

The Central Oklahoma Carney District: A Unique Hunton Oil and Gas Play

Zuhair Al-Shaieb¹, Kenneth Rechlin², David Chernicky³ (1) Oklahoma State University, Stillwater, OK (2) Oklahoma State University, Stillwater, (3) New Dominion LLC, Tulsa, OK

The Ordovician-Devonian Hunton Group was deposited in a shallow epicontinental sea during a period of relatively slow subsidence. Hydrocarbon reservoirs in the Carney District represent a lagoonal facies and are rimmed by an inter-supratidal facies, which were deposited in a ramp environment. This particular setting has not been identified in other Hunton Group reservoirs of the Anadarko Basin. Reservoir characterization methods were specifically designed for the various reservoir zones identified. The subtidal/lagoonal facies comprises one of the two facies present in the immediate Carney area and is stratigraphically equivalent to the Silurian Cochrane Formation and possibly the lowermost Henryhouse Formation. This low-energy facies is mainly composed of wackestone to packstone with the major biota including brachiopods and tabulate corals. The brachiopod beds are primarily biostrome type deposits, whereas the tabulate corals are likely fragments of a patch reef associated with the brachiopod biostrome. The reservoir interval commonly contains shelter porosity associated with brachiopod beds and intragranular porosity associated with the tabulate corals. Vugular porosity also developed with these reservoirs as a result of fluid migration during karstification. The dolomitized lithofacies occurs in an intertidal to supratidal environment and is characterized by vertical burrowing, chicken-wire structures, and algal laminations. This zone is most often present in the Silurian Clarita Formation of the Hunton Group. Reservoirs of this type exhibit relatively high porosity and permeability. Porosity is mainly intercrystalline (sucrosic) and vugular in the dolomitic facies. The stratigraphic framework was established utilizing electro-facies derived from wire-line logs and conodont biostratigraphy.