An Overview of Bighorn Basin Oil and Gas Fields, with Emphasis on Badger Basin Field

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ABSTRACT

The Bighorn Basin of northwestern Wyoming has produced 2.4 billion barrels of oil and 1.7 trillion cubic ft (Tcf) of natural gas since oil was discovered in a small Frontier Formation reservoir at Garland Field in 1906. Most oil and a large part of the basin's gas production have been from eight fields - Elk Basin, Oregon Basin, Hamilton Dome, Grass Creek, Garland, Little Buffalo Basin, Byron, and Frannie - that have each produced over 100 million barrels of oil. Several of these fields have also produced large quantities of associated gas. Cottonwood Creek Field is the largest stratigraphically-controlled field in the basin.

Sandstone and carbonate reservoirs in the Tensleep Sandstone, Phosphoria Formation, and Madison Limestone have accounted for most of the oil production. Reservoirs in the Frontier Formation have produced about one-third of the total gas from the basin. The Worland, Heart Mountain, Dobie Creek/Five Mile, Hidden Dome, and Meeteetse fields have produced 495 billion cubic ft (Bcf) of gas from the Frontier Formation.

Badger Basin Field is a typical Bighorn Basin field. The discovery well for the field was completed in 1931 after over two years of drilling with a cable tool rig. At the time of completion in the Frontier, below 8250 ft depth, this was the deepest well in the Rocky Mountain region. Since 1931, reservoirs at Badger Basin Field in the first, second, and third Frontier Formation sequences have produced three million barrels of oil and at least 6.6 Bcf of gas.

The Frontier Formation in the Bighorn Basin has several sands that are capable of production. So far, the Frontier sands have only been tested in structural settings. The potential for stratigraphic traps in the Frontier in deeper parts of the basin is untested.

Note: The complete text can be found in Chapter 2 of the Institute for Energy Research section.

É Montana Geological Society, Wyoming Geological Association, and Yellowstone-Bighorn Research Association 2010 - Bighorn Basin: 50 Years on the Frontier:Evolution of the Geology of the Bighorn Basin: 1997 Field Trip Symposium, 1997.