

## **Stacking Geometry of the Parkman Sandstone and its Controls on Production: A Case Study of the Porcupine to K-Bar Area of the Powder River Basin.**

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### **ABSTRACT**

The Parkman Sandstone may prove to be the single largest unconventional sandstone oil reservoir play in the Powder River Basin; however, it has been plagued with variables that have impeded its development. Issues that have confounded operators include pay identification, water cut prediction and trap configuration. Five Parkman cores in the study area were analyzed and described at a very high resolution level. These descriptions were subsequently incorporated into subsurface open hole log characteristics to determine recognizable pattern signatures for facies and depositional interpretation. Through this, a model was developed consisting of a highstand systems tract bound at the top by a significant wave ravinement surface. This is overlain by a diachronous transgressive systems tract that onlaps and backsteps west-northwest in the study area. Four 3D seismic data sets covering a large portion of the study area were merged and re-processed with simultaneous inversion techniques to extract rock property volumes. After inversion, the data set revealed confirmation of the depositional model stacking pattern that otherwise cannot be seen in the traditional P-wave data. The two systems tracts have distinctly different internal stacking patterns which control sand body geometry. This appears to have a significant influence on productivity.