



# OILFIELD RESEARCH LABORATORIES

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October 6, 1978

Tutcher Oil & Gas Company  
Box 308  
Overbrook, Kansas 66524

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Williamson Lease, Well No. 3, Coffey County, Kansas, and submitted to our laboratory on September 28, 1978.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

  
Benjamin R. Pearman

SAM:km  
4 c to Overbrook, Kansas  
1 c to Topeka, Kansas

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## GENERAL INFORMATION & SUMMARY

Company Tutcher Oil & Gas Company Lease Williamson Well No. 3

Location 330' SNL & 660' WEL E $\frac{1}{2}$  NE $\frac{1}{4}$

Section 4 Twp. 23S Rge. 16E County Coffey State Kansas

Name of Sand	Lower Squirrel
Top of Core	1018.0
Bottom of Core	1036.5
Top of Sand	1018.0
Bottom of Sand	1026.3
Total Feet of Permeable Sand	7.3
Total Feet of Floodable Sand	1.0

**Distribution of Permeable Sand:**  
Permeability Range  
Millidarcys

	Feet	Cum. Ft.
0 - 5	3.3	3.3
5 - 15	0.7	4.0
15 - 30	3.3	7.3

Average Permeability Millidarcys	17.3
Average Percent Porosity	15.0
Average Percent Oil Saturation	40.9
Average Percent Water Saturation	44.9
Average Oil Content, Bbls./A. Ft.	504.
Total Oil Content, Bbls./Acre	4,181.
Average Percent Oil Recovery by Laboratory Flooding Tests	2.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	28.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	28.
Total Calculated Oil Recovery, Bbls./Acre	180.
(Primary & Waterflooding)	
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

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The core was reported to be from virgin territory. Drilling fluid was fresh water mud. The core was sampled by a representative of Oilfield Research Laboratories.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
1018.0 - 1019.0	Brown shaly sandstone.
1019.0 - 1021.3	Brownish gray very shaly sandstone.
1021.3 - 1022.3	Brown shaly sandstone.
1022.3 - 1026.3	Brown slightly carbonaceous slightly shaly sandstone.
1026.3 - 1036.5	Gray sandy shale.

It would appear from a study of the data that efficient primary and waterflood operations in the vicinity of this well should recover approximately 180 barrels of oil per acre. This is an average recovery of 180 barrels per acre foot from 1.0 feet of floodable pay sand analyzed in this core.

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

Original formation volume factor	1.05
Reservoir water saturation, percent	24.0
Average porosity, percent	17.6
Oil saturation after flooding, percent	46.0
Performance factor, percent	50.0
Net floodable pay sand, feet	1.0

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**RESULTS OF SATURATION & PERMEABILITY TESTS**

TABLE 1-B

Company Tutcher Oil & Gas Company Lease Williamson 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			Ft.	Cum. Ft.		
1	1018.5	15.5	43	43	517	4.2	1.0	1.0	517	4.20
2	1019.5	12.3	14	80	134	Imp.	1.0	2.0	134	0.00
3	1020.5	10.1	25	70	196	0.52	1.3	3.3	255	0.68
4	1021.5	14.8	35	51	402	2.8	1.0	4.3	402	28.00
5	1022.5	17.6	51	27	696	12.	0.7	5.0	487	8.40
6	1023.5	17.4	48	30	648	29.	1.0	6.0	648	29.00
7	1024.5	17.2	51	25	681	29.	1.0	7.0	681	29.00
8	1025.5	16.9	62	26	813	21.	1.3	8.3	1,057	27.00

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lease	Well No.			
Tutcher Oil & Gas Company	Williamson	3			
			Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys
			1018.0 - 1026.3	7.3	17.3
					Permeability Capacity Ft. x Md.
					126.28
			Depth Interval, Feet	Average Percent Porosity	Average Percent Water Saturation
			1018.0 - 1026.3	15.0	44.9
			8.3	40.9	504
					Average Oil Content Bbl./A. Ft.
					Total Oil Content Bbls./Acre
					4,181

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## RESULTS OF LABORATORY FLOODING TESTS

**TABLE IV**

Company Tutcher Oil & Gas Company Lease Williamson 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	Bbls./A. Ft.			
1	1018.5	15.5	43	518	0	0	43	43	518	0	Imp.	-
2	1019.5	12.3	14	134	0	0	14	80	134	0	Imp.	-
3	1020.5	10.1	25	196	0	0	25	70	196	0	Imp.	-
4	1021.5	14.8	35	402	0	0	35	51	402	0	Imp.	-
5	1022.5	17.4	48	649	0	0	48	30	649	0	Imp.	-
6	1023.5	17.6	48	656	2	28	46	45	628	31	0.61	30
7	1024.5	17.7	50	687	0	0	50	47	687	31	0.61	30
8	1025.5	16.9	62	813	0	0	62	26	813	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	Tutcher Oil & Gas Company	Lease	Williamson	Well No.	3
Depth Interval, Feet	1018.0 - 1026.3				
Feet of Core Analyzed	1.0				
Average Percent Porosity	17.6				
Average Percent Original Oil Saturation	48.0				
Average Percent Oil Recovery	2.0				
Average Percent Residual Oil Saturation	46.0				
Average Percent Residual Water Saturation	45.0				
Average Percent Total Residual Fluid Saturation	91.0				
Average Original Oil Content, Bbls./A. Ft.	656.				
Average Oil Recovery, Bbls./A. Ft.	28.				
Average Residual Oil Content, Bbls./A. Ft.	628.				
Total Original Oil Content, Bbls./Acre	656.				
Total Oil Recovery, Bbls./Acre	28.				
Total Residual Oil Content, Bbls./Acre	628.				
Average Effective Permeability, Millidarcys	0.61				
Average Initial Fluid Production Pressure, p.s.i.	30.0				

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