

Tidal-Fluvial Sedimentology and Stratigraphy of the McMurray Formation in the Surmont Area of the Athabasca Oil Sands

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Abstract

An understanding of the complex organization of subsurface properties and architectural elements in the McMurray Formation is essential to successfully managing hydrocarbon recovery by steam-assisted gravity drainage (SAGD). Hybrid geocellular models provide a technique for capturing a detailed 3D characterization of reservoir architecture by subdividing the McMurray stratigraphy with a series of correlated surfaces that result from channel base migration. The resulting framework yields a stratigraphically-constrained grid whose cells are populated stochastically with geological properties and calibrated to an extensive dataset from delineation boreholes. Production data and time-lapse seismic volumes help calibrate successful numerical simulations of SAGD from these reservoir models.