

PANETTA, BRIAN J., Center for Sedimentary Basin Studies, Department of Geological Sciences, The University of Alabama, Box 870338, Tuscaloosa, Alabama 35487

Reservoir characterization and 3-D geologic modeling, North Blowhorn Creek Oil Field, Alabama

North Blowhorn Creek Field, located in Lamar County, Alabama, was unitized and a water flood project was started in 1983. In 1992, a microbial permeability profile modification project began as a result of continued declining production. The original oil in place was estimated to be 16 million barrels. Currently there are 19 oil wells producing from the Upper Mississippian Carter sandstone and 19 water injection wells. The Carter sandstone is interpreted as having been deposited as a delta-destructive barrier island spit complex characterized by spit accretion. Carter sandstone deposition ended with the drowning of the barrier island and deposition of open marine shelf deposits. The Carter is an elongate sand body that trends northwest to southeast. The primary reservoir facies is the foreshore / upper shoreface facies. The Carter sandstone is a quartz-arenite, containing approximately 78% quartz, and average porosity is 9% with an average permeability of 19 md. The trapping mechanism is stratigraphic. Reservoir characterization and modeling of the Carter sandstone has the potential to improve field-scale reservoir management. Resistivity logs were used to identify reservoir rocks in wells without core. High resistivities characterized by blocky log patterns are indicative of quality reservoir. Lower resistivities characterized by serrate log patterns indicate lower grade reservoir rocks. 3-D modeling shows the heterogeneous nature of the reservoir facies. Heterogeneities within the reservoir reduce waterflood sweep efficiency across the main axis of the reservoir in the field. Flow is also restricted along the axis of the sand body due in part to spit accretion.