

National Assessment of Oil and Gas Fact Sheet

Assessment of Undiscovered Oil and Gas Resources in Cretaceous-Tertiary Coal Beds of the Gulf Coast Region, 2007

Using a geology-based assessment methodology, the U.S. Geological Survey estimated a mean of 4.06 trillion cubic feet of undiscovered, technically recoverable natural gas in Cretaceous-Tertiary coal beds of the onshore lands and State waters of the Gulf Coast.

Introduction

The U.S. Geological Survey (USGS) recently completed an assessment of the undiscovered continuous gas potential of Cretaceous-Tertiary coal beds of the onshore areas and State waters of the Gulf Coast (fig. 1). This continuous gas assessment was part of a broader assessment of the undiscovered oil and gas potential of Tertiary strata of the onshore areas and State waters of the Gulf Coast (Dubiel and others, 2007). The assessment of Cretaceous-Tertiary continuous gas resources

is based on geologic elements such as hydrocarbon source rocks (the level of source-rock maturation and the timing of hydrocarbon generation and migration), the availability of suitable reservoir rocks (sequence stratigraphy and petrophysical properties), and hydrocarbon traps (trap formation and timing) in the three coalbed gas total petroleum systems (TPS) identified in the region by the USGS. Four continuous assessment units (AU) were defined within the TPSs, and estimates of the undiscovered gas resources in the AUs are presented in table 1. The Olmos Coalbed Gas TPS, located in south Texas and north-eastern Mexico (fig. 1), contains two Upper Cretaceous AUs: the Cretaceous Olmos Coalbed Gas AU and the Rio Escondido Basin Olmos Coalbed Gas AU (figs. 1 and 2). The Wilcox Coalbed Gas TPS, which contains the Wilcox Coalbed Gas AU, is the primary coal gas petroleum system in the Gulf Coast area. The Wilcox Coalbed Gas TPS boundaries are defined by an approximate northern up-dip freshwater-saltwater transition



Figure 1. Map of the Gulf Coast region showing the continuous coalbed gas assessment units (AUs). Province boundaries defined by the U.S. Geological Survey are indicated by red lines.

Table 1. Gulf Coast Region unconventional coalbed gas assessment results.

[MMBO, million barrels of oil; BCFG, billion cubic feet of gas; MMBNGL, million barrels of natural gas liquids. 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. TPS, total petroleum system; AU, assessment unit, CBG, coalbed gas. Gray shading indicates not applicable]

| | Total Petroleum Systems (TPS) and Assessment Units (AU) | Field Type | Total Undiscovered Resources | | | | | | | | | | | |
|----------------------------------|---|------------|------------------------------|-----|----|------|--------------|--------------|--------------|--------------|--------------|----------|----------|----------|
| | | | Oil (MMBO) | | | | Gas (BCFG) | | | | NGL (MMBNGL) | | | |
| | | | F95 | F50 | F5 | Mean | F95 | F50 | F5 | Mean | F95 | F50 | F5 | Mean |
| Continuous Oil and Gas Resources | Olmos Coalbed Gas TPS (504702) | | | | | | | | | | | | | |
| | Cretaceous Olmos Coalbed Gas AU (50470281) | CBG | | | | | 37 | 70 | 133 | 75 | 0 | 0 | 1 | 0 |
| | Rio Escondido Basin Olmos Coalbed Gas AU (53000281) | CBG | | | | | 60 | 114 | 215 | 123 | 0 | 0 | 1 | 0 |
| | Wilcox Coalbed Gas TPS (504703) | | | | | | | | | | | | | |
| | Wilcox Coalbed Gas AU (50470381) | CBG | | | | | 1,565 | 3,442 | 7,570 | 3,861 | 0 | 0 | 0 | 0 |
| | Cretaceous-Tertiary Coalbed Gas TPS (504704) | | | | | | | | | | | | | |
| | Cretaceous-Tertiary Coalbed Gas AU (50470481) | CBG | Not quantitatively assessed | | | | | | | | | | | |
| | Total Continuous Resources | | | | | | 1,662 | 3,626 | 7,918 | 4,059 | 0 | 0 | 2 | 0 |

zone within the Wilcox Group (Paleocene and Eocene) (derived from Pettijohn, 1996) and a southern down-dip depth to the top of Wilcox of about 6,000 ft. The southeast boundary of the Wilcox Coalbed Gas TPS is defined by the State-Federal water boundary offshore, and the southwest limit is the border with Mexico. The Cretaceous-Tertiary Coalbed Gas TPS defines one AU (Cretaceous-Tertiary Coalbed Gas AU) that contains all other Cretaceous and Tertiary coal beds that are not part of the Cretaceous Olmos Coalbed Gas AU and the Wilcox Coalbed Gas TPS (fig. 2).

Resource Summary

The USGS assessment of undiscovered unconventional coalbed gas resources resulted in an estimated mean of 4.06 trillion cubic feet of gas (TCFG) in the TPSs and AUs that were assessed (table 1). Nearly all of the undiscovered gas resource (95 percent, or 3.86 TCFG) is assessed within the Wilcox Coalbed Gas AU (fig. 2). The unconventional gas resources reside in coalbed reservoirs and in adjacent and interfingering sandstones

deposited in fluvial and deltaic depositional environments. The assessment results reflect estimates based on vertical drilling technology.

For Additional Information

Supporting geologic studies of total petroleum systems, assessment units, and the methodology used in the assessment of conventional resources in Tertiary strata and of unconventional coalbed gas resources in Cretaceous and Tertiary rocks of the Gulf Coast are in progress. Assessment results are available at the USGS Energy Team Website: <http://energy.cr.usgs.gov/oilgas/noga/>

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| PERIOD | EPOCH | STRATIGRAPHIC INTERVAL |
|-------------------|--------|------------------------|
| TERTIARY (part) | EOCENE | Jackson Group |
| | | Claiborne Group |
| | | Wilcox Group |
| | PAL. | Midway Group |
| CRETACEOUS (part) | LATE | Olmos Formation |

Figure 2. Generalized stratigraphic section showing the coalbed gas assessment intervals of the Gulf Coast region. Assessment interval colors match AU colors used in figure 1. Pal., Paleocene.