18-26-18E

March 18, 1949

Deep Rock Oil Corporation
Tulsa, Oklahoma

Attention: Mr. T. F. Lawry

Gentlemen:

Enclosed herewith is the report of the analysis of the Keystone Barrel core taken from the Fraker Lease, Well No. FQ-19, Allen County, Kansas, and submitted to our laboratory on March 5, 1949.

Very truly yours,

OIL FIELD RESEARCH LABORATORIES

Carl L. Pate

CLP:ls
c.c. to Mr. Neil Henderson.

Fraker FQ-19

DEEP ROCK OIL CORPORATION

CORE ANALYSIS REPORT

FRAKER LEASE WELL NO. FC-19

ALLEN COUNTY, KANSAS

OIL FIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

MARCH 17,1949

Oil Field Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Deep Rock Oil Corporation Lease Fraker Well No. FQ-19

Location NE¼

Section 18 Twp. 26S Rge. 18E County Allen State Kansas

Name of Sand	Bartlesville
Top of Core	835.50
Bottom of Core	865.00
Top of Sand	854.80
Bottom of Sand	?
Total Feet of Permeable Sand	5.34

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	1.12	1.12
5 - 10	0.55	1.67
10 - 20	2.30	3.97
20 & above	1.37	5.34

Average Permeability, Millidarcys	14.88
Average Percent Porosity	15.93
Average Percent Oil Saturation	33.99
Average Percent Water Saturation	43.05
Average Oil Content, Bbls./A. Ft.	419.
Total Oil Content, Bbls./Acre	3,459.
Average Percent Oil Recovery by Laboratory Flooding Tests	6.43
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	86.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	380.
Total Calculated Oil Recovery, Bbls./Acre	700.
Packer Setting, Feet	855.5
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	

Note: The above averages are for that part of the sand section extending from the packer setting to the bottom of the hole.

Water was used as a circulating fluid in the coring of the sand in this well.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
835.50 - 839.00	Gray shale.
839.00 - 845.20	Gray sandy shale.
845.20 - 845.97	Gray shale.
845.97 - 846.75	Soft laminated micaceous sandstone.
846.75 - 848.35	Gray sandy shale.
848.35 - 848.70	Light brown fine grained micaceous sandstone.
848.70 - 853.16	Gray shale.
853.16 - 854.30	Laminated sandstone and shale.
854.30 - 854.65	Brown fine grained micaceous shaley sandstone.
854.65 - 854.80	Sandy limestone.
854.80 - 855.80	Brown fine grained micaceous laminated sandstone.
855.80 - 856.63	Hard brown fine grained micaceous calcareous sandstone.
856.63 - 857.20	Brown fine grained micaceous shaley sandstone.
857.20 - 857.60	Laminated micaceous shaley sandstone.
857.60 - 858.10	Gray sandy shale.
858.10 - 858.45	Brown fine grained micaceous laminated sandstone.
858.45 - 858.65	Sandy shale.
858.65 - 858.80	Brown fine grained micaceous shaley sandstone.
858.80 - 858.90	Gray shale.
858.90 - 860.20	Brown fine grained micaceous slightly shaley sandstone.
860.20 - 860.58	Brown fine grained micaceous laminated sandstone.
860.58 - 861.60	Brown fine grained micaceous shaley sandstone.
861.60 - 862.57	Dark brown fine grained micaceous finely laminated sandstone.

862.57 - 863.32 - Dark brown fine grained micaceous sandstone.

863.32 - 865.00 - Dark brown fine grained finely laminated micaceous sandstone.

Coring was started at a depth of 835.50 feet in gray shale and completed at 865.00 feet in finely laminated micaceous sandstone. This core shows a total of 10.73 feet of sandstone and the pay is made up of fine grained micaceous to shaley sandstone.

PERMEABILITY

The sand in this well is comparatively tight; having an overall weighted average permeability of only 14.88 millidarcys (See Table II). By observing the data given on the coregraph it is noticeable that the sand has a fairly irregular permeability profile.

PERCENT SATURATION & OIL CONTENT

For the sake of distribution the core was divided into two sections. The weighted average percent oil saturation of the upper and lower sections are 23.72 and 33.99 respectively. The lower section represents that part of the pay extending from the packer setting to the bottom of the hole and will be referred to in the remainder of the report as the pay sand. The weighted average percent water saturation of the upper and lower sections are 51.22 and 43.05 respectively (See Table IV). This gives an overall weighted average total fluid saturation of 77.04 percent.

The weighted average oil content of the pay sand is 419 barrels per acre while the total oil content, as shown by this core, is 3,459 barrels per acre (See Table IV).

LABORATORY FLOODING TESTS

The sand in this core did not respond very well to laboratory flooding tests, as a total recovery of 380 barrels per acre was obtained from

4.24 feet of sand. The weighted average percent oil saturation was reduced from 37.47 to 31.04 or represents an average recovery of 6.43 percent. The weighted average effective permeability of the samples is 0.50 millidarcys, while the average initial fluid production pressure is 37.5 pounds per square inch (See Table VI).

By observing the data given in Table V, you will note that of the 8 samples tested, 4 produced oil and took water. Furthermore, comparatively high pressures were required to flood out the samples.

CONCLUSION

From a study of the above data, we believe an efficient water flood within the vicinity of this well will recover approximately 700 barrels of oil per acre. In calculating this recovery an allowance was made for oil lost during coring and it was assumed that the true water saturation of the sand is 34 percent.

The principle drawback of this core is that it contains only approximately 4½ feet of good floodable sand.

OIL FIELD RESEARCH LABORATORIES

SHOT RECOMMENDATION

Company Deep Rock Oil Corporation Lease Fraker Well No. FC-19

Depth Interval, Feet	Feet of Sand	Size of Shell Inches	Qts./Ft.	Total Qts.
860.0 - 863.0	3.0	4½	3.1	9.3

Recommended Packer Setting - 855.5 feet.

Oil Field Research Laboratories

RESULTS OF PERMEABILITY TESTS

TABLE I

Company Deep Rock Oil Corporation Lease Fraker Well No. FC-19

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	855.06	Imp.	0.50	0.50	0.00
2	856.13	Imp.	0.83	1.33	0.00
3	856.65	2.3	0.17	1.50	0.39
4	856.90	9.2	0.20	1.70	1.84
5	857.15	4.0	0.20	1.90	0.80
6	858.70	3.9	0.15	2.05	0.59
7	858.96	1.8	0.20	2.25	0.36
8	859.26	4.8	0.40	2.65	1.92
9	859.70	16.	0.40	3.05	6.40
10	860.10	14.	0.30	3.35	4.20
11	860.62	22.	0.52	3.87	11.44
12	861.66	11.	0.25	4.12	2.75
13	862.06	7.8	0.35	4.47	2.73
14	862.40	38.	0.37	4.84	14.06
15	862.75	11.	0.75	5.59	8.25
16	863.36	32.	0.48	6.07	15.36
17	864.46	14.	0.60	6.67	8.40

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SUMMARY OF PERMEABILITY TESTS

TABLE II

Company Deep Rock Oil Corporation Lease Fraker Well No. FC-19

Depth Interval Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.
855.80 - 865.00	5.34	14.88	79.49

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RESULTS OF SATURATION TESTS

TABLE III

Company Deep Rock Oil Corporation Lease Fraker Well No. FQ-19

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content, Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
1	846.25	16.0	23.0	52.0	75.0	286	0.78	0.78	223
3	848.46	16.2	22.2	53.7	75.9	279	0.35	1.13	98
4	854.35	17.2	26.9	47.1	74.0	463	0.35	1.48	162
5	856.31	15.2	32.4	32.4	64.8	382	0.83	2.31	317
6	857.30	16.4	27.1	32.7	59.8	345	0.97	3.28	335
7	858.20	13.4	26.1	56.0	82.1	271	0.35	3.63	95
8	859.42	18.0	32.1	33.2	65.3	448	1.30	4.93	583
9	860.30	15.4	33.4	49.4	82.8	399	0.38	5.31	152
10	861.22	14.7	36.2	53.4	89.6	413	1.02	6.33	421
11	862.90	17.0	36.1	49.0	85.1	476	1.72	8.05	819
12	863.91	14.7	38.4	45.5	83.9	438	1.68	9.73	737
								Total	3,942

Oil Field Research Laboratories

SUMMARY OF SATURATION TESTS

TABLE IV

Company Deep Rock Oil Corporation Lease Fraker Well No. F-19

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbls./A. Ft.	Total Oil Content Bbls./Acre
845.97-854.65	1.48	16.35	23.72	51.22	326	483
855.80-865.00	8.25	15.93	33.99	43.05	419	3,459

Oil Field Research Laboratories

SUMMARY OF LABORATORY FLOODING TESTS

TABLE VI

Company Deep Rock Oil Corporation Lease Fraker Well No. F-19

Depth Interval, Feet	858.90 - 863.32
Feet of Core Analyzed	4.42
Average Percent Porosity	17.01
Average Percent Original Oil Saturation	37.47
Average Percent Oil Recovery	6.43
Average Percent Residual Oil Saturation	31.04
Average Percent Residual Water Saturation	63.19
Average Percent Total Residual Fluid Saturation	94.23
Average Original Oil Content, Bbls./A. Ft.	495.
Average Oil Recovery, Bbls./A. Ft.	86.
Average Residual Oil Content, Bbls./A. Ft.	409.
Total Original Oil Content, Bbls./Acre	2,188.
Total Oil Recovery, Bbls./Acre	380.
Total Residual Oil Content, Bbls./Acre	1,808.
Average Effective Permeability, Millidarcys	0.50
Average Initial Fluid Production Pressure, p.s.i.	37.5

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

Oil Field Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE V

Company Deep Rock Oil Corporation Lease Fraker Well No. FC-19

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.
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
5	856.46	15.9	30.2	373	0.0	0	30.2	61.4	373	0	Imp.	50+
6	857.50	15.0	28.9	336	0.0	0	28.9	66.6	336	0	Imp.	50+
7	858.36	12.6	28.3	290	0.0	0	28.3	79.4	290	0	Imp.	50+
8	859.56	17.0	55.6	472	3.7	49	32.1	64.2	423	5	0.157	35
9	860.46	16.8	38.8	506	2.2	29	36.6	60.0	477	3	0.206	45
10	861.40	16.3	36.7	465	3.8	48	32.9	57.9	417	1	0.086	50
11	863.10	17.5	38.9	528	11.0	149	27.9	66.3	379	52	1.070	20
12A	864.10	13.7	45.8	487	0.0	0	45.8	82.5	487	0	Imp.	50+

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.

Salt water was used to flood out these samples.