

THE OHIO OIL COMPANY

CORE ANALYSIS REPORT

R. BRYDEN A/C 1 LEASE WELL NO. 17

GREENWOOD COUNTY, KANSAS

OILFIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

SEPTEMBER 11, 1954

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

Location _____

Section 36 Twp 25S Rge 8E County Greenwood State Kansas

Name of Sand Bartlesville

Top of Core 2336.00

Bottom of Core 2408.00

Pay
Top of Sand (Analyzed) 2336.00

Pay
Bottom of Sand (Analyzed) 2400.00

Total Feet of Permeable Sand 60.20

Good Pay
Total Feet of Floodable Sand (Analyzed) 47.70

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 5	2.85	2.85	
5 - 10	3.25	6.10	
10 - 20	9.55	15.65	
20 - 35	14.80	30.45	
35 - 50	16.55	47.00	
50 - 65	9.80	56.80	
65 & above	3.40	60.20	
Average Permeability Millidarcys	54.10		34.30

Average Percent Porosity 18.52

Average Percent Oil Saturation 27.50

Average Percent Water Saturation 50.80

Average Oil Content, Bbls./A. Ft. 397.

Total Oil Content, Bbls./Acre 24,613.

Average Percent Oil Recovery by Laboratory Flooding Tests 6.02

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. 89.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre 4,528.

Total Calculated Oil Recovery, Bbls./Acre 10,600.

Packer Setting, Feet

Viscosity, Centipoises @

A. P. I. Gravity, degrees @ 60 °F

Elevation, Feet

Oilfield Research Laboratories

SUMMARY OF LABORATORY FLOODING TESTS

TABLE VI

Company	The Ohio Oil Company	Lense	R. Bryden A/C 1	Well No. 17
	2336.00	2365.10	2379.20	2390.00
Depth Interval, Feet	2365.10	2378.00	2389.00	2400.00
Feet of Core Analyzed	25.15	10.00	5.90	10.00
Average Percent Porosity	18.80	18.18	18.85	18.95
Average Percent Original Oil Saturation	29.30	29.77	27.23	26.32
Average Percent Oil Recovery	7.00	5.38	4.83	4.87
Average Percent Residual Oil Saturation	22.30	24.59	22.40	21.45
Average Percent Residual Water Saturation	70.30	67.37	71.60	71.53
Average Percent Total Residual Fluid Saturation	92.60	91.96	94.00	92.98
Average Original Oil Content, Bbls./A. Ft.	429.	426.	399.	387.
Average Oil Recovery, Bbls./A. Ft.	103.	79.	72.	72.
Average Residual Oil Content, Bbls./A. Ft.	326.	347.	327.	315.
Total Original Oil Content, Bbls./Acre	10,800.	4,255.	2,353.	3,874.
Total Oil Recovery, Bbls./Acre	2,598.	785.	424.	721.
Total Residual Oil Content, Bbls./Acre	8,202.	3,470.	1,929.	3,153.
Average Effective Permeability, Millidarcys	5.14	3.52	5.13	9.67
Average Initial Fluid Production Pressure, p.s.i.	16.1	16.7	11.7	8.0

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

September 11, 1954

The Ohio Oil Company
Thompson Building
Tulsa 3, Oklahoma

Attention: Mr. Fred Kluck

Gentlemen:

Enclosed herewith is the report of the analysis on the 2½" Rotary core taken from the R. Bryden A/C 1 Lease, Well No. 17, Greenwood County, Kansas, and submitted to our laboratory on August 27, 1954.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. McElrea
Carl L. McElrea

CLM:ls

4 c.c.



A water base mud 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:

<u>Depth Interval, Feet</u>	<u>Description</u>
2336.00 - 2341.65	- Light brown fine grained micaceous sandstone.
2341.65 - 2342.50	- Light brown fine grained slightly laminated micaceous shaley sandstone.
2342.50 - 2351.70	- Light brown fine grained micaceous sandstone.
2351.70 - 2353.00	- Loss.
2353.00 - 2365.10	- Light brown fine grained micaceous sandstone.
2365.10 - 2366.70	- Light brown fine grained micaceous slightly shaley sandstone.
2366.70 - 2370.50	- Light brown fine grained micaceous sandstone.
2370.50 - 2371.70	- Light brown fine grained micaceous slightly shaley sandstone.
2371.70 - 2372.60	- Light brown fine grained micaceous shaley sandstone.
2372.60 - 2383.75	- Light brown fine grained micaceous sandstone.
2383.75 - 2384.00	- Light brown fine grained laminated micaceous shaley sandstone.
2384.00 - 2386.00	- Light brown fine grained micaceous sandstone.
2386.00 - 2387.00	- Light brown fine grained slightly laminated micaceous shaley sandstone.
2387.00 - 2389.00	- Light brown fine grained micaceous sandstone.
2389.00 - 2390.00	- Loss.
2390.00 - 2400.60	- Brown fine grained micaceous sandstone.
2400.60 - 2401.00	- Brown fine grained micaceous conglomeratic sandstone.
2401.00 - 2408.00	- Loss.

Coring was started at a depth of 2336.00 feet in light brown fine grained micaceous sandstone and completed at 2408.00 feet. There was

a core loss extending from 2401.00 to 2408.00 feet. This core shows a total of 62.70 feet of sandstone. There were three losses of core totaling 10.30 feet, of which 2.30 feet was probably sandstone. For the most part, the pay is made up of fine grained micaceous sandstone.

PERMEABILITY

For the sake of distribution, the core was divided into four sections. The weighted average permeability of the four sections, in order of increasing depth, is 32.68, 24.85, 33.41 and 49.40 millidarcys respectively; the overall average being 34.30 (See Table II). 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 impermeable to a maximum of 125 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a fairly low weighted average percent oil saturation, namely, 27.50. The weighted average percent oil saturation of the four sections, in order of increasing depth, is 28.89, 29.01, 23.52 and 26.20 respectively. The weighted average percent water saturation of the four sections is 46.30, 52.81, 55.00 and 55.80 respectively; the overall average being 50.80 (See Table IV). This gives an overall weighted average total fluid saturation of 78.30 percent. This low total fluid saturation indicates considerable fluid was lost during coring which was probably oil.

The weighted average oil content of the four sections, in the order indicated above, is 420, 399, 341 and 387 barrels per acre foot respectively; the overall average being 397. The total oil content, as shown by this core, is 24,613 barrels per acre (See Table IV).

LABORATORY FLOODING TESTS

When taking into consideration that the sand in this core has a

fairly low oil saturation, the sand responded satisfactorily to laboratory flooding tests, as a total recovery of 4,523 barrels of oil per acre was obtained from 51.05 feet of sand. The weighted average percent oil saturation was reduced from 28.62 to 22.60, or represents an average recovery of 6.02 percent. The weighted average effective permeability of the samples is 5.71 millidarcys, while the average initial fluid production pressure is 14.1 pounds per square inch (See Table VI).

By observing the data given in Table V, you will note that of the 64 samples tested, 62 produced water and 52 oil. This indicates that approximately 81 percent of the sand represented by these samples is floodable pay sand. The tests also show that the sand has a wide variation in effective permeability.

CONCLUSION

On the basis of the above data, it is evident that an efficient water-flood within the vicinity of this well will recover approximately 10,600 barrels of oil per acre, or an average of 222 barrels of oil per acre foot from the 47.70 feet of good floodable pay sand analyzed. In calculating this recovery an allowance was made for oil lost during coring, and it was assumed that the primary production and true water saturation of the sand are 17 and 38 percent respectively, and that the reservoir is not affected by a planned or artificial water drive.

This core shows a thick section of clean sand having a fairly low oil saturation and a wide variation of effective permeability. The apparently low oil saturation is probably due to flushing of the sand during coring.

Oilfield Research Laboratories
RESULTS OF PERMEABILITY TESTS
TABLE I

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	2336.25	55.	- 0.50	0.50	27.50
2	2336.85	40.	- 0.65	1.15	26.00
3	2337.45	59.	- 0.55	1.70	32.40
4	2337.85	57.	- 0.45	2.15	25.60
5	2338.45	40.	- 0.50	2.65	20.00
6	2338.85	61.	- 0.55	3.20	33.50
7	2339.45	28. +	- 0.45	3.65	12.60
8	2339.80	40.	- 0.40	4.05	16.00
9	2340.35	11. +	- 0.55	4.60	6.05
10	2340.85	38. -	- 0.45	5.05	17.10
11	2341.25	28. +	- 0.60	5.65	16.80
12	2341.90	Imp. +	- 0.40	6.05	0.00
13	2342.15	Imp. +	- 0.45	6.50	0.00
14	2343.15	1.1 +	- 0.85	7.35	0.94
15	2343.55	31. -	- 0.50	7.85	15.50
16	2344.15	3.2 +	- 0.55	8.40	1.76
17	2344.60	2.6 +	- 0.45	8.85	1.17
18	2345.15	14. +	- 0.45	9.30	6.30
19	2345.45	25. +	- 0.50	9.80	12.50
20	2346.10	22. +	- 0.60	10.40	13.20
21	2346.65	33. -	- 0.50	10.90	16.50
22	2347.20	13. +	- 0.60	11.50	7.80
23	2347.78	11. +	- 0.45	11.95	4.95
24	2348.15	13. +	- 0.40	12.35	5.20
25	2348.65	22. +	- 0.50	12.85	11.00
26	2349.05	29. +	- 0.45	13.30	13.05
27	2349.60	32. -	- 0.55	13.85	17.60
28	2350.10	37. -	- 0.45	14.30	16.65
29	2350.50	45. -	- 0.70	15.00	31.50
30	2353.45	41. -	- 0.65	15.65	26.60
31	2353.85	51. -	- 0.45	16.10	22.95
32	2354.40	38. -	- 0.60	16.70	22.80
33	2354.95	36. -	- 0.55	17.25	19.80
34	2355.50	28. +	- 0.55	17.80	15.40
35	2356.10	25. +	- 0.55	18.35	13.75
36	2356.60	30. -	- 0.65	19.00	19.50
37	2357.40	28. +	- 0.60	19.60	16.80
38	2357.80	29. +	- 0.50	20.10	14.50
39	2358.30	35. -	- 0.50	20.60	17.50
40	2358.90	54. -	- 0.45	21.05	24.30

Oilfield Research Laboratories
RESULTS OF PERMEABILITY TESTS
TABLE I

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
41	2359.20	43.	0.30	21.35	12.90
42	2359.50	42.	0.65	22.00	27.30
43	2360.40	39. -	0.60	22.60	23.40
44	2360.80	45.	0.40	23.00	18.00
45	2361.15	37. -	0.40	23.40	14.80
46	2361.60	37. -	0.65	24.05	24.00
47	2362.50	44.	0.65	24.70	28.60
48	2362.95	50.	0.35	25.05	17.50
49	2363.15	37. -	0.30	25.35	11.10
50	2363.60	28. +	0.50	25.85	14.00
51	2364.10	38. -	0.45	26.30	17.10
52	2364.55	45.	0.45	26.75	20.20
53	2365.00	17.	0.35	27.10	5.95
54	2365.75	9.1	0.80	27.90	7.28
55	2366.20	11.	0.80	28.70	8.80
56	2366.80	62.	0.50	29.20	31.00
57	2367.60	65.	0.55	29.75	35.80
58	2367.95	46.	0.40	30.15	18.40
59	2368.40	49.	0.55	30.70	27.00
60	2368.95	46.	0.35	31.05	16.10
61	2369.15	44.	0.30	31.35	13.20
62	2369.50	10. +	0.45	31.80	4.50
63	2370.10	5.7	0.40	32.20	2.28
64	2370.40	5.9	0.30	32.50	1.77
65	2370.85	8.9	0.60	33.10	5.34
66	2371.25	10.	0.60	33.70	6.00
67	2371.75	5.8	0.20	33.90	1.16
68	2372.00	Imp.	0.70	34.60	0.00
69	2372.65	14.	0.30	34.90	4.20
70	2373.20	28. +	0.60	35.50	16.80
71	2373.80	31. -	0.50	36.00	15.50
72	2374.25	35. -	0.50	36.50	17.50
73	2374.75	32. -	0.50	37.00	16.00
74	2375.25	25. +	0.45	37.45	11.25
75	2375.75	24.	0.50	37.95	12.00
76	2376.15	11.	0.40	38.35	4.40
77	2376.55	8.1	0.50	38.85	4.05
78	2377.20	11.	0.55	39.40	6.05
79	2377.80	28. +	0.60	40.00	16.80
80	2378.25	65.	0.50	40.50	32.50

Oilfield Research Laboratories
RESULTS OF PERMEABILITY TESTS
TABLE I

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
81	2378.80	20. +	0.50	41.00	10.00
82	2379.20	48.	0.40	41.40	19.20
83	2379.60	59.	-0.45	41.85	26.50
84	2380.10	9.1 +	0.45	42.30	4.09
85	2380.55	61.	-0.45	42.75	27.40
86	2381.00	15. +	0.75	43.50	11.25
87	2382.15	55.	-0.85	44.35	46.70
88	2382.70	36. -	0.55	44.90	19.80
89	2383.10	30. -	0.40	45.30	12.00
90	2383.60	17. +	0.45	45.75	7.65
91	2384.15	48.	0.50	46.25	24.00
92	2384.80	51.	-0.50	46.75	25.50
93	2385.30	14. +	0.50	47.25	7.00
94	2385.80	12. +	0.50	47.75	6.00
95	2386.80	3.6 +	1.00	48.75	3.60
96	2387.10	49.	0.35	49.10	17.15
97	2387.55	15. +	0.45	49.55	6.75
98	2388.05	16. +	0.50	50.05	8.00
99	2388.70	63.	-0.70	50.75	44.10
100	2390.08	30. -	0.30	51.05	9.00
101	2390.50	57.	-0.45	51.50	25.60
102	2390.95	67.	-0.55	52.05	36.80
103	2391.50	69.	-0.50	52.55	34.50
104	2392.00	13. +	0.50	53.05	6.50
105	2392.50	34. -	0.50	53.55	17.00
106	2393.05	62.	-0.55	54.10	34.10
107	2393.60	-125.	0.40	54.50	50.00
108	2393.90	37. -	0.35	54.85	12.95
109	2394.25	43.	0.45	55.30	19.35
110	2394.80	27. +	0.55	55.85	14.85
111	2395.45	54.	-0.60	56.45	32.40
112	2395.90	34. -	0.40	56.85	13.60
113	2396.25	68.	-0.50	57.35	34.00
114	2396.75	49.	0.30	57.65	14.70
115	2397.05	56.	-0.45	58.10	25.20
116	2397.75	34. -	0.55	58.65	18.70
117	2398.10	25. +	0.45	59.10	11.25
118	2398.60	60.	-0.50	59.60	30.00
119	2399.05	69.	-0.40	60.00	27.60
120	2399.40	51.	-0.50	60.50	25.50
121	2400.05	40.	0.85	61.35	34.00
122	2400.70	33. -	0.40	61.75	15.20

Oilfield Research Laboratories
SUMMARY OF PERMEABILITY TESTS

TABLE II

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

Depth Interval Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.
2336.00 - 2365.10	26.25	32.68	857.92
2365.10 - 2378.00	12.20	24.85	303.18
2378.00 - 2389.00	10.75	33.41	359.19
2390.00 - 2401.00	11.00	49.40	542.80
2336.00 - 2401.00	60.20	34.30	2,063.09

Oilfield Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

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	2336.55	19.6	28.1	46.4	74.5	428	0.80	0.80	342
2	2337.15	20.5	28.7	42.3	71.0	457	0.90	1.70	411
3	2338.15	19.9	32.3	40.6	72.9	500	1.00	2.70	500
4	2339.15	20.5	30.4	41.5	71.9	484	1.00	3.70	484
5	2340.15	17.5	28.5	47.9	76.4	388	1.10	4.80	427
6	2341.55	17.6	30.1	50.8	80.9	412	0.85	5.65	350
7	2342.35	13.8	26.4	59.8	86.2	283	0.85	6.50	240
8	2343.85	18.1	23.0	48.8	71.8	323	1.80	8.30	581
9	2344.85	17.6	30.6	48.1	78.7	418	1.05	9.35	439
10	2345.75	18.7	27.8	45.0	72.8	404	0.70	10.05	282
11	2346.35	19.3	31.4	44.5	75.9	470	0.85	10.90	400
12	2347.45	18.5	31.4	36.3	67.7	451	1.05	11.95	474
13	2348.45	20.3	28.0	46.5	74.5	441	1.15	13.10	507
14	2349.75	19.9	28.3	43.0	71.3	438	1.20	14.30	525
15	2350.85	19.8	30.9	39.1	70.0	475	0.70	15.00	332
16	2351.15	20.1	27.3	38.3	65.6	426	0.40	15.40	170
17	2351.60	18.7	27.4	39.3	66.7	398	0.30	15.70	119

Oilfield Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

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.	
18	2353.15	18.5	30.0	48.5	78.5	431	0.65	16.35	280
19	2354.15	19.2	26.4	42.2	68.6	394	1.35	17.70	532
20	2355.85	18.0	26.5	50.0	76.5	371	1.35	19.05	500
21	2356.90	18.4	28.0	50.8	78.8	400	0.65	19.70	260
22	2357.15	18.5	29.9	49.2	79.1	430	0.90	20.60	387
23	2358.65	19.3	28.1	52.3	80.4	421	1.40	22.00	590
24	2359.85	17.9	29.2	44.0	73.2	405	0.70	22.70	284
25	2360.15	18.2	29.8	45.0	74.8	421	1.00	23.70	421
26	2361.88	18.5	30.2	44.9	75.1	434	1.00	24.70	434
27	2362.18	18.2	32.4	49.4	81.8	458	1.00	25.70	458
28	2363.85	19.5	30.9	47.8	78.7	468	1.30	27.00	608
29	2364.80	19.6	29.4	48.6	78.0	448	0.80	27.80	358
30	2365.25	16.3	32.0	56.5	88.5	405	0.80	28.60	324
31	2366.45	15.7	25.6	58.6	84.2	312	0.80	29.40	250
32	2367.25	19.5	33.9	40.8	74.7	514	1.30	30.70	668
33	2368.65	19.9	30.0	45.5	75.5	464	1.25	31.95	580
34	2369.85	17.3	29.1	56.7	85.8	391	1.25	33.20	489

Oilfield Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company The Ohio Oil Company Lease R. Dryden A/C 1 Well No. 17

Snt. 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.	
35	2370.65	16.3	27.1	55.0	82.1	343	0.60	33.80	206
36	2371.50	16.8	20.9	57.0	77.9	273	0.60	34.40	164
37	2372.28	14.2	28.4	53.4	81.8	313	0.90	35.30	282
38	2373.45	19.2	33.6	50.8	84.4	501	1.40	36.70	700
39	2374.55	19.0	27.8	52.8	80.6	410	1.00	37.70	410
40	2375.52	18.2	25.6	53.0	78.6	362	0.90	38.60	326
41	2376.38	16.5	28.3	57.6	85.9	363	1.10	39.70	400
42	2377.55	16.9	27.2	59.0	86.2	357	1.00	40.70	357
43	2378.55	18.3	18.4	58.4	76.8	262	1.20	41.90	314
44	2379.85	18.4	25.7	61.0	86.7	367	1.05	42.95	386
45	2380.75	19.1	24.7	52.6	77.3	367	1.05	44.00	385
46	2381.85	18.5	29.3	44.9	74.2	421	0.85	44.85	358
47	2382.42	19.2	28.8	46.7	75.5	430	0.75	45.60	322
48	2383.35	17.4	23.5	51.8	75.3	318	0.85	46.45	270
49	2384.55	20.1	30.0	46.5	76.5	468	1.00	47.45	468
50	2385.55	19.0	19.9	56.8	76.7	294	1.00	48.45	294
51	2386.55	15.6	17.8	70.0	87.8	216	1.00	49.45	216

Oilfield Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

Snl. 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.	
52	2387.25	19.7	16.1	63.3	79.4	246	0.80	50.25	197
53	2388.35	18.9	25.8	50.7	76.5	379	1.20	51.45	455
54	2390.72	19.7	24.3	55.0	79.3	372	1.30	52.75	484
55	2391.78	18.6	27.8	54.0	81.8	401	0.70	53.45	280
56	2392.25	18.3	27.4	61.4	88.8	389	0.80	54.25	311
57	2393.30	18.3	26.5	60.9	87.4	377	1.20	55.45	453
58	2394.55	18.2	30.0	56.6	86.6	424	1.10	56.55	466
59	2395.70	20.4	31.3	50.0	81.3	496	1.00	57.55	496
60	2396.45	19.1	22.9	55.6	78.5	340	0.80	58.35	272
61	2397.45	18.9	27.1	58.3	85.4	398	1.00	59.35	398
62	2398.35	19.3	22.9	57.6	80.5	344	1.10	60.45	378
63	2399.65	19.1	23.5	49.4	72.9	349	1.00	61.45	349
64	2400.35	18.6	24.2	53.4	77.6	350	0.60	62.05	210
						Total - - - - -	- - - - -	- - - - -	24,613

Oilfield Research Laboratories
SUMMARY OF SATURATION TESTS

TABLE IV

Company The Ohio Oil Company Lease R. Bryden A/C 1 Well No. 17

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
2336.00-2365.10	27.80	18.75	28.89	46.30	420	11,695
2365.10-2378.00	12.90	17.62	29.01	52.81	399	5,156
2378.00-2389.00	10.75	18.55	23.52	55.00	341	3,665
2390.00-2400.60	10.60	19.00	26.20	55.80	387	4,097
2336.00-2400.60	62.05	18.52	27.50	50.80	397	24,613

Oilfield Research

RESULTS OF LABORATORY TESTS

TABLE

Company The Ohio Oil Company

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery	
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.
1	2336.55	19.4	28.1	424	7.4	112
2	2337.15	20.4	28.7	455	9.5	151
3	2338.15	19.6	32.3	492	12.5	190
4	2339.15	20.4	30.4	482	10.2	162
5	2340.15	17.2	28.5	385	5.9	79
6	2341.55	17.5	30.1	409	7.7	105
7	2342.35	13.6	25.6	270	0.0	0
8	2343.85	18.0	22.0	308	0.0	0
9	2344.85	17.7	30.6	421	4.3	59
10	2345.75	18.8	27.8	406	5.2	76
11	2346.55	19.1	31.4	466	9.3	138
12	2347.45	18.3	31.4	446	7.3	104
13	2348.45	20.2	28.0	440	7.2	113
14	2349.75	19.7	28.3	433	6.7	102
15	2350.85	19.5	30.9	468	10.7	162
16	2351.15	20.0	27.3	424	7.4	115
17	2351.60	18.5	27.4	394	4.7	68
18	2353.15	18.2	30.0	423	7.6	107
19	2354.15	19.0	26.4	390	3.8	56
20	2355.85	17.9	26.5	369	2.7	38
21	2356.90	18.2	28.0	396	4.1	58
22	2357.15	18.4	29.9	427	6.9	98
23	2358.65	19.0	28.1	415	5.5	81
24	2359.85	17.8	29.2	404	4.8	66
25	2360.15	18.0	29.8	417	6.2	87
26	2361.88	18.4	30.2	438	7.9	113
27	2362.18	18.4	32.4	463	9.8	140
28	2363.85	19.3	30.9	463	7.7	115
29	2364.80	19.3	29.4	441	8.4	126
30	2365.25	16.2	32.0	403	6.9	87
31	2366.45	15.6	25.3	306	0.0	0
32	2367.25	19.4	33.9	513	11.0	166
33	2368.65	19.7	30.0	459	7.0	107
34	2369.85	17.4	29.1	394	3.1	42
35	2370.65	16.1	26.5	332	0.0	0
36	2371.50	16.6	21.6	279	0.0	0

Oilfield Research
RESULTS OF LABORATORY TESTS

TABLE

Company The Ohio Oil Company

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery	
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.
37	2372.28	14.1	27.8	304	0.0	0
38	2373.45	19.3	33.6	504	9.2	138
39	2374.55	18.9	27.8	414	3.8	57
40	2375.52	18.1	25.6	360	1.6	23
41	2376.38	16.4	28.3	360	2.3	29
42	2377.55	17.0	27.2	359	0.7	9
43	2378.55	18.1	19.8	268	0.0	0
44	2379.85	18.1	25.7	361	3.7	52
45	2380.75	18.8	24.7	361	2.1	31
46	2381.85	18.2	29.3	414	5.4	76
47	2382.42	19.0	28.8	425	5.2	77
48	2383.35	17.2	22.2	382	0.0	0
49	2384.55	20.3	30.0	473	9.3	147
50	2385.55	18.9	18.8	276	0.0	0
51	2386.55	15.5	18.3	220	0.0	0
52	2387.25	19.8	15.9	245	0.0	0
53	2388.35	18.7	25.8	375	3.8	55
54	2390.72	19.8	24.3	374	3.6	55
55	2391.78	18.3	27.8	396	6.0	85
56	2392.25	18.4	27.4	392	4.8	69
57	2393.30	18.5	26.5	381	5.2	75
58	2394.55	18.1	30.0	422	7.3	103
59	2395.70	20.2	31.3	491	11.3	177
60	2396.45	19.0	22.9	338	2.5	37
61	2397.45	18.7	27.1	394	4.7	68
62	2398.35	19.2	22.9	341	1.9	28
63	2399.65	18.9	23.5	345	1.7	25
64	2400.35	18.5	23.0	330	0.0	0

Notes: cc - cubic centimeter.
 * - Volume of water recovered at 100% recovery.
 ** - Determined by passing water through sample.

Field Research Laboratories

LABORATORY FLOODING TESTS

TABLE V

Lease R. Bryden A/C 1 Well No. 17

Bbls./A. Ft.	Residual Saturation		Bbls./A. Ft.	Volume of Water Recovered cc*	Effective Permeability, Millidarcys **	Initial Fluid Production Pressure Lbs./Sq. In.
	% Oil	% Water				
0	27.8	57.5	304	0	Imp.	50 ⁺
138	24.4	67.5	366	101	2.71	15
57	24.0	70.4	357	125	3.27	15
23	24.0	69.0	337	130	3.36	20
29	26.0	64.0	331	45	0.870	15
9	26.5	66.3	350	59	0.980	15
0	19.8	71.7	268	82	0.701	15
52	22.0	73.5	309	171	6.58	10
31	22.6	73.6	330	159	6.71	10
76	23.9	69.0	338	107	2.78	15
77	23.6	71.1	348	197	5.78	15
0	22.2	67.0	382	62	1.18	15
147	20.7	69.3	326	170	4.61	10
0	18.6	74.0	276	111	2.52	10
0	18.3	72.5	220	35	0.490	15
0	15.9	73.3	245	72	15.30	5
55	22.0	72.7	320	156	4.16	10
55	20.7	70.4	319	176	15.98	5
85	21.8	69.1	311	142	8.44	10
69	22.6	71.8	323	157	5.67	5
75	21.3	68.2	306	111	9.40	10
103	22.7	73.0	319	185	5.40	10
177	20.0	74.9	314	130	11.51	10
37	20.4	73.1	301	102	11.30	5
68	22.4	70.6	326	220	4.24	10
28	21.0	72.0	313	156	13.88	5
25	21.8	72.7	320	184	8.17	10
0	23.0	65.9	330	66	3.24	10

measured at the time of maximum oil recovery.
 passing water through sample which still contains residual oil.

field Research Laboratories

OF LABORATORY FLOODING TESTS

TABLE V

Lease R. Bryden A/C 1 Well No. 17

Recovery Bbls./A. Ft.	Residual Saturation			Volume of Water Recovered cc*	Effective Permeability, Millidarcys **	Initial Fluid Production Pressure Lbs./Sq. In.
	% Oil	% Water	Bbls./A. Ft.			
112	20.7	71.9	312	107	6.10	15
151	19.2	72.4	304	156	12.31	10
190	19.8	70.4	302	162	8.77	15
162	20.2	72.6	320	163	5.50	20
79	22.6	71.4	306	80	2.68	20
105	22.4	70.1	304	94	2.56	15
0	25.6	63.4	270	0	Imp.	50+
0	22.0	72.3	308	16	0.326	20
59	26.3	68.5	362	6	0.190	35
76	22.6	70.4	330	167	5.13	15
138	22.1	72.6	328	180	5.70	15
104	24.1	69.5	342	10	0.175	30
113	20.8	73.0	327	185	7.33	15
102	21.6	71.1	331	160	5.32	15
162	20.2	74.0	306	167	7.88	15
115	19.9	73.6	309	161	8.55	10
68	22.7	70.6	326	116	6.40	15
107	22.4	70.0	316	118	5.68	15
56	22.6	72.8	334	121	3.25	15
38	23.8	67.2	331	151	4.50	15
58	23.9	67.4	338	125	3.08	15
98	23.0	69.9	329	108	2.92	15
81	22.6	68.0	334	174	6.49	10
66	24.4	69.0	338	187	4.86	15
87	23.6	70.6	330	120	6.26	15
113	22.3	66.3	325	113	4.66	15
140	22.6	67.5	323	150	5.65	15
115	23.2	67.5	348	96	2.80	15
128	21.0	73.6	315	148	9.84	15
87	25.1	64.2	316	61	2.03	20
0	25.3	68.7	306	4	0.184	40
166	22.9	71.6	347	159	9.64	10
107	23.0	67.3	352	175	6.94	15
42	26.0	65.4	352	14	0.285	25
0	26.5	65.6	332	12	0.250	30
0	21.6	70.9	279	11	0.248	30