

OILFIELD RESEARCH LABORATORIES

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January 25, 1980

Jackson Brothers
514 North Main
Eureka, Kansas 67045

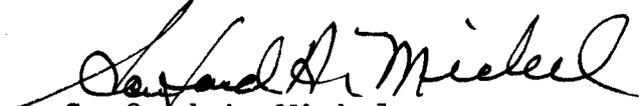
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Jackson Brothers Heirs "C" Lease, Well No. 6, Greenwood County, Kansas, and submitted to our laboratory on December 29 & 30, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Sanford A. Michel

SAM/tem
7 c to Eureka, Kansas

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The core was sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid. The core was reported to be from a virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
2468.0 - 2469.9	Light brown shaly sandstone.
2469.9 - 2472.2	Light brown sandstone.
2472.2 - 2473.3	Light brown slightly shaly sandstone.
2473.3 - 2476.0	Light brown shaly sandstone.
2476.0 - 2476.7	Light brown very shaly sandstone.
2476.7 - 2482.0	Light brown slightly shaly sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 533 barrels of oil per acre was obtained from 9.4 feet of sand. The weighted average percent oil saturation was reduced from 23.7 to 19.4, or represents an average recovery of 4.3 percent. The weighted average effective permeability of the samples is 0.96 millidarcys, while the average initial fluid production pressure is 35.6 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 13 samples tested, 9 produced water and oil. This indicates that approximately 69 percent of the sand represented by these samples is floodable pay sand. The tests also show that the sand has a relatively low, uniform permeability profile.

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Please note that the coregraph now presents residual oil saturation instead of recovery, as in the past.

CALCULATED RECOVERY

It would appear from a study of the core data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 1,650 barrels of oil per acre. This is an average recovery of 175 barrels per acre foot from 9.4 feet of floodable sand analyzed in this core.

These recovery values were calculated using the following data and assumptions:

Original formation volume factor, estimated	1.20
Reservoir water saturation, percent, estimated	45.0
Average porosity, percent	17.1
Oil saturation after flooding, percent	19.4
Performance factor, percent, estimated	50.0
Net floodable sand, feet	9.4

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Jackson Brothers

Lease Jackson Brothers Heirs "C"

Well No. 6

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	2468.8	11.3	26	70	96	228	Imp.	1.0	1.0	228	0.00
2	2469.8	17.1	26	56	82	345	4.9	0.9	1.9	311	4.41
3	2470.6	17.2	20	53	73	267	18.	1.1	3.0	294	19.80
4	2471.5	18.0	22	52	74	307	16.	1.2	4.2	368	19.20
5	2472.5	16.8	17	60	77	222	6.6	1.1	5.3	244	7.26
6	2473.5	16.7	18	59	77	233	3.8	0.7	6.0	163	2.65
7	2474.6	14.2	19	60	79	209	4.7	1.0	7.0	209	4.70
8	2475.7	16.7	25	57	82	324	2.8	1.0	8.0	324	2.80
9	2476.6	13.0	21	73	94	212	0.64	0.7	8.7	148	0.45
10	2477.7	18.0	27	57	84	377	6.3	1.3	10.0	490	8.19
11	2478.5	17.3	27	53	80	362	5.4	1.0	11.0	362	5.40
12	2479.5	16.4	29	48	77	369	9.5	1.0	12.0	369	9.50
13	2480.9	16.1	27	51	78	337	6.8	1.0	13.0	337	6.80

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Jackson Brothers Lease Jackson Brothers Heirs "C" Well No. 6

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
2468.0 - 2481.0	12.0	6.9	82.97

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbbl./Acre
2468.0 - 2481.0	13.0	16.2	23.5	57.1	296	3,847

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Jackson Brothers
Lease Heirs "C"

Well No. 6

Company Jackson Brothers

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation		Volume of Water Recovered cc*	Effective Permeability Millidarcys**	Initial Fluid Production Pressure Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water			
1	2468.8	11.5	26	232	0	0	26	70	0	Imp.	-
2	2469.8	17.0	26	343	0	0	26	68	0	Imp.	-
3	2470.6	17.2	20	267	4	53	16	76	27	0.40	35
4	2471.5	17.8	22	304	4	55	18	76	18	0.60	30
5	2472.5	16.8	17	222	2	26	15	82	46	0.60	25
6	2473.5	16.5	18	230	2	26	16	72	9	0.20	50
7	2474.6	14.7	18	205	0	0	18	74	0	Imp.	-
8	2475.7	17.0	25	330	4	53	21	71	29	0.40	35
9	2476.6	13.0	21	212	0	0	21	75	0	Imp.	-
10	2477.7	17.8	27	373	5	69	22	72	10	0.30	50
11	2478.5	17.1	27	358	4	53	23	69	21	0.40	40
12	2479.5	16.3	29	367	9	114	20	67	38	0.70	30
13	2480.9	16.6	27	348	4	52	23	73	167	5.20	25

Notes: cc—cubic centimeter.

*—Volume of water recovered at the time of maximum oil recovery.

**—Determined by passing water through sample which still contains residual oil.

SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Jackson Brothers Lease Jackson Brothers Heirs "C" Well No. 6

Depth Interval, Feet	2468.0 - 2481.0
Feet of Core Analyzed	9.4
Average Percent Porosity	17.1
Average Percent Original Oil Saturation	23.7
Average Percent Oil Recovery	4.3
Average Percent Residual Oil Saturation	19.4
Average Percent Residual Water Saturation	73.3
Average Percent Total Residual Fluid Saturation	92.7
Average Original Oil Content, Bbls./A. Ft.	314.
Average Oil Recovery, Bbls./A. Ft.	57.
Average Residual Oil Content, Bbls./A. Ft.	257.
Total Original Oil Content, Bbls./Acre	2,952.
Total Oil Recovery, Bbls./Acre	533.
Total Residual Oil Content, Bbls./Acre	2,419.
Average Effective Permeability, Millidarcys	0.96
Average Initial Fluid Production Pressure, p.s.i.	35.6

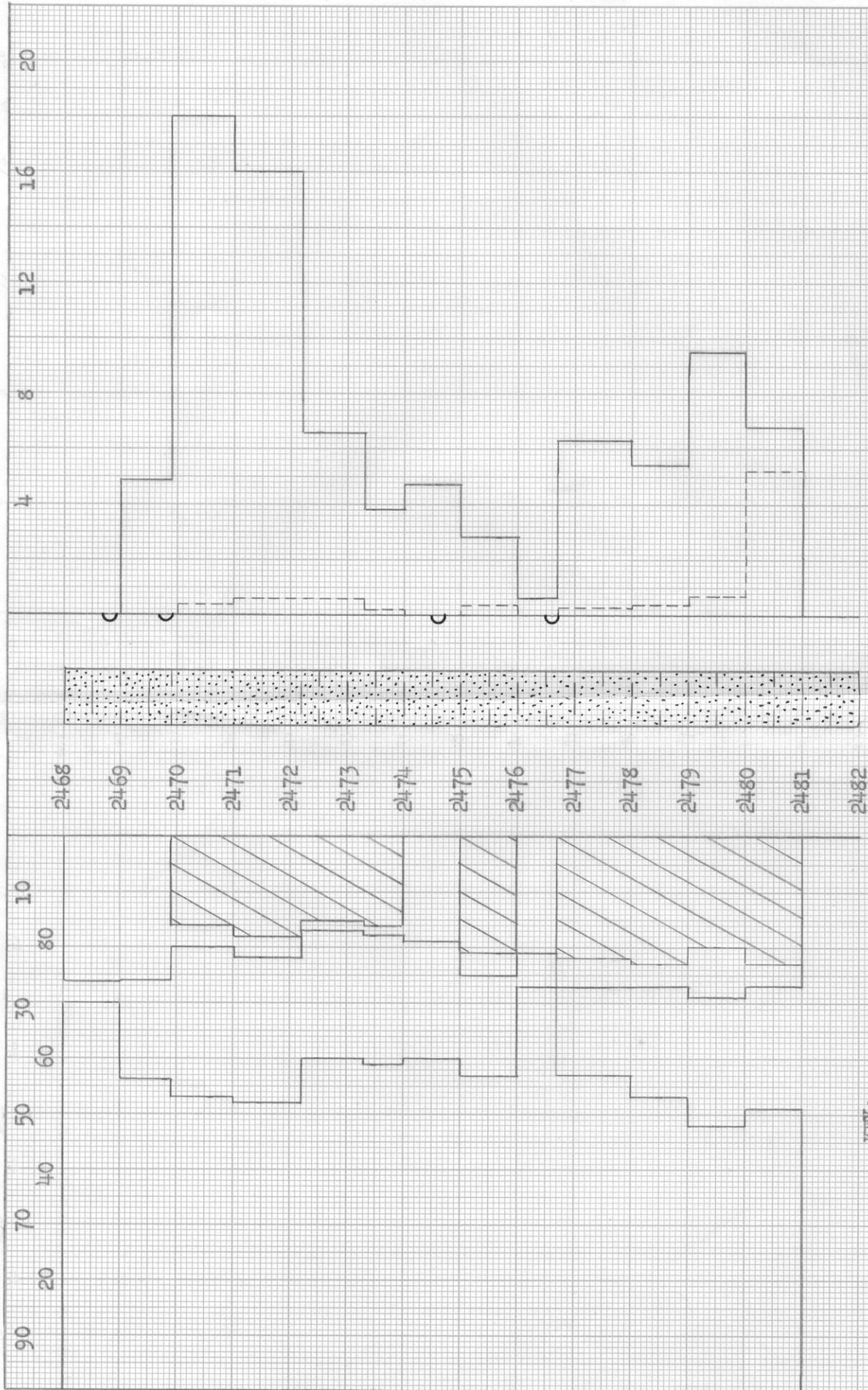
NOTE: Only those samples which recovered oil were used in calculating the above averages.

PERMEABILITY, IN MILLIDARCS

EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCS

WATER SAT., PERCENT

OIL SAT., PERCENT



KEY:

SANDSTONE

FLOODPOT RESIDUAL OIL SATURATION

SEALY SANDSTONE

IMPERMEABLE TO WATER

JACKSON BROTHERS

JACKSON BROTHERS HEIRS "C" LEASE WELL NO. 6

GREENWOOD COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BELS./ACRE
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2468.0 - 2481.0

13.0

16.2

23.5

57.1

6.9

1,650 (PRIMARY AND

WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JANUARY, 1980
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