

Influence of Volcanism on the Basin Fills and Petroleum Systems of the Songliao Basin, Northeast China

Pujun Wang¹, Taiji Yu¹, Ang Sun¹, Wenhua Wang¹, and Xiangyu Wei¹

¹Jilin University, China

ABSTRACT

Basin fills of the Songliao Basin are composed of three tectono-stratigraphic sequences. (1) The syn-rift stage is characterized by widespread fault-bounded grabens and volcanogenic successions. (2) The post-rift stage shows a special feature that the subsidence rate is abnormally high (mean of 103 m/Ma), and that flood basalt erupted along an axial wrench fault zone, associated with several marine intervals from the mid-Turonian to early Campanian. (3) Stretching stopped abruptly at approximately 79.1 Ma and was followed by uplift and rapid erosion (−145 m/Ma). The structural inversion stage included a continuous depocenter migration to the northwest. The basin was shrinking to demise as a result of changing subduction parameters of the Pacific subduction zone. In addition to the three tectonic basin cycles, a cyclic basin fill pattern exists with three volcanic basin fill intervals that alternate with sedimentary basin fill intervals. We observed an intricate link between the subsidence rate and type of basin fill. After each volcanic interval, the subsidence rates increased in a cyclic fashion during the sedimentary intervals.