

Medicine River Coals – Mannville Formation A More Promising CBM Target?

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As part of an on-going industry-funded study of unconventional gas resources of the Western Canada Sedimentary Basin, detailed work has been carried out over the past year in assessing the coalbed methane (CBM) potential of the Medicine River coals of the Upper Mannville Formation. This investigation has included core examination, case studies and detailed localized geological analysis. The intent has been to ascertain the relative prospectivity of these coals with respect to other coal-bearing intervals within the basin.

Within the Upper Mannville Formation, it has been well recognized that both coal seam net thickness and rank of coal increase downdip towards the Rocky Mountain thrust belt. However, with increasing depth of cover, reduced permeability becomes an increasing issue. At relatively shallow depth of cover (less than 700 meters), seam development is often thin and sporadic while rank of coal suggests biogenic rather than thermogenic gas production processes will prevail. Effort has been made to investigate coal thickness anomalies at depth of cover that would offer a balance between these opposing factors.

Recent CBM exploration efforts have indicated that measured permeability in Mannville coals at moderate depth of cover may offer economic potential. Preliminary data suggests that level of gas saturation and the nature of gas composition (low CO₂, significant C²⁺ components) may make this zone an excellent CBM target. The oily nature of the coal, perhaps an outcome of the basin-wide petroleum migration updip towards the northeast Alberta oil sand deposits, suggests minimal water production should be expected.