OILFIELD RESEARCH LABORATORIES

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January 22, 1958

Creek Oil & Gas Company, Inc.
P. O. Box 377
Chanute, Kansas

Gentlemen:

Enclosed herewith is the report of the analysis of the 3" Rotary core taken from the Wells Lease, Well No. I-1, Neosho County, Kansas, and submitted to our laboratory by Mr. Jack McKelvey on January 9, 1958.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. McElrea

Carl L. McElrea

CLM:cb

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GENERAL INFORMATION & SUMMARY

Company Creek Oil & Gas Company, Inc. Lease Wells Well No. I-1

Location

Section 27 Twp. 28S Rge. 18E County Neosho State Kansas

Name of Sand	Bartlesville
Top of Core	794.0
Bottom of Core	821.0
Top of Sand	? 790
Bottom of Pay Sand	797.5
Total Feet of Permeable Sand (Analyzed)	10.4
Total Feet of Floodable Sand (Analyzed)	3.5

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 15	3.2	3.2
15 - 20	1.6	4.8
20 - 40	2.0	6.8
40 - 60	1.1	7.9
60 & above	2.5	10.4

Average Permeability Millidarcys	32.6
Average Percent Porosity	19.1
Average Percent Oil Saturation	46.6
Average Percent Water Saturation	31.0
Average Oil Content, Bbls./A. Ft.	691.
Total Oil Content, Bbls./Acre	8,706.
Average Percent Oil Recovery by Laboratory Flooding Tests	8.2
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	128.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	447.
Total Calculated Oil Recovery, Bbls./Acre	1,000.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

Water was used as the circulating fluid during the coring of the sand in this well.

The core was sampled and the samples were sealed in cans by a representative of the client.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
794.0 - 795.2	Brown fine grained micaceous sandstone.
795.2 - 796.3	Dark brown fine grained micaceous slightly carbonaceous sandstone.
796.3 - 798.9	Dark carbonaceous sandstone.
798.9 - 801.1	Dark carbonaceous shaley sandstone.
801.1 - 801.3	Light brown fine grained micaceous shaley sandstone.
801.3 - 801.8	Dark brown fine grained micaceous carbonaceous sandstone.
801.8 - 805.1	Dark brown fine grained micaceous carbonaceous shaley sandstone.
805.1 - 805.3	Gray sandy shale.
805.3 - 806.2	Dark brown fine grained micaceous carbonaceous shaley sandstone.
806.2 - 807.3	Gray carbonaceous sandstone.
807.3 - 818.0	Gray shaley sandstone.
818.0 - 821.0	Sandy shale.

Coring was started at a depth of 794.0 feet in brown fine grained micaceous sandstone and completed at 821.0 feet in sandy shale. This core shows a total of 23.8 feet of sandstone. For the most part, the pay is made up of fine grained micaceous to carbonaceous sandstone.

PERMEABILITY

For the sake of distribution, the core was divided into two sections. The weighted average permeability of the upper and lower sections is 63.0 and 17.1 millidarcys respectively; the overall average being 32.6 (See Table III). By observing the data given on the coregraph, it is noticeable that the sand has a very irregular permeability profile. The permeability of the sand varies from impermeable to a maximum of 78 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a good weighted average percent oil saturation, namely, 46.6. The weighted average percent oil saturation of the upper and lower sections is 44.7 and 47.5 respectively. The weighted average percent water saturation of the upper and lower sections is 29.4 and 31.8 respectively; the overall average being 31.0 (See Table III). This gives an overall weighted average total fluid saturation of 77.6 percent. This low total fluid saturation indicates considerable fluid was lost during coring which was probably oil.

The weighted average oil content of the upper and lower sections is 706 and 685 barrels per acre foot respectively; the overall average being 691. The total oil content, as shown by this core, is 8,706 barrels per acre (See Table III).

LABORATORY FLOODING TESTS

Part of the sand in this core responded fairly well to laboratory flooding tests, as a total recovery of 447 barrels of oil per acre was obtained from 3.5 feet of sand. The weighted average percent oil saturation was reduced from 44.8 to 36.6, or represents an average recovery of

8.2 percent. The weighted average effective permeability of the samples is 1.18 millidarcys, while the average initial fluid production pressure is 30.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 12 samples tested, 8 produced water and 4 oil. This indicates that approximately 33 percent of the sand represented by these samples is floodable pay sand. The tests also show that the sand is for the most part rather tight.

CONCLUSION

On the basis of the core analysis, it is evident that an efficient water-flood, within the area represented by this core, will recover approximately 1,000 barrels of oil per acre or an average of 286 barrels of oil per acre foot from the 3.5 feet of floodable pay sand analyzed, provided the sand will take the required volume of water satisfactorily. In calculating this recovery, an allowance was made for oil lost during coring and it was assumed that primary production and true water saturation of the sand are 7 and 29 percent respectively. In these calculations, an allowance was also made for sweep efficiency but not for permeability distribution.

This core shows a thin section of pay sand having a good oil saturation, a normal water saturation and fairly uniform effective permeability. The results of the core analysis indicate that the pay sand extends from the top of the core to a depth of 797.5 feet. The sand below that depth is very tight.

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RESULTS OF PERMEABILITY TESTS

TABLE I

Company Creek Oil & Gas Company, Inc. Lease Wells Well No. I-1

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	794.4	48.	0.6	0.6	28.80
2	794.9	74.	0.6	1.2	44.40
3	795.4	48.	0.5	1.7	24.00
4	795.9	78.	0.6	2.3	46.80
5	796.4	65.	0.4	2.7	26.00
6	796.9	65.	0.4	3.1	26.00
7	797.4	61.	0.5	3.6	30.50
8	797.9	28.	0.5	4.1	14.00
9	798.4	20.	0.5	4.6	10.00
10	798.8	15.	0.3	4.9	4.50
11	799.4	13.	0.7	5.6	9.10
12	799.9	7.3	0.5	6.1	3.65
13	800.4	9.3	0.5	6.6	4.65
14	800.8	Imp.	0.5	7.1	0.00
15	801.4	11.	0.5	7.6	5.50
16	801.9	19.	0.3	7.9	5.70
17	802.4	23.	0.5	8.4	11.50
18	802.9	19.	0.5	8.9	9.50
19	803.4	12	0.5	9.4	6.00
20	803.9	18.	0.5	9.9	9.00
21	804.4	11.	0.5	10.4	5.50
22	804.9	27.	0.5	10.9	13.50

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RESULTS OF SATURATION TESTS

TABLE II

Company Creek Oil & Gas Company, Inc. **Lease** Wells **Well No.** I-1

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
1	794.1	21.2	43	29	72	708	0.6	0.6	425
2	795.0	20.2	41	30	71	643	0.6	1.2	386
3	796.0	19.9	42	32	74	649	1.1	2.3	714
4	797.0	20.3	50	27	77	787	1.2	3.5	945
5	798.0	19.6	52	27	79	791	1.4	4.9	1,109
6	799.0	19.8	53	29	82	815	0.6	5.5	489
7	800.0	18.2	57	27	84	805	1.0	6.5	805
8	801.0	16.9	56	38	94	735	0.6	7.1	441
F-8	801.2	15.7	37	-	-	451	0.2	7.3	90
9	802.0	17.4	54	32	86	730	0.7	8.0	511
10	803.0	18.8	52	29	81	759	1.0	9.0	759
11	804.0	17.8	45	34	79	621	1.0	10.0	621
12	805.0	20.4	41	32	73	650	0.6	10.6	390
13	806.0	20.8	34	32	66	549	0.9	11.5	494
14	807.0	17.1	36	40	76	478	1.1	12.6	527
							Total - - - - - -		8,706

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Creek Oil & Gas Company, Inc. Lease Wells Well No. I-1

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
794.0 - 797.5	3.5	63.0	220.40
797.5 - 805.1	6.9	17.1	118.20
794.0 - 805.1	10.4	32.6	338.60

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
794.0 - 797.5	3.5	20.4	44.7	29.4	706	2,470
797.5 - 807.3	9.1	18.6	47.5	31.8	685	6,236
794.0 - 807.3	12.6	19.1	46.6	31.0	691	8,706

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Creek Oil & Gas Company, Inc. Lease Wells Well No. I-1

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	794.1	21.1	43	705	8	131	35	56	574	50	2.10	30
2	795.0	20.0	41	637	7	109	34	60	528	31	1.21	30
3	796.0	19.7	42	642	8	122	34	59	520	33	1.40	30
4	797.0	20.2	50	784	9	141	41	50	643	18	0.516	30
5	798.0	19.8	53	815	0	0	53	41	815	3	0.204	50
6	799.0	20.0	52	808	0	0	52	34	808	7	0.410	50
7	800.0	17.9	57	791	0	0	57	31	791	0	Imp.	50+
8	801.2	15.7	37	451	0	0	37	46	451	0	Imp.	50+
9	802.0	17.7	52	715	0	0	52	42	715	4	0.200	50
10	803.0	18.6	53	765	0	0	53	40	765	0	Imp.	50+
11	804.0	17.7	43	591	0	0	43	46	591	0	Imp.	50+
12	805.0	20.4	41	650	0	0	41	40	650	11	0.347	50

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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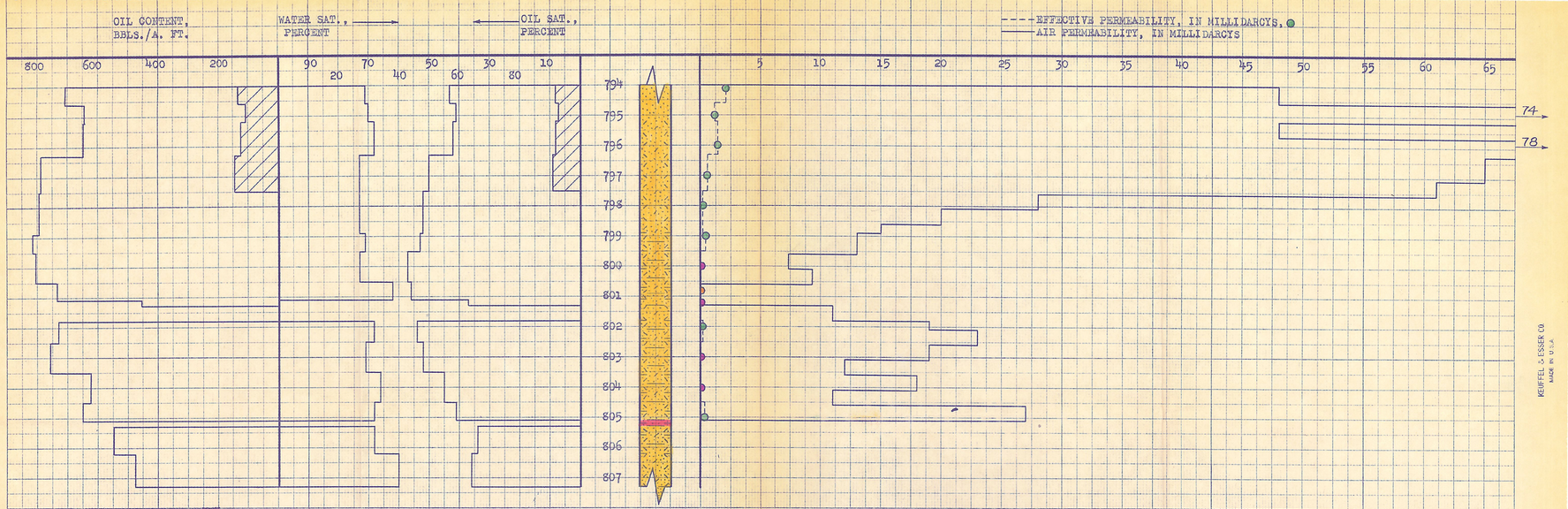
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Creek Oil & Gas Company, Inc. Lease Wells Well No. I-1

Depth Interval, Feet	794.0 - 797.5
Feet of Core Analyzed	3.5
Average Percent Porosity	20.2
Average Percent Original Oil Saturation	44.8
Average Percent Oil Recovery	8.2
Average Percent Residual Oil Saturation	36.6
Average Percent Residual Water Saturation	55.6
Average Percent Total Residual Fluid Saturation	92.2
Average Original Oil Content, Bbls./A. Ft.	700.
Average Oil Recovery, Bbls./A. Ft.	128.
Average Residual Oil Content, Bbls./A. Ft.	572.
Total Original Oil Content, Bbls./Acre	2,452.
Total Oil Recovery, Bbls./Acre	447.
Total Residual Oil Content, Bbls./Acre	2,005.
Average Effective Permeability, Millidarcys	1.18
Average Initial Fluid Production Pressure, p.s.i.	30.0

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



CREEK OIL & GAS COMPANY, INCORPORATED

WELLS LEASE — WELL NO. I-1

NEOSHO COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY, PERCENT	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVG. OIL CONTENT BBLS./A.FT.	TOTAL OIL CONTENT BBLS./ACRE	AVG. AIR PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY, BBLS./ACRE
794.0 - 797.5	3.5	20.4	44.7	29.4	706	2,470	63.0	
797.5 - 807.3	9.1	18.6	47.5	31.8	685	6,236	17.1	
794.0 - 807.3	12.6	19.1	46.6	31.0	691	8,706	32.6	1,000

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CHANUTE, KANSAS
JANUARY, 1958