

Analysis of Sequence Architecture for Prediction of Hydrocarbon Reservoirs in Early Cretaceous Deposits in the Wuerxun Sag in Northeastern China

Liu, He^{1,2}, Meng, Qian², Lu, Yanfang³, Wu, Haibo², and Li, Junhui²

¹*Department of Earth Science, Northeast Petroleum University, Daqing, Heilongjiang, China*

²*Exploration and Development Institute, Daqing Oilfield Co. Ltd, Daqing, Heilongjiang, China*

³*Northeast Petroleum University, Daqing, Heilongjiang, China*

Abstract

Wuerxun Sag is one of the main oil and gas exploration and development zones in the Hailar Basin. Comprehensive research on the sequence architecture and depositional filling during the Early Cretaceous shows that filling sequences are controlled by tectonic evolution and have distinct phases. Under the tectonism of the episodic fault depression activities and the different activities of synsedimentary fracture, the sequence configuration can be divided into three types: steep-slope type, step-fault type and deep sub-sag type. Tectonism controls the sediment distribution process and sand accumulation. It plays an important role in the sequence architecture and distribution of the sedimentary systems of Wuerxun Sag. Results show that different tectonic units have characteristic sequence styles and depositional systems. Different sequence patterns also determine different kinds of reservoirs in different tectonic units. The fault-controlled steep-slope area mainly develops fault nosing structure reservoirs and fault lithologic reservoirs; step-fault belts in gentle slope areas develop fault-block reservoirs and fault-lithologic reservoirs; in deep sub-sag areas sand lens reservoirs develop. In addition, the margins of deep sub-sag areas probably develop fault-lithologic reservoirs.