

Tertiary Gravity Slides In Saskatchewan Creates Potential Traps For Cretaceous Shallow Gas

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ABSTRACT

Tertiary gravity slides off the Bearpaw Mountains in northern Montana are well known and traps large quantities of biogenic shallow gas. Less known is the fact that these slides extend into southwestern Saskatchewan.

The elongated dome structure of the Bearpaw Mountains was induced by basement tectonic and volcanic activity at Eocene time. The doming formed slope angles on the flanks of the structure of a few degrees. This combined with two bentonitic "sliding" layers in Upper Cretaceous strata, was enough to create gravity sliding, which is observed up to 50 km away from the mountains.

Well log information, seismic, but also gravity and creekology are helpful tools to delineate the structure and potential trapping. Repeat sections of Niobrara and Milk River formations indicates the presence of these gravity slides in southwestern Saskatchewan and the potential for trapping Cretaceous gas. The gravity sliding creates the possibilities for at least two types of play; a regional footwall play and a "pop up"/anticline hanging wall play. In Montana the reservoir consists mainly of the Eagle Formation, which is the time equivalent of the Milk River/Alderson Formation in Saskatchewan. In southwestern Saskatchewan several sandstones are potential reservoirs including the Medicine Hat Member, the Milk River/Alderson Formation and the Ribstone Creek Member of the Belly River Formation.

Two Montana gas fields, the Tiger Ridge and especially the Battle Creek, are potential analog for a new play in southwestern Saskatchewan. Battle Creek has produced more than 50 BCF and Tiger Ridge close to 400 BCF.