OILFIELD RESEARCH LABORATORIES

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

July 27, 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. B-2, located in Miami County, Kansas and submitted to our laboratory on July 21, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/dlb

5 c to Ottawa, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Andercan Energy Corporation Lease Black Well No. B-2

Location

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

Elevation, Feet	
Name of Sand	Peru
Top of Core	477.0
Bottom of Core	493.2
Top of Sand	477.0
Bottom of Sand	491.1
Total Feet of Permeable Sand	11.6
Total Feet of Floodable Sand	4.9

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 4	2.8	2.8
4 - 12	5.3	8.1
15 - 50	3.5	11.6

Average Permeability Millidarcys	15.0
Average Percent Porosity	18.1
Average Percent Oil Saturation	24.7
Average Percent Water Saturation	53.1
Average Oil Content, Bbls./A. Ft.	355.
Total Oil Content, Bbls./Acre	4,479.
Average Percent Oil Recovery by Laboratory Flooding Tests	5.6
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	87.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	428.
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
477.0 - 478.0	Grayish light brown slightly calcareous slightly shaly sandstone.
478.0 - 480.0	Grayish light brown slightly calcareous shaly sandstone.
480.0 - 480.6	Light brown slightly calcareous sandstone.
480.6 - 481.1	Gray very shaly sandstone.
481.1 - 481.5	Light brown slightly calcareous sandstone with shale partings.
481.5 - 481.8	Light brown slightly calcareous sandstone.
481.8 - 484.0	Brown slightly calcareous sandstone.
484.0 - 485.0	Brown slightly calcareous sandstone with fine shale partings.
485.0 - 485.8	Brown slightly calcareous shaly sandstone.
485.8 - 487.4	Gray sandy limestone.
487.4 - 491.1	Light brown slightly calcareous sandstone.
491.1 - 493.2	Gray shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 428 barrels of oil per acre was obtained from 4.9 feet of sand. The weighted average percent oil saturation was reduced from 35.1 to 29.5, or represents an average recovery of 5.6 percent.

The weighted average effective permeability of the samples is 1.01 millidarcys, while the average initial fluid production pressure is 30.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 14 samples tested, 5 produced water and oil, and 6 samples water only. This indicates that approximately 36 percent of the sand represented by these samples is floodable pay sand.

CALCULATED 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 1,190 barrels of oil per acre. This is an average recovery of 290 barrels per acre foot from 4.9 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.04
Reservoir water saturation, percent, estimated	30.0
Average porosity, percent	19.8
Oil saturation after flooding, percent	29.5
Performance factor, percent, estimated	50.0
Net floodable sand, feet	4.9

Oilfield Research Laboratories

RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Andercan Energy Corporation Lease Black Well No. B-2

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	477.4	21.1	4	62	66	66	8.5	1.0	1.0	66	8.50
2	478.3	19.3	10	65	75	150	3.4	1.0	2.0	150	3.40
3	479.6	19.6	32	51	83	487	3.1	1.0	3.0	487	3.10
4	480.5	20.2	11	56	67	172	11.	0.6	3.6	103	6.60
5	481.6	19.4	21	53	74	316	20.	0.3	3.9	95	6.00
6	482.5	20.5	35	44	79	557	35.	1.2	5.1	668	42.00
7	483.4	20.3	32	43	75	504	49.	1.0	6.1	504	49.00
8	484.3	20.5	39	50	89	620	9.6	1.0	7.1	620	9.60
9	485.6	14.8	39	54	93	448	2.7	0.8	7.9	358	2.16
10	486.5	6.4	8	83	91	40	Imp.	1.0	8.9	40	0.00
11	487.7	16.8	38	32	70	495	9.9	0.7	9.6	347	6.93
12	488.5	16.8	33	33	66	430	15.	1.0	10.6	430	15.00
13	489.5	19.3	29	51	80	434	11.	1.0	11.6	434	11.00
14	490.5	19.0	12	63	75	177	11.	1.0	12.6	177	11.00

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Andercan Energy Corp. Lease Black Well No. B-2

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
477.0 - 481.8	3.9	7.1	27.60
481.8 - 491.1	7.7	19.1	146.69
477.0 - 491.1	11.6	15.0	174.29

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
477.0 - 481.8	3.9	20.0	15.1	58.3	231	901
481.8 - 491.1	8.7	17.3	29.1	50.7	411	3,578
477.0 - 491.1	12.6	18.1	24.7	53.1	355	4,479

Oilfield Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Andercan Energy Corporation Lease Black Well No. B-2

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	477.4	20.0	4	62	0	0	4	76	62	16	0.15	35
2	478.3	19.3	10	150	0	0	10	70	150	10	0.15	45
3	479.6	19.7	32	489	2	31	30	60	458	22	0.30	35
4	480.5	20.7	10	161	0	0	10	60	161	0	Imp.	-
5	481.6	19.3	21	314	0	0	21	67	314	42	0.52	25
6	482.5	20.5	35	557	9	143	26	64	414	72	1.05	25
7	483.4	20.3	32	504	3	47	29	53	457	30	0.37	35
8	484.3	20.6	39	623	10	160	29	63	463	192	2.77	20
9	485.6	14.9	39	450	0	0	39	56	450	38	0.50	30
10	486.5	6.4	8	40	0	0	8	84	40	0	Imp.	-
11	487.7	16.7	38	492	2	26	36	43	466	16	0.33	35
12	488.5	16.9	33	433	0	0	33	52	433	28	0.37	35
13	489.5	19.5	28	424	0	0	28	52	424	0	Imp.	-
14	490.5	18.9	12	176	0	0	12	72	176	16	0.19	35

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.

Oilfield Research Laboratories

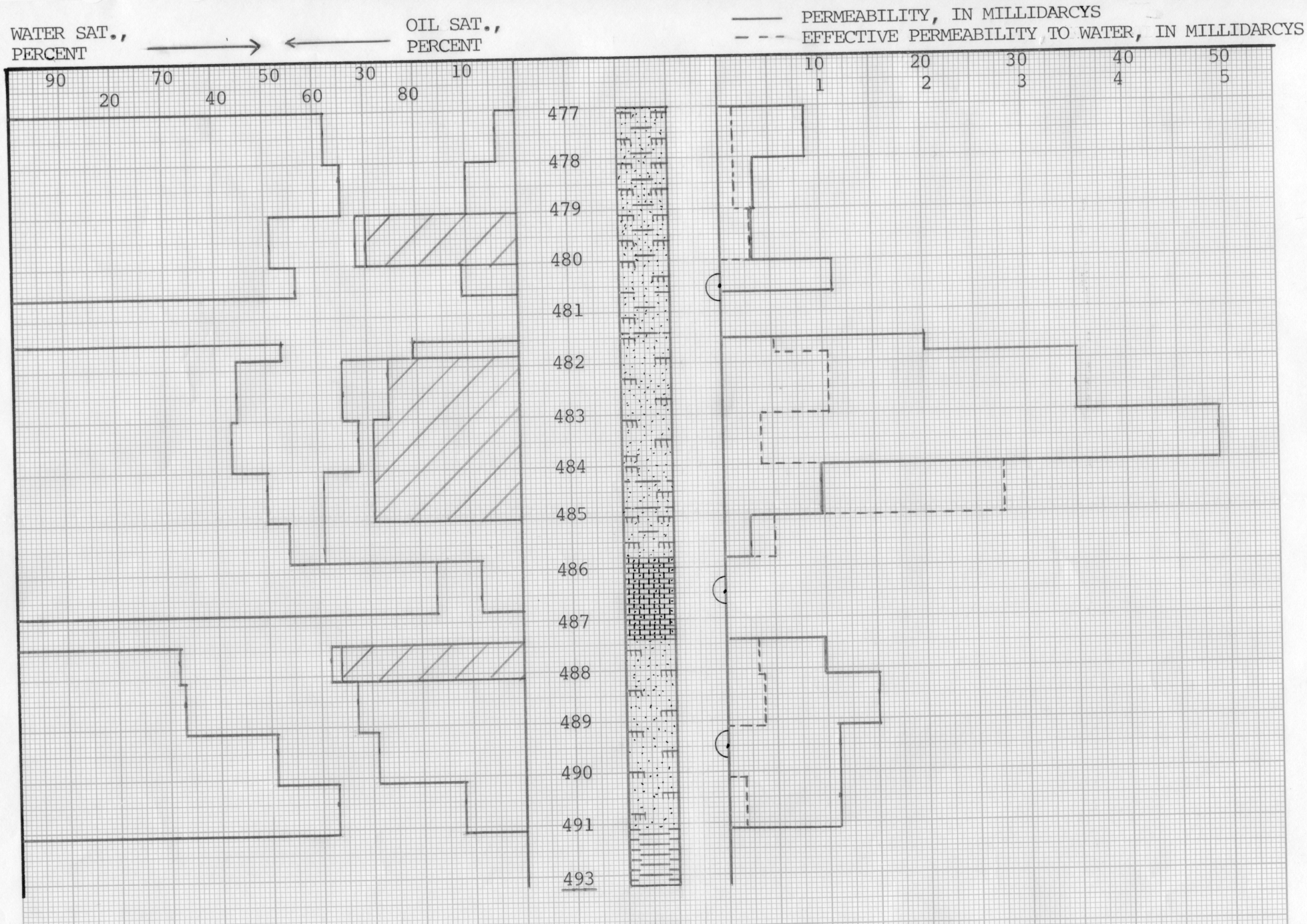
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

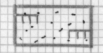
Company Andercan Energy Corporation Lease Black Well No. B-2

Depth Interval, Feet	477.0 - 481.8	481.8 - 491.1	477.0 - 491.1
Feet of Core Analyzed	1.0	3.9	4.9
Average Percent Porosity	19.7	19.8	19.8
Average Percent Original Oil Saturation	32.0	35.8	35.1
Average Percent Oil Recovery	2.0	6.5	5.6
Average Percent Residual Oil Saturation	30.0	29.3	29.5
Average Percent Residual Water Saturation	60.0	57.2	57.7
Average Percent Total Residual Fluid Saturation	90.0	86.5	87.2
Average Original Oil Content, Bbls./A. Ft.	489.	549.	536.
Average Oil Recovery, Bbls./A. Ft.	31.	102.	87.
Average Residual Oil Content, Bbls./A. Ft.	458.	447.	449.
Total Original Oil Content, Bbls./Acre	489.	2,140.	2,629.
Total Oil Recovery, Bbls./Acre	31.	397.	428.
Total Residual Oil Content, Bbls./Acre	458.	1,743.	2,201.
Average Effective Permeability, Millidarcys	0.30	1.19	1.01
Average Initial Fluid Production Pressure, p.s.i.	35.0	28.8	30.0

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


WATER SAT., PERCENT
OIL SAT., PERCENT
PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS
90
70
50
30
10
20
40
60
80
10
20
30
40
50
1
2
3
4
5
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
493

KEY:


CALCAREOUS SANDSTONE


SHALY SANDSTONE


SHALE


IMPERMEABLE TO WATER


SANDY SHALE


CALCAREOUS SANDSTONE WITH SHALE PARTINGS


SHALY CALCAREOUS SANDSTONE


FLOODPOT RESIDUAL OIL SATURATION

ANDERCAN ENERGY CORPORATION

BLACK LEASE WELL NO. B-2

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
477.0 - 481.8	3.9	20.0	15.1	58.3	7.1	
481.8 - 491.1	8.7	17.3	29.1	50.7	19.1	
477.0 - 491.1	12.6	18.1	24.7	53.1	15.0	1190 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JULY, 1982 PDC