

Natural Fractures Characterization and Horizontal Drilling of an Oil-Prone Devonian Carbonate - Birth of a New Major Play in Eastern Canada

Jean-Sebastien Marcil¹

¹Junex

Abstract

The Galt Oil Project covers an area of 216 sq-km in Eastern Canada. Located in the Gaspesian Silurian-Devonian Basin, Galt is the most advanced oil project in Quebec in terms of geological knowledge and engineering, and in terms of delineation of the structure, wells drilled and resource potential. Based on publicly disseminated information, the project contains the largest Discovered and Undiscovered Oil Resource potential so far established on the Gasp and Eacute Peninsula by independent evaluators. In June 2015, the Best Estimate of the total Oil-Initially-In-Place resources was established at 557 million barrels for the Early Devonian Forillon and Indian Point formations of the Galt property. To make this discovery, the team of Junex has used two main tools: imaging technologies in logging and directional drilling.

Based on a number of in-depth studies performed by Junex and independent experts over the past two years, the Junex Galt #4HZ wellbore trajectory was designed to optimally intersect the maximum number of open, near-vertical, natural fractures in the Forillon. Drilled in Summer 2012, the Junex Galt #4 vertical well served as the vertical pilot hole portion for this horizontal wellbore. Image log tool plays a major role in the natural fractures characterization. Junex Galt #4HZ directionally drilled from the existing vertical wellbore to a total measured depth of 2,400 meters, of which 1,503 meters was drilled within the naturally fractured oil reservoir. Numerous significant oil shows associated with fracture porosity recorded during drilling and results from downhole well logging clearly indicate that the oil reservoir is intensely fractured and that the Galt #4HZ well has therefore achieved the goal of meeting an optimal number of near-vertical natural fractures present in the Forillon reservoir.

It is anticipated that additional horizontal drilling and the acquisition of a 3D seismic are realized by the end of the year 2016 to better define the reservoir properties and the field reserves. However, we can already state that the use of directional drilling based on well log image analysis played a significant role in the unlocking of this promising Devonian play.