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

May 15, 1979

Neosho Oil & Gas, Inc.
7757 San Felipe Road
Suite 200
Houston, Texas 77063

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Perkins Lease, Well No. 2, Allen County, Kansas, and submitted to our laboratory on May 7, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman

SAM:cgb

5 c to Houston, Texas
1 c to Chanute, Kansas

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GENERAL INFORMATION & SUMMARY

Company Neosho Oil & Gas, Inc. Lease Perkins Well No. 2

Location 200' FWL & 1100' SNL

Section 34 Twp. 24S Rge. 21E County Allen State Kansas

Name of Sand	Tucker
Top of Core	696.0
Bottom of Core	712.0
Top of Sand	696.0
Bottom of Sand	704.3
Total Feet of Permeable Sand	6.4
Total Feet of Floodable Sand	3.1

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	2.4	2.4
10 - 100	1.6	4.0
100 - 200	2.4	6.4

Average Permeability Millidarcys	65.9
Average Percent Porosity	17.8
Average Percent Oil Saturation	41.0
Average Percent Water Saturation	46.0
Average Oil Content, Bbls./A. Ft.	569.
Total Oil Content, Bbls./Acre	3,642.
Average Percent Oil Recovery by Laboratory Flooding Tests	16.3
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	223.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	692.
Total Calculated Oil Recovery, Bbls./Acre (Primary & Waterflooding)	725.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

The core was sampled by a representative of Oilfield Research Laboratories. The drilling fluid consisted of fresh water mud.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
696.0 - 697.0	Dark brown slightly calcareous sandstone.
697.0 - 697.8	Dark brown sandstone.
697.8 - 698.2	Brown and gray laminated sandstone and shale.
698.2 - 698.8	Dark brown sandstone.
698.8 - 699.4	Gray sandy shale.
699.4 - 700.5	Dark brown sandstone.
700.5 - 701.1	Gray sandy shale.
701.1 - 703.0	Dark brown sandstone.
703.0 - 703.3	Gray sandy shale.
703.3 - 704.3	Dark brown sandstone.
704.3 - 705.5	Coal.
705.5 - 712.0	Gray sandy shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 692 barrels of oil per acre was obtained from 3.1 feet of sand. The weighted average percent oil saturation was reduced from 49.2 to 32.9, or represents an average recovery of 16.3 percent. The weighted average effective permeability of the samples is 1.17 millidarcys, while the average initial fluid

production pressure is 23.8 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 8 samples tested, 8 produced water and 4 oil. This indicates that approximately 50 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

From a study of the data, it would appear that efficient primary and waterflood operations in the vicinity of this well should recover approximately 725 barrels of oil per acre. This is an average recovery of 234 barrels per acre foot from 3.1 feet of floodable sand analyzed in this core.

These recovery values were calculated using the following data and assumptions:

Original formation volume factor	1.03
Reservoir water saturation, percent	30.0
Average porosity, percent	17.2
Oil saturation after flooding, percent	32.9
Performance factor, percent	50.0
Net floodable pay sand, feet	3.1

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Neosho Oil & Gas, Inc. Lease Perkins Well No. 2

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	696.5	15.6	42	48	90	508	130.	1.0	1.0	508	130.00
2	697.5	19.6	45	33	78	684	166.	0.8	1.8	547	132.80
3	698.5	19.5	60	35	95	908	65.	0.6	2.4	545	39.00
4	699.6	14.9	22	59	81	254	101.	0.6	3.0	152	60.60
5	700.4	17.2	61	32	93	814	1.1	0.5	3.5	407	0.55
6	701.4	20.1	31	54	85	483	8.2	0.9	4.4	435	7.38
7	702.4	16.8	44	39	83	574	47.	1.0	5.4	574	47.00
8	703.7	18.5	33	60	93	474	4.2	1.0	6.4	474	4.20

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Neosho Oil & Gas, Inc. Lease Perkins Well No. 2

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
696.0 - 704.3	6.4	65.9	421.53

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
696.0 - 704.3	6.4	17.8	41.0	46.0	569	3,642

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Neosho Oil & Gas, Inc. Lease Perkins Well No. 2

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	696.5	15.6	42	508	11	133	31	60	375	59	0.90	20
2	697.5	19.1	45	667	0	0	45	51	667	18	0.30	30
3	698.5	19.9	60	926	24	371	36	60	555	61	0.75	25
4	699.6	15.0	23	268	0	0	23	72	268	17	0.22	30
5	700.4	17.6	61	833	28	382	33	65	451	291	4.27	15
6	701.4	19.6	31	472	0	0	31	61	472	63	0.97	25
7	702.4	17.0	44	580	11	145	33	59	435	12	0.15	35
8	703.4	18.0	35	489	0	0	35	57	489	16	0.30	35

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 Neosho Oil & Gas, Inc. Lease Perkins Well No. 2

Depth Interval, Feet	696.0 - 704.3
Feet of Core Analyzed	3.1
Average Percent Porosity	17.2
Average Percent Original Oil Saturation	49.2
Average Percent Oil Recovery	16.3
Average Percent Residual Oil Saturation	32.9
Average Percent Residual Water Saturation	60.5
Average Percent Total Residual Fluid Saturation	93.4
Average Original Oil Content, Bbls./A. Ft.	665.
Average Oil Recovery, Bbls./A. Ft.	223.
Average Residual Oil Content, Bbls./A. Ft.	442.
Total Original Oil Content, Bbls./Acre	2,061.
Total Oil Recovery, Bbls./Acre	692.
Total Residual Oil Content, Bbls./Acre	1,369.
Average Effective Permeability, Millidarcys	1.17
Average Initial Fluid Production Pressure, p.s.i.	23.8

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