



OILFIELD RESEARCH LABORATORIES

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

December 21, 1981

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 Burke Lease, Well No. 0-10, located in Anderson County, Kansas and submitted to our laboratory on December 15, 1981.

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

- REGISTERED ENGINEERS -

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

Offield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company James E. Russell Petroleum, Inc. Lease Burke Well No. 0-10
 Location 543' EWL & 988' SNL NW¼
 Section 26 Twp. 22S Rge. 19E County Anderson State Kansas

Elevation, Feet Datum: Mean Sea Level (Ground Level) 1087.95
 Name of Sand..... Squirrel
 Top of Core 777.0
 Bottom of Core 796.7
 Top of Sand 778.2
 Bottom of Sand 791.6
 Total Feet of Permeable Sand 8.0
 Total Feet of Floodable Sand 2.4

Distribution of Permeable Sand:
 Permeability Range
 Millidarcys

	Feet	Cum. Ft.
0 - 2	3.8	3.8
2 - 3	1.6	5.4
5 - 10	1.6	7.0
20 - 22	1.0	8.0

Average Permeability Millidarcys 5.1
 Average Percent Porosity 13.3
 Average Percent Oil Saturation 36.3
 Average Percent Water Saturation..... 54.5
 Average Oil Content, Bbls./A. Ft. 384.
 Total Oil Content, Bbls./Acre 5,143.
 Average Percent Oil Recovery by Laboratory Flooding Tests..... 4.4
 Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. 50.
 Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre 120.
 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.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
777.0 - 778.2	Shale, gray.
778.2 - 781.4	Sandstone, slightly shaly, grayish brown.
781.4 - 783.2	Sandstone, very shaly, gray.
783.2 - 785.2	Sandstone, very shaly, grayish brown.
785.2 - 790.6	Sandstone and shale, laminated brown and gray.
790.6 - 791.6	Sandstone, very shaly, gray.
791.6 - 796.7	Shale, gray.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 120 barrels of oil per acre was obtained from 2.4 feet of sand. The weighted average percent oil saturation was reduced from 51.3 to 46.9, or represents an average recovery of 4.4 percent. The weighted average effective permeability of the samples is 0.08 millidarcys, while the average initial fluid production pressure is 46.7 pounds per square inch (See Table V).

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 290 barrels of oil per acre. This is an average recovery of 122 barrels per acre foot from 2.4 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	25.0
Average porosity, percent	14.3
Oil saturation after flooding, percent	46.9
Performance factor, percent, estimated	45.0
Net floodable sand, feet	2.4

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company James E. Russell Petroleum, Inc. Lease Burke Well No. 0 - 10

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	778.4	11.0	30	56	86	256	1.6	1.0	1.0	256	1.60
2	779.6	14.5	51	34	85	574	5.7	0.9	1.9	517	5.13
3	780.2	14.3	59	27	86	655	9.3	0.7	2.6	459	6.51
4	781.3	15.3	54	38	92	641	2.6	0.6	3.2	385	1.56
5	782.5	11.8	24	70	94	220	Imp.	1.8	5.0	396	0.00
6	783.4	13.5	42	56	98	440	Imp.	1.0	6.0	440	0.00
7	784.5	14.8	21	65	86	241	0.60	1.0	7.0	241	0.60
8	785.7	13.8	45	41	86	482	1.6	0.8	7.8	386	1.28
9	786.6	16.9	31	52	83	406	20.	1.0	8.8	406	20.00
10	787.5	10.3	35	60	95	280	1.8	1.0	9.8	280	1.80
11	788.4	15.9	62	26	88	765	2.4	1.0	10.8	765	2.40
12	789.6	10.6	29	68	97	239	Imp.	1.0	11.8	239	0.00
13	790.5	12.5	34	63	97	330	Imp.	0.6	12.4	198	0.00
14	791.4	13.3	17	79	96	175	Imp.	1.0	13.4	175	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lease	Well No.	0-10
James E. Russell Petroleum, Inc.	Burke		
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
778.2 - 791.6	8.0	5.1	40.88
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Oil Saturation	Average Percent Water Saturation
778.2 - 791.6	13.4	36.3	54.5
		Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
		384	5,143

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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	778.4	11.3	29	254	0	0	29	59	0	Imp.	-	
2	779.6	14.6	51	578	3	34	48	42	0	0.01	50	
3	780.2	14.4	59	659	9	101	50	42	0	0.02	50	
4	781.3	15.1	55	644	0	0	55	38	0	Imp.	-	
5	782.5	12.3	23	219	0	0	23	72	0	Imp.	-	
6	783.4	13.2	43	440	0	0	43	55	0	Imp.	-	
7	784.5	14.7	21	239	0	0	21	66	0	Imp.	-	
8	785.7	13.9	45	485	2	22	43	48	10	0.22	40	
9	786.6	16.4	32	407	0	0	32	54	0	Imp.	-	
10	787.5	10.2	35	277	0	0	35	60	0	Imp.	-	
11	788.4	16.1	61	762	0	0	61	27	0	Imp.	-	
12	789.6	10.5	29	236	0	0	29	68	0	Imp.	-	
13	790.5	12.9	33	330	0	0	33	65	0	Imp.	-	
14	791.4	13.4	17	177	0	0	17	80	0	Imp.	-	

Company James E. Russell Petroleum, Inc. Lease Burke Well No. 0-10

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 Burke

Well No. 0-10

Depth Interval, Feet 778.2 - 791.6

Feet of Core Analyzed 2.4

Average Percent Porosity 14.3

Average Percent Original Oil Saturation 51.3

Average Percent Oil Recovery 4.4

Average Percent Residual Oil Saturation 46.9

Average Percent Residual Water Saturation 44.0

Average Percent Total Residual Fluid Saturation 90.9

Average Original Oil Content, Bbls./A. Ft. 571.

Average Oil Recovery, Bbls./A. Ft. 50.

Average Residual Oil Content, Bbls./A. Ft. 521.

Total Original Oil Content, Bbls./Acre 1,371.

Total Oil Recovery, Bbls./Acre 120.

Total Residual Oil Content, Bbls./Acre 1,251.

Average Effective Permeability, Millidarcys 0.08

Average Initial Fluid Production Pressure, p.s.i. 46.7

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

KEY:



SHALE



IMPERMEABLE TO WATER



SHALY SANDSTONE



LAMINATED SANDSTONE AND SHALE



FLOODPOT RESIDUAL OIL SATURATION

JAMES E. RUSSELL PETROLEUM, INC.

BURKE LEASE

ANDERSON COUNTY, KANSAS

WELL NO. 0-10

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCS	CALCULATED OIL RECOVERY, BBLs. / ACRE
778.2 - 791.6	13.4	13.3	36.3	54.5	5.1	290 (PRIMARY AND WATERFLOODING)

NOTE: ELEVATION, FEET - DATUM: MEAN SEA LEVEL (GROUND LEVEL) 1087.95

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
DECEMBER, 1981

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