

15-001-26452

JAMES E. RUSSELL PETROLEUM, INC.

CORE ANALYSIS REPORT

NELSON LEASE

WELL NO. RW-10

ALLEN COUNTY, KANSAS

21-26-21E

Core  
Available

OILFIELD RESEARCH LABORATORIES

536 N. HIGHLAND

CHANUTE, KANSAS



# OILFIELD RESEARCH LABORATORIES

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

July 18, 1983

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

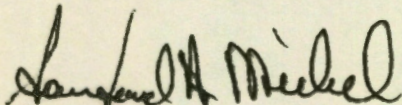
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Nelson Lease, Well No. RW-10, located in Allen County, Kansas and submitted to our laboratory on July 8, 1983.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

  
Sanford A. Michel

SAM/rmc

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

**Oilfield Research Laboratories**  
**GENERAL INFORMATION & SUMMARY**

Company James E. Russell Petroleum, Inc. Lease Nelson Well No. RW-10  
 Location 1670' WEL & 1865' SNL, SW $\frac{1}{4}$   
 Section 21 Twp. 26S Rge. 21E County Allen State Kansas

Elevation, Feet ..... DATUM: MEAN SEA LEVEL (GROUND LEVEL) 1045.7

Name of Sand ..... Bartlesville

Top of Core ..... 644.0

Bottom of Core ..... 680.0

Top of Sand ..... 644.0

Bottom of Sand ..... 656.8

Total Feet of Permeable Sand ..... 2.9

Total Feet of Productive Sand ..... 1.7

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 1	1.2	1.2
13 - 15	0.8	2.0
38 - 40	0.9	2.9

	<u>Laboratory</u>	<u>Net</u>
Average Permeability Millidarcys .....	16.2	27.2
Average Percent Porosity .....	13.8	17.9
Average Percent Oil Saturation .....	27.9	34.9
Average Percent Water Saturation .....	60.6	38.6
Average Oil Content, Bbls./A. Ft. ....	305.	473.
Total Oil Content, Bbls./Acre .....	1,798.	804.
Average Percent Oil Recovery by Laboratory Flooding Tests .....	6.2	-
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. ....	90.	-

-2-

The core was sampled by a representative of Oilfield Research Laboratories. Salt water mud and KCl were 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>
644.0 - 645.0	Sandstone, very shaly, brown, with gray shale partings.
645.0 - 647.6	Shale, gray.
647.6 - 648.0	Sandstone, very shaly, brown, with gray shale partings.
648.0 - 649.2	Shale, gray.
649.2 - 650.4	Sandstone, very shaly, grayish brown.
650.4 - 651.2	Sandstone, brown.
651.2 - 651.4	Shale, gray.
651.4 - 651.6	Sandstone, shaly, brown.
651.6 - 652.7	Shale, gray.
652.7 - 653.6	Sandstone, brown.
653.6 - 655.2	Shale, gray.
655.2 - 656.8	Sandstone, very shaly, grayish brown.
656.8 - 666.0	Shale, gray.
666.0 - 672.6	Shale, slightly sandy, gray.
672.6 - 676.5	Shale, black:
676.5 - 680.0	Shale, slightly sandy, gray.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 150 barrels of oil per acre was obtained from 1.7

-3-

feet of sand. The weighted average percent oil saturation was reduced from 34.9 to 28.7, or represents an average recovery of 6.2 percent. The weighted average effective permeability of the samples is 0.68 millidarcys, while the average initial fluid production pressure is 42.5 pounds per square inch.

#### PRIMARY RECOVERY

A detailed analysis of the core data would indicate that the pay sand section is from 650.4 feet to 653.6 feet. A well in this area should produce approximately 51 barrels of oil per acre foot by primary methods. These recovery estimates assume a pressured, virgin reservoir.

Any oil previously produced from the area represented by this core should be deducted from the above estimate.

#### WATERFLOOD RECOVERY

The estimated additional oil recovery from a well in this vicinity by waterflood is approximately 280 barrels per acre foot.

PRIMARY AND SECONDARY			
Oil Recovery Barrels Stock Tank	Solution Gas Energy	Increase By Waterflood After Primary	Total
Barrels per Acre Foot	51	280	331

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

Company James E. Russell Petroleum, Inc. Lease Nelson Well No. RW-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	644.6	11.7	29	68	97	263	Imp.	1.0	1.0	263	0.00
2	647.8	12.1	42	53	95	394	Imp.	0.4	1.5	158	0.00
3	649.5	11.9	16	78	94	148	0.64	1.2	2.6	178	0.77
4	650.6	17.5	27	45	72	367	14.	0.8	3.4	294	11.20
5	653.2	18.3	42	33	75	567	39.	0.9	4.3	510	35.10
6	655.3	12.6	26	68	94	254	Imp.	0.8	5.1	203	0.00
7	656.7	12.9	24	68	92	240	Imp.	0.8	5.9	192	0.00
			<u>AVERAGES</u>						<u>TOTALS</u>		
	644.0 - 650.4	11.8	25.0	70.3			0.64		2.6	599	0.77
	650.4 - 653.6	17.9	34.9	38.6			27.2		1.7	804	46.30
	655.2 - 656.8	12.8	25.0	68.0			0.0		1.6	395	0.00
	644.0 - 656.8	13.8	27.9	60.6			16.2		5.9	1,798	47.07

**Oilfield Research Laboratories**

**RESULTS OF LABORATORY FLOODING TESTS**

Company James E. Russell Petroleum, Inc. Lease Nelson Well No. RW-10

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	644.6	12.2	28	265	0	0	28	69	265	0	Imp.	-
2	647.8	12.5	41	398	0	0	41	54	398	0	Imp.	-
3	649.5	12.0	16	149	0	0	16	79	149	0	Imp.	-
4	650.6	18.0	27	377	2	28	25	50	349	64	1.04	35
5	653.2	18.7	42	609	10	145	32	49	464	10	0.37	50
6	655.3	12.8	26	258	0	0	26	69	258	0	Imp.	-
7	656.7	12.4	25	240	0	0	25	67	240	0	Imp.	-
						AVERAGES						
650.4 - 653.6		18.4			6.2	90.0	28.7	49.5	410		0.68	42.5

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.

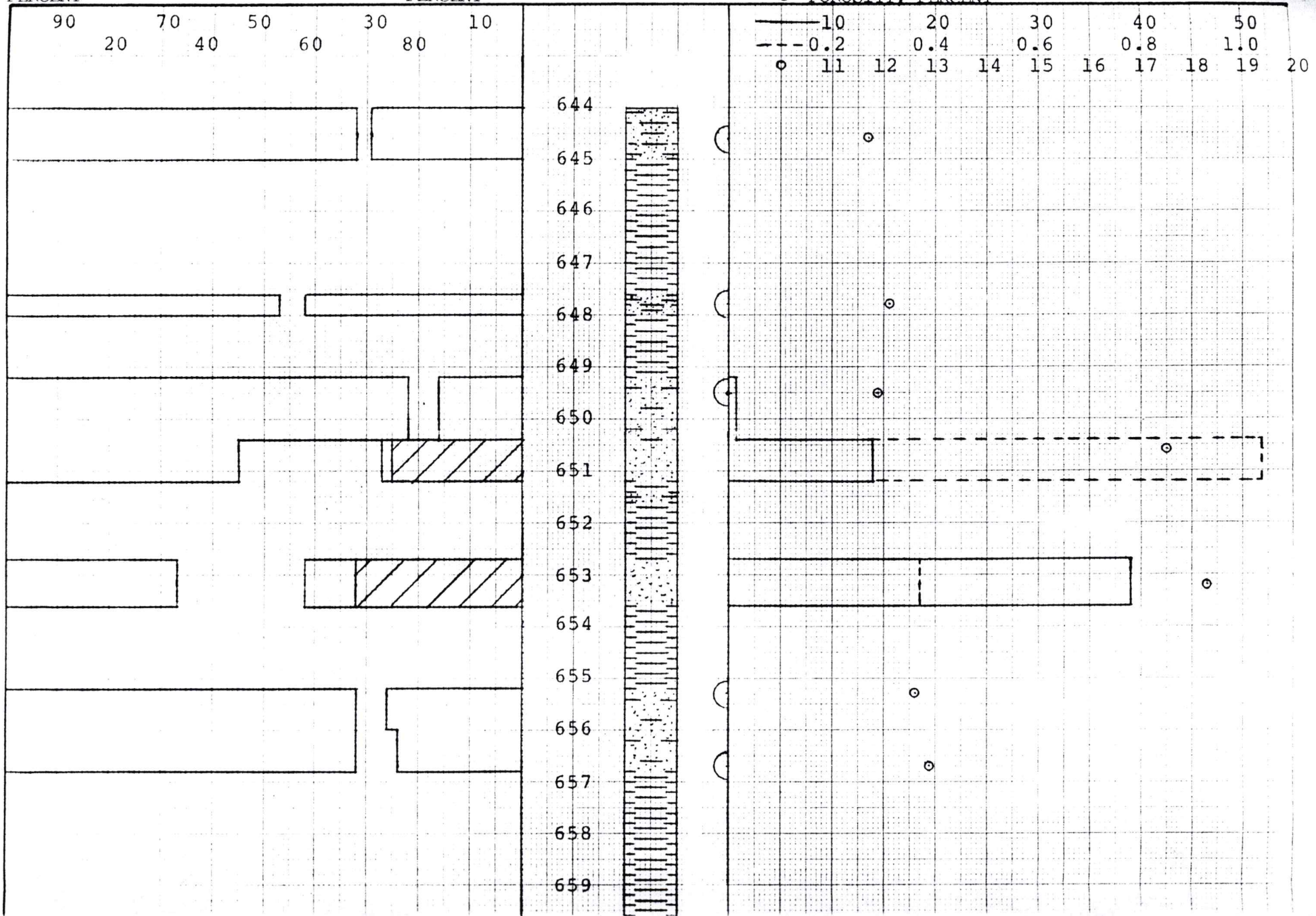
WATER SAT.,  
PERCENT



OIL SAT.,  
PERCENT



— PERMEABILITY, IN MILLIDARCYS  
- - - EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS  
○ POROSITY, PERCENT



659

660

661

662

663

664

665

666

667

668

669

670

671

672

673

674

675

676

677

678

679

677  
678  
679  
680



KEY:



SANDSTONE



SHALE



IMPERMEABLE TO WATER



SHALY SANDSTONE



SANDY SHALE



SHALY SANDSTONE WITH SHALE PARTINGS



FLOODPOT RESIDUAL OIL SATURATION

# JAMES E. RUSSELL PETROLEUM, INC.

NELSON LEASE

ALLEN COUNTY, KANSAS

WELL NO. RW - 10

DEPTH INTERVAL, FEET	AVERAGE PERCENT POROSITY	AVERAGE OIL SATURATION PERCENT	AVERAGE WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYs
-------------------------	--------------------------------	--------------------------------------	--	---

644.0 - 650.4	11.8	25.0	70.3	0.64
650.4 - 653.6	17.9	34.9	38.6	27.2
655.2 - 656.8	12.8	25.0	68.0	0.0
644.0 - 656.8	13.8	27.9	60.6	16.2

NOTE: ELEVATION, FEET - DATUM: MEAN SEA LEVEL (GROUND LEVEL) 1045.7

OILFIELD RESEARCH LABORATORIES  
CHANUTE, KANSAS  
JULY, 1983 RAL