



# OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND - CHANUTE, KANSAS - PHONE HE1-2650

October 24, 1967

Mr. Ward A. McGinnis  
114 West 4th  
Eureka, Kansas 67045

Dear Sir:

Enclosed herewith is the report of the analysis of the Rotary core taken from the Kipfer Lease, Well No. 22, Greenwood County, Kansas, and submitted to our laboratory on October 19, 1967.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. Pate

CLP:bjo

5 c. - Eureka, Kansas

# Oilfield Research Laboratories

## GENERAL INFORMATION & SUMMARY

Company Ward McGinnis Lease Kipfer Well No. 22

Location NW/4

Section 6 Twp. 24S Rge. 11E County Greenwood State Kansas

Name of Sand	Wiggans
Top of Core	1943.0
Bottom of Core	1963.0
Top of Sand	1943.7
Bottom of Sand (Cored)	1963.0
Total Feet of Permeable Sand	19.3
Total Feet of Floodable Sand	?

**Distribution of Permeable Sand:**  
Permeability Range  
Millidarcys

	Feet	Cum. Ft.
0 - 100	6.0	6.0
100 - 200	5.0	11.0
200 - 400	3.8	14.8
400 & above	4.5	19.3

Average Permeability Millidarcys	232.3
Average Percent Porosity	19.7
Average Percent Oil Saturation	15.2
Average Percent Water Saturation	11.2
Average Oil Content, Bbls./A. Ft.	231.
Total Oil Content, Bbls./Acre	4,458.
Average Percent Oil Recovery by Laboratory Flooding Tests	2.2
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	35.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	141.
Total Calculated Oil Recovery, Bbls./Acre	
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

A fresh water mud was used as a circulating fluid in the coring of the sand in this well. The core was sampled by an employee of Oilfield Research Laboratories after it was submitted to our laboratory. The core was cut and exposed to air for two days prior to sampling.

#### FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth interval, Feet</u>	<u>Description</u>
1943.0 - 1943.3	Gray shaly sandstone.
1943.3 - 1943.7	Dark shale.
1943.7 - 1960.2	Light brown medium sandstone.
1960.2 - 1963.0	Gray medium grained sandstone.

Coring was started at a depth of 1943.0 feet in gray shaly sandstone and completed at 1963.0 feet in gray medium sandstone. This core shows a total of 19.6 feet of sandstone. For the most part, the pay is made up of light brown medium grained 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 117.0 and 319.3 millidarcys respectively; the overall average being 232.3 (See Table III). By observing the data given on the coregraph, it is noticeable that the sand has a very irregular permeability profile. The permeability of the sand varies from 15. to a maximum of 607. millidarcys.

#### PERCENT SATURATION & OIL CONTENT

The sand in this core shows a very low weighted average percent

oil saturation, namely, 15.2. The weighted average percent oil saturation of the upper and lower sections is 17.1 and 13.5 respectively. The weighted average percent water saturation of the upper and lower sections is 14.8 and 8.4 respectively; the overall average being 11.2 (See Table III). This gives an overall weighted average total fluid saturation of 26.4 percent. This low total fluid saturation indicates most of the fluid, in the core, evaporated from same during the two day period it was exposed to air.

The weighted average oil content of the upper and lower sections is 243 and 221 barrels per acre foot respectively; the overall average being 231. The total oil content, as shown by this core, is 4,456 barrels per acre (See Table III).

#### LABORATORY FLOODING TESTS

In as much as the sand in the core has a very low oil saturation, one would expect very little, if any, oil to be recovered by laboratory flooding tests.

A total recovery of 141 barrels of oil per acre was obtained from 4.0 feet of sand. The weighted average percent oil saturation was reduced from 21.4 to 19.2, or represents an average recovery of 2.2 percent. The weighted average effective permeability of the samples is 11.23 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 19 samples tested, all produced water and 4 oil. This indicates that all of the sand represented by these samples will take water.

CONCLUSION

Due to the fact that the core was exposed to air for two days prior to sampling, it is impossible to give a reliable oil recovery value.

The core shows a clean sand section having a low oil and water saturation and a high average permeability. The sand should take water at a low pressure.

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Ward McGinnis Lease Kipfer Well No. 22

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	1944.3	19.7	16	4	20	244	463.	1.3	1.3	317	602.00
2	1945.5	17.1	25	15	40	332	15.	1.0	2.3	332	15.00
3	1946.5	19.7	16	8	24	244	84.	1.0	3.3	244	84.00
4	1947.5	16.9	13	32	45	170	36.	1.0	4.3	170	36.00
5	1948.5	18.9	23	17	40	337	54.	1.0	5.3	337	54.00
6	1949.5	18.6	19	16	35	274	141.	1.0	6.3	274	141.00
7	1950.5	15.6	16	19	35	194	22.	1.0	7.3	194	22.00
8	1951.5	15.2	13	11	24	153	17.	1.0	8.3	153	17.00
9	1952.5	18.7	21	16	37	305	202.	1.0	9.3	305	202.00
10	1953.5	20.1	14	7	21	218	177.	1.0	10.3	218	177.00
11	1954.5	19.9	10	8	18	154	198.	1.0	11.3	154	198.00
12	1955.5	19.7	11	4	15	168	276.	1.0	12.3	168	276.00
13	1956.5	20.9	16	4	20	259	407.	1.0	13.3	259	407.00
14	1957.5	21.7	7	17	24	118	384.	1.0	14.3	118	384.00
15	1958.5	20.2	15	8	23	235	107.	1.0	15.3	235	107.00
16	1959.5	21.9	15	5	20	255	607.	1.2	16.5	306	728.50
17	1960.5	24.4	6	7	13	114	362.	0.8	17.3	91	289.00
18	1961.5	19.5	15	10	25	227	322.	1.0	18.3	227	322.00
19	1962.5	27.0	17	7	22	356	422.	1.0	19.3	356	422.00

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Ward McGinnis	Lease	Kipfer	Well No.	22	
	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.		
	1943.7 - 1952.0	8.3	117.0	971.00		
	1952.0 - 1963.0	11.0	319.3	3,512.50		
	1943.7 - 1963.0	19.3	232.3	4,483.50		
	Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
	1943.7 - 1952.0	8.3	17.8	17.1	14.8	2,021.
	1952.0 - 1963.0	11.0	21.2	13.5	8.4	2,437.
	1943.7 - 1963.0	19.3	19.7	15.2	11.2	4,458.

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## RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

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.
			%	Bbbs./A. Ft.	%	Bbbs./A. Ft.	% Oil	% Water	Bbbs./A. Ft.			
1	1944.3	19.3	14	208	0	0	14	77	208	542	42.00	10
2	1945.5	16.7	25	324	1	13	24	73	311	18	0.50	25
3	1946.5	19.4	17	256	0	0	17	64	256	101	2.20	10
4	1947.5	16.4	15	191	0	0	15	82	191	41	1.12	15
5	1948.5	18.4	23	329	3	43	20	63	286	111	3.60	15
6	1949.5	18.8	20	292	0	0	20	71	292	173	5.70	10
7	1950.5	16.0	14	174	0	0	14	81	174	94	2.00	15
8	1951.5	15.6	11	133	0	0	11	77	133	68	1.30	15
9	1952.5	19.0	21	309	3	44	18	76	265	364	9.86	10
10	1953.5	19.6	14	213	0	0	14	82	213	331	5.87	10
11	1954.5	20.1	9	140	0	0	9	87	140	295	25.63	10
12	1955.5	20.1	13	203	0	0	13	77	203	421	29.12	10
13	1956.5	21.2	17	280	0	0	17	80	280	461	21.00	10
14	1957.5	21.5	5	83	0	0	5	85	83	305	33.97	10
15	1958.5	20.5	13	207	0	0	13	82	207	486	18.60	10
16	1959.5	21.8	17	288	0	0	17	75	288	403	47.95	10
17	1960.5	24.0	4	75	0	0	4	85	75	248	22.78	10
18	1961.5	20.0	12	186	0	0	12	73	186	247	18.65	10
19	1962.5	26.6	17	350	2	41	15	79	309	400	30.97	10

Company **Ward McGinnis**
Lease **Kipfer**
Well No. **22**

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	Lease	Well No.	
Ward McGinnis	Kipfer	22	
Depth Interval, Feet	1943.7 - 1952.0	1952.0 - 1963.0	1943.7 - 1963.0
Feet of Core Analyzed	2.0	2.0	4.0
Average Percent Porosity	17.5	22.8	20.2
Average Percent Original Oil Saturation	24.0	19.0	21.4
Average Percent Oil Recovery	2.0	2.5	2.2
Average Percent Residual Oil Saturation	22.0	16.5	19.2
Average Percent Residual Water Saturation	68.0	77.0	72.8
Average Percent Total Residual Fluid Saturation	90.0	93.5	92.0
Average Original Oil Content, Bbls./A. Ft.	326.	329.	328.
Average Oil Recovery, Bbls./A. Ft.	28.	42.	35.
Average Residual Oil Content, Bbls./A. Ft.	298.	287.	293.
Total Original Oil Content, Bbls./Acre	653.	659.	1,312.
Total Oil Recovery, Bbls./Acre	56.	85.	141.
Total Residual Oil Content, Bbls./Acre	597.	574.	1,171.
Average Effective Permeability, Millidarcys	2.05	20.41	11.23
Average Initial Fluid Production Pressure, p.s.i.	20.0	10.0	15.0

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