

OIL FIELD RESEARCH LABORATORIES  
CHANUTE, KANSAS

January 11, 1951

Suamico Oil Company  
Box 1894  
Wichita, Kansas

Attention: Mr. O. A. Sutton

Gentlemen:

Enclosed herewith is the report of the partial analysis of the Cable tool core taken from your Wolfe Lease, Well No. 4, Woodson County, Kansas, and submitted to our laboratory on December 28, 1950.

In calculating the recovery for the sand within the vicinity of this well, an allowance was made for oil lost during coring, and it is assumed that the true water saturation of the sand is 20 percent and that the well was drilled in virgin territory.

Very truly yours,

OIL FIELD RESEARCH LABORATORIES

Clayton A. Nattier

CAN:em  
c.c. to Mr. G. H. Smith

24-23-10E

Wolfe 4

SUNSHINE OIL COMPANY

CORE ANALYSIS REPORT

WOLFE LEASE

WELL NO. 4

WOODSON COUNTY, KANSAS

OIL FIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

JANUARY 11, 1951

# Oil Field Research Laboratories

## GENERAL INFORMATION & SUMMARY

Company Sunoco Oil Company Lease Wolfe Well No. 4  
 Location 1,100' North of South Line, 190' East of West Line W $\frac{1}{2}$ , NE $\frac{1}{4}$   
 Section 24 Twp. 23S Rge. 16E County Woodson State Kansas

Name of Sand	Squirrel
Top of Core	934.50
Bottom of Core	965.45
Top of Sand (According to driller)	933.00
Bottom of Sand	961.60
Total Feet of Permeable Sand, Analyzed	15.60

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
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Average <b>Effective</b> Permeability Millidarcys	7.77
Average Percent Porosity	21.12
Average Percent Oil Saturation	44.57
Average Percent Water Saturation	38.84
Average Oil Content, Bbls./A. Ft.	739.
Total Oil Content, Bbls./Acre	17,216.
Average Percent Oil Recovery by Laboratory Flooding Tests	4.75
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	81.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	1,025.
Total Calculated Oil Recovery, Bbls./Acre	5,400.
Packer Setting, Feet	-
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	

OIL FIELD RESEARCH LABORATORIES  
CHANUTE, KANSAS

LOG

Company Suamico Oil Company Lease Wolfe Well No. 4

<u>Depth Interval, Feet</u>	<u>Description</u>
934.50 - 936.55	- Brown fine grained micaceous sandstone.
936.55 - 940.90	- Dark brown fine grained micaceous sandstone.
940.90 - 941.75	- Brown fine grained laminated micaceous shaley sandstone.
941.75 - 942.80	- Brown fine grained finely laminated micaceous shaley sandstone.
942.80 - 943.10	- Brown fine grained micaceous sandstone.
943.10 - 945.90	- Gray sandy shale.
945.90 - 946.90	- Gray shale.
946.90 - 948.45	- Laminated gray sandy shale.
948.45 - 950.00	- Gray sandy shale.
950.00 - 958.00	- Brown fine grained micaceous sandstone.
958.00 - 961.60	- Brown fine grained laminated micaceous shaley sandstone.
961.60 - 962.10	- Dark brown fine grained micaceous slightly laminated carbonaceous sandstone.
962.10 - 965.45	- Dark fine grained laminated micaceous carbonaceous shaley sandstone.

**Oil Field Research Laboratories**  
**RESULTS OF PERMEABILITY TESTS**  
**TABLE I**

Company Susmie Oil Company Lease Wolfe Well No. 4

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	958.95	28.	0.50	0.50	14.00
2	959.45	38.	0.50	1.00	19.00
3	959.95	28.	0.50	1.50	14.00
4	961.75	68.	0.50	2.00	34.00
5	962.22	424.	0.35	2.35	148.40
6	962.65	156.	0.55	2.90	85.80

**Oil Field Research Laboratories**  
**SUMMARY OF PERMEABILITY TESTS**

**TABLE II**

Company	<b>Sunco Oil Company</b>	Lease	<b>Wolfe</b>	Well No.	<b>4</b>
Depth Interval Feet		Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.	
<b>958.00 - 965.00</b>		<b>2.90</b>	<b>108.69</b>	<b>315.20</b>	

Oil Field Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company Sunoco Oil Company Lease Wolfe Well No. 4

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content, Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
F1	934.72	18.7	38.8	-	-	563	0.70	0.70	394
F2	935.61	18.6	39.2	-	-	565	1.35	2.05	763
F3	936.82	18.6	45.3	-	-	654	0.75	2.80	490
F4	937.72	20.2	44.9	-	-	704	0.90	3.70	634
F5	938.72	20.3	44.8	-	-	705	0.85	4.55	599
6	939.80	19.5	42.7	27.3	70.0	646	0.95	5.50	614
F7	940.57	20.0	44.2	-	-	686	0.90	6.40	617
8	941.57	17.7	39.6	37.2	76.8	544	0.85	7.25	462
9	942.62	14.2	24.0	62.8	86.8	264	1.05	8.30	277
F14	950.06	21.4	44.1	-	-	732	0.60	8.90	439
F15	951.12	20.8	45.3	-	-	731	1.10	10.00	804
F16	952.36	24.6	44.5	-	-	849	1.15	11.15	976
F17	953.36	24.7	46.8	-	-	896	0.95	12.10	852
F18	954.31	22.8	45.4	-	-	804	1.00	13.10	804
F19	955.36	23.5	45.9	-	-	837	1.20	14.30	1,004
F20	956.56	23.8	45.2	-	-	834	1.10	15.40	917
F21	957.57	22.6	46.0	-	-	806	0.90	16.30	725
22	958.45	22.2	46.1	31.5	77.6	795	1.00	17.30	795
23	959.57	19.6	47.2	36.1	83.3	717	1.20	18.50	860

Oil Field Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company Susnio Oil Company Lease Wolfe Well No. 4

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content, Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
24	960.85	20.2	46.4	43.3	89.7	726	1.40	19.90	1,016
25	961.95	23.0	51.1	34.5	85.6	911	0.50	20.40	456
26	962.87	22.9	51.5	33.6	85.1	915	1.50	21.90	1,373
27	964.32	23.7	52.3	40.0	92.3	961	1.40	23.30	1,345
							Total	- - -	17,216

**Oil Field Research Laboratories**

**SUMMARY OF SATURATION TESTS**

**TABLE IV**

Company Bussio Oil Company Lease Wolfe Well No. 4

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbls./A. Ft.	Total Oil Content Bbls./Acre
934.50 - 942.80	8.30	18.55	39.94	43.53	584	4,830
950.00 - 958.00	8.00	23.11	45.42	-	815	6,521
958.00 - 965.00	7.00	21.89	49.09	37.01	835	5,845
934.50 - 965.00	23.30	21.12	44.57	38.84	739	17,216

**Oil Field Research Laboratories**  
**SUMMARY OF LABORATORY FLOODING TESTS**

TABLE VI

Company Sunoco Oil Company Lease Wolfe Well No. 4

Depth Interval, Feet	934.50 - 940.90	950.00 - 958.00	934.50 - 958.00
Feet of Core Analyzed	4.70	8.00	12.70
Average Percent Porosity	19.51	23.11	21.78
Average Percent Original Oil Saturation	42.17	45.42	44.21
Average Percent Oil Recovery	4.36	4.98	4.75
Average Percent Residual Oil Saturation	37.81	40.44	39.46
Average Percent Residual Water Saturation	56.60	49.99	52.43
Average Percent Total Residual Fluid Saturation	94.41	90.43	91.89
Average Original Oil Content, Bbls./A. Ft.	640.	817.	750.
Average Oil Recovery, Bbls./A. Ft.	67.	89.	81.
Average Residual Oil Content, Bbls./A. Ft.	573.	728.	669.
Total Original Oil Content, Bbls./Acre	3,006.	6,519	9,525.
Total Oil Recovery, Bbls./Acre	313.	712.	1,025.
Total Residual Oil Content, Bbls./Acre	2,693.	5,807.	8,500.
Average Effective Permeability, Millidarcys	3.09	10.52	7.77
Average Initial Fluid Production Pressure, p.s.i.	19.0	13.1	15.4

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

**Oil Field Research Laboratories**

**RESULTS OF LABORATORY FLOODING TESTS**

**TABLE V**

Company Sunoco Oil Company Lease Wolfe Well No. 4

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.
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1	934.72	18.7	38.8	563	1.7	25	37.1	58.2	538	92	2.97	20
2	935.61	18.6	39.2	565	3.2	46	36.0	59.3	519	85	3.55	15
3	936.82	18.6	45.3	654	0.0	0	45.3	43.1	654	14	0.371	30
4	937.72	20.2	44.9	704	4.2	66	40.7	53.8	638	156	3.85	20
5	938.72	20.3	44.8	705	6.6	104	38.2	54.9	601	115	3.53	20
6A	939.40	20.2	43.4	660	0.0	0	43.4	39.8	660	125	3.57	50
7	940.57	20.0	44.2	666	6.2	96	38.0	55.6	590	41	1.30	20
14	950.06	21.4	44.1	732	4.4	73	39.7	52.1	659	123	11.69	10
15	951.12	20.8	45.3	731	5.76	92	39.6	55.2	639	133	9.18	15
16	952.36	24.6	44.5	849	5.2	99	39.3	46.8	750	156	19.90	10
17	953.36	24.7	46.8	896	4.7	90	42.1	45.6	806	140	13.10	10
18	954.31	22.8	45.4	804	4.5	80	40.9	49.6	724	181	6.46	15
19	955.36	23.5	45.9	837	3.6	66	42.3	45.2	771	147	8.56	15
20	956.56	23.8	45.2	834	4.3	79	40.9	49.6	755	139	9.63	15
21	957.57	22.6	46.0	806	7.7	135	38.3	58.4	671	129	4.71	15
25A	962.36	24.1	52.6	983	0.0	0	52.6	33.2	983	118	5.51	15

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.  
 "A" samples were taken from the core after it was received in the laboratory.