Triassic and Wabamun Carbonates: Effects of Pore Geometry on Resistivity Logs

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Abstract

It can be very difficult to differentiate between gas and water producing wells using porosity and resistivity logs alone, in the absence of core, in carbonate reservoirs. A major reason is the heterogeneous nature of pore geometries which can range from microporous to vuggy. The result is gas wells with different facies can have wildly different resistivity readings at similiar porosities. We must know the rocks if we are to do a good job of interpreting the logs.

Presented examples from Baldonnel dolomites in north east BC use core permeability and porosity data, thin sections, and mercury injection capillary pressures to illustrate why resistivity can vary by an order of magnitude in producing gas zones. Additional examples from Charlie Lake and Wabamun wells, with production and wireline formation test data but limited core, illustrate the difficulties of predicting production from resistivity logs.