



OILFIELD RESEARCH LABORATORIES

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September 20, 1979

Oaks Petroleum, Inc.
Rt. 2
Stoystown, Pennsylvania 15563


Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the East Miller Lease, Well No. O-48, Franklin County, Kansas, and submitted to our laboratory on September 17, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Benjamin R. Pearman

SAM:km
3 c to Stoystown, Pennsylvania
1 c to Ottawa, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Oaks Petroleum, Inc. Lease East Miller Well No. 0-48
 Location 660' WEL & 660' NSL E $\frac{1}{2}$ SW $\frac{1}{4}$
 Section 10 Twp. 17S Rge. 21E County Franklin State Kansas

Name of Sand	Upper Squirrel
Top of Core	584.0
Bottom of Core	598.0
Top of Sand	584.5
Bottom of Sand	594.0
Total Feet of Permeable Sand	7.2
Total Feet of Floodable Sand	4.8

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	2.4	2.4
10 - 30	1.9	4.3
30 - 60	2.9	7.2

Average Permeability Millidarcys	24.1
Average Percent Porosity	19.8
Average Percent Oil Saturation	46.0
Average Percent Water Saturation	38.6
Average Oil Content, Bbls./A. Ft.	71.0
Total Oil Content, Bbls./Acre	5,115.
Average Percent Oil Recovery by Laboratory Flooding Tests	21.9
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	362.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	1,736.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

The core was sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
584.0 - 584.2	Brown sandstone.
584.2 - 584.5	Gray sandy shale.
584.5 - 587.0	Dark brown sandstone.
587.0 - 587.6	Brown and gray laminated sandstone and shale.
587.6 - 588.0	Brown slightly shaly sandstone.
588.0 - 588.8	Gray sandy shale.
588.8 - 589.6	Brown and gray laminated sandstone and shale.
589.6 - 590.0	Gray sandy shale.
590.0 - 591.0	Dark brown sandstone.
591.0 - 591.4	Brown shaly sandstone.
591.4 - 591.9	Gray sandy shale.
591.9 - 592.8	Dark brown slightly calcareous sandstone.
592.8 - 594.0	Brown slightly calcareous shaly sandstone.
594.0 - 598.0	Loss.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,736 barrels of oil per acre was obtained from 4.8 feet of sand. The weighted average percent oil saturation was reduced from 47.3 to 25.4, or represents an average recovery of 21.9 percent. The weighted average effective permeability of the samples is 2.71 millidarcys,

while the average initial fluid production pressure is 15.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 9 samples tested, 6 produced water and oil. This indicates that approximately 67 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 2,030 barrels of oil per acre. This is an average recovery of 422 barrels per acre foot from 4.8 feet of floodable sand analyzed in this core.

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

Original formation volume factor	1.04
Reservoir water saturation, percent	20.0
Average porosity, percent	21.1
Oil saturation after flooding, percent	25.4
Performance factor, percent	50.0
Net floodable pay sand, feet	4.8

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Oaks Petroleum, Inc. Lease East Miller well No. 0-48

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	584.6	19.8	47	35	82	722	24.	0.5	0.5	361	12.00
2	585.5	23.3	53	25	78	958	53.	1.0	1.5	958	53.00
3	586.5	20.4	52	28	80	823	23.	1.0	2.5	823	23.00
4	587.8	21.2	52	34	86	855	17.	0.4	2.9	342	6.80
5	589.5	19.9	45	37	82	695	0.36	0.8	3.7	556	0.29
6	590.5	19.4	47	41	88	707	38.	1.0	4.7	707	38.00
7	591.3	16.8	54	43	97	704	2.9	0.4	5.1	282	1.16
8	592.4	20.2	34	46	80	533	39.	0.9	6.0	480	35.10
9	593.5	16.7	39	54	93	505	3.7	1.2	7.2	606	4.44

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lease	Well No.				
Oaks Petroleum, Inc.	East Miller	0-48				
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.			
584.5 - 594.0	7.2	24.1	173.79			
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre	
584.5 - 594.0	7.2	19.8	46.0	38.6	710	5,115

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Oaks Petroleum, Inc. Lease East Miller Well No. 0-48

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	584.6	20.3	47	740	22	346	25	69	23	0.70	15
2	585.5	23.0	53	946	30	535	23	73	69	2.30	15
3	586.5	20.9	52	843	27	438	25	73	223	8.00	10
4	587.8	21.7	52	875	25	421	27	72	94	2.30	15
5	589.5	20.0	44	683	0	0	44	50	0	Imp.	-
6	590.5	19.8	47	722	20	307	27	71	39	0.80	15
7	591.3	16.8	54	704	0	0	54	41	0	Imp.	-
8	592.4	20.5	34	541	8	127	26	67	21	0.70	20
9	593.5	16.8	38	495	0	0	38	55	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	East Miller	Well No.	0-48
Depth Interval, Feet	584.5 - 594.0				
Feet of Core Analyzed	4.8				
Average Percent Porosity	21.1				
Average Percent Original Oil Saturation	47.3				
Average Percent Oil Recovery	21.9				
Average Percent Residual Oil Saturation	25.4				
Average Percent Residual Water Saturation	71.0				
Average Percent Total Residual Fluid Saturation	96.4				
Average Original Oil Content, Bbls./A. Ft.	775.				
Average Oil Recovery, Bbls./A. Ft.	362.				
Average Residual Oil Content, Bbls./A. Ft.	413.				
Total Original Oil Content, Bbls./Acre	3,718.				
Total Oil Recovery, Bbls./Acre	1,736.				
Total Residual Oil Content, Bbls./Acre	1,982.				
Average Effective Permeability, Millidarcys	2.71				
Average Initial Fluid Production Pressure, p.s.i.	15.0				

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