TG21

The Wamsutter Tight Gas Reservoir - Making Unconventional Gas Conventional Through Integrated Methodologies

R.B. Lieber* (BP), L.A. Banfield (BP) & N.A. Mcinnis (BP)

SUMMARY

The Wamsutter gas field located in Wyoming of the western US has been in development since the mid 1970s with over 2500 wells drilled to date. The field has gone through several generations of development, but had never been fully evaluated from an integrated perspective. The hypothesis was that by understanding the structural, stratigraphic, and petroleum systems framework within the basin; by improving the quality of the well log database; and integrating consistent and up to date production data insights would be gained into controls on reservoir productivity that could be used to optimize the future infill drilling program.

BP engaged in a classical integrated study of the field to accurately characterize the resource and facilitate full field development. Chronostratigraphic surfaces were mapped throughout the field using well log and seismic datasets. Depositional environments were interpreted using well logs calibrated to multiple conventional cores. The relationships observed between the gas and water production in different depositional environments can then be related to time equivalent deposits. This extrapolation provides a basis for the optimization of density and location of future infill drilling opportunities and an improved understanding of the variability associated with reservoir deliverability and water potential. Basin history and hydrocarbon migration timing were also factored in to help characterize the reservoir not only in its current framework, but in seeing how the accumulation evolved through time.

In many ways understanding Wamsutter has led BP to believe that this hydrocarbon accumulation is much more conventional than previously envisioned. Lessons learned at Wamsutter have implications to our understanding of unconventional hydrocarbon accumulations not only in North America, but in across the world as well.