

Revisiting Old Plays with New Ideas – Exploration Trends in Saskatchewan

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Summary

Rising oil prices, coupled with improved technologies such as horizontal wells and hydraulic fracturing techniques, along with an attractive fiscal regime that includes drilling incentives for horizontal oil wells, has attracted the industry to the Saskatchewan oil patch. This presentation will briefly highlight the key exploration focal points in Saskatchewan.

The Bakken play in southeastern Saskatchewan continues to dominate exploration and development in Saskatchewan. Notably, of the 527 wells completed in the Bakken in the southeast, more than 400 were drilled since 2005 and production from the Bakken in southeast Saskatchewan has increased from approximately 100 m³/day in 2004 to over 1,400 m³/day in 2007. The middle siltstone/sandstone member of the Bakken, which is sandwiched between two layers of organic-rich shale Bakken is commonly drilled horizontally and completed with large sand-fractures. The dolostones and dolarenites of the Upper Devonian Torquay Formation, underlying the Bakken Formation have also proven to be productive in Saskatchewan in a region along the Saskatchewan-Manitoba boundary.

In southwest Saskatchewan renewed interest in the Lower Shaunavon has seen several players picking up mineral rights in recent land sales, particularly in the area north of the town of Shaunavon. To date over 2000 wells have produced oil from the mixed carbonate – siliclastic reservoirs of the Upper Shaunavon. Nearly 50 wells have produced from a less explored Lower Shaunavon, from a fossiliferous-oolitic vuggy-mouldic porous interval which occurs in the upper few metres of the homogeneous carbonate mudstone that is characteristic of the lower member, along the paleosyncline that forms the Shaunavon Oil Field Trend.

Recent exploration trends in the Mississippian in southeastern Saskatchewan indicate a shift away from the traditional subcrop play, and are now of ten facies related. As indicated by landsale and drilling data, oolitic shoals in the Frobisher, and related rocks, seem to be where the majority of the attention has shifted. Also being explored are subtle linear structures and facies changes related to them.

Renewed interest in Saskatchewan oil sands north of the Clearwater River began again in the winter of 2005-2006, when Oil sands Quest Inc. commenced drilling exploration wells targeting the potential bitumen reservoir identified by the 1970's drilling activity. The bituminous oil sands of Saskatchewan have been reported to be up to 90 feet thick with preliminary research suggesting a fluvial facies for the sandstones of the Dina Formation (McMurray equivalent). Core examined in-house to date display a fining upward sequence of very coarse to medium grain quartz, exhibit high angle planar cross-bedding and low angle trough cross-bedding, excellent 35%+ porosity and are extremely bitumen saturated.

Gas exploration and drilling has slowed considerably in response to market conditions. However, several exploratory permits in shallow-gas prone areas of northeast Saskatchewan were sold last year indicating continued interest in that play.