

Reservoir quality and porosity evolution of Cambrian and Ordovician rift-drift and foreland basin sandstones, western Newfoundland

Project Description

This two-year project will utilize two sessions of field work, including river traversing and coastal mapping by kayak/boat to remote areas. Micro-analytical imaging methodologies on the collected samples will determine the reservoir quality and porosity evolution, as well as the mineralogy of prospective conventional onshore reservoirs in the Port au Port Peninsula (Hawke Bay Fm.) and Bay of Islands (Blow Me Down Brook Fm.) areas of western Newfoundland. The proposed field studies will identify lateral and/or vertical changes in stratigraphy (pinch-outs, unconformities, and others) and provide the geological context for collected rock samples. Reservoir quality will be determined through traditional thin-section petrography and high-resolution Mineral Liberation Analysis (using SEM-MLA) at Memorial University. Automated SEM-MLA mapping quantitatively evaluates the percentage, size, and type of detrital minerals, and hence also how rigid, ductile, and matrix components influence the reservoir quality. Primary and secondary porosity, cements, and other diagenetic features will also be identified in the SEM-MLA maps. Results of the 2016-17 PEEP project indicated, for example, the presence of chromite not only in the Ordovician foreland basin sandstones, but also in Blow Me Down Brook Fm sandstones. It is therefore proposed to complement the SEM-MLA analyses with in-situ mineral geochemistry at Memorial University, such as trace element studies of chromite and other key minerals. The combined SEM-MLA and geochemical results will define distinguishing features of the Cambrian vs. Ordovician strata and better constrain the prospectivity of these onshore rock units in western Newfoundland.