

OILFIELD RESEARCH LABORATORIES

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

December 1, 1980

Inexco Oil Company
R R # 2, Box 3
Moran, Kansas 66755

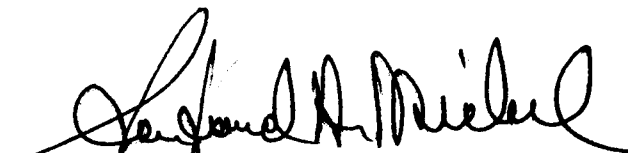
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Booth Lease, Well No. 17, located in Allen County, Kansas and submitted to our laboratory on September 16, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Sanford A. Michel

SAM/(BRP)/km

3 c to Moran, Kansas
1 c to Oklahoma City, Oklahoma
1 c to Dick McCauley, Houston, Texas

- REGISTERED ENGINEERS -

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

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This core was sampled and the samples sealed in plastic bags by a representative of the client. The well was reportedly drilled in non-virgin territory, using fresh water mud as the circulating fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
772.0 - 778.3	Light brown slightly calcareous sandstone.
778.3 - 783.7	Brown slightly calcareous sandstone.
783.7 - 784.6	Gray and brown slightly calcareous shaly sandstone.
784.6 - 789.8	Brown slightly calcareous sandstone.
789.8 - 790.9	Gray and brown slightly calcareous shaly sandstone.
790.9 - 792.0	Brown slightly calcareous sandstone.
792.0 - 792.7	Grayish light brown sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,213 barrels of oil per acre was obtained from 12.6 feet of sand. The weighted average percent oil saturation was reduced from 38.9 to 32.5, or represents an average recovery of 6.4 percent. The weighted average effective permeability of the samples is 11.36 millidarcys, while the average initial fluid production pressure was 15.8 pounds per square inch (See Table V).

CALCULATED RECOVERY

A study of the laboratory data indicates that efficient primary and waterflooding operations in the vicinity of this well should recover approximately 3,210 barrels of oil per acre. This

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is an average recovery of 255 barrels per acre foot from the 12.6 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)	25.0
Average porosity, percent	19.1
Oil saturation after flooding, percent	32.5
Performance factor, percent (estimated)	45.0
Net floodable pay sand, feet	12.6

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Sample No.	Depth, Feet	Effective Porosity Percent	Inexco Oil Company			Lease		Booth		Well No.	
			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	772.5	19.6	17	56	73	259	59.	1.0	1.0	259	59.00
2	773.5	20.0	32	51	83	497	31.	1.0	2.0	497	31.00
3	774.5	18.3	34	49	83	483	41.	1.0	3.0	483	41.00
4	775.5	18.8	50	27	77	729	84.	1.0	4.0	729	84.00
5	776.5	14.7	35	54	89	399	43.	1.0	5.0	399	43.00
6	777.5	14.3	22	76	98	244	16.	1.3	6.3	317	20.80
7	778.5	21.1	35	43	78	573	195.	0.4	6.7	229	78.00
8	779.5	21.1	34	39	73	557	273.	1.0	7.7	557	273.00
9	780.5	18.3	41	40	81	582	150.	1.0	8.7	582	150.00
10	781.5	19.8	27	50	77	415	43.	1.0	9.7	415	43.00
11	782.5	18.7	19	59	78	276	358.	1.0	10.7	276	358.00
12	783.5	21.2	42	33	75	691	170.	1.0	11.7	691	170.00
13	784.5	14.2	33	63	96	364	0.31	0.9	12.6	328	0.28
14	785.5	19.8	39	36	75	599	259.	1.0	13.6	599	259.00
15	786.5	19.4	36	36	72	542	182.	1.0	14.6	542	182.00
16	787.5	19.2	44	37	81	655	280.	1.7	16.3	1114	476.00
17	789.5	18.4	39	33	72	557	170.	1.5	17.8	836	255.00
18	790.5	19.1	12	81	93	178	8.2	1.1	18.9	196	9.02
19	791.5	19.6	28	47	75	426	153.	1.1	20.0	469	168.30
20	792.5	14.8	17	65	82	195	11.	0.7	20.7	137	7.70

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Inexco Oil Company	Lease	Booth	Well No.	17	
	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.		
	772.0 - 792.7	20.7	130.8	2708.10		
	Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
	772.0 - 792.7	20.7	18.2	32.2	48.5	466
	772.0 - 792.7	20.7	18.2	32.2	48.5	9,655

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Inexco Oil Company			Lease		Booth		Well No.		17		
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	772.5	19.5	18	272	0	0	18	80	61	1.05	25
2	773.5	19.6	32	487	3	46	29	56	131	1.95	20
3	774.5	18.0	34	475	5	70	29	70	286	9.30	15
4	775.5	19.3	50	749	22	329	28	57	117	1.65	20
5	776.5	15.1	35	410	3	35	32	65	429	12.00	20
6	777.5	14.8	23	264	0	0	23	72	63	0.90	25
7	778.5	21.0	35	570	5	81	30	66	330	18.99	10
8	779.5	21.6	34	570	3	50	31	64	320	14.62	15
9	780.5	18.7	41	595	7	102	34	58	362	20.13	15
10	781.5	20.4	26	411	0	0	26	71	170	3.30	15
11	782.5	19.1	22	326	0	0	22	67	328	17.99	10
12	783.5	21.4	42	697	11	183	31	60	276	27.59	10
13	784.5	14.0	36	391	0	0	36	62	0	Imp.	-
14	785.5	20.3	39	614	3	47	36	61	282	19.81	10
15	786.5	19.5	36	545	2	30	34	57	101	1.80	25
16	787.5	19.0	44	649	9	133	35	60	354	9.75	15
17	789.5	18.1	39	548	3	42	36	58	348	6.75	15
18	790.5	18.7	15	218	0	0	15	77	12	0.50	45
19	791.5	19.7	29	443	0	0	29	65	250	8.83	15
20	792.5	15.1	17	199	0	0	17	79	254	4.35	15

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

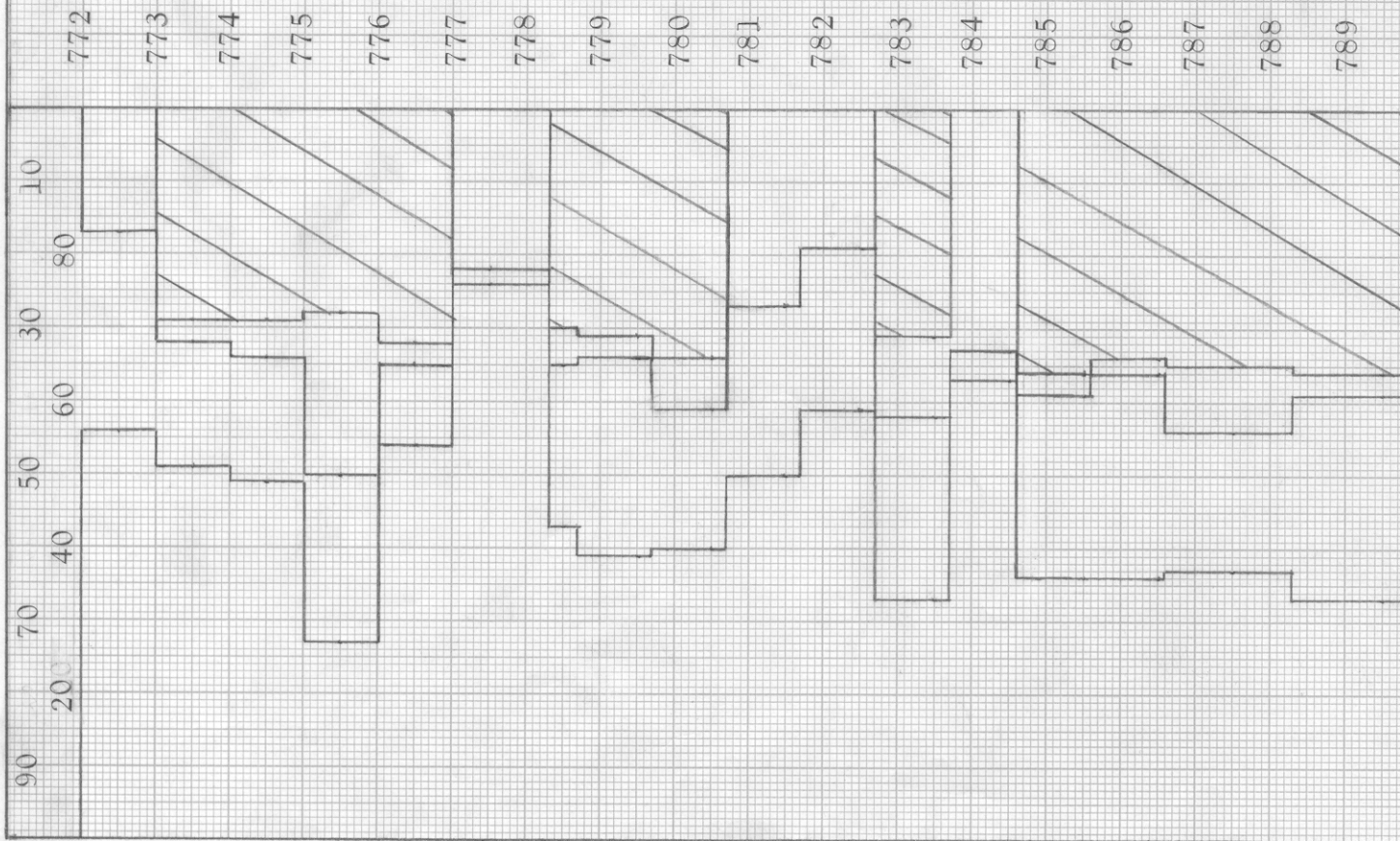
TABLE V

Company	Inexco Oil Company	Lease	Booth	Well No.
Depth Interval, Feet	772.0 - 792.7			
Feet of Core Analyzed	12.6			
Average Percent Porosity	19.1			
Average Percent Original Oil Saturation	38.9			
Average Percent Oil Recovery	6.4			
Average Percent Residual Oil Saturation	32.5			
Average Percent Residual Water Saturation	60.6			
Average Percent Total Residual Fluid Saturation	93.1			
Average Original Oil Content, Bbls./A. Ft.	577.			
Average Oil Recovery, Bbls./A. Ft.	94.			
Average Residual Oil Content, Bbls./A. Ft.	483.			
Total Original Oil Content, Bbls./Acre	7,295.			
Total Oil Recovery, Bbls./Acre	1,213.			
Total Residual Oil Content, Bbls./Acre	6,082.			
Average Effective Permeability, Millidarcys	11.36			
Average Initial Fluid Production Pressure, p.s.i.	15.8			

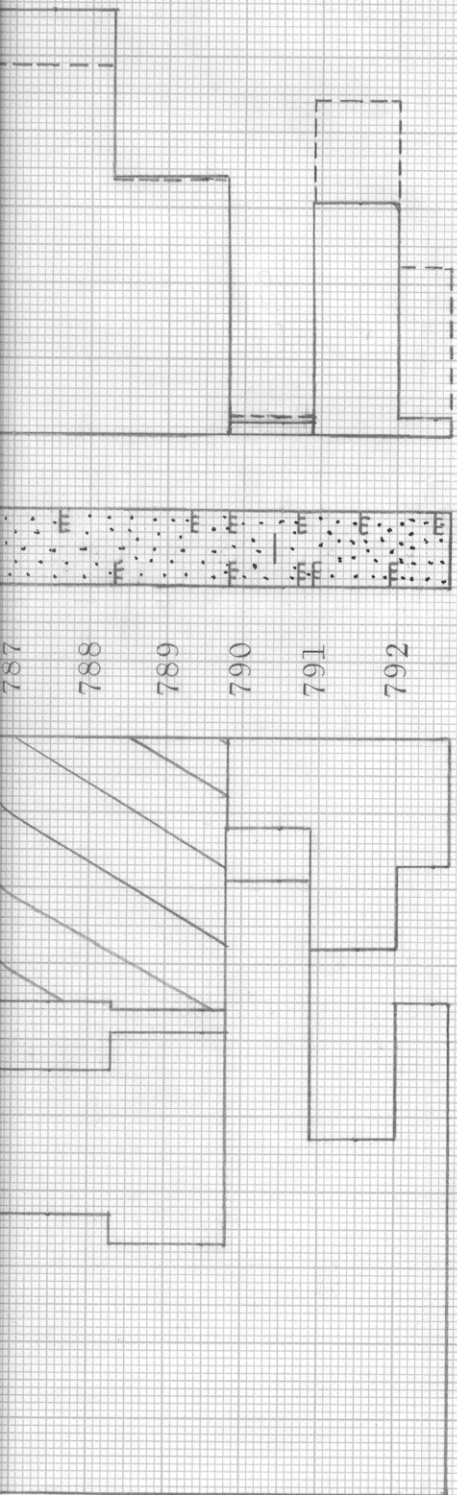
NOTE: Only those samples which recovered oil were used in calculating the above averages.

WATER SAT., ———→
PERCENT

PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER,
----- IN MILLIDARCYS



27.59



KEY:

 CALCAREOUS SANDSTONE
  SHALY CALCAREOUS SANDSTONE
  FLOODPOT RESIDUAL OIL SATURATION

 IMPERMEABLE TO WATER
  SANDSTONE

INEXCO OIL COMPANY

BOOTH LEASE ALLEN COUNTY, KANSAS WELL NO. 17

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY PERCENT	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY MILLIDARCYS	CALCULATED OIL RECOVERY BBLs./ACRE
772.0 - 792.7	20.7	18.2	32.2	48.5	130.8	3,210 (PRIMARY & WATERFLOODING)

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CHANUTE, KANSAS
NOVEMBER, 1980 SO