


Oil & Gas TIDBITS

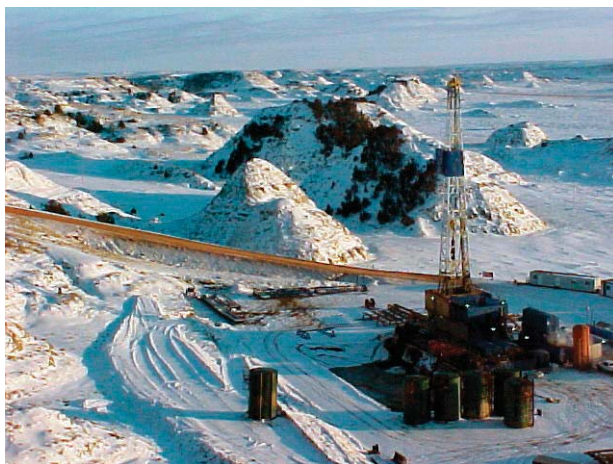


We Keep North Dakota Going Strong

GREETINGS

Greetings from North Dakota's oil and gas industry! This is our second issue of "Oil & Gas Tidbits." This publication will be distributed quarterly to North Dakota policy makers and interested parties in the oil and gas industry to keep you updated on issues that may be of interest in guiding our state's economy.

In future editions, we will focus on Energy Education, New Technology in the Oil and Gas Industry, Oil and Gas Research Council, Refining, the Economic Impact of North Dakota's Oil and Gas Industry and Workforce Needs Study Results. 



Drilling rig in North Dakota Badlands

North Dakota Bakken – Geology at it's Best and Worst!

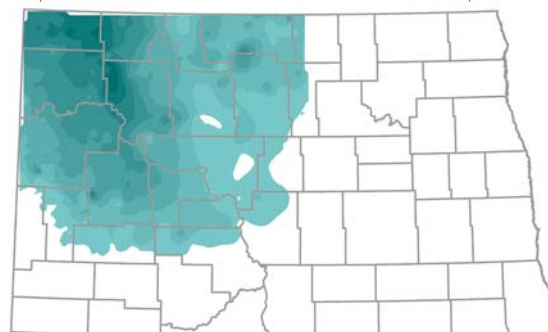
Right now, the North Dakota Bakken Formation is the focus of much attention within the oil and gas industry as well as in the general media. Why all the excitement and why now? There are many answers, but the most important is it has great potential!

Oil industry leaders, as well as new operators, are beginning to find success in the North Dakota portion of the Bakken Formation over a widespread area. The Bakken is once again creating excitement in the state's oil and gas industry.

365 million years ago North Dakota was covered by an ocean or sea which deposited various amounts of sand, silt, and shale. For this reason the Bakken Formation has been split into upper, middle, and lower members. The upper Bakken in North Dakota is comprised of black, oil-bearing shale. This rock is the source of Bakken oil.

The Bakken Formation is geology at its best because of the tremendous oil reserves (see facts below), however, the Bakken Formation is also

geology at its worst because sustainable oil production has proven to be elusive because of the character of the reservoir rock. ►



Extent of the Middle Bakken Formation in North Dakota

FACTS

- The **Wilson M. Laird Core and Sample Library** in Grand Forks, North Dakota contains **6,119 feet of Bakken cores** from oil and gas wells.
- Reserve studies estimate **250 billion barrels of oil in the North Dakota Bakken**. However, current technology allows that we **could only produce about 1% of those reserves**.
- In 2006, there were **46 new horizontal Bakken wells drilled**.
- It cost nearly **\$6 million to complete a Bakken well in 2006 compared to \$1.3 million in 2004**.
- **All Bakken wells** in North Dakota since October of 2005 **have been horizontal wells**. Statewide horizontal drilling accounted for **72% of all new wells drilled** and **55% of the state's total oil production** in 2005.
- The typical North Dakota **Bakken well is 10,000 feet deep** and has one to three horizontal **legs extending out as far as 9,000 feet** across two sections of minerals.

ND Bakken - Future Depends on Technology

Historically, the problem with drilling horizontally in this shale member, as was discovered during the previous Bakken plays of the 1980s and 1990s, is that the shale is impermeable, meaning it does not allow the oil to move

freely. Unless a fracture system is encountered, the oil stays in place and the production declines rapidly. The formation needs natural conduits to enable oil to be produced. Recent technological advancements in horizontal drilling

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A core sample from the Middle Bakken Formation



and well completion techniques including fracture stimulation has enabled the Bakken to be explored in a new way. This has resulted in the Williston Basin Bakken becoming one of the largest on-shore oil plays in the lower 48 states.

Geologic study, continued drilling, and refinement of completion practices, will hopefully improve the success of this North Dakota Bakken play. Geology of the Bakken is very complex and this new technology is very expensive (see Facts section). As the Play develops scientists will continue to work together to unlock the mysteries of these ancient rocks. 🛠️

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