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

June 16, 1980

Rantoul Energy Corporation
Box 516
Hutchinson, Kansas 67501

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary corestaken from the Judson A Lease, Well No. 17, Franklin County, Kansas, and submitted to our laboratory on May 1, 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 Judson A Well No. 17

Location –

Section 22 Twp. 17S Rge. 21E County Franklin State Kansas

Elevation, Feet	–	–
Name of Sand	Peru	Squirrel
Top of Core	340.0	490.0
Bottom of Core	354.0	495.0
Top of Sand	340.0	490.4
Bottom of Sand	352.7	494.7
Total Feet of Permeable Sand	12.3	2.7
Total Feet of Floodable Sand	7.8	0.5

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
PERU SAND		
0 – 50	2.8	2.8
50 – 100	2.0	4.8
100 – 150	1.8	6.6
150 – 250	4.7	11.3
250 & Above	1.0	12.3
SQUIRREL SAND		
0 – 20	2.2	2.2
20 – 30	0.5	2.7

Average Permeability Millidarcys	166.9	12.2
Average Percent Porosity	19.8	17.1
Average Percent Oil Saturation	20.0	13.6
Average Percent Water Saturation	66.1	77.5
Average Oil Content, Bbls./A. Ft.	330.	200.
Total Oil Content, Bbls./Acre	4,051.	862.
Average Percent Oil Recovery by Laboratory Flooding Tests	5.8	3.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	104.	49.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	809.	25.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section	

The cores were sampled and the samples sealed in plastic bags by a representative of the client. Fresh water mud was used as a drilling fluid.

FORMATION CORED

Depth Interval, Feet	Description
	PERU SAND
340.0 - 341.8	Brown calcareous sandstone.
341.8 - 342.2	Gray limestone.
342.2 - 352.7	Brown calcareous sandstone.
352.7 - 353.5	Gray limestone.
353.5 - 354.0	Gray sandy shale.
	SQUIRREL SAND
490.0 - 490.4	Gray sandy shale.
490.4 - 490.9	Brown sandstone.
490.9 - 491.8	Grayish brown shaly sandstone.
491.8 - 493.3	Brown sandstone.
493.3 - 494.7	Brown shaly sandstone.
494.7 - 495.0	Gray sandy shale.

LABORATORY FLOODING TESTS

PERU SAND

The sand in this core responded to laboratory flooding tests, as a total recovery of 809 barrels of oil per acre was obtained from 7.8 feet of sand. The weighted average percent oil saturation was reduced from 25.0 to 19.2, or represents an average recovery of 5.8 percent. The weighted

average effective permeability of the samples is 9.12 millidarcys, while the average initial fluid production pressure is 14.4 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 13 samples tested, 8 produced water and oil, and 3 samples produced water only. This indicates that approximately 62 percent of the sand represented by these samples is floodable pay sand.

LABORATORY FLOODING TESTS

SQUIRREL SAND

The sand in this core responded to laboratory flooding tests, as a total recovery of 25 barrels of oil per acre was obtained from 0.5 feet of sand. The weighted average percent oil saturation was reduced from 31.0 to 28.0, or represents an average recovery of 3.0 percent. The weighted average effective permeability of the samples is 0.37 millidarcys, while the average initial fluid production pressure is 25.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 5 samples tested, 1 produced water and oil. This indicates that approximately 20 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 2,710 barrels of oil per acre from the Peru sand, and approximately 110 barrels of oil per acre from the Squirrel sand. This is an average recovery of 348 barrels per acre foot from 7.8 feet of floodable sand from the Peru, and an average recovery of 223 barrels per acre foot from 0.5 feet of floodable sand from the Squirrel sand.

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

	PERU SAND
Original formation volume factor, estimated	1.04
Reservoir water saturation, percent, estimated	40.0
Average porosity, percent	23.3
Oil saturation after flooding, percent	19.2
Performance factor, percent, estimated	50.0
Net floodable sand, feet	7.8
	SQUIRREL SAND
Original formation volume factor, estimated	1.04
Reservoir water saturation, percent, estimated	45.0
Average porosity, percent	21.0
Oil saturation after flooding, percent	28.0
Performance factor, percent, estimated	55.0
Net floodable sand, feet	0.5

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Rantoul Energy Corporation Lease Judson A Well No. 17

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.		
						PERU SAND					
1	340.6	15.2	12	70	82	142	141.	1.0	1.0	142	141.00
2	341.5	13.9	33	41	74	356	100.	0.8	1.8	285	80.00
3	342.5	9.4	2	84	86	15	18.	0.8	2.6	12	14.40
4	343.5	12.0	16	72	88	149	37.	1.0	3.6	149	37.00
5	344.5	24.2	34	51	85	638	784.	1.0	4.6	638	784.00
6	345.5	25.3	21	68	89	412	67.	1.0	5.6	412	67.00
7	346.5	25.4	23	65	88	453	82.	1.0	6.6	453	82.00
8	347.5	25.0	27	69	96	524	161.	1.0	7.6	524	161.00
9	348.5	22.4	12	78	90	209	31.	1.0	8.6	209	31.00
10	349.5	22.9	16	69	85	284	153.	1.0	9.6	284	153.00
11	350.6	23.5	24	51	75	438	156.	1.0	10.6	438	156.00
12	351.5	24.7	24	60	84	460	239.	1.0	11.6	460	239.00
13	352.5	6.9	12	85	97	64	153.	0.7	12.3	45	107.10
						SQUIRREL SAND					
1	490.5	21.2	31	47	78	510	22.	0.5	0.5	255	11.00
2	491.5	14.6	1	94	95	11	Imp.	0.9	1.4	10	0.00
3	492.5	14.3	9	89	98	100	12.	1.5	2.9	150	18.00
4	493.6	20.3	21	64	85	331	5.7	0.7	3.6	232	3.99
5	494.5	19.8	20	67	87	307	Imp.	0.7	4.3	215	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Rantoul Energy Corporation Lease Judson A Well No. 17

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
	PERU SAND		
340.0 - 352.7	12.3	166.9	2052.50
	SQUIRREL SAND		
490.4 - 494.7	2.7	12.2	32.99

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
			PERU SAND			
340.0 - 352.7	12.3	19.8	20.0	66.1	330	4,051
			SQUIRREL SAND			
490.4 - 494.7	4.3	17.1	13.6	77.5	200	862

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Rantoul Energy Corporation Lease Judson A Well No. 17

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.			
						PERU SAND						
1	340.6	15.0	12	140	0	0	12	78	140	72	1.12	25
2	341.5	13.7	33	351	8	85	25	64	266	263	13.92	25
3	342.5	9.1	3	21	0	0	3	85	21	0	Imp.	-
4	343.5	11.7	16	145	0	0	16	79	145	12	0.22	45
5	344.5	24.3	34	649	10	189	24	57	452	234	13.00	10
6	345.5	25.2	21	411	3	59	18	72	352	352	13.28	10
7	346.5	25.3	23	451	5	98	18	69	353	489	9.00	10
8	347.5	23.0	27	524	6	116	21	71	408	166	1.80	20
9	348.5	22.2	12	207	0	0	12	81	207	132	1.72	20
10	349.5	22.8	16	283	2	35	14	77	248	89	1.20	20
11	350.6	23.8	24	443	7	129	17	76	314	443	5.25	10
12	351.5	24.6	24	458	6	115	18	72	343	290	14.78	10
13	352.5	7.0	12	65	0	0	12	86	65	0	Imp.	-
						SQUIRREL SAND						
1	490.5	21.0	31	505	3	49	28	68	456	24	0.37	25
2	491.5	14.1	2	22	0	0	2	94	22	0	Imp.	-
3	492.5	14.8	8	92	0	0	8	90	92	0	Imp.	-
4	493.6	20.0	21	326	0	0	21	64	326	0	Imp.	-
5	494.5	20.0	20	310	0	0	20	68	310	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.

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Rantoul Energy Corporation Lease Judson A Well No. 17

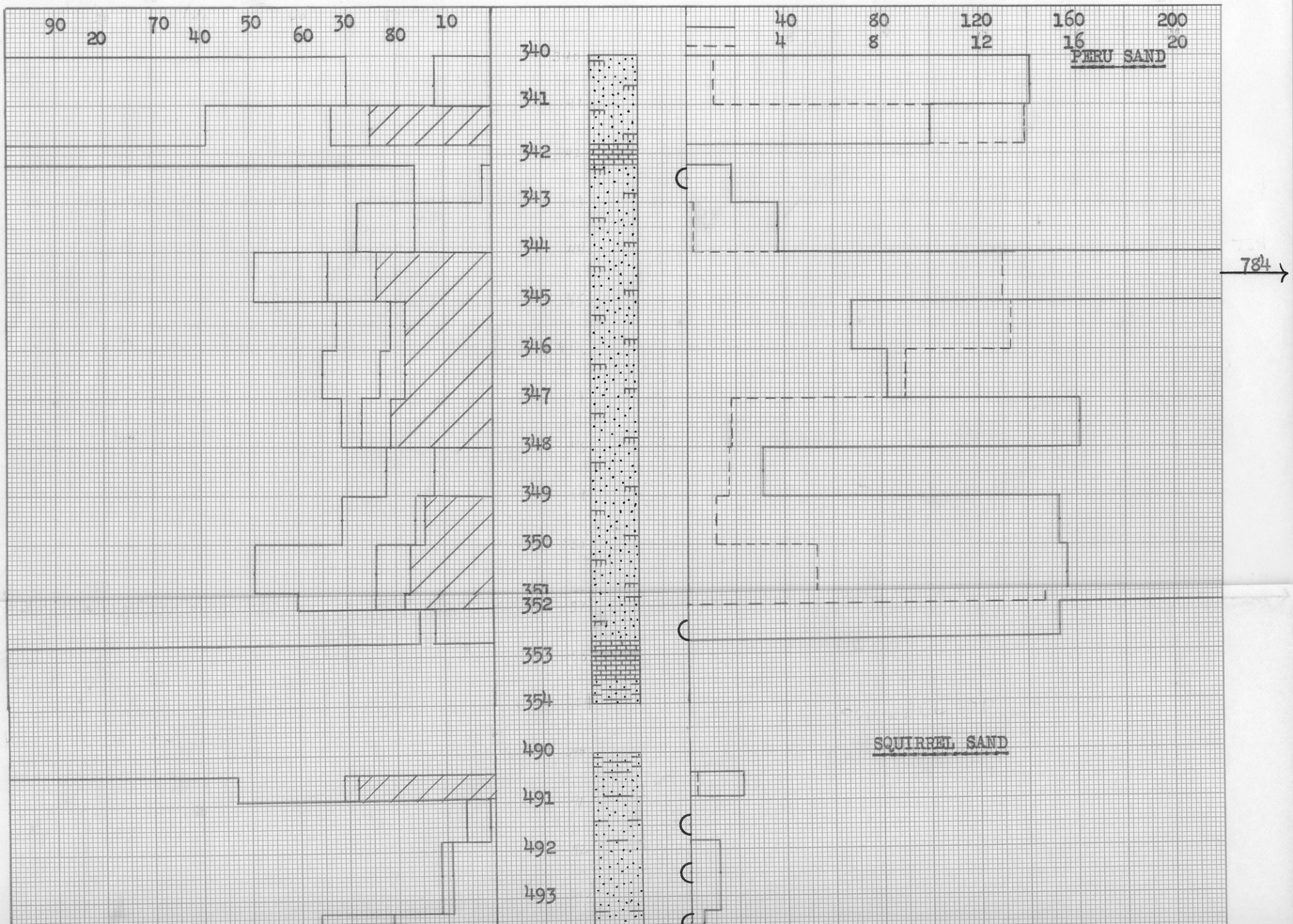
	PERU SAND	SQUIRREL SAND
Depth Interval, Feet	340.0 - 352.7	490.4 - 494.7
Feet of Core Analyzed	7.8	0.5
Average Percent Porosity	23.3	21.0
Average Percent Original Oil Saturation	25.0	31.0
Average Percent Oil Recovery	5.8	3.0
Average Percent Residual Oil Saturation	19.2	28.0
Average Percent Residual Water Saturation	69.9	68.0
Average Percent Total Residual Fluid Saturation	89.1	96.0
Average Original Oil Content, Bbls./A. Ft.	448.	505.
Average Oil Recovery, Bbls./A. Ft.	104.	49.
Average Residual Oil Content, Bbls./A. Ft.	344.	456.
Total Original Oil Content, Bbls./Acre	3,492.	253.
Total Oil Recovery, Bbls./Acre	809.	25.
Total Residual Oil Content, Bbls./Acre	2,683.	228.
Average Effective Permeability, Millidarcys	9.12	0.37
Average Initial Fluid Production Pressure, p.s.i.	14.4	25.0

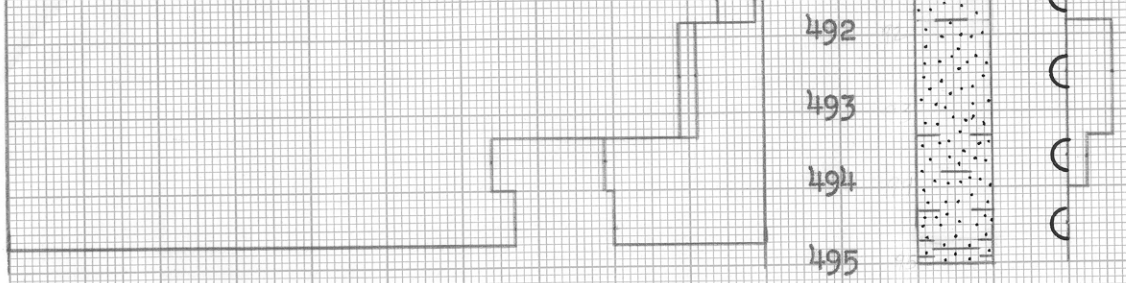
NOTE: Only those samples which recovered oil were used in calculating the above averages.

WATER SAT., PERCENT ⟶ ⟵ OIL SAT., PERCENT

_____ PERMEABILITY, IN MILLIDARCYS

_ _ _ _ EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS





KEY:

- CALCAREOUS SANDSTONE
- SANDY SHALE
- SHALY SANDSTONE
- IMPERMEABLE TO WATER
- LIMESTONE
- SANDSTONE
- FLOODPOT RESIDUAL OIL SATURATION

RANTOUL ENERGY CORP.

JUDSON A LEASE WELL NO. 17

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
			PERU SAND			
340.0 - 352.7	12.3	19.8	20.0	66.1	166.9	2,710 (PRIMARY & WATERFLOODING)
			SQUIRREL SAND			
490.4 - 494.7	4.3	17.1	13.6	77.5	12.2	110 (PRIMARY & WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JUNE, 1960 VM