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Multiple Play Types in the Hydrothermally Altered Beekmantown Group Carbonates of East-Central New York

Two play types may occur in the Cambro-Ordovician Beekmantown Group of the Mohawk Valley, New York: a laterally extensive matrix dolomite play in the Cambrian Little Falls Formation and a fault-related hydrothermal dolomite play in the overlying Ordovician Tribes Hill Formation. The cyclic Cambrian Little Falls Formation is composed of seven 3rd-order sequences that have mud-dominated carbonates in the TST and grain-rich carbonates in the HST. Some of the laterally extensive grain-dominated carbonates have excellent intercrystalline porosity that can be correlated across the 30-mile wide study area. Because the porosity zones are laterally extensive, four-way closures may be necessary to develop a good trap. The overlying Tribes Hill Formation carbonates are only dolomitized around faults. In one outcrop, the dolomite clearly follows NW-SE trending en echelon strike-slip faults; in others the dolomite may form around NE-SW trending normal faults. These faults were active during the Late Ordovician Taconic Orogeny. Because the dolomite pinches out laterally into tight limestone, there may be a play in the Tribes Hill Formation in diagenetic traps around faults similar to the Trenton Black River play. Although there is probably some early dolomite, most of the reservoir facies are probably in hydrothermal dolomite. This includes the coarse dolomitized grainstones and fracture and void filling saddle dolomite of the Little Falls and almost all of the dolomite in the Tribes Hill Formation. Other indicators of hydrothermal alteration include: quartz and sulfide-filled fractures and vugs, abundant anthraxolite, and a clear link between faults and dolomitization. Strontium isotopes, stable isotopes, trace elements and fluid inclusions all support a hydrothermal origin for the fracture-filling saddle dolomite and most of the matrix dolomite.