

Alternative Methodologies

Generally may need to combine several types

1) Geologic & Geophysical Mapping, Cross sections, Data

- a) Formations with no surface exposure – generally L. Paleozoic & SE Colorado FM's (See XS)
- b) Geologic Separation from Surface exposures – See XS of DJ Basin west-bounding fault
- c) Basin-Center hydrocarbon accumulations requiring a “water-seal” (See XS)

2) Petrophysics & Reservoir data—

- a) Water R_w/Salinity calculations from logs showing lack of connection to surface (see Map)
- b) Reservoir pressure – continuity to surface, above/below hydrostatic
- c) Permeabilities (“Tight-gas” formations generally <0.1 mD. (0.1 mD is approx. 1×10^{-7} cm/sec or 2.7 x 10⁻⁴ ft/day— about that of landfill liner)
- d) Porosity & Storage Coefficient
- e) Distance from stream segment that contacts formation (s)
- f) Pumping rate and volume of water produced
- g) Reservoir pressures

3) Water chemistry

- a) Sampled and measure formation waters
- b) Measured Salinities
- c) Isotopes
- d) Age dating
- e) Exotic contents