Pore Volume Reserve Calculation
South Mattix Unit No. 15
Fowler Upper Silurian Gas Pool

Interval	h (ft.)	ϕ (Avg.)	S_w (Avg.)	ϕh	$\phi h S_w$
7002'-10'	8'	9%	38%	.72	.274
7010'-22'	12'	10%	37%	1.2	.444
7022'-32'	10'	8%	39%	.8	.312
7032'-38'	6'	6%	45%	.36	.162
				3.08	1.19

Total h = 36' $\quad \phi_{avg} = 8.6\%$ $\quad S_w$ Avg. = 39%

Initial BHP = 2350 psi
Initial BHT = 129° F
Gas Gravity = 0.72
z_i = 0.77

Abandonment Pressure = 500 psi

$z_a = 0.965$

$$\text{Gas Reserves} = (43{,}560)\ (\phi)(h)(1-S_w)(A)\left[\frac{\frac{pi}{zi} - \frac{pa}{za}}{pb}\ \frac{tb}{t}\right]$$

where:

ϕ = porosity, fraction = 8.6%
h = net pay height = 36'
S_w = water saturation = 39%
A = drainage area = 56.6 acres
p_i = initial bottom hole pressure = 2350 psi
p_a = abandonment bottom hole pressure = 500 psi
z_i = initial gas compressibility factor = .77
z_a = abandonment gas compressibility factor = .927
P_b = pressure base = 15.025 psi
t_b = temperature base, °R
t = reservoir temperature, °R

$$\text{Gas Reserves} = (43{,}560)(.086)(36)(1-.39)(56.6)\left[\frac{\frac{2350}{.77} - \frac{500}{.927}}{15.025}\ \frac{520}{589}\right]$$

= 687.4 MMCF

Amoco Production Company
Case No. 9866
February 7, 1990
Exhibit No. //