Case No. 5994

Application, Transcripts, Small Exhibits, Etc.

De Novo 11-10-77

Blackwood + Nicholas
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. 92?
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 4,259-4,262' 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 northwest San Juan Basin of New Mexico to south part of Denver Basin, Colorado. Tertiary rocks regionally cover irregular 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 contemporanenty 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 WELL NO: 105 A

LOCATION: NEBU STATE: NM

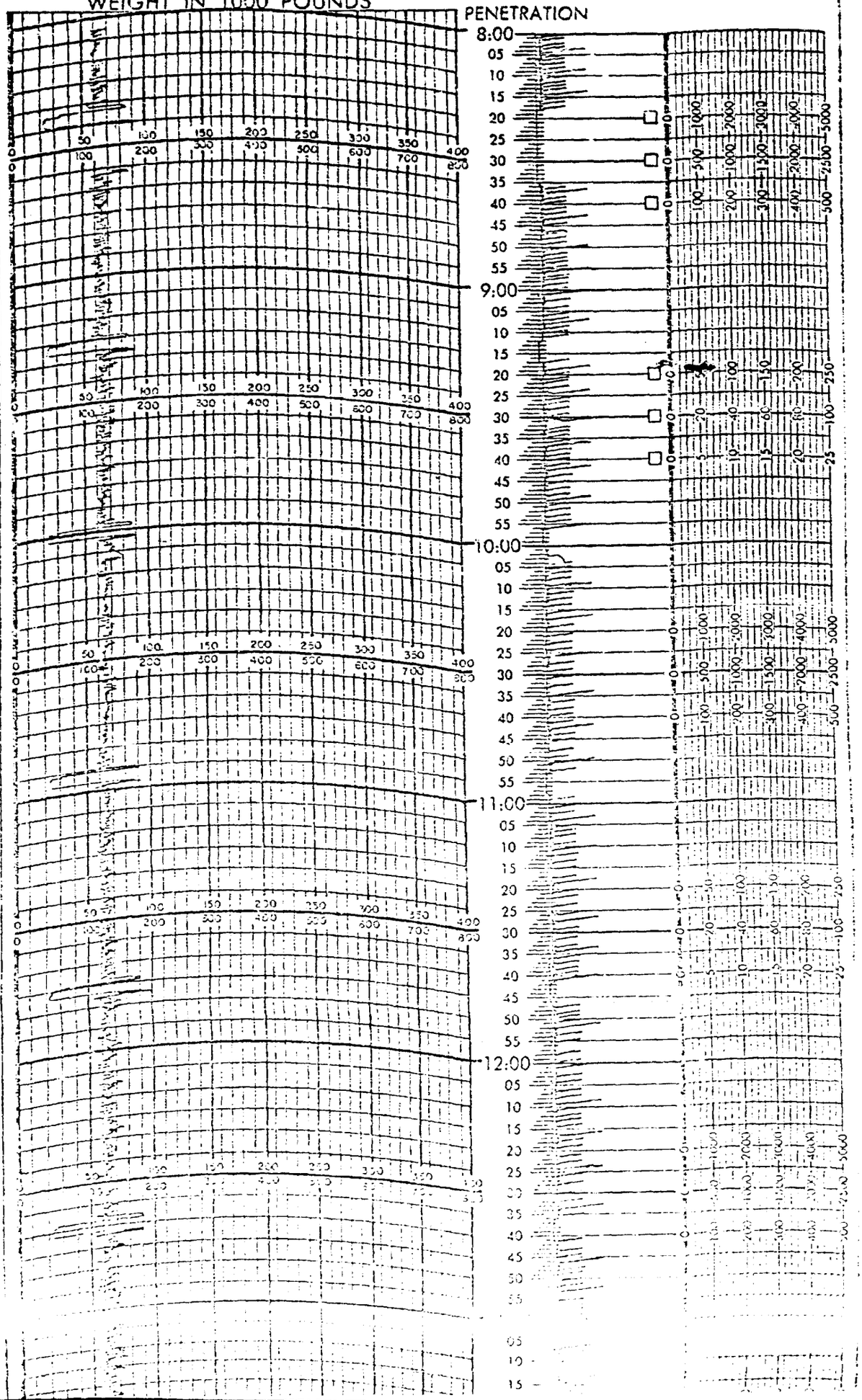
COUNTY: RIO ARRIBA T.D. OFF: 4262

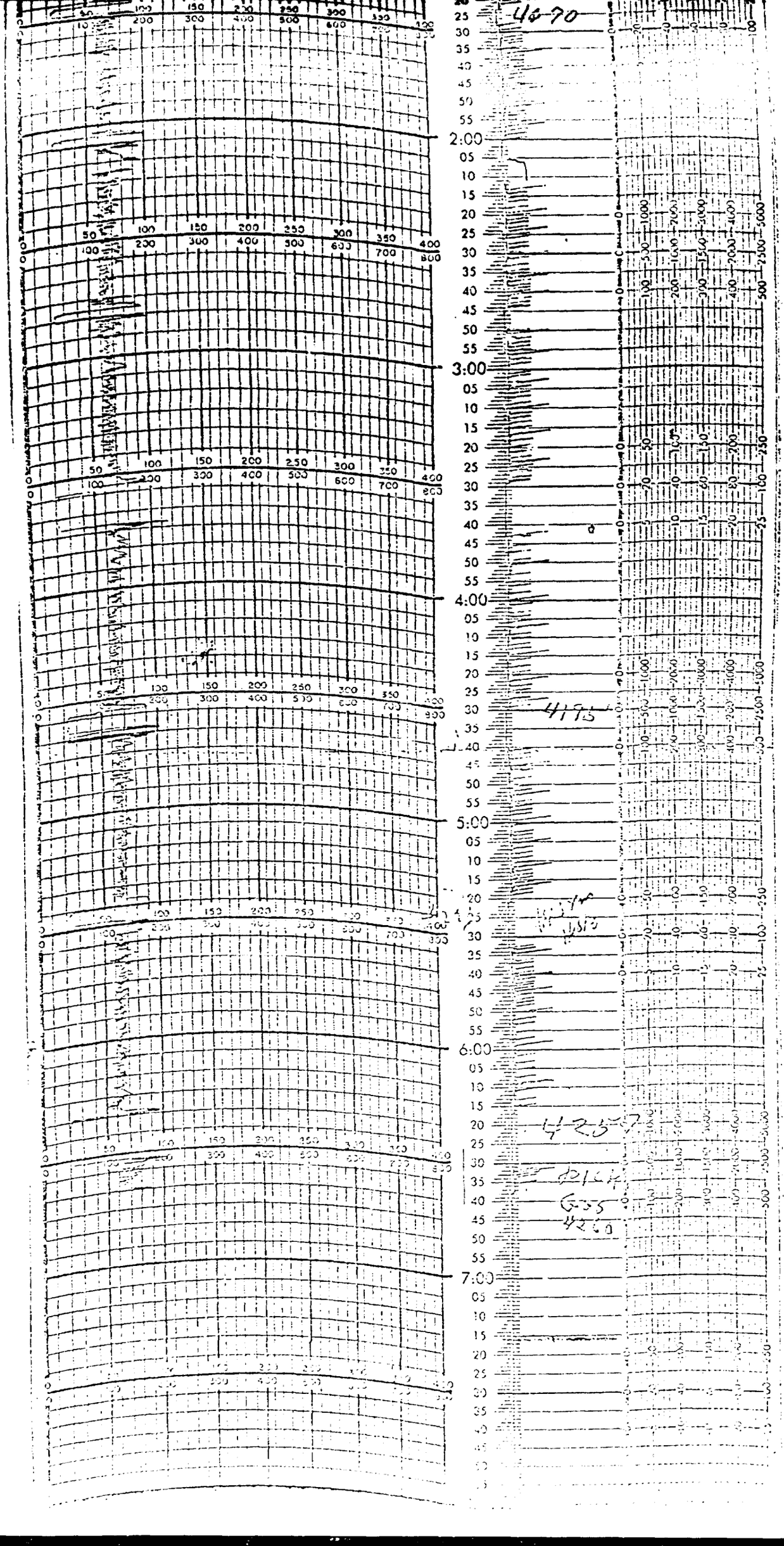
DATE ON: 7-7-76 T.D. ON: 3862

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

DITTO

☐ FLUID PRESSURE
☐ PUMP STROKES
☐ TORQUE
☐ R.P.M.
☐ % MUD FLOW
☐ % PIT LEVEL




2:00
3:00
4:00
5:00
6:00
7:00

(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

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.:
15. DATE ISSUED:

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

16. DATE SPUDDED	17. DATE T.D. REACHED	18. DATE COMPL. (Ready to prod.)	19. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	20. ELEV. CASINGHEAD
8/5/75	8/14/75	8/16/75	6263 GL	

21. TOTAL DEPTH, MD & TVD	22. PLUG, BACK T.D., MD & TVD	23. IF MULTIPLE COMPL., HOW MANY*	24. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
TD 4503'	Open Hole		→	Yes	No

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

26. WAS DIRECTIONAL SURVEY MADE: Yes

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

28. WAS WELL CORED: No

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: 9/3/1975

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

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 25: "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.)

37. 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.
Kirtland	2192'	2830'	
Fruitland	2830'	3088'	
Pictured Cliffs	3088'	3118'	
Lewis	4410'	4503'	Gas

38. GEOLOGIC MARKERS

NAME	TOP MEAS. DEPTH	TOP TRUE VERT. DEPTH
Kirkland	2192'	
Fruitland	2830'	
Pictured Cliffs	3088'	
Lewis	3118'	

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5994 Exhibit No. 2
Submitted by Blackwood + Nichols
Hearing Date 11/10/77

DISTRIBUTION		
SANTA FE	1	
FILE	1	✓
U.S.G.S.		
LAND OFFICE		
TRANSPORTER OIL	1	
TRANSPORTER GAS	1	
OPERATOR		
PRORATION OFFICE	1	

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

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	Lease No.
Florance	29A	Mesa Verde ✓	State, Federal or Fee 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]	Address (Give address to which approved copy of this form is to be sent)
Plateau Refining	P. O. Box 108, Farmington, New Mexico 87401
Name of Authorized Transporter of Casinghead Gas [ ] or Dry Gas [X]	Address (Give address to which approved copy of this form is to be sent)
Southern Union Gas Co.	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 Shoe**
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 8 1975 OIL CON. COM. DIST. 3

RECEIVED SEP 29 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)
Production Clerk
(Title)
Sept 2 1975
(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 multiply

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

Case No. 5994 Exhibit No. 3

Submitted by Blackwood + Nichols.

Hearing Date 11/10/77

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

December 29, 1975

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

The Oil and Gas Supervisor
United States 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

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, District Manager

DL:lw

Four copies to each addressee

Approved: Carl C. Traywick (ACTING) Date: MAR 11 1976

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

Case 5944
10514-64
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.

Mesa Verde 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. 5944 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.

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 wast 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 Wel. 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 define 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

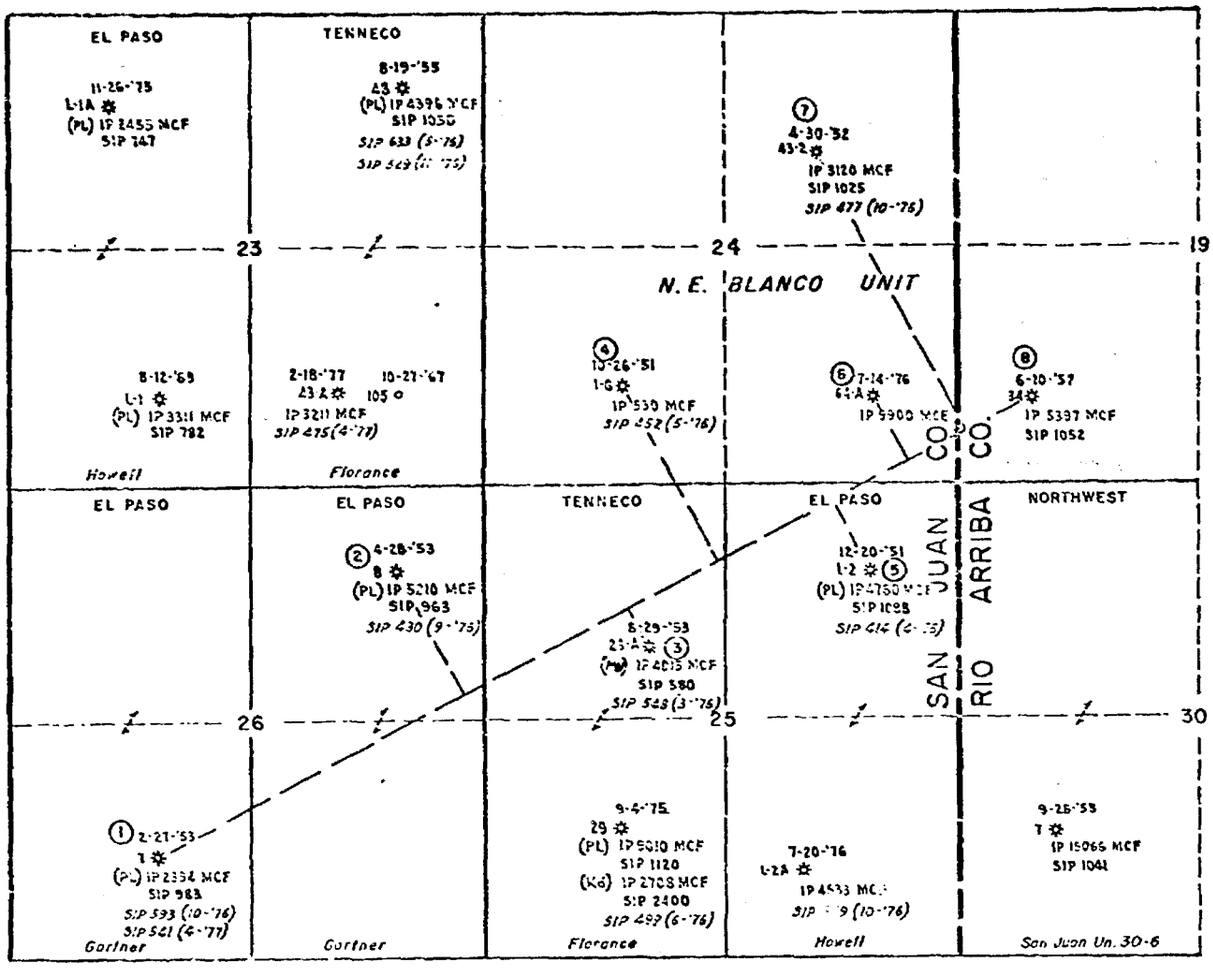
TOWNSHIP 24 NORTH, RANGE 1 WEST, NMPM
Section 3: West
Sections 10 and 14: West and South
Section 24: West
Section 25: West and South

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

R 6 W

R 7 W

T 30 N



— LEGEND —

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

T — TRACE OF CROSS SECTION

N.E. BLANCO UNIT BOUNDARY

BLACKWOOD & NICHOLS CO. LTD.

LOCATION & PRESSURE DATA MAP

SCALE

0 1

MILES

RECEIVED
OIL CONSERVATION COMMISSION
Case No. 5994 Exhibit No. 8A
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 AVE.	
WELLS COMPLETED	NO. WELLS	INITIAL SIP	CAOF MCF	OFFSET P_c	AVE. P_c	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		3508	450		

5994 10
Maxwell Hughes
11-11-77

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 0-29N-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.

5994 ... 11
Bradenhead & ...
11-16-77

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	.0573	
Hexane	.26	.1131	
TOTALS	100.00	1.410	

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 %

Run By Ross Checked By James

Remarks

R L Ahrens
H. L. Holder
R. Ullrich
R. E. Johnson
R. S. Herr
M. E. Blakely
R. F. Lemon
J. E. Ashworth
Don Adams
File

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5911 Exhibit No. 12
Blackwood & Nichols
11-10-77

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

Exhibit #2

Form 23-183 (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

ACTIONAL 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-A 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
ADAMS

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

Pool 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	1.000	

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 %

Run By Ross Checked By James

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

Column/s Used
AEGHS
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 23-1.82 (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. 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	.0573	
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
P. F. Leron
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. 19 T. 30 N. R. 7 W.

County
Rio Arriba

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. 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	

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 %

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

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

Form 23-[illegible] (Rev. 5-42)

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 #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	

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 .653

Calculated from % Liquid

VAPOR PRESSURE

PSIA at 100° F.
Calculated from Mole %

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

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

Form 23-T-3ST (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. 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	.0573	
Hexane	.26	.1131	
TOTALS	100.00	1.410	

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

Run By Ross Checked 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

LOCATION AND WELL DATA

Sec. 19 T. 30 N. R. 7 W.

County
Rio Arriba

State
New Mexico

Formation
Mesa Verde

Bomb Pressure

Form 23-1187 (Rev. 9-63)

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	

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 %

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

Column/s Used
AE&NS
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

Case 334

Extra Blackwood + Nichols
exhibits