OILFIELD RESEARCH LABORATORIES

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

July 29, 1982

Andercan Energy Corporation
227½ South Main
P.O. Box 108
Ottawa, Kansas 66067

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Black Lease, Well No. C-3, located in Miami County, Kansas and submitted to our laboratory on July 23, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel
by B.L.

Sanford A. Michel

SAM/dlb

5 c to Ottawa, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Andercan Energy Corporation Lease Black Well No. C-3

Location

Section 14 Twp. 17S Rge. 21E County Miami State Kansas

Elevation, Feet	
Name of Sand	Peru
Top of Core	471.0
Bottom of Core	484.0
Top of Sand	471.5
Bottom of Sand	483.0
Total Feet of Permeable Sand	10.5
Total Feet of Floodable Sand	9.7

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
26 - 50	3.9	3.9
50 - 75	2.8	6.7
75 - 100	3.8	10.5

Average Permeability Millidarcys	62.6
Average Percent Porosity	18.9
Average Percent Oil Saturation	39.9
Average Percent Water Saturation	39.4
Average Oil Content, Bbls./A. Ft.	573.
Total Oil Content, Bbls./Acre	6,016.
Average Percent Oil Recovery by Laboratory Flooding Tests	8.5
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	119.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	1,156.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section

The core was sampled and the samples sealed in plastic bags by a representative of the client. Fresh water mud was used as a drilling fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
471.0 - 471.5	Alternate layers gray shale and brown slightly calcareous sandstone.
471.5 - 475.6	Brown slightly calcareous sandstone
475.6 - 476.1	Gray slightly sandy limestone.
476.1 - 476.7	Brown slightly calcareous sandstone.
476.7 - 477.0	Gray sandy limestone.
477.0 - 477.5	Brown slightly calcareous sandstone.
477.5 - 477.7	Gray sandy slightly calcareous shale.
477.7 - 479.2	Brown slightly calcareous sandstone.
479.2 - 480.0	Light brown slightly calcareous sandstone with scattered shale partings.
480.0 - 481.2	Brown slightly calcareous sandstone.
481.2 - 482.0	Brown slightly calcareous sandstone with scattered shale partings.
482.0 - 483.0	Light brown slightly calcareous sandstone.
483.0 - 484.0	Gray shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 1,156 barrels of oil per acre was obtained from

9.7 feet of sand. The weighted average percent oil saturation was reduced from 40.9 to 32.4, or represents an average recovery of 8.5 percent. The weighted average effective permeability of the samples is 1.40 millidarcys, while the average initial fluid production pressure is 22.7 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 12 samples tested, 11 produced water and oil, and 1 sample water only. This indicates that approximately 92 percent of the sand represented by these samples is floodable pay sand.

CALCAULATED RECOVERY

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 2,440 barrels of oil per acre. This is an average recovery of 252 barrels per acre foot from 9.7 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.04
Reservoir water saturation, percent, estimated	30.0
Average porosity, percent	18.6
Oil saturation after flooding, percent	32.4
Performance factor, percent, estimated	50.0
Net floodable sand, feet	9.7

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Andercan Energy Corporation Lease Black Well No. C-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.		
1	471.6	19.3	39	33	72	584	42.	0.9	0.9	526	37.80
2	472.5	15.5	49	31	80	589	52.	0.9	1.8	530	46.80
3	473.4	20.2	38	40	78	596	94.	1.0	2.8	596	94.00
4	474.5	22.1	41	43	84	703	90.	0.7	3.5	492	63.00
5	475.3	20.3	34	49	83	536	66.	0.6	4.1	322	39.60
6	476.4	18.6	45	36	81	649	87.	0.6	4.7	389	52.20
7	477.4	17.6	50	28	78	683	60.	0.5	5.2	342	30.00
8	478.5	19.3	39	36	75	584	99.	1.5	6.7	876	148.50
9	479.5	22.9	29	47	76	515	70.	0.8	7.5	412	56.00
10	480.4	13.2	49	37	86	502	28.	1.2	8.7	602	33.60
11	481.5	19.8	35	46	81	538	37.	0.8	9.5	430	29.60
12	482.4	20.1	32	48	80	499	26.	1.0	10.5	499	26.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Andercan Energy Corporation Lease Black Well No. C-3

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
471.5 - 475.6	4.1	68.6	281.20
476.1 - 483.0	6.4	58.7	375.90
471.5 - 483.0	10.5	62.6	657.10

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
471.5 - 475.6	4.1	19.3	40.6	38.3	601	2,466
476.1 - 483.0	6.4	18.6	39.5	40.1	555	3,550
471.5 - 483.0	10.5	18.9	39.9	39.4	573	6,016

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Andercan Energy Corporation Lease Black Well No. C-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.			
1	471.6	19.4	39	587	10	151	30	58	436	10	0.15	35
2	472.5	15.6	49	593	17	206	32	63	387	116	1.50	15
3	473.4	20.0	38	590	9	140	29	67	450	102	1.50	15
4	474.5	22.2	41	706	10	172	31	60	534	134	1.65	15
5	475.3	20.3	34	535	4	63	30	62	472	34	0.56	25
6	476.4	18.6	45	649	10	144	35	54	505	136	1.50	15
7	477.4	17.7	50	687	12	165	38	48	522	224	2.62	15
8	478.5	19.1	39	578	9	133	30	66	445	180	2.40	15
9	479.5	22.7	29	511	0	0	29	63	511	16	0.33	35
10	480.4	13.3	49	506	8	83	41	46	423	94	1.20	20
11	481.5	19.9	35	540	3	46	32	59	494	110	1.42	20
12	482.4	20.2	32	501	2	31	30	61	470	52	0.67	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.

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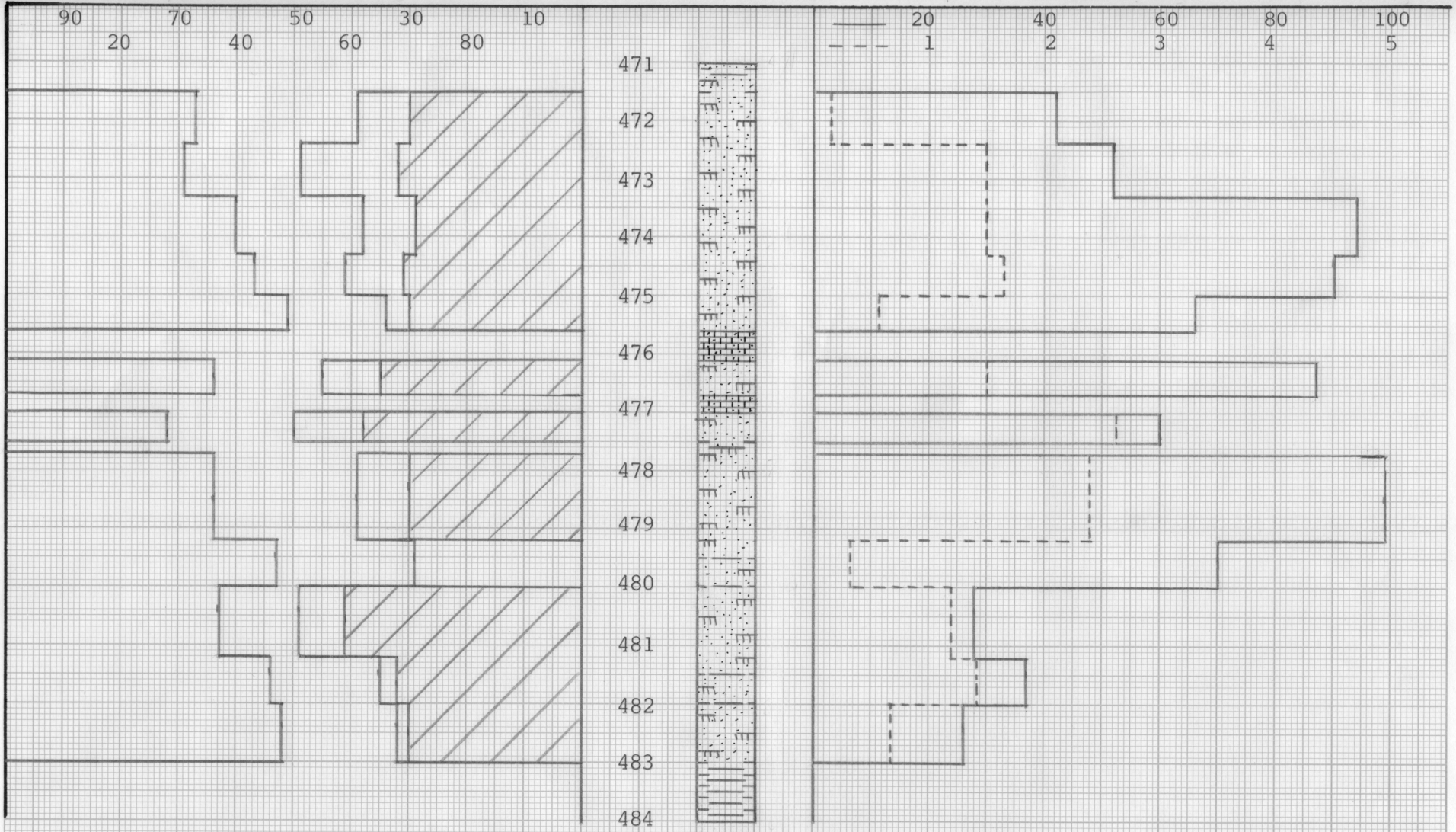
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Andercan Energy Corporation Lease Black Well No. C-3

Depth Interval, Feet	471.5 - 475.6	476.1 - 483.0	471.5 - 483.0
Feet of Core Analyzed	4.1	5.6	9.7
Average Percent Porosity	19.3	18.0	18.6
Average Percent Original Oil Saturation	40.8	41.0	40.9
Average Percent Oil Recovery	10.4	7.1	8.5
Average Percent Residual Oil Saturation	30.4	33.9	32.4
Average Percent Residual Water Saturation	62.2	56.9	59.2
Average Percent Total Residual Fluid Saturation	92.6	90.8	91.6
Average Original Oil Content, Bbls./A. Ft.	601.	561.	578.
Average Oil Recovery, Bbls./A. Ft.	151.	96.	119.
Average Residual Oil Content, Bbls./A. Ft.	450.	465.	459.
Total Original Oil Content, Bbls./Acre	2,466.	3,142.	5,608.
Total Oil Recovery, Bbls./Acre	619.	537.	1,156.
Total Residual Oil Content, Bbls./Acre	1,847.	2,605.	4,452.
Average Effective Permeability, Millidarcys	1.09	1.62	1.40
Average Initial Fluid Production Pressure, p.s.i.	21.0	24.2	22.7

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



KEY:

SHALE

SANDY CALCAREOUS SHALE

FLOODPOT RESIDUAL OIL SATURATION

CALCAREOUS SANDSTONE

CALCAREOUS SANDSTONE WITH SHALE PARTINGS

SANDY LIMESTONE

ALTERNATE LAYERS OF SHALE AND CALCAREOUS SANDSTONE

ANDERCAN ENERGY CORPORATION

BLACK LEASE WELL NO. C-3

MIAMI COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLS. /ACRE
471.5 - 475.6	4.1	19.3	40.6	38.3	68.6	
476.1 - 483.0	6.4	18.6	39.5	40.1	58.7	
471.5 - 483.0	10.5	18.9	39.9	39.4	62.6	2440 (PRIMARY AND WATERFLOODING)

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CHANUTE, KANSAS
JULY, 1982 PDC