OILFIELD RESEARCH LABORATORIES
536 NORTH HIGHLAND - CHANUTE, KANSAS - PHONE HE1-2650

June 20, 1967

5-20-23E

Dakota Oil Company
P.O. Box 253
Pierre, South Dakota 57501

Gentlemen:

Enclosed herewith are the results of tests run on the Rotary core taken from the Harvey Lease, Well No. 15, Linn County, Kansas, and submitted to our laboratory on June 17, 1967.

This core was sampled after being received in the laboratory.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. Pate

Carl L. Pate

Harvey 15

CLP:rf

10 c.

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Dakota Oil Company Lease Harvey Well No. 15

Location SW SE

Section 5 Twp. 20S Rge. 23E County Linn State Kansas

Name of Sand	Peru
Top of Core	266.0
Bottom of Core	297.0
Top of Sand	266.3
Bottom of Sand (Cored)	297.0
Total Feet of Permeable Sand	24.0
Total Feet of Floodable Sand	

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	8.1	8.1
5 - 25	4.3	12.4
25 - 50	3.0	15.4
50 - 75	2.4	17.8
75 & above	6.2	24.0

Average Permeability Millidarcys	38.6
Average Percent Porosity	17.9
Average Percent Oil Saturation	37.6
Average Percent Water Saturation	47.5
Average Oil Content, Bbls./A. Ft.	513.
Total Oil Content, Bbls./Acre	13,951.
Average Percent Oil Recovery by Laboratory Flooding Tests	
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	
Total Calculated Oil Recovery, Bbls./Acre	
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	
Elevation, Feet	

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-LOG-

Company Dakota Oil Company Lease Harvey Well No. 15

Depth Interval, Feet	Description
266.0 - 266.3	Gray sandy shale.
266.3 - 272.3	Light brown to brown, slightly shaly sandstone.
272.3 - 272.4	Sandy shale.
272.4 - 273.5	Brown, fine grained sandstone.
273.5 - 274.1	Brown, calcareous, shaly sandstone.
274.1 - 275.0	Dark brown, fine grained sandstone.
275.0 - 279.9	Hard, brown, slightly calcareous sandstone.
279.9 - 282.0	Dark brown, fine grained sandstone.
282.0 - 283.4	Brown, fine grained, shaly sandstone.
283.4 - 284.6	Dark brown, fine grained sandstone.
284.6 - 285.0	Brown shaly sandstone.
285.0 - 286.4	Brown, fine grained sandstone.
286.4 - 287.2	Brown shaly sandstone.
287.2 - 288.3	Finely, laminated sandstone and shale.
288.3 - 288.9	Brown shaly sandstone.
288.9 - 289.4	Gray sandy shale.
289.4 - 290.2	Dark brown, shaly sandstone.
290.2 - 291.8	Dark brown, fine grained sandstone.
291.8 - 292.2	Soft sandy shale.
292.2 - 294.1	Dark brown, slightly shaly sandstone.
294.1 - 297.0	Gray shale containing thin layers of brown sandstone.

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Dakota Oil Company Lease Harvey Well No. 15

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	266.5	21.6	26	41	67	436	14.	0.7	0.7	305	9.80
2	267.5	18.8	23	58	81	335	27.	1.0	1.7	335	27.00
3	268.5	23.1	22	49	71	394	57.	1.0	2.7	394	57.00
4	269.5	20.7	16	56	72	257	110.	1.0	3.7	257	110.00
5	270.5	13.0	45	46	91	454	3.1	1.0	4.7	454	3.10
6	271.5	21.4	20	44	64	332	24.	1.3	6.0	432	31.20
7	272.5	13.4	44	37	81	456	0.96	0.6	6.6	274	0.58
8	273.4	12.0	47	44	91	438	-	0.5	7.1	219	-
P-8	273.6	-	-	-	-	-	Imp.	0.6	7.7	-	0.00
9	274.5	18.9	56	38	94	821	84.	0.9	8.6	739	75.60
10	275.5	13.1	43	49	92	436	2.0	1.0	9.6	436	2.00
11	276.5	12.7	47	40	87	464	1.0	1.0	10.6	464	1.00
12	277.5	9.9	49	49	98	376	1.2	1.0	11.6	376	1.20
13	278.5	13.5	48	38	86	503	1.4	1.0	12.6	503	1.40
14	279.5	14.7	56	33	89	638	6.2	0.9	13.5	574	5.58
P-15	280.4	-	-	-	-	-	1.4	0.6	14.1	-	0.84
15	280.6	24.2	46	29	75	864	-	0.5	14.6	432	-
16	281.5	23.4	40	44	84	726	92.	1.0	15.6	726	92.00
17	282.5	16.9	32	63	95	419	96.	1.4	17.0	586	134.40
18	283.5	24.0	41	38	79	763	31.	0.6	17.6	458	18.60
19	284.5	21.8	41	43	84	693	65.	0.6	18.2	416	39.00
20	285.5	21.6	43	44	87	720	21.	1.4	19.6	1,008	29.40
21	286.5	15.2	29	68	97	342	4.3	0.8	20.4	274	3.44
22	287.5	14.7	20	78	98	228	1.4	1.1	21.5	251	1.54
23	288.5	17.6	51	42	93	696	31.	0.6	22.1	418	18.60

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Dakota Oil Company Lease Harvey Well No. 15

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.		
24	289.5	16.0	33	65	98	409	Imp.	0.8	22.9	327	0.00
25	290.5	21.8	48	30	78	811	61.	0.8	23.7	649	48.80
26	291.5	19.6	30	31	61	456	81.	0.8	24.5	365	64.80
27	292.5	21.3	52	22	74	858	46.	0.8	25.3	686	36.80
28	293.5	20.7	49	32	81	787	99.	1.1	26.4	866	108.90
29	294.5	15.9	27	71	98	333	Imp.	1.0	27.4	333	0.00
30	296.5	16.4	31	67	98	394	Imp.	1.0	28.4	394	0.00
								Total	-------	13,951	

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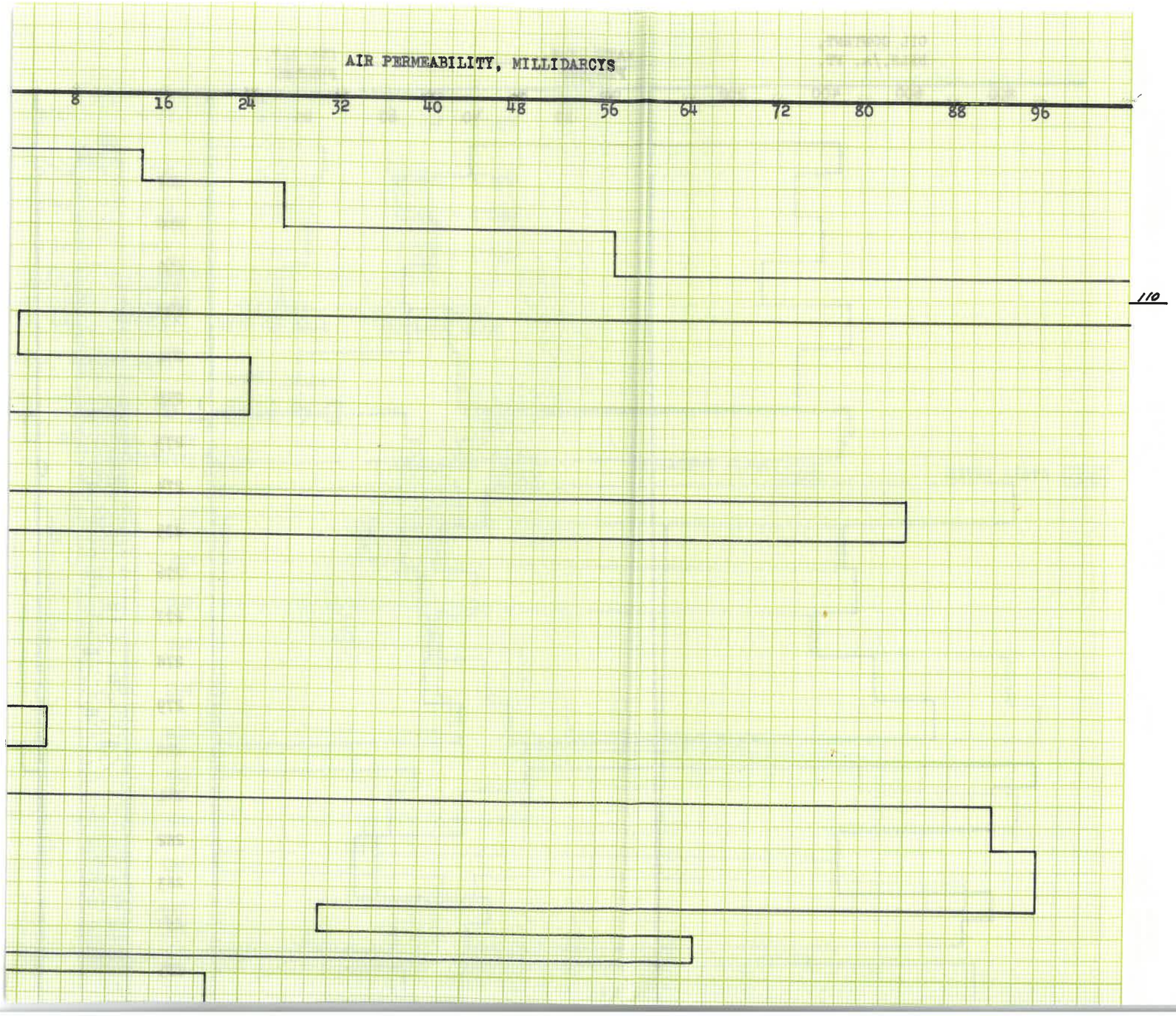
SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

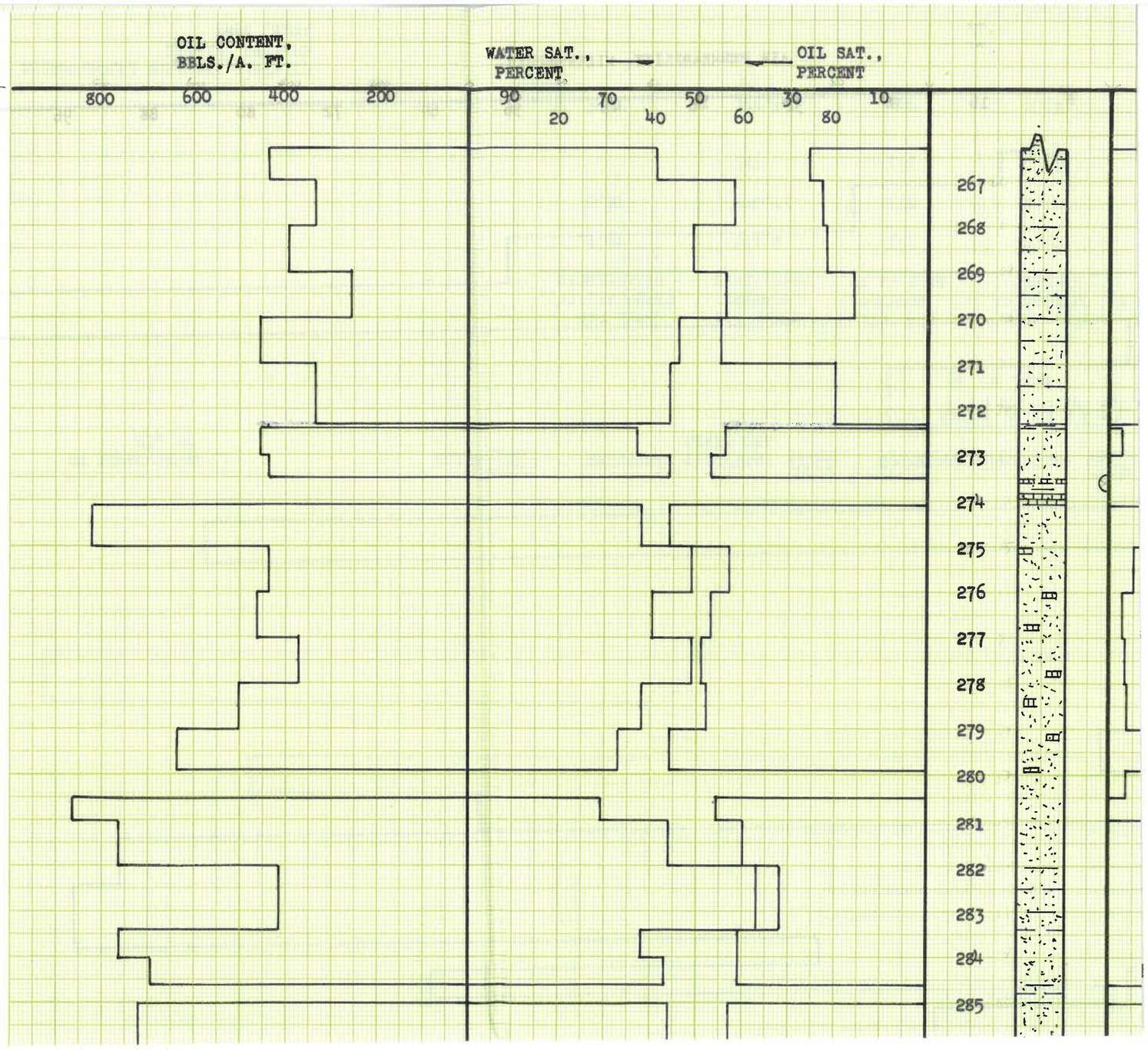
Company Dakota Oil Company Lease Harvey Well No. 15

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
266.3 - 272.3	6.0	39.7	238.10
272.4 - 294.1	18.0	38.0	684.48
266.3 - 294.1	24.0	38.6	922.58

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
266.3 - 272.3	6.0	19.8	25.0	49.2	363	2,177
272.4 - 294.1	19.2	17.4	42.5	44.8	573	11,047
294.1 - 297.0	2.0	16.1	29.0	69.0	363	727
266.3 - 297.0	27.2	17.9	37.6	47.5	513	13,951

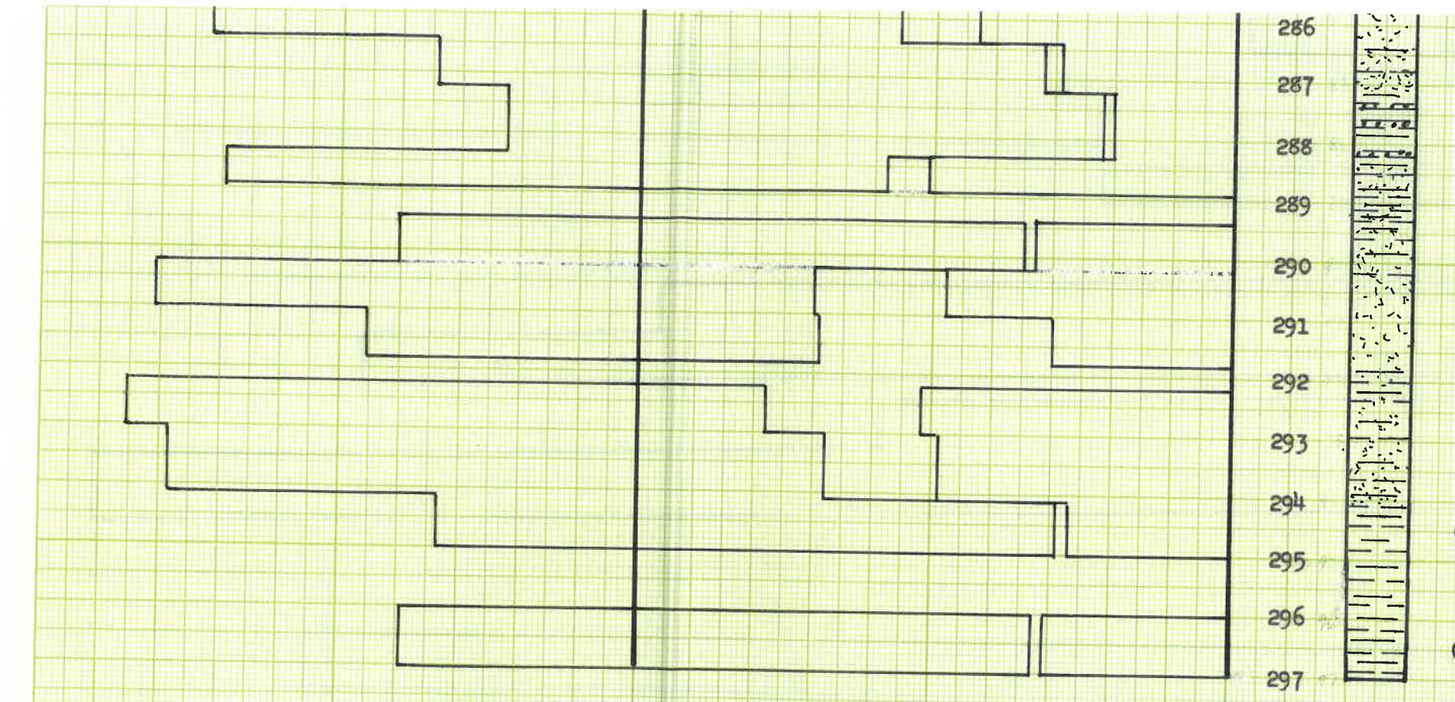

AIR PERMEABILITY, MILLIDARCYS
8
16
24
32
40
48
56
64
72
80
88
96
110

KEUFFEL & ESSER CO.
MADE IN U.S.A.



K&E STANDARD MILLIMETER

KEUFFEL & ESSER CO.
MADE IN U.S.A.



SANDY SHALE

SHALY SANDSTONE

SANDSTONE

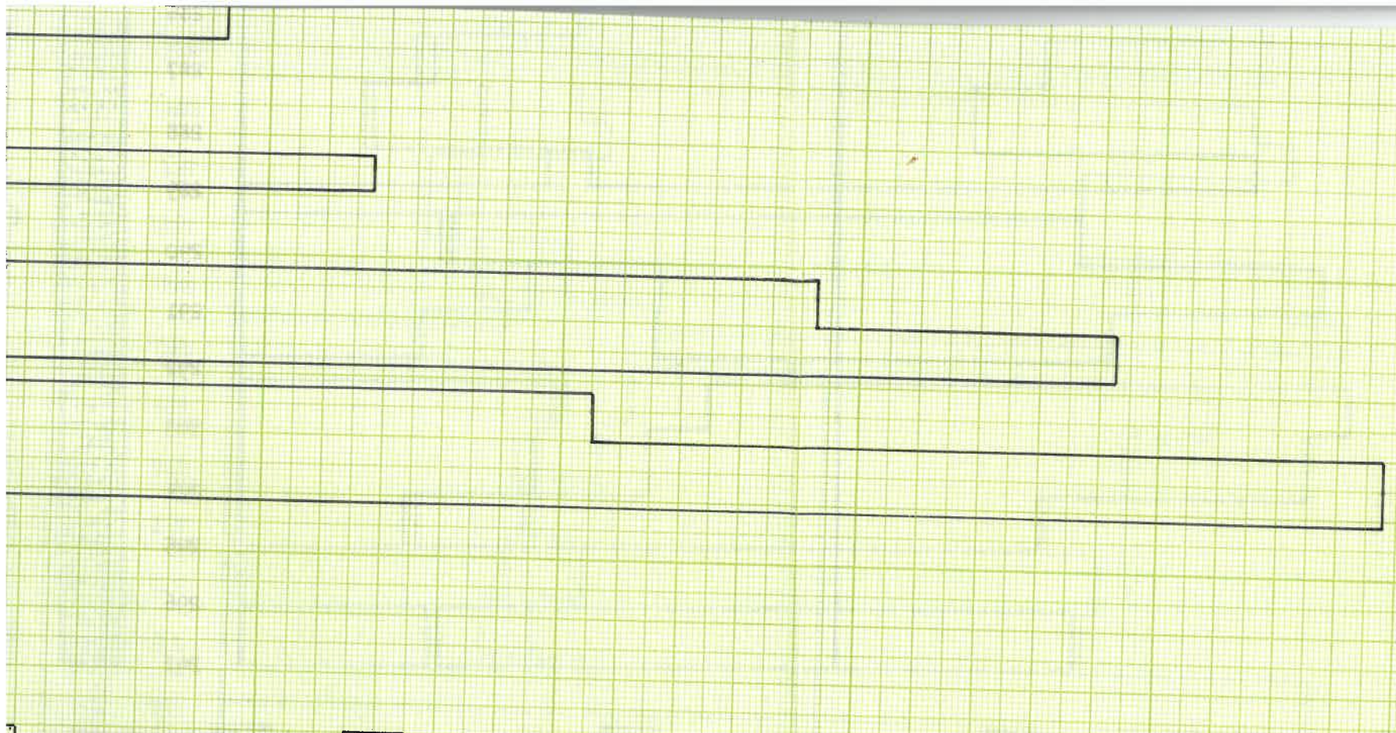
CALCAREOUS SHALY SANDSTONE

DAKOTA OIL

HARVEY LEASE

LINN COUNTY,

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE POROSITY, PERCENT	AV SAT PE
266.3 - 272.3	6.0	19.8	2
272.4 - 294.1	19.2	17.4	4
294.1 - 297.0	2.0	16.1	2
266.3 - 297.0	27.2	17.9	3



CALCAREOUS SANDSTONE

LAMINATED SANDSTONE AND SHALE

SHALE

① IMPERMEABLE TO TO AIR

MPANY

WELL NO. 15

AVG. WATER SATURATION PERCENT	AVG. OIL CONTENT BBLS./A.FT.	TOTAL OIL CONTENT BBLS./ACRE	AVG. AIR PERMEABILITY, MILLIDARCYS
49.2	363	2,177	39.7
44.8	573	11,047	38.0
69.0	363	727	
47.5	513	13,951	38.6

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JUNE, 1967