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

November 27, 1968

Jackson Brothers
514 North Main
Eureka, Kansas 67045

Gentlemen:

Enclosed herewith is the report of the analysis of the Rotary core taken from the Pixlee Lease, Well No. 1, Greenwood County, Kansas, and submitted to our laboratory on November 23, 1968.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. Pate

CLP:dp

6 c. - Eureka, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Jackson Brothers Lease Pixlee Well No. 1

Location NE NE SE NW

Section 10 Twp. 22S Rge. 10E County Greenwood State Kansas

Name of Sand	Burgess
Top of Core	2285.0
Bottom of Core	2308.0
Top of Sand (Cored)	2285.0
Bottom of Sand	2307.0
Total Feet of Permeable Sand (Analyzed)	21.0
Total Feet of Floodable Sand	

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 50	5.5	5.5
50 - 75	4.0	9.5
75 - 100	2.6	12.1
100 - 200	7.4	19.5
200 & above	1.5	21.0

Average Permeability Millidarcys	108.4
Average Percent Porosity	19.7
Average Percent Oil Saturation	12.3
Average Percent Water Saturation	71.7
Average Oil Content, Bbls./A. Ft.	187.
Total Oil Content, Bbls./Acre	3,937.
Average Percent Oil Recovery by Laboratory Flooding Tests	2.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	30.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	90.
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 and sealed in tin cans by a representative of Oilfield Research Laboratories.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
2285.0 - 2307.0	Coarse grained micaceous slightly calcareous sandstone with a few carbonaceous streaks.
2307.0 - 2308.0	Loss. Cored like shale.

Coring was started at a depth of 2285.0 feet in coarse grained micaceous slightly calcareous sandstone and completed at 2308.0 feet; probably in shale. There was a one foot core loss at the bottom of the core. This shows a total of 22.0 feet of sandstone. For the most part, the pay is made up of coarse grained micaceous slightly calcareous sandstone containing a few carbonaceous streaks.

PERMEABILITY

For the sake of distribution, the core was divided into two sections. The weighted average permeability of the upper and lower sections is 127.6 and 92.2 millidarcys respectively; the overall average being 108.4 (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 9.7 to a maximum of 429 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a very low weighted average percent oil saturation, namely, 12.3. The weighted average percent oil saturation of the upper and lower sections is 14.4 and 10.5 respectively. The weighted average percent water saturation of the upper and lower sections

is 70.0 and 73.1 respectively; the overall average being 71.7 (See Table III). This gives an overall weighted average total fluid saturation of 84.0 percent. This fairly low total fluid saturation indicates some fluid was lost during coring which was probably oil.

In an effort to determine whether or not any flushing of the sand occurred during coring, six of the saturation samples were analyzed for chloride content. The results of these tests are given in Tables VI and VII. From the data given in these tables and on the coregraph, it is evident that the sand was badly flushed during coring as the chloride content is much lower than one would expect of water in a sand of this depth.

The weighted average oil content of the upper and lower sections is 219 and 161 barrels per acre foot respectively; the overall average being 187. The total oil content, as shown by this core, is 3,937 barrels per acre (See Table III).

LABORATORY FLOODING TESTS

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

A total recovery of only 90 barrels of oil per acre was obtained from 3.0 feet of sand. The weighted average percent oil saturation was reduced from 17.0 to 15.0, or represents an average recovery of 2.0 percent. The weighted average effective permeability of the samples is 14.17 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 22 samples tested, all produced water and 3 oil. This indicates that

approximately 14 percent of the sand represented by these samples is floodable pay sand.

CONCLUSION

On the basis of the above data, we are of the opinion that this well would not make a commercial oil producer. The chloride tests do show that the sand in the core was flushed by the circulating fluid during the cutting of same. However, we do not believe this would entirely account for the unusually high water.

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Jackson Brothers Lease Pixlee Well No. 1

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	2285.1	21.8	4	57	61	68	84.	0.6	0.6	41	50.40
2	2286.1	18.3	10	66	76	142	162.	1.0	1.6	142	162.00
3	2287.1	19.0	18	66	84	265	78.	1.0	2.6	265	78.00
4	2288.1	19.2	18	80	98	268	102.	1.0	3.6	268	102.00
5	2289.1	19.8	9	84	93	138	29.	1.0	4.6	138	29.00
6	2290.1	19.0	15	79	94	221	171.	1.0	5.6	221	171.00
7	2291.1	19.8	17	66	83	261	187.	1.0	6.6	261	187.00
8	2292.1	21.9	15	54	69	255	183.	1.0	7.6	255	183.00
P-9	2293.0	-	2	-	-	-	9.7	0.5	8.1	-	4.85
9	2293.2	20.2	15	64	79	235	-	0.5	8.6	117	-
10	2294.0	17.7	16	80	96	220	-	0.5	9.1	110	-
P-10	2294.2	-	-	-	-	-	429.	0.5	9.6	-	214.50
11	2295.1	20.5	18	71	89	286	43.	1.0	10.6	286	43.00
12	2296.1	19.7	13	65	78	199	28.	1.0	11.6	199	28.00
13	2297.1	19.7	11	72	83	168	52.	1.0	12.6	168	52.00
14	2298.1	19.9	12	71	83	185	59.	1.0	13.6	185	59.00
15	2299.1	21.5	11	64	75	183	26.	1.0	14.6	183	26.00
16	2300.1	17.9	8	88	96	111	57.	1.0	15.6	111	57.00
17	2301.1	21.1	10	67	77	164	137.	1.0	16.6	164	137.00
18	2302.1	19.1	2	87	89	30	92.	1.0	17.6	30	92.00
19	2303.1	18.9	16	73	89	235	281.	1.0	18.6	235	281.00
20	2304.1	19.3	21	71	92	315	65.	1.0	19.6	315	65.00
21	2305.1	19.3	6	74	80	90	40.	1.0	20.6	90	40.00
22	2306.1	20.1	7	72	79	109	154.	1.4	22.0	153	215.30

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Jackson Brothers Lease Pixlee Well No. 1

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
2285.0 - 2295.6	9.6	127.6	1,224.75
2295.6 - 2307.0	11.4	92.2	1,052.30
2285.0 - 2307.0	21.0	108.4	2,277.05

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
2285.0 - 2295.6	9.6	19.7	14.4	70.0	219	2,104
2295.6 - 2307.0	11.4	19.7	10.5	73.1	161	1,833
2285.0 - 2307.0	21.0	19.7	12.3	71.7	187	3,937

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Jackson Brothers Lease Pixlee Well No. 1

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	2285.1	21.5	6	100	0	0	6	92	100	40	1.04	20
2	2286.1	18.1	13	182	0	0	13	79	182	225	6.88	10
3	2287.1	18.5	18	259	2	29	16	78	230	90	2.89	20
4	2288.1	19.6	18	274	3	46	15	83	228	353	12.98	5
5	2289.1	20.1	10	156	0	0	10	88	156	143	4.96	10
6	2290.1	19.5	15	227	1	15	14	82	212	333	26.63	5
7	2291.1	19.3	15	225	0	0	15	83	225	34	1.04	25
8	2292.1	21.3	17	281	0	0	17	61	281	48	1.63	20
9	2293.2	20.3	15	236	0	0	15	64	236	107	3.55	10
10	2294.0	18.0	14	196	0	0	14	84	196	106	3.26	10
11	2295.1	20.3	20	315	0	0	20	74	315	83	3.03	20
12	2296.1	19.9	10	154	0	0	10	83	154	92	3.40	20
13	2297.1	19.3	13	195	0	0	13	77	195	179	5.70	10
14	2298.1	20.1	13	203	0	0	13	76	203	79	2.89	20
15	2299.1	21.0	12	196	0	0	12	76	196	39	1.25	20
16	2300.1	18.3	9	128	0	0	9	88	128	89	2.59	10
17	2301.1	21.5	13	217	0	0	13	86	217	349	13.24	5
18	2302.1	19.6	3	46	0	0	3	96	46	279	28.30	5
19	2303.1	18.6	13	188	0	0	13	79	188	144	4.66	10
20	2304.1	19.2	18	268	0	0	18	80	268	382	16.74	5
21	2305.1	19.0	9	133	0	0	9	86	133	97	2.74	20
22	2306.1	20.5	5	80	0	0	5	81	80	121	5.03	20

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 Jackson Brothers Lease Pixlee Well No. 1

Depth Interval, Feet	2285.0 - 2307.0
Feet of Core Analyzed	3.0
Average Percent Porosity	19.2
Average Percent Original Oil Saturation	17.0
Average Percent Oil Recovery	2.0
Average Percent Residual Oil Saturation	15.0
Average Percent Residual Water Saturation	81.0
Average Percent Total Residual Fluid Saturation	96.0
Average Original Oil Content, Bbls./A. Ft.	253.
Average Oil Recovery, Bbls./A. Ft.	30.
Average Residual Oil Content, Bbls./A. Ft.	223.
Total Original Oil Content, Bbls./Acre	760.
Total Oil Recovery, Bbls./Acre	90.
Total Residual Oil Content, Bbls./Acre	670.
Average Effective Permeability, Millidarcys	14.17
Average Initial Fluid Production Pressure, p.s.i.	10.0

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

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RESULTS OF WATER DIFFERENTIATION TESTS

TABLE VI

Company Jackson Brothers Lease Pixlee Well No. 1

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Water Saturation Connate	Drilling & Foreign	Total
2	2286.1	9,010			
6	2290.1	14,250			
7	2291.1	8,175			
15	2299.1	15,350			
18	2302.1	7,360			
20	2304.1	6,745			

Note: ppm — parts per million