



OILFIELD RESEARCH LABORATORIES

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

October 19, 1979

Seagull Resources, Inc.
One Allen Center
Suite 1000
Houston, Texas 77002

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Cuppy Lease, Well No. 1, Bourbon County, Kansas, and submitted to our laboratory on October 4, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Benjamin R. Pearman

SAM:km
10 c to Houston, Texas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Seagull Resources, Inc. Lease Cuppy Well No. 1

Location NW NE NE

Section 26 Twp. 24S Rge. 21E County Bourbon State Kansas

Name of Sand	Bartlesville
Top of Core	668.5
Bottom of Core	683.2
Top of Sand	668.5
Bottom of Sand	681.5
Total Feet of Permeable Sand	8.5
Total Feet of Floodable Sand	2.0

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 5	4.2	4.2
5 - 10	2.7	6.9
10 - 20	0.6	7.5
30 - 40	1.0	8.5

Average Permeability Millidarcys	9.4
Average Percent Porosity	15.5
Average Percent Oil Saturation	36.7
Average Percent Water Saturation	36.0
Average Oil Content, Bbls./A. Ft.	426.
Total Oil Content, Bbls./Acre	3,920.
Average Percent Oil Recovery by Laboratory Flooding Tests	8.1
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	94.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	187.

Total Calculated Oil Recovery, Bbls./Acre - - - - - See "Calculated Recovery" Section

Packer Setting, Feet - - - - -

Viscosity, Centipoises @ - - - - -

A. P. I. Gravity, degrees @ 60 °F - - - - -

Elevation, Feet - - - - -

The core was sampled in the laboratory after being delivered by the client, and was exposed to air approximately $1\frac{1}{2}$ hours before being sampled. Fresh water mud was used as a drilling fluid. The core was reported to be from a non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
668.5 - 670.1	Brown sandstone.
670.1 - 672.2	Brown slightly shaly sandstone.
672.2 - 674.5	Gray sandy shale.
674.5 - 676.4	Brown very shaly sandstone.
676.4 - 677.0	Dark shale.
677.0 - 677.7	Light brown and gray laminated sandstone and shale.
677.7 - 678.1	Gray shale.
678.1 - 679.3	Brown slightly shaly sandstone.
679.3 - 679.5	Gray sandy shale.
679.5 - 680.6	Brown slightly shaly sandstone.
680.6 - 680.9	Gray shale.
680.9 - 681.5	Brown shaly sandstone.
681.5 - 682.3	Gray laminated shale.
682.3 - 682.8	Coal.
682.8 - 683.2	Gray shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 187 barrels of oil per acre

was obtained from 2.0 feet of sand. The weighted average percent oil saturation was reduced from 43.0 to 34.9, or represents an average recovery of 8.1 percent. The weighted average effective permeability of the samples is 0.48 millidarcys, while the average initial fluid production pressure is 28.3 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 12 samples tested, 3 produced water and oil, and 2 samples produced water only. This indicates that approximately 25 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 460 barrels of oil per acre. This is an average recovery of 228 barrels per acre foot from 2.0 feet of floodable sand analyzed in this core.

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

Original formation volume factor	1.05
Reservoir water saturation, percent	25.0
Average porosity, percent	16.1
Oil saturation after flooding, percent	34.9
Performance factor, percent	50.0
Net floodable pay sand, feet	2.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Seagull Resources, Inc. Lease Cuppy Well No. 1

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	668.8	18.6	25	38	63	361	11.	0.6	0.6	217	6.60
2	669.5	19.6	22	40	62	335	37.	1.0	1.6	335	37.00
3	670.5	18.7	35	39	74	508	7.2	0.9	2.5	457	6.48
4	671.4	14.8	54	42	96	620	9.4	1.2	3.7	744	11.28
5	674.6	12.9	47	18	65	470	0.51	0.5	4.2	235	0.26
6	675.5	14.4	32	26	58	358	2.5	1.0	5.2	358	2.50
7	676.2	13.9	31	35	66	334	0.92	0.4	5.6	134	0.37
8	677.4	13.5	30	43	73	314	Imp.	0.7	6.3	220	0.00
9	678.4	15.6	21	53	74	254	4.6	1.2	7.5	305	5.52
10	679.6	12.4	51	29	80	491	3.1	0.5	8.0	246	1.55
11	680.5	15.2	48	15	63	566	9.4	0.6	8.6	340	5.64
12	681.2	11.8	60	28	88	549	3.8	0.6	9.2	329	2.28

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Seagull Resources, Inc.	Lease	Cuppy	Well No.	1
Depth Interval, Feet	Feet of Core Analyzed	Average Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
668.5 - 681.5	8.5	15.5	36.7	36.0	426	3,920
					79.48	
					9.4	
					Permeability Capacity Ft. x Md.	

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Seagull Resources, Inc. Lease Cuppy Well No. 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			
1	668.8	18.7	26	377	0	0	26	61	22	0.30	30
2	669.5	19.4	23	346	0	0	23	75	116	2.85	30
3	670.5	18.7	35	508	3	44	32	65	21	0.37	30
4	671.4	15.2	54	637	0	0	54	33	0	Imp.	-
5	674.6	13.0	46	464	0	0	46	40	0	Imp.	-
6	675.5	14.3	34	377	0	0	34	52	0	Imp.	-
7	676.2	14.0	30	326	0	0	30	41	0	Imp.	-
8	677.4	13.5	29	304	0	0	29	60	0	Imp.	-
9	678.4	15.4	22	263	0	0	22	60	0	Imp.	-
10	679.6	12.8	51	506	10	99	41	55	51	1.05	30
11	680.5	15.0	48	559	14	163	34	55	7	0.15	25
12	681.2	12.0	57	531	0	0	57	32	0	Imp.	-

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

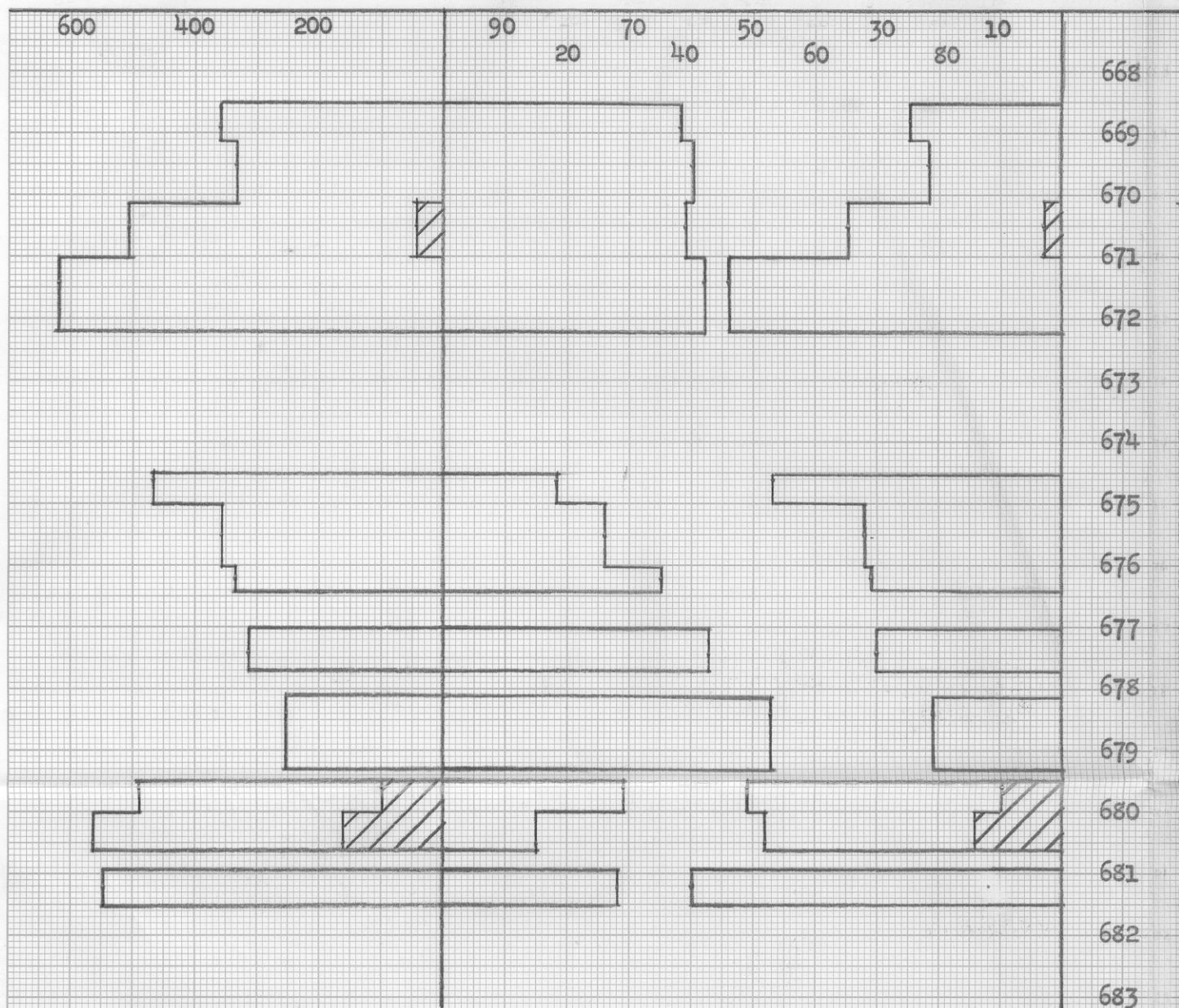
Company	Seagull Resources, Inc.	Lease	Cuppy	Well No.	1
Depth Interval, Feet	668.5 - 681.5				
Feet of Core Analyzed	2.0				
Average Percent Porosity	16.1				
Average Percent Original Oil Saturation	43.0				
Average Percent Oil Recovery	8.1				
Average Percent Residual Oil Saturation	34.9				
Average Percent Residual Water Saturation	59.5				
Average Percent Total Residual Fluid Saturation	94.4				
Average Original Oil Content, Bbls./A. Ft.	154.				
Average Oil Recovery, Bbls./A. Ft.	94.				
Average Residual Oil Content, Bbls./A. Ft.	60.				
Total Original Oil Content, Bbls./Acre	1,046.				
Total Oil Recovery, Bbls./Acre	187.				
Total Residual Oil Content, Bbls./Acre	859.				
Average Effective Permeability, Millidarcys	0.48				
Average Initial Fluid Production Pressure, p.s.i.	28.3				

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

OIL CONTENT,
BBLs./A. FT.

WATER SAT.,
PERCENT

OIL SAT.,
PERCENT



KEY:
 FLOOD POT RECOVERY
 SANDSTONE

 SHALY SANDSTONE
 LAMINATED SANDSTONE AND SHALE

SEAGULL RES

CUPPY LEASE

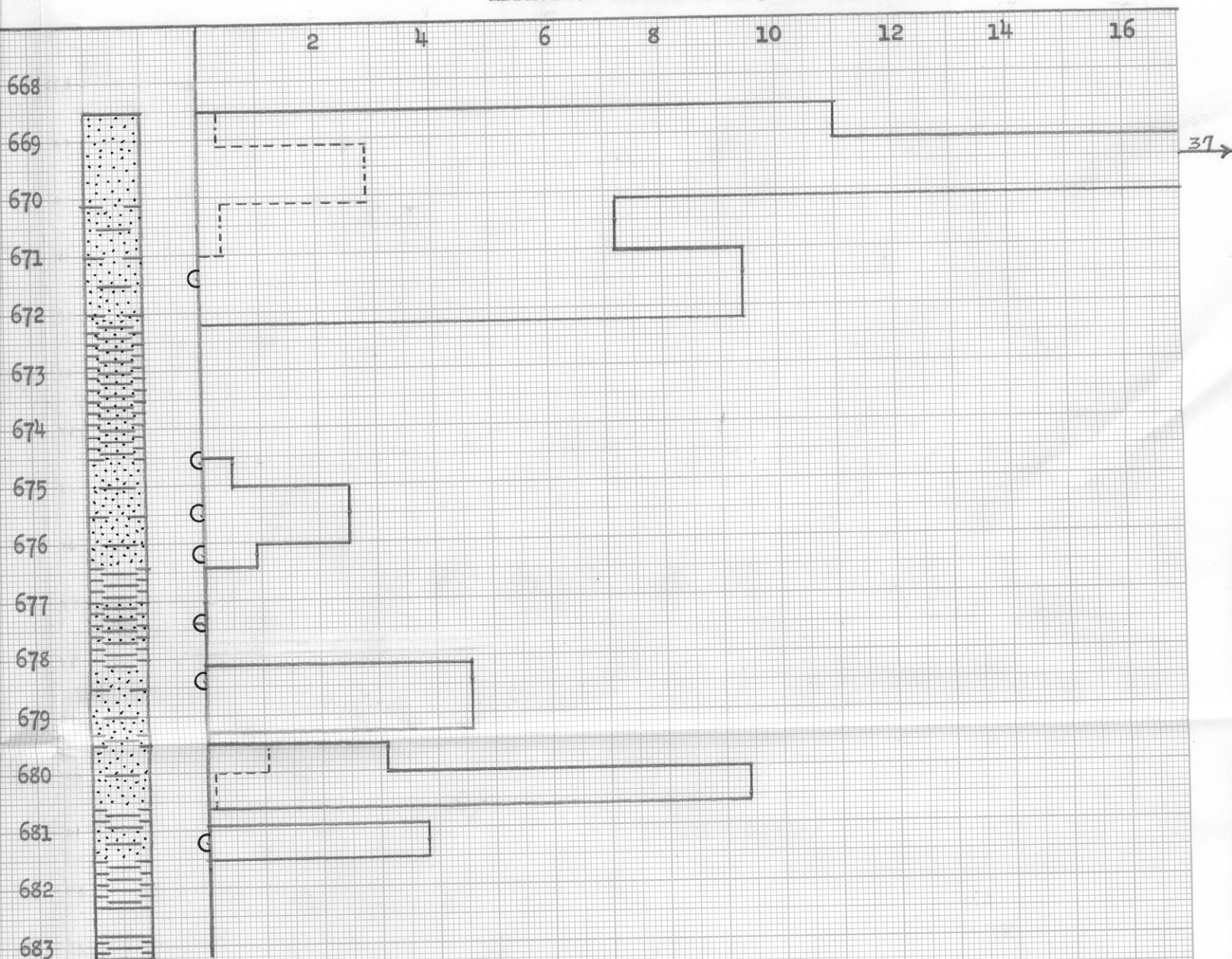
BOURBON COUNTY

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT
668.5 - 681.5	9.2	15.5	36.7

47 1512

10 X 10 TO THE CENTIMETER 25 X 38 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

— AIR PERMEABILITY, IN MILLIDARCYS
 - - - EFFECTIVE PERMEABILITY, IN MILLIDARCYS



COAL

SANDY SHALE

SHALE

- IMPERMEABLE TO AIR
- IMPERMEABLE TO WATER

RESOURCES, INC.

WELL NO. 1

ON COUNTY, KANSAS

OIL ATION ENT	AVG. WATER SATURATION PERCENT	AVG. OIL CONTENT BBLs./A.FT.	TOTAL OIL CONTENT BBLs./ACRE	AVG. AIR PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLs./ACRE
7	36.0	426	3,920	9.4	460

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 CHANUTE, KANSAS
 OCTOBER, 1979.