OILFIELD RESEARCH LABORATORIES
536 NORTH HIGHLAND - CHANUTE, KANSAS - PHONE HE1-2650

October 21, 1968

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

Dear Sir:

Enclosed herewith is the report of the analysis of the Rotary core taken from the Kipfer Lease, Well No. 25, Greenwood County, Kansas, and submitted to our laboratory on October 16, 1968.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. Pate

CLP:dp

5 c. - Eureka, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Ward A. McGinnis Lease Kipfer Well No. 25

Location

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

Name of Sand	Cattleman
Top of Core	1906.0
Bottom of Core	1930.3
Top of Sand (Received)	1906.0
Bottom of Sand	1929.6
Total Feet of Permeable Sand	23.6
Total Feet of Floodable Sand	?

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 100	6.0	6.0
100 - 200	10.0	16.0
200 - 300	2.0	18.0
300 - 400	2.0	20.0
400 & above	3.6	23.6

Average Permeability Millidarcys	214.5
Average Percent Porosity	20.4
Average Percent Oil Saturation	17.3
Average Percent Water Saturation	10.6
Average Oil Content, Bbls./A. Ft.	272.
Total Oil Content, Bbls./Acre	6,423.
Average Percent Oil Recovery by Laboratory Flooding Tests	3.3
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	58.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	175.
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. This core was sampled by an employee of Oilfield Research Laboratories after it was submitted to our laboratory. The core was exposed to air for 36 hours before it was sampled.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
1906.0 - 1920.0	Light brown fine grained micaceous sandstone.
1920.0 - 1925.0	Grayish brown fine grained micaceous sandstone.
1925.0 - 1927.0	Grayish light brown fine grained micaceous slightly calcareous sandstone.
1927.0 - 1929.6	Grayish light brown fine grained micaceous sandstone.
1929.6 - 1929.7	Gray sandy shale.
1929.7 - 1930.3	Grayish brown fine grained micaceous sandstone.

Coring was started at a depth of 1906.0 feet in light brown fine grained micaceous sandstone and completed at 1930.3 feet in grayish brown fine grained micaceous sandstone. This core shows a total of 24.2 feet of sandstone. For the most part, the pay is made up of grayish brown to light brown fine 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 102.9 to 296.6 millidarcys respectively; the overall average being 214.5 (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 21. to a maximum of 279. millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a very low weighted average percent oil saturation, namely 17.3. The weighted average percent oil saturation of the upper and lower sections is 17.5 and 17.1 respectively. The weighted average percent water saturation of the upper and lower sections is 12.7 and 9.1 respectively; the overall average being 10.6 (See Table III). This gives an overall weighted average total fluid saturation of 27.9 percent. This low total fluid saturation indicates that most of the fluid was lost from the core during the 36 hour period it was exposed to air.

The weighted average oil content of the upper and lower sections is 253 and 286 barrels per acre foot respectively; the overall average being 272. The total oil content, as shown by this core, is 6,423 barrels per acre (See Table III).

LABORATORY FLOODING TESTS

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

A total recovery of 175 barrels of oil per acre was obtained from 3.0 feet of sand. The weighted average percent oil saturation was reduced from 21.3 to 18.0, or represents an average recovery of 3.3 percent. The weighted average effective permeability of the samples is 14.48 millidarcys, while the average initial fluid production pressure is 10.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 24 samples tested, all produced water and 3 oil. This indicates that all of the sand represented by these samples will take water. The tests also show that the sand has a wide variation in effective permeability.

CONCLUSION

Inasmuch as the core was exposed to air for 36 hours prior to sampling, no reliable oil recovery value can be given.

The core shows a clean sand section having a low oil and water saturation and a good porosity and permeability. No difficulty should be encountered in forcing the sand to take an ample volume of water.

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Ward A. McGinnis Lease Kipfer Well No. 25

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	1906.5	17.7	18	11	29	247	120	1.0	1.0	247	120.00
2	1907.5	15.9	22	9	31	271	51	1.0	2.0	271	51.00
3	1908.5	16.3	18	31	49	228	21	1.0	3.0	228	21.00
4	1909.5	17.7	17	11	28	234	55	1.0	4.0	234	55.00
5	1910.5	18.4	17	13	30	243	88	1.0	5.0	243	88.00
6	1911.5	18.6	17	10	27	245	156	1.0	6.0	245	156.00
7	1912.5	21.1	17	12	29	278	172	1.0	7.0	278	172.00
8	1913.5	18.2	18	12	30	254	51	1.0	8.0	254	51.00
9	1914.5	21.7	14	8	22	236	141	1.0	9.0	236	141.00
10	1915.5	22.0	17	10	27	290	174	1.0	10.0	290	174.00
11	1916.5	23.2	20	9	29	360	277	1.0	11.0	360	277.00
12	1917.5	21.5	22	8	30	367	155	1.0	12.0	367	155.00
13	1918.5	22.5	16	10	26	279	110	1.0	13.0	279	110.00
14	1919.5	21.1	15	8	23	246	96	1.0	14.0	246	96.00
15	1920.5	22.6	16	9	25	281	125	1.0	15.0	281	125.00
16	1921.5	23.2	13	6	19	234	137	1.0	16.0	234	137.00
17	1922.5	23.6	22	9	31	402	296	1.0	17.0	402	296.00
18	1923.5	22.1	16	8	24	274	352	1.0	18.0	274	352.00
19	1924.5	21.7	16	10	26	269	456	1.0	19.0	269	456.00
20	1925.5	17.4	21	10	31	283	359	1.0	20.0	283	359.00
21	1926.5	17.4	18	9	27	243	194	1.0	21.0	243	194.00
22	1927.5	18.9	15	11	26	220	599	1.0	22.0	220	599.00
23	1928.5	24.6	16	12	28	305	470	1.0	23.0	305	470.00
24	1929.5	24.1	12	8	20	224	679	0.6	23.6	134	407.30

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Ward A. McGinnis Lease Kipfer Well No. 25

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
1096.0 - 1916.0	10.0	102.9	1,029.00
1916.0 - 1929.6	13.6	296.6	4,033.30
1906.0 - 1929.6	23.6	214.5	5,062.30

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
1096.0 - 1916.0	10.0	18.8	17.5	12.7	253	2,526
1916.0 - 1929.6	13.6	21.6	17.1	9.1	286	3,897
1906.0 - 1929.6	23.6	20.4	17.3	10.6	272	6,423

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Ward A. McGinnis Lease Kipfer Well No. 25

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	1906.5	17.5	20	272	0	0	20	73	272	74	2.60	15
2	1907.5	16.2	20	251	0	0	20	60	251	20	0.60	25
3	1908.5	16.7	18	233	0	0	17	73	233	30	1.00	20
4	1909.5	18.1	20	281	0	0	20	56	281	40	1.40	20
5	1910.5	18.9	18	264	0	0	18	64	264	43	1.50	20
6	1911.5	19.0	15	221	0	0	15	80	221	194	11.00	15
7	1912.5	21.4	14	232	0	0	14	76	232	258	17.98	10
8	1913.5	18.6	16	231	0	0	16	79	231	106	4.60	15
9	1914.5	21.4	16	266	0	0	16	83	266	131	5.40	15
10	1915.5	22.4	15	261	0	0	15	79	261	174	6.70	10
11	1916.5	23.5	20	365	3	55	17	73	310	372	26.75	10
12	1917.5	21.2	22	362	4	66	18	75	296	257	12.20	10
13	1918.5	22.9	15	266	0	0	15	81	266	277	13.50	10
14	1919.5	20.7	17	273	0	0	17	69	273	121	3.00	10
15	1920.5	22.1	18	309	0	0	18	79	309	97	2.50	10
16	1921.5	22.7	14	246	0	0	14	86	246	267	12.00	10
17	1922.5	23.2	22	396	3	54	19	69	342	146	4.50	10
18	1923.5	21.7	17	286	0	0	17	91	286	162	6.00	10
19	1924.5	21.2	16	263	0	0	16	78	263	265	14.24	10
20	1925.5	17.8	18	249	0	0	18	76	249	336	42.00	10
21	1926.5	17.7	17	233	0	0	17	82	233	214	19.97	10
22	1927.5	19.1	13	193	0	0	13	59	193	300	21.99	10
23	1928.5	25.0	13	252	0	0	13	68	252	330	32.80	10
24	1929.5	24.6	9	172	0	0	9	76	172	731	137.40	10

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 Ward A McGinnis Lease Kipfer Well No. 25

Depth Interval, Feet	1916.0 - 1923.0
Feet of Core Analyzed	3.0
Average Percent Porosity	22.6
Average Percent Original Oil Saturation	21.3
Average Percent Oil Recovery	3.3
Average Percent Residual Oil Saturation	18.0
Average Percent Residual Water Saturation	72.4
Average Percent Total Residual Fluid Saturation	90.4
Average Original Oil Content, Bbls./A. Ft.	374.
Average Oil Recovery, Bbls./A. Ft.	58.
Average Residual Oil Content, Bbls./A. Ft.	316.
Total Original Oil Content, Bbls./Acre	1,123.
Total Oil Recovery, Bbls./Acre	175.
Total Residual Oil Content, Bbls./Acre	948.
Average Effective Permeability, Millidarcys	14.48
Average Initial Fluid Production Pressure, p.s.i.	10.0

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