

Internal Stratigraphy and Reservoir Facies of the Rock Creek Formation, central Alberta

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The Middle Jurassic Rock Creek Formation is the reservoir for many high-volume producers in west-central Alberta. It has been called the riskiest play in the Western Canada Basin because of a number of factors: 1) reservoirs and traps cannot be distinguished on seismic data, 2) internal stratigraphy is not understood, and 3) depositional facies are not clear.

The Rock Creek was deposited during a period of very slow subsidence resulting in a thin, areally-extensive sheet-like sandstone body. The cores displayed are typical of the Rock Creek over wide areas. They are overwhelmingly dominated by marine bioturbation and ripples with muddy lenses. The sands also show minor amounts of crossbedding, hummocky stratification, shell lags, mudclasts, and associated minor limestones. The burrowing is diverse, suggesting that the environment of deposition was close to normal marine salinity. The association of ripples and muddy lenses filling the troughs is best interpreted as flaser bedding, a tidal structure resulting from rapidly varying current strength and/or direction. However, tidal currents are usually too weak on open shelves to form the reserved sedimentary structures in sands; in most cases, wave-formed structures such as hummocky stratification predominates. Tidal features are more common in narrower bodies of water such as estuaries. Wide estuaries such as Chesapeake Bay or completely flooded drainage basins allow open-marine salinities and tidal currents. The Rock Creek sheet is composed of numerous estuarine channels cut into one another.