

Evaluating Undeveloped Bakken Reserves: the Importance of a Statistical Approach for Investment Decisions

Jay Goldfarb¹

Abstract

The Middle Bakken has been geologically de-risked over a great extent of the thermally mature Bakken Shales in the US Williston Basin. The de-risked region contains a large number of undeveloped locations classified as reserves. In aggregate, undeveloped reserves are predictable since Bakken wells exhibit a repeatable distribution of EURs. However, reserves associated with individual locations are uncertain because offsetting wells have not been reliable indicators of proven undeveloped locations. Consequently, a statistical approach is essential when forecasting cash flows from development projects. To illustrate, a Bakken development project was evaluated using graphical analysis to examine the distribution of EURs from nearby producing wells and using the Monte-Carlo method to generate probabilistic forecasts for potential reserves, cash flow and return on investment. The results are useful for quantifying investment risk and determining the minimum number of wells and drilling rate required to achieve sufficient diversification to match an investors' tolerance for risk..

¹ Big Sky Energy Advisors

Jay Goldfarb Ph.D., is co-founder and Chief Executive Officer of Big Sky Energy Advisors, LLC, and Big Sky Energy Capital, LLC, a FINRA registered broker/dealer. He provides transaction advisory and consulting services to North American independent oil & gas producers. With nearly 15 years of investment banking experience, Dr. Goldfarb has assisted his clients with the execution of \$2 billion in acquisition, divestiture and financing transactions. Prior to founding Big Sky, Dr. Goldfarb was President of Woodbridge Oil & Gas Advisors, a Minneapolis-based investment bank, and a Vice President of Investment Banking at Mesriow Financial, a Chicago-based securities firm.

In addition to his investment banking experience, Dr. Goldfarb has 10 years of experience in the medical device and advanced materials industries, where he specialized in industrial statistics, manufacturing process optimization and new product development. He holds a B.S. in Chemical Engineering and a Ph.D. in Polymer Science and Engineering from the University of Massachusetts, Amherst. He is FINRA Series 7, 24, 28, 63, and 79 registered.