

OILFIELD RESEARCH LABORATORIES

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

November 29, 1983

Lincoln 77, Incorporated
P. O. Box 30538
Lincoln, Nebraska 68510

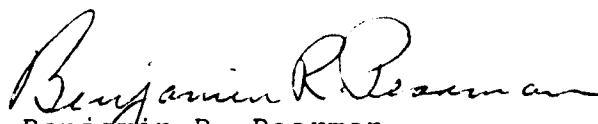
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Parmely Lease, Well No. 8, located in Coffey County, Kansas and submitted to our laboratory on November 19, 1983.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Benjamin R. Pearman

BRP/ph

4 c to Lincoln, Nebraska
1 c to Topeka, Kansas

Oilfield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company Lincoln 77, Incorporated Lease Parmely Well No. 8
 Location NE $\frac{1}{4}$, NW $\frac{1}{4}$, SW $\frac{1}{4}$
 Section 29 Twp. 22S Rge. 17E County Coffey State Kansas

Elevation, Feet

Name of Sand

Lower Squirrel

Top of Core

983.0

Bottom of Core

992.0

Top of Sand (Tested)

983.6

Bottom of Sand

991.0

Total Feet of Permeable Sand

7.4

Total Feet of Floodable Sand

2.4

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	3.0	3.0
6 - 18	3.0	6.0
40 - 52	1.4	7.4

Average Permeability Millidarcys

14.9

Average Percent Porosity

18.0

Average Percent Oil Saturation

50.7

Average Percent Water Saturation

22.1

Average Oil Content, Bbls./ A. Ft.

713.

Total Oil Content, Bbls./ Acre

5,273.

Average Percent Oil Recovery by Laboratory Flooding Tests

8.0

Average Oil Recovery by Laboratory Flooding Tests, Bbls./ A. Ft.

125.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./ Acre

299.

Total Calculated Oil Recovery, Bbls./ Acre

See "Calculated
Recovery" Section

The core was sampled and the samples sealed in plastic bags by a representative of the client. 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>
983.0 - 983.2	Gray shale.
983.2 - 983.6	Brown shaly sandstone.
983.6 - 986.0	Dark brown sandstone with widely scattered gray shale partings.
986.0 - 988.0	Gray and brown laminated shale, sandstone, and mica.
988.0 - 989.0	Dark brown sandstone with scattered gray shale inclusions.
989.0 - 991.0	Gray and brown laminated shale, sandstone, and mica.
991.0 - 992.0	Gray shale with scattered brown sandstone partings.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 299 barrels of oil per acre was obtained from 2.4 feet of sand. The weighted average percent oil saturation was reduced from 49.7 to 41.7, or represents an average recovery of 8.0 percent. The weighted average effective permeability of the samples is 0.44 millidarcys, while the average initial fluid production pressure is 36.7 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 8 samples tested, 3 produced water and oil, and 2 produced water only. This indicates that approximately 38 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 860 barrels of oil per acre. This is an average recovery of 360 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	15.0
Average porosity, percent	19.7
Oil saturation after flooding, percent	41.7
Performance factor, percent, estimated	60.0
Net floodable sand, feet	2.4

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Lincoln 77, Incorporated Lease Parmely Well No. 8

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	983.8	20.6	54	11	65	863	52.	0.7	0.7	604	36.40
2	984.8	20.8	52	14	66	839	42.	0.7	1.4	587	29.40
3	985.7	17.6	45	18	63	614	13.	1.0	2.4	614	13.00
4	986.8	17.7	50	22	72	687	7.2	1.0	3.4	687	7.20
5	987.8	16.8	42	34	76	547	4.4	1.0	4.4	547	4.40
6	988.7	19.0	60	16	76	884	18.	1.0	5.4	884	18.00
7	989.5	18.3	56	19	75	795	1.2	1.0	6.4	795	1.20
8	990.5	14.9	48	37	85	555	0.34	1.0	7.4	555	0.34

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Lease		Well No.	
Lincoln 77, Incorporated		Parmely		8	
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
983.6 - 991.0	7.4	14.9	109.94		
Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Total Oil Content Bbl./Acre
983.6 - 991.0	7.4	18.0	50.7	22.1	5,273

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company			Lincoln 77, Incorporated				Lease		Parmely		Well No.		8	
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						
1	983.8	20.7	54	867	10	161	44	40	706	40	0.67	30		
2	984.8	20.3	52	819	13	205	39	44	614	16	0.30	40		
3	985.7	18.1	45	632	3	42	42	45	590	14	0.37	40		
4	986.8	17.2	50	667	0	0	50	38	667	4	0.15	50		
5	987.8	16.3	42	531	0	0	42	47	531	4	0.15	50		
6	988.7	18.7	60	870	0	0	60	17	870	0	Imp.	-		
7	989.5	18.6	55	794	0	0	55	20	794	0	Imp.	-		
8	990.5	15.1	48	562	0	0	48	37	562	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.

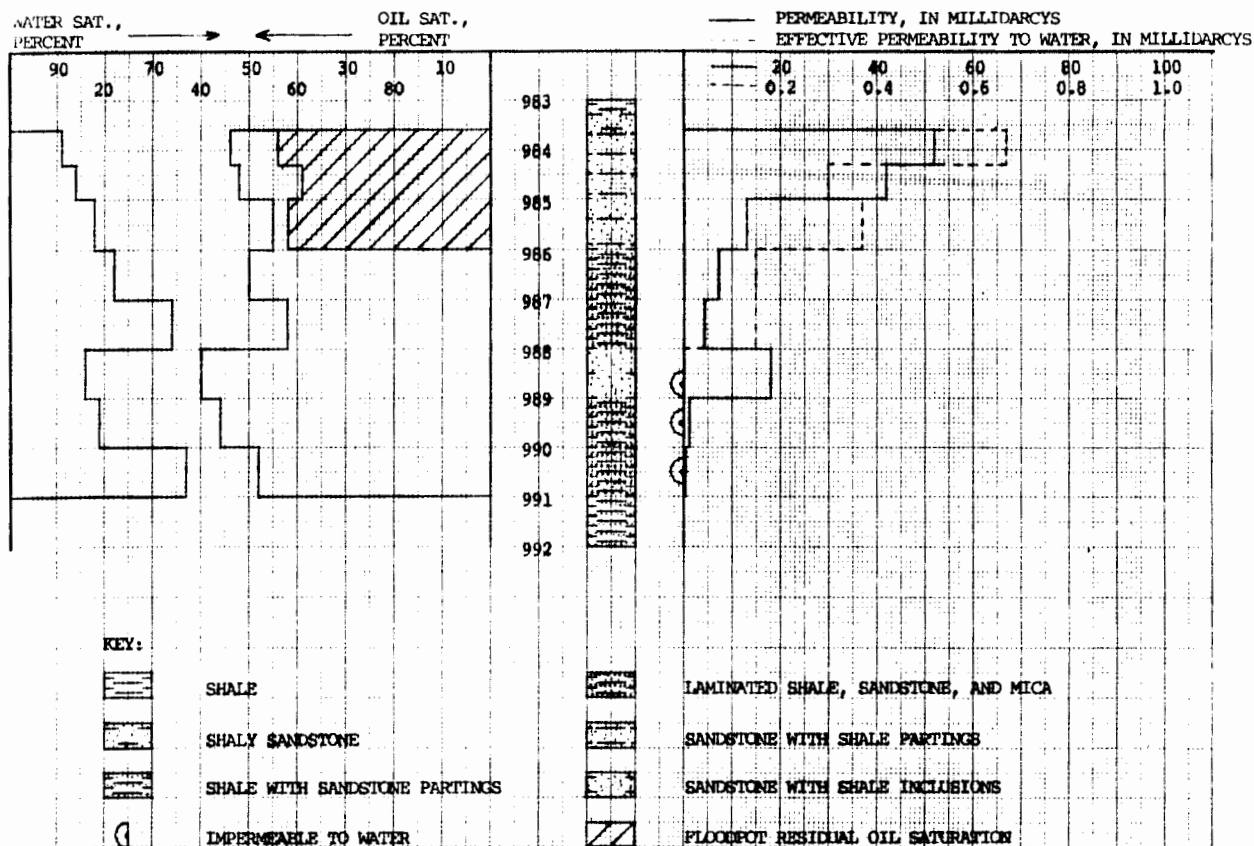
Oilfield Research Laboratories

SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	Lincoln 77, Incorporated	Lease	Parmely	Well No.	8
Depth Interval, Feet	983.6 - 991.0				
Feet of Core Analyzed	2.4				
Average Percent Porosity	19.7				
Average Percent Original Oil Saturation	49.7				
Average Percent Oil Recovery	8.0				
Average Percent Residual Oil Saturation	41.7				
Average Percent Residual Water Saturation	43.3				
Average Percent Total Residual Fluid Saturation	85.0				
Average Original Oil Content, Bbls./A. Ft.	756.				
Average Oil Recovery, Bbls./A. Ft.	125.				
Average Residual Oil Content, Bbls./A. Ft.	631.				
Total Original Oil Content, Bbls./Acre	1,813.				
Total Oil Recovery, Bbls./Acre	299.				
Total Residual Oil Content, Bbls./Acre	1,514.				
Average Effective Permeability, Millidarcys	0.44				
Average Initial Fluid Production Pressure, p.s.i.	36.7				

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



LINCOLN 77, INCORPORATED

PARMELV LEASE

COFFEY COUNTY, KANSAS

WELL NO. 8

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
983.6 - 991.0	7.4	18.0	50.7	22.1	14.9	860 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHAMUTE, KANSAS
NOVEMBER, 1983

RAI

Lincoln 77, Inc.

2

D, D3

Parmely # 8 • API # 15-031-21,420
NE NW SW, Sec 29, T22S-R17E Coffey Count,
Kansas 11/16/83 Cored Lower Squirrel
981-1001 (Full Recovery) Boxed 983.1-991.8
(3 Boxes) 8-in log & CA