

23-29-41W  
3-9-92

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Computer Inventoried

**K C C**

APR 25 1996

RELEASED

APR 1 1996

CORE ANALYSIS REPORT

FROM CONFIDENTIAL

FOR

J. M. HUBER CORPORATION

KENDRICK NO. 23-1 WELL

ARROYO FIELD

STANTON, KANSAS

15-187-20632

CONFIDENTIAL

**KCC**

MAY 28

CONFIDENTIAL

RECEIVED  
STATE CORPORATION COMMISSION

DEC 22 1993

CONSERVATION DIVISION  
Wichita, Kansas

These analyses, opinions or interpretations are based on observations and materials 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 (all errors and omissions excepted); but Core Laboratories and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitableness of any oil, gas or other mineral well or formation in connection with which such report is used or relied upon.



**CORE LABORATORIES**

**KCC**

March 5, 1992

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APR 25 1996

J. M. HUBER CORPORATION  
7120 I-40 West  
Amarillo, Texas 79106-2596

APR 1 1996

FROM CONFIDENTIAL

KCC

Attn: Mr. Tony Kolodziej

MAY 28

Subject: Core Analysis Data  
Kendrick No. 23-1 Well  
Stanton County, Kansas  
CL File: 57182-13465

CONFIDENTIAL

Dear Mr. Kolodziej:

Core material obtained from the subject well was submitted to Core Laboratories' Oklahoma City, Oklahoma facility for analytical testing described on the following page of this report. This final report presents the following information:

1. Core Analysis Procedures
2. Tabular Core Analysis Results
3. Core Analysis Cross-Plot and Histograms
4. Correlation Coregraph

Thank you for the opportunity to participate in this project. If you have questions concerning this report, or if we can be of additional service, please contact us at (405) 946-5422.

Sincerely,

Core Laboratories, a division of  
WESTERN ATLAS INTERNATIONAL

Stacey Blackwell  
Laboratory Supervisor

# CORE LABORATORIES

Company : J. M. HUBER CORPORATION  
Well : KENDRICK NO. 23-1 WELL

Field : ARROYO FIELD  
Formation : MORROW

File No.: 57182-13465  
Date : 24-FEB-1992

## ANALYTICAL PROCEDURES AND QUALITY ASSURANCE

### HANDLING & CLEANING

Core Transportation : Core Laboratories Vehicle  
Solvent : Toluene  
Extraction Equipment : Dean Stark Apparatus  
Extraction Time : 48 Hrs.  
Drying Equipment : Convection Oven  
Drying Time : 24 Hrs.  
Drying Temperature : 240 Deg. F.

### ANALYSIS

Grain volume measured by Boyle's Law in a matrix cup using He  
Bulk volume by Archimedes Principle  
Water saturations by Dean Stark  
Oil saturations by weight difference in Dean Stark  
Permeabilities measured on 1 in. diameter drilled plugs  
Core Gamma Composite  
Dean Stark grain densities clean, dry solid mineral phase are measured

### REMARKS

Air permeability measurements not Klinkenberg corrected.  
Cores were slabbed for future geological work.  
Slabs were picked up by Peter Gale of Target Reservoir.  
Core butts are temporarily stored in the Oklahoma City facility.

APR 25 1995

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MAY 28

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FEB 1 1996

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## CORE LABORATORIES

Company : J. M. HUBER CORPORATION  
 Well : KENDRICK NO. 23-1 WELL  
 Location : SEC 23, T:29S R:41W  
 Co,State : STANTON, KANSAS

Field : ARROYO FIELD  
 Formation : MORROW  
 Coring Fluid : WATER BASE  
 Elevation :

File No.: 57182-13465  
 Date : 24-FEB-1992  
 API No. :  
 Analysts: MH,SB,TW

### C O R E   A N A L Y S I S   R E S U L T S

SAMPLE NUMBER	DEPTH ft	PERMEABILITY		POROSITY (HELIUM) %	SATURATION		GRAIN DENSITY gm/cc	DESCRIPTION
		(HORIZONTAL) Kair md	(VERTICAL) Kair md		(PORE VOLUME) OIL %	WATER %		
	5375.0- 76.0							Sst crs gr sh/lam
1	5376.0- 77.0	2.00		11.2	9.6	54.8	2.71	Sst gry m-crs gr slty calc chlor
	5377.0- 78.0							Sst gry m-crs gr shily shly lam
2	5378.0- 79.0	10.0		14.3	9.0	39.8	2.69	Sst gry f-crs gr slty calc chlor
	5379.0- 80.0							Sst gry f-crs gr slily shly lam calc
3	5380.0- 81.0	78.0		15.1	6.4	32.1	2.68	Sst gry f-crs gr calc chlor
	5381.0- 82.0							sst gry f-crs gr slily shly lam calc
4	5382.0- 83.0	22.0		11.1	15.3	43.6	2.65	Sst dk gry f-crs gr slty calc chlor SHR
	5383.0- 84.0							Sst dk gry m-crs gr slily shly lam calc
5	5384.0- 85.0	1.00		11.3	15.4	46.5	2.67	Sst dk gry m-crs gr slty clac slily chlor
	5385.0- 86.0							Sst gry vf-crs gr sh/lam calc
6	5386.0- 87.0	0.57		10.8	13.7	44.2	2.68	Sst gry f-crs gr slty calc
	5387.0- 88.0							Sst gry f-crs gr calc
7	5388.0- 89.0	0.32		9.7	0.0	77.9	2.83	Sst dk gry f-v crs gr cgl dol-clasts v slty shly slily calc slily pyr
	5389.0- 90.0							Sst gry f-v crs gr cgl calc
8	5390.0- 91.0	0.39		15.7	8.2	64.2	2.72	Sst gry vf-crs gr slty calc
	5391.0- 92.0							Sst gry f-v crs cgl slily shly lam slily foss styl calc
9	5392.0- 93.0	0.10		7.2	5.9	60.7	2.71	Sst gry f-v crs gr v calc foss
	5393.0- 94.0							Sst gry f-v crs slily shly lam styl calc
10	5394.0- 95.0	0.01		3.0	0.0	47.2	2.72	Ls gry f xln slily sdy v foss slily chlor
	5395.0- 96.0							Ls gry f xln slily sdy calc v foss
11	5396.0- 97.0	0.02		4.4	0.0	59.5	2.71	Sst gry f-crs gr v calc foss slily chlor
	5397.0- 98.0							Sst dk gry f-v crs cgl slty shly calc slily foss
12	5398.0- 99.0	0.62		17.8	0.0	76.7	2.70	Sst gry f-crs gr v slty v shly calc
	5399.0- 00.0							Sst gry f-crs gr slily shly lam calc
13	5400.0- 01.0	0.60		10.1	0.0	68.6	2.72	Sst gry f-crs gr v slty shly calc
	5401.0- 02.0							Sst gry f-crs gr slily shly lam calc

# CORE LABORATORIES

Company : J. M. HUBER CORPORATION  
Well : KENDRICK NO. 23-1 WELL

Field : ARROYO FIELD  
Formation : MORROW

File No.: 57182-13465  
Date : 24-FEB-1992

## CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	PERMEABILITY		POROSITY (HELIUM) %	SATURATION (PORE VOLUME)		GRAIN DENSITY gm/cc	DESCRIPTION
		(HORIZONTAL) Kair md	(VERTICAL) Kair md		OIL %	WATER %		
14	5402.0- 03.0	3.10		15.4	8.7	51.8	2.71	Sst gry vf-crs gr slty slily shly lam calc
	5403.0- 04.0							Sst dk gry vf-crs gr slily shly lam calc
15	5404.0- 05.0	0.52		8.4	5.3	52.3	2.71	Sst gry m-crs gr v calc foss pp-vug
	5405.0- 07.0							Sst gry m-crs gr slily shly lam calc
16	5407.0- 08.0	1.50		10.9	8.1	52.3	2.74	Sst gry m-crs gr v calc slily foss pp-vug
	5408.0- 10.0							Sst gry m-crs gr calc
17	5410.0- 11.0	0.93		8.8	5.7	59.4	2.71	Sst gry m-crs gr v calc slily foss pp-vug
	5411.0- 13.0							Sst gry m-crs gr v calc
18	5413.0- 14.0	0.24		8.6	5.3	71.1	2.71	Sst gry m-crs gr v calc foss occ-pp-vug
19	5414.0- 15.0	0.09		7.3	7.8	70.9	2.72	Sst gry m-crs gr v calc foss occ-pp-vug
	5415.0- 17.0							Sst dk gry m-crs gr cgl shly calc
20	5417.0- 18.0	0.81		19.3	0.0	97.2	2.72	Sst dk gry f-v crs gr slty v shly calc
	5418.0- 19.0							Sst dk gry m crs gr cgl shly calc
	5419.0- 20.0							Shale blk
21	5420.0- 21.0	0.39		15.6	0.0	84.4	2.74	Sst dk gry vf-v crs gr slty shly calc
	5421.0- 23.0							Sst vf-v crs gr cgl calc
22	5423.0- 24.0	0.80		9.5	0.0	65.6	2.69	Sst gry vf-v crs gr slty calc
	5424.0- 26.0							Sst gry vf-vf cgl calc
	5426.0- 30.0							Shale blk
23	5430.0- 31.0	64.0		15.0	0.0	66.0	2.68	Sst gry f-m gr slily slty sily shly slily calc occ-pp-vug
24	5431.0- 32.0	130.		16.3	0.0	68.3	2.69	Sst gry vf-m gr slily carb lam slily calc slily chlor slily pyr
25	5432.0- 33.0	83.0	51.0	15.9	0.0	47.8	2.65	Sst gry vf-f gr slily carb lam slily calc slily chlor
26	5433.0- 34.0	97.0		16.1	0.0	50.3	2.65	Sst gry vf-f gr slily carb lam slily calc slily chlor
27	5434.0- 35.0	88.0	23.0	15.6	0.0	51.4	2.65	Sst gry vf-f gr slily carb lam slily calc
28	5435.0- 36.0	109.	26.0	16.2	0.0	56.2	2.66	Sst gry vf-f gr slily carb lam slily calc
29	5436.0- 37.0	67.0		15.2	0.0	50.4	2.66	Sst gry vf-f gr slily carb lam slily calc slily pyr
30	5437.0- 38.0	74.0	61.0	15.7	0.0	49.5	2.65	Sst gry vf-f gr slily carb lam slily calc
31	5438.0- 39.0	74.0		15.3	0.0	53.8	2.67	Sst gry vf-f gr slily carb lam slily calc
32	5439.0- 40.0	61.0		15.3	0.0	53.8	2.65	Sst gry vf-f gr slily carb lam slily calc

# CORE LABORATORIES

Company : J. M. HUBER CORPORATION  
 Well : KENDRICK NO. 23-1 WELL

Field : ARROYO FIELD  
 Formation : MORROW

File No.: 57182-13465  
 Date : 24-FEB-1992

## C O R E A N A L Y S I S R E S U L T S

SAMPLE NUMBER	DEPTH ft	PERMEABILITY		POROSITY (HELIUM) %	SATURATION		GRAIN DENSITY gm/cc	DESCRIPTION
		(HORIZONTAL) Kair md	(VERTICAL) Kair md		(PORE VOLUME) OIL %	WATER %		
33	5440.0- 41.0	44.0	36.0	14.1	0.0	48.9	2.65	Sst gry vf-f gr slily carb lam slily calc
34	5441.0- 42.0	50.0	15.0	14.7	0.0	49.7	2.65	Sst gry vf-f gr slily carb lam slily calc
35	5442.0- 43.0	41.0	12.0	14.3	0.0	46.6	2.65	Sst gry vf-f gr slily carb lam slily calc
36	5443.0- 44.0	37.0	9.20	14.5	0.0	46.0	2.66	Sst gry vf-f gr slily carb lam slily calc
37	5444.0- 45.0	94.0	31.0	15.9	0.0	45.8	2.65	Sst gry vf-f gr slily carb lam slily calc
38	5445.0- 46.0	12.0		11.7	0.0	43.6	2.93	Sst gry vf-f gr calc v pyr
39	5446.0- 47.0	54.0		15.5	0.0	45.1	2.66	Sst gry vf-f gr calc slily carb
40	5447.0- 48.0	42.0		14.2	0.0	47.2	2.66	Sst gry f gr calc slily carb
41	5448.0- 49.0	0.02		3.4	0.0	81.2	2.69	Sst gry vf-f gr v calc slily carb
42	5449.0- 50.0	110.		16.0	0.0	54.6	2.65	Sst gry vf-f gr slily calc slily carb
43	5450.0- 51.0	90.0		15.3	0.0	51.9	2.65	Sst gry vf-f gr slily calc slily carb
44	5451.0- 52.0	162.		17.4	0.0	58.0	2.66	Sst gry vf-f gr slily calc slily carb
45	5452.0- 53.0	131.		17.2	7.0	48.0	2.66	Sst gry vf-f gr slily calc slily carb
46	5453.0- 54.0	101.		17.1	3.2	54.3	2.66	Sst gry vf-f gr slily calc slily carb slily chlor slily pyr
47	5454.0- 55.0	139.		17.6	6.8	49.3	2.66	Sst gry vf-f gr slily calc slily carb slily chlor slily pyr
48	5455.0- 56.0	99.0		16.6	1.4	49.7	2.65	Sst gry vf-f gr slily calc slily carb slily chlor slily pyr
49	5456.0- 57.0	144.		17.2	3.9	50.4	2.65	Sst gry vf-f gr slily calc slily carb
50	5457.0- 58.0	137.		17.2	3.0	50.6	2.65	Sst gry vf-f gr slily calc slily carb
51	5458.0- 59.0	148.		18.3	6.8	42.8	2.66	Sst gry vf-f gr slily calc slily carb
52	5459.0- 59.5	40.0		15.2	9.4	45.8	2.66	Sst gry vf-f gr slily calc slily carb

# CORE LABORATORIES

Company : J. M. HUBER CORPORATION  
 Well : KENDRICK NO. 23-1 WELL

Field : ARROYO FIELD  
 Formation : MORROW

File No.: 57182-13465  
 Date : 24-FEB-1992

## TABLE I

### SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA		CHARACTERISTICS REMAINING AFTER CUTOFFS			
<b>ZONE:</b>		<b>ZONE:</b>		<b>PERMEABILITY:</b>	
Identification -----	MORROW	Number of Samples -----	52	Flow Capacity -----	2626.0 md-ft
Top Depth -----	5375.0 ft	Thickness Represented -	51.5 ft	Arithmetic Average ----	51.0 md
Bottom Depth -----	5459.5 ft			Geometric Average -----	8.73 md
Number of Samples -----	74			Harmonic Average -----	0.21 md
		<b>POROSITY:</b>		Minimum -----	0.01 md
<b>DATA TYPE:</b>		Storage Capacity -----	697.9 $\phi$ -ft	Maximum -----	162. md
Porosity -----	(HELIUM)	Arithmetic Average ----	13.6 %	Median -----	41.5 md
Permeability -----	(HORIZONTAL) Kair	Minimum -----	3.0 %	Standard Dev. (Geom) --	K $\cdot$ 10 $\pm$ 1.235 md
		Maximum -----	19.3 %		
<b>CUTOFFS:</b>		Median -----	15.2 %	<b>HETEROGENEITY (Permeability):</b>	
Porosity (Minimum) -----	0.0 %	Standard Deviation ----	$\pm$ 3.9 %	Dykstra-Parsons Var. --	0.755
Porosity (Maximum) -----	100.0 %			Lorenz Coefficient ----	0.461
Permeability (Minimum) ---	0.0000 md	<b>GRAIN DENSITY:</b>			
Permeability (Maximum) ---	100000. md	Arithmetic Average ----	2.69 gm/cc	<b>AVERAGE SATURATIONS (Pore Volume):</b>	
Water Saturation (Maximum)	100.0 %	Minimum -----	2.65 gm/cc	Oil -----	2.9 %
Oil Saturation (Minimum) -	0.0 %	Maximum -----	2.93 gm/cc	Water -----	54.9 %
Grain Density (Minimum) --	2.00 gm/cc	Median -----	2.66 gm/cc		
Grain Density (Maximum) --	3.00 gm/cc	Standard Deviation ----	$\pm$ 0.05 gm/cc		
Lithology Excluded -----	NONE				

# CORE LABORATORIES

Company : J. M. HUBER CORPORATION  
 Well : KENDRICK NO. 23-1 WELL

Field : ARROYO FIELD  
 Formation : MORROW

File No.: 57182-13465  
 Date : 24-FEB-1992

## TABLE II

### SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA	CHARACTERISTICS REMAINING AFTER CUTOFFS	
<p>ZONE:</p> <p>Identification ----- MORROW ZONE 1</p> <p>Top Depth ----- 5375.0 ft</p> <p>Bottom Depth ----- 5405.0 ft</p> <p>Number of Samples ----- 30</p> <p>DATA TYPE:</p> <p>Porosity ----- (HELIUM)</p> <p>Permeability ----- (HORIZONTAL) Kair</p> <p>CUTOFFS:</p> <p>Porosity (Minimum) ----- 0.0 %</p> <p>Porosity (Maximum) ----- 100.0 %</p> <p>Permeability (Minimum) --- 0.0000 md</p> <p>Permeability (Maximum) --- 100000. md</p> <p>Water Saturation (Maximum) 100.0 %</p> <p>Oil Saturation (Minimum) - 0.0 %</p> <p>Grain Density (Minimum) -- 2.00 gm/cc</p> <p>Grain Density (Maximum) -- 3.00 gm/cc</p> <p>Lithology Excluded ----- NONE</p>	<p>ZONE:</p> <p>Number of Samples ----- 15</p> <p>Thickness Represented - 15.0 ft</p> <p>POROSITY:</p> <p>Storage Capacity ----- 165.5 <math>\phi</math>-ft</p> <p>Arithmetic Average ---- 11.0 %</p> <p>Minimum ----- 3.0 %</p> <p>Maximum ----- 17.8 %</p> <p>Median ----- 11.1 %</p> <p>Standard Deviation ---- <math>\pm 4.2</math> %</p> <p>GRAIN DENSITY:</p> <p>Arithmetic Average ---- 2.71 gm/cc</p> <p>Minimum ----- 2.65 gm/cc</p> <p>Maximum ----- 2.83 gm/cc</p> <p>Median ----- 2.71 gm/cc</p> <p>Standard Deviation ---- <math>\pm 0.04</math> gm/cc</p>	<p>PERMEABILITY:</p> <p>Flow Capacity ----- 119.2 md-ft</p> <p>Arithmetic Average ---- 7.95 md</p> <p>Geometric Average ---- 0.79 md</p> <p>Harmonic Average ----- 0.09 md</p> <p>Minimum ----- 0.01 md</p> <p>Maximum ----- 78.0 md</p> <p>Median ----- 0.60 md</p> <p>Standard Dev. (Geom) -- <math>K \cdot 10^{\pm 1.038}</math> md</p> <p>HETEROGENEITY (Permeability):</p> <p>Dykstra-Parsons Var. -- 0.712</p> <p>Lorenz Coefficient ---- 0.813</p> <p>AVERAGE SATURATIONS (Pore Volume):</p> <p>Oil ----- 7.1 %</p> <p>Water ----- 54.7 %</p>

# CORE LABORATORIES

Company : J. M. HUBER CORPORATION  
 Well : KENDRICK NO. 23-1 WELL

Field : ARROYO FIELD  
 Formation : MORROW

File No.: 57182-13465  
 Date : 24-FEB-1992

## TABLE III

### SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA	CHARACTERISTICS REMAINING AFTER CUTOFFS	
<b>ZONE:</b>	<b>ZONE:</b>	<b>PERMEABILITY:</b>
Identification ----- MORROW ZONE 2	Number of Samples ----- 12	Flow Capacity ----- 466.8 md-ft
Top Depth ----- 5405.0 ft	Thickness Represented - 12.0 ft	Arithmetic Average ---- 38.9 md
Bottom Depth ----- 5435.0 ft		Geometric Average ----- 4.34 md
Number of Samples ----- 19	<b>POROSITY:</b>	Harmonic Average ----- 0.54 md
	Storage Capacity ----- 158.9 $\phi$ -ft	Minimum ----- 0.09 md
<b>DATA TYPE:</b>	Arithmetic Average ---- 13.2 %	Maximum ----- 130. md
Porosity ----- (HELIUM)	Minimum ----- 7.3 %	Median ----- 1.22 md
Permeability ----- (HORIZONTAL) Kair	Maximum ----- 19.3 %	Standard Dev. (Geom) -- $K \cdot 10^{\pm 1.204}$ md
	Median ----- 15.3 %	
<b>CUTOFFS:</b>	Standard Deviation ---- $\pm 3.9$ %	<b>HETEROGENEITY (Permeability):</b>
Porosity (Minimum) ----- 0.0 %		Dykstra-Parsons Var. -- 0.730
Porosity (Maximum) ----- 100.0 %	<b>GRAIN DENSITY:</b>	Lorenz Coefficient ---- 0.573
Permeability (Minimum) --- 0.0000 md	Arithmetic Average ---- 2.70 gm/cc	
Permeability (Maximum) --- 100000. md	Minimum ----- 2.65 gm/cc	<b>AVERAGE SATURATIONS (Pore Volume):</b>
Water Saturation (Maximum) 100.0 %	Maximum ----- 2.74 gm/cc	Oil ----- 1.5 %
Oil Saturation (Minimum) - 0.0 %	Median ----- 2.70 gm/cc	Water ----- 66.2 %
Grain Density (Minimum) -- 2.00 gm/cc	Standard Deviation ---- $\pm 0.03$ gm/cc	
Grain Density (Maximum) -- 3.00 gm/cc		
Lithology Excluded ----- NONE		

# CORE LABORATORIES

Company : J. M. HUBER CORPORATION  
 Well : KENDRICK NO. 23-1 WELL

Field : ARROYO FIELD  
 Formation : MORROW

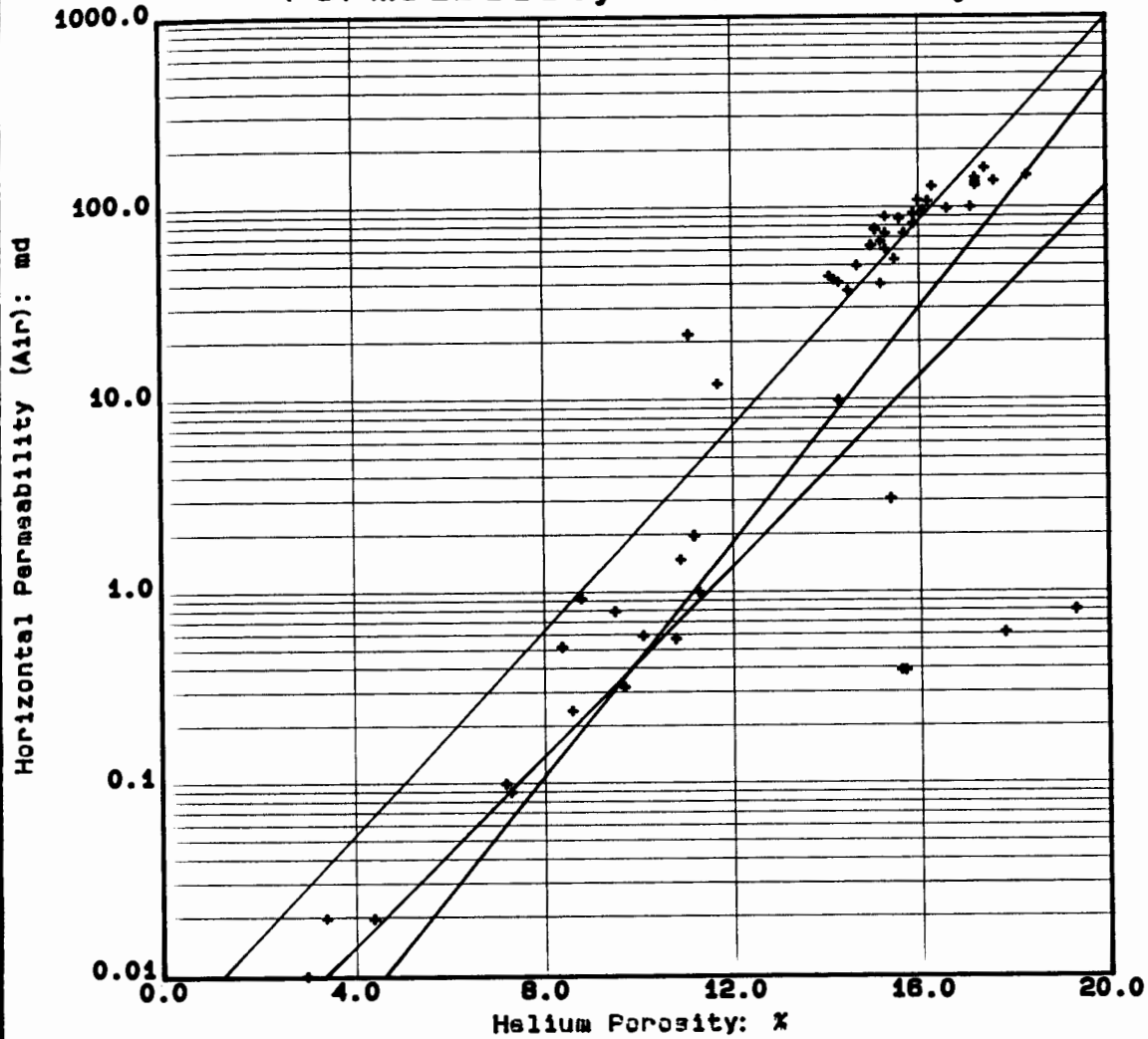
File No.: 57182-13465  
 Date : 24-FEB-1992

## TABLE IV

### SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA	CHARACTERISTICS REMAINING AFTER CUTOFFS	
<p>ZONE:            Identification ----- MORROW ZONE 3            Top Depth ----- 5435.0 ft            Bottom Depth ----- 5459.5 ft            Number of Samples ----- 25</p> <p>DATA TYPE:            Porosity ----- (HELIUM)            Permeability ----- (HORIZONTAL) Kair</p> <p>CUTOFFS:            Porosity (Minimum) ----- 0.0 %            Porosity (Maximum) ----- 100.0 %            Permeability (Minimum) --- 0.0000 md            Permeability (Maximum) --- 100000. md            Water Saturation (Maximum) 100.0 %            Oil Saturation (Minimum) - 0.0 %            Grain Density (Minimum) -- 2.00 gm/cc            Grain Density (Maximum) -- 3.00 gm/cc            Lithology Excluded ----- NONE</p>	<p>ZONE:            Number of Samples ----- 25            Thickness Represented - 24.5 ft</p> <p>POROSITY:            Storage Capacity ----- 373.5 <math>\phi</math>-ft            Arithmetic Average --- 15.2 %            Minimum ----- 3.4 %            Maximum ----- 18.3 %            Median ----- 15.5 %            Standard Deviation --- <math>\pm 2.9</math> %</p> <p>GRAIN DENSITY:            Arithmetic Average --- 2.67 gm/cc            Minimum ----- 2.65 gm/cc            Maximum ----- 2.93 gm/cc            Median ----- 2.66 gm/cc            Standard Deviation --- <math>\pm 0.06</math> gm/cc</p>	<p>PERMEABILITY:            Flow Capacity ----- 2040.0 md-ft            Arithmetic Average --- 83.3 md            Geometric Average --- 53.5 md            Harmonic Average ----- 0.49 md            Minimum ----- 0.02 md            Maximum ----- 162. md            Median ----- 74.0 md            Standard Dev. (Geom) -- <math>K \cdot 10^{\pm 0.760}</math> md</p> <p>HETEROGENEITY (Permeability):            Dykstra-Parsons Var. -- 0.522            Lorenz Coefficient ---- 0.245</p> <p>AVERAGE SATURATIONS (Pore Volume):            Oil ----- 1.7 %            Water ----- 50.1 %</p>

# Permeability vs. Porosity



**J. M. HUBER CORPORATION**  
**KENDRICK NO. 23-1 WELL**  
**STANTON COUNTY, KANSAS**

**MORROW (5375 - 5459.5 feet)**

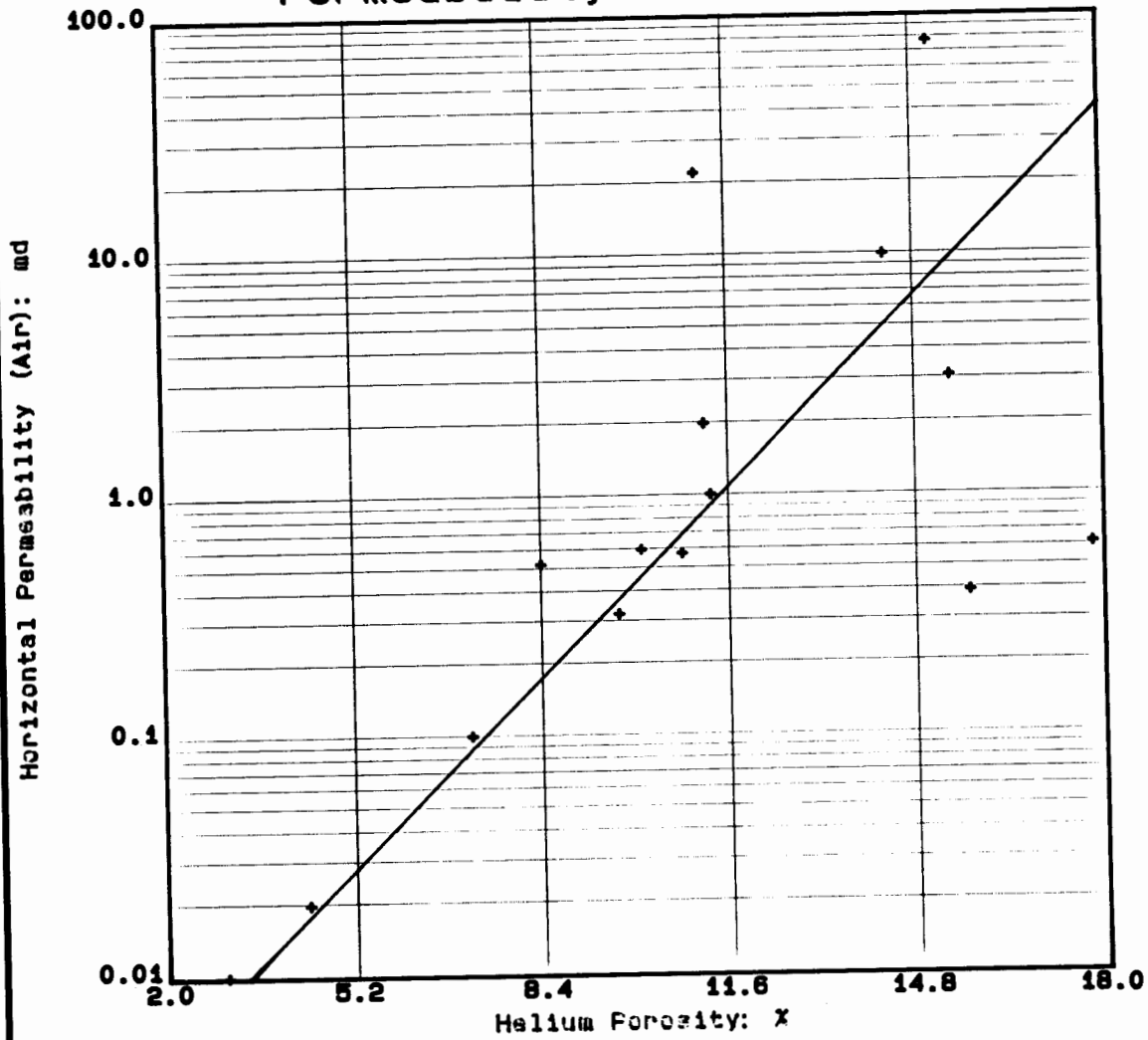
**Core Laboratories**

**24-Feb-1992**

**- LEGEND -**

- MORROW ZONE 1**
- MORROW ZONE 2**
- MORROW ZONE 3**

# Permeability vs. Porosity



**J. M. HUBER CORPORATION**  
**KENDRICK NO. 29-1 WELL**  
**STANTON COUNTY, KANSAS**

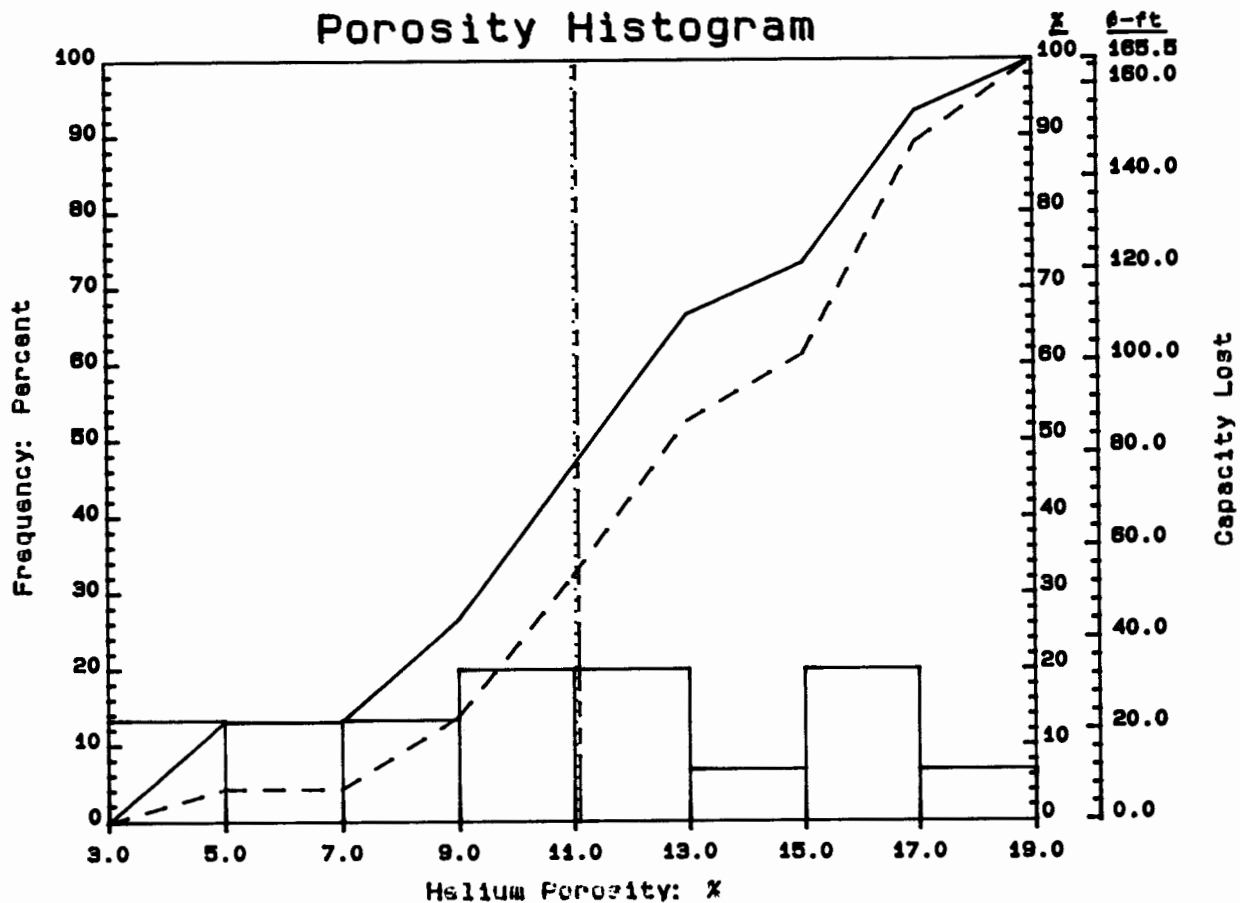
**MORROW (5375 - 5405 feet)**  
**ZONE I**

Core Laboratories

24-Feb-1992

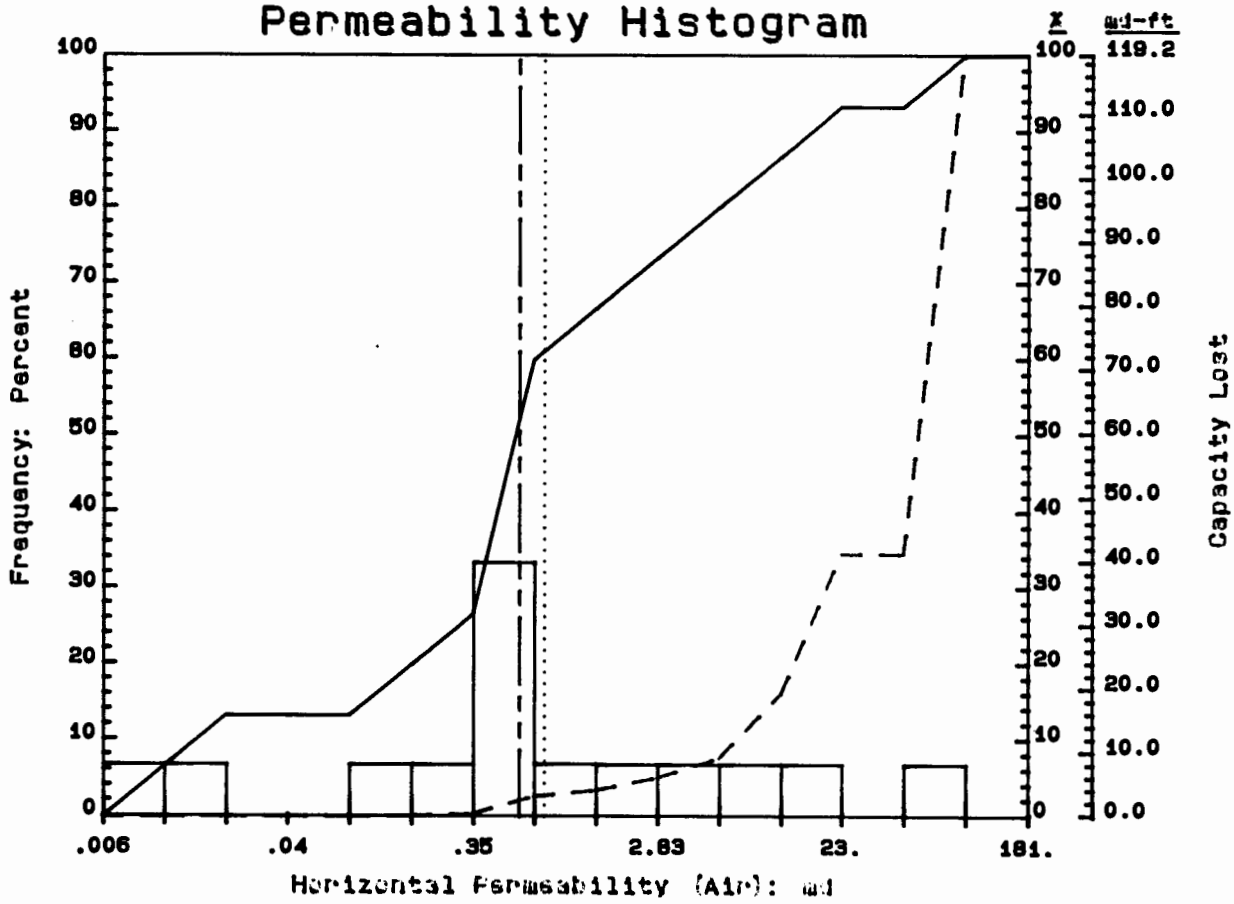
**- LEGEND -**  
**MORROW ZONE 1**

# Porosity Histogram



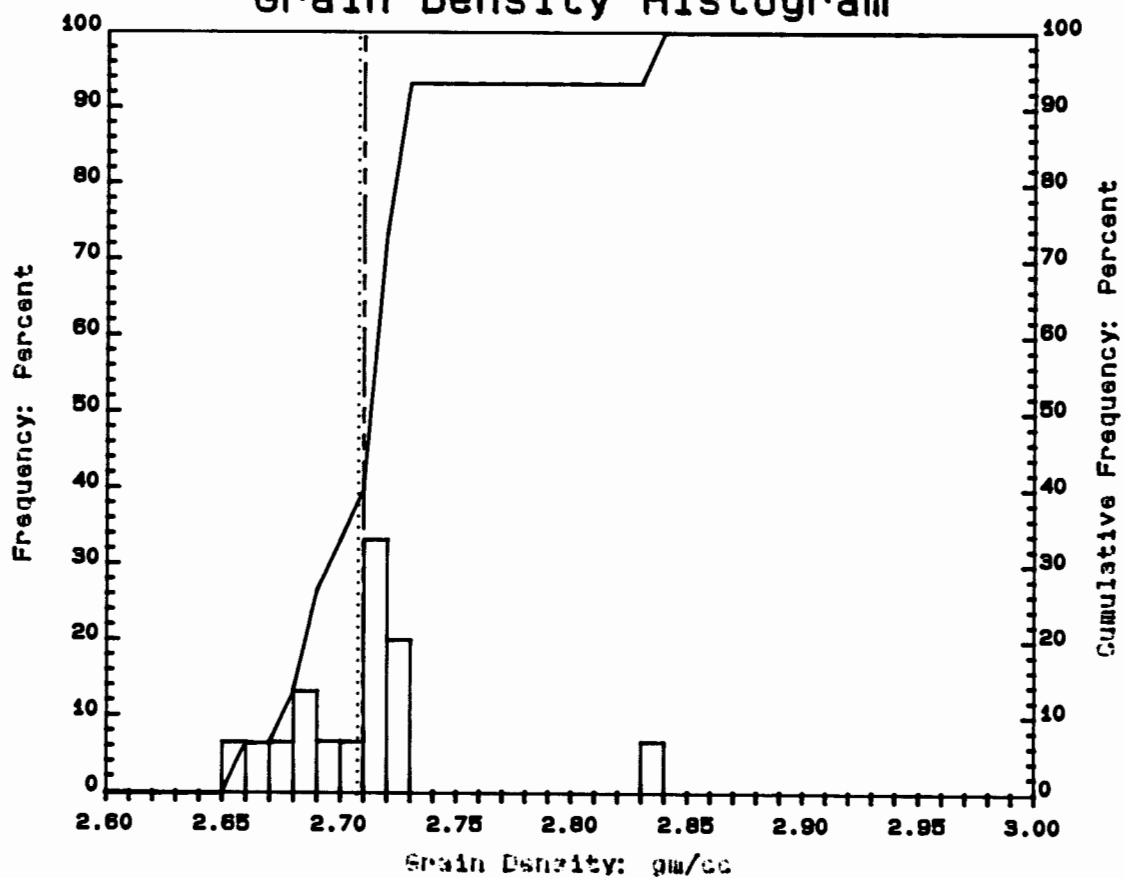
<p style="text-align: center;"><b>J. M. HUBER CORPORATION</b>                  KENDRICK NO. 23-1 WELL                  STANTON COUNTY, KANSAS</p> <p style="text-align: center;">MORROW (5375 - 5405 feet)                  ZONE I</p> <p>Core Laboratories <span style="float: right;">24-Feb-1992</span></p>	<p style="text-align: center;">- LEGEND -</p> <p>———— Median Value (11.1)                  ..... Arith. Average (11.0)                  ——— Cumulative Frequency                  - - - Cumulative Capacity Lost</p> <p style="text-align: center;">15 Samples</p>
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# Permeability Histogram



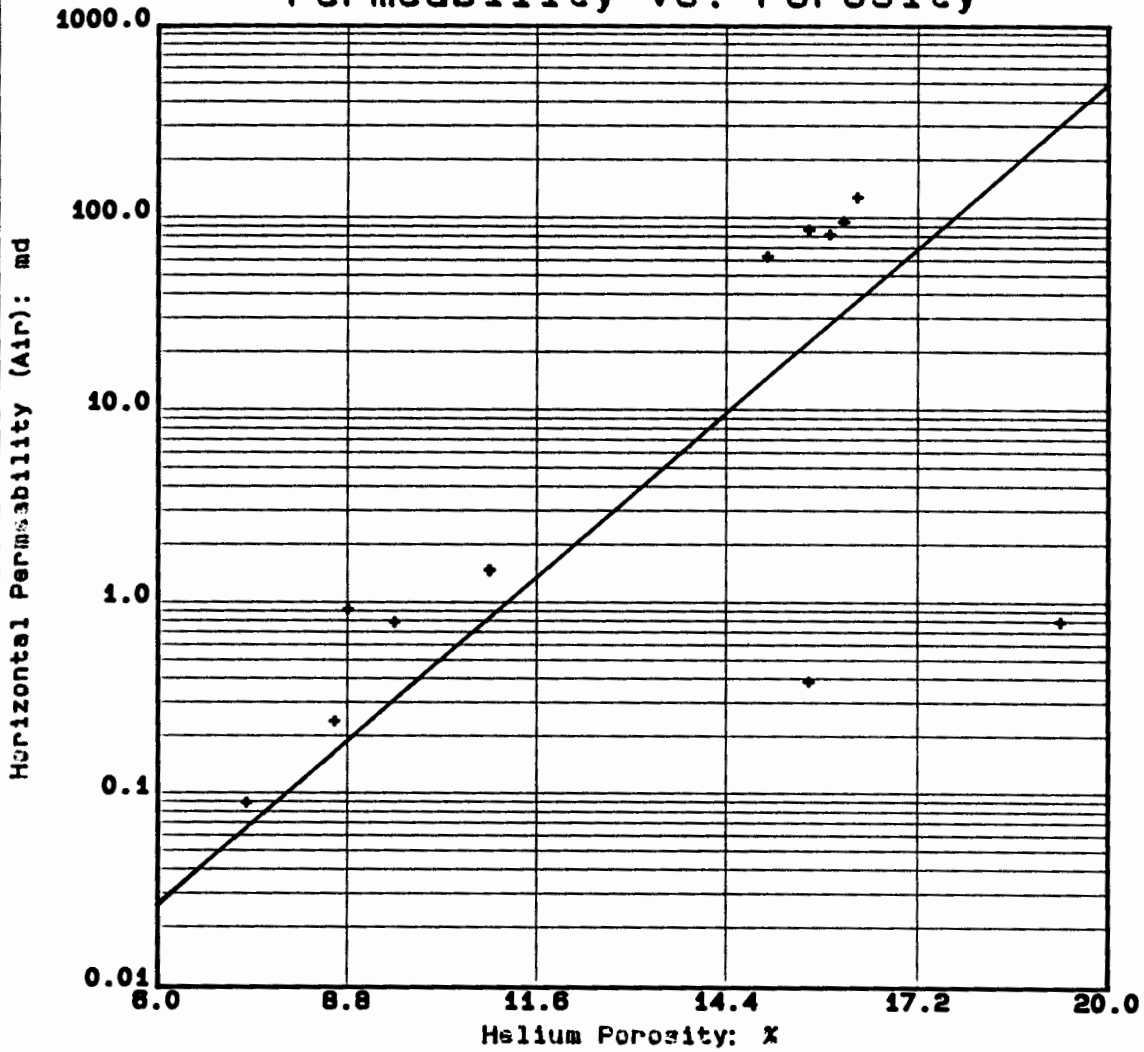
<p style="text-align: center;"><b>J. M. HUBER CORPORATION</b>                  KENDRICK NO. 23-1 WELL                  STANTON COUNTY, KANSAS</p> <p style="text-align: center;">MORROW (5375 - 5405 feet)                  ZONE I</p> <p>Core Laboratories <span style="float: right;">24-Feb-1992</span></p>	<p style="text-align: center;">- LEGEND -</p> <p>— Median Value (0.600)                  ..... Geom. Average (0.790)                  — Cumulative Frequency                  - - - Cumulative Capacity Lost</p> <p style="text-align: center;">15 Samples</p>
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### Grain Density Histogram



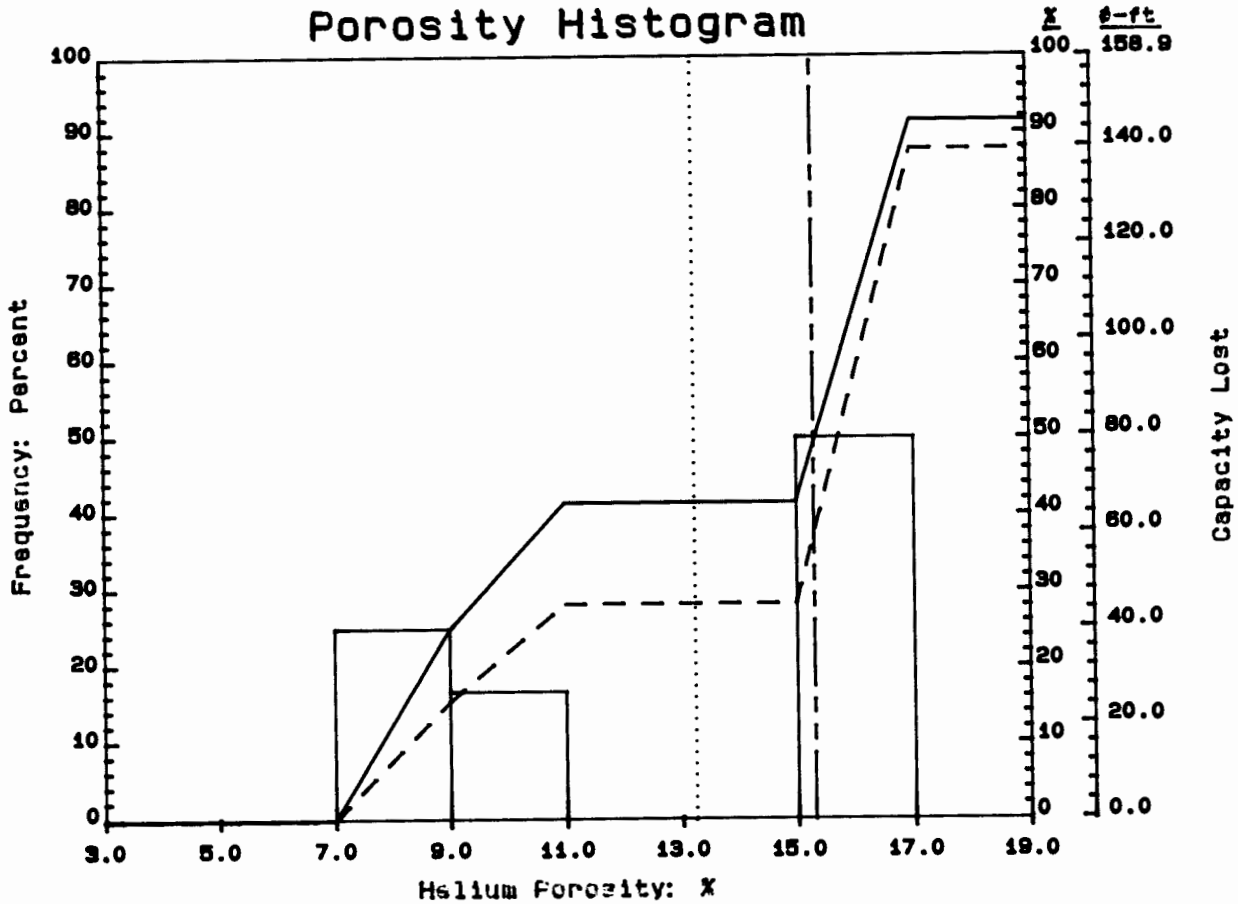
<p style="text-align: center;"><b>J. M. HUBER CORPORATION</b>                  KENDRICK NO. 23-1 WELL                  STANTON COUNTY, KANSAS</p> <p style="text-align: center;">MORROW (5375 - 5405 feet)                  ZONE I</p> <p>Core Laboratories <span style="float: right;">24-Feb-1992</span></p>	<p style="text-align: center;">- LEGEND -</p> <p>— Median Value (2.71)</p> <p>..... Arith. Average (2.71)</p> <p>— Cumulative Frequency</p> <p style="text-align: center;">15 Samples</p>
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# Permeability vs. Porosity



<p style="text-align: center;"><b>J. M. HUBER CORPORATION</b>  <b>KENDRICK NO. 23-1 WELL</b>  <b>STANTON COUNTY, KANSAS</b></p> <p style="text-align: center;"><b>MORROW (5405 - 5435 feet)</b>  <b>ZONE II</b></p> <p><b>Core Laboratories</b></p>	<p style="text-align: center;">- LEGEND -  <b>MORROW ZONE 2</b></p>
<p><b>24-Feb-1982</b></p>	

# Porosity Histogram



**J. M. HUBER CORPORATION**

KENDRICK NO. 23-1 WELL  
STANTON COUNTY, KANSAS

MORROW (5405 - 5435 feet)  
ZONE II

Core Laboratories

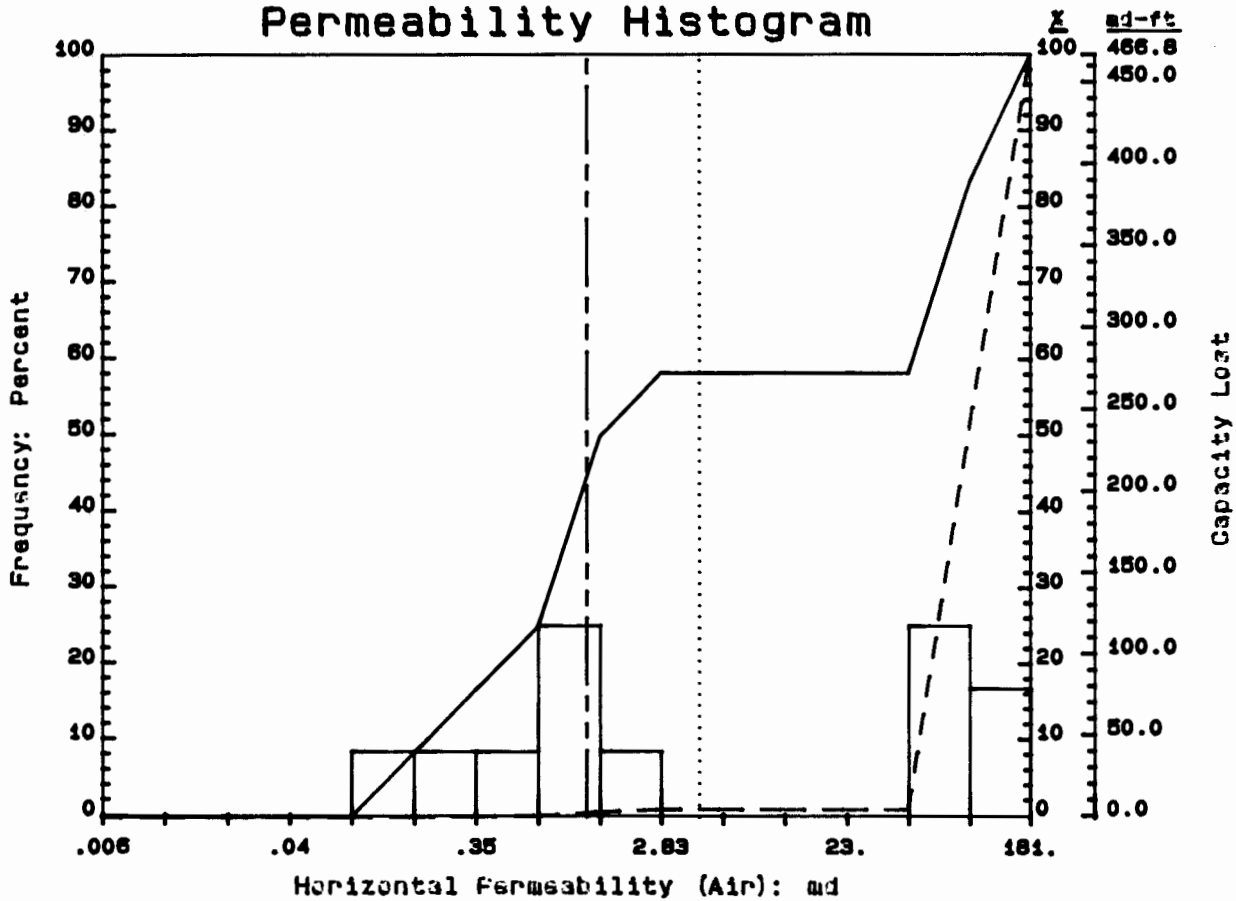
24-Feb-1992

- LEGEND -

- Median Value (15.3)
- ..... Arith. Average (13.2)
- Cumulative Frequency
- - - Cumulative Capacity Lost

12 Samples

# Permeability Histogram



**J. M. HUBER CORPORATION**  
**KENDRICK NO. 23-1 WELL**  
**STANTON COUNTY, KANSAS**

**MORROW (5405 - 5435 feet)**  
**ZONE II**

Core Laboratories

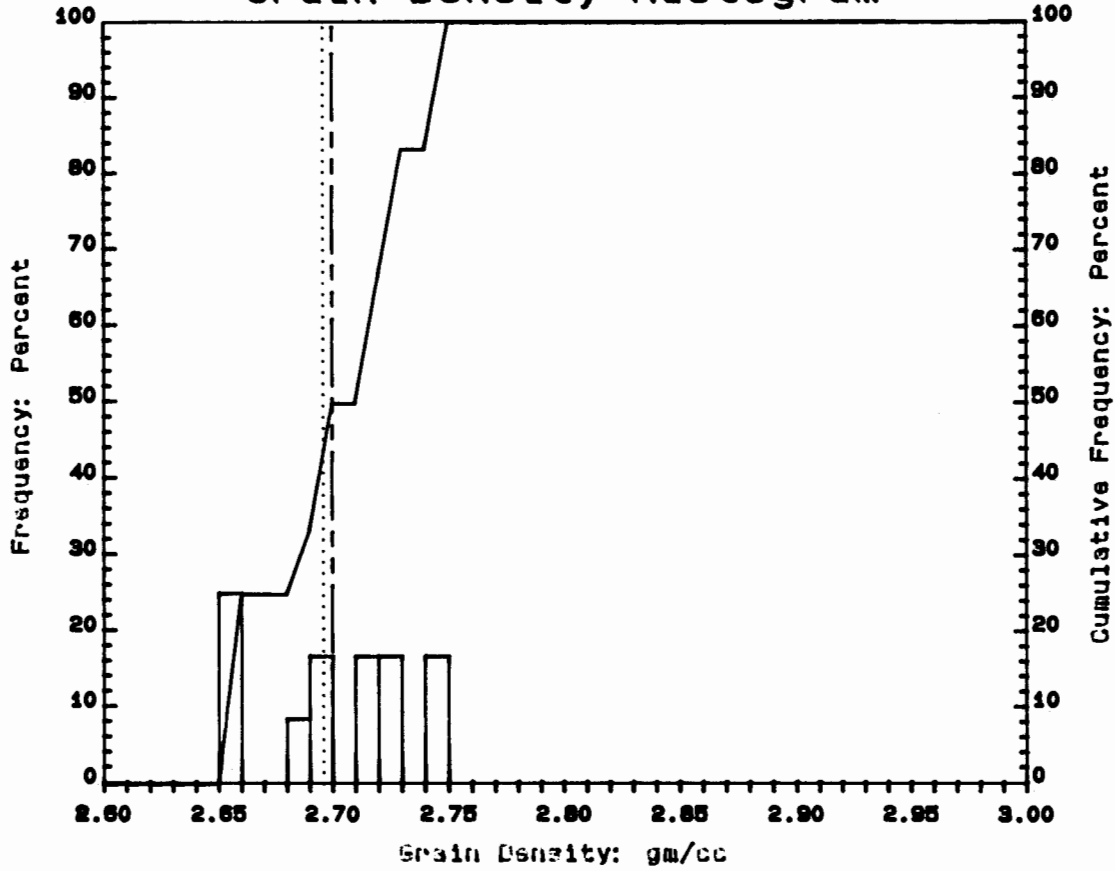
24-Feb-1992

**- LEGEND -**

- Median Value (1.22)
- ..... Geom. Average (4.34)
- Cumulative Frequency
- - - Cumulative Capacity Lost

12 Samples

# Grain Density Histogram



**J. M. HUBER CORPORATION**  
**KENDRICK NO. 23-1 WELL**  
**STANTON COUNTY, KANSAS**

**MORROW (5405 - 5435 feet)**  
**ZONE II**

Core Laboratories

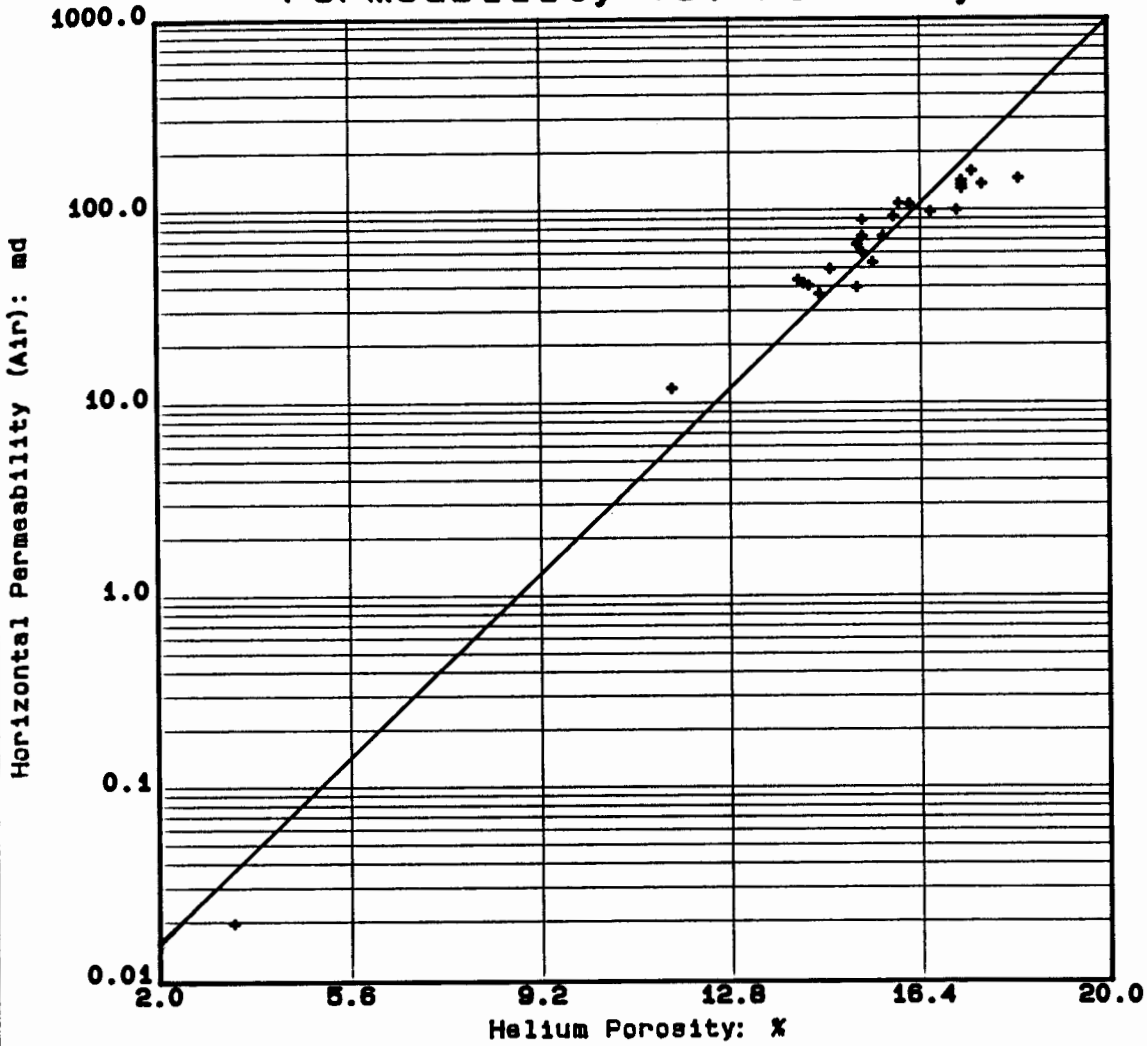
24-Feb-1992

- LEGEND -

- Median Value (2.70)
- ..... Arith. Average (2.70)
- Cumulative Frequency

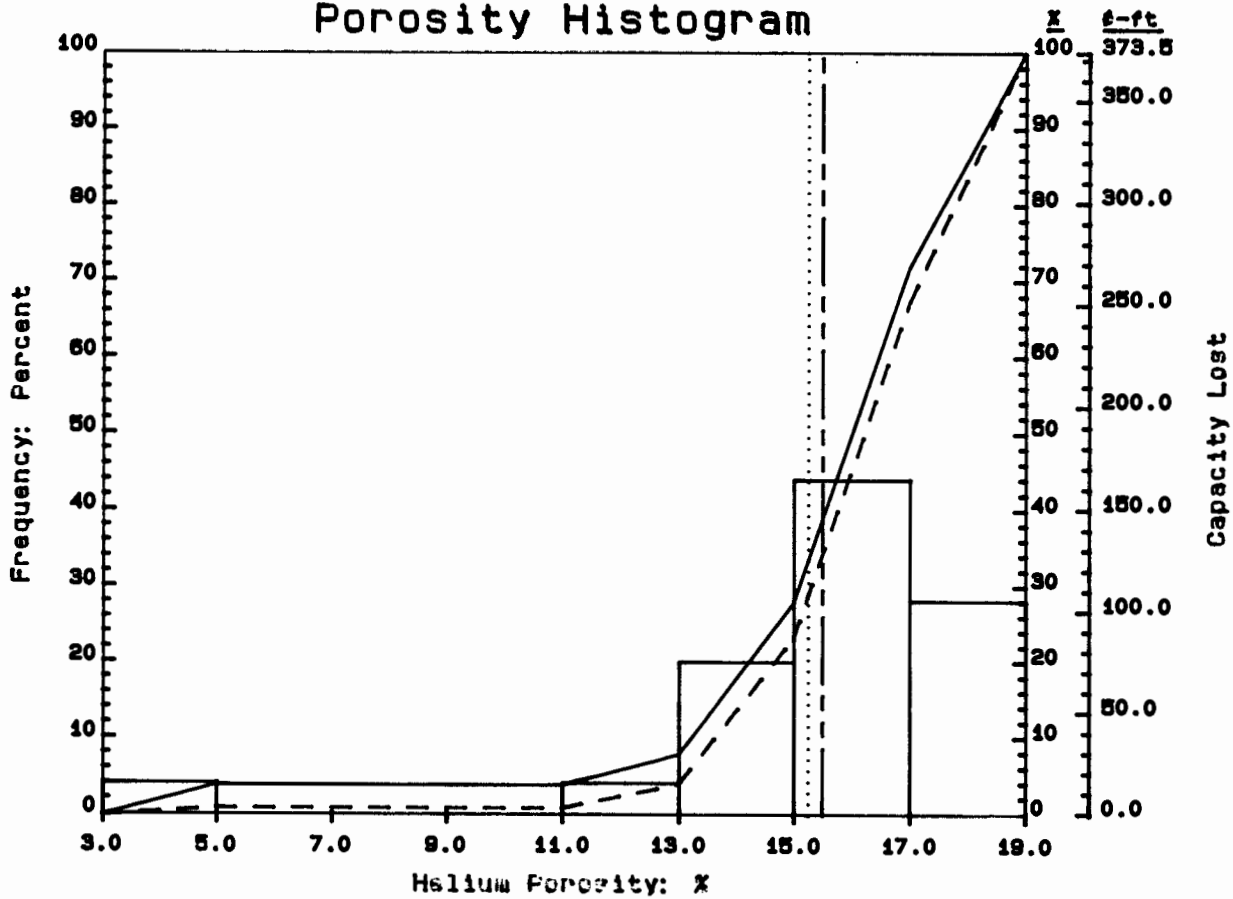
12 Samples

# Permeability vs. Porosity



<p style="text-align: center;"><b>J. M. HUBER CORPORATION</b>  <b>KENDRICK NO. 23-1 WELL</b>  <b>STANTON COUNTY, KANSAS</b></p> <p style="text-align: center;"><b>MORROW (5435 - 5459.5 feet)</b>  <b>ZONE III</b></p> <p><b>Core Laboratories</b> <span style="float: right;"><b>24-Feb-1992</b></span></p>	<p style="text-align: center;">- LEGEND -  <b>MORROW ZONE 3</b></p>
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# Porosity Histogram



**J. M. HUBER CORPORATION**  
**KENDRICK NO. 23-1 WELL**  
**STANTON COUNTY, KANSAS**

**MORROW (5435 - 5459.5 feet)**  
**ZONE III**

Core Laboratories

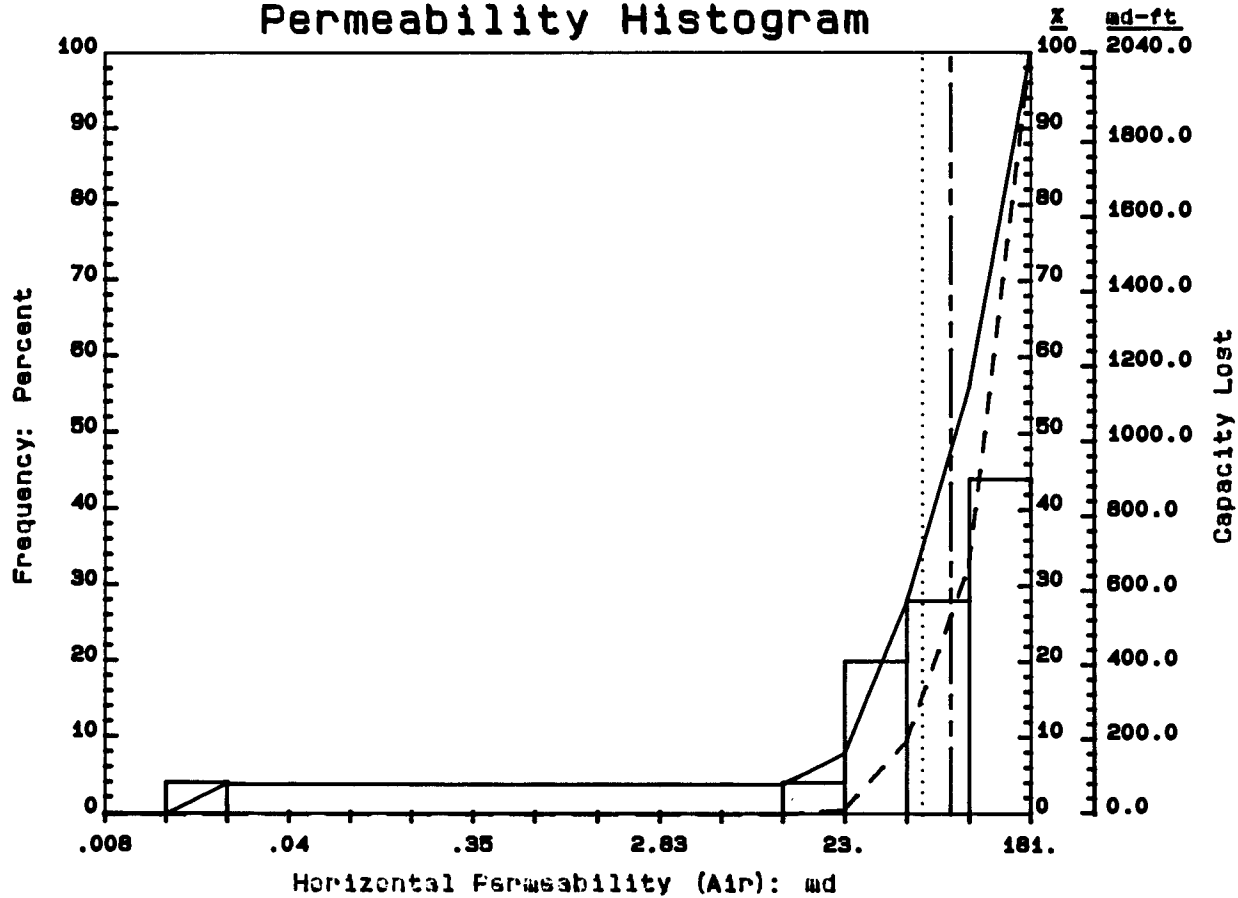
24-Feb-1992

- LEGEND -

- Median Value (15.5)
- ..... Arith. Average (15.2)
- Cumulative Frequency
- - - Cumulative Capacity Lost

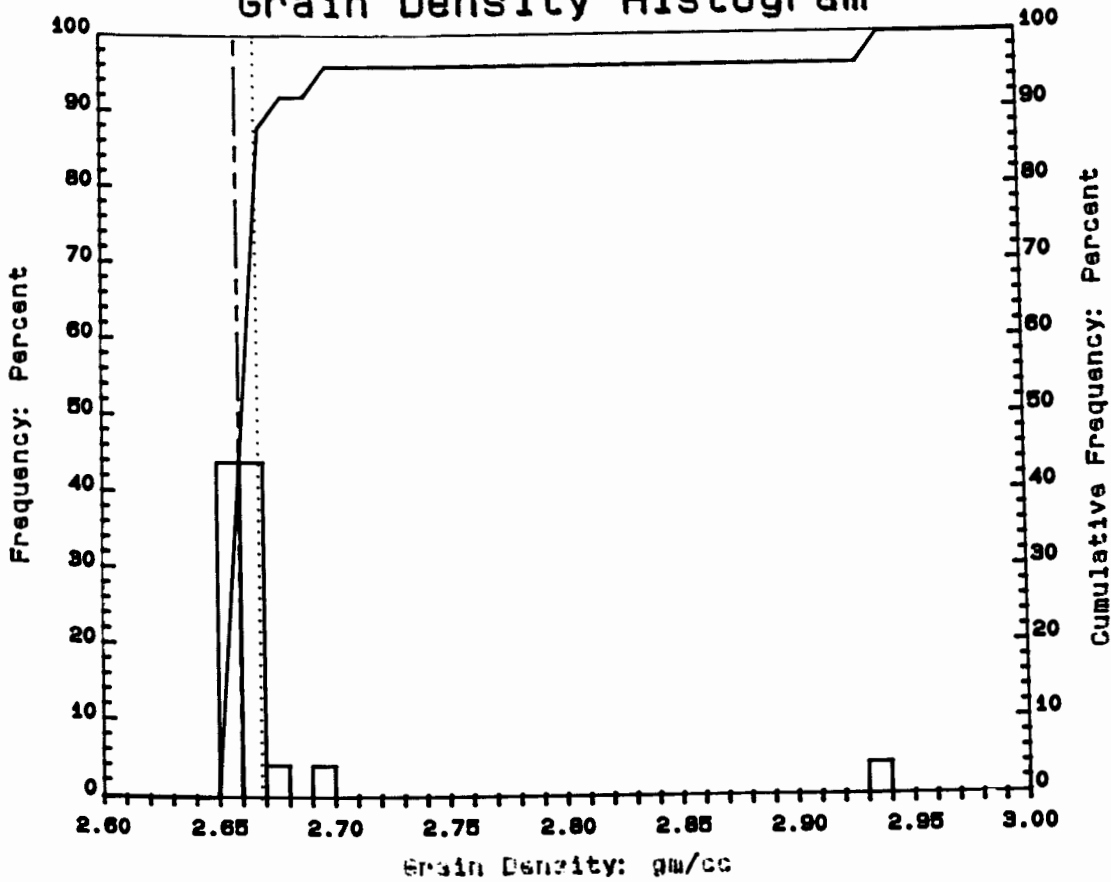
25 Samples

# Permeability Histogram



<p><b>J. M. HUBER CORPORATION</b>                  KENDRICK NO. 23-1 WELL                  STANTON COUNTY, KANSAS</p> <p>MORROW (5435 - 5459.5 feet)                  ZONE III</p> <p>Core Laboratories <span style="float: right;">24-Feb-1992</span></p>	<p style="text-align: center;">- LEGEND -</p> <p>—— Median Value (74.0)                  ..... Geom. Average (53.5)                  ——— Cumulative Frequency                  - - - Cumulative Capacity Lost</p> <p style="text-align: center;">25 Samples</p>
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# Grain Density Histogram



**RELEASED**  
APR 1 1996

FROM CONFIDENTIAL

<p style="text-align: center;"><b>J. M. HUBER CORPORATION</b> KENDRICK NO. 23-1 WELL STANTON COUNTY, KANSAS</p> <p style="text-align: center;">MORROW (5435 - 5459.5 feet) ZONE III</p> <p>Core Laboratories <span style="float: right;">24-Feb-1992</span></p>	<p style="text-align: center;">- LEGEND -</p> <p>— Median Value (2.66)</p> <p>..... Arith. Average (2.67)</p> <p>— Cumulative Frequency</p> <p style="text-align: center;">25 Samples</p>
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**DISTRIBUTION OF FINAL REPORT**

J. M. HUBER CORPORATION  
Kendrick No. 23-1 Well  
Stanton County, Kansas  
CL File: 57182-13465

3 cc - J. M. HUBER CORPORATION  
7120 I-40 West  
Amarillo, Texas 79106-2596

Attention: Mr. Tony Kolodziej

**RELEASED**

**APR 1 1996**

**FROM CONFIDENTIAL**