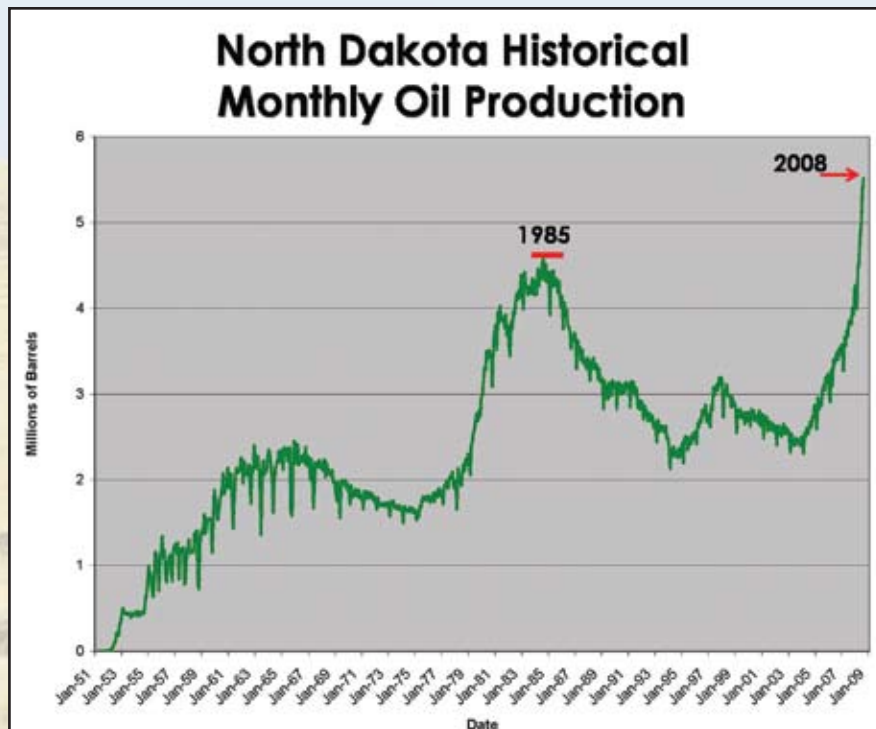
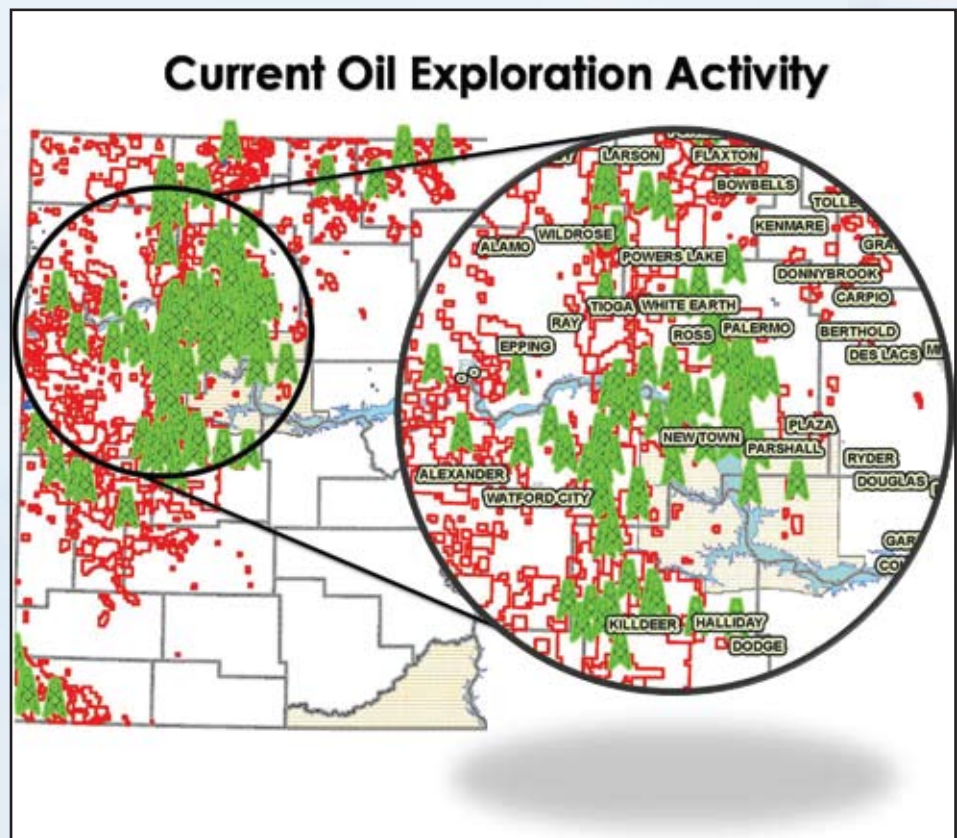


Oil in North Dakota Brings Big Opportunity, Big Challenges

By Cory Chorne, project manager, AE2S

For anyone who has driven through the rolling hills of western North Dakota during the past few years it is obvious that the skyline has changed. Gone are the days of seeing open space, and here are the days of oil derricks, oil tankers, and gas flares.

Everyone in North Dakota has been exposed to the growth in oil activity in one way or another, from excess oil revenue to housing shortages and overnight wealth to infrastructure needs. The energy growth and development of the Bakken Formation is exciting for North Dakota, but with its rapid growth comes concerns from communities about how to support the industry. Many questions are arising, such as, “Where do we find the people to work in the industry?” “Will our infrastructure support the industry growth?” and, “Where will the money



come from to continue to meet the needs brought on by oil development?”

The last major boom in oil production in North Dakota occurred in the mid-1980s. At that time, the maximum monthly oil production peaked at approximately 4.5 million barrels. Since 2005, the oil production has steadily increased to the current production rate of 5.5 million barrels per month – double the production of only three years ago.

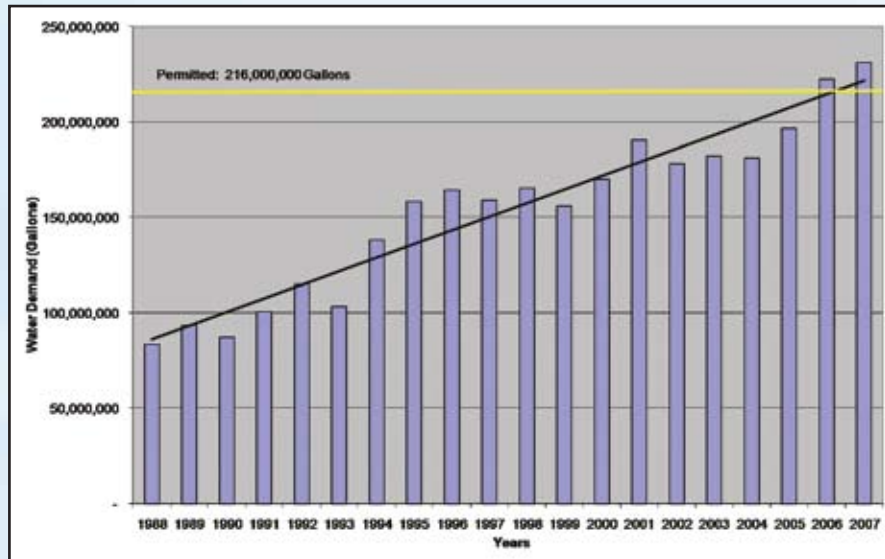
The majority of the oil activity is

occurring in west central North Dakota, including the counties of Mountrail, Williams, eastern McKenzie, and northern Dunn. To support the explosion of growth in the region, local governments have been working vigorously to support the oil industry, as well as provide the incentives

capabilities to keep up with the water demands. R&T Water Supply Association, which services the communities of Ray, Tioga, and Stanley, has been rationing water for several years, because its water treatment facility does not have the capacity to meet the system demands. The City of Stanley has been forced to deny requests from the energy companies to build campus housing for up to 800 workers due to the lack of water to serve the new growth.

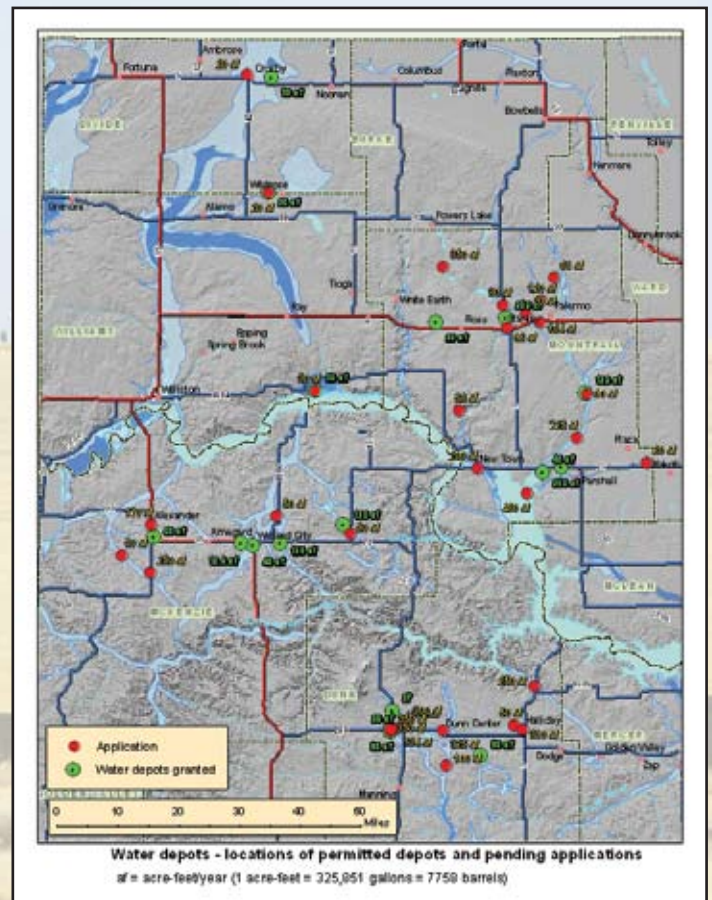
Not only have water utilities struggled to meet the domestic water needs of the expanding population, the development of the Bakken Formation has proven to be extremely water intensive, further stressing the regional water resources. Current technology uses hydraulic fracturing to bring each oil well into production. This is a process that requires approximately 1 million to 1.5 million gallons of water per well. To meet this need, energy companies have tapped into nearly every existing regional source of water and have developed many more.

The City of Parshall is another



to influence the relocation of people to the region to fill the employment gaps that are being left open by this growth. These employment gaps exist not only in the oil industry, but all service industries. Officials estimate that the oil industry will need 12,000 new and replacement workers over the next four years to get the job done. Translating 12,000 new positions into 12,000 new families equates to the potential for nearly 36,000 new residents in western North Dakota, which is a population growth equivalent to the city of Minot.

The influx of people and the increase in industrial activity have placed a significant burden on the local infrastructure. Roadways are taking a beating from the truck traffic, many communities are lacking adequate housing for the influx of new workers, and water utilities are being pushed to their limits. Many water systems have been forced to limit new user connections, and in some cases have been required to ration water. Williams Rural Water District and McKenzie County Water Resource District are moving quickly to increase their water distribution



community feeling the pressure from the oil industry. In the heart of the current exploration activity, Parshall has experienced a significant increase in bulk water sales to the oil industry. According to Loren Hoffman, Parshall's city auditor, the water treatment plant has gone from operating 40 hours a week to 24 hours a day, seven days a week, and from one full time employee to three (likely four in the near future). These changes have allowed the city to produce approximately 12 million gallons of water per month. Of the 12 million gallons produced, the energy industry is using in excess of 75 percent of that water, or 8 million gallons per month, which is still not enough to meet the needs.

To address the shortage, the City of Parshall is pursuing the construction of a new water treatment facility as part of the Fort Berthold Rural Water System that will provide water for both rural water customers and the energy industry. This \$12.5 million water treatment plant will be paid for with federal, state, and local funds.

To manage the water needs of the communities being impacted by the upsurge in energy production in western North Dakota, other water systems are also developing plans to expand their capacity. For instance McKenzie County Water Resource District and Williams Rural Water District are planning system expansions that are estimated to cost \$12 million and \$9 million, respectively. The R&T Water System Association is planning to expand its water

treatment facility to provide an additional 2.5 million gallons per day to offset the demands of the expanding communities as well as the oil industry, at an estimated cost of \$13 million.

New rural water systems are being formed, as well. The northwest corner of North Dakota is an area rich in natural resources such as oil, coal, and coal bed methane, but lacking a good quality water source. In order to help attract new industry and increase economic development in the area, BDW Water System was formed under a joint powers agreement. Future plans for this system include upgrading the Crosby water treatment plant, and providing assistance in reducing arsenic levels in the Fortuna and Columbus water systems.

The North Central Rural Water Consortium is also in the process of developing a \$10 million water project to serve the rural areas and several small communities in eastern Mountrail County.

Ten years ago it was estimated that there were 100 million barrels of recoverable oil in the Bakken Formation. Today, the United States Geological Survey estimates that that volume is nearly 4 billion barrels. If the trends continue and oil production stays steady or increases in North Dakota, there will continue to be challenges that need to be addressed. But, with those challenges also come endless opportunities for many North Dakota communities.



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