

## Gas-Cycling EOR in Unconventional Reservoirs

### Course Summary

Interest continues to grow in the application of "Huff and Puff" gas-cycling enhanced oil recovery (GCEOR) for unconventional reservoirs. EOG has published results from their GCEOR projects indicating many benefits that they have derived from their EOR applications including 30 to 70% incremental oil recovery, after primary depletion, as well as reporting incremental oil costs of 6 USD per BBL with significant increase in net present value of their reservoirs where they have applied GCEOR.

This one-day course is created to articulate the science of GCEOR with emphasis on the mechanisms involved and field design considerations. The course will be presented according to the following outline:

1. Introduction to Enhanced Oil Recovery (EOR)
2. The principles that govern Reservoir Optimization including EOR applications
3. What makes GCEOR an unique opportunity in unconventional reservoirs
4. Three mechanisms that must be understood in order to design GCEOR
5. How to tune an Equation of State model to account for these mechanisms
6. Detailed discussion of the relevant parameters in the design of GCEOR:
  - i. What is the optimal cycling pressure for GCEOR?
  - ii. What is the role of soak time?
  - iii. What is the role of injection gas composition?
  - iv. What effect does the level of reservoir depletion have on GCEOR?
  - v. The impact of reservoir properties such as fracture intensity, matrix permeability, water saturation, degree of undersaturation among others
7. Scale-up from laboratory to field using a compositional simulator
8. Future applications

### Instructor:

Dr. F. Brent Thomas, P.Eng. has been involved in enhanced oil recovery (EOR) since 1981. He has researched and designed EOR strategies using: 1) Continuous and Huff 'n Puff Gas injection with N<sub>2</sub>, CO<sub>2</sub>, Methane, Lean Gas, Flue Gas, LPG-enriched, C<sub>2</sub>+ 2) ASP floods 3) Polymers 4) Thermal – steam and fire floods 5) Profile modifiers. He has lectured on EOR themes world-wide since 1988. In 2003-2004 Brent was a Distinguished Lecturer for the SPE on the theme of Gas Condensate Reservoir Optimization. He was the recipient of Best Paper of the year awards from the JCPT and a distinguished author for the same organization.

In 2017, Brent organized a ten-company consortium for the purpose of understanding the phenomena of GCEOR in order to better design and implement Huff and Puff gas cycling EOR in unconventional reservoirs.

Please register with Dr. Thomas at [fbt@resopstrategies.com](mailto:fbt@resopstrategies.com).