

A high resolution stratigraphic and petrological investigation of the Braeburn Member, Charlie Lake Formation, Peace River Arch, northwestern Alberta: reservoir implications?

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The Middle Triassic Braeburn Member (Western Canadian Sedimentary Basin) is a relatively thin dolomitic sandstone/dolomite, formed in a sabkha environment. It is a part of the Charlie Lake Formation, which conformably overlies the Halfway Formation and is, in turn, conformably overlain by the Baldonnel Formation. Its structure and distribution have been influenced by activity along the Peace River Arch. The Braeburn Member has not been the subject of many studies but is now being re-evaluated as a potential oil producer. Location of potential reservoir facies has been problematic due to the variability in lithology, thickness and porosity over short distances. In this study a high-resolution evaluation of the Braeburn Member has been attempted to help determine the sedimentary and diagenetic conditions that might enhance porosity development.

Core specimens, thin sections and geophysical logs

comprise the database used in this study. Image analysis techniques were used to calculate thin section porosity. Core analysis revealed some bedding development and vuggy porosity. Anhydrite commonly occurs as nodules but also as infills in fractures. Preliminary petrological analyses indicated significant alteration. Most samples are dolomitic and exhibit early secondary porosity development; significant amounts of detrital quartz are present in all samples. Anhydrite appears in fractures and is common near the base of the Braeburn Member. Initial porosity results ranged from 8% to 17%. Porosity appears to be significantly enhanced in those samples located along the Braeburn Member subcrop edge and the up-dip (NE) edge of erosional outliers. These data will be used to re-evaluate the economic potential of recently discovered erosional outliers of the Braeburn Member.