

Diagenetic history and porosity evolution of Upper Carboniferous sandstones in the Deer Lake Basin, Western Newfoundland.

Reservoir quality is a critical risk factor and a cornerstone in understanding the possibility of potential hydrocarbon occurrences in sandstones. The diagenetic processes that resulted in cementation of Carboniferous sandstones of Deer Lake Basin in western Newfoundland are a major issue, which may still need further investigation to better understand the reservoir evolution. The variability in porosity and permeability laterally across the sequence and with burial may need to be better evaluated. Diagenesis and petrophysical properties can be interpreted from petrographic data and core analyses. Also, mineralogical compositions may vary with sequence-stratigraphic position. The Deer Lake Basin is an entirely non-marine basin associated with the Cabot fault zone. Structural and stratigraphic evidence strongly suggest dextral strike-slip movements along the fault zone during Tournaisian-Visean time. Earlier studies of equivalent clastic sediments in the Carboniferous Maritimes Basin, which includes a small part of Southwestern Newfoundland, consist mainly of alternating sandstones and mudstones with sandstone porosity between 0%, in heavily calcite cemented samples, and 28%. This may encourage the investigation of onshore equivalent sandstone sequence in Deer Lake Basin.

The objectives of this study are:

- (1) To investigate the characteristics of the main phases of cementation (e.g., diagenetic environments, types of cements, phases of cementation, temperature of cement precipitation, etc....) and their controls on distribution of porosity in the carboniferous sandstones of Deer Lake Basin in western Newfoundland and
- (2) To better understand the relationship of porosity and their distribution patterns across the sandstone beds (laterally) and also with depth.