

OILFIELD RESEARCH LABORATORIES

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February 7, 1958

Home-Stake Production Company
Philtower Building
Tulsa 3, Oklahoma

Gentlemen:

Enclosed herewith is the report of the analysis of the 2 11/16" Rotary core taken from the Poss Lease, Well No. G-15, Anderson County, Kansas, and submitted to our laboratory on January 28, 1958.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. McElrea

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CLM:cb

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205-20E-11

Fresh water base mud was used as the circulating fluid during the coring of the sand.

This core was sampled and the samples were sealed in cans by a representative of our laboratory.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
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646.0 - 648.2	- Brown fine grained micaceous slightly shaley sandstone.
648.2 - 648.7	- Gray sandy shale.
648.7 - 649.6	- Brown fine grained micaceous slightly shaley sandstone.
649.6 - 650.1	- Gray and light brown shaley sandstone.
650.1 - 654.2	- Brown fine grained micaceous slightly shaley sandstone.
654.2 - 655.2	- Light brown fine grained micaceous shaley sandstone.
655.2 - 657.2	- Brown fine grained micaceous slightly shaley sandstone.
657.2 - 657.5	- Gray sandy shale.
657.5 - 658.6	- Brown fine grained micaceous slightly shaley sandstone.
658.6 - 659.0	- Laminated shaley sandstone.
659.0 - 666.2	- Gray sandy shale.
666.2 - 671.1	- Alternate layers of sandstone and shale.
671.1 - 671.5	- Dark brown fine grained micaceous sandstone.
671.5 - 675.5	- Alternate layers of sandstone and shale.
675.5 - 695.0	- Gray shale.

Coring was started at a depth of 646.0 feet in brown fine grained micaceous slightly shaley sandstone and completed at 695.0 feet in gray shale. This core shows a total of 12.6 feet of sandstone. For the most part, the pay is made up of brown fine grained micaceous slightly shaley 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 39.1 and 12.0 millidarcys respectively; the overall average being 29.5 (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 2.5 to a maximum of 114 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a good weighted average percent oil saturation, namely, 36.4. The weighted average percent oil saturation of the upper and lower sections is 37.5 and 34.9 respectively. The weighted average percent water saturation of the upper and lower sections is 42.3 and 45.1 respectively; the overall average being 43.6 (See Table III). This gives an overall weighted average total fluid saturation of 80.0 percent. This total fluid saturation indicates some fluid was lost during coring which was probably oil.

The weighted average oil content of the upper and lower sections is 20 and 497 barrels per acre foot respectively; the overall average being 70. The total oil content, as shown by this core, is 11,429 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 1,973 barrels of oil per acre was obtained from 14.1 feet of sand. The weighted average percent oil saturation was reduced from 37.5 to 29.1, or represents an average recovery of 8.4 percent. The weighted average effective permeability of the

samples is 3.73 millidarcys, while the average initial fluid production pressure is 22.8 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 30 samples tested, 17 produced water and 16 oil. This indicates that approximately 80 percent of the sand represented by these samples is floodable pay sand. The tests also show that the sand has a very wide variation in effective permeability.

CONCLUSION

On the basis of the core analysis, we believe that an efficient water-flood, within the vicinity of this well, will recover approximately 2,400 barrels of oil per acre, or an average of 233 barrels of oil per acre foot from the 10.3 feet of floodable pay sand analyzed. In calculating this recovery, an allowance was made for oil lost during coring and it was assumed that the primary production and true water saturation of the sand are 10 and 38 percent respectively. In these calculations, an allowance was also made for permeability distribution but not for sweep efficiency.

The results of the core analysis indicate that the good floodable pay sand extends from the top of the cored section to a depth of 658.6 feet. The sand in that interval shows a good oil saturation, a normal water saturation and a wide variation in effective permeability. The cored section is broken and shaley with only a thin section having good effective permeability.

Company Home-Stake Production Company Lease Poss Well No C-15

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	646.1	21.3	38	41	79	628	0.6	0.6	377
2	647.1	20.6	34	47	81	544	1.0	1.6	544
3	648.1	22.5	46	39	85	802	0.6	2.2	482
4	649.1	24.2	40	37	77	751	0.9	3.1	676
5	650.0	15.4	30	64	94	358	0.5	3.6	179
F-5	650.2	24.2	35	-	-	658	0.5	4.1	329
6	651.1	22.5	36	43	79	628	1.0	5.1	628
7	652.1	23.0	39	42	81	696	1.0	6.1	696
8	653.1	19.4	40	46	86	602	1.0	7.1	602
9	654.1	20.5	35	40	75	557	0.6	7.7	334
10	655.1	17.8	34	43	77	469	1.0	8.7	469
11	656.1	21.2	39	37	76	642	1.4	10.1	900
12	657.1	21.8	43	41	84	728	0.6	10.7	436
13	658.1	21.1	36	41	77	590	1.1	11.8	650
22	667.1	18.8	34	41	75	496	1.4	13.2	695
23	668.1	16.2	31	55	86	390	1.5	14.7	585
25	670.1	18.2	42	39	81	594	1.5	16.2	890
F-26	671.0	17.0	27	-	-	356	0.5	16.7	178
26	671.2	21.4	52	29	81	865	0.4	17.1	346
28	673.1	16.3	22	51	73	278	1.1	18.2	306
29	674.1	19.2	49	47	96	730	1.0	19.2	730
30	675.1	20.3	28	43	71	441	0.9	20.1	397
							Total	- - - - -	11,429

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company		Home-Stake Production Company					Lease		Poss		Well No. C-15	
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	646.1	21.6	38	637	12	201	26	69	436	154	5.96	15
2	647.1	20.4	34	539	6	95	28	68	444	18	0.475	30
3	648.1	22.5	46	802	17	296	29	67	506	167	7.13	15
4	649.1	24.1	40	749	12	224	28	69	525	122	12.60	15
5	650.2	24.2	35	658	5	94	30	64	564	109	11.60	15
6	651.1	22.6	36	631	12	210	24	74	421	197	5.85	15
7	652.1	22.6	39	684	11	193	28	66	491	171	5.90	15
8	653.1	19.5	40	606	11	167	29	64	439	16	0.500	30
9	654.1	20.4	35	554	6	95	29	68	459	14	0.407	30
10	655.1	17.7	36	495	0	0	36	62	495	10	0.330	35
11	656.1	21.3	39	645	7	116	32	60	529	69	2.52	20
12	657.1	21.8	43	728	11	186	32	66	542	160	7.98	20
13	658.1	20.9	36	584	6	97	30	69	487	112	4.33	20
22	667.1	19.0	34	502	2	30	32	63	472	4	0.213	25
23	668.1	16.6	31	400	0	0	31	62	400	0	0.005	50
25	670.1	18.0	40	559	0	0	40	55	559	0	Imp.	50+
26	671.0	17.0	27	356	2	26	25	70	330	10	0.933	50
28	673.1	16.6	24	309	0	0	24	58	309	0	Imp.	50+
29	674.1	19.2	49	730	17	253	32	66	477	10	0.414	25
30	675.1	20.0	28	435	1	16	27	65	419	19	0.386	25

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.