NMOCC CASE NO. 9802

ORYX ENERGY EXHIBIT NO. 10

JANUARY 18, 1990

INDIAN BASIN FIELD

RESERVOIR SIMULATION STUDY

MODEL PROGRAM SOFTWARE

VIP (VECTORIZED IMPLICIT PROGRAM) CORE AND EXEC MODULES

- DEVELOPED BY J. S. NOLEN AND ASSOCIATES HOUSTON, TEXAS
- THREE DIMENSIONAL, THREE-PHASE (OIL, GAS, WATER)
- GAS PROPERTIES DESCRIBED BY INPUT OF GAS DEVIATION FACTOR AND VISCOSITY
- ACCOUNTS FOR GRAVITY, VISCOUS, AND CAPILLARY FORCES USES MATHMATICAL EQUATIONS FOR FLUID FLOW COMMON TO ALL MODERN RESERVOIR SIMULATION PROGRAMS
- RESULTS COMPARED AGAINST OTHER INDUSTRY PRODUCTS IN SOCIETY OF PETROLEUM ENGINEERS COMPARITIVE TEST, (JOURNAL OF PETROLEUM TECHNOLOGY, MARCH 1986)
- USED BY OTHER MAJOR OIL COMPANIES INCLUDING CONOCO, PHILLIPS, STANDARD OIL, AND UNOCAL

ORYX ENERGY COMPANY'S EXPERIENCE

- EXTENSIVELY TESTED AND BENCHMARKED PROGRAM AGAINST OTHER PUBLICLY AVAILABLE SOFTWARE
- HAS BEEN USED TO MODEL NUMEROUS RESERVOIRS OF VARIOUS TYPES SINCE ACQUISITION IN 1983

ORYX ENERGY COMPANY

INDIAN BASIN FIELD

RESERVOIR SIMULATION STUDY

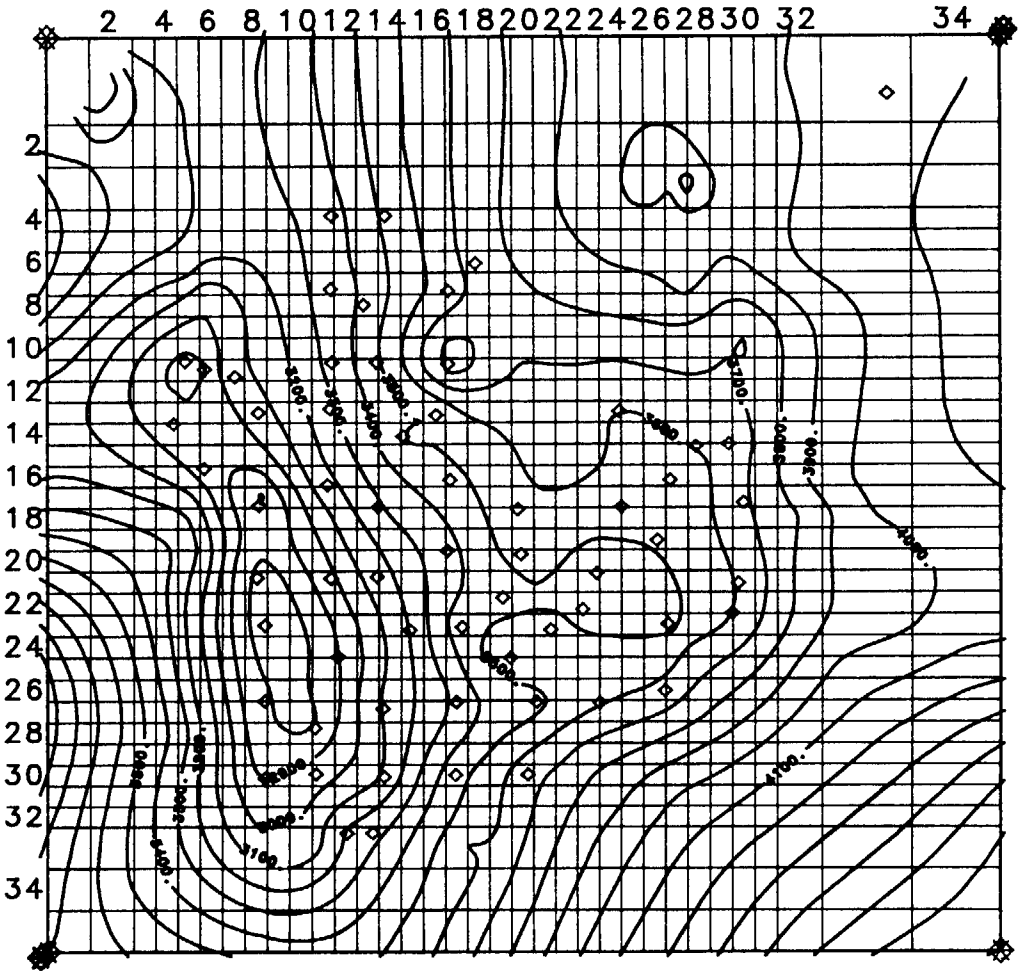
RESERVOIR CONDITIONS AND PROPERTIES

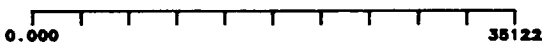
Initial Pressure	2946 PSIA
Temperature	138 °F
Porosity	5% to 15%
Irreducible Water Saturation	20%
Critical Gas Saturation	1%
OGIP	1.92 TCF
Rock Compressibility	6×10^{-6} 1/PSI
Permeability	1 to 40 MD

GAS PROPERTIES

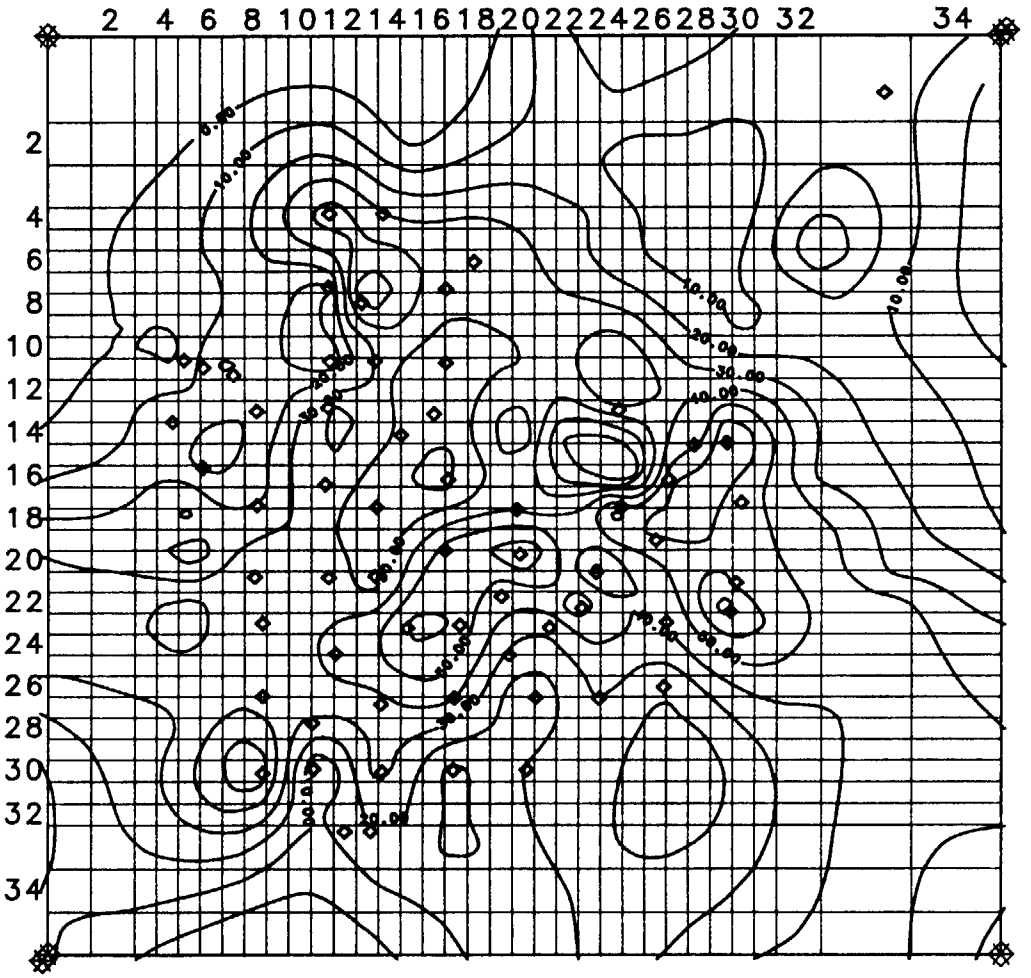
Initial Gas Deviation Factor	.799
Initial Gas Viscosity	.021 CP

Top of Structure -- Zone 01

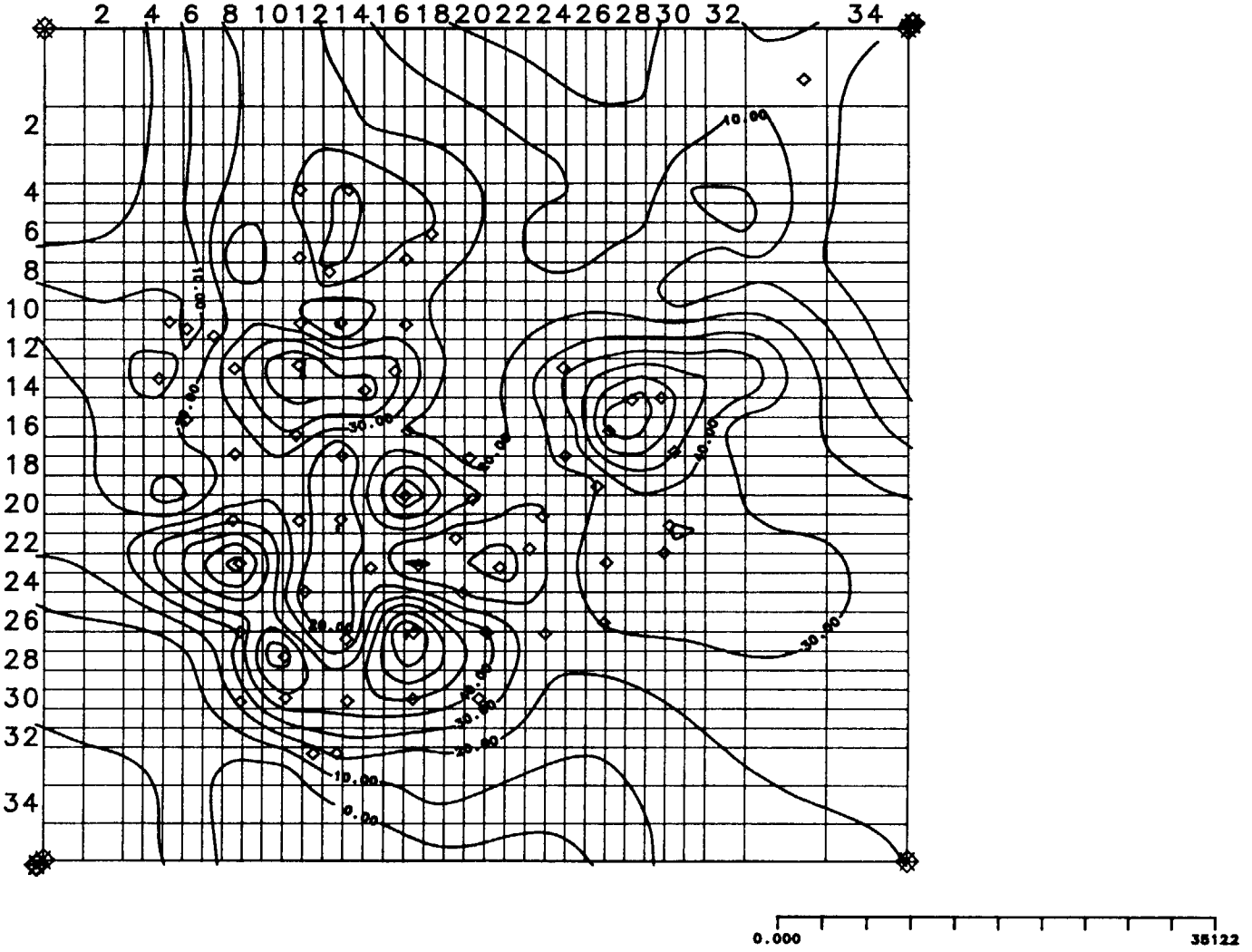




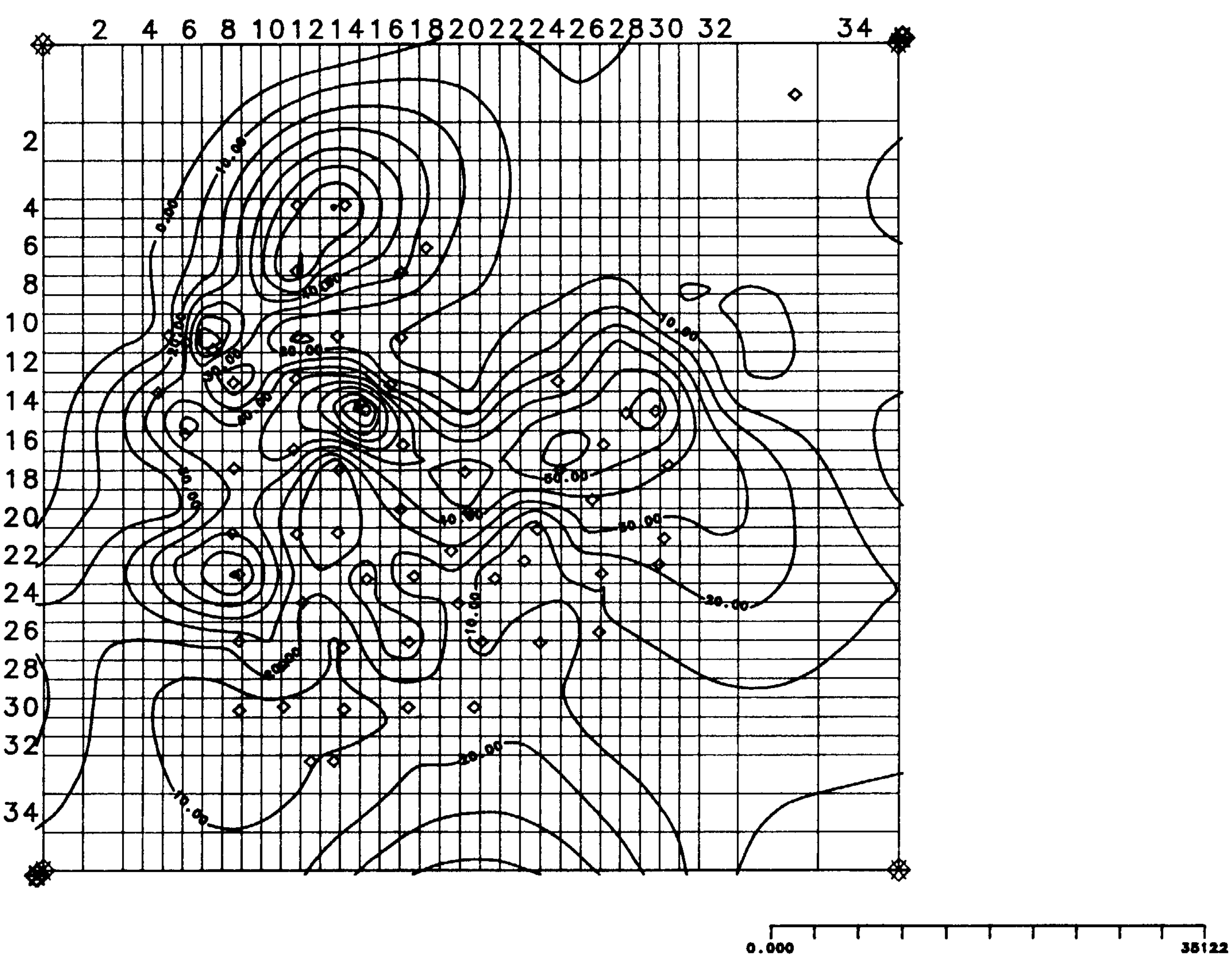
Net Thickness -- Zone 01



Net Thickness -- Zone 02



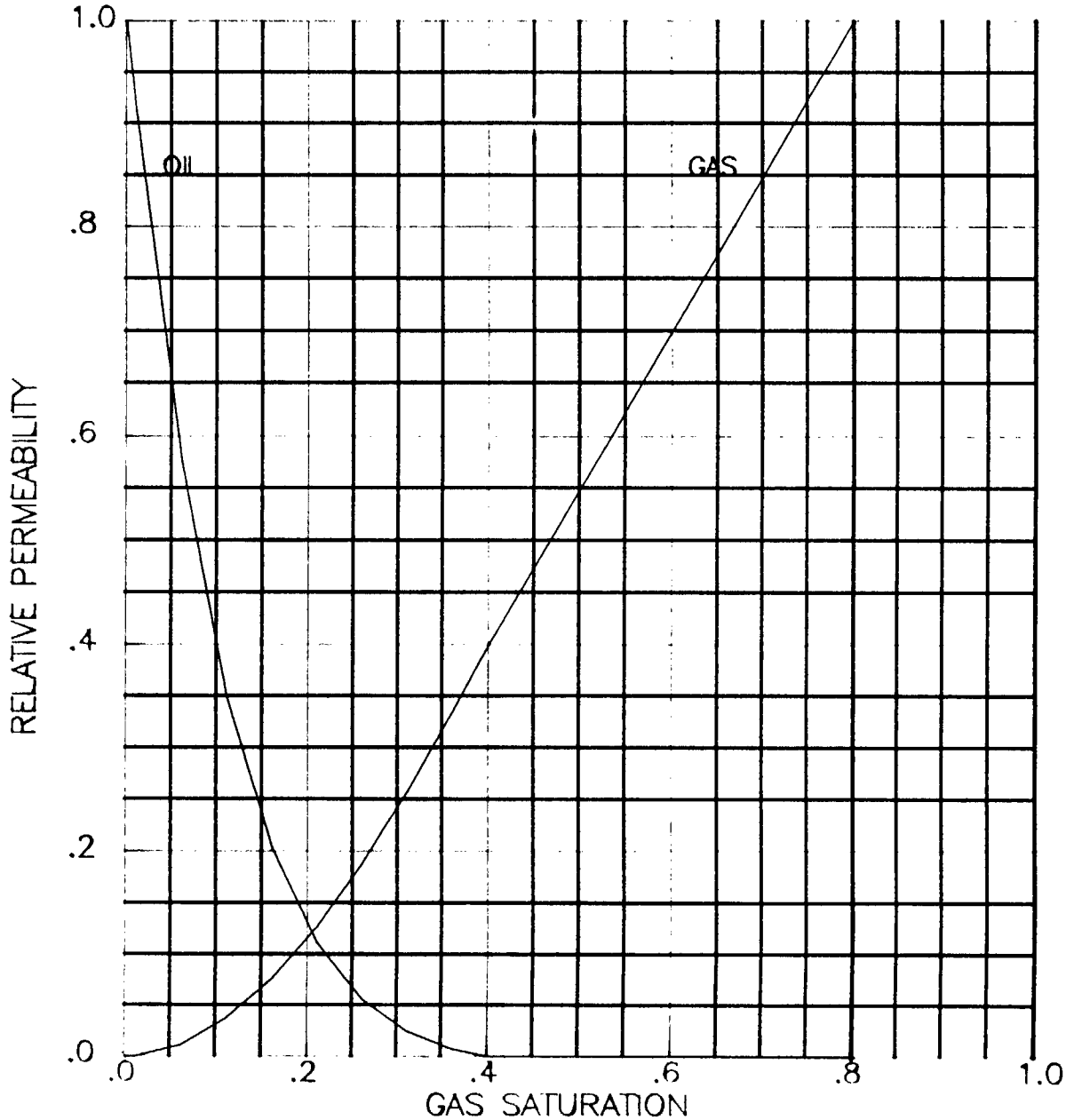
Net Thickness — Zone 03

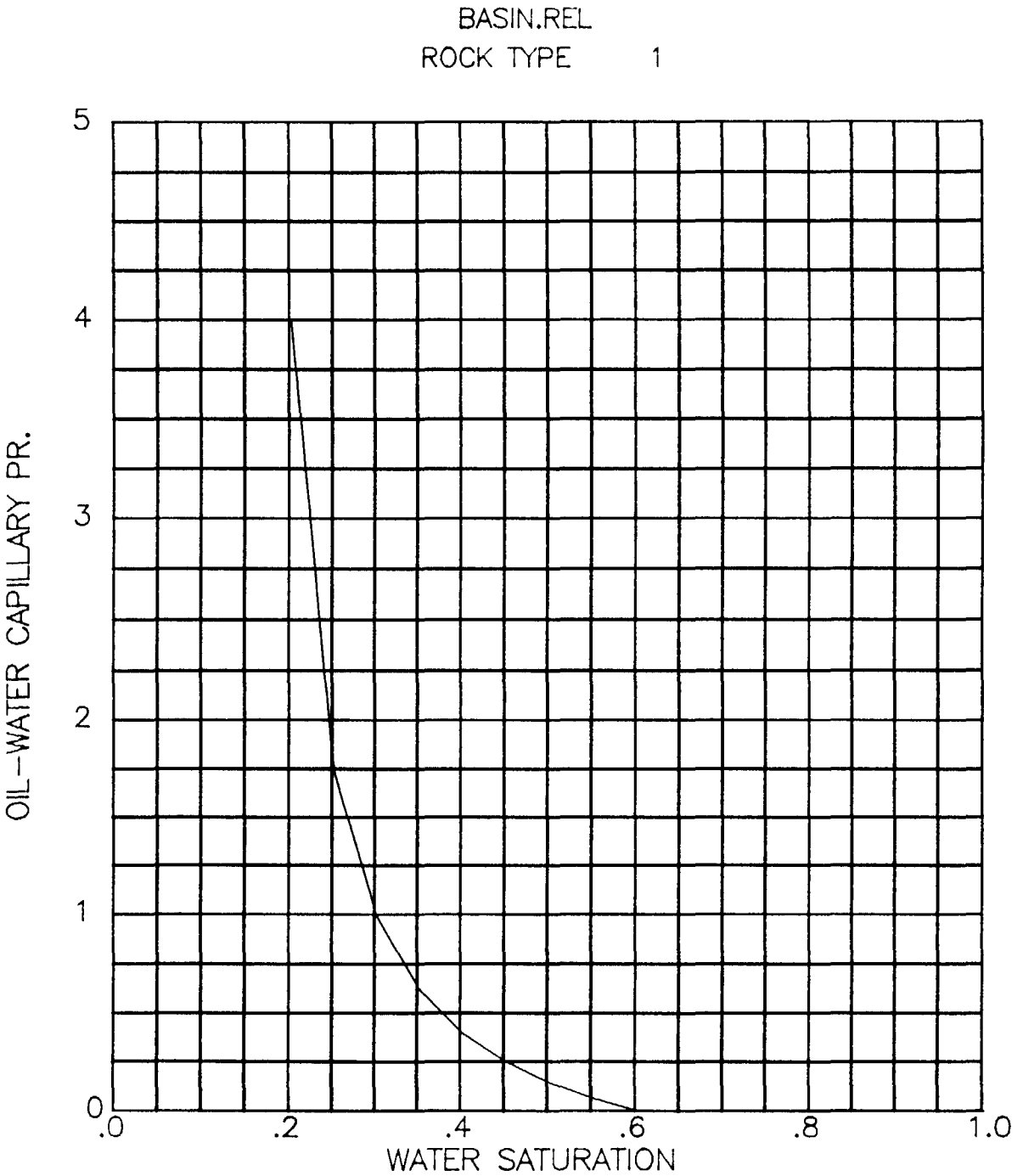


BASIN.REL

ROCK TYPE 1

NG = 2.0000 NOG = 6.0000
KRGRO = .4000 SGIR = .0100 SWIR = .2000 SORG = .4000

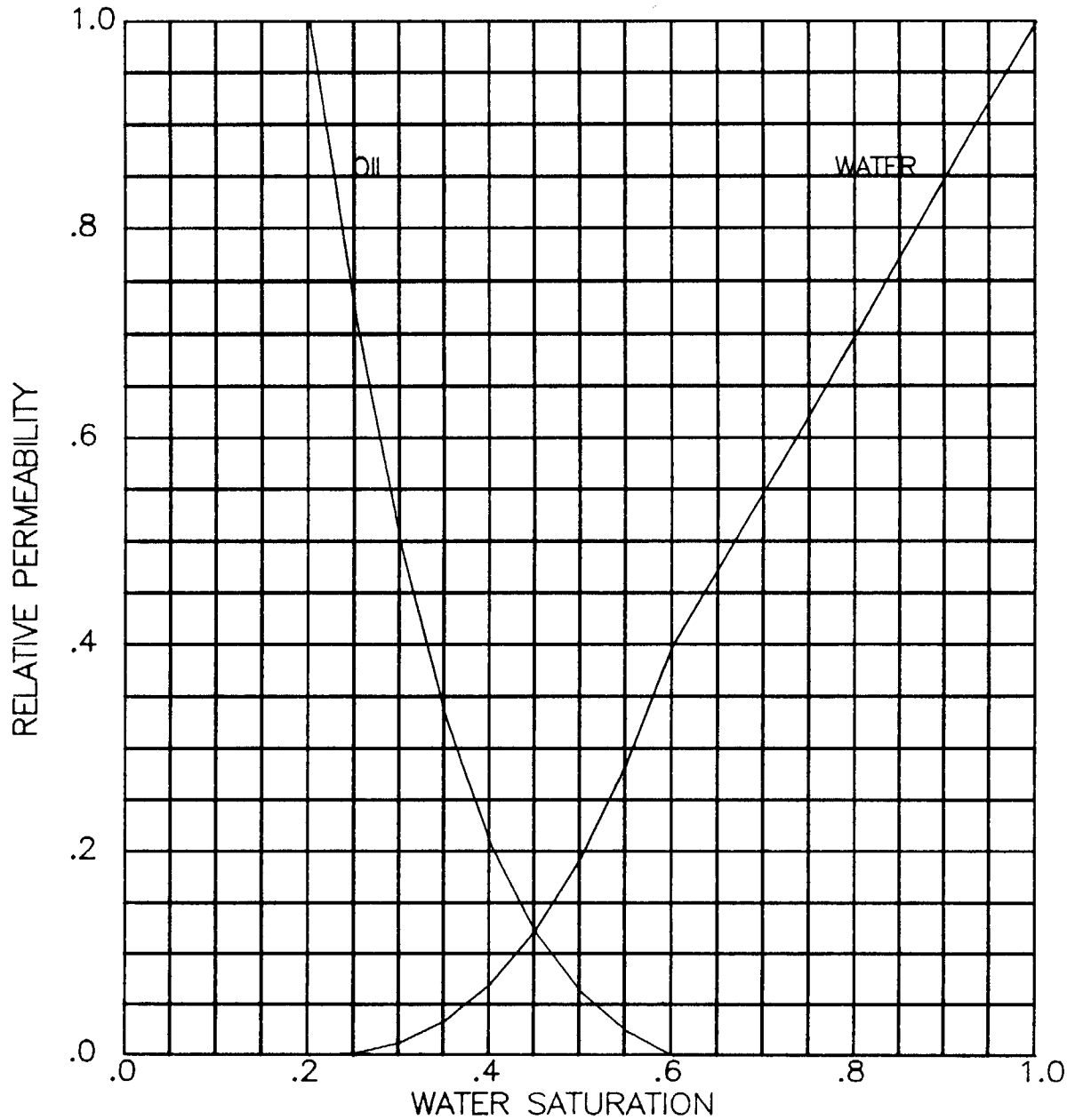



BASIN.REL
ROCK TYPE 1
OIL-WATER CAPILLARY PR.
5
4
3
2
1
0
.0
.2
.4
.6
.8
1.0
WATER SATURATION

BASIN.REL

ROCK TYPE 1

NW = 2.5000 NOW = 6.0000
KRWRO = .4000 KROCW = 1.0000 SWIR = .2000 SORW = .4000



INDIAN BASIN

HISTORY MATCH