

## **Facies Control on Reservoir Quality of Hydrothermal Dolomites, Black River Group, Michigan Basin**

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The Ordovician Trenton and Black River carbonates of the Michigan Basin are significant hydrocarbon reservoirs that are characterized by hydrothermal dolomitization. Production has exceeded 132 million barrels of oil with forty new discoveries made in the past three years alone. The Albion-Scipio Trend is often used as a model for other prolific hydrothermal dolomite reservoirs around the world with current models focused on the structural control of reservoir quality dolomite. Evaluation of published examples of these reservoirs, however, suggests there is a secondary control on the lateral development of reservoir quality rock away from the major fault zones.

Previous studies of the Black River Group have not delimited a well-constrained depositional model. This study integrates high-resolution core interpretations, whole core analysis, and thin section evaluation to determine how primary depositional fabrics relate to reservoir quality, and to show how the predictability of reservoir units can be enhanced through the application of a sequence stratigraphic framework. For example, the highly-interconnected, burrow galleries of the bioturbated facies are a pervasive fabric in the Albion-Scipio Trend, which act as highly permeable, migration pathways for dolomitizing fluid extending laterally away from the major fault and fracture zones. By characterizing and constraining the distribution of dolomitized reservoir facies within the Albion-Scipio Trend, predictive distribution models may lead to more targeted exploration in hydrothermal altered reservoirs around the world.