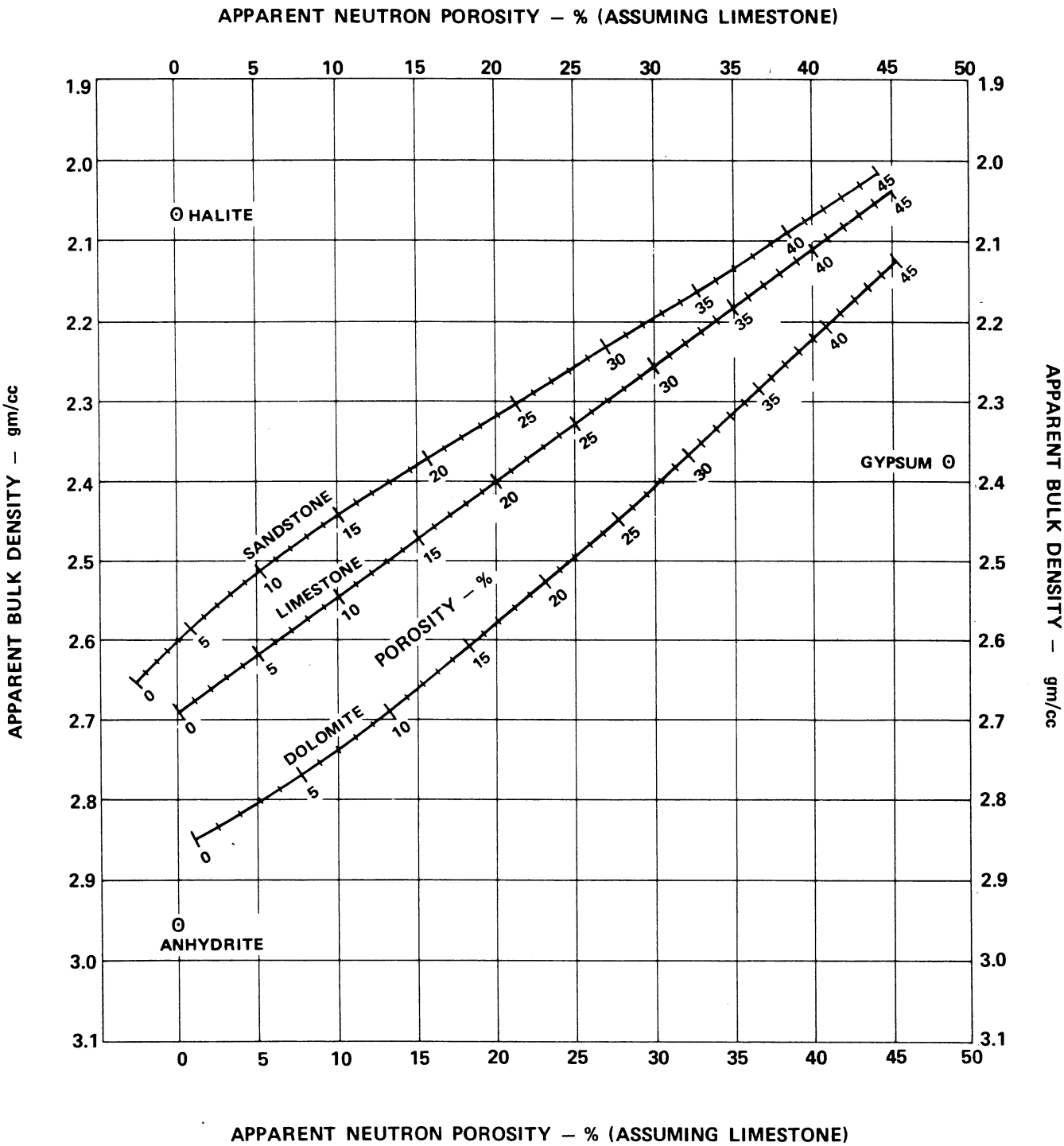
BULK DENSITY – NEUTRON CROSS PLOT

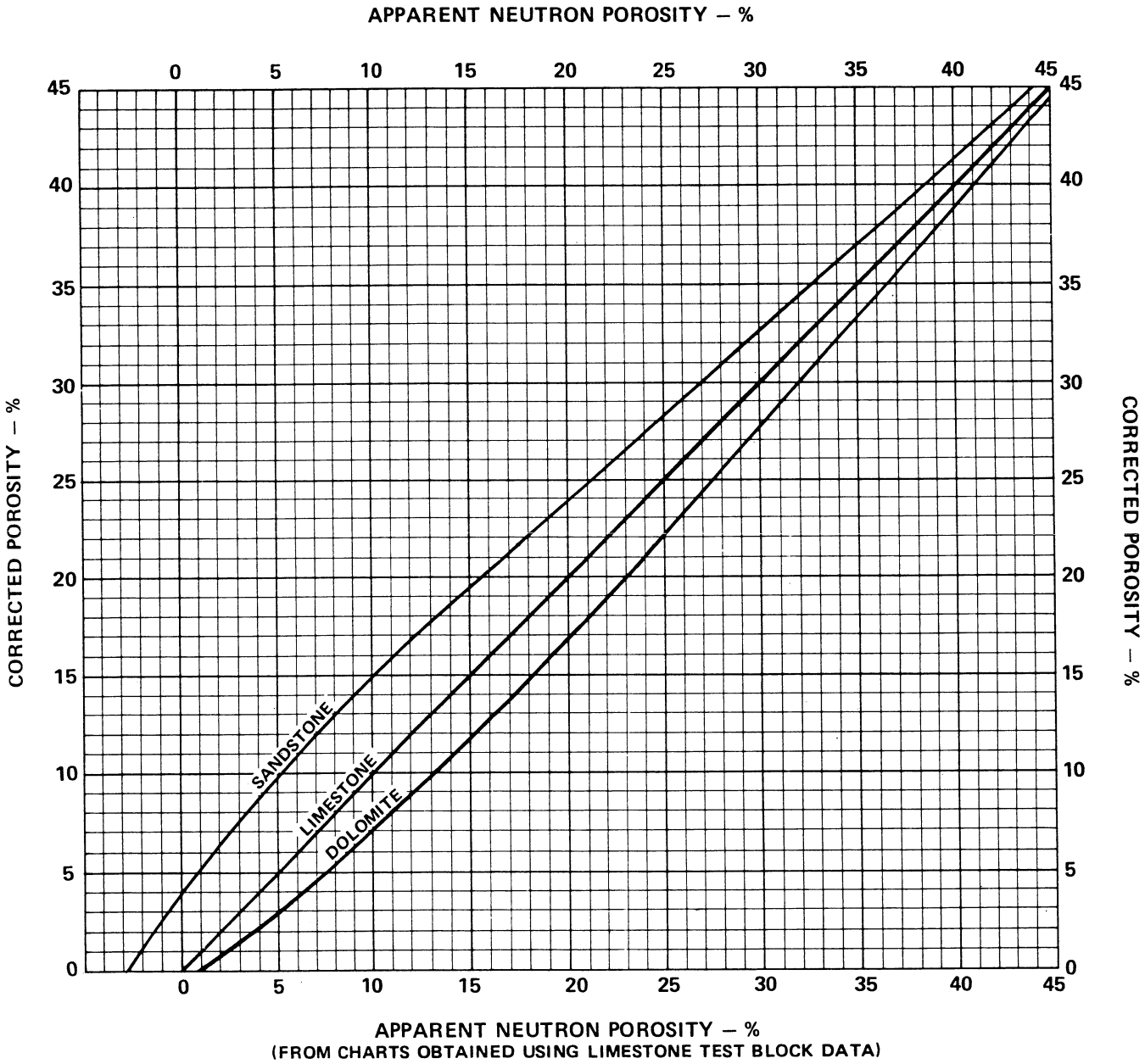
ρ_{fa} = 1.24 gm/cc

(Density Log Calibration to Z/A=0.5)



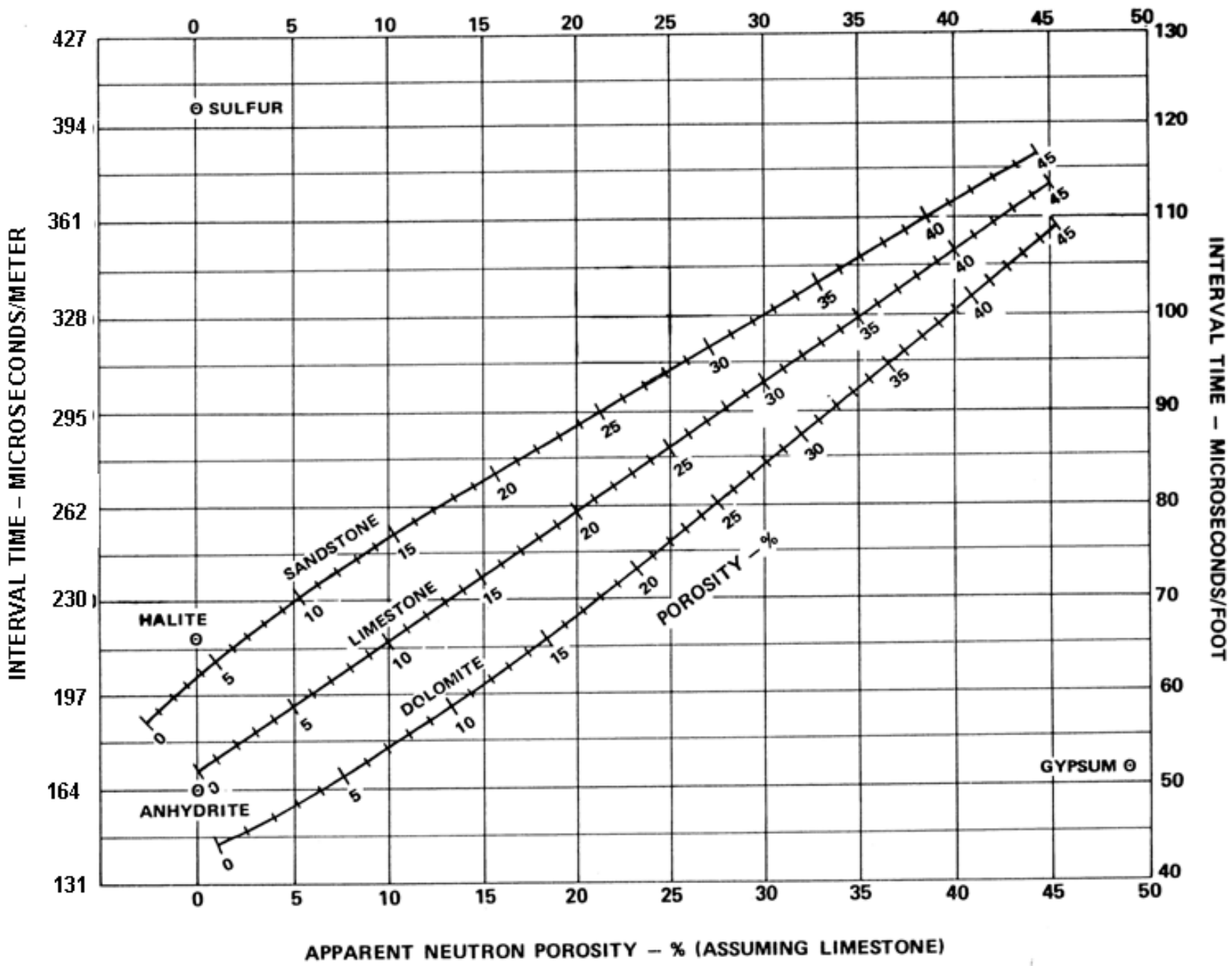
ESTIMATED NEUTRON CORRECTION FOR FORMATION CHEMISTRY EFFECTS

(NEUTRON–NEUTRON LOGGING, WATER FILLED HOLES)



SONIC – NEUTRON CROSS PLOT

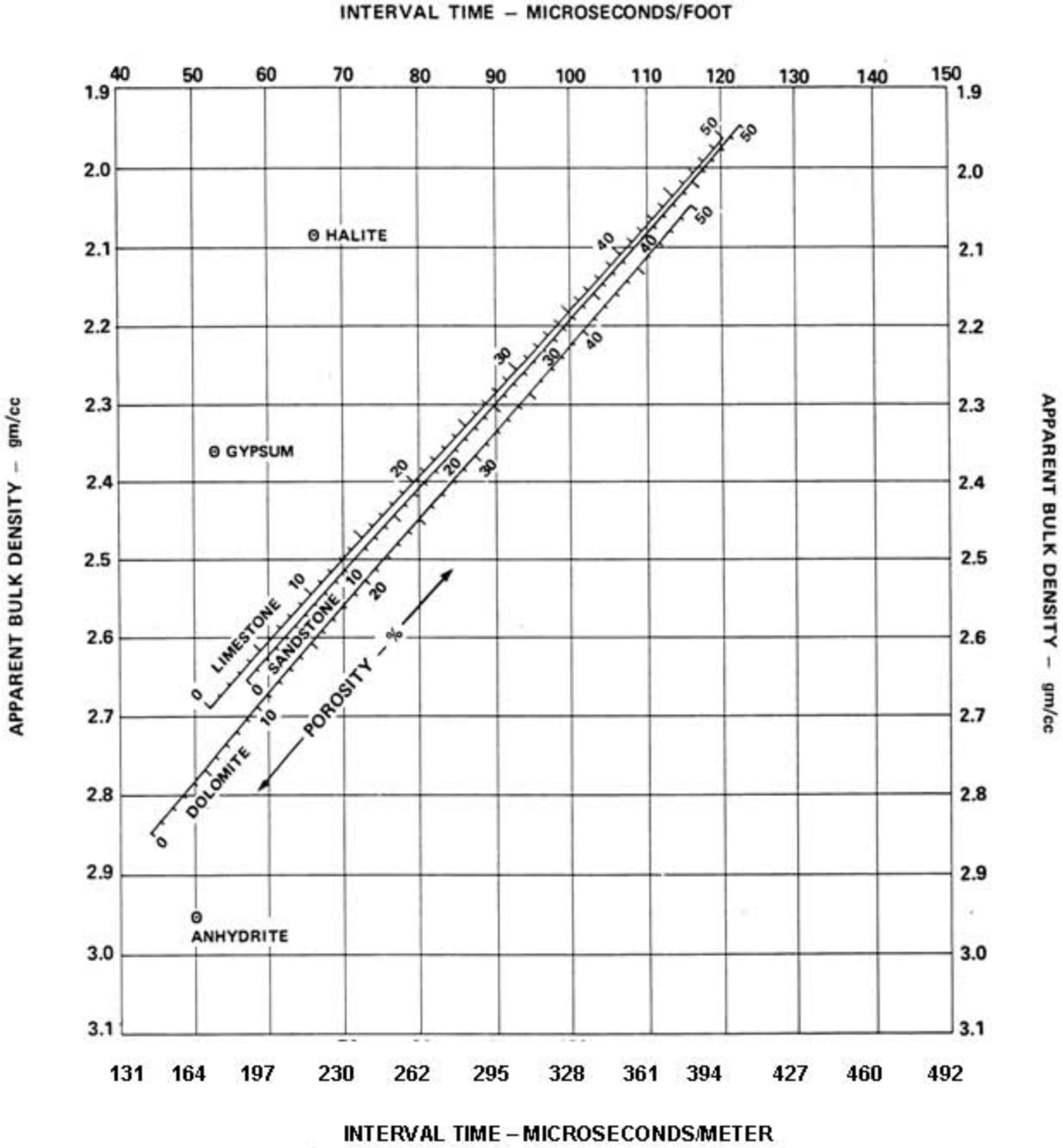
(V_f=5,300'/sec, Hydrogen Index of Pore Fluid=1)



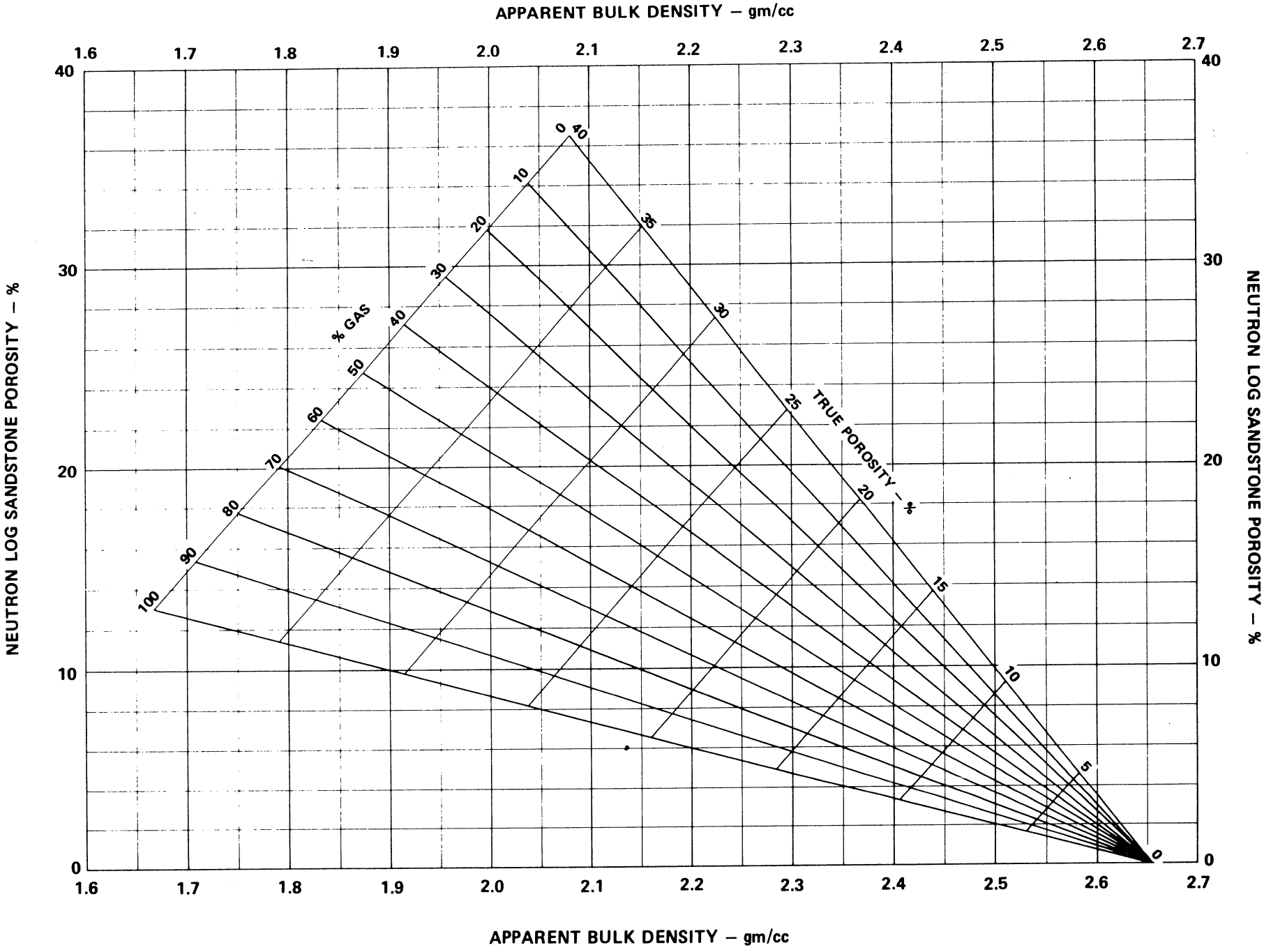
SONIC - DENSITY CROSS PLOT (COMMON)

ρf_a = 1.24 gm/cc, V_f = 5300'/sec

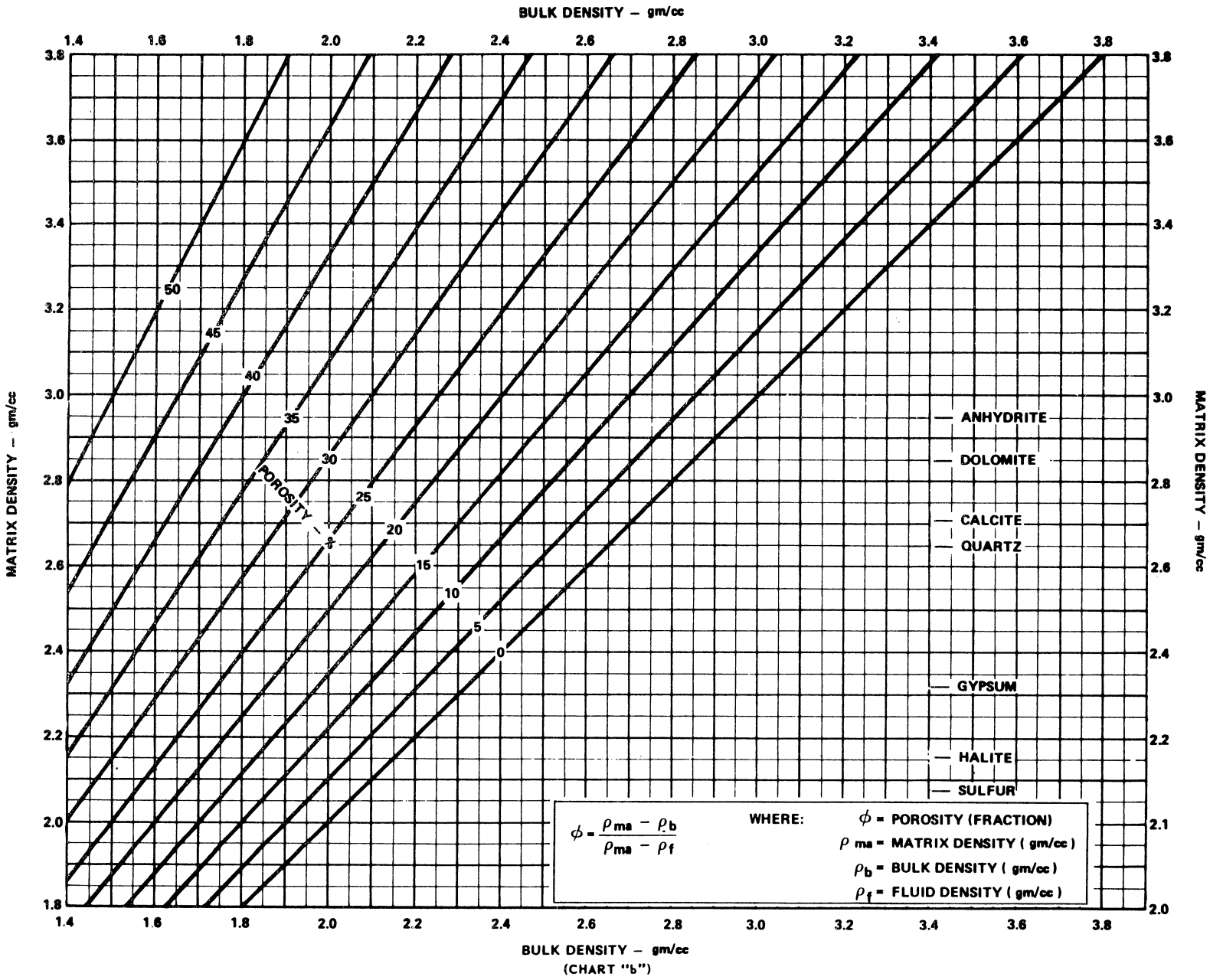
(Density Log Calibration to Z/A=0.5)



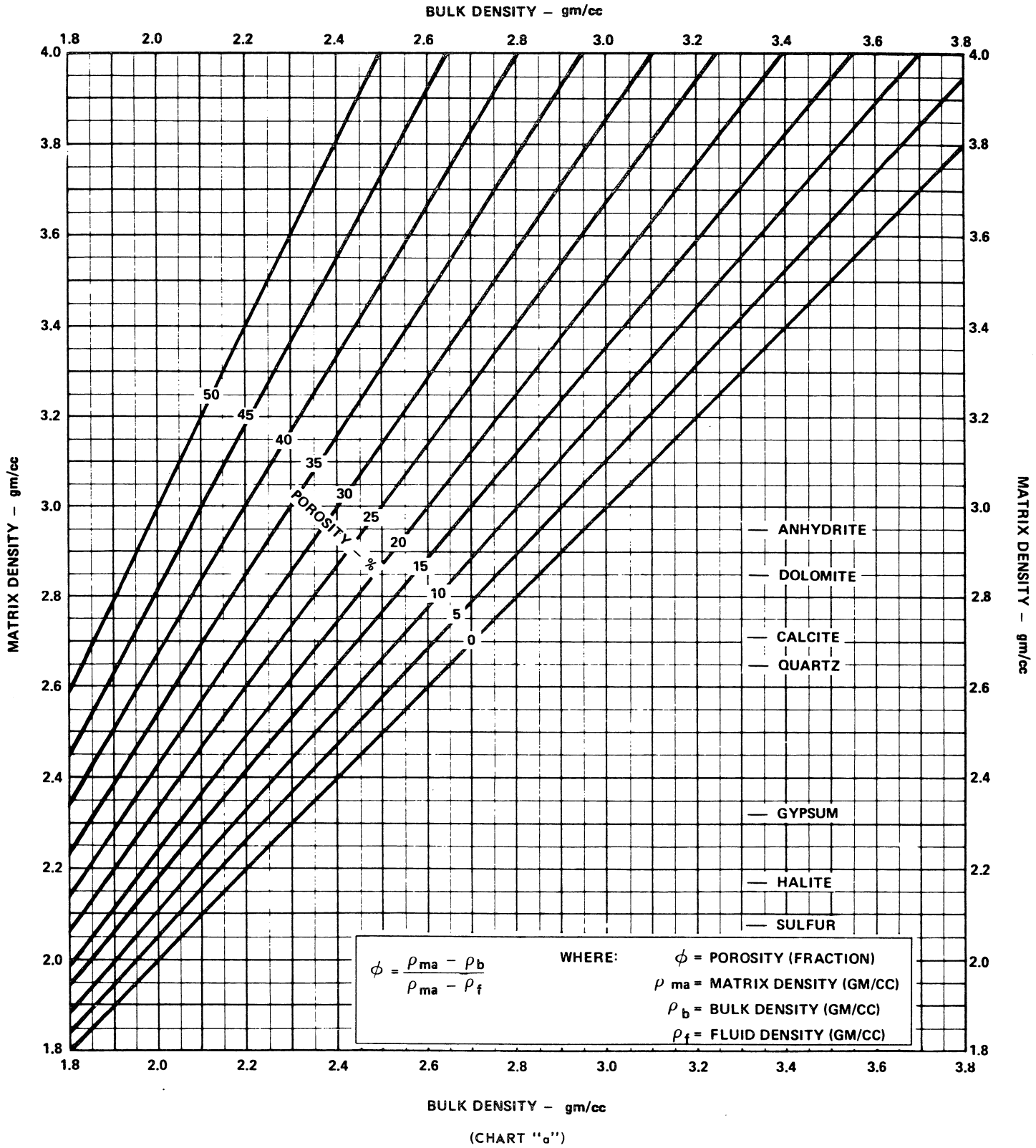
GAS DETECTION AND POROSITY DETERMINATION IN SANDS FROM DENSITY – NEUTRON LOG CROSS PLOTTING



CALCULATION OF POROSITY FROM BULK DENSITY (GAS FILLED HOLES, $\rho_f = 0$)



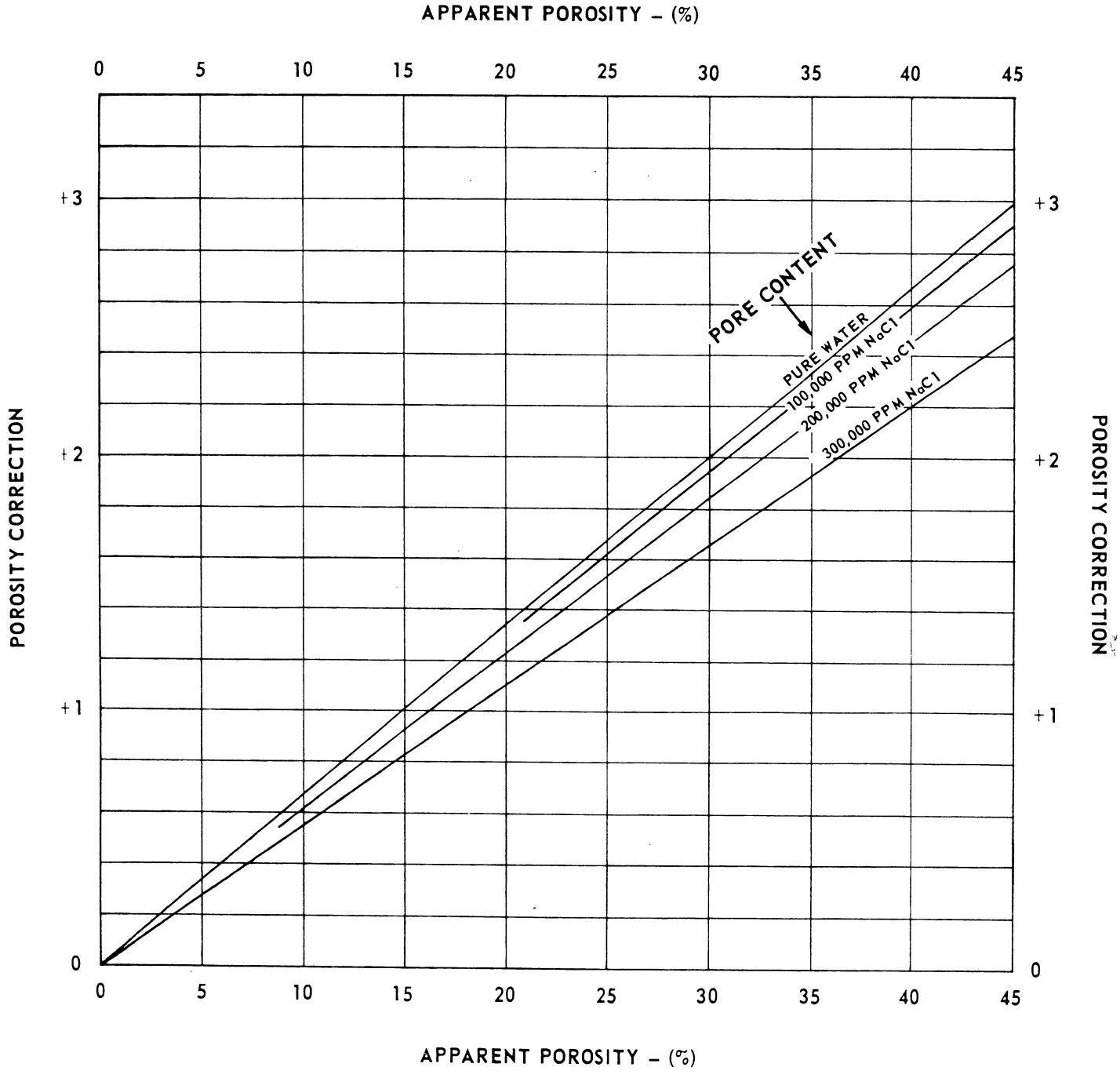
CALCULATION OF POROSITY FROM BULK DENSITY (WATER FILLED HOLES, $\rho_f = 1.0$)



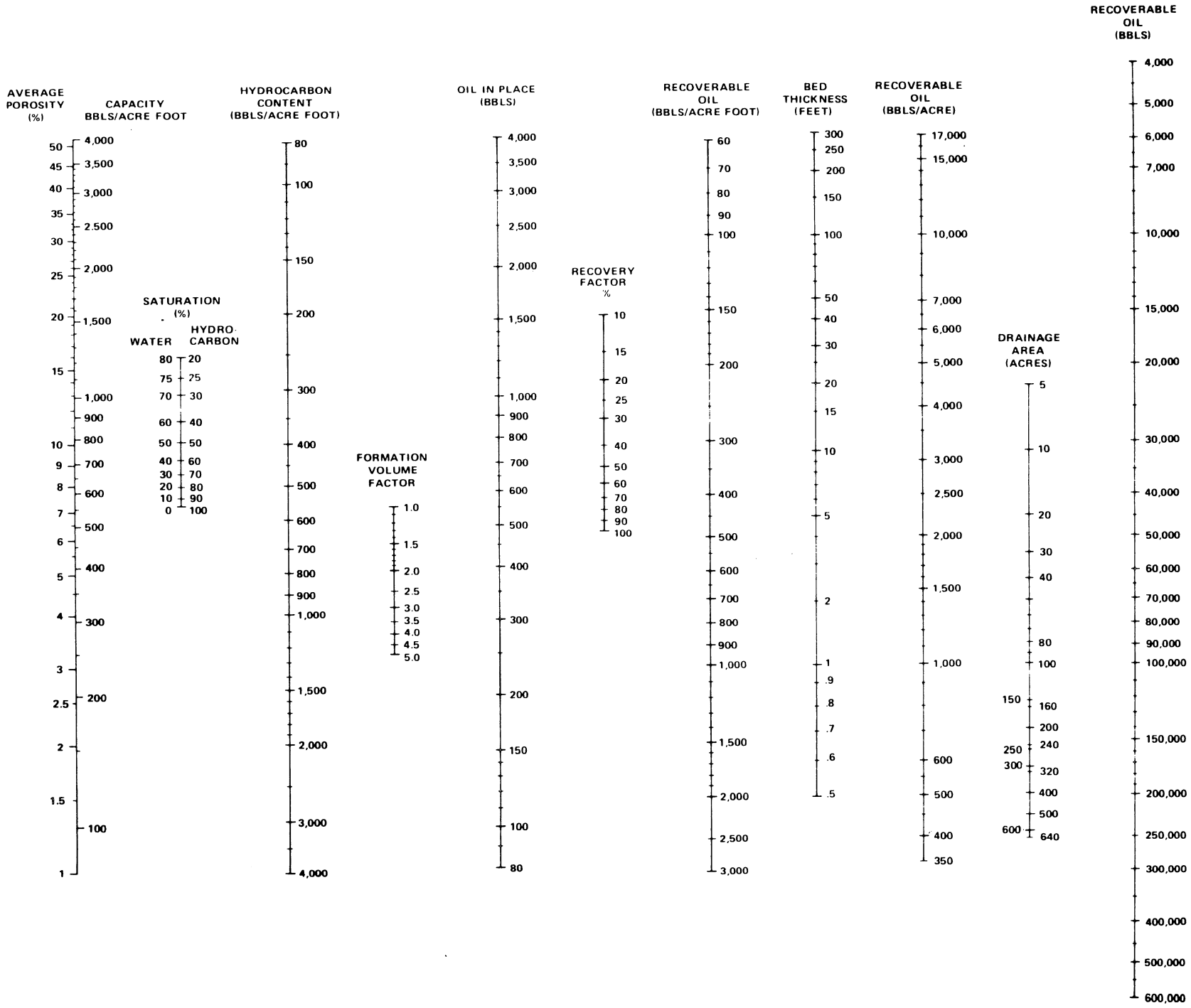
(CHART "a")

Z/A RATIO EFFECTS ON SAND POROSITY CALCULATION WHERE ρ_{ma} = 2.655, Z/A = 0.499

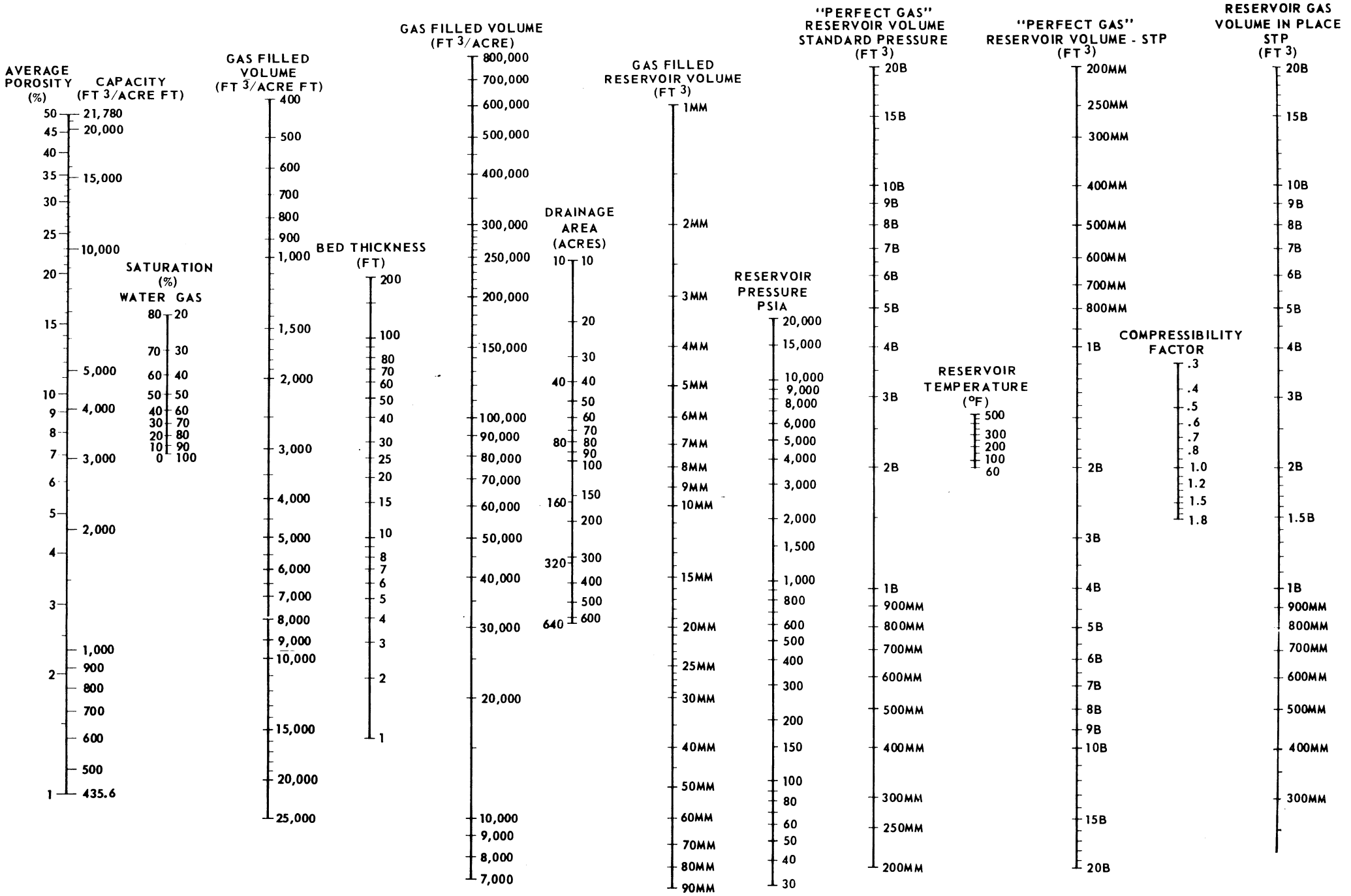
(FOR TOOLS CALIBRATED TO Z/A = 0.5)



OIL RESERVE NOMOGRAPH



GAS RESERVE NOMOGRAPH



COMMON DENSITY DERIVED POROSITY CORRECTION FOR CHANGE IN MATRIX DENSITY*

$$\phi_D = \frac{\rho_{ma} - \rho_b}{\rho_{ma} - \rho_f}$$

$(\rho_f = 1.0)$

ASSUMED MATRIX DENSITY (GM/CC)

ACTUAL MATRIX DENSITY - GM/CC	(Anhydrite) 2.95	(Dolomite) 2.85	(Calcite) 2.71	(Quartz) 2.65	(Gypsum) 2.32	(Halite) 2.16	(Sulfur) 2.08
2.95	0	+ 5	+ 13	+ 16	+ 33	+ 42	+ 45
2.85	− 5	0	+ 7	+ 10	+ 29	+ 38	+ 42
2.71	−13	− 7	0	+ 3	+ 27	+ 32	+ 36
2.65	−16	−10	− 3	0	+ 20	+ 30	+ 34
2.32	−33	−29	−27	−20	0	+ 12	+ 18
2.16	−42	−38	−32	−30	−12	0	+ 13
2.08	−45	−42	−36	−34	−18	−13	0

*This tables gives the error values at the zero porosity level. For other porosities these values should be multiplied by $(100 - \phi\%)/100$.

GULF COAST SHALE DENSITIES

Depth		Bulk Densities
0	0 METERS	1.80
2000′	610	2.20
4000′	1220	2.34
6000′	1830	2.44
8000′	2440	2.52
10000′	3050	2.57
12000′	3660	2.60
16000′	4880	2.63

SONIC DENSITY CROSS PLOT FOR SHALE CONTENT