



OILFIELD RESEARCH LABORATORIES

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November 18, 1980

James E. Russell Petroleum, Inc.
P. O. Box 2618
Abilene, Texas 79604

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Minckley B Lease, Well No. W-8, located in Anderson County, Kansas and submitted to our laboratory on August 28, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Sanford A. Michel

SAM/kas

3 c to Abilene, Texas
2 c to Chanute, Kansas

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GENERAL INFORMATION & SUMMARY

Company James E. Russell Petroleum, Inc. Lease Minckley B Well No. W-8

Location 880' EWL & 1320' SNL - SW $\frac{1}{4}$

Section 3 Twp. 23S Rge. 19E County Anderson State Kansas

Elevation, Feet Datum: Mean Sea Level (Ground Level) 1043.5

Name of Sand	-	Squirrel
Top of Core	-	689.0
Bottom of Core	-	709.0
Top of Sand	(Tested)	693.2
Bottom of Sand	-	700.8
Total Feet of Permeable Sand	-	7.6
Total Feet of Floodable Sand	-	1.9

Distribution of Permeable Sand:
Permeability Range
Millidarcys

	Feet	Cum. Ft.
0 - 5	3.4	3.4
5 - 10	0.6	4.0
10 - 20	2.1	6.1
30 - 40	1.5	7.6

Average Permeability Millidarcys	-	12.6
Average Percent Porosity	-	14.3
Average Percent Oil Saturation	-	50.0
Average Percent Water Saturation	-	29.5
Average Oil Content, Bbls./A. Ft.	-	562.
Total Oil Content, Bbls./Acre	-	4,272.
Average Percent Oil Recovery by Laboratory Flooding Tests	-	14.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	-	173.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	-	329.
Total Calculated Oil Recovery, Bbls./Acre	-	See "Calculated Recovery" Section

The core was sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid. The core was from a non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
689.0 - 689.6	Shale, gray.
689.6 - 692.3	Shale, gray, calcareous, sandy.
692.3 - 692.8	Sandstone, brown, very shaly. First oil show at 692.3
692.8 - 693.2	Shale, gray, sandy.
693.2 - 694.1	Sandstone, brown shaly.
694.1 - 694.7	Sandstone, brown, slightly shaly.
694.7 - 697.2	Sandstone, brown, slightly calcareous.
697.2 - 698.3	Sandstone and shale, brown and gray laminated, slightly calcareous.
698.3 - 699.4	Sandstone, brown, slightly calcareous.
699.4 - 700.8	Sandstone and shale, brown and gray, slightly calcareous.
700.8 - 709.0	Shale, gray, sandy.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 329 barrels of oil per acre was obtained from 1.9 feet of sand. The weighted average percent oil saturation was reduced from 63.2 to 49.2, or represents an average recovery of 14.0 percent. The weighted average effective permeability of the samples is 0.51 millidarcys, while the average initial fluid production pressure is 42.5 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 8 samples tested, 2 produced water and oil, and 1 sample produced water only. This indicates that approximately 25 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 410 barrels of oil per acre. This is an average recovery of 218 barrels per acre foot from 1.9 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	15.0
Average porosity, percent	16.1
Oil saturation after flooding, percent	49.2
Performance factor, percent, estimated	55.0
Net floodable sand, feet	1.9

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company James E. Russell Petroleum, Inc.

Lease Minckley B

Well No. W-8

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbbs. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	693.5	8.9	38	59	97	262	0.51	0.9	0.9	236	0.46
2	694.5	17.4	60	17	77	810	7.2	0.6	1.5	486	4.32
3	695.5	17.5	43	26	69	584	15.	1.0	2.5	584	15.00
4	696.5	15.8	65	17	82	797	34.	1.5	4.0	1196	51.00
5	697.5	14.7	39	24	63	445	4.3	1.1	5.1	490	4.73
6	698.5	11.1	56	37	93	482	17.	1.1	6.2	530	18.70
7	699.5	14.2	42	33	75	463	0.92	1.0	7.2	463	0.92
8	700.5	16.5	56	23	74	717	1.0	0.4	7.6	287	0.40

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company James E. Russell Petroleum, Inc. Lease Minckley B Well No. W-8

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
693.2 - 700.8	7.6	12.6	95.53

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
693.2 - 700.8	7.6	14.3	50.0	29.5	562	4,272

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

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	693.5	9.1	38	268	0	0	38	59	0	Imp.	-	
2	694.5	17.4	60	810	0	0	60	32	0	Imp.	-	
3	695.5	17.0	44	580	0	0	44	29	0	Imp.	-	
4	696.5	15.9	65	802	15	185	50	46	31	0.56	35	
5	697.5	14.8	39	448	0	0	39	58	0	Imp.	-	
6	698.5	11.2	56	487	0	0	56	40	35	0.86	35	
7	699.5	13.7	43	457	0	0	43	36	0	Imp.	-	
8	700.5	16.5	56	717	10	128	46	43	4	0.30	50	

Company James E. Russell Petroleum, Inc. Lease Minckley B Well No. W-8

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	James E. Russell Petroleum, Inc.	Lease	Minckley B	Well No.	W-8
Depth Interval, Feet	693.2 - 700.8				
Feet of Core Analyzed	1.9				
Average Percent Porosity	16.1				
Average Percent Original Oil Saturation	63.2				
Average Percent Oil Recovery	14.0				
Average Percent Residual Oil Saturation	49.2				
Average Percent Residual Water Saturation	45.4				
Average Percent Total Residual Fluid Saturation	94.6				
Average Original Oil Content, Bbls./A. Ft.	784.				
Average Oil Recovery, Bbls./A. Ft.	173.				
Average Residual Oil Content, Bbls./A. Ft.	611.				
Total Original Oil Content, Bbls./Acre	1,490.				
Total Oil Recovery, Bbls./Acre	329.				
Total Residual Oil Content, Bbls./Acre	1,161.				
Average Effective Permeability, Millidarcys	0.51				
Average Initial Fluid Production Pressure, p.s.i.	42.5				

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