

## **EFFECT OF HYDRODYNAMICS ON SEALS IN STRATIGRAPHIC OR UNCONFORMITY TRAPS: CASE HISTORIES - UPDIP VS. DOWNDIP FLOW.**

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The effect of downdip hydrodynamic flow in preserving large oil and gas columns in stratigraphic traps with weak barriers will be discussed, utilizing Canadian field situations.

For example, in central and eastern Alberta, every Viking Formation gas and oil field from Provost to Westlock, is located in an area of downdip flow. In particular, the Joffre oil field with over 700 feet of column owes its existence to downdip flow. Entry pressures taken in the updip barrier facies show it is only capable of holding 50-100 feet under static conditions. Thus over 80% of the accumulation is due to downdip flow. By contrast, in western Alberta there are several Viking Formation oil fields located in an area of updip flow, but these are in every case, trapped against major lithologic barriers with high entry pressures (e.g. Ferrier, Garrington and Leafland Fields).

The talk will also illustrate the beneficial effects of downdip flow in retaining very long 600 foot oil columns in Midale unconformity traps in the Weyburn and Steelman Fields in southern Saskatchewan. This is in sharp contrast to the minor insignificant 90 foot column oil fields where updip flow exists in the underlying beds (Mission Canyon fields).