
Using Basin Scale Understanding to Guide Infill Development in a Mature Gas Field, Wamsutter Field, Wyoming

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ABSTRACT

Wamsutter Field is a supergiant tight gas accumulation located in the eastern Green River Basin of Wyoming. Over the past two years, a regional characterization project has focused on developing a broader understanding of the basin as a way to improve future field development. 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, through normalization, and by 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.

Project results indicate that structure is a more significant controlling factor on this dominantly stratigraphic trap than previously realized. Height on structure at the time of migration and also within the modern structural configuration is an important control on production. The current petroleum systems model has charge occurring significantly earlier than previously thought and into rocks that were much better reservoir quality than the modern day range of 0.001-0.1 millidarcies. Finally, establishment of a chronostratigraphic framework has supported development of productivity relationships with three main sand body types: shoreface, estuarine deltaic and tidal, and fluvial, allowing characterization of the sand-body types relative to higher versus lower productivity and storage capacity.

Improved understanding of reservoir productivity has enabled division of the field into segments characterized by common geologic attributes with similar risk profiles. This field-wide understanding of risk has created the opportunity to consider various development strategies, with respect to infill drilling spacing, well pad size, and infill drilling pace, to match more optimally the risk profiles in the different segments.