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

June 25, 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 Unit 2, Robbins (Martin Glover) Lease, Well No. R-29, located in Anderson County, Kansas and submitted to our laboratory on June 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

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company James E. Russell Petroleum, Inc. Lease Unit 2, Robbins (Martin Glover) Well No. R-29

Location 330' SNL & 2370' EWL, NE¼

Section 32 Twp. 22S Rge. 19E County Anderson State Kansas

Elevation, Feet — Datum: Mean Sea Level (Ground Level)	1081.9
Name of Sand	Squirrel
Top of Core	766.0
Bottom of Core	784.7
Top of Sand	766.0
Bottom of Sand (Tested)	783.0
Total Feet of Permeable Sand	12.1
Total Feet of Floodable Sand	5.1

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	7.0	7.0
12 - 30	1.1	8.1
40 - 70	2.0	10.1
110 - 155	2.0	12.1

Average Permeability Millidarcys	34.5
Average Percent Porosity	17.3
Average Percent Oil Saturation	34.3
Average Percent Water Saturation	44.1
Average Oil Content, Bbls./A. Ft.	466.
Total Oil Content, Bbls./Acre	6,764.
Average Percent Oil Recovery by Laboratory Flooding Tests	6.4
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	100.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	509.
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 reported to be from a non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
766.0 - 767.4	Sandstone, light brown, shaly.
767.4 - 768.0	Shale, gray, sandy.
768.0 - 769.8	Sandstone, light brown, shaly.
769.8 - 770.9	Shale, gray, sandy.
770.9 - 772.6	Sandstone, brown.
772.6 - 773.1	Sandstone and shale, brown and gray laminated.
773.1 - 776.1	Sandstone, brown.
776.1 - 776.4	Shale, gray, sandy.
776.4 - 776.8	Sandstone, brown.
776.8 - 784.1	Sandstone and shale, brown and gray laminated.
784.1 - 784.7	Shale, gray, sandy.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 509 barrels of oil per acre was obtained from 5.1 feet of sand. The weighted average percent oil saturation was reduced from 37.3 to 30.9, or represents an average recovery of 6.4 percent. The weighted average effective permeability of the samples is 14.47 millidarcys, while the average initial fluid production pressure is 23.3 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 15 samples tested, 6 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 1,840 barrels of oil per acre. This is an average recovery of 361 barrels per acre foot from 5.1 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	20.9
Oil saturation after flooding, percent	30.9
Performance factor, percent, estimated	55.0
Net floodable sand, feet	5.1

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company James E. Russell Petroleum, Inc. **Lease** Unit 2, Robbins (Martin Glover) **Well No.** R-29

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	766.5	12.1	25	50	75	235	Imp.	1.4	1.4	329	0.00
2	768.5	12.4	45	48	93	436	3.1	0.8	2.2	349	2.48
3	769.4	15.0	7	70	77	82	Imp.	1.0	3.2	82	0.00
4	771.5	21.4	37	32	69	614	44.	1.0	4.2	614	44.00
5	772.5	15.6	43	37	80	520	13.	0.7	4.9	364	9.10
6	773.5	21.4	39	39	78	647	153.	1.0	5.9	647	153.00
7	774.4	21.5	45	29	74	751	65.	1.0	6.9	751	65.00
8	775.5	24.1	25	38	63	467	113.	1.0	7.9	467	113.00
9	776.5	17.9	35	46	81	486	27.	0.4	8.3	194	10.80
10	777.8	15.9	27	53	80	333	3.9	1.2	9.5	400	4.68
11	778.5	17.7	44	29	73	604	1.3	1.0	10.5	604	1.30
12	779.6	15.5	44	37	81	529	2.6	1.0	11.5	529	2.60
13	780.5	18.3	38	42	80	540	4.2	1.0	12.5	540	4.20
14	781.5	15.3	38	55	93	451	4.5	1.0	13.5	451	4.50
15	782.5	17.3	33	52	85	443	2.4	1.0	14.5	443	2.40

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company James E. Russell Petroleum, Inc. Lease Unit 2, Robbins (Martin Glover) Well No. R-29

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
766.0 - 769.8	0.8	3.1	2.48
770.9 - 776.8	5.1	77.4	394.90
776.8 - 783.0	6.2	3.2	19.68
766.0 - 783.0	12.1	34.5	417.06

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
766.0 - 769.8	3.2	13.1	24.4	55.8	238	760
770.9 - 776.8	5.1	20.9	37.3	35.7	595	3,037
776.8 - 783.0	6.2	16.6	37.0	44.9	479	2,967
766.0 - 783.0	14.5	17.3	34.3	44.1	466	6,764

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company James E. Russell Petroleum, Inc. Lease Unit 2, Robbins (Martin Glover) Well No. R-29

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	766.5	12.2	25	237	0	0	25	51	237	0	Imp.	-
2	768.5	12.5	45	436	0	0	45	40	436	0	Imp.	-
3	769.4	15.1	7	82	0	0	7	78	82	0	Imp.	-
4	771.5	21.5	37	617	8	133	29	66	484	362	16.83	20
5	772.5	15.7	43	524	11	134	32	59	390	216	3.60	25
6	773.5	21.5	39	651	3	50	36	57	601	422	17.49	20
7	774.4	21.6	45	754	11	184	34	52	570	458	19.16	15
8	775.5	24.1	25	467	2	37	23	72	430	380	17.49	10
9	776.5	17.8	35	483	2	28	33	50	455	20	0.75	50
10	777.8	16.0	27	335	0	0	27	54	335	0	Imp.	-
11	778.5	18.0	43	600	0	0	43	31	600	0	Imp.	-
12	779.6	15.6	44	533	0	0	44	43	533	0	Imp.	-
13	780.5	18.0	39	545	0	0	39	42	545	0	Imp.	-
14	781.5	15.4	38	454	0	0	48	56	454	12	0.90	50
15	782.5	17.4	33	445	0	0	33	53	445	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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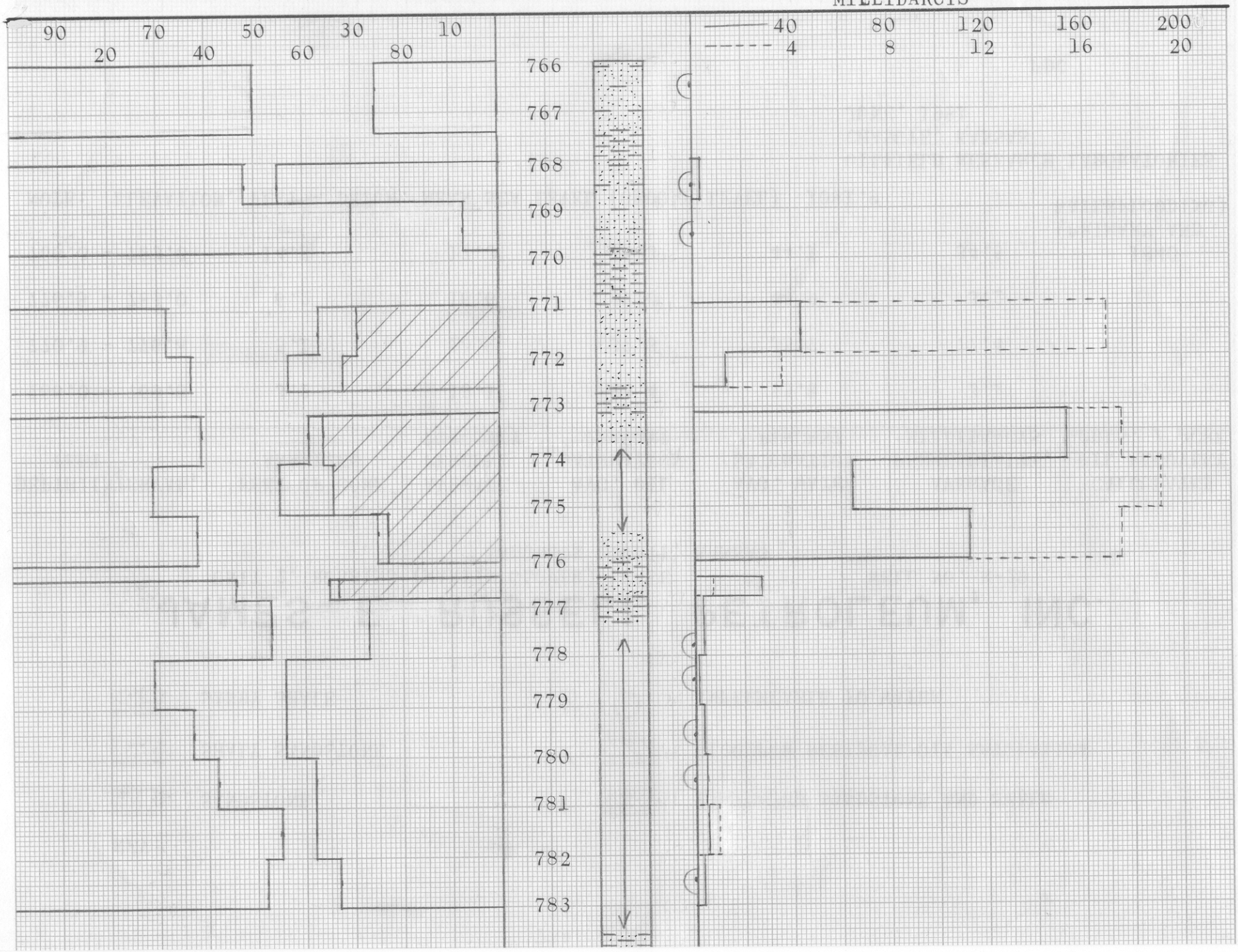
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company James E. Russell Petroleum, Inc. Lease Unit 2, Robbins (Martin Glover) Well No. R-29

Depth Interval, Feet	766.0 - 783.0
Feet of Core Analyzed	5.1
Average Percent Porosity	20.9
Average Percent Original Oil Saturation	37.3
Average Percent Oil Recovery	6.4
Average Percent Residual Oil Saturation	30.9
Average Percent Residual Water Saturation	60.5
Average Percent Total Residual Fluid Saturation	91.4
Average Original Oil Content, Bbls./A. Ft.	598.
Average Oil Recovery, Bbls./A. Ft.	100.
Average Residual Oil Content, Bbls./A. Ft.	498.
Total Original Oil Content, Bbls./Acre	3,049.
Total Oil Recovery, Bbls./Acre	509.
Total Residual Oil Content, Bbls./Acre	2,540.
Average Effective Permeability, Millidarcys	14.47
Average Initial Fluid Production Pressure, p.s.i.	23.3

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


WATER SAT., PERCENT
OIL SAT., PERCENT
PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS
90 70 50 30 10
20 40 60 80
40 80 120 160 200
4 8 12 16 20
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783

784

KEY:

SANDSTONE

SHALY SANDSTONE

SANDY SHALE

LAMINATED SANDSTONE AND SHALE

FLOODPOT RESIDUAL OIL SATURATION

IMPERMEABLE TO WATER

JAMES E. RUSSELL PETROLEUM, INC.

UNIT 2, ROBBINS (MARTIN GLOVER) LEASE WELL NO. R-29
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
766.0 - 769.8	3.2	13.1	24.4	55.8	3.1	
770.9 - 776.8	5.1	20.9	37.3	35.7	77.4	
776.8 - 783.0	6.2	16.6	37.0	44.9	3.2	
766.0 - 783.0	14.5	17.3	34.3	44.1	34.5	1840 (PRIMARY AND WATERFLOODING)

NOTE: ELEVATION, FEET - DATUM: MEAN SEA LEVEL (GROUND LEVEL) 1081.9

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JUNE, 1981

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