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SPECIAL CORE ANALYSIS

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

RESERVOIRS INC.

1151 BRITTMORE ROAD ▪ HOUSTON, TEXAS 77043 ▪ (713) 932-7183 ▪ FAX (713) 932-0520

RESERVOIRS, INC.

GEOLOGICAL ANALYSIS • CLASTICS/CARBONATES
SINGLE WELL/FIELD/REGIONAL STUDIES
WELL COMPLETION/STIMULATION STUDIES
ROUTINE AND SPECIAL CORE ANALYSIS

1151 BRITTMORE ROAD HOUSTON, TEXAS 77043 (713) 932-7183 FAX (713) 932-0520

August 2, 1994

Mr. Todd Montgomery
Anadarko Petroleum Corporation
17001 Northchase Drive
Houston, Texas 77060

Dear Mr. Montgomery:

Following a meeting on June 15, 1994, Reservoirs, Inc. was requested and authorized by Mr. Todd Montgomery of Anadarko Petroleum Corporation to perform special core analysis tests on twelve (12) one and one-half inches in diameter, core plug samples. The samples had been selected from the depth interval of 2320 - 2574 ft. of the Anadarko Petroleum Corporation, Cornell university Project. Each sample was leached with methanol to remove any residual salts present and the basic rock properties were determined.

The twelve (12) samples were selected for the following special core analysis tests:

- Formation Resistivity Factor At Confining Pressure
- Formation Resistivity Index At Confining Pressure
- Mercury Injection Capillary Pressure

A simulated formation brine based upon an analysis (Table 2) provided by Halliburton Services for the Anadarko Petroleum Corporation Tucker 3-19 Well, located in Morton County, Kansas was used during the electrical properties analyses. In addition, the confining pressure to be used during the analyses was derived from Nelson's Equation, using a reservoir pressure of 150 psig and a Poisson's Ratio of 0.30. Nelson's Equation is described separately in the section entitled "Laboratory Procedures".

Preliminary test results of the special core analyses were delivered to Mr. Montgomery of Anadarko Petroleum Corporation and to Mr. John T. Kulha of Loren & Associates, Inc. on July 29, 1994. This report presents the basic rock properties, electrical properties and mercury injection capillary pressure test results in both tabular and graphical formats. These test results supersede all previously issued preliminary test results.

The basic rock properties test results are presented in Table 1 and Figures 1 and 2. Examination of Table 1 indicates the specific permeabilities to gas ranged from 0.273 md to 54.3 md and the porosities ranged from 11.1 to 27.0 percent of the bulk volume. Figure 1 presents the relationship of specific permeability to gas-porosity. Grain densities and bulk densities ranged from 2.65 to 2.83 g/cc and from 1.99 to 2.44 g/cc, respectively. Figure 2 presents the relationship of bulk density-porosity.

The formation resistivity factor test results are presented in Table 2a and Figure 3. The formation resistivity factors ranged from 35.70 to 116.10 and the individual cementation exponent (m) derived for each sample ranged from 1.83 to 2.76. Figure 3 presents the composite graphical presentation of formation resistivity factor-porosity and the composite cementation exponent was m = 2.15.

Tables 3 through 14 and Figures 4 through 15 present the individual formation resistivity index-saturation relationships. The saturation exponents (n) ranged from 1.51 to 2.04 and Figure 16 presents the composite relationship of formation resistivity index-saturation for all twelve (12) samples analyzed. Two main trends were apparent from the test results presented in Figure 16 and the composite saturation exponent (n) derived from Figure 16 were n = 1.55 and n = 1.97.

The mercury injection capillary pressure and derived pore size distribution data are presented in Tables 15 through 26 And Figures 17 through 40. Final wetting phase saturations attained at the maximum injection pressure of 2000 psia ranged from 4.1 to 24.4 percent of the pore volume. Examination of Figures 17 through 40 indicates several different pore geometrical systems were represented by the samples analyzed and are evident in the capillary pressure-saturation and pore size distribution profiles.

It has been a pleasure to be of service to you and the Anadarko Petroleum Corporation, and Reservoirs, Inc. looks forward to working together with you on future projects. If you should have any questions pertaining to the test results, the procedures used to obtain the test results or if I can be of any further service, please do not hesitate to contact me at (713) 932-9670.

Sincerely,

Paul Delacoe

Paul Delacoe
Manager
Special Core Analysis
RESERVOIRS, INC.

LABORATORY PROCEDURES

Sample Preparation

Each core plug sample was examined, and marked with a Reservoirs' Inc. identification using indelible ink. The samples were subsequently cleaned using a hot solvent extraction/distillation process. Methanol was the solvent utilized during the process. The samples were subsequently dried in a temperature controlled chamber for twelve (12) hours and allowed to cool to room temperature in a desiccator containing silica-gel prior to the determination of the basic rock properties.

Basic Rock Properties

The **bulk volume** of each core plug sample was determined by mercury immersion (Archimedes' principle) and confirmed by measuring the length and diameter of each sample with calipers and calculating the bulk volume.

The **porosity** and **grain density** of each core plug sample was determined using the Boyle's law method and helium as the gaseous phase. The sample was placed in a matrix cup (sealed chamber) of known volume. Another chamber of known volume containing helium at a preselected pressure was connected to the matrix cup. The helium expanded into the matrix cup, and an equilibrium pressure was recorded. Using Boyle's law, the grain volume of the sample being tested can be determined. The grain volume subtracted from the bulk volume of the sample results in the pore volume of the sample. Porosity is the pore volume expressed as a percent of the bulk volume.

The **grain density** is the weight of the core material per unit volume of the core material (grain volume). The weight of the core material is determined by weighing the clean and dry sample on a pan-balance at ambient conditions. The grain volume is obtained from the Boyle's law calculation.

The **specific permeability** to gas was determined by placing each sample in a Hassler-type core holder. A confining pressure of 400 psig was applied to the system to prevent bypassing of the gas around the sample. Nitrogen gas was injected into each sample at a constant pressure until a constant flow rate of gas through the sample was attained (steady-state conditions). The specific permeability to gas was calculated using the Darcy equation.

Sample Saturation (Vacuum-Pressure Method)

Each clean and dried core plug sample selected for special core analysis testing was weighed and placed in a vacuum-pressure saturation chamber. The system was evacuated to a pressure of fifty (50) microns for a period of twelve (12) hours. A simulated formation brine (Table 2) was injected into the chamber until the level of the fluid was above the samples. A pressure of 1200 psig was applied to the system for a minimum of six (6) hours. The chamber was depressured and each sample was removed from the fluid and weighed. The pore volume was calculated gravimetrically using the dry weight and the saturated weight of each sample and the corresponding density of the fluid. This pore volume was compared to the pore volume previously derived by the Boyle's Law helium porosity method, to ensure one hundred percent (100%) saturation.

Formation Resistivity Factor At Confining Pressure

Each saturated sample was weighed and individually mounted in a hydrostatic core holder with a silver electrode/distribution plate at the upstream of the sample and a silver electrode/ capillary pressure porous-plate at the downstream of the sample. A confining pressure of 400 psig was applied to the system to prevent bypassing of fluid around the sample.

Several pore volumes of simulated formation brine were injected through the sample to ensure the sample and system were completely saturated with the brine. The resistance of the saturated sample was determined at a frequency of 1000 Hz, using a GenRad® meter. The determinations performed at the confining

pressure of 400 psig are for the purpose of quality control.

A pipette was attached to the system, and the confining pressure was slowly increased to a confining pressure which was derived from Nelson's Equation:

$$\frac{\text{Depth of Sample - Reservoir Pressure}}{3} \bullet \frac{(1+\nu)}{(1-\nu)}$$

Where: Depth of sample is in feet
Reservoir pressure is in psig
ν = Poisson's Ratio

Given Values: Reservoir pressure for 2320.9 - 2573.2 ft. depth range = 150 psig

Poisson's Ratio ν = 0.30

The sample and system were allowed to stabilize for several hours. The volume of brine produced into the pipette is equivalent to the reduction in the pore volume. The porosity at confining pressure was calculated from these test results.

The resistance of the equilibrated sample was determined over a period of several hours to ensure that the sample had stabilized (ionic equilibrium). A frequency of 1000 Hz was used to determine the resistance. The resistance and the porosity at confining pressure (previously determined) and the resistance of the simulated formation brine were used to calculate the formation resistivity factor and cementation exponent (m) for each sample.

Formation Resistivity Index At Confining Pressure

Immediately following the formation resistivity factor at confining pressure test, the sample was injected with nitrogen gas. The nitrogen was injected into the sample to displace the simulated formation brine through the capillary pressure porous-plate mounted at the downstream end of the sample. The resistance of the sample was determined as a function of the corresponding volume of brine produced. The resistance was measured at a frequency of 1000 Hz. The formation resistivity indices (I), saturation exponents (n) and the corresponding water saturations were calculated from the test results.

At the conclusion of the test, the confining pressure was removed and the sample was unloaded from the core holder. The sample was weighed to gravimetrically determine the final water saturation present in the sample. This saturation was compared to the final saturation determined volumetrically at the conclusion of the test to verify the test results.

Mercury Injection-Pore Size Distribution

Each clean and dry sample was placed in the pycnometer (injection chamber) of the mercury injection apparatus, and evacuated to 50 microns of pressure. Mercury was injected at a predetermined pressure and maintained at that pressure until capillary equilibrium was attained (mercury intrusion into the sample ceased). The pressure and the volume of mercury injected into the sample were recorded. The pressure was then increased and the procedure repeated. The range of injection pressures selected for the mercury injection test was 0-2000 psia.

The pore size distribution was derived from the mercury injection capillary pressure data using the following equation:

$$Ri = \frac{2 \gamma \cos \theta C}{P_c}$$

Where:
- Ri = Pore Radii (microns)
- P_c = Capillary Pressure in laboratory (psia)
- γ = Interfacial Tension (dynes/cm)
- θ = Contact Angle (degrees)
- C = Conversion Constant equal to 145×10^{-3}

Leverett's J-Function was derived from the mercury injection capillary pressure data using the following equation:

$$J(S_w) = \frac{P_c}{\gamma \cos \theta} \left(\frac{k}{\phi} \right)^{\frac{1}{2}}$$

Where: P_c = Capillary pressure in laboratory (dynes/cm²)

γ = Interfacial tension (dynes/cm)

θ = Contact angle (degrees)

k = Permeability (cm²)

ϕ = Fractional porosity

For Air-Mercury System:

γ = 480 dynes/cm

Contact angle, θ = 140°

Cosine 140° = 0.766

Table 1

BASIC ROCK PROPERTIES

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability to Gas (md)	Porosity (% BV)	Grain Density (g/cc)	Bulk Density (g/cc)	
C 446	2320.9	3.01	16.0	2.69	2.26	vfg Mar ss
C 449	2353.7	0.273	12.2	2.78	2.44	Wkst
C 447	2356.3	0.509	13.0	2.71	2.36	pk-grnst
C 450	2389.3	4.48	15.5	2.69	2.27	mar Vfg ss
C 451	2391.7	0.374	12.8	2.69	2.34	Mar vfg ss
C 452	2405.2	11.6	15.7	2.83	2.39	Mrln mdst
C 453	2461.2	0.513	11.2	2.71	2.40	pk-grnst
C 454	2463.5	54.3	27.0	2.72	1.99	pk-grnst
C 455	2465.4	19.3	23.7	2.73	2.08	pk-grnst
C 456	2514.6	37.0	19.1	2.65	2.15	Mar vfg ss
C 457	2532.8 *	2.88	14.7	2.71	2.31	plast
C 458	2573.2	0.276	11.1	2.69	2.39	Mar vfg ss

* - FT Riley Sample

Alan, 12 Cap Pressures
We did not describe core
but can Id facies from
Res Inc. (Have)

Variety of Mar ss
One FT Riley Sample

Figure 1

SPECIFIC PERMEABILITY TO GAS - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

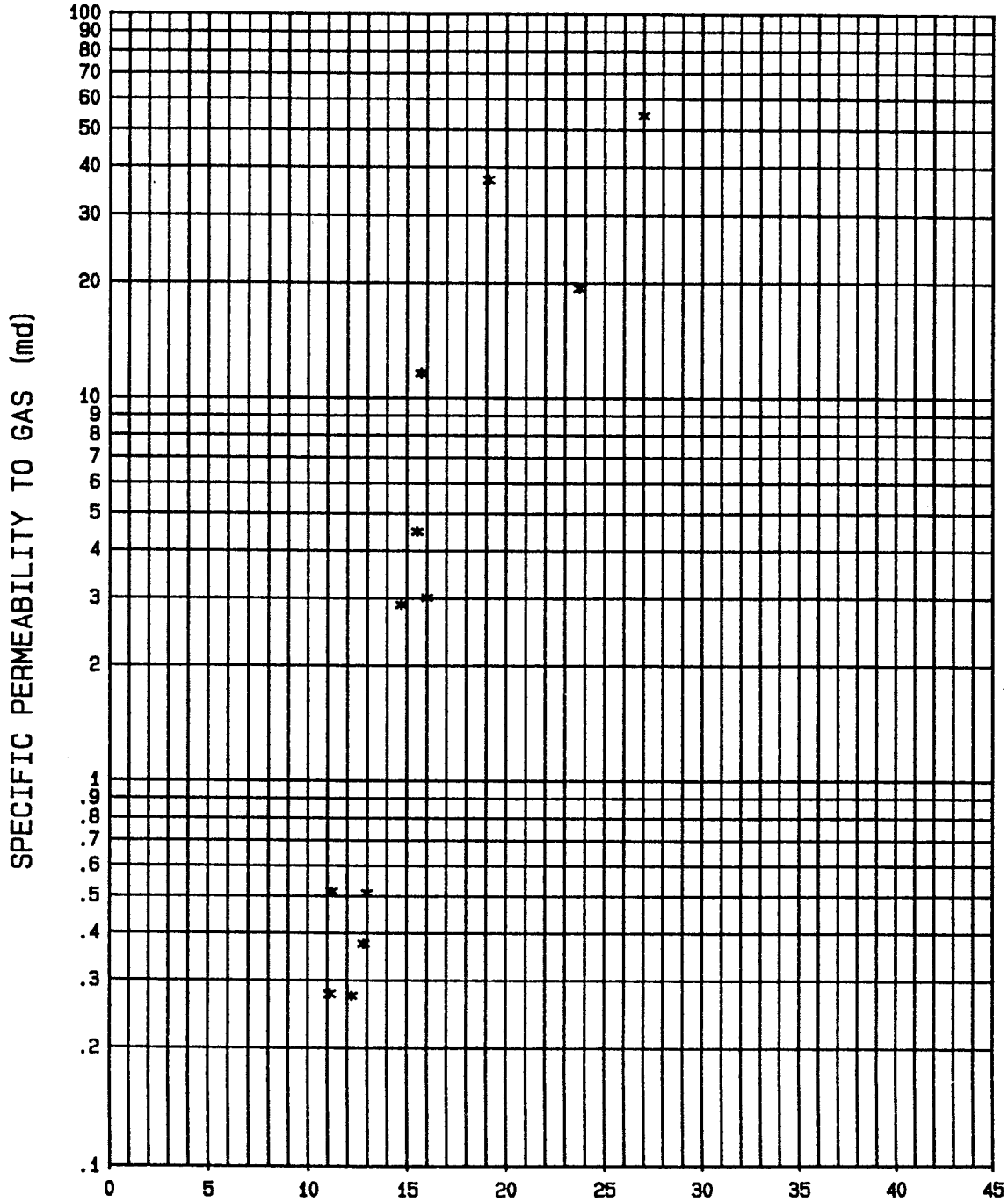


Figure 2

BULK DENSITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

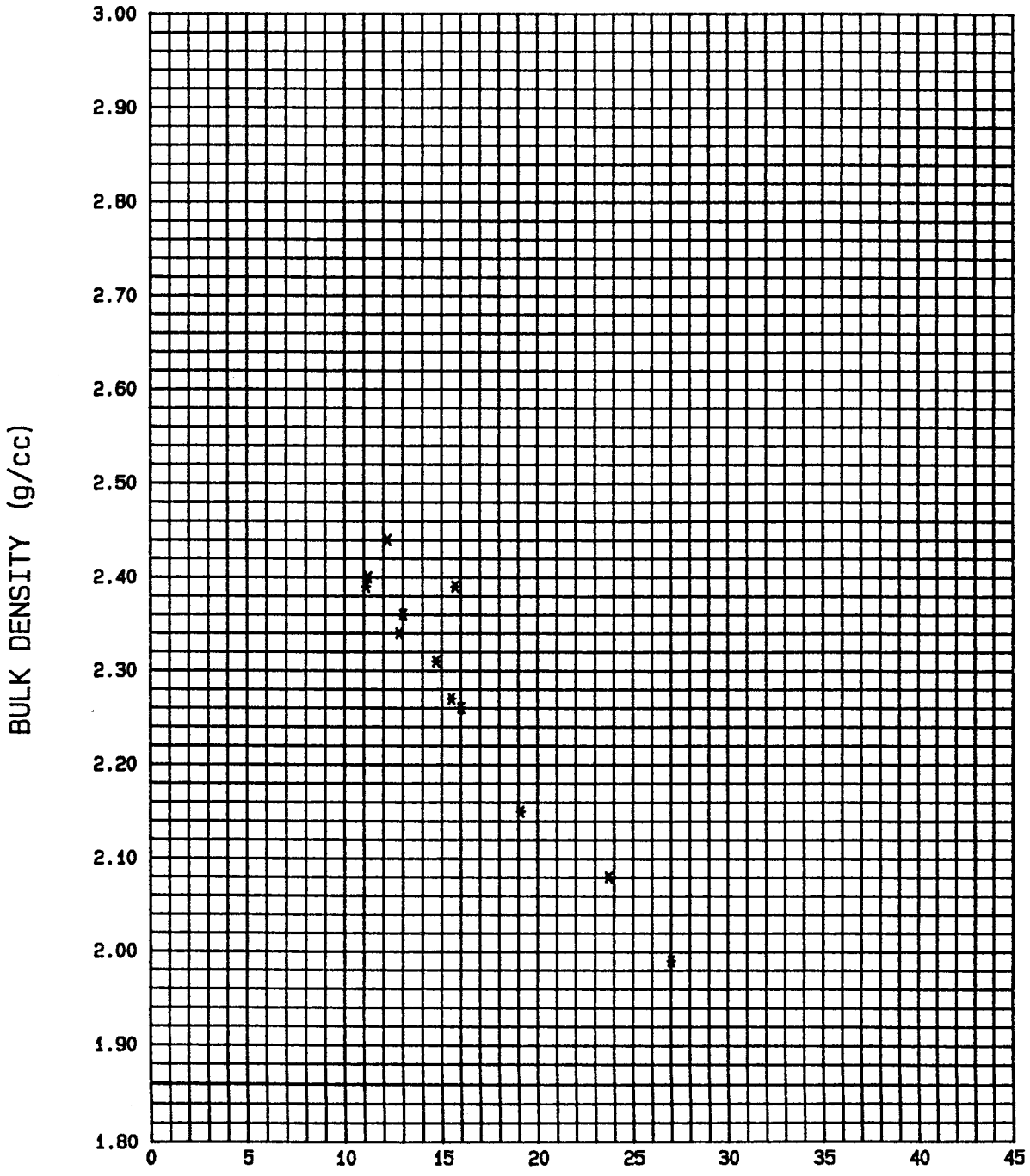


Table 2

SIMULATED FORMATION BRINE ANALYSIS*

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Constituent(s)	g/L
Sodium Bicarbonate	0.50
Sodium Sulfate	1.18
Magnesium Chloride	17.54
Calcium Chloride	16.26
Potassium Chloride	1.10
Sodium Chloride	198.20
Total Dissolved Solids:	234.78

* Denotes simulated formation brine was based upon an analysis performed by Halliburton Services in Liberal, Kansas on March 13, 1992 for the Anadarko Petroleum Corporation, Tucker 3-19 Well, located in Morton County, Kansas,

Table 2a

FORMATION RESISTIVITY FACTOR - POROSITY RELATIONSHIP

AT CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft.)	Confining Pressure (psig)	Formation Resistivity Factor (F)	Porosity (% BV)	Cementation Exponent(m)
C 446	2320.9	1425	38.50	15.8	1.98
C 449	2353.7	1425	61.89	12.0	1.95
C 447	2356.3	1425	69.53	12.8	2.06
C 450	2389.3	1425	37.34	15.3	1.93
C 451	2391.7	1425	66.41	12.6	2.03
C 452	2405.2	1425	54.58	15.5	2.15
C 453	2461.2	1425	116.10	11.1	2.16
C 454	2463.5	1425	38.00	26.8	2.76
C 455	2465.4	1425	53.93	23.4	2.75
C 456	2514.6	1425	35.70	18.9	2.15
C 457	2532.8	1425	54.60	14.6	2.08
C 458	2573.2	1425	58.91	10.8	1.83

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

Figure 3

FORMATION RESISTIVITY FACTOR - POROSITY RELATIONSHIP AT CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

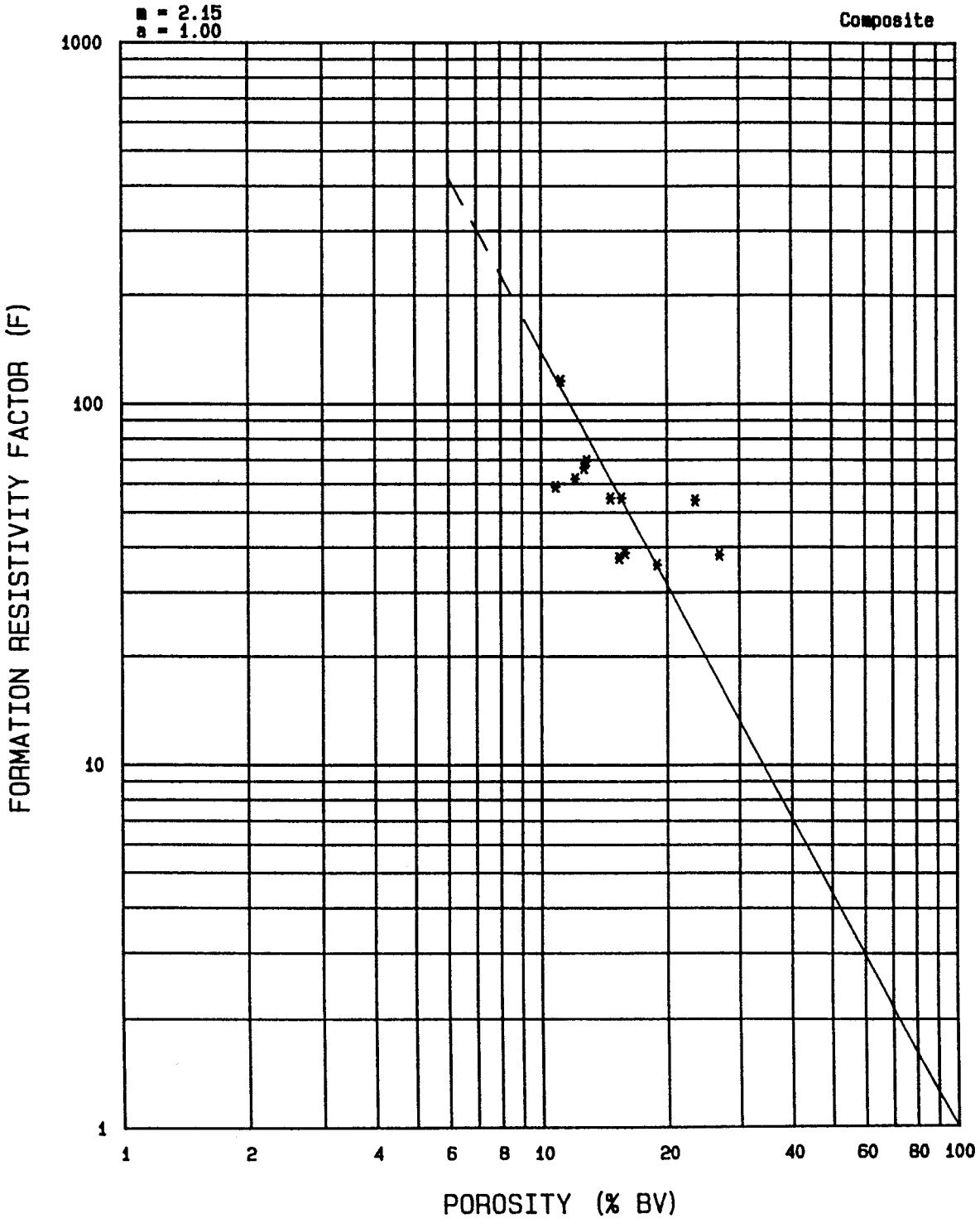


Table 3

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 446	2320.9	3.01*	15.8	1.00	100.0
				1.07	96.1
				1.24	87.1
				1.41	80.3
				1.78	69.0
				6.03	31.2

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 4

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

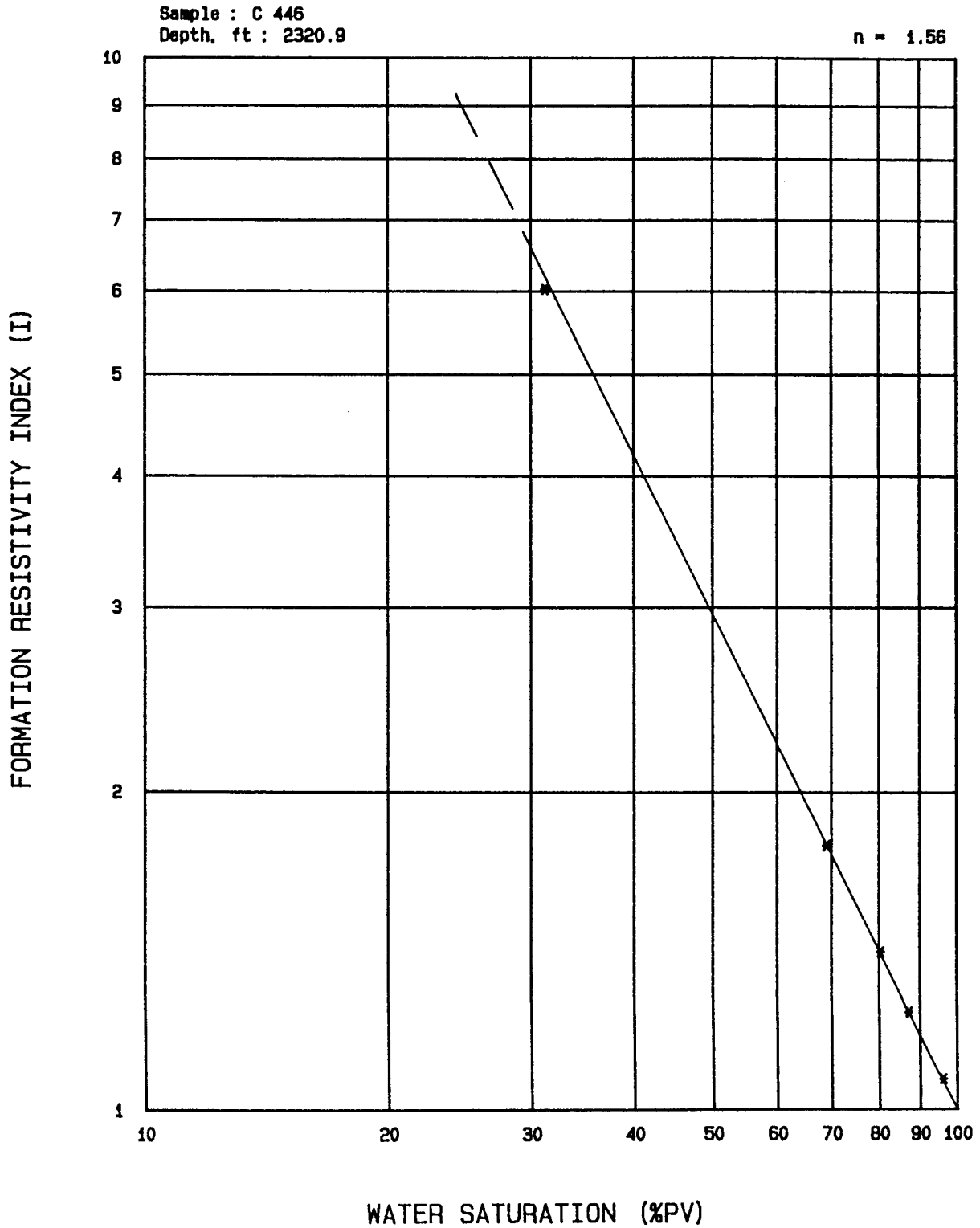


Table 4

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 449	2353.7	0.273*	12.0	1.00	100.0
				1.05	96.9
				1.13	92.3
				1.23	87.2
				3.97	39.6

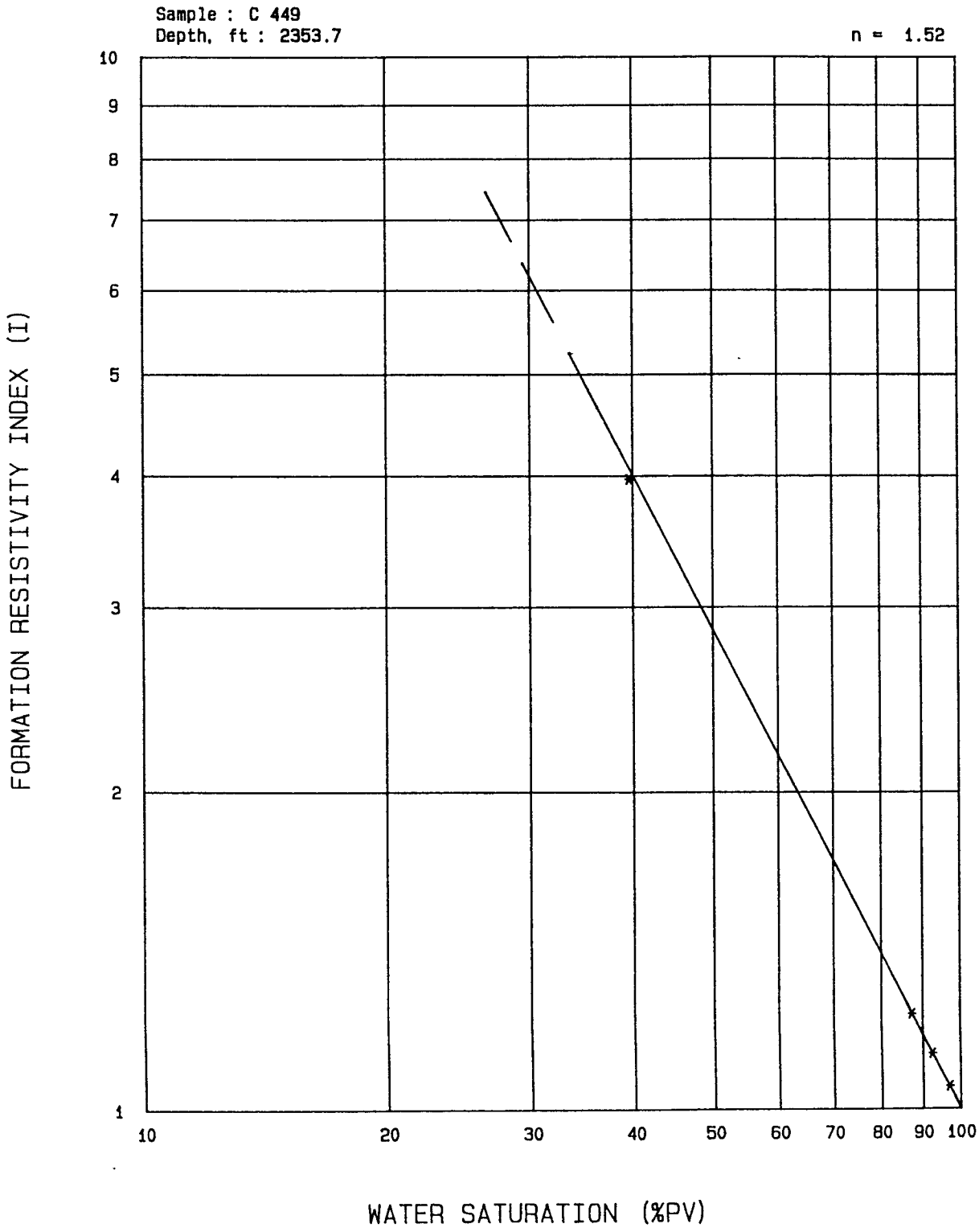
Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 5

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982



Reservoirs Inc.

Table 5

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 447	2356.3	0.509*	12.8	1.00	100.0
				1.12	92.8
				1.39	80.7
				1.72	70.2
				2.09	60.9
				2.37	56.6
				6.30	29.3

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 6

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

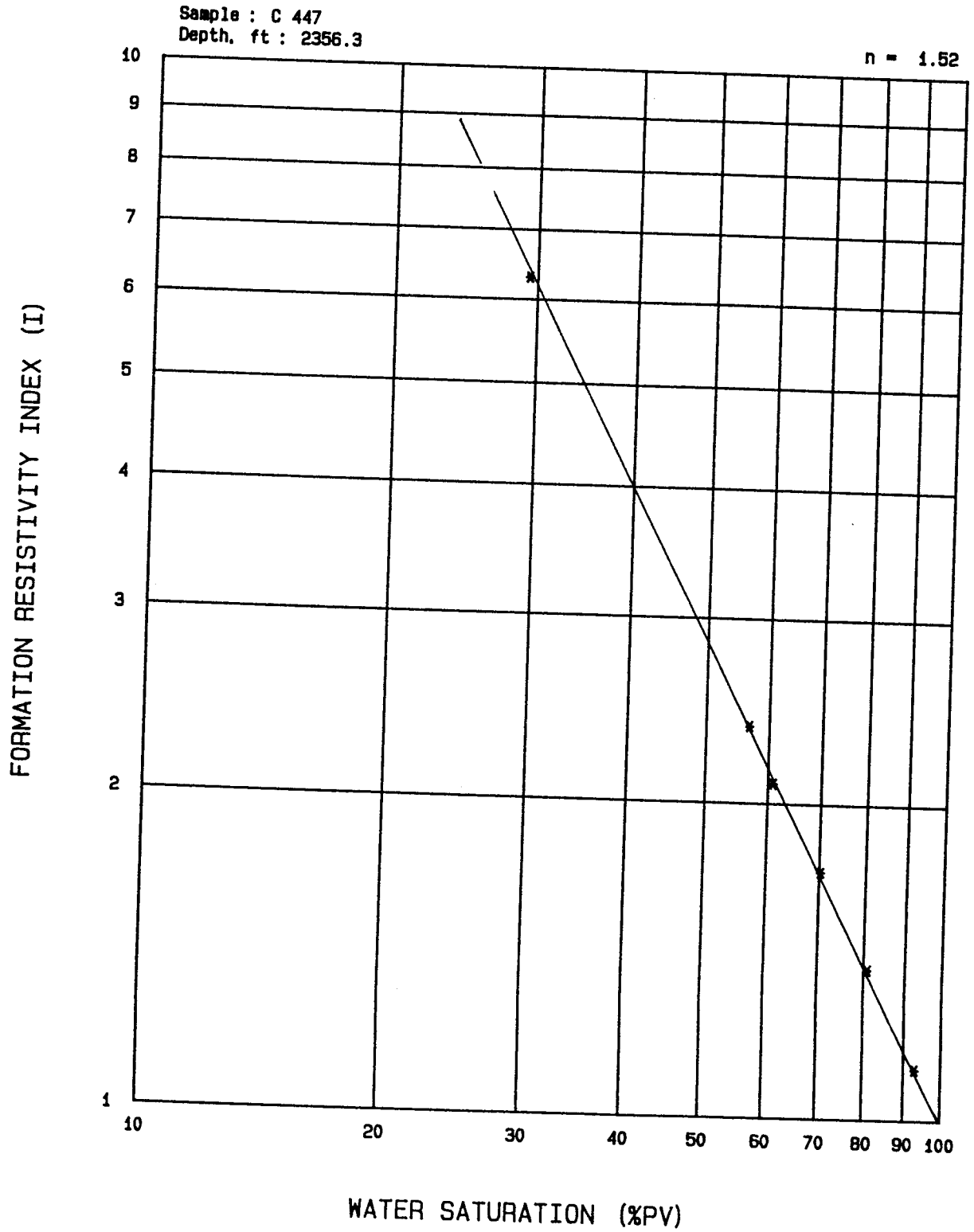


Table 6

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 450	2389.3	4.48*	15.3	1.00	100.0
				1.34	83.2
				1.62	74.3
				2.30	57.7
				2.82	50.4
				3.24	46.8
				10.95	20.7

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 7

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

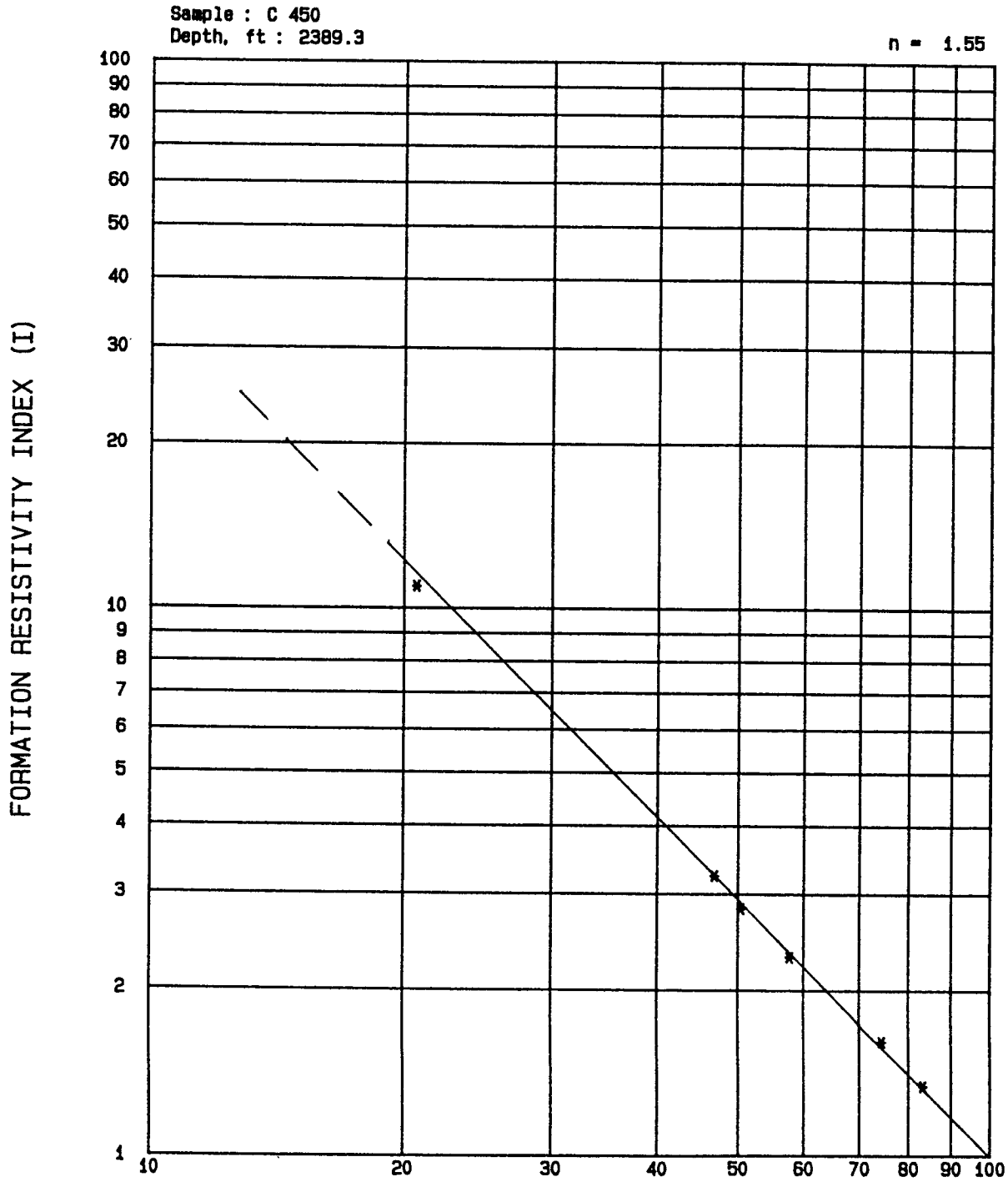


Table 7

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 451	2391.7	0.374*	12.6	1.00	100.0
				1.06	96.9
				3.63	50.3

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 8

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

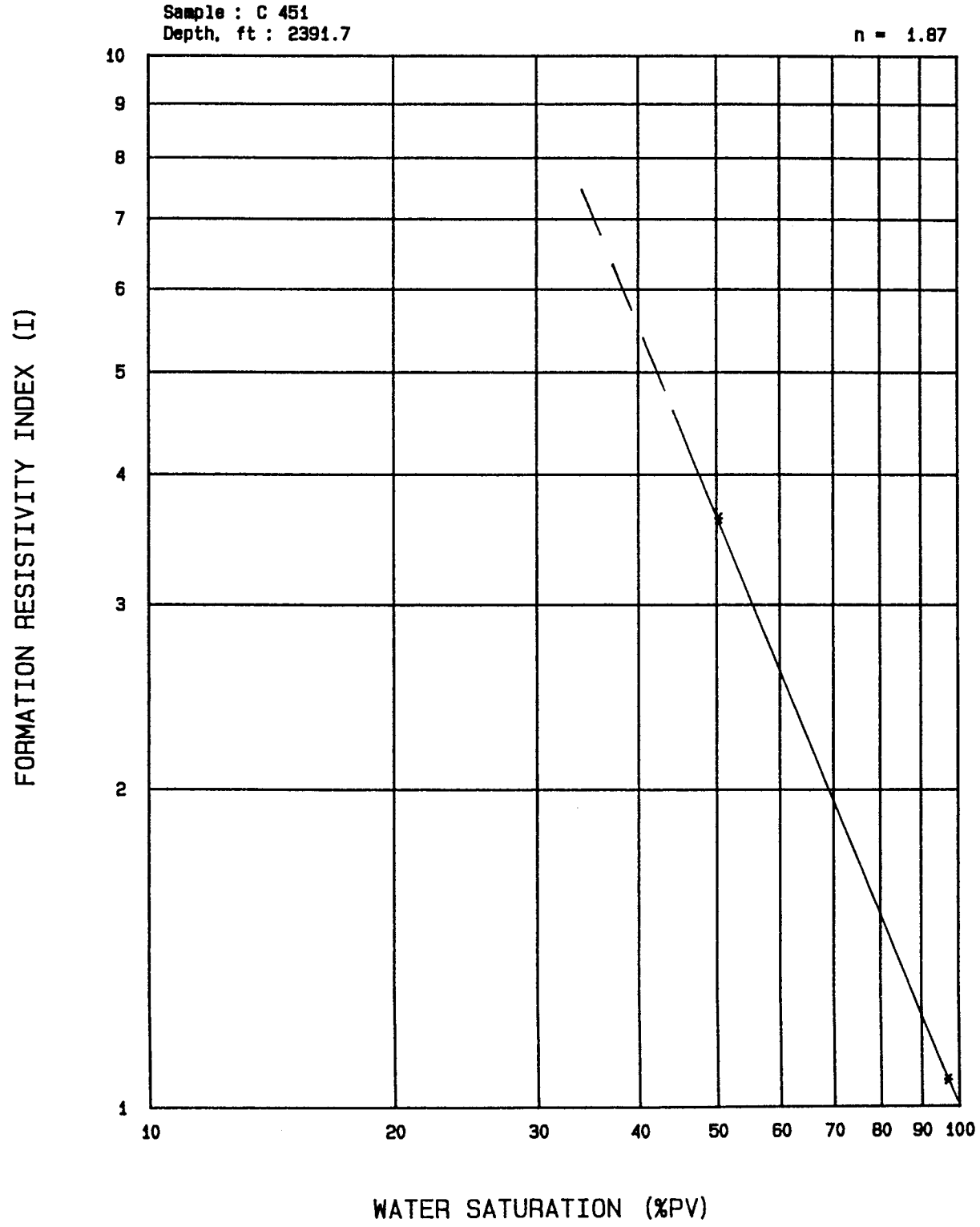


Table 8

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 452	2405.2	11.6*	15.5	1.00	100.0
				1.10	94.4
				1.43	80.6
				3.18	48.4
				4.13	41.3
				6.34	30.8
				9.06	24.8

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 9

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

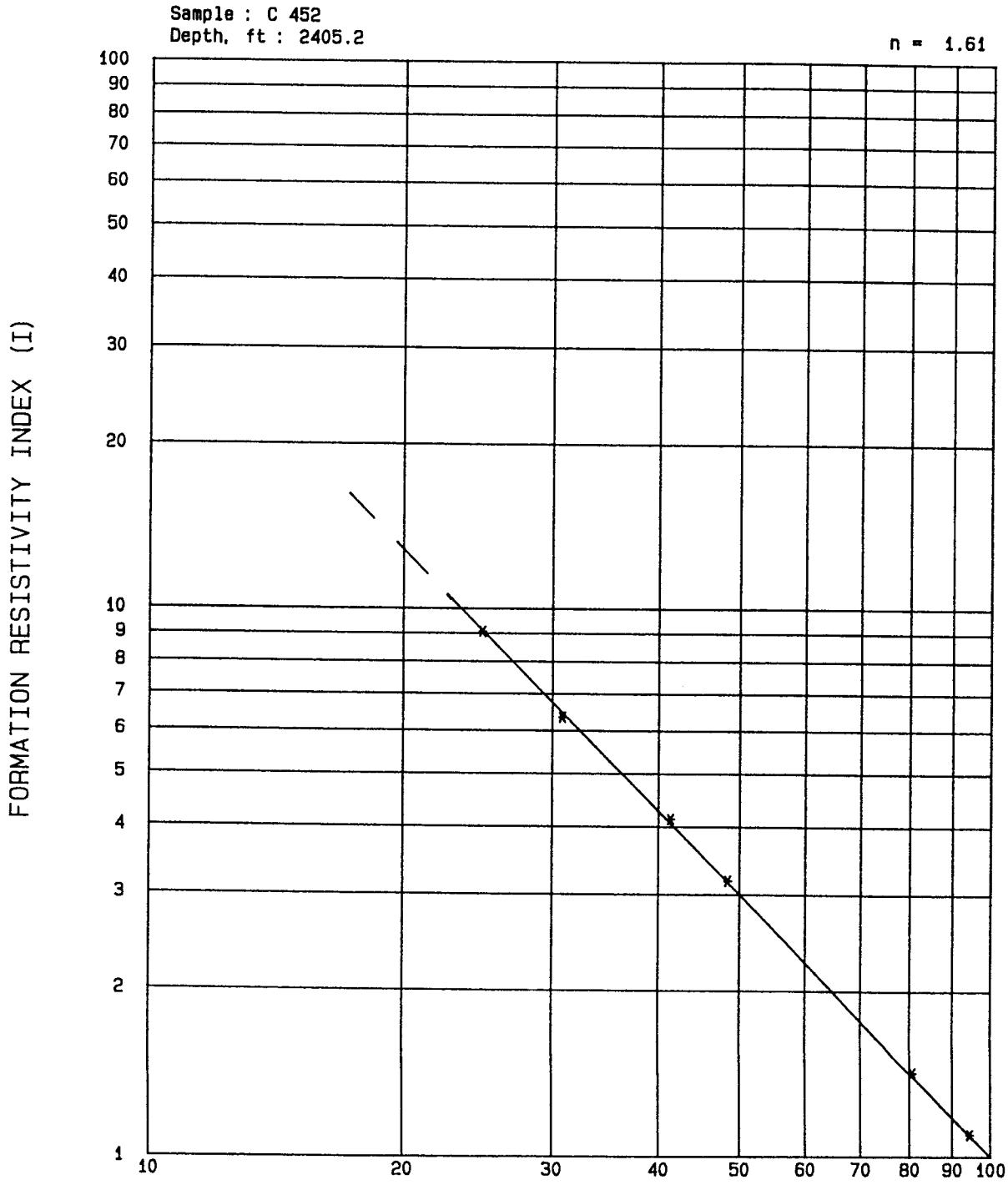


Table 9

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 453	2461.2	0.513*	11.1	1.00	100.0
				1.20	89.2
				1.48	78.5
				2.13	61.9
				2.40	57.7
				2.80	51.6
				9.03	25.5

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 10

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

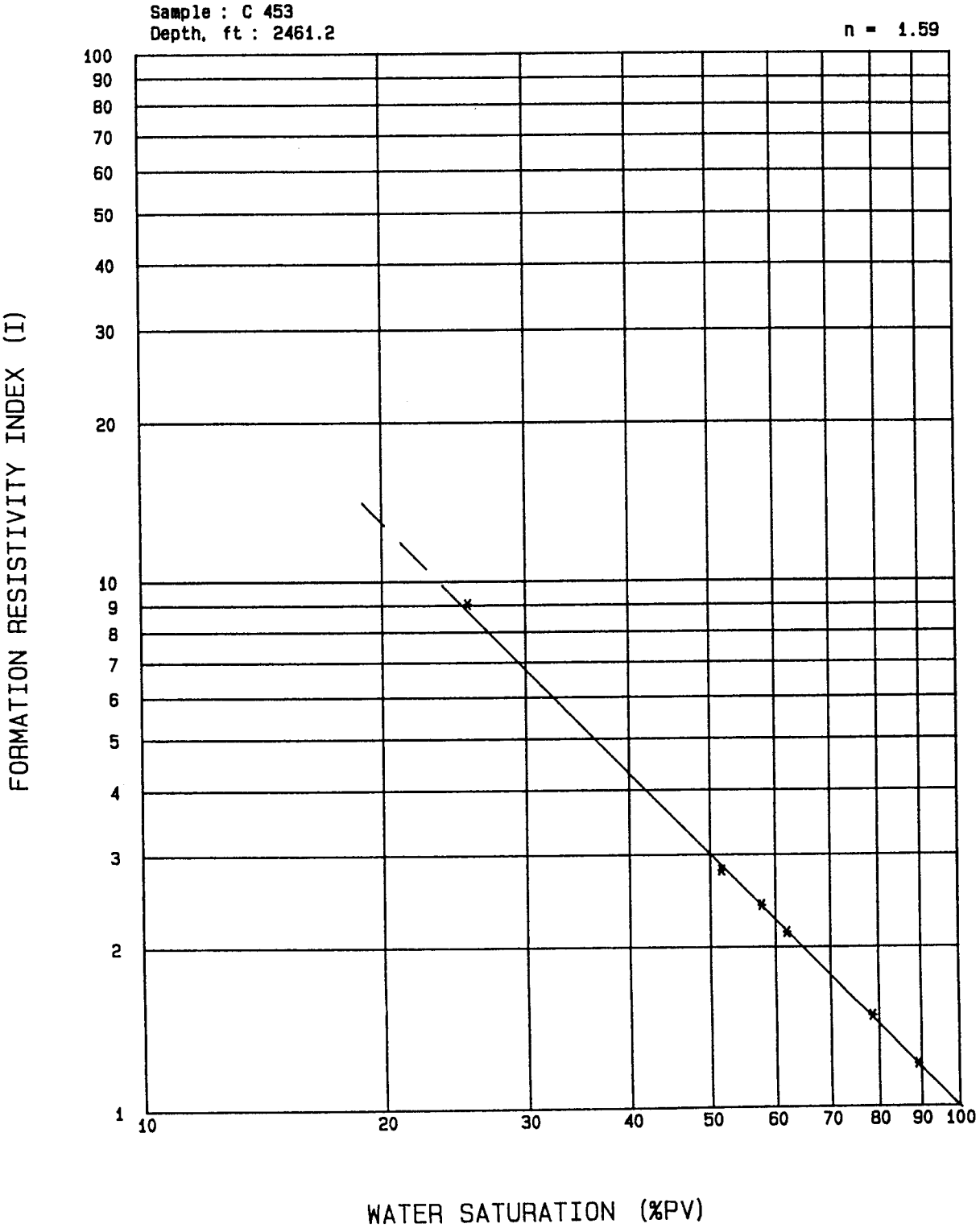


Table 10

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 454	2463.5	54.3*	26.8	1.00	100.0
				1.17	92.6
				2.06	70.2
				2.67	61.9
				3.11	57.2
				8.53	35.3

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 11

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

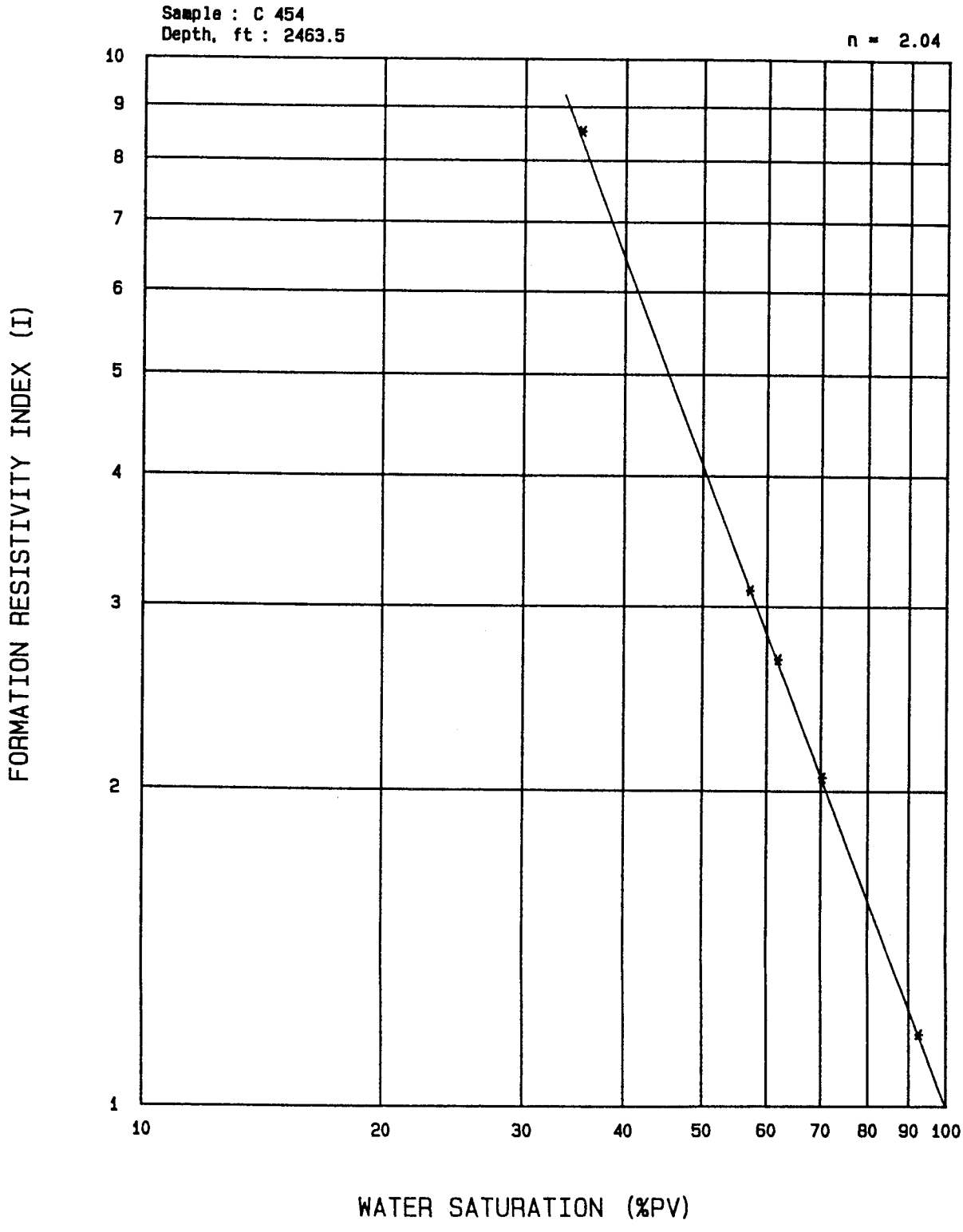


Table 11

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2892

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 455	2465.4	19.3*	23.4	1.00	100.0
				1.06	97.1
				1.38	85.4
				2.55	62.3
				3.11	57.0
				3.80	51.6
				11.96	29.0

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 12

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2892

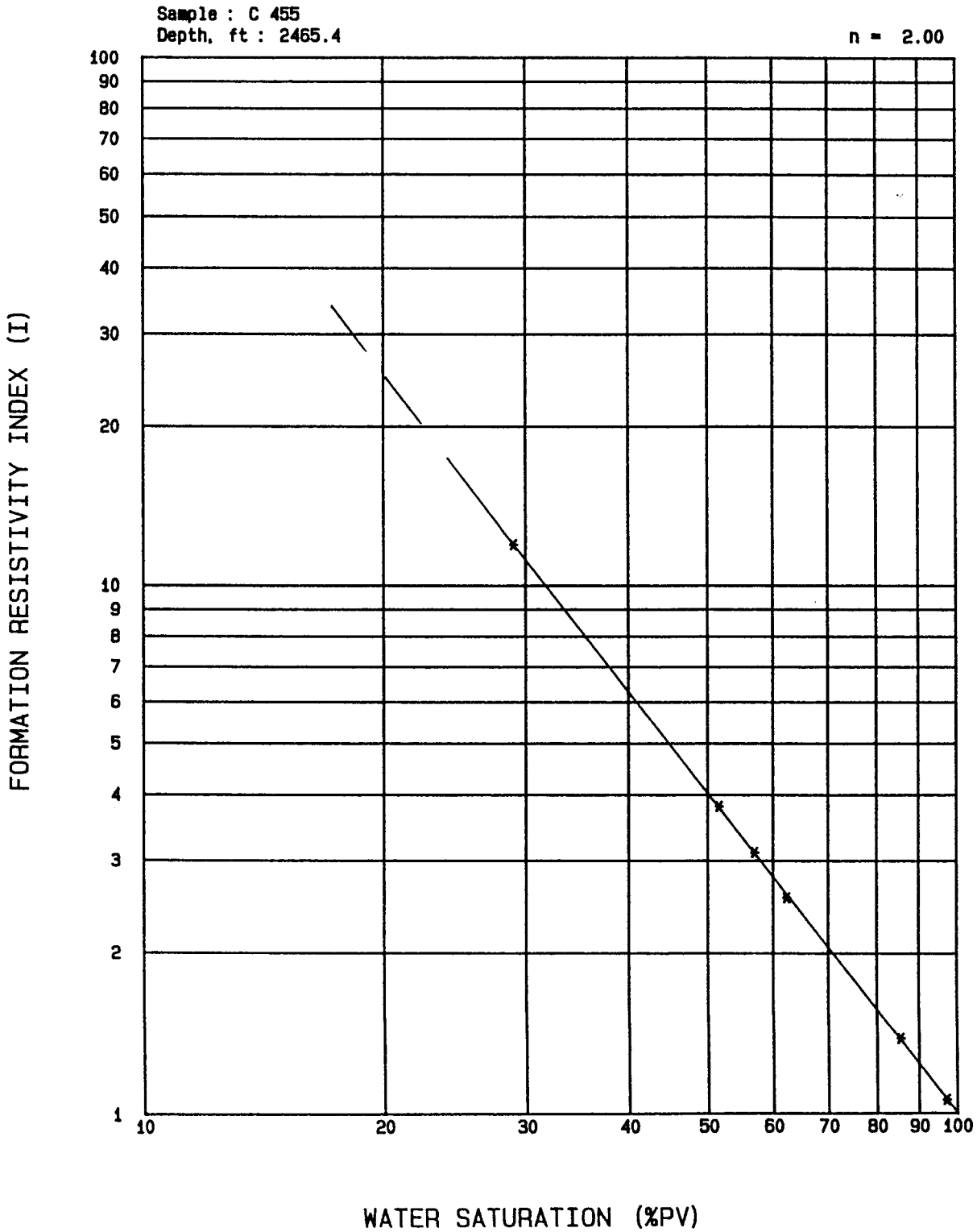


Table 12

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 456	2514.6	37.0*	18.9	1.00	100.0
				1.08	95.6
				1.13	92.5
				2.87	50.1
				3.49	44.0
				5.23	32.5
				15.32	16.9

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 13

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

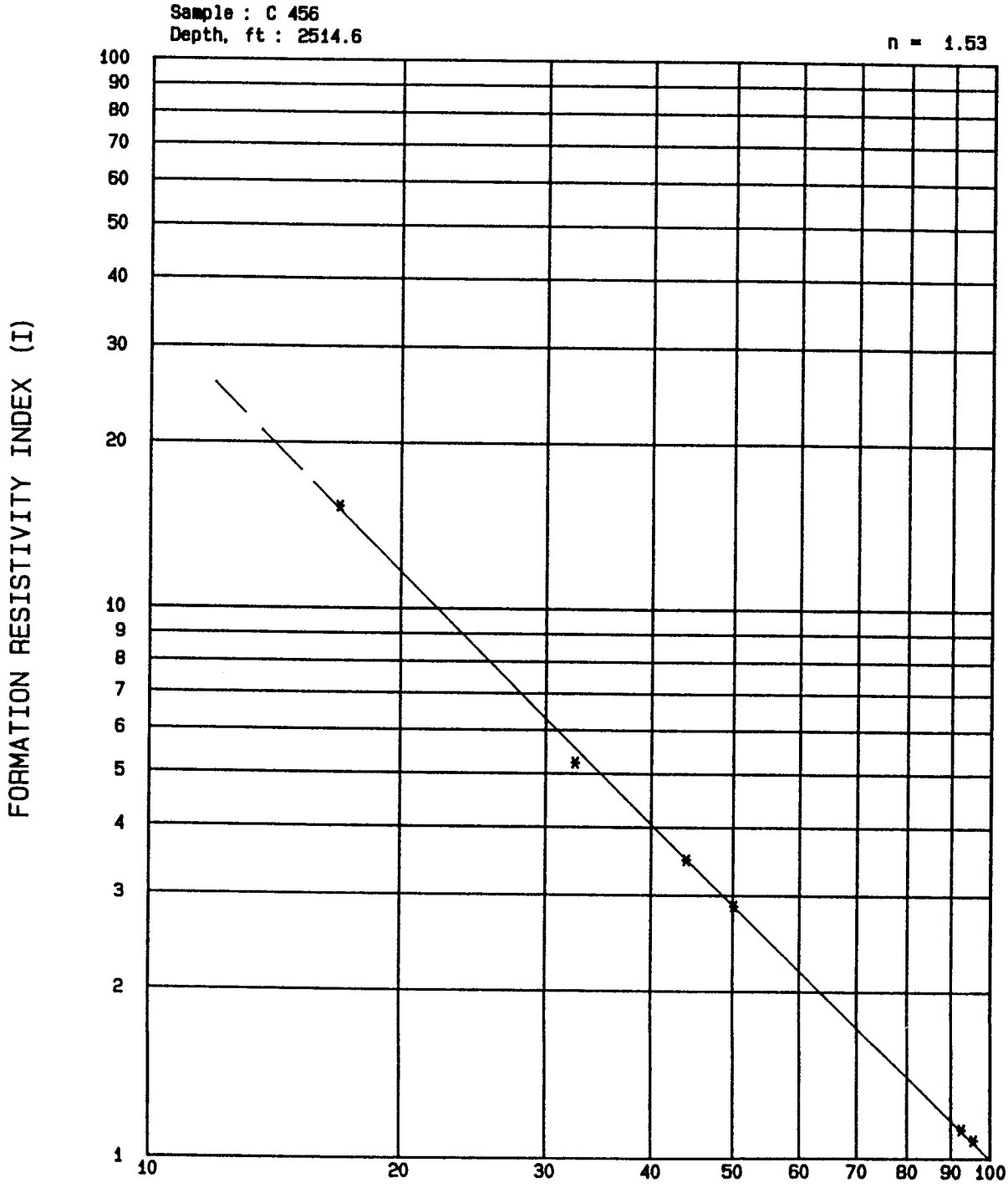


Table 13

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 457	2532.8	2.88*	14.6	1.00	100.0
				1.07	95.9
				1.24	86.8
				1.45	79.3
				1.98	63.8
				17.61	10.9

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 14

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

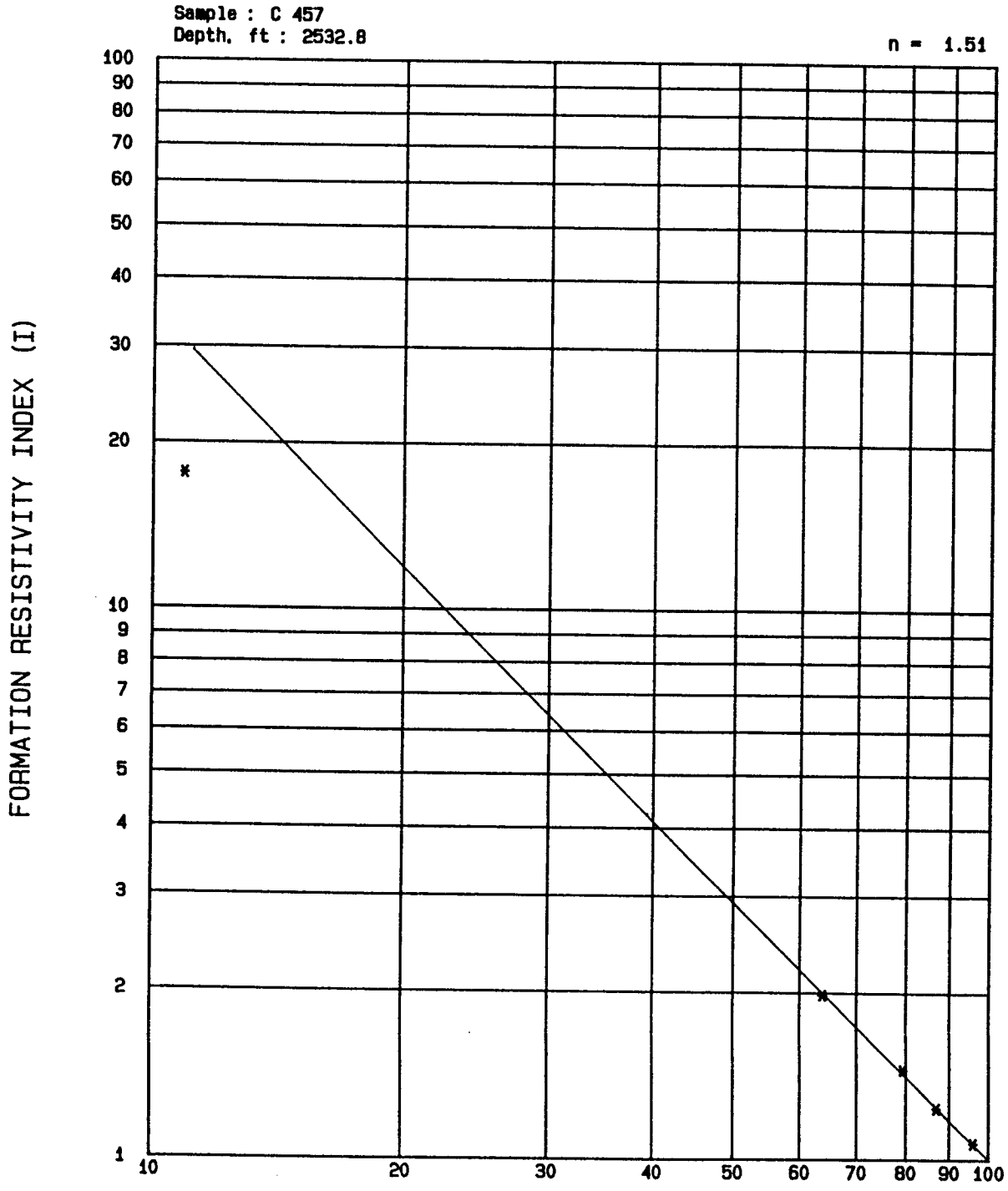


Table 14

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample	Depth (ft)	Permeability To Gas (md)	Porosity (% BV)	Formation Resistivity Index (I)	Water Saturation (% PV)
C 458	2573.2	0.276*	10.8	1.00	100.0
				1.05	97.0
				1.26	86.3
				1.38	81.8
				3.31	47.3

Rw = 0.044 ohm-meters @ 72 degrees Fahrenheit

* Permeability to gas measured at 400 psig confining pressure.

Figure 15

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT 1425 psig CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

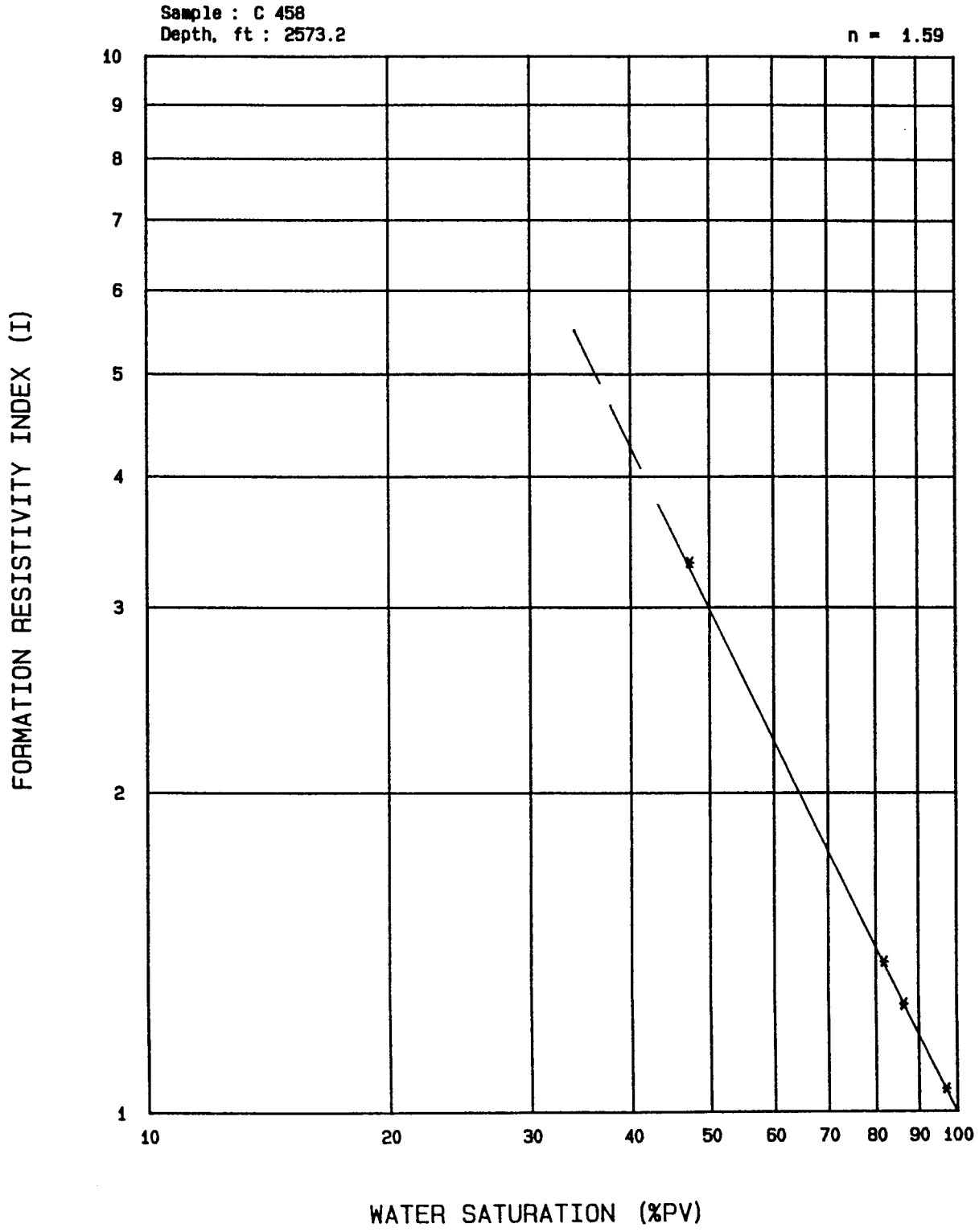


Figure 16

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP AT CONFINING PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

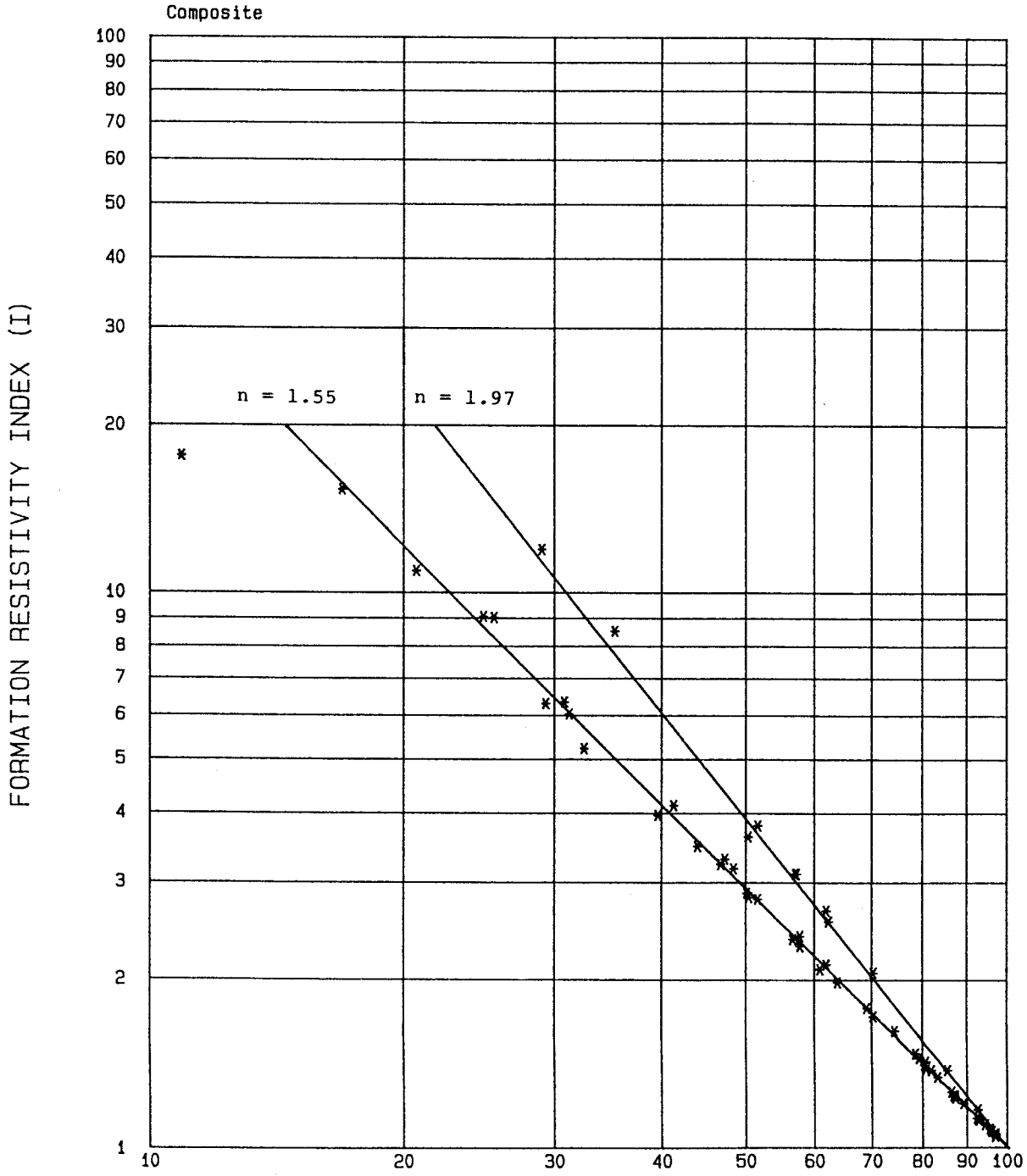


Table 15

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 446 Porosity,% BV: 16.0

Depth, ft: 2320.9 Perm. to Gas, md: 3.01

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.40	100.0	-	-
3.90	100.0	-	-
6.40	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	100.0	-	-
26.4	100.0	-	-
31.4	100.0	-	-
45.4	94.9	2.35	0.115
61.4	80.1	1.74	0.155
75.4	71.1	1.41	0.190
111	57.8	0.96	0.281
161	48.5	0.66	0.407
201	44.2	0.53	0.508
301	38.4	0.35	0.760
401	35.3	0.27	1.01
601	30.7	0.18	1.52
801	27.4	0.13	2.02
1000	24.9	0.11	2.53
1200	23.0	0.09	3.03
1500	20.7	0.07	3.79
2000	18.0	0.05	5.05

Figure 17

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

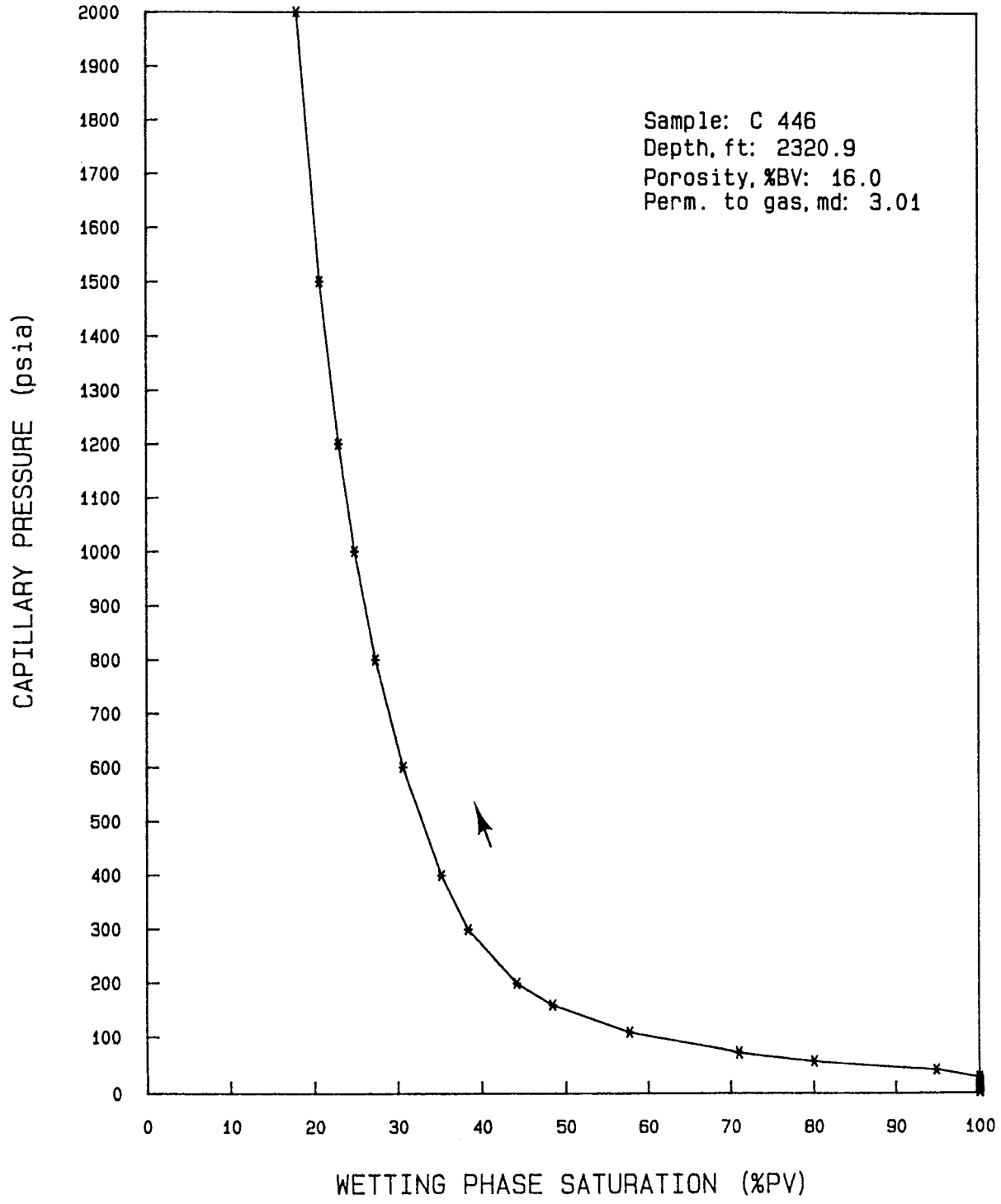


Figure 18

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

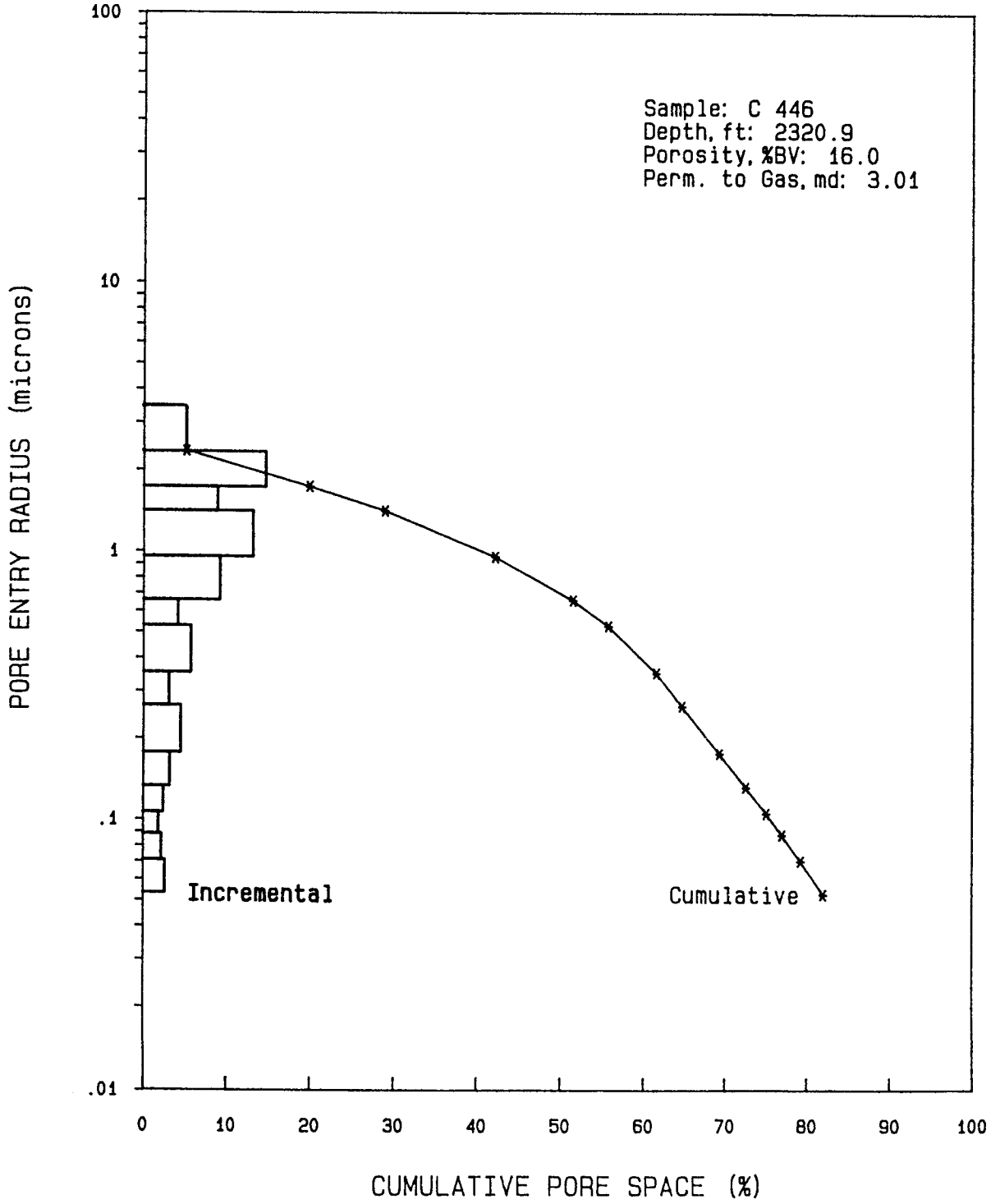


Table 16

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 449 Porosity,% BV: 12.2

Depth, ft: 2353.7 Perm. to Gas, md: 0.273

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.39	100.0	-	-
3.89	100.0	-	-
6.39	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	100.0	-	-
26.4	100.0	-	-
31.4	100.0	-	-
45.4	100.0	-	-
61.4	100.0	-	-
75.4	100.0	-	-
111	98.8	0.96	0.096
161	87.9	0.66	0.139
201	75.0	0.53	0.173
301	55.6	0.35	0.259
401	46.8	0.27	0.346
601	37.0	0.18	0.518
801	30.6	0.13	0.690
1000	26.5	0.11	0.862
1200	23.5	0.09	1.03
1500	20.4	0.07	1.29
2000	17.6	0.05	1.72

Figure 19

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

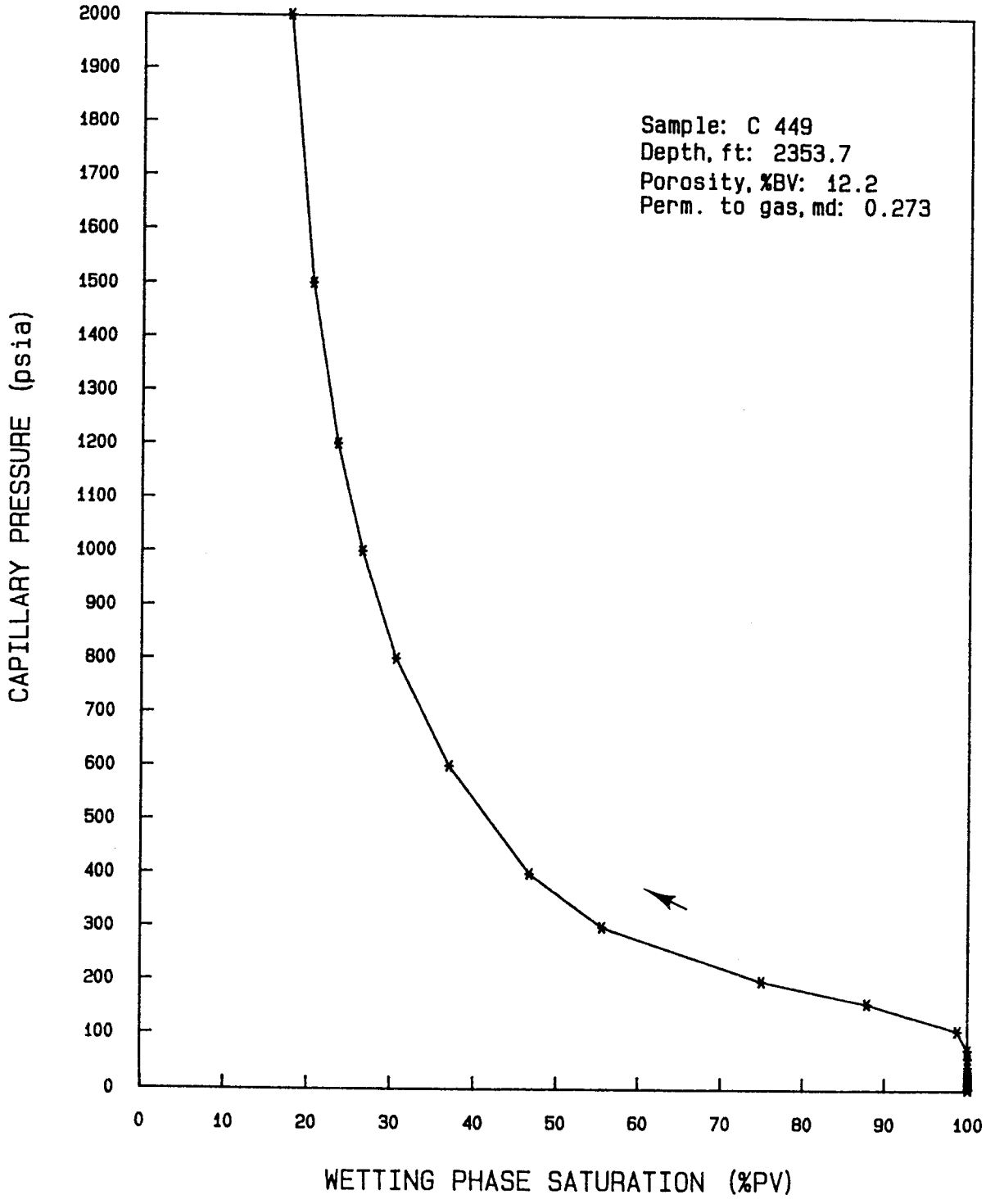


Figure 20

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

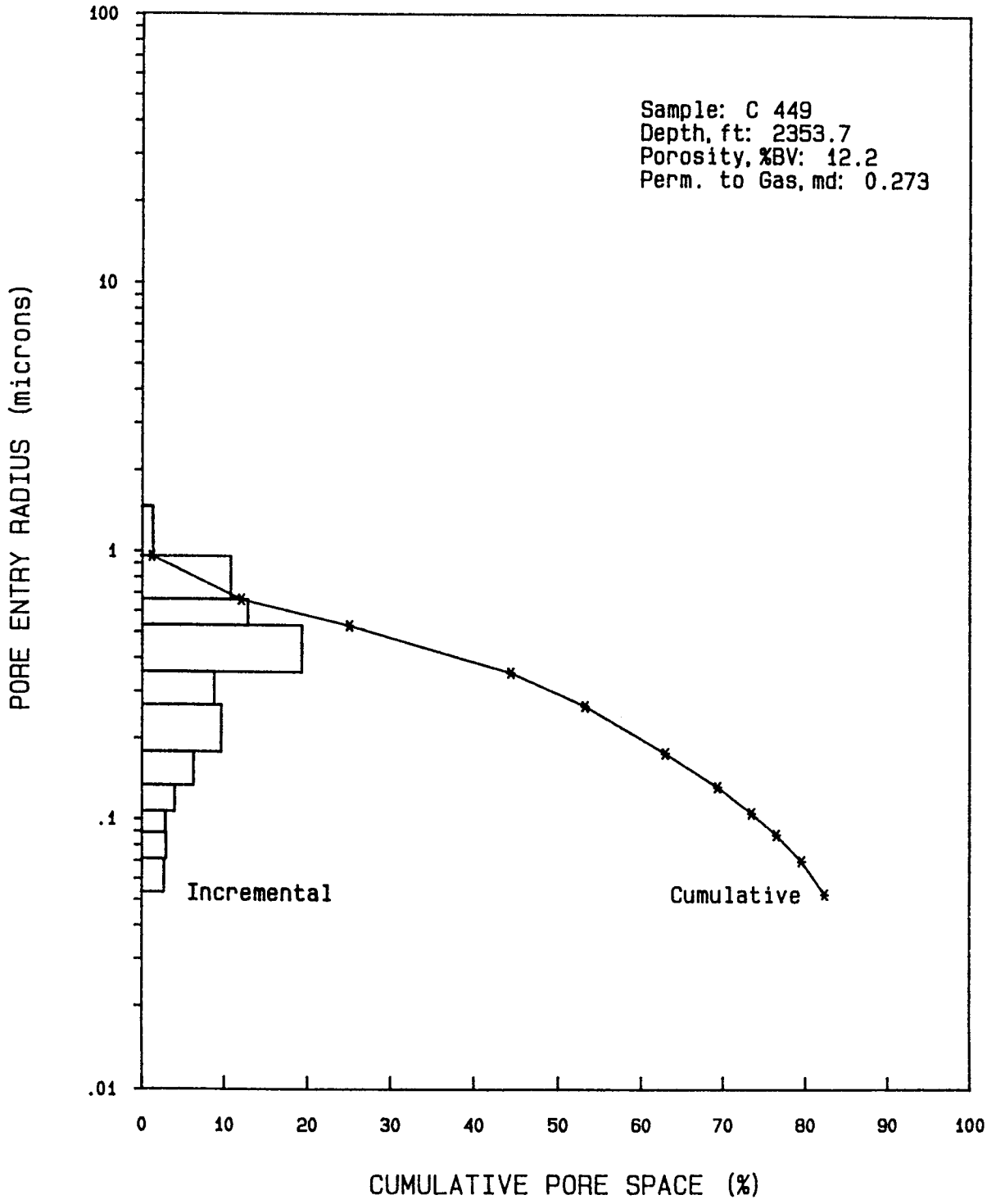


Table 17

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 447

Depth, ft: 2356.3

Porosity,% BV: 13.0

Perm. to Gas, md: 0.509

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.40	100.0	-	-
3.90	100.0	-	-
6.40	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	100.0	-	-
26.4	100.0	-	-
31.4	100.0	-	-
45.4	100.0	-	-
61.4	99.6	1.74	0.071
75.4	98.6	1.41	0.087
111	80.1	0.96	0.128
161	64.7	0.66	0.186
201	57.4	0.53	0.232
301	43.9	0.35	0.347
401	35.9	0.27	0.462
601	27.0	0.18	0.692
801	22.3	0.13	0.922
1000	19.0	0.11	1.15
1200	16.9	0.09	1.38
1500	14.3	0.07	1.73
2000	11.5	0.05	2.30

Figure 21

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

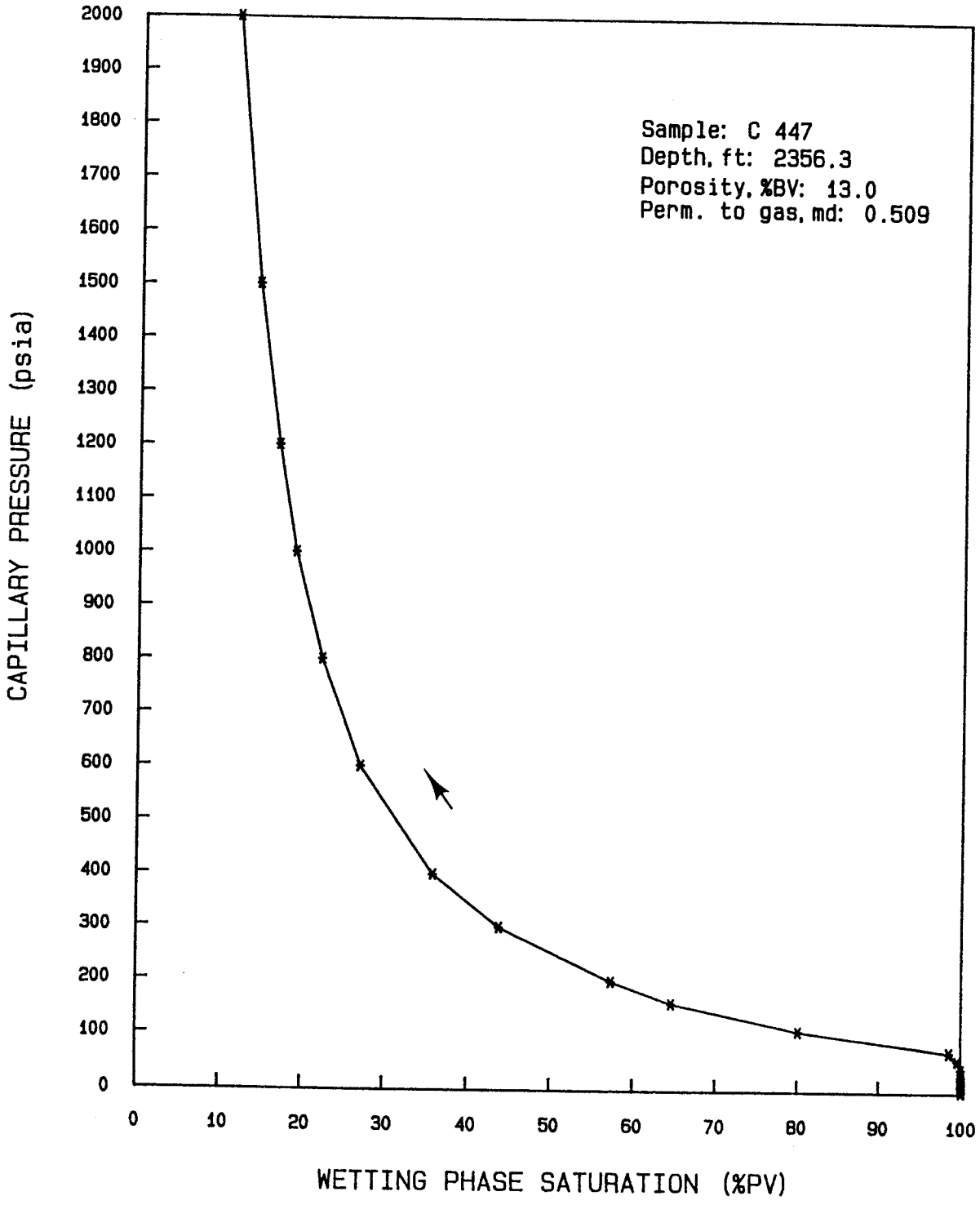


Figure 22

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

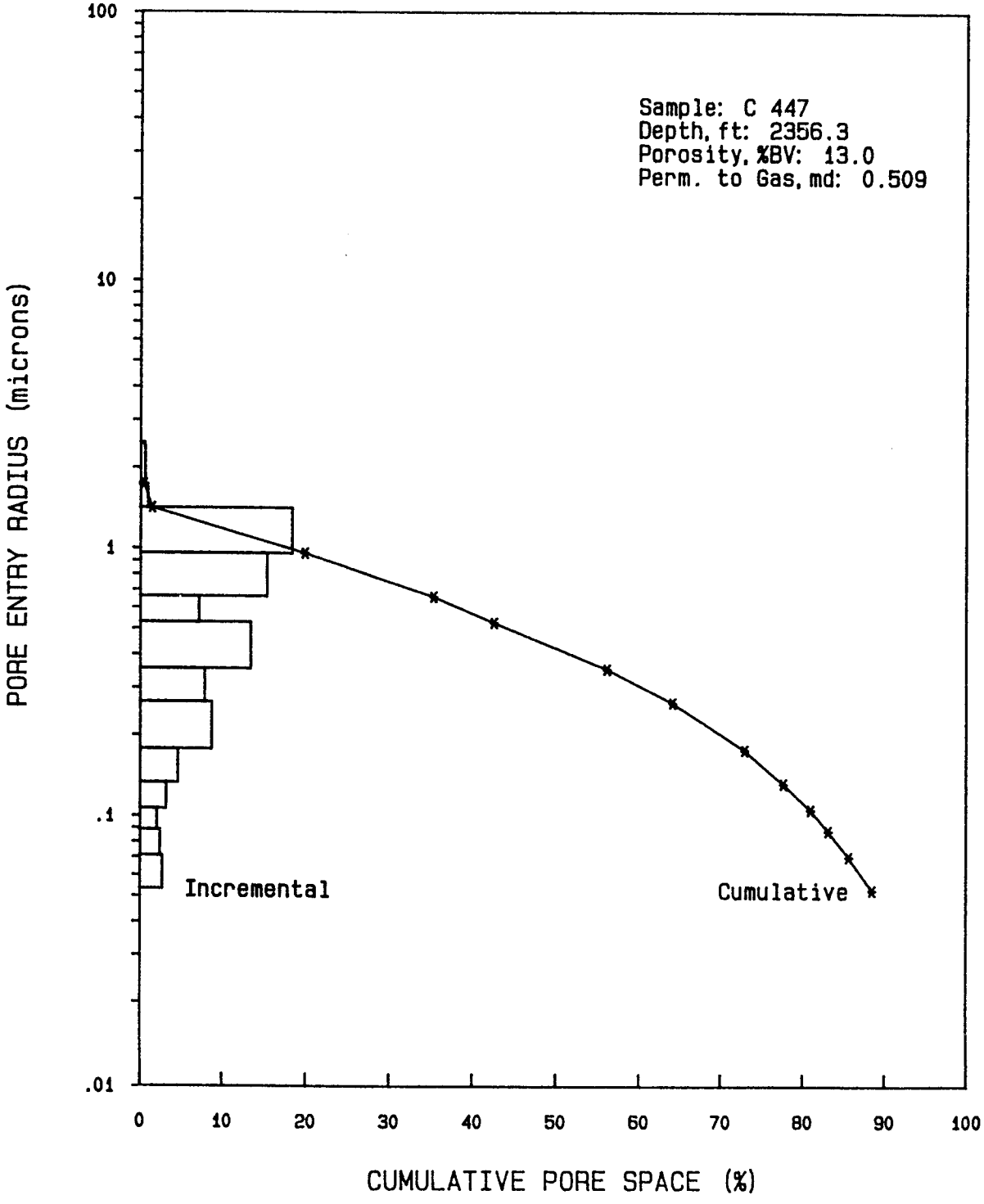


Table 18

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 450

Depth, ft: 2389.3

Porosity,% BV: 15.5

Perm. to Gas, md: 4.48

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.39	100.0	-	-
3.89	100.0	-	-
6.39	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	99.3	4.98	0.067
26.4	99.2	4.04	0.083
31.4	96.8	3.40	0.098
45.4	81.3	2.35	0.142
61.4	67.8	1.74	0.192
75.4	60.7	1.41	0.236
111	50.3	0.96	0.349
161	42.6	0.66	0.506
201	38.2	0.53	0.631
301	31.6	0.35	0.944
401	27.9	0.27	1.26
601	23.3	0.18	1.88
801	20.1	0.13	2.51
1000	17.8	0.11	3.14
1200	16.2	0.09	3.76
1500	14.2	0.07	4.70
2000	12.1	0.05	6.27

Figure 23

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

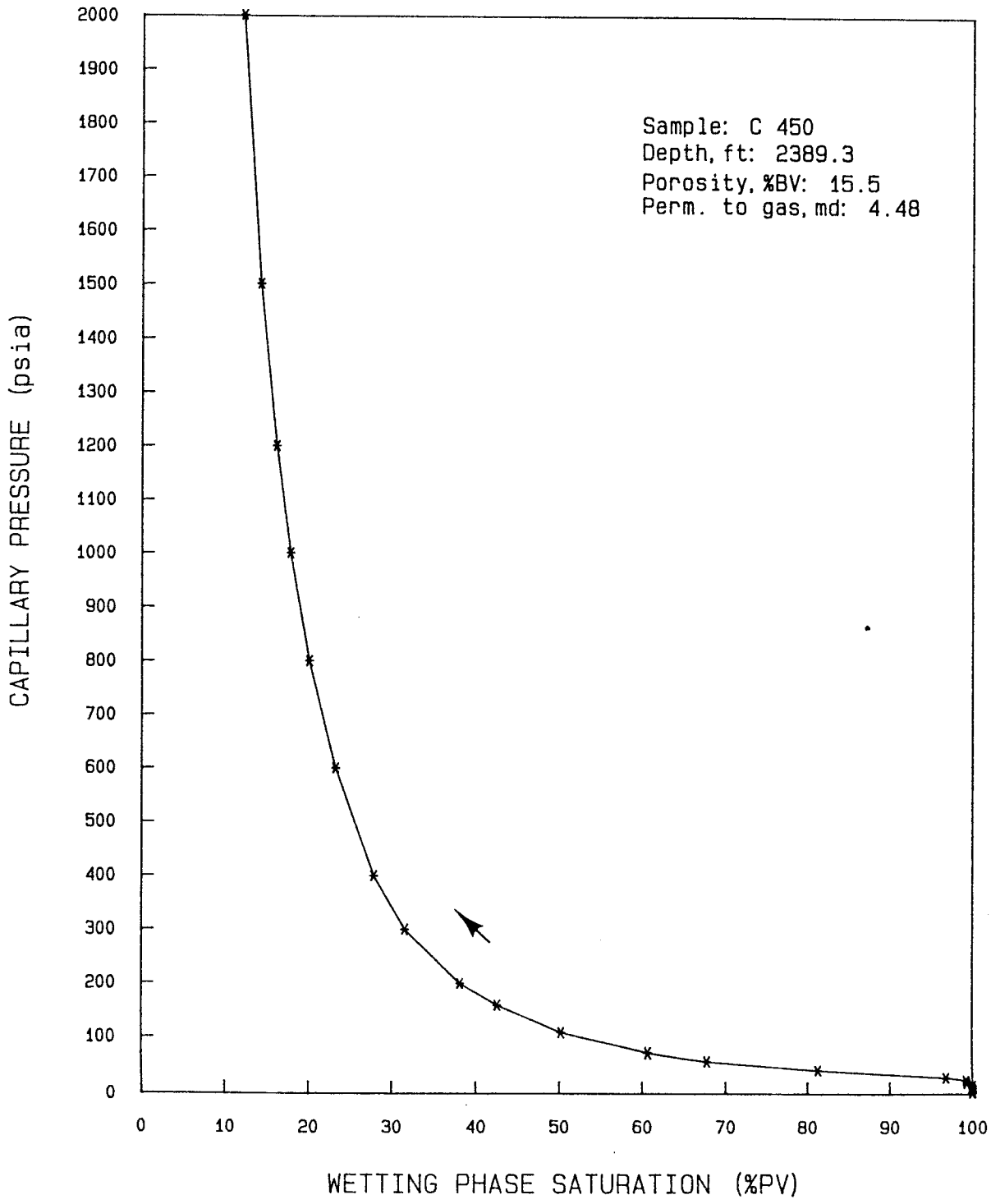


Figure 24

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

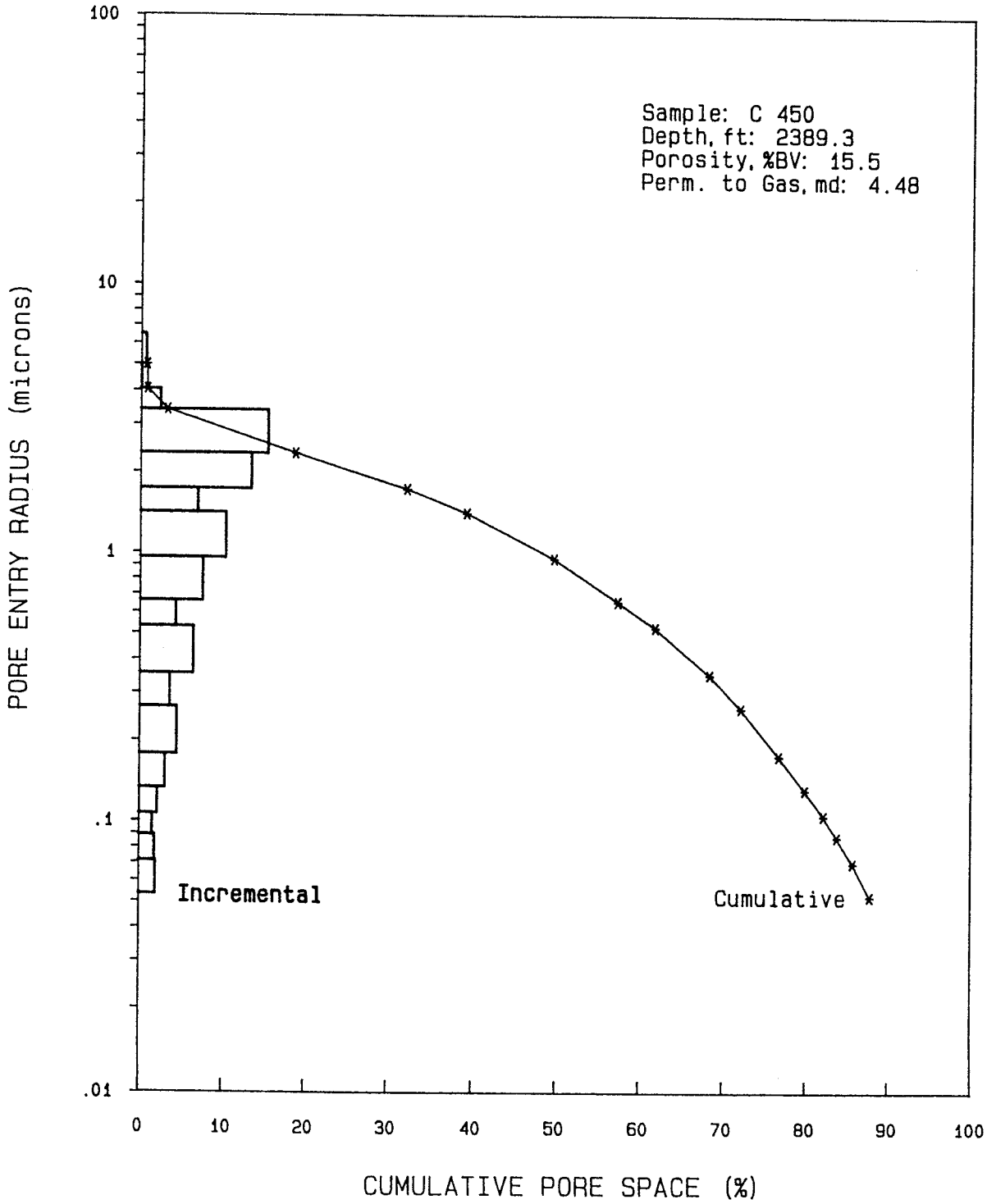


Table 19

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 451

Depth, ft: 2391.7

Porosity,% BV: 12.8

Perm. to Gas, md: 0.374

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.42	100.0	-	-
3.92	100.0	-	-
6.42	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	100.0	-	-
26.4	100.0	-	-
31.4	100.0	-	-
45.4	98.3	2.35	0.044
61.4	96.0	1.74	0.060
75.4	94.0	1.41	0.073
111	86.6	0.96	0.108
161	76.1	0.66	0.157
201	68.3	0.53	0.196
301	57.7	0.35	0.293
401	51.8	0.27	0.390
601	44.2	0.18	0.585
801	39.1	0.13	0.779
1000	35.4	0.11	0.973
1200	32.3	0.09	1.17
1500	28.8	0.07	1.46
2000	24.4	0.05	1.95

Figure 25

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

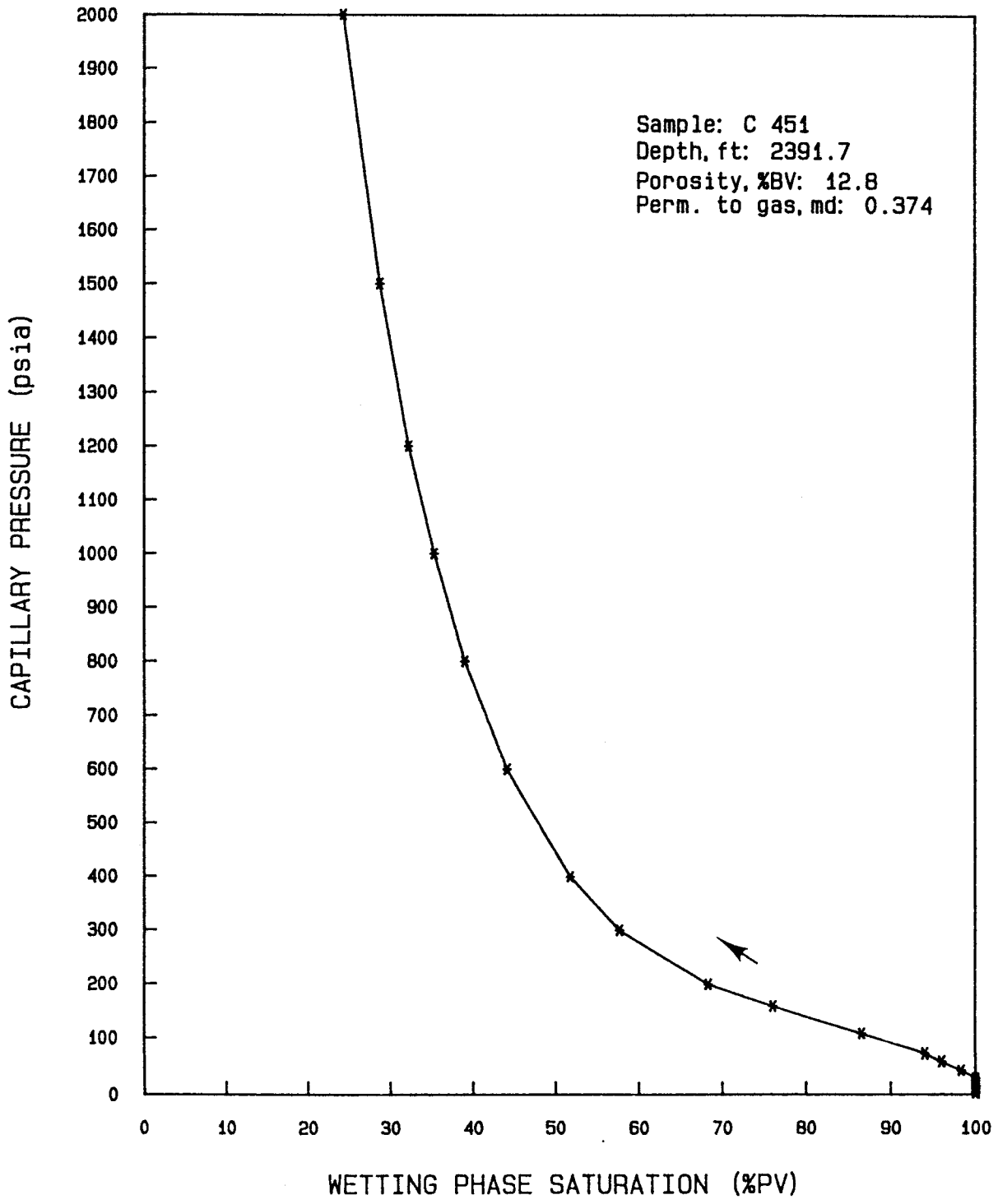


Figure 26

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

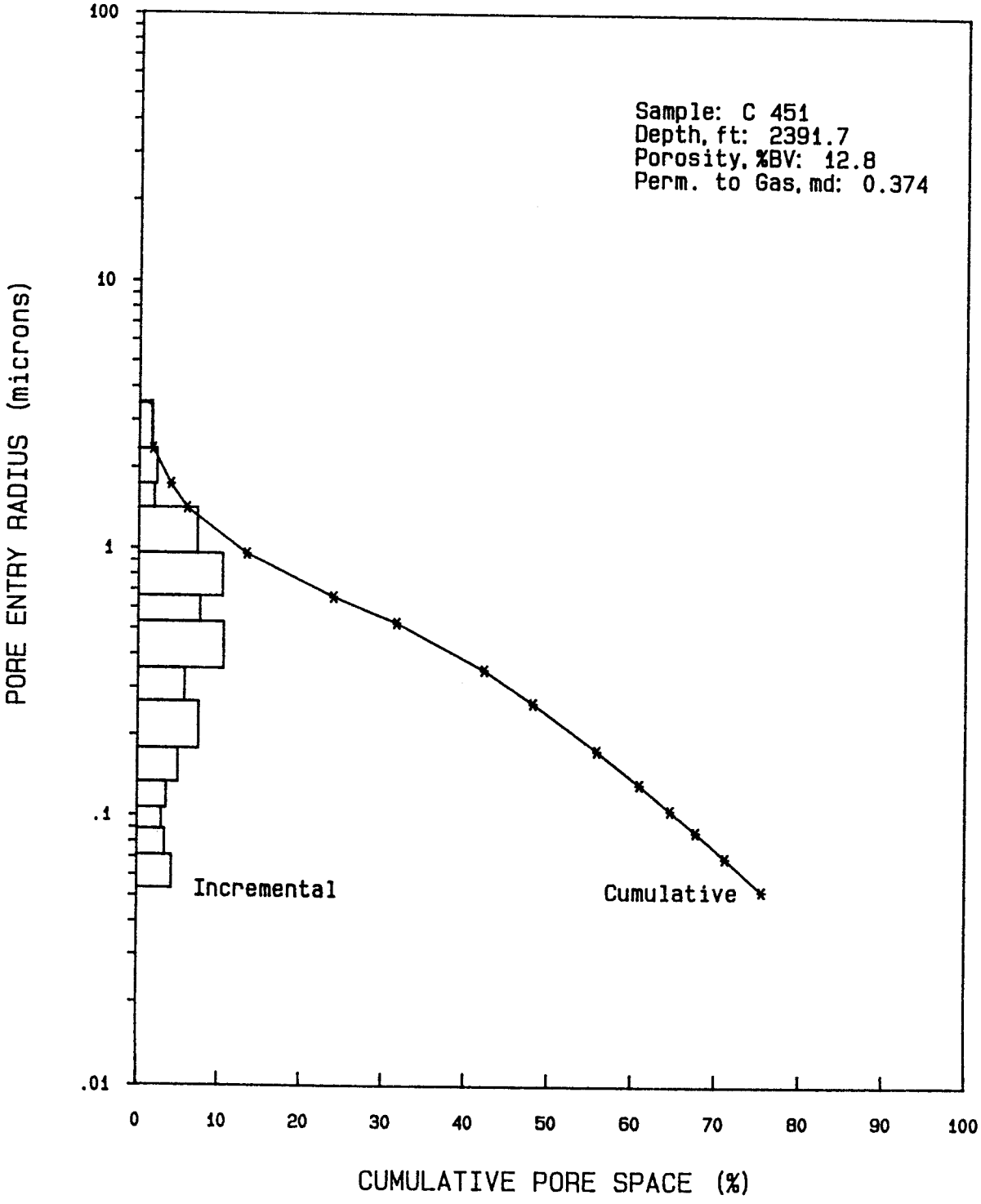


Table 20

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 452

Depth, ft: 2405.2

Porosity,% BV: 15.7

Perm. to Gas, md: 11.6

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.37	100.0	-	-
3.87	100.0	-	-
6.37	100.0	-	-
11.4	99.7	9.37	0.057
16.4	99.3	6.51	0.082
21.4	98.8	4.99	0.107
26.4	97.6	4.04	0.132
31.4	91.0	3.40	0.157
45.4	65.1	2.35	0.227
61.4	52.8	1.74	0.307
75.4	46.4	1.41	0.377
111	36.6	0.96	0.557
161	29.6	0.66	0.807
201	26.0	0.53	1.01
301	21.5	0.35	1.51
401	19.2	0.27	2.01
601	16.2	0.18	3.01
801	14.3	0.13	4.01
1000	13.0	0.11	5.01
1200	12.1	0.09	6.01
1500	11.0	0.07	7.51
2000	9.7	0.05	10.01

Figure 27

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

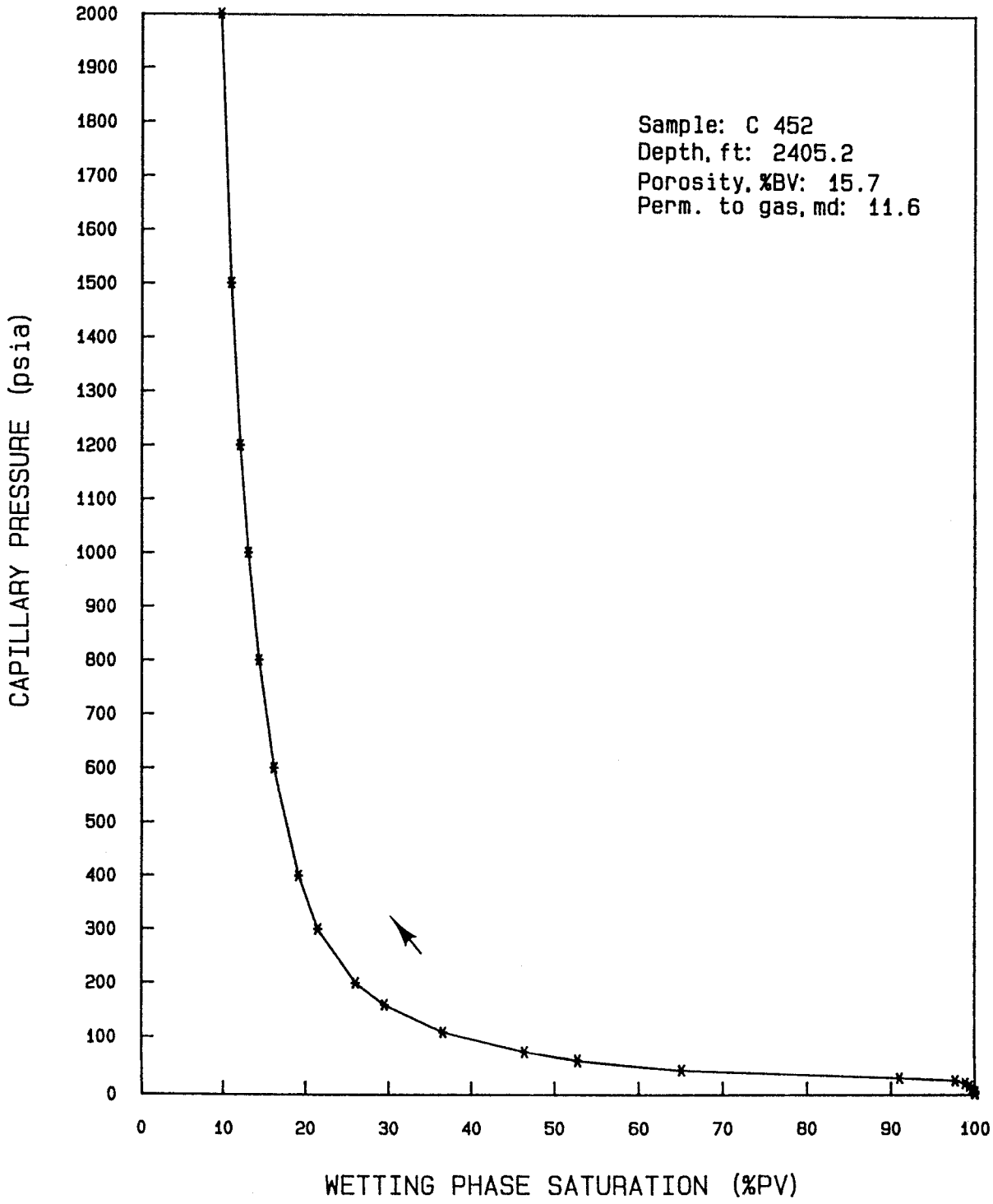


Figure 28

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

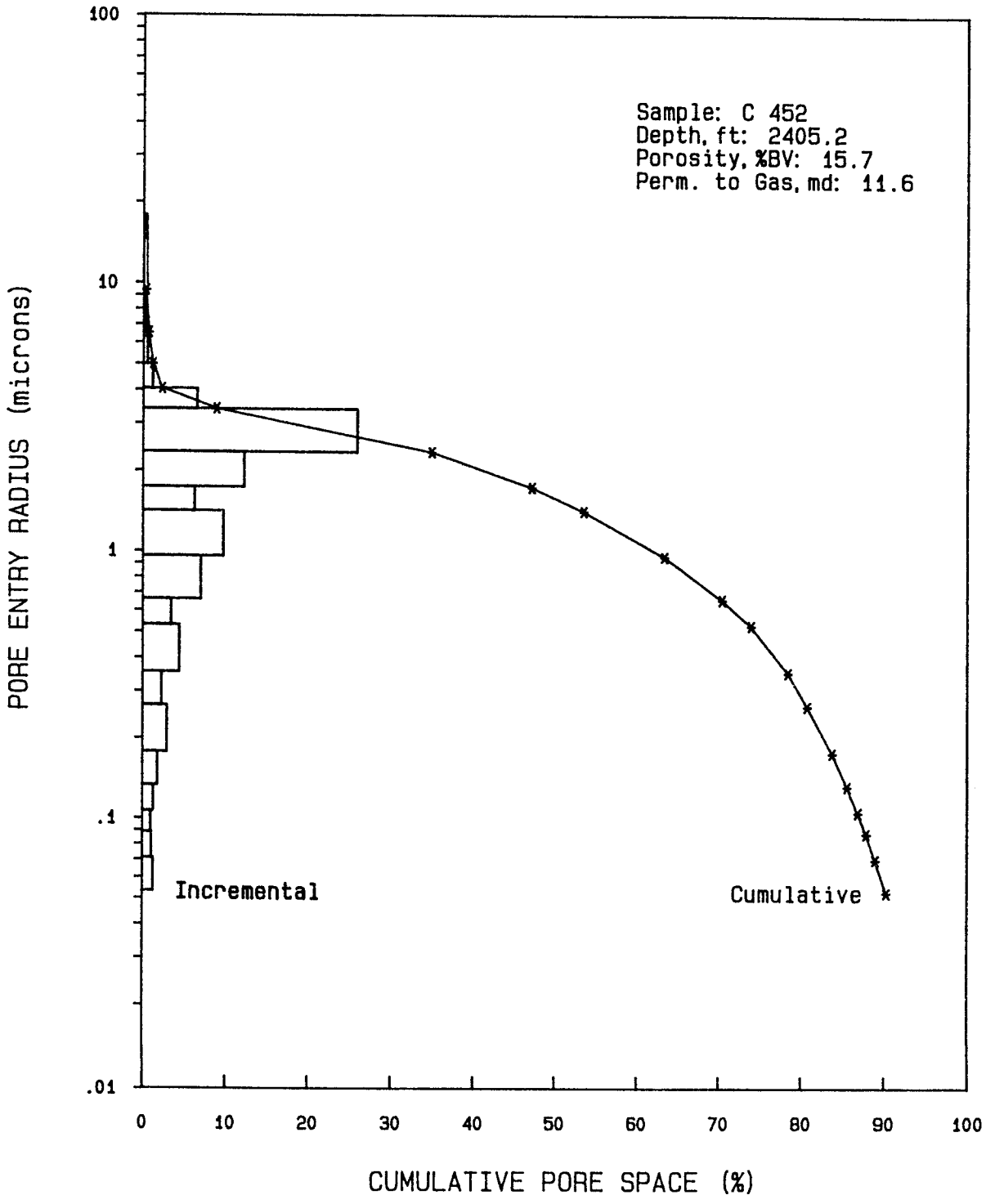


Table 21

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 453

Depth, ft: 2461.2

Porosity,% BV: 11.2

Perm. to Gas, md: 0.513

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.39	100.0	-	-
3.89	100.0	-	-
6.39	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	100.0	-	-
26.4	100.0	-	-
31.4	100.0	-	-
45.4	99.7	2.35	0.057
61.4	98.2	1.74	0.077
75.4	92.7	1.41	0.095
111	69.2	0.96	0.140
161	54.3	0.66	0.203
201	47.7	0.53	0.253
301	38.8	0.35	0.379
401	33.6	0.27	0.505
601	28.0	0.18	0.756
801	24.8	0.13	1.01
1000	22.5	0.11	1.26
1200	20.7	0.09	1.51
1500	18.4	0.07	1.89
2000	14.8	0.05	2.52

Figure 29

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

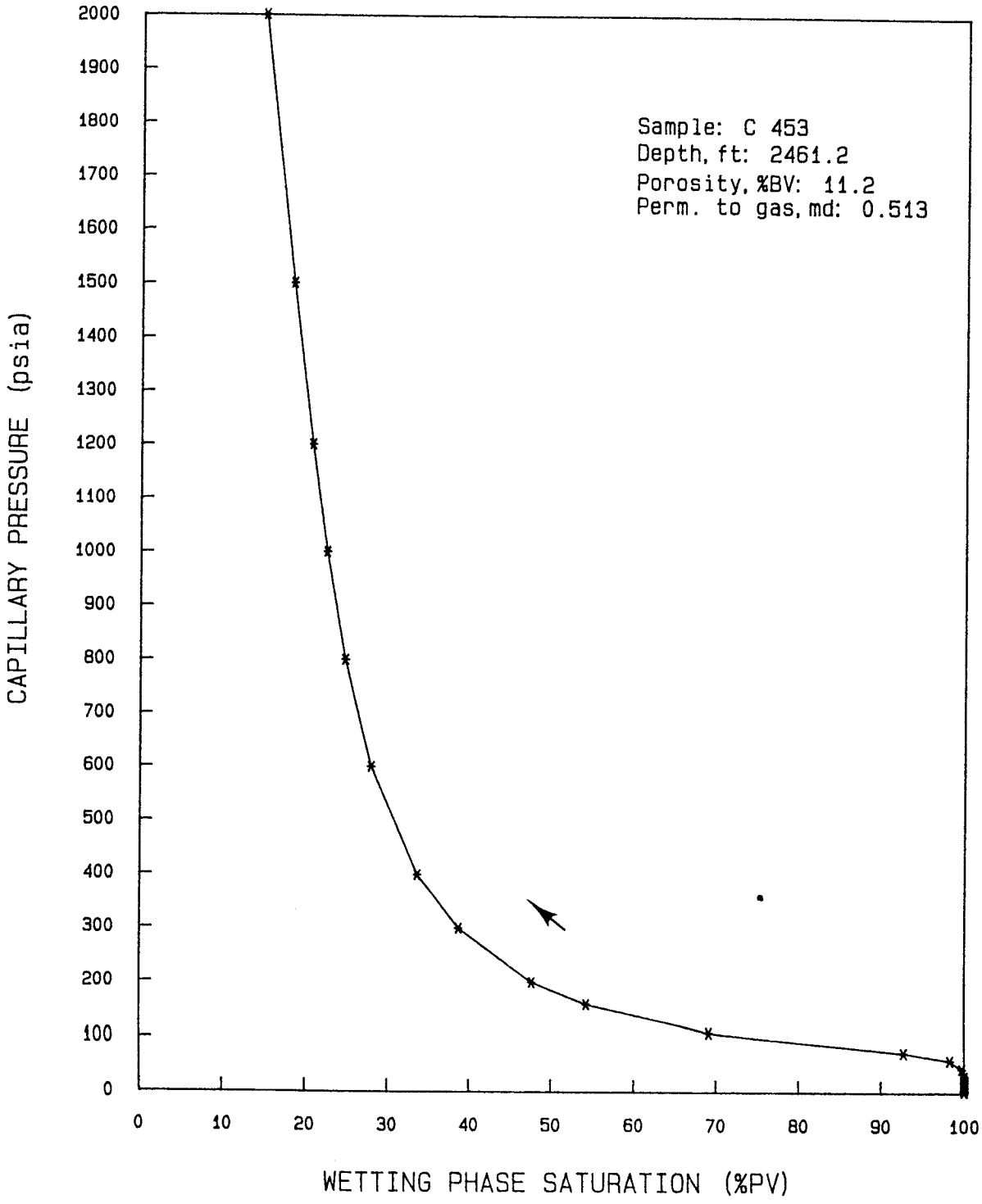


Figure 30

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

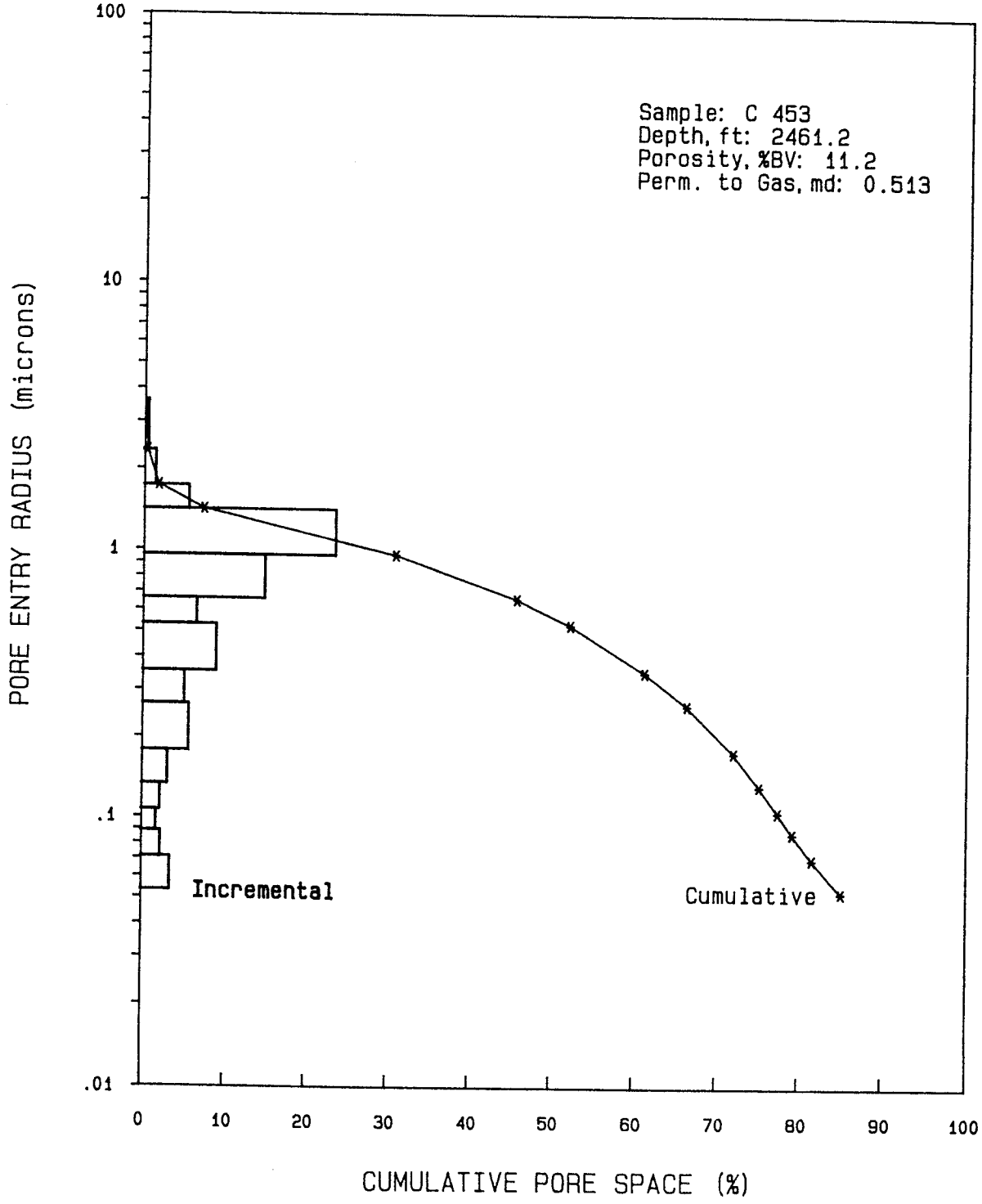


Table 22

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 454

Depth, ft: 2463.5

Porosity,% BV: 27.0

Perm. to Gas, md: 54.3

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.39	100.0	-	-
3.89	100.0	-	-
6.39	99.6	16.69	0.053
11.4	94.7	9.36	0.095
16.4	83.1	6.50	0.137
21.4	78.3	4.98	0.179
26.4	75.2	4.04	0.220
31.4	72.8	3.40	0.262
45.4	67.0	2.35	0.379
61.4	61.6	1.74	0.513
75.4	57.5	1.41	0.630
111	48.5	0.96	0.931
161	39.5	0.66	1.35
201	34.1	0.53	1.68
301	26.4	0.35	2.52
401	22.2	0.27	3.35
601	17.4	0.18	5.03
801	14.2	0.13	6.70
1000	11.7	0.11	8.37
1200	9.6	0.09	10.04
1500	6.9	0.07	12.55
2000	4.5	0.05	16.72

Figure 31

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

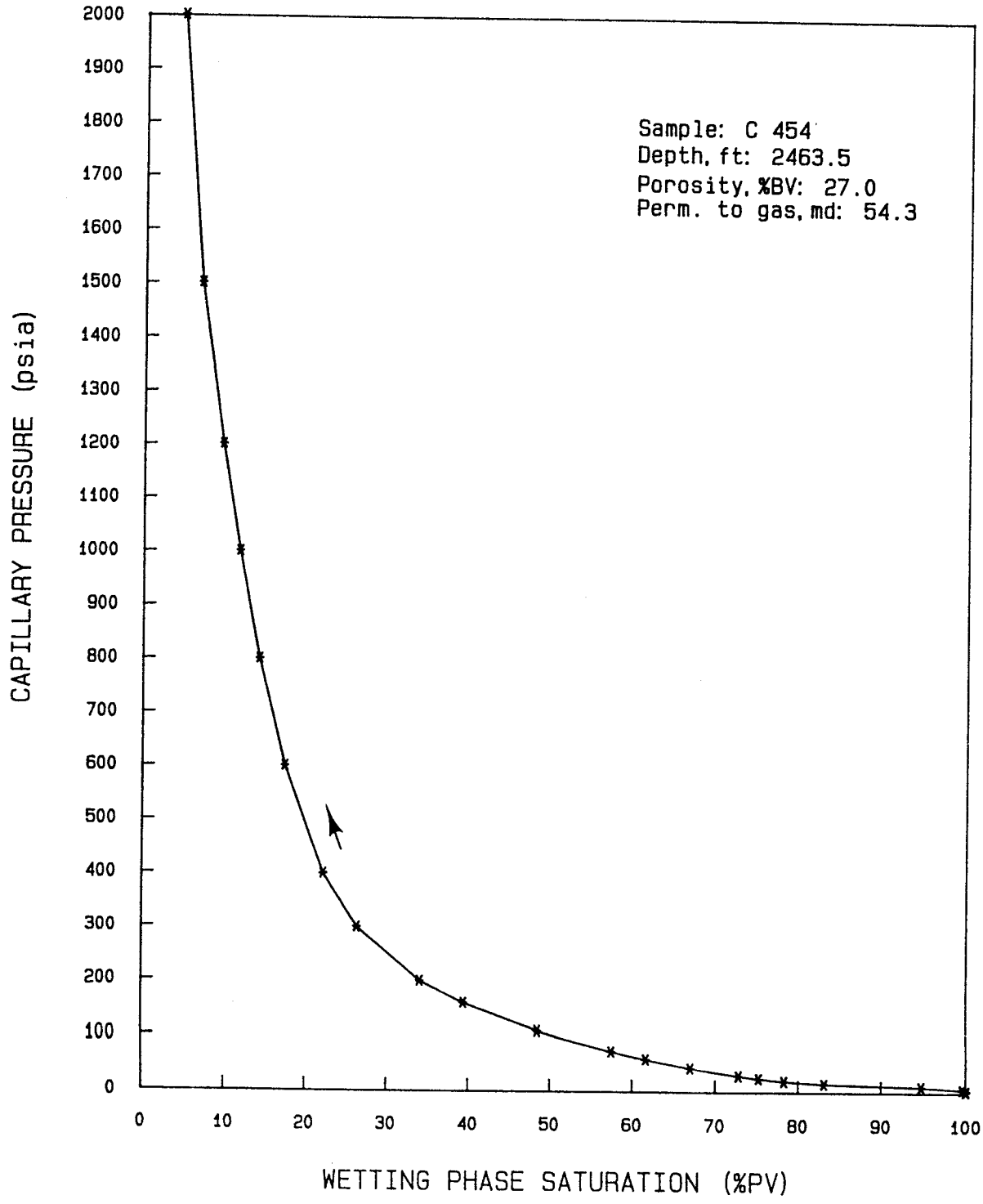


Figure 32

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

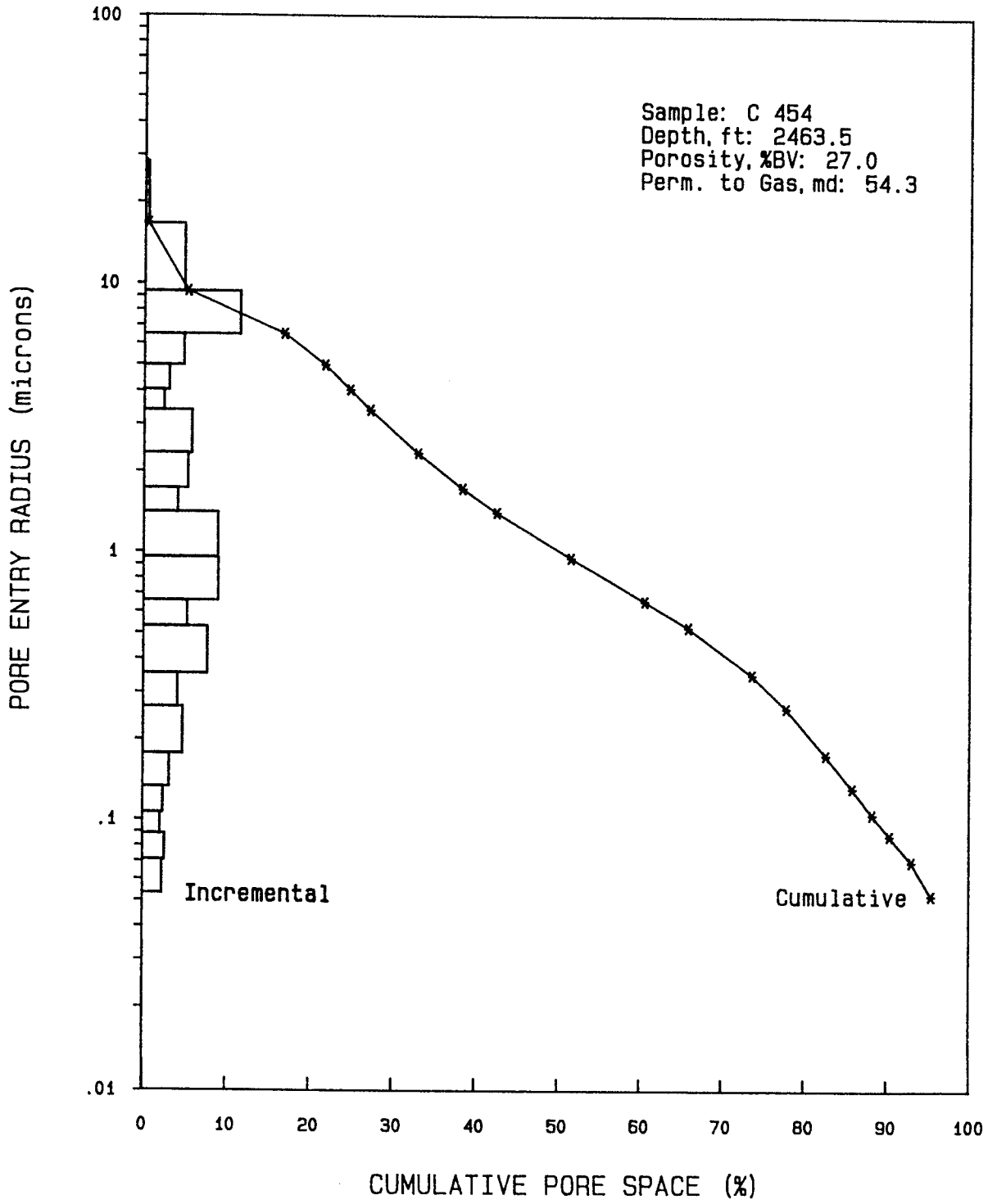


Table 23

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 455

Depth, ft: 2465.4

Porosity,% BV: 23.7

Perm. to Gas, md: 19.3

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.39	100.0	-	-
3.89	100.0	-	-
6.39	99.7	16.68	0.035
11.4	98.8	9.36	0.062
16.4	91.1	6.50	0.089
21.4	84.7	4.98	0.116
26.4	80.9	4.04	0.144
31.4	78.3	3.40	0.171
45.4	72.4	2.35	0.247
61.4	65.9	1.74	0.334
75.4	60.3	1.41	0.410
111	48.6	0.96	0.606
161	37.6	0.66	0.878
201	31.7	0.53	1.10
301	22.9	0.35	1.64
401	18.0	0.27	2.18
601	12.6	0.18	3.27
801	9.6	0.13	4.36
1000	7.7	0.11	5.45
1200	6.4	0.09	6.53
1500	5.3	0.07	8.16
2000	4.1	0.05	10.88

Figure 33

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

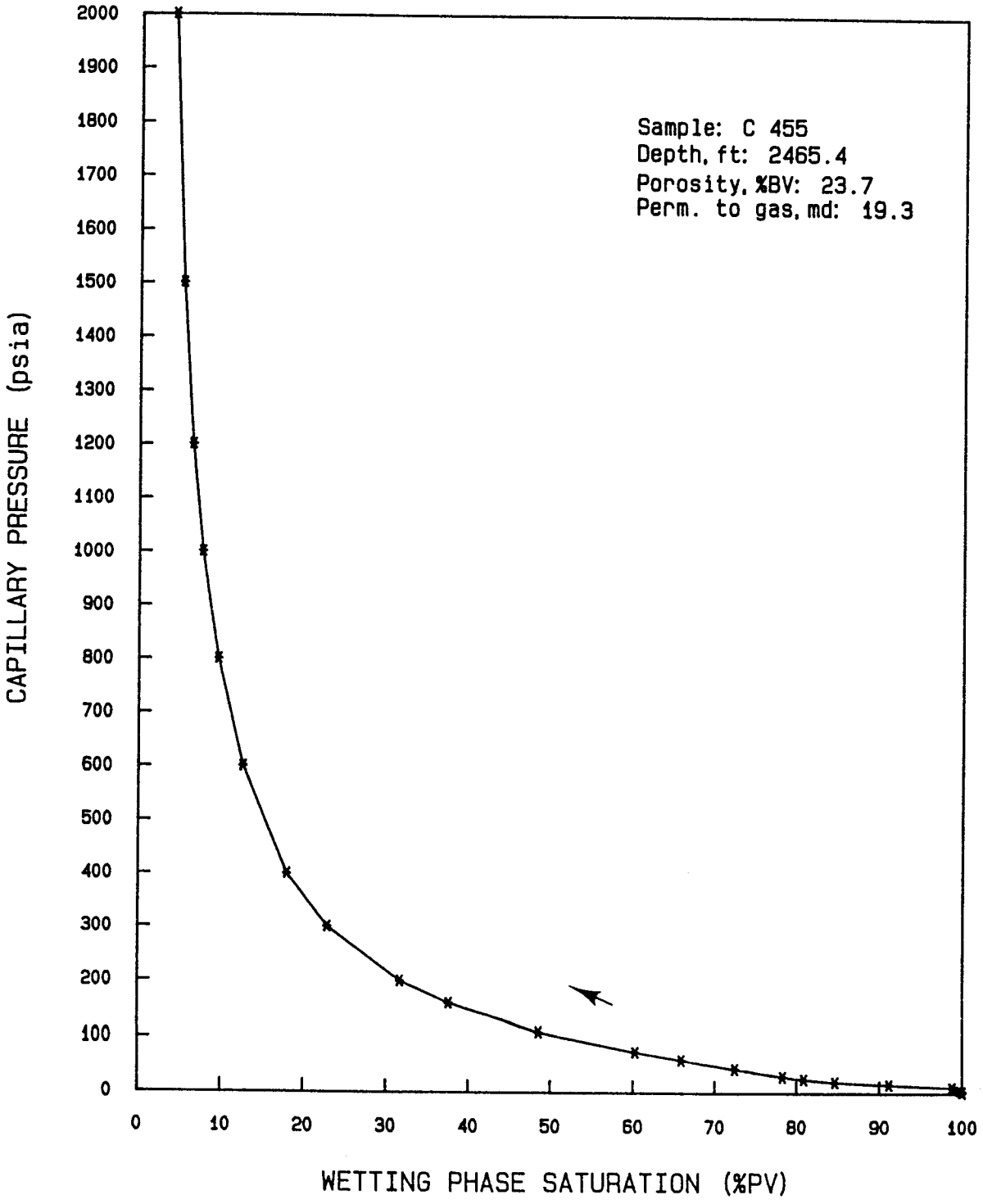


Figure 34

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

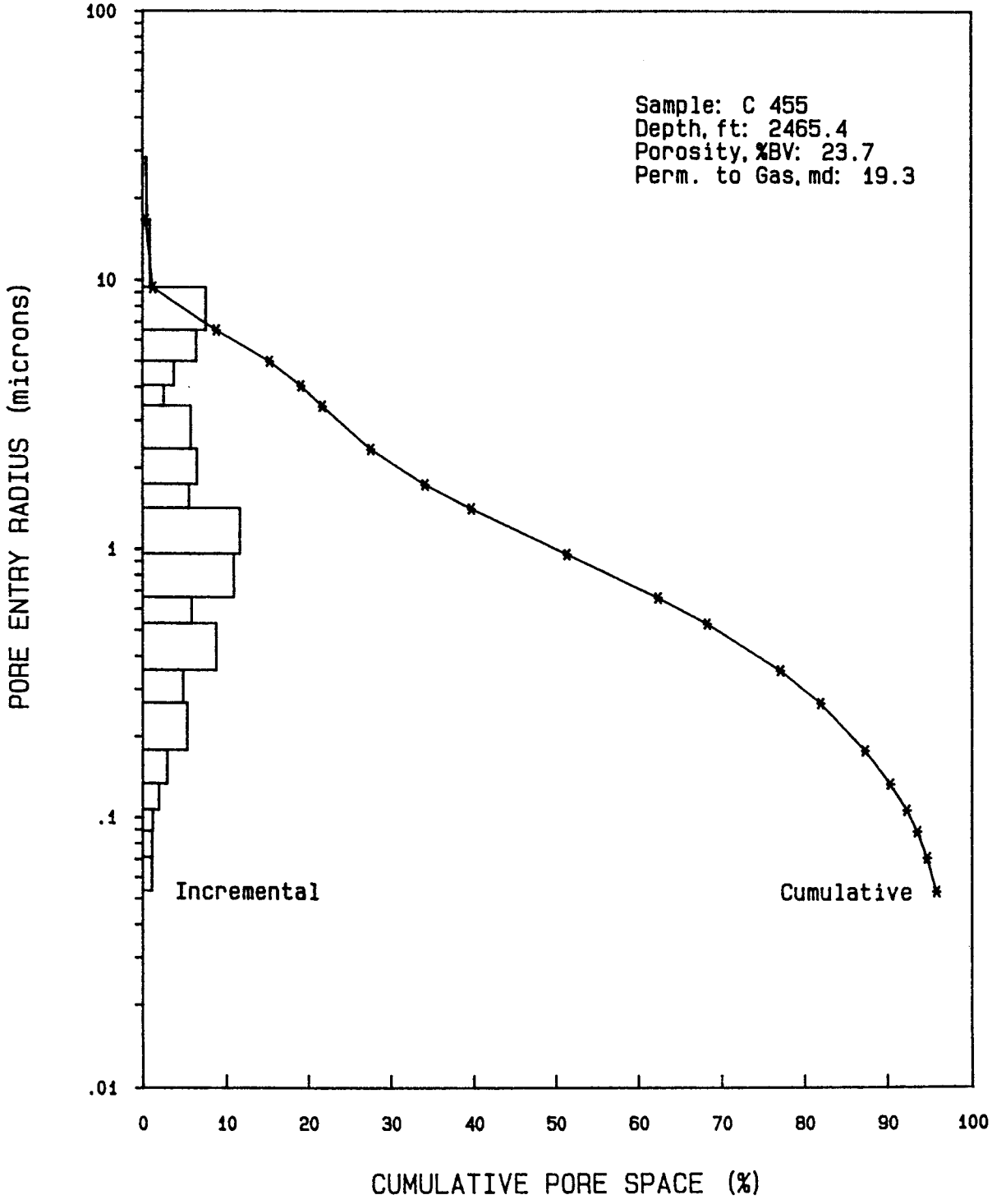


Table 24

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 456

Depth, ft: 2514.6

Porosity,% BV: 19.1

Perm. to Gas, md: 37.0

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.41	100.0	-	-
3.91	100.0	-	-
6.41	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	90.4	4.98	0.175
26.4	72.5	4.04	0.216
31.4	58.8	3.39	0.257
45.4	42.4	2.35	0.372
61.4	35.5	1.74	0.503
75.4	32.4	1.41	0.618
111	27.9	0.96	0.913
161	24.7	0.66	1.32
201	23.1	0.53	1.65
301	20.5	0.35	2.47
401	18.8	0.27	3.29
601	16.2	0.18	4.93
801	14.4	0.13	6.57
1000	13.1	0.11	8.21
1200	12.0	0.09	9.85
1500	10.8	0.07	12.31
2000	9.4	0.05	16.40

Figure 35

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

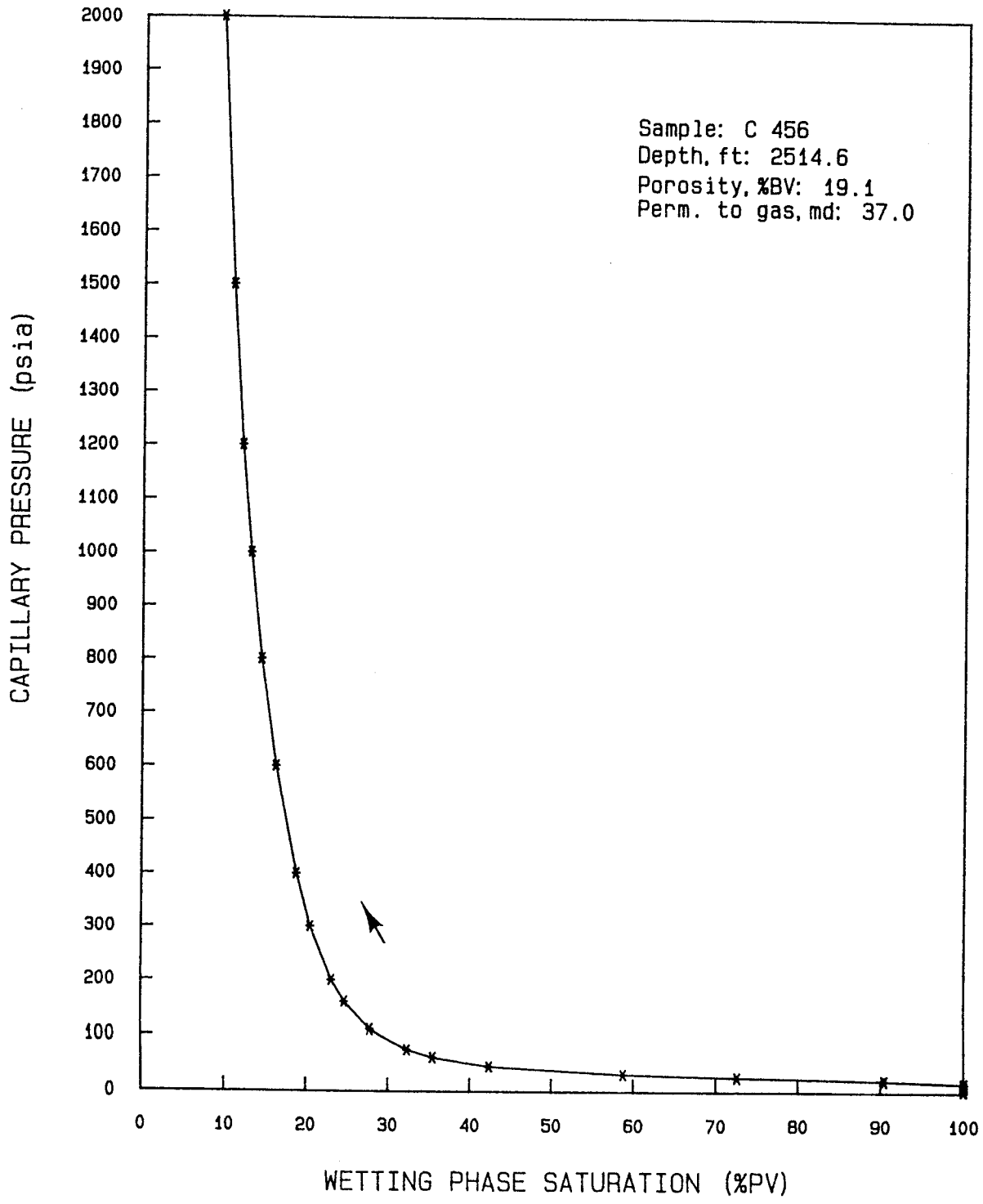


Figure 36

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

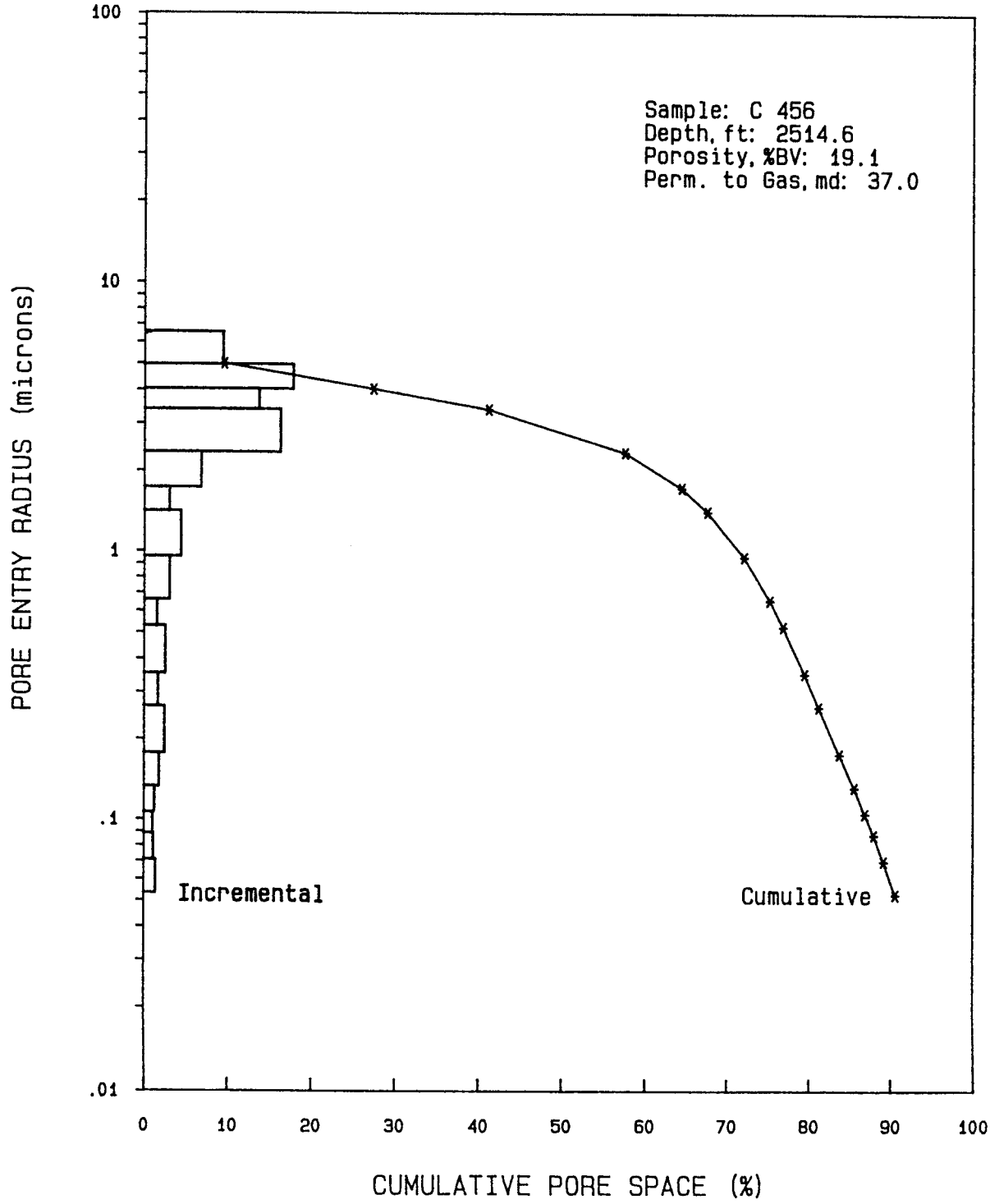


Table 25

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 457 Porosity,% BV: 14.7

Depth, ft: 2532.8 Perm. to Gas, md: 2.88

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.41	100.0	-	-
3.91	100.0	-	-
6.41	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	100.0	-	-
26.4	100.0	-	-
31.4	100.0	-	-
45.4	97.4	2.35	0.117
61.4	76.4	1.74	0.158
75.4	63.2	1.41	0.194
111	46.7	0.96	0.286
161	36.7	0.66	0.415
201	31.7	0.53	0.518
301	23.6	0.35	0.775
401	19.5	0.27	1.03
601	14.7	0.18	1.55
801	11.9	0.13	2.06
1000	10.3	0.11	2.57
1200	9.0	0.09	3.09
1500	7.7	0.07	3.86
2000	6.1	0.05	5.14

Figure 37

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

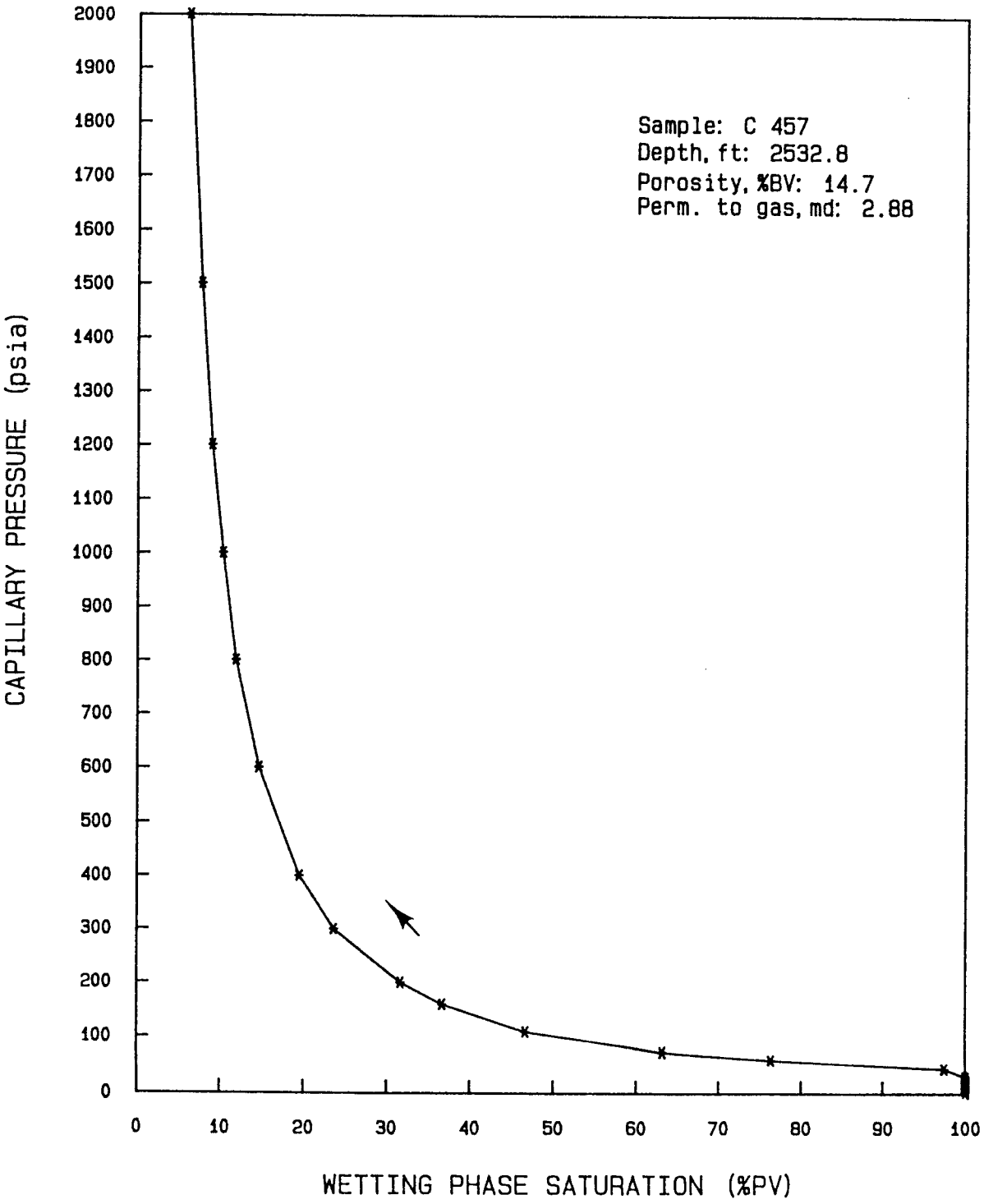


Figure 38

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

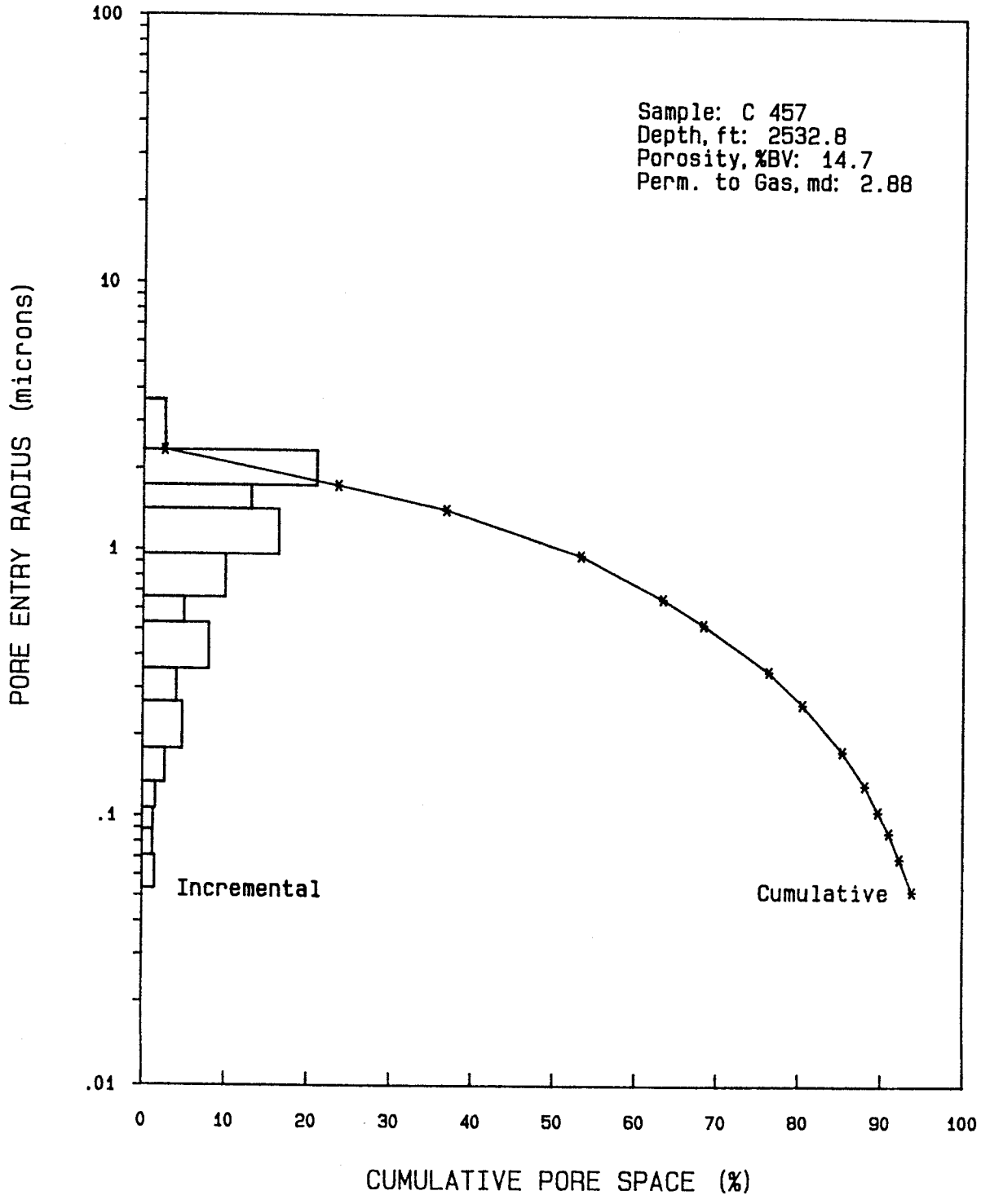


Table 26

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

Sample: C 458

Depth, ft: 2573.2

Porosity,% BV: 11.1

Perm. to Gas, md: 0.276

CAPILLARY PRESSURE (psia)	WETTING PHASE SATURATION (%PV)	PORE ENTRY RADIUS (microns)	LEVERETT'S J-FUNCTION
2.41	100.0	-	-
3.91	100.0	-	-
6.41	100.0	-	-
11.4	100.0	-	-
16.4	100.0	-	-
21.4	100.0	-	-
26.4	100.0	-	-
31.4	100.0	-	-
45.4	100.0	-	-
61.4	100.0	-	-
75.4	100.0	-	-
111	94.2	0.96	0.103
161	82.5	0.66	0.150
201	75.8	0.53	0.187
301	61.8	0.35	0.280
401	52.0	0.27	0.373
601	43.1	0.18	0.559
801	37.8	0.13	0.744
1000	34.1	0.11	0.930
1200	31.3	0.09	1.12
1500	28.1	0.07	1.39
2000	24.1	0.05	1.86

Figure 39

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982

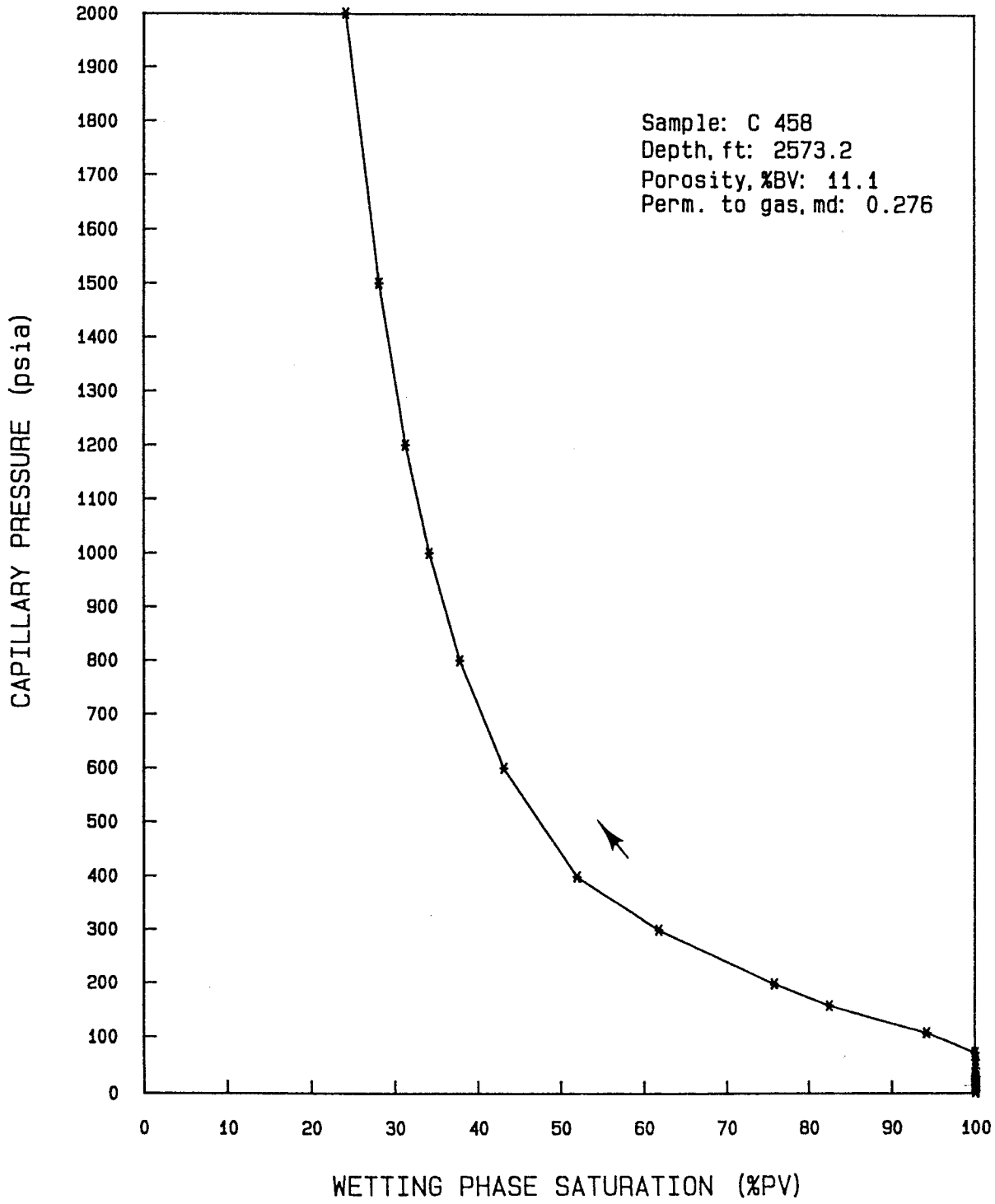


Figure 40

PORE SIZE DISTRIBUTION

Anadarko Petroleum Corporation
Cornell University Project
SRS 1869/RSH 2982