



OILFIELD RESEARCH LABORATORIES

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August 11, 1980

North Slope Properties, Ltd.
c/o Davis Oil Company
P. O. Box 1004
Independence, Kansas 67301

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Payne Lease, Well No. 1, Wilson County, Kansas and submitted to our laboratory on July 30, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Sanford A. Michel

BRP/ks

5 c to Independence, Kansas

- REGISTERED ENGINEERS -

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

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GENERAL INFORMATION & SUMMARY

Company North Slope Properties, Ltd. **Lease** Payne **Well No.** 1
Location 1600' SNL & 1800' WEL NE $\frac{1}{4}$
Section 9 **Twp.** 27S **Rge.** 14E **County** Wilson **State** Kansas

Elevation, Feet - - - - -
Name of Sand - - - - - Bartlesville
Top of Core - - - - - 1238.0
Bottom of Core - - - - - 1277.5
Top of Sand - - - - - 1238.0
Bottom of Sand - - - - - 1272.5
Total Feet of Permeable Sand - - - - - 20.1
Total Feet of Floodable Sand - - - - - (Analyzed) 8.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0.24 - 1.0	5.3	5.3
1 - 20	3.7	9.0
20 - 100	5.5	14.5
100 - 200	1.6	16.1
200 & above	4.0	20.1

Average Permeability Millidarcys - - - - - 73.0
Average Percent Porosity - - - - - 15.8
Average Percent Oil Saturation - - - - - 39.2
Average Percent Water Saturation - - - - - 43.8
Average Oil Content, Bbls./A. Ft. - - - - - 481.
Total Oil Content, Bbls./Acre - - - - - 13,942.
Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 6.5
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 96.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 764.
Total Calculated Oil Recovery, Bbls./Acre - - - - - See "Calculated Recovery" Section

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This core was sampled and the samples sealed in plastic bags by a representative of the client. Salt water mud was used as the circulating fluid while taking this core.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
1238.0-1240.8	Brown and gray laminated sandstone and shale.
1240.8-1243.7	Grayish brown very shaly sandstone.
1243.7-1244.5	Brown slightly carbonaceous very shaly sandstone.
1244.5-1245.9	Grayish brown very shaly sandstone.
1245.9-1249.0	Gray carbonaceous very shaly sandstone.
1249.0-1251.2	Brown very shaly sandstone.
1251.2-1256.7	Gray sandy shale.
1256.7-1258.2	Brown sandstone.
1258.2-1261.0	Grayish brown very shaly laminated sandstone.
1261.0-1272.5	Brown sandstone.
1272.5-1277.5	Gray sandy shale.

LABORATORY FLOODING TESTS

At the request of the client, several samples were subjected to laboratory water flooding susceptibility tests; the lower portion of the sand responded as a total recovery of 764 barrels of oil per acre was obtained from 8.0 feet of sand. The weighted average percent oil saturation was reduced from 45.5 to 39.0, or represents an average recovery of 6.5 percent. The weighted average effective permeability of the samples is 14.20 millidarcys, while the average initial fluid production pressure is 13.8 pounds per square inch (see Table V). The tests also show that the sand has a fairly uniform effective permeability to water.

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CALCULATED RECOVERY

Based on the results of the laboratory testing, it appears that efficient primary and waterflooding operations in the vicinity of this well should recover approximately 1780 barrels of oil per acre. This is an average recovery of 222 barrels per acre foot from the 8.0 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.06
Reservoir water saturation , percent, estimated	30.0
Average porosity, percent	19.3
Oil saturation after flooding, percent	39.0
Performance factor, percent, estimated	55.0
Net floodable pay sand, feet	8.0

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company North Slope Properties, Ltd.

Lease

Payne

Well No.

1

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	1238.5	14.5	28	60	315	Imp.	1.0	1.0	315	0.00
2	1239.5	10.5	35	63	285	Imp.	1.0	2.0	285	0.00
3	1240.5	12.2	32	42	303	Imp.	0.8	2.8	242	0.00
4	1241.5	6.7	36	58	187	Imp.	1.2	4.0	224	0.00
5	1242.5	10.7	24	62	199	Imp.	1.0	5.0	199	0.00
6	1243.5	13.7	15	56	159	Imp.	0.7	5.7	111	0.00
7	1244.3	15.7	57	32	694	0.36	0.8	6.5	555	0.29
8	1245.5	16.3	48	29	607	0.24	1.4	7.9	850	0.34
9	1246.5	17.2	38	34	507	0.42	1.1	9.0	559	0.46
10	1247.3	18.5	42	25	603	1.0	1.0	10.0	603	1.00
11	1248.7	15.7	49	25	597	Imp.	1.0	11.0	597	0.00
12	1249.7	17.4	48	28	648	0.60	1.0	12.0	648	0.60
13	1250.8	16.4	58	16	738	1.1	1.2	13.2	885	1.32
14	1257.5	15.7	47	29	573	31.	1.5	14.7	860	46.50
15	1258.5	10.1	20	73	157	Imp.	0.8	15.5	126	0.00
16	1259.5	13.1	13	67	132	Imp.	1.4	16.9	185	0.00
17	1260.5	6.4	12	84	60	169.	0.6	17.5	36	101.40
18	1261.3	20.3	39	43	614	83.	1.0	18.5	614	83.00
19	1262.5	19.7	48	46	734	24.	1.0	19.5	734	24.00
20	1263.5	20.3	48	33	756	203.	1.0	20.5	756	203.00
21	1264.5	15.0	52	40	605	203.	1.0	21.5	605	203.00
22	1265.5	18.8	40	36	583	259.	1.0	22.5	583	259.00
23	1266.5	19.9	45	43	695	169.	1.0	23.5	695	169.00
24	1267.5	19.7	51	33	779	74.	1.0	24.5	779	74.00
25	1268.5	21.0	44	31	717	236.	1.0	25.5	717	236.00
26	1269.5	15.3	29	60	344	10.	1.0	26.5	344	10.00
27	1270.8	15.5	20	57	241	20.	1.0	27.5	241	20.00
28	1271.5	17.3	25	51	336	31.	1.0	28.5	336	31.00
29	1272.4	16.6	40	41	515	11.	0.5	29.0	258	5.50

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lease	Payne	Well No.			
North Slope Properties, Ltd.			1			
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.			
1238.0 - 1261.0	8.6	17.7	151.91			
1261.0 - 1272.5	11.5	114.7	1317.50			
1238.0 - 1272.5	20.1	73.0	1469.41			
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 Bbl./Acres
1238.0 - 1261.0	17.5	14.0	37.3	44.2	416	7,280
1261.0 - 1272.5	11.5	18.4	40.1	42.9	580.	6,662.
1238.0 - 1272.5	29.0	15.8	39.2	43.8	481	13,942.

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company North Slope Properties, Ltd. Lease Payne Well No. 1

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			
10	1247.3	18.2	41	579	0	0	41	32	579	Imp.	-
13	1250.8	16.4	60	763	0	0	60	18	763	Imp.	-
18	1261.3	20.6	39	623	2	32	37	62	591	12.57	15
19	1262.5	19.2	48	715	7	104	41	55	611	16.70	15
20	1263.5	20.3	48	756	8	126	40	56	630	11.69	15
21	1264.5	15.5	52	625	9	108	43	51	517	16.93	15
22	1265.5	19.1	40	593	4	59	36	54	534	10.12	10
23	1266.5	19.4	45	677	6	90	36	57	587	11.60	15
24	1267.5	19.5	51	772	13	197	38	61	575	18.63	10
25	1268.5	20.6	44	703	3	48	41	57	655	15.39	15
26	1269.5	15.8	29	355	0	0	29	65	355	0.45	45
27	1270.8	16.0	22	273	0	0	22	70	273	4.50	30
28	1271.5	17.3	25	336	0	0	25	69	336	1.50	40
29	1272.4	17.0	39	514	0	0	39	50	514	1.00	40

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 North Slope Properties, Ltd.

Lease Payne

Well No. 1

Depth Interval, Feet 1261.0 - 1272.5

Feet of Core Analyzed 8.0

Average Percent Porosity 19.3

Average Percent Original Oil Saturation 45.5

Average Percent Oil Recovery 6.5

Average Percent Residual Oil Saturation 39.0

Average Percent Residual Water Saturation 56.6

Average Percent Total Residual Fluid Saturation 95.6

Average Original Oil Content, Bbls./A. Ft. 684.

Average Oil Recovery, Bbls./A. Ft. 96.

Average Residual Oil Content, Bbls./A. Ft. 588.

Total Original Oil Content, Bbls./Acre 5464.

Total Oil Recovery, Bbls./Acre 764.

Total Residual Oil Content, Bbls./Acre 4700.

Average Effective Permeability, Millidarcys 14.20

Average Initial Fluid Production Pressure, p.s.i. 13.8

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