

CORE ANALYSIS REPORT

PENNZOIL COMPANY
YAWKEY-FREEMAN NO. 115 WELL
BOONE CO., W. VA.

005 1093
4100501093 crds

CORE LABORATORIES, INC.



P. O. Box 131
Mt. Pleasant, Mich. 48858
July 18, 1978

Pennzoil Company
P. O. Drawer 1588
Parkersburg, W. Va. 26101

File No. 3602-394

Att: Mr. Bill Toomey

Re: Core Analysis Report
Berea Sandstone Formation
Yawkey-Freeman No. 115 Well
Boone Co., W. Va.

Gentlemen:

A diamond core from this well between the depths of 2157 feet and 2190 feet has been submitted to our Michigan laboratory for full diameter analyses with a conventional plug-type analysis of horizontal permeability every 4 feet. Results of these analyses are herein submitted in tabular and graphical form with a graph of the Core-Gamma surface log.

The core from this well is being shipped to your Parkersburg office via motor freight. The opportunity to have been of service on this well is appreciated and please call if you have any questions.

Very truly yours,

CORE LABORATORIES, INC.

A handwritten signature in cursive script, appearing to read "Mabre Maness".

Mabre Maness
District Manager

er

encl.

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
 DALLAS, TEXAS

PENNZOIL COMPANY
 YAWKEY-FREEMAN NO. 115
 YAWKEY-FREEMAN FIELD
 BOONE COUNTY, WEST VIRGINIA

DATE: 7-10-78
 FORMATION: BEREA SANDSTONE
 DRLG. FLUID:
 LOCATION:

FILE NO: 3602-394
 ENGINEER: ANTWINE
 ELEVATION:

* INDICATES PLUG PERM

S INDICATES PRESERVED SAMPLE

SMP. NO.	DEPTH	PERM. TO AIR MD.			POROSITY GEX. FLD.	FLUID SATS.		GR. DEN.	DESCRIPTION
		MAXIMUM	90 DEG	PLUG		OIL	WTR.		
FULL DIAMETER AND CONVENTIONAL (PLUG) ANALYSIS									
1	2157.0-58.0	0.1	<0.1	<0.1	3.3			2.75	SH, PYR, SDY
2	2158.0-59.0	0.1	<0.1		2.4			2.64	SH, PYR, SDY
3	2159.0-60.0	0.2	0.2		2.0			2.96	SS, SHY, PYR
4	2160.0-61.0	0.1	<0.1		3.5			2.75	SS, SL/DOL
5	2161.0-62.0	1.5	1.4	1.2	9.3			2.67	SS
6	2162.0-63.0	1.2	1.1		9.3			2.69	SS
7	2163.0-64.0	2.4	2.3		9.6			2.68	SS
8	2164.0-65.0	0.9	0.9		7.8			2.68	SS
9	2165.0-66.0	<0.1	<0.1	<0.1	5.9			2.68	SS
10	2166.0-67.0	0.1	<0.1		4.5			2.67	SS
11	2167.0-68.0	0.4	0.3		7.7			2.70	SS, SL/LMY
12	2168.0-69.0	0.7	0.6		7.3			2.69	SS
13	2169.0-70.0	0.6	0.4	1.9	4.4			2.73	SS, PYR
14	2170.0-71.0	0.3	0.3		5.5			2.68	SS
15	2171.0-72.0	0.2	0.2		6.3			2.67	SS
16	2172.0-73.0	0.3	0.3		4.6			2.66	SS
17	2173.0-74.0	0.1	<0.1	<0.1	5.8			2.68	SS
18	2174.0-75.0	<0.1	<0.1		6.5			2.69	SS
19	2175.0-76.0	<0.1	<0.1		6.2			2.70	SS, SL/LMY
20	2176.0-77.0	<0.1	<0.1		5.9			2.70	SS, SL/LMY
21	2177.0-78.0	<0.1	<0.1	<0.1	5.5			2.70	SS, SL/LMY
22	2178.0-79.0	<0.1	<0.1		5.5			2.69	SS, SL/LMY
23	2179.0-80.0	<0.1	<0.1		4.9			2.70	SS, SL/LMY
24	2180.0-81.0	<0.1	<0.1		5.4			2.69	SS
25	2181.0-82.0	<0.1	<0.1	<0.1	3.9			2.71	SS, SL/LMY
26	2182.0-83.0	<0.1	<0.1		4.6			2.68	SS, SL/LMY

2.69

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
 DALLAS, TEXAS

PENNZOIL COMPANY
 YAWKEY-FREEMAN NO.115

DATE: 7-10-78
 FORMATION: BEREA SANDSTONE

FILE NO: 3602-394
 ENGINEER: ANTWINE

SMP. NO.	DEPTH	PERM. TO AIR MD.		PLUG	POROSITY GEX. FLD.	FLUID SATS.		GR. DEN.	DESCRIPTION
		MAXIMUM	90 DEG			OIL	WTR.		
27	2183.0-84.0	<0.1	<0.1		5.0			2.72	SS, PYR
28	2184.0-85.0	<0.1	<0.1		5.0			2.69	SS
29	2185.0-86.0	<0.1	<0.1	<0.1	5.0			2.69	SS
30	2186.0-87.0	<0.1	<0.1		4.1			2.71	SS, SL/LMY
31	2187.0-88.0	<0.1	<0.1		4.1			2.69	SS
32	2188.0-89.0	<0.1	<0.1	<0.1	4.6			2.69	SS
33	2189.0-90.0	<0.1	<0.1		5.4			2.68	SS

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
 DALLAS, TEXAS

PERMEABILITY VS POROSITY

COMPANY: PENNZOIL COMPANY
 FIELD : YAWKEY-FREEMAN FIELD

WELL : YAWKEY-FREEMAN NO. 115
 COUNTY, STATE: BOONE COUNTY, WEST VIRGINIA

AIR PERMEABILITY : MD = 90 DEGREE (UNCORRECTED FOR SLIPPAGE)
 POROSITY : PERCENT (GAS EXPANSION)

DEPTH INTERVAL	RANGE & SYMBOL	PERMEABILITY		POROSITY		POROSITY AVERAGE	PERMEABILITY AVERAGES		
		MAXIMUM	MINIMUM	MAX.	MIN.		ARITHMETIC	HARMONIC	GEOMETRIC
2157.0 - 2190.0	1 (.)	100.0	0.10	10.0	5.0	7.9	0.89	0.48	0.63

EQUATION OF LINE RELATING PERMEABILITY TO POROSITY :
 $\text{LOG } K = (\text{SLOPE})(\text{POROSITY}) + \text{LOG OF INTERCEPT}$
 $K = \text{ANTILOG}((\text{SLOPE})(\text{POROSITY}) + \text{LOG OF INTERCEPT})$

RANGE _____ EQUATION OF THE LINE _____

POROSITY DEVIATION MINIMIZED FOR SELECTED PERMEABILITIES:
 (SOLID LINE)

1 PERM = ANTILOG((0.28452)(POROSITY) + -2.41636)

PERMEABILITY: MILLIDARCIES

1000

100

10

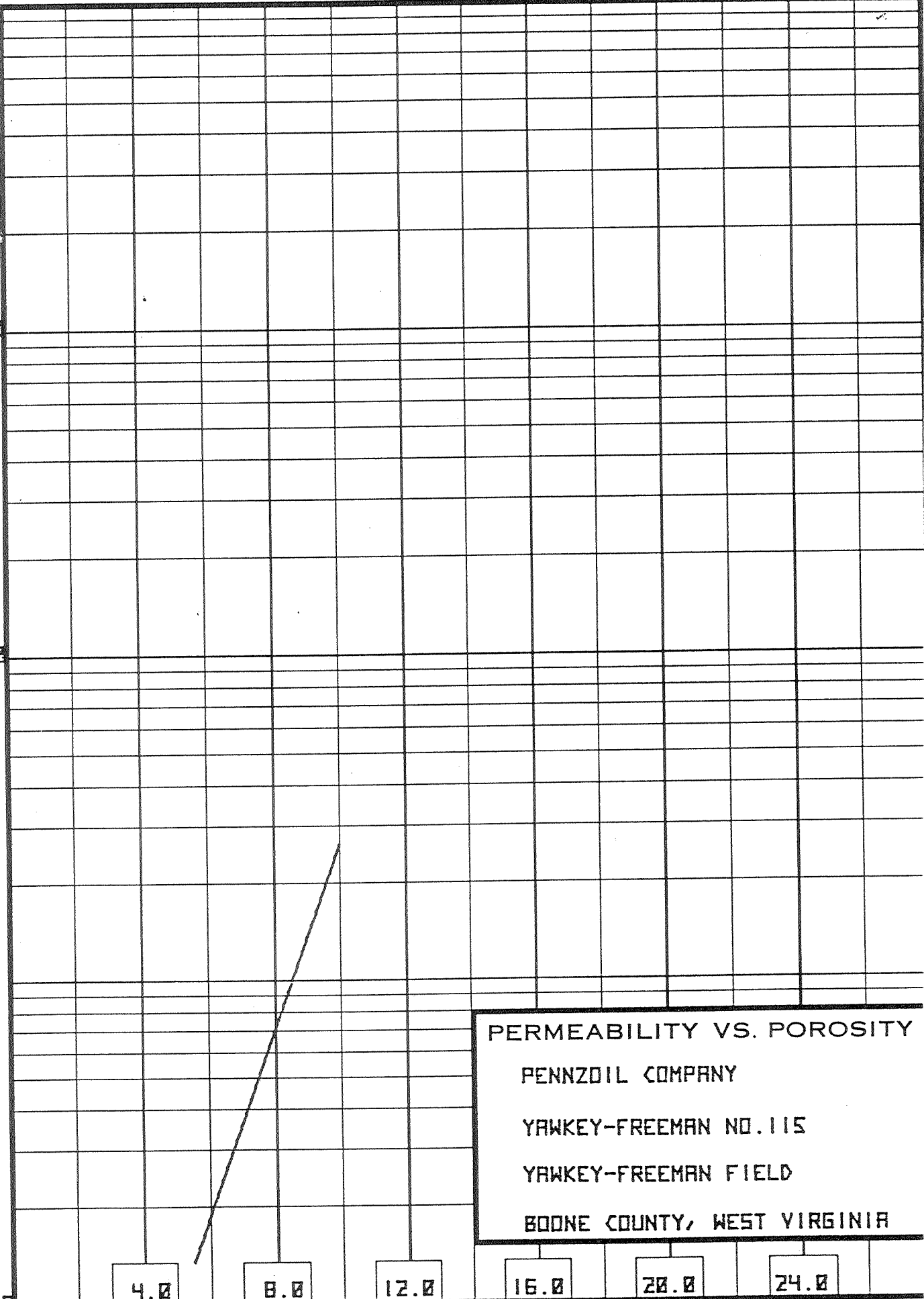
1.0

0.10

4.0 8.0 12.0 16.0 20.0 24.0

POROSITY : PERCENT

PERMEABILITY VS. POROSITY
PENNZOIL COMPANY
YAWKEY-FREEMAN NO. 115
YAWKEY-FREEMAN FIELD
BOONE COUNTY, WEST VIRGINIA



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Pennzoil Company
P. O. Drawer 1588
Parkersburg, W. Va. 26101
Att: Mr. Bill Toomey



COMPANY PENNERGOL COMPANY FIELD YARNEY-FREEMAN FILE 3602-30
 WELL YARNEY-FREEMAN NO. 115 COUNTY SOOND DATE 7-10-77
 LOCATION _____ STATE WEST VIRGINIA ELEV. _____

CORE-GAMMA CORRELATION

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted), but Core Laboratories, Inc. and its officers and employees assume no responsibility and make no warranty of representations as to the productivity, proper operation, or professionalism of any oil, gas or other mineral well or land in connection with which such report is used or relied upon.

VERTICAL SCALE: 5" = 100'

TOTAL WATER 0000
PERCENT PORE SPACE

80 60 40 20 0

GAMMA RAY
RADIATION INCREASE
→

PERMEABILITY 25-900
MILLIDARCYS

POROSITY 45X
PERCENT

OIL SATURATION XXXX
PERCENT PORE SPACE

100.0 10.0 1.0 0.1 30 20 10 0 0 20 40 60 80

