

The Lower Woodbine Organic Shale of Burleson and Brazos Counties, Texas: Anatomy of a New “Old” Play

Richard L. Adams¹, John P. Carr¹, and John A. Ward²

¹Carr Resources, Inc., 305 S. Broadway Ave., Ste. 900, Tyler, Texas 75702

²PetroEdge Energy III, 2925 Briarpark Dr., Ste. 150, Houston, Texas 77042

ABSTRACT

The Lower Woodbine Organic Shale, in the southwest portion of the East Texas Basin is a very organic-rich shale with high resistivity, a hot gamma ray response and very good mud log shows.

This zone owes its high organic content and the resultant well-established oil production to its deposition in a silled basin, the product of a prograding delta from the north and northeast, a shelf-rimming Sligo/Edwards barrier reef complex to the south and southeast, a large basement high that affected water depth to the east, and a constricted area between the Sligo-Edwards Shelf Margin and the San Marcos Arch to the west. Within this silled basin, the zone grades from producing 30–35 gravity oil in northern Brazos County to dry gas in southernmost Grimes County.

In 2008, concurrent with the development of the “Eagleford play” in South Texas, Apache began a program recompleting wells from the underlying Buda and the overlying Austin Chalk into the Giddings (“Eagleford”) zone. The early recompletions were vertical completions with very small cumulative oil production. Later they would drill several short lateral horizontal wells to better test this organic shale.

The data from the Apache wells would prove to be invaluable in the current round of evaluation and drilling that began in 2012. Data such as oil gravity, gas-oil ratios, and organic shale isolith values, when combined with the completed lengths of the few horizontal completions and the regional geologic stress-strain field, allow for both a reservoir and an economic evaluation to predict where sweet spots should exist in this newly re-developing play and how to best exploit them. Datasets from multiple plays confirm that the sweet spots are most often located in the high oil gravity portion of the oil window where the oil-generating shale is the thickest.

This play demonstrates the economic necessity of a proper evaluation of all data in a play before acreage acquisition. The play covers portions of several counties, but the best sweet spots will be much smaller.

The Woodbine and Eagle Ford were first defined in the Dallas, Texas, area in the late 1800s. The Maness was defined in 1945, from a cored well interval in Cherokee County, Texas. Correlations back to the outcrops and Cherokee County suggest that this productive interval is neither Eagle Ford nor the true Maness Shale. Therefore, following correct North American Commission on Stratigraphic Nomenclature (NACSN) practices, these organic-rich shales should be called the Lower Woodbine Formation and not the Eagle Ford Shale. The name Maness Shale only truly applies to a portion of the section below the high resistive oil-generating shale and above the Buda Limestone. The Maness is separated from the Woodbine over most of its area by the Lower Cretaceous Unconformity. By definition, the reservoir/source interval may be called a portion of the Pepper Shale Member of the Woodbine Formation. For clarity, the authors will refer to this restricted interval as the Lower Woodbine Organic Shale (LWOS).