12-26-18E

April 14, 1950

Mr. A. E. Dawson
525 Knickerbocker Place
Kansas City 2, Missouri

Dear Sir:

Enclosed herewith is the report of the analysis made on the small Keystone barrel core taken from the A. E. Dawson Lease, Well No. 1, Allen County, Kansas, and submitted to our laboratory on April 4, 1950.

Very truly yours,

OIL FIELD RESEARCH LABORATORIES

Carl L. Pate

CLP:dt

A.E. Dawson 1

A. E. DAWSON

CORE ANALYSIS REPORT

A. E. DAWSON LEASE WELL NO. 1

ALLEN COUNTY, KANSAS

OIL FIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

APRIL 14, 1950

Oil Field Research Laboratories

GENERAL INFORMATION & SUMMARY

Company A. E. Dawson Lease A. E. Dawson Well No. 1

Location

Section 12 Twp. 26S Rge. 18E County Allen State Kansas

Name of Sand	Bartlesville
Top of Core	827.50
Bottom of Core	838.15
Top of Sand (according to driller)	824.00
Bottom of pay Sand	831.22
Total Feet of Permeable Sand	5.85

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	2.63	2.63
5 - 10	1.97	4.60
10 - 30	0.75	5.35
30 & above	0.50	5.85

Average Permeability, Millidarcys	17.21
Average Percent Porosity	18.36
Average Percent Oil Saturation	36.21
Average Percent Water Saturation	41.91
Average Oil Content, Bbls./A. Ft.	523.
Total Oil Content, Bbls./Acre	1,945.
Average Percent Oil Recovery by Laboratory Flooding Tests	3.53
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	81.
Aotal Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	140.
Total Calculated Oil Recovery, Bbls./Acre	700.
Packer Setting, Feet	824.0
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	

Fresh 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
827.50 - 831.22	Light brown fine grained micaceous shaley sandstone.
831.22 - 834.40	Gray shale.
834.40 - 834.55	Light brown fine grained micaceous carbonaceous sandstone.
834.55 - 834.82	Gray shale.
834.82 - 834.92	Light brown fine grained micaceous sandstone.
834.92 - 837.05	Dark fine grained micaceous carbonaceous sandstone.
837.05 - 837.20	Gray shale.
837.20 - 837.75	Coal.
837.75 - 838.15	Gray shale.

Coring was started at a depth of 827.50 feet in fine grained micaceous shaley sandstone and completed at 838.15 feet in gray shale. This core shows a total of 6.10 feet of sandstone. According to the driller, approximately 3.5 feet of sand was drilled before coring was started. The pay sand, or that part of the sand section from 827.50 to 831.22 feet, is made up of fine grained micaceous shaley sandstone. The lower part of the sand section is composed of dark fine grained micaceous carbonaceous sandstone.

PERMEABILITY

The pay sand in this core is comparatively tight, having an overall weighted average permeability of only 17.21 millidarcys. The weighted

average permeability of the entire sand section analyzed is 11.67 millidarcys (See Table II). By observing the data given on the coregraph it is noticeable that the pay zone has a considerable higher permeability than the carbonaceous sand at the bottom of the core.

PERCENT SATURATION & OIL CONTENT

The weighted average percent oil saturation of the pay sand is 36.21, while the average percent water saturation is 41.91 (See Table IV). This gives an overall weighted average total fluid saturation of 78.12 percent. This comparatively low total fluid saturation indicates that an appreciable amount of fluid was lost during coring which was probably oil.

In order to get some idea of the degree of flushing of the sand during coring, all of the saturation samples were analyzed for chloride content. The results of these tests are given in Tables VII and VIII. From the data given in these tables and on the coregraph, it is evident that some flushing of the sand did occur during coring.

The weighted average oil content of the pay sand is 523 barrels per acre foot, while the total oil content of the entire cored section, as shown by this core, is 3,298 barrels per acre of which 1,945 barrels are in the pay sand zone.

LABORATORY FLOODING TESTS

The sand in this core did not respond very well to laboratory flooding tests as a total recovery of only 140 barrels per acre was obtained from 2.72 feet of sand. The weighted average percent oil

saturation was reduced from 36.99 to 33.46, or represents an average recovery of 3.53 percent. The weighted average effective permeability of the samples is 0.38 millidarcys, while the average initial fluid production pressure is 30.0 pounds per square inch (See Table VI). From the above data it is noticeable that the sand samples, after flooding, had comparatively high percent residual oil saturations.

By observing the data given in Table V you will note that of the six samples tested, only two produced oil and three took water. This would indicate that only part of the sand analyzed is floodable. Furthermore, comparatively high pressures were required to force the sand to take water.

CONCLUSION

From a study of the above data we believe that an efficient water flood within the vicinity of this well will recover approximately 700 barrels of oil per acre from the sand section analyzed. 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 37.0 percent.

The principle drawback of this core is the fact that it contains very little floodable sand, and that the sand is comparatively tight. It is unfortunate that the some 3.5 feet of sand drilled was not cored, as this may have made the core look considerable better.

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SHOT RECOMMENDATION

Company A. E. Dawson Lease A. E. Dawson Well No. 1

Depth Interval, Feet	Feet of Sand	Size of Shell Inches	Qts./Ft.	Total Quarts
826.0 - 831.0	3.0	4½	3.1	9.3

Recommended Packer Setting - 824.0 feet
Note: Plug hole back to - 831.5 feet

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RESULTS OF PERMEABILITY TESTS

TABLE I

Company A. E. Dawson Lease A. E. Dawson Well No. 1

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	828.05	8.5	0.70	0.70	5.95
2	828.45	4.7	0.50	1.20	2.40
3	828.95	8.9	0.50	1.70	4.40
4	829.50	17.	0.40	2.10	6.80
5	829.80	24.	0.35	2.45	8.40
6	830.10	8.0	0.35	2.80	2.80
7	830.55	61.	0.50	3.30	30.50
8	831.15	6.6	0.42	3.72	2.77
9	835.05	2.3	0.28	4.00	0.64
10	835.34	3.4	0.50	4.50	1.70
11	835.95	4.3	0.45	4.95	1.93
12	836.35	1.9	0.45	5.40	0.86
13	837.00	0.60	0.45	5.85	0.27

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RESULTS OF SATURATION TESTS

TABLE III

Company A. E. Dawson Lease A. E. Dawson Well No. 1

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	827.72	16.7	32.3	50.0	82.3	419	1.00	1.00	419
2	829.26	18.3	40.5	37.7	78.2	575	1.25	2.25	719
3	830.36	19.5	36.3	40.0	76.3	549	1.47	3.72	807
F-6	834.45	16.5	43.3	-	-	555	0.15	3.87	83
7	835.72	19.2	38.1	32.5	70.6	568	1.23	5.10	698
F-A	836.70	18.6	44.0	-	-	636	0.90	6.00	572
								Total -	- 3,298

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SUMMARY OF SATURATION TESTS

TABLE IV

Company A. E. Dawson Lease A. E. Dawson Well No. 1

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
827.50-837.05	6.00	18.52	37.95	39.58	550	3,298
827.50-831.22	3.72	18.36	36.21	41.91	523	1,945

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE VI

Company A. E. Dawson Lease A. E. Dawson Well No. 1

Depth Interval, Feet	828.50 - 831.22
Feet of Core Analyzed	2.72
Average Percent Porosity	18.57
Average Percent Original Oil Saturation	36.99
Average Percent Oil Recovery	3.53
Average Percent Residual Oil Saturation	33.46
Average Percent Residual Water Saturation	57.46
Average Percent Total Residual Fluid Saturation	90.92
Average Original Oil Content, Bbls./A. Ft.	536.
Average Oil Recovery, Bbls./A. Ft.	51.
Average Residual Oil Content, Bbls./A. Ft.	485.
Total Original Oil Content, Bbls./Acre	1,460.
Total Oil Recovery, Bbls./Acre	140.
Total Residual Oil Content, Bbls./Acre	1,320.
Average Effective Permeability, Millidarcys	0.380
Average Initial Fluid Production Pressure, p.s.i.	30.0

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

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SUMMARY OF PERMEABILITY TESTS

TABLE II

Company A. E. Dawson Lease A. E. Dawson Well No. 1

Depth Interval Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.
827.50 - 837.05	5.95	11.67	69.42
827.50 - 831.28	3.78	17.21	64.02

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RESULTS OF WATER DIFFERENTIATION TESTS

TABLE VII

Company A. E. Dawson Lease A. E. Dawson Well No. 1

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Water Saturation		
			Connate	Drilling & Foreign	Total
1	827.72	26,300			
2	829.26	25,900			
3	830.36	16,300			
7	835.72	24,800			

Note: ppm - parts per million

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RESULTS OF LABORATORY FLOODING TESTS

TABLE V

Company A. E. Dawson Lease A. E. Dawson Well No. 1

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc*	[redacted] Effective Permeability, Millidarcys **	Initial Fluid Production Pressure Lbs./Sq. In.
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1	827.57	16.8	31.5	404	0.0	0	31.5	68.0	404	4	0.086	40
2	829.12	17.4	42.4	573	3.6	49	38.8	50.6	524	5	0.172	35
3	830.22	19.8	38.4	499	3.5	54	29.9	62.4	445	16	0.557	35
6	834.45	16.5	43.3	555	0.0	0	43.3	40.9	555	0	Imp.	50+
7	835.56	18.9	36.8	540	0.0	0	36.8	28.9	540	0	Imp.	50+
A	836.70	16.6	44.0	636	0.0	0	44.0	33.2	636	0	Imp.	50+

Note: 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 WATER DIFFERENTIATION TESTS

TABLE VIII

Company A. E. Dawson Lease A. E. Dawson Well No. 1

Depth Interval, Feet	Chloride Content of Brine in Sand, ppm	Average Percent Connate Water	Average Percent Drilling & Foreign Water
827.50 - 837.05	22,000		
827.50 - 831.22	22,700		