OIL FIELD RESEARCH LABORATORIES
CHANUTE, KANSAS

February 14, 1952

Mr. E. O. Bradley
P. O. Box 1400
Wichita, Kansas

Gentlemen:

Enclosed herewith is the report of the analysis of the Cable Tool core taken from the Chambers Lease, Well No. 1, Greenwood County, Kansas, and submitted to our laboratory on January 31, 1952.

Very truly yours,

OIL FIELD RESEARCH LABORATORIES

Fred O. Stenger

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E. O. BRADLEY

CORE ANALYSIS REPORT

CHAMBERS LEASE WELL NO. 1

GREENWOOD COUNTY, KANSAS

OIL FIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

FEBRUARY 14, 1952

Oil Field Research Laboratories

GENERAL INFORMATION & SUMMARY

Company E. G. Bradley Lease Chambers Well No. 1

Location NW¼ of the SE¼ of the SE¼.

Section 16 Twp. 26S Rge. 13E County Greenwood State Kansas

Name of Sand	Peru
Top of Core	1104.00
Bottom of Core	1117.10
Top of Sand	1104.00
Bottom of Sand	1108.95
Total Feet of Permeable Sand (Analyzed)	4.27
Total Feet of Floodable Sand (Analyzed)	2.12

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	2.15	2.15
10 - 100	1.15	3.30
100 - 200	0.75	4.05
200 & above	0.22	4.27

Average Permeability Millidarcys	60.28
Average Percent Porosity	18.20
Average Percent Oil Saturation	31.52
Average Percent Water Saturation	45.15
Average Oil Content, Bbls./A. Ft.	451.
Total Oil Content, Bbls./Acre	1,924.
Average Percent Oil Recovery by Laboratory Flooding Tests	2.83
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	39.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	83.
Total Calculated Oil Recovery, Bbls./Acre	400.
Packer Setting, Feet	
Viscosity, Centipoises @ 89° F.	65.7
A. P. I. Gravity, degrees @ 60 °F	26.0
Elevation, Feet	

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
1102.00 - 1104.90	Brown fine grained micaceous sandstone.
1104.90 - 1105.00	Gray shale.
1105.00 - 1105.15	Gray sandy shale.
1105.15 - 1105.60	Brown fine grained micaceous slightly shaley sandstone
1105.60 - 1105.70	Gray shale.
1105.70 - 1106.40	Brown fine grained micaceous shaley sandstone.
1106.40 - 1106.63	Gray sandy shale.
1106.63 - 1107.85	Dark brown fine grained micaceous sandstone.
1107.85 - 1107.95	Gray shale.
1107.95 - 1108.95	Brown fine grained laminated micaceous shaley sandstone.
1108.95 - 1110.35	Laminated sandy shale.
1110.35 - 1117.10	Gray sandy shale.

Coring was started at a depth of 1104.00 feet in brown fine grained micaceous sandstone and completed at a depth of 1117.10 feet in sandy shale. This core shows a total of 2.12 feet of sand. For the most part, the sand body is made up of brown fine grained micaceous sandstone and brown fine grained micaceous shaley sandstone.

PERMEABILITY

The core was not divided because of its short length. The weighted average permeability of the core is 60.28 millidarcys (See Table II).

PERCENT SATURATION & OIL CONTENT

This core shows a weighted average percent oil saturation of 31.52. The weighted average percent water saturation is 45.15. This gives an overall weighted average total fluid saturation of 76.67 percent.

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.

The weighted average oil content is 451 barrels per acre foot while the total oil content, as shown by this core, is 1,924 barrels per acre.

LABORATORY FLOODING TESTS

A total recovery of 39 barrels per acre was obtained by laboratory flooding tests. The weighted average percent oil saturation was reduced from 36.60 to 33.77 which represents an average recovery of 2.83 percent. The weighted average effective permeability of the samples is 4.21 millidarcys and the average initial fluid production pressure is 20.0 pounds per square inch (See Table VI).

By observing the data given in Table V, you will note that of the 4 samples tested, only 2 produced oil and also took water. From the data given on the coregraph, it is evident that the tight shaley sand near the middle section of this core is not floodable.

CONCLUSION

From a study of the above data, we believe that an efficient water flood within the vicinity of this well will recover approximately 400 barrels per acre from the 2.12 feet of floodable sand analyzed. We believe that it would not be economical to water flood this property unless a thicker pay sand body can be found. In calculating this recovery, an

allowance was made for oil lost during coring, and it was assumed that the primary production and the true water saturation of the sand is 10 and 35 percent.

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RESULTS OF PERMEABILITY TESTS

TABLE I

Company B. G. Bradley Lease Chambers Well No. 1

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	1104.05	72.	0.35	0.35	25.20
2	1104.57	131.	0.35	0.70	45.85
3	1104.83	91.	0.20	0.90	18.20
4	1105.50	7.4	0.45	1.35	3.33
5	1105.92	1.2	0.70	2.05	0.84
6	1106.65	234.	0.22	2.27	51.48
7	1107.00	179.	0.40	2.67	71.60
8	1107.52	65.	0.60	3.27	39.00
9	1108.00	1.9	1.00	4.27	1.90

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SUMMARY OF PERMEABILITY TESTS

TABLE II

Company E. G. Bradley Lease Chambers Well No. 1

Depth Interval Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.
1104.00 - 1108.95	4.27	60.28	257.40

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RESULTS OF SATURATION TESTS

TABLE III

Company E. G. Bradley Lease Chambers 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	1104.35	18.5	35.8	43.2	79.0	515	0.90	0.90	464
2	1105.30	17.0	26.7	55.7	82.4	352	0.45	1.35	159
F-3A	1105.85	14.5	20.0	-	-	225	0.35	1.70	79
3	1106.30	17.3	41.9	45.2	87.1	564	0.35	2.05	198
4	1107.20	20.0	35.8	40.7	76.5	556	1.22	3.27	679
5	1108.20	17.7	25.1	47.7	72.8	345	1.00	4.27	345
							Total - - - - -		- - 1,924

Note: "A" sample was taken from the core after it was received in the laboratory.

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SUMMARY OF SATURATION TESTS

TABLE IV

Company E. G. Bradley Lease Chambers Well No. 1

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
1104.00-1108.95	4.27	18.20	31.52	45.15	451	1,924

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RESULTS OF LABORAT

TABL

Company E. G. Bradley

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery	
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.
1	1104.35	18.6	37.1	535	2.6	37
2	1105.30	17.8	26.8	370	0.0	0
3A	1105.85	14.5	20.0	225	0.0	0
4	1107.20	19.2	36.3	537	3.0	41

Notes: cc - cubic centimeter
* - Volume of water recovered at
** - Determined by passing water t
"A" - Sample was taken from core af

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ORY FLOODING TESTS

E V

Lease Chambers Well No. 1

	Residual Saturation			Volume of Water Recovered cc*	Effective Permeability, Millidarcys **	Initial Fluid Production Pressure Lbs./Sq. In.
	% Oil	% Water	Bbls./A. Ft.			
	34.5	50.0	498	115	3,69	20
	26.8	56.3	370	0	Imp.	50
	20.0	56.0	225	5	0.102	35
	33.3	52.8	496	142	4.60	20

the time of maximum oil recovery.
rough sample which still contains residual oil.
ter it was received in the laboratory.

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE VI

Company E. G. Bradley Lease Chambers Well No. 1

Depth Interval, Feet	1104.00 - 1108.95
Feet of Core Analyzed	2.12
Average Percent Porosity	18.95
Average Percent Original Oil Saturation	36.60
Average Percent Oil Recovery	2.83
Average Percent Residual Oil Saturation	33.77
Average Percent Residual Water Saturation	51.65
Average Percent Total Residual Fluid Saturation	85.42
Average Original Oil Content, Bbls./A. Ft.	536.
Average Oil Recovery, Bbls./A. Ft.	39.
Average Residual Oil Content, Bbls./A. Ft.	497.
Total Original Oil Content, Bbls./Acre	1,137.
Total Oil Recovery, Bbls./Acre	83.
Total Residual Oil Content, Bbls./Acre	1,054.
Average Effective Permeability, Millidarcys	4.21
Average Initial Fluid Production Pressure, p.s.i.	20.0

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

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RESULTS OF WATER DIFFERENTIATION TESTS

TABLE VII

Company E. G. Bradley Lease Chambers Well No. 1

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Water Saturation		
			Connate	Drilling & Foreign	Total
1	1104.35	22,200			
2	1105.30	29,800			
3	1106.30	41,000			
4	1107.20	10,200			
5	1108.20	22,300			

Note: ppm - parts per million.

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SUMMARY OF WATER DIFFERENTATION TESTS

TABLE VIII

Company E. G. Bradley Lease Chambers Well No. 1

Depth Interval, Feet	Chloride Content of Brine in Sand, ppm	Average Percent Connate Water	Average Percent Drilling & Foreign Water
1104.00-1108.95	21,059		

Note: ppm - parts per million.