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

July 15, 1981

Rantoul Energy Corporation
1505 SW 42nd Street
Topeka, Kansas 66609

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Black Lease, Well No. C-9A, located in Franklin County, Kansas and submitted to our laboratory on July 10, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Topeka, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Rantoul Energy Corporation Lease Black Well No. C-9A

Location

Section 17 Twp. 17S Rge. 21E County Franklin State Kansas

Elevation, Feet	
Name of Sand	Squirrel
Top of Core	480.0
Bottom of Core	500.3
Top of Sand	481.2
Bottom of Sand	500.3
Total Feet of Permeable Sand	12.7
Total Feet of Floodable Sand	6.6

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 6	4.1	4.1
10 - 20	2.1	6.2
35 - 55	3.6	9.8
65 - 106	2.9	12.7

Average Permeability Millidarcys	34.3
Average Percent Porosity	20.4
Average Percent Oil Saturation	38.1
Average Percent Water Saturation	40.8
Average Oil Content, Bbls./A. Ft.	621.
Total Oil Content, Bbls./Acre	7,892.
Average Percent Oil Recovery by Laboratory Flooding Tests	12.4
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	215.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	1,420.
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. Fresh water mud with 3% KCl was used as a drilling fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
480.0 - 481.2	Gray shale.
481.2 - 482.3	Grayish brown calcareous vuggy sandstone.
482.3 - 484.0	Grayish brown calcareous shaly sandstone.
484.0 - 486.0	Grayish brown calcareous sandstone.
486.0 - 492.4	Hard gray limestone.
492.4 - 493.4	Grayish light brown slightly calcareous shaly sandstone.
493.4 - 495.6	Brown slightly calcareous sandstone.
495.6 - 497.0	Grayish light brown calcareous shaly sandstone.
497.0 - 500.3	Brown sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,420 barrels of oil per acre was obtained from 6.6 feet of sand. The weighted average percent oil saturation was reduced from 46.5 to 34.1, or represents an average recovery of 12.4 percent. The weighted average effective permeability of the samples is 6.84 millidarcys, while the average initial fluid production pressure is 16.4 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 13 samples tested, 7 produced water and oil. This indicates that approximately 54 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 2,420 barrels of oil per acre. This is an average recovery of 367 barrels per acre foot from 6.6 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.04
Reservoir water saturation, percent, estimated	20.0
Average porosity, percent	22.1
Oil saturation after flooding, percent	34.1
Performance factor, percent, estimated	50.0
Net floodable sand, feet	6.6

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Rantoul Energy Corporation Lease Black Well No. C-9A

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	481.5	19.1	59	20	79	874	14.	1.1	1.1	961	15.40
2	482.6	20.8	19	22	41	307	1.3	0.7	1.8	215	0.91
3	483.5	12.9	28	43	71	280	0.22	1.0	2.8	280	0.22
4	484.6	20.2	34	60	94	533	35.	1.0	3.8	533	35.00
5	485.5	25.6	37	55	92	735	37.	1.0	4.8	735	37.00
6	492.6	23.7	36	58	94	662	5.6	1.0	5.8	662	5.60
7	493.5	22.8	44	31	75	778	19.	1.0	6.8	778	19.00
8	494.6	20.9	31	37	68	503	40.	0.6	7.4	302	24.00
9	495.4	23.8	39	24	63	720	105.	0.6	8.0	432	63.00
10	496.6	12.0	20	72	92	186	0.24	1.4	9.4	260	0.34
11	497.6	22.6	44	30	74	772	94.	1.0	10.4	772	94.00
12	498.6	21.2	51	27	78	839	53.	1.0	11.4	839	53.00
13	499.5	23.7	47	30	77	864	68.	1.3	12.7	1123	88.40

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Rantoul Energy Corporation Lease Black Well No. C-9A

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
481.2 - 486.0	4.8	18.4	88.53
492.4 - 500.3	7.9	44.0	347.34
481.2 - 500.3	12.7	34.3	435.87

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
481.2 - 486.0	4.8	19.6	36.9	40.7	568	2,724
492.4 - 500.3	7.9	20.8	38.7	40.8	654	5,168
481.2 - 500.3	12.7	20.4	38.1	40.8	621	7,892

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Rantoul Energy Corporation Lease Black Well No. C-9A

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	481.5	18.9	59	865	9	132	50	46	733	264	4.64	15
2	482.6	20.3	20	315	0	0	20	30	315	0	Imp.	-
3	483.5	13.1	27	274	0	0	29	44	274	0	Imp.	-
4	484.6	20.2	34	533	0	0	34	61	533	0	Imp.	-
5	485.5	25.5	37	732	0	0	37	55	732	0	Imp.	-
6	492.6	23.4	37	672	0	0	37	57	672	0	Imp.	-
7	493.5	22.9	44	782	10	178	34	50	604	28	0.85	20
8	494.6	20.9	31	503	4	65	27	66	438	64	1.19	25
9	495.4	24.0	39	726	9	168	30	59	558	190	10.92	15
10	496.6	12.3	19	181	0	0	19	73	181	0	Imp.	-
11	497.6	22.7	44	775	10	176	34	61	599	208	9.55	15
12	498.6	21.3	51	843	21	347	30	60	496	266	7.64	15
13	499.5	23.9	47	871	18	334	29	62	537	204	11.35	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.

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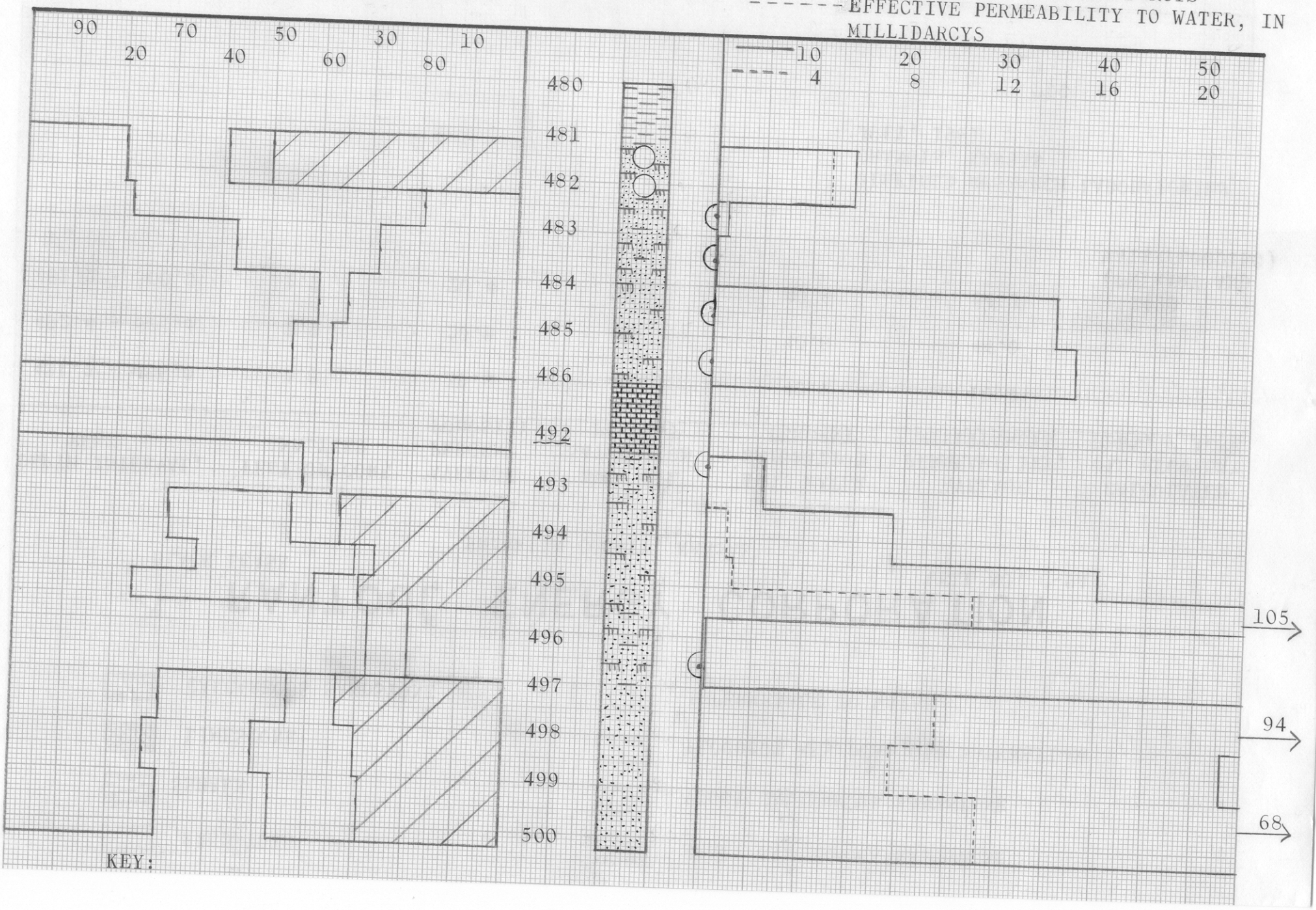
SUMMARY OF LABORATORY FLOODING TESTS

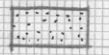
TABLE V

Company Rantoul Energy Corporation Lease Black Well No. C-9A

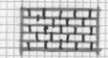
Depth Interval, Feet	481.2 - 486.0	492.4 - 500.3	481.2 - 500.3
Feet of Core Analyzed	1.1	5.5	6.6
Average Percent Porosity	18.9	22.7	22.1
Average Percent Original Oil Saturation	59.0	44.0	46.5
Average Percent Oil Recovery	9.0	13.1	12.4
Average Percent Residual Oil Saturation	50.0	30.9	34.1
Average Percent Residual Water Saturation	46.0	59.4	57.2
Average Percent Total Residual Fluid Saturation	96.0	90.3	91.3
Average Original Oil Content, Bbls./A. Ft.	865.	777.	791.
Average Oil Recovery, Bbls./A. Ft.	132.	232.	215.
Average Residual Oil Content, Bbls./A. Ft.	733.	545.	576.
Total Original Oil Content, Bbls./Acre	951.	4,270.	5,221.
Total Oil Recovery, Bbls./Acre	145.	1,275.	1,420.
Total Residual Oil Content, Bbls./Acre	806.	2,995.	3,801.
Average Effective Permeability, Millidarcys	4.64	7.28	6.84
Average Initial Fluid Production Pressure, p.s.i.	15.0	16.7	16.4

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

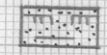

WATER SAT., PERCENT
OIL SAT., PERCENT
90 70 50 30 10
20 40 60 80
PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS
10 20 30 40 50
4 8 12 16 20
480
481
482
483
484
485
486
492
493
494
495
496
497
498
499
500
105
94
68
KEY:


SANDSTONE


SHALE


LIMESTONE


CALCAREOUS SANDSTONE


SHALY CALCAREOUS SANDSTONE


VUGGY CALCAREOUS SANDSTONE


FLOODPOT RESIDUAL OIL SATURATION


IMPERMEABLE TO WATER

RANTOUL ENERGY CORPORATION

BLACK LEASE WELL NO. C-9A

FRANKLIN 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
481.2 - 486.0	4.8	19.6	36.9	40.7	18.4	
492.4 - 500.3	7.9	20.8	38.7	40.8	44.0	
481.2 - 500.3	12.7	20.4	38.1	40.8	34.3	2420 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JULY, 1981

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