

A Potential Outcrop Analogue for a Secondary Reservoir in the McCully Gas Field, Sussex, New Brunswick: Lithofacies and Spectral Gamma-Ray Analysis

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Abstract

The McCully Gas Field, near Sussex, NB, comprises a succession of gas-filled sandstone units interbedded with organic-rich shale that are collectively included within the Hiram Brook Member of the Albert Formation (Horton Group, Tournaisian). Lithofacies and sequence stratigraphic interpretations have been based on limited core extracted from the reservoir interval in the gas field, and on broad interpretations of Albert Formation outcrop in the region. Our continuing research will provide a more detailed interpretation of the outcrops, in order to provide a better correlation with producing horizons in the subsurface and to develop a basin-wide sequence stratigraphic model.

The main reservoir in the McCully field is the 'A-sand', which from total-gamma-ray wireline logs is interpreted to be a sharply based, fining upward sandstone. An equivalent outcrop analogue has yet to be identified. In contrast, overlying secondary targets include overall sandstone packages that appear to coarsen upward over a scale of several tens of metres. Four roadcuts, comprising the same coarsening upward succession, have been identified as potentially correlative with the subsurface. Detailed sedimentological logging and spectral gamma ray data has been collected over an approximately 40 m thick (vertical) interval of the outcrop succession.

Preliminary interpretations indicate sedimentation in a periodically and progressively shallowing (likely prograding and laterally extensive) wave-dominated lake shoreface. A possible root horizon near the top of the succession could indicate a temporary lowering of lake-level and development of a shallow lagoon or back-swamp whereas an overlying, localized limestone conglomerate is identified as a storm-beach deposit.