

Speciation of McMurray Formation Inclined Heterolithic Strata: Varying Depositional Character Along a Riverine Estuary System

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ABSTRACT

Within the Athabasca Oil Sands of northeastern Alberta, the lower Cretaceous (Aptian and older) McMurray Formation forms the most volumetrically significant portion of the deposit. Inclined Heterolithic Strata (IHS) and associated sand accumulations comprise a significant portion of the McMurray Formation, and represent some of the thickest and richest pay zones (Mossop, 1980). Through sedimentological and ichnological investigation (Pemberton et al., 1982; Ranger and Pemberton, 1992), and comparison to modern deposits (Smith, 1988a), a model of channel bank accretion within a riverine estuary has emerged to explain the IHS. While IHS has been given a cursory treatment in many subsequent studies of the McMurray Formation, little explanation of their genetic aspects has been presented. Of particular interest is the great variation of character observed between sets of IHS, and the processes and timing reflected in the cyclic sand-mud interbeds. This presentation has been undertaken to demonstrate the breadth of character inherent to IHS of the McMurray Formation, and inasmuch as is feasible, explain the depositional dynamics responsible for the observed character.