

## **Microfossils and Sequence Stratigraphy – Examples from the Viking and Westgate Formations in the Vicinity of the Kimberlite Fields of Central Saskatchewan**

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Benthic foraminifera occur widely in marine terrigenous clastic sediments of Western Canada Sedimentary Basin. Their distribution is controlled by many of the same processes that control sedimentation. This close link to sedimentation means that benthic foraminifera can be used to demarcate, test, and refine the basic components of sequence stratigraphic models. In this context, foraminiferal assemblages have been analyzed from a relatively complete depositional sequence in central Saskatchewan comprising the upper Viking Formation and the overlying Westgate Formation (*Miliammina manitobensis* Zone, late Albian).

The Viking contains a major sequence boundary marked by a changeover from terrestrial to marine microfossils. Lagoonal and marginal marine foraminiferal assemblages occur above the sequence boundary and indicate the initial transgressive systems tract constituting the upper Viking Formation. At the base of the Westgate, marine mudstones overlie transgressive lag deposits (flooding surface) and contain shallow-marine, coarse-grained, agglutinated foraminifera. Foraminiferal diversity and abundance increase upsection until a maximum is reached and deeper water species dominate (maximum marine flooding). Data suggests that a maximum flooding surface could be drawn at several closely spaced horizons. For practical purposes, a flooding zone is recognized rather than a flooding surface. The upper Westgate contains a lower diversity assemblage of agglutinated foraminifera indicating the regressive systems tract. The upper sequence boundary is marked by last occurrences of species. Application of sequence stratigraphy, coupled with detailed foraminiferal distributions, provides a reliable framework for sequence correlation through central Saskatchewan. The geochronology of the section is constrained by a limited number of radiometric dates (Pb/U).