

# OILFIELD RESEARCH LABORATORIES

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

September 25, 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. F-24, located in Neosho County, Kansas and submitted to our laboratory on September 14, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Oklahoma City, Oklahoma

- REGISTERED ENGINEERS -

CORE ANALYSIS - WATER ANALYSIS - REPRESSURING ENGINEERING - SURVEYING & MAPPING - PROPERTY EVALUATION & OPERATION

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

Company Pathfinder Petroleum Corp. Lease Smith Well No. F-24

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

Elevation, Feet .....  
 Name of Sand ..... Upper Squirrel  
 Top of Core ..... 663.0  
 Bottom of Core ..... 672.0  
 Top of Sand ..... 663.0  
 Bottom of Sand ..... 672.0  
 Total Feet of Permeable Sand ..... 6.4  
 Total Feet of Floodable Sand ..... 0.

Distribution of Permeable Sand; Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 2	3.7	3.7
20 - 35	2.0	5.7
49 - 51	0.7	6.4

Average Permeability Millidarcys ..... 14.5  
 Average Percent Porosity ..... 15.0  
 Average Percent Oil Saturation ..... 37.5  
 Average Percent Water Saturation ..... 41.1  
 Average Oil Content, Bbls./A. Ft. .... 469.  
 Total Oil Content, Bbls./Acre ..... 3,941.  
 Average Percent Oil Recovery by Laboratory Flooding Tests ..... 0.  
 Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. .... 0.  
 Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre ..... 0.  
 Total Calculated Oil Recovery, Bbls./Acre ..... 0.

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.

In as much as the core did not respond to flooding susceptibility tests, no calculated recovery is given.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
663.0 - 665.6	Brown sandstone.
665.6 - 666.3	Black carbonaceous sandstone.
666.3 - 670.0	Grayish brown shaly sandstone with shale partings.
670.0 - 672.0	Gray and light brown laminated shale and sandstone.

# Oilfield Research Laboratories

## RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Pathfinder Petroleum Corp. Lease Smith Well No. F-24

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			Ft.	Cum. Ft.		
1	663.5	18.4	43	24	614	22.	1.0	1.0	614	22.00
2	664.4	18.2	27	30	381	34.	1.0	2.0	381	34.00
3	665.8	20.7	52	7	835	50.	0.7	2.7	585	35.00
4	666.6	19.2	72	10	1073	1.3	0.7	3.4	751	0.91
5	667.5	15.6	64	22	775	0.30	1.0	4.4	775	0.30
6	668.4	14.6	23	44	261	0.40	1.0	5.4	261	0.40
7	669.7	9.6	16	80	119	0.16	1.0	6.4	119	0.16
8	670.6	10.7	36	59	299	Imp.	1.0	7.4	299	0.00
9	671.6	10.6	19	74	156	Imp.	1.0	8.4	156	0.00

# Oilfield Research Laboratories

## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Pathfinder Petroleum Corp. Lease Smith Well No. F-24

Depth Interval, Feet	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
663.0 - 666.3	663.0 - 666.3	2.7	33.7	91.00	39.4	21.8	585	1,580
666.3 - 672.0	663.0 - 672.0	3.7	0.48	1.77	36.6	50.2	414	2,361
663.0 - 672.0	663.0 - 672.0	6.4	14.5	92.77	37.5	41.1	469	3,941

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Pathfinder Petroleum Corp. Lease Smith Well No. F-24

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	663.5	18.5	43	617	0	0	43	41	617	338	6.75	25
2	664.4	18.3	7	99	0	0	7	70	99	22	0.37	45
3	665.8	20.8	52	839	0	0	52	31	839	150	3.67	30
4	666.6	19.1	72	1067	0	0	72	12	1067	0	Imp.	-
5	667.5	15.7	64	780	0	0	64	23	780	0	Imp.	-
6	668.4	14.1	24	263	0	0	24	45	263	0	Imp.	-
7	669.7	9.7	16	120	0	0	16	80	120	0	Imp.	-
8	670.6	10.8	36	302	0	0	36	60	302	0	Imp.	-
9	671.6	10.7	19	158	0	0	19	75	158	0	Imp.	-

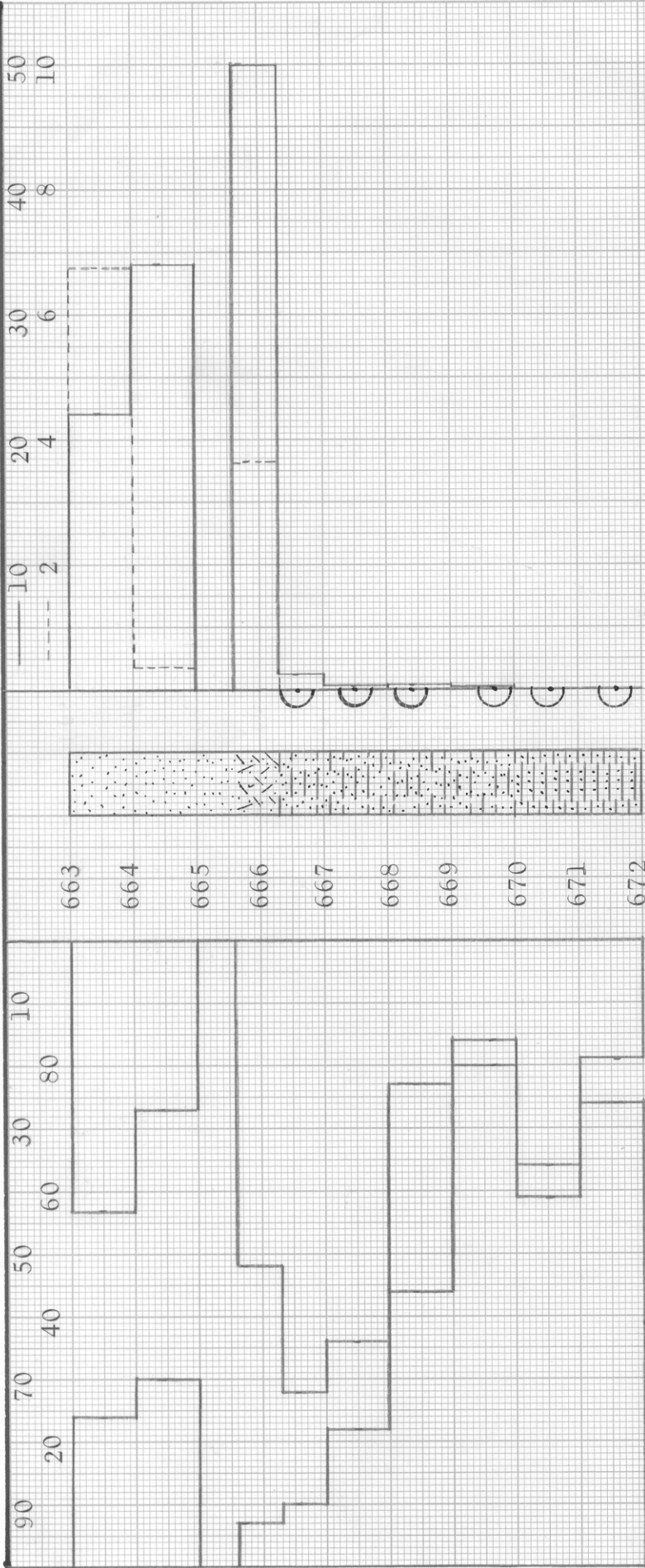
Notes: cc—cubic centimeter.

\*—Volume of water recovered at the time of maximum oil recovery.

\*\*—Determined by passing water through sample which still contains residual oil.

WATER SAT., PERCENT →

PERMEABILITY, IN MILLIDARCYS  
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS



KEY:

SANDSTONE

CARBONACEOUS SANDSTONE

LAMINATED SANDSTONE AND SHALE

SHALY SANDSTONE WITH SHALE PARTINGS

○ IMPERMEABLE TO WATER

# PATHFINDER PETROLEUM CORPORATION

SMITH LEASE

NEOSHO COUNTY, KANSAS

WELL NO. F-24

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT	AVG. OIL SATURATION	AVG. WATER SATURATION	AVERAGE PERMEABILITY	CALCULATED OIL RECOVERY
90 - 80		~85	~85	~10	~10	
80 - 70		~85	~85	~10	~10	
70 - 60		~85	~85	~10	~10	
60 - 50		~85	~85	~10	~10	
50 - 40		~85	~85	~10	~10	
40 - 30		~85	~85	~10	~10	
30 - 20		~85	~85	~10	~10	
20 - 10		~85	~85	~10	~10	

# PATHFINDER PETROLEUM CORPORATION

SMITH LEASE

WELL NO. F-24

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
663.0 - 666.3	2.7	18.9	39.4	21.8	33.7	
666.3 - 672.0	5.7	13.1	36.6	50.2	0.48	
663.0 - 672.0	8.4	15.0	37.5	41.1	14.5	-

OILFIELD RESEARCH LABORATORIES  
 CHANUTE, KANSAS  
 SEPTEMBER, 1981 PDC