

Integration of Coalbed Methane Exploration Data into a Practical Reservoir Model

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ABSTRACT

In our industry, we must often make the decision to commercialize and develop long-life, unconventional gas resources, like coalbed methane reservoirs, at a time when little is known about the true future production performance of a reservoir. This inverse relationship between the timing of decision-making and the availability of critical information increases risk significantly.

To solve this inverse problem, and help quantify the risk, we can integrate early exploration data into a comprehensive, yet practical reservoir model that predicts the future performance of different types of wells in a project. The integrated reservoir model should

- take into account the known variability of all reservoir properties derived from early exploration data, and
- be able to quantify the impact of this variability on the resource in place, and the future production of gas from the reservoir.

In this presentation, we illustrate how we used early exploration data from a coalbed methane reservoir to develop a probabilistic forecast of production performance. This probabilistic model coupled Monte Carlo sampling of known reservoir inputs with numerical reservoir simulation to predict the range of potential outcomes for the project. Using these probabilistic predictions, we were able to integrate reservoir risk with economic calculations to make mission-critical decisions early in the project.