

OILFIELD RESEARCH LABORATORIES

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

February 26, 1980

Inexco Oil Company
Rural Route 2
Box 3
Moran, Kansas 66755

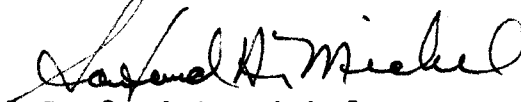
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Stottler Lease, Well No. Z-18, Allen County, Kansas and submitted to our laboratory on February 7, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES



Sanford A. Michel

SAM/kas
3 c to Moran, Kansas
2 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 Inexco Oil Company Lease Stottler Well No. 7-18

Location 1155' WEL & 660' NSL SE

Section 21 Twp. 25S Rgs. 21E County Allen State Kansas

Elevation, Feet - - - - -

Name of Sand - - - - - Bartlesville

Top of Core - - - - - 657.0

Bottom of Core - - - - - 677.0

Top of Sand - - - - - 657.0

Bottom of Sand - - - - - 676.2

Total Feet of Permeable Sand - - - - - 7.7

Total Feet of Floodable Sand - - - - - 4.1

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 100

1.0

1.0

100 - 200

1.3

2.3

200 - 300

4.1

6.4

500 - 600

1.3

7.7

Average Permeability Millidarcys - - - - - 269.1

Average Percent Porosity - - - - - 19.1

Average Percent Oil Saturation - - - - - 38.3

Average Percent Water Saturation - - - - - 58.4

Average Oil Content, Bbls./A. Ft. - - - - - 559.

Total Oil Content, Bbls./Acre - - - - - 4,301.

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 15.4

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 217.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 890.

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. The core was reported to be from a non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
657.0 - 658.3	Light brown sandstone.
658.3 - 658.7	Gray sandy shale.
658.7 - 662.0	Brown sandstone with widely scattered carbonaceous partings.
662.0 - 663.0	Dark gray shale.
670.0 - 670.3	Gray shale.
670.3 - 672.0	Dark brown sandstone.
672.0 - 673.8	Gray shale with sandstone partings.
673.8 - 674.2	Dark brown sandstone.
674.2 - 675.7	Brown sandstone with shale nodules.
675.7 - 676.2	Dark brown sandstone.
676.2 - 677.0	Gray shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 890 barrels of oil per acre was obtained from 4.1 feet of sand. The weighted average percent oil saturation was reduced from 52.3 to 36.9, or represents an average recovery of 15.4 percent. The weighted average effective permeability of the samples is 8.16 millidarcys, while the average initial fluid production pressure is 22.0 pounds per square inch (See Table V).

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By observing the data given in Table IV, you will note that of the 8 samples tested, 5 produced water and oil, and 3 samples produced water only. This indicates that approximately 63 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 1,010 barrels of oil per acre. This is an average recovery of 245 barrels per acre foot from 4.1 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	18.3
Oil saturation after flooding, percent	36.9
Performance factor, percent, estimated	50.0
Net floodable sand, feet	4.1

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Inexco Oil Company Lease Stottler Well No. Z-18

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Fc. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	657.2	21.4	18	79	97	299	102.	1.3	1.3	389	132.60
2	659.7	20.1	29	69	98	452	599.	1.3	2.6	588	778.70
3	660.7	18.4	20	73	93	286	208.	1.0	3.6	286.	208.00
4	670.5	19.6	55	33	88	836	226.	0.7	4.3	585	158.20
5	671.8	17.5	50	42	92	679	98.	1.0	5.3	679	247.00
6	674.0	18.4	54	30	84	771	247.	0.4	5.7	308	98.80
7	674.9	18.0	53	45	98	740	203.	1.5	7.2	1110	304.50
8	675.9	18.7	49	36	85	711	288.	0.5	7.7	356	144.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lease	Well No.							
Inexco Oil Company	Stottler	Z-18							
Depth Interval, Feet	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Average Percent Porosity	Average Percent Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
657.0 - 661.0	657.0 - 661.0	3.6	310.9	1190.30	20.1	22.5	79.8	351	1,263
670.3 - 676.2	670.3 - 676.2	4.1	232.3	952.50	18.3	52.2	39.7	741	3,038
657.0 - 676.2	657.0 - 676.2	7.7	269.1	2071.80	19.1	38.3	58.4	559	4,301

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Well No. **Z-18**

Lease **Stottler**

Company **Inexco Oil Company**

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			
1	657.2	21.2	18	296	0	0	18	80	244	36.98	10
2	659.7	20.4	28	443	0	0	28	70	218	41.48	10
3	660.7	18.0	20	279	0	0	20	73	216	12.99	15
4	670.5	19.0	55	811	11	162	44	46	330	7.12	25
5	671.8	17.9	50	694	16	222	34	63	310	12.74	10
6	674.0	18.9	54	792	12	176	42	47	136	21.37	15
7	674.9	17.8	53	732	17	235	36	61	2	0.15	40
8	675.9	18.8	49	715	18	263	31	57	224	13.92	20

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	Inexco Oil Company	Lease	Stottler	Well No.	Z-18
Depth Interval, Feet	670.3 - 676.2				
Feet of Core Analyzed	4.1				
Average Percent Porosity	18.3				
Average Percent Original Oil Saturation	52.3				
Average Percent Oil Recovery	15.4				
Average Percent Residual Oil Saturation	36.9				
Average Percent Residual Water Saturation	57.1				
Average Percent Total Residual Fluid Saturation	94.0				
Average Original Oil Content, Bbbls./A. Ft.	740.				
Average Oil Recovery, Bbbls./A. Ft.	217.				
Average Residual Oil Content, Bbbls./A. Ft.	523.				
Total Original Oil Content, Bbbls./Acre	3,034.				
Total Oil Recovery, Bbbls./Acre	890.				
Total Residual Oil Content, Bbbls./Acre	2,144.				
Average Effective Permeability, Millidarcys	8.16				
Average Initial Fluid Production Pressure, p.s.i.	22.0				

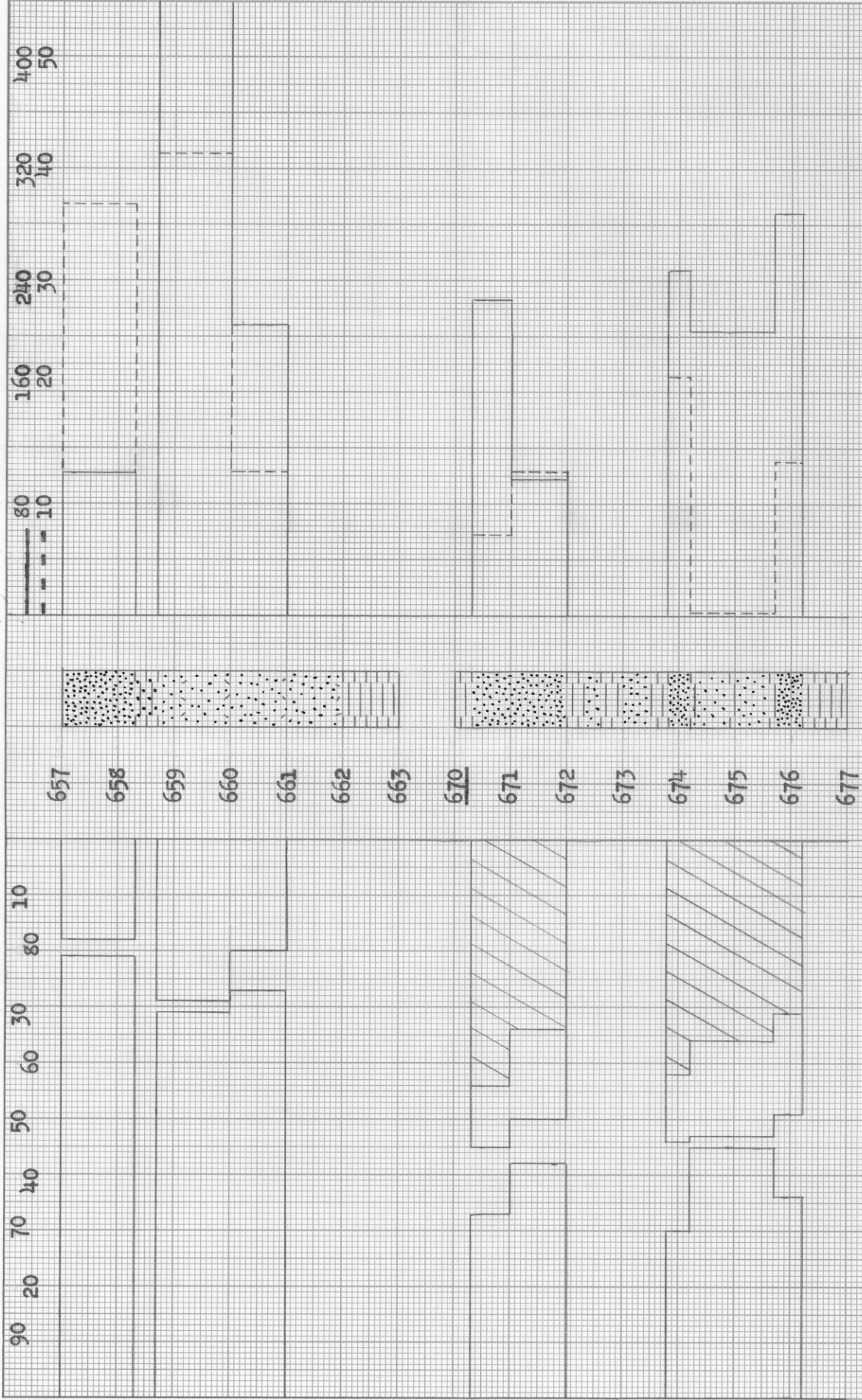
NOTE: Only those samples which recovered oil were used in calculating the above averages.

WATER SAT.,
PERCENT

OIL SAT.,
PERCENT

PERMEABILITY, IN MILLIDARCS

EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCS









KEY:

- SANDSTONE
- SANDSTONE WITH SHALE NODULES
- SANDSTONE WITH CARBON PARTINGS
- SANDY SHALE
- SANDSTONE WITH SHALE PARTINGS
- SHALE
- SHALE WITH SANDSTONE PARTINGS

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KEY:

	SANDSTONE		SANDSTONE WITH CARBON PARTINGS
	SANDSTONE WITH SHALE NODULES		SHALE
	SANDY SHALE		SHALE WITH SANDSTONE PARTINGS

FLOODPOT RESIDUAL OIL SATURATION

INEXCO OIL COMPANY

STOTTLE LEASE WELL NO. Z - 18

ALLEN COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE		AVG. WATER		AVERAGE		CALCULATED
		POROSITY PERCENT	SATURATION PERCENT	SATURATION PERCENT	PERMEABILITY, MILLIDARCS	PERMEABILITY, MILLIDARCS	OIL RECOVERY BELS./ACRE	
657.0 - 661.0	3.6	20.1	22.5	79.8	310.9			
670.3 - 676.2	4.1	18.3	52.2	39.7	232.3			
657.0 - 676.2	7.7	19.1	38.3	58.4	269.1			1,010 (PRIMARY AND WATERFLOODING)

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CHANUTE, KANSAS
FEBRUARY, 1980. HR