OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND - CHANUTE, KANSAS 66720 - PHONE (316) 431-2650

January 12, 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. 12-C, located in Miami County, Kansas and submitted to our laboratory on November 18, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Hutchinson, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Rantoul Energy Corporation Lease ABC Well No. 12-C

Location

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

Elevation, Feet	
Name of Sand	Peru
Top of Core	325.0
Bottom of Core	347.3
Top of Sand (Tested)	326.4
Bottom of Sand	346.7
Total Feet of Permeable Sand	10.4
Total Feet of Floodable Sand	9.1

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	0.5	0.5
30 - 60	3.8	4.3
80 - 100	1.0	5.3
110 - 130	3.3	8.6
150 & Above	1.8	10.4

Average Permeability Millidarcys	92.1
Average Percent Porosity	20.6
Average Percent Oil Saturation	40.5
Average Percent Water Saturation	41.9
Average Oil Content, Bbls./A. Ft.	649.
Total Oil Content, Bbls./Acre	6,746.
Average Percent Oil Recovery by Laboratory Flooding Tests	7.6
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	129.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	1,171.
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:

Depth Interval, Feet	Description
325.0 - 329.7	Brown and gray laminated slightly calcareous sandstone and shale.
339.0 - 339.6	Hard gray limestone.
339.6 - 341.4	Brown slightly calcareous sandstone.
341.4 - 341.9	Hard brown calcareous sandstone.
341.9 - 346.7	Brown slightly calcareous sandstone.
346.7 - 347.3	Hard gray limestone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,171 barrels of oil per acre was obtained from 9.1 feet of sand. The weighted average percent oil saturation was reduced from 40.2 to 32.6, or represents an average recovery of 7.6 percent. The weighted average effective permeability of the samples is 6.94 millidarcys, while the average initial fluid production pressure is 26.7 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 11 samples tested, 9 produced water and oil, and 1 sample produced water only. This indicates that approximately 82 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 2,990 barrels of oil per acre. This is an average recovery of 329 barrels per acre foot from 9.1 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	21.1
Oil saturation after flooding, percent	32.6
Performance factor, percent, estimated	50.0
Net floodable sand, feet	9.1

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Rantoul Energy Corporation Lease ABC Well No. 12-C

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	326.5	27.1	34	41	75	715	127.	1.2	1.2	858	152.40
2	327.7	23.1	48	48	96	860	58.	1.0	2.2	860	58.00
3	328.7	17.1	36	54	90	478	110.	1.1	3.3	526	121.00
4	339.8	13.1	32	64	96	325	33.	0.8	4.1	260	26.40
5	340.5	22.1	52	28	80	892	115.	1.0	5.1	892	115.00
6	341.7	12.6	49	34	83	479	4.9	0.5	5.6	240	2.45
7	342.5	20.3	39	49	88	614	153.	0.8	6.4	491	122.40
8	343.5	22.7	48	31	79	845	84.	1.0	7.4	845	84.00
9	344.5	22.8	34	34	68	601	199.	1.0	8.4	601	199.00
10	345.3	18.6	40	36	76	577	39.	1.0	9.4	577	39.00
11	346.5	20.2	38	43	81	596	38.	1.0	10.4	596	38.00

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Rantoul Energy Corporation Lease ABC Well No. 12-C

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
326.4 - 329.7	3.3	100.4	331.40
339.6 - 346.7	7.1	88.2	626.25
326.4 - 346.7	10.4	92.1	957.65

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
326.4 - 329.7	3.3	22.5	38.9	47.5	680	2,244
339.6 - 346.7	7.1	19.6	41.3	39.4	634	4,502
326.4 - 346.7	10.4	20.6	40.5	41.9	649	6,746

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Rantoul Energy Corporation Lease ABC Well No. 12-C

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	326.5	27.0	34	712	3	63	31	61	649	302	11.66	10
2	327.7	23.3	48	868	18	325	30	65	543	246	8.25	20
3	328.7	17.1	36	478	3	40	33	54	438	12	0.33	45
4	339.8	13.2	32	328	4	41	28	70	287	284	6.90	25
5	340.5	22.1	52	892	17	291	35	61	601	279	10.05	20
6	341.7	12.9	48	480	0	0	48	48	480	0	Imp.	-
7	342.5	20.1	39	608	0	0	39	57	608	122	2.83	25
8	343.5	22.9	48	853	10	178	38	52	675	226	12.64	15
9	344.5	22.7	34	599	5	88	29	63	511	118	2.40	20
10	345.3	18.8	40	583	5	73	35	59	510	253	9.58	20
11	346.5	20.2	38	596	4	63	34	57	533	12	0.33	40

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 Rantoul Energy Corporation Lease ABC Well No. 12-C

Depth Interval, Feet	326.4 - 329.7	339.6 - 346.7	326.4 - 346.7
Feet of Core Analyzed	3.3	5.8	9.1
Average Percent Porosity	22.6	20.2	21.1
Average Percent Original Oil Saturation	38.9	40.9	40.2
Average Percent Oil Recovery	7.5	7.6	7.6
Average Percent Residual Oil Saturation	31.4	33.3	32.6
Average Percent Residual Water Saturation	59.9	60.0	60.0
Average Percent Total Residual Fluid Saturation	91.3	93.3	92.6
Average Original Oil Content, Bbls./A. Ft.	682.	653.	664.
Average Oil Recovery, Bbls./A. Ft.	135.	125.	129.
Average Residual Oil Content, Bbls./A. Ft.	547.	528.	535.
Total Original Oil Content, Bbls./Acre	2,249.	3,786.	6,035.
Total Oil Recovery, Bbls./Acre	445.	726.	1,171.
Total Residual Oil Content, Bbls./Acre	1,804.	3,060.	4,864.
Average Effective Permeability, Millidarcys	6.85	6.99	6.94
Average Initial Fluid Production Pressure, p.s.i.	25.0	27.5	26.7

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

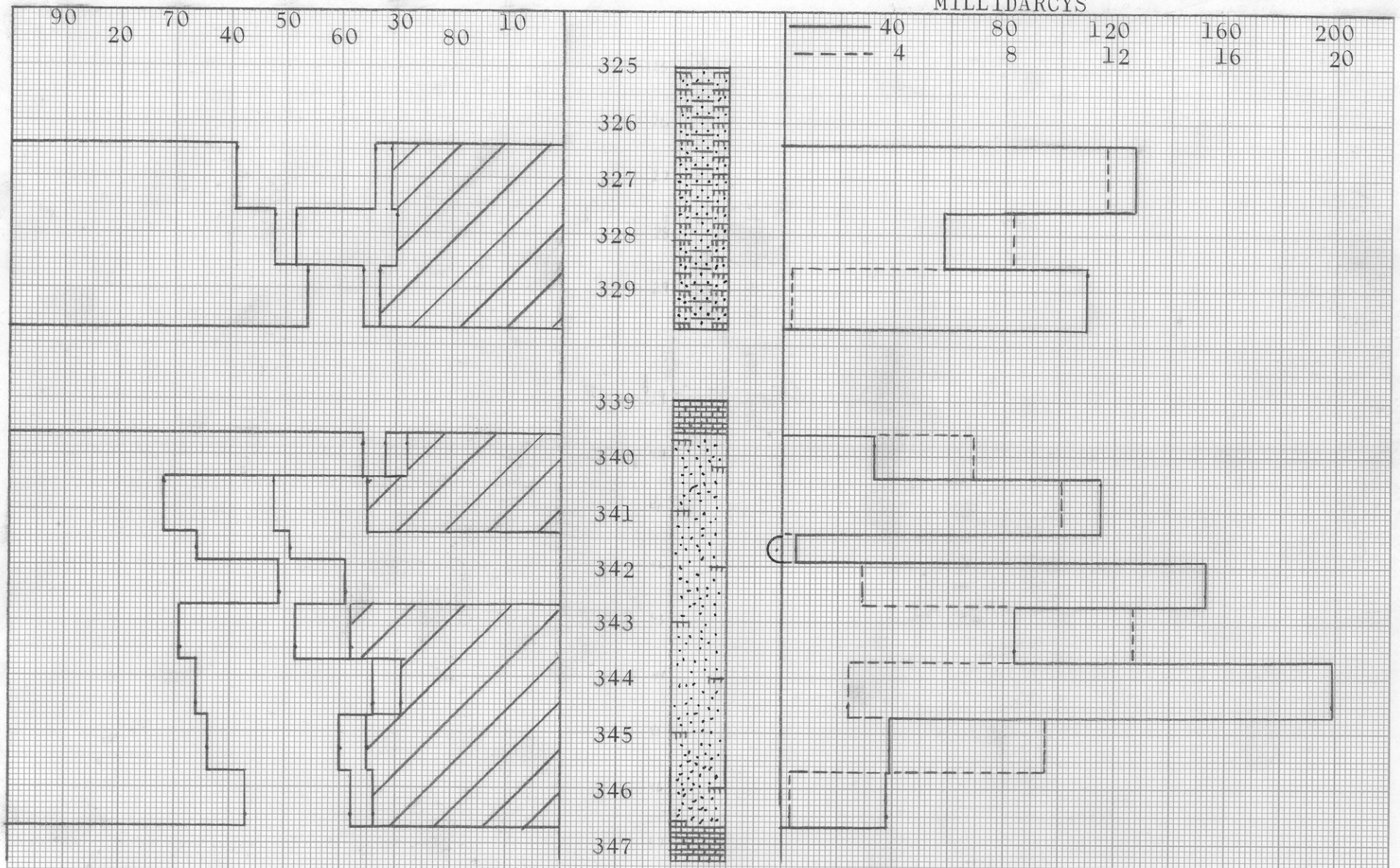
WATER SAT., PERCENT → 90 20 70 40 50 60 30 80 10 ← OIL SAT., PERCENT

——— PERMEABILITY, IN MILLIDARCYS

- - - - - EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS

——— 40 80 120 160 200

- - - - 4 8 12 16 20



KEY:

CALCAREOUS SANDSTONE

LIMESTONE

LAMINATED CALCAREOUS SANDSTONE AND SHALE

FLOODPOT RESIDUAL OIL SATURATION

IMPERMEABLE TO WATER

RANTOUL ENERGY CORP.

ABC LEASE — WELL NO. 12 - C

MIAMI COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLS. / ACRE
326.4 - 329.7	3.3	22.5	38.9	47.5	100.4	
339.6 - 346.7	7.1	19.6	41.3	39.4	88.2	
326.4 - 346.7	10.4	20.6	40.5	41.9	92.1	2990

(PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JANUARY, 1981

KK