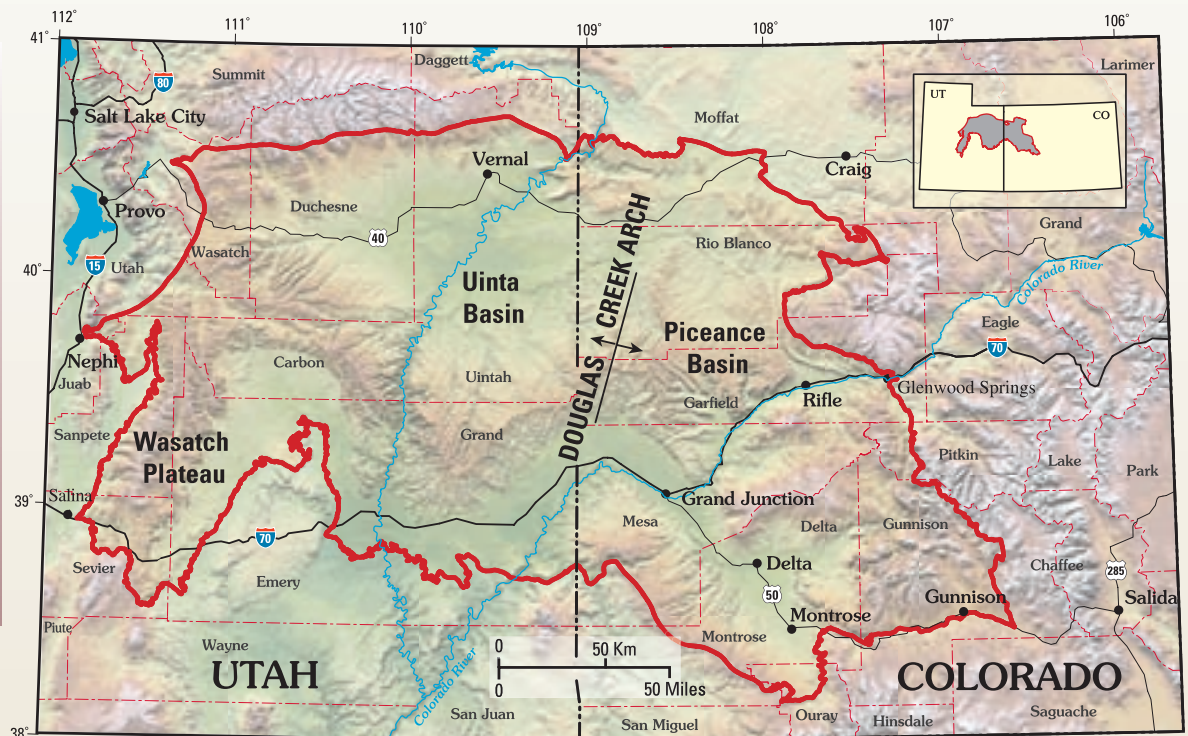


## National Assessment of Oil and Gas Fact Sheet

# Assessment of Undiscovered Oil and Gas Resources of the Uinta-Piceance Province of Colorado and Utah, 2002

*Using a geology-based assessment methodology, the U.S. Geological Survey estimates a mean of 21 trillion cubic feet of undiscovered natural gas and a mean of 60 million barrels of undiscovered oil in the Uinta-Piceance Province. Nearly all of the undiscovered gas resource is unconventional (continuous).*



**Figure 1.** Uinta-Piceance Province located in northwestern Colorado and northeastern Utah. The Douglas Creek arch separates Piceance Basin from Uinta Basin. The Wasatch Plateau is included in this province.

## Introduction

The U.S. Geological Survey (USGS) recently completed an assessment of the undiscovered oil and gas potential of the Uinta-Piceance Province of northwestern Colorado and northeastern Utah (fig. 1). The assessment of the Uinta-Piceance Province is geology based and uses the Total Petroleum System concept. The geologic elements of Total Petroleum Systems include hydrocarbon source rocks (source rock maturation, hydrocarbon generation and migration), reservoir rocks (sequence stratigraphy, petrophysical properties), and hydrocarbon traps (trap formation and timing). Using this geologic framework, the USGS defined five Total Petroleum Systems and 20 Assessment Units within these Total Petroleum Systems, and quantitatively estimated the undiscovered oil and gas resources within each Assessment Unit (table 1).

## Resource Summary

The USGS assessed undiscovered conventional oil and gas and continuous (unconventional) oil and gas, including coal-bed gas (CBG in table 1). The USGS estimated a mean of 21 trillion cubic feet of gas (TCFG), a mean of 60 million barrels of oil (MMBO), and a mean of 43 million barrels of natural gas liquids (MMBNGL) in five Total Petroleum Systems. Nearly all of the undiscovered

gas resource is continuous (unconventional) rather than conventional. Of the 21 TCFG, 13 TCFG is estimated to be in the Mesaverde Total Petroleum System, and 7 TCFG is in the Mancos/Mowry Total Petroleum System. The Ferron/Wasatch Plateau Total Petroleum System and Mesaverde Total Petroleum System are estimated to contain 2.3 TCFG of coal-bed gas. The Phosphoria and Green River Total Petroleum Systems contain the balance of the undiscovered gas resource.

## For Further Information

Supporting geologic studies of Total Petroleum Systems and Assessment Units, and the methodology used in the Uinta-Piceance Province assessment are in progress. Assessment results are available at the USGS Central Energy Team website: <http://energy.cr.usgs.gov/oilgas/noga/>

## Uinta-Piceance Assessment Team

**Mark A. Kirschbaum** (*Task Leader; mkirsch@usgs.gov*); Larry Anna, Timothy S. Collett, Troy Cook, Russell F. Dubiel, Thomas M. Finn, Robert D. Hettinger, Mitchell Henry, Edward A. Johnson, Ronald C. Johnson, Paul G. Lillis, Philip H. Nelson, Vito F. Nuccio, Cynthia A. Rice, Laura N.R. Roberts, and Stephen B. Roberts.

**Table 1. Uinta-Piceance Province 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 fields, all liquids are included under the NGL (natural gas liquids) category. Undiscovered gas resources are the sum of non-associated and associated gas. 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. Gray shade indicates not applicable. CBG is coal-bed gas]

| 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         |
| <b>Conventional Oil and Gas Resources</b>               |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| <b>Phosphoria TPS</b>                                   |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| Hanging Wall AU   | Oil        | 1.75                         | 4.13         | 8.37         | 4.47         | 0.47             | 1.21             | 2.67             | 1.34             | 0.03         | 0.07         | 0.17         | 0.08         |
|   | Gas        |                              |              |              |              | 10.48            | 24.78            | 50.27            | 26.81            | 0.30         | 0.78         | 1.70         | 0.86         |
| Paleozoic/Mesozoic AU                                   | Oil        | 2.66                         | 5.82         | 11.55        | 6.29         | 0.71             | 1.70             | 3.69             | 1.89             | 0.04         | 0.10         | 0.23         | 0.11         |
|   | Gas        |                              |              |              |              | 15.82            | 43.74            | 94.30            | 48.04            | 0.47         | 1.36         | 3.21         | 1.54         |
| <b>Ferron/Wasatch Plateau TPS</b>                       |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| Ferron Sandstone Gas AU                                 | Gas        |                              |              |              |              | 10.73            | 35.91            | 81.23            | 39.75            | 0.03         | 0.07         | 0.19         | 0.08         |
| <b>Mesaverde TPS</b>                                    |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| Mesaverde Sandstone Gas AU                              | Gas        |                              |              |              |              | 17.91            | 58.95            | 140.12           | 66.41            | 0.13         | 0.46         | 1.18         | 0.53         |
| <b>Green River TPS</b>                                  |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| Uinta Green River Oil and Gas AU                        | Oil        | 2.74                         | 8.52         | 20.52        | 9.63         | 7.59             | 24.83            | 63.73            | 28.88            | 0.42         | 1.45         | 3.98         | 1.73         |
| <b>Total Conventional Resources</b>                     |            | <b>7.15</b>                  | <b>18.47</b> | <b>40.44</b> | <b>20.39</b> | <b>63.71</b>     | <b>191.12</b>    | <b>436.01</b>    | <b>213.12</b>    | <b>1.42</b>  | <b>4.29</b>  | <b>10.66</b> | <b>4.93</b>  |
| <b>Continuous Oil and Gas Resources</b>                 |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| <b>Mancos/Mowry TPS</b>                                 |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| Piceance Basin AU                                       | Gas        |                              |              |              |              | 649.30           | 1,463.09         | 3,296.86         | 1,652.90         | 0.60         | 1.43         | 3.45         | 1.65         |
| Uinta Basin AU  | Gas        |                              |              |              |              | 1,781.69         | 2,965.07         | 4,934.43         | 3,110.69         | 3.16         | 5.81         | 10.67        | 6.22         |
| Uinta-Piceance Transitional and Migrated Gas AU         | Gas        |                              |              |              |              | 1,429.61         | 1,742.59         | 2,124.11         | 1,755.26         | 0.74         | 1.98         | 5.31         | 2.37         |
| <b>Ferron/Wasatch Plateau TPS</b>                       |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| Deep (> 6,000 ft) Coal and Sandstone AU                 | Gas        |                              |              |              |              | 0.00             | 52.04            | 136.43           | 59.10            | 0.00         | 0.00         | 0.00         | 0.00         |
| Northern Coal Fairway/ Drunkards Wash AU                | CBG        |                              |              |              |              | 451.14           | 722.18           | 1,156.05         | 752.33           | 0.00         | 0.00         | 0.00         | 0.00         |
| Central Coal Fairway/ Buzzards Bench AU                 | CBG        |                              |              |              |              | 311.61           | 512.69           | 843.54           | 536.73           | 0.00         | 0.00         | 0.00         | 0.00         |
| Southern Coal Fairway AU                                | CBG        |                              |              |              |              | 78.16            | 145.81           | 255.49           | 152.59           | 0.00         | 0.00         | 0.00         | 0.00         |
| Southern Coal Outcrop AU                                | CBG        |                              |              |              |              | 0.00             | 9.95             | 30.71            | 10.56            | 0.00         | 0.00         | 0.00         | 0.00         |
| <b>Mesaverde TPS</b>                                    |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| Uinta Basin Continuous AU                               | Gas        |                              |              |              |              | 4,134.19         | 7,018.47         | 11,915.02        | 7,391.36         | 5.52         | 10.31        | 19.27        | 11.09        |
| Uinta Basin Transitional AU                             | Gas        |                              |              |              |              | 889.42           | 1,431.73         | 2,304.72         | 1,492.97         | 1.18         | 2.10         | 3.76         | 2.24         |
| Piceance Basin Continuous AU                            | Gas        |                              |              |              |              | 1,902.23         | 2,956.15         | 4,594.01         | 3,064.27         | 5.00         | 8.69         | 15.09        | 9.19         |
| Piceance Basin Transitional AU                          | Gas        |                              |              |              |              | 161.74           | 284.47           | 500.33           | 301.73           | 0.29         | 0.56         | 1.07         | 0.60         |
| Uinta Basin Blackhawk Coalbed Gas AU                    | CBG        |                              |              |              |              | 181.97           | 433.84           | 1,034.28         | 498.78           | 0.00         | 0.00         | 0.00         | 0.00         |
| Mesaverde Group Coalbed Gas AU                          | CBG        |                              |              |              |              | 138.72           | 322.45           | 749.54           | 367.77           | 0.00         | 0.00         | 0.00         | 0.00         |
| <b>Green River TPS</b>                                  |            |                              |              |              |              |                  |                  |                  |                  |              |              |              |              |
| Deep Uinta Overpressured Continuous Oil AU              | Oil        | 24.83                        | 37.57        | 56.84        | 38.78        | 35.72            | 60.74            | 103.29           | 63.99            | 2.23         | 4.17         | 7.79         | 4.48         |
| <b>Total Continuous Resources</b>                       |            | <b>24.83</b>                 | <b>37.57</b> | <b>56.84</b> | <b>38.78</b> | <b>12,145.49</b> | <b>20,121.27</b> | <b>33,978.81</b> | <b>21,211.03</b> | <b>18.72</b> | <b>35.05</b> | <b>66.41</b> | <b>37.84</b> |
| <b>Total Undiscovered Oil and Gas Resources</b>         |            | <b>31.98</b>                 | <b>56.04</b> | <b>97.28</b> | <b>59.17</b> | <b>12,209.20</b> | <b>20,312.39</b> | <b>34,414.82</b> | <b>21,424.15</b> | <b>20.14</b> | <b>39.34</b> | <b>77.07</b> | <b>42.77</b> |