

OILFIELD RESEARCH LABORATORIES

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June 17, 1980

Rantoul Energy Corporation
Box 516
Hutchinson, Kansas 67501

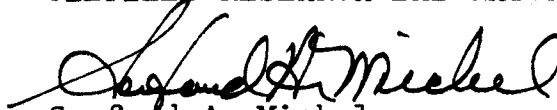
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Hahn Lease, Well No. 14, Franklin County, Kansas, and submitted to our laboratory on May 5, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES



Sanford A. Michel

SAM/tem

5 c to Hutchinson, Kansas

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GENERAL INFORMATION & SUMMARY

Company Rantoul Energy Corporation Lease Hahn Well No. 14

Location —

Section 22 Twp 18S Rge 21E County Franklin State Kansas

Elevation, Feet - - - - -

Name of Sand - - - - - Lower Squirrel

Top of Core - - - - - 583.0

Bottom of Core - - - - - 592.0

Top of Sand - - - - - 583.0

Bottom of Sand - - - - - 592.0

Total Feet of Permeable Sand - - - - - 4.8

Total Feet of Floodable Sand - - - - - 1.0

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 1 1.8 1.8

5 - 10 2.1 3.9

20 - 30 0.9 4.8

Average Permeability Millidarcys - - - - - 6.8

Average Percent Porosity - - - - - 13.6

Average Percent Oil Saturation - - - - - 23.5

Average Percent Water Saturation - - - - - 47.6

Average Oil Content, Bbls./A. Ft. - - - - - 269.

Total Oil Content, Bbls./Acre - - - - - 2,419.

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 4.0

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 54.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 54.

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

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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>
583.0 - 583.9	Brown calcareous sandstone.
583.9 - 588.8	Brown calcareous shaly sandstone.
588.8 - 592.0	Grayish brown shaly sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 54 barrels of oil per acre was obtained from 1.0 feet of sand. The weighted average percent oil saturation was reduced from 34.0 to 30.0, or represents an average recovery of 4.0 percent. The weighted average effective permeability of the samples is 2.25 millidarcys, while the average initial fluid production pressure is 30.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 10 samples tested, 1 produced water and oil. This indicates that approximately 10 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 277 barrels of oil per acre.

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This is an average recovery of 54 barrels per acre foot from 1.0 foot 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	30.0
Average porosity, percent	17.4
Oil saturation after flooding, percent	30.0
Performance factor, percent, estimated	55.0
Net floodable sand, feet	1.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

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			Ft.	Cum. Ft.		
1	583.5	13.2	38	39	389	20.	0.9	0.9	350	18.00
2	584.5	14.4	33	36	369	4.9	1.1	2.0	406	5.39
3	585.5	9.4	12	45	88	0.21	1.0	3.0	88	0.21
4	586.5	16.2	20	54	251	Imp.	1.0	4.0	251	0.00
5	587.5	17.5	34	34	462	8.4	1.0	5.0	462	8.40
6	588.5	12.6	7	46	68	0.55	0.8	5.8	54	0.44
7	589.5	15.2	19	59	224	Imp.	1.2	7.0	269	0.00
8	590.5	11.3	27	56	237	Imp.	1.0	8.0	357	0.00
9	591.5	11.7	20	57	182	Imp.	1.0	9.0	182	0.00

Company Rantoul Energy Corporation

Lease

Hahn

Well No.

14

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Rantoul Energy Corporation		Lease		Hahn		Well No.		14
Depth Interval, Feet	Feet of Core Analyzed	Average Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Total Oil Content Bbl./Acre			
583.0 - 592.0	9.0	13.6	23.5	47.6	269	2,419				

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Rantoul Energy Corporation Lease Hahn Well No. 14

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.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1	583.5	13.0	383	38	0	0	0	38	41	383	0	Imp.	-
2	584.5	14.5	371	33	0	0	0	33	39	371	0	Imp.	-
3	585.5	9.8	84	11	0	0	0	11	50	84	0	Imp.	-
4	586.5	16.7	246	19	0	0	0	19	56	246	0	Imp.	-
5	587.5	17.4	459	34	4	54	30	65	65	405	91	2.25	30
6	588.5	12.3	67	7	0	0	7	50	50	67	0	Imp.	-
7	589.5	15.0	221	19	0	0	19	59	59	221	0	Imp.	-
8	590.5	11.6	234	26	0	0	26	57	57	234	0	Imp.	-
9	591.5	12.0	177	19	0	0	19	58	58	177	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

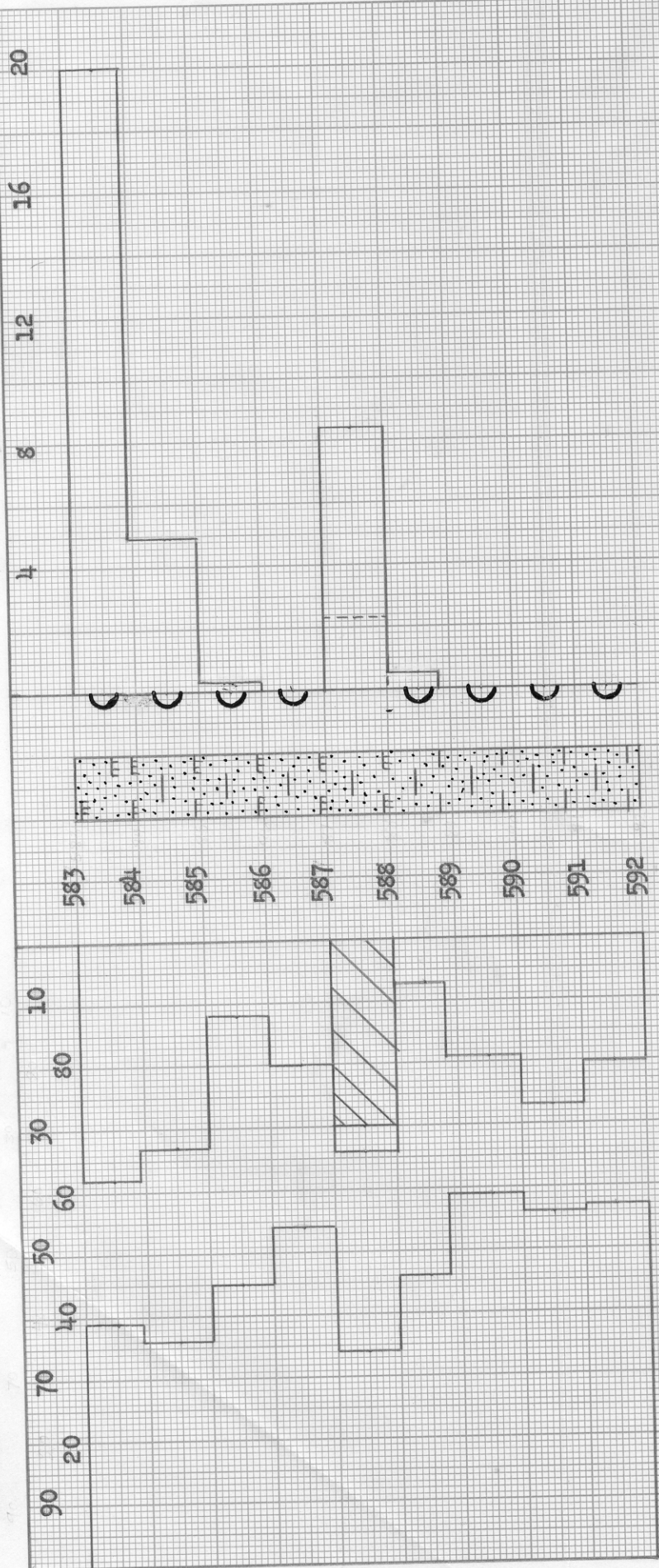
TABLE V

Company	Lease	Well No.
Rantoul Energy Corporation	Hahn	14
Depth Interval, Feet	583.0 - 590.0	
Feet of Core Analyzed	1.0	
Average Percent Porosity	17.4	
Average Percent Original Oil Saturation	34.0	
Average Percent Oil Recovery	4.0	
Average Percent Residual Oil Saturation	30.0	
Average Percent Residual Water Saturation	65.0	
Average Percent Total Residual Fluid Saturation	95.0	
Average Original Oil Content, Bbls./A. Ft.	459.	
Average Oil Recovery, Bbls./A. Ft.	54.	
Average Residual Oil Content, Bbls./A. Ft.	405.	
Total Original Oil Content, Bbls./Acre	459.	
Total Oil Recovery, Bbls./Acre	54.	
Total Residual Oil Content, Bbls./Acre	405.	
Average Effective Permeability, Millidarcys	2.25	
Average Initial Fluid Production Pressure, p.s.i.	30.0	

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

PERMEABILITY, IN MILLIDARCYs
--- EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYs

WATER SAT., PERCENT ← OIL SAT., PERCENT



KEY:

Calcareous Sandstone

Shaly Sandstone

Impermeable to Water

Calcareous Shaly Sandstone

Floodpot Residual Oil Saturation

RANTOUL ENERGY CORP.

HAHN LEASE

FRANKLIN COUNTY, KANSAS

WELL NO. 14

RANTOUL ENERGY CORP.

HAHN LEASE

WELL NO. 14

FRANKLIN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE		AVG. OIL		AVG. WATER		AVERAGE		CALCULATED	
		PERCENT	POROSITY	SATURATION PERCENT	PERCENT	SATURATION PERCENT	PERCENT	PERMEABILITY MILLIDARCS	OIL RECOVERY BBL./ACRE		

583.0 - 592.0	9.0	13.6	23.5	47.6	6.8	277 (PRIMARY & WATERFLOODING)
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OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JUNE, 1980
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