesa Petroleum Company, is the operator of one of the wells referenced in Findings Nos. (17) and (18) of said Order No. R-5459, the well being its Primo Well No. 1-A located in Unit D of Section 6, Township 31 North, Range 10 West, San Juan County, New Mexico.

(6) That the applicant seeks an exclusion from the vertical limits of said Blanco Mesaverde Pool for said Primo Well No. 1-A as an exception to said Order No. R-5459.

(7) That said Primo Well No. 1-A was drilled in late 1975 and was completed as a triple completion in such a manner as to produce gas from the Pictured Cliffs formation through the casing-tubing annulus and gas from the Chacra formation and the Blanco-Mesaverde Gas Pool through parallel strings of tubing, with separation of the zones achieved by means of packers set at 2764 feet and 4050 feet.

(8) That the so-called "Chacra" zone in said well may be considered to include the productive stringers in the overall perforated interval from 3444 feet to 3990 feet.

(9) That said Primo Well No. 1-A first delivered gas into the pipeline on January 31, 1976.

(10) That the evidence presented at the hearing indicates that there is no communication between the Chacra zone in the subject well and the Mesaverde zone in said well and in nearby offsetting Mesaverde wells.

(11) That approval of the application for an exception to the vertical limits of the Blanco-Mesaverde Pool for the subject well will not cause waste nor impair correlative rights and should be granted.

IT IS THEREFORE ORDERED:

(1) That effective August 1, 1977, the Mesa Petroleum Company Primo Well No. 1-A located in Unit D of Section 6, Township 31 North, Range 10 West, NMPM, San Juan County, New Mexico, is hereby excluded from the Blanco-Mesaverde Pool as an exception to Commission Order No. R-5459.

PROVIDED HOWEVER, that such exclusion and exception shall apply only to such zone or zones producing in said well from within the interval from 3444 feet to 3990 feet of depth.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year herein-above designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

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

CASE No. 5994 DE NOVO
Order No. R-5531
Order No. R-5531-A

APPLICATION OF TENNECO OIL COMPANY FOR AN EXCEPTION TO THE PROVISIONS OF ORDER NO. R-5459, SAN JUAN COUNTY, NEW MEXICO

APPLICATION FOR REHEARING

COMES NOW TENNECO OIL COMPANY and CONTINENTAL OIL COMPANY, and pursuant to the Provisions of Section 65-3-22, New Mexico Statutes Annotated, 1953 Compilation, as amended, apply to the Oil Conservation Commission of New Mexico for rehearing of the above captioned Case No. 5994 and Orders Nos. R-5531 and 5531-A, issued pursuant thereto, and in support thereof would show the Commission:

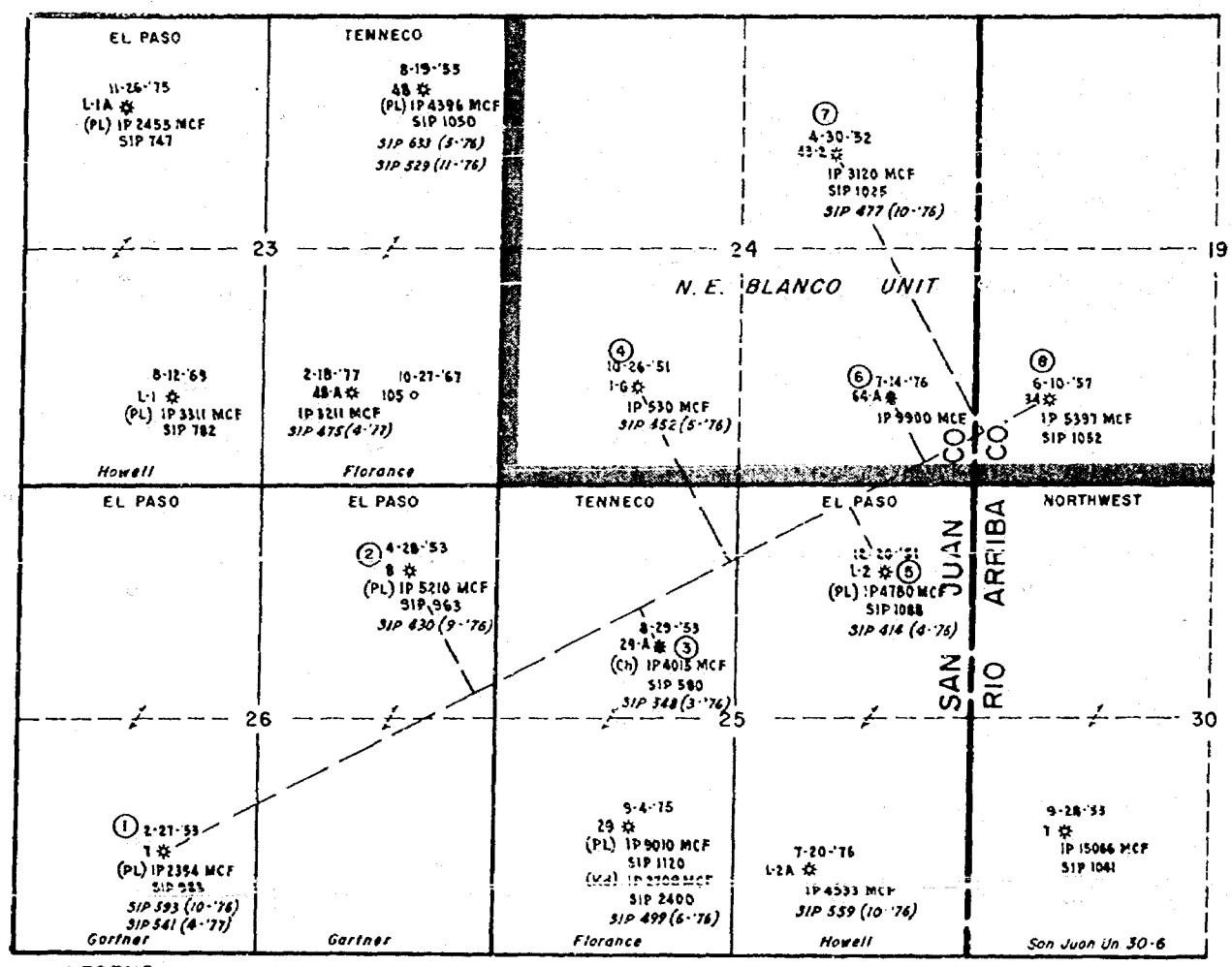
STATEMENT OF FACTS:

1. Tenneco Oil Company is the operator of the Florence Well No. 29-A located in Unit F of Section 25 and is an interest owner in the Blackwood and Nichols Northeast Blanco Unit and is the 100% owner of the lease (other than the Mesaverde producing interval) on which is located Well No. 64, Unit P of Section 24; both wells in Township 30 North, Range 8 West, San Juan County, New Mexico.

2. Continental Oil Company is an interest owner in both of the above named wells.

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
Blackwood & Nichols EXHIBIT NO. 1
CASE NO. 5994
Submitted by Blackwood
Hearing Date 7/20/77

R 8 W R 7 W



– LEGEND –

COMPLETION DATE
✲
INITIAL PRODUCTION
ORIGINAL SHUT-IN CASING PRESS.
RECENT SHUT-IN PRESS (DATE TAKEN)

TRACE OF CROSS SECTION

N. E. BLANCO UNIT BOUNDARY

BLACKWOOD & NICHOLS CO. LTD.

LOCATION & PRESSURE DATA MAP

SCALE
0 1
MILES

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
1000 RIO BRAZOS RD. - AZTEC
87410

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

BEFORE EXAMINER ROBERTS
OIL CONSERVATION COMMISSION
Blackwood & Nichols Exhibit No. 2
CASE NO. 5994
Submitted by Blackwood
Hearing Date 7/20/77

MEMORANDUM

5-25-77

TO: INTERESTED PARTIES
FROM: N. E. MAXWELL, JR., ENGINEER, DIST. #3
PROJECT: MESAVERDE INFILL WELL DATA, REPORT #4

Attached is a compilation of data on the Mesaverde infill completion program thru 5-20-77. Operator, well name and location are given. The initial shut-in is tabulated and CAOF where available. The average 1976 pressure of the four wells offset to each infill well has been tabulated and the latest shut-in pressure (P_c) and Q rate for the infill well is shown.

Test data for 53 wells, received since 2-22-77 show that these infill wells had an average initial shut-in pressure (P_c) of 777# while their offsets only had 461#. A difference of 316#.

Sixteen of the new completions or 30% were in Township 26 North, Range 3 West; Township 26 North, Range 7 West; Township 27 North, Range 3 West and Township 29 North, Range 6 West. The 16 infill wells had an average P_c of 978#. The remaining 37 new infill wells only had an average P_c of 689#.

503 infill locations have appeared on our scout letter. As of 5-20-77, 306 infill wells have been completed.

All infill wells have been numbered according to the dates they appeared on the scout letter.

#1 - #105 appeared during 1975
#106- #214 appeared during 1976
#215- #306 have been shown on the scout letters for 1977.

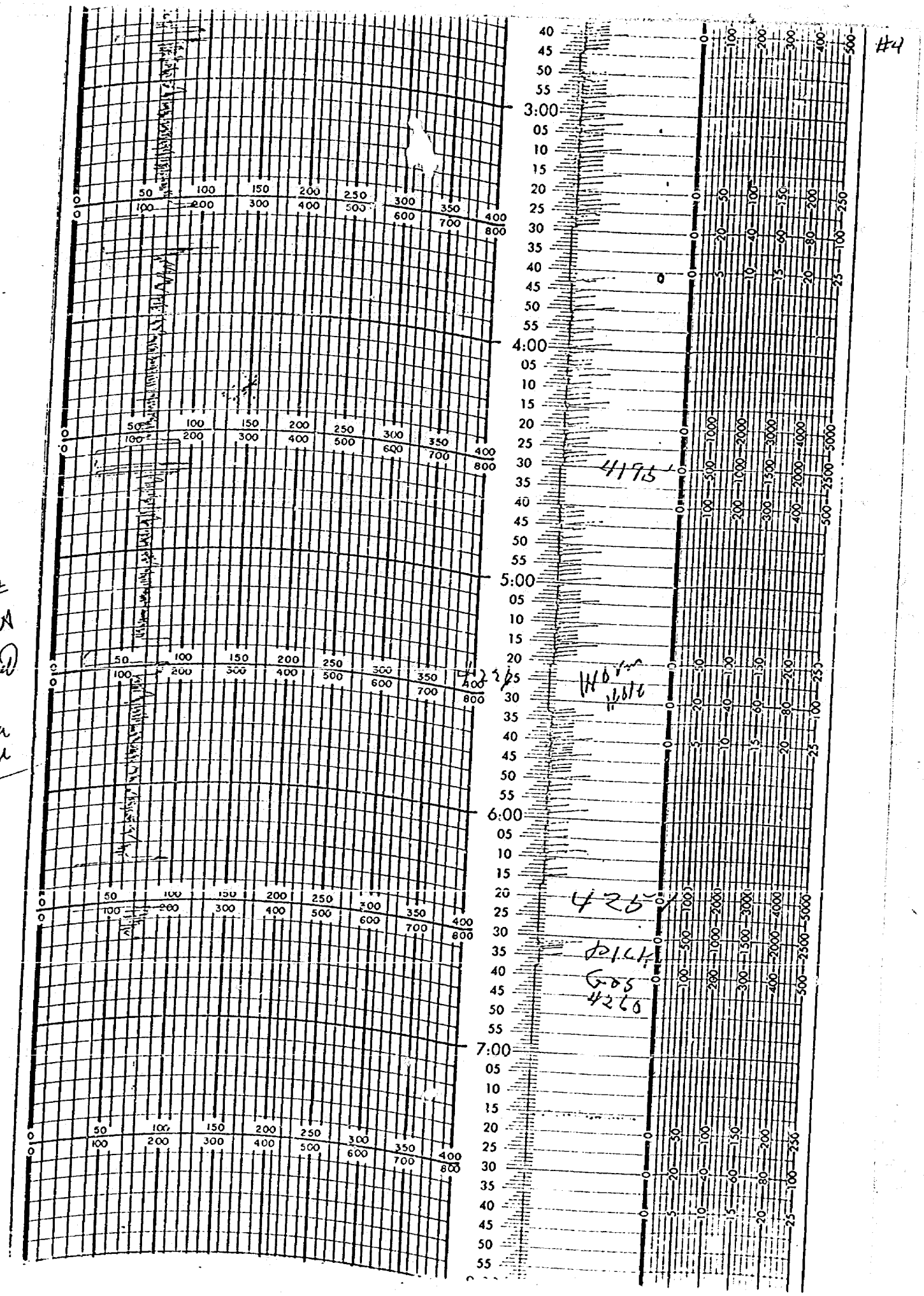
Our records show Mesa Petroleum Corporation, State Com #10-A located in O-29N-8W to be the first infill completion on 1-16-75, carried on scout letter 2-27-75.

MESAVERDE INFILL WELLS

COMPLETIONS	NO. OF WELLS	INITIAL AVE. SIP	LATEST TEST P_c	LATEST TEST Q	1976 OFFSET P_c
1975	105	678	510	905	474
1976	109	758	636	1114	479
1977 thru May	92	764	588*	838*	461
TOTAL	306	732	571	993	452

*1977 test data available on 20 infill wells completed in 1977 thru May 20.

#4



7-7-76

NEBU #
105 N

Encountered
gas in
Chocker
Formation

-116T (Rev. 5-62)

EL PASO NATURAL GAS COMPANY
SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐

GAS CHROMATOGRAPHY ANALYSIS ☑

Date of Run 10-5-76 Analysis No. VF29586

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 34 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.14		
Hydrogen Sulfide	.00		
Nitrogen	.32		
Methane	87.93		
Ethane	6.96		
Propane	2.73	.7493	
I-Butane	.55	.1794	
N-Butane	.72	.2263	
I-Pentane	.23	.0839	
N-Pentane	.16	.0578	
Hexane	.26	.1131	
TOTALS	100.00	1.410	

Run By Ross Checked By James

Remarks

R L Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakely
R. F. Lemon
J. E. Ashworth
Don Adams
File

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
Blackwood & Nichols EXHIBIT NO. 5
CASE NO. 5994
Submitted by Blackwood (Mobos)
Hearing Date 7/20/77

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1150

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F. .650
Calculated from % Composition

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AE&MS
Calculation By
NGPA
Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 19 T. 30 N. R. 7 W.
County
Rio Arriba
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

EL PASO NATURAL GAS COMPANY

SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29588

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit #64 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.92		
Hydrogen Sulfide	.00		
Nitrogen	.20		
Methane	89.95		
Ethane	5.60		
Propane	2.06	.5654	
I-Butane	.34	.1109	
N-Butane	.47	.1477	
I-Pentane	.13	.0474	
N-Pentane	.09	.0325	
Hexane	.24	.1044	
TOTALS	100.00	1.009	

Run By Ross Checked By Janes

Remarks

R L Ahrens
H. L. Holder
R. U. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1107

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .633

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AEGMS
Calculation By
NGPA

Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 24 T. 30 N. R. 8 W.
County
San Juan
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

EL PASO NATURAL GAS COMPANY

SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29687

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 105 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.87		
Hydrogen Sulfide	.00		
Nitrogen	.28		
Methane	88.33		
Ethane	6.31		
Propane	2.46	.6752	
I-Butane	.48	.1565	
N-Butane	.64	.2012	
I-Pentane	.20	.0730	
N-Pentane	.13	.0469	
Hexane	.30	.1305	
TOTALS	100.00	1.284	

Run By Ross Checked By James

Remarks

R. L. Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don Adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1131

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .649

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AE&MS

Calculation By
NGPA

Carbon Dioxide
NGPA

Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 24 T. 30 N. R. 8 W.

County
San Juan

State
New Mexico

Formation
Mesa Verde

Bomb Pressure

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

September 7, 1977

Re: CASE NO. 5994
ORDER NO. R-5531

Mr. Tom Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Applicant:

Tenneco Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC x

Other William F. Carr

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

JERRY APODACA
GOVERNOR

NICK FRANKLIN
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

C E R T I F I C A T I O N

TO WHOM IT MAY CONCERN:

I, JOE D. RAMEY, Director of the Oil Conservation Division of the New Mexico Energy & Minerals Department, do hereby certify that the attached is a true and correct copy of the Transcript from an Examiner Hearing held on July 20, 1977, in Case No. 5994.

JOE D. RAMEY, Director

July 20, 1978

STATE OF NEW MEXICO)
)ss.
COUNTY OF SANTA FE)

The foregoing instrument was acknowledged before me this 20th day of July, 1978.

Notary Public

My Commission Expires:

_____

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5994
Order No. R-5531

APPLICATION OF TENNECO OIL COMPANY
FOR AN EXCEPTION TO THE PROVISIONS
OF ORDER NO. R-5459, SAN JUAN COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 20, 1977, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 6th day of September, 1977, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That by its Order No. R-5459, entered on June 14, 1977, the Commission redefined the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico.

(3) That such redefinition resulted in the inclusion of "Chacra" equivalent fractured shales or siltstone zones within the vertical limits of said pool in approximately one-half of said pool North and East of a certain line traversing the pool.

(4) That in said Order No. R-5459 the Commission found:

> "(17) That there are 4 wells North and East of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool." and

"(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission."

(5) That the applicant, Tenneco Oil Company, is the operator of one and an interest owner in another of the wells referenced in Findings Nos. (17) and (18) of said Order No. R-5459, the wells being, respectively, its Florance Well No. 29A located in Unit F of Section 25 and the Blackwood and Nichols Northeast Blanco Unit Well No. 64 located in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico.

(6) That the applicant seeks an exclusion from the vertical limits of said Blanco-Mesaverde Pool for said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 as an exception to said Order No. R-5459.

(7) That an owner of interest offsetting said Florance Well No. 29A and in said Northeast Blanco Unit Well No. 64 appeared and presented testimony in opposition to the subject application.

(8) That the evidence presented demonstrated that the initial pressures encountered in the "Chacra" equivalent producing zones in said two wells were lower than should be expected in an undrained reservoir in this area.

(9) That the evidence presented demonstrated that such pressures do not vary in any significant degree from pressures encountered in other Blanco-Mesaverde Pool infill wells in the area.

(10) That the pressure evidence presented demonstrated that the "Chacra" equivalent zones in said two wells are in communication with other pay zones in said Blanco-Mesaverde Pool and are a part of the same common source of supply.

(11) That said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 are currently classified as infill wells drilled on pre-existing Blanco-Mesaverde Pool proration units in accordance with applicable special pool rules and regulations.

(12) That if the subject application is approved said wells would no longer be classified as infill wells in the W/2 of Section 25 and the E/2 of Section 24, respectively, of Township 30 North, Range 8 West, of said Blanco-Mesaverde Pool.

(13) That the evidence presented demonstrated that if the application should be approved, the protestant, Blackwood and Nichols Company, would be required to drill another Blanco-Mesaverde Pool infill well in the SE/4 of said Section 24.

(14) That since said Northeast Blanco Unit Well No. 64 is already completed in the SE/4 of said Section 24 and is capable of producing gas from a zone that is a part of the common source of supply being said Blanco-Mesaverde Pool, the additional infill well described in Finding No. (13) above is an unnecessary well.

(15) That the drilling of unnecessary wells constitutes economic waste.

(16) That if the subject application is denied, the owners of interest under said Florance Well No. 29A in the W/2 of said Section 25 and under said Northeast Blanco Unit Well No. 64 in the E/2 of said Section 24 will be able to recover their just and equitable share of the production from said Blanco-Mesaverde Pool underlying said half sections.

(17) That approval of the subject application would result in said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 being spaced, prorated, and produced under rules differing from the special rules and regulations for wells producing from the same common source of supply being said Blanco-Mesaverde Pool.

(18) That such differences in spacing, prorationing, and producing within the same common source of supply could result in the violation of the correlative rights of the owners of interest in offsetting tracts.

(19) That denial of the subject application will not result in violation of correlative rights but will instead serve to protect the same and will prevent the economic waste which would result from the drilling of unnecessary wells.

(20) That the subject application should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Tenneco Oil Company for an exception to Commission Order No. R-5459 to exclude its Florance Well No. 29A in Unit F of Section 25, and the Blackwood and Nichols Company Northeast Blanco Unit Well No. 64 in Unit P of Section 24, both in Township 30 North, Range 8 West, from the vertical limits of the Blanco-Mesaverde Pool, San Juan County, New Mexico, is hereby denied.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

DRAFT

RLS/jr

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5994

Order No. R- 5531

APPLICATION OF TENNECO OIL COMPANY
FOR AN EXCEPTION TO THE PROVISIONS
OF ORDER NO. R-5459, SAN JUAN COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 20, 19 77, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of September, 19 77, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That by its Order No. R-5459, entered on June 14, 1977, the Commission redefined the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico.

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE No. 6028

Order No. R- 5532

APPLICATION OF UNION OIL COMPANY OF CALIFORNIA
FOR APPROVAL OF THE LUZON
UNIT AGREEMENT, LEA, COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on September 14, 1967, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of September 1967, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Union Oil Company of California, seeks approval of the Luzon Unit Agreement covering 5117.43 acres, more or less, of Federal and Fee lands described as follows:

LEA COUNTY, NEW MEXICO
TOWNSHIP 24 South, RANGE 35 East, NMPM

Section 1: All
Sections 12, 13, and 14: All
Sections 23 and 24: All

Township 24 South, Range 36 East, NMPM

Section 6: W/2
Section 7: W/2
Section 18: W/2
Section 19: W/2

(3) That approval of the proposed unit agreement should promote the prevention of waste and the protection of correlative rights within the unit area.

IT IS THEREFORE ORDERED:

(1) That the Luzon Unit Agreement is hereby approved.

(2) That the plan contained in said unit agreement for the development and operation of the unit area is hereby approved in principle as a proper conservation measure; provided, however, that notwithstanding any of the provisions contained in said unit agreement, this approval shall not be considered as waiving or relinquishing, in any manner, any right, duty, or obligation which is now, or may hereafter be, vested in the Commission to supervise and control operations for the exploration and development of any lands committed to the unit and production of oil or gas therefrom.

(3) That the unit operator shall file with the Commission an executed original or executed counterpart of the unit agreement within 30 days after the effective date thereof; that in the event of subsequent joinder by any party or expansion or contraction of the unit area, the unit operator shall file with the Commission within 30 days thereafter counterparts of the unit agreement reflecting the subscription of those interests having joined or ratified.

(4) That this order shall become effective upon the approval of said unit agreement by the ~~Commissioner of Public Lands for the State of New Mexico and the~~ Director of the United States Geological Survey; that this order shall terminate ipso facto upon the termination of said unit agreement; and that the last unit operator shall notify the Commission immediately in writing of such termination.

(5) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

(3) That such redefinition resulted in the inclusion of "Chacra" equivalent fractured shales or siltstone zones within the vertical limits of said pool in approximately one-half of said pool North and East of a certain line traversing the pool.

(4) That in said Order No. R-5459 the Commission found:

"(17) That there are 4 wells North and East of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool." and

"(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission."

(5) That the applicant, Tenneco Oil Company, is the operator of one and an interest owner in another of the wells referenced in Findings Nos. (17) and (18) of said Order No. R-5459, the wells being, respectively, its Florance Well No. 29A located in Unit F of Section 25 and the Blackwood and Nichols Northeast Blanco Unit Well No. 64 located in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico.

(6) That the applicant seeks an exclusion from the vertical limits of said Blanco-Mesaverde Pool for said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 as an exception to said Order No. R-5459.

(7) That an owner of interest offsetting said Florance Well No. 29A and in said Northeast Blanco Unit Well No. 64 appeared and presented testimony in opposition to the subject application.

(8) That the evidence presented demonstrated that the initial pressures encountered in the "Chacra" equivalent producing zones in said two wells were lower than should be expected in an undrained reservoir in this area.

(9) That the evidence presented demonstrated that such pressures do not vary in any significant degree from pressures encountered in other Blanco-Mesaverde Pool infill wells in the area.

(10) That the pressure evidence presented demonstrated that the "Chacra" equivalent zones in said two wells are in communication with other pay zones in said Blanco-Mesaverde Pool and are a part of the same common source of supply.

(11) That said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 are currently classified as infill wells drilled on pre-existing Blanco-Mesaverde Pool proration units in accordance with applicable special pool rules and regulations.

(12) That if the subject application is approved said wells would no longer be classified as infill wells in the W/2 of Section 25 and the E/2 of Section 24, respectively, of Township 30 North, Range 8 West, of said Blanco-Mesaverde Pool.

(13) That the evidence presented demonstrated that if the application should be approved, the protestant, Blackwood and Nichols Company, would be required to drill another Blanco-Mesaverde Pool infill well in the SE/4 of said Section 24.

(14) That since said Northeast Blanco Unit Well No. 64 is already completed in the SE/4 of said Section 24 and is capable of producing gas from a zone that is a part of the common source of supply being said Blanco-Mesaverde Pool, the additional infill well described in Finding No. (13) above is an unnecessary well..

(15) That the drilling of unnecessary wells constitutes economic waste.

(16) That if the subject application is denied, the owners of interest under said Florance Well No. 29A in the W/2 of said Section 25 and under said Northeast Blanco Unit Well No. 64 in the E/2 of said Section 24 will be able to recover their just and equitable share of the production from said Blanco-Mesaverde Pool underlying said half sections.

(17) That approval of the subject application would result in said Florance Well No. 29A and said Northeast Blanco Unit Well No. 64 being spaced, prorated, and produced under rules differing from the special rules and regulations for wells producing from the same common source of supply being said Blanco-Mesaverde Pool.

(18) That such differences in spacing, prorationing, and producing within the same common source of supply could result in the violation of the correlative rights of the owners of interest in offsetting tracts, ~~in said Blanco-Mesaverde Pool.~~

(19) That denial of the subject application will not result in violation of correlative rights but will instead serve to protect the same and will prevent the economic waste which would result from the drilling of unnecessary wells.

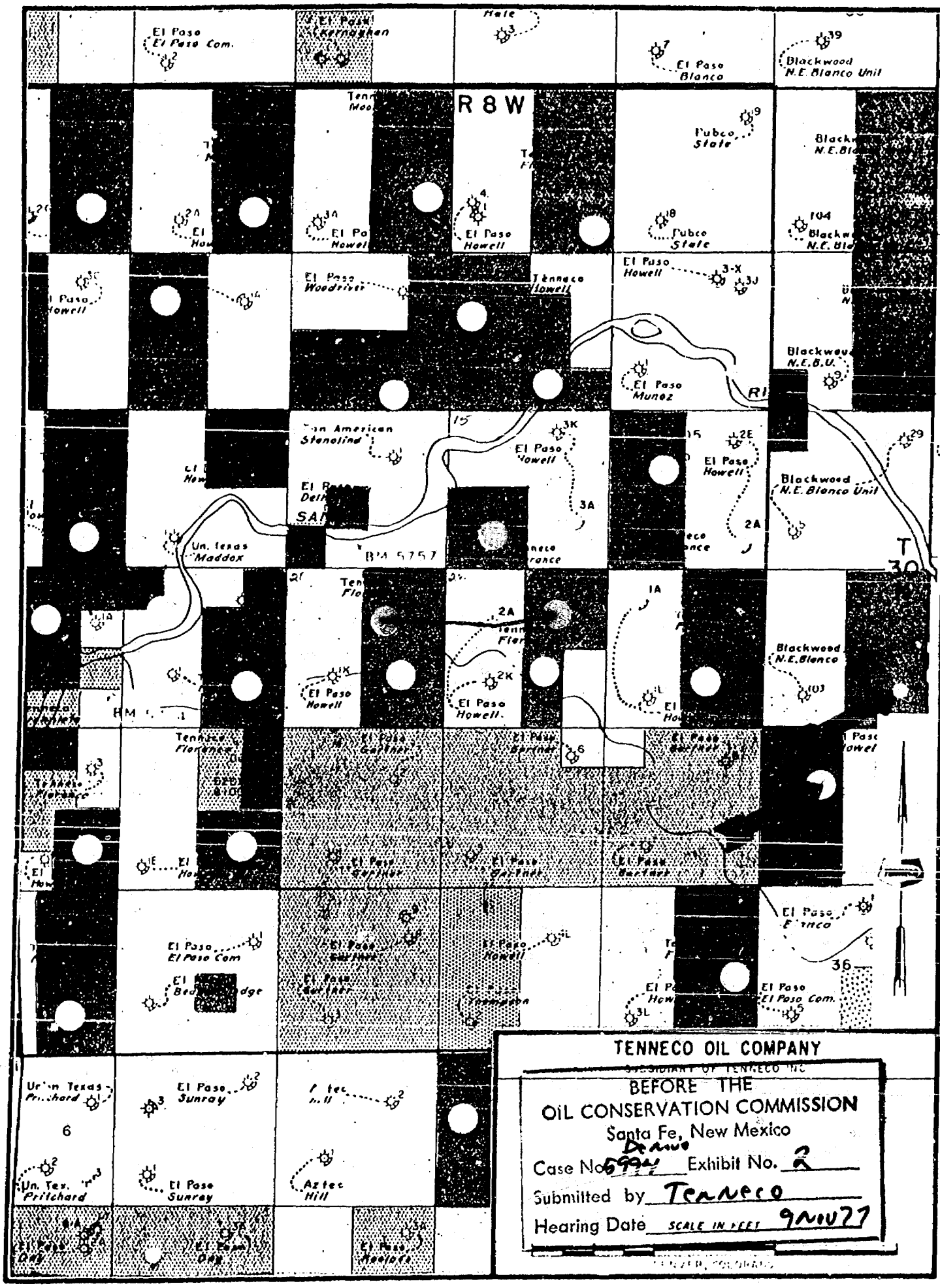
(20) That the subject application should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Tenneco Oil Company for an exception to Commission Order No. R-5459 to exclude its Florance Well No. 29A in Unit F of Section 25, and the Blackwood and Nichols Company Northeast Blanco Unit Well No. 64 in Unit P of Section 24, both in Township 30 North, Range 8 West, from the vertical limits of the Blanco-Mesaverde Pool, San Juan County, New Mexico, is hereby denied.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year herein-above designated.



TENNECO OIL COMPANY
SUBSIDIARY OF TENNECO INC.

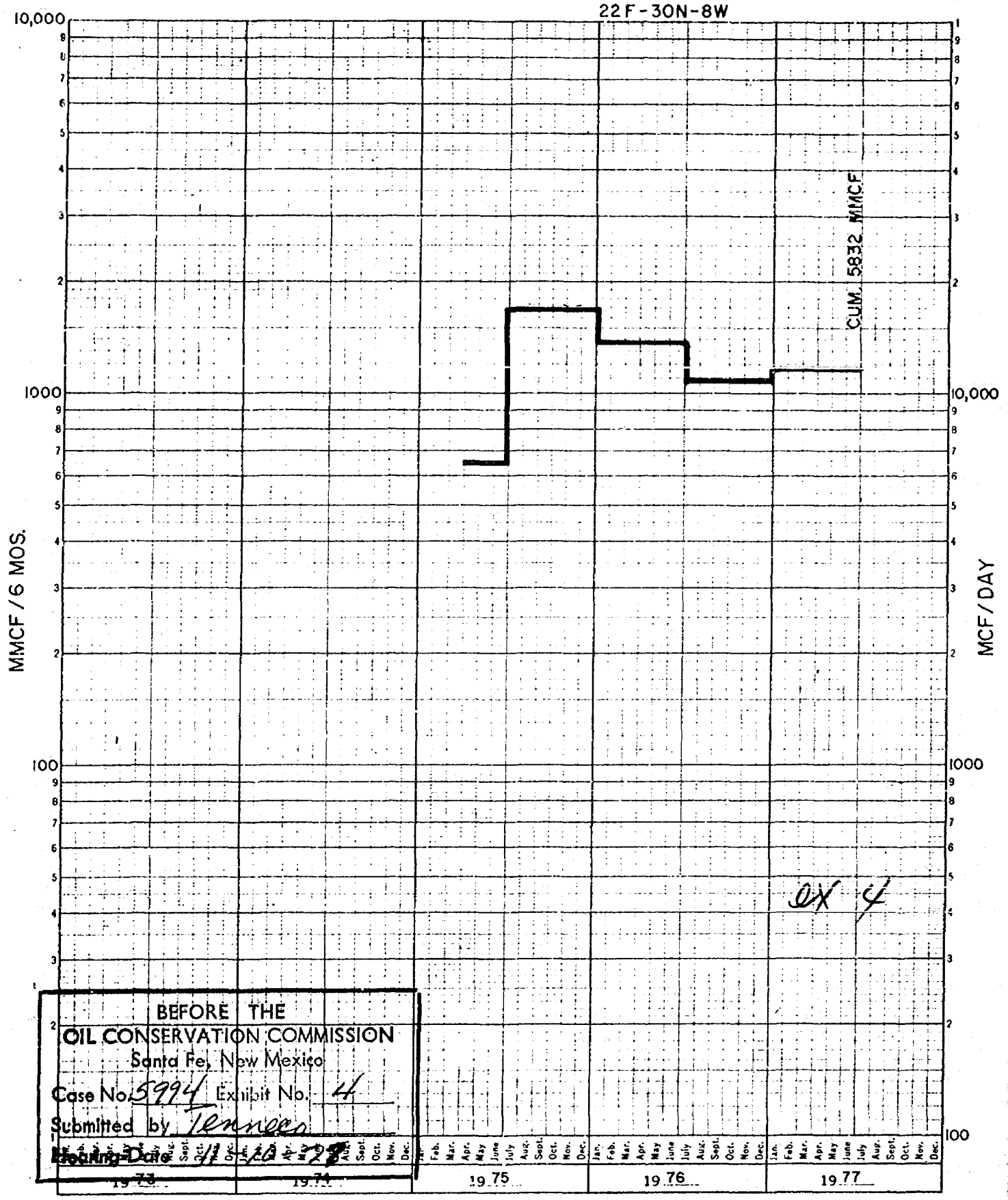
BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

Case No. Denovo 6994 Exhibit No. 2

Submitted by Tenneco

Hearing Date SCALE IN FEET 9 Nov 77

EL PASO NATURAL GAS COMP.
HOWELL K 2-A
22 F - 30N - 8W



BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 4
Submitted by Pennzoil
Hearing Date 9/12 10 & 11

4275-83
CAOF 168.7 MMCFD
SITP 730, NATURAL

FLORENCE 40
21G-30N-8W
SUG

MMCF / 6 MOS.

MCF / DAY

10,000
1000
100

CUM 3012 MMCF

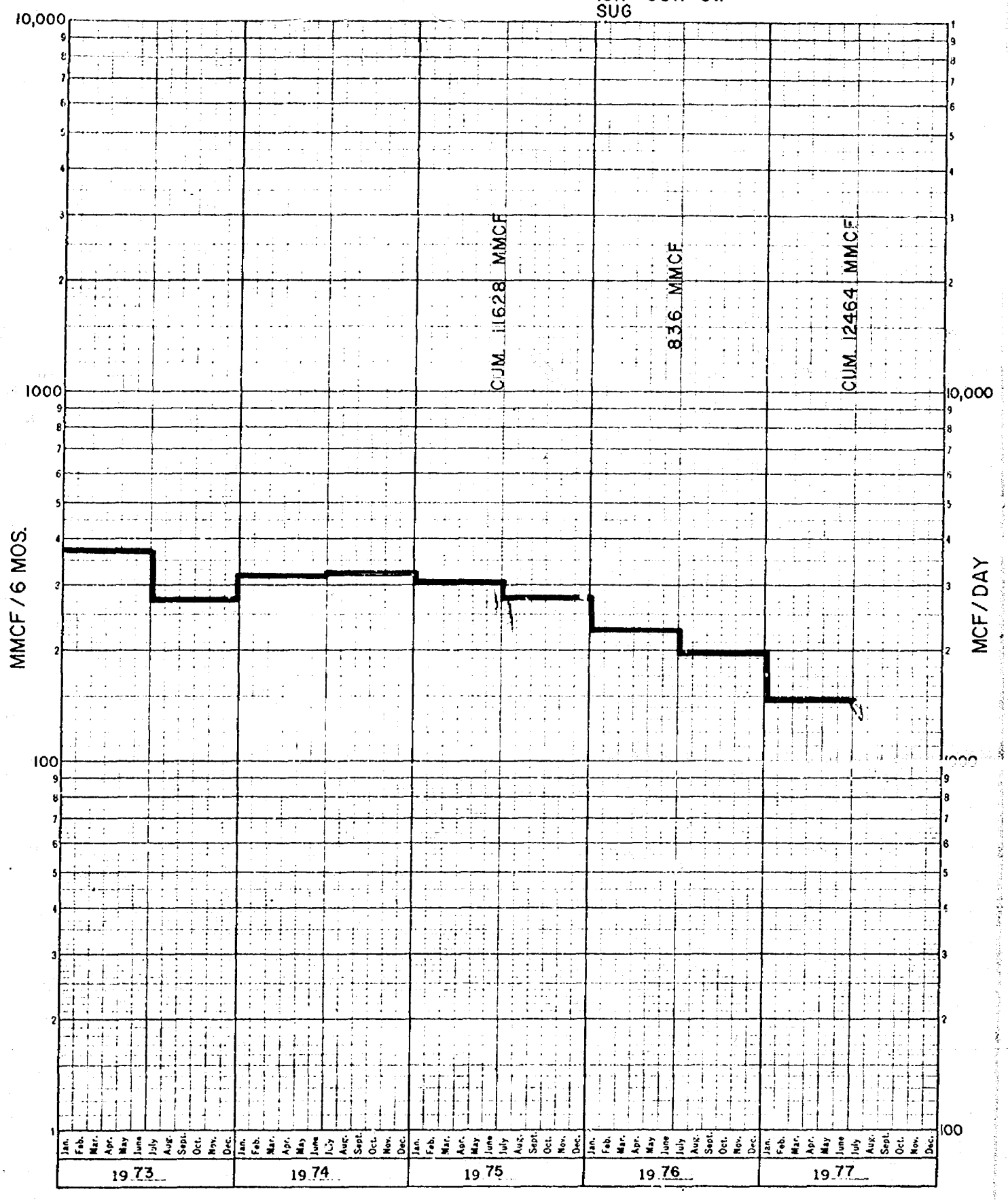
28i MMCF

CUM 3293 MMCF

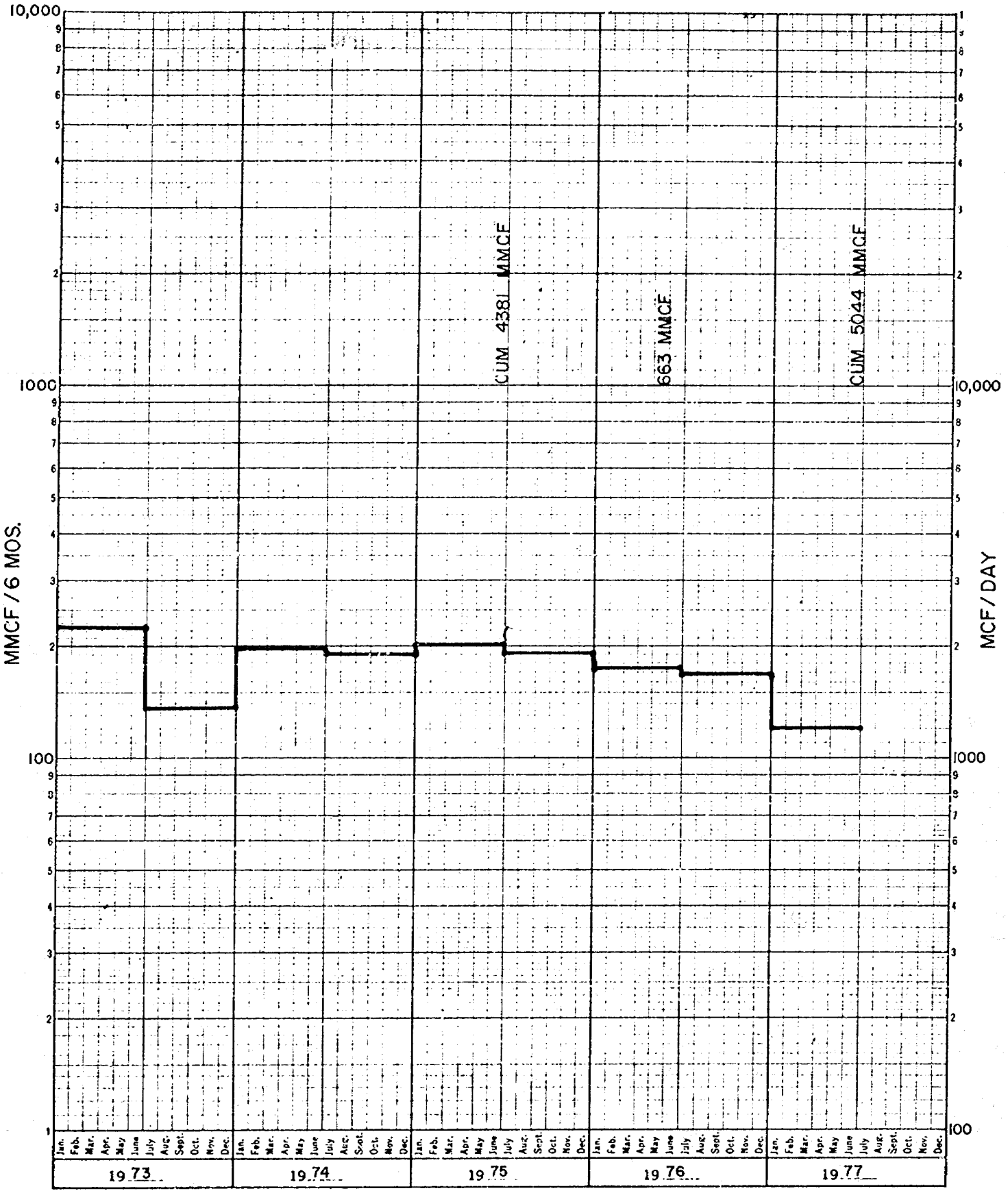
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 73 | 19 74 | 19 75 | 19 76 | 19 77

TENNECO OIL COMPANY
FLORANCE 32
15N - 30N - 8W
SUG

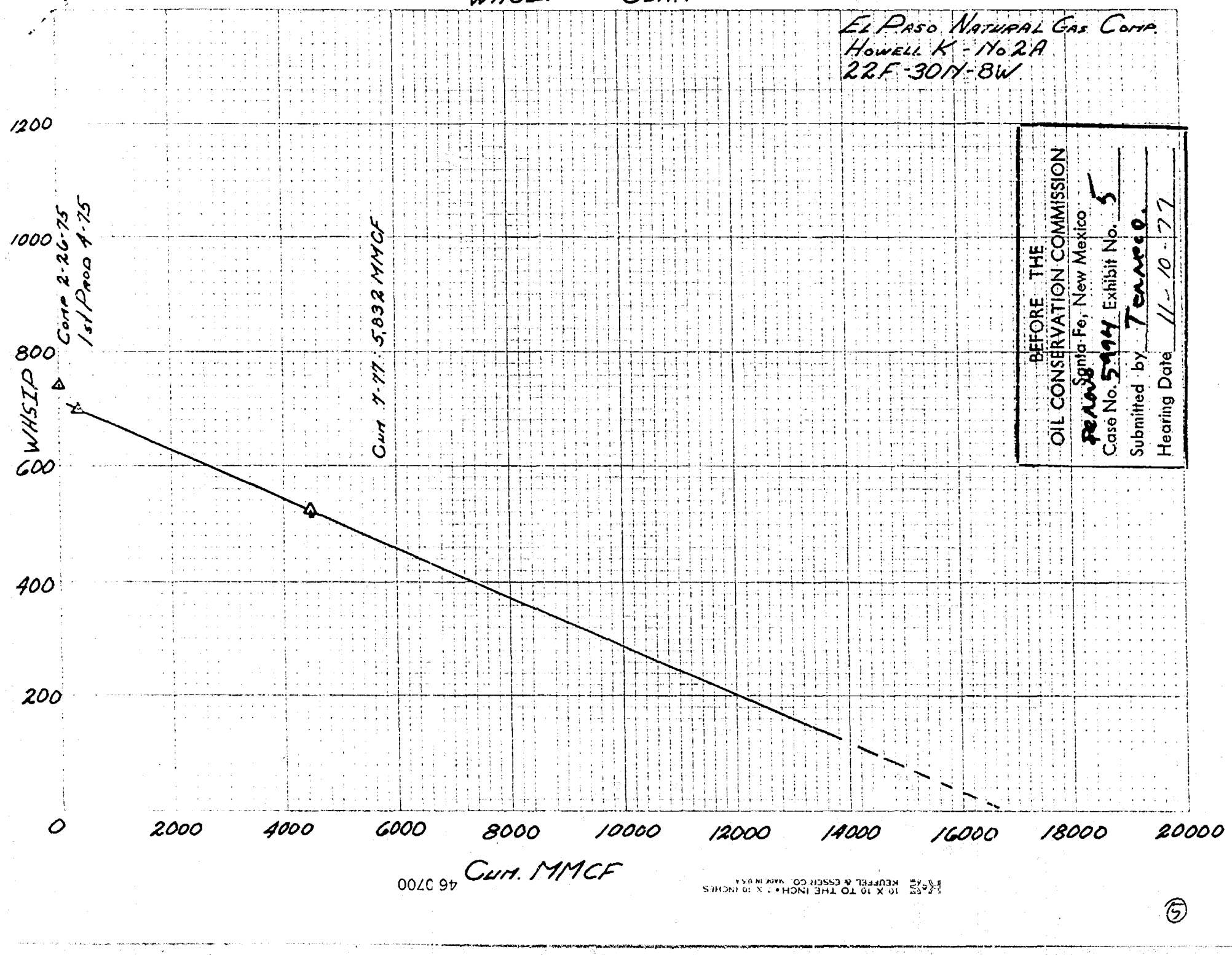


TENNECO OIL COMPANY
FLORANCE 45
22G-30N-8W



WHSIP vs Cum. Prod.

El Paso Natural Gas Comp.
Howell K - No 2A
22F-30N-8W



BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 5
Submitted by Tenneco
Hearing Date 11-10-77

46 0700
KEUFFEL & ESSER CO. MADE IN U.S.A.
10 X 10 TO THE INCH • 7 X 10 INCHES

(5)

WHSIP vs Cum. Prod.

Tenneco Oil Co.
Florance 40
21G-30N-8W

Conn 5-18-65

Cum 7-72: 3012 MMCF (281 MMCF)
Cum 7-77: 3293 MMCF

W X-Section well

1200
1000
800
600
400
200
0

1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

46 0700

KEUFFEL & ESSER CO. MADE IN U.S.A. 10 X 10 TO THE INCH • 7 X 10 INCHES

WHSIP vs Cum. Prod.

Tennеco Oil Co
Florance 32
15N-30N-8W

Comp. 10-6-55
1st Prod. 1-56

N. offset to X-section

Cum 7-55 11628 MMCF (836 MM)
Cum 7-57 12464 MMCF

WHSIP

1000
800
600
400
200
0

2000 4000 6000 8000 10000 12000 14000 16000 18000 20000

Cum MMCF

46 0700

KE 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

WHSIP vs Cum. Prod.

Tenneco Oil Co.
Florance 45
22G-30N-8W

Comp 2-15-54
1st Prod 2-54

Cum 1-75 : 498 MMCF (663 MMCF)

Cum 7-77 : 3044 MMCF

E well on X-section

WHSIP

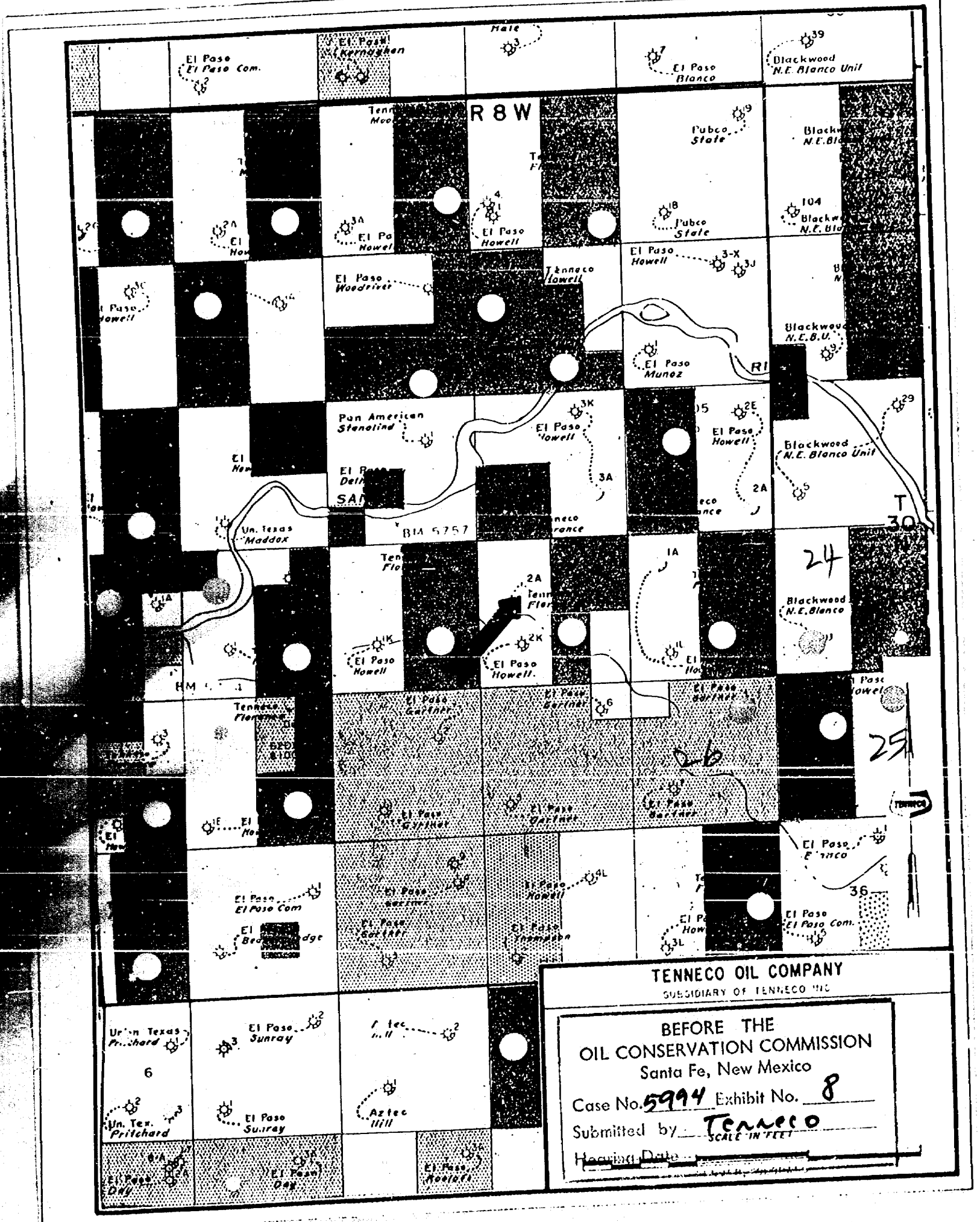
1200
1000
800
600
400
200
0

1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

Cum MMCF

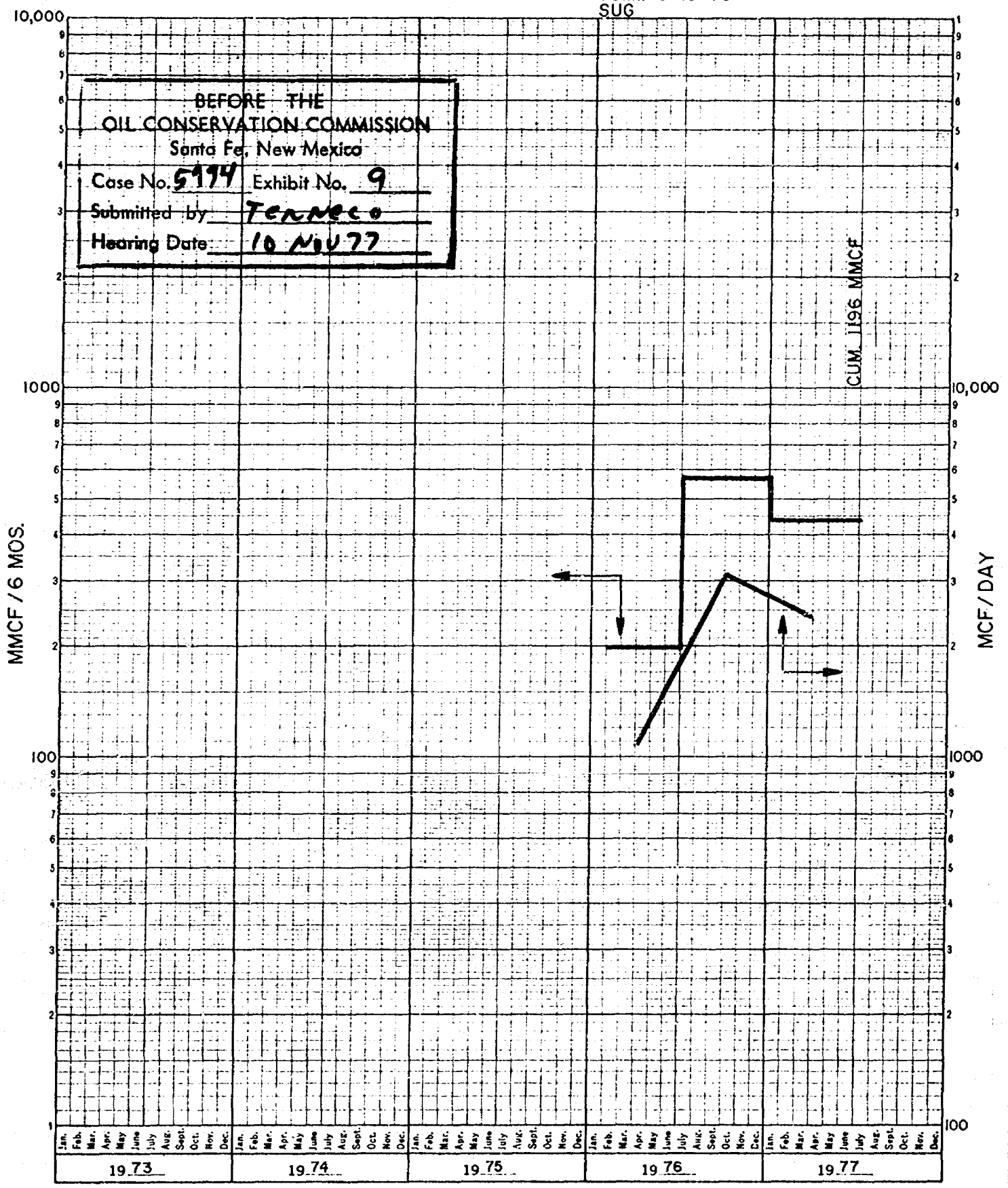
46 0700

KEUFFEL & ESSER CO. MADE IN U.S.A.
10 X 10 TO THE INCH • 5 X 10 INCHES

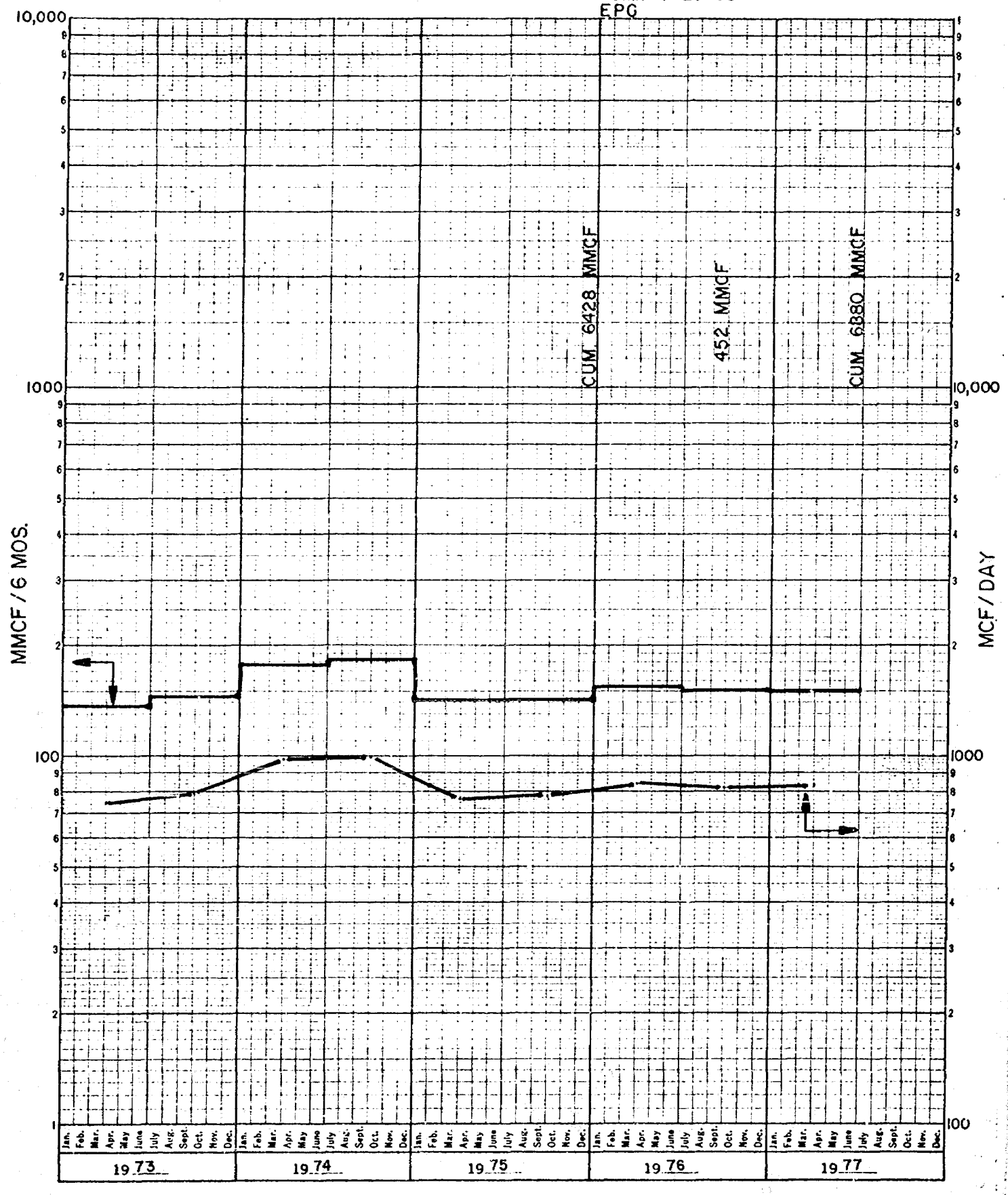

R 8 W
El Paso
El Paso Com.
El Paso
Kerrochan
Hale
El Paso
Blanco
Blackwood
N.E. Blanco Unit
Pubco
State
El Paso
Howell
El Paso
Woodriver
Tennaco
Howell
El Paso
Howell
Blackwood
N.E.B.U.
El Paso
Munoz
Pan American
Stenolind
El Paso
Howell
Blackwood
N.E. Blanco Unit
Un. Texas
Maddox
BIA 5757
Blackwood
N.E. Blanco
El Paso
Howell
El Paso
Howell.
Tennaco
Florence
El Paso
Gartner
El Paso
Gartner
El Paso
Gartner
El Paso
Howell
El Paso
Howell
El Paso
Com
El Paso
Com.
Un. Texas
Pritchard
El Paso
Sunray
Aztec
El Paso
Sunray
El Paso
Day
El Paso
Day
El Paso
Acreloft
T 30
24
25
36
TENNECO OIL COMPANY
SUBSIDIARY OF TENNECO INC
BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 8
Submitted by Tenneco
Hearing Date
SCALE IN FEET

TENNECO OIL CO.
FLORANCE NO. 29-A
25F - 30N - 8W
COMP. 8-16-75
SUG

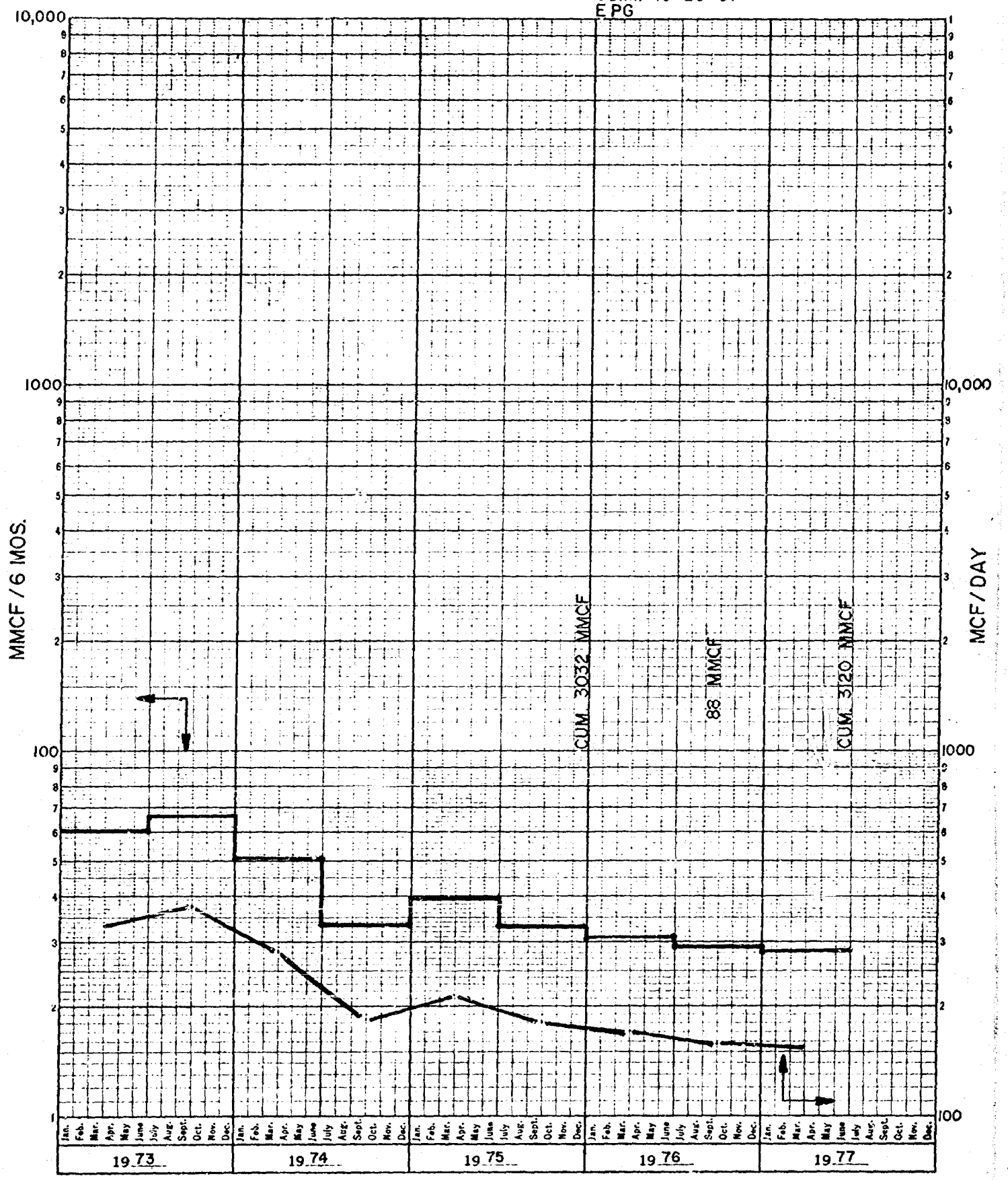
BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 9
Submitted by Tenneco
Hearing Date 10 Nov 77



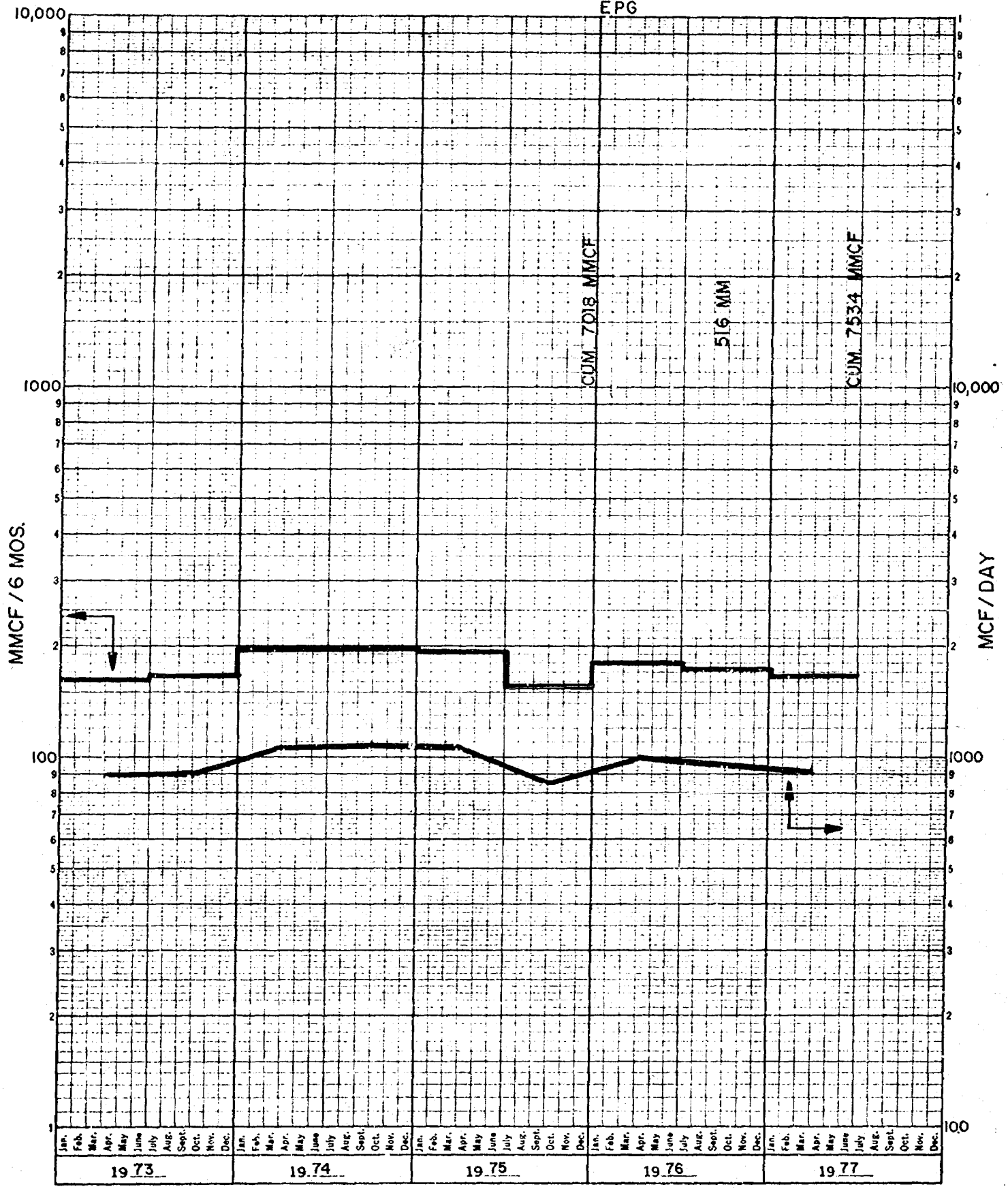
EL PASO NATURAL GAS COMP.
GARTNER NO. 8
26A-30N-8W
COMP. 4-28-53
EPG



BLACKWOOD & NICHOLS CO.
NE BLANCO UNIT NO. 103
24N-30N-8W
COMP. 10-20-51
E.P.G.



EL PASO NATURAL GAS COMP.
HOWELL 2L
25A-30N-8W
COMP. 12-11-51
EPG

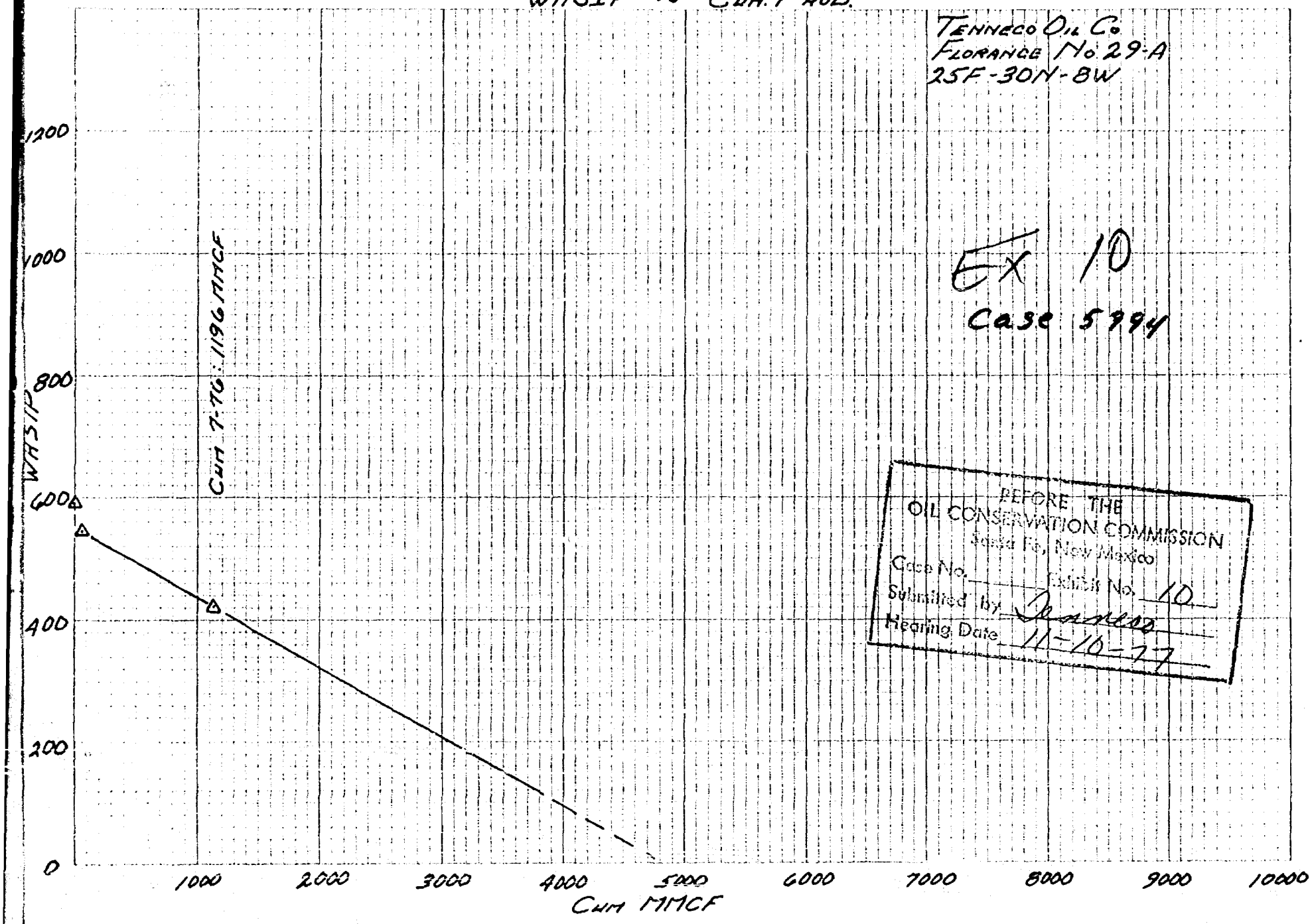


WHSIP vs Cum. Prod.

Tennneco Oil Co.
Florance No 29-A
25F-30N-8W

EX 10
Case 5994

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. _____ Exhibit No. 10
Submitted by Tenneco
Hearing Date 11-10-77



46 0700

KEUFFEL & ESSER CO. MADE IN U.S.A.
10 X 10 TO THE INCH • 7 X 10 INCHES

WHSIP vs Cum. Prod.

El Paso Natural Gas Co.
Gartner No. 8
26-A-30N-8W

Cum 1-1-62: 6428 MMCF (452 MMCF)
Cum 7-1-72: 6880 MMCF

1200
1000
800
600
400
200

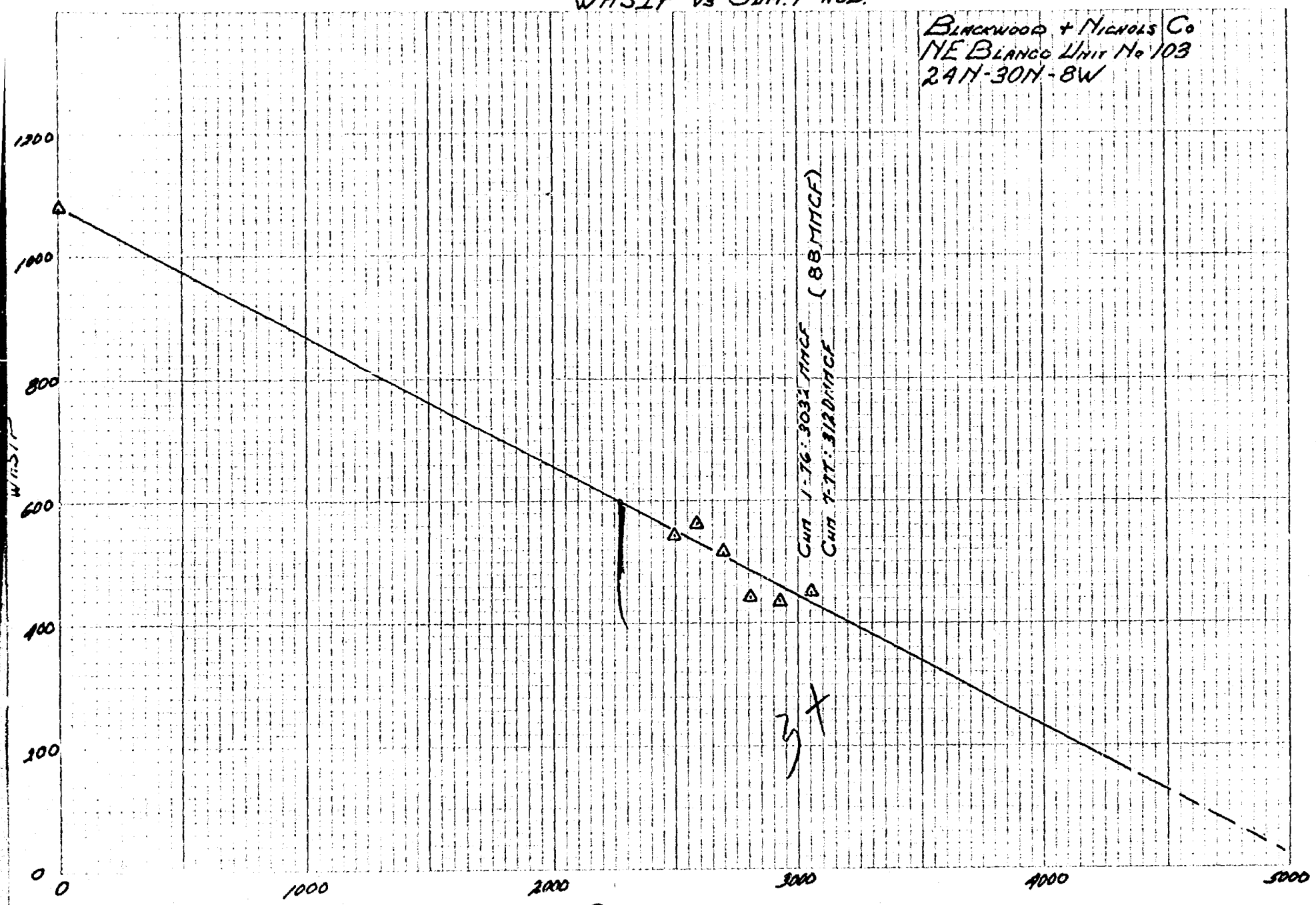
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

5+

KEUFFEL & ESSER CO. MADE IN U.S.A. 10 X 10 TO THE INCH • 7 X 10 INCHES
46 0700

WHSIP vs Cum. Prod.

Blackwood + Nichols Co
NE Blanco Unit No 103
24N-30N-8W



46 0700

KEUFFEL & ESSER CO. MADE IN U.S.A.
10 X 10 TO THE INCH • 7 X 10 INCHES

WHSIP vs Cum. Prod.

El Paso Natural Gas Co
Howell 2L
25A-30N-8W

Cum 1-16: 701 MMCF
Cum 1-11: 1534 MMCF
(SIGMA)

WHSIP

1200
1000
800
600
400
200
0

1000 2000 3000 4000 5000 6000 7000 8000 9000 1000

Cum MMCF

46 0700
KEUFFEL & ESSER CO. MADE IN U.S.A.
10 X 10 TO THE INCH 5 X 10 CYCLES

Form 9-330
(Rev. 5-63)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☒ DRY ☐ Other

b. TYPE OF COMPLETION: NEW WELL ☒ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ Other

2. NAME OF OPERATOR: Tenneco Oil Company

3. ADDRESS OF OPERATOR: 1860 Lincoln, Suite 1200 Lincoln Twr. Bldg, Denver, CO 80203

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*
At surface: 1850 FNL & 1850 FWL
At top prod. interval reported below
At total depth

5. LEASE DESIGNATION AND SERIAL NO.: SF- 078385

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Florance

9. WELL NO.: 29A

10. FIELD AND POOL, OR WILDCAT: Blanco Mesa Verde

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec. 25, T30N, R8W

14. PERMIT NO.: DATE ISSUED:

12. COUNTY OR PARISH: San Juan

13. STATE: New Mexico

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (Ready to prod.)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
8/5/75	8/14/75	8/16/75	6263 GL	

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
TD 4503'	Open Hole		→	Yes	No

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: 4410 - 4503 (Lewis)

25. WAS DIRECTIONAL SURVEY MADE: Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN: Comp Density log, Induction Electric log

27. WAS WELL CORED: No

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
9 5/8"	36# K-55	2041	12¼"	200 sx. CIB + 3% CaCl	None
7"	20# K-55	3458	8 3/4"	475 sx.	None
4½"	10.5# K-55	4410'	6 1/8"	200 sx.	None

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
	4378	

31. PERFORATION RECORD (Interval, size and number): Open Hole Completion

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
None	

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)	WELL STATUS (Producing or shut-in)
8/20/75	Flowing	Shut In

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
8/20/75	24	3/4		NA	501	NA	

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
230	Packer		NA	3724	NA	

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.): To be sold

TEST WITNESSED BY:

35. LIST OF ATTACHMENTS:

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records.

SIGNED: [signature] TITLE: Production Clerk DATE: 8/21/1975

*(See Instructions and Spaces for Additional Data on Reverse Side)

Tenneco Oil Company
A Tenneco Company

EX 12

1200 Lincoln Tower Bldg.
1860 Lincoln Street
Denver, Colorado 80203
(303) 292-9920

September 20, 1976

Blackwood & Nichols Company
2013 First National Center
Oklahoma City, Oklahoma 73102

Re: Northeast Blanco Unit #64 Well
SE/4SE/4 Section 24, T30N-R8W
Northeast Blanco Unit I - Sec. No.929
San Juan & Rio Arriba Counties, New Mexico
PA-4224

Gentlemen:

Last spring Tenneco approved your AFE for the drilling of the Northeast Blanco Unit #105-A, intended as an infill Mesaverde development well with costs to be borne by the Mesaverde participating working interest owners. We have had no completion report on this well from Blackwood & Nichols, but Oil Conservation Commission records show that the well was completed July 10, 1976 as a producer from the Chacra formation and redesignated the Unit #64 well. A 3240 MCF/day IP and a 9900 MCF open flow were reported.

Article 11 of the Unit Agreement requires that the Operator, upon completion of a commercial unit well, submit for approval by the Geological Survey, the Commissioner of Public Lands and the NMOCC a schedule of lands constituting the initial participating area for such well. The "commercial" test of the Unit Agreement is certainly met since from the reported initial potential and open flow there can be no question but that the well is "productive of unitized substances in paying quantities". However, although the well has been completed for over two months and should be ready for pipeline connection, Blackwood & Nichols has taken no steps toward filing for an initial Chacra participating area.

Tenneco Oil Company and Continental Oil Company are equal owners of all the working interest in unit tract 2-B, the E/2 of Section 24, T-30-N, R-8-W, and it appears the initial Chacra participating area should comprise the SE/4 of Section 24, within such tract 2-B. Article 11 of the Unit Agreement requires that a new participating area be effective with first production and the Unit and Unit Operating Agreements clearly recognize the ownership of newly established production by the working interest owners in the new participating area. Accordingly Tenneco hereby notifies you that any sales of production from the Northeast Blanco Unit #64 well must be made for the sole benefit of the working interest owners in the initial Chacra participating area, regardless of when formally established.

Tenneco Oil Company hereby makes demand that Blackwood & Nichols immediately submit a schedule of unitized lands within the initial Chacra participating

EXHIBIT NO. 2

Blackwood & Nichols Company September 20, 1976

area for approval by the necessary authorities. We also request that you furnish Tenneco with an itemization of drilling and completion costs for the #64 well. Since the well was actually drilled outside any existing participating area we believe it proper to bill the Chacra participating owners for this expense directly and not through adjustments with the Mesaverde participating owners simply because of their approval of the original AFE.

Please advise immediately if you do not concur with our conclusions.

Yours very truly,

TENNECO OIL COMPANY

By: D. D. Myers
D. D. Myers
Division Production Manager.

DDM/MFC:mt

cc: Continental Oil Company
U.S. Geological Survey
New Mexico Oil Conservation Commission

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
DPNo
Case No. 5994 Exhibit No. 12
Submitted by Tenneco
Hearing Date

Ex 13

COMPARATIVE GAS SAMPLES

SAMPLE NO.	CO_2	N_2	METHANE	ETHANE	PROPANE	I-BUTANE	N-BUTANE	I-PENTANE	N-PENTANE
1	.82	.24	84.62	8.45	3.60	.67	.86	.31	.21
2	.67	.24	82.29	9.86	4.37	.67	1.05	.33	.26
3	.45	.38	79.32	11.81	5.41	.82	1.18	.24	.19
4	.02	2.17	82.38	9.06	3.95	.42	1.16	.21	.25
5	.02	2.33	82.75	8.78	3.90	.42	1.09	.23	.23
6	.13	1.97	86.61	5.56	3.12	.81	.81	.34	.20
7	.16	1.43	86.84	5.96	3.09	.76	.81	.31	.20
8	.16	1.72	81.80	7.69	5.04	1.23	1.28	.44	.26
9	.36	.39	90.02	5.70	2.06	.37	.42	.19	.11
10	-	2.72	80.69	9.64	3.83	.37	1.16	.45	.29
11	2.49	1.75	86.12	5.62	2.73	.32	.67	.17	.13
12	.51	1.86	86.29	6.32	3.11	.40	.87	.28	.20
13	2.43	1.90	85.12	5.98	3.05	.37	.79	.20	.16
14	.80	1.86	86.82	5.99	2.75	.45	.86	.25	.17
15	2.49	1.75	86.12	5.62	2.73	.32	.67	.17	.13
16	.16	1.80	84.62	8.00	3.64	.35	.90	.15	.24
17	.14	.32	87.93	6.96	2.73	.55	.72	.23	.16
18	.87	.28	88.33	6.31	2.46	.48	.64	.20	.13
19	.92	.20	89.95	5.60	2.06	.34	.47	.13	.09
20	.25	.75	95.76	2.55	.63	.06	-	-	-
21	.38	.38	90.47	5.65	2.00	.35	.39	.14	.08
22	.53	.47	81.65	11.62	3.44	.67	.81	.33	.24
23	.21	.39	84.34	9.02	3.74	.57	.87	.24	.17
24	.16	.43	83.98	9.21	3.83	.60	.94	.27	.20

KEY TO GAS SAMPLES

SAMPLE NO.	POOL	WELL
1	Blanco-MV	Tenneco-San Juan 28-7 #72
2	Blanco-MV	Tenneco-San Juan 28-7 #46
3	Blanco-MV	Tenneco-Florance No. 3-C
4	Blinebry	Amoco-Owen B #4
5	Tubb	Amoco-Southland Roy. A #4
6	Ballard-PC	Conoco-AXI Apache "P" #1
7	Ballard-PC	Conoco-AXI Apache "F" #4
8	Ballard-PC	Conoco-AXI Apache "D" #2
9	Bell Lake, So. Morrow	Conoco-BLU #15 (3-6-75)
10	Blinebry	Conoco-Lockhard B-14-A Separator
11	Eumont	Conoco-Britt-Skaggs Com #2
12	Jalmat	Conoco-Vaughan B-1 #6
13	Eumont	Conoco-SEMU Eumont #91
14	Jalmat	Conoco-Jack A-20 #10
15	Eumont	Conoco-SEMU Eumont #92
16	Blinebry	Conoco-Warren Unit #8
17	Blanco-MV	B&N-NE Blanco Unit #34
18	Blanco-MV	B&N-NE Blanco Unit #105
19	Chacra	B&N-NE Blanco Unit #64
20	Bell Lake, So. Morrow	Conoco-BLU #5
21	Bell Lake, So. Morrow	Conoco-BLU #15 (2-21-75)
22	Basin-Dakota	Conoco-NE Haynes #7
23	Otero-Chacra	Conoco-AXI Apache J #21
24	Otero-Chacra	Conoco-AXI Apache J #15

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5821 DE NOVO
Order No. R-5339-B

APPLICATION OF BLACKWOOD AND
NICHOLS CO., LTD., FOR A HEARING
DE NOVO, SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 23, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 14th day of June, 1977, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That in Case 5821, by its Order No. R-5339, Paragraph (i), the Commission created and defined the Navajo City-Chacra Pool in Township 30 North, Range 8 West, NMPM, San Juan County, New Mexico.

(3) That in Case 5821, by its Order No. R-5339, Paragraph (j), the Commission created and defined the Animas-Chacra Pool in Township 31 North, Range 10 West, San Juan County, New Mexico.

(4) That said Commission Order No. R-5339 was entered on the 25th day of January, 1977, with an effective date of February 1, 1977.

(5) That on February 10, 1977, the applicant, Blackwood & Nichols Co., Ltd., submitted an application for a hearing de novo on said Paragraphs (i) and (j) of said Case 5821 and Order No. R-5339.

(6) That said application was timely filed and was set for hearing.

(7) That at the time of creation of said Navajo City-Chacra Pool and said Animas-Chacra Pool a Commission-called committee was studying pool limits around and within the area of said pools.

(8) That said Navajo City-Chacra Pool and said Animas-Chacra Pool should not have been created or defined until after said Committee had concluded its study and made its recommendations to the Commission.

(9) That said Paragraphs (i) and (j) of said Commission Order No. R-5339, as amended, should be deleted.

(10) That such deletion will not violate correlative rights nor result in waste.

IT IS THEREFORE ORDERED:

(1) That effective January 23, 1977, Paragraphs (i) and (j) of Commission Order No. R-5339, as amended, are hereby deleted.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO ON ITS OWN MOTION TO CONSIDER REDEFINITION OF THE VERTICAL LIMITS OF THE BLANCO-MESAVERDE POOL, RIO ARRIBA AND SAN JUAN COUNTIES, NEW MEXICO.

CASE NO. 5893
Order No. R-5459

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 23, 1977, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 14th day of June, 1977, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the Blanco-Mesaverde Pool, located in Rio Arriba and San Juan Counties, New Mexico, was created by Commission Order No. 799, dated February 25, 1949.

(3) That Section (2) of said Order No. 799 defined the vertical limits of said Blanco-Mesaverde Pool as the "4200-5100 feet productive horizon where the productive sands are contained between the top of the Cliff House Sand and the base of the Point Lookout Sand of the Mesaverde."

(4) That said definition of the vertical limits of said Blanco-Mesaverde Pool has proved inadequate for the following reasons:

A. The definition does not take into account variations in surface elevations and formation dip which can cause the "Mesaverde" productive horizon to occur above or below the 4200 feet to 5100 feet interval.

B. The definition does not adequately take into account the transgressive, regressive, gradational nature of formations composing the "Mesaverde" productive horizon.

(5) That because of the imprecise nature of said vertical limits definition, Mesaverde productive zones above or below the 4200 foot to 5100 foot interval in any particular well might not be completed in said well.

(6) That failure to complete such zones could result in waste of gas in the ground.

(7) That the current infill drilling program within said Blanco-Mesaverde Pool has increased the need for a more precise definition of the vertical limits of such pool.

(8) That in December, 1976, the Commission appointed an industry-government study committee to examine the problem and report its findings to the Commission.

(9) That, based on geological evidence, the study committee recommended that the vertical limits of said Blanco-Mesaverde Pool be redefined as that interval from the Huerfanito bentonite marker to a point 500 feet below the top Point Lookout formation.

(10) That the Induction-Electrical Log of the El Paso Natural Gas Company Johnston State Well No. 1 located in Unit A of Section 32, Township 26 North, Range 6 West, NMPM, Rio Arriba County, New Mexico, should be the type log for said Blanco-Mesaverde Pool.

(11) That the Huerfanito bentonite marker and the top of the Point Lookout formation are found at depths of 3255 feet and 5100 feet, respectively, on said type log.

(12) That such definition should permit maximum development of productive horizons within the Blanco-Mesaverde Pool, thereby preventing waste.

(13) That there are several Chacra Sand gas pools developed along the Southwest flank of the Blanco-Mesaverde Pool which have been separately drilled and developed which would be included within the revised definition of the vertical limits of the Blanco-Mesaverde Pool.

(14) That such pools are completed in porous Chacra sands.

(15) That such porous Chacra sands lie South and West of a line generally running from the Northwest corner of Township 31 North, Range 13 West, NMPM, San Juan County, New Mexico, to the Southwest Corner of Township 24 North, Range 1 East, NMPM, Rio Arriba County, New Mexico, as more fully described on Exhibit "A" of this order.

(16) That to protect the correlative rights of the owners in said Chacra pools, the top vertical limit of said Blanco-Mesaverde Pool should be lowered to a point 750 feet below the Huerfanito bentonite marker within the area South and West of the line defined in Finding No. (15) above and Exhibit "A".

(17) That there are 4 wells North and East of the line defined in Finding No. 15 above and Exhibit A which may be producing from fractured shale or siltstone zones equivalent to said Chacra sands and which may or may not be connected to other producing zones in said Blanco-Mesaverde Pool.

(18) That to protect the correlative rights of the owners of said four wells, the effective date of any redefinition of the vertical limits of said Blanco-Mesaverde Pool should be delayed to provide such owners with the opportunity to bring a case for an exception before the Commission.

(19) That with the safeguards provided in Finding No. (16) and No. (18) above, the proposed redefinition of the vertical limits of the Blanco-Mesaverde Pool will not violate correlative rights.

(20) That to prevent waste, the vertical limits of said Blanco-Mesaverde Pool should be redefined in accordance with the study committee recommendation as adjusted to protect Chacra gas pools as set out in Finding No. (14) above.

IT IS THEREFORE ORDERED:

(1) That effective August 1, 1977, the vertical limits of the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico, as previously described and defined by the Commission are hereby redefined as follows:

A. That North and East of a line generally running from the Northwest corner of Township 31 North, Range 13 West, San Juan County, New Mexico, to the Southwest corner of Township 24 North, Range 1 East, NMPM, Rio Arriba County, New Mexico, as fully described on Exhibit "A" attached to this order, and incorporated herein by reference the vertical limits of the Blanco-Mesaverde Pool shall be from the Huerfanito bentonite marker to a point 500 feet below the top of the Point Lookout Sandstone.

B. That South and West of the line described under A above, the vertical limits of the Blanco-Mesaverde Pool shall be from a point 750 feet below said Huerfanito bentonite marker to a point 500 feet below the top of the Point Lookout Sandstone.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year herein-above designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

EXHIBIT "A"

COMMISSION ORDER NO. R-5459

This exhibit defines the Northwest-Southeast trending line that divides the Blanco-Mesaverde Pool, Rio Arriba and San Juan Counties, New Mexico, for purposes of defining the vertical limits for said pool. Said line traverses the South side or west side of the sections listed below:

TOWNSHIP 31 NORTH, RANGE 14 WEST, NMPM
Section 12: South

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM
Sections 7 and 8: South
Section 16: West and South
Sections 15 and 14: South
Section 24: West and South

TOWNSHIP 31 NORTH, RANGE 12 WEST, NMPM
Section 19: South
Section 29: West and South
Sections 28 and 27: South
Section 35: West and South
Section 36: South

TOWNSHIP 30 NORTH, RANGE 11 WEST, NMPM
Section 6: West and South
Section 5: South
Section 9: West and South
Sections 10 and 11: South
Section 13: West and South

TOWNSHIP 30 NORTH, RANGE 10 WEST, NMPM
Section 18: South
Section 20: West and South
Sections 21 and 22: South
Section 26: West and South
Section 25: South

TOWNSHIP 30 NORTH, RANGE 9 WEST, NMPM
Section 31: West and South
Section 32: South

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM
Section 4: West and South
Section 3: South
Section 11: West and South
Section 12: South

TOWNSHIP 29 NORTH, RANGE 8 WEST, NMPM
Section 18: West and South
Section 17: South
Section 21: West and South
Section 22: South
Section 26: West and South
Section 25: South

TOWNSHIP 29 NORTH, RANGE 7 WEST, NMPM
Section 31: West and South
Sections 32 through 36: South

TOWNSHIP 28 NORTH, RANGE 6 WEST, NMPM
Sections 7, 18, 19, 30, and 31: West

TOWNSHIP 27 NORTH, RANGE 6 WEST, NMPM
Section 6: West
Section 7: West and South
Sections 8 and 9: South
Section 15: West and South
Section 14: South
Section 24: West
Section 25: West and South

TOWNSHIP 27 NORTH, RANGE 5 WEST, NMPM
Section 31: West and South
Sections 32 through 36: South

TOWNSHIP 27 NORTH, RANGE 4 WEST, NMPM
Sections 31 through 36: South

TOWNSHIP 27 NORTH, RANGE 3 WEST, NMPM
Sections 31 and 32: South

TOWNSHIP 26 NORTH, RANGE 3 WEST, NMPM
Section 4: West and South
Sections 3 and 2: South
Section 12: West and South

TOWNSHIP 26 NORTH, RANGE 2 WEST, NMPM
Sections 7 and 8: South
Sections 16 and 22: West and South
Section 26: West
Section 35: West and South

TOWNSHIP 25 NORTH, RANGE 2 WEST, NMPM
Section 1: West and South

TOWNSHIP 25 NORTH, RANGE 1 WEST, NMPM
Section 7: West
Sections 18 and 20: West and South
Section 28: West
Section 33: West and South

TOWNSHIP 24 NORTH, RANGE 1 WEST, NMPM
Section 3: West
Sections 10 and 14: West and South
Section 24: West
Section 25: West and South

TOWNSHIP 24 NORTH, RANGE 1 EAST, NMPM
Section 31: West

JUN 24 1977
OIL CONSERVATION COMM.
Santa Fe

5994

KELLAHIN AND FOX
ATTORNEYS AT LAW
500 DON GASPAR AVENUE
POST OFFICE BOX 1769
SANTA FE, NEW MEXICO 87501

JASON W. KELLAHIN
ROBERT E. FOX
W. THOMAS KELLAHIN

TELEPHONE 982-4315
AREA CODE 505

June 24, 1977

Mr. Dan Nutter, Chief Engineer
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Dan:

Enclosed, in accordance with our telephone conversation, is the amended application of Tenneco Oil Company for an exception to the provisions of Order No. R-5459 to include both the Florance 29-A well, and the Northeast Blanco Unit Well No. 64, which are producing from the Chacra formation.

Thanks for handling this.

Sincerely,

Jason W. Kellahin

CC: Millard F. Carr
Paul Thompson
Fred Hull

JWK:kfm

Enclosure

Case 5994

JUN 24 1977
OIL CONSERVATION COMM.
Santa Fe

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF TEH APPLICATION OF TENNECO OIL COMPANY FOR AN EXCEPTION OF COMMISSION ORDER NO. R-5459, VERTICAL LIMITED OF THE BLANCO-MESAVERDE POOL, RIO ARRIBA AND SAN JUAN COUNTIES, NEW MEXICO

A P P L I C A T I O N

(AMENDED)

COMES now the applicant, by and through its Attorneys, Kellahin & Fox, and applies to the New Mexico Oil Conservation Commission for an exception to Commission Order No. R-5459 insofar as said order applies to the Florance Well No. 29-A, SE/4 NW/4, Section 25, Township 30 North, Range 8 West, and to the Northeast Blanco Unit Well No. 64, located in the ~~SW/4~~ SE/4 of Section 24, Township 30 North, Range 8 West, N.M.P.M., San Juan County, New Mexico, and in support thereof would show the Commission:

1. That Tenneco Oil Company is the operator of the Florance 29-A Well, and holds the right to operate the Northeast Blanco Unit Well No. 64 as to the Chacra formation.

2. That both wells are completed in the Chacra formation.

3. That the subject wells are not producing from the Cliff House or any other Mesaverde sands, and therefore should be excluded from the provisions of Order No. R-5459.

4. Approval of the application will not impair correlative rights and will prevent waste.

Case 5994

WHEREFORE Applicant respectfully requests that his application be set for hearing before the Commission's duly appointed Examiner and that upon hearing, an order be entered granting an exception as requested.

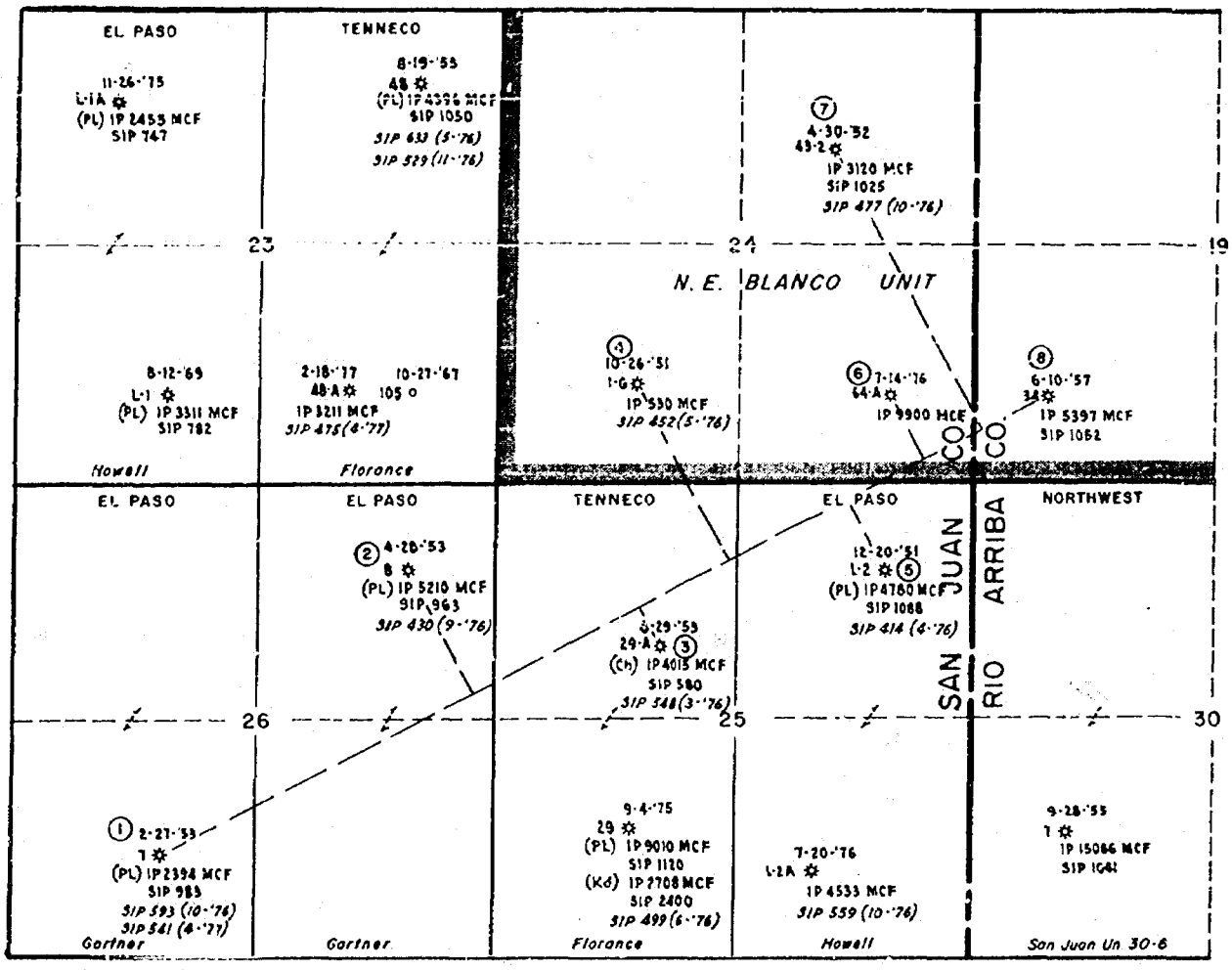
TENNECO OIL COMPANY

By _____
Kellahin & Fox
P. O. Box 1769
Santa Fe, New Mexico 87501

ATTORNEYS FOR APPLICANT

BEFORE EXAMINER STAMETS
OIL CONSERVATION
Blackwood + Nichols 1
CASE No. 5994
Submitted by Blackwood
Hearing Date 7/20/77

R 8 W R 7 W



– LEGEND –

COMPLETION DATE
☼
INITIAL PRODUCTION
ORIGINAL SHUT-IN CASING PRESS.
RECENT SHUT-IN PRESS (DATE TAKEN)

T — T' TRACE OF CROSS SECTION

N. E. BLANCO UNIT BOUNDARY

BLACKWOOD & NICHOLS CO. LTD.

LOCATION & PRESSURE DATA MAP

0 SCALE 1
MILES

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
1000 RIO BRAZOS RD. - AZTEC
87410

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Blackwood & Nichols EXHIBIT NO. 2
CASE NO. 5994
Submitted by Blackwood
Hearing Date 7/20/77

MEMORANDUM

5-25-77

TO: INTERESTED PARTIES
FROM: N. E. MAXWELL, JR., ENGINEER, DIST. #3
PROJECT: MESAVERDE INFILL WELL DATA, REPORT #4

Attached is a compilation of data on the Mesaverde infill completion program thru 5-20-77. Operator, well name and location are given. The initial shut-in is tabulated and CAOF where available. The average 1976 pressure of the four wells offset to each infill well has been tabulated and the latest shut-in pressure (P_c) and Q rate for the infill well is shown.

Test data for 53 wells, received since 2-22-77 show that these infill wells had an average initial shut-in pressure (P_c) of 777# while their offsets only had 461#. A difference of 316#.

Sixteen of the new completions or 30% were in Township 26 North, Range 3 West; Township 26 North, Range 7 West; Township 27 North, Range 3 West and Township 29 North, Range 6 West. The 16 infill wells had an average P_c of 978#. The remaining 37 new infill wells only had an average P_c of 689#.

503 infill locations have appeared on our scout letter. As of 5-20-77, 306 infill wells have been completed.

All infill wells have been numbered according to the dates they appeared on the scout letter.

#1 - #105 appeared during 1975
#106- #214 appeared during 1976
#215- #306 have been shown on the scout letters for 1977.

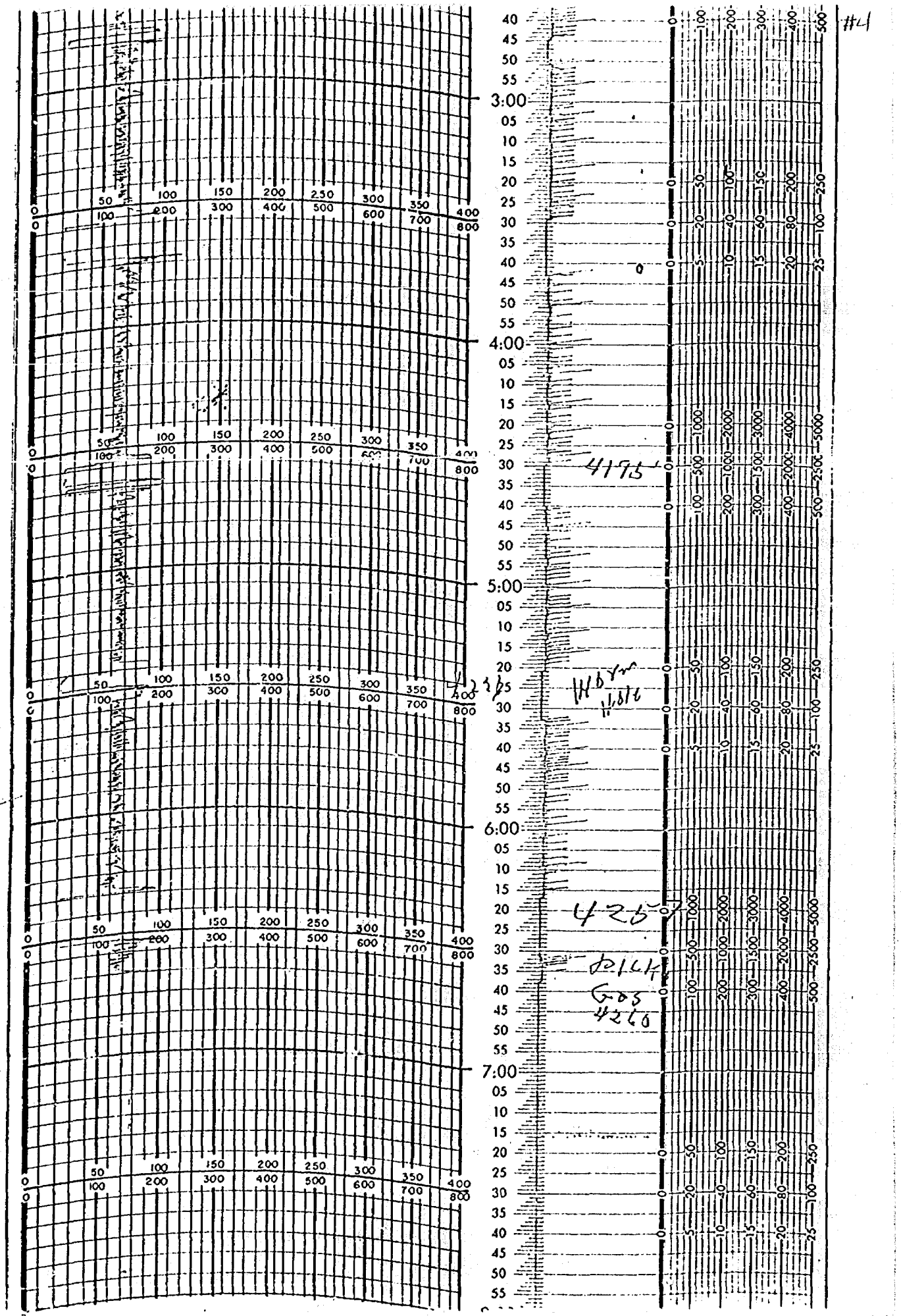
Our records show Mesa Petroleum Corporation, State Com #10-A located in O-29N-8W to be the first infill completion on 1-16-75, carried on scout letter 2-27-75.

MESAVERDE INFILL WELLS

COMPLETIONS	NO. OF WELLS	INITIAL AVE. SIP	LATEST TEST P_c	LATEST TEST Q	1976 OFFSET P_c
1975	105	678	510	905	474
1976	109	758	636	1114	479
1977 thru May	92	764	588*	838*	461
TOTAL	306	732	571	993	452

*1977 test data available on 20 infill wells completed in 1977 thru May 20.

#4



7-7-76

NEBU #
105 A

Encountered
gas in
Chocken
Formation

Case 5994

JASON W. KELLAHIN
ROBERT E. FOX
W. THOMAS KELLAHIN

KELLAHIN AND FOX
ATTORNEYS AT LAW
500 DON GASPAR AVENUE
POST OFFICE BOX 1769
SANTA FE, NEW MEXICO 87501

TELEPHONE 982-4315
AREA CODE 505

RECEIVED
JUN 24 1977
OIL CONSERVATION COMM.
Santa Fe

June 22, 1977

Mr. Joe Ramey
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Tenneco Oil Company

Dear Mr. Ramey:

Please find enclosed an application on behalf of Tenneco Oil Company for an exception to NMOCC R-5459, vertical limits for the Blanco-Mesaverde Pool.

We would appreciate having this matter set for hearing on July 20, 1977.

Very truly yours,

W. Thomas Kellahin

CC: Mr. Millard Carr
Mr. Vic Lyon
Mr. Fred Hull
Mr. C. F. Ellis
Mr. Paul Thompson

WTK:kfm

Enclosure

Case 5774

RECEIVED
JUN 24 1977
CONSERVATION COMM.

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF TENNECO OIL COMPANY FOR AN EXCEPTION OF COMMISSION ORDER NO. R-5459, VERTICAL LIMITED OF THE BLANCO-MESAVERDE POOL, RIO ARRIBA AND SAN JUAN COUNTIES, NEW MEXICO

A P P L I C A T I O N

COMES now the Applicant by and through its Attorneys, Kellahin & Fox, and applies to the New Mexico Oil Conservation Commission for an Exception to Commission Order No. R-5459 insofar as said order applies to the Florence Well No. 29-A, SE/4NW/4, Section 25, T30N, R8W, San Juan County and its spacing Unit consisting of the W/2 of said section and in support thereof would show:

1. That Tenneco Oil Company is the operator of the Florence 29-A Well located in Section 25, T30N, R8W, NMPM. also NE Blanco Unit Well #64, SW/4 24, 30N, 8W

2. That said well was completed in the Chacra formation.

3. That the subject well is not producing from the Cliff-House or any other Mesaverde sands and therefore should be excluded from the provision of Order No. R-5459.

4. Approval of the application will not impair correlative rights and will prevent waste.

WHEREFORE Applicant respectfully requests that his application be set for hearing before the Commission's duly appointed Examiner and that upon hearing, an order be entered granting an exception as requested.

two weeks; Amended appl. will be filed 6/24

TENNECO OIL COMPANY

By W. T. Kellahin

Kellahin & Fox
P. O. Box 1769
Santa Fe New Mexico 87501

ATTORNEYS FOR APPLICANT

Form 23-118T (Rev. 5-62)

EL PASO NATURAL GAS COMPANY

SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29586

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 34 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.14		
Hydrogen Sulfide	.00		
Nitrogen	.32		
Methane	87.93		
Ethane	6.96		
Propane	2.73	.7493	
I-Butane	.55	.1794	
N-Butane	.72	.2263	
I-Pentane	.23	.0839	
N-Pentane	.16	.0578	
Hexane	.26	.1131	
TOTALS	100.00	1.410	

Run By Ross Checked By James

Remarks

R L Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakely
R. F. Lemon
J. E. Ashworth
Don Adams
File

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
Blackwood & Nichols EXHIBIT NO. 5
CASE NO. 5994
Submitted by Blackwood & Loos
Hearing Date 7/20/77

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1150

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F. .650
Calculated from % Composition

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AE&MS

Calculation By
NGPA

Carbon Dioxide
NGPA

Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 19 T. 30 N. R. 7 W.
County
Rio Arriba
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

Form 23-116? (Rev. 5-62)

EL PASO NATURAL GAS COMPANY

SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29607

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit # 105 Secured By DeLasso Loos

COMPONENT	MOL. %	G.P.M.	LIQ. VOL. %
Carbon Dioxide	.87		
Hydrogen Sulfide	.00		
Nitrogen	.28		
Methane	88.33		
Ethane	6.31		
Propane	2.46	.6752	
I-Butane	.48	.1565	
N-Butane	.64	.2012	
I-Pentane	.20	.0730	
N-Pentane	.13	.0469	
Hexane	.30	.1305	
TOTALS	100.00	1.284	

Run By Ross Checked By James

Remarks

R. L. Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don Adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1131

Colorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .649

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AE&MS

Calculation By
NGPA

Carbon Dioxide
NGPA

Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 24 T. 30 N. R. 8 W.

County
San Juan

State
New Mexico

Formation
Mesa Verde

Bomb Pressure

EL PASO NATURAL GAS COMPANY

SAN JUAN LABORATORY

FRACTIONAL DISTILLATION ANALYSIS ☐ GAS CHROMATOGRAPHY ANALYSIS ☐

Date of Run 10-5-76 Analysis No. VF29588

Sample From Blackwood Nickols Date Secured 10-4-76

Sample Marked N. E. Blanco Unit #64 Secured By DeLasso Laos

COMPONENT	MOL. %	G. P. M.	LIQ. VOL. %
Carbon Dioxide	.92		
Hydrogen Sulfide	.00		
Nitrogen	.20		
Methane	89.95		
Ethane	5.60		
Propane	2.06	.5654	
I-Butane	.34	.1109	
N-Butane	.47	.1477	
I-Pentane	.13	.0474	
N-Pentane	.09	.0325	
Hexane	.24	.1044	
TOTALS	100.00	1.009	

Run By Ross Checked By James

Remarks

R L Ahrens
H. L. Holder
R. U. Ullrich
R. E. Johnson
R. B. Herr
M. E. Blakley
R. F. Lemon
J. E. Ashworth
Don adams
File

HEATING VALUE
B.T.U. PER CU. FT.

Dry Basis, 14.696 lbs./sq. in., 60° F.
Calculated from % Composition 1107

Calorimeter

SULPHUR CONTENT
GRAINS PER 100 CU. FT.

14.7 lbs./sq. in., 60° F.
Hydrogen Sulfide .00

Mercaptans .00

SPECIFIC GRAVITY

14.696 lbs./sq. in., 60° F.
Calculated from % Composition .633

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

Column/s Used
AEGMS
Calculation By
NGPA

Carbon Dioxide
NGPA
Hydrogen Sulfide

LOCATION AND WELL DATA

Sec. 24 T. 30 N. R. 8 W.
County
San Juan
State
New Mexico
Formation
Mesa Verde
Bomb Pressure

Dockets Nos. 25-77 and 26-77 are tentatively set for hearing on August 3 and August 17, 1977. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - JULY 20, 1977

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

ALLOWABLE: (1) Consideration of the allowable production of gas for August, 1977, from fifteen prorated pools in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(2) Consideration of the allowable production of gas for August, 1977, from four prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

CASE 5982: Application of Sam H. Snoddy for directional drilling and a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the directional drilling of two 14,000-foot Morrow gas wells in Unit P of Section 25, Township 20 South, Range 32 East, South Salt Lake-Morrow Gas Pool, Lea County, New Mexico, one of which would be vertically drilled to a depth of 4000 feet from a surface location 660 feet from the South line and 760 feet from the East line of said Section 25, then directionally drilled in a North-Northwesterly direction and bottomed in the approximate center of the NE/4 of said Section 25, the N/2 of the section being dedicated to the well; the other well would be vertically drilled to a depth of 4000 feet from a surface location 760 feet from the South line and 660 feet from the East line of said Section 25, then directionally drilled in a West-Northwesterly direction and bottomed in the approximate center of the SW/4 of said Section 25, which would be a 160-acre non-standard unit for said well.

CASE 5983: Application of Yates Petroleum Corporation for the amendment of Order No. R-5445, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-5445 to provide for a 200 percent risk factor for drilling the unit well rather than 20 percent. Said order pooled the N/2 of Section 19, Township 20 South, Range 25 East, Eddy County, New Mexico.

CASE 5984: Application of Morris R. Antweil for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in and underlying the N/2 of Section 20, Township 18 South, Range 25 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 5985: Application of Orla Petco, Inc., for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its B. K. Morrison Well No. 1 to be located 1980 feet from the South line and 660 feet from the West line of Section 5, Township 19 South, Range 26 East, Eddy County, New Mexico, the S/2 of said Section 5 to be dedicated to the well.

CASE 5986: Application of J. Gregory Merrion for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Devils Fork-Gallup and Mesaverde production in the wellbore of his Edna Well No. 2 located in Unit O of Section 7, Township 24 North, Range 6 West, Rio Arriba County, New Mexico.

CASE 5987: Application of Getty Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Gallup, Mesaverde, and Dakota production in the wellbore of its C. W. Roberts Well No. 5, located in Unit F of Section 17, Township 25 North, Range 3 West, Rio Arriba County, New Mexico. Applicant also seeks approval for the reopening of its C. W. Roberts Wells Nos. 3 and 4 and its Lydia Rentz Well No. 4 to commingle Dakota, Mesaverde, and possibly Gallup production within the wellbores of the above-described wells located in Units O, M, and A of Sections 18, 17, and 19, respectively, of the same township.

CASE 5988: Application of Continental Oil Company for three unorthodox locations, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 2-A of the Blanco-Mesaverde Gas Pool Rules, to permit the drilling of its AXI Apache "N" Wells Nos. 12 and 14 in the NW/4 of Sections 11 and 1, respectively, and its AXI Apache "O" Well No. 10 in the SE/4 of Section 3, all in Township 25 North, Range 4 West, Rio Arriba County, New Mexico. Each of said wells is the first Mesaverde well on its proration unit.

Docket No. 24-77

CASE 5989: Application of Continental Oil Company for an unorthodox oil well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its Marshall Well No. 8 to be located 2600 feet from the South line and 1230 feet from the West line of Section 19, Township 23 South, Range 33 East, Cruz-Delaware Pool, Lea County, New Mexico.

CASE 5990: Application of Continental Oil Company for an unorthodox location, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its AXI Apache "D" Well No. 5 to be located 2310 feet from the North line and 990 feet from the West line of Section 19, Township 24 North, Range 4 West, Ballard-Pictured Cliffs Pool, Rio Arriba County, New Mexico.

CASE 5991: Application of Continental Oil Company for capacity allowable, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for a capacity allowable for its Pearl "B" Well No. 4 located 330 feet from the South line and 2310 feet from the West line of Section 25, Township 17 South, Range 32 East, Maljamar Grayburg-San Andres Pool, Lea County, New Mexico.

CASE 5992: Application of Burleson & Huff for compulsory pooling and a non-standard unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the SE/4 NW/4 of Section 14, Township 24 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico, to form a non-standard 40-acre gas proration unit to be dedicated to applicant's Cooper Well No. 1 located in Unit F of said Section 14, or in the alternative to drill another well at a standard location thereon. Also to be considered will be the cost of recompletion or of drilling and completing the unit well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in recompleting or drilling said well.

CASE 5993: Application of Lively Exploration Company for an exception to the provisions of Order No. R-5459, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the provisions of Order No. R-5459 to exclude its Chacra Well No. 7Y in Unit E of Section 35, Township 30 North, Range 8 West, San Juan County, New Mexico, from the vertical limits of the Blanco-Mesaverde Pool as defined by said order.

CASE 5994: Application of Tenneco Oil Company for an exception to the provisions of Order No. R-5459, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the provisions of Order No. R-5459 to exclude its Florance Well No. 29-A in Unit F of Section 25, and its Northeast Blanco Unit Well No. 64 in Unit P of Section 24, both in Township 30 North, Range 8 West, San Juan County, New Mexico, from the vertical limits of the Blanco-Mesaverde Pool.

CASE 5995: Application of Tenneco Oil Company for dual completions and waterflood expansions, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its South Hospah-Upper Sand and -Lower Sand Waterflood Projects by dually completing its Hospah Unit Wells Nos. 58 and 59, located in Units F and G, respectively, of Section 12, Township 17 North, Range 9 West, McKinley County, New Mexico, in such a manner as to permit water injection into each of said zones thru parallel strings of tubing.

CASE 5996: Application of Petroleum Corporation of Texas for salt water disposal, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Abo formation through the perforated interval from 6852 feet to 6877 feet in its Dexter Federal Well No. 3 located in Unit I of Section 22, Township 17 South, Range 30 East, Jackson Abo Pool, Eddy County, New Mexico.

CASE 5997: Application of Atlantic Richfield Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for its East Drinkard Unit Area comprising 3080 acres, more or less, of Federal and fee lands in Sections 11, 12, 13, 14, 23 and 24, Township 21 South, Range 37 East, Lea County, New Mexico.

CASE 5998: Application of Atlantic Richfield Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project on its East Drinkard Unit Area, Lea County, New Mexico, by the injection of water into the Drinkard formation through 30 wells.

CASE 5999: Application of Atlantic Richfield Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for its East Blinebry Unit Area comprising 3080 acres, more or less, of Federal and fee lands in Sections 11, 12, 13, 14, 23, and 24, Township 21 South, Range 37 East, Lea County, New Mexico.

CASE 6000: Application of Atlantic Richfield Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project on its East Blinebry Unit Area, Lea County, New Mexico, by the injection of water into the Blinebry formation through 38 wells.