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

September 30, 1982

Robert E. Austin
c/o Alcock Production Company
R. R. # 1, Box 45
Chanute, Kansas 66720

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Coltrain Lease, Well No. 1, located in the Southeast ¼ of Section 34, T-29S, R-16E, Wilson County, Kansas and submitted to our laboratory on September 27, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/rmc

5 c to Chanute, Kansas

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GENERAL INFORMATION & SUMMARY

Company Robert E. Austin Lease Coltrain Well No. 1

Location SE¼

Section 34 Twp. 29S Rge. 16E County Wilson State Kansas

Elevation, Feet	
Name of Sand	Wiser
Top of Core	494.0
Bottom of Core	503.0
Top of Sand	494.0
Bottom of Sand	501.7
Total Feet of Permeable Sand	7.7
Total Feet of Floodable Sand	1.7

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 3	4.0	4.0
4 - 11	3.7	7.7

Average Permeability Millidarcys	4.5
Average Percent Porosity	15.4
Average Percent Oil Saturation	27.7
Average Percent Water Saturation	65.5
Average Oil Content, Bbls./A. Ft.	331.
Total Oil Content, Bbls./Acre	2,551.
Average Percent Oil Recovery by Laboratory Flooding Tests	3.2
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	40.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	68.
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. The core was reported to be from a non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
494.0 - 495.0	Grayish light brown slightly shaly sandstone.
495.0 - 496.0	Grayish light brown sandstone.
496.0 - 497.0	Grayish light brown slightly shaly sandstone.
497.0 - 498.7	Grayish light brown shaly sandstone with fine gray shale partings.
498.7 - 500.7	Grayish light brown very shaly sandstone,
500.7 - 501.7	Grayish light brown shaly sandstone.
501.7 - 503.0	Gray sandy shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 68 barrels of oil per acre was obtained from 1.7 feet of sand. The weighted average percent oil saturation was reduced from 33.6 to 30.4, or represents an average recovery of 3.2 percent. The weighted average effective permeability of the samples is 0.26 millidarcys, while the average initial fluid production pressure is 40.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 8 samples tested, 2 produced water and oil, and 3 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 core data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 150 barrels of oil per acre. This is an average recovery of 90 barrels per acre foot from 1.7 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.06
Reservoir water saturation, percent, estimated	55.0
Average porosity, percent	16.0
Oil saturation after flooding, percent	30.4
Performance factor, percent, estimated	60.0
Net floodable sand, feet	1.7

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Robert E. Austin Lease Coltrain 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	494.4	15.3	28	64	92	332	6.6	1.0	1.0	332	6.60
2	495.6	14.9	33	64	97	382	10.	1.0	2.0	382	10.00
3	496.4	16.2	36	57	93	452	9.4	1.0	3.0	452	9.40
4	497.5	16.0	23	72	95	286	1.2	1.0	4.0	286	1.20
5	498.5	15.4	30	60	90	358	4.7	0.7	4.7	251	3.29
6	499.5	15.1	16	78	94	187	0.47	1.0	5.7	187	0.47
7	500.5	15.8	26	70	96	319	0.87	1.0	6.7	319	0.87
8	501.3	14.7	30	57	87	342	2.5	1.0	7.7	342	2.50

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Robert E. Austin Lease Coltrain Well No. 1

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
494.0 - 498.7	4.7	6.5	30.49
498.7 - 501.7	3.0	1.3	3.84
494.0 - 501.7	7.7	4.5	34.33

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
494.0 - 498.7	4.7	15.6	30.0	63.6	362	1,703
498.7 - 501.7	3.0	15.2	24.0	68.3	283	848
494.0 - 501.7	7.7	15.4	27.7	65.5	331	2,551

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Robert E. Austin Lease Coltrain 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	Bbls./A. Ft.			
1	494.4	15.4	28	335	0	0	28	65	335	14	0.17	35
2	495.6	15.1	33	387	0	0	33	64	387	26	0.33	35
3	496.4	16.3	36	455	4	51	32	63	404	18	0.33	40
4	497.5	16.2	23	289	0	0	23	73	289	8	0.10	50
5	498.5	15.6	30	363	2	24	28	66	339	14	0.15	40
6	499.5	14.6	17	193	0	0	17	77	193	0	Imp.	-
7	500.5	15.7	26	317	0	0	26	70	317	0	Imp.	-
8	501.3	15.2	29	342	0	0	29	58	342	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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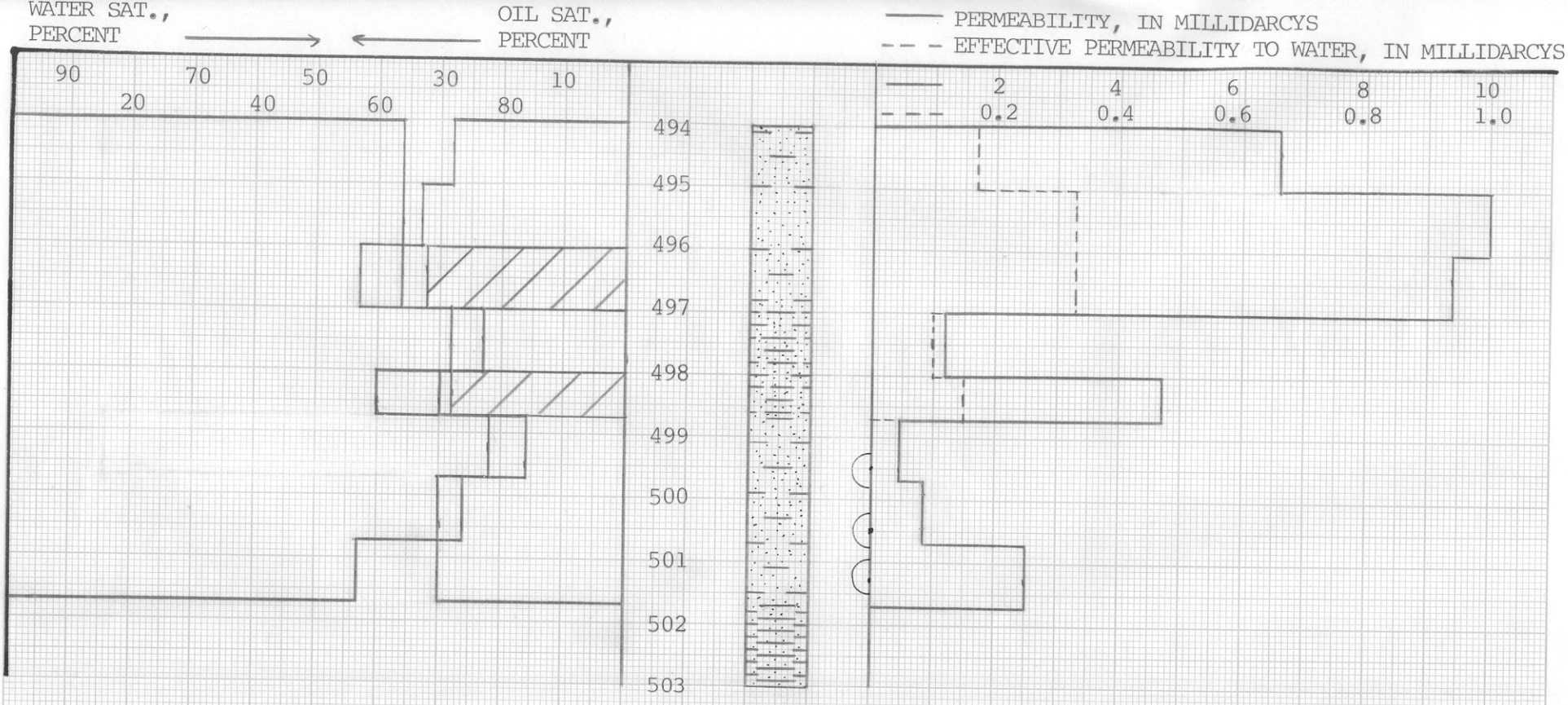
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company Robert E. Austin Lease Coltrain Well No. 1

Depth Interval, Feet	494.0 - 498.7
Feet of Core Analyzed	1.7
Average Percent Porosity	16.0
Average Percent Original Oil Saturation	33.6
Average Percent Oil Recovery	3.2
Average Percent Residual Oil Saturation	30.4
Average Percent Residual Water Saturation	64.2
Average Percent Total Residual Fluid Saturation	94.6
Average Original Oil Content, Bbls./A. Ft.	417.
Average Oil Recovery, Bbls./A. Ft.	40.
Average Residual Oil Content, Bbls./A. Ft.	377.
Total Original Oil Content, Bbls./Acre	709.
Total Oil Recovery, Bbls./Acre	68.
Total Residual Oil Content, Bbls./Acre	641.
Average Effective Permeability, Millidarcys	0.259
Average Initial Fluid Production Pressure, p.s.i.	40.0

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



KEY:

- SANDSTONE
- IMPERMEABLE TO WATER
- FLOODPOT RESIDUAL OIL SATURATION
- SHALY SANDSTONE
- SHALY SANDSTONE WITH SHALE PARTINGS
- SANDY SHALE

ROBERT E. AUSTIN

COLTRAIN LEASE

WELL NO. 1

WILSON 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
494.0 - 498.7	4.7	15.6	30.0	63.6	6.5	



FLOODPOT RESIDUAL OIL SATURATION

ROBERT E. AUSTIN

COLTRAIN LEASE WELL NO. 1

WILSON 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
494.0 - 498.7	4.7	15.6	30.0	63.6	6.5	
498.7 - 501.7	3.0	15.2	24.0	68.3	1.3	
494.0 - 501.7	7.7	15.4	27.7	65.5	4.5	150 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
SEPTEMBER, 1982 PDC