OILFIELD RESEARCH LABORATORIES

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December 22, 1962

Schermerhorn Oil Corporation
P.O. Box 287
Tulsa, Oklahoma

Gentlemen:

Enclosed herewith is the report of the analysis of the Rotary core taken from the Wiggans Lease, Well No. H-24, Wilson County, Kansas, and submitted to our laboratory on December 16, 1962.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman

Benjamin R. Pearman

BRP:rf

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Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Schermerhorn Oil Corp. Lease Wiggans "D" Well No. H-24

Location 330' South of North line & 165' West of East line, SW

Section 17 Twp. 28S Rge. 17E County Wilson State Kansas

Name of Sand	Bartlesville
Top of Core	980.0
Bottom of Core	1000.0
Top of Sand	980.0
Bottom of Sand (Analyzed)	990.4
Total Feet of Permeable Sand	10.0
Total Feet of Floodable Sand	5.0

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	6.1	6.1
30 - 100	2.3	8.4
100 & above	1.6	10.0

Average Permeability Millidarcys	72.1
Average Percent Porosity	16.9
Average Percent Oil Saturation	45.8
Average Percent Water Saturation	41.6
Average Oil Content, Bbls./A. Ft.	606.
Total Oil Content, Bbls./Acre	6,057.
Average Percent Oil Recovery by Laboratory Flooding Tests	21.2
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	288.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	1,438.
Total Calculated Oil Recovery, Bbls./Acre	1,160.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

Fresh water mud was used as the circulating fluid while taking this core. The core was sampled and the samples sealed in cans by a representative of Oilfield Research Laboratories. The well was drilled in non-virgin territory.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
980.0 - 982.0	Light brown, laminated, shaly sandstone.
982.0 - 982.4	Laminated sandy shale.
982.4 - 983.5	Light brown, laminated, shaly sandstone.
983.5 - 984.3	Brown, laminated, shaly sandstone.
984.3 - 985.9	Dark brown, slightly shaly sandstone.
985.9 - 986.3	Gray, laminated, sandy shale.
986.3 - 989.9	Grayish, light brown, laminated, shaly sandstone.
989.9 - 994.0	Gray, laminated, shaly sandstone.
994.0 - 995.0	Gray shale.
995.0 - 1000.0	Gray, laminated, slightly sandy shale.

Coring was started at a depth of 980.0 feet in laminated shaly sandstone and completed at 1000.0 feet in sandy shale. For the mort part, the pay is made up of light to dark brown, laminated, shaly sandstone.

PERMEABILITY

For the sake of distribution, the core was divided into two sections. The weighted average permeability of the upper and lower sections is 121.0 and 39.2 millidarcys respectively; the overall average being 72.1 (See Table III). By observing the data given on the coregraph, it is noticeable that the sand has an irregular permeability profile. The permeability of the sand varies from 0.24 to a maximum of 356. millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a good weighted average percent oil saturation, namely, 45.8. The weighted average percent oil saturation of the upper and lower sections is 48.1 and 43.1 respectively. The weighted average percent water saturation of the upper and lower sections is 40.6 and 42.8 respectively; the overall average being 41.6 (See Table III). This gives an overall weighted average total fluid saturation of 87.4 percent.

The weighted average oil content of the upper and lower sections is 635 and 570 barrels per acre foot respectively; the overall average being 606. The total oil content, as shown by this core, is 6,057 barrels per acre (See Table III).

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,438 barrels of oil per acre was obtained from 5.0 feet of sand. The weighted average percent oil saturation was reduced from 49.5 to 28.3, or represents an average recovery of 21.2 percent. The weighted average effective permeability of the samples is 3.92 millidarcys, while the average initial fluid production pressure is 32.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 10 samples tested, 5 produced water and oil. This indicates that approximately 50 percent of the sand represented by these samples is floodable pay sand. The tests also show that the sand has a wide variation in effective permeability to water.

CONCLUSION

The laboratory data indicates that an efficient water-flood in the vicinity of this well should recover approximately 1,160 barrels of oil per acre or an average of 232 barrels per acre foot from the 5.0 feet

of floodable pay sand analyzed in this core. These recovery values were calculated using the following data and assumptions:

Original formation volume factor	1.07
Present formation volume factor	1.02
Reservoir water saturation, percent	30.0
Primary recovery, estimated, percent	4.0
Present oil saturation, percent	62.8
Average porosity, percent	17.7
Oil saturation after flooding, percent	28.3
Performance factor, percent	50.0
Net floodable pay sand, feet	5.0

This core shows a more or less shaly pay sand section having a good oil saturation, a moderate water saturation and a wide variation in effective permeability to water.

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Schermerhorn Oil Corp. Lease Wiggans Well No. H-24

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	980.1	16.7	31	58	89	401	90.	0.5	0.5	201	45.00
2	981.1	15.9	39	46	85	480	3.8	1.5	2.0	720	5.70
3	983.1	17.1	39	38	77	516	4.7	1.1	3.1	569	5.17
4	984.1	15.5	60	33	93	720	50.	0.8	3.9	576	40.00
5	985.1	18.6	62	36	98	894	356.	1.6	5.5	1,430	569.60
6	986.1	14.5	43	52	95	484	0.24	0.4	5.9	194	0.10
7	987.1	16.7	43	47	90	557	5.1	1.3	7.2	725	6.63
8	988.1	19.0	42	32	74	618	39.	1.0	8.2	618	39.00
9	989.1	17.6	51	34	85	696	6.6	1.3	9.5	905	8.58
10	990.1	12.3	25	69	94	238	2.3	0.5	10.0	119	1.15
								Total	-------	6,057	

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Schermerhorn Oil Corp. Lease Wiggans Well No. H-24

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
980.0 - 985.9	5.5	121.0	665.47
985.9 - 990.4	4.5	39.2	55.46
980.0 - 990.4	10.0	72.1	720.93

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 Bbls./Acre
980.0 - 985.9	5.5	17.0	48.1	40.6	635	3,496
985.9 - 990.4	4.5	16.8	43.1	42.8	570	2,561
980.0 - 990.4	10.0	16.9	45.8	41.6	606	6,057

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Schermerhorn Oil Corp. Lease Wiggans Well No. H-24

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	Bbls./A. Ft.			
1	980.1	16.8	31	404	7	91	24	73	313	407	7.11	30
2	981.1	16.1	36	449	0	0	36	50	449	0	Imp.	-
3	983.1	17.5	39	529	14	190	25	61	339	5	0.174	40
4	984.1	15.3	60	711	34	403	26	69	308	14	0.346	30
5	985.1	18.4	62	884	28	399	34	63	485	171	9.53	30
6	986.1	14.7	40	456	0	0	40	55	456	0	Imp.	-
7	987.1	16.3	45	568	0	0	45	47	568	0	Imp.	-
8	988.1	19.1	42	621	15	222	27	58	399	14	0.346	30
9	989.1	17.1	51	676	0	0	51	36	676	0	Imp.	-
10	990.1	11.9	27	249	0	0	27	68	249	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 Schermerhorn Oil Corp. Lease Wiggans Well No. H-24

Depth Interval, Feet	980.0 - 990.3
Feet of Core Analyzed	5.0
Average Percent Porosity	17.7
Average Percent Original Oil Saturation	49.5
Average Percent Oil Recovery	21.2
Average Percent Residual Oil Saturation	28.3
Average Percent Residual Water Saturation	63.7
Average Percent Total Residual Fluid Saturation	92.0
Average Original Oil Content, Bbls./A. Ft.	678.
Average Oil Recovery, Bbls./A. Ft.	288.
Average Residual Oil Content, Bbls./A. Ft.	390.
Total Original Oil Content, Bbls./Acre	3,388.
Total Oil Recovery, Bbls./Acre	1,438.
Total Residual Oil Content, Bbls./Acre	1,950.
Average Effective Permeability, Millidarcys	3.92
Average Initial Fluid Production Pressure, p.s.i.	32.0

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