

OILFIELD RESEARCH LABORATORIES

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May 6, 1981

Oaks Petroleum, Inc.
% Calvin T. Oaks, Jr.
R. R. 2
Stoystown, Pennsylvania 15563

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Collins Lease, Well No. C-13, located in Franklin County, Kansas and submitted to our laboratory on April 22, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES



Sanford A. Michel

SAM/mkf

2 c to Stoystown, Pa.
3 c to Paola, Ks.

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GENERAL INFORMATION & SUMMARY

Company Oaks Petroleum, Inc. Lease Collins Well No. C-13
 Location 1020' SNL & 2280' WEL SE $\frac{1}{4}$
 Section 16 Twp. 17S Rge. 21E County Franklin State Kansas

Elevation, Feet

	FIRST SQUIRREL
Name of Sand.....	495.0
Top of Core	503.4
Bottom of Core	495.0
Top of Sand	500.7
Bottom of Sand	5.7
Total Feet of Permeable Sand	3.7
Total Feet of Floodable Sand	

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 8	1.0	1.0
18 - 25	2.5	3.5
44 - 80	2.2	5.7

Average Permeability Millidarcys	33.1
Average Percent Porosity	19.6
Average Percent Oil Saturation	39.1
Average Percent Water Saturation	41.4
Average Oil Content, Bbls./A. Ft.	596.
Total Oil Content, Bbls./Acre	3,397.
Average Percent Oil Recovery by Laboratory Flooding Tests	7.7
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	117.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	433.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery"

Section

The core was sampled and the samples sealed in plastic bags by a representative of the client. Air was used as a drilling fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
495.0 - 498.2	Brown slightly calcareous sandstone.
498.2 - 498.7	Grayish light brown slightly calcareous shaly sandstone.
498.7 - 500.2	Brown slightly calcareous sandstone.
500.2 - 500.7	Grayish light brown slightly calcareous shaly sandstone.
500.7 - 503.4	Gray shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 433 barrels of oil per acre was obtained from 3.7 feet of sand. The weighted average percent oil saturation was reduced from 41.8 to 34.1, or represents an average recovery of 7.7 percent. The weighted average effective permeability of the samples is 3.34 millidarcys, while the average initial fluid production pressure is 41.3 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 7 samples tested, 4 produced water and oil. This indicates that approximately 57 percent of the sand represented by these samples is floodable pay sand.

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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 1,180 barrels of oil per acre. This is an average recovery of 318 barrels per acre foot from 3.7 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.04
Reservoir water saturation percent, estimated	25.0
Average porosity, percent	19.6
Oil saturation after flooding, percent	34.1
Performance factor, percent, estimated	55.0
Net floodable sand, feet	3.7

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Oaks Petroleum, Inc. Lease Collins Well No. C-13

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	495.2	18.5	39	46	85	560	24.	1.0	1.0	560	24.00
2	496.2	21.8	43	29	72	727	78.	1.0	2.0	727	78.00
3	497.2	20.8	40	34	74	646	44.	1.2	3.2	775	52.80
4	498.3	16.6	50	44	94	644	7.5	0.5	3.7	322	3.75
5	499.1	19.0	34	48	82	501	18.	0.8	4.5	401	14.40
6	499.9	19.4	29	55	84	437	18.	0.7	5.2	306	12.60
7	500.6	19.2	41	43	84	611	6.3	0.5	5.7	306	3.15

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Oaks Petroleum, Inc.	Lease	Collins	Well No.	C-13
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
495.0 - 500.7	5.7	33.1	188.70		
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Total Oil Content Bbls./Acre
495.0 - 500.7	5.7	19.6	39.1	41.4	596
					3,397

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Oaks Petroleum, Inc. Lease Collins Well No. C-13

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc's	Effective Permeability Millidarcys**	Initial Fluid Production Pressure Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1	495.2	18.6	39	563	5	72	34	53	491	102	2.10	50
2	496.2	20.6	43	687	12	192	31	54	495	216	6.27	25
3	497.2	20.8	40	645	5	81	35	50	564	197	3.18	40
4	498.3	16.9	49	642	11	144	38	56	498	24	0.30	50
5	499.1	19.3	33	494	0	0	33	51	494	0	Imp.	-
6	499.9	19.1	30	445	0	0	30	56	445	0	Imp.	-
7	500.6	19.1	41	608	0	0	41	44	608	0	Imp.	-

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.

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

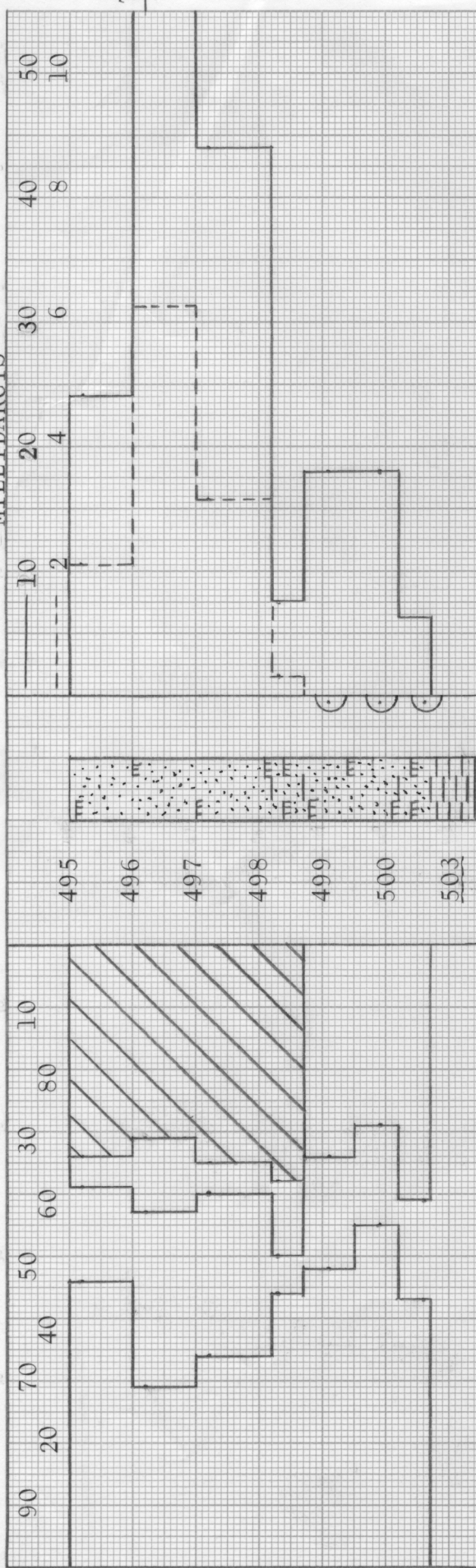
Company	Oaks Petroleum, Inc.	Lease	Collins	Well No.
Depth Interval, Feet	495.0 - 500.7			C-13
Feet of Core Analyzed	3.7			
Average Percent Porosity	19.6			
Average Percent Original Oil Saturation	41.8			
Average Percent Oil Recovery	7.7			
Average Percent Residual Oil Saturation	34.1			
Average Percent Residual Water Saturation	52.7			
Average Percent Total Residual Fluid Saturation	86.8			
Average Original Oil Content, Bbls./A. Ft.	634.			
Average Oil Recovery, Bbls./A. Ft.	117.			
Average Residual Oil Content, Bbls./A. Ft.	517.			
Total Original Oil Content, Bbls./Acre	2,345.			
Total Oil Recovery, Bbls./Acre	433.			
Total Residual Oil Content, Bbls./Acre	1,912.			
Average Effective Permeability, Millidarcys	3.34			
Average Initial Fluid Production Pressure, p.s.i.	41.3			

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

WATER SAT.,
PERCENT

OIL SAT.,
PERCENT

PERMEABILITY, IN MILLIDARCS
EFFECTIVE PERMEABILITY TO WATER, IN
MILLIDARCS



KEY:

SHALE

CALCAREOUS SANDSTONE

SHALY CALCAREOUS SANDSTONE

FLOODPOT RESIDUAL OIL SATURATION

IMPERMEABLE TO WATER

OAKS PETROLEUM, INC.

COLLINS LEASE

WELL NO. C - 13

FRANKLIN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCS	CALCULATED OIL RECOVERY, BBLs. / ACRE
495.0 - 500.7	5.7	19.6	39.1	41.4	33.1	1180
						(PRIMARY AND WATERFLOODING)