

# OILFIELD RESEARCH LABORATORIES

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May 25, 1982

Lane Petroleum Company  
c/o Jim Chambers  
R R 1  
Lane, Kansas 66042

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Giefer Lease, Well No. 3, located in Crawford County, Kansas and submitted to our laboratory on May 19, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Lane, Kansas

- REGISTERED ENGINEERS -

CORE ANALYSIS - WATER ANALYSIS - REPRESSURING ENGINEERING - SURVEYING & MAPPING - PROPERTY EVALUATION & OPERATION

**Oilfield Research Laboratories**  
**GENERAL INFORMATION & SUMMARY**

Company Lane Petroleum Company Lease Giefer Well No. 3  
 Location 480' FNL & 810' FWL  
 Section 34 Twp. 28S Rge. 22E Country Crawford State Kansas

Elevation, Feet .....  
 Name of Sand..... Bartlesville  
 Top of Core ..... 390.0  
 Bottom of Core ..... 401.3  
 Top of Sand ..... 390.0  
 Bottom of Sand ..... 400.8  
 Total Feet of Permeable Sand ..... 9.8  
 Total Feet of Floodable Sand ..... 6.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	1.5	1.5
5 - 10	1.3	2.8
10 - 30	6.0	8.8
50 - 60	1.0	9.8

Average Permeability Millidarcys ..... 20.7  
 Average Percent Porosity ..... 17.0  
 Average Percent Oil Saturation ..... 35.8  
 Average Percent Water Saturation ..... 44.2  
 Average Oil Content, Bbls./A. Ft. .... 492.  
 Total Oil Content, Bbls./Acre ..... 5,310.  
 Average Percent Oil Recovery by Laboratory Flooding Tests ..... 8.3  
 Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. .... 125.  
 Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre ..... 750.  
 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. Air and water were used as a drilling fluid.

#### FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval,</u> <u>Feet</u>	<u>Description</u>
390.0 - 391.0	Gray very shaly sandstone.
391.0 - 399.3	Brown sandstone.
399.3 - 400.2	Grayish brown shaly slightly micaceous sandstone.
400.2 - 400.8	Grayish brown very shaly sandstone.
400.8 - 401.3	Gray shale.

#### LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 750 barrels of oil per acre was obtained from 6.0 feet of sand. The weighted average percent oil saturation was reduced from 40.8 to 32.5, or represents an average recovery of 8.3 percent. The weighted average effective permeability of the samples is 0.61 millidarcys, while the average initial fluid production pressure is 21.7 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 11 samples tested, 6 produced water and oil. This indicates that approximately 55 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 1,920 barrels of oil per acre. This is an average recovery of 320 barrels per acre foot from 6.0 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.04
Reservoir water saturation, percent, estimated	25.0
Average porosity, percent	18.9
Oil saturation after flooding, percent	32.5
Performance factor, percent, estimated	55.0
Net floodable sand, feet	6.0

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## RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Lane Petroleum Company Lease Giefer Well No. 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	390.6	9.5	7	87	94	52	Imp.	1.0	1.0	52	0.00
2	391.6	18.2	40	31	71	565	52.	1.0	2.0	565	52.00
3	392.6	18.9	39	42	80	557	13.	1.0	3.0	557	13.00
4	393.4	19.4	40	35	75	602	28.	1.0	4.0	602	28.00
5	394.6	16.6	36	40	76	464	22.	1.0	5.0	464	22.00
6	395.6	16.4	46	40	86	585	20.	1.0	6.0	585	20.00
7	396.5	25.9	40	29	69	804	24.	1.0	7.0	804	24.00
8	397.6	17.1	43	43	86	570	26.	1.0	8.0	570	26.00
9	398.6	14.8	30	54	84	344	10.	1.3	9.3	447	13.00
10	399.6	15.2	37	46	83	436	4.9	0.9	10.2	392	4.41
11	400.6	15.0	39	31	70	454	0.63	0.6	10.8	272	0.38

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lane Petroleum Company	Lease	Giefer	Well No.	3	
	<b>Depth Interval, Feet</b>	<b>Feet of Core Analyzed</b>	<b>Average Permeability, Millidarcys</b>	<b>Permeability Capacity Ft. x Md.</b>		
	390.0 - 398.0	7.0	26.4	185.00		
	398.0 - 400.8	2.8	6.4	17.79		
	390.0 - 400.8	9.8	20.7	202.79		
	<b>Depth Interval, Feet</b>	<b>Feet of Core Analyzed</b>	<b>Average Percent Oil Saturation</b>	<b>Average Percent Water Saturation</b>	<b>Average Oil Content Bbl./A. Ft.</b>	<b>Total Oil Content Bbls./Acre</b>
	390.0 - 398.0	8.0	36.4	43.4	525	4,199
	398.0 - 400.8	2.8	34.2	46.5	397	1,111
	390.0 - 400.8	10.8	35.8	44.2	492	5,310

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

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	390.6	9.4	7	51	0	0	7	88	0	Imp.	-
2	391.6	18.3	40	568	4	57	36	54	53	0.67	25
3	392.6	18.8	39	569	0	0	39	54	0	Imp.	-
4	393.4	19.4	40	602	10	151	30	58	26	0.30	20
5	394.6	16.5	36	461	5	64	31	65	50	0.60	20
6	395.6	16.5	46	589	13	166	33	65	23	0.30	25
7	396.5	25.7	40	798	11	219	29	65	23	0.30	25
8	397.6	17.2	43	574	7	93	36	60	176	1.50	15
9	398.6	15.3	29	344	0	0	29	59	0	Imp.	-
10	399.6	15.2	37	436	0	0	37	60	0	Imp.	-
11	400.6	14.6	40	453	0	0	40	41	0	Imp.	-

Company Lane Petroleum Company Lease Giefer Well No. 3

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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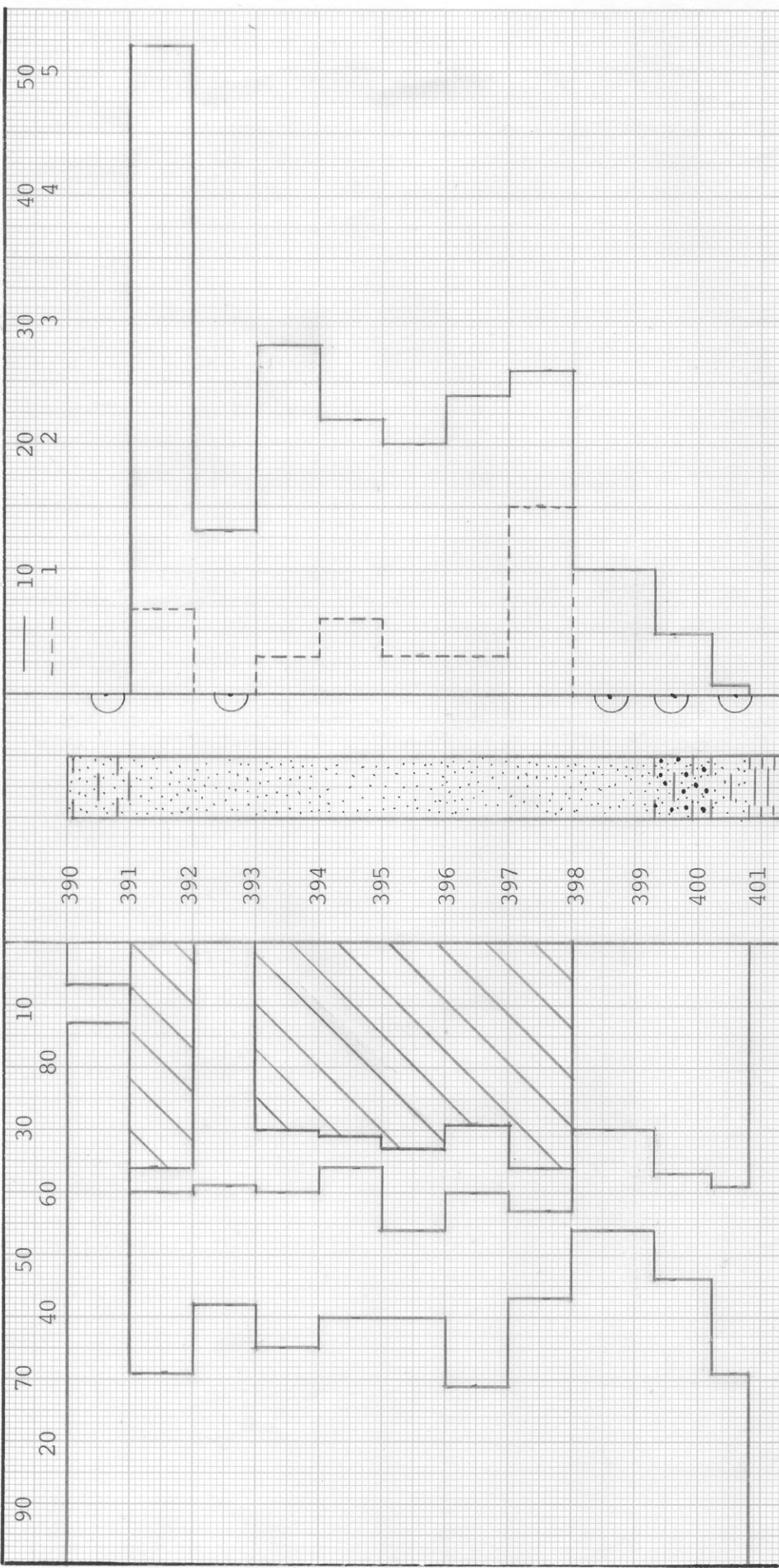
## SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	Lane Petroleum Company	Lease	Giefer	Well No.	3
Depth Interval, Feet	390.0 - 398.0				
Feet of Core Analyzed	6.0				
Average Percent Porosity	18.9				
Average Percent Original Oil Saturation	40.8				
Average Percent Oil Recovery	8.3				
Average Percent Residual Oil Saturation	32.5				
Average Percent Residual Water Saturation	61.2				
Average Percent Total Residual Fluid Saturation	93.7				
Average Original Oil Content, Bbls./A. Ft.	599.				
Average Oil Recovery, Bbls./A. Ft.	125.				
Average Residual Oil Content, Bbls./A. Ft.	474.				
Total Original Oil Content, Bbls./Acre	3,592.				
Total Oil Recovery, Bbls./Acre	750.				
Total Residual Oil Content, Bbls./Acre	2,842.				
Average Effective Permeability, Millidarcys	0.61				
Average Initial Fluid Production Pressure, p.s.i.	21.7				

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

KEY:

- SANDSTONE
- SHALE
- IMPERMEABLE TO WATER
- SHALY SANDSTONE
- MICACEOUS SHALY SANDSTONE
- FLOODPOT RESIDUAL OIL SATURATION

# LANE PETROLEUM COMPANY

GIEFFER LEASE  
CRAWFORD COUNTY, KANSAS  
WELL NO. 3

# LANE PETROLEUM COMPANY

WELL NO. 3

GIEFER LEASE

CRAWFORD COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCS	CALCULATED OIL RECOVERY BBLs. / ACRE
390.0 - 398.0	8.0	17.8	36.4	43.4	26.4	
398.0 - 400.8	2.8	15.0	34.2	46.5	6.4	
390.0 - 400.8	10.8	17.0	35.8	44.2	20.7	1920 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES  
CHANUTE, KANSAS  
MAY, 1982  
PDC