

## Similar in age and lithology to Eagle Ford

# Tuscaloosa Another Shale Playground

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The word on the street indicates the next potentially big U.S. shale oil play is ... drumroll, please: The Tuscaloosa Marine Shale (TMS).



A flare from the vertical “test” well that Indigo drilled recently in Vernon Parish, which established production in the Louisiana Eagle Ford.

Covering about 2.7 million acres and quite possibly more (depending on where one draws the boundary) across central Louisiana and reaching into southwestern Mississippi, this Cretaceous-age shale play is creating quite a stir, with early participants scurrying to prove the evolving play has legs.

The Marine shale zone is sandwiched between the upper and lower units of the Tuscaloosa formation, which has long produced enormous volumes of hydrocarbons from the fields drilled along the famed Tuscaloosa Trend.

The consensus among many geologists is the deep, high pressure Marine shale has sourced the amazingly productive sands in the Tuscaloosa Trend.

In west-central Louisiana, the target shale in this new play is referred to as the Louisiana Eagle Ford by some industry folks, who note that it is similar in age and lithology to the highly productive, liquids-rich Cretaceous-age Eagle Ford interval in Texas.

The Eagle Ford in Louisiana actually is dubbed the Eutaw. It lies atop the age-equivalent Tuscaloosa formation in the east, which is the locus of most of the current new action as well as earlier activity.

Similarities in lithology make it difficult to distinguish the Eagle Ford from the upper Tuscaloosa sands and clays.

Players in this new hot spot include Devon Energy, Amelia Resources, Indigo II Louisiana Operating LLC, Encana Oil & Gas (via a partnership with Denbury Resources) and Goodrich Petroleum.

The carrot luring operators and others to pursue the Tuscaloosa Marine shale occurs in the form of perhaps seven billion barrels of oil awaiting recovery. This is the estimated volume noted in a study published in 1997, “An Unproven Unconventional Seven Billion Barrel Oil Resource – The Tuscaloosa Marine Shale.”

The study and resulting publication are a product of what at that time was Louisiana State University’s Basin Research Institute, which is now the Basin Research Energy Section of the Louisiana Geological Survey, noted AAPG member Chacko John, LGS director in addition to state geologist and research professor at LSU.

“We did the study based strictly on logs, because we didn’t have access to any cores,” John said.

“We’re getting calls all the time now about the play, mostly from landowners who want detailed information,” he added, “particularly about how much their land is worth.”

### **Devon’s Presence**

A lot of eyes currently are focused on Devon, which has acquired a leasehold of 250,000 acres across the shale in several Louisiana parishes and plans to drill two horizontal wells in the eastern area of the play this year.

The wells reportedly may undergo as many as 15 frack stages.

The shale is about 200 to 400 feet thick at depths of 11,000 to 14,000 feet across Devon’s acreage position.

Devon reportedly is anticipating a decision from the Louisiana Department of Natural Resources Office of Conservation regarding its requested approval for a drilling production unit in the Ethel Field in East Feliciana Parish, where it drilled a vertical well to greater than 15,000 feet in depth.

AAPG member M.B. Kumar, chief geologist of the Conservation Office’s geological oil and gas division, reportedly commented that Devon’s application for a production unit shows the company believes the area around the well contains multiple leases.

Indigo, running neck and neck acreage-wise with Devon, has scooped up over 240,000 net acres of leasehold and mineral fees in central Louisiana in the western part of the play, according to Indigo chairman and CEO Bill Pritchard.

A vertical “test” well that Indigo drilled recently in Vernon Parish established production in the Louisiana Eagle Ford, as Indigo references the target interval on its leasehold. In this locale, the zone is underlain by the Edwards limestone rather than the main body of Tuscaloosa sand.

“We call it the Louisiana Eagle Ford, because it’s more like the Eagle Ford than what’s going on to the east,” Pritchard noted. “We have better calcite percentage, which means a better ability to frack.”

Pritchard emphasized that they’re cheering for the success of the companies to the east, e.g., Devon, noting that “a rising tide lifts all boats.”

Indigo will spud a horizontal well in the play in Rapides Parish in July.

### **‘Father’ Moore**



Al Moore - 1975 - Lazy Creek Field Discovery - Lower Tuscaloosa Production

The Tuscaloosa Marine Shale once was viewed as no more than a nuisance zone. Yet it was known to throw oil on occasion when the drill bit passed through, causing it to pique the interest and imagination of many geoscientists over the years.

“I don’t think it’s a stretch to call my dad, the late wildcatter/geophysical engineer Alfred C. Moore, the ‘Father of the Tuscaloosa Marine Shale play,’” said AAPG member Clint Moore, vice president of corporate development at ION Geophysical.



Al Moore - 1975 - Cutrer # 1 MTS Location

“He was responsible for the initial focused effort to produce the shale in 1970, when he sold a Marine shale project to his former employer, Sun Oil,” Moore noted. “He also had partnered with Sun in Tuscaloosa sand wells, all the while documenting oil shows from the shale just above the Lower Tuscaloosa sands.”

Based on the elder Moore’s project, Sun drilled a Marine shale well in Pike County, Mississippi, in 1971. The well had shows and was fracked, but was plugged.

Undaunted, Moore persevered, selling his project to Callon, which put down two wells – with the second giving up a total of 3,500 barrels.

He then took the project to Texas Pacific, which drilled the #1 Blades well in northern Tangipahoa Parish in 1977. The non-commercial well has produced 24 Mbo over the past 30 years from 134 feet of perfs and continues to give up a few bopd.

Alas, Alfred Moore’s hopes to spur a major Marine shale development were dashed when the partnership’s leaseblock of 10-year leases expired.

### **Current Activity**

It’s a whole different world today where sophisticated horizontal drilling technology along with high-tech multi-stage fracking procedures can create barn-burners out of wells that likely would be dusters otherwise.

Still, each shale is different; in fact, properties within the same shale zone can vary from well to well, meaning these babies can require some high level customized care.

Prior to Denbury’s purchase of Encore Acquisition, Encore took on a large leasehold in the Marine shale, acquiring acreage on the state line in the northeast end of East Feliciana Parish and going into Amite County, Mississippi.

Encore drilled four horizontal wells in 2008. The initial three holes were plagued with myriad problems, and completions reportedly were not state-of-the-art, which can be a death knell of sorts for a shale well.

Each well reportedly underwent only three frack stages, yet they're still producing, albeit at miniscule rates, according to Zach Hart, reservoir engineering manager at Indigo. He quoted public data listing current production at 10 bopd for two of the wells and four to five bopd for the other.

Encana recently took over as operator of the fourth Encore horizontal well in Amite County; it was not completed earlier.

(At press time, Encana informed Clint Moore that it had filed a completion report on the Board of Education 1-H horizontal well; the find has been dubbed the Alfred Moore field – a fitting posthumous tribute.)

It's said that where there's a will there's a way, and some serious will can be generated by an estimated seven billion barrels of oil waiting to be tapped.

Significant risk is a given, but it doesn't require big bucks to stake a claim – for now.

“About five months ago, the leasing price per acre was about \$75 for a three-year paid-up lease,” said AAPG member Kirk Barrell, president of The Woodlands, Texas-based Amelia Resources, which generates prospects and then seeks out partners. “They're now getting \$200 an acre for three years paid-up, and most are getting two-year extensions for another \$200.

“Well costs of about \$9 to \$15 million each is my guess, with vertical depth of about 10,000 feet to 15,500 feet, depending on where you are in the play,” Barrell noted.

Amelia has transacted a deal covering about 55,000 acres with a partner and is marketing additional acreage across the play. 