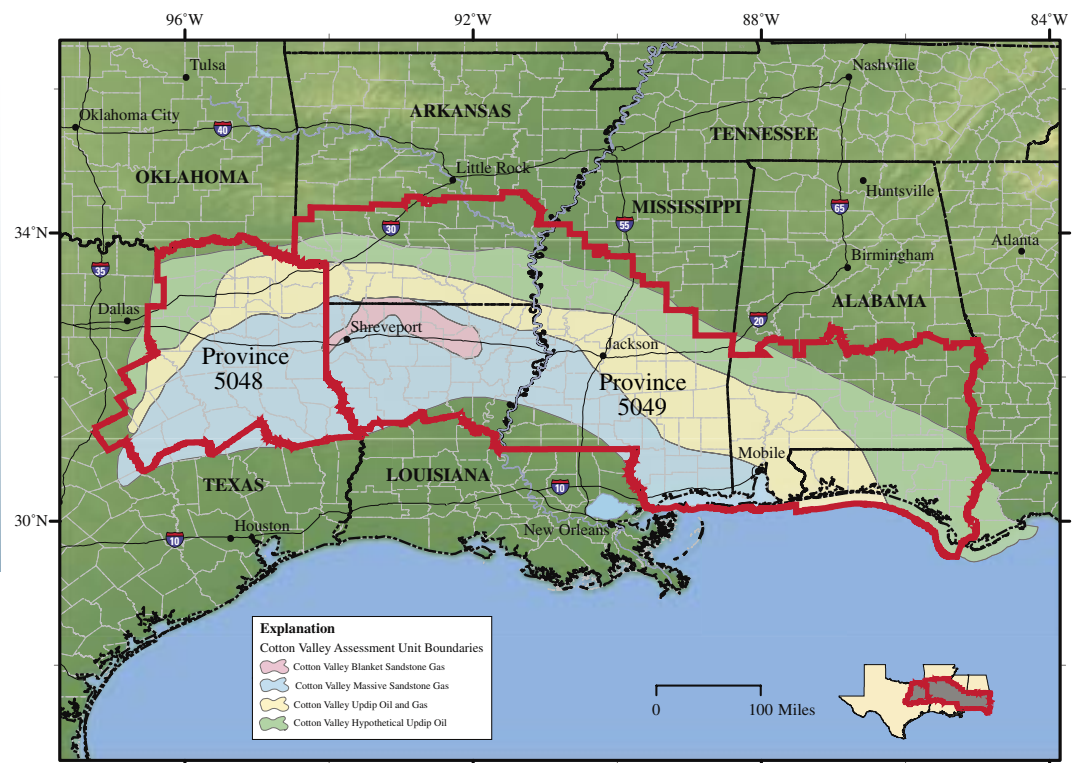


2002 Assessment of Undiscovered Oil and Gas Resources of the Jurassic-Cretaceous Cotton Valley Group, Jurassic Smackover Interior Salt Basins Total Petroleum System, in the Louisiana-Mississippi Salt Basins Province of the Northern Gulf Coast Region

Using a geology-based assessment methodology, the U.S. Geological Survey estimated means of 605.03 billion cubic feet of undiscovered natural gas, 29.81 million barrels of undiscovered oil, and 19.00 million barrels of undiscovered natural gas liquids in the Cotton Valley Group in the Louisiana-Mississippi Salt Basins Province of the northern Gulf Coast Region.

Figure 1. Map of Louisiana-Mississippi Salt Basins Province 5049 and East Texas Basin Province 5048 of the Gulf Coast region showing geographic distribution of the Cotton Valley Group assessment units in the Jurassic Smackover Interior Salt Basins Total Petroleum System.



Introduction

The U.S. Geological Survey (USGS) recently completed an assessment of the undiscovered oil and gas potential of the Jurassic-Cretaceous Cotton Valley Group in the Louisiana-Mississippi Salt Basins Province of the northern Gulf Coast Region (fig. 1) as part of a national oil and gas assessment effort. For assessment purposes, the East Texas Basin Province was included with the Louisiana-Mississippi Salt Basins Province. The assessment of the petroleum potential of the Cotton Valley Group was based on the general geologic elements used to define a total petroleum system (TPS), which include hydrocarbon source rocks (source rock maturation, hydrocarbon generation and migration), reservoir rocks (sequence stratigraphy and petrophysical properties), and hydrocarbon traps (trap formation and timing). Using this geologic framework, the USGS defined four assessment units (AU) that are included in one TPS, the Jurassic Smackover Interior Salt Basins TPS: Cotton Valley Blanket Sandstone Gas AU, Cotton Valley Massive Sandstone Gas AU, Cotton Valley Updip Oil and Gas AU, and Cotton Valley Hypothetical Updip Oil AU.

Resource Summary

The USGS assessed undiscovered conventional oil and gas for each of the AUs, resulting in estimated means of 605.03 billion cubic feet of non-associated gas and associated gas in oil fields, 29.81 million barrels of oil, and 19.00 million barrels of natural gas liquids in the Jurassic Smackover Interior Salt Basins TPS (table 1). All of the undiscovered gas is conventional. The Cotton Valley Massive Sandstone Gas AU contains 547.25 billion cubic feet of gas, representing about 90 percent of the total mean undiscovered gas resource (605.03 billion cubic feet) for the Cotton Valley Group in the province. The Bossier Shale TPS of the lower Cotton Valley Group was not quantitatively assessed for this study.

Table 1. Cotton Valley Group assessment results for the Jurassic Smackover Interior Salt Basins Total Petroleum System.

[MMBO, million barrels of oil. BCFG, billion cubic feet of gas. MMBNGL, million barrels of natural gas liquids. MAS, minimum accumulation size assessed (MMBO or BCFG). Prob., probability (including both geologic and accessibility probabilities) of at least one accumulation equal to or greater than the MAS or, for continuous-type resources, at least one additional cell equal to or greater than the minimum estimated ultimate recovery. Accum., accumulation. Results shown are fully risked estimates. For gas accumulations, all liquids are included as NGL (natural gas liquids). F95 represents a 95 percent chance of at least the amount tabulated. Other fractiles are defined similarly. Fractiles are additive under the assumption of perfect positive correlation. Shading indicates not applicable]

| Accumulation Type | MAS | Prob. (0-1) | Total Undiscovered Resources | | | | | | | | | | | |
|--|-----|-------------|------------------------------|-------|-------|-------|------------|--------|----------|--------|--------------|-------|-------|-------|
| | | | Oil (MMBO) | | | | Gas (BCFG) | | | | NGL (MMBNGL) | | | |
| | | | F95 | F50 | F5 | Mean | F95 | F50 | F5 | Mean | F95 | F50 | F5 | Mean |
| Undiscovered conventional resources in Cotton Valley Group reservoirs within the Jurassic Smackover Interior Salt Basins Total Petroleum System | | | | | | | | | | | | | | |
| Oil | 0.5 | 1.00 | 9.20 | 26.81 | 61.14 | 29.81 | 7.57 | 23.41 | 58.22 | 26.81 | 0.35 | 1.14 | 3.05 | 1.34 |
| Gas | 3.0 | | | | | | 136.46 | 515.29 | 1,220.81 | 578.22 | 3.93 | 15.30 | 39.31 | 17.66 |
| Total | | 1.00 | 9.20 | 26.81 | 61.14 | 29.81 | 144.03 | 538.69 | 1,279.03 | 605.03 | 4.28 | 16.44 | 42.36 | 19.00 |
| Cotton Valley Blanket Sandstone Gas Assessment Unit | | | | | | | | | | | | | | |
| Oil | 0.5 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gas | 3.0 | | | | | | 4.54 | 13.89 | 31.85 | 15.54 | 0.22 | 0.68 | 1.66 | 0.78 |
| Total | | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.54 | 13.89 | 31.85 | 15.54 | 0.22 | 0.68 | 1.66 | 0.78 |
| Cotton Valley Massive Sandstone Gas Assessment Unit | | | | | | | | | | | | | | |
| Oil | 0.5 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gas | 3.0 | | | | | | 127.40 | 487.62 | 1,157.23 | 547.25 | 3.58 | 14.22 | 36.65 | 16.42 |
| Total | | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 127.40 | 487.62 | 1,157.23 | 547.25 | 3.58 | 14.22 | 36.65 | 16.42 |
| Cotton Valley Updip Oil and Gas Assessment Unit | | | | | | | | | | | | | | |
| Oil | 0.5 | 1.00 | 9.20 | 24.42 | 51.44 | 26.70 | 7.57 | 21.43 | 49.17 | 24.02 | 0.35 | 1.04 | 2.58 | 1.20 |
| Gas | 3.0 | | | | | | 4.52 | 13.78 | 31.73 | 15.43 | 0.13 | 0.40 | 0.99 | 0.46 |
| Total | | 1.00 | 9.20 | 24.42 | 51.44 | 26.70 | 12.09 | 35.21 | 80.90 | 39.45 | 0.48 | 1.45 | 3.57 | 1.66 |
| Cotton Valley Hypothetical Updip Oil Assessment Unit | | | | | | | | | | | | | | |
| Oil | 0.5 | 0.56 | 0.00 | 2.39 | 9.70 | 3.11 | 0.00 | 1.98 | 9.05 | 2.80 | 0.00 | 0.09 | 0.47 | 0.14 |
| Gas | 3.0 | | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | | 0.56 | 0.00 | 2.39 | 9.70 | 3.11 | 0.00 | 1.98 | 9.05 | 2.80 | 0.00 | 0.09 | 0.47 | 0.14 |

For Further Information

Geologic studies of total petroleum systems and assessment units and reports on the methodology used in the Cotton Valley Group assessment in the Louisiana-Mississippi Salt Basins Province of the northern Gulf Coast Region are available at the USGS Central Energy Team website:

<http://energy.cr.usgs.gov/oilgas/noga>

Cotton Valley Group Assessment Team

T.S. Dyman (Task Leader: dyman@usgs.gov), S.M. Condon, R.R. Charpentier, T.A. Cook, M.D. Lewan, R.M. Pollastro, C.J. Schenk, and J.W. Schmoker.