

Resource Potential of the Devonian Winnipegosis and Duperow Formations in Southwestern Manitoba

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Abstract

Only limited deep well information is available for southwestern Manitoba. Out of the 6409 vertical wells drilled in the region (as of March 15, 2013), only 184 wells penetrate Middle Devonian strata. Oil shows have been documented in all Devonian formations in Manitoba, with the exception of the Ashern Formation and Prairie Evaporite, but no economic discoveries have been made in these formations to date. This industry-supported project investigates the stratigraphy and sedimentology of the Winnipegosis and Duperow formations in Manitoba with the goal of understanding the controls on their reservoir and source rock potential and stimulating exploration of deep targets in the province.

The Winnipegosis Formation consists of fossiliferous dolostones and minor limestones which are divided into a lower member of ramp facies and an upper member of rimmed shelf-to-basin facies with isolated reefs. Potential exists for conventional reef plays and platform plays where subcrop or structural trapping occurs. Bituminous laminites, which are up to 70 cm thick, occur in ramp and platform strata, and have TOC values of 2 to 52%, suggesting potential for a resource play.

The Duperow Formation is a cyclical succession of platform limestones, dolostones and evaporites. The middle unit of the Wymark Member, which has massive dolostone with 20 to 35% porosity, is recognized as the main reservoir unit. Potential exists for structural, stratigraphic and subcrop traps. Rock-Eval pyrolysis of bituminous laminites has yielded preliminary TOC results of up to 3.9%, suggesting the potential for local sourcing and, perhaps optimistically, for a resource play.

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