SUMMARY OF MERCURY INJECTION TEST RESULTS

Company: University of Colorado at Boulder
Formation: Dolomite
County, State: Hodgeman, Kansas

Well: Oasis No. 1 Deutsch
Field: Bindley

Sample Identification:	2	3	4
Depth, feet:	4627.7	4630.9	4635.4
Permeability to Air, md:	234	4.7	40
Porosity, percent:	25.3	10.9	18.8

Injection Pressure, psia	Pore Aperture Radius, microns	Mercury Saturation, percent pore space		
3	35.5	0.0	0.0	0.0
6	17.7	3.1	0.0	0.0
9	11.8	12.4	0.0	0.0
12	8.87	32.5	0.0	4.5
15	7.09	50.7	0.0	14.6
18	5.91	59.9	0.0	23.6
21	5.07	65.8	0.0	32.9
24	4.44	70.2	0.0	39.1
27	3.94	73.6	0.0	44.7
30	3.55	76.1	3.3	48.6
40	2.66	82.1	22.8	57.9
60	1.77	85.3	36.9	65.2
80	1.33	85.7	43.5	68.6
100	1.06	86.4	48.3	70.0
200	.532	87.2	64.0	75.0
300	.355	88.0	70.9	78.1
500	.213	90.2	76.6	82.1
750	.142	91.5	79.0	84.3
1000	.106	91.8	79.9	85.4
1250	.085	92.4	80.5	86.6
1500	.071	92.6	82.0	87.1
1750	.061	92.7	82.9	87.4
2000	.053	92.9	83.5	87.4

SUMMARY OF MERCURY INJECTION TEST RESULTS

Company: University of Colorado at Boulder
Formation: Dolomite
County, State: Hodgeman, Kansas

Well: Oasis No. 1 Deutsch
Field: Bindley

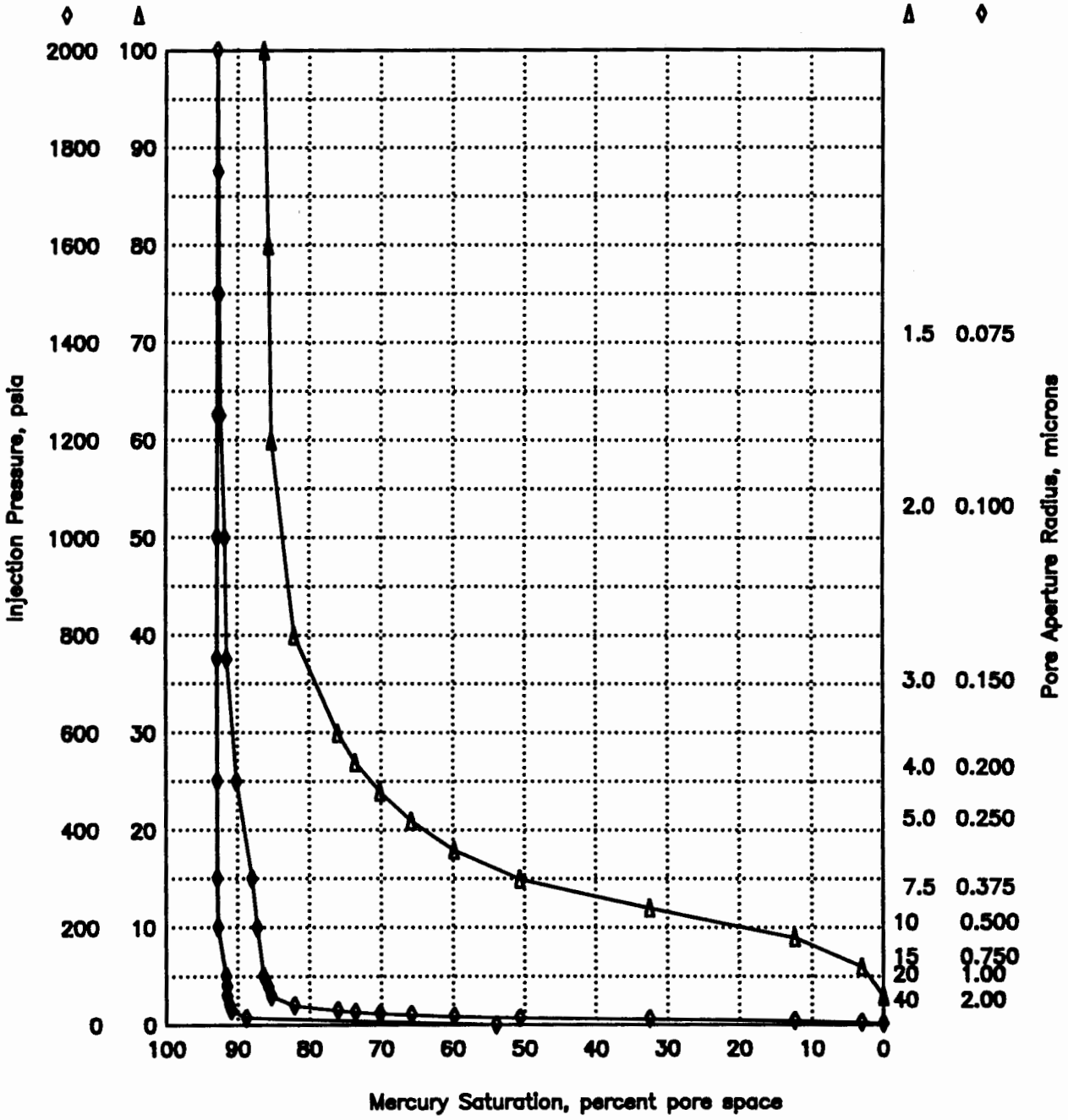
Sample Identification:	2	3	4
Depth, feet:	4627.7	4630.9	4635.4
Permeability to Air, md:	234	4.7	40
Porosity, percent:	25.3	10.9	18.8

Injection Pressure, psia	Pore Aperture Radius, microns	Mercury Saturation, percent pore space	
1500		92.9	87.1
1250		92.9	86.6
1000		92.9	86.0
750		92.9	85.7
500		92.9	85.2
300		92.9	84.6
200		92.7	83.8
100		91.6	76.4
80		91.5	73.6
60		91.5	67.7
40		91.1	57.9
30		90.9	47.2
15		88.8	41.9
0		54.0	41.3

Injection Pressure vs Mercury Saturation

UNIVERSITY OF COLORADO AT BOULDER
OASIS NO. 1 DEUTSCH WELL
BINDLEY FIELD
HODGEMAN COUNTY, KANSAS

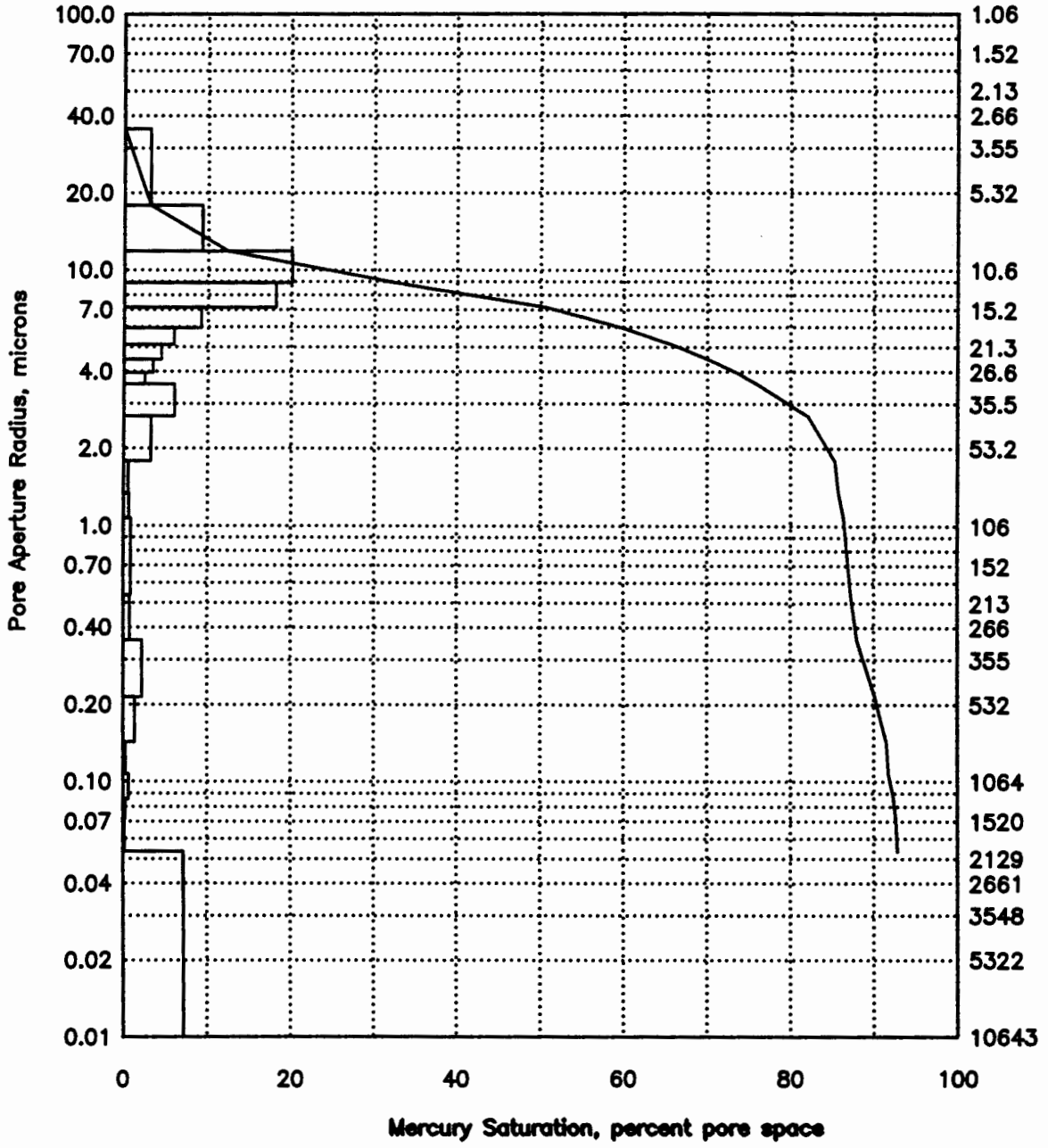
SAMPLE ID: 2
SAMPLE DEPTH, feet: 4627.7
PERMEABILITY TO AIR, md: 234
POROSITY, percent: 25.3



Pore Aperture Radius vs Mercury Saturation

UNIVERSITY OF COLORADO AT BOULDER
OASIS NO. 1 DEUTSCH WELL
BINDLEY FIELD
HODGEMAN COUNTY, KANSAS

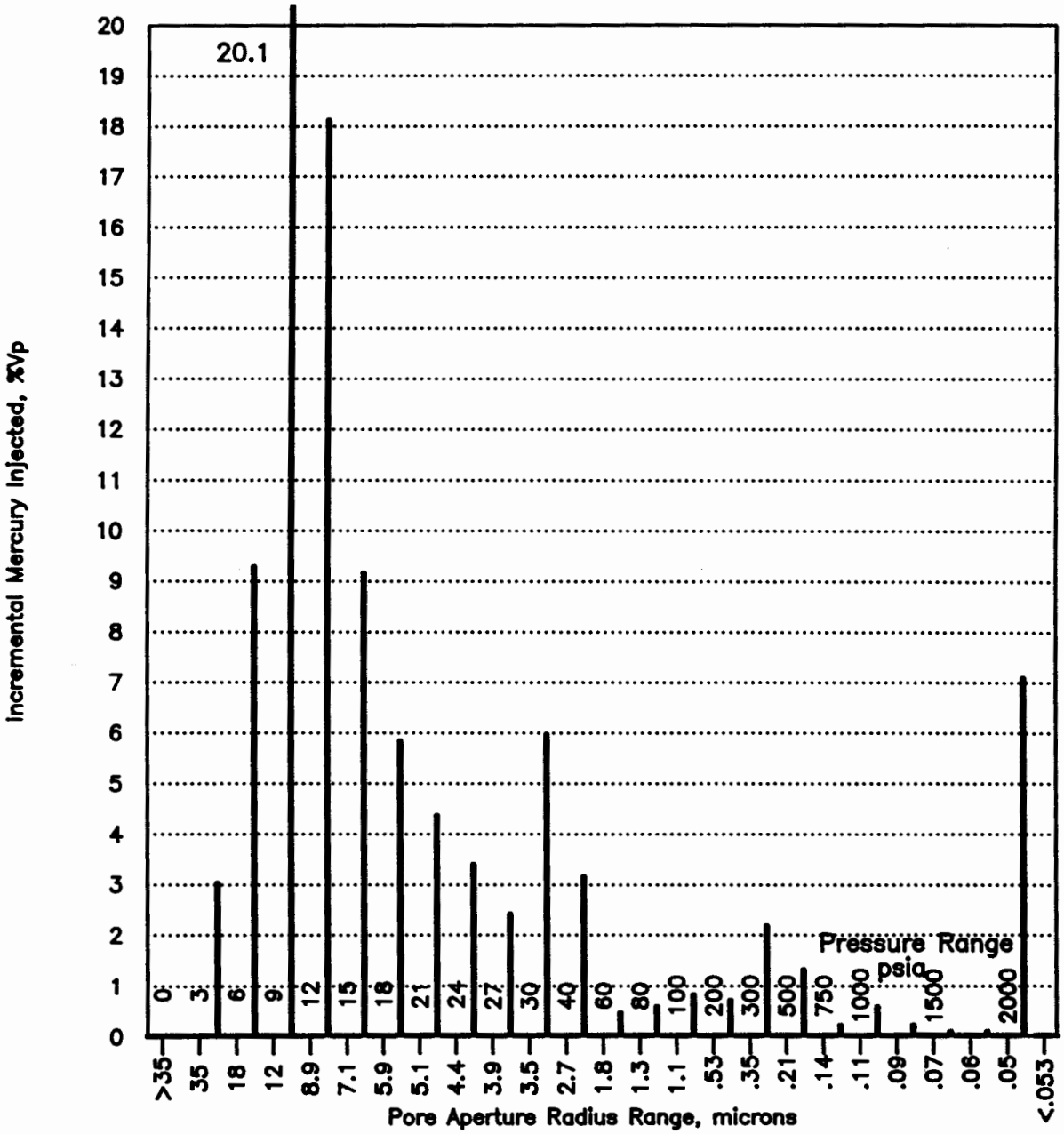
SAMPLE ID: 2
SAMPLE DEPTH, feet: 4627.7
PERMEABILITY TO AIR, md: 234
POROSITY, percent: 25.3



PORE PRINT

Pore Space Controlled by Pore Apertures

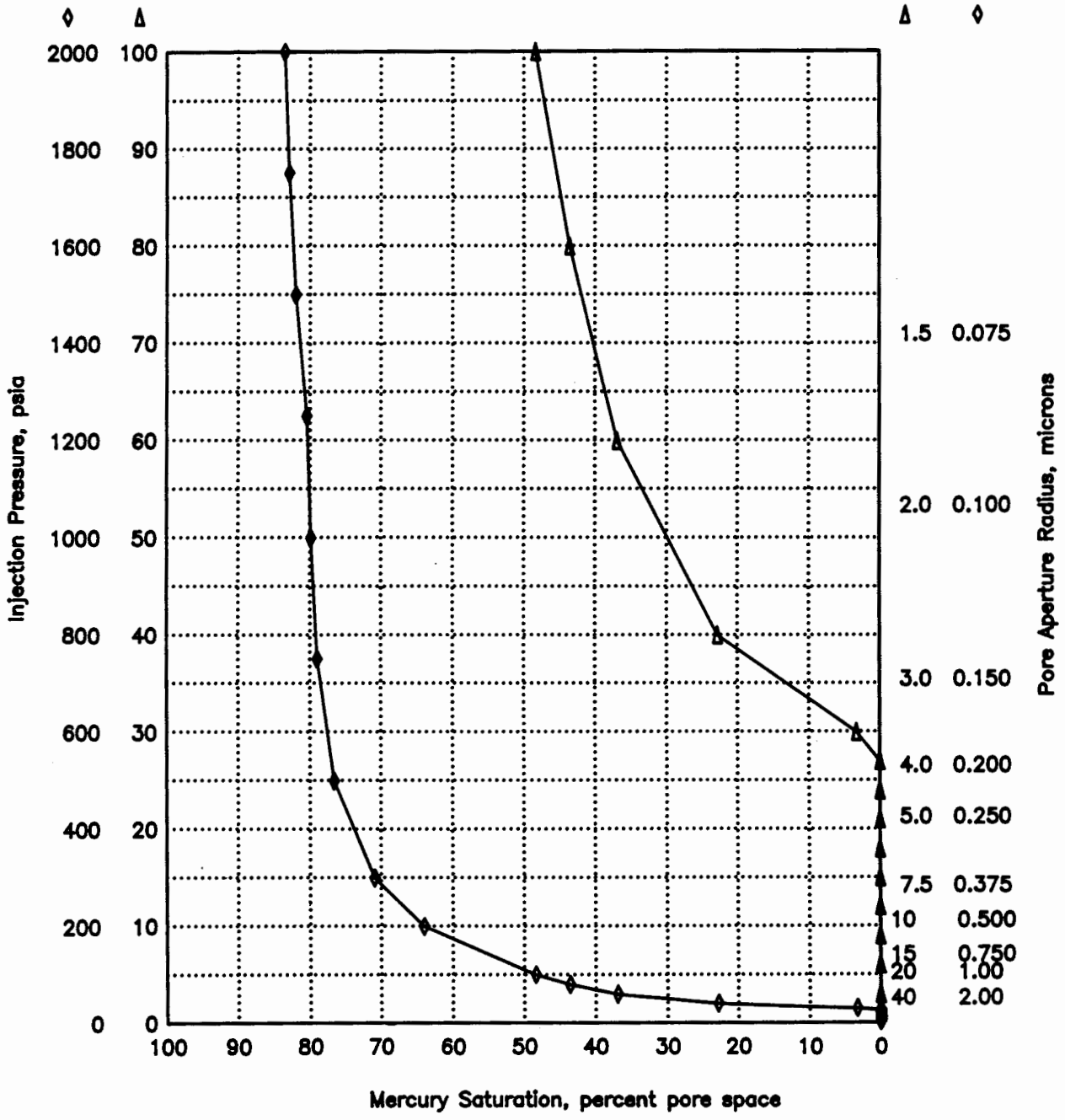
UNIVERSITY OF COLORADO AT BOULDER	SAMPLE ID:	2
OASIS NO. 1 DEUTSCH WELL	DEPTH, feet:	4627.7
BINDLEY FIELD	AIR PERMEABILITY, md:	234
HODGEMAN COUNTY, KANSAS	POROSITY, percent:	25.3



Injection Pressure vs Mercury Saturation

UNIVERSITY OF COLORADO AT BOULDER
OASIS NO. 1 DEUTSCH WELL
BINDLEY FIELD
HODGEMAN COUNTY, KANSAS

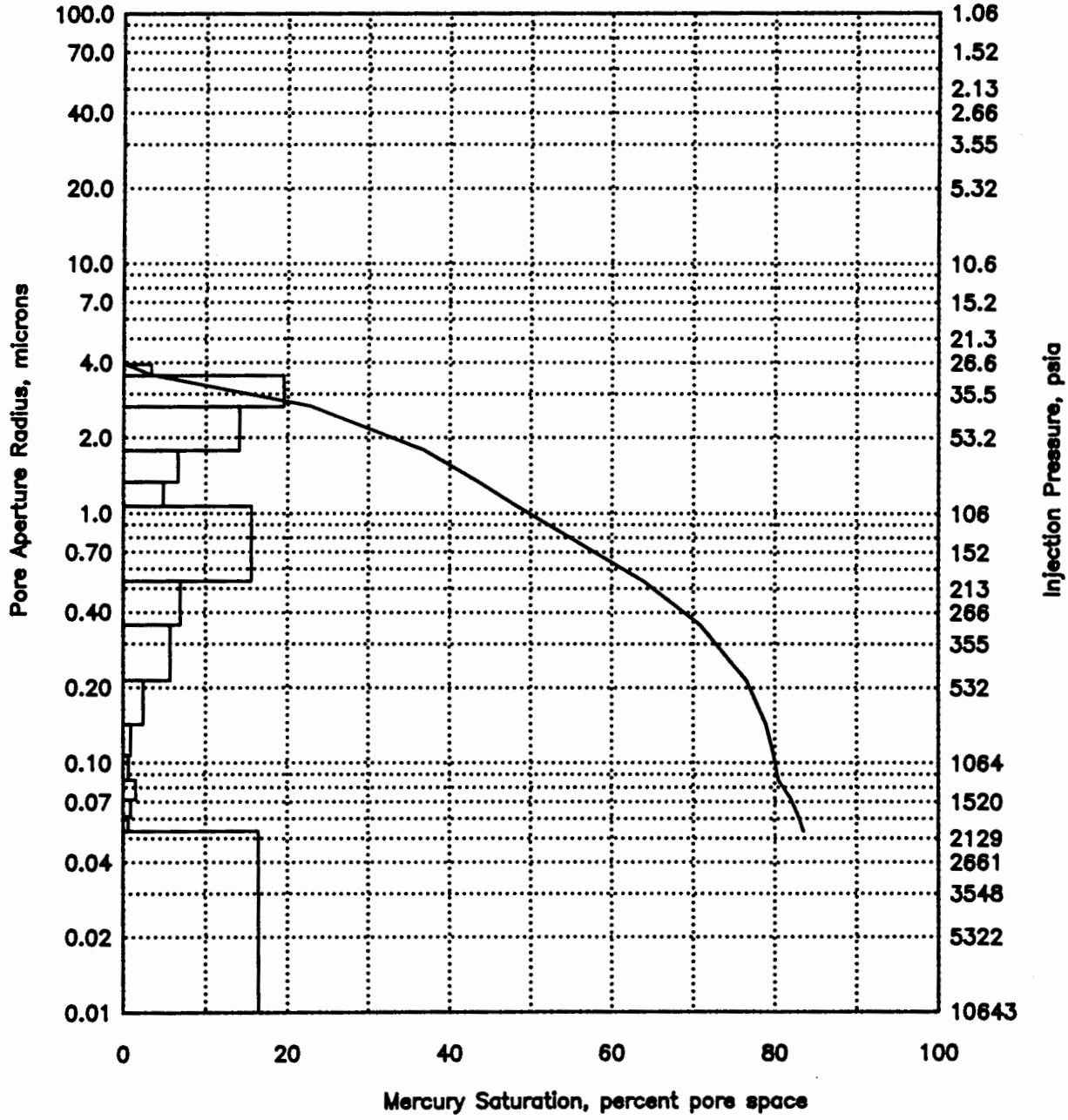
SAMPLE ID:	3
SAMPLE DEPTH, feet:	4630.9
PERMEABILITY TO AIR, md:	4.7
POROSITY, percent:	10.9



Pore Aperture Radius vs Mercury Saturation

UNIVERSITY OF COLORADO AT BOULDER
OASIS NO. 1 DEUTSCH WELL
BINDLEY FIELD
HODGEMAN COUNTY, KANSAS

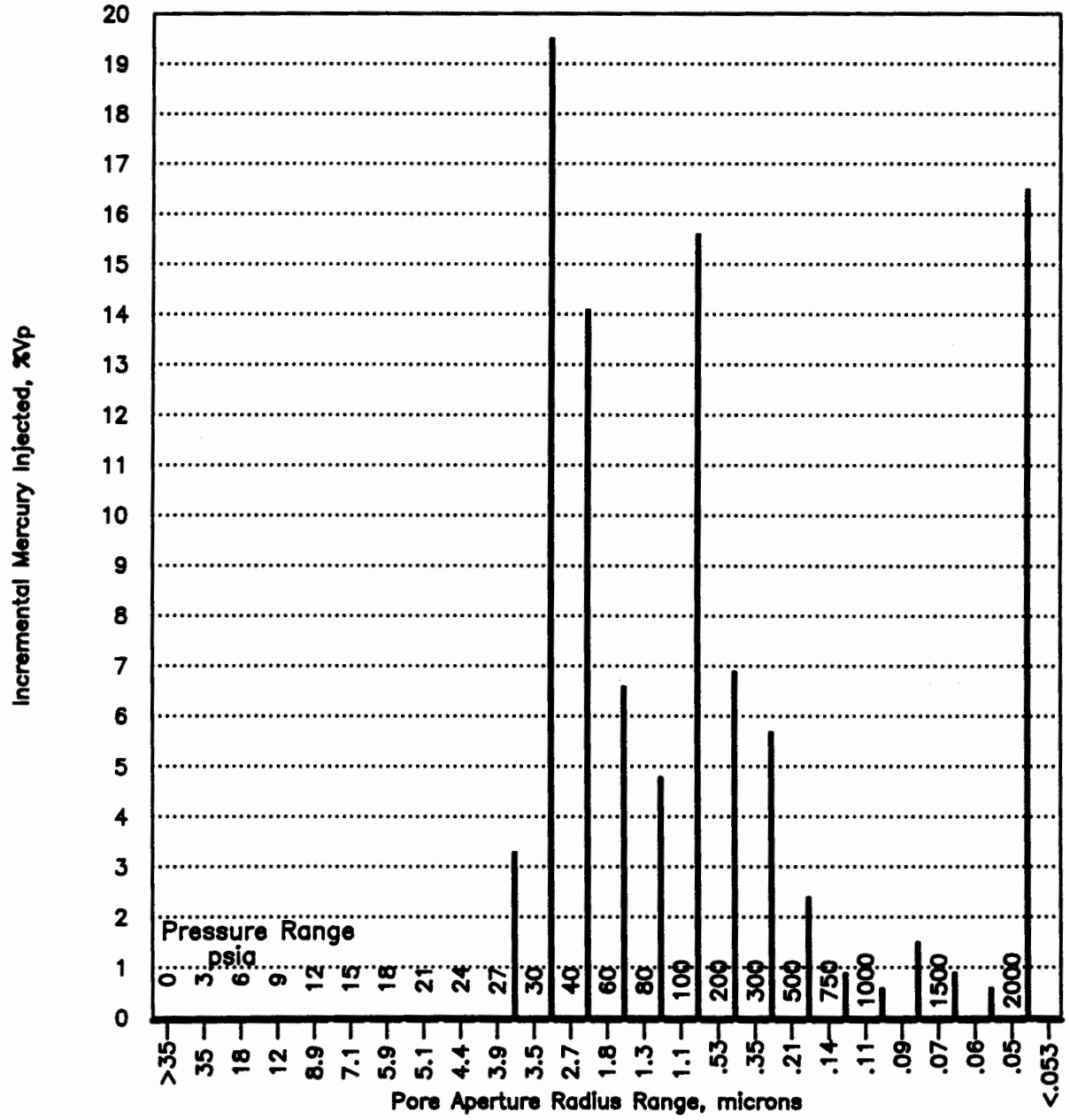
SAMPLE ID:	3
SAMPLE DEPTH, feet:	4630.9
PERMEABILITY TO AIR, md:	4.7
POROSITY, percent:	10.9



PORE PRINT

Pore Space Controlled by Pore Apertures

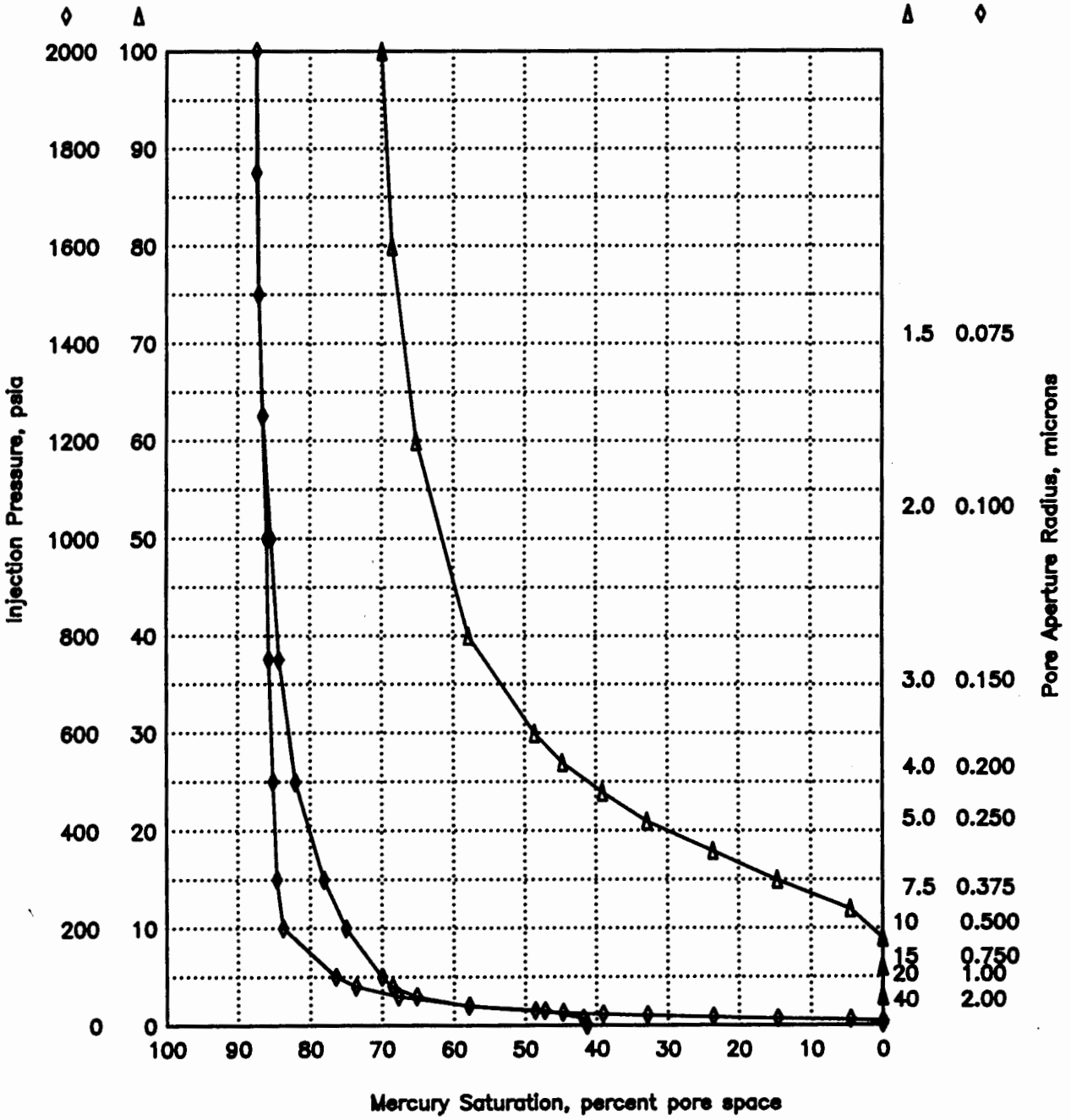
UNIVERSITY OF COLORADO AT BOULDER	SAMPLE ID:	3
OASIS NO. 1 DEUTSCH WELL	DEPTH, feet:	4630.9
BINDLEY FIELD	AIR PERMEABILITY, md:	4.7
HODGEMAN COUNTY, KANSAS	POROSITY, percent:	10.9



Injection Pressure vs Mercury Saturation

UNIVERSITY OF COLORADO AT BOULDER
OASIS NO. 1 DEUTSCH WELL
BINDLEY FIELD
HODGEMAN COUNTY, KANSAS

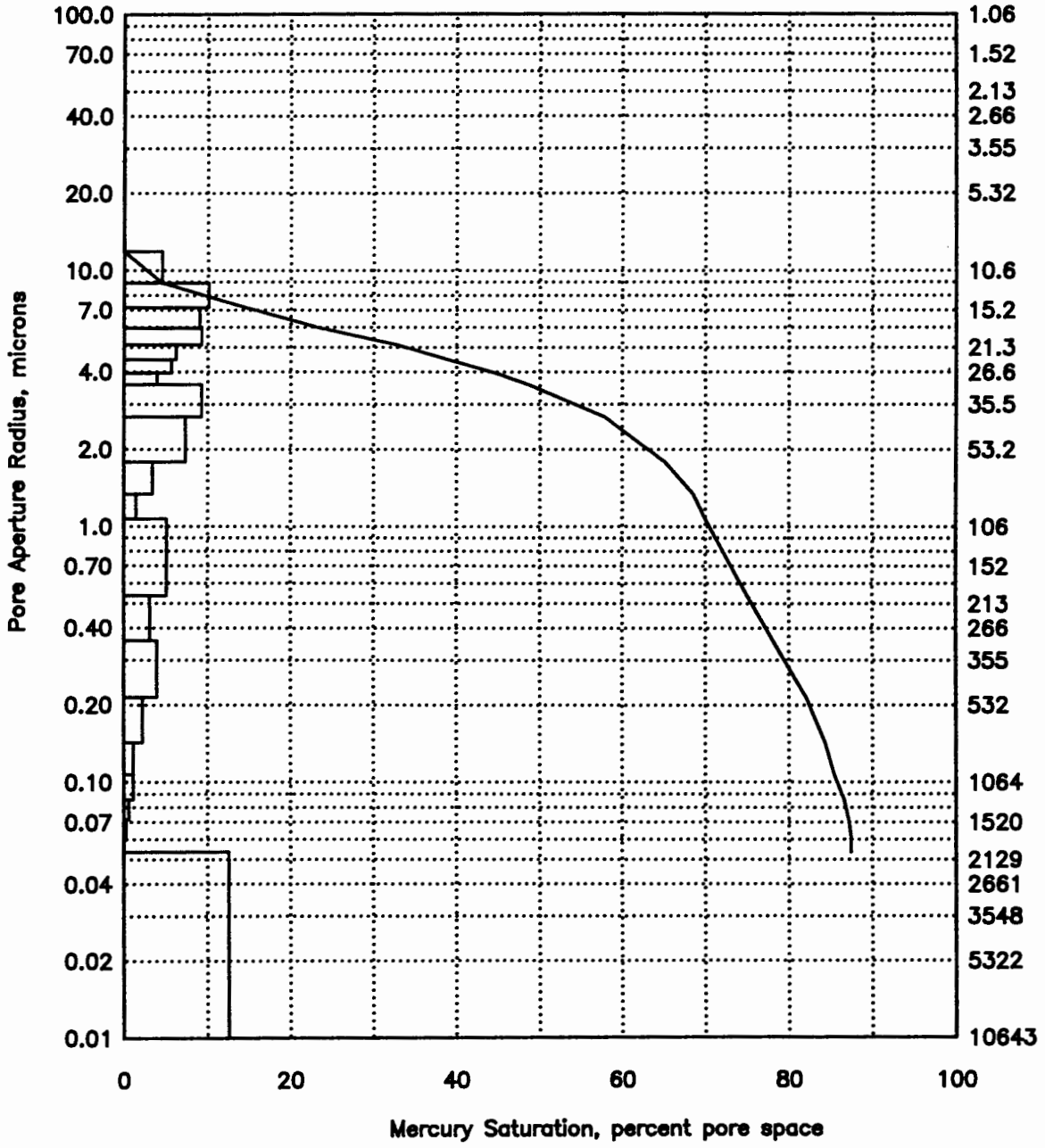
SAMPLE ID: 4
SAMPLE DEPTH, feet: 4635.4
PERMEABILITY TO AIR, md: 40
POROSITY, percent: 18.8



Pore Aperture Radius vs Mercury Saturation

UNIVERSITY OF COLORADO AT BOULDER
OASIS NO. 1 DEUTSCH WELL
BINDLEY FIELD
HODGEMAN COUNTY, KANSAS

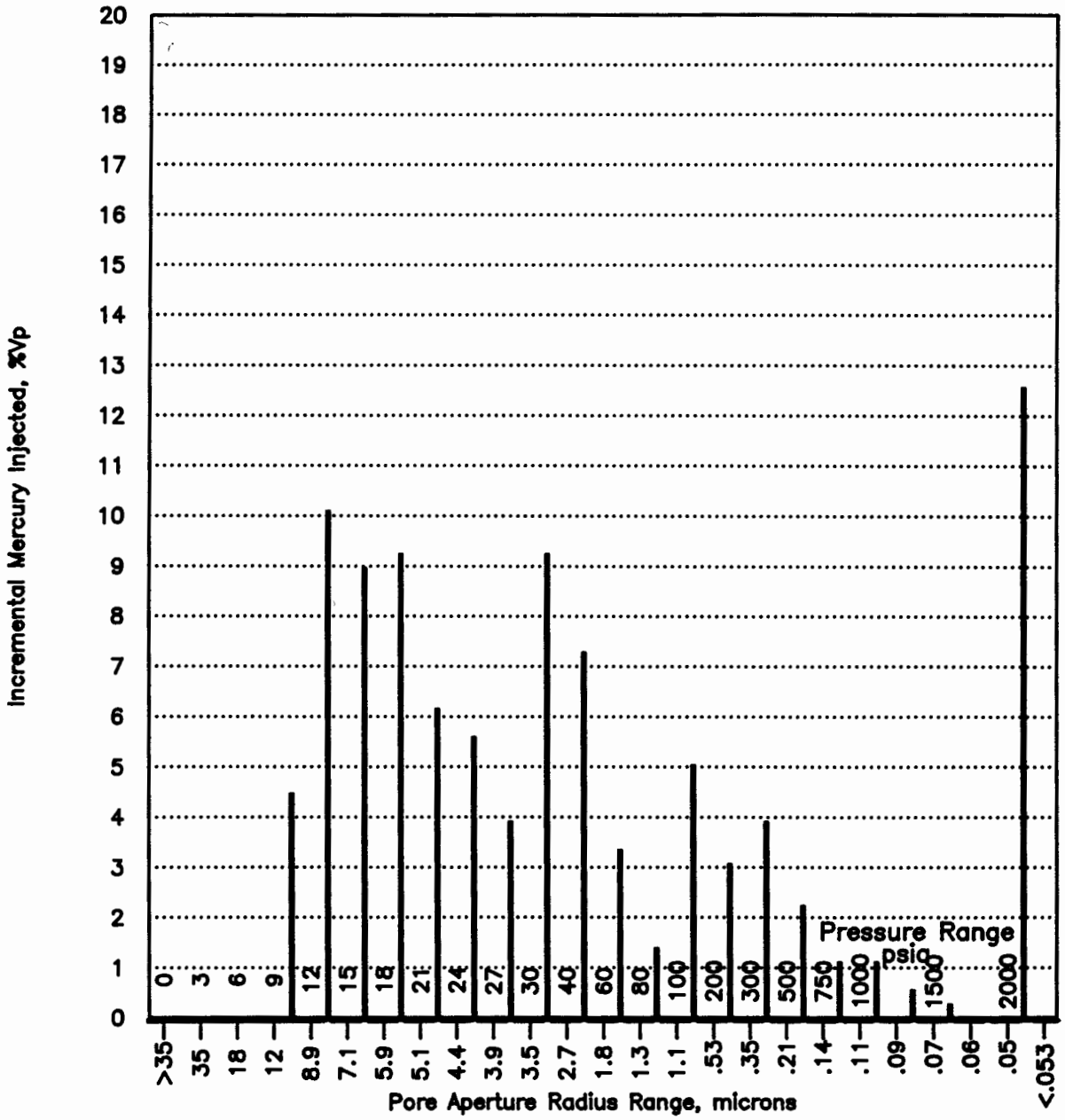
SAMPLE ID: 4
SAMPLE DEPTH, feet: 4635.4
PERMEABILITY TO AIR, md: 40
POROSITY, percent: 18.8



PORE PRINT

Pore Space Controlled by Pore Apertures

UNIVERSITY OF COLORADO AT BOULDER	SAMPLE ID:	4
OASIS NO. 1 DEUTSCH WELL	DEPTH, feet:	4635.4
BINDLEY FIELD	AIR PERMEABILITY, md:	40
HODGEMAN COUNTY, KANSAS	POROSITY, percent:	18.8



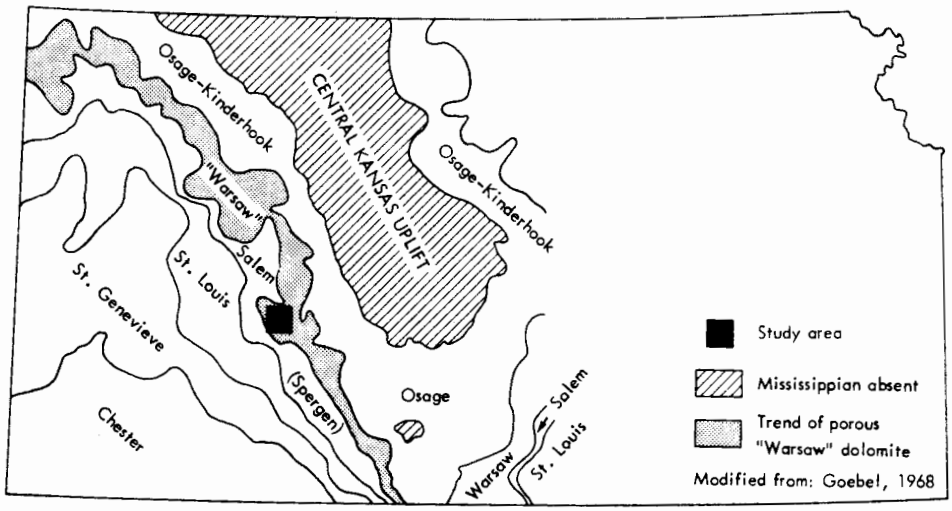


FIG. 5—Regional map of formations within Mississippian beneath pre-Pennsylvanian unconformity in western Kansas, with study area shown in belt of subcrop of "Warsaw" Formation.

beds. Northeastward, successively greater truncation of the top of the Mississippian units is present. The local structural relief just west of Bindley field may be caused either by gentle folding or by faulting of rocks beneath the Mississippian. This movement occurred relatively late, because it is reflected in beds as young as Late Permian.

GEOLOGY OF BINDLEY FIELD

Basal Pennsylvanian Beds

The Cherokee and Marmaton Groups (Fig. 7) comprise alternating shale and limestone beds with only small variations in thickness in the study area. The limestones may contain shows of

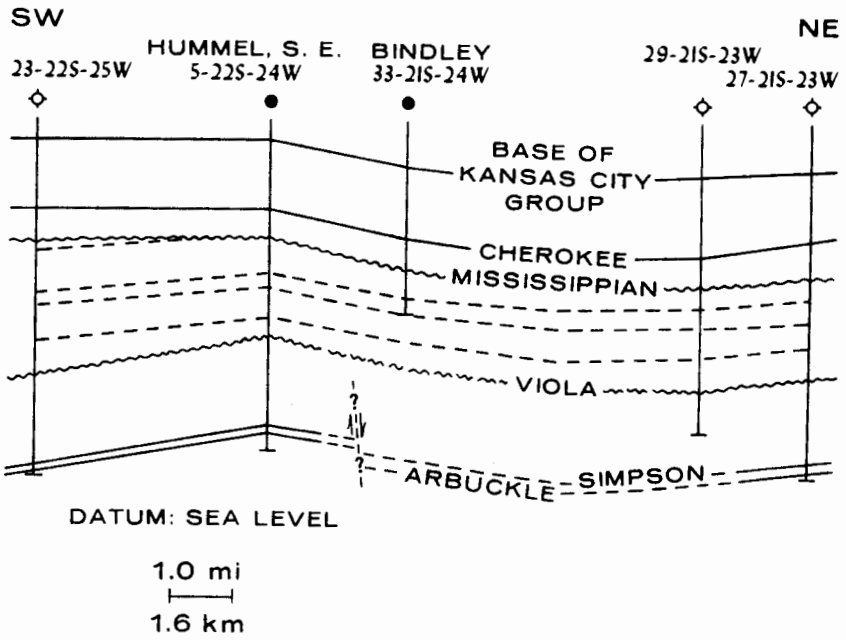


FIG. 6—Regional structural cross section through Bindley field area, indicating relation of Mississippian section to under- and overlying beds.

Spot C NESE Loc. 33-21-24W Code 9

Oper. Oasis No. 1 Lse. Deütsch Field Bindley County Hodgeman

Stratigraphy | Core Recov. | Samples (Photo, Chemical, X Ray, Peel, Thin Section) | Unit No. | Depth | Lithology | Contact | Color | Depositional Texture (Mudstone, Wackestone, Packstone, Grainstone, Boundstone) | Grain Size or Allochem or Dolomite X'l (Silt, v. fine, fine, medium, coarse, v. coarse, granule, >gran.) | Cement | Porosity (Small, large, v. large, Interpart., Intrapart., Transpart.) | Permeability (.01-1.0, 1.0-10.0, 10.0-100, 100-1000, >1000) | Fossils (Fen. Bryoz., Echinoderms, Brachiopods, Foram's, Sponge spic. (Allie.)) | Accessory Constituents (Pyrite, Glauc., Quartz, Sphal., Sol.) | Bedding: Horizontal (massive, thick, medium, thin, lamin, Wavy, Interstrat., Flaser); Cross Lamin. (Large scale sets, Medium, Small, Low-Angle, Ripple) | Sedimentary Structures | Interpreted Depos. Envir. | Prod. Data: Parts., Tests | Remarks

Stratigraphy	Unit No.	Depth	Contact	Color	Cement	Sedimentary Structures	Interpreted Depos. Envir.	Remarks
Є1: 4609-41'	1	4610	Shp	gn-gy	M		Bry. Mnd.	lt. oil stn
	2		Shp	lt. gn & lt. gy	M	SLK	Mound Flank	clasts interpenetrate;
	3	4620		gy-brn; gn-gy; gy & lt.-dk. brn	M, D; D; M, D; D		Bry. mound	v. hvy oil stn.; v. hvy oil stn
	4	4630	Shp Alt.	brn; lt. gy	C, O; M		Bry. Md.	v. thin Ls. zone; cht. pseud. gyp.
	5	4640	Grd Alt.	gy-brn; lt. gy; gy-brn	M, D; M; M, D		Bry. Md.; Int. Md.; Bry. Md.	cht. pseud gyp.?
Є2: 4641-94'	6	4650	Grd.	lt. gy & lt. tan	M		Premound subtidal	spotty, v. lt. oil stn.; diffuse cht. nods.; cht. pseud. gyp.; cht. pseud. anhy
	7	4660; 4670	Grd; Grd	dk. gy; v. lt ol. gy; v. lt gy-wht	M		Premound subtidal	diffuse cht. nods.
		4680; 4690	Grd	v. lt ol. gy; dk. gy; lt. ol. gy & lt. blue gy; ol. gy & blue gy	M	Geode; Geode; Geode; Geode; Geode; Geode	pre-mound inter-tidal – supratidal?	55% chert; cht. nods. "squashed"; 50% chert; 70% chert