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Dwayne F. Giggs and S. George Pemberton, University of Alberta, Edmonton, AB

Characterization of the Coalbed Methane Potential in the Western Canada Sedimentary Basin: Evidence from the Upper Cretaceous Horseshoe Canyon Formation of South-Central Alberta

The mature Western Canada Sedimentary Basin has extensive, well-documented coal resources, and coalbed methane is fast becoming a new and exciting play. In this era, because of the need for cleaner fuel sources, coal seams are being re-evaluated as a source of ecologically sound methane gas production. Because carbon dioxide is preferentially adsorbed to coal relative to methane, coal seams also have potential as a sink for greenhouse gases during and following methane production.

This study is focused on the coalbed methane potential of the Horseshoe Canyon Formation (Uppermost Cretaceous) of the Alberta Foreland Basin. After retreat of the Bearpaw Sea, the Horseshoe Canyon was deposited as a prograding clastic wedge during Campanian and Maastrichtian time. Deposits are mainly marginal marine but range from non-marine to marine successions that consist of interbedded mudstones, siltstones, and sandstones with ten coal seams.

The area of investigation is near Drumheller, Alberta, Canada, with extensive outcrop in the Red Deer River valley and its associated tributaries. This presentation concentrates on the methane production potential of the coal seams and the effects of the inter-seam strata on this production. The research strategy uses an integrated approach that incorporates detailed sedimentological, stratigraphic, and ichnological study of both cores and the extensive outcrop exposures. Upon completion, this study will highlight the great potential as well as some limitations of coalbed methane as a resource in this part of the Western Canada Sedimentary Basin.