

Fetkovich "Pot" Aquifer Gas Material Balance

$$\frac{P_R}{Z_{gR}} [1 - C_e (P_{ri} - P_R)] = \left(\frac{P_{ri}}{Z_{gi}} \right) \left[1 - \frac{G_P}{G} \right]$$

$$C_e = \frac{C_f + C_w S_{wc} + M (C_f + C_w)}{1 - S_{wc}} \quad *$$

$$M = \frac{V_{AQ} + V_{NUP}}{V_{PR}}$$

$V_{PR} \leftarrow$ PV containing gas

$$V_{PR} = \frac{HCPV_i}{1 - S_{wc}} = \frac{V_{pgi}}{1 - S_{wc}}$$

① Practical Consequence of $HCPV \neq \text{const}$

AQ ...
SL MB not valid

- ✓ $\frac{P_R}{Z_R}$
- ✓ G_P

"PIZ-Chm" : SL MB

Biggest reasons for deviation :

① Aquifer $\left\{ \begin{array}{l} ? \text{ Size } \pm \\ k_{AQ} \text{ ("net effect" of AQ } f(t)) \end{array} \right.$

Minimize Uncertainty:

- Include all known water
- HPHT reservoirs $C_e (C_f)$

- van Everdigen & Hurst (IA)
- Schilthuis
- Fetkovich (PSS)
- Pot

② Layered No-Crossflow Reservoirs (Fetkovich & et al)

Individual wells produce commingled
from 2+ more layers (non-communicating)



