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

September 30, 1980

Lamco Energy, Inc.
P. O. Box 776
Chanute, Kansas 66720

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary cores taken from the Stanley Stitt Lease, Well No. L-3, Neosho County, Kansas and submitted to our laboratory on June 24, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/ks

5 c to Chanute, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Lamco Energy, Inc. Lease Stanley Stitt Well No. L-3

Location -

Section 24 Twp. 29S Rge. 17E County Neosho State Kansas

Elevation, Feet	-	-
Name of Sand	Upper Bartlesville	Bartlesville
Top of Core	897.0	997.0
Bottom of Core	917.0	1017.6
Top of Sand	897.0	997.0
Bottom of Sand (Tested)	916.0	1017.6
Total Feet of Permeable Sand (Tested)	13.0	15.7
Total Feet of Floodable Sand (Tested	0.0	3.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
	UPPER BARTLESVILLE SAND	
1 - 5	8.5	8.5
5 - 10	2.0	10.5
10 - 20	2.5	13.0
	BARTLESVILLE SAND	
0 - 100	4.6	4.6
100 - 150	3.0	7.6
150 - 200	6.2	13.8
200 - 250	1.9	15.7

Average Permeability Millidarcys	4.8	126.6
Average Percent Porosity	14.0	20.4
Average Percent Oil Saturation	15.9	12.3
Average Percent Water Saturation	56.3	76.3
Average Oil Content, Bbls./A. Ft.	175.	179.
Total Oil Content, Bbls./Acre	3322.	3013.
Average Percent Oil Recovery by Laboratory Flooding Tests	0.0	3.7
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	0.0	55.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	0.0	165.
Total Calculated Oil Recovery, Bbls./Acre	0.0	See "Calculated Recovery" Section

The core was sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid.

Since only the Bartlesville sand responded to flooding susceptibility tests, a calculated recovery is given for the Bartlesville sand only.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
	UPPER BARTLESVILLE SAND
897.0 - 907.8	Gray laminated slightly calcareous sandstone and shale.
907.8 - 910.3	Brown slightly calcareous sandstone.
910.3 - 914.1	Brown and gray laminated calcareous sandstone and shale.
914.1 - 917.0	Gray laminated calcareous sandstone and shale.
	BARTLESVILLE SAND
997.0 - 999.6	Brown slightly calcareous sandstone.
999.6 - 1001.2	Gray sandy shale.
1001.2 - 1003.0	Light brown slightly calcareous sandstone.
1003.0 - 1005.9	Gray slightly calcareous sandstone.
1005.9 - 1007.2	Gray sandy shale.
1007.2 - 1009.1	Gray very shaly sandstone.
1009.1 - 1010.0	Gray laminated sandstone and shale.
1010.0 - 1011.1	Gray very shaly slightly calcareous sandstone.
1011.1 - 1017.6	Gray slightly calcareous sandstone.
	LOWER BARTLESVILLE SAND
1065.0 - 1082.0	Gray shale.

LABORATORY FLOODING TESTS

BARTLESVILLE SAND

The Bartlesville sand in this core responded to laboratory flooding tests, as a total recovery of 16.5 barrels of oil per acre was obtained from 3.0 feet of sand. The weighted average percent oil saturation was reduced from 35.0 to 31.3, or represents an average recovery of 3.7 percent. The weighted average effective permeability of the samples is 28.27 millidarcys, while the average initial fluid production pressure is 10.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 18 samples tested, 3 produced water and oil, and 14 samples produced water only. This indicates that approximately 17 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

BARTLESVILLE SAND

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 650 barrels of oil per acre. This is an average recovery of 215 barrels per acre foot from 3.0 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.08
Reservoir water saturation, percent, estimated	35.0
Average porosity, percent	19.2
Oil saturation after flooding, percent	31.3
Performance factor, percent, estimated	50.0
Net floodable sand, feet	3.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Lamco Energy, Inc. Lease Stanley Stitt Well No. L-3

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.		
						UPPER BARTLESVILLE SAND					
1	897.5	9.7	20	47	67	151	Imp.	1.0	1.0	151	0.00
2	898.5	11.4	6	75	81	53	Imp.	1.0	2.0	53	0.00
3	900.0	13.9	12	65	77	129	Imp.	1.5	3.5	194	0.00
4	901.5	14.0	6	76	82	65	Imp.	1.5	5.0	98	0.00
5	902.7	12.7	14	44	58	138	Imp.	1.0	6.0	138	0.00
6	903.5	13.8	17	46	63	182	1.3	1.0	7.0	182	1.30
7	904.6	13.0	2	75	77	20	6.8	1.0	8.0	20	6.80
8	905.5	14.1	18	52	70	197	0.36	1.0	9.0	197	0.36
9	906.5	13.9	14	55	69	151	1.4	1.0	10.0	151	1.40
10	907.5	15.0	18	44	62	210	2.9	0.8	10.8	168	2.32
11	908.8	15.7	21	41	62	256	12.	1.2	12.0	307	14.40
12	909.5	15.6	29	30	59	351	19.	1.3	13.3	456	24.70
13	910.6	15.3	20	63	83	237	0.61	0.7	14.0	166	0.43
14	911.3	18.1	22	55	77	309	7.8	1.0	15.0	309	7.80
15	912.5	11.1	27	60	87	233	0.31	1.0	16.0	233	0.31
16	913.6	13.8	23	54	77	246	0.45	1.1	17.1	271	0.50
17	915.6	15.5	10	64	74	120	1.3	1.9	19.0	228	2.47
						BARTLESVILLE SAND					
18	997.5	19.4	39	40	79	587	121.	1.0	1.0	587	121.00
19	998.7	19.2	36	45	81	536	169.	1.0	2.0	536	169.00
20	999.4	19.9	21	62	83	324	163.	0.6	2.6	194	97.80
21	1001.3	21.6	7	84	91	117	90.	0.8	3.4	94	72.00
22	1002.7	19.2	30	45	75	447	123.	1.0	4.4	447	123.00
23	1003.6	19.6	10	80	90	152	26.	1.0	5.4	152	26.00
24	1004.8	20.7	7	84	91	112	158.	1.0	6.4	112	158.00
25	1005.7	18.8	6	90	96	88	56.	0.9	7.3	79	50.40
26	1007.5	14.3	14	66	80	155	0.42	1.0	8.3	155	0.42

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Lamco Energy, Inc. Lease Stanley Stitt Well No. L-3

BARTLESVILLE SAND

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.		
27	1008.9	13.7	14	63	77	149	0.55	0.9	9.2	134	0.50
28	1010.2	19.4	3	89	92	45	Imp.	1.1	10.3	50	0.00
29	1011.3	18.5	7	91	98	100	203.	0.9	11.2	90	182.70
30	1012.5	21.5	4	90	94	67	199.	1.0	12.2	67	199.00
31	1013.4	21.1	5	89	94	82	169.	1.0	13.2	82	169.00
32	1014.4	20.8	2	90	92	32	203.	1.0	14.2	32	203.00
33	1015.5	21.2	2	93	95	33	169.	1.0	15.2	33	169.00
34	1016.4	17.4	6	90	96	81	145.	1.0	16.2	81	145.00
35	1017.3	18.9	10	80	90	147	169.	0.6	16.8	88	101.40

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Lamco Energy, Inc. Lease Stanley Stitt Well No. L-3

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
	UPPER BARTLESVILLE SAND		
897.0 - 907.8	4.8	2.5	12.18
907.8 - 916.0	8.2	6.2	50.61
897.0 - 916.0	13.0	4.8	62.79
	BARTLESVILLE SAND		
997.0 - 1003.0	4.4	132.5	582.80
1003.0 - 1017.6	11.3	124.3	1404.42
997.0 - 1017.6	15.7	126.6	1987.22

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
		UPPER BARTLESVILLE SAND				
897.0 - 907.8	10.8	13.2	12.3	59.3	125	1,352
907.8 - 916.0	8.2	15.1	20.8	52.2	240	1,970
897.0 - 916.0	19.0	14.0	15.9	56.3	175	3,322
		BARTLESVILLE SAND				
997.0 - 1003.0	4.4	19.8	28.0	53.3	422	1,858
1003.0 - 1017.6	12.4	20.6	6.7	84.5	93	1,155
997.0 - 1017.6	16.8	20.4	12.3	76.3	179	3,013

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Lamco Energy, Ind. Lease Stanley Stitt Well No. L-3

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.			
					UPPER BARTLESVILLE SAND							
1	897.5	10.0	20	155	0	0	20	68	155	0	Imp.	-
2	898.5	11.4	6	53	0	0	6	76	53	0	Imp.	-
3	900.0	13.7	12	128	0	0	12	69	128	0	Imp.	-
4	901.5	13.5	7	73	0	0	7	77	73	0	Imp.	-
5	902.7	13.1	13	132	0	0	13	50	132	0	Imp.	-
6	903.5	13.6	17	179	0	0	17	60	179	20	0.22	50
7	904.6	12.9	2	20	0	0	2	76	20	0	Imp.	-
8	905.5	14.0	18	196	0	0	18	54	196	0	Imp.	-
9	906.5	14.1	14	153	0	0	14	56	153	0	Imp.	-
10	907.5	15.1	18	211	0	0	18	45	211	0	Imp.	-
11	908.8	15.9	21	259	0	0	21	72	259	111	2.10	25
12	909.5	15.8	29	355	0	0	29	56	355	169	3.67	25
13	910.6	15.3	20	237	0	0	20	64	237	0	Imp.	-
14	911.3	18.0	22	307	0	0	22	62	307	36	0.52	40
15	912.5	11.2	27	235	0	0	27	60	235	0	Imp.	-
16	913.6	13.2	22	225	0	0	22	56	225	0	Imp.	-
17	915.6	15.5	10	120	0	0	10	66	120	0	Imp.	-
					BARTLESVILLE SAND							
18	997.5	19.3	39	584	4	60	35	63	524	368	38.98	10
19	998.7	19.3	36	539	5	75	31	60	464	168	19.12	10
20	999.4	19.7	21	321	0	0	21	73	321	217	23.24	10
21	1001.3	21.5	7	117	0	0	7	87	117	328	21.99	10
22	1002.7	19.1	30	445	2	30	28	68	415	283	26.70	10
23	1003.6	19.7	10	153	0	0	10	87	153	170	19.87	10
24	1004.8	20.5	7	111	0	0	7	84	111	136	50.98	10
25	1005.7	19.0	6	88	0	0	6	90	88	632	6.66	10
26	1007.5	14.2	14	154	0	0	14	71	154	10	0.15	30

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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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Lamco Energy, Inc. Lease Stanley Stitt Well No. L-3

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.			
					BARTLESVILLE SAND							
27	1008.9	13.9	14	151	0	0	14	84	151	13	0.22	10
28	1010.2	19.3	3	45	0	0	3	92	45	0	Imp.	-
29	1011.3	18.6	7	101	0	0	7	88	101	567	7.41	10
30	1012.5	21.4	4	66	0	0	4	92	66	274	24.37	10
31	1013.4	21.1	5	82	0	0	5	91	82	296	26.24	10
32	1014.4	20.7	2	32	0	0	2	96	32	303	26.99	10
33	1015.5	21.2	2	33	0	0	2	96	33	204	23.24	10
34	1016.4	17.6	6	82	0	0	6	91	82	892	7.65	10
35	1017.3	18.9	10	147	0	0	10	83	147	173	64.47	10

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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Lamco Energy, Inc. Lease Stanley Stitt Well No. L-3

	BARTLESVILLE SAND
Depth Interval, Feet	997.0 - 1003.0
Feet of Core Analyzed	3.0
Average Percent Porosity	19.2
Average Percent Original Oil Saturation	35.0
Average Percent Oil Recovery	3.7
Average Percent Residual Oil Saturation	31.3
Average Percent Residual Water Saturation	65.3
Average Percent Total Residual Fluid Saturation	96.6
Average Original Oil Content, Bbls./A. Ft.	523.
Average Oil Recovery, Bbls./A. Ft.	55.
Average Residual Oil Content, Bbls./A. Ft.	468.
Total Original Oil Content, Bbls./Acre	1568.
Total Oil Recovery, Bbls./Acre	165.
Total Residual Oil Content, Bbls./Acre	1403.
Average Effective Permeability, Millidarcys	28.27
Average Initial Fluid Production Pressure, p.s.i.	10.0

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

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WATER SAT., PERCENT → 90 70 50 30 10

← OIL SAT., PERCENT 20 40 60 80 90

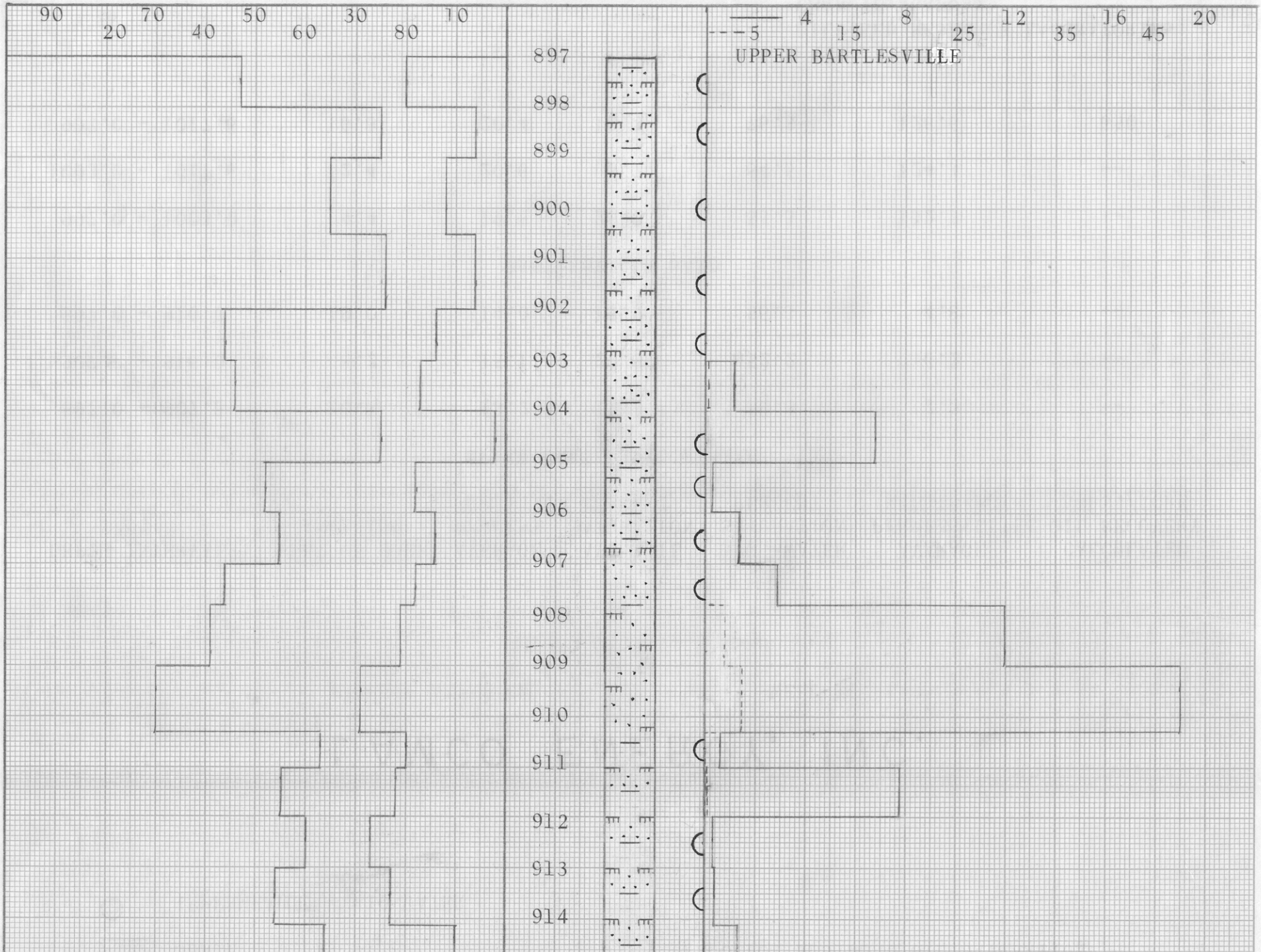
——— PERMEABILITY IN MDS.

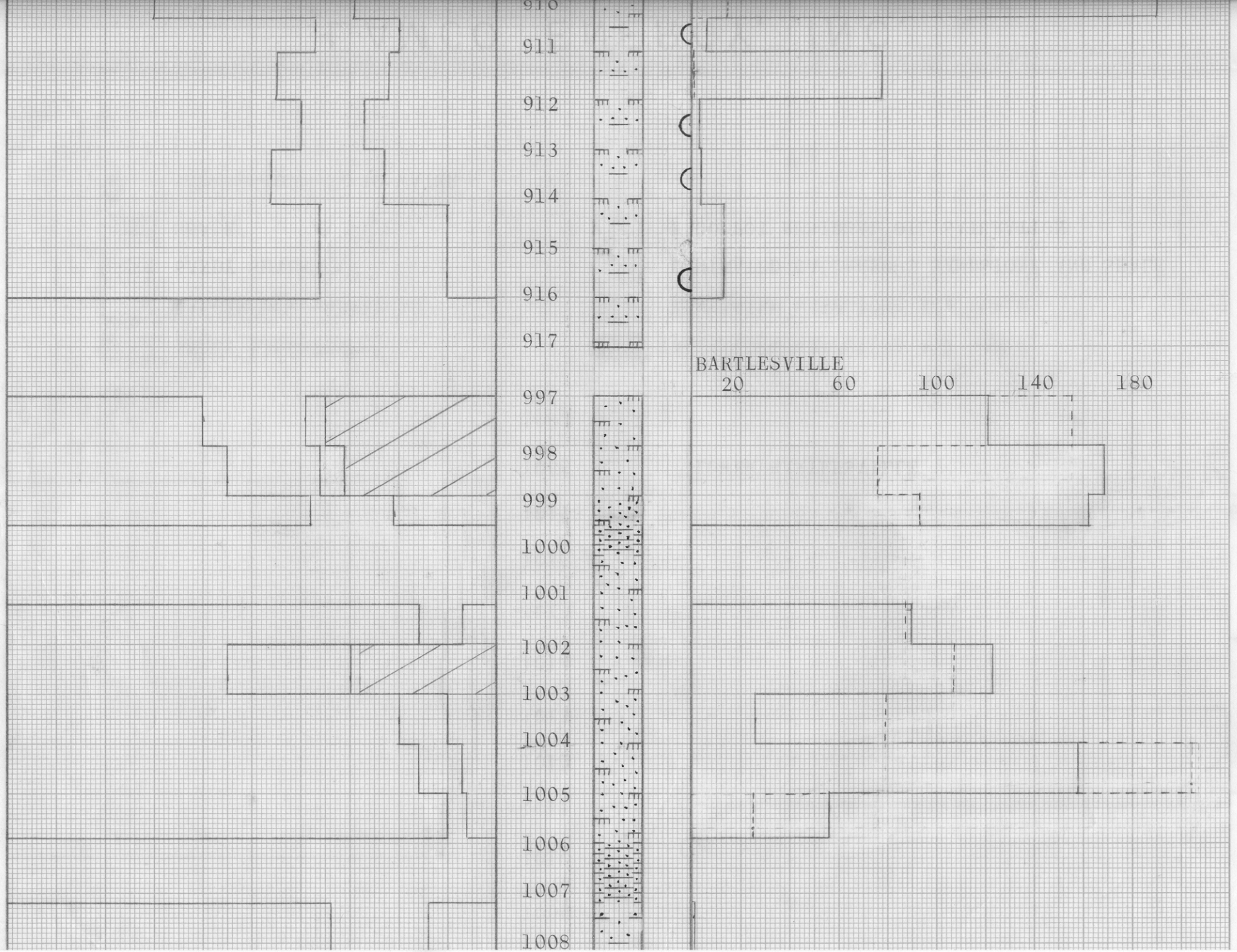
– – – – – EFFECTIVE PERMEABILITY TO WATER, IN MDS.

4 8 12 16 20

5 15 25 35 45

UPPER BARTLESVILLE

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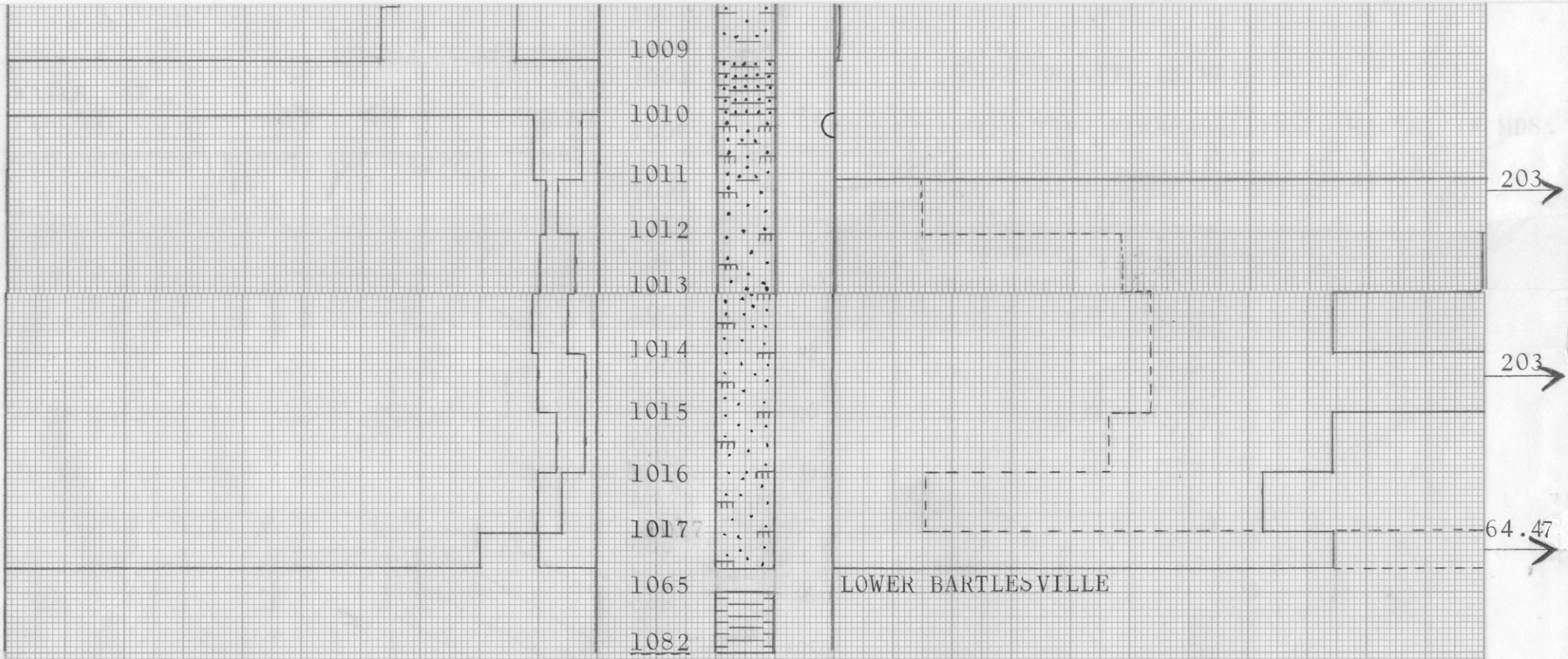

KEY:

- SHALY SANDSTONE
- CALCAREOUS SANDSTONE
- SANDY SHALE
- SHALE
- IMPERMEABLE TO WATER
- CALCAREOUS SANDSTONE AND SHALE
- LAMINATED SANDSTONE AND SHALE
- LAMINATED CALCAREOUS SANDSTONE AND SHALE
- FLOODPOT RESIDUAL OIL SATURATION

LAMCO ENERGY, INC.

STANLEY STITT LEASE WELL NO. L-3

NEOSHO COUNTY, KANSAS

DEPTH INTERVALS, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLS./ACRE
UPPER BARTLESVILLE SAND						
897.0 - 907.8	10.8	13.2	12.3	59.3	2.5	--
907.8 - 916.0	8.2	15.1	20.8	52.2	6.2	--
897.0 - 916.0	19.0	14.0	15.9	56.3	4.8	--
BARTLESVILLE SAND						
997.0 - 1003.0	4.4	19.8	28.0	53.3	132.5	--
1003.0 - 1017.6	12.4	20.6	6.7	84.5	124.3	--
997.0 - 1017.6	16.8	20.4	12.3	76.3	126.6	650

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
SEPTEMBER, 1980

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