



OILFIELD RESEARCH LABORATORIES

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

July 29, 1981

ShoMor Gas & Oil Corporation
10600 Mastin
Overland Park, Kansas 66212

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Owens Lease, Well No. 20-A, located in Miami County, Kansas and submitted to our laboratory on July 17, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/mkf

5 c to Overland Park, Kansas

Oilfield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company ShoMor Gas & Oil Corp. Lease Owens Well No. 20-A
Location 495' WEL & 260' SNL NE $\frac{1}{4}$
Section 8 Twp. 18S Rge. 22E County Miami State Kansas

Elevation, Feet

Name of Sand.....	CATTLEMAN
Top of Core	580.0
Bottom of Core	598.9
Top of Sand	580.0
Bottom of Sand	598.9
Total Feet of Permeable Sand	16.9
Total Feet of Floodable Sand	3.7

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	4.2	4.2
10 - 30	4.4	8.6
30 - 50	3.6	12.2
50 -100	3.0	15.2
150 & Above	1.7	16.9

Average Permeability Millidarcys	58.3
Average Percent Porosity	19.3
Average Percent Oil Saturation	45.0
Average Percent Water Saturation.....	36.7
Average Oil Content, Bbls./A. Ft.....	672.
Total Oil Content, Bbls./Acre.....	12,695.
Average Percent Oil Recovery by Laboratory Flooding Tests.....	5.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	85.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	315.
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.

FORMATION CORED

580.0 - 581.4	Brown slightly calcareous sandstone with shale partings.
581.4 - 582.6	Dark brown sandstone.
582.6 - 588.2	Brown slightly calcareous sandstone with shale partings.
588.2 - 588.7	Brown slightly calcareous sandstone.
588.7 - 592.7	Grayish brown slightly calcareous sandstone with shale partings.
592.7 - 598.9	Grayish very dark brown slightly carbonaceous slightly calcareous sandstone with shale partings.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 315 barrels of oil per acre was obtained from 3.7 feet of sand. The weighted average percent oil saturation was reduced from 46.9 to 41.9, or represents an average recovery of 5.0 percent. The weighted average effective permeability of the samples is 11.8 millidarcys, while the average initial fluid production pressure is 13.8 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 19 samples tested, 4 produced water and oil, and 7 produced water only. This indicates that approximately 20 percent of the sand represented by these samples is floodable pay sand.

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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 1030 barrels of oil per acre. This is an average recovery of 278 barrels per acre foot from 3.7 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.03
Reservoir water saturation, percent, estimated	20.0
Average porosity, percent	22.3
Oil saturation after flooding, percent	41.9
Performance factor, percent, estimated	45.0
Net floodable sand, feet	3.7

TABLE 1-B

Company ShoMor Gas & Oil Corp. Lease Owens Well No. 20-A

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	580.5	19.3	53	26	79	794	26.	1.4	1.4	1112	36.40
2	581.5	25.5	51	23	74	1009	415.	0.6	2.0	605	249.00
3	582.4	26.0	44	17	61	888	399.	0.6	2.6	533	239.40
4	583.5	20.6	45	31	76	719	31.	1.6	4.2	1150	49.60
5	584.5	19.9	43	30	73	664	38.	1.0	5.2	664	38.00
6	585.4	21.5	51	27	78	851	77.	1.0	6.2	851	77.00
7	586.5	21.5	41	31	72	684	50.	1.0	7.2	684	50.00
8	587.6	18.9	47	40	87	689	26.	1.0	8.2	689	26.00
9	588.5	24.2	48	27	75	901	158.	0.5	8.7	451	79.00
10	589.5	20.5	33	33	66	525	52.	1.0	9.7	525	52.00
11	590.4	19.1	57	25	82	845	26.	1.0	10.7	845	26.00
12	591.4	20.3	51	31	82	803	44.	1.0	11.7	803	44.00
13	592.5	14.6	30	53	83	340	14.	1.0	12.7	340	14.00
14	593.4	15.0	27	63	90	314	0.60	1.2	13.9	377	0.72
15	594.4	16.2	36	59	95	452	0.65	1.0	14.9	452	0.65
16	595.5	15.5	40	53	93	481	Imp.	1.0	15.9	481	0.00
17	596.6	20.0	60	30	90	931	2.7	1.0	16.9	931	2.70
18	597.6	13.8	55	40	95	589	Imp.	1.0	17.9	589	0.00
19	598.6	16.8	47	42	89	613	1.3	1.0	18.9	613	1.30
		21.4	47	28.4							
Net SD 580-592 12'		$OOIP = 7758 \times .214 \times (1 - .284) \times \frac{1}{1.02} = 1154$ $= 1154 \times 25 \times 12 = 34620$									

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company ShoMor Gas & Oil Corp. Lease Owens Well No. 20-A

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
580.0 - 591.7	11.7	82.6	966.40
591.7 - 598.9	5.2	3.7	19.37
580.0 - 598.9	16.9	58.3	985.77

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
580.0 - 591.7	11.7	20.9	47.3	29.1	762	8,912
591.7 - 598.9	7.2	16.0	41.7	49.0	525	3,783
580.0 - 598.9	18.9	19.3	45.0	36.7	672	12,695

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company		ShoMor Gas & Oil Corp.					Lease		Owens		Well No.		20-A	
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	580.5	19.4	53	798	0	0	53	32	798	216	10.16	20		
2	581.5	25.4	51	1005	0	0	51	34	1005	226	4.57	20		
3	582.4	26.1	44	891	4	81	40	41	810	240	23.09	10		
4	583.5	20.7	45	723	6	96	39	48	627	190	9.16	15		
5	584.5	19.8	43	661	0	0	43	50	661	44	0.67	30		
6	585.4	21.6	51	855	5	84	46	41	771	336	6.60	15		
7	586.5	21.7	41	690	0	0	41	44	690	198	3.97	20		
8	587.6	19.3	46	689	0	0	46	42	689	350	18.32	15		
9	588.5	24.3	48	905	3	57	45	41	848	378	17.16	15		
10	589.5	20.6	33	527	0	0	33	53	527	256	5.02	15		
11	590.4	19.0	57	840	0	0	57	40	840	10	1.20	20		
12	591.4	20.4	51	807	0	0	51	32	807	0	Imp.	-		
13	592.5	14.7	30	342	0	0	30	54	342	0	Imp.	-		
14	593.4	15.1	27	316	0	0	27	62	316	0	Imp.	-		
15	595.5	16.6	35	451	0	0	35	60	451	0	Imp.	-		
16	595.5	15.4	40	478	0	0	40	54	478	0	Imp.	-		
17	596.6	20.3	59	929	0	0	59	30	929	0	Imp.	-		
18	597.6	13.9	54	582	0	0	54	42	582	0	Imp.	-		
19	598.6	16.7	47	609	0	0	47	43	609	0	Imp.	-		

Notes: cc—cubic centimeter.

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

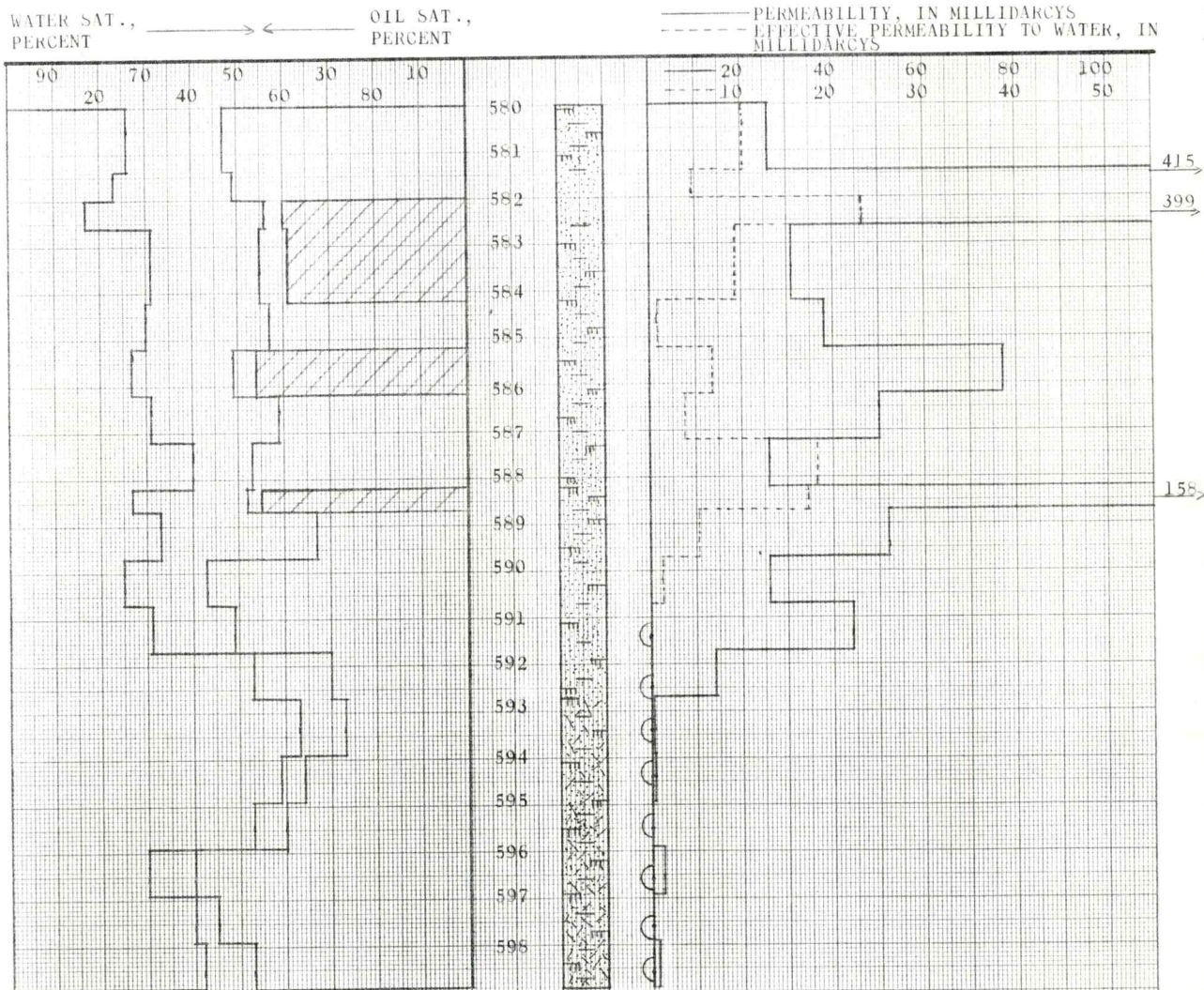
**—Determined by passing water through sample which still contains residual oil.

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	ShoMor Gas & Oil Corp.	Lease	Owens	Well No.	20-A
Depth Interval, Feet	580.0 - 591.7				
Feet of Core Analyzed	3.7				
Average Percent Porosity	22.3				
Average Percent Original Oil Saturation	46.9				
Average Percent Oil Recovery	5.0				
Average Percent Residual Oil Saturation	41.9				
Average Percent Residual Water Saturation	44.0				
Average Percent Total Residual Fluid Saturation	85.9				
Average Original Oil Content, Bbls./A. Ft.	810.				
Average Oil Recovery, Bbls./A. Ft.	85.				
Average Residual Oil Content, Bbls./A. Ft.	725.				
Total Original Oil Content, Bbls./Acre	2,999.				
Total Oil Recovery, Bbls./Acre	315.				
Total Residual Oil Content, Bbls./Acre	2,684.				
Average Effective Permeability, Millidarcys	11.8				
Average Initial Fluid Production Pressure, p.s.i.	13.8				

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



KEY:

- CALCAREOUS SANDSTONE
- SANDSTONE
- CALCAREOUS SANDSTONE WITH SHALE PARTINGS

- CARBONACEOUS CALCAREOUS SANDSTONE WITH SHALE PARTINGS
- FLOODPOT RESIDUAL OIL SATURATION
- IMPERMEABLE TO WATER

SHOMOR GAS & OIL CORPORATION

OWENS LEASE

MIAMI COUNTY, KANSAS

WELL NO. 20 A

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
580.0 - 591.7	11.7	20.9	47.3	29.1	82.6	
591.7 - 598.9	7.2	16.0	41.7	40.0	3.7	
580.0 - 598.9	18.9	19.3	45.0	36.7	88.3	1030 (PRIMARY AND WATERFLOODING)

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 CHANUTE, KANSAS
 JULY, 1981

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