OILFIELD RESEARCH LABORATORIES

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

May 21, 1981

McGown Drilling
Box 216
Mound City, Kansas 66056

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Slater Lease, Well No. 2, located in Johnson County, Kansas and submitted to our laboratory on May 8, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel by B.L.

Sanford A. Michel

SAM/kas

5 c to Mound City, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company McGown Drilling Lease Slater Well No. 2

Location

Section 33 Twp. 14S Rge. 25E County Johnson State Kansas

Elevation, Feet	
Name of Sand	Bartlesville
Top of Core	636.5
Bottom of Core	653.4
Top of Sand	636.5
Bottom of Sand	652.9
Total Feet of Permeable Sand	16.4
Total Feet of Floodable Sand	10.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
95 - 135	5.0	5.0
145 - 205	5.9	10.9
245 - 270	3.0	13.9
280 - 340	2.5	16.4

Average Permeability Millidarcys	190.5
Average Percent Porosity	26.7
Average Percent Oil Saturation	58.5
Average Percent Water Saturation	21.2
Average Oil Content, Bbls./A. Ft.	1,209.
Total Oil Content, Bbls./Acre	19,827.
Average Percent Oil Recovery by Laboratory Flooding Tests	13.9
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	282.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	2,816.
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.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
636.5 - 652.9	Dark brown slightly calcareous sandstone.
652.9 - 653.4	Coal.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 2,816 barrels of oil per acre was obtained from 10.0 feet of sand. The weighted average percent oil saturation was reduced from 61.1 to 47.2, or represents an average recovery of 13.9 percent. The weighted average effective permeability of the samples is 5.06 millidarcys, while the average initial fluid production pressure is 29.5 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 16 samples tested, 10 produced water and oil, and 5 produced water only. This indicates that approximately 62.5 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 3,890 barrels of oil per acre. This is an average recovery of 389 barrels per acre foot from 10 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.04
Reservoir water saturation, percent, estimated	15.0
Average porosity, percent	26.4
Oil saturation after flooding, percent	47.2
Performance factor, percent, estimated	55.0
Net floodable sand, feet	10.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company McGown Drilling Lease Slater 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	637.5	28.6	40	27	67	888	335.	1.5	1.5	1332	502.50
2	638.5	26.8	42	26	68	873	266.	1.0	2.5	873	266.00
3	639.5	28.6	51	22	73	1132	158.	1.0	3.5	1132	158.00
4	640.5	27.9	65	7	72	1407	181	1.0	4.5	1407	181.00
5	641.5	26.0	65	21	86	1311	130.	1.0	5.5	1311	130.00
6	642.6	25.0	67	25	92	1300	127.	1.0	6.5	1300	127.00
7	643.5	28.0	60	20	80	1303	123.	1.0	7.5	1303	123.00
8	644.6	24.3	56	29	85	1056	96.	1.0	8.5	1056	96.00
9	645.6	27.8	55	23	78	1186	203.	1.0	9.5	1186	203.00
10	646.5	26.2	71	15	86	1443	280.	1.0	10.5	1443	280.00
11	647.5	25.5	57	27	84	1128	158.	1.0	11.5	1128	158.00
12	648.5	25.3	72	9	81	1413	105.	1.0	12.5	1413	105.00
13	649.6	25.8	55	23	78	1101	153.	1.0	13.5	1101	153.00
14	650.5	27.8	58	20	78	1251	247.	1.0	14.5	1251	247.00
15	651.5	26.8	63	18	81	1310	260.	1.0	15.5	1310	260.00
16	652.5	26.2	70	24	94	1423	139.	0.9	16.4	1281	134.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company McGown Drilling Lease Slater Well No. 2

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
636.5 - 645.0	8.5	186.3	1583.50
645.0 - 652.9	7.9	194.9	1540.00
636.0 - 652.9	16.4	190.5	3123.50

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
636.5 - 645.0	8.5	27.0	54.8	22.4	1,143	9,714
645.0 - 652.9	7.9	26.4	62.5	19.8	1,280	10,113
636.5 - 652.9	16.4	26.7	58.5	21.2	1,209	19,827

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company McGown Drilling Lease Slater 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	637.5	28.8	40	894	0	0	40	36	894	22	0.83	45
2	638.5	26.4	43	881	0	0	43	30	881	0	Imp.	-
3	639.5	28.5	51	1128	8	177	43	46	951	347	7.05	25
4	640.5	27.9	65	1407	9	195	56	41	1212	212	5.10	25
5	641.5	26.1	65	1316	30	607	35	55	709	382	10.80	20
6	642.6	25.2	67	1310	29	567	38	55	743	292	7.80	30
7	643.5	28.1	60	1308	14	305	46	38	1003	380	6.00	20
8	644.6	24.5	56	1064	12	228	44	47	836	128	2.85	20
9	645.6	27.6	55	1178	0	0	55	41	1178	221	6.30	25
10	646.5	26.3	71	1449	0	0	71	19	1449	20	0.67	45
11	647.5	25.6	57	1132	5	99	52	36	1033	16	0.45	40
12	648.5	25.2	72	1408	19	371	53	39	1037	37	0.90	40
13	649.6	25.6	55	1092	5	99	50	32	993	16	0.67	45
14	650.5	27.8	58	1251	0	0	58	30	1251	223	8.40	30
15	651.5	27.0	63	1320	8	168	55	33	1152	248	9.00	30
16	652.5	26.1	70	1417	0	0	70	26	1417	26	0.67	45

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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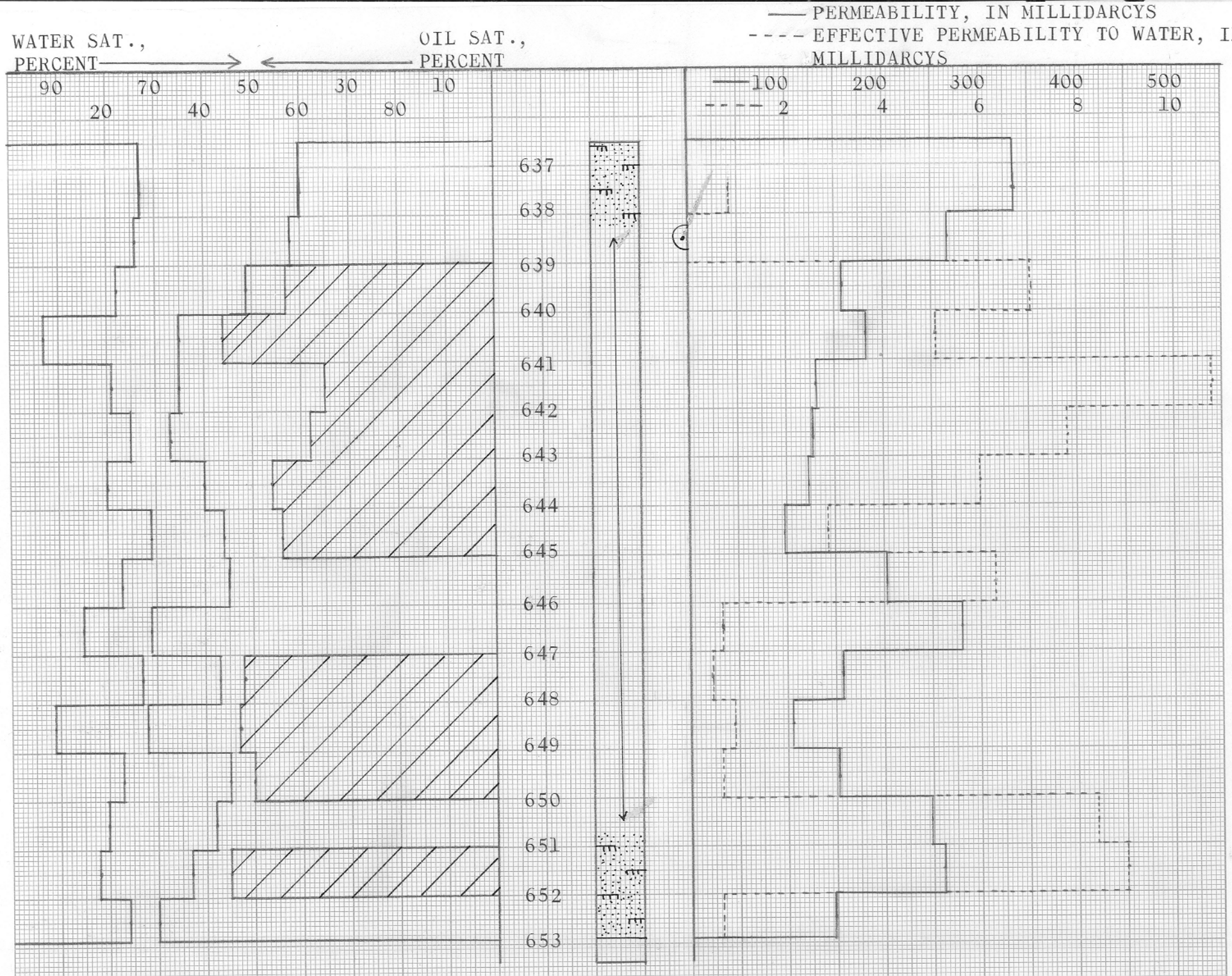
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company McGown Drilling Lease Slater Well No. 2

Depth Interval, Feet	636.5 - 645.0	645.0 - 652.9	636.5 - 652.9
Feet of Core Analyzed	6.0	4.0	10.0
Average Percent Porosity	26.7	25.9	26.4
Average Percent Original Oil Saturation	60.7	61.8	61.1
Average Percent Oil Recovery	17.0	9.3	13.9
Average Percent Residual Oil Saturation	43.7	52.5	47.2
Average Percent Residual Water Saturation	47.0	35.0	42.2
Average Percent Total Residual Fluid Saturation	90.7	87.5	89.4
Average Original Oil Content, Bbls./A. Ft.	1,256.	1,238.	1,249.
Average Oil Recovery, Bbls./A. Ft.	347.	184.	282.
Average Residual Oil Content, Bbls./A. Ft.	909.	1,054.	967.
Total Original Oil Content, Bbls./Acre	7,533.	4,952.	12,485.
Total Oil Recovery, Bbls./Acre	2,079.	737.	2,816.
Total Residual Oil Content, Bbls./Acre	5,454.	4,215.	9,669.
Average Effective Permeability, Millidarcys	6.60	2.76	5.06
Average Initial Fluid Production Pressure, p.s.i.	23.3	38.8	29.5

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


WATER SAT., PERCENT
OIL SAT., PERCENT
90 70 50 30 10
20 40 60 80
PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS
100 200 300 400 500
2 4 6 8 10
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653

KEY:

COAL

CALCAREOUS SANDSTONE

FLOODPOT RESIDUAL OIL SATURATION

IMPERMEABLE TO WATER

Mc GOWN DRILLING

SLATER LEASE WELL NO. 2

JOHNSON COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLS. / ACRE
636.5 - 645.0	8.5	27.0	54.8	22.4	186.3	
645.0 - 652.9	7.9	26.4	62.5	19.8	194.9	
636.5 - 652.9	16.4	26.7	58.5	21.2	190.5	3890 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
MAY, 1981

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