

The Laurentian Basin Revisited

Phonse Fagan*
A.J. Fagan Consulting Inc., St. John's, NL, Canada
info@petro-ed.com

and

Michael Enachescu
Memorial University, St. John's, NL, Canada

The Laurentian Basin covers an area of approximately 60,000 square km between the island of Newfoundland and province of Nova Scotia on the Atlantic coast of Canada. As petroleum exploration was restricted in the area until the recent resolution of international and inter-provincial boundary disputes, only one well has been drilled in the basin thus far. This well (Bandol #1) was drilled in French territory, and although no well report or logs have yet been released the operators have reported by in the media that it was a dry hole. Nevertheless this large basin with up to 20 km of Mesozoic/Cenozoic fill in its southern half and which onlaps Paleozoic sediments on its landward flank presents a very significant economic opportunity. Three dimensional "Q" seismic data has been shot over selected parts of the basin by current licence holders and additional drilling is expected to occur within the next couple of years. In preliminary work based on a regional seismic grid, the Geological Survey of Canada (GSC) estimated that the basin could contain recoverable resources of 8-9 trillion cubic feet of natural gas and 600 to 700 million barrels of oil at an average expectation. From a tectonic-stratigraphic point of view, the basin's location at the intersection of the Mesozoic Scotian Shelf extensional margin and the Southern Grand Banks extensional/strike slip margin, dictates that elements of both systems will be observed in its structural style and stratigraphy. Additionally, the basin partially overlies the confluence of the Paleozoic suture between the Avalon and Meguma terranes and Mesozoic Newfoundland Fracture Zone, and thus provides the opportunity to look for linkages and interplay between the Mesozoic faulting and the pre-existing basement fabric. Laurentian Basin is covered by both industry and government seismic and potential field data which can be tied to several wells in adjacent basins on the Scotian Shelf and Southern Grand Banks to decipher its structure and stratigraphy. In this regard the basin can be subdivided into tectono-stratigraphic packages which can be correlated along strike to the surrounding basins – including within the deep water depocentres. This study also addresses the basin's petroleum systems including the possibility of Mesozoic reservoirs being sourced by Paleozoic source rocks.