

Evaluating Tight Oil and Gas Reservoirs

Summary

This 4 to 5 day class provides an extensive introduction to the exploration, appraisal and development of tight oil and gas reservoirs. It identifies the data that need to be collected, how to analyze and interpret them, and how to integrate and apply this knowledge to the decision-making process. Participants will develop a broad understanding of the practices and pitfalls in assessing these reservoirs, and will reinforce this by analyzing case study posters as teams. Attendees will receive a course notebook and 4 GBs of reference material.

Who Should Attend

This course is intended for geoscientists, petrophysicists, engineers, and managers who are seeking a comprehensive introduction to tight oil and gas. It is appropriate for those with no previous experience in tight rocks, those with some experience that want to broaden their understanding, and more experienced hands interested in new technologies and practices.

Course Content

1. Introduction: Definitions, technologies, global potential, commercial aspects, reserves
2. Gas shales and liquids-rich shales (2-3 days)
 - a. Geology: Origin, composition, deposition, pore types, natural fractures
 - b. Geochemistry: TOC, Rock-Eval, thermal maturity, sorption, liquids to gas transition
 - c. Geophysics: Geohazards, seismic attributes, micro-seismic, geomodeling
 - d. Petrophysics: Core analyses, log analyses, integration, practices and pitfalls
 - e. Geomechanics: Static & dynamic properties, stress calculations, frac stim design
 - f. Drilling/Completions: Drilling practices, completion types, refracs, simul-fracs
 - g. Well Performance: Well testing, flow regimes, forecasting, condensate blockage
 - h. Shale Gas Case Studies: Fayetteville, Haynesville, Montney, Horn River
 - i. Liquids-Rich Shale Case Studies: Eagle Ford, Marcellus, Woodford, Barnett
 - j. Sweet-spotting: Data to collect/integrate, strategies, decision trees, exit ramps
3. Tight sandstones and carbonates (1-2 days)
 - a. Geology: Depositional systems, diagenesis, stratigraphy, correlation, res. quality
 - b. Geophysics: Resolving geo-bodies, fractures, poroperms with 3D seismic & VSPs
 - c. Petrophysics: Routine and special core analyses, log analyses, field examples
 - d. Drilling and Completions: Best practices, problems, technologies and limitations
 - e. Well Performance: Well testing, material balance, modeling, rate vs time relations
 - f. Discrete vs basin-centered accumulations: Characteristics, differentiating them
 - g. TS Case Studies: Jonah, Wamsutter, Wattenberg, Chiswick Fields; Medina, Hamra
 - h. TC Case Studies: Bakken, Niobrara, Austin Chalk, Jean Marie, Kharab B, Baturaja
 - i. Identifying Sweetspots: Key data to collect/analyze, success criteria and exit ramps
4. Coal seam gas (0.5-1 day)
 - a. Deposition, coalification, fractures, hydrology, lab/log analyses, undersaturation, well performance, drilling/completions, appraisal and development strategies
 - b. Case studies: South Shale Ridge, Spanish Peaks, Drunkard's Wash, Castlegate fields