



OILFIELD RESEARCH LABORATORIES

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March 28, 1979

Inexco Oil Company
Rt. 2, Box 3
Moran, Kansas 66755

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Cook Lease, Well No. D-9, Allen County, Kansas, and submitted to our laboratory on March 20, 1979.

Your business is greatly appreciated.

Very truly yours,

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Benjamin R. Pearman
Benjamin R. Pearman

SAM:km
3 c to Oklahoma City, Oklahoma
2 c to Moran, Kansas

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GENERAL INFORMATION & SUMMARY

Company Inexco Oil Company Lease Cook Well No. D-9

Location 660' EWL & 1100' NSL NW

Section 24 Twp 26S Rge 20E County Allen State Kansas

Name of Sand	- - - - -	Bartlesville
Top of Core	- - - - -	738.0
Bottom of Core	- - - - -	774.5
Top of Sand	- - - - -	738.8
Bottom of Sand	- - - - -	773.4
Total Feet of Permeable Sand	- - - - -	10.6
Total Feet of Floodable Sand	- - - - -	3.4

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 10	3.0	3.0
10 - 50	1.9	4.9
50 - 100	4.7	9.6
100 - 200	1.0	10.6

Average Permeability Millidarcys	- - - - -	52.4
Average Percent Porosity	- - - - -	18.4
Average Percent Oil Saturation	- - - - -	38.7
Average Percent Water Saturation	- - - - -	37.1
Average Oil Content, Bbls./A. Ft.	- - - - -	548.
Total Oil Content, Bbls./Acre	- - - - -	5,814.
Average Percent Oil Recovery by Laboratory Flooding Tests	- - - - -	4.6
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	- - - - -	66.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	- - - - -	225.
Total Calculated Oil Recovery, Bbls./Acre	(Primary & Waterflooding)	830.
Packer Setting, Feet	- - - - -	
Viscosity, Centipoises @	- - - - -	
A. P. I. Gravity, degrees @ 60 °F	- - - - -	
Elevation, Feet	- - - - -	

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The core was sampled and the samples sealed in plastic bags by a representative of the client. The drilling fluid consisted of fresh water mud. The core was reported to be from non-virgin territory.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
738.0 - 738.8	Gray and brown laminated sandstone and shale.
738.8 - 742.5	Dark brown sandstone containing a vertical fracture.
742.5 - 743.4	Dark brown and gray laminated sandstone and shale.
743.4 - 745.0	Dark brown sandstone.
745.0 - 749.0	Dark brown and gray laminated sandstone and shale.
749.0 - 750.0	Gray laminated sandstone and shale.
761.5 - 762.5	Brown and gray laminated sandstone and shale.
772.0 - 773.4	Dark brown sandstone.
773.4 - 774.5	Gray slightly laminated sandy shale.

SUMMARY

From a study of the data, it would appear that efficient primary and waterflood operations in the vicinity of this well should recover approximately 830 barrels of oil per acre. This is an average recovery of 245 barrels per acre foot from 3.4 feet of floodable sand analyzed in this core.

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

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Original formation volume factor	1.06
Reservoir water saturation, percent	30.0
Average porosity, percent	17.6
Oil saturation after flooding, percent	34.9
Performance factor, percent	50.0
Net floodable pay sand, feet	3.4

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Inexco Oil Company Lease Cook Well No. D-9

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbbs. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	739.1	18.6	36	35	71	520	73.	1.2	1.2	624	87.60
2	740.5	20.8	44	35	79	710	42.	1.0	2.2	710	42.00
3	741.5	19.8	40	39	79	614	55.	1.0	3.2	614	55.00
4	742.3	19.2	31	48	79	462	61.	0.5	3.7	231	30.50
5	743.3	18.7	39	43	82	566	19.	0.9	4.6	509	17.10
6	744.3	18.4	36	48	84	514	60.	1.6	6.2	822	96.00
7	747.3	17.0	38	40	78	501	1.3	1.0	7.2	501	1.30
8	748.3	21.4	29	32	61	482	2.2	1.0	8.2	482	2.20
9	762.0	15.7	57	24	81	694	7.4	1.0	9.2	694	7.40
10	772.3	16.0	36	29	65	447	182.	1.0	10.2	447	182.00
11	773.2	16.1	36	32	68	450	86.	0.4	10.6	180	34.40

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Inexco Oil Company	Lease	Cook	Well No.	D-9
Depth Interval, Feet	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Total Oil Content Bbls./Acre
738.8 - 749.0	738.8 - 749.0	8.2	40.5	331.70	4,493
761.5 - 773.4	761.5 - 773.4	2.4	93.3	223.80	1,321
738.8 - 773.4	738.8 - 773.4	10.6	52.4	555.50	5,814

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
738.8 - 749.0	8.2	19.2	36.9	39.9	548	4,493
761.5 - 773.4	2.4	15.9	44.8	27.4	550	1,321
738.8 - 773.4	10.6	18.4	38.7	37.1	548	5,814

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Inexco Oil Company Lease Cook Well No. D-9

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation		Volume of Water Recovered cc ^a	Effective Permeability Millidarcys ^{cc}	Initial Fluid Production Pressure Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water			
1	739.1	18.1	36	506	0	0	36	68	47	1.13	35
2	740.5	20.3	44	693	7	110	37	60	141	3.97	30
3	741.5	19.3	40	599	3	45	37	57	71	2.25	35
4	742.3	18.7	31	450	0	0	31	62	12	0.23	40
5	743.3	18.8	38	554	0	0	38	57	0	Imp.	-
6	744.4	17.9	36	500	0	0	36	59	21	0.30	30
7	747.3	17.2	36	480	0	0	36	57	0	Imp.	-
8	748.3	21.0	30	489	0	0	30	62	0	Imp.	-
9	762.0	16.0	55	683	0	0	55	39	0	Imp.	-
10	772.3	16.2	36	452	4	50	32	59	33	0.45	30
11	773.2	16.6	36	464	4	51	32	49	29	0.60	30

Notes: cc—cubic centimeter.

^a—Volume of water recovered at the time of maximum oil recovery.

^{cc}—Determined by passing water through sample which still contains residual oil.

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	Inexco Oil Company	Lease	Cook	Well No.	D-9
Depth Interval, Feet	738.8 - 749.0	761.5 - 773.4	738.8 - 773.4		
Feet of Core Analyzed	2.0	1.4	3.4		
Average Percent Porosity	19.8	16.3	17.6		
Average Percent Original Oil Saturation	42.0	36.0	39.5		
Average Percent Oil Recovery	5.0	4.0	4.6		
Average Percent Residual Oil Saturation	37.0	32.0	34.9		
Average Percent Residual Water Saturation	58.5	56.1	57.5		
Average Percent Total Residual Fluid Saturation	95.5	88.1	92.4		
Average Original Oil Content, Bbls./A. Ft.	647.	455.	567.		
Average Oil Recovery, Bbls./A. Ft.	78.	50.	66.		
Average Residual Oil Content, Bbls./A. Ft.	569.	405.	501.		
Total Original Oil Content, Bbls./Acre	1,292.	637.	1,929.		
Total Oil Recovery, Bbls./Acre	155.	70.	225.		
Total Residual Oil Content, Bbls./Acre	1,137.	567.	1,704.		
Average Effective Permeability, Millidarcys	3.1	0.49	2.0		
Average Initial Fluid Production Pressure, p.s.i.	32.5	30.	31.3		

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