THE MEASUREMENT OF PRESSURE GRADIENTS HORIZONTALLY ACROSS THE RESERVOIR

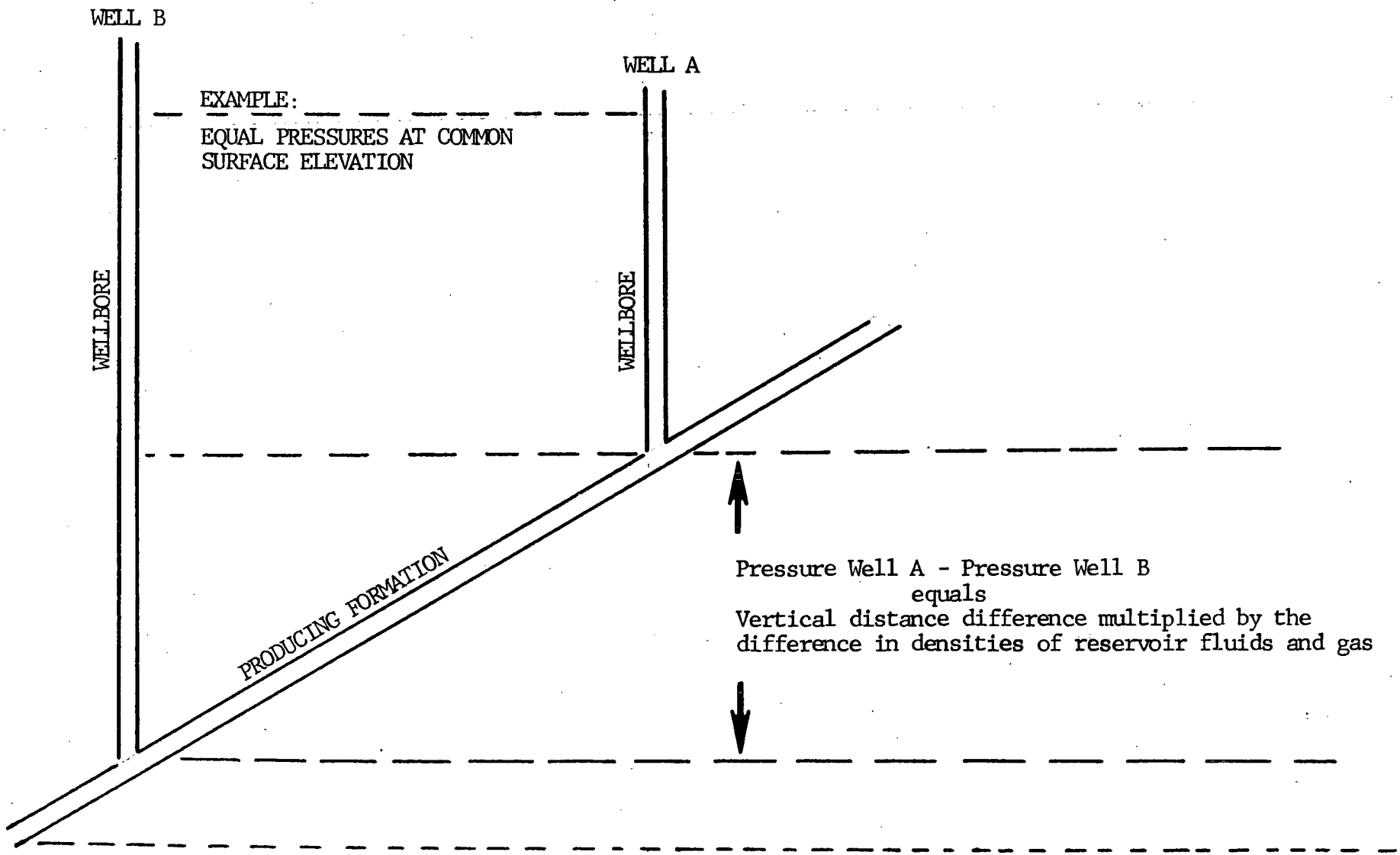
The infirmities of bottom hole pressure surveys, as described earlier, prevent them from being useful for determining small pressure differences horizontally across the reservoir.

These infirmities are eliminated through use of surface pressures - where applicable - as in the November pressure survey conducted by Benson-Montin-Greer on unit wells. The wells involved had gas columns from the surface to the pay zone; and since the structurally higher wells were in the higher pressure areas, the horizontal pressure gradient as shown by the surface pressures, adjusted to a common elevation, show the minimum pressure gradient east to west across the reservoir.

The plat on the facing page shows why this is the case.

DATUM PRESSURE EQUALS WELLBORE FORMATION PRESSURE
ADJUSTED TO DATUM BY VERTICAL DISTANCE TO DATUM LEVEL
USING RESERVOIR DENSITY

FOR WELLS WITH GAS COLUMNS TO PAY ZONE
THE WELLS STRUCTUALLY HIGHER WILL HAVE GREATER DATUM PRESSURES
BY AN AMOUNT EQUAL TO THE VERTICAL DIFFERENCE IN STRUCTURAL
POSITION MULTIPLIED BY THE DIFFERENCE IN DENSITY
OF THE RESERVOIR FLUIDS AND GAS



CAÑADA OJITOS UNIT

WEST PUERTO CHIQUITO MANCOS POOL

LAN - MANCOS POOL

T 25 N

T 24 N

2 W

R 1 W

R 1 E

BENSON - MONTIN - GREER DRILLING CORP.

CAÑADA OJITOS UNIT
NOVEMBER 1987 SURFACE PRESSURE SURVEY

PRESSURES ADJUSTED TO COMMON ELEVATION OF 7500'

(From Case 9111, March, 1988 Benson - Montin - Greer Exhibit 1, Section G)

May, 1988

THE MEASUREMENT OF PRESSURE GRADIENTS HORIZONTALLY ACROSS THE RESERVOIR

The plat on the facing page shows the same information as that in Case 9111, B-M-G Exhibit 1, Section G.

Evident here is north-south permeability trends; and the fact that reservoir flow is east to west across the entire unit - even for the yellow and brown areas of small east-west pressure differential.