



OILFIELD RESEARCH LABORATORIES

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January 5, 1981

Rantoul Energy Corporation
Box 516
Hutchinson, Kansas 67501

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the ABC Lease, Well No. 22-D, located in Miami County, Kansas and submitted to our laboratory on November 5, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Hutchinson, Kansas

- REGISTERED ENGINEERS -

CORE ANALYSIS - WATER ANALYSIS - REPRESSURING ENGINEERING - SURVEYING & MAPPING - PROPERTY EVALUATION & OPERATION

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GENERAL INFORMATION & SUMMARY

Company Rantoul Energy Corporation Lease ABC Well No. 22-D

Location _____

Section 22 Twp 17S Rge. 22E County Miami State Kansas

Elevation, Feet - - - - -

Name of Sand - - - - - Peru

Top of Core - - - - - 348.0

Bottom of Core - - - - - 365.5

Top of Sand - - - - - 348.0

Bottom of Sand - - - - - 365.0

Total Feet of Permeable Sand - - - - - 15.3

Total Feet of Floodable Sand - - - - - 12.1

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
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0 - 10	2.0	2.0
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24 - 90	4.7	6.7
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140 - 200	5.6	12.3
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250 - 260	1.8	14.1
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455 & Above	1.2	15.3
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Average Permeability Millidarcys - - - - - 144.2

Average Percent Porosity - - - - - 16.7

Average Percent Oil Saturation - - - - - 43.7

Average Percent Water Saturation - - - - - 37.1

Average Oil Content, Bbls./A. Ft. - - - - - 593.

Total Oil Content, Bbls./Acre - - - - - 10,078.

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 9.6

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 140.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 1,699.

Total Calculated Oil Recovery, Bbls./Acre - - - - - See "Calculated Recovery" Section

The core was sampled and the samples sealed in plastic bags by a representative of the client.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
348.0 - 348.9	Grayish brown very shaly sandstone.
348.9 - 350.1	Brown slightly calcareous sandstone.
350.1 - 351.9	Hard grayish brown limestone.
351.9 - 353.6	Brown calcareous sandstone.
353.6 - 355.8	Brown and gray laminated slightly calcareous sandstone and shale.
355.8 - 358.8	Brown slightly calcareous sandstone.
358.8 - 359.6	Light brown and gray laminated slightly calcareous sandstone and shale.
359.6 - 362.2	Light brown slightly calcareous sandstone.
362.2 - 363.7	Light brown and gray laminated slightly calcareous sandstone and shale.
363.7 - 365.0	Brown slightly calcareous sandstone.
365.0 - 365.5	Gray sandy shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,699 barrels of oil per acre was obtained from 12.1 feet of sand. The weighted average percent oil saturation was reduced from 49.2 to 39.6, or represents an average recovery of 9.6 percent. The weighted average effective permeability of the samples is 8.27 millidarcys, while the average initial fluid production pressure is 22.3 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 16 samples tested, 11 produced water and oil, and 2 samples produced water only. This indicates that approximately 69 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the core data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 2,880 barrels of oil per acre. This is an average recovery of 238 barrels per acre foot from 12.1 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.03
Reservoir water saturation, percent, estimated	25.0
Average porosity, percent	18.5
Oil saturation after flooding, percent	39.6
Performance factor, percent, estimated	50.0
Net floodable sand, feet	12.1

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Rantoul Energy Corporation Lease ABC Well No. 22-D

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.		
1	348.5	20.7	37	4	41	594	Imp.	0.9	0.9	535	0.00
2	349.5	21.1	52	14	66	851	456.	1.2	2.1	1021	547.20
3	350.5	6.8	32	36	68	169	1.6	1.0	3.1	169	1.60
4	351.5	4.6	17	60	77	61	Imp.	0.8	3.9	49	0.00
5	352.5	15.0	30	60	90	349	169.	1.0	4.9	349	169.00
6	353.5	21.2	48	24	72	790	30.	0.7	5.6	553	21.00
7	354.5	15.3	52	36	88	617	9.9	1.0	6.6	617	9.90
8	355.5	16.3	33	57	90	417	47.	1.2	7.8	500	56.40
9	356.5	20.2	50	45	95	784	195.	1.0	8.8	784	195.00
10	357.5	17.5	51	32	83	692	199.	1.0	9.8	692	199.00
11	358.5	16.2	51	36	87	641	140.	1.0	10.8	641	140.00
12	359.5	18.7	45	27	72	653	259.	0.8	11.6	522	207.20
13	360.5	20.3	57	28	85	898	253.	1.0	12.6	898	253.00
14	361.5	19.6	50	27	77	768	162.	1.6	14.2	1229	259.20
15	363.5	14.3	43	50	93	477	24.	1.5	15.7	716	36.00
16	364.5	18.1	44	49	93	618	86.	1.3	17.0	803	111.80

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Lease		Well No.	
Rantoul Energy Corporation		ABC		22-D	
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
348.0 - 355.8	6.1	132.0	805.10		
355.8 - 365.0	9.2	152.3	1401.20		
348.0 - 365.0	15.3	144.2	2206.30		

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
348.0 - 355.8	7.8	15.3	38.0	36.6	486	3,793
355.8 - 365.0	9.2	18.0	48.6	37.4	683	6,285
348.0 - 365.0	17.0	16.7	43.7	37.1	593	10,078

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Rantoul Energy Corporation										Lease ABC		Well No. 22-D	
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.	
1	348.5	20.2	38	596	0	0	38	11	0	Imp.	-		
2	349.5	20.9	52	843	10	162	42	47	474	27.40	10		
3	350.5	7.2	32	179	0	0	32	40	0	Imp.	-		
4	351.5	4.6	17	61	0	0	17	62	0	Imp.	-		
5	352.5	15.5	31	373	0	0	31	66	185	3.30	30		
6	353.5	21.0	48	782	9	147	39	54	33	0.60	40		
7	354.5	15.8	52	637	15	184	37	57	8	0.30	40		
8	355.5	16.7	34	440	0	0	34	61	231	6.00	20		
9	356.5	20.6	50	799	12	192	38	58	204	9.73	15		
10	357.5	18.0	51	712	14	196	37	57	378	13.10	15		
11	358.5	16.6	51	657	12	155	39	59	328	12.00	15		
12	359.5	19.2	45	670	5	74	40	56	326	14.08	15		
13	360.5	19.9	57	880	16	247	41	56	293	5.55	20		
14	361.5	20.0	50	776	12	186	38	62	338	7.65	15		
15	363.5	14.8	43	494	2	23	41	58	61	1.20	30		
16	364.5	18.3	44	625	2	28	42	55	34	0.60	30		

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 V

Company	Rantoul Energy Corporation	Lease	ABC	Well No.	22-D
Depth Interval, Feet	348.0 - 355.8	355.8 - 365.0	348.0 - 365.0		
Feet of Core Analyzed	2.9	9.2	12.1		
Average Percent Porosity	19.2	18.3	18.5		
Average Percent Original Oil Saturation	51.1	48.6	49.2		
Average Percent Oil Recovery	11.5	9.0	9.6		
Average Percent Residual Oil Saturation	39.6	39.6	39.6		
Average Percent Residual Water Saturation	52.1	57.9	56.5		
Average Percent Total Residual Fluid Saturation	91.7	97.5	96.1		
Average Original Oil Content, Bbls./A. Ft.	757.	693.	708.		
Average Oil Recovery, Bbls./A. Ft.	166.	132.	140.		
Average Residual Oil Content, Bbls./A. Ft.	591.	561.	568.		
Total Original Oil Content, Bbls./Acre	2,196.	6,380.	8,576.		
Total Oil Recovery, Bbls./Acre	481.	1,218.	1,699.		
Total Residual Oil Content, Bbls./Acre	1,715.	5,162.	6,877.		
Average Effective Permeability, Millidarcys	11.59	7.22	8.27		
Average Initial Fluid Production Pressure, p.s.i.	30.0	19.4	22.3		

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