



# OILFIELD RESEARCH LABORATORIES

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February 27, 1979

Triangle Petroleum Company  
Box 1047  
Independence, Kansas 67301

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Miller Lease, Well No. 3, Montgomery County, Kansas, and submitted to our laboratory on February 21, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

*Benjamin R. Pearman*  
Benjamin R. Pearman

SAM:km  
5 c to Independence, Kansas

# Oilfield Research Laboratories

## GENERAL INFORMATION & SUMMARY

Company Triangle Petroleum Company Lease Miller Well No. 3  
 Location 165' SNL & 495' WEL W3/4 S1/4

Section 14 Twp. 31S Rge. 16E County Montgomery State Kansas

Name of Sand	Bartlesville
Top of Core	817.0
Bottom of Core	835.5
Top of Sand	817.0
Bottom of Sand	834.8
Total Feet of Permeable Sand	12.5
Total Feet of Floodable Sand	8.0

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

	Feet	Cum. Ft.
0 - 1	3.5	3.5
1 - 5	3.4	6.9
5 - 10	4.0	10.9
10 & Above	1.6	12.5

Average Permeability Millidarcys	7.4
Average Percent Porosity	14.4
Average Percent Oil Saturation	33.3
Average Percent Water Saturation	44.2
Average Oil Content, Bbls./A. Ft.	380.
Total Oil Content, Bbls./Acre	5,621.
Average Percent Oil Recovery by Laboratory Flooding Tests	5.3
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	67.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	538.
Total Calculated Oil Recovery, Bbls./Acre (Primary & Waterflooding)	1,920.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

The core was sampled and the samples sealed in plastic bags by an agent of the laboratory. The drilling fluid consisted of fresh water mud. The core was reported to be from non-virgin territory.

#### FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
817.0 - 818.5	Light brown very shaly sandstone.
818.5 - 820.0	Gray sandy shale.
820.0 - 820.5	Light brown very shaly sandstone.
820.5 - 822.0	Gray sandy shale.
822.0 - 823.8	Gray very shaly sandstone.
823.8 - 824.8	Light brown and gray finely laminated very shaly sandstone.
824.8 - 828.0	Brown slightly shaly sandstone.
828.0 - 829.0	Light brown very shaly sandstone.
829.0 - 834.2	Brown slightly shaly sandstone. Vertical fracture from 832.6 to 833.0.
834.2 - 834.8	Brown sandstone.
834.8 - 835.5	Finely laminated gray shale.

#### SUMMARY

From a study of the data, it would appear that efficient primary and waterflood operations in the vicinity of this well should recover approximately 1,920 barrels of oil per acre. This is an average recovery of 240 barrels per acre foot from 8.0 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	1.06
Reservoir water saturation, percent	25.
Average porosity, percent	16.3
Oil saturation after flooding, percent	32.9
Performance factor, percent	50.0
Net floodable pay sand, feet	8.0

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Triangle Petroleum Company Lease Miller 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.	Cam. Ft.		
1	817.6	9.6	18	70	134	Imp.	1.0	1.0	134	0.00
2	818.3	13.3	34	39	351	Imp.	0.5	1.5	176	0.00
3	820.3	13.3	33	44	341	0.19	0.5	2.0	171	0.10
4	822.3	12.0	18	53	168	0.36	1.0	3.0	168	0.36
5	823.3	11.7	19	56	173	Imp.	0.8	3.8	138	0.00
6	824.3	13.3	39	31	402	0.37	1.0	4.8	402	0.37
7	825.4	15.8	42	30	515	4.4	1.2	6.0	618	5.28
8	826.4	17.3	37	51	497	8.7	1.0	7.0	497	8.70
9	827.5	17.3	33	39	443	9.4	1.0	8.0	443	9.40
10	828.5	12.0	32	51	298	0.39	1.0	9.0	298	0.39
11	829.5	18.4	39	33	557	11.	1.0	10.0	557	11.00
12	830.5	15.3	37	40	439	8.3	1.0	11.0	439	8.30
13	831.5	16.7	30	44	389	5.3	1.0	12.0	389	5.30
14	832.5	13.2	32	42	328	3.1	1.0	13.0	328	3.10
15	833.5	12.1	45	46	422	3.0	1.2	14.2	506	3.60
16	834.5	18.7	41	37	595	62.	0.6	14.8	357	37.20

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lease	Miller	Well No.		
Triangle Petroleum Company			3		
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
817.0 - 824.8	2.5	0.33	0.83		
824.8 - 834.8	10.0	9.2	92.27		
817.0 - 834.8	12.5	7.4	93.10		
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre	
817.0 - 824.8	4.8	25.8	50.1	248	1,189
824.8 - 834.8	10.0	36.9	41.3	443	4,432
817.0 - 834.8	14.8	33.3	44.2	380	5,621

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## RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Triangle Petroleum Company Lease Miller 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	817.6	9.8	19	144	0	0	19	71	0	Imp.	-
2	818.3	13.3	35	362	0	0	35	53	0	Imp.	-
3	820.3	13.1	34	345	0	0	34	55	0	Imp.	-
4	822.3	12.2	17	161	0	0	17	70	0	Imp.	-
5	823.3	11.8	21	192	0	0	21	69	0	Imp.	-
6	824.3	13.2	37	379	0	0	37	52	0	Imp.	-
7	825.4	16.0	42	521	11	137	31	64	14	0.30	40
8	826.4	17.0	37	488	9	119	28	66	24	0.52	30
9	827.5	17.5	33	448	3	41	30	61	45	0.67	30
10	828.5	12.0	32	298	0	0	32	60	0	Imp.	-
11	829.5	17.9	39	542	6	83	33	62	54	0.90	30
12	830.5	15.6	37	448	3	36	34	57	5	0.15	50
13	831.5	17.1	30	398	2	26	28	62	36	0.67	25
14	832.5	13.7	32	340	0	0	32	61	5	0.15	45
15	833.5	12.6	45	440	3	29	42	53	19	0.45	30
16	834.5	18.5	41	589	4	57	37	57	299	5.85	20

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## SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Triangle Petroleum CompanyLease MillerWell No. 3Depth Interval, Feet 824.8 - 834.8Feet of Core Analyzed 8.0Average Percent Porosity 16.3Average Percent Original Oil Saturation 38.2Average Percent Oil Recovery 5.3Average Percent Residual Oil Saturation 32.9Average Percent Residual Water Saturation 60.3Average Percent Total Residual Fluid Saturation 93.2Average Original Oil Content, Bbls./A. Ft. 479.Average Oil Recovery, Bbls./A. Ft. 67.Average Residual Oil Content, Bbls./A. Ft. 412.Total Original Oil Content, Bbls./Acre 3,831.Total Oil Recovery, Bbls./Acre 538.Total Residual Oil Content, Bbls./Acre 3,293.Average Effective Permeability, Millidarcys 0.92Average Initial Fluid Production Pressure, p.s.i. 33.3

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