

## **Niobrara and Mowry Source Rocks in Powder River and Wind River Basins: Asset Trend Analysis**

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The Niobrara (carbonate-based shale) and Mowry (siliceous-based shale) are important Cretaceous source rocks in the Northern Rocky Mountain Laramide structural basins. Both sequences were deposited within the Mid-Cretaceous Seaway, along with additional intervals (e.g., Mesaverde, Frontier) that have not yet been targeted for unconventional resources. Using a database of over 2000 samples, regional trends are extracted after the measured data is corrected to the original generation potential using the corresponding thermal maturity. It is noted that the thermal maturity contours are influenced by heat flow anomalies in the Powder River Basin, including an area of enhanced heat flow that coincides with the increased productivity in the southern area. In contrast, the productivity trend is forecast to be more predictable in the Wind River Basin as thermal maturity is better constrained by sedimentary loading. The results also document multiple organic facies in both the Niobrara and Mowry with a distinct shift from kerogen Type II/III (i.e., more gas-oil prone) to Type II (i.e., oil prone) above 2% TOC. These organic facies variations are important as they will exert control on the thermal stress required for peak hydrocarbon generation. Both basins are demonstrated to benefit from fluid inclusion stratigraphy (FIS) in the pre-drill acreage assessment stage.