

# OILFIELD RESEARCH LABORATORIES

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

July 8, 1980

Yenom Oil Company  
841 North Broadway  
Wichita, Kansas 67214

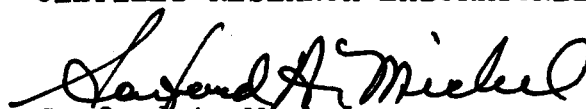
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Wiles Lease, Well No. 3, Allen County, Kansas, and submitted to our laboratory on May 14, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

  
Sanford A. Michel

SAM/tem

1 c to Kayla Fink, Miami, Florida  
1 c to George Abbott, Miami, Florida  
1 c to Millie Beardsley, Miami, Florida  
1 c to C.E. Hoffman, Hialeah, Florida  
1 c to Yenom Oil Co., Wichita, Kansas

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## GENERAL INFORMATION & SUMMARY

Company Yenom Oil Company Lease Wiles Well No. 3  
 Location 165' SNL & 1,320' FWL  
 Section 31 Twp 26S Rge 18E County Allen State Kansas

Elevation, Feet - - - - -

Name of Sand - - - - - Tucker

Top of Core - - - - - 858.0

Bottom of Core - - - - - 875.8

Top of Sand - - - - - 858.0

Bottom of Sand - - - - - 875.8

Total Feet of Permeable Sand - - - - - 16.4

Total Feet of Floodable Sand - - - - - 9.4

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
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0 - 20	5.3	5.3
20 - 50	2.8	8.1
50 - 100	5.3	13.4
100 - 200	3.0	16.4

Average Permeability Millidarcys - - - - - 55.1

Average Percent Porosity - - - - - 17.1

Average Percent Oil Saturation - - - - - 35.1

Average Percent Water Saturation - - - - - 42.0

Average Oil Content, Bbls./A. Ft. - - - - - 493.

Total Oil Content, Bbls./Acre - - - - - 8,089.

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 3.5

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 52.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 488.

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. Fresh water mud was used as a drilling fluid.

#### FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
858.0 - 859.1	Brown shaly sandstone.
859.1 - 860.9	Brown sandstone.
860.9 - 861.6	Brown shaly sandstone.
861.6 - 866.0	Brown sandstone.
866.0 - 867.5	Brown and gray laminated sandstone and shale.
867.5 - 868.3	Gray sandy shale.
868.3 - 869.2	Brown and gray laminated sandstone and shale.
869.2 - 873.2	Brown sandstone.
873.2 - 873.8	Gray sandy shale.
873.8 - 875.8	Brown slightly calcareous sandstone.

#### LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 488 barrels of oil per acre was obtained from 9.4 feet of sand. The weighted average percent oil saturation was reduced from 39.2 to 35.7, or represents an average recovery of 3.5 percent. The weighted average effective permeability of the samples is 2.02 millidarcys, while the average initial fluid production pressure is 35.0 pounds per square inch (See Table V).

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By observing the data given in Table IV, you will note that of the 14 samples tested, 7 produced water and oil, and 2 samples produced water only. This indicates that approximately 50 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 2,130 barrels of oil per acre. This is an average recovery of 227 barrels per acre foot from 9.4 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	30.0
Average porosity, percent	18.9
Oil saturation after flooding, percent	35.7
Performance factor, percent, estimated	50.0
Net floodable sand, feet	9.4

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE I-B

Company Yenom Oil Company

Lease Wiles

Well No. 3

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	858.2	15.2	32	47	79	377	2.5	1.1	1.1	415	2.75
2	859.5	18.0	43	39	82	601	41.	1.0	2.1	601	41.00
3	860.6	18.5	32	41	73	459	38.	0.8	2.9	367	30.40
4	861.5	14.3	34	47	81	377	3.1	0.7	3.6	264	2.17
5	863.5	19.5	42	37	79	635	70.	2.4	6.0	1524	168.00
6	864.5	16.5	35	41	76	448	20.	1.0	7.0	448	20.00
7	865.5	17.4	42	40	82	567	13.	1.0	8.0	567	13.00
8	866.9	17.6	30	47	77	410	3.6	1.5	9.5	615	5.40
9	868.5	12.3	6	69	75	57	56.	0.9	10.4	51	50.40
10	869.3	20.2	34	36	70	533	125.	1.0	11.4	533	125.00
11	870.7	19.9	39	37	76	602	23.	1.0	12.4	602	23.00
12	871.9	19.0	43	32	75	634	105.	1.0	13.4	634	105.00
13	873.1	18.4	30	43	73	428	199.	1.0	14.4	428	199.00
14	874.7	18.1	37	41	78	520	59.	2.0	16.4	1040	118.00

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lease	Wells	Well No.				
Yenom Oil Company			3				
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Average Percent Porosity	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
858.0 - 869.2	10.4	32.0	333.12	16.0	34.2	44.1	4,852
869.2 - 875.8	6.0	95.0	570.0	18.9	36.7	38.3	3,237
858.0 - 875.8	16.4	55.1	903.12	17.1	35.1	42.0	8,089

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## RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Yenom Oil Company Lease Wiles Well No. 3

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			
1	858.2	15.4	32	382	0	0	32	48	0	Imp.	-
2	859.5	18.7	43	624	5	73	38	59	8	0.15	50
3	860.6	18.3	32	454	0	0	32	65	88	1.12	35
4	861.5	14.7	33	376	0	0	33	48	0	Imp.	-
5	863.5	19.5	42	635	3	45	39	54	58	1.12	35
6	864.5	16.6	35	451	2	26	33	55	6	0.15	50
7	865.5	17.4	42	567	0	0	42	43	0	Imp.	-
8	866.9	17.5	30	407	0	0	30	50	0	Imp.	-
9	868.5	12.1	6	56	0	0	6	70	0	Imp.	-
10	869.3	20.2	34	533	3	47	31	59	146	3.60	35
11	870.7	19.6	39	593	6	91	33	64	290	4.12	25
12	871.9	18.9	43	630	4	59	39	58	171	2.92	25
13	873.1	18.4	30	428	0	0	30	66	275	4.80	25
14	874.7	18.2	37	522	3	42	34	62	129	2.70	25

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	Wiles	Well No.
Yenom Oil Company	858.0 - 869.2	869.2 - 875.8	858.0 - 875.8
Depth Interval, Feet	4.4	5.0	9.4
Feet of Core Analyzed	18.7	19.0	18.9
Average Percent Porosity	40.6	38.0	39.2
Average Percent Original Oil Saturation	3.2	3.8	3.5
Average Percent Oil Recovery	37.4	34.2	35.7
Average Percent Residual Oil Saturation	55.4	61.0	58.4
Average Percent Residual Water Saturation	92.8	95.2	94.1
Average Original Oil Content, Bbls./A. Ft.	591.	560.	574.
Average Oil Recovery, Bbls./A. Ft.	47.	56.	52.
Average Residual Oil Content, Bbls./A. Ft.	544.	504.	522.
Total Original Oil Content, Bbls./Acre	2,599.	2,800.	5,399.
Total Oil Recovery, Bbls./Acre	207.	281.	488.
Total Residual Oil Content, Bbls./Acre	2,392.	2,519.	4,911.
Average Effective Permeability, Millidarcys	0.68	3.21	2.02
Average Initial Fluid Production Pressure, p.s.i.	45.0	22.0	35.0

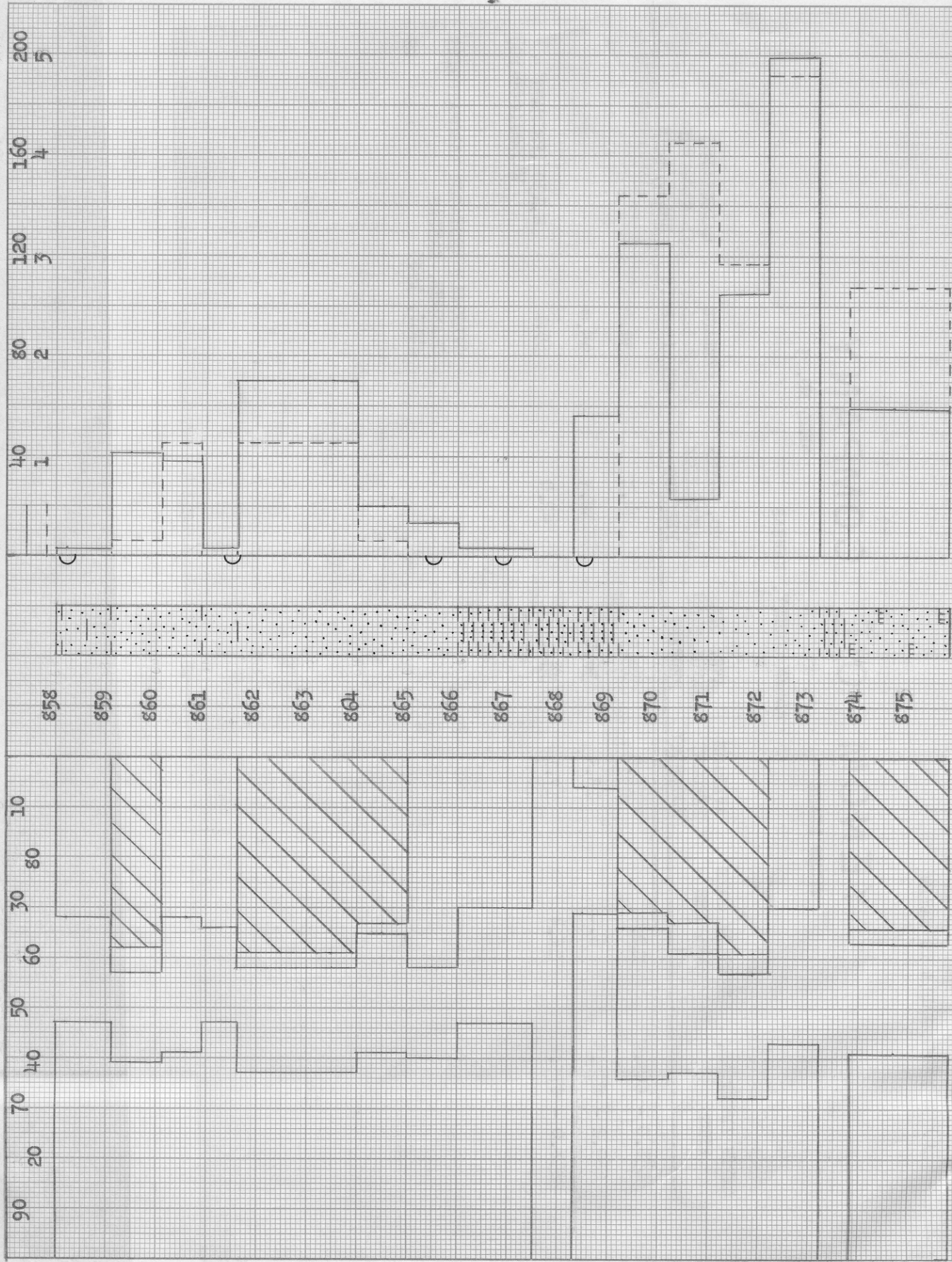
NOTE: Only those samples which recovered oil were used in calculating the above averages.

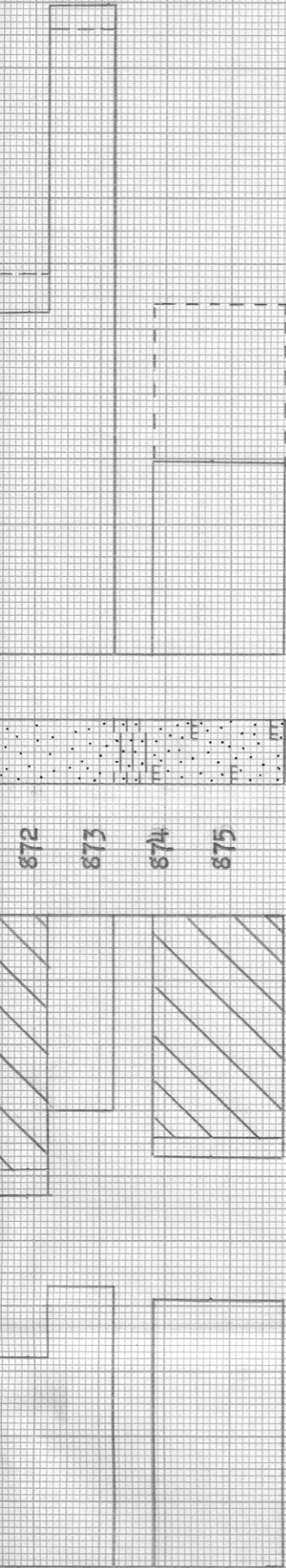
WATER SAT., PERCENT →

PERMEABILITY, IN MILLIDARCS

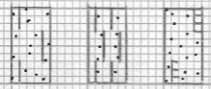
← OIL SAT., PERCENT

--- EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCS





KEY:



SEALY SANDSTONE

LAMINATED SANDSTONE & SHALE

CALCAREOUS SANDSTONE



SANDSTONE



SANDY SHALE



FLOOPOOT RESIDUAL OIL SATURATION

○ IMPERMEABLE TO WATER

# YENOM OIL COMPANY

WILKS LEASE

WELL NO. 3

ALLEN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY PERCENT	AVERAGE OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY MILLIDARCS	CALCULATED OIL RECOVERY BELS./ACRE
858.0 - 869.2	10.4	16.0	34.2	44.1	32.0	
869.2 - 875.8	6.0	18.9	36.7	38.3	95.0	
858.0 - 875.8	16.4	17.1	35.1	42.0	55.1	2,130 (PRIMARY & WATERFLOODING)

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 CHANUTE, KANSAS  
 JULY, 1980

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