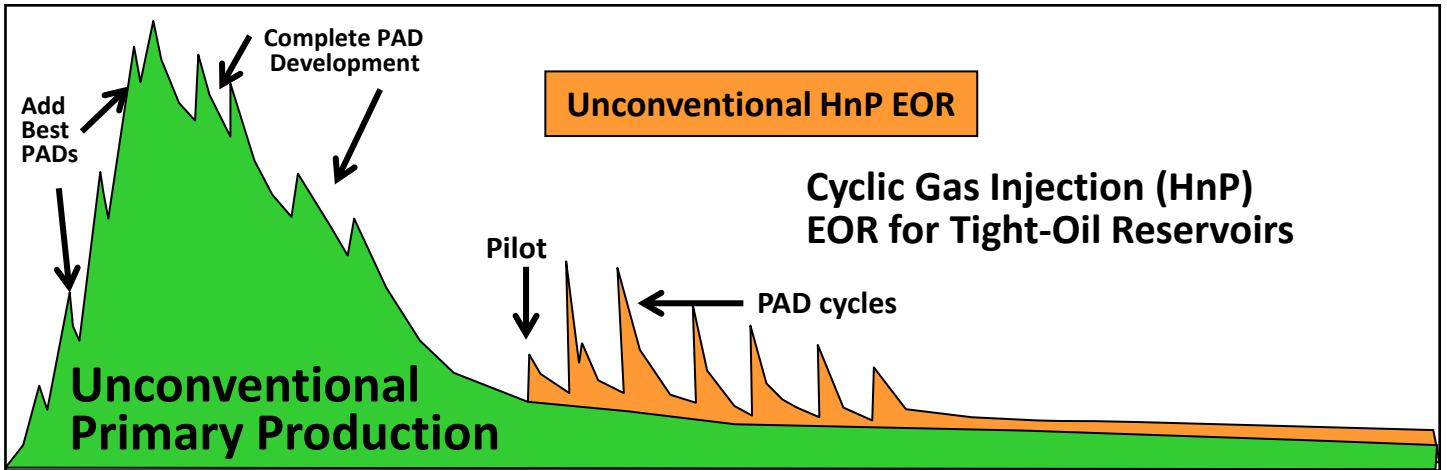


All EOR Projects Require Fit-for-Purpose Reservoir Characterization

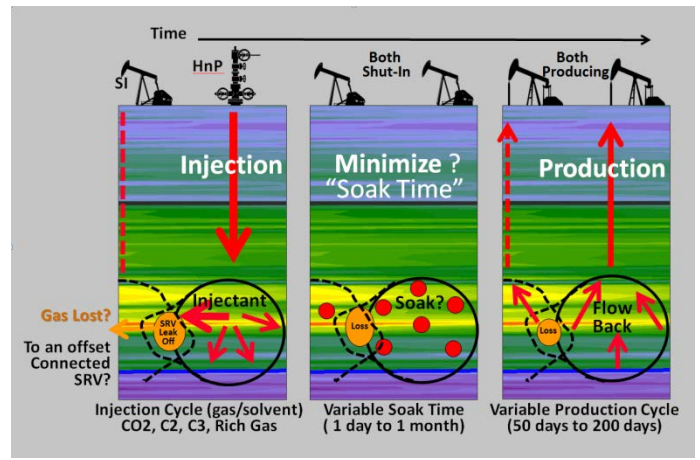
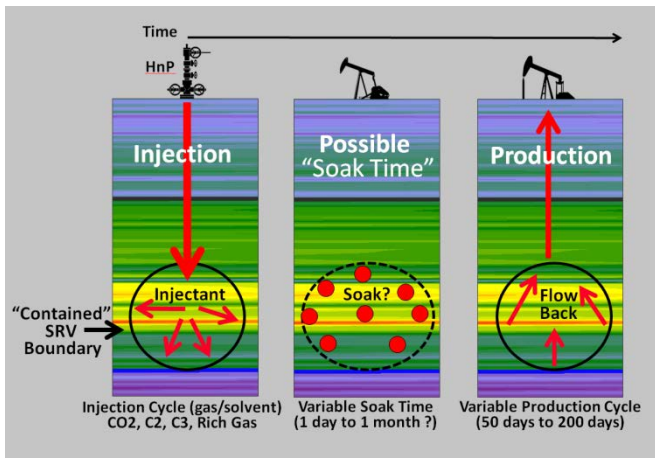


Huff-n-Puff Concepts

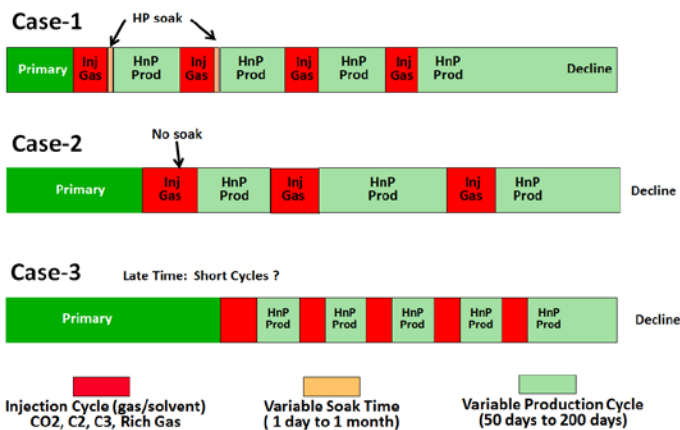
Ideal Case Independent SRVs
what you'd like to do

vs.

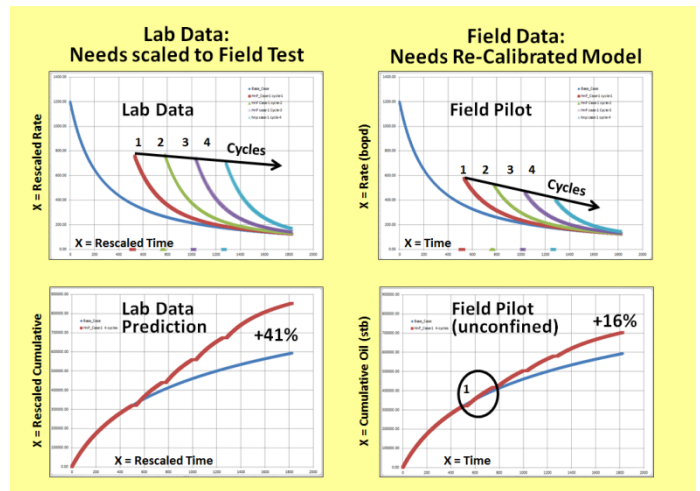
Real World SRV Leakoff Case
what might happen



Cycle Implementation Choices



Lab Data vs. Field Pilot Test Data



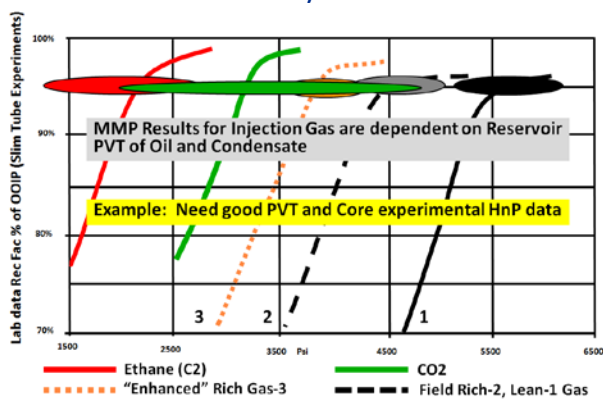
Unconventional EOR Huff-n-Puff Workflow

- Quick-look screening HnP injection for "Tight Oil" EOR viability
- Reservoir Characterization [Matrix, Fractures, SRV, Well Interference]
- Acquire Lab Data [PVT w/EOS, New Core HnP tests (Mcf/bbl/cycle)]
- Identify Key HnP Drivers [Timing, Injectant, BHP, Cycle Design]
- Flow-Simulation Sensitivities using relevant Geomodel + Lab Data to optimize pilot test design (HnP parameters, BHP increase)
- Verify Economics, then Design and Implement Field Pilot Test.
- Pilot Test Data Collection and Pilot Test Performance Analysis
- Re-Calibrate Flow-Sim model with Pilot Test data, New predictions
- Verify Economics, Design and Implement Multi-Pad HnP sequence

Variables to Watch Out for or to Control

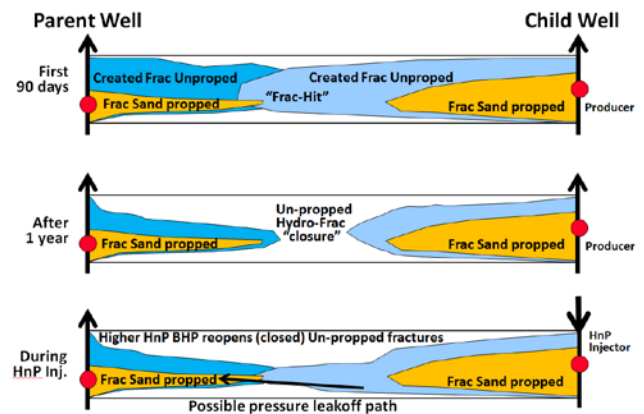
HnP EOR Injection Fluid Choices

Which gas to inject? and What BHP increase?
For: Maximum-Recovery or Cost-Effective EOR



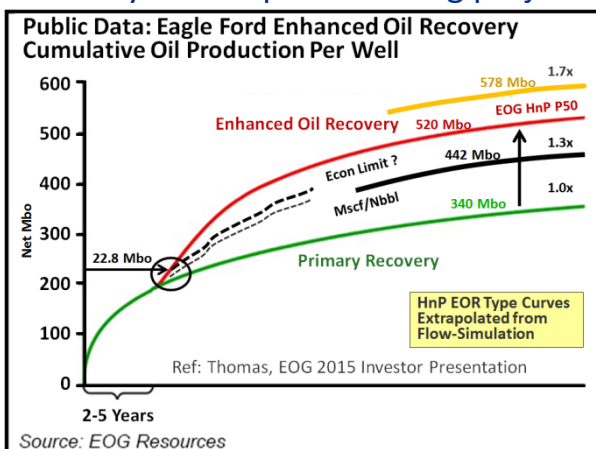
Geomechanics:

SRV stress change with HnP injection



Data Pitfalls: Screening EOR HnP

carefully review public analog projects



EOR HnP "Economic Optimization"

EOR timeline

