

# OILFIELD RESEARCH LABORATORIES

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October 23, 1984

Continental Exploration, Inc.  
7315 Frontage Road, Suite 110  
Shawnee Mission, Kansas 66204

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken on October 11, 1984 from the Feedback Lease, Well No. 15, located in Franklin County, Kansas and submitted to our laboratory on October 16, 1984.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

  
Benjamin R. Pearman

BRP/rmc

5 c to Shawnee Mission, Kansas

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

Company Continental Exploration, Inc. Lease Feedback Well No. 15  
 Location \_\_\_\_\_  
 Section 29 Twp. 17S Rge. 22E County Franklin State Kansas

Elevation, Feet .....  
 Name of Formation..... Peru  
 Top of Core ..... 383.0  
 Bottom of Core ..... 391.6  
 Top of Formation ..... 383.0  
 Bottom of Formation ..... 391.6  
 Total Feet of Permeable Formation ..... 8.1  
 Total Feet of Floodable Formation (Sample Nos. 2 thru 8 Tested) 6.5

Distribution of Permeable Formation:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 1	0.0	0.0
1 - 10	1.6	1.6
65 - 90	1.8	3.4
115 - 160	3.7	7.1
925 - 928	1.0	8.1

Average Permeability Millidarcys ..... 196.0  
 Average Percent Porosity ..... 14.8  
 Average Percent Oil Saturation ..... 52.4  
 Average Percent Water Saturation..... 22.5  
 Average Oil Content, Bbls./A. Ft. .... 593.  
 Total Oil Content, Bbls./Acre..... 4,805.  
 Average Percent Oil Recovery by Laboratory Flooding Tests..... \*10.3  
 Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. .... \*126.  
 Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre ..... \*820.  
 Total Calculated Oil Recovery, Bbls./Acre..... \* See "Calculated Recovery"  
 Section

Note: \* Sample Nos. 2 thru 8 Tested

The core was sampled and the samples sealed in plastic by a representative of the client, with the exception of samples five and eight which were sampled in the laboratory after being delivered unbagged.

#### FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
383.0 - 384.0	Limestone, brown, very sandy.
384.0 - 384.5	Sandstone, brown, calcareous, with shale nodules.
384.5 - 391.0	Sandstone, brown, slightly calcareous.
391.0 - 391.6	Limestone, brown, very sandy.

#### LABORATORY FLOODING TESTS

The formation in this core responded to laboratory flooding tests, as a total recovery of 820 barrels of oil per acre was obtained from 6.5 feet of formation. The weighted average percent oil saturation was reduced from 53.3 to 43.0, or represents an average recovery of 10.3 percent. The weighted average effective permeability of the samples is 5.25 millidarcys, while the average initial fluid production pressure is 22.1 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 7 samples tested, 7 produced water and oil. This indicates that approximately 100 percent of the formation represented by these samples is floodable pay formation.

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 2,200 barrels of oil per acre. This is an average recovery of 338 barrels per acre foot from 6.5 feet of floodable formation 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	10.0
Average porosity, percent	16.7
Oil saturation after flooding, percent	43.0
Performance factor, percent, estimated	60.0
Net floodable formation, feet	6.5

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**RESULTS OF SATURATION & PERMEABILITY TESTS**

**TABLE 1-B**

Company Continental Exploration, Inc. Lease Feedback Well No. 15

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Formation		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	383.3	6.2	41	49	90	197	1.3	1.0	1.0	197	1.30
2	384.9	14.7	48	29	77	547	68.	0.8	1.8	438	54.40
3	385.8	14.7	53	14	67	604	121.	0.7	2.5	423	84.70
4	386.8	14.1	60	12	72	656	89.	1.0	3.5	656	89.00
*5	387.4	18.1	55	14	69	772	158.	1.0	4.5	772	158.00
6	388.3	24.4	37	15	52	700	926.	1.0	5.5	700	926.00
7	389.3	14.7	61	28	89	696	115.	1.0	6.5	696	115.00
*8	390.5	16.1	58	21	79	724	153.	1.0	7.5	724	153.00
9	391.5	7.0	61	17	78	331	8.9	0.6	8.1	199	5.34

Note: \* Samples unbagged.

16.7      37.2      19

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**SUMMARY OF PERMEABILITY & SATURATION TESTS**

**TABLE III**

Company Continental Exploration, Inc. Lease Feeback Well No. 15

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
383.0 - 391.6	8.1	196.0	1586.74

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
383.0 - 391.6	8.1	14.8	52.4	22.5	593	4,805

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## RESULTS OF LABORATORY FLOODING TESTS

### TABLE IV

Company Continental Exploration, Inc. Lease Feedback Well No. 15

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.			
2	384.9	14.2	48	529	4	44	44	47	485	31	0.67	30
3	385.8	14.6	53	600	4	45	49	42	555	107	2.22	25
4	386.8	14.1	60	656	18	197	42	56	459	221	4.65	25
*5	387.4	17.7	55	755	12	165	43	54	590	209	4.20	20
6	388.3	24.0	37	689	2	37	35	58	652	276	5.85	20
7	389.3	15.2	61	719	14	165	47	51	554	215	6.82	20
*8	390.5	16.2	58	729	15	189	43	56	540	320	10.50	15

Note: \*Samples unbagged.

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**

<u>Company</u> Continental Exploration, Inc.	<u>Lease</u> Feedback	<u>Well No.</u> 15
	(Sample Nos. 2 thru 8)	
<u>Depth Interval, Feet</u>	384.5 - 391.6	
<u>Feet of Core Analyzed</u>	6.5	
<u>Average Percent Porosity</u>	16.7	
<u>Average Percent Original Oil Saturation</u>	53.3	
<u>Average Percent Oil Recovery</u>	10.3	
<u>Average Percent Residual Oil Saturation</u>	43.0	
<u>Average Percent Residual Water Saturation</u>	52.6	
<u>Average Percent Total Residual Fluid Saturation</u>	95.6	
<u>Average Original Oil Content, Bbls./A. Ft.</u>	676.	
<u>Average Oil Recovery, Bbls./A. Ft.</u>	126.	
<u>Average Residual Oil Content, Bbls./A. Ft.</u>	550.	
<u>Total Original Oil Content, Bbls./Acre</u>	4,392.	
<u>Total Oil Recovery, Bbls./Acre</u>	820.	
<u>Total Residual Oil Content, Bbls./Acre</u>	3,572.	
<u>Average Effective Permeability, Millidarcys</u>	5.25	
<u>Average Initial Fluid Production Pressure, p.s.i.</u>	22.1	

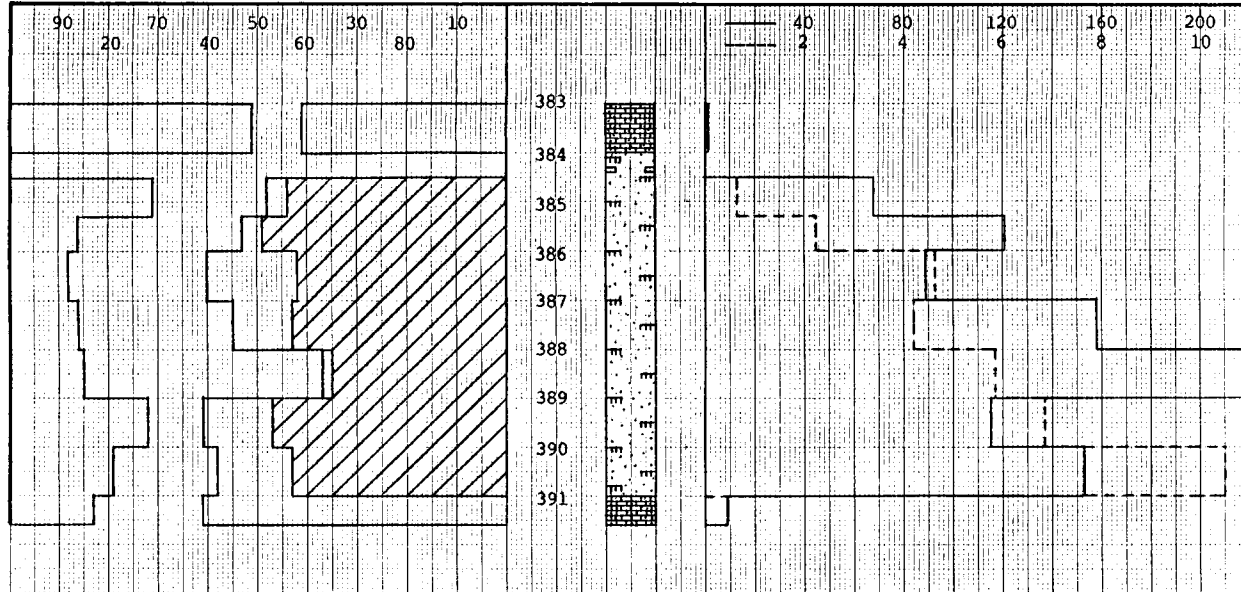
NOTE: Only those samples which recovered oil were used in calculating the above averages.

WATER SAT., PERCENT →

← OIL SAT., PERCENT

— PERMEABILITY, MD

- - - - - EFFECTIVE PERMEABILITY TO WATER, MD



KEY:  
 FLOODPOT RESIDUAL OIL SATURATION  
 LIMESTONE, SANDY  
 SANDSTONE, CALCAREOUS, WITH SHALE NODULES  
 SANDSTONE, CALCAREOUS

# CONTINENTAL EXPLORATION, INC.

FEEDBACK LEASE

FRANKLIN COUNTY, KANSAS

WELL NO. 15

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBL. / ACRE
383.0 - 391.6	8.1	14.8	52.4	22.5	196.0	2200 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES  
 CHANUTE, KANSAS  
 OCTOBER, 1984 RAL