Integrated Sedimentology and High-Resolution Stratigraphy of the Lower Cretaceous (Albian) Glauconitic Member (Mannville Group) in the Jenner Upper Mannville "E" Pool, southeast Alberta, Canada: Unconventional Reservoir Characteristics of a Conventional Oil Pool

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Deposition of the Albian Glauconitic Member (Mannville Group) in southeast Alberta succeeded a drop in relative sea level and the establishment of a number of broad incised valleys which downcut into underlying barrier and coastal plain deposits. Corresponding with a fall in relative sea level was the development of an extensive system of fluvial and tidal channels, of which reservoir sandstones of the Glauconitic Member were deposited. A subsequent period of transgression drowned this valley system and established a regional estuarine depositional setting with distinctive wave- and current-dominant bedforms and a brackish suite of trace fossils.

Currently, the Jenner "E" Pool produces oil from the Glauconitic Member and contains an estimated volume of oil in place of 33 million barrels. Locally, the reservoir sandstone body is stratigraphically trapped by later-stage, impermeable lithic channels which partially incise into the Glauconitic Member. Internally, the reservoir contains a number of distinct sub-facies, including granular to pebbly conglomerates, interbedded pedogenic mudstones and well-sorted moderate- to high-angle cross-stratified sandstones.

The successful development of the Jenner "E" Pool is dependent upon the recognition of the partitioning of the Glauconitic Member reservoir sandstone body into separate sub-facies. Currently, this study focuses on identifying distinct reservoir units from core and mapping their distribution across the pool boundaries in order to reconstruct a paleodepositional model. Such a model will aid in further development of the pool and may be used as an analog for future exploration of estuarine valley fill Mannville Group sediments in southeast Alberta.