Case No.

2164

Application, Transcript,
Small Exhibits, Etc.

DRAFT

RSM/esr
February 3

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. 2164
Order No. R- [illegible]

APPLICATION OF HUDSON AND HUDSON FOR AN EXCEPTION TO RULE 506 (A) OF THE COMMISSION RULES AND REGULATIONS AND FOR PERMISSION TO TRANSFER ALLOWABLES IN THE WEST TONTO YATES SEVEN RIVERS POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on January 25, 1961, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this _____ day of February, 1961, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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, Hudson and Hudson, seeks an exception to Rule 506 (A) by increasing the limiting gas-oil ratio for the West Tonto Yates-Seven Rivers Pool, Lea County, New Mexico, from 2,000 to 6,000 cubic feet of gas per barrel of oil, and further seeks permission to shut-in its Federal 18 Well No. 3 producing from said pool and transfer its allowable to its Federal 18 Well No. 2.

(3) That ~~inasmuch as the West Tonto Yates-Seven Rivers Pool is an associated oil-gas reservoir,~~ approval of the subject application ~~will~~ would not be in the best interests of conservation.

IT IS THEREFORE ORDERED:

That the subject application is hereby denied.

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

WILLIAM A. & EDWARD R. HUDSON - WEST TONTO (YATES-SEVEN RIVERS) POOL

	WELL TESTS					GAS ANALYSES		
WELL	DATE	BBLS.OIL	HRS.	GOR	PRODUCING METHOD	DATE	PERCENT NITROGEN	B.T.U.
Federal 18 #1	7/25/60	22	24	5,814	Continuous	7/15/60	37.58	
	8/2/60	84	24	1,270	"			
	8/3/60	49	20	3,240	"			
	9/5/60	52	1.6	225	Intermitter	8/30/60	8.55	1410
Federal 18 #2	7/24/60	102	24	484	Continuous	8/19/60	12.95	1515
	8/28/60	57	2.3	230	Intermitter			
Federal 18 #3	7/25/60	60	24	17,516	Continuous	8/30/60	35.39	861
	9/8/60	23	3.7	4,210	Intermitter			
Federal 18 #4	11/18/60			872	Pump			
Federal 18 #7	11/26/60	50	6	205	Intermitter			

WILLIAM A. & EDWARD R. HUDSON - WEST TONTO (Y-SR) POOL

WELL DATA

WELL	COMPLETION DATE	TOTAL DEPTH	INITIAL POTENTIAL	5½" CASING	PERFORATED INTERVALS	TREATMENT
Federal 18 #1	5/23/60	3280	F 40 BO/1½ hrs. 20/64" ch.	3280	3259-63	300 gals. acid.
Federal 18 #2	6/13/60	3280	F 153 BO/16 hrs. 22/64" ch.	3280	3247-49 3252-56	None.
Federal 18 #3	6/20/60	3283	F 40 BO/5 hrs. 23/64" ch.	3283	3250-54 3266-70	500 gals. acid.
Federal 18 #4	8/20/60	3349	27 BO + 14 BW/24 hrs. on pump.	3349	3282-85 3287-90 3293-3300 3305-10	500 gals. acid, then 2,000 gals. in Aug. 1960. 6,000 gals. acid in Dec. 1960.
Federal 18 #7	10/17/60	3290	F 203 BO/24 hrs. 10/16" ch.	3290	3268-80	300 gals. acid.

WILLIAM A. & EDWARD R. HUDSON - WEST TONTO (Y-SR) POOL

WELL DATA

WELL	COMPLETION DATE	TOTAL DEPTH	INITIAL POTENTIAL	5½" CASING	PERFORATED INTERVALS	TREATMENT
Federal 18 #1	5/23/60	3280	F 40 BO/1½ hrs. 20/64" ch.	3280	3259-63	300 gals. acid.
Federal 18 #2	6/13/60	3280	F 153 BO/16 hrs. 22/64" ch.	3280	3247-49 3252-56	None.
Federal 18 #3	6/20/60	3283	F 40 BO/5 hrs. 23/64" ch.	3283	3250-54 3266-70	300 gals. acid.
Federal 18 #4	8/20/60	3349	27 BO + 14 BW/24 hrs. on pump.	3349	3282-85 3287-90 3293-3300 3305-10	500 gals. acid, then 2,000 gals. in Aug. 1960. 6,000 gals. acid in Dec. 1960.
Federal 18 #7	10/17/60	3290	F 203 BO/24 hrs. 10/16" ch.	3290	3268-80	300 gals. acid.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. _____
CASE NO. _____

Form 286 1-60

COPY

PHILLIPS PETROLEUM COMPANY
Gasoline Department
Analysis Results Summary

Location **Odessa, Texas**

SS No. D-344-1
File No. 565
Date Run 7-20-60
Date Secured 7-15-60
Time
Sampler's Ident

A Sample of **Sngh. Nat'l Gas, Undesignated Field, Yates & Seven Rivers, Mn. & Ed Hudson Company**

Secured from **Wells # 1&2-1 Federal "18" Lease**
Location **[illegible] Sec. 18-19-33** County **Lea** State **New Mexico**
Purpose **Survey** Secured by **R. T. O'Neill**
Sampling Conditions: Atmos. Temp **79** °F Pressure on Bomb **14** lbs./sq. in. Bbls oil/day
Volume/day Weather conditions at time of sampling
Field Gas Pressure PSIG Line Pressure PSIG

Chroma. Analysis 14.65 PSI at 60°F

	Mol. %	Liq. %
Carbon Dioxide		
Oxygen		
Nitrogen	37.[illegible]	
Hydrogen Sulfide	[illegible]	
Methane	50.67	
Ethane	5.14	
Propane	3.06	
Iso-Butane	.51	
Nor-Butane	1.13	
Iso-Pentane	[illegible]	
Nor-Pentane	.38	
Hexanes	.35	
Heptanes Plus	.36	
Total	100.00	100.00

Propane Calc. G.P.M.	.839
Iso Butane Calc. G.P.M.	.166
Nor Butane Calc. G.P.M.	.353
Pentanes Calc. G.P.M.	.589
Test Car Date	.708
B.T.U. ... cu. ft. W.B.	.789
Calc. Specific Gravity	.823
Calc. A.P.I. @ 60°F	
Observed A.P.I. Av.	
H_2S + CO_2 by orsat	0.30 %
H_2S grains/100 cu. ft.	267
Mercaptans gr/100 cu. ft.	
Calc. Vap. Press. # sq. in.	
Reid Vap. Press. # sq. in.	
Cu. ft. gas/Gal. Liq.	
Calc. Gasoline Factors	
26-70 Gasoline	0
Excess Butane	0
Excess Propane	0
Excess Ethane & lighter	0
	1.0000

Run by **Mason** Calculated by **Mason**
Checked by **Rogers** Approved by

Additional Data and Remarks
Trap Press. 11#
Line Temp. 84°
Conventional Trap
Choke 1/8"
Casing Press. 900#
Flo. Tub. Press. 50#
Oil Gravity 30.0
Wells 2&3 shut in during test
Baro. 678

Distribution

(PATS)

Petroleum Analytical & Testing Service

Odessa, Texas

No. 3:88
Date of Rep. 8-31-60
Date Secured 8-30-60

A Sample of WILLIAMS EDWARDS HUDSON FEDERAL 24 #1
Secured from Ralph L. Gray
At 201 Carper Bldg. Artesia, N. M. Secured by L. M. Ward
Time 9 am Date 8-30-60
Sampling conditions Temp. 78°
Press. 28#

FRACTIONAL DISTILLATION

Percentage Composition

	MOL %	LIQ. %
Carbon Dioxide	1.48	
Air		
Nitrogen	8.38	
Oxygen		
Hydrogen sulf.	1.32 (960 grs.)	
Hydrogen		
Methane	50.16	
Ethane	18.75	
Propane	15.03	
Butanes		
Iso-Butane	0.74	
N-Butane	1.07	
Pentanes		
Iso-Pentane	0.92	
N-Pentane	0.71	
Hexanes plus	1.08	
Heptanes		
TOTAL	100.00	

Volume Sample 7628 gms. c.c. at 60 °F.
Vol. distilled, % 100.00
Vol. of residue, % 0.00
Recovery, % 100.00
Calc. Sp. Gr. .942
Calc. A.P.I.
Calc. Vapor Press. Lb. Sq. In.

Liquid Content

Method	G.P.M.
Based on Analysis (Butanes)	6.508
Based on Analysis (Pentanes & Heavier)	1.079
Based on Analysis (Propanes)	4.187

Heating Value

British Thermal Units Per Cu. Ft. at 14.65 p.s.i. at 60 °F

Method	Cal.	Dry Basis	Wet Basis
Based on % Composition		1410	1385

Run by T. M. Simpson Checked by Approved by [signature]

Additional Data and Remarks

Exhibit #6

PALS

Fractional Distillation Analysis Results Summary

Petroleum Analysts' Laboratory Service, Inc.

[illegible] Texas Street

ODESSA, TEXAS

PH. [illegible]

No.
Run No. 2189
DATE OF RUN 8-31-60
Date Secured 8-30-60

A Sample of WILLIAMS EDWARDS HUDSON FEDERAL #5
Secured from Ralph L. Gray
At 201 Cooper Bldg. Artesia, N.M. Secured by L. H. Ward
Time 10:45 am Date 8-30-60
Sampling conditions Temp. 78°
Press. 256

FRACTIONAL DISTILLATION

Percentage Composition

	SOLV	LIQ.
Carbon Dioxide	0.61	
Air		
Nitrogen	35.39	
Oxygen		
Hydrogen sulf.	0.39	
Hydrogen		
Methane	50.67	
Ethane	5.23	
Propane	3.68	
Butanes		
Iso-Butane	0.67	
N-Butane	1.27	
Pentanes		
Iso-Pentane	0.46	
N-Pentane	0.41	
Hexanes	1.22	
Heptanes		
TOTAL	100.00	

Volume Sample 7834 cc. at 60 F.
Vol. distilled, % 100.00
Vol. of residue, % 0.00
Recovery, % 100.00
Calc. Sp. Gr. .869
Calc. A.P.I.
Calc. Vapor Press. Lb./Sq. in.

Liquid Content

Method	G.P.M.
Based on Analysis (Butanes)	0.636
Based on Analysis (Pentanes & Heavier)	0.881
Based on Analysis (Propanes)	1.025

Heating Value

Method	Gal.	British Thermal Units Per Cu. Ft. at 14.65 p.s.i. & 60 °F. Dry Basis	Wet Basis
Based on % Composition		861	846

Run by T. M. Simpson Checked by Approved by

Additional Data and Remarks

Exhibit 7

PRELIMINARY PRINT

CORE LABORATORIES, INC. CORE LAB *Petroleum Reservoir Engineering*

COMPANY WM. A. & EDWARD R. [illegible] FILE NO WP-3-149[illegible]
WELL FEDERAL 18 NO. 1 DATE 6-19-60 ENGRS BOONE
FIELD [illegible]MURS FORMATION YATES ELEV 3646' KB
COUNTY LEA STATE NEW MEXICO DRLG. FLD WATER BASE MUD CORES DIAMOND 4 3/8"
LOCATION 1980' FR&NL SEC 19-19-33 REMARKS SAMPLED AS DIRECTED BY CLIENT
[illegible] 7% OIL

COMPLETION COREGRAPH

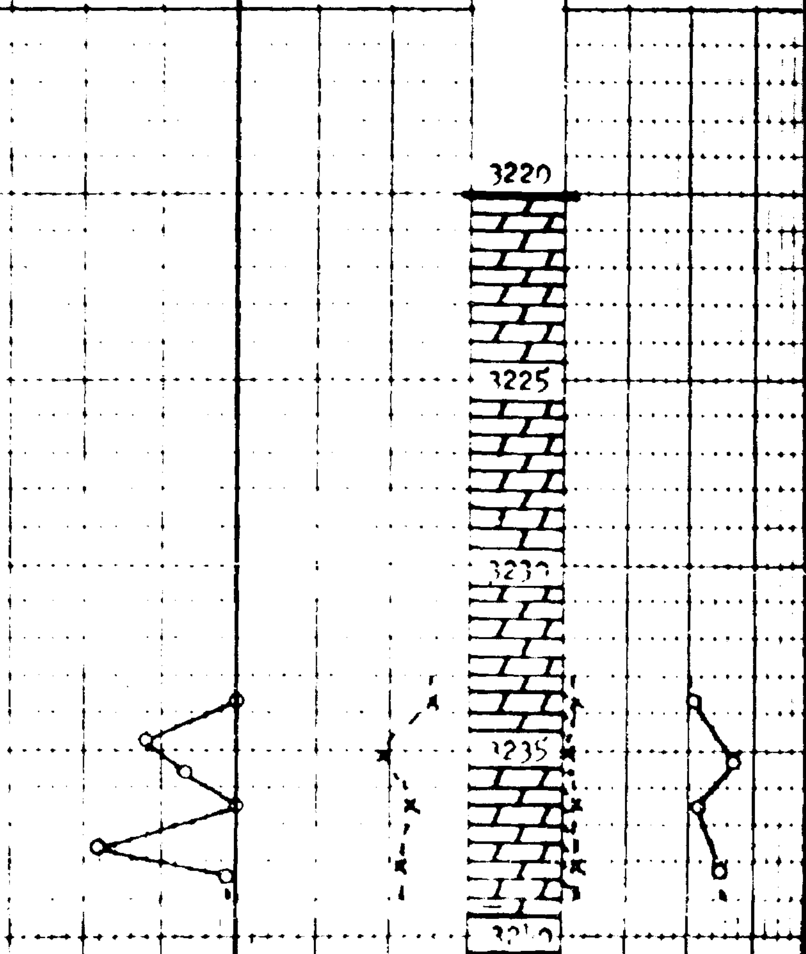
[illegible]

SAND	[sand symbol]	LIMESTONE	[limestone symbol]	CONGLOMERATE	[conglomerate symbol]	CHERT	[chert symbol]	ANHYDRITE
SHALE	[shale symbol]	DOLOMITE	[dolomite symbol]	OOLITES	[oolites symbol]			

SAMPLE CHARACTERISTICS: F: Fractured L: Laminated FG, MG, CG Type Grain Size S: Sty[illegible] V: Vuggy — O: [illegible] W: Water G: Gas T: Transitional

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MD HORIZONTAL MAX.	PERMEABILITY MD HORIZONTAL 90°	POROSITY %	RESIDUAL SATURATION % PORE SPACE OIL	RESIDUAL SATURATION % PORE SPACE TOTAL WATER	
		WHOLE-CORE ANALYSIS					
		SHOW					
1	3233.0-34.5	<0.1	<0.1	4.7	6.0	40.8	FV
2	34.5-35.8	11	3.2	10.3	3.9	31.9	FV
2A		6.4	3.2				
3	3235.8-37.2	<0.1	<0.1	7.3	7.2	45.6	FV
4	37.2-39.0	18	5.7	6.2	7.3	37.1	FV
4A		*1.0	*0.6				

PERMEABILITY O—O MILLIDARCYS 20 10 | POROSITY X---X PERCENT 20 10 | TOTAL WATER O—O PERCENT PORE SPACE 75 50 25 | OIL SATURATION X---X PERCENT PORE SPACE 25 50 75



5	3245.0-46.5	<0.1	<0.1	4.8	6.4	62.5	FV
6	3247.5-49.0	1.4	0.1	10.9	13.5	38.3	V
7	49.0-50.5	*30	*25	11.2	11.7	39.5	FV
8	50.5-52.0	*2.1	*1.4	12.8	11.2	39.1	FV
8A		*1.7	*1.3				
9	3252.0-53.3	288	26	7.8	14.2	38.5	FV
10	53.3-54.7	0.4	0.3	4.3	2.3	90.3	
11	54.7-56.0	<0.1	<0.1	5.4	3.1	89.7	
11A		0.5	0.3				
12	3256.0-57.2	*<0.1	*<0.1	7.2	9.7	67.0	
13	57.2-58.6	0.5	0.4	18.5	16.2	46.3	
14	58.6-60.2	0.4	0.2	14.6	14.4	48.4	
14A		1.6	0.5				
15	5260.2-61.8	0.8	0.4	7.8	9.6	65.0	
15A		0.1	<0.1				
16	5261.8-63.0	*<0.1	*<0.1	7.0	10.0	67.1	
17	3264.0-65.6	93	15	9.8	8.6	47.6	V
17A		1.1	1.0				
18	3265.6-67.0	Sh SHOW	0.3	7.6	14.4	63.1	SF
19	3269.0-70.3	Sh	8.3	7.8	8.8	44.0	FS
20	70.3-71.5	1710	1710	14.5	8.3	39.7	V
21	71.5-73.0	1570	1570				
21A		*6300	*6300				
22	3273.0-74.2	1245	1245	10.8	6.6	27.7	V
23	74.2-75.0	0.1	<0.1	6.2	6.7	72.8	
24	75.0-76.6	1.8	1.1	11.8	10.8	47.5	
24A		32	23				
25	3276.6-78.2	6.0	3.3	10.5	11.3	51.7	
26	78.2-79.0	<0.1	<0.1	6.2	7.8	88.5	
		SHOW					

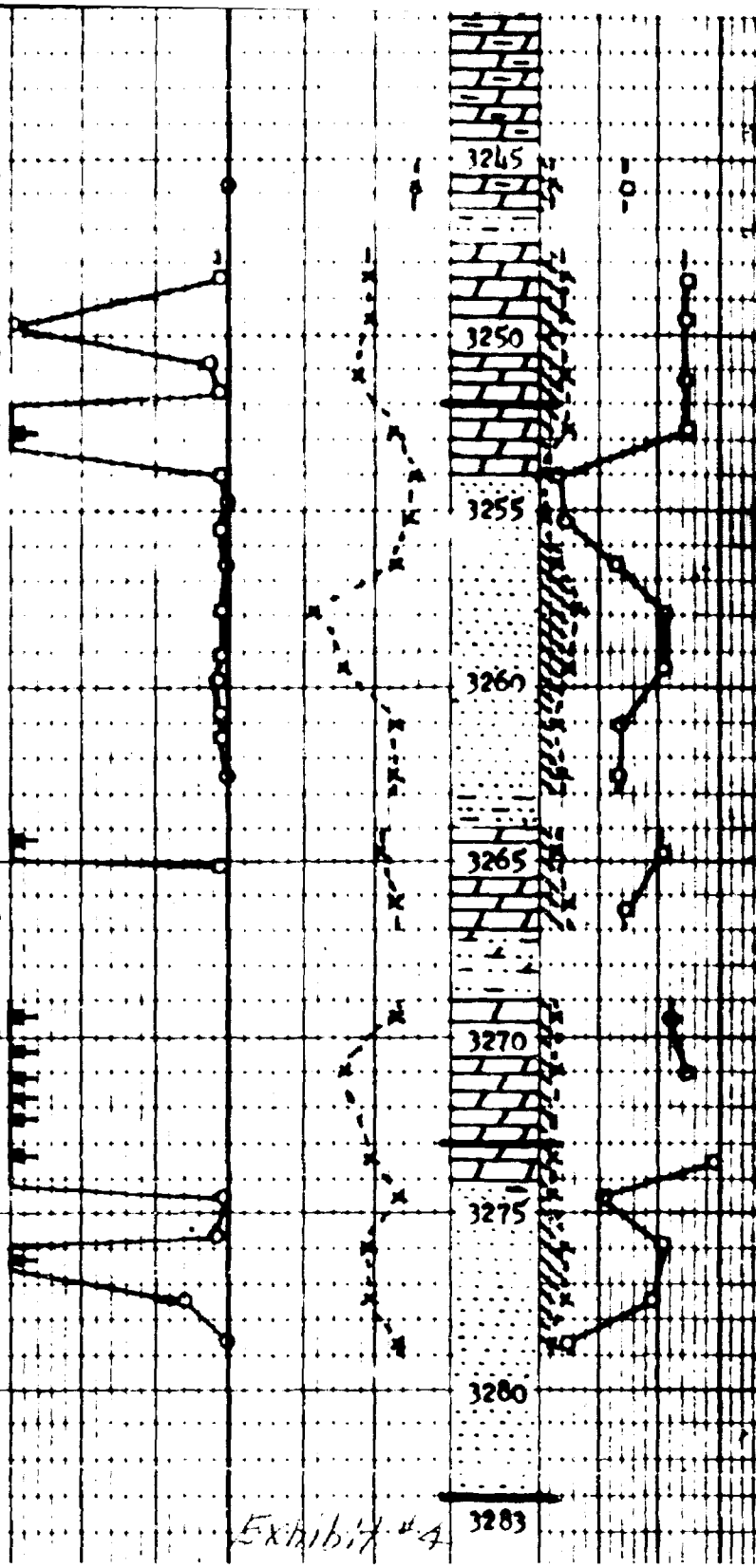
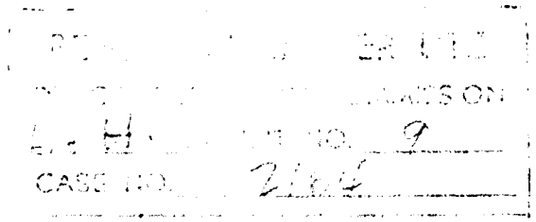


Exhibit #4



WILLIAM A. & EDWARD R. HUDSON - WEST TONTO (YATES-SEVEN RIVERS) POOL

	WELL TESTS					GAS ANALYSES		
WELL	DATE	BBLS.OIL	HRS.	GOR	PRODUCING METHOD	DATE	PERCENT NITROGEN	B.T.U.
Federal 18 #1	7/26/60	22	24	5,814	Continuous	7/25/60	37.58	
	8/2/60	84	24	1,270	"			
	8/3/60	49	20	3,240	"			
	9/5/60	52	1.6	225	Intermitter	9/30/60	8.55	1410
Federal 18 #2	7/24/60	102	24	484	Continuous	7/29/60	12.95	1515
	8/28/60	57	2.3	230	Intermitter			
Federal 18 #3	7/25/60	60	24	17,516	Continuous	9/30/60	35.39	861
	9/8/60	23	3.7	4,210	Intermitter			
Federal 18 #4	11/18/60			872	Pump			
Federal 18 #7	11/26/60	50	6	205	Intermitter			

Exhibit #7

Form 206 1 60

COPY

PHILLIPS PETROLEUM COMPANY
Gasoline Department
Analysis Results Summary

Location Odessa, Texas

Lab. No. 11-344-1
565
Date Run 7-20-60
Date Secured 7-15-60
Time
Sampler's Ident.

A Sample of Sngh. Nat'l Gas, Undesignated Field, Yates & Seven Rivers, Wm. & Ed Hudson Company

Secured from Wells # 1&2-3 Federal "10" Lease
Location S/2 NW & SW NE Sec. 10-19-33 County Lea State New Mexico
Purpose Survey Secured by R. T. O'Neil
Sampling Conditions: Atmos. Temp 79 °F. Pressure on Bomb 14 lbs/sq. in. Bbls. per day
Volume/day Weather conditions at time of sampling
Field Gas Pressure PSIG. Line Pressure PSIG.

Chroma. Analysis 14.65 PSI at 60°F

	Mol. %	Liq. %
Carbon Dioxide		
Oxygen		
Nitrogen	37.[illegible]	
Hydrogen Sulfide	.[illegible]	
Methane	50.67	
Ethane	5.14	
Propane	3.06	
Iso-Butane	.51	
Nor-Butane	1.13	
Iso-Pentane	.44	
Nor-Pentane	.3[illegible]	
Hexanes	.35	
Heptanes Plus	.34	
Total	100.00	100.00

Propane Calc. G.P.M.	.839
Iso Butane Calc. G.P.M.	.166
Nor Butane Calc. G.P.M.	.353
Pentanes Calc. G.P.M.	.589
Test Calc. State	.708
B.T.U. cu. ft. W.B.	.789
Calc. Specific Gravity	.823
Calc. A.P.I. @ 60°F	
Observed A.P.I. At	
$H_2S + CO_2$ by orsat	0.30 %
H_2S grains/100 cu. ft.	267
Mercaptans gr./100 cu. ft.	
Calc. Vap. Press. # sq. in.	
Reid Vap. Press. # sq. in.	
Cu. ft. gas/Gal. Liq.	
Calc. Gasoline Factors	
26-70 Gasoline	0
Excess Butane	0
Excess Propane	0
Excess Ethane & Lighter	0
	100.00

Run by Mason Calculated by Mason
Checked by Rogers Approved by

Additional Data and Remarks
Trap Press. 14#
Gas Temp. 81°
Conventional Trap
Choke 1/8"
Casing Press. 900#
Flo. Tbg. Press. 50#
Oil Gravity 30.0
Wells 2&3 shut in during test
[illegible]

Distribution

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. [illegible]

Exhibit #5

PALS INC

Fractional Distillation Analysis Results Summary

Petroleum Analytical Laboratory Service, Inc

1711 East 8th Street

ODESSA, TEXAS

Ph. FE 2-4767

No.
Run No. 2188 — —
DATE OF RUN 8-31-60
Date Secured 8-30-60

A Sample of WILLIAMS EDWARDS HUDSON FEDERAL 28 #1
Secured from Ralph L. Gray
At 201 Carper Bldg. Artesia, N. M. Secured by L. M. Ward
Time 9 am Date 8-30-60
Sampling conditions Temp. 78°
Press. 25#

FRACTIONAL DISTILLATION

Percentage Composition

	MOL%	LIQ. %
Carbon Dioxide	1.48	
Air		
Nitrogen	8.55	
Oxygen		
Hydrogen sulf.	1.82 (960 grs.)	
Hydrogen		
Methane	50.16	
Ethane	18.75	
Propane	15.03	
Butanes		
Iso-Butane	0.76	
N-Butane	1.07	
Pentanes		
Iso-Pentane	0.92	
N-Pentane	0.71	
Hexanes plus	1.05	
Heptanes		
TOTAL	100.00	

Volume Sample 7698 gms. c.c. at 60 °F.
Vol. distilled, % 100.00
Vol. of residue, % 0.00
Recovery, % 100.00
Calc. Sp. Gr. .942
Calc. A.P.I.
Calc. Vapor Press. Lb./Sq. In.

Liquid Content

Method	G.P.M.
Based on Analysis (Butanes)	[illegible]
Based on Analysis (Pentanes & Heavier)	1.079
Based on Analysis (Propanes)	4.187

Heating Value

British Thermal Units Per Cu. Ft. at 14.65 p.s.i. at 60 °F

Method	Gal.	Dry Basis	Wet Basis
Based on % Composition		1410	1385

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO.
CASE NO.

Run by T. M. Simp... Checked by Approved by [signature]

Additional Data and Remarks

Exhibit 6

2129
5-31-60
6-10-60

WILLIAMS EDWARDS HUDSON FEDERAL #3
Submitted by: Ralph L. Gray
At: 201 Carper Bldg. Artesia, N. M.
Secured by: L. H. Ward
Time: 10:45 am — 5-31-60
Sampling conditions: Temp. 78°
Press. 15#

FRACTIONAL DISTILLATION

Percentage Composition

	MOL %	LIQ. %
Carbon Dioxide	0.61	
Air		
Nitrogen	36.39	
Oxygen		
Hydrogen sulf.	0.39	
Hydrogen		
Methane	50.67	
Ethane	5.25	
Propane	2.68	
Butanes		
Iso-Butane	0.67	
N-Butane	1.17	
Pentanes		
Iso-Pentane	0.46	
N-Pentane	0.41	
Hexanes	1.22	
Heptanes		
TOTAL	100.00	

Volume Sample	7036 cc.	at 68
Vol. distilled, %	100.00	
Vol. of residue, %	0.00	
Recovery, %	100.00	
Calc. Sp. Gr.	.849	
Calc. A.P.I.		
Calc. Vapor Press.		Lb. Sq. In.

Liquid Content

Method	G.P.M.
Based on Analysis (Butanes)	5.656
Based on Analysis (Pentanes & Heavier)	0.661
Based on Analysis (Propanes)	1.025

Heating Value

British Thermal Units Per Cu. Ft. at 14.65 p.s.i. at 60°F

Method	Cal.	Dry Basis	Wet Basis
Based on % Composition		861	846

Run by: E. M. Simpson — Checked by — Approved by: [signature]

Additional Data and Remarks

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. ______
CASE NO. ______

Exhibit # 7

DOCKET: EXAMINER HEARING - WEDNESDAY, JANUARY 25, 1961

OIL CONSERVATION COMMISSION - 9 a.m., CONFERENCE ROOM - STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Elvis A. Utz Examiner, or Oliver E. Payne, attorney, as alternate examiner:

CASE 2159: Application of Continental Oil Company for three non-standard gas proration units. Applicant, in the above-styled cause, seeks the establishment of the following-described non-standard gas proration units in the Jalmat Gas Pool, Lea County, New Mexico:

A 320-acre non-standard gas proration unit consisting of the W/2 E/2 and E/2 W/2 of Section 19, Township 25 South, Range 37 East, to be dedicated to the Sholes B-19 Well No. 1, located in the center of the SE/4 SW/4 of said Section 19.

A 320-acre non-standard gas proration unit consisting of the E/2 and NE/4 NW/4 of Section 1, Township 25 South, Range 36 East, to be dedicated to the Wells B-1 Well No. 1, located in the center of the NE/4 NE/4 of said Section 1.

A 360-acre non-standard gas proration unit consisting of the SE/4, E/2 W/2 and SW/4 SW/4 of Section 29, Township 22 South, Range 36 East, to be dedicated to the Meyer A-29 Well No. 3, located in the center of the SE/4 SW/4 of said Section 29.

CASE 2160: Application of Continental Oil Company for a quadruple completion. Applicant, in the above-styled cause, seeks an order authorizing the quadruple completion of its Northeast Haynes-Apache 9 No. 1 Well, located in the NW/4 SW/4 of Section 9, Township 24 North, Range 5 West, Rio Arriba County, New Mexico, in such a manner as to permit the production of hydrocarbons from the Greenhorn formation through a string of 2 7/8-inch casing, the production of hydrocarbons from the Dakota formation through 2 3/8-inch tubing installed within a string of 4 1/2-inch casing, the production of hydrocarbons from the Mesaverde formation through the 2 3/8 x 4 1/2-inch annulus of the latter casing string, and the production of hydrocarbons from the Gallup formation through 2 3/8-inch tubing installed within a second string of 4 1/2-inch casing, the three strings of casing being cemented in a common well bore.

CASE 2161: Application of Texaco, Inc. for a triple completion. Applicant, in the above-styled cause, seeks an order authorizing the triple completion of the C. H. Weir "B" Well No. 4, located in Unit I, Section 11, Township 20 South, Range 37 East, Lea County, New Mexico, in such a manner as to permit the production of gas from the Eumont Gas Pool, the production of oil from the Skaggs-Glorieta Pool and the production of oil from the Skaggs-Drinkard Pool through the casing-tubing annulus, through 2 3/8-inch tubing, and through 2 3/8-inch tubing respectively.

CASE 2162: Application of The Atlantic Refining Company for an automatic custody transfer system. Applicant, in the above-styled cause, seeks permission to install an automatic custody transfer system to handle the commingled Justis Tubb-Drinkard and Justis-Blinebry production from the following-described leases:

Langlie Federal Lease, N/2 SE/4 of Section 14

Langlie Federal "A" Lease, S/2 NE/4 of Section 14

Langlie Federal "B" Lease, N/2 NE/4 of Section 14

all in Township 25 South, Range 37 East, Lea County, New Mexico.

CASE 2163: Application of Yates Drilling Company for an automatic custody transfer system. Applicant, in the above-styled cause, seeks permission to install an automatic custody transfer system to handle the Pennsylvanian formation production from all wells presently completed or hereafter drilled on Federal Lease NM 03283, comprising the W/2 of Section 31, Township 8 South, Range 37 East, Roosevelt County, New Mexico.

CASE 2164: Application of Hudson and Hudson for an exception to Rule 506 (A) of the Commission Rules and Regulations and for permission to transfer allowables. Applicant, in the above-styled cause, seeks an exception to Rule 506 (A) by increasing the limiting gas-oil ratio for the West Tonto Yates Seven Rivers Pool, Lea County, New Mexico, from 2,000 to 6,000 cubic feet of gas per barrel of oil. Applicant further seeks permission to shut-in one well in said pool and transfer its allowable to another well.

CASE 2165: Application of Pan American Petroleum Corporation for two unorthodox oil well locations and a non-standard oil proration unit. Applicant, in the above-styled cause, seeks approval of two unorthodox oil well locations in the Cha Cha-Gallup Oil Pool, San Juan County, New Mexico, said locations to be as follows.

Navajo Tribal "E" Well No. 7, to be located 250 feet from the South line and 800 feet from the West line of Section 16.

Navajo Tribal "G" Well No. 5, to be located 1830 feet from the South line and 885 feet from the East line of Section 18, both in Township 29 North, Range 14 West.

Applicant also seeks an 88.7-acre non-standard oil proration unit in said pool comprising that portion of the SW/4 of Section 16, within the Navajo Reservation lying South of the mid-channel of the San Juan River, Township 29 North, Range 14 West, to be dedicated to said Navajo Tribal "E" Well No. 7.

CASE 2166: Application of Pan American Petroleum Corporation for permission to take interference tests and transfer allowables. Applicant, in the above-styled cause, seeks permission to take interference tests in the Cha Cha-Gallup Oil Pool, San Juan County, New Mexico, by shutting in its Navajo Tribal "E" Well No. 3, located in the NE/4 SW/4 of Section 21, Township 29 North, Range 14 West and transferring the allowable of said well in equal parts to the other five wells on the said Navajo "E" Lease.

CASE 2167: Application of Chambers & Kennedy for a 200-acre non-standard gas proration unit and for an unorthodox gas well location. Applicant, in the above-styled cause, seeks the establishment of a 200-acre non-standard gas proration unit in the Eumont Gas Pool, Lea County, New Mexico, comprising the NE/4 NE/4, S/2 NE/4, and the N/2 SE/4 of Section 34, Township 19 South, Range 37 East. Said unit is to be dedicated to the Monument State Well No. 1, located on an unorthodox location at a point 1649 feet from the South line and 2197 feet from the East line of said Section 34.

CASE 2168: Application of Continental Oil Company for permission to shut-in one well and transfer its allowable to other wells. Applicant, in the above-styled cause, seeks permission to shut-in its Wilder Well No. 20, located 1980 feet from the South and East lines of Section 26, Township 26 South, Range 32 East, El Mar-Delaware Pool, Lea County, New Mexico, and transfer its allowable to the following offset wells in said Section 26: Wilder Lease Well Nos. 17, 18, 22 and 25.

CASE 2169: Application of Gulf Oil Corporation for a salt water disposal well. Applicant, in the above-styled cause, seeks an order authorizing the disposal of produced salt water into the Grayburg and San Andres formations through its J. F. Janda "F" Well No. 17, located in Unit A, Section 4, Township 22 South, Range 36 East, Lea County, New Mexico, with the proposed injection interval from 3999 feet to 5650 feet.

CASE 2170: Application of Amerada Petroleum Corporation for an amendment of Order R-1750. Applicant, in the above-styled cause, seeks an amendment of Order No. R-1750, which authorized the triple completion of its Wimberly Well No. 13, located in Unit M, Section 24, Township 25 South, Range 37 East, NMPM, Lea County, New Mexico, to substitute an undesignated oil pool, probably Paddock, for the Langlie-Mattix which was previously authorized. Applicant also proposes to use three parallel strings of tubing rather than two as provided in Order R-1750.

APPLICATION OF WILLIAM A. & EDWARD R. HUDSON FOR AN EXCEPTION TO RULE 506(A) AND FOR AUTHORIZATION TO TRANSFER ALLOWABLE IN THE WEST TONTO (Y-SR) POOL

APPLICANTS WILLIAM A. AND EDWARD R. HUDSON, 1810 Electric Building, Fort Worth, Texas, respectfully show:

1. That they are Operators of Oil and Gas Leases LC-067847 and LC-064790, insofar as they cover the following land in Lea County, New Mexico, above the base of the Grayburg Formation:

Township 19 South, Range 33 East
Section 18: All

2. That the West Tonto (Y-SR) Pool has a very substantial part of the reservoir porosity filled with gas overlying the oil.

3. That the gas has a very high Nitrogen content, making its use as a marketable gas questionable.

4. That the reservoir rock has a vuggy and fractured type of porosity, which permits easy vertical communication.

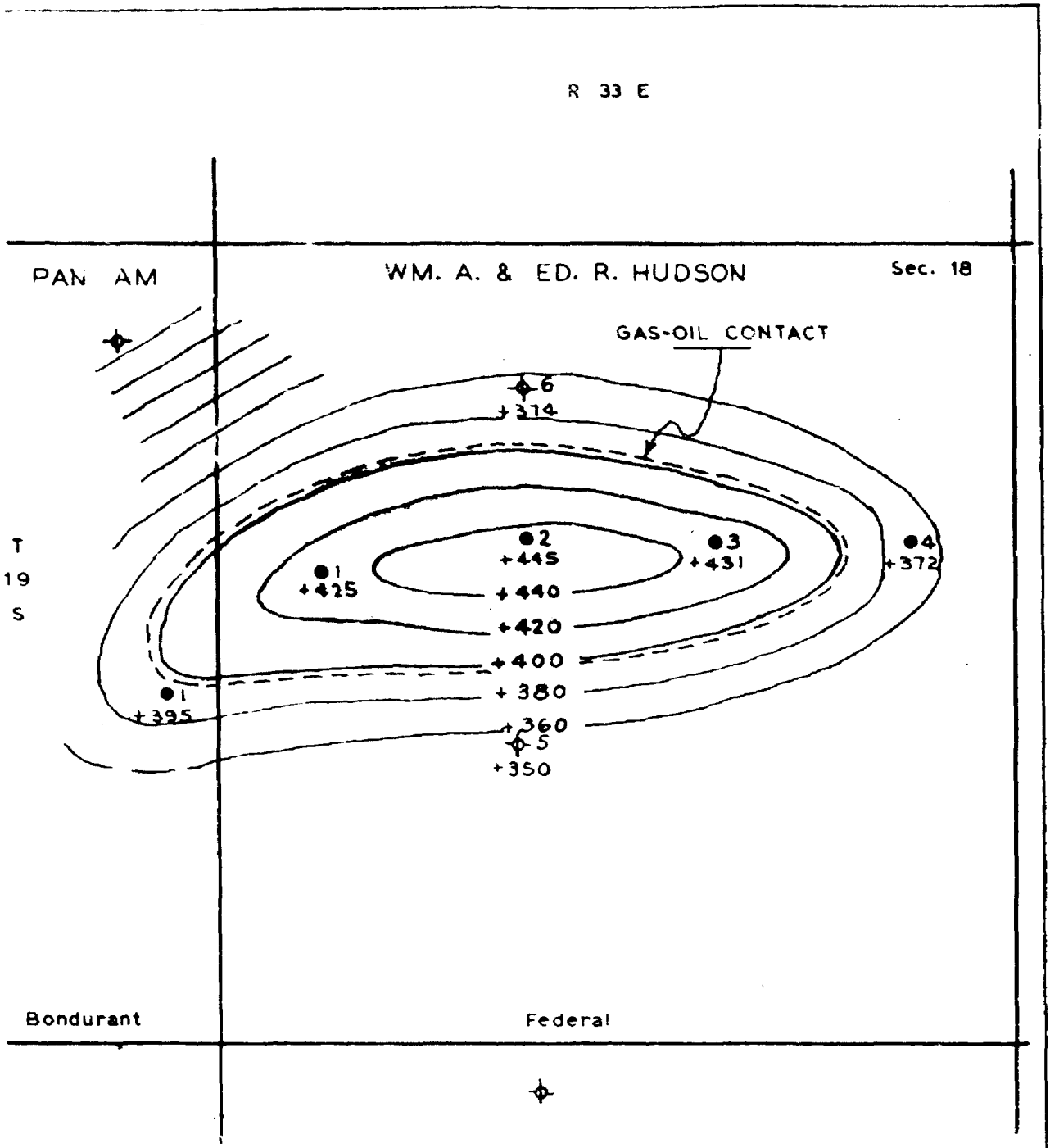
5. That due to the characteristics, the limiting gas-oil ratio should be raised from 2,000 to 6,000 cubic feet per barrel in order to prevent undue hardships from gas-oil ratio penalties.

6. That in order to conserve reservoir energy, the Commission is asked to transfer the allowable from Federal 18 Well #3, to Federal 18 Well #2.

7. That the producing of this extra allowable from Well #2 can be done without creating waste and will conserve the reservoir energy.

WHEREFORE, the Applicants pray that after due consideration, the Commission change the limiting gas-oil ratio for the West Tonto (Y-SR) Pool from 2,000 to 6,000 cubic feet per barrel, and authorize the transfer of allowable from Well #3 to Well #2.

Respectfully submitted,
WILLIAM A. & EDWARD R. HUDSON
By: Edward R Hudson



WEST TONTO (Y-SR) POOL

Lea County, New Mexico

CONTOURED ON TOP OF POROUS DOLOMITE

Scale 1" = 1000' Sept. 15, 1960

Case 2164
Heard 1-25-61
1-30-61

1. This application is contrary to the usual OCC policy in regard to the handling of Gas cap reservoirs i.e. the raising of GOR's to increase oil production and gas production as well as to transfer of allowables from one 40 Ac. proration unit to another rather than to remedy the GOR of the ailing well. While it is true that the well to which allowable is requested to be transfered is completed well into the oil zone, the fact that the allowable would be doubled would be likely to cause excessive GOR in the future. Also this is a perforation which has never been allowed heretofore and one which could prove to be dangerous to the principals of conservation as well as to cause the commission many more similar applications. It is my opinion that each 40 Ac. proration unit should stand on its own.

It appears that the 6000 GOR is not attained at this time as the operator is using intermitter which successfully keeps GOR to a figure well below the present 2000:1 with the exception of the #3 well which is 4200:1.

(over)

The applicant also requested that if
their was to be a no-flare provision
put in this order they would prefer
denial.

A 6000:1 GOR would certainly
cause the flaring of a larger volume
of Gas.

I therefore recommend denial of
this application in the interest of
conservation.

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

MEMORANDUM

TO: Governor Mechem and Commissioner Walker

FROM: A. L. Porter, Jr., Secretary-Director

SUBJECT: Commission Order R-1868

This order is a denial of an application by Hudson & Hudson to increase the gas-oil ratio limits in an Eddy County pool from 2000 to 1 to 6000 to 1, and to allow them to shut-in a well with an excessive ratio and transfer its allowable to another well on the lease.

We feel that the application should be denied in the interest of conservation. The increase in G.O.R. limit would allow a much more rapid dissipation of reservoir energy as well as the flaring of a much greater volume of gas. In the matter of allowable transfer, there was little evidence that it would result in efficient drainage.

ALP/ir

February 9, 1961

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. 2164
Order No. R-1868

APPLICATION OF HUDSON AND HUDSON
FOR AN EXCEPTION TO RULE 506 (A) OF
THE COMMISSION RULES AND REGULATIONS
AND FOR PERMISSION TO TRANSFER ALLOW-
ABLES IN THE WEST TONTO YATES-SEVEN
RIVERS POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on January 25, 1961, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 9th day of February, 1961, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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, Hudson and Hudson, seeks an exception to Rule 506 (A) by increasing the limiting gas-oil ratio for the West Tonto Yates-Seven Rivers Pool, Lea County, New Mexico, from 2,000 to 6,000 cubic feet of gas per barrel of oil, and further seeks permission to shut-in its Federal 18 Well No. 3 producing from said pool and transfer its allowable to its Federal 18 Well No. 2.

(3) That approval of the subject application would not be in the best interests of conservation.

IT IS THEREFORE ORDERED:

That the subject application is hereby denied.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

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

esr/

GOVERNOR

JOHN BURROUGHS
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
MURRAY E. MORGAN
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY DIRECTOR

P. O. BOX 871
SANTA FE

February 9, 1961

Mr. Jason Kellahin
Kellahin & Fox
Box 1713
Santa Fe, New Mexico

Re: Case No. 2164
Order No. R-1368
Applicant:
Hudson & Hudson

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.,
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC

Other

CORE LAB — **PRELIMINARY PRINT**

CORE LABORATORIES, INC. *Petroleum Reservoir Engineering*

COMPANY WM. A. & EDWARD R. HUDSON — FILE NO. WP-3-1196
WELL FEDERAL 18 NO. 3 — DATE 6-19-60 — ENGRS BOONE
FIELD [illegible] — FORMATION YATES — ELEV 3646' KB
COUNTY LEA — STATE NEW MEXICO — DRLG. FLD. WATER BASE MUD — CORES DIAMOND 4 3/8"
LOCATION 1980' FN&SL SEC 19-19-33 — REMARKS SAMPLED AS DIRECTED BY CLIENT
71 [illegible]

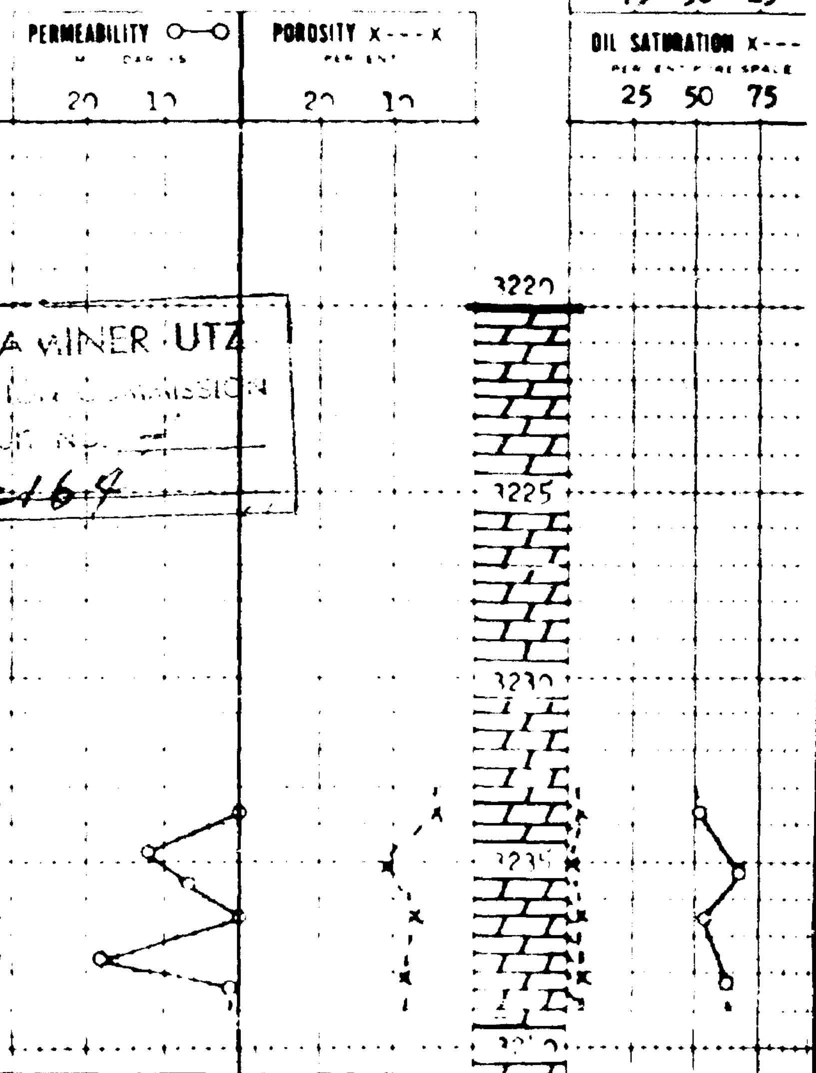
COMPLETION COREGRAPH

[illegible fine print]

SAND — LIMESTONE — CONGLOMERATE — CHERT — ANHYDRITE
SHALE — DOLOMITE — OOLITES

SAMPLE CHARACTERISTICS: F Fractured L Laminated FG, MG, CG Type Grain Size S [illegible] V Vugs [illegible] O [illegible] W Water G Gas T Transition

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MD. HORIZONTAL MAX.	PERMEABILITY MD. HORIZONTAL 90°	POROSITY %	RESIDUAL SATURATION % PORE SPACE OIL	RESIDUAL SATURATION % PORE SPACE TOTAL WATER	V
	WHOLE-CORE ANALYSIS						
	SHOW						
1	3233.0-34.5	<0.1	<0.1	4.7	6.0	[illegible].8	FV
2	34.5-35.8	11	3.2	10.3	3.9	31.9	FV
2A		6.4	3.2				
3	3235.8-37.2	<0.1	<0.1	7.3	7.2	[illegible].6	FV
4	37.2-39.0	18	5.7	[illegible].2	7.3	37.1	FV
4A		*1.0	*0.6				



BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
[illegible] EXHIBIT NO. [illegible]
CASE NO. 2164

5	3245.0-46.5	<0.1	<0.1	4.8	6.4	62.5	FV
6	3247.5-49.0	1.4	0.1	10.9	13.5	38.3	V
7	49.0-50.5	•30	•25	11.2	11.7	39.5	FV
8	50.5-52.0	•2.1	•1.4	12.8	11.2	39.1	FV
8A		•1.7	•1.3				
9	3252.0-53.3	288	26	7.8	14.2	38.5	FV
10	53.3-54.7	0.4	0.3	4.3	2.3	90.3	
11	54.7-56.0	<0.1	<0.1	5.4	3.1	89.7	
11A		0.5	0.3				
12	3256.0-57.2	•<0.1	•<0.1	7.1	9.7	67.0	
13	57.2-58.6	0.5	0.4	18.5	16.2	46.3	
14	58.6-60.2	0.4	0.2	14.6	14.4	48.4	
14A		1.6	0.5				
15	5260.2-61.8	0.8	0.4	7.8	9.6	65.0	
15A		0.1	<0.1				
16	5261.8-63.0	•<0.1	•<0.1	7.0	10.0	67.1	
17	3264.0-65.6	93	15	9.8	8.6	47.6	V
17A		1.1	1.0				
18	3265.6-67.0	SH	0.3	7.6	14.4	63.1	SF
		SHOW					
19	3269.0-70.3	SH	8.3	7.8	8.8	44.0	FS
20	70.3-71.5	1710	1710	14.5	8.3	39.7	V
21	71.5-73.0	1570	1570				
21A		•6300	•6300				
22	3273.0-74.2	1245	1245	10.8	6.6	27.7	V
23	74.2-75.0	0.1	<0.1	6.2	6.7	72.8	
24	75.0-76.6	1.8	1.1	11.8	10.8	47.5	
24A		32	23				
25	3276.6-78.2	6.0	3.3	10.5	11.3	51.7	
26	78.2-79.0	<0.1	<0.1	6.2	7.8	86.5	
		SHOW					

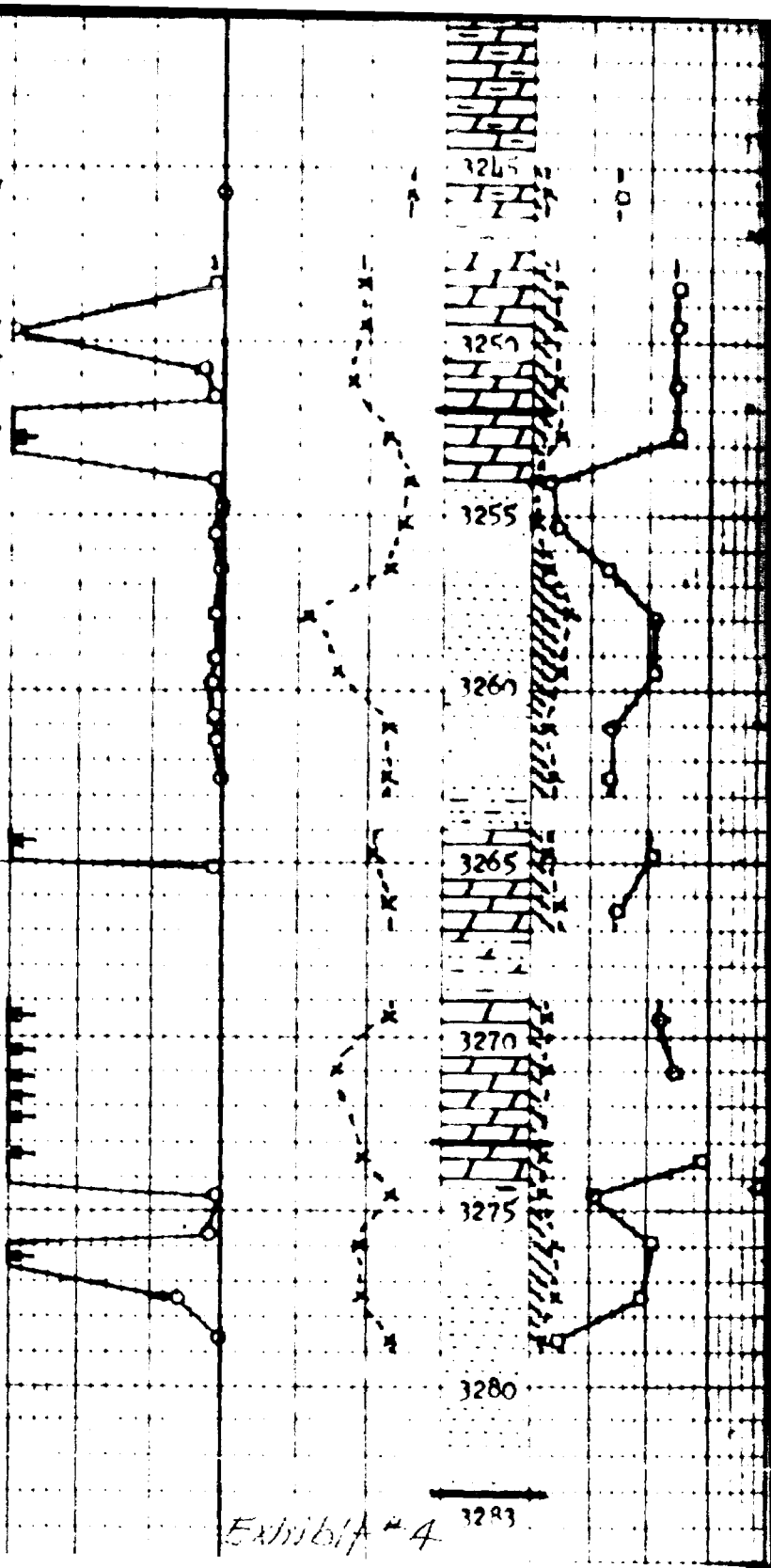
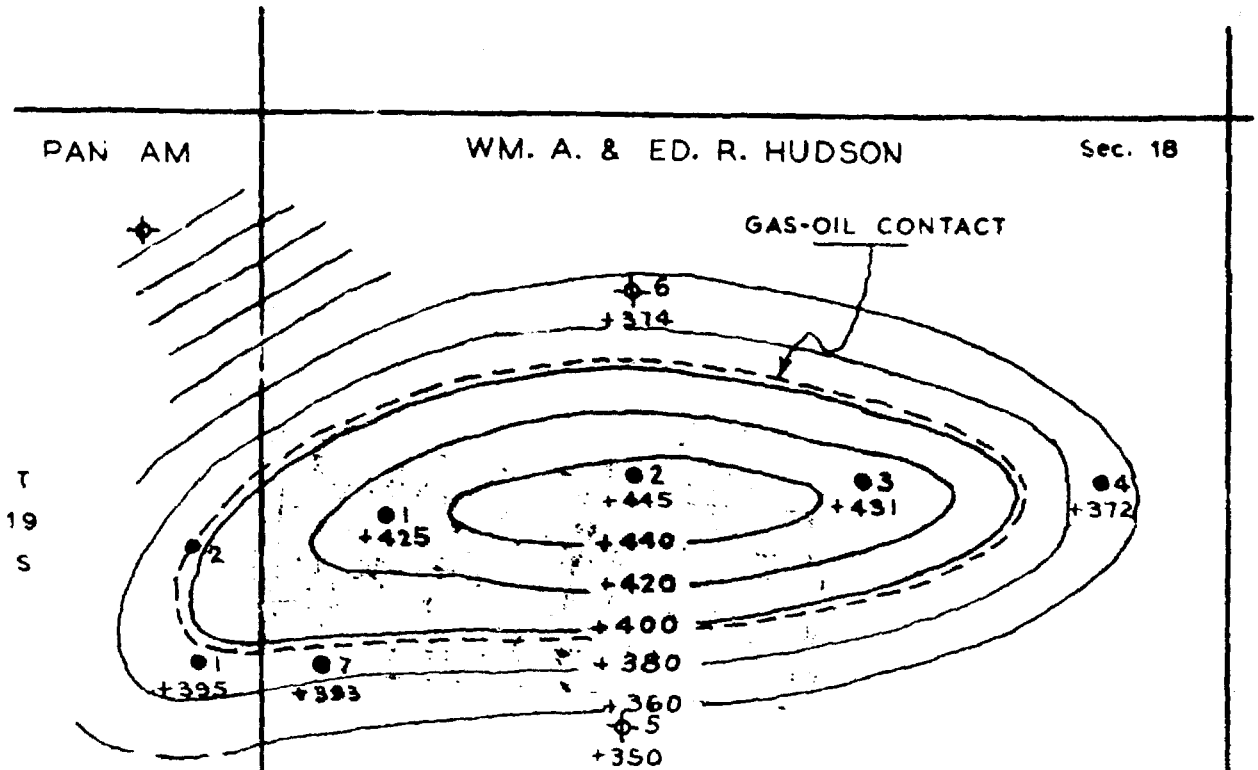


EXHIBIT 4

R 33 E



BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 1
CASE NO. 2164

WEST TONTO (Y-SR) POOL

Lea County, New Mexico

CONTOURED ON TOP OF POROUS DOLOMITE

Scale 1"= 1000' Sept. 15, 1960

Exhibit #1

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 25, 1961

EXAMINER HEARING

IN THE MATTER OF:

Application of Hudson and Hudson for an exception to Rule 506 (A) of the Commission Rules and Regulations and for permission to transfer allowables. Applicant, in the above-styled cause, seeks an exception to Rule 506 (A) by increasing the limiting gas-oil ratio for the West Tonto Yates Seven Rivers Pool, Lea County, New Mexico, from 2,000 to 6,000 cubic feet of gas per barrel of oil. Applicant further seeks permission to shut-in one well in said pool and transfer its allowable to another well. Case 2164

BEFORE:

Elvin A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. PAYNE: Application of Hudson and Hudson for an exception to Rule 506 (A) of the Commission Rules and Regulations and for permission to transfer allowables.

MR. KELLAHIN: Jason Kellahin, representing the applicant. We will have one witness.

(Witness sworn.)

MR. UTZ: Any other appearances in this case?

RALPH L. GRAY,

called as a witness, having been previously duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Ralph L. Gray.

Q Are you a consulting engineer, Mr. Gray?

A Yes, sir.

Q Have you testified before the Oil Conservation Commission as a petroleum engineer?

A I have.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. UTZ: Yes, they are.

Q Mr. Gray, are you connected in any way with Hudson and Hudson?

A Yes. I am a consultant for them.

Q Are you familiar with the application in Case No. 2164?

A Yes, I am.

Q Will you state briefly what is proposed in this application?

A It is proposed to raise the limiting gas-oil ratio from 2,000 cubic feet per barrel, which is the Statewide rule, to 6,000 cubic feet per barrel. It is also requested that the allowable from the Hudson Federal 18 Well No. 3 be transferred to their well No. 2.

Q Referring you to what has been marked as Exhibit No. 1, will you discuss that exhibit, please?

A Exhibit No. 1 is a map of the area. It shows the location of the West Tonto (Yates-Seven Rivers) Pool and, principally, it is located in Section 18, Township 19 South, Range 33 East. This map shows the structural contours on top of the porous dolomite. As will be shown on the map, there are five producing wells on the Hudson lease, and two wells on the Pan American Bondurant lease, for a total of seven producing wells in the field.

Q Is that all the producing wells in this pool?

A Yes, sir.

Q Now, referring to what has been marked as Exhibit No. 2, would you discuss the information shown on that exhibit?

A Exhibit No. 2 shows the well data for all of the Hudson wells. These wells were completed last year, from April through October, 1960. Most of them were drilled to a depth of approximately 3300 feet. The initial potentials are shown on this sheet. Five and a half casing, generally, was set to the bottom, and the pay was perforated. This table shows the perforated intervals, also the treatment is shown for each well, and the treatments required were very small amounts of acid just to clean the wells up.

Q Could you, on the basis of an exhibit you prepared, discuss the reservoir conditions in Exhibit 3?

A Exhibit No. 3 is a cross section, west to east cross section through the field, and the yellow portion shown on the map represents the space that is filled with gas. It has an original gas cap present. There are gamma ray neutron logs shown for each

well. Then the blue portion on each end of the cross section represents what we think is the approximate water table. Apparently there is water existing in the lower portions of the field.

This cross section also shows the intervals that are perforated in each well, and shows the location of the casing, and so forth. The space shown between the yellow, gas cap, and the water interval represents the volume of the reservoir that is saturated with oil.

Q Will you discuss briefly the perforation intervals as shown on this exhibit in each of the wells?

A Generally speaking, the wells are perforated low or in the middle portion of the oil saturated section. The gas cap was determined very early in the drilling of these wells, so an effort has been made to keep these perforations fairly low in the oil section, away from the gas cap.

Q Are any of the wells in the area making water?

A Yes, sir. The Well No. 4, shown on the extreme right of the cross section makes approximately 15% water.

Q Would you describe the nature of this gas cap and the market possibilities for the gas that is available?

A Well, first of all, on the cross section it is evident that the gas cap occupies a very substantial part of the reservoir, both in area and in thickness. It is a very sour gas. It also has a very high nitrogen content, and --

Q Before we get into that, do you have any core information on the No. 4 well, or any of the wells?

A Yes. We have core data on, I think, three or four of the wells.

Q Is that marked as Exhibit No. 4?

A Yes, sir, that's right.

Q Would you discuss the information shown on that exhibit?

A Exhibit No. 4 shows a core analysis graphically through all of the section on Well No. 3, and I think the pertinent thing about this is that it will be noted that the permeabilities are very high. Permeabilities range as high as 6300 millidarcies, and the cores were found to be a very vuggy type of material, large holes existing, and fractures, and there is very good communication as evidenced by these high permeabilities. I think that is the main thing that this core graph shows.

Q Were you discussing the gas analysis? Would you continue your discussion of that?

A As I mentioned, it has been found that the gas content of the gas cap has a very high nitrogen content, which makes it of a questionable commercial value. I can comment on each one of these three analyses we have.

Q Are those Exhibits 5, 6 and 7?

A Yes, sir, that's right.

Q Would you discuss those?

A Exhibit 5 is a gas analysis taken by Phillips Petroleum Company in July, 1960, on the well No. 1, and this will show that the nitrogen content of this well at the time the analysis

was taken was above 37% nitrogen.

On Exhibit No. 6, which is also Well No. 1, this was taken several months later at a time when there had been a change in operating conditions, and the gas-oil ratio in the well had been lowered. It will be noted that the nitrogen content is only 8.55%, which indicates that there is less gas from the cap being produced. This analysis also shows the hydrogen sulfide content of 960 grains per 100 cubic feet, which is a very sour gas.

Exhibit No. 7 is an analysis on Well No. 3, and this well has a high gas-oil ratio which we know from performance indicates it is producing gas cap gas, and the nitrogen on this well was above 35%.

Q Does the nitrogen content have any effect on the marketability of the gas?

A Yes, it does. It lowers the BTU content. On this last analysis it was only about 800 BTU, which is below normal gas and below the usual contract requirements.

Q Is there gas line facilities available in the area?

A No, there are not.

Q Referring to what has been marked as Exhibit No. 8, would you discuss that exhibit, please?

A I am sorry, we only have two maps of that. We couldn't get a third one, but Exhibit No. 8 shows a very large area in Southeast New Mexico, and the purpose of that map is just to show the vicinity and the West Tonto (Yates-Seven Rivers) Pool is indicated by the red portion on the map. This shows the closest dis-

tance to any gas gathering facilities that we know about at this time. It is approximately six miles from the field, in a northerly direction to the E. K. Queen Field where gathering facilities are available, and it is approximately seven miles in a northwesterly direction to the Shugart Field, which has gathering facilities, so this shows that we aren't very close to any gathering facilities that I know about.

Q Has any effort been made to secure a market for the gas that is available?

A Yes. Last July the Phillips Petroleum Company took a sample of the gas and made the analysis, which was included as one of these exhibits, and since then they have never expressed any interest in purchasing this gas.

Q Have any well tests been made on the wells?

A Yes.

Q Referring to what has been marked as Exhibit 9, would you discuss the information shown on that exhibit?

A Exhibit No. 9 shows various well tests, dates, which have been made on each one of the Hudson wells, and along with this information it also shows some pertinent data on gas analyses made at about the same time. I think the important thing on this table is a comparison of the gas-oil ratios on some of these tests, and the nitrogen content that was shown to exist at those times. For instance, on Well No. 1 we had a gas-oil ratio problem to start with. The gas-oil ratio to start with was 5,514 cubic feet per

barrel. At this time the well was being produced by continuous flow, and the nitrogen content as shown by gas analysis was 37.58%. Then, later on, we tried various producing methods in an effort to reduce the gas-oil ratio, and approximately two months later it was found that by flowing this well on intermitter it was possible to reduce the gas-oil ratio to 225 cubic feet per barrel, and at this time another analysis of the gas was made which showed the low nitrogen content of 8.55%. Then, on Well No. 2 it will be noted that this is one of the few wells where we haven't really had a gas-oil ratio problem. The gas-oil ratio has varied from 230 to 484 cubic feet per barrel, and some of these tests were conducted up as high as 102 barrels of oil per day, which shows that this well is capable of producing much more than one or two top allowables.

Well No. 3 has had a gas-oil ratio problem from the start. The ratio has been as high as 17,516 cubic feet per barrel where it was produced on continuous flow, and you will note, also, that the nitrogen content was high at that rate, signifying that some of the gas was produced from the gas cap. Then, the lowest ratio on this well was 4,210 by intermitter control, which is well above the present limiting gas-oil ratio and causes the well to be penalized. I think those are the pertinent points on this table.

Q Mr. Gray, assuming the Commission should approve the request as shown in this application, what would be the approximate volume of gas produced from the five wells on the Hudson & Hudson lease?

A At the present time there would be approximately 50 MCF per day of gas produced.

Q Do you think this volume is sufficient to interest a gatherer to come into the area under present conditions?

A I wouldn't think so.

Q In the event the gas-oil ratios were to increase substantially in the future, would the chances of obtaining a market be improved?

A I think so. I think the gas gatherers would be more interested in coming into the area in that event.

Q Would your answer be the same if the Commission did not remove it, or increase the limiting gas-oil ratio?

A There wouldn't be as much likelihood for a gatherer to come in because the volumes would be lower, and there wouldn't be as much chance for the thing to be economical.

Q Under your present limiting gas-oil ratio of 2,000 cubic feet per barrel, are you suffering the penalty on the allowable?

A Yes, sir. On Well No. 3, at the present time the penalized allowable on that well is 17 barrels of oil per day, even though this is a new well and capable of producing well above top allowable.

Q Does that make that well an economical operation?

A Yes, sir, it is economical to operate, but the pay out on the well will be very slow.

Q Because of the nature of the reservoir, do you expect the

gas-oil ratios in the other wells to increase substantially?

A Yes, I think they will, and probably within a very short time. I think the fact that the character of the formation is a very vuggy type of material, and there are fractures existing, I expect the gas-oil ratios to increase very rapidly.

Q In such an event would this create any further hardship on the operator?

A Yes. Under the existing limiting gas-oil ratio it could cause a hardship and could result in his investment being recovered over a very long period of time.

Q In your opinion, is a limiting gas-oil ratio of 6,000 cubic feet per barrel of oil a reasonable limit for this field?

A Yes, sir, at the present time.

Q Mr. Gray, in your opinion will the granting of a 6,000 to one ratio have any affect on the ultimate recovery of oil from this pool?

A No, sir, I don't think so, because, first of all, I think it is an impossibility to recover the oil from this reservoir without producing with a very high ratio over the life of the pool.

Q You base that on the nature of the reservoir?

A Yes, sir.

Q Its characteristics?

A Yes, sir. By the nature of the reservoir and the relatively thin column of oil existing.

Q In the application you are also asking for transfer of the

allowable from the No. 3 well to the No. 2 well; would this result in a conservation of the reservoir energy?

A Yes, it would. By transferring the allowable less space in the reservoir would be voided because of the lower ratio of the Well No. 2, which would conserve reservoir energy.

Q Would it have any adverse affect on correlative rights or the rights of other operators?

A I can't see where it would affect any other operator. Well No. 2 is almost in the center of this section. It is located a great distance from the nearest line and I don't think it would affect any other operator.

Q Were Exhibits 1 through 9 inclusive prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits 1 through 9 inclusive.

MR. UTZ: Without objection Exhibits 1 through 9 inclusive in this case will be entered into the record.

Q (By Mr. Kellahin) Do you have anything to add, Mr. Gray?

A I don't believe so.

MR. KELLAHIN: At this time, if the Examiner please, I would like to make this statement. We are aware that the Commission generally, in raising the gas-oil ratio, has frequently adopted a "No Flare" order along with such an increase. It is a request of the applicant in this case that if the Commission feels that that

is necessary, that a "No Flare" order be included, that that portion of our application seeking the removal of the ratio and increasing it to 6,000 to 1 be denied rather than having a "No Flare" order entered, due to the fact that there is no market at the present time for the gas, and because of the nature of the gas and the nature of the reservoir generally, it doesn't appear there will be a market for the gas for sometime to come. It is, of course, our position that an increase in the ratio to 6,000 to one is fully justified under the circumstances in this particular pool. That is all we have, Mr. Utz.

BY MR. UTZ:

Q Mr. Gray, the five wells that you stated were producing now 56 MCF per day, at 6,000 ratio, what do you estimate they will produce?

A You mean how much gas?

Q Yes.

A Well, of course, you mean in the event the gas-oil ratio is increased later. At the present time changing the limiting gas-oil ratio to 6,000 would not affect the amount of gas that is being produced at the present time, which would be about 56 MCF per day. Changing the limiting ratio would not affect that at the present time.

Q You mean, providing the allowable from the No. 3 is transferred?

A Yes, sir, providing it is transferred.

Q If that wasn't transferred, then it would increase?

A If the allowable is not transferred there would be a little additional gas produced; that would increase it, roughly, to about 180 MCF per day.

Q I note on your cross section, Exhibit 2, that your upper perforations in the No. 3 well are in the base of the gas zone. Do you suppose that might be some of your GOR problems?

A When the well was originally perforated it was perforated in the two intervals shown, and the upper perforations were tested and found to be gassy. Of course, that was one reason for our locating the gas cap where we did on the cross section. Then we ran a packer between the perforations and produced from the lower perforation. Although we had a lower gas-oil ratio we still had a comparatively high ratio compared to the other wells, so at the present time the well is actually producing from the lower perforations by a packer set between them.

Q Then the No. 2 well is perforated well down into the oil zone only?

A Yes, sir.

Q And that is probably the reason that you have no GOR problems on that well, don't you think?

A We think that in that particular case we don't have quite as good a vertical communication up into the gas cap as we do on some of the other wells. It is possible maybe we don't have the fracturing in that particular area that we do in other parts of

the reservoir.

Q That well is producing top allowable at the present time?

A Yes, sir.

Q If you doubled the rate of production on the No. 2 well, is there a likelihood of increasing the gas-oil ratio on the well?

A Not substantially. Our Exhibit No. 9, for instance, shows two well tests there, and one test, conducted at a rate of 57 barrels of oil per day, had a gas-oil ratio of 230 cubic feet per barrel. Another test, 102 barrels of oil per day, ratio of 484 cubic feet per barrel.

Q In other words, by transferring the allowable from the No. 3 to the No. 2 you don't believe there will be but very little more gas cap gas produced?

A Yes, sir. At the present time we don't think there will be. I'd say practically no gas from the gas cap is produced in Well No. 2.

Q Do you have any bottomhole samples available?

A No, we do not.

Q What kind of pressures are we talking about in this pool?

A The bottomhole, original pressure, is about 1250 pounds per square inch.

MR. UTZ: Any other questions?

BY MR. NUTTER:

Q Mr. Gray, what is that stippled area on this cross section, outside of it?

A That is a member that exists clear across the reservoir. It is just a sandy formation that is present within that dolomite section.

Q It is not productive, I take it, since there are no perforations opposite it?

A The core analyses we have through there show a very low permeability, so we don't think it will probably produce very much oil, although it does show some oil saturation.

Q Your production is actually coming from the dolomite, either above or below the sands, as the case may be?

A That's right.

Q Is this all one common reservoir then; if some of the perforations are above and some are below this impermeable sand?

A Well, I think probably so. The fact that we have a gas-oil ratio problem in this Well No. 3, which is perforated below that sand break would indicate that.

Q It is perforated from above and below?

A It is producing from below at the present time because we have a packer set there. I think that indicates it is probably in communication, both below and above that sand break.

Q Can you rule out the possibility of communication behind the pipe?

A Not positively, no, sir.

Q Where is the pipe set in this well; is it down here where this little black triangle is?

A That's right.

Q What kind of a packer have you separating ?

A Hook-wall packer. I don't believe we have a bad cement job there, because when we first produced from the upper perforations we had this very gassy condition, and then we ran the tubing back and set the packers between the perforations, and then we produced the well and didn't get but very little fluid out of it. It was practically dry, which indicated, at least at that time, that there was no communication between those two sets of perforations, and then after that we gave it a small acid treatment, and we were able, then, to get oil from those perforations, so I think that would probably mean that we do have a good cement job behind the pipe.

Q I am at a loss to understand how you can have gas coming down through the formation if you have vertical communication, when the upper perforations are in the gas cap, then there is this interval of non-permeable sand, and the lower?

A The sand would have to be fractured.

Q Is the sand fractured as well as the dolomite?

A That would be a guess. There is no way of knowing except through possibly performance.

Q Is there any indication of fractures in the sand on the core graph?

A They don't indicate any fracturing on the core graph. However, that is not definite proof one way or the other, actually.

Q They do indicate fractures in the dolomite, however, don't

they?

A Yes, they show some fracturing through there.

Q By the use of intermitters you have been able to drop the ratio on all wells to substantially below 2,000 to one, with the exception of the one well, No. 3; is that correct?

A Yes, for the present, although we think that is a very temporary situation.

Q This test on the No. 3 well, which shows a ratio of 4300, 10 to 1, was made September 8th, 1960. Has any test been made on this well since that date?

A No, sir.

Q On these three analyses of the gas that have been made, Phillips Petroleum Company, when they made their analysis in July, 1960, apparently thought they were getting gas from the 1, 2 and 3 well?

A If you will note on the bottom part of the sheet there is a statement made that Wells No. 2 and 3 are shut in.

Q While the three wells were hooked in the system, two were shut in and gas did come from the No. 1?

A Yes, sir.

Q Is it your belief, Mr. Gray, that the gas that is in the oil here has a lower nitrogen content, as reflected by the analysis of the gas from the No. 1 well, and that the gas that is in the gas cap has the high nitrogen content?

A Yes, sir. I think that is indicated.

Q If you take the allowable from the No. 3 and transfer it to the No. 2, how will the Commission know how much to transfer?

A If the Commission grants the increase in limiting gas-oil ratio to 6,000 cubic feet per barrel I would think that would automatically raise the allowable on Well No. 3 to top allowable, since the gas-oil ratio is below the 6,000 cubic feet per barrel, and that, in that event, that top allowable would be transferred. If the Commission does not change the limiting ratio, then I assume they would transfer the present allowable.

Q How long should the Commission transfer top allowable?

A Well, gas-oil ratio surveys are required, annually on these wells. The operator has to report these gas-oil ratios once a year.

Q Including the shut in well there?

A Well, that would be up to the Commission as to what they would require.

Q If that well weren't being produced it would probably, on an annual gas-oil ratio, remain a relatively high producer for a great number of years, would it not?

A As I say, the character of this reservoir is very vuggy type, high permeabilities, and my thought is that in that type of reservoir shutting the well in is not going to greatly change the conditions that exist throughout the reservoir.

Q That was the next question I was going to come to. Mr. Gray, what about the reserves that surround the No. 3. How will

they be produced if the well is shut in?

A I think they will be recovered by the present wells due to the high permeabilities.

Q By the No. 4 or No. 2, only No. 2, or what?

A That would be impossible to say.

Q But you don't feel those reserves are going to be left in the ground by shutting the well in?

A No, sir, I do not.

Q Have you given any thought to the possibility of squeezing off those upper perforations in the No. 3 well?

A We have given consideration to it, but we know that that dolomite has very large vugs in it, some as large as your thumb, larger even, and we are a little bit afraid if we try to squeeze that type of material that we could squeeze it off to the point where we might have difficulty in getting anything back.

Q If you could squeeze off that sour gas, you wouldn't want it back anyway, would you, or that nitrogen gas?

A We would, of course, prefer not to have it at the present time, but we would sure like to have the oil.

MR. NUTTER: I believe that is all. Thank you.

BY MR. UTZ:

Q How much oil did you say you were getting from the upper perforations?

A I don't have an exact figure on that, but at the time we were producing out of the top perforations it was predominantly gas

with only a very small amount of oil.

BY MR. NUTTER:

Q What are the ratios of the Pan American wells to the west?

A I am sorry. I don't have any information on their wells.

BY MR. PAYNE:

Q What is the percentage of nitrogen, as a rule of thumb, that purchasers use in determining whether they want the gas or not?

A Well, actually the purchasers go more by BTU content, rather than nitrogen, although one is the reflection of the other, and I think in most gas contracts they require a minimum of, say a thousand BTU, from there on up. I think that is about the lowest, and from the analyses shown here, the analyses with the high nitrogen content show BTU content of approximately 800, which is below the usual contract requirements.

Q That is on the one well?

A Yes, sir.

Q No. 3 Well?

A I believe that was the one.

Q But the other two would meet the minimum standards?

A The other one was producing with a low gas-oil ratio and it had a low nitrogen content.

Q So we can't completely rule out the possibility that a gas purchaser will come in this area?

A No, sir. We can't rule that out. We can only say at the present time, at least, no one has shown an interest in coming in.

We hope that later they will.

BY MR. NUTTER:

Q Mr. Gray, on your Exhibit No. 9 you show a nitrogen content of 37.58 for the No. 1 well. When was that test made?

A Will you repeat that question?

Q You show a nitrogen content of 37.58 for the gas in the No. 1 well. Was that well producing gas cap gas or what?

A Yes, I think so. You see, that analysis was made July 15th, 1960, and on July 26th we took a test of that well, at which time the gas-oil ratio was 5814 cubic feet per barrel, so I think that the evidence shows that, due to the high ratio and the high nitrogen content that we were taking some gas out of the gas cap at that time.

Q Now, that is not the same test that the nitrogen content was reported? Oh, yes, that is the No. 1 well.

A Yes.

Q And the only test that has ever been made of this No. 3 well is the one that was run on Exhibit 7?

A Yes, sir, that's right.

BY MR. PAYNE:

Q You say at the present time if the ratio is increased and the allowable was transferred from the No. 3 well to the No. 2 well there will be no increase in gas production?

A By transferring the allowable the gas production will be lower because the gas-oil ratio in the Well No. 2 is much lower than

the ratio on Well No. 3.

Q How long do you think this situation will exist; when will you reach the point, by raising the ratio you also increase the amount of gas being produced and flared?

A I don't understand your question.

Q This situation isn't going to continue forever in this status?

A No, sir.

Q You are going to reach the point where more gas is being produced and flared than is now being produced and flared?

A That's right.

Q Do you have any idea when that point would be reached?

A No, sir, I can't say.

BY MR. UTZ:

Q Mr. Gray, how much gas do you think that you will have to produce from this field before you can get a market?

A I don't believe I can answer that question.

Q You haven't discussed that with Phillips?

A Phillips analyzed the gas last July, and they have expressed no interest in purchasing the gas up to this time.

Q Do they have facilities for removing nitrogen at this gas line plant, or is it necessary to remove it?

A I don't know.

BY MR. PAYNE:

Q Their disinterest might be due to either the volume or the

quality of the gas?

A Probably both.

BY MR. NUTTER:

Q Transferring the allowable from the No. 3 well to the No. 2 well would entail drainage of an 80-acre spacing pattern, would it not, if you were going to recover the reserves from the No. 3?

A Yes, sir.

Q Do we have any evidence here today this pool can be efficiently drained on 80-acre spacing?

A Yes, sir, I think so.

Q What is that evidence?

A The high permeabilities shown in the core analyses, the type of porosity existing, existing fractures.

Q Porosity doesn't indicate drainage, does it?

A I say permeability.

Q Those vugs wouldn't necessarily contribute to the permeability, either?

A Well, no, except that if that type of material has good connection between vugs usually you do have high permeability existing.

BY MR. PAYNE:

Q I take it, then, this transfer of allowable you are talking about, you contemplate that would be a permanent situation?

A No, sir, not necessarily. I think it may be a temporary situation.

Q When would it be temporary and when would it be permanent; when would you decide maybe you wanted to let the No. 3 well produce allowable again?

A If the gas-oil ratios on these other wells should increase later on, which we think they will, we may reach a time when we would choose to assign the allowable back to the Well No. 3, and let it produce its own allowable at that time.

Q If the GOR's on the other wells producing with intermitters got as high or higher than the No. 3 well?

A Yes, sir.

BY MR. NUTTER:

Q Would you continue to produce the other wells with intermitters if you had a higher ratio limitation?

A I think so, as long as we could keep the gas-oil ratio lower by doing so we would.

MR. UTZ: Any more questions? The witness may be excused. Other statements in this case? Case will be taken under advisement.

(Whereupon, a short recess was taken.)

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, JUNE PAIGE, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 1st day of February, 1961.

June Paige

Notary Public - Court Reporter

I N D E X

E X H I B I T S

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[redacted] for exception to Rule 506 (A) by increasing the limiting gas-oil ratio for West Tonto-Yates Seven Rvs.