No. 37-62

DOCKET: REGULAR HEARING - WEDNESDAY - DECEMBER 19, 1962

OIL CONSERVATION COMMISSION - 9 A.M., MORGAN HALL, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

ALLOWABLE: (1) Consideration of the oil allowable for January, 1963.

(2) Consideration of the allowable production of gas for January, 1963, for ten prorated pools in Lea and Eddy Counties, New Mexico. Consideration of the allowable production of gas for nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for January, 1963, and also presentation of purchaser's nominations for the six-month period beginning February 1, 1963, for that area.

CASE 2628: (De Novo)
Application of Marathon Oil Company for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of an unorthodox gas well location in the Atoka-Pennsylvanian Gas Pool at a point 990 feet from the North line and 990 feet from the East line of Section 30, Township 18 South, Range 26 East, Eddy County, New Mexico. This case will be heard de novo under the provisions of Rule 1220.

CASE 2118:) Consolidated (Reopened)
2459:) Application of The Ohio Oil Company (now Marathon Oil Company), for 160-acre proration units in the Lea-Devonian Pool, Lea County, New Mexico.

CASE 2721: Application of Continental Oil Company for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to complete its State A-2 Well No. 2, located in Unit J of Section 2, Township 25 South, Range 37 East, Lea County, New Mexico, as a triple completion (tubingless) to produce oil from the North Justis Tubb-Drinkard Pool, an undesignated Abo Pool, and the North Justis-Devonian Pool through parallel strings of casing cemented in a common well bore.

CASE 2504: (Rehearing - Continued)
Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba, and Sandoval Counties, New Mexico. In accordance with the Commission's Ruling of October 18, 1962, on motions to Quash Subpoenas

Duces Tecum, George Eaton, David H. Rainey, Frank Renard, and L. M. Stevens will be required to produce all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by their respective companies, if they have not filed the same with the Commission prior to December 19, 1962. The Case will then be continued to the regular hearing on February 14, 1963.

CASE 2722: Southeastern New Mexico nomenclature case calling for an order creating new pools and extending certain existing pools in Chaves, Eddy, Lea and Roosevelt Counties, New Mexico.

(a) Create a new pool in Chaves County, New Mexico, classified as an oil pool for San Andres production, designated as the Diablo-San Andres Pool, and described as:

TOWNSHIP 10 SOUTH, RANGE 27 EAST, NMPM
Section 16: SE/4

(b) Create a new oil pool for Wolfcamp production, designated as the South Anderson-Wolfcamp Pool, and described as:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 23: NW/4

(c) Create a new gas pool for Wolfcamp production, designated as the Big Eddy-Wolfcamp Gas Pool, and described as:

TOWNSHIP 20 SOUTH, RANGE 31 EAST, NMPM
Section 3: SE/4

(d) Create a new oil pool, for San Andres production, designated as the South Prairie-San Andres Pool, and described as:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 16: SE/4

(e) Extend the Allison-Pennsylvanian Pool to include:

TOWNSHIP 8 SOUTH, RANGE 37 EAST, NMPM
Section 33: E/2 SE/4

(f) Extend the West Anderson Ranch-Grayburg Pool to include:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 5: SW/4
Section 6: S/2

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

MEMORANDUM

TO: ALL PERSONS INTERESTED IN CASE NO. 2504, APPLICATION OF CONSOLIDATED OIL & GAS, INC. FOR AN AMENDMENT OF ORDER NO. R-1670-C CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL

FROM: A. L. PORTER, Jr., SECRETARY-DIRECTOR

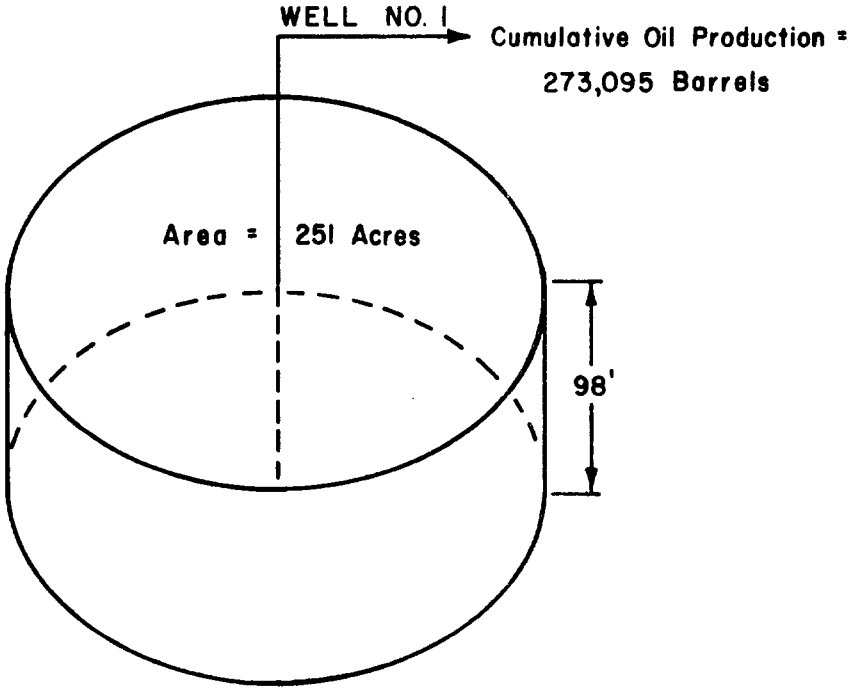
SUBJECT: COMPLIANCE WITH RULING ON MOTIONS TO QUASH SUBPOENAS DUCES TECUM AND CONTINUANCE OF CASE NO. 2504

The Commission has decided to continue Case No. 2504 to the regular hearing on February 14, 1963. The Commission will therefore allow all persons ordered to produce core analysis reports and electric and radioactivity logs to file the same with the Commission prior to December 19, 1962, in lieu of producing the required documents at the December 19th hearing. All persons ordered to produce documents will be required to do so at the December 19th hearing if they have not previously filed the same with the Commission. The case will then be continued to the Regular Commission Hearing on February 14, 1963.

DECEMBER 5, 1962

ir/

PRESSURE DECLINE CALCULATED FOR LEA UNIT NO. 1
FROM
JULY, 1960 TO NOVEMBER, 1962
BASED ON MAXIMUM RADIAL DRAINAGE OF 251 ACRES



$$\text{Pressure Decline} = \frac{N_p}{c_e N} \times \frac{B_o}{B_{oi}}$$

$$\text{Pressure Decline} = \frac{273{,}095}{(23.2 \times 10^{-6})(5.04 \times 10^{6})} \times \frac{1.241}{1.185}$$

$$\text{Pressure Decline} = \frac{338{,}911}{139}$$

$$\text{Pressure Decline} = 2438 \text{ psi}$$

Measured Pressure Decline from July, 1960 to November, 1962 = 27 psi

NMOCC Case No. 2118 & 2459
Marathon Exhibit No. 6
Date 12-19-62

The Material Balance for an oil reservoir producing when the reservoir pressure is above the bubble point pressure of the reservoir fluid is given by the following equation:

$$NB_{oi}\, c_e \Delta p = N_p B_o - W_e + B_w W_p$$

where:

N = original oil in place

N_p = cumulative oil production

B_o = oil formation volume factor

W_e = cumulative water influx

B_w = water formation volume factor

W_p = cumulative water production

Δp = reservoir pressure decline

B_{oi} = initial oil formation volume factor

c_e = effective fluid compressibility

$$c_e = \frac{S_o c_o + S_w c_w + c_f}{S_o}$$

S_o = oil saturation

c_o = oil compressibility

S_w = water saturation

c_o = water compressibility

c_f = formation or rock compressibility

For a volumetric reservoir $W_e = 0$ and $W_p = 0$ and the above equation reduces to:

$$NB_{oi}\, c_e \Delta p = N_p B_o$$

The reservoir pressure decline at any time is thus given by the following expression:

$$\Delta p = \frac{N_p}{c_e N} \times \frac{B_o}{B_{oi}}$$

Basic Data for Lea Unit No. 1:

Porosity	(ϕ)	= 5.49%
Water Saturation	(S_w)	= 43%
Net Pay	(h)	= 98 feet
Area	(A)	= 251 acres
Initial Formation Volume Factor	(B_{oi})	= 1.185
Oil Compressibility	(c_o)	= 9.99×10^{-6} vol/vol/psi
Water Compressibility	(c_w)	= 3.00×10^{-6} vol/vol/psi
Rock Compressibility	(c_f)	= 6.25×10^{-6} vol/vol/psi

Original Oil in Place in 251 Acres Surrounding Lea Unit No. 1

$$N = \frac{7758\ Ah\ \phi\ (1 - S_w)}{B_{oi}}$$

$$N = \frac{(7758)(251)(98)(0.0549)(0.57)}{1.185}$$

$$N = 5{,}040{,}000 \text{ bbls. of stock tank oil}$$

Effective Fluid Compressibility

$$c_e = \frac{S_o c_o + S_w c_w + c_f}{S_o}$$

$$c_e = \frac{[(0.57)(9.99) + (0.43)(3.0) + (6.25)]\ 10^{-6}}{(0.57)}$$

$$c_e = 23.2 \times 10^{-6} \text{ vol/vol/psi}$$

LEA DEVONIAN POOL

WELL COST DATA

	DRILLING COST $	COMPLETION COST $	DRILLING AND COMPLETION COST $	SURFACE EQUIPMENT COST $	GRAND TOTAL $
Well No. 1	396,096	261,315	657,411	39,740	697,151
Well No. 2	354,201	187,371	541,572	22,840	564,412
Well No. 4	366,761	148,545	515,306	5,981	521,287
Well No. 5	368,523	190,931	559,454	5,948	565,403
Well No. 6	305,286	185,667	490,953	12,113	503,066
TOTAL	1,790,867	973,829	2,764,696	86,622	2,851,319
Average Per Well	358,173	194,766	552,939	17,324	570,264
Average Per Well Excluding #1	348,693	178,129	526,821	11,721	538,542

Estimated Cost to Dual	25,000
Estimated Cost Per Devonian Well	$ 501,821
Number of Devonian Wells to Date	7
Approximate Total Devonian Well Costs to Date	$3,512,747

NMOCC Case No. 2118 & 2459
Marathon Exhibit No. 7
Date 12-19-62

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA167 DB385

D MDA235 PD=MIDLAND TEX 8 506P CST=
NEW MEXICO OIL CONSERVATION COMMISSION,
ATTN A L PORTER JR= PO BOX 871 SANTA FE NMEX=

Case File

DOCKET MAILED
Date

REGARDING CASES2118, 2119, AND 2459 SCHEDULED FOR HEARING DEC 13TH 1961. SINCLAIR OIL AND GAS COMPANY CONCURS WITH OHIO OIL COMPANY IN RECOMMENDING 160 ACRE OIL PRORATION UNITS FOR THE LEA DEVONIAN POOL WITH A TOP ALLOWABLE OF A REGULAR 40 ACRE DEPTH FACTOR ALLOWABLE PLUS THREE ADDITIONAL UNIT ALLOWABLES. SINCLAIR ALSO CONCURS WITH OHIO IN RECOMMENDING CONTINUATION OF 80 ACRE OIL PRORATION UNITS AND 80

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION

TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS

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ACRE ALLOWABLES FOR THE LEA BONE SPRINGS POOL=

JOE MEFFORD...

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

RECOVERABLE OIL RESERVES

LEA DEVONIAN POOL

Basic Data

Net Pay	=	98 feet	(Neutron Log)
Porosity	=	4.7%	(Neutron Log)
Water Saturation	=	30%	(estimated)
Formation Volume Factor	=	1.185	(fluid analysis)
Recovery Factor	=	50%	(estimated)

Volumetric Calculation

$$\frac{7758 \text{ Bbl/acre-foot} \times \text{Porosity} \times (1\text{-Water Saturation}) \times \text{Net Pay} \times \text{Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.047)(0.70)(98)(0.50)}{1.185} = 10{,}554 \text{ bbls/acre}$$

NMOCC Case No. 2115

Ohio Exhibit No. 4

Date 11-16-60

BEFORE THE OIL CONSERVATION COMMISSION
Ohio Exhibit 4
CASE 2115

RELATIONSHIP OF TOTAL DAILY WITHDRAWALS
LEA DEVONIAN POOL

40-ACRE SPACING VS. 80-ACRE SPACING VS. 160-ACRE SPACING

Normal Unit Allowable = 34 BOPD

Spacing (Acres)	40	80	160
Allowable Factor 14-15,000'	9.33	10.33	15.50
Top Well Allowable (BOPD)	318	352	527
No. of Wells	57	29	15
Top Field Allowable (BOPD)	18,126	10,208	7,905

NMOCC Case No. 2118 & 2459
Ohio Exhibit No. 13
Date 12-13-61

COMPARATIVE ECONOMICS
FOR DEVELOPMENT OF
LEA DEVONIAN POOL

40-ACRE SPACING VS. 80-ACRE SPACING

Minimum Area Expected to be Productive		800 Acres
Wells Required with 40 Acre Spacing		20 Wells
Wells Required with 80 Acre Spacing		10 Wells
Investment @ $471,000 per Well		
For 40 Acre Spacing (20 Wells)		$ 9,420,000
For 80 Acre Spacing (10 Wells)		$ 4,710,000
Ultimate Reserves		
Oil		8,443,200 bbls.
Gas @ 300 cu. ft. per bbl.		2,532,960 MCF
W.I. Net Operating Income Per Gross Bbl. of Oil Produced Including Income From Gas Produced with Oil		
Value		
Bbl. of oil		$2.77
300 cu. ft. of gas		.06
Total Gross Value		$2.83
Costs		
Severance & Advalorem Taxes	$0.20	
Royalty	0.35	
Lifting Costs	0.25	
		$0.80
Net Operating Income per gross bbl.		$2.03
W.I. Total Net Operating Income		
8,443,200 x $2.03/bbl.		$17,139,696
Net Profit for 40-Acre Spacing		$ 7,719,696
Net Profit per Well	$385,985	
Profit to Investment Ratio		0.82 to 1
Net Profit for 80-Acre Spacing		$12,429,696
Net Profit per Well	$1,242,970	
Profit to Investment Ratio		2.64 to 1

NMOCC Case No. 2118

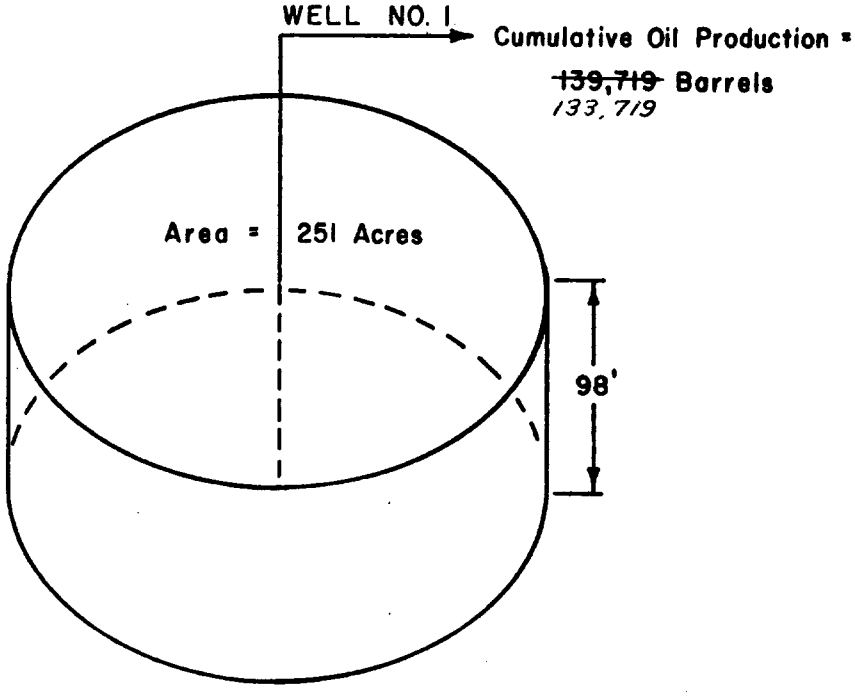
Ohio Exhibit No. 5

Date 11-16-60

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT NO. 5
CASE 2118

BEFORE THE
OIL CONSERVATION COMMISSION

PRESSURE DECLINE CALCULATED FOR LEA UNIT NO. 1 TO OCTOBER 1, 1961, BASED ON MAXIMUM RADIAL DRAINAGE OF 251 ACRES



$$\text{Pressure Decline} = \frac{N_p}{c_e N} \times \frac{B_o}{B_{oi}}$$

$$\text{Pressure Decline} = \frac{133{,}719}{(23.2 \times 10^{-6})(5.04 \times 10^{6})} \times \frac{1.198}{1.185}$$

$$\text{Pressure Decline} = \frac{160{,}195}{139}$$

Pressure Decline = 1153 psi

Measured Pressure Change to October 1, 1961 = 12 psi increase

NMOCC Case No. 2118 & 2459
Ohio Exhibit No. 11
Date 12-13-61

The Material Balance for an oil reservoir producing when the reservoir pressure is above the bubble point pressure of the reservoir fluid is given by the following equation:

$$NB_{oi}\, c_e \Delta p = N_p\, B_o - W_e + B_w\, W_p$$

where:

N = original oil in place

N_p = cumulative oil production

B_o = oil formation volume factor

W_e = cumulative water influx

B_w = water formation volume factor

W_p = cumulative water production

Δp = reservoir pressure decline

B_{oi} = initial oil formation volume factor

c_e = effective fluid compressibility

$$c_e = \frac{S_o c_o + S_w c_w + c_f}{S_o}$$

S_o = oil saturation

c_o = oil compressibility

S_w = water saturation

c_o = water compressibility

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For a volumetric reservoir $W_e = 0$ and $W_p = 0$ and the above equation reduces to:

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The reservoir pressure decline at any time is thus given by the following expression:

$$\Delta p = \frac{N_p}{c_e N} \times \frac{B_o}{B_{oi}}$$

Basic Data for Lea Unit No. 1:

Porosity (ϕ)	= 5.49%
Water Saturation (S_w)	= 43%
Net Pay (h)	= 98 feet
Area (A)	= 251 acres
Initial Formation Volume Factor (B_{oi})	= 1.185
Oil Compressibility (c_o)	= 9.99×10^{-6} vol/vol/psi
Water Compressibility (c_w)	= 3.00×10^{-6} vol/vol/psi
Rock Compressibility (c_f)	= 6.25×10^{-6} vol/vol/psi

Original Oil in Place in 251 Acres Surrounding Lea Unit No. 1

$$N = \frac{7758\ Ah\ \phi\ (1 - S_w)}{B_{oi}}$$

$$N = \frac{(7758)(251)(98)(0.0549)(0.57)}{1.185}$$

N = 5,040,000 bbls. of stock tank oil

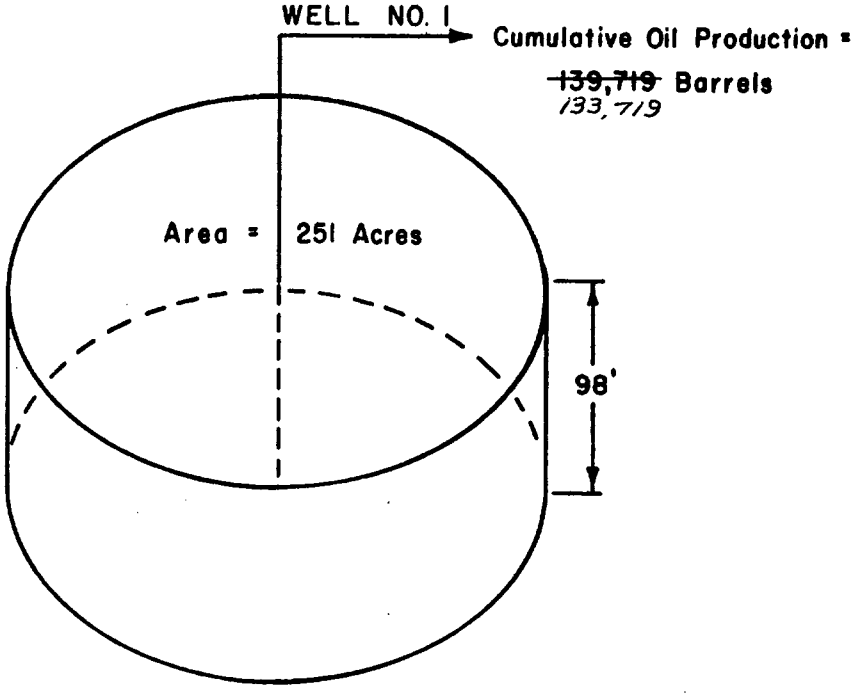
Effective Fluid Compressibility

$$c_e = \frac{S_o c_o + S_w c_w + c_f}{S_o}$$

$$c_e = \frac{\left[(0.57)(9.99) + (0.43)(3.0) + (6.25)\right] 10^{-6}}{(0.57)}$$

$c_e = 23.2 \times 10^{-6}$ vol/vol/psi

PRESSURE DECLINE CALCULATED FOR LEA UNIT NO. 1 TO OCTOBER 1, 1961, BASED ON MAXIMUM RADIAL DRAINAGE OF 251 ACRES



$$\text{Pressure Decline} = \frac{N_p}{c_e N} \times \frac{B_o}{B_{oi}}$$

$$\text{Pressure Decline} = \frac{133{,}719}{(23.2 \times 10^{-6})(5.04 \times 10^{6})} \times \frac{1.198}{1.185}$$

$$\text{Pressure Decline} = \frac{160{,}195}{139}$$

Pressure Decline = 1153 psi

Measured Pressure Change to October 1, 1961 = 12 psi increase

NMOCC Case No. 2118 & 2459
Ohio Exhibit No. 11
Date 12-13-61

The Material Balance for an oil reservoir producing when the reservoir pressure is above the bubble point pressure of the reservoir fluid is given by the following equation:

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where:

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B_o = oil formation volume factor

W_e = cumulative water influx

B_w = water formation volume factor

W_p = cumulative water production

Δp = reservoir pressure decline

B_{oi} = initial oil formation volume factor

c_e = effective fluid compressibility

$$c_e = \frac{S_o c_o + S_w c_w + c_f}{S_o}$$

S_o = oil saturation

c_o = oil compressibility

S_w = water saturation

c_o = water compressibility

c_f = formation or rock compressibility

For a volumetric reservoir $W_e = 0$ and $W_p = 0$ and the above equation reduces to:

$$NB_{oi}\, c_e\, \Delta p = N_p\, B_o$$

The reservoir pressure decline at any time is thus given by the following expression:

$$\Delta p = \frac{N_p}{c_e N} \times \frac{B_o}{B_{oi}}$$

Basic Data for Lea Unit No. 1:

Porosity (ϕ)	= 5.49%
Water Saturation (S_w)	= 43%
Net Pay (h)	= 98 feet
Area (A)	= 251 acres
Initial Formation Volume Factor (B_{oi})	= 1.185
Oil Compressibility (c_o)	= 9.99×10^{-6} vol/vol/psi
Water Compressibility (c_w)	= 3.00×10^{-6} vol/vol/psi
Rock Compressibility (c_f)	= 6.25×10^{-6} vol/vol/psi

Original Oil in Place in 251 Acres Surrounding Lea Unit No. 1

$$N = \frac{7758\ Ah\ \phi\ (1 - S_w)}{B_{oi}}$$

$$N = \frac{(7758)(251)(98)(0.0549)(0.57)}{1.185}$$

N = 5,040,000 bbls. of stock tank oil

Effective Fluid Compressibility

$$c_e = \frac{S_o c_o + S_w c_w + c_f}{S_o}$$

$$c_e = \frac{\left[(0.57)(9.99) + (0.43)(3.0) + (6.25)\right] 10^{-6}}{(0.57)}$$

$c_e = 23.2 \times 10^{-6}$ vol/vol/psi

COMPARATIVE ECONOMICS FOR DEVELOPMENT OF LEA DEVONIAN POOL

40-ACRE SPACING VS. 80-ACRE SPACING VS. 160-ACRE SPACING

Proposed Participating Area		2280 Acres
Wells Required with 40-Acre Spacing		57 Wells
Wells Required with 80-Acre Spacing		29 Wells
Wells Required with 160-Acre Spacing		15 Wells
Investment @ $510,000 per Well		
For 40-Acre Spacing (57 Wells)		$29,070,000
For 80-Acre Spacing (29 Wells)		$14,790,000
For 160-Acre Spacing (15 Wells)		$ 7,650,000
Ultimate Reserves		
Oil		15,180,240 bbls.
Gas @ 300 cu. ft. per bbl.		4,554,072 MCF
W.I. Net Operating Income Per Gross Bbl. of Oil Produced Including Income From Gas Produced With Oil		
Value		
Bbl. of oil		$2.81
300 cu. ft. of gas		.06
Total Gross Value		$2.87
Costs		
Severance & Ad valorem Taxes	$0.20	
Royalty	0.36	
Lifting Costs	0.25	
		$0.81
Net Operating Income Per Gross Bbl.		$2.06
W.I. Total Net Operating Income		
15,180,240 x $2.06/bbl.		$31,271,294
Net Profit for 40-Acre Spacing		$ 2,201,294
Net Profit per Well	$38,619	
Profit to Investment Ratio		0.08 to 1
Net Profit for 80-Acre Spacing		$16,481,294
Net Profit per Well	$568,320	
Profit to Investment Ratio		1.11 to 1
Net Profit for 160-Acre Spacing		$23,621,294
Net Profit per Well	$1,574,753	
Profit to Investment Ratio		3.09 to 1

NMOCC Case No. 2118 & 2959
Ohio Exhibit No. 10
Date 12-13-61

RECOVERABLE OIL RESERVES

LEA DEVONIAN POOL

Basic Data

Net Pay	=	65 feet
Porosity	=	5.49% (Core Analysis)
Water Saturation	=	43% (Capillary Pressure Tests)
Formation Volume Factor	=	1.185 (Fluid Analysis)
Recovery Factor	=	50% (Estimated)

Volumetric Calculation

$$\frac{7758 \text{ Bbl/acre-ft.} \times \text{Porosity} \times (1\text{-Water Saturation}) \times \text{Net Pay} \times \text{Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.0549)(0.57)(65)(0.50)}{1.185} = 6{,}658 \text{ bbls/acre}$$

NMOCC Case No. 2118 & 2459
Ohio Exhibit No. 9
Date 12-13-61

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

MEMORANDUM

TO: ALL PERSONS INTERESTED IN CASE NO. 2504, APPLICATION OF CONSOLIDATED OIL & GAS, INC. FOR AN AMENDMENT OF ORDER NO. R-1670-C CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL

FROM: A. L. PORTER, Jr., SECRETARY-DIRECTOR

SUBJECT: COMPLIANCE WITH RULING ON MOTIONS TO QUASH SUBPOENAS DUCES TECUM AND CONTINUANCE OF CASE NO. 2504

The Commission has decided to continue Case No. 2504 to the regular hearing on February 14, 1963. The Commission will therefore allow all persons ordered to produce core analysis reports and electric and radioactivity logs to file the same with the Commission prior to December 19, 1962, in lieu of producing the required documents at the December 19th hearing. All persons ordered to produce documents will be required to do so at the December 19th hearing if they have not previously filed the same with the Commission. The case will then be continued to the Regular Commission Hearing on February 14, 1963.

DECEMBER 5, 1962

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No. 37-62

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OIL CONSERVATION COMMISSION - 9 A.M., MORGAN HALL, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

ALLOWABLE: (1) Consideration of the oil allowable for January, 1963.

(2) Consideration of the allowable production of gas for January, 1963, for ten prorated pools in Lea and Eddy Counties, New Mexico. Consideration of the allowable production of gas for nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for January, 1963, and also presentation of purchaser's nominations for the six-month period beginning February 1, 1963, for that area.

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Duces Tecum, George Eaton, David H. Rainey, Frank Renard, and L. M. Stevens will be required to produce all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by their respective companies, if they have not filed the same with the Commission prior to December 19, 1962. The Case will then be continued to the regular hearing on February 14, 1963.

CASE 2722: Southeastern New Mexico nomenclature case calling for an order creating new pools and extending certain existing pools in Chaves, Eddy, Lea and Roosevelt Counties, New Mexico.

(a) Create a new pool in Chaves County, New Mexico, classified as an oil pool for San Andres production, designated as the Diablo-San Andres Pool, and described as:

TOWNSHIP 10 SOUTH, RANGE 27 EAST, NMPM
Section 16: SE/4

(b) Create a new oil pool for Wolfcamp production, designated as the South Anderson-Wolfcamp Pool, and described as:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 23: NW/4

(c) Create a new gas pool for Wolfcamp production, designated as the Big Eddy-Wolfcamp Gas Pool, and described as:

TOWNSHIP 20 SOUTH, RANGE 31 EAST, NMPM
Section 3: SE/4

(d) Create a new oil pool, for San Andres production, designated as the South Prairie-San Andres Pool, and described as:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 16: SE/4

(e) Extend the Allison-Pennsylvanian Pool to include:

TOWNSHIP 8 SOUTH, RANGE 37 EAST, NMPM
Section 33: E/2 SE/4

(f) Extend the West Anderson Ranch-Grayburg Pool to include:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 5: SW/4
Section 6: S/2

(g) Extend the Arkansas Junction-Queen Gas Pool to include:

TOWNSHIP 18 SOUTH, RANGE 36 EAST, NMPM
Section 23: NE/4

(h) Extend the Blinebry Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 19: W/2 SW/4

(i) Extend the Brushy Draw-Delaware Pool to include:

TOWNSHIP 26 SOUTH, RANGE 29 EAST, NMPM
Section 14: E/2 SE/4

(j) Extend the Corbin-Abo Pool to include:

TOWNSHIP 18 SOUTH, RANGE 33 EAST, NMPM
Section 2: NE/4

(k) Extend the Double A-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 36 EAST, NMPM
Section 21: NW/4

(l) Extend the Double X-Delaware Pool to include:

TOWNSHIP 24 SOUTH, RANGE 32 EAST, NMPM
Section 14: SW/4

(m) Extend the Drinkard Pool to include:

TOWNSHIP 21 SOUTH, RANGE 36 EAST, NMPM
Section 24: E/2 SE/4

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 2: Lot 10
Section 19: W/2 SW/4

(n) Extend the West Hume-Queen Pool to include:

TOWNSHIP 16 SOUTH, RANGE 33 EAST, NMPM
Section 15: SE/4

(o) Extend the South Lane-Pennsylvanian Pool to include:

TOWNSHIP 10 SOUTH, RANGE 33 EAST, NMPM
Section 23: S/2
Section 26: NW/4

(p) Extend the Loco Hills Pool to include:

TOWNSHIP 18 SOUTH, RANGE 29 EAST, NMPM
Section 19: N/2 SW/4

(q) Extend the Mesa-Queen Pool to include:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 16: NE/4

(r) Extend the East Millman-Seven Rivers Pool to include:

TOWNSHIP 19 SOUTH, RANGE 28 EAST, NMPM
Section 22: W/2 SW/4

(s) Extend the Monument-Tubb Pool to include:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM
Section 22: NW/4

(t) Extend the Paddock Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 19: W/2 SW/4

(u) Extend the Round Tank-San Andres Pool to include:

TOWNSHIP 15 SOUTH, RANGE 28 EAST, NMPM
Section 25: E/2

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM
Section 19: SW/4

(v) Extend the Salado Draw-Delaware Pool to include:

TOWNSHIP 26 SOUTH, RANGE 33 EAST, NMPM
Section 10: NE/4

(w) Extend the East Turkey Track-Queen Pool to include:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM
Section 1: SW/4

(x) Extend the Vacuum-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 26: NW/4 NE/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 7: S/2 SW/4

CASE 2723: Northwestern New Mexico nomenclature case calling for an order extending certain existing pools in Rio Arriba, San Juan, and Sandoval Counties, New Mexico.

(a) Extend the Aztec-Pictured Cliffs Pool to include:

TOWNSHIP 30 NORTH, RANGE 10 WEST, NMPM
Section 14: NW/4

(b) Extend the Ballard-Pictured Cliffs Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 5: All
Section 6: All
Section 7: N/2
Section 8: N/2

TOWNSHIP 25 NORTH, RANGE 6 WEST, NMPM
Section 31: S/2

(c) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 27 NORTH, RANGE 5 WEST, NMPM
Section 7: E/2

(d) Extend the Tapacito-Pictured Cliffs Pool to include:

TOWNSHIP 26 NORTH, RANGE 3 WEST, NMPM
Section 5: W/2

(e) Extend the Angels Peak-Gallup Oil Pool to include:

TOWNSHIP 26 NORTH, RANGE 9 WEST, NMPM
Section 4: W/2
Section 5: S/2
Section 6: SE/4

(f) Extend the Boulder-Mancos Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 1 West, NMPM
Section 14: W/2 NE/4, NW/4 SE/4
Section 23: W/2 E/2

(g) Extend the Cha Cha-Gallup Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 12 WEST, NMPM
Section 30: NW/4

TOWNSHIP 29 NORTH, RANGE 14 WEST, NMPM
Section 17: S/2 NW/4 & N/2 SW/4

(h) Extend the Devils Fork-Gallup Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 7: NE/4
Section 16: E/2 NW/4, W/2 NE/4 & W/2 SW/4

(i) Extend the Puerto Chiquito-Gallup Oil Pool to include:

TOWNSHIP 27 NORTH, RANGE 1 EAST, NMPM
Section 29: N/2 NW/4

iqg/

LEA DEVONIAN POOL

PERTINENT DATA

1. Location of Field:

Approximately 14 miles west-southwest of Monument, New Mexico, Section 12, T-20-S, R-34-E, Lea County

2. Completion Data Lea Unit Well No. 1:

a.	Formation	Devonian
b.	Total Depth	14,735
c.	Top of Devonian	14,285 (-10,611)
d.	Top of Devonian Pay	14,349 (-10,675)
e.	Completion Data	7-8-60
f.	Perforated Interval	14,347-375 14,393-489
g.	Treatment	500 gal MA 4,000 gal Acid
h.	Initial Potential Test	
	(1) Potential (BOPD)	516
	(2) Choke Size (in.)	8/64
	(3) GOR (CF/B)	321
	(4) Casing Pressure (psig)	pkr.
	(5) Tubing Pressure (psig)	1570

3. Reservoir Fluid Characteristics:

a.	Saturation Pressure (bubble point)	567 psi @ 202°F
b.	Formation Volume Factor @ Original Pressure	1.185
c.	Solution Gas Oil Ratio (CF/B)	318
d.	Oil Viscosity @ Original Pressure (cp)	0.310
e.	Oil Gravity (°API @ 60°F)	58.2

4. Reservoir Characteristics:

a.	Porosity (%)	4.7
b.	Permeability (md)	9.6 and greater
c.	Water Saturation (%)	30.0 est.
d.	New Pay (ft.)	98
e.	Reservoir Temperature (°F)	202
f.	Original Reservoir Pressure (psig)	6046 @ -10,744
g.	Probable Reservoir Mechanism	Water Drive

NMOCC Case No. 2118

Ohio Exhibit No. 2

Date Nov 16

BEFORE THE
OIL CONSERVATION
SANTA FE, NEW MEXICO
EXHIBIT NO. 2
CASE NO. 2118

LEA DEVONIAN POOL

WELL COST DATA

	DRILLING COST $	COMPLETION COST $	DRILLING AND COMPLETION COST $	SURFACE EQUIPMENT COST $	GRAND TOTAL $
Well No. 1	396,096	261,315	657,411	39,740	697,151
Well No. 2	354,201	187,371	541,572	22,840	564,412
Well No. 4	366,761	148,545	515,306	5,981	521,287
Well No. 5	368,523	190,931	559,454	5,948	565,403
Well No. 6	305,286	185,667	490,953	12,113	503,066
TOTAL	1,790,867	973,829	2,764,696	86,622	2,851,319
Average Per Well	358,173	194,766	552,939	17,324	570,264
Average Per Well Excluding #1	348,693	178,129	526,821	11,721	538,542

Estimated Cost to Dual 25,000

Estimated Cost Per Devonian Well $ 501,821

Number of Devonian Wells to Date 7

Approximate Total Devonian Well Costs to Date $3,512,747

NMOCC Case No. 2118 & 2459
Marathon Exhibit No. 7
Date 12-19-62

LEA DEVONIAN POOL

SHUT-IN BOTTOM HOLE PRESSURES

POOL DATUM -10,744'

DATE	WELL NO. 1 SI Time (Hours)	WELL NO. 1 BHP (psi)	WELL NO. 2 SI Time (Hours)	WELL NO. 2 BHP (psi)	WELL NO. 4 SI Time (Hours)	WELL NO. 4 BHP (psi)	WELL NO. 5 SI Time (Hours)	WELL NO. 5 BHP (psi)	WELL NO. 6 SI Time (Hours)	WELL NO. 6 BHP (psi)	WELL NO. 9 SI Time (Hours)	WELL NO. 9 BHP (psi)
7-15-60	161	6046										
8-15-60	65	6054										
10-13-60	23	6057										
4-13-61			28	6089								
4-26-61					36	6091						
4-27-61	37	6065	36	6073								
5- 1-61	133	6072	71	6065								
5-12-61					456	6087						
5-23-61	648	6028			672	6096						
8-21-61							26	6016				
10-2-61	264	6069	53	6082	53	6085						
10-6-61	363	6058										
12-6-61							24	5963	93	6065		
2-13-62	24	6036	27	6044			24	6046	29	6065		
5- 2-62	46	6036	48	6044	47	6033	53	6033	27	6060		
7-11-62											22	6014
8- 2-62	23	6025	24	6038	26	6041	28	6005	26	6033	29	6038
11-7-62	24	6019	28	6024	27	6031	27	5997	25	6024	28	6015

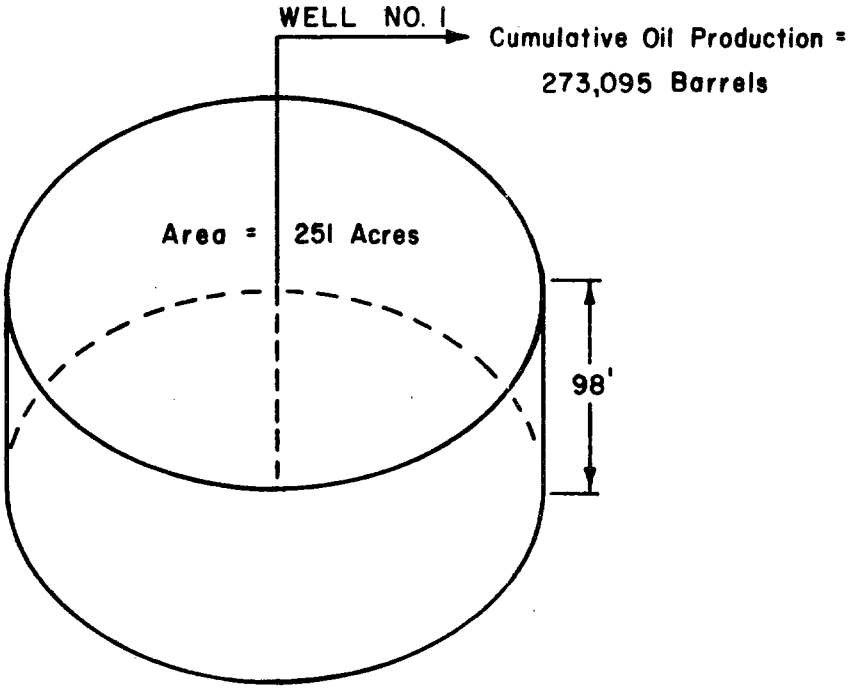
2-4

NMOCC Case No. 2118 & 2454

Marathon Exhibit No. 5

Date 12-19-62

PRESSURE DECLINE CALCULATED FOR LEA UNIT NO. 1
FROM
JULY, 1960 TO NOVEMBER, 1962
BASED ON MAXIMUM RADIAL DRAINAGE OF 251 ACRES



$$\text{Pressure Decline} = \frac{N_p}{c_e N} \times \frac{B_o}{B_{oi}}$$

$$\text{Pressure Decline} = \frac{273{,}095}{(23.2 \times 10^{-6})(5.04 \times 10^{6})} \times \frac{1.241}{1.185}$$

$$\text{Pressure Decline} = \frac{338{,}911}{139}$$

$$\text{Pressure Decline} = 2438 \text{ psi}$$

Measured Pressure Decline from July, 1960
to November, 1962 = 27 psi

NMOCC Case No. 2118 & 2457
Marathon Exhibit No. 6
Date 2-19-62

The Material Balance for an oil reservoir producing when the reservoir pressure is above the bubble point pressure of the reservoir fluid is given by the following equation:

$$NB_{oi}\, c_e \Delta p = N_p B_o - W_e + B_w W_p$$

where:

N = original oil in place

N_p = cumulative oil production

B_o = oil formation volume factor

W_e = cumulative water influx

B_w = water formation volume factor

W_p = cumulative water production

Δp = reservoir pressure decline

B_{oi} = initial oil formation volume factor

c_e = effective fluid compressibility

$$c_e = \frac{S_o c_o + S_w c_w + c_f}{S_o}$$

S_o = oil saturation

c_o = oil compressibility

S_w = water saturation

c_o = water compressibility

c_f = formation or rock compressibility

For a volumetric reservoir $W_e = 0$ and $W_p = 0$ and the above equation reduces to:

$$NB_{oi}\, c_e \Delta p = N_p B_o$$

The reservoir pressure decline at any time is thus given by the following expression:

$$\Delta p = \frac{N_p}{c_e N} \times \frac{B_o}{B_{oi}}$$

Basic Data for Lea Unit No. 1:

Porosity (ϕ)	= 5.49%
Water Saturation (S_w)	= 43%
Net Pay (h)	= 98 feet
Area (A)	= 251 acres
Initial Formation Volume Factor (B_{oi})	= 1.185
Oil Compressibility (c_o)	= 9.99×10^{-6} vol/vol/psi
Water Compressibility (c_w)	= 3.00×10^{-6} vol/vol/psi
Rock Compressibility (c_f)	= 6.25×10^{-6} vol/vol/psi

Original Oil in Place in 251 Acres Surrounding Lea Unit No. 1

$$N = \frac{7758\ Ah\ \phi\ (1 - S_w)}{B_{oi}}$$

$$N = \frac{(7758)(251)(98)(0.0549)(0.57)}{1.185}$$

$$N = 5{,}040{,}000 \text{ bbls. of stock tank oil}$$

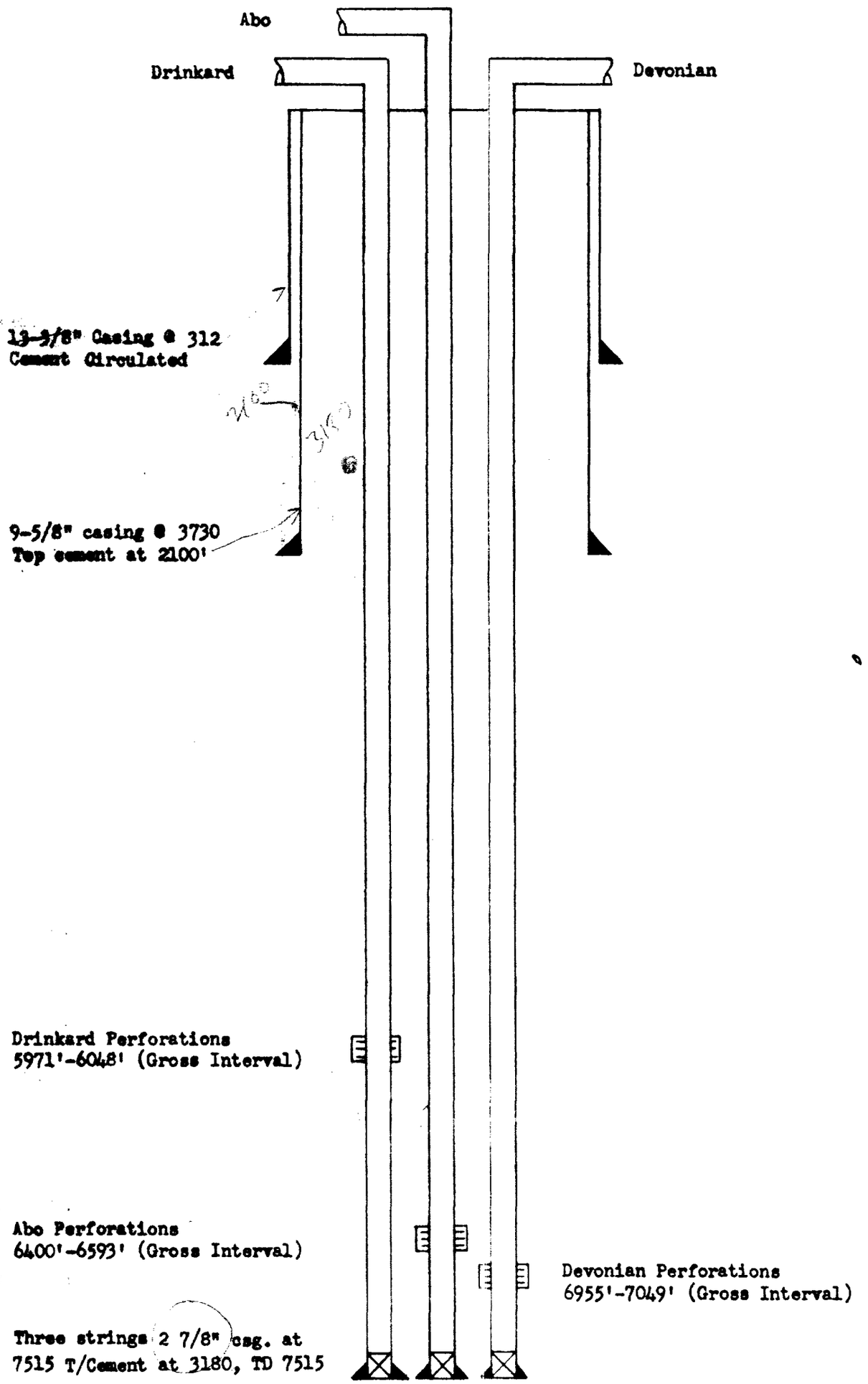
Effective Fluid Compressibility

$$c_e = \frac{S_o c_o + S_w c_w + c_f}{S_o}$$

$$c_e = \frac{[(0.57)(9.99) + (0.43)(3.0) + (6.25)]\ 10^{-6}}{(0.57)}$$

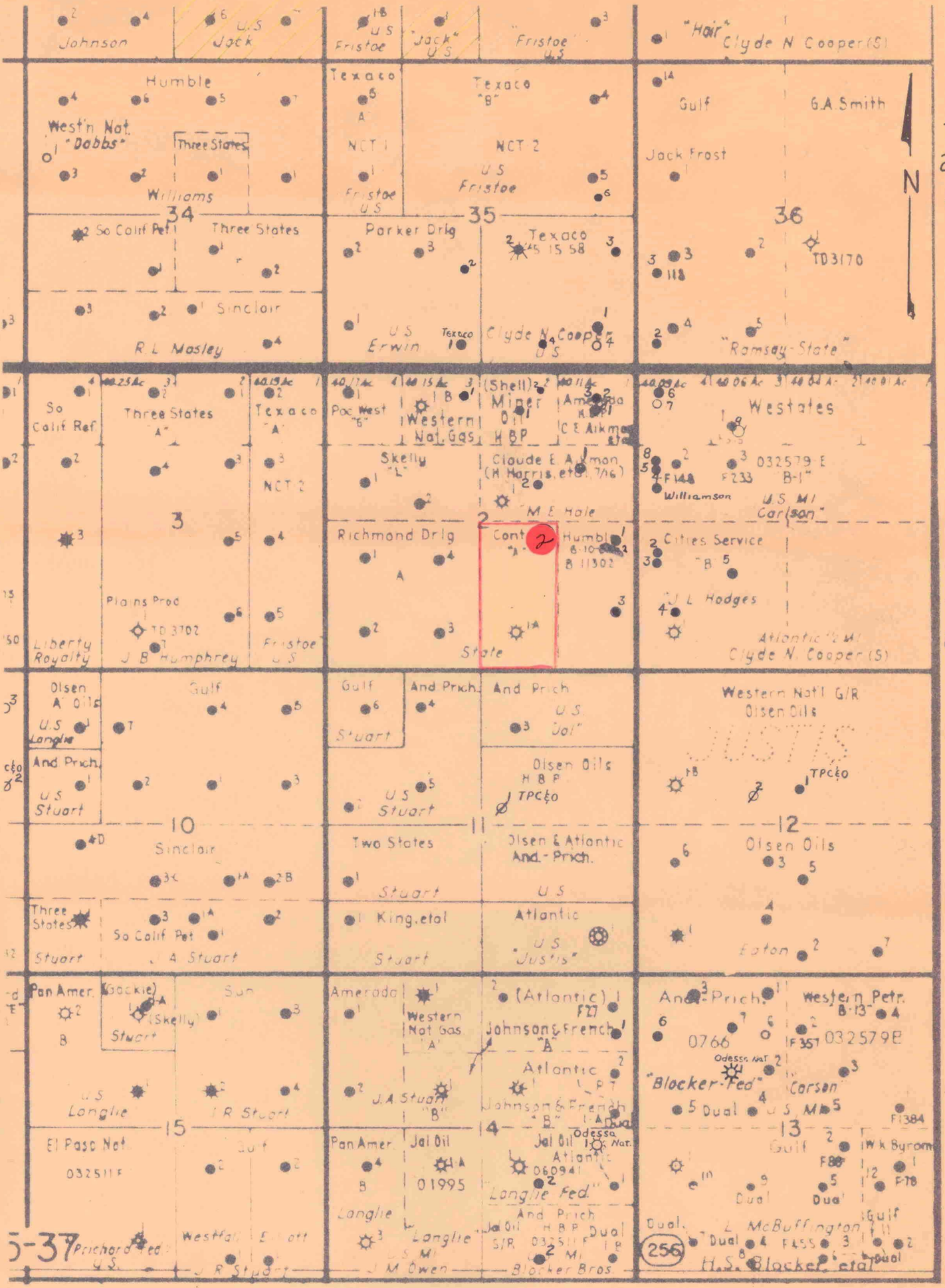
$$c_e = 23.2 \times 10^{-6} \text{ vol/vol/psi}$$

CONTINENTAL OIL COMPANY
PROPOSED METHOD OF TRIPLE COMPLETION
(Tubingless)
STATE A-2 NO. 2
NORTH JUSTIS FIELD



Ex. 2

R-37-E



R-37-E

STATE A-2 WELL No. 2

CONTINENTAL OIL COMPANY
LOCATION AND OWNERSHIP PLAT
STATE A-2 LEASE
NORTH JUSTIS AREA

Scale: 1" = 2000'
Date: 6-11-62

Exhibit No. 1

RECOVERABLE OIL RESERVES

LEA DEVONIAN POOL

Basic Data

Net Pay	=	65 feet
Porosity	=	5.49% (Core Analysis)
Water Saturation	=	43% (Capillary Pressure Tests)
Formation Volume Factor	=	1.185 (Fluid Analysis)
Recovery Factor	=	50% (Estimated)

Volumetric Calculation

$$\frac{7758 \text{ Bbl/acre-ft.} \times \text{Porosity} \times (1\text{-Water Saturation}) \times \text{Net Pay} \times \text{Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.0549)(0.57)(65)(0.50)}{1.185} = 6{,}658 \text{ bbls/acre}$$

NMOCC Case No. 2118 & 2459
Ohio Exhibit No. 9
Date 12-13-61

R 34 E

R 35 E

T 20 S

Pure
Gulf
Cactus
Texaco
Cactus Drlg
EL 3697
TD5003
EL 3693
TD5044
-11,300
L.A. & B.G. Parks
1
Texaco
-11,400
Cactus Drlg
"Featherstone Fed."
6
Martha Featherstone
2
-11,200
U
D
State
U.S.
Virgil Linam
U.S.
Virgil Linam
U.S. Smelting
Gulf
Sinclair
Ohio
Sinclair
"6025"
-11,100
-11,000
U.S.
-10,900
EL 3686
EL 3676
U.S.
11
U.S. Smelting
Gulf
Sinclair
Ohio
U.S.
12
Drlg. & Expl.
"Fed Lea"
U.S.
7
Sinclair
EL 3674
TD 14735
DEV-10611
-10,900
-11,400
-11,500
-11,600
Texaco
1
EL 3655
TD 3861
U.S.
Nathan T. Roberts
-11,000
U.S.
Nathan T. Roberts
J. N. Smith
L.V. & G.P. Sims, et al
Gulf
Ohio, et al
Ohio
Sinclair
Ohio
LEA
-11,100
-11,000
W.G. Ross
Ohio
V.K. Ross
Ohio
-11,700
Texaco
1
EL 3654
TD 3659
U.S.
14
13
18
Gulf
Pure
Pure
Cox & Hamon
Ohio
Drlg. & Expl.
Sinclair
Ohio
Ross
Texaco
-11,200
3
EL 3654
TD 3708
-11,300
"A. Gackle"
"Hanson Fed."
1-B
EL 3661
TD 4145
Ohio
-10,900
-11,600
U.S.
Nathan T. Roberts
U.S.
L.V. & G.P. Sims, et al
Gulf
Pure
Pure
Drlg. & Expl.
Cox & Hamon
Ohio
Ohio
Pan American
-11,000
C.C. Bankhead
Drlg. & Expl.
-11,100
-11,900
-11,200
U.S.
23
24
19
E.A. Hanson
H. Aid, Est
Cox & Hamon
Ohio
Cox & Hamon
EL 3676
TD 3518
-12,000
-11,300
U.S.
U.S.
L.V. & G.P. Sims, et al
State

LEGEND

- BOUNDARY OF LEA UNIT AREA
- DUAL - BONE SPRINGS & DEVONIAN
- DRILLING WELL
- MINIMUM AREA EXPECTED TO BE PRODUCTIVE

NOTE: LOG TOP OF THE DEVONIAN IN THE DISCOVERY WELL ESTABLISHED THAT THE SEISMIC CONTOURS AS SHOWN ABOVE ARE APPROXIMATELY 275 FEET LOW, HOWEVER THE SEISMIC CONTOURS REPRESENT THE RELATIVE CONFIGURATION OF THE DEVONIAN STRUCTURE.

N

REFLECTION SEISMOGRAPH MAP
CONTOURED ON TOP OF "DEVONIAN"
CONTOUR INTERVAL ——— 100'

LEA UNIT AREA

LEA COUNTY, NEW MEXICO

SCALE
0 1000 2000
FEET

THE OHIO OIL COMPANY ——— HOUSTON, TEXAS

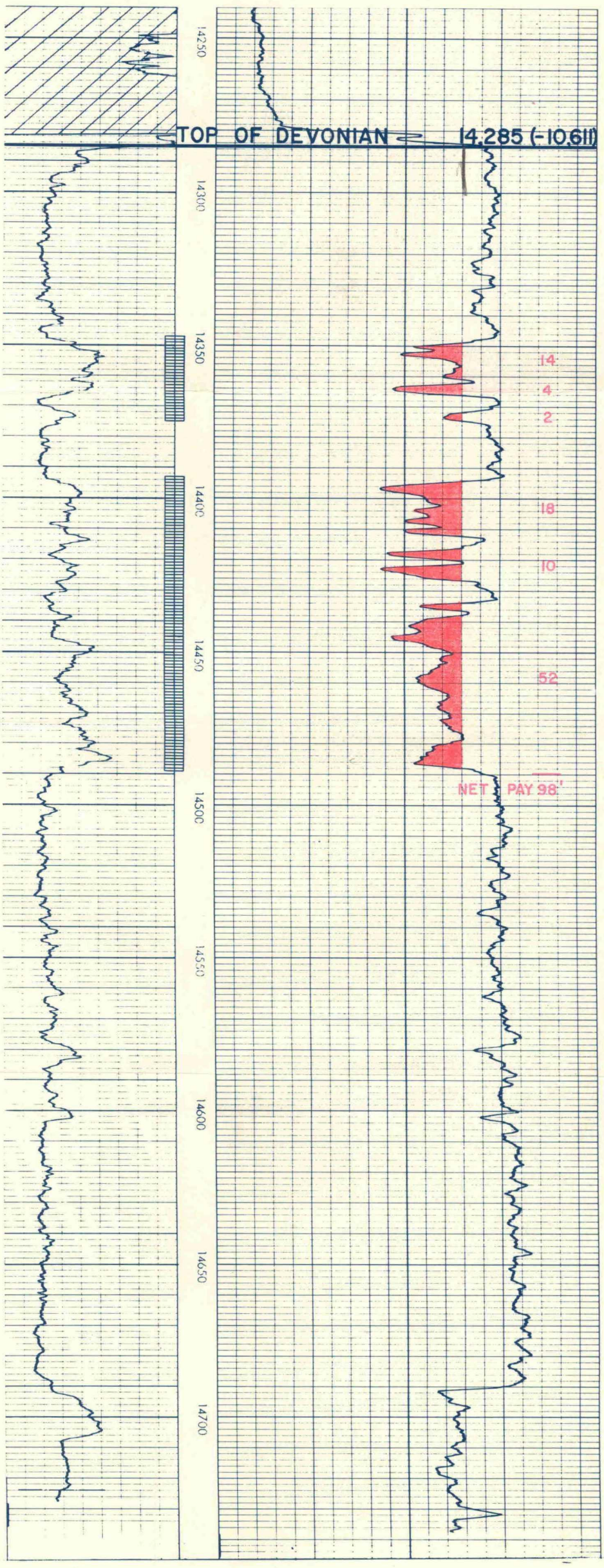
NMOCC CASE NO. 2118
OHIO EXHIBIT NO. 1
DATE.

OHIO OIL COMPANY
LEA UNIT FEDERAL WELL NO. 1

ELEV. 3674

NW/4 SW/4 SEC. 12, T-20-S, R-34-E

RADIOACTIVITY LOG OF DEVONIAN SECTION



NMOCC CASE NO. 2118
OHIO EXHIBIT NO. 3
DATE.

LEA DEVONIAN POOL

PERTINENT DATA

1. Location of Field:

   Approximately 14 miles west-southwest of Monument, New Mexico, Section 12, T-20-S, R-34-E, Lea County

2. Completion Data Lea Unit Well No. 1:

a.	Formation	Devonian
b.	Total Depth	14,735
c.	Top of Devonian	14,285 (-10,611)
d.	Top of Devonian Pay	14,349 (-10,675)
e.	Completion Data	7-8-60
f.	Perforated Interval	14,347-375 14,393-489
g.	Treatment	500 gal MA 4,000 gal Acid
h.	Initial Potential Test	
	(1) Potential (BOPD)	516
	(2) Choke Size (in.)	8/64
	(3) GOR (CF/B)	321
	(4) Casing Pressure (psig)	pkr.
	(5) Tubing Pressure (psig)	1570

3. Reservoir Fluid Characteristics:

a.	Saturation Pressure (bubble point)	567 psi @ 202°F
b.	Formation Volume Factor @ Original Pressure	1.185
c.	Solution Gas Oil Ratio (CF/B)	318
d.	Oil Viscosity @ Original Pressure (cp)	0.310
e.	Oil Gravity (°API @ 60°F)	58.2

4. Reservoir Characteristics:

a.	Porosity (%)	4.7
b.	Permeability (md)	9.6 and greater
c.	Water Saturation (%)	30.0 est.
d.	New Pay (ft.)	98
e.	Reservoir Temperature (°F)	202
f.	Original Reservoir Pressure (psig)	6046 @ -10,744
g.	Probable Reservoir Mechanism	Water Drive

NMOCC Case No. 2118

Ohio Exhibit No. 2

Date _____

RECOVERABLE OIL RESERVES

LEA DEVONIAN POOL

Basic Data

Net Pay	=	98 feet	(Neutron Log)
Porosity	=	4.7%	(Neutron Log)
Water Saturation	=	30%	(estimated)
Formation Volume Factor	=	1.185	(fluid analysis)
Recovery Factor	=	50%	(estimated)

Volumetric Calculation

$$\frac{7758 \text{ Bbl/acre-foot} \times \text{Porosity} \times (1\text{-Water Saturation}) \times \text{Net Pay} \times \text{Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.047)(0.70)(98)(0.50)}{1.185} = 10{,}554 \text{ bbls/acre}$$

NMOCC Case No. 2118

Ohio Exhibit No. 4

Date _____

COMPARATIVE ECONOMICS FOR DEVELOPMENT OF LEA DEVONIAN POOL

40-ACRE SPACING VS. 80-ACRE SPACING

Minimum Area Expected to be Productive		800 Acres
Wells Required with 40 Acre Spacing		20 Wells
Wells Required with 80 Acre Spacing		10 Wells
Investment @ $471,000 per Well		
For 40 Acre Spacing (20 Wells)		$ 9,420,000
For 80 Acre Spacing (10 Wells)		$ 4,710,000
Ultimate Reserves		
Oil		8,443,200 bbls.
Gas @ 300 cu. ft. per bbl.		2,532,960 MCF
W.I. Net Operating Income Per Gross Bbl. of Oil Produced Including Income From Gas Produced with Oil		
Value		
Bbl. of oil		$2.77
300 cu. ft. of gas		.06
Total Gross Value		$2.83
Costs		
Severance & Advalorem Taxes	$0.20	
Royalty	0.35	
Lifting Costs	0.25	
		$0.80
Net Operating Income per gross bbl.		$2.03
W.I. Total Net Operating Income		
8,443,200 x $2.03/bbl.		$17,139,696
Net Profit for 40-Acre Spacing		$ 7,719,696
Net Profit per Well	$385,985	
Profit to Investment Ratio		0.82 to 1
Net Profit for 80-Acre Spacing		$12,429,696
Net Profit per Well	$1,242,970	
Profit to Investment Ratio		2.64 to 1

NMOCC Case No. 2118

Ohio Exhibit No. 5

Date _____

LEA BONE SPRINGS POOL

PERTINENT DATA

1. Location of Field:

   Approximately 14 miles west-southwest of Monument, New Mexico, Section 12, T-20-S, R-34-E, Lea County

2. Completion Data Lea Unit Well No. 1:

a.	Formation	Bone Springs
b.	Top of Bone Springs	8183 (-4509)
c.	Top of Bone Springs Pay	9480 (-5806)
d.	Completion Date	10-9-60
e.	Perforated Interval	9480-9550
f.	Treatment	None
g.	Initial Potential Test	
	(1) Potential (BOPD)	214
	(2) Choke Size (in.)	1/2
	(3) GOR (CF/B)	1817
	(4) Casing Pressure (psig)	pkr.
	(5) Tubing Pressure (psig)	100

3. Reservoir Fluid Characteristics:

a.	Saturation Pressure	Unknown
b.	Formation Volume Factor	1.95 est.
c.	Solution GOR (CF/B)	1817
d.	Oil Gravity (^{o}API @ 60^{o}F)	42

4. Reservoir Characteristics:		Dolomite	Sand
a.	Porosity (%)	3.05	10.2
b.	Permeability (md)	4.39	0.25
c.	Water Saturation (%)	30.0 est.	30.0 est.
d.	Net Pay (ft.)	28	19
e.	Reservoir Temperature (^{o}F)	142	
f.	Original Reservoir Press. (psig)	3983 @ -5840	
g.	Probable Reservoir Mechanism	Solution Gas	

NMOCC Cas No. 2119

Ohio Exhibit No. 6

Date _____

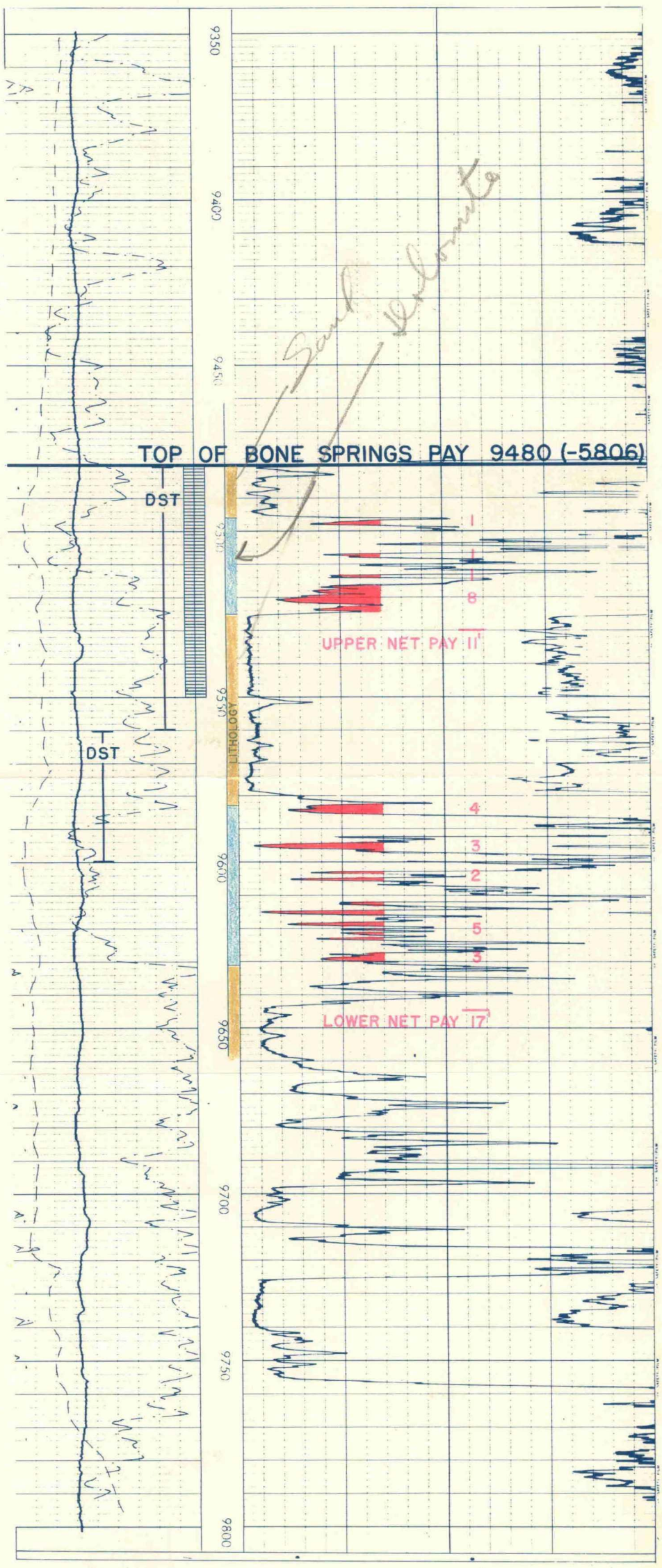
OHIO OIL COMPANY

LEA UNIT FEDERAL WELL NO. 1

ELEV. 3674

NW/4 SW/4 SEC. 12, T-20-S, R-34-E

FORXO LOG OF BONE SPRINGS PAY



DST 9480-9560 Open 3 hrs. GTS 20 min. OTS 1-2/3 hrs. F est 20 BO 1st hr. F to tank 22.88 BO in 1 hr. (549 BOPD). FTP 125#, GOR 2030, Gty 42.9°. 45 min ISIP 3980#, IFP 420#, FFP 1060#.

DST 9560-9600 Open 4 hrs. GTS 2 hrs. F 28.65 BO in 1-3/4 hrs. (391 BOPD). GOR 2006, Gty 41.3°. FTP 1135-155. 1 hr ISIP 4060#, IFP 800#, Max FP 1600#, FFP 900#, 30 min FSIP 3800#.

NMOCC CASE NO. 2119

OHIO EXHIBIT NO. 7

DATE.

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

RECOVERABLE OIL RESERVE

LEA BONE SPRINGS POOL

DOLOMITE INTERVAL:

Basic Data

Porosity	-3.05% (core analysis #2 well)
Permeability	-4.39 md (core analysis #2 well)
Net Pay	- 28 ft. (Log #1 well)
Water Saturation	- 30% (estimated)
Recovery Factor	- 20% (estimated)
Formation Volume Factor	- 1.95 (estimated)

Volumetric Calculation

$$\frac{7758 \text{ Bbl/Acre-foot} \times \text{Porosity} \times (1\text{-Water Saturation}) \times \text{Net Pay} \times \text{Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.0305)(0.70)(28)(0.20)}{1.95} = 476 \text{ bbl/acre}$$

SAND INTERVAL

Basic Data

Porosity	- 10.2% (core analysis #2 well)
Permeability	- 0.25 md (core analysis #2 well)
Net Pay	- 19 ft. (core analysis #2 well)
Water Saturation	- 30% (estimated)
Recovery Factor	- 10% (estimated)
Formation Volume Factor	- 1.95 (estimated)

Volumetric Calculations

$$\frac{7758 \text{ Bbl/Acre-foot} \times \text{Porosity} \times (1\text{-Water Saturation}) \times \text{Net Pay} \times \text{Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.102)(0.70)(19)(0.10)}{1.95} = 540 \text{ bbl/acre}$$

TOTAL BONE SPRINGS INTERVAL:

Zone Total = 476 + 540 = 1016 bbl/acre

NMOCC Case No. 2119

Ohio Exhibit No. 9

Date _____

COMPARATIVE ECONOMICS FOR DEVELOPMENT OF LEA BONE SPRINGS POOL

40-ACRE SPACING VS. 80-ACRE SPACING

Minimum Area Expected to be Productive			800 Acres
Wells Required with 40 Acre Spacing			20 Wells
Wells Required with 80 Acre Spacing			10 Wells
Investment @ $225,000 per well			
For 40 Acre Spacing (20 Wells)			$4,500,000
For 80 Acre Spacing (10 Wells)			$2,250,000
Investment for Dual Completion @ $25,000 per Well			
For 40 Acre Spacing (20 Wells)			$ 500,000
For 80 Acre Spacing (10 Wells)			$ 250,000
Ultimate Reserves			
Oil			812,800 bbls.
Gas @ 2000 cu. ft. per bbl.			1,625,600 MCF
W.I. Net Operating Income Per Gross Bbl. of Oil Produced Including Income from Gas Produced With Oil			
Value			
Bbl. of oil			$ 2.77
2000 cu. ft. of gas			0.20
Total Gross Value			$ 2.97
Costs			
Severance & Advalorem Taxes	$0.21		
Royalty	0.37		
Lifting Costs	0.24		
			$ 0.82
Net Operating Income per Gross Bbl.			$ 2.15
W.I. Total Net Operating Income			
812,800 x $2.15/bbl.			$1,747,520
Net Loss for 40-Acre Spacing			$2,752,480
Net Loss per Well	$137,624		
Net Loss for 80-Acre Spacing			$ 502,480
Net Loss per Well	$ 50,248		
Net Profit for Dual Completion for 40-Acre Spacing			$1,247,520
Net Profit per Well	$ 62,376		
Profit to Investment Ratio		2.50 to 1	
Net Profit for Dual Completion for 80-Acre Spacing			$1,497,520
Net Profit per Well	$149,752		
Profit to Investment Ratio		5.99 to 1	

NMOCC Case No. 2119

Ohio Exhibit No. 10

Date

CORE ANALYSIS

LEA UNIT WELL NO. 2

BONE SPRINGS PAY

LOWER DOLOMITE INTERVAL 9607-9648

W/PERMEABILITY EQUAL TO OR GREATER THAN 0.1 MILLIDARCY

Depth Interval	Footage	Permeability md.	Porosity %
9607.6-09.1	1.5	1.0	2.8
09.1-10.8	1.7	0.2	1.4
13.7-15.6	1.9	1.8	2.4
15.6-17.0	1.4	10.0	2.7
17.0-18.0	1.0	0.2	2.9
21.0-22.5	1.5	23.0	5.9
22.5-23.7	1.2	6.6	3.1
23.7-25.2	1.5	2.8	2.3
25.2-26.5	1.3	2.3	3.3
28.0-29.5	1.5	2.1	6.1
32.3-34.0	1.7	6.1	2.4
34.0-36.0	2.0	0.7	2.0
44.5-45.5	1.0	0.1	3.2
Net Pay	19.2 ft.		
Weighted Average		4.39 md.	3.05%

CORE ANALYSIS

LEA UNIT WELL NO. 2

BONE SPRINGS PAY

LOWER SAND INTERVAL 9565-9607

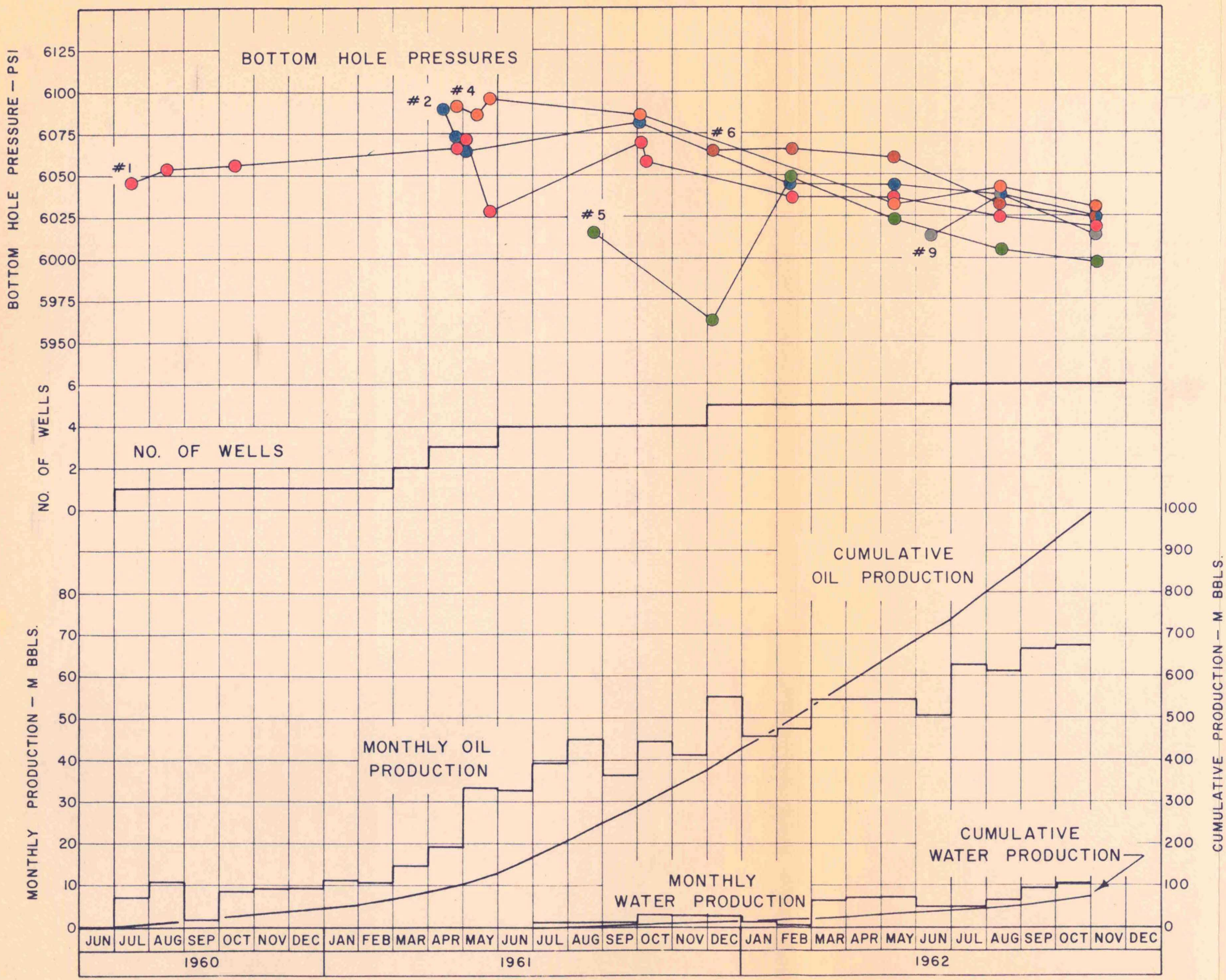
W/PERMEABILITY EQUAL TO OR GREATER THAN 0.1 MILLIDARCY

Depth Interval	Footage	Permeability md.	Porosity %
9566.0-67.0	1.0	0.3	9.6
72.0-73.0	1.0	0.1	9.3
75.0-76.0	1.0	0.3	10.3
76.0-77.0	1.0	0.6	14.5
77.0-78.0	1.0	0.4	13.3
79.0-80.0	1.0	0.1	8.6
80.0-81.0	1.0	0.1	8.0
81.0-82.0	1.0	0.1	7.1
82.0-83.0	1.0	0.1	8.3
83.0-84.0	1.0	0.1	9.6
84.0-85.0	1.0	0.1	10.4
85.0-86.0	1.0	0.4	14.9
86.0-87.0	1.0	0.4	11.5
94.0-95.0	1.0	0.1	6.0
95.0-96.0	1.0	0.1	7.5
96.0-97.0	1.0	0.1	8.0
97.0-98.0	1.0	0.4	12.5
98.0-99.0	1.0	0.6	12.8
99.0-00.0	1.0	0.4	10.8
Net Pay	19.0 ft.		
Weighted Average		0.25 md.	10.2%

Case No.

2118

Large Exhibits



PRODUCTION HISTORY GRAPH

LEA DEVONIAN POOL

LEA COUNTY, NEW MEXICO

NMOCC CASE NO. 2118 & 2459

MARATHON EXHIBIT NO. 4

DATE 12-19-62

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

SCHLUMBERGER

SONIC LOG

SCHLUMBERGER WELL SURVEYING CORPORATION
Houston, Texas

COUNTY LEA
FIELD or LOCATION NORTH JUSTIS
WELL STATE A-2 #2
COMPANY CONTINENTAL OIL CO.

COMPANY CONTINENTAL OIL COMPANY
WELL STATE A-2 #2
FIELD NORTH JUSTIS
LOCATION SEC. 2, T-25S R32E
COUNTY LEA
STATE NEW MEXICO

Other Surveys
LL

Location of Well
2310' FSL
1650' FEL

Elevation: K.B.: 3163
D.F.: 3162
or G.L.: 3153

FOLD HERE

Log Depths Measured From KB 10 Ft. above GL

RUN No.	1		
Date	9-29-62		
First Reading	7517		
Last Reading	SURF (GR)		
Feet Measured	7517		
Csg. Schlum.	3735		
Csg. Driller	3750		
Depth Reached	7526		
Bottom Driller	7517		
Mud Nat.	STARCH, SALT GEL		
Dens. | Visc.	10.4 | 32	|	|
Mud Resist.	0.054 @ 81 °F	@ °F	@ °F
" Res. BHT	.043 @ 110 °F	@ °F	@ °F
" pH	6.0 @ °F	@ °F	@ °F
" Wtr. Loss	10.0 CC 30 min	CC 30 min	CC 30 min
" Rmf	- @ °F	@ °F	@ °F
Bit Size	8 3/4"		
Spacing:			
T2 R1 R2	4200 To 7516	To	To
T2 R3 R2	3735 To 7517	To	To
Opr. Rig Time	5 HRS.		
Truck No.	1582-KERMIT		
Recorded By	BRUMHALL		
Witness	CARNES		

R 34 E

R 35 E

T 20 S

Pure | Gulf | Texaco | Cactus Drlg.

L.A. & B.G. Parks — 1 — Texaco | Cactus Drlg. | "Featherstone Fed." — 6 — Martha Featherstone

EL 3699
TD 13,745 (-10,046)
DEV -11,081 est.

-11050 -11000 -10950 -10900 -10850 -10800 -10750 -10700 -10650 -10600 -10650 -10700 -10750 -10800 -10850

A — A'

U D

State | U.S. | U.S.

U.S. Smelting | Gulf | Sinclair Marathon | Sinclair "6025"

EL 3693
TD 14,693
DEV -10,878

EL 3667
TD 14,619
DEV -10,812

EL 3677
TD 14,492
DEV-10,680

EL 3686
TD 14,501
DEV-10,630

EL 3676
TD14947
DEV-11,092

"Fed. Lea" U.S. — 7 — Sinclair

U.S. Smelting | Drlg. & Expl.

EL 3667
TD 14,472
DEV -10,674

EL 3674
TD 14,735
DEV -10,611

EL 3683
TD 14,476
DEV -10,660

EL 3678
TD 13,569 (-9890)
DEV-10,600 est.

U.S. | U.S. | J.N. Smith

Gulf | Marathon, et al | Marathon | Marathon | Sinclair Marathon

EL 3676
TD 14,408
DEV -10,620

W.G. Ross Marathon | V.K. Ross Marathon

U.S. | 14 | 13 | 18

Gulf | Pure | Pure | Cox & Hamon Marathon | Drlg. & Expl. | Sinclair Marathon | Ross

EL 3677
TD 14,435
DEV-10,608

Marathon

U.S. | U.S. | U.S.

Gulf | Pure | Pure | Drlg. & Expl. | Cox & Hamon Marathon | Marathon | Pan American

C.C. Bankhead | Drlg. & Expl.

U.S. | 24 | 19

23 — E.A. Hanson | H. Aid, Est. | Cox & Hamon | Marathon

U.S. | U.S. | State

LEGEND

- BOUNDARY OF LEA UNIT
- DUAL — BONE SPRINGS & DEVONIAN
- DUAL — PENN. (GAS) & DEVONIAN
- DUAL — BONE SPRINGS & PENN. (GAS)
- BONE SPRINGS
- PENNSYLVANIAN (GAS)
- PROPOSED DEVONIAN PARTICIPATING AREA
- DEVONIAN PRODUCERS

CONTOURED ON TOP OF DEVONIAN
CONTOUR INTERVAL ——— 50'

LEA UNIT AREA

LEA COUNTY, NEW MEXICO

SCALE
1000 0 1000 2000
FEET

MARATHON OIL COMPANY ——— HOUSTON, TEXAS

NMOCC CASE NO. 2118 & 2454
MARATHON EXHIBIT NO. 1
DATE 12-19-62

RBB

R 34 E

R 35 E

T 20 S

Pure | Gulf | Cactus | Texaco | Cactus Drlg

EL 3697 TD 5003

EL 3699 TD 5044

-11,300

L.A. & B.G. Parks — 1 — Texaco

"Featherstone Fed." — 6 — Martha Featherstone

Cactus Drlg

-11,400

U

D

-11,200

State

U.S. Smelting

U.S. Virgil Linam

Sinclair Ohio

Sinclair "6025"

-11,100

-11,000

U.S.

-10,900

EL 3686

EL 3676

"Fed Lea" U.S. — 7 — Sinclair

U.S. — 11 — U.S. Smelting

Gulf

Sinclair Ohio

12

Drlg. & Expl.

-11,400

-11,500

-11,600

EL 3674 TD 14735 DEV-10611

-10,900

Texaco

EL 3655 TD 3861

U.S. Nathan T. Roberts

-11,000

U.S. Nathan T. Roberts

J.N. Smith L.V. & G.P. Sims, et al

Gulf | Ohio, et al | Ohio | Ohio

Sinclair Ohio

W.G. Ross Ohio | V.K. Ross Ohio

-11,700

LEA

Texaco

EL 3654 TD 3659

-11,100

U.S.

Gulf | Pure | Pure

13 — Cox & Hamon Ohio — Drlg. & Expl.

Sinclair Ohio — 18 — Ross

Texaco

-11,200

EL 3654 TD 3708

-11,300

"A. Gackle" "Hanson Fed." I-B

EL 3661 TD 4145

U.S. Nathan T. Roberts

Ohio

-10,900

U.S. Nathan T. Roberts

U.S. L.V. & G.P. Sims, et al

-11,600

Gulf | Pure | Pure | Drlg. & Expl. | Cox & Hamon Ohio | Ohio | Pan American

-11,000

C.C. Bankhead | Drlg. & Expl.

-11,100

-11,900

-11,200

E.A. Hanson — 23 — H. Aid, Est — 24 — Cox & Hamon — 19

Ohio — Cox & Hamon

EL 3676 TD 3518

-11,300

-12,000

U.S. | U.S. L.V. & G.P. Sims, et al | State

2x40 #80

LEGEND

- BOUNDARY OF LEA UNIT AREA
- DUAL - BONE SPRINGS & DEVONIAN
- DRILLING WELL
- MINIMUM AREA EXPECTED TO BE PRODUCTIVE

NOTE: LOG TOP OF THE DEVONIAN IN THE DISCOVERY WELL ESTABLISHED THAT THE SEISMIC CONTOURS AS SHOWN ABOVE ARE APPROXIMATELY 275 FEET LOW, HOWEVER THE SEISMIC CONTOURS REPRESENT THE RELATIVE CONFIGURATION OF THE DEVONIAN STRUCTURE.

N

REFLECTION SEISMOGRAPH MAP
CONTOURED ON TOP OF "DEVONIAN"
CONTOUR INTERVAL ——— 100'

LEA UNIT AREA

LEA COUNTY, NEW MEXICO

SCALE
0 1000 2000
FEET

THE OHIO OIL COMPANY ——— HOUSTON, TEXAS

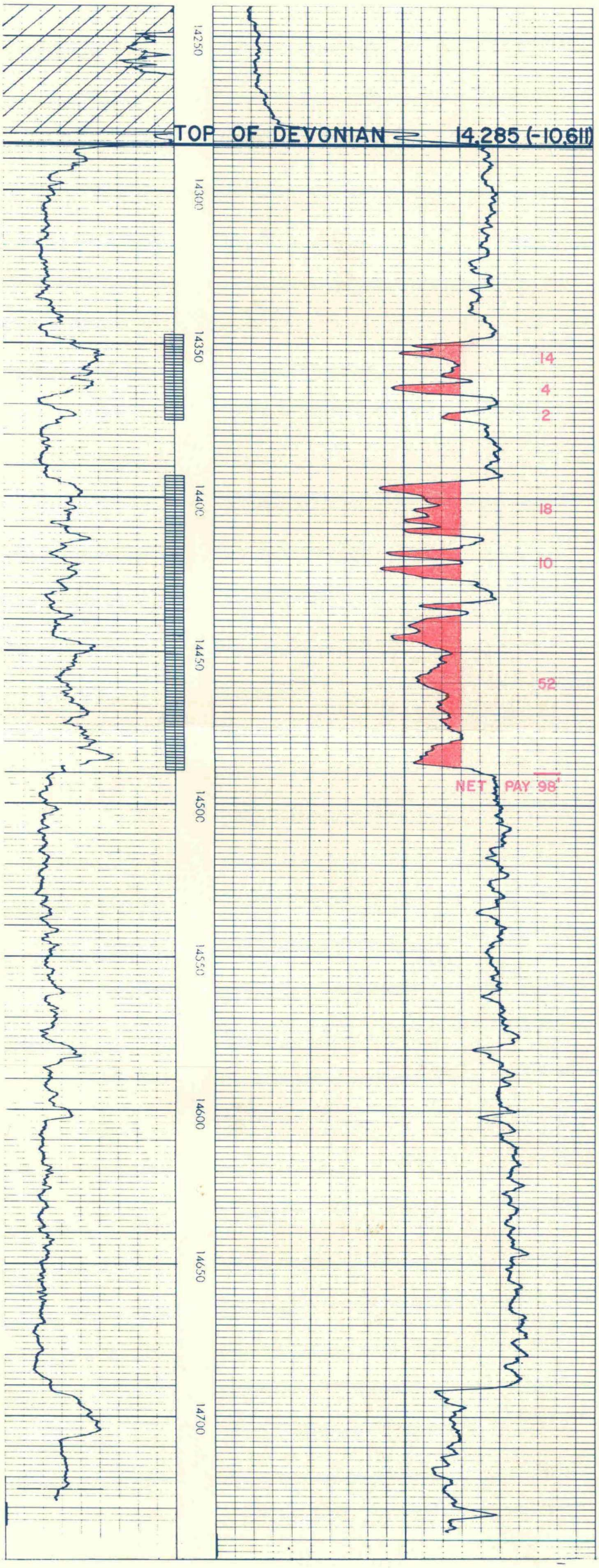
NMOCC CASE NO. 2118
OHIO EXHIBIT NO. 1
DATE.

OHIO OIL COMPANY
LEA UNIT FEDERAL WELL NO. 1

ELEV. 3674

NW/4 SW/4 SEC. 12, T-20-S, R-34-E

RADIOACTIVITY LOG OF DEVONIAN SECTION



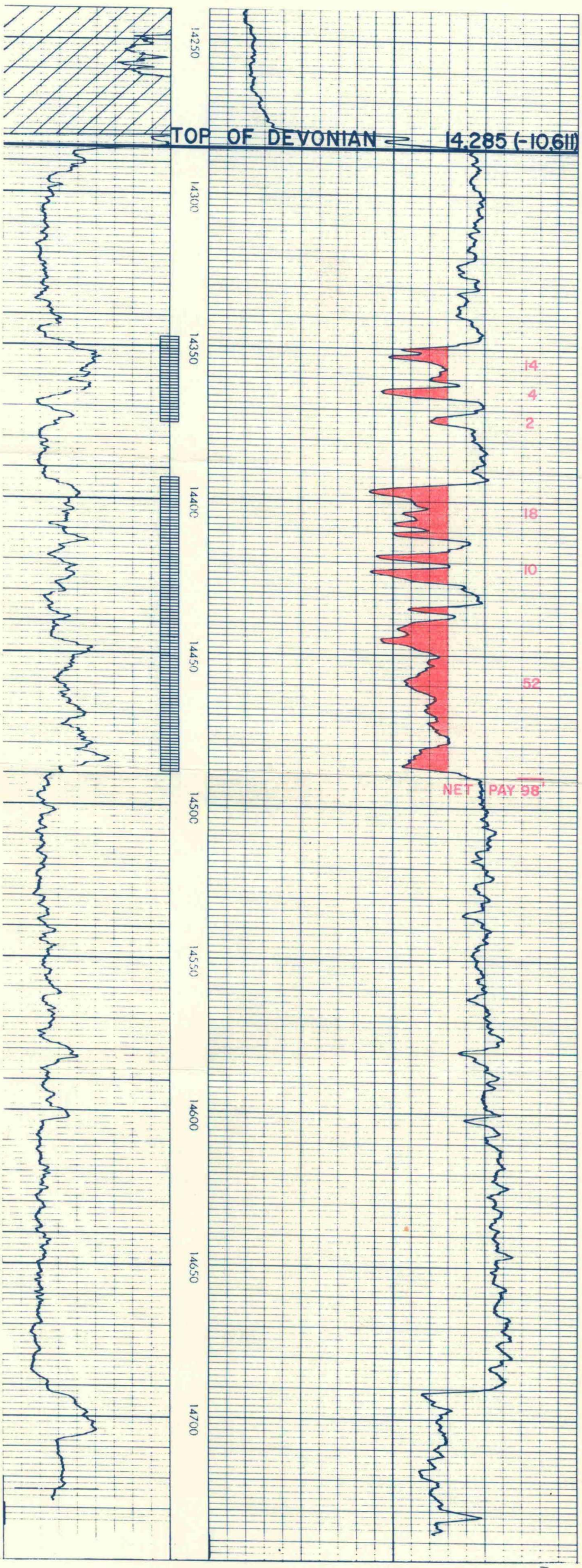
NMOCC CASE NO. 2118
OHIO EXHIBIT NO. 3
DATE.

OHIO OIL COMPANY
LEA UNIT FEDERAL WELL NO. 1

ELEV. 3674

NW/4 SW/4 SEC. 12, T-20-S, R-34-E

RADIOACTIVITY LOG OF DEVONIAN SECTION



DF = (1 + (100+50)/18
= 1 + 8.33
= 9.33

NMOCC CASE NO. 2118
OHIO EXHIBIT NO. 3
DATE.

OHIO OIL COMPANY

LEA UNIT FEDERAL WELL NO. 2

ELEV. 3686

SE/4 NW/4 SEC. 12, T-20-S, R-34-E

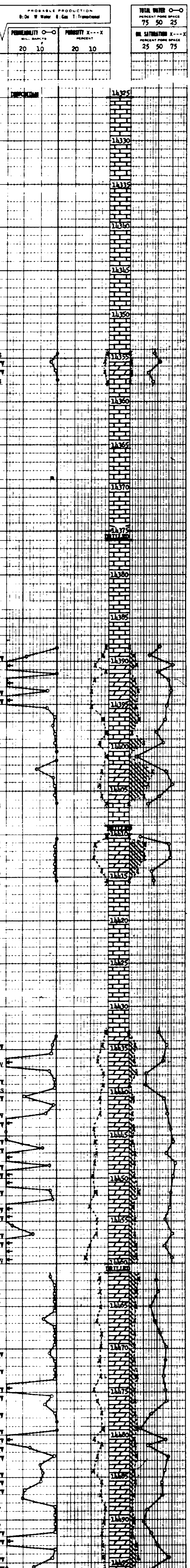
COMPLETION COREGRAPH OF DEVONIAN

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

SAMPLE CHARACTERISTICS — F: Fractured L: Laminated FG, MG, CG: Type Grain Size S: Stylolitic V: Vuggy

PROBABLE PRODUCTION — O: Oil W: Water G: Gas T: Transitional

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MD (H: Horizontal Perm Plug)		POROSITY %	RESIDUAL SATURATION % PORE SPACE: OIL	TOTAL WATER	SAMPLE CHARACTERISTICS
123	14354.0-55.0	<0.1	<0.1	1.3	0.0	55.2	S
124	55.0-56.0	3.8	1.3	2.2	1.8	45.2	FV
125	56.0-57.3	0.6	0.4	2.3	1.3	66.7	FV
126	57.3-58.3	<0.1	<0.1	0.9	0.0	58.4	S
	DENSE-NO SHOW						
127	14388.0-88.7	<0.1	<0.1	1.3	0.0	46.6	S
128	88.7-90.0	18	0.5	3.2	8.2	64.4	FV
129	90.0-91.0	87	73	7.6	12.5	24.4	V
130	91.0-91.5	<0.1	<0.1	1.4	0.0	50.0	S
131	91.5-92.8	127	0.4	8.0	8.3	30.7	V
132	92.8-94.4	5.4	3.6	9.7	15.3	26.9	FV
133	94.4-96.0	1150	1150	9.4	11.0	33.5	FV
133A		5.6	5.3				
134	14396.0-97.6	0.2	0.2	3.2	16.8	36.7	
134A		2.4	1.7				
135	14397.6-99.0	0.6	0.5	1.3	5.2	50.7	
136	99.0-00.0	0.4	0.2	4.8	25.1	39.1	F
137	14400.0-02.0	<0.1	<0.1	0.7	0.0	87.2	S
137A		<0.1	<0.1				
138	14402.0-03.5	12	0.9	3.6	41.0	34.6	F
139	03.5-05.2	2.0	1.1	5.2	33.1	24.4	F
139A		0.4	0.2				
140	14405.2-06.0	0.5	0.3	3.5	25.4	47.0	
141	06.0-07.0	<0.1	<0.1	0.4	0.0	66.7	S
142	14410.0-10.7	<0.1	<0.1	0.6	0.0	80.0	S
143	10.7-11.9	0.2	0.1	7.5	28.0	28.8	F
144	11.9-13.6	0.6	0.5	8.2	26.6	27.1	F
144A		0.4	0.3				
145	14413.6-15.0	0.1	0.1	3.5	14.5	60.0	F
146	15.0-16.0	<0.1	<0.1	0.9	0.0	56.0	S
	DENSE-NO SHOW						
147	14432.5-33.5	<0.1	<0.1	1.3	0.0	47.0	S
148	33.5-35.4	2.5	1.4	3.1	11.1	32.8	FV
148A		3.0	0.5				
149	14435.4-37.3	60	9.0	5.6	8.8	38.5	FV
149A		4.6	2.3				
150	14437.3-38.5	0.3	0.2	2.7	13.5	69.3	FL
151	38.5-39.8	0.4	0.2	2.8	1.1	70.8	FS
152	39.8-41.5	19	17	4.3	7.2	37.8	FV
152A		1.5	0.6				
153	14441.5-43.4	6.3	2.9	4.6	5.7	31.6	FV
154	43.4-45.0	122	114	8.1	8.1	26.3	FV
154A		30	25				
155	14445.0-46.4	30	20	7.2	6.3	22.3	FV
156	46.4-47.7	8.3	5.0	6.7	10.4	33.1	FV
156A		74	43				
157	14447.7-48.9	4.4	1.7	7.5	9.6	17.5	FV
158	48.9-50.8	50	46	9.0	8.8	22.8	FV
158A		34	25				
159	14450.8-52.6	3.4	1.5	7.0	16.4	26.8	FV
159A		2.4	1.8				
160	14452.6-54.1	271	64	10.1	7.0	27.4	FV
161	54.1-55.6	98	31	6.2	11.0	35.7	FV
161A		26	23				
162	14455.6-57.2	14	9.2	6.5	9.5	23.0	FV
163	57.2-58.6	38	33	10.3	11.8	36.9	FV
163A		32	31				
164	14458.6-60.0	120	104	13.2	13.4	24.2	FV
165	14461.0-62.6	3.5	0.4	4.7	17.1	50.4	F
165A		0.2	0.1				
166	14462.6-64.1	0.2	0.1	4.5	13.0	48.5	F
167	64.1-65.9	0.1	0.1	4.2	10.8	61.1	F
167A		0.1	0.1				
168	14465.9-67.5	7.8	4.9	6.3	10.0	53.5	F
169	67.5-69.0	0.8	0.6	3.6	9.0	44.2	F
169A		0.4	0.3				
170	14469.0-70.6	0.2	0.2	4.0	9.3	34.2	F
171	70.6-72.2	4.6	2.6	4.9	8.6	35.1	FV
171A		0.5	0.3				
172	14472.2-74.0	0.2	0.2	4.5	13.4	38.0	FV
172A		0.8	0.6				
173	14474.0-75.4	54	7.2	8.1	8.8	36.5	FV
174	75.4-76.7	3.0	1.7	6.1	9.4	33.9	FV
174A		7.1	5.6				
175	14476.7-78.6	0.3	0.2	3.5	9.2	61.6	FV
175A		<0.1	<0.1				
176	14478.6-80.2	<0.1	<0.1	3.1	13.4	80.0	FV
177	80.2-80.7	58	48	8.0	8.0	36.4	FV
178	80.7-81.7	16	0.2	3.9	9.5	67.8	FV
179	81.7-83.6	1.3	0.9	6.3	11.7	30.9	FV
179A		10	8.3				
180	14483.6-84.8	8.5	6.1	9.0	7.1	37.6	FV
181	84.8-86.2	9.5	2.9	4.0	10.1	42.2	FV
182	86.2-88.0	19	3.6	4.5	7.7	42.0	FV
182A		20	2.9				
183	14488.0-89.6	0.3	0.1	1.8	4.5	68.6	F
183A		0.3	0.3				
184	14489.6-91.0	0.7	0.2	2.7	7.5	76.0	F
185	91.0-92.4	0.2	0.2	3.7	4.3	61.5	FV
186	92.4-93.6	45	0.7	3.4	11.6	50.1	FV
186A		0.5	0.2				
187	14493.6-95.2	2.9	2.1	3.1	15.3	29.5	FV
188	95.2-96.7	14	0.7	2.3	6.0	63.3	FVS
188A		2.9	0.4				
189	14496.7-98.0	<0.1	<0.1	3.0	13.3	60.8	FS



NMOCC CASE NO. *2118 & 2459*

OHIO EXHIBIT NO. *4*

DATE *12-13-61*

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

LARGE FORMAT
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BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

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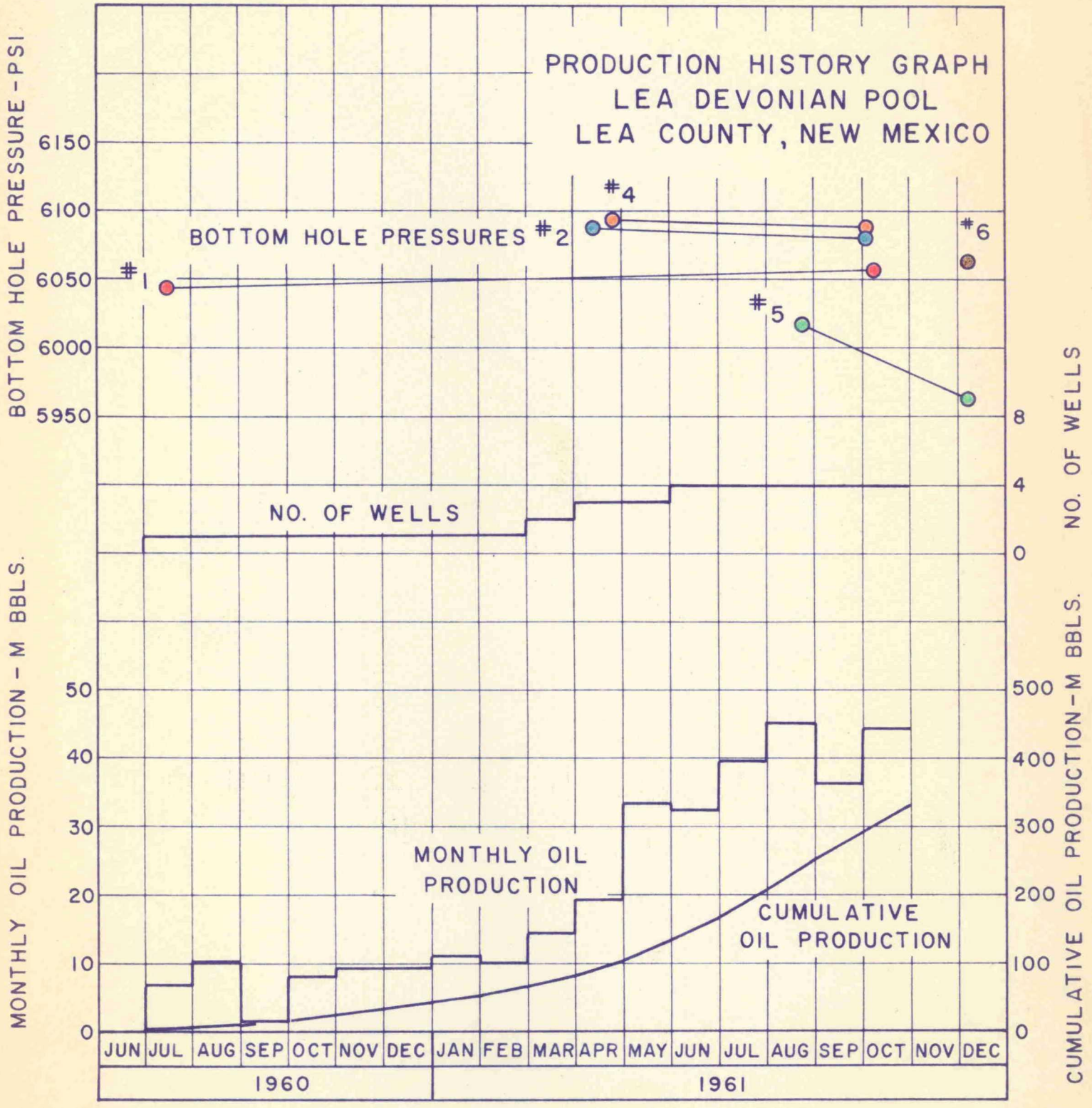


NMOCC CASE NO. 2118 & 2459

OHIO EXHIBIT NO. 3

DATE 12-13-61

R 34 E

R 35 E

T 20 S

Pure | Gulf | Texaco | Cactus Drlg.

L.A. & B.G. Parks — 1 — Texaco | Cactus Drlg.

"Featherstone Fed." — 6 — Martha Featherstone

2

"Quail-Federal" U.S.

State | U.S.

U.S. Smelting | Gulf | Sinclair Ohio | Sinclair "6025"

U.S.

EL 3676 TD14947

"Fed. Lea" U.S. — 7 — Sinclair

U.S. Smelting — 11 — 12 — Drlg. & Expl.

J.N. Smith

Gulf | Ohio, et al | Ohio | Ohio | Sinclair Ohio

W.G. Ross Ohio | V.K. Ross Ohio

Gulf — 14 — Pure | Pure — 13 — Cox & Hamon | Drlg. & Expl. | Sinclair Ohio — 18 — Ross

Ohio

Gulf | Pure | Pure | Drlg. & Expl. | Cox & Hamon Ohio | Ohio | Pan American

C.C. Bankhead | Drlg. & Expl.

E.A. Hanson — 23 — H. Aid, Est. | 24 — Cox & Hamon | Ohio — 19

U.S. | U.S. | State

LEGEND

- BOUNDARY OF LEA UNIT
- DUAL — BONE SPRINGS & DEVONIAN
- DUAL — BONE SPRINGS & PENN. (GAS)
- PROPOSED PARTICIPATING AREA

MINIMUM RADIAL DRAINAGE
LEA DEVONIAN POOL
LEA UNIT AREA
LEA COUNTY, NEW MEXICO

SCALE
1000 0 1000 2000
FEET

THE OHIO OIL COMPANY ——— HOUSTON, TEXAS

NMOCC CASE NO. 2118 & 2459

OHIO EXHIBIT NO. 12

DATE 12-13-61

RBB

R 34 E

R 35 E

T 20 S

Pure | Gulf | Cactus | Texaco | Cactus Drlg

EL 3697 TD5003

EL 3693 TD5044

-11,300

L.A. & B.G. Parks 1 Texaco

"Featherstone Fed." 6 Martha Featherstone

Cactus Drlg

-11,400

U

D

-11,200

State

U.S. Virgil Linam

U.S. Smelting | Gulf | Sinclair Ohio

-11,100

-11,000

U.S.

-10,900

EL 3686

EL 3676

U.S. 11 | 12 | 7

U.S. Smelting | Gulf | Sinclair Ohio | Drlg. & Expl. | "Fed Lea" U.S. Sinclair

EL 3674 TD 14735 DEV-10611

-10,900

-11,400

-11,500

-11,600

Texaco 1 EL 3655 TD 3861

U.S. Nathan T. Roberts

-11,000

U.S. Nathan T. Roberts

J. N. Smith L.V. & G.P. Sims, et al

Gulf | Ohio, et al | Ohio | Ohio | Sinclair Ohio

LEA

Texaco 1 EL 3654 TD 3659

-11,100

-11,000

W.G. Ross Ohio | V.K. Ross Ohio

-11,700

U.S. 14 | 13 | 18

Gulf | Pure | Pure | Cox & Hamon Ohio | Drlg. & Expl. | Sinclair Ohio | Ross

D

Texaco 3 EL 3654 TD 3708

-11,200

-11,300

"A. Gackle" "Hanson Fed." 1-B EL 3661 TD 4145

Ohio

-10,900

-11,600

U.S. Nathan T. Roberts

U.S. L.V. & G.P. Sims, et al

Gulf | Pure | Pure | Drlg. & Expl. | Cox & Hamon Ohio | Ohio | Pan American

-11,000

C.C. Bankhead | Drlg. & Expl.

-11,100

-11,900

-11,200

U.S. 23 | 24 | 19

E.A. Hanson | H. Aid, Est | Cox & Hamon | Ohio

Cox & Hamon 1 EL 3676 TD 3518

-12,000

-11,300

U.S. | U.S. L.V. & G.P. Sims, et al | State

LEGEND

- BOUNDARY OF LEA UNIT AREA
- DUAL - BONE SPRINGS & DEVONIAN
- DRILLING WELL
- MINIMUM AREA EXPECTED TO BE PRODUCTIVE

NOTE: LOG TOP OF THE DEVONIAN IN THE DISCOVERY WELL ESTABLISHED THAT THE SEISMIC CONTOURS AS SHOWN ABOVE ARE APPROXIMATELY 275 FEET LOW, HOWEVER THE SEISMIC CONTOURS REPRESENT THE RELATIVE CONFIGURATION OF THE DEVONIAN STRUCTURE.

N

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO
Ohio EXHIBIT No. 1
CASE 2118

REFLECTION SEISMOGRAPH MAP
CONTOURED ON TOP OF "DEVONIAN"
CONTOUR INTERVAL ——— 100'

LEA UNIT AREA

LEA COUNTY, NEW MEXICO

SCALE 0 1000 2000 FEET

THE OHIO OIL COMPANY ——— HOUSTON, TEXAS

NMOCC CASE NO. 2118
OHIO EXHIBIT NO. 1
DATE.

R 34 E

R 35 E

T 20 S

Pure | Gulf | Texaco | Cactus Drlg.

L.A. & B.G. Parks 1 Texaco

Cactus Drlg.

"Featherstone Fed." 6 Martha Featherstone

-10900

-10800

-10700

-11100

-11200

-11300

"Quail-Federal" U.S.

State

U.S. Smelting

Gulf

Sinclair Ohio

U.S.

Sinclair "6025"

X

X'

EL 3667 TD 14619 DEV-10803

EL 3677 TD 14492 DEV-10680

EL 3686 TD 14501 DEV-10630

EL 3676 TD14947 DEV-11094

"Fed Lea" U.S. 7 Sinclair

U.S. Smelting

Drlg. & Expl.

EL 3667 TD14472 DEV-10675

EL 3674 TD14735 DEV-10611

EL 3683 TD14476 DEV-10660

J.N Smith

Gulf

Ohio, et al

Ohio

Ohio

Sinclair Ohio

W.G. Ross Ohio

V.K. Ross Ohio

Gulf

Pure

Pure

Cox & Hamon Ohio

Drlg. & Expl.

Sinclair Ohio

Ross

Ohio

Gulf

Pure

Pure

Drlg. & Expl.

Cox & Hamon Ohio

Ohio

Pan American

C.C. Bankhead

Drlg. & Expl.

E.A. Hanson

H. Aid, Est.

Cox & Hamon

Ohio

U.S.

State

LEGEND

- BOUNDARY OF LEA UNIT
- DUAL — BONE SPRINGS & DEVONIAN
- DUAL — BONE SPRINGS & PENN. (GAS)
- PROPOSED PARTICIPATING AREA

NOTE: CONTOURS DEPICTED HEREON ARE BASED ON ORIGINAL SEISMIC CONTOURS CORRECTED BY 265 FEET TO REFLECT THE INFORMATION OBTAINED FROM SEVEN WELLS.

CONTOURED ON TOP OF DEVONIAN

CONTOUR INTERVAL —— 100'

LEA UNIT AREA

LEA COUNTY, NEW MEXICO

SCALE

1000 0 1000 2000

FEET

THE OHIO OIL COMPANY —— HOUSTON, TEXAS

NMOCC CASE NO. 2118 & 2459

OHIO EXHIBIT NO. 1

DATE 12-13-61

RBB

R 34 E

R 35 E

T 20 S

Pure | Gulf | Texaco | Cactus Drlg.

L.A. & B.G. Parks — "Featherstone Fed." — 6 — Martha Featherstone

1 — Texaco | Cactus Drlg.

2

"Quail-Federal" U.S.

State | U.S.

U.S. Smelting | Gulf | Sinclair Ohio | Sinclair "6025"

U.S.

EL 3676 TD14947

"Fed. Lea" U.S. — 7 — Sinclair

11 — U.S. Smelting | 12 — Drlg. & Expl.

J.N. Smith

Gulf | Ohio, et al | Ohio | Ohio | Sinclair Ohio

W.G. Ross Ohio | V.K. Ross Ohio

14 — Gulf | Pure | 13 — Pure | Cox & Hamon | Drlg. & Expl. | 18 — Sinclair Ohio | Ross

Ohio

Gulf | Pure | Pure | Drlg. & Expl. | Cox & Hamon Ohio | Ohio | Pan American

C.C. Bankhead | Drlg. & Expl.

23 — E.A. Hanson | H. Aid, Est. | 24 — Cox & Hamon | 19 — Ohio

U.S. | U.S. | State

LEGEND

- BOUNDARY OF LEA UNIT
- DUAL — BONE SPRINGS & DEVONIAN
- DUAL — BONE SPRINGS & PENN. (GAS)
- PROPOSED PARTICIPATING AREA

MINIMUM RADIAL DRAINAGE
LEA DEVONIAN POOL
LEA UNIT AREA
LEA COUNTY, NEW MEXICO

SCALE
1000 0 1000 2000
FEET

THE OHIO OIL COMPANY ——— HOUSTON, TEXAS

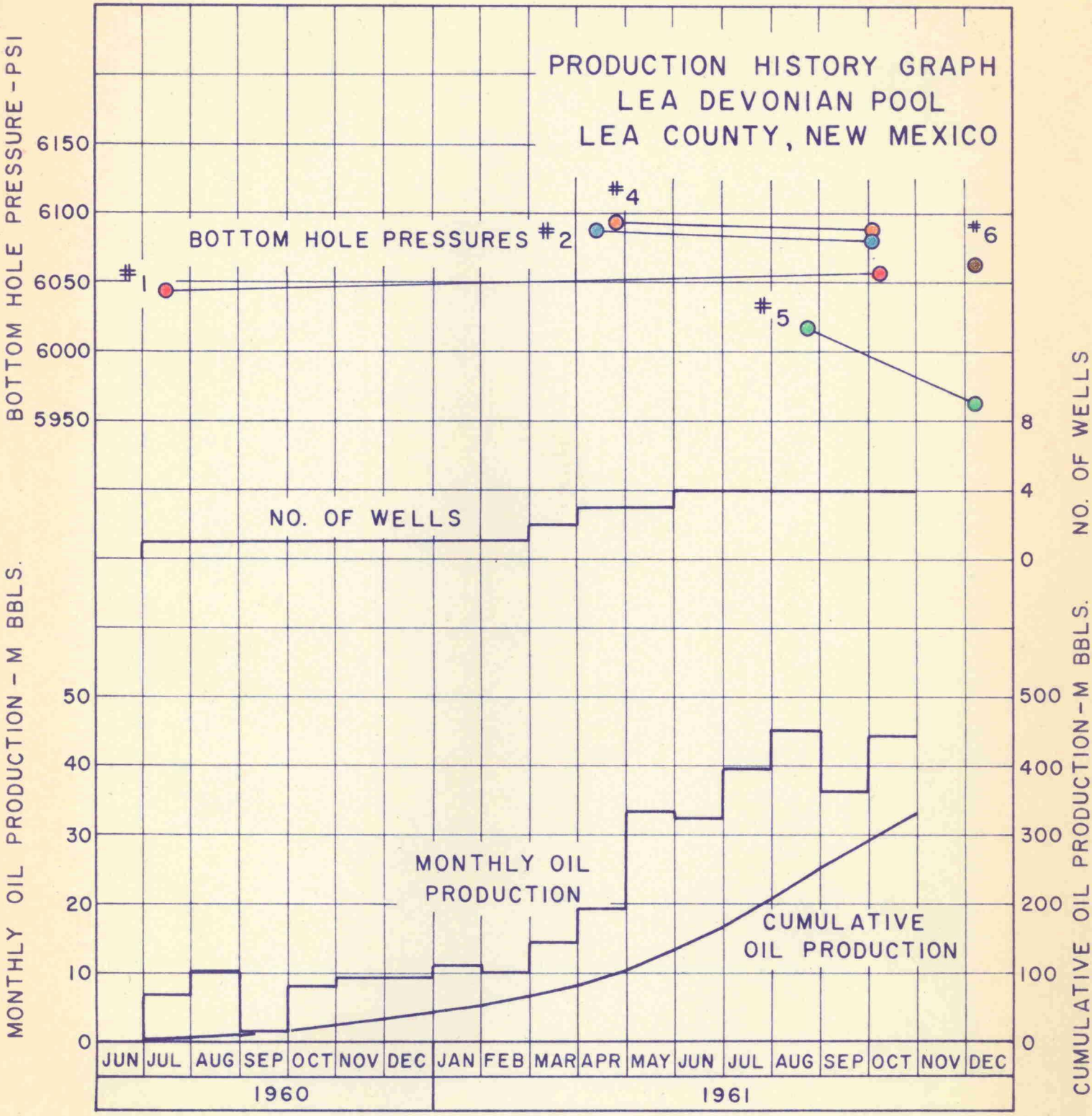
NMOCC CASE NO. 2118 & 2459

OHIO EXHIBIT NO. 12

DATE 12-13-61

RBB

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE



NMOCC CASE NO. 2118 & 2459

OHIO EXHIBIT NO. 3

DATE 12-13-61

OHIO OIL COMPANY

LEA UNIT FEDERAL WELL NO. 2

ELEV. 3686

SE/4 NW/4 SEC. 12, T-20-S, R-34-E

COMPLETION COREGRAPH OF DEVONIAN

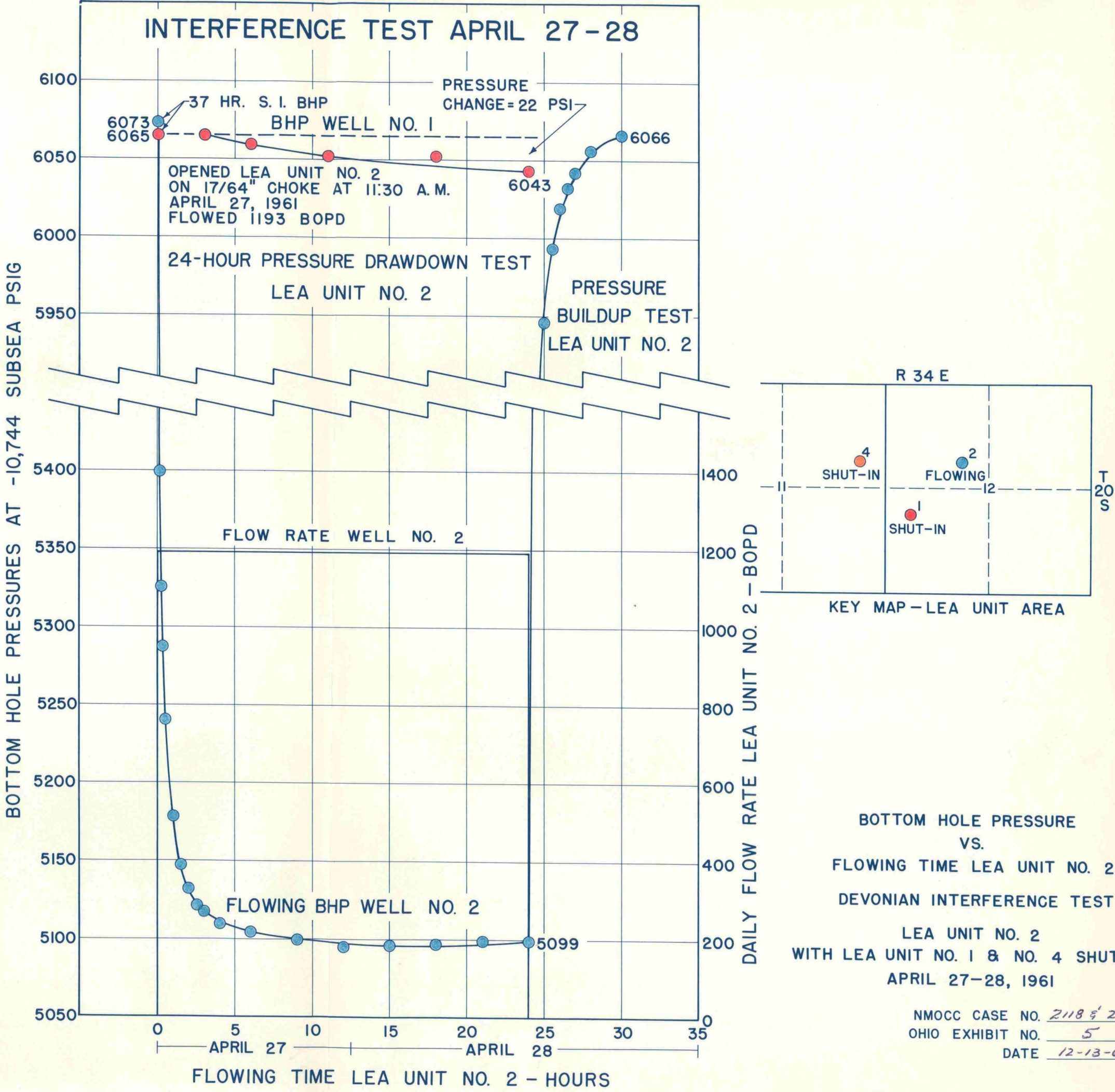
121	11358.0-55.0	<0.1	<0.1	1.1	0.0	55.2	S	
124	55.0-56.0	1.8	1.3	2.2	1.8	45.2	FV	
125	56.0-57.3	0.6	0.4	2.1	1.3	66.7	FV	
126	57.3-58.3	<0.1	<0.1	0.9	0.0	58.4	S	
127	11388.0-88.7	<0.1	<0.1	1.1	0.0	66.6	S	
128	88.7-90.0	18	0.5	3.2	8.2	64.4	FV	
129	90.0-91.0	87	73	7.6	12.5	24.4	V	
130	91.0-91.5	<0.1	<0.1	1.4	0.0	50.0	S	
131	91.5-92.8	127	0.4	8.0	8.3	30.7	V	
132	92.8-94.4	5.4	3.6	9.7	15.3	26.9	FV	
133	94.4-96.0	1150	1150	9.4	11.0	33.5	FV	
133A		5.6	5.3					
134	11396.0-97.6	0.2	0.2	3.2	16.8	36.7		
134A		2.4	1.7					
135	11397.6-99.0	0.6	0.5	1.3	5.2	50.7		
136	99.0-00.0	0.4	0.2	4.8	25.1	39.1	F	
137	11400.0-02.0	<0.1	<0.1	0.7	0.0	87.2	S	
137A		<0.1	<0.1					
138	11402.0-03.5	12	0.9	3.6	11.0	34.6	F	
139	03.5-05.2	2.0	1.1	5.2	33.1	24.4	F	
139A		0.4	0.2					
140	11405.2-06.0	0.5	0.3	3.5	25.4	47.0		
141	06.0-07.0	<0.1	<0.1	0.4	0.0	66.7	S	
142	11410.0-10.7	<0.1	<0.1	0.6	0.0	80.0	S	
143	10.7-11.9	0.2	0.1	7.5	28.0	28.8	F	
144	11.9-13.6	0.6	0.5	8.2	26.6	27.1	F	
144A		0.4	0.3					
145	11413.6-15.0	0.1	0.1	3.5	14.5	60.0	F	
146	15.0-16.0	<0.1	<0.1	0.9	0.0	56.0	S	
147	11432.5-33.5	<0.1	<0.1	1.3	0.0	47.0	S	
148	33.5-35.4	2.5	1.4	3.1	11.1	32.8	FV	
148A		3.0	0.5					
149	11435.4-37.3	60	9.0	5.6	8.8	38.5	FV	
149A		4.6	2.3					
150	11437.3-38.5	0.3	0.2	2.7	13.5	69.3	FV	
151	38.5-39.8	0.4	0.2	2.8	1.1	70.8	FS	
152	39.8-41.5	19	17	4.3	7.2	37.8	FV	
152A		1.5	0.6					
153	11441.5-43.4	6.3	2.9	4.6	5.7	31.6	FV	
154	43.4-45.0	122	114	8.1	8.1	26.3	FV	
154A		30	25					
155	11445.0-46.4	30	20	7.2	6.3	22.0	FV	
156	46.4-47.7	8.3	5.0	6.7	10.4	33.1	FV	
156A		74	43					
157	11447.7-48.9	44	1.7	7.5	9.6	17.5	FV	
158	48.9-50.8	50	46	9.0	8.8	22.8	FV	
158A		34	25					
159	11450.8-52.6	3.4	1.5	7.0	16.4	26.8	FV	
159A		2.4	1.8					
160	11452.6-54.1	272	64	10.3	7.0	27.4	FV	
161	54.1-55.6	98	31	6.2	11.0	35.7	FV	
161A		26	23					
162	11455.6-57.2	14	9.2	6.5	9.5	23.0	FV	
163	57.2-58.6	38	33	10.3	11.8	36.9	FV	
163A		32	31					
164	11458.6-60.0	120	104	11.2	13.4	24.2	FV	
165	11461.0-62.6	3.5	0.4	4.7	17.1	50.4	F	
165A		0.2	0.1					
166	11462.6-64.1	0.2	0.1	4.5	13.9	48.5	F	
167	64.1-65.9	0.1	0.1	4.2	10.8	61.1	F	
167A		0.1	0.1					
168	11465.9-67.5	7.8	4.9	6.3	10.0	53.5	F	
169	67.5-69.0	0.8	0.6	3.6	9.0	44.2	F	
169A		0.4	0.3					
170	11469.0-70.6	0.2	0.2	4.0	9.3	34.2	F	
171	70.6-72.2	4.6	2.6	4.9	8.6	35.1	FV	
171A		0.5	0.3					
172	11472.2-74.0	0.2	0.2	4.5	13.4	38.0	FV	
172A		0.8	0.6					
173	11474.0-75.4	54	7.2	8.1	8.8	36.5	FV	
174	75.4-76.7	3.0	1.7	6.1	9.4	33.9	FV	
174A		7.1	5.6					
175	11476.7-78.6	0.3	0.2	3.5	9.2	61.6	FV	
175A		<0.1	<0.1					
176	11478.6-80.2	<0.1	<0.1	3.1	13.4	80.0	FV	
177	80.2-80.7	58	48	8.0	8.0	36.4	FV	
178	80.7-81.7	16	0.2	3.9	9.5	67.8	FV	
179	81.7-83.6	1.3	0.9	6.3	11.7	30.9	FV	
179A		10	8.3					
180	11483.6-84.8	8.5	6.1	9.0	7.1	37.6	FV	
181	84.8-86.2	9.5	2.9	4.0	10.1	42.2	FV	
182	86.2-88.0	19	3.6	4.5	7.7	42.0	FV	
182A		20	2.9					
183	11488.0-89.6	0.3	0.1	1.8	4.5	68.6	F	
183A		0.3	0.3					
184	11489.6-91.0	0.7	0.2	2.7	7.5	76.0	F	
185	91.0-92.4	0.2	0.2	3.7	4.3	61.5	FV	
186	92.4-93.6	45	0.7	3.4	11.6	50.1	FV	
186A		0.5	0.2					
187	11493.6-95.2	2.9	2.1	3.3	15.3	29.5	FV	
188	95.2-96.7	14	0.7	2.3	6.0	63.3	FVS	
188A		2.9	0.4					
189	11496.7-98.0	<0.1	<0.1	3.0	13.3	60.8	FS	

NMOCC CASE NO. 2118 & 2459

OHIO EXHIBIT NO. 4

DATE 12-13-61

INTERFERENCE TEST APRIL 27-28



KEY MAP - LEA UNIT AREA

BOTTOM HOLE PRESSURE
VS.
FLOWING TIME LEA UNIT NO. 2

DEVONIAN INTERFERENCE TEST

LEA UNIT NO. 2
WITH LEA UNIT NO. 1 & NO. 4 SHUT-IN
APRIL 27-28, 1961

NMOCC CASE NO. 2118 & 2459
OHIO EXHIBIT NO. 5
DATE 12-13-61

LARGE FORMAT
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BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

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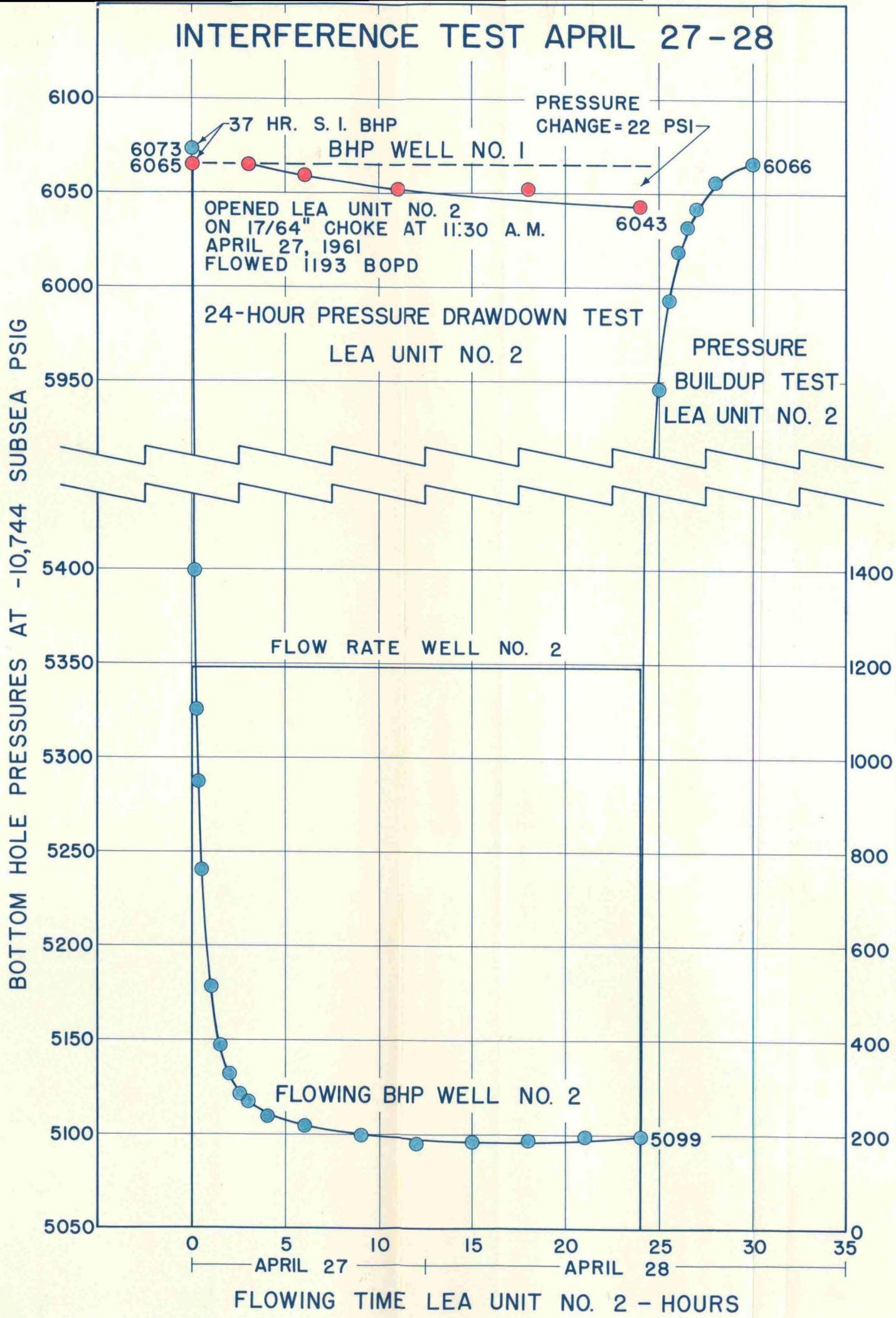
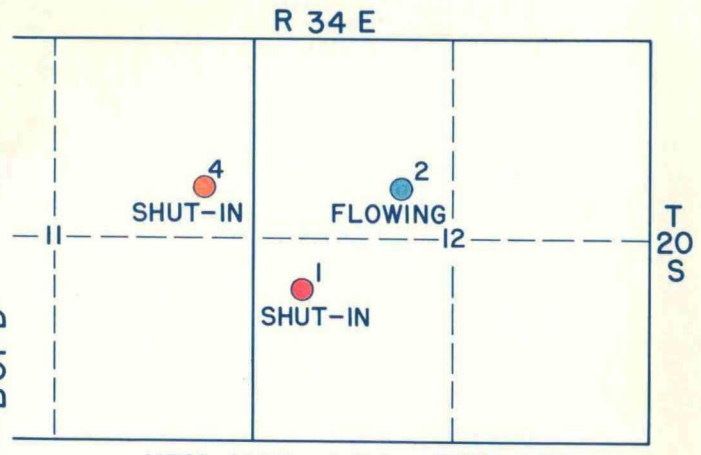
INTERFERENCE TEST APRIL 27-28





KEY MAP - LEA UNIT AREA

BOTTOM HOLE PRESSURE
VS.
FLOWING TIME LEA UNIT NO. 2

DEVONIAN INTERFERENCE TEST

LEA UNIT NO. 2
WITH LEA UNIT NO. 1 & NO. 4 SHUT-IN
APRIL 27-28, 1961

NMOCC CASE NO. 2118 & 2459
OHIO EXHIBIT NO. 5
DATE 12-13-61

R 34 E

R 35 E

T 20 S

Pure | Gulf | Texaco | Cactus Drlg.

L.A. & B.G. Parks 1 — Texaco | Cactus Drlg.

"Featherstone Fed." 6 — Martha Featherstone

A

U D

EL 3699
TD 13,745 (-10,046)
DEV -11,081 est.

-11050
-11000
-10950
-10900
-10850
-10800
-10750
-10700
-10650
-10600

State | U.S. | U.S.

U.S. Smelting | Gulf | Sinclair Marathon | Sinclair "6025"

EL 3693
TD 14,693
DEV -10,878

EL 3667
TD 14,619
DEV -10,812

EL 3677
TD 14,492
DEV-10,680

EL 3686
TD 14,501
DEV-10,630

EL 3676
TDI4947
DEV-11,092

"Fed. Lea" U.S. 7 — Sinclair

U.S. Smelting | Drlg. & Expl.

EL 3667
TD 14,472
DEV -10,674

EL 3674
TD 14,735
DEV -10,611

EL 3683
TD 14,476
DEV -10,660

EL 3678
TD 13,569 (-9891)
DEV-10,600 est.

U.S. | U.S. | J.N. Smith

Gulf | Marathon, et al | Marathon | Marathon | Sinclair Marathon

EL 3676
TD 14,408
DEV -10,620

W.G. Ross Marathon | V.K. Ross Marathon

U.S. | 14 | 13 | 18

Gulf | Pure | Pure | Cox & Hamon Marathon | Drlg. & Expl. | Sinclair Marathon | Ross

EL 3677
TD 14,435
DEV-10,608

Marathon

U.S. | U.S. | U.S.

Gulf | Pure | Pure | Drlg. & Expl. | Cox & Hamon Marathon | Marathon | Pan American

C.C. Bankhead | Drlg. & Expl.

23 | 24 | 19

E.A. Hanson | H. Aid, Est. | Cox & Hamon | Marathon

A'

U.S. | U.S. | State

LEGEND

- BOUNDARY OF LEA UNIT
- DUAL — BONE SPRINGS & DEVONIAN
- DUAL — PENN. (GAS) & DEVONIAN
- DUAL — BONE SPRINGS & PENN. (GAS)
- BONE SPRINGS
- PENNSYLVANIAN (GAS)
- PROPOSED DEVONIAN PARTICIPATING AREA
- DEVONIAN PRODUCERS

CONTOURED ON TOP OF DEVONIAN
CONTOUR INTERVAL ——— 50'

LEA UNIT AREA

LEA COUNTY, NEW MEXICO

SCALE
1000 0 1000 2000
FEET

MARATHON OIL COMPANY ——— HOUSTON, TEXAS

NMOCC CASE NO. 2118 & 2459
MARATHON EXHIBIT NO. 1
DATE 12-19-62

RBB

LARGE FORMAT
EXHIBIT HAS
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AND IS LOCATED
IN THE NEXT FILE

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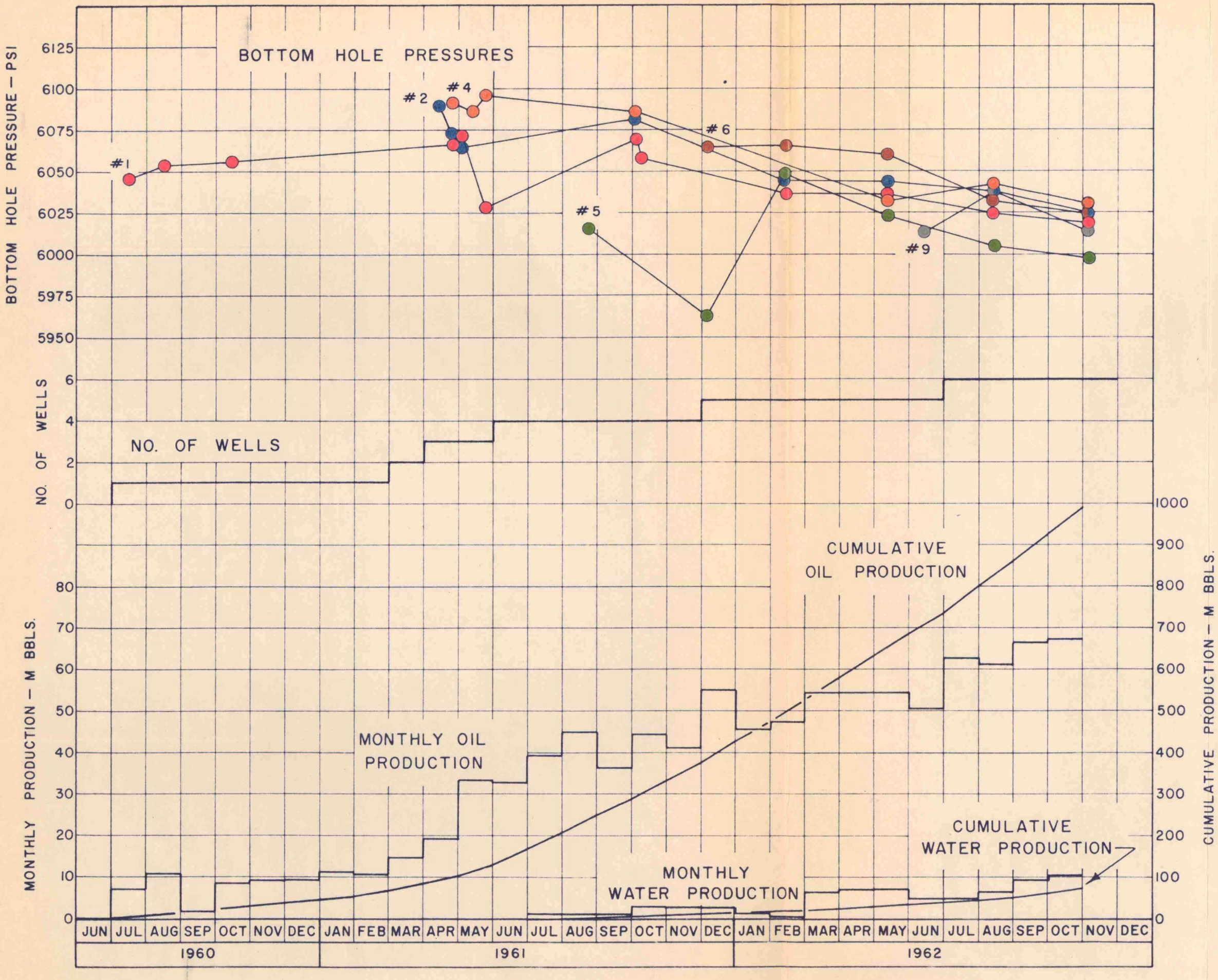
IN THE NEXT FILE



PRODUCTION HISTORY GRAPH

LEA DEVONIAN POOL

LEA COUNTY, NEW MEXICO

NMOCC CASE NO. 2118 & 2459

MARATHON EXHIBIT NO. 4

DATE 12-19-62

LEA DEVONIAN POOL

SHUT-IN BOTTOM HOLE PRESSURES

POOL DATUM -10,744'

DATE	WELL NO. 1 SI Time (Hours)	WELL NO. 1 BHP (psi)	WELL NO. 2 SI Time (Hours)	WELL NO. 2 BHP (psi)	WELL NO. 4 SI Time (Hours)	WELL NO. 4 BHP (psi)	WELL NO. 5 SI Time (Hours)	WELL NO. 5 BHP (psi)	WELL NO. 6 SI Time (Hours)	WELL NO. 6 BHP (psi)	WELL NO. 9 SI Time (Hours)	WELL NO. 9 BHP (psi)
7-15-60	161	6046										
8-15-60	65	6054										
10-13-60	23	6057										
4-13-61			28	6089								
4-26-61					36	6091						
4-27-61	37	6065	36	6073								
5- 1-61	133	6072	71	6065								
5-12-61					456	6087						
5-23-61	648	6028			672	6096						
8-21-61							26	6016				
10-2-61	264	6069	53	6082	53	6085						
10-6-61	363	6058										
12-6-61							24	5963	93	6065		
2-13-62	24	6036	27	6044			24	6046	29	6065		
5- 2-62	46	6036	48	6044	47	6033	53	6033	27	6060		
7-11-62											22	6014
8- 2-62	23	6025	24	6038	26	6041	28	6005	26	6033	29	6038
11-7-62	24	6019	28	6024	27	6031	27	5997	25	6024	28	6015

NMOCC Case No. 2118 & 2459

Marathon Exhibit No. 5

Date 12-19-62

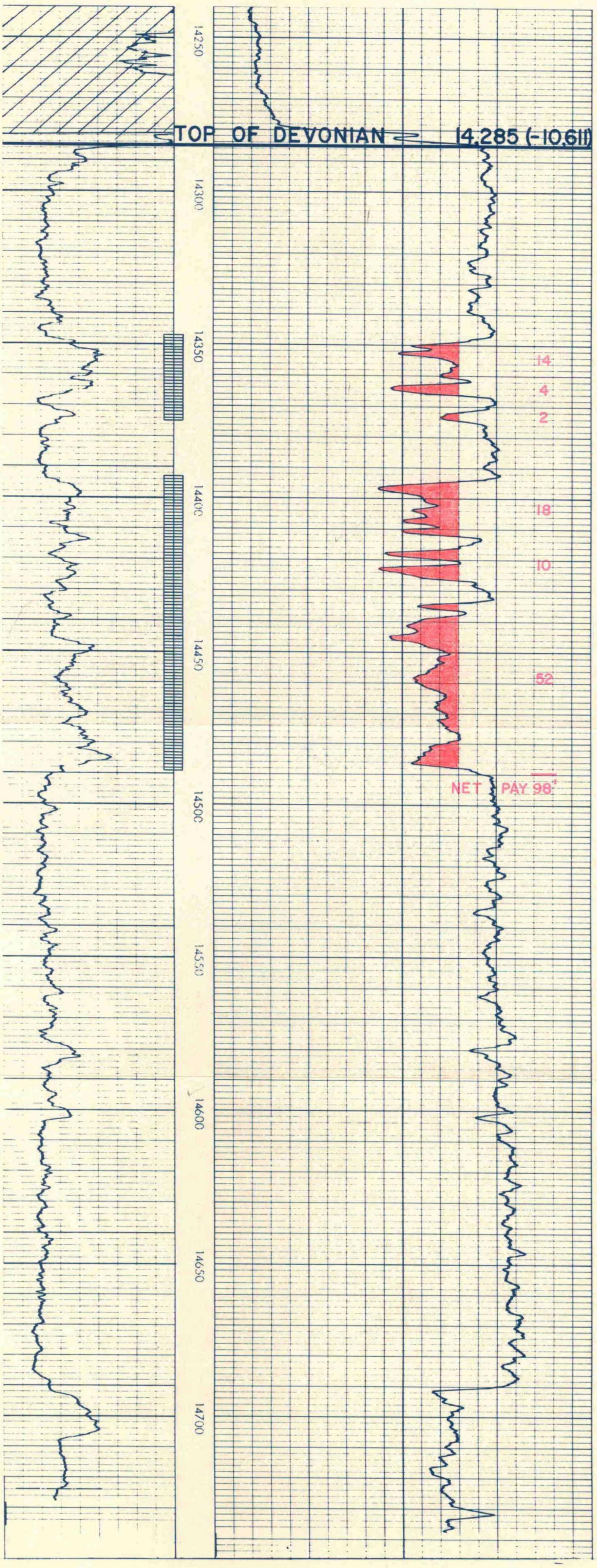
LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

OHIO OIL COMPANY
LEA UNIT FEDERAL WELL NO. 1

ELEV. 3674

NW/4 SW/4 SEC. 12, T-20-S, R-34-E

RADIOACTIVITY LOG OF DEVONIAN SECTION



NMOCC CASE NO. 2118
OHIO EXHIBIT NO. 3
DATE.

RECOVERABLE OIL RESERVES

LEA DEVONIAN POOL

Basic Data

Net Pay	= 98 feet	(Neutron Log)
Porosity	= 4.7%	(Neutron Log)
Water Saturation	= 30%	(estimated)
Formation Volume Factor	= 1.185	(fluid analysis)
Recovery Factor	= 50%	(estimated)

Volumetric Calculation

$$\frac{7758 \text{ Bbl/acre-foot} \times \text{Porosity} \times (1\text{-Water Saturation}) \times \text{Net Pay} \times \text{Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.047)(0.70)(98)(0.50)}{1.185} = 10{,}554 \text{ bbls/acre}$$

NMOCC Case No. 2118

Ohio Exhibit No. 4

Date _____

COMPARATIVE ECONOMICS FOR DEVELOPMENT OF LEA DEVONIAN POOL

40-ACRE SPACING VS. 80-ACRE SPACING

Minimum Area Expected to be Productive		800 Acres
Wells Required with 40 Acre Spacing		20 Wells
Wells Required with 80 Acre Spacing		10 Wells
Investment @ $471,000 per Well		
For 40 Acre Spacing (20 Wells)		$ 9,420,000
For 80 Acre Spacing (10 Wells)		$ 4,710,000
Ultimate Reserves		
Oil		8,443,200 bbls.
Gas @ 300 cu. ft. per bbl.		2,532,960 MCF
W.I. Net Operating Income Per Gross Bbl. of Oil Produced Including Income From Gas Produced with Oil		
Value		
Bbl. of oil		$2.77
300 cu. ft. of gas		.06
Total Gross Value		$2.83
Costs		
Severance & Advalorem Taxes	$0.20	
Royalty	0.35	
Lifting Costs	0.25	
		$0.80
Net Operating Income per gross bbl.		$2.03
W.I. Total Net Operating Income		
8,443,200 x $2.03/bbl.		$17,139,696
Net Profit for 40-Acre Spacing		$ 7,719,696
Net Profit per Well	$385,985	
Profit to Investment Ratio		0.82 to 1
Net Profit for 80-Acre Spacing		$12,429,696
Net Profit per Well	$1,242,970	
Profit to Investment Ratio		2.64 to 1

NMOCC Case No. 2118

Ohio Exhibit No. 5

Date _____

LEA BONE SPRINGS POOL

PERTINENT DATA

1. Location of Field:

   Approximately 14 miles west-southwest of Monument, New Mexico, Section 12, T-20-S, R-34-E, Lea County

2. Completion Data Lea Unit Well No. 1:

a.	Formation	Bone Springs
b.	Top of Bone Springs	8183 (-4509)
c.	Top of Bone Springs Pay	9480 (-5806)
d.	Completion Date	10-9-60
e.	Perforated Interval	9480-9550
f.	Treatment	None
g.	Initial Potential Test	
	(1) Potential (BOPD)	214
	(2) Choke Size (in.)	1/2
	(3) GOR (CF/B)	1817
	(4) Casing Pressure (psig)	pkr.
	(5) Tubing Pressure (psig)	100

3. Reservoir Fluid Characteristics:

a.	Saturation Pressure	Unknown
b.	Formation Volume Factor	1.95 est.
c.	Solution GOR (CF/B)	1817
d.	Oil Gravity (^{o}API @ 60^{o}F)	42

4. Reservoir Characteristics:		Dolomite	Sand
a.	Porosity (%)	3.05	10.2
b.	Permeability (md)	4.39	0.25
c.	Water Saturation (%)	30.0 est.	30.0 est.
d.	Net Pay (ft.)	28	19
e.	Reservoir Temperature (^{o}F)	142	
f.	Original Reservoir Press. (psig)	3983 @ -5840	
g.	Probable Reservoir Mechanism	Solution Gas	

NMOCC Cas No. 2119

Ohio Exhibit No. 6

Date

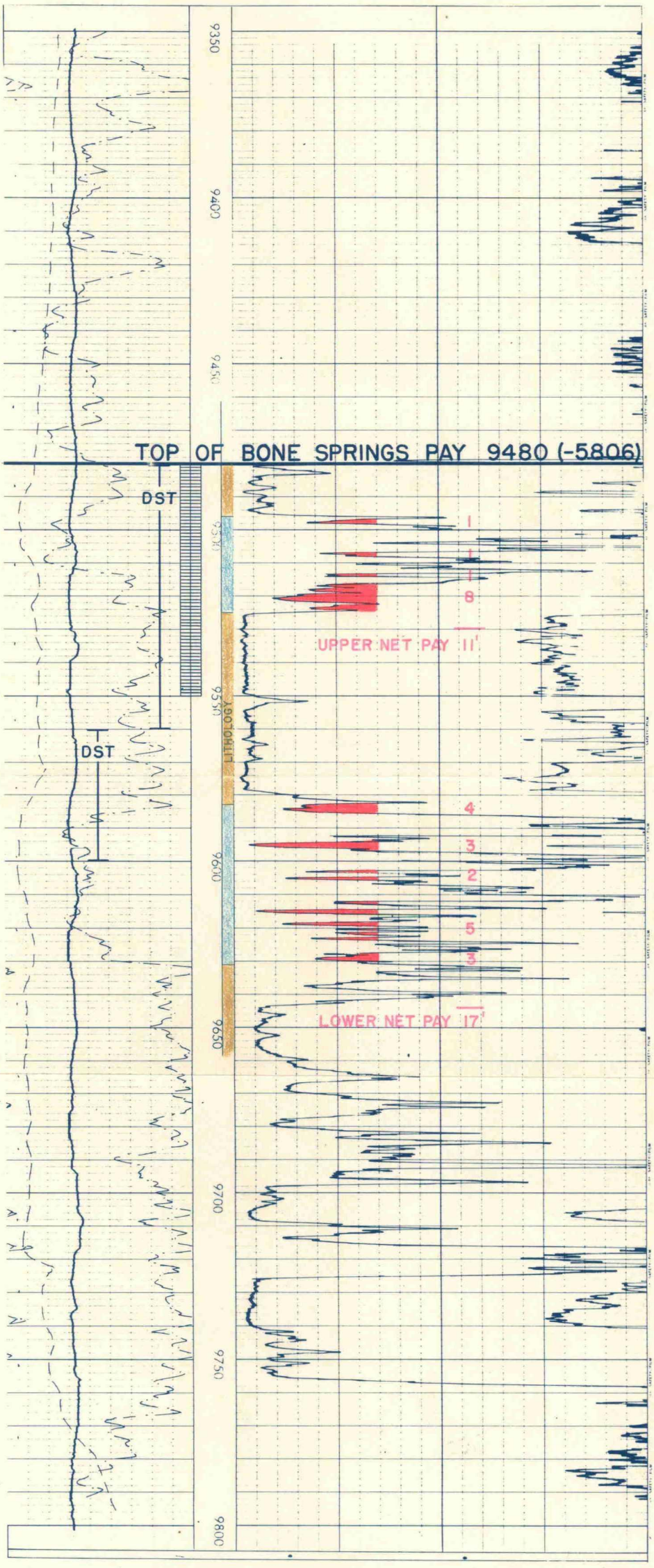
OHIO OIL COMPANY

LEA UNIT FEDERAL WELL NO. 1

ELEV. 3674

NW/4 SW/4 SEC. 12, T-20-S, R-34-E

FORXO LOG OF BONE SPRINGS PAY



DST 9480-9560 Open 3 hrs. GTS 20 min. OTS 1-2/3 hrs. F est 20 BO 1st hr. F to tank 22.88 BO in 1 hr. (549 BOPD). FTP 125#, GOR 2030, Gty 42.9°. 45 min ISIP 3980#, IFP 420#, FFP 1060#.

DST 9560-9600 Open 4 hrs. GTS 2 hrs. F 28.65 BO in 1-3/4 hrs. (391 BOPD). GOR 2006, Gty 41.3°. FTP 1135-155. 1 hr ISIP 4060#, IFP 800#, Max FP 1600#, FFP 900#, 30 min FSIP 3800#.

NMOCC CASE NO. 2119

OHIO EXHIBIT NO. 7

DATE.

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

RECOVERABLE OIL RESERVE

LEA BONE SPRINGS POOL

DOLOMITE INTERVAL:

Basic Data

Porosity	-3.05% (core analysis #2 well)
Permeability	-4.39 md (core analysis #2 well)
Net Pay	- 28 ft. (Log #1 well)
Water Saturation	- 30% (estimated)
Recovery Factor	- 20% (estimated)
Formation Volume Factor	- 1.95 (estimated)

Volumetric Calculation

$$\frac{\text{7758 Bbl/Acre-foot x Porosity x (1-Water Saturation) x Net Pay x Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.0305)(0.70)(28)(0.20)}{1.95} = 476 \text{ bbl/acre}$$

SAND INTERVAL

Basic Data

Porosity	- 10.2% (core analysis #2 well)
Permeability	- 0.25 md (core analysis #2 well)
Net Pay	- 19 ft. (core analysis #2 well)
Water Saturation	- 30% (estimated)
Recovery Factor	- 10% (estimated)
Formation Volume Factor	- 1.95 (estimated)

Volumetric Calculations

$$\frac{\text{7758 Bbl/Acre-foot x Porosity x (1-Water Saturation) x Net Pay x Recovery Factor}}{\text{Formation Volume Factor}}$$

$$\frac{(7758)(0.102)(0.70)(19)(0.10)}{1.95} = 540 \text{ bbl/acre}$$

TOTAL BONE SPRINGS INTERVAL:

Zone Total = 476 + 540 = 1016 bbl/acre

NMOCC Case No. 2119

Ohio Exhibit No. 9

Date _____

CORE ANALYSIS

LEA UNIT WELL NO. 2

BONE SPRINGS PAY

LOWER DOLOMITE INTERVAL 9607-9648

W/PERMEABILITY EQUAL TO OR GREATER THAN 0.1 MILLIDARCY

Depth Interval	Footage	Permeability md.	Porosity %
9607.6-09.1	1.5	1.0	2.8
09.1-10.8	1.7	0.2	1.4
13.7-15.6	1.9	1.8	2.4
15.6-17.0	1.4	10.0	2.7
17.0-18.0	1.0	0.2	2.9
21.0-22.5	1.5	23.0	5.9
22.5-23.7	1.2	6.6	3.1
23.7-25.2	1.5	2.8	2.3
25.2-26.5	1.3	2.3	3.3
28.0-29.5	1.5	2.1	6.1
32.3-34.0	1.7	6.1	2.4
34.0-36.0	2.0	0.7	2.0
44.5-45.5	1.0	0.1	3.2
Net Pay	19.2 ft.		
Weighted Average		4.39 md	3.05%

CORE ANALYSIS

LEA UNIT WELL NO. 2

BONE SPRINGS PAY

LOWER SAND INTERVAL 9565-9607

W/PERMEABILITY EQUAL TO OR GREATER THAN 0.1 MILLIDARCY

Depth Interval	Footage	Permeability md.	Porosity %
9566.0-67.0	1.0	0.3	9.6
72.0-73.0	1.0	0.1	9.3
75.0-76.0	1.0	0.3	10.3
76.0-77.0	1.0	0.6	14.5
77.0-78.0	1.0	0.4	13.3
79.0-80.0	1.0	0.1	8.6
80.0-81.0	1.0	0.1	8.0
81.0-82.0	1.0	0.1	7.1
82.0-83.0	1.0	0.1	8.3
83.0-84.0	1.0	0.1	9.6
84.0-85.0	1.0	0.1	10.4
85.0-86.0	1.0	0.4	14.9
86.0-87.0	1.0	0.4	11.5
94.0-95.0	1.0	0.1	6.0
95.0-96.0	1.0	0.1	7.5
96.0-97.0	1.0	0.1	8.0
97.0-98.0	1.0	0.4	12.5
98.0-99.0	1.0	0.6	12.8
99.0-00.0	1.0	0.4	10.8
Net Pay	19.0 ft.		
Weighted Average		0.25 md.	10.2%

COMPARATIVE ECONOMICS FOR DEVELOPMENT OF LEA BONE SPRINGS POOL

40-ACRE SPACING VS. 80-ACRE SPACING

Minimum Area Expected to be Productive		800 Acres
Wells Required with 40 Acre Spacing		20 Wells
Wells Required with 80 Acre Spacing		10 Wells
Investment @ $225,000 per well		
For 40 Acre Spacing (20 Wells)		$4,500,000
For 80 Acre Spacing (10 Wells)		$2,250,000
Investment for Dual Completion @ $25,000 per Well		
For 40 Acre Spacing (20 Wells)		$ 500,000
For 80 Acre Spacing (10 Wells)		$ 250,000
Ultimate Reserves		
Oil		812,800 bbls.
Gas @ 2000 cu. ft. per bbl.		1,625,600 MCF
W.I. Net Operating Income Per Gross Bbl. of Oil Produced Including Income from Gas Produced With Oil		
Value		
Bbl. of oil		$ 2.77
2000 cu. ft. of gas		0.20
Total Gross Value		$ 2.97
Costs		
Severance & Advalorem Taxes	$0.21	
Royalty	0.37	
Lifting Costs	0.24	
		$ 0.82
Net Operating Income per Gross Bbl.		$ 2.15
W.I. Total Net Operating Income		
812,800 x $2.15/bbl.		$1,747,520
Net Loss for 40-Acre Spacing		$2,752,480
Net Loss per Well	$137,624	
Net Loss for 80-Acre Spacing		$ 502,480
Net Loss per Well	$ 50,248	
Net Profit for Dual Completion for 40-Acre Spacing		$1,247,520
Net Profit per Well	$ 62,376	
Profit to Investment Ratio	2.50 to 1	
Net Profit for Dual Completion for 80-Acre Spacing		$1,497,520
Net Profit per Well	$149,752	
Profit to Investment Ratio	5.99 to 1	

NMOCC Case No. 2119

Ohio Exhibit No. 1C

Date _____

ATOKA PENNSYLVANIAN POOL
Eddy County, New Mexico
"Bottom Hole Pressure vs Time"
Prepared by: T. O. Webb November 29, 1962

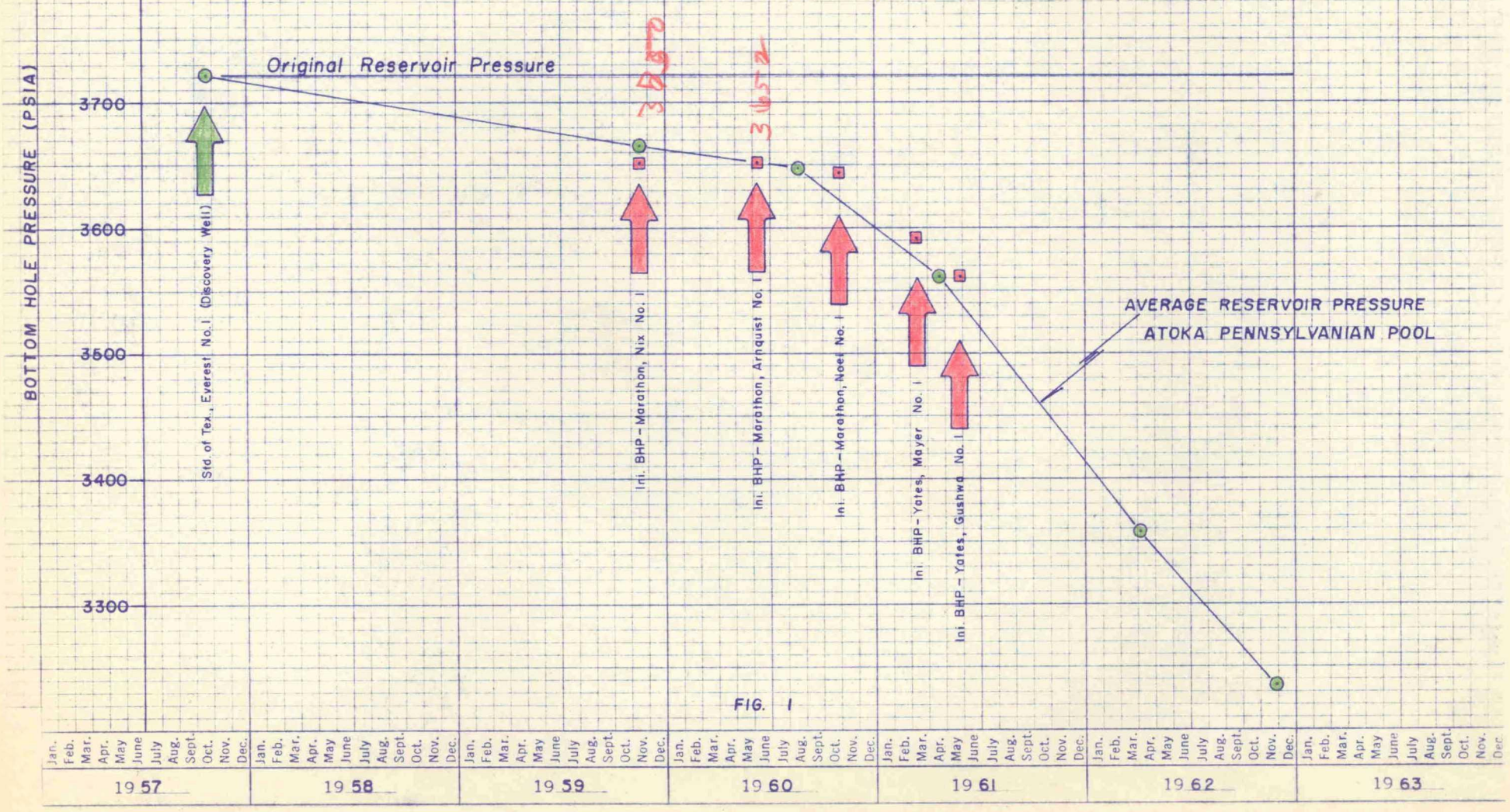


FIG. 1

ATOKA PENNSYLVANIAN POOL
Eddy County, New Mexico
"Bottom Hole Pressure vs Cumulative Pool Production"
Prepared by: T. O. Webb November 29, 1962

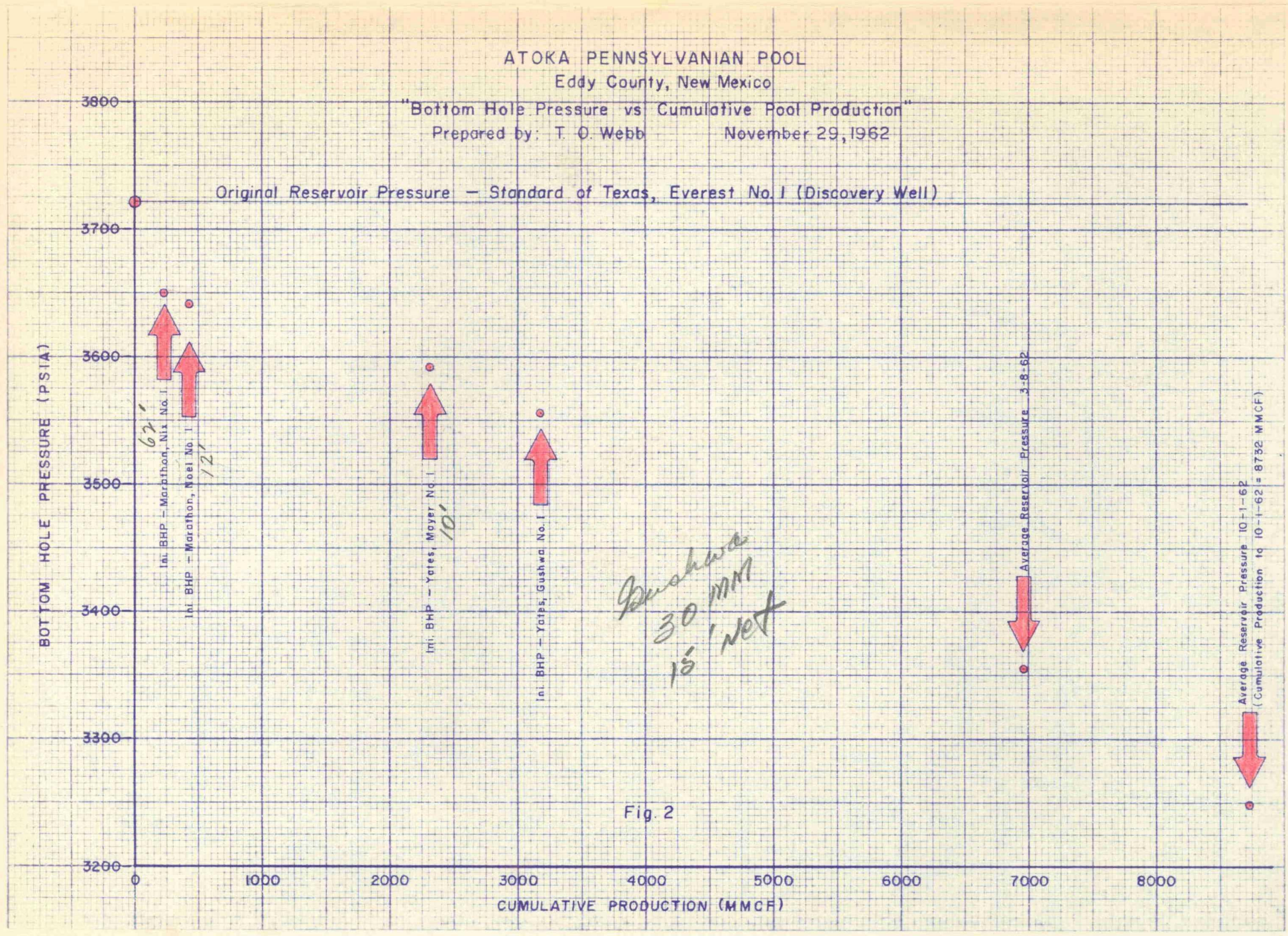


Fig. 2

MARATHON OIL COMPANY
Case No. 2628 (De Novo)
Exhibit No. 7

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

ATOKA PENNSYLVANIAN POOL
EDDY COUNTY, NEW MEXICO
BOTTOM HOLE PRESSURE DATA

Company	Lease & Well No.	Test Date	Shut-In Time (Hrs/Mins)	BHP @ -5600' (PSIA)	Cum.Prod. @ Time of BHP Test (MMCF)	Total Pay Thick-ness	Remarks
			1961 Cooperative Survey				
Marathon	Ralph Nix #1	3/15/61	50/40	3542	403	62'	Gen. Survey
	E.V.Noel #1	3/15/61	55/05	3589	226	12'	"
Std. of Texas	Everest #1	4/4/61	98/00	3571	324	34'	"
	Martin #1	3/22/61	48/00	3589	341	52'	"
Pan American	Flint #1	3/21/61	52/30	3512	769	20'	"
Yates	Gushwa #1	4/28/61	-	3561	0	15'	Initial BHP
	Mayer #1	2/15/61	-	3592	0	10'	"
			1962 Cooperative Survey				
Marathon	Ralph Nix #1	11/23/62	43/30	3228	989	62'	Gen. Survey
	Arnquist #1	11/23/62	41/00	3228	940	58'	"
	E.V.Noel #1	11/23/62	45/00	3221	808	12'	"
Pan American	Flint #1	10/12/62	97/56	3233	1581	20'	"
	Lee "C" #1	10/12/62	4 Mos.	3258	472	17'	"

MARATHON OIL COMPANY

CASE NO. 2628 (Re Hearing)
EXHIBIT NO. B

2721 Cont. [illegible]
Turbolgiers.

2628 - Webbernack.

1 Do you intend to [illegible] a well in Sec. 31

2. Why does a [illegible] have 25' Pay.

Tom Webb.

Martin Judson

ILLEGIBLE

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

R 34 E

R 35 E

T 20 S

Pure | Gulf | Cactus | Texaco | Cactus Drlg

EL 3697 TD5003

EL 3693 TD5044

-11,300

L.A. & B.G. Parks

"Featherstone Fed."

Texaco -11,400 Cactus Drlg

Martha Featherstone

U

D

-11,200

U.S. Virgil Linam

U.S. Virgil Linam

State

U.S. Smelting | Gulf | Sinclair Ohio | Sinclair "6025"

-11,100

-11,000

U.S.

-10,900

EL 3686

EL 3676

U.S. Smelting | Gulf | Sinclair Ohio | Drlg. & Expl. | "Fed Lea" U.S. Sinclair

EL 3674 TD 14735 DEV-10611

-10,900

-11,400

-11,500

-11,600

Texaco

EL 3655 TD 3861

-11,000

U.S. Nathan T. Roberts

U.S. Nathan T. Roberts

J. N. Smith L.V. & G.P. Sims, et al

Gulf | Ohio, et al | Ohio | Ohio | Sinclair Ohio

-11,000

W.G. Ross Ohio

V.K. Ross Ohio

-11,700

LEA

-11,100

Texaco

EL 3654 TD 3659

U.S.

Gulf | Pure | Pure | Cox & Hamon Ohio | Drlg. & Expl. | Sinclair Ohio | Ross

Texaco

EL 3654 TD 3708

-11,200

-11,300

"A. Gackle" "Hanson Fed." 1-B

EL 3661 TD 4145

Ohio

-10,900

-11,600

U.S. Nathan T. Roberts

U.S. Nathan T. Roberts

U.S. L.V. & G.P. Sims, et al

Gulf | Pure | Pure | Drlg. & Expl. | Cox & Hamon Ohio | Ohio | Pan American

-11,000

-11,900

C.C. Bankhead | Drlg. & Expl.

-11,100

-11,200

U.S.

E.A. Hanson | H. Aid, Est | Cox & Hamon | Ohio

Cox & Hamon

EL 3676 TD 3518

-12,000

-11,300

U.S.

U.S. L.V. & G.P. Sims, et al

State

LEGEND

- BOUNDARY OF LEA UNIT AREA
- DUAL - BONE SPRINGS & DEVONIAN
- DRILLING WELL
- MINIMUM AREA EXPECTED TO BE PRODUCTIVE

NOTE: LOG TOP OF THE DEVONIAN IN THE DISCOVERY WELL ESTABLISHED THAT THE SEISMIC CONTOURS AS SHOWN ABOVE ARE APPROXIMATELY 275 FEET LOW, HOWEVER THE SEISMIC CONTOURS REPRESENT THE RELATIVE CONFIGURATION OF THE DEVONIAN STRUCTURE.

N

REFLECTION SEISMOGRAPH MAP
CONTOURED ON TOP OF "DEVONIAN"
CONTOUR INTERVAL ——— 100'

LEA UNIT AREA

LEA COUNTY, NEW MEXICO

SCALE
0 1000 2000
FEET

THE OHIO OIL COMPANY ——— HOUSTON, TEXAS

NMOCC CASE NO. 2118
OHIO EXHIBIT NO. 1
DATE.

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

R 34 E

R 35 E

T 20 S

Pure | Gulf | Texaco | Cactus Drlg.

L.A. & B.G. Parks — Texaco | Cactus Drlg. | "Featherstone Fed." — 6 — Martha Featherstone

A

U D

EL 3699
TD 13,745 (-10,046)
DEV -11,081 est.

-11050
-11000
-10950
-10900
-10850
-10800
-10750
-10700
-10650
-10600

State | U.S. | U.S.

U.S. Smelting | Gulf | Sinclair Marathon | Sinclair "6025"

EL 3693
TD 14,693
DEV -10,878

U.S.

EL 3667
TD 14,619
DEV -10,812

EL 3677
TD 14,492
DEV-10,680

EL 3686
TD 14,501
DEV-10,630

EL 3676
TD14947
DEV-11,092

"Fed. Lea" — U.S. — 7 — Sinclair

U.S. Smelting | Drlg. & Expl.

EL 3667
TD 14,472
DEV -10,674

EL 3674
TD 14,735
DEV -10,611

EL 3683
TD 14,476
DEV -10,660

EL 3678
TD 13,569 (-9890)
DEV-10,600 est.

U.S. | U.S. | J.N. Smith

Gulf | Marathon, et al | Marathon | Marathon | Sinclair Marathon

EL 3676
TD 14,408
DEV -10,620

W.G. Ross Marathon | V.K. Ross Marathon

U.S. | 14 | 13 | 18

Gulf | Pure | Pure | Cox & Hamon Marathon | Drlg. & Expl. | Sinclair Marathon | Ross

EL 3677
TD 14,435
DEV-10,608

Marathon

U.S. | U.S. | U.S.

Gulf | Pure | Pure | Drlg. & Expl. | Cox & Hamon Marathon | Marathon | Pan American

C.C. Bankhead | Drlg. & Expl.

U.S. | 24

23 | 19

E.A. Hanson | H. Aid, Est. | Cox & Hamon | Marathon

A'

U.S. | U.S. | State

LEGEND

- BOUNDARY OF LEA UNIT
- DUAL — BONE SPRINGS & DEVONIAN
- DUAL — PENN. (GAS) & DEVONIAN
- DUAL — BONE SPRINGS & PENN. (GAS)
- BONE SPRINGS
- PENNSYLVANIAN (GAS)
- PROPOSED DEVONIAN PARTICIPATING AREA
- DEVONIAN PRODUCERS

CONTOURED ON TOP OF DEVONIAN
CONTOUR INTERVAL——50'

LEA UNIT AREA

LEA COUNTY, NEW MEXICO

SCALE
1000 0 1000 2000
FEET

MARATHON OIL COMPANY——HOUSTON, TEXAS

NMOCC CASE NO. 2118 & 2459
MARATHON EXHIBIT NO. 1
DATE 12-19-62

RBB