

June 29, 1951

File: OC-2115

Re: Core Analysis
T & K Oil Company
O'Brien No. 29 Well 35-28-21
Walnut Field
Crawford County, ~~Oklahoma~~ Kansas

T. & K. Oil Company
Box 204
Pittsburgh, Kansas

Gentlemen:

Cores from the above well have been analyzed from 390 to 416 feet, inclusive. The detailed analysis results are given in graphical and tabular form. Pursuant to earlier conversation on this subject, we have examined the section for water flood possibilities and it is our opinion that the section could be put on a 5 spot flood under a close spacing program of 330 or 440 feet between like wells. This type of spacing is required because of the relatively shallow depths and consequent limitation of well head pressure. In the same vein, it may be pointed out that the low order of horizontal permeability severely limits water intake volumes. It is doubtful that this well could take over 50 barrels per day under a maximum safe pressure, although shooting would favorably alter this limitation.

Despite the above considerations, it is possible that this section under prudent operation could produce some 6000 barrels per acre at the time of reaching 95 percent water out. A more detailed evaluation of reserves and economics will be forthcoming when a map of the area and previous reservoir data are at hand.

TWP 28S RGE 21E SEC 35

Work is underway to perform certain laboratory experiments on several of these cores to ascertain the maximum recovery and the productive history of a section of this reservoir under capillary displacement. By this method we mean the enforced segregation of oil from air within the reservoir by proper pressure control and the production of a single phase, mainly oil, by proper mechanical installations. To this end we shall extract and re-saturate several core samples and place them on a shelf simulating the type of production practice just described.

Very truly yours,

PRODUCTION ENGINEERING LABORATORIES

Ward M. Edinger

WME:rc

Oilfield Research Laboratories
RESULTS OF PERMEABILITY TESTS
TABLE I

Company T. & K. Oil Company Lease O'Brien Well No. 29

Sample No.	Depth, Feet	Permeability Millidarcys		Feet of Core		Permeability Capacity Ft. x Md.
		VERT.	HOR.	Ft.	Cum. Ft.	
1	390.5	0.2	0.8			
2	391.5	4.2	1.7			
3	392.5	0.6	1.7			
4	393.5	0.1	0.4			
5	394.5	2.9	2.6			
6	395.5	6.1	18.			
7	396.5	1.9	15.			
8	397.5	17.	37.			
9	398.5	1.0	21.			
10	399.5	1.7	14.			
11	400.5	1.7	15.			
12	401.5	23.	35.			
13	402.5	53.	53.			
14	403.5	0.6	4.1			
15	404.5	10.	27.			
16	405.5	15.	40.			
17	406.5	15.	25.			
18	407.5	7.0	13.			
19	408.5	1.5	9.1			
20	409.5	4.4	7.0			
21	410.5	30.	42.			
22	411.5	12.	18.			
23	412.5	76.	54.			
24	413.5	5.3	5.0			
25	415.5	2.5	7.6			

Oil Field Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company T & K. Oil Company Lease O'Brien Well No. 29

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation		Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water		Ft.	Cum. Ft.	
1	390.5	20.6	17.5	37.4				
2	391.5	21.4	15.4	46.3				
3	392.5	20.4	16.2	43.6				
4	393.5	18.5	15.7	52.4				
5	394.5	19.8	14.6	38.4				
6	395.5	23.1	14.3	45.0				
7	396.5	21.8	19.7	39.9				
8	397.5	24.4	21.7	38.5				
9	398.5	20.5	20.0	37.6				
10	399.5	22.2	23.4	38.7				
11	400.5	21.6	10.2	34.3				
12	401.5	22.2	24.8	32.9				
13	402.5	22.4	32.6	31.7				
14	403.5	20.2	35.1	39.6				
15	404.5	22.2	33.8	28.8				
16	405.5	24.8	26.2	27.4				
17	406.5	23.2	27.6	25.4				

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Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation		Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water		Ft.	Cum. Ft.	
18	407.5	17.0	33.5	45.9				
19	408.5	20.9	28.2	48.8				
20	409.5	22.6	33.6	35.4				
21	410.5	21.8	33.5	35.3				
22	411.5	22.8	32.5	38.2				
23	412.5	21.3	31.9	31.9				
24	413.5	21.3	26.3	35.2				
25	415.5	19.3	39.4	34.2				

Formation Name Bartlesville Depth 380 to 426

Productive formation recovered 23 feet

Average of determined values:

Permeability	Vert.	<u>13.</u>	mdcys.
	Horz.	<u>20.</u>	
Porosity		<u>21.6</u>	percent
Oil saturation		<u>25.8</u>	percent
Water saturation		<u>37.1</u>	percent
Connate water		<u>28</u>	percent

Estimated or measured reservoir data used:

Original solution

gas/oil ratio 30 cu.ft/bbl.

Original formation

volume factor 1.01 bbls./bbl.

Original saturation

pressure 160 PSI

Original bottom

hole pressure 160 PSI

Permeability Distribution

Factor 0.568

(Perfect distribution----1.0)

Predicted unit recoverable oil in bbls. per acre foot

By gas expansion to zero PSI 125

By complete water drive, pressure maintained 760

By pattern flooding to 95% water cut 310