

## **Fluid Contact Prediction at Hibernia Field, Offshore Newfoundland and Labrador, Canada**

Glen McCrimmon\*

Hibernia Management Dev. Co., St John's, Newfoundland, Canada  
glen.mccrimmon@exxonmobil.com

Robert Stokes and Bill Scott

Hibernia Management Dev. Co., St John's, Newfoundland, Canada

Peter Vrolijk

ExxonMobil Upstream Research Co., Houston, Texas, United States

and

Bill Richards and John Eastwood

ExxonMobil Canada, Halifax, Nova Scotia, Canada

### **Abstract**

The Hibernia Field, offshore Newfoundland and Labrador, is a structurally complex, stratigraphically simple field with approximately 1.5 Gbbl of original oil in place. The main reservoir intervals of the Lower Cretaceous Hibernia Formation formed in a braided fluvial environment and maintain on-structure permeabilities over 1 Darcy. Due to the structural complexity, simple field-wide extrapolation of known OWC's and GOC's has been problematic.

Application of Reservoir Connectivity Analysis (RCA), a rigorous, disciplined analytical approach to reconcile fluid contacts, pressures, and geologic interpretations within a field, led to recognition of key geometric controls on fluid contacts. Folding of base seal across the structure acts to segregate fluid columns and offset contacts while reservoir separation across faults isolates oil columns above juxtaposition spill points. In some areas, fault block geometries create pockets of structurally high, isolated and trapped water that are limited by the deepest point of reservoir juxtaposition across faults.

Putting these observations and inferences into local and regional context, we developed a predictive framework to explain fluid segregation and contact elevation for the Hibernia reservoir. Notably, this framework led to prediction of oil filled fault blocks downdip and adjacent to known water-bearing blocks and the recognition that previous interpretations significantly underestimated OWC elevation in other areas. Subsequent delineation drilling has proven the method and has already extended the known ODT by 300 m in the southeastern flank of the field.

**This information is confidential and proprietary, and shall not be used or distributed, directly or indirectly, in any form whatsoever without the written consent of ExxonMobil Canada Properties. ExxonMobil Canada Properties reserves all rights, title and interest in this information including without limitation, copyright.**