OILFIELD RESEARCH LABORATORIES
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September 28, 1981

Pathfinder Petroleum Corporation
10603 North Penn
Suite 300
Oklahoma City, Oklahoma 73120

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Smith Lease, Well No. L-19, located in Neosho County, Kansas and submitted to our laboratory on September 18, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Oklahoma City, Oklahoma

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Pathfinder Petroleum Corp. Lease Smith Well No. L-19

Location

Section 34 Twp. 28S Rge. 19E County Neosho State Kansas

Elevation, Feet	
Name of Sand	Bartlesville
Top of Core	630.0
Bottom of Core	639.3
Top of Sand	630.0
Bottom of Sand (Tested)	638.8
Total Feet of Permeable Sand	6.5
Total Feet of Floodable Sand	3.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 16	1.5	1.5
30 - 55	2.0	3.5
84 - 115	3.0	6.5

Average Permeability Millidarcys	62.7
Average Percent Porosity	19.1
Average Percent Oil Saturation	30.2
Average Percent Water Saturation	31.1
Average Oil Content, Bbls./A. Ft.	436.
Total Oil Content, Bbls./Acre	3,404.
Average Percent Oil Recovery by Laboratory Flooding Tests	3.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	48.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	143.
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:

Depth Interval, Feet	Description
630.0 - 635.0	Light brown sandstone.
635.0 - 635.5	Gray and light gray laminated shale and sandstone.
635.5 - 636.0	Gray and light brown laminated shale and sandstone.
636.0 - 636.5	Grayish brown shaly sandstone.
636.5 - 637.0	Gray and light gray laminated shale and sandstone.
637.0 - 638.0	Brown sandstone.
638.0 - 638.8	Brownish black carbonaceous shaly sandstone.
638.8 - 639.3	Gray and light gray laminated shale and sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 143 barrels of oil per acre was obtained from 3.0 feet of sand. The weighted average percent oil saturation was reduced from 29.7 to 26.7, or represents an average recovery of 3.0 percent. The weighted average effective permeability of the samples is 12.39 millidarcys, while the average initial fluid production pressure is 30.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 9 samples tested, 3 produced water and oil, and 1 sample produced water only. This indicates that approximately 33 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 1,080 barrels of oil per acre. This is an average recovery of 359 barrels per acre foot from 3.0 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	20.7
Oil saturation after flooding, percent	26.7
Performance factor, percent, estimated	50.0
Net floodable sand, feet	3.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Pathfinder Petroleum Corporation Lease Smith Well No. L-19

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	630.6	22.3	17	41	58	294	84.	1.0	1.0	294	84.00
2	631.5	19.8	29	26	55	446	31.	1.0	2.0	446	31.00
3	632.6	20.7	21	28	49	337	110.	1.0	3.0	337	110.00
4	633.6	21.6	26	32	58	436	113.	1.0	4.0	436	113.00
5	634.5	21.7	32	28	60	539	54.	1.0	5.0	539	54.00
6	635.6	9.5	33	40	73	243	Imp.	0.5	5.5	122	0.00
7	636.4	14.9	23	54	77	266	0.68	0.5	6.0	133	0.34
8	637.4	19.4	38	28	66	572	15.	1.0	7.0	572	15.00
9	638.6	15.1	56	16	72	656	Imp.	0.8	7.8	525	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Pathfinder Petroleum Corporation Lease Smith Well No. L-19

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
630.0 - 635.0	5.0	78.4	392.00
635.0 - 638.8	1.5	10.2	15.34
630.0 - 638.8	6.5	62.7	407.34

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
630.0 - 635.0	5.0	21.2	25.0	31.0	405	2,052
635.0 - 638.8	2.8	15.6	39.6	31.4	483	1,352
630.0 - 638.8	7.8	19.1	30.2	31.1	436	3,404

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Pathfinder Petroleum Corporation Lease Smith Well No. L-19

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	630.6	22.4	17	295	0	0	17	51	295	214	13.92	20
2	631.5	19.3	30	449	4	60	26	54	389	144	34.99	30
3	632.6	20.6	21	336	0	0	21	29	336	0	Imp.	-
4	633.6	21.1	27	442	2	33	25	55	409	26	0.45	30
5	634.5	21.6	32	536	3	50	29	43	486	94	1.72	30
6	635.6	9.6	33	246	0	0	33	41	246	0	Imp.	-
7	636.4	15.0	23	268	0	0	23	55	268	0	Imp.	-
8	637.4	19.3	39	569	0	0	38	53	569	18	0.30	40
9	638.6	15.0	56	652	0	0	56	17	652	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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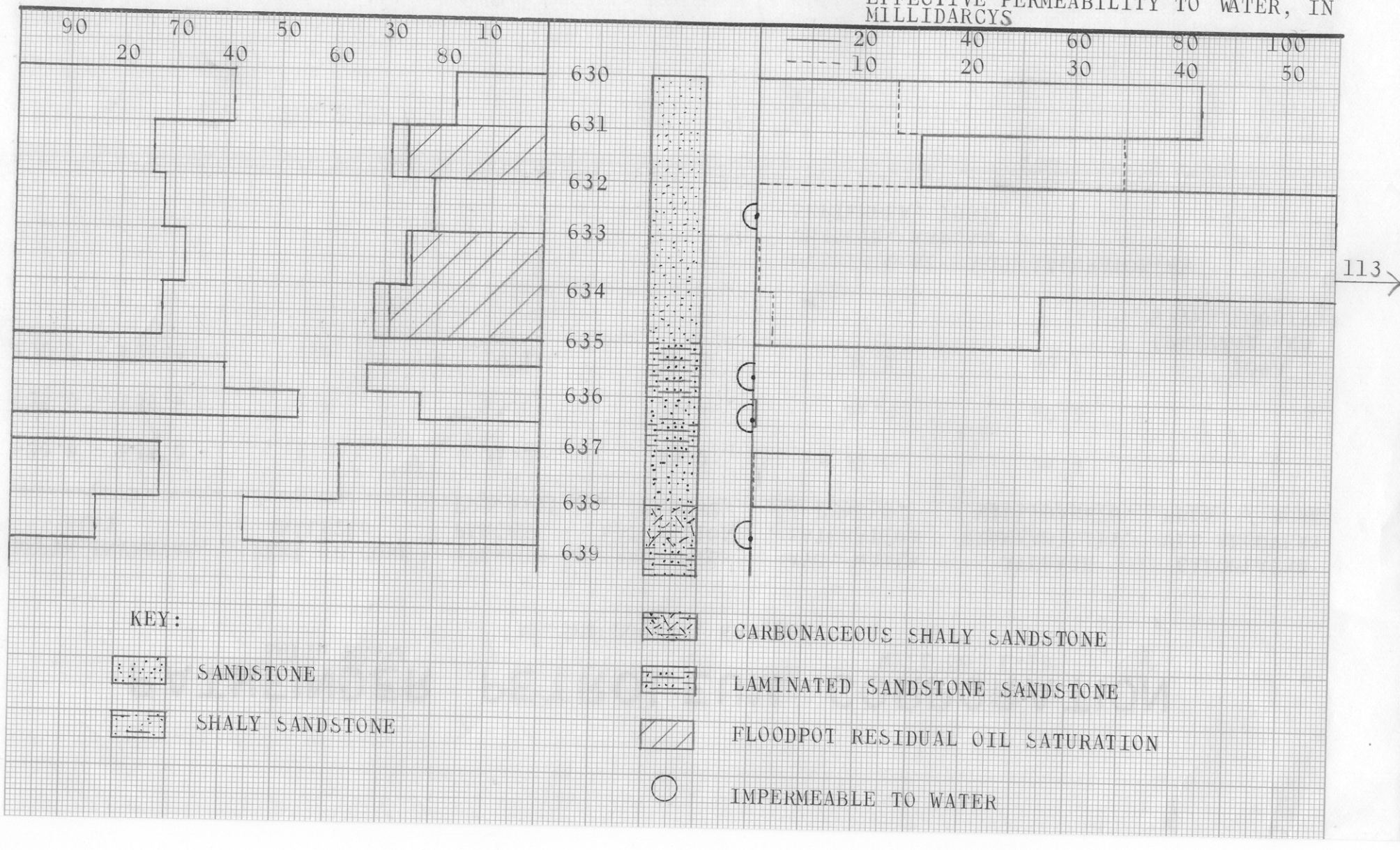
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Pathfinder Petroleum Corporation Lease Smith Well No. L-19

Depth Interval, Feet	630.0 - 635.0
Feet of Core Analyzed	3.0
Average Percent Porosity	20.7
Average Percent Original Oil Saturation	29.7
Average Percent Oil Recovery	3.0
Average Percent Residual Oil Saturation	26.7
Average Percent Residual Water Saturation	50.7
Average Percent Total Residual Fluid Saturation	77.4
Average Original Oil Content, Bbls./A. Ft.	476.
Average Oil Recovery, Bbls./A. Ft.	48.
Average Residual Oil Content, Bbls./A. Ft.	428.
Total Original Oil Content, Bbls./Acre	1,427.
Total Oil Recovery, Bbls./Acre	143.
Total Residual Oil Content, Bbls./Acre	1,284.
Average Effective Permeability, Millidarcys	12.39
Average Initial Fluid Production Pressure, p.s.i.	30.0

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
20 40 60 80 100
10 20 30 40 50
630
631
632
633
634
635
636
637
638
639
113
KEY:
SANDSTONE
SHALY SANDSTONE
CARBONACEOUS SHALY SANDSTONE
LAMINATED SANDSTONE SANDSTONE
FLOODPOT RESIDUAL OIL SATURATION
IMPERMEABLE TO WATER

PATHFINDER PETROLEUM CORPORATION

SMITH LEASE — WELL NO. L-19

NEOSHO 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
630.0 - 635.0	5.0	21.2	25.0	31.0	78.4	
635.0 - 638.8	2.8	15.6	39.6	31.4	10.2	
630.0 - 638.8	7.8	19.1	30.2	31.1	62.7	1080 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
SEPTEMBER, 1981

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