

Lithofacies Characterization and Sequence Stratigraphic Framework of Some Gas-bearing Shales within the Horn River Basin and Cordova Embayment

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Until recently, shale gas plays have been developed as technical plays with minimal to moderate geologic investigation of what are often described as simply black shales. However, lateral and vertical variation of shale lithofacies can influence the source and reservoir quality within the greater shale unit. The mid-Late Devonian Evie, Otter Park, and Muskwa shales within the Horn River Basin and Cordova Embayment of northeastern British Columbia are currently being targeted for exploration and recovery of shale gas. The reservoir properties and estimated reserves of these organic rich, basinal shales are being reported as comparable to the Barnett shale in Texas.

Detailed core and well log characterization of lithofacies within the Horn River shales has revealed the following. The Evie shale is a medium grey, organic rich, calcareous, siliceous shale; the Otter Park shale is a dark grey, calcareous to non-calcareous, siliceous shale; and the Muskwa shale is a dark grey to black, organic rich, siliceous shale. The Evie and Muskwa shales are relatively more siliceous and high in organic content. A high frequency sequence stratigraphic framework has been developed based upon interpretation of depositional environment for each lithofacies and their stacking patterns. This characterization will aid in the identification of superior source, reservoir, and seal intervals/lithofacies for potential enhanced recovery of natural gas. Lithofacies stacking patterns within the sequence stratigraphic framework may be correlative throughout the basin, further improving exploration and development opportunities in the Horn River Basin.