



*'Symbol of Service'*

1 B

REPORT  
of  
SUB-SURFACE  
DIRECTIONAL  
SURVEY

PURE OIL COMPANY

COMPANY

RED HILLS UNIT WELL NO. 1

WELL NAME

WILDCAT FIELD

LEA COUNTY, NEW MEXICO

LOCATION

JOB NUMBER

WT-85964

TYPE OF SURVEY

MAGNETIC

DATE

AUGUST 13, 1964

SURVEY BY  
JACK B. JONES

OFFICE  
ODESSA, TEXAS



# RECORD OF SURVEY

CHECKED BY \_\_\_\_\_ DATE August 13, 1964

JOB NO. WT-85964

ASSUMED VERTICAL TO 16,900'

STATION	MEASURED DEPTH	DRIFT ANGLE	TRUE VERTICAL DEPTH	VERTICAL SECTION	COURSE DEVIATION	DRIFT DIRECTION	RECTANGULAR COORDINATES			
							NORTH	SOUTH	EAST	WEST
1	17000 00	0° 30'			87	S 09 W	0 70	0 86	5 31	0 14
2	17100 00	3° 15'			5 67	N 74 E	4 78		14 93	
3	17200 00	6° 00'			10 45	N 67 E	7 85		22 15	
4	17300 00	4° 30'			7 85	N 67 E	7 85		25 64	
5	17400 00	2° 00'	17398 92		3 49	EAST				
6	17500 00	1° 45'			3 05	S 84 E	7 53		28 68	
7	17600 00	2° 15'			3 93	N 82 E	8 08		32 57	
8	17700 00	1° 00'			1 75	S 60 E	7 21		34 08	
9	17900 00	1° 00'			3 50	S 78 E	6 48		37 50	
10	18100 00	0° 45'	18098 71		2 62	N 74 E	7 20		40 02	
11	18300 00	2° 15'			7 86	N 27 E	14 20		43 59	
12	18400 00	2° 00'			3 49	N 45 E	16 67		46 06	
13	18500 00	2° 00'			3 49	N 65 E	18 14		49 22	
14	18600 00	4° 00'			6 98	N 54 E	22 24		54 86	

B / #

RED HILLS UNIT WELL NO. 1  
RESERVOIR ROCK AND FLUID PROPERTIES

<u>NAME</u>	<u>WOLFCAMP</u>	<u>PENNSYLVANIAN</u>	<u>DEVONIAN</u>
AVERAGE POROSITY - %	10.0	9.2	4.91
POROSITY RANGE - %	5 - 20	5 - 14	3.5 - 5.0
AVERAGE PERMEABILITY - md	.94	12.3	6.7
CONNATE WATER SATURATION - %	30.0	32.2	24.4
RESERVOIR PRESSURE - psia	11,304	7,863	7,632
GAS COMPRESSIBILITY	1.596	1.229	1.206
GAS GRAVITY - (Air = 1.0)	.766	.580	.58
STOCK TANK LIQUIDS - Bbls./MMCF	40	0	0

*EX. 5 to 16*  
*Feb 17, 1965* *Healing*

RED HILLS UNIT  
WELL COST ESTIMATE WOLFCAMP-DEVONIAN DUAL

Labor, Transportation, District Expense	\$ 30,000
Location, Roads, ROW, Damages	20,000
Contract Rig	400,000
Drilling Mud	230,000
Cementing Service & Cement	70,000
Logging, Perforating, Coring & Testing	60,000
Bits	50,000
Stimulation	10,000
Miscellaneous	20,000
Casing:	
550' - 20"	7,000
5,000' - 13-3/8"	45,000
13,000' - 10-3/4"	145,000
16,000' - 7-5/8"	100,000
2,000' - 5"	10,000
Tubing:	
30,000' - 2-7/8"	75,000
Control Equipment & Christmas Tree	35,000
Float Equipment, Centralizers, etc.	18,000
Packers & Down Hole Equipment	10,000
Miscellaneous	20,000
Surface Equipment	<u>105,000</u>
TOTAL	\$1,460,000

10-1-70

RESERVES

ECONOMIC CALCULATIONS

WOLF CAMP - DEV. AREA BURL  
 WELL COST \$1,460,000

DEVONIAN RESERVES	610 Ac.	320 Ac.
Gas Reserves - MMCF	11.6	5.8
Liquid Reserves	0	0
Net Gas Revenue @ \$141/MMCF Average	\$1,635,600	\$ 817,800
Total Net Revenue	\$1,635,600	\$ 817,800

WOLF CAMP RESERVES

Gas Reserves - MMSCF	10.065	5.032
Liquid Reserves - Thousands Bbls.	402.4	201.2
Net Gas Revenue @ \$146/MMCF Average	\$1,469,490	\$ 734,745
Net Liquid Revenue @ \$2.00/Bbl. Average	804,800	402,400
Total Net Revenue	\$2,274,290	\$1,137,145
Net Value of Production	\$3,909,890	\$1,954,915
Investment	1,460,000	1,460,000
Profit	2,449,890	494,915
Profit to Investment	1.68	.328
Net Value of Production 6% Discount	\$2,569,200	\$1,465,000
Investment	1,460,000	1,460,000
Profit @ 6% Discount	1,109,200	5,000
Profit @ 6% Discount to Investment	.76	.0034

All values are net to operator assuming 80% Net to Gross ratio and before Federal Income Tax.

WELL COST ESTIMATE

WELL COST ESTIMATE - WITH N-PAH TRIPLE

Labor, Transportation, District Expenses	30,000
Location, Roads, ROW, Damages	20,000
Contract Rig	105,000
Drilling Mud	20,000
Cementing Service & Cement	70,000
Logging, Perforating, Coring & Testing	65,000
Bits	50,000
Stimulation	15,000
Miscellaneous	20,000

Casing:

550' - 20"	7,000
5,000' - 13-3/8"	15,000
13,000' - 10-3/4"	115,000
16,000' - 7-5/8"	100,000
2,000' - 5"	10,000

Tubing:

46,000' - 2-7/8"	105,000
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Control Equipment & Christmas Tree	15,000
Float Equipment, Centralizers, Etc.	10,000
Packers & Down Hole Equipment	10,000
Miscellaneous	20,000

Surface Equipment	<u>120,000</u>
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TOTAL	\$1,535,000
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RED HILLS

ECONOMIC CALCULATIONS

WOLFCAMP-PENNSYLVANIAN-DEVONIAN TRIPLE  
WELL COST \$1,535,000

	<u>640 Ac.</u>	<u>320 Ac.</u>
<b>DEVONIAN RESERVES</b>		
Gas Reserves - MMMCF	11.60	5.80
Liquid Reserves - Thousands Bbls.	0	0
Net Gas Revenue @ \$141/MMCF Average	\$1,635,600	\$ 817,800
Total Net Revenue	1,635,600	817,800
<b>PENNSYLVANIAN RESERVES</b>		
Gas Reserves - MMMCF	.757	.3785
Liquid Reserves - Thousands Bbls.	0	0
Net Gas Revenue @ \$146/MMCF Average	\$ 110,500	\$ 55,250
Net Liquid Revenue @ \$200/Bbl. Average	0	0
Total Net Revenue	\$ 110,500	\$ 55,250
<b>WOLFCAMP RESERVES</b>		
Gas Reserves - MMMCF	10.065	5.032
Liquid Reserves-Thousands Bbls.	402.4	201.2
Net Gas Revenue @ \$146/MMCF Average	\$1,469,490	\$ 734,745
Net Liquid Revenue @ \$2.00/Bbl. Average	804,800	402,400
Total Net Revenue	\$2,274,290	\$1,137,145
Net Value of Production	\$4,020,390	\$2,010,195
Investment	1,535,000	1,535,000
Profit	2,485,390	475,195
Profit to Investment	1.62	.31
Net Value of Production 6% Discount	\$2,641,800	\$1,506,400
Investment	1,535,000	1,535,000
Profit @ 6% Discount	1,106,800	(-28,600)
Profit @ 6% Discount to Investment	.72	-

All values are net to operator 80% net to gross ration and before federal income tax.

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RED HILLS UNIT

WELL COST ESTIMATE WOLFCAMP-PENN DUAL

Labor, Transportation, District Expense	\$ 20,000
Location, Roads, ROW, Damages	20,000
Contract Rig	280,000
Drilling Mud	200,000
Cementing Service & Cement	40,000
Logging, Perforating, Coring, & Testing	40,000
Bits	15,000
Stimulation	10,000
Miscellaneous	10,000
Casing:	
550' - 20"	7,000
5,000' - 13-3/8"	45,000
13,000' - 10-3/4"	145,000
16,000' - 7-5/8"	100,000
Tubing:	
27,000' - 2-7/8"	60,000
Control Equipment & Christmas Tree	35,000
Float Equipment, Centralizers, etc.	18,000
Packers & Down Hole Equipment	10,000
Miscellaneous	10,000
Surface Equipment	<u>45,000</u>
TOTAL	\$1,100,000

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RED HILLS  
ECONOMIC CALCULATIONS

WOLFCAMP-PENN DUAL  
WELL COST     \$1,100,000

	<u>640 Ac.</u>	<u>320 Ac.</u>
<b>WOLFCAMP RESERVES</b>		
Gas Reserves - MMMCF	10.065	5.032
Liquid Reserves - Thousands Bbls.	402.4	201.2
Net Gas Revenue @ \$146/MMCF Average	\$1,469,490	\$ 734,745
Net Liquid Revenue @ \$2.00/Bbl. Average	804,800	402,400
<b>Total Net Revenue</b>	<b>\$2,274,290</b>	<b>\$1,137,145</b>
 <b>PENNSYLVANIAN RESERVES</b>		
Gas Reserves - MMMCF	.757	.3785
Liquid Reserves - Thousands Bbls.	0	0
Net Gas Revenue @ \$146/MMCF Average	\$ 110,500	\$ 55,250
Net Liquid Revenue @ \$2.00/Bbl. Average	0	0
<b>Total Net Revenue</b>	<b>\$ 110,500</b>	<b>\$ 55,250</b>
 Net Value of Production	 \$2,384,790	 \$1,192,395
Investment	1,100,000	1,100,000
Profit	1,284,790	92,395
Profit to Investment	1.17 to 1	.077 to 1
 Net Value of Production 6% Discount	 \$1,569,000	 \$ 893,500
Investment	1,100,000	1,100,000
Profit @ 6% Discount	469,000	(-206,500)
Profit @ 6% Discount to Investment	.30 to 1	-

All values are net to operator assuming 80% Net to Gross ratio and before Federal Income Tax.

RED HILLS UNIT

WELL COST ESTIMATE WOLFCAMP-SINGLE

Labor, Transportation, District Expense	\$ 20,000
Location, Roads, ROW, Damages	20,000
Contract Rig	200,000
Drilling Mud	120,000
Cementing Service & Cement	40,000
Logging, Perforating, Coring, & Testing	30,000
Bits	13,000
Stimulation	5,000
Miscellaneous	10,000
Casing:	
550' - 13-3/8"	4,700
5,000' - 9-5/8"	30,000
13,000' - 7"	65,000
1,400' - 5"	7,000
Tubing:	
13,500' - 3-1/2"	47,000
Control Equipment & Christmas Tree	15,000
Float Equipment, Centralizers, etc.	15,000
Packers & Down Hole Equipment	4,000
Mascellaneous	10,000
Surface Equipment	<u>31,000</u>
TOTAL	\$686,700

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RED HTLS

ECONOMIC CRITERIA  
 1962-1963  
 NET INVESTMENT \$1,500

	610 ac.	520 ac.
Working Reserves		
Gas reserves - MMSCF	10,065	7,350
Liquid reserves - Thousands Bbls.	108.4	201.2
Net Gas Revenue @ \$11.6/MSCF Average	\$1,169,190	831,715
Net Liquid Revenue @ \$1.00/Bbl. Average	108,800	202,100
Total Revenue	2,277,990	1,137,115
Investment	\$ 686,700	\$ 686,700
Profit	1,587,590	150,115
Profit to Investment	2.32	.95
Net Value of Production @ 6% Discount	\$1,491,100	\$ 842,200
Investment	686,700	686,700
Profit @ 6% Discount	807,700	155,500
Profit @ 6% Discount to Investment	1.175	.225

All values are net to operator assuming 50% net to gross ratio and before federal income tax.

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 14-7-63

SPECIAL RULES AND REGULATIONS  
FOR THE  
RED HILLS-WOLFCAMP GAS POOL

- RULE 1. Each well completed in the Red Hills-Wolfcamp Gas Pool or in the Wolfcamp formation within one mile of the Red Hills-Wolfcamp Gas Pool, and not nearer to or within the limits of another designated Wolfcamp pool, shall be spaced, drilled, operated, and produced in accordance with these Special Rules and Regulations.
- RULE 2. Each well completed in the Red Hills-Wolfcamp Gas Pool shall be located on a standard unit containing 640 acres, more or less, consisting of a single governmental section.
- RULE 3. Each well completed in the Red Hills-Wolfcamp Gas Pool shall be located no nearer than 1650 feet to the outer boundary of the section and no nearer than 330 feet to any governmental quarter-quarter section line. Any well drilled to or being completed in the Red Hills-Wolfcamp Gas Pool is granted an exception to the well location requirements of this rule.

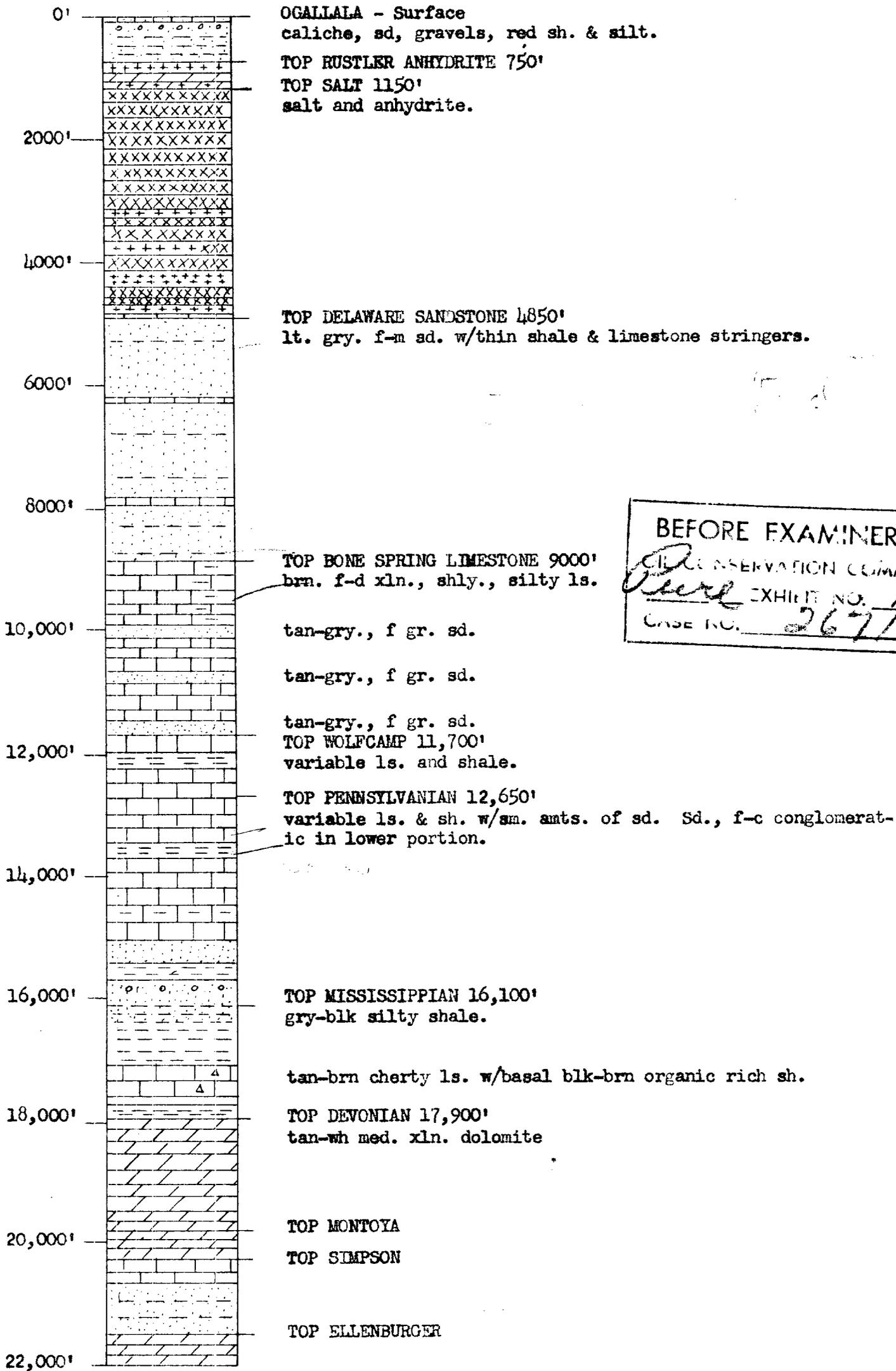
SPECIAL RULES AND REGULATIONS  
FOR THE  
RED HILLS-PENNSYLVANIAN GAS POOL

- RULE 1. Each well completed in the Red Hills-Pennsylvanian Gas Pool or in the Pennsylvanian formation within one mile of the Red Hills-Pennsylvanian Gas Pool, and not nearer to or within the limits of another designated Pennsylvanian pool, shall be spaced, drilled, operated, and produced in accordance with these Special Rules and Regulations.
- RULE 2. Each well completed in the Red Hills-Pennsylvanian Gas Pool shall be located on a standard unit containing 640 acres, more or less, consisting of a single governmental section.
- RULE 3. Each well completed in the Red Hills-Pennsylvanian Gas Pool shall be located no nearer than 1650 feet to the outer boundary of the section and no nearer than 330 feet to any governmental quarter-quarter section line. Any well drilled to or being completed in the Red Hills-Pennsylvanian Gas Pool is granted an exception to the well location requirements of this rule.

SPECIAL RULES AND REGULATIONS  
FOR THE  
RED HILLS-DEVONIAN GAS POOL

- RULE 1. Each well completed in the Red Hills-Devonian Gas Pool or in the Devonian formation within one mile of the Red Hills-Devonian Gas Pool, and not nearer to or within the limits of another designated Devonian pool, shall be spaced, drilled, operated, and produced in accordance with these Special Rules and Regulations.
- RULE 2. Each well completed in the Red Hills-Devonian Gas Pool shall be located on a standard unit containing 640 acres, more or less, consisting of a single governmental section.
- RULE 3. Each well completed in the Red Hills-Devonian Gas Pool shall be located no nearer than 1650 feet to the outer boundary of the section and no nearer than 330 feet to any governmental quarter-quarter section line. Any well drilled to or being completed in the Red Hills-Devonian Gas Pool is granted an exception to the well location requirements of this rule.

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BEFORE EXAMINER UTZ  
 CONSERVATION COMMISSION  
 EXHIBIT NO. P  
 CASE NO. 2671

RED HILLS UNIT  
 Townships 25 and 26 South  
 Ranges 32 and 33 East  
 Lea County, New Mexico  
 Proposed 18,000' Devonian Test  
 Columnar Section

Vert. Scale  
 1" = 2000'

EXHIBIT "D"

10 September 1962

March 17, 1965  
Reg. Hearing

EX. NO. 1

Yegor  
Lomonosov

RESERVE AND ECONOMIC EVALUATION  
WOLFCAMP-ATOKA DUAL COMPLETION

I - Atoka-Pennsylvanian Pool Reserve

(A) Average Porosity	9.2%	
Connate Water	32.2%	(?)
Reservoir Pressure, psia	7,863	
Reservoir Temperature	208 °F	
Gas Deviation	1.229	
Gas Gravity	0.580	
Condensate, Bbls/MMcf	1.5	
Pay Thickness, Ft.	84+	(42)

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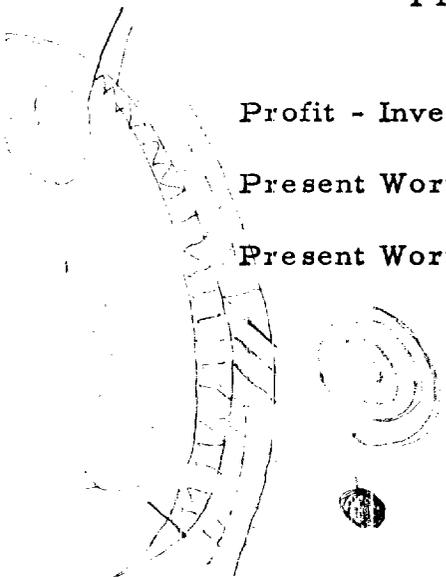
	<u>Gas, MMcf</u>	<u>Cond., Bbls</u>
(B) Hydrocarbons In-Place per Ac-Ft.	0.9192	1.38
Reserve per Ac-Ft. (90% Recovery)	0.8273	1.24
Reserve per Acre	69.49	104.24
W. I. Reserve per Acre (after 1/8 Royalty)	60.80	91.21

\* \* \* \* \*

	<u>640 Acres</u>	<u>320 Acres</u>
(C) Reserve: MMMcf	38.91	19.46
Bbls.	58,374	29,187
(D) Revenue: Gas @ \$160/MMcf	\$ 6,225,600	\$3,113,600
Cond. @ \$2.70/Bbl. (15¢ transp.)	<u>157,610</u>	<u>78,805</u>
Total	<u>\$ 6,383,210</u>	<u>\$3,192,405</u>

II - Wolfcamp-Atoka Dual Economic Evaluation

(D-a) Revenue: Wolfcamp (Ex. _____)	\$ 8,921,620	\$4,460,810
Atoka	<u>6,383,210</u>	<u>3,192,405</u>
Total	\$15,304,830	\$7,653,215
Operating Expense (360 months)	(216,000)	(216,000)
Production Tax - 2%	<u>(306,100)</u>	<u>(153,100)</u>
Operating Income	\$14,782,730	\$7,284,115
Investment - Well and Equipment	<u>(900,000)</u>	<u>(900,000)</u>
Profit	<u>\$13,882,730</u>	<u>\$6,384,115</u>
Profit - Investment Ratio	15.43	7.09
Present Worth Profit (6%)	\$ 6,558,063	\$3,015,792
Present Worth Profit - Investment Ratio	7.29	3.35



RESERVE AND ECONOMIC EVALUATION  
WOLFCAMP-DEVONIAN DUAL COMPLETION

I - Devonian Pool Reserve

(A)	Average Porosity	5.0%	
	Connate Water	24.4%	
	Reservoir Pressure, psia	7,632	
	Reservoir Temperature	240 °F	
	Gas Deviation	1.206	
	Gas Gravity	0.58	
	Condensate, Bbls/MMcf	0	
	Pay Thickness, Ft.	62	(42)

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		<u>Gas, MMcf</u>	
(B)	Hydrocarbons In-Place per Ac-Ft.	0.5265	
	Reserve per Ac-Ft. (90% Recovery)	0.4739	
	Reserve per Acre	29.38	
	W. I. Reserve per Acre (after 1/8 Royalty)	25.71	

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		<u>640 Acres</u>	<u>320 Acres</u>
(C)	Reserve: MMMcf	16.454	8.227
(D)	Revenue: Gas @ \$160/MMcf	<u>\$ 2,632,640</u>	<u>\$1,316,320</u>

II - Wolfcamp-Devonian Dual Economic Evaluation

(D-a)	Revenue: Wolfcamp (Ex. ___)	\$ 8,921,620	\$4,460,810
	Devonian	<u>2,632,640</u>	<u>1,316,320</u>
	Total	\$11,554,260	\$5,777,130
	Operating Expense (360 months)	(216,000)	(216,000)
	Production Tax - 2%	<u>(231,100)</u>	<u>(115,500)</u>
	Operating Income	\$11,107,160	\$5,445,630
	Investment - Well and Equipment	<u>(1,150,000)</u>	<u>(1,150,000)</u>
	Profit	<u>\$ 9,957,160</u>	<u>\$4,295,630</u>

Profit - Investment Ratio	8.66	3.74
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Present Worth Profit (6%)	\$ 4,703,634	\$2,029,213
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Present Worth Profit - Investment Ratio	4.09	1.76
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RESERVE AND ECONOMIC EVALUATION

WOLFCAMP POOL

(A)	Average Porosity	7%	(10%)
	Connate Water	30%	(?)
	Reservoir Pressure, psia	11,304	
	Reservoir Temperature	190 °F	
	Gas Deviation	1.596	
	Gas Gravity	0.766	
	Condensate, Bbls/MMcf	40	
	Pay Thickness, Ft.	80+	(28)

\* \* \* \* \*

		<u>Gas, Mcf</u>	<u>Cond., Bbls</u>
(B)	Hydrocarbons In-Place per Ac-Ft.	825	33.0
	Reserve per Ac-Ft. (90% Recovery)	743	29.72
	Reserve per Acre	59,440	2,378
	W. I. Reserve per Acre (after 1/8 Royalty)	52,010	2,081

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		<u>640 Acres</u>	<u>320 Acres</u>
(C)	Reserve: MMcf	33,286	16,643
	Bbls	1,331,800	665,900
(D)	Revenue: Gas @ \$160/MMcf	\$5,325,760	\$2,662,880
	Cond. @ \$2.70 (15¢ transp.)	<u>3,595,860</u>	<u>1,797,930</u>
	Total	\$8,921,620	\$4,460,810
	Operating Expense (360 months)	(180,000)	(180,000)
	Production Tax - 2%	<u>(178,400)</u>	<u>(89,200)</u>
	Operating Income	\$8,563,220	\$4,191,610
	Investment - Well and Equipment	<u>(600,000)</u>	<u>(600,000)</u>
	Profit	<u>\$7,963,220</u>	<u>\$3,591,610</u>

Profit - Investment Ratio	13.27	5.99
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Present Worth Profit (6%)	\$3,761,745	\$1,696,641
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Present Worth Profit - Investment Ratio	6.27	2.83
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