OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND - CHANUTE, KANSAS - PHONE HE1-2650

January 7, 1967

Jackson Brothers
514 North Main
Eureka, Kansas

Gentlemen:

Enclosed herewith is the report of the analysis of the Rotary core taken from the Barrier Lease, Well No. 36, Greenwood County, Kansas, and submitted to our laboratory on December 30, 1966.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman

Benjamin R. Pearman

BRP:rf

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Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Jackson Bros. Lease Barrier Well No. 36

Location 330' N #4 & 330' S #25, NE SE

Section 3 Twp. 26S Rge. 8E County Greenwood State Kansas

Name of Lime	Oswego
Top of Core	1823.0
Bottom of Core	1835.0
Top of Lime (Analyzed)	1823.0
Bottom of Lime (Tested)	1832.4
Total Feet of Permeable Lime	4.6
Total Feet of Floodable Lime	3.0

Distribution of Permeable Lime

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 20	2.6	2.6
20 & above	2.0	4.6

Average Permeability Millidarcys	41.0
Average Percent Porosity	14.2
Average Percent Oil Saturation	28.0
Average Percent Water Saturation	58.2
Average Oil Content, Bbls./A. Ft.	320.
Total Oil Content, Bbls./Acre	3,007.
Average Percent Oil Recovery by Laboratory Flooding Tests	7.3
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	126.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	378.
Total Calculated Oil Recovery, Bbls./Acre (Primary & Secondary)	930.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Jackson Bros. Lease Barrier Well No. 36

Location 330' N #4 & 330' S #25, NE SE

Section 3 Twp. 26S Rge. 8E County Greenwood State Kansas

Name of Sand	Bartlesville
Top of Core	2430.0
Bottom of Core	2508.0
Top of Sand	2450.2
Bottom of Sand (Analyzed)	2508.0
Total Feet of Permeable Sand	32.3
Total Feet of Floodable Sand	14.2

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 1	6.9	6.9
1 - 5	8.2	15.1
5 - 10	7.0	22.1
10 - 20	3.8	25.9
20 - 50	4.0	29.9
50 & above	2.4	32.3

Average Permeability Millidarcys	13.9
Average Percent Porosity	16.3
Average Percent Oil Saturation	19.5
Average Percent Water Saturation	69.5
Average Oil Content, Bbls./A. Ft.	250.
Total Oil Content, Bbls./Acre	10,352.
Average Percent Oil Recovery by Laboratory Flooding Tests	4.9
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	68.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	966.
Total Calculated Oil Recovery, Bbls./Acre (Primary & Secondary)	3,230.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

Fresh water mud was used as the circulating fluid while taking this core. The core was sampled by a representative of Oilfield Research Laboratories. The well was drilled in non-virgin territory.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
1823.0 - 1827.6	Brown, slightly sandy limestone.
1827.6 - 1832.4	Gray limestone.
1832.4 - 1835.0	Gray calcareous shale.

Coring was started at a depth of 1823.0 feet in sandy limestone and completed at 1835.0 feet in calcareous shale. This core shows a total of 9.4 feet of limestone. For the most part, the pay is made up of brown, slightly sandy limestone.

PERMEABILITY

For the sake of distribution, the core was divided into two sections. The weighted average permeability of the upper and lower sections is 41.0 and 0.0 millidarcys respectively; the overall average being 41.0 (See Table III). By observing the data given on the core-graph, it is noticeable that the core has an irregular permeability profile. The permeability varies from impermeable to a maximum of 87. millidarcys.

PERCENT SATURATION & OIL CONTENT

This core shows a good weighted average percent oil saturation, namely, 28.0. The weighted average percent oil saturation of the upper and lower sections is 31.2 and 25.0 respectively. The weighted

average percent water saturation of the upper and lower sections is 50.2 and 65.9 respectively; the overall average being 58.2 (See Table III). This gives an overall weighted average total fluid saturation of 86.2 percent.

The weighted average oil content of the upper and lower sections is 524 and 125 barrels per acre foot respectively; the overall average being 320. The total oil content, as shown by this core, is 3,007 barrels per acre of which 1,849 barrels are in the pay section (See Table III).

LABORATORY FLOODING TESTS

The upper portion of this core responded to laboratory flooding tests, as a total recovery of 378 barrels of oil per acre was obtained from 3.0 feet. The weighted average percent oil saturation was reduced from 36.6 to 29.3, or represents an average recovery of 7.3 percent. The weighted average effective permeability of the samples is 2.23 millidarcys, while the average initial fluid production pressure is 20.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 6 samples tested, 3 produced water and oil. This indicates that approximately 50 percent of the core represented by these samples is floodable pay lime. The tests also show that the core has a fairly uniform effective permeability to water.

CONCLUSION

Based on the results of the laboratory tests, it appears that efficient primary and secondary operations in the vicinity of this

well should recover approximately 930 barrels of oil per acre or an average of 310 barrels per acre foot from the 3.0 feet of pay analyzed in this core.

These recovery values were calculated using the following data and assumptions:

Original formation volume factor	1.11
Reservoir water saturation, percent	30.0
Average porosity, percent	21.8
Oil saturation after flooding, percent	29.3
Performance factor, percent	50.0
Net floodable pay, feet	3.0

This core shows a thin limy pay section having a good oil saturation, a moderate water saturation and a fairly uniform effective permeability to water. This lime is as high as 91 percent acid soluble.

-BARTLESVILLE-

Fresh water mud was used as the circulating fluid while taking this core. The core was sampled and the samples sealed in cans by a representative of Oilfield Research Laboratories. The well was drilled in non-virgin territory.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
2430.0 - 2450.2	Sandy shale.
2450.2 - 2454.3	Grayish light brown, sandy shale.

2454.3 - 2457.4 - Grayish light brown, shaly sandstone.

2457.4 - 2460.0 - Gray shale.

2460.0 - 2463.0 - Gray shaly sandstone.

2463.0 - 2465.5 - Gray sandy shale.

2465.5 - 2470.8 - Gray shaly sandstone.

2470.8 - 2473.5 - Dark sandy shale.

2473.5 - 2476.0 - Gray shaly sandstone.

2476.0 - 2479.0 - Light brown, shaly sandstone.

2479.0 - 2479.8 - Gray sandy shale.

2479.8 - 2490.6 - Grayish light brown, laminated, shaly sandstone.

2490.6 - 2500.4 - Light brown, slightly shaly sandstone.

2500.4 - 2502.8 - Grayish light brown, shaly sandstone.

2502.8 - 2508.0 - Light brown sandstone.

Coring was started at a depth of 2430.0 feet in sandy shale and completed at 2508.0 feet in sandstone. For the most part, the pay is made up of light brown, slightly shaly sandstone.

PERMEABILITY

For the sake of distribution, the core was divided into two sections. The weighted average permeability of the upper and lower sections is 1.3 and 22.2 millidarcys respectively; the overall average being 13.9 (See Table III). By observing the data given on the coregraph, it is noticeable that the sand has an irregular permeability profile. The permeability of the sand varies from impermeable to a maximum of 97. millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a fairly low weighted average percent

oil saturation, namely, 19.5. The weighted average percent oil saturation of the upper and lower sections is 17.3 and 22.0 respectively. The weighted average percent water saturation of the upper and lower sections is 74.4 and 64.1 respectively; the overall average being 69.5 (See Table III). This gives an overall weighted average total fluid saturation of 89.0 percent.

In an effort to determine whether or not any flushing of the sand occurred during coring, all of the saturation samples were analyzed for chloride content. The results of these tests are given in Tables VI and VII. From the data given in these tables and on the coregraph, it appears that, for the most part, very little flushing occurred.

The weighted average oil content of the upper and lower sections is 204 and 303 barrels per acre foot respectively; the overall average being 250. The total oil content, as shown by this core, is 10,352 barrels per acre of which 4,758 barrels are in the pay sand section (See Table III).

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 966 barrels of oil per acre was obtained from 14.2 feet of sand. The weighted average percent oil saturation was reduced from 24.1 to 19.2, or represents an average recovery of 4.9 percent. The weighted average effective permeability of the samples is 1.31 millidarcys, while the average initial fluid production pressure is 38.6 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 41 samples tested, 19 produced water and 14 oil. This indicates that approximately 34 percent of the sand represented by these samples

is floodable pay sand. The tests also show that the sand has a fairly uniform effective permeability to water.

CONCLUSION

The results of the laboratory tests indicate that efficient primary and secondary operations in the vicinity of this well should recover approximately 3,230 barrels of oil per acre or an average of 202 barrels per acre foot from 16.0 feet of floodable pay sand. These recovery values were calculated using the following data and assumptions:

Original formation volume factor	1.23
Reservoir water saturation, percent	45.0
Average porosity, percent	17.9
Oil saturation after flooding, percent	19.2
Performance factor, percent	50.0
Net floodable pay sand, feet	16.0

This core shows a pay sand section having a fairly good oil saturation, a moderate water saturation and fairly uniform effective permeability to water.

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Jackson Bros. Lease Barrier Well No. 36

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
						-OSWEGO-					
1	1823.1	24.7	21	60	81	402	3.6	0.6	0.6	242	2.16
2	1824.1	21.1	21	68	89	344	0.34	1.0	1.6	344	0.34
3	1825.1	24.6	42	38	80	802	87.	1.0	2.6	802	87.00
4	1826.1	16.4	39	35	74	496	17.	1.0	3.6	496	17.00
5	1827.1	23.3	29	54	83	524	82.	1.0	4.6	524	82.00
6	1828.1	8.7	17	76	93	115	Imp.	1.0	5.6	115	0.00
7	1829.1	9.6	23	73	96	172	Imp.	1.0	6.6	172	0.00
8	1830.1	5.8	31	59	90	139	Imp.	1.0	7.6	139	0.00
9	1831.1	6.7	22	68	90	114	Imp.	1.0	8.6	114	0.00
10	1832.1	2.8	34	50	84	74	Imp.	0.8	9.4	59	0.00
						-BARTLESVILLE-					
1	2451.1	13.6	22	70	92	232	Imp.	1.4	1.4	325	0.00
2	2452.1	12.0	12	83	95	102	Imp.	1.0	2.4	102	0.00
3	2453.1	14.8	17	78	95	195	Imp.	1.0	3.4	195	0.00
4	2454.1	12.7	14	80	94	138	Imp.	0.7	4.1	97	0.00
5	2455.1	16.7	30	66	96	389	0.29	1.3	5.4	506	0.38
6	2456.1	15.1	25	70	95	293	0.95	1.0	6.4	293	0.95
7	2457.1	16.0	22	70	92	273	0.44	0.8	7.2	218	0.35
8	2460.1	16.1	20	76	96	250	Imp.	1.0	8.2	250	0.00
9	2466.1	16.9	9	86	95	118	Imp.	1.0	9.2	118	0.00
10	2469.1	13.3	11	83	94	113	Imp.	1.0	10.2	113	0.00
11	2476.1	16.3	26	68	94	329	3.0	0.6	10.8	197	1.80
12	2477.1	13.8	23	55	78	246	3.3	1.0	11.8	246	3.30
13	2478.1	15.0	18	80	98	210	1.2	1.4	13.2	294	1.68
14	2480.1	12.7	8	86	94	79	0.34	0.8	14.0	63	0.27

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Jackson Bros. Lease Barrier Well No. 36

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. /A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
15	2481.1	14.8	15	76	91	172	Imp.	1.0	15.0	172	0.00
16	2482.1	14.7	25	72	97	284	Imp.	1.0	16.0	284	0.00
17	2483.1	16.2	17	70	87	214	0.89	1.0	17.0	214	0.89
18	2484.1	16.3	10	76	86	126	1.9	1.0	18.0	126	1.90
19	2485.1	18.0	18	62	80	251	3.0	1.0	19.0	251	3.00
20	2486.1	15.7	12	71	83	146	1.6	1.0	20.0	146	1.60
21	2487.1	13.9	14	73	87	151	0.26	1.0	21.0	151	0.26
22	2488.1	16.1	9	89	98	112	0.33	1.0	22.0	112	0.33
23	2489.1	16.4	18	71	89	229	5.4	1.0	23.0	229	5.40
24	2490.1	16.4	17	68	85	216	7.8	1.0	24.0	216	7.80
25	2491.1	17.1	21	57	78	278	7.3	1.0	25.0	278	7.30
26	2492.1	13.7	26	57	83	276	15.	1.0	26.0	276	15.00
27	2493.1	17.7	27	59	86	370	8.2	1.0	27.0	370	8.20
28	2494.1	18.2	33	56	89	466	6.8	1.0	28.0	466	6.80
29	2495.1	18.3	27	59	86	383	26.	1.0	29.0	383	26.00
30	2496.1	18.7	24	61	85	348	29.	1.0	30.0	348	29.00
31	2497.1	19.3	29	56	85	434	27.	1.0	31.0	434	27.00
32	2498.1	17.4	19	63	82	256	13.	1.0	32.0	256	13.00
33	2499.1	18.3	22	61	83	312	14.	1.0	33.0	312	14.00
34	2500.1	16.4	20	78	98	254	9.3	0.8	33.8	203	7.44
35	2501.1	17.5	13	72	85	176	6.0	1.2	35.0	211	7.20
36	2502.1	17.6	13	85	98	177	3.4	1.2	36.2	212	4.18
37	2503.1	17.9	24	64	88	333	15.	0.8	37.0	266	12.00
38	2504.1	15.5	14	84	98	168	1.7	1.0	38.0	168	1.70
39	2505.1	19.6	19	59	78	289	37.	1.0	39.0	289	37.00
40	2506.1	19.7	25	51	76	382	67.	1.0	40.0	382	67.00
41	2507.1	19.8	27	55	82	414	97.	1.4	41.4	580	135.80

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Jackson Bros. Lease Barrier Well No. 36

-OSWEGO-

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
1823.0 - 1827.6	4.6	41.0	188.50
1827.6 - 1832.4	0.0	0.0	0.0
1823.0 - 1832.4	4.6	41.0	188.50

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
1823.0 - 1827.6	4.6	21.8	31.2	50.2	524	2,408
1827.6 - 1832.4	4.8	6.9	25.0	65.9	125	599
1823.0 - 1832.4	9.4	14.2	28.0	58.2	320	3,007

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Jackson Bros. Lease Barrier Well No. 36

-BARTLESVILLE-

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
2450.2 - 2488.6	12.9	1.3	16.71
2488.6 - 2508.0	19.4	22.2	431.82
2450.2 - 2508.0	32.3	13.9	448.53

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
2450.2 - 2488.6	22.0	15.0	17.3	74.4	204	4,473
2488.6 - 2508.0	19.4	17.7	22.0	64.1	303	5,879
2450.2 - 2508.0	41.4	16.3	19.5	69.5	250	10,352

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Jackson Bros. Lease Barrier Well No. 36

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.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
						-OSWEGO-						
1	1823.1	25.0	20	388	0	0	20	70	388	5	0.200	50
2	1824.1	21.0	21	342	0	0	21	70	342	0	Imp.	-
3	1825.1	25.0	42	813	11	213	31	39	600	49	1.00	20
4	1826.1	16.7	39	504	7	91	32	45	413	110	2.00	20
5	1827.1	23.7	29	532	4	74	25	67	458	159	3.70	20
6	1828.1	9.0	18	126	0	0	18	76	126	0	Imp.	-
						-BARTLESVILLE-						
1	2451.1	13.8	22	236	0	0	22	71	236	0	Imp.	-
2	2452.1	12.3	14	134	0	0	14	81	134	0	Imp.	-
3	2453.1	14.4	17	190	0	0	17	80	190	0	Imp.	-
4	2454.1	12.6	15	146	0	0	15	81	146	0	Imp.	-
5	2455.1	16.7	30	388	0	0	30	66	388	0	Imp.	-
6	2456.1	15.1	24	281	0	0	24	72	281	0	Imp.	-
7	2457.1	16.0	22	273	0	0	22	72	273	0	Imp.	-
8	2460.1	16.0	19	236	0	0	19	78	236	0	Imp.	-
9	2466.1	16.7	11	142	0	0	11	87	142	0	Imp.	-
10	2469.1	13.4	11	114	0	0	11	83	114	0	Imp.	-
11	2476.1	16.2	25	314	0	0	25	71	314	0	Imp.	-
12	2477.1	13.7	23	244	0	0	23	57	244	0	Imp.	-
13	2478.1	15.0	18	209	0	0	18	80	209	0	Imp.	-
14	2480.1	12.9	9	90	0	0	9	87	90	0	Imp.	-
15	2481.1	14.5	17	191	0	0	17	77	191	0	Imp.	-
16	2482.1	14.5	24	270	0	0	24	73	270	0	Imp.	-
17	2483.1	16.2	16	201	0	0	16	73	201	0	Imp.	-

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.

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Jackson Bros. Lease Barrier Well No. 36

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.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
18	2484.1	16.3	9	114	0	0	9	78	114	0	Imp.	-
19	2485.1	17.6	20	273	0	0	20	63	273	0	Imp.	-
20	2486.1	15.8	14	171	0	0	14	73	171	0	Imp.	-
21	2487.1	13.5	14	147	0	0	14	75	147	0	Imp.	-
22	2488.1	16.5	10	128	0	0	10	89	128	9	0.300	30
23	2489.1	16.8	18	234	2	26	16	78	208	4	0.200	50
24	2490.1	16.8	17	221	2	26	15	75	195	6	0.200	50
25	2491.1	17.0	21	277	4	53	17	74	224	8	0.200	50
26	2492.1	14.2	26	286	6	66	20	70	220	7	0.200	50
27	2493.1	17.2	27	360	5	67	22	66	293	8	0.300	50
28	2494.1	17.9	33	457	10	139	23	67	318	6	0.200	50
29	2495.1	18.7	27	391	9	131	18	70	260	27	0.800	30
30	2496.1	18.2	24	338	5	71	19	74	267	10	0.400	30
31	2497.1	18.9	29	425	8	117	21	68	308	15	0.400	40
32	2498.1	17.8	19	262	2	28	17	67	234	15	0.500	40
33	2499.1	18.2	23	324	0	0	23	65	324	16	0.400	40
34	2500.1	16.9	24	314	0	0	24	74	314	10	0.400	50
35	2501.1	17.4	15	202	0	0	15	74	202	20	0.500	40
36	2502.1	17.2	12	160	0	0	12	87	160	21	0.600	20
37	2503.1	17.6	24	328	6	82	18	77	246	9	0.300	40
38	2504.1	15.2	16	189	0	0	16	83	189	0	Imp.	-
39	2505.1	19.1	19	282	2	30	17	78	252	30	0.800	40
40	2506.1	19.4	25	376	4	60	21	77	316	171	4.70	10
41	2507.1	20.0	27	419	4	62	23	75	357	249	6.80	10

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.

Oilfield Research Laboratories

SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Jackson Bros. Lease Barrier Well No. 36

	-OSWEGO-	-BARTLESVILLE-
Depth Interval, Feet	1823.0 - 1828.6	2488.6 - 2508.0
Feet of Core Analyzed	3.0	14.2
Average Percent Porosity	21.8	17.9
Average Percent Original Oil Saturation	36.6	24.1
Average Percent Oil Recovery	7.3	4.9
Average Percent Residual Oil Saturation	29.3	19.2
Average Percent Residual Water Saturation	50.3	72.6
Average Percent Total Residual Fluid Saturation	79.6	91.8
Average Original Oil Content, Bbls./A. Ft.	616.	335.
Average Oil Recovery, Bbls./A. Ft.	126.	68.
Average Residual Oil Content, Bbls./A. Ft.	490.	267.
Total Original Oil Content, Bbls./Acre	1,849.	4,758.
Total Oil Recovery, Bbls./Acre	378.	966.
Total Residual Oil Content, Bbls./Acre	1,471.	3,792.
Average Effective Permeability, Millidarcys	2.23	1.31
Average Initial Fluid Production Pressure, p.s.i.	20.0	38.6

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

Oilfield Research Laboratories

RESULTS OF WATER DIFFERENTIATION TESTS

TABLE VI

Company Jackson Bros. Lease Barrier Well No. 36

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Water Saturation		
			Connate	Drilling & Foreign	Total
1	2451.1	74,100			
2	2452.1	89,750			
3	2453.1	78,950			
4	2454.1	90,700			
5	2455.1	94,400			
6	2456.1	96,600			
7	2457.1	92,200			
8	2460.1	85,300			
9	2466.1	92,200			
10	2469.1	98,300			
11	2476.1	97,000			
12	2477.1	119,750			
13	2478.1	105,750			
14	2480.1	101,100			
15	2481.1	90,600			
16	2482.1	101,200			
17	2483.1	102,800			
18	2484.1	103,800			
19	2485.1	95,800			
20	2486.1	96,900			
21	2487.1	101,600			
22	2488.1	92,350			
23	2489.1	110,750			
24	2490.1	109,800			
25	2491.1	96,100			
26	2492.1	104,700			
27	2493.1	97,850			
28	2494.1	98,650			
29	2495.1	93,800			
30	2496.1	89,200			
31	2497.1	85,100			
32	2498.1	95,700			
33	2499.1	103,900			
34	2500.1	96,700			
35	2501.1	109,000			
36	2502.1	109,700			
37	2503.1	88,000			
38	2504.1	99,600			
39	2505.1	54,600			

Note: ppm — parts per million

Oilfield Research Laboratories

RESULTS OF WATER DIFFERENTIATION TESTS

TABLE VI

Company Jackson Bros. Lease Barrier Well No. 36

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Water Saturation		
			Connate	Drilling & Foreign	Total
40	2506.1	15,100			
41	2507.1	9,820			

Note: ppm — parts per million

Oilfield Research Laboratories

SUMMARY OF WATER DIFFERENTIATION TESTS

TABLE VII

Company Jackson Bros. Lease Barrier Well No. 36

Depth Interval, Feet	Chloride Content of Brine in Sand, ppm	Average Percent Connate Water	Average Percent Drilling & Foreign Water
2450.2 - 2488.6	95,100		
2488.6 - 2508.0	86,400		
2450.2 - 2508.0	91,200		

Note: ppm — parts per million.

Oilfield Research Laboratories

Acid Solubility Tests

TABLE VIII

Company Jackson Bros. Lease Barrier Well No. 36

Sample No.	Depth Interval, Feet	Acid Solubility, Percent
1	1823.1	86
2	1824.1	82
3	1825.1	86
4	1826.1	89
5	1827.1	85
6	1828.1	87
7	1829.1	89
8	1830.1	91
9	1831.1	90
10	1832.1	91