OILFIELD RESEARCH LABORATORIES

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

June 2, 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 Minckley "B", Section 10 Lease, Well No. 123, located in Anderson County, Kansas and submitted to our laboratory on May 21, 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

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company James E. Russell Petroleum, Inc. Lease Minckley "B", Section 10 Well No. 123

Location 650' SNL & 970' EWL - NW¼

Section 10 Twp. 23S Rge. 19E County Anderson State Kansas

Elevation, Feet Datum: Mean Sea Level (Ground Level)	1040.4
Name of Sand	Upper Squirrel
Top of Core	692.0
Bottom of Core	712.0
Top of Sand	696.4
Bottom of Sand	707.4
Total Feet of Permeable Sand	8.3
Total Feet of Floodable Sand	3.7

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
3 - 5	1.4	1.4
5 - 10	4.2	5.6
11 - 15	2.7	8.3

Average Permeability Millidarcys	7.9
Average Percent Porosity	15.1
Average Percent Oil Saturation	29.9
Average Percent Water Saturation	45.4
Average Oil Content, Bbls./A. Ft.	362.
Total Oil Content, Bbls./Acre	3,219.
Average Percent Oil Recovery by Laboratory Flooding Tests	2.2
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	26.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	95.
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:

Depth Interval, Feet	Description
692.0 - 696.4	Shale, gray, sandy.
696.4 - 697.0	Sandstone, grayish light brown, shaly.
697.0 - 697.8	Shale, gray, sandy.
697.8 - 698.5	Sandstone and shale, light brown and gray laminated.
698.5 - 699.1	Sandstone, brown, shaly.
699.1 - 701.8	Sandstone, brown.
701.8 - 702.8	Sandstone, brown, shaly.
702.8 - 703.4	Sandstone and shale, light brown and gray laminated.
703.4 - 704.3	Sandstone, brown, slightly shaly.
704.3 - 705.7	Sandstone and shale, light brown and gray laminated.
705.7 - 706.8	Sandstone, brown, slightly shaly.
706.8 - 707.4	Sandstone, brown, shaly.
707.4 - 712.0	Shale, gray, sandy.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 95 barrels of oil per acre was obtained from 3.7 feet of sand. The weighted average percent oil saturation was reduced from 31.8 to 29.6, or represents an average recovery of 2.2 percent. The weighted average effective permeability of the samples is 0.37 millidarcys, while the average initial fluid production pressure is 46.3 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 10 samples tested, 4 produced water and oil, and 1 produced water only. This indicates that approximately 40 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 890 barrels of oil per acre. This is an average recovery of 240 barrels per acre foot from 3.7 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	30.0
Average porosity, percent	15.2
Oil saturation after flooding, percent	29.6
Performance factor, percent, estimated	55.0
Net floodable sand, feet	3.7

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company James E. Russell Petroleum, Inc. Lease Minckley "B", Section 10 Well No. 123

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	696.5	9.2	12	70	82	86	Imp.	0.6	0.6	52	0.00
2	698.6	18.8	10	41	51	146	6.3	0.6	1.2	88	3.78
3	699.6	16.9	31	32	63	406	11.	1.0	2.2	406	11.00
4	700.5	14.2	28	43	71	309	11.	1.0	3.2	309	11.00
5	701.7	14.8	34	47	81	390	11.	0.7	3.9	273	7.70
6	702.6	14.7	35	39	74	399	6.3	1.0	4.9	399	6.30
7	703.7	16.3	33	49	82	417	9.1	0.9	5.8	375	8.19
8	705.4	13.3	13	75	88	134	3.2	1.4	7.2	188	4.48
9	706.5	16.9	55	21	76	721	9.4	1.1	8.3	793	10.34
10	707.3	16.4	44	30	74	560	5.2	0.6	8.9	336	3.12

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company James E. Russell Petroleum, Inc. Lease Minckley "B", Section 10 Well No. 123

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
696.4 - 707.4	8.3	7.9	65.91

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
696.4 - 707.4	8.9	15.1	29.9	45.4	362	3,219

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company James E. Russell Petroleum, Inc. Lease Minckley "B", Section 10 Well No. 123

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	696.5	9.3	12	87	0	0	12	71	87	0	Imp.	-
2	698.6	18.9	10	147	0	0	10	42	147	0	Imp.	-
3	699.6	17.0	31	409	2	26	29	64	383	26	0.30	45
4	700.5	14.3	28	311	2	22	26	67	289	22	0.37	45
5	701.7	14.8	34	390	3	34	31	54	356	10	0.37	45
6	702.6	14.6	35	396	2	23	33	50	373	12	0.45	50
7	703.7	15.8	34	417	0	0	34	57	417	10	0.37	50
8	705.4	13.4	13	135	0	0	13	77	135	0	Imp.	-
9	706.5	17.2	54	721	0	0	54	24	721	0	Imp.	-
10	707.3	16.0	45	559	0	0	45	31	559	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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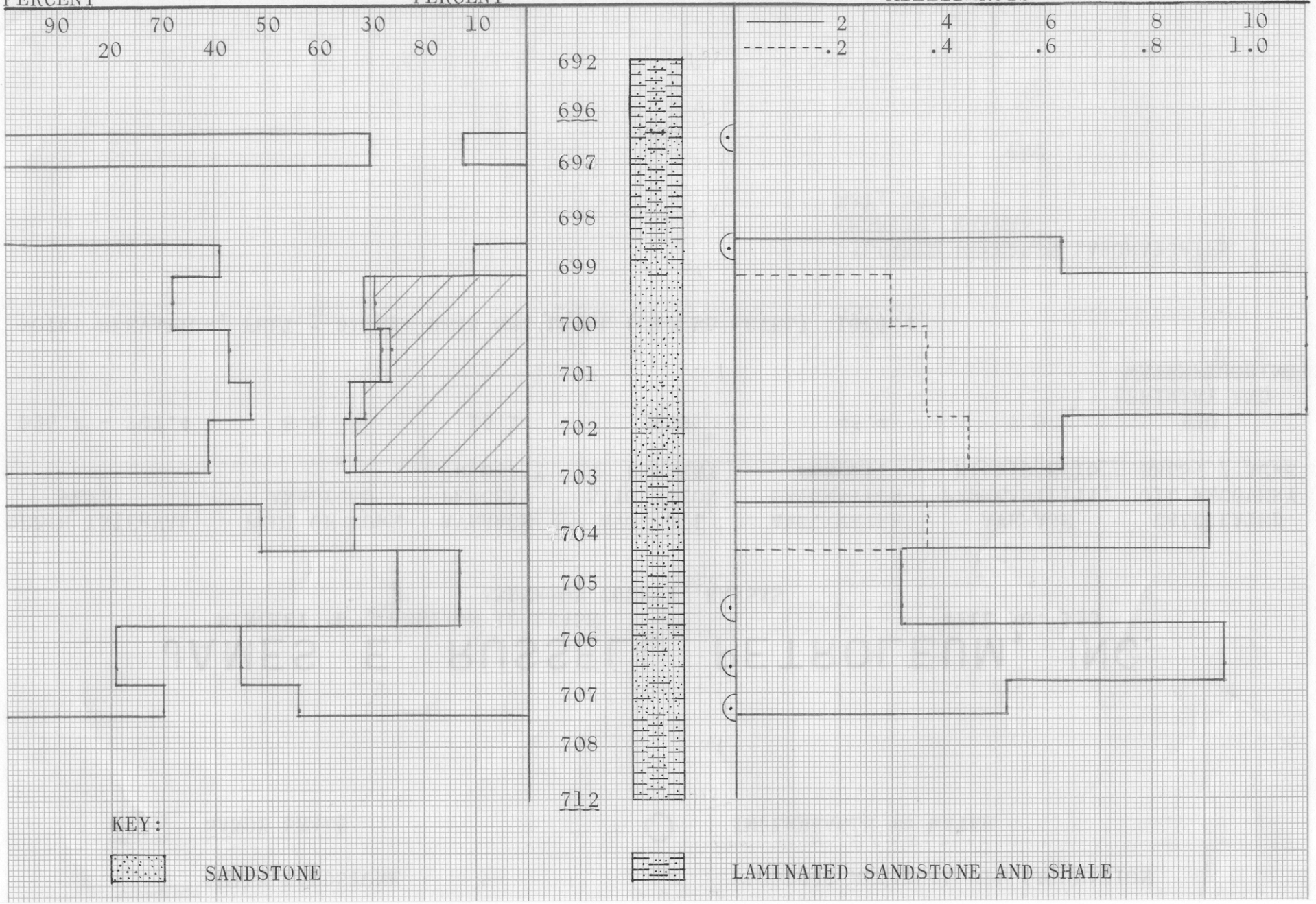
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company James E. Russell Petroleum, Inc. Lease Minckley "B", Section 10 Well No. 123

Depth Interval, Feet	696.4 - 707.4
Feet of Core Analyzed	3.7
Average Percent Porosity	15.2
Average Percent Original Oil Saturation	31.8
Average Percent Oil Recovery	2.2
Average Percent Residual Oil Saturation	29.6
Average Percent Residual Water Saturation	59.1
Average Percent Total Residual Fluid Saturation	88.7
Average Original Oil Content, Bbls./A. Ft.	376.
Average Oil Recovery, Bbls./A. Ft.	26.
Average Residual Oil Content, Bbls./A. Ft.	350.
Total Original Oil Content, Bbls./Acre	1,389.
Total Oil Recovery, Bbls./Acre	95.
Total Residual Oil Content, Bbls./Acre	1,294.
Average Effective Permeability, Millidarcys	0.37
Average Initial Fluid Production Pressure, p.s.i.	46.3

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


WATER SAT., PERCENT
OIL SAT., PERCENT
90 70 50 30 10
20 40 60 80
PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS
2 4 6 8 10
.2 .4 .6 .8 1.0
692
696
697
698
699
700
701
702
703
704
705
706
707
708
712
KEY:
SANDSTONE
LAMINATED SANDSTONE AND SHALE


SHALY SANDSTONE


SANDY SHALE


FLOODPOT RESIDUAL OIL SATURATION


IMPERMEABLE TO WATER

JAMES E. RUSSELL PETROLEUM, INC.

MINCKEY "B", SECTION 10 LEASE WELL NO. 123

ANDERSON COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLS. / ACRE
696.4 - 707.4	8.9	15.1	29.9	45.4	7.9	890 (PRIMARY AND WATERFLOODING)

NOTE: ELEVATION, FEET - DATUM: MEAN SEA LEVEL (GROUND LEVEL) 1040.4

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
MAY, 1981

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