June 7, 1950

18-34-17E

Beeler Oil & Gas Company
317 Westminster Street
Independence, Kansas

Gentlemen:

Enclosed herewith is the report of the analysis made on the large Keystone barrel core taken from the Helt Lease, Well No. 1-B, Montgomery County, Kansas, and submitted to our laboratory on June 1, 1950.

Very truly yours,

OIL FIELD RESEARCH LABORATORIES

Carl L. Pate

Carl L. Pate

CLP:dt
c.c.

Helt 1-B

BEELER OIL & GAS COMPANY

CORE ANALYSIS REPORT

HELT LEASE WELL NO. 1B

MONTGOMERY COUNTY, KANSAS

OIL FIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

JUNE 6, 1950

Oil Field Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Beeler Oil & Gas Company Lease Holt Well No. 1-B

Location 150' SE of O.E. Martin Lease, Well No. 1-A,

Section 18 Twp. 34S Rge. 17E County Montgomery State Kansas

Name of Sand	Squirrel
Top of Core	485.00
Bottom of Core	494.50
Top of Sand	488.40
Bottom of Sand	494.40
Total Feet of Permeable Sand	4.73

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 15	0.80	0.80
15 - 30	1.10	1.90
30 - 60	2.43	4.33
60 & above	0.40	4.73

Average Permeability, Millidarcys	35.28
Average Percent Porosity	17.71
Average Percent Oil Saturation	35.96
Average Percent Water Saturation	45.69
Average Oil Content, Bbls./A. Ft.	499.
Total Oil Content, Bbls./Acre	2,284.
Average Percent Oil Recovery by Laboratory Flooding Tests	10.43
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	153.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	532.
Total Calculated Oil Recovery, Bbls./Acre	800.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	

Salt water was used as a circulating fluid in the coring of the sand in this well. The core was bleeding very freely as it was removed from the core barrel.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
485.00 - 488.25	Shale (discarded at well).
488.25 - 488.40	Gray shale.
488.40 - 490.08	Brown fine grained micaceous sandstone.
490.08 - 490.90	Gray shale.
490.90 - 491.05	Finely laminated shale and sandstone.
491.05 - 491.50	Brown fine grained micaceous shaley sandstone.
491.50 - 491.65	Brown fine grained laminated micaceous shaley sandstone.
491.65 - 492.95	Brown fine grained micaceous sandstone.
492.95 - 493.10	Brown fine grained laminated micaceous shaley sandstone.
493.10 - 494.05	Brown fine grained micaceous sandstone.
494.05 - 494.40	Brown fine grained micaceous shaley sandstone.
494.40 - 494.50	Gray sandy shale.

Coring was started at a depth of 485.00 feet in shale and completed at 494.50 feet in gray sandy shale. This core shows a total of 4.88 feet of sandstone. For the most part, the sand body is made up of fine grained micaceous sandstone.

PERMEABILITY

The sand in this core shows a fairly good overall weighted average permeability, namely, 35.28 millidarcys (See Table II). By observing the data given on the coregraph, it is noticeable that the sand has a

fairly irregular permeability profile. The sand in this core has a higher permeability than that taken from the O. E. Martin 1-A well.

PERCENT SATURATION & OIL CONTENT

The overall weighted average percent oil saturation for the sand in this core is 35.96; while the weighted average percent water saturation is 45.69 (See Table IV). This gives an overall weighted average total fluid saturation of 81.65 percent. This comparatively low total fluid saturation indicates that an appreciable amount of fluid was lost during coring which was probably oil.

Inasmuch as salt water was used as a circulating fluid in the coring of the sand in this well, no chloride determinations of the water in the sand were made.

The overall weighted average oil content is 499 barrels per acre foot while the total oil content as shown by this core is 2,284 barrels per acre (See Table IV).

LABORATORY FLOODING TESTS

The sand in this core responded fairly well to laboratory flooding tests as a total recovery of 532 barrels of oil per acre was obtained from 3.48 feet of sand. The weighted average percent oil saturation was reduced from 36.67 to 26.24, or represents an average recovery of 10.43 percent. The weighted average effective permeability of the samples is 6.53 millidarcys while the average initial fluid production pressure is 12.5 pounds per square inch (See Table VI).

By observing the data given in Table V, you will note that of the 6 samples tested, 4 produced oil and took water. Furthermore, for the most part, the samples show a good effective permeability, thereby indicating that the floodable sand will take water at a reasonable pressure.

CONCLUSION

From a study of the above data, we belive that an efficient water flood within the vicinity of this well will recover approximately 800 barrels of oil per acre. In calculating this recovery, an allowance was made for oil lost during coring, and it is assumed that the true water saturation of the sand is 37 percent.

The principle drawback of this core is the fact that it contains only 3.48 feet of floodable sand. We were somewhat surprised in that this well did not show a thicker sand section as we, more or less, assumed that the O. E. Martin No. 1-A Well was drilled near the edge of the trend.

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RESULTS OF PERMEABILITY TESTS

TABLE I

Company Beeler Oil & Gas Company Lease Helt Well No. 1B

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	488.62	58.	0.40	0.40	23.20
2	489.02	55.	0.45	0.85	24.75
3	489.50	38.	0.50	1.35	19.00
4	490.00	30.	0.33	1.68	9.90
5	491.15	6.1	0.25	1.93	1.52
6	491.45	7.5	0.20	2.13	1.50
7	491.86	18.	0.45	2.58	8.10
8	492.30	74.	0.40	2.98	29.60
9	492.78	40.	0.45	3.43	18.00
10	493.20	28.	0.25	3.68	7.00
11	493.50	15.	0.35	4.03	5.25
12	493.95	49.	0.30	4.33	14.70
13	494.03	17.	0.05	4.38	0.85
14	494.35	10.	0.35	4.73	3.50
15	494.45	Imp.	0.10	4.83	0.00

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SUMMARY OF PERMEABILITY TESTS

TABLE II

Company Beeler Oil & Gas Company Lease Helt Well No. 1B

Depth Interval Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.
488.40 - 494.40	4.73	35.28	166.87

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RESULTS OF SATURATION TESTS

TABLE III

Company Beeler Oil & Gas Company Lease Holt Well No. 1B

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	488.92	18.3	31.5	36.8	88.3	449	0.90	0.90	404
2	489.78	18.4	39.1	38.4	77.5	559	0.78	1.68	436
3	490.96	13.0	15.3	80.0	95.3	155	0.15	1.83	23
F4	491.56	14.0	32.5	-	-	354	0.15	1.98	53
4	491.72	20.0	34.6	48.3	82.9	538	0.45	2.43	242
5	492.66	18.8	41.0	45.0	86.0	600	0.85	3.28	510
6	493.78	17.1	39.5	50.0	89.5	525	0.95	4.23	499
7	494.25	14.1	30.6	56.8	87.4	334	0.35	4.58	117
							Total	- - - -	2,284

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SUMMARY OF SATURATION TESTS

TABLE IV

Company Beeler Oil & Gas Company Lease Holt Well No. 1B

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
488.40-494.40	4.58	17.71	35.96	45.69	499	2,284

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RESULTS OF LABORATORY FLOODING TESTS

TABLE V

Company Beeler Oil & Gas Company Lease Helt Well No. 1B

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	488.78	18.7	29.7	431	4.2	61	25.5	66.2	370	135.5	11.70	10
2	489.62	19.9	38.2	490	11.4	176	26.8	66.3	414	135.5	7.51	10
4	491.56	14.0	32.5	354	0.0	0	32.5	59.9	354	0	Imp.	50+
5	492.51	21.1	36.9	637	14.0	229	24.9	71.8	408	210.	7.10	10
6	493.62	16.0	39.9	496	12.5	153	27.6	66.7	343	19.5	0.329	20
7	494.12	12.4	34.0	328	0.0	0	34.0	60.7	328	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.

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE VI

Company Beeler Oil & Gas Company Lease Helt Well No. 1B

Depth, Interval, Feet	488.40 - 494.05
Feet of Core Analyzed	3.48
Average Percent Porosity	18.29
Average Percent Original Oil Saturation	36.67
Average Percent Oil Recovery	10.43
Average Percent Residual Oil Saturation	26.24
Average Percent Residual Water Saturation	67.76
Average Percent Total Residual Fluid Saturation	94.00
Average Original Oil Content, Bbls./A. Ft.	535.
Average Oil Recovery, Bbls./A. Ft.	153.
Average Residual Oil Content, Bbls./A. Ft.	382.
Total Original Oil Content, Bbls./Acre	1,861.
Total Oil Recovery, Bbls./Acre	532.
Total Residual Oil Content, Bbls./Acre	1,329.
Average Effective Permeability, Millidarcys	6.53
Average Initial Fluid Production Pressure, p.s.i.	12.5

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