

DAVIS OIL COMPANY

CORE ANALYSIS REPORT

UMBARGER LEASE


WELL NO. K-11

WILSON COUNTY, KANSAS

OILFIELD RESEARCH LABORATORIES

538 N. HIGHLAND

CHANDLER, KANSAS



OILFIELD RESEARCH LABORATORIES

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

November 21, 1978

John Davis
212 East Locust
Independence, Kansas 67301

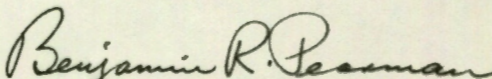
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Umbarger Lease, Well No. K-11, Wilson County, Kansas, and submitted to our laboratory on November 15, 1978.

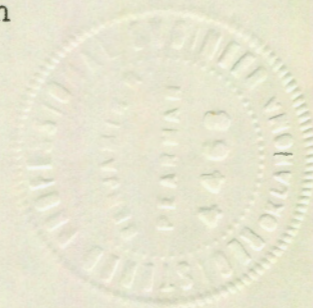
Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Benjamin R. Pearman

SAM:km
5 c to Independence, Kansas



- REGISTERED ENGINEERS -

CORE ANALYSIS - WATER ANALYSIS - REPRESSURING ENGINEERING - SURVEYING & MAPPING - PROPERTY EVALUATION & OPERATION

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GENERAL INFORMATION & SUMMARY

Company John Davis Lease Umbarger Well No. K-11

Location 1000' WEL & 1000' NSL - SW $\frac{1}{4}$

Section 36 Twp. 28S Rge. 16E County Wilson State Kansas

Name of Sand	- - - - -	Squirrel
Top of Core	- - - - -	656.0
Bottom of Core	- - - - -	670.0
Top of Sand	- - - - -	656.0
Bottom of Sand	- - - - -	670.0
Total Feet of Permeable Sand	- - - - -	12.8
Total Feet of Floodable Sand	- - - - -	6.8

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	6.0	6.0
10 - 50	4.8	10.8
50 - 200	2.0	12.8

Average Permeability Millidarcys	- - - - -	33.8
Average Percent Porosity	- - - - -	17.4
Average Percent Oil Saturation	- - - - -	42.9
Average Percent Water Saturation	- - - - -	30.0
Average Oil Content, Bbls./A. Ft.	- - - - -	619.
Total Oil Content, Bbls./Acre	- - - - -	7,928.
Average Percent Oil Recovery by Laboratory Flooding Tests	- - - - -	4.5
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	- - - - -	70.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	- - - - -	477.
Total Calculated Oil Recovery, Bbls./Acre	(Primary & Waterflooding)	2,536.
Packer Setting, Feet	- - - - -	
Viscosity, Centipoises @	- - - - -	
A. P. I. Gravity, degrees @ 60 °F	- - - - -	
Elevation, Feet	- - - - -	

The core was sampled and the samples were sealed in plastic bags by a representative of the client. The core was reported to be from virgin territory. The drilling fluid consisted of salt water mud.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
656.0 - 659.7	Brown sandstone.
659.7 - 661.7	Dark brown sandstone.
661.7 - 662.3	Gray shaly sandstone.
662.3 - 663.0	Laminated gray and brown slightly shaly sandstone.
663.0 - 663.4	Light brown and gray shaly sandstone.
663.4 - 663.9	Gray very shaly sandstone.
663.9 - 666.2	Brown and gray laminated carbonaceous sandstone.
666.2 - 667.0	Gray and brown laminated slightly shaly sandstone.
667.0 - 670.0	Gray and brown laminated shaly sandstone.

SUMMARY

It would appear from a study of the data, that efficient primary and waterflooding operations in the vicinity of this well should recover approximately 2,536 barrels of oil per acre. This is an average recovery of 373 barrels per acre foot from 6.8 feet of floodable sand analyzed in this core.

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

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Original formation volume factor	1.04
Reservoir water saturation, percent	13.0
Average porosity, percent	20.3
Oil saturation after flooding, percent	36.3
Performance factor, percent	50.0
Net floodable pay sand, feet	6.8

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company John Davis Lease Umbarger Well No. K-11

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	656.5	20.8	47	18	65	758	25.	1.0	1.0	758	25.00
2	657.5	21.8	35	32	67	592	29.	1.0	2.0	592	29.00
3	658.5	23.3	37	28	65	669	26.	1.0	3.0	669	26.00
4	659.5	24.6	32	29	61	611	187.	0.7	3.7	428	130.90
5	660.5	22.0	35	36	71	597	100.	1.3	5.0	776	130.00
6	661.5	20.5	44	32	76	700	49.	0.7	5.7	490	34.30
7	662.5	17.0	62	14	76	818	9.7	0.7	6.4	573	6.79
8	663.5	14.0	38	50	88	413	2.4	0.5	6.9	207	1.20
9	664.5	18.7	46	29	75	667	20.	1.1	8.0	734	22.00
10	665.5	14.8	46	32	78	528	10.	1.0	9.0	528	10.00
11	666.5	17.5	45	28	73	611	2.1	0.8	9.8	489	1.68
12	667.5	14.1	52	36	88	569	9.5	1.0	10.8	569	9.50
13	668.5	17.1	44	27	71	584	3.8	1.0	11.8	584	3.80
14	669.5	17.1	40	33	73	531	2.1	1.0	12.8	531	2.10

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company John Davis Lease Umbarger Well No. K-11

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
656.0 - 666.0	9.0	46.1	415.19
666.2 - 670.0	3.8	4.5	17.08
656.0 - 670.0	12.8	33.8	432.27

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
656.0 - 666.0	9.0	17.5	41.9	29.6	639	5,755
666.2 - 670.0	3.8	17.3	45.3	31.2	572	2,173
656.0 - 670.0	12.8	17.4	42.9	30.0	619	7,928

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company John Davis Lease Umbarger Well No. K-11

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	656.5	20.5	47	748	12	191	35	55	557	13	0.40	30
2	657.5	21.5	35	584	3	50	32	59	534	126	4.96	20
3	658.5	23.0	37	660	0	0	37	57	660	88	3.22	20
4	659.5	24.2	32	601	2	38	30	64	563	204	12.57	20
5	660.5	22.4	35	608	3	53	32	63	555	302	21.59	20
6	661.5	20.8	44	711	3	49	41	49	662	74	2.48	20
7	662.5	17.5	62	842	0	0	62	18	842	0	Imp.	-
8	663.5	14.1	38	416	0	0	38	50	416	0	Imp.	-
9	664.5	18.5	46	660	3	43	43	51	617	20	0.48	25
10	665.5	15.2	46	543	5	59	41	48	484	26	0.80	25
11	666.5	17.5	45	611	0	0	45	40	611	0	Imp.	-
12	667.5	14.4	52	581	0	0	52	36	581	0	Imp.	-
13	668.5	16.8	44	574	0	0	44	22	574	0	Imp.	-
14	669.5	17.3	40	537	0	0	40	23	537	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	John Davis	Lease	Umbarger	Well No.	K-11
Depth Interval, Feet	656.0 - 666.0				
Feet of Core Analyzed	6.8				
Average Percent Porosity	20.3				
Average Percent Original Oil Saturation	40.8				
Average Percent Oil Recovery	4.5				
Average Percent Residual Oil Saturation	36.3				
Average Percent Residual Water Saturation	55.8				
Average Percent Total Residual Fluid Saturation	92.1				
Average Original Oil Content, Bbls./A. Ft.	634.				
Average Oil Recovery, Bbls./A. Ft.	70.				
Average Residual Oil Content, Bbls./A. Ft.	564.				
Total Original Oil Content, Bbls./Acre	4,314.				
Total Oil Recovery, Bbls./Acre	477.				
Total Residual Oil Content, Bbls./Acre	3,837.				
Average Effective Permeability, Millidarcys	6.66				
Average Initial Fluid Production Pressure, p.s.i.	22.9				

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