

# North Dakota Oil

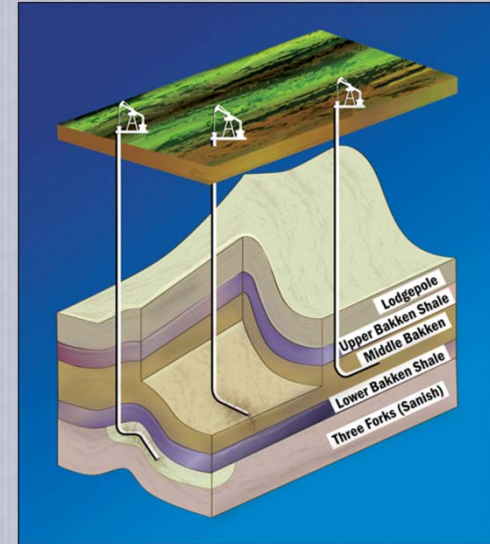


May 2012

# Overview – Williston Basin

The Williston Basin is comprised of different layered formations of shale source rock.

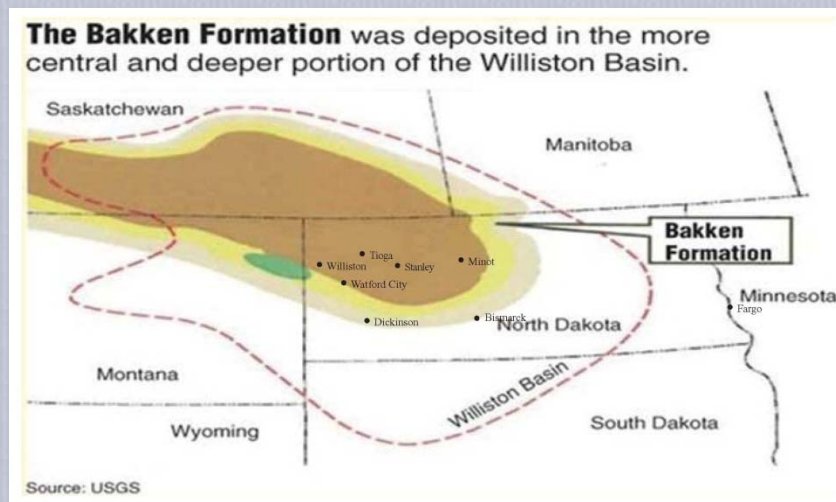
- The formations (Commonly referred to as the Bakken Formation):
  - Lodgepole
  - Bakken
    - Upper Bakken
    - Middle Bakken
    - Lower Bakken
  - Three forks
- The Bakken Formation covers approximately 200,000 square miles of North Dakota, Montana and Saskatchewan.



Source: [www.shaleexp.com](http://www.shaleexp.com)

Today, the Williston Basin is North America's largest known reserve of light sweet crude.

North Dakota has grown from the 9th largest oil producer in 2009 to the 3rd largest today and is on pace to overtake Alaska as the 2<sup>nd</sup> largest producer within the next 1-2 years at current growth rates.



# Oil in the Bakken

The current estimates of actual oil in the Bakken Formation range from 267-500 billion barrels of oil.

- In 2008, the United States Geological Survey (USGS), using a 1 percent recovery rate, estimated 3.65 billion barrels of undiscovered oil in the Bakken Formation.
- Recent advances in technology allow the USGS to undertake a new 2012 survey to help determine updated oil estimates and what percentage is recoverable.

## Recoverable Oil

- Estimates have ranged from 1-50% of the oil being recoverable.
- Many experts estimate recoverable oil as high as 20-50 billion barrels, with 24 billion barrels being used in many new assumptions.

CNBC Bakken Overview - <http://www.bakkenoil.org/cnbs-video-bakken-play>

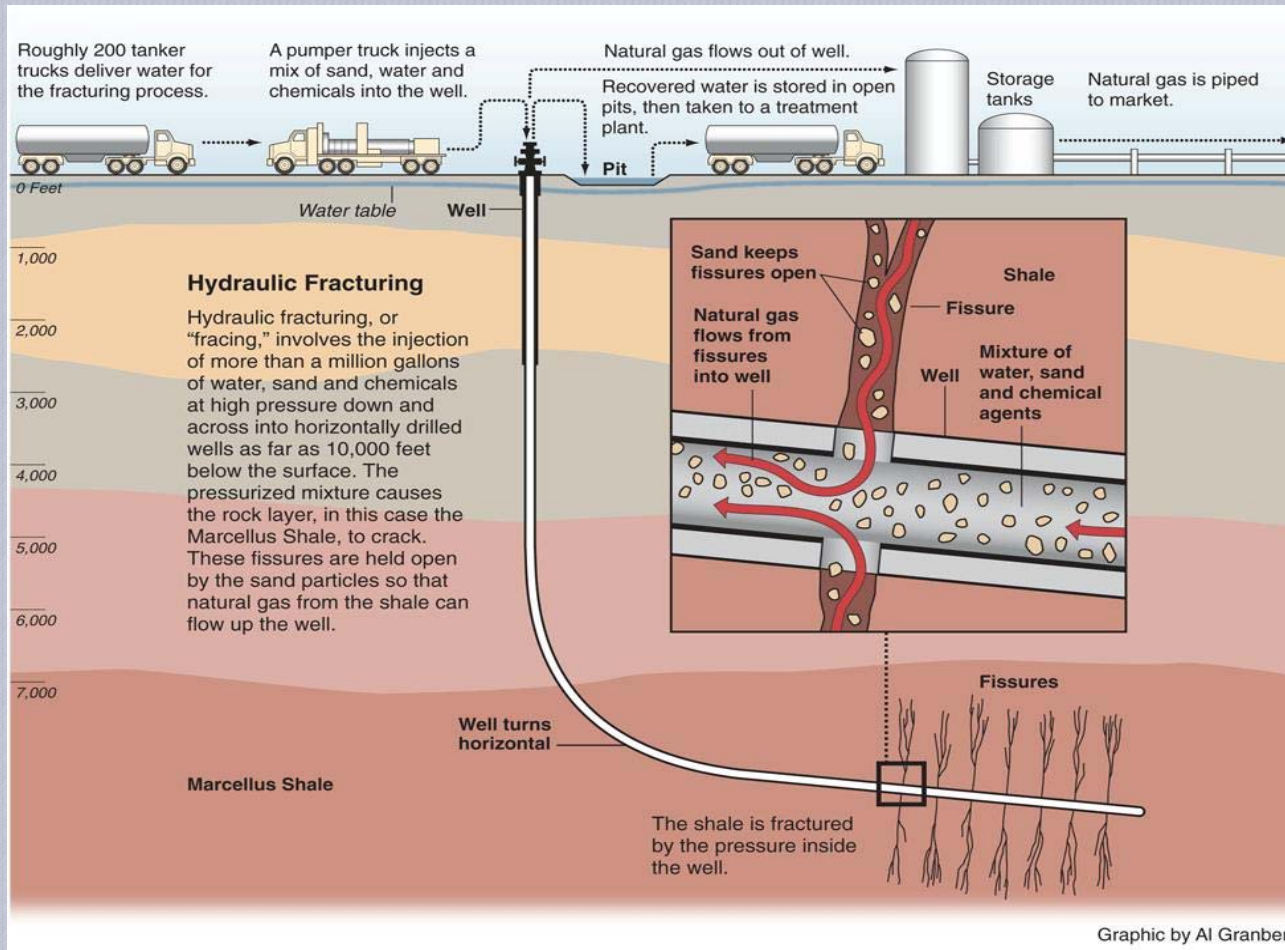




# Cause for Recent Growth

## New Extraction Technology

### Hydraulic Fracturing (Fracking)



Excellent Fracking Demonstration from Northern Oil and Gas - <http://northernoil.com/drilling>

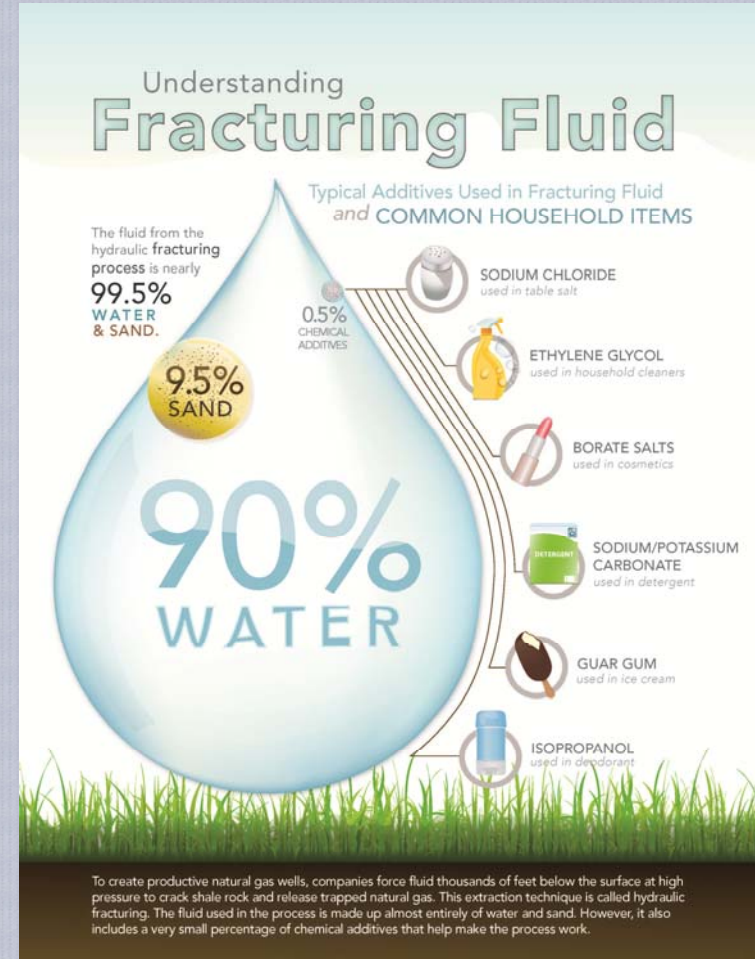
# Hydraulic Fracturing (Fracking)

- Halliburton, biggest provider of fracking in North America, invented hydraulic fracturing in 1949.
- Fracking process; makes cement-cased well by drilling vertically ~6,000 to 10,000 ft. Then drilling horizontally ~ 4,000 to 8,000 ft.
- Takes 18 days on average to drill a horizontal well.
- Drilling companies use more than 3 million pounds of steel casing and cement to construct wells that typically reach 6,000 feet or more below ground.
- After well is drilled, the fracking process takes anywhere from 3 to 10 days.
- 2 to 4 million gallons of water and 2.4 to 3.3 million pounds of sand are used in this process
- Fracking fluid is a mixture of 99% water and sand (sometimes ceramic material is added to the sand) and 1% chemical additives.
- Fracking fluid is pumped into the well at a very high pressure expanding the hole formed by the drill thus breaking up the rock formation and trapping oil and natural gas. The oil and gas then travel through these cracks allowing workers to draw the oil and gas up through the well.
- Efficiencies have brought Sanish field wells down to a cost of \$6.5-8.5 million.
- In 2005, the Energy Policy Act (EPA) exempted fracking from the Clean Water Act, the CLEAR Act, and EPA regulation. Since then, fracking has been introduced in at least 34 states and since 2008, many companies have used the fracking process in 90% of their newly drilled wells.





# Hydraulic Fracturing (Fracking)



# Oil Companies in the Bakken



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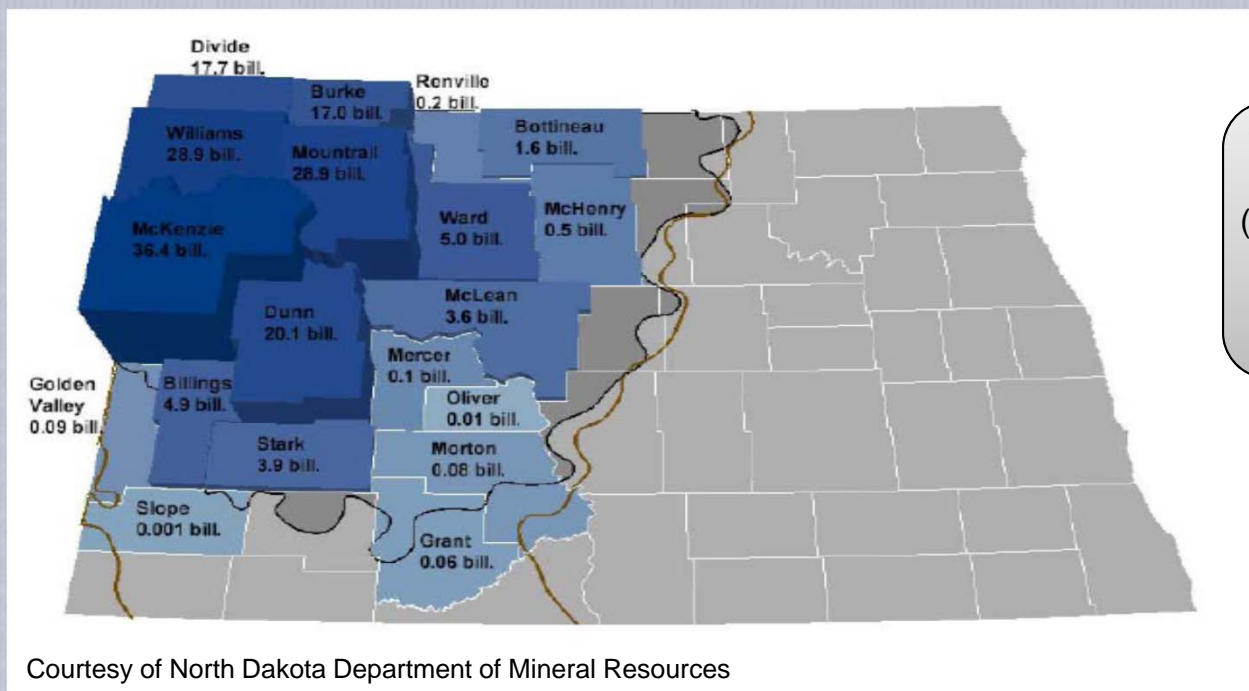
**ExxonMobil**



# Oil in North Dakota

North Dakota Geological Survey (NDGS), estimates ND contains 167 billion barrels out of the estimated 267-500 billion barrel range within the Bakken Formation.

North Dakota currently assumes a 3-10% recovery rate on Bakken Oil.



This map shows the combined OOIP (Original Oil in Place) estimates for the Three Forks and Bakken by County.



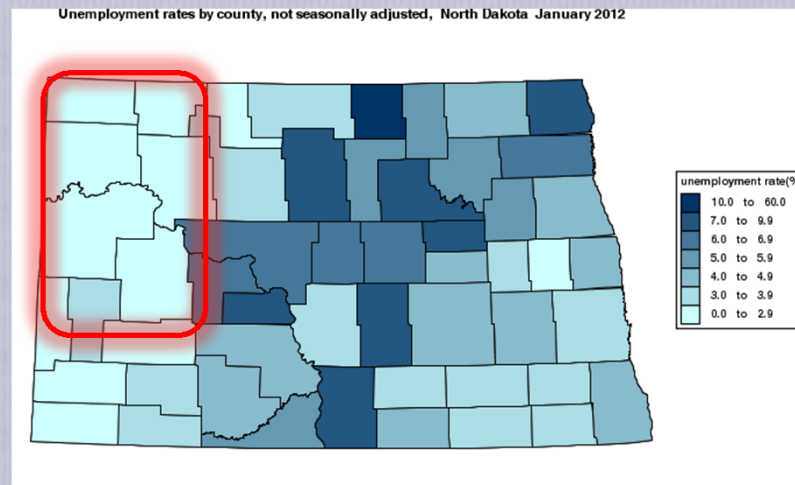
# A Thriving North Dakota

In January 2012, North Dakota was number one for job growth in the U.S.

- A 6.3% growth, 23,900 new jobs, compared to a year ago.

North Dakota has the lowest unemployment rate in the country at 3.2%.

- Oil producing counties in Northwest North Dakota range from .8-2.9% unemployment.
- The city of Williston and the surrounding Williams County unemployment rate fell to 0.8% in January 2012, the lowest unemployment rate ever recorded in North Dakota.

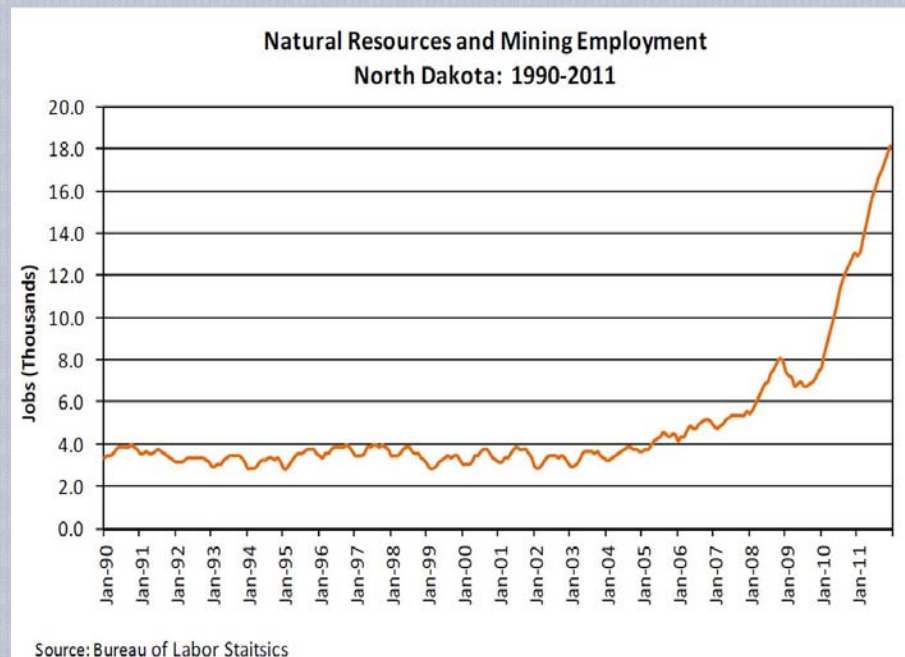


# A Thriving North Dakota

Over the past two years, the North Dakota oil industry has more than doubled its employment rates.

Today there are about 17,000 job openings in the Bakken

- On average, workers in the oil and gas sector of the Bakken earn more than \$90,000 a year.





# A Thriving North Dakota

The booming oil industry in North Dakota has increased the state surplus to over \$1 billion.

The Bloomberg Economic Evaluation of States Index recently named North Dakota as having the best economic index in the nation.

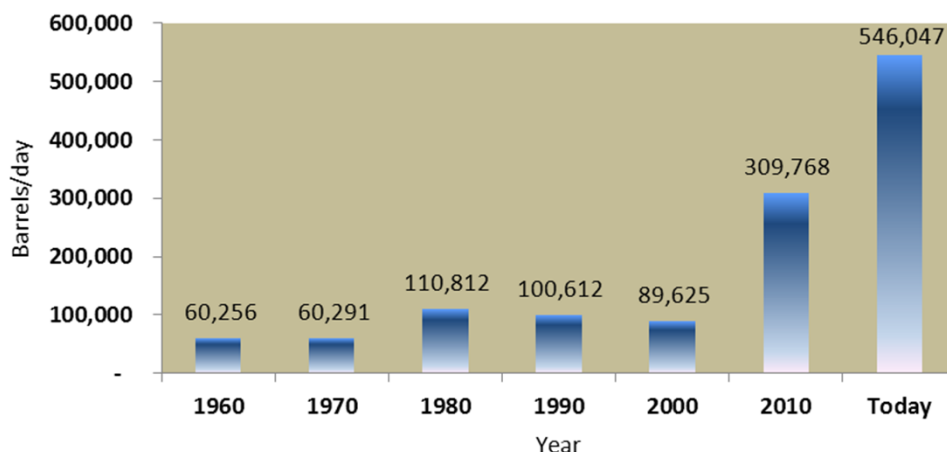
- New job opportunities and increasing income were key indicators of this strengthening economy.
- North Dakota was the only state in the nation to experience a positive economic index.

The state has benefited from taxes on the oil and gas industry, which generated an estimated \$839 million in FY 2011 and are expected to generate more than \$2 billion over the next two years.



# North Dakota Oil Growth

## Daily Oil Production



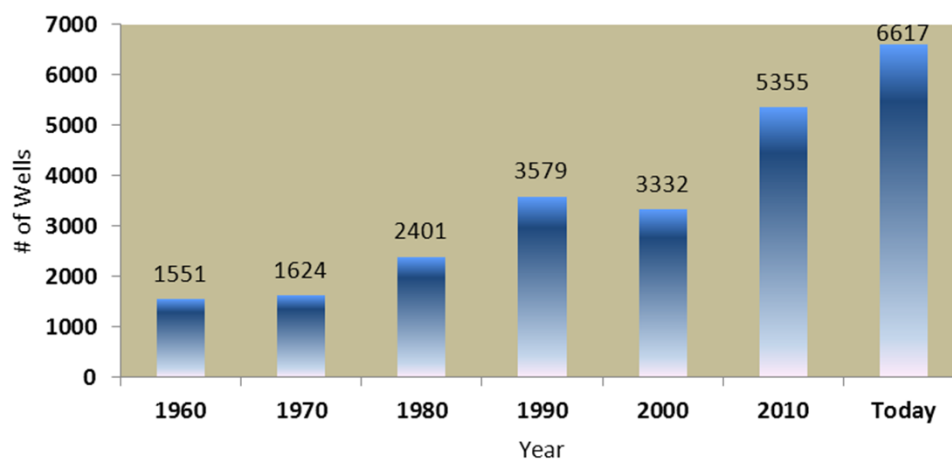
## Daily Oil Production Growth

1960 to 2000: **48.7%**  
2000 to Today: **509.3%**

## Well Growth

1960 to Today:  
**326.6%**

## Wells Producing







# Developing in the Bakken and ND

Recent sales data shows huge increases in taxable sales and purchases year-to-year for the third quarter in the following North Dakota cities located in the Bakken Formation.

<b>Taxable Sales and Purchases</b>			
<b>3rd Quarter</b>			
<b>City</b>	<b>2010</b>	<b>2011</b>	<b>% Change</b>
Dickinson	\$133,360,678	\$209,214,756	56.88%
Minot	\$292,908,514	\$430,244,577	46.89%
Stanley	\$ 16,470,728	\$ 37,465,485	127.47%
Tioga	\$ 78,607,295	\$186,897,651	137.76%
Watford City	\$ 20,348,092	\$ 33,096,540	62.65%
Williston	\$378,972,293	\$721,888,591	90.49%



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# Developing in North Dakota

## Improving Infrastructure

Dickinson has identified over \$97 million in infrastructure needs

- truck bypass, a new fire substation, an upgraded wastewater treatment plant, etc.

Williston has acknowledged \$89.4 in similar needs.

Minot has also recognized \$122 million in similar needs.

## Investment to improve the ND road infrastructure

- \$1.73 billion U.S. Department of Transportation budgets for ND.
- North Dakota's Permanent Oil Trust Fund is investing \$370.6 million for road projects within the 17 oil and gas producing counties.
- Drilling each new well requires more than 2,000 truck trips which has resulted in deteriorated roads.



# Developing in North Dakota

Recent growth has generated needs for:

- New living facilities
- New retail development
- Increased medical facilities
- Increased job opportunities



Many people are forced to use trailers as a means for selling goods and services due to lack of available retail space.



Currently many workers in the oil and gas counties are forced to live in places like 'man camps' or mobile trailers because permanent housing is just not available.



# Future Growth Potential

Today there are 6,000 wells with room for 30,000-45,000 wells

To date on average, approximately 2,400 new wells can be drilled a year, meaning this continuous drilling will likely last at least 15 more years.

- 15% complete with drilling, still 85% to go

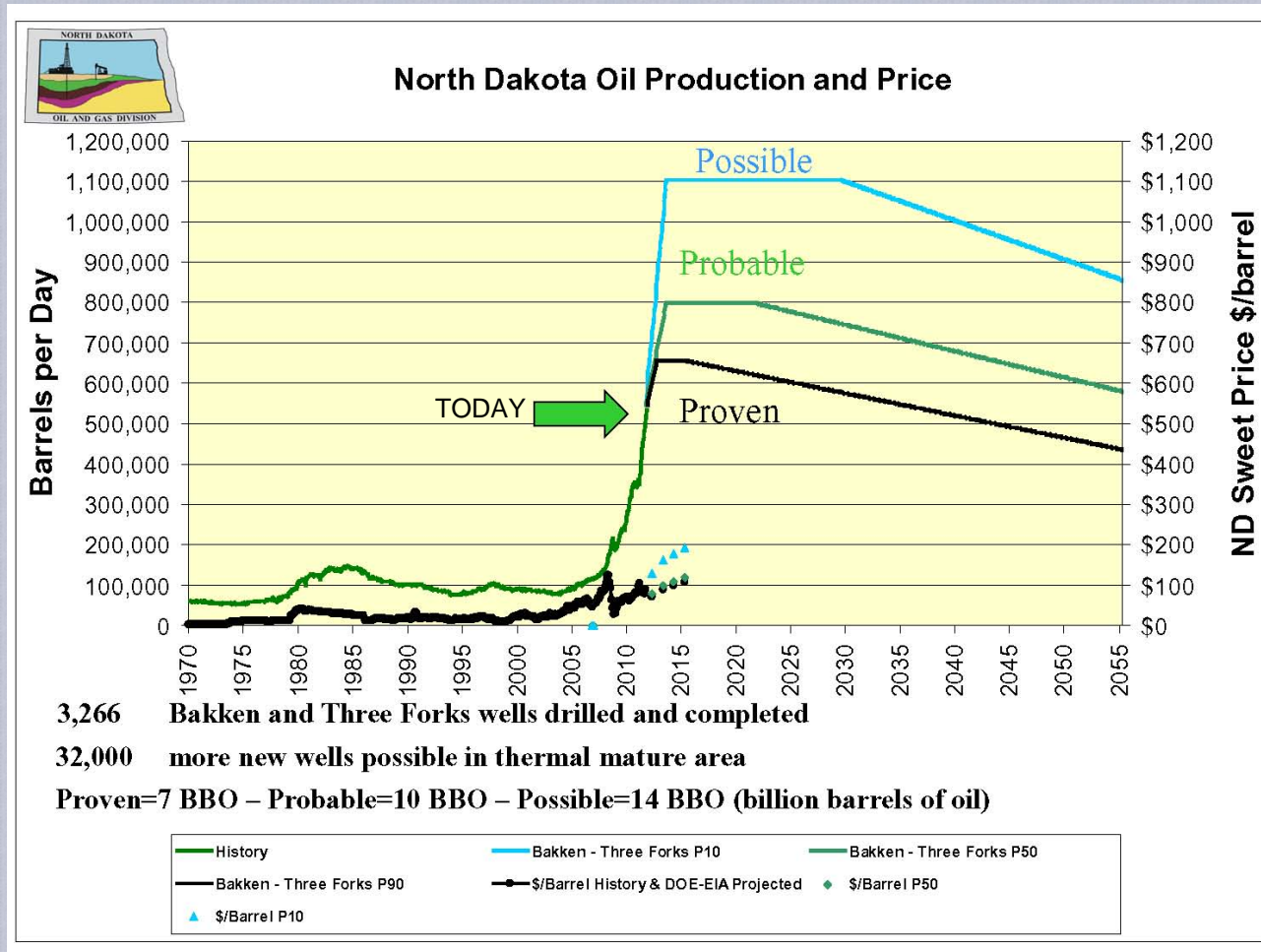
One well has roughly:

- 29 year lifespan
- Generates 580,000 barrels of oil
- \$22 million net profit
- \$4.16 million in taxes
- \$7.93 million in royalties
- \$1.5 million in wages

Experts anticipate \$15 billion of economic activity for the next 15 years.

# Future Growth Potential

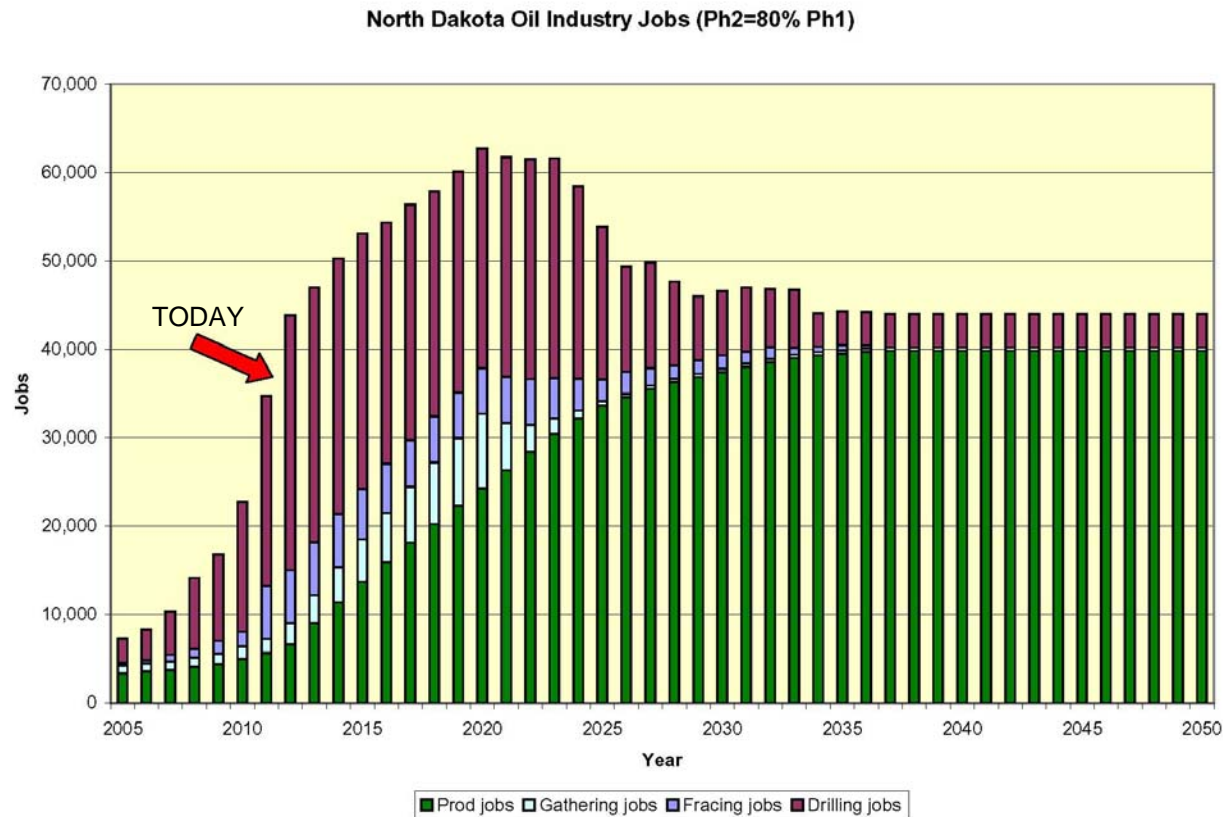
Projected North Dakota Oil Production and Price (March 2012)



Courtesy of North Dakota Department of Mineral Resources

# Future Growth Potential

Projected North Dakota Oil Industry Jobs (March 2012)



Courtesy of North Dakota Department of Mineral Resources



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- National property development firm offering a full range of real estate services
  - Minneapolis based, founded in 1991
- Our Services:
  - Property development, asset management, construction and project management, and brokerage services.
  - Finding our clients the right properties in the right locations at the right price
  - Understand our clients business and growth objectives
  - Add value to the economics of the deal – lower costs
- Statistics:
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  - Over 8 million square feet of space
  - Developed over 205 projects for 80 clients in 24 states
- Our Clients:
  - Supervalu, Target, Carl's Jr., Camping World, Gander Mountain, Sears, Goodwill, Verizon Wireless, Coborn's, McDonald's and more!
  - Every client has become a repeat client – working with Oppidan on more than one deal.



visit our website:  
[www.oppidan.com](http://www.oppidan.com)



# Sources

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- United States Bureau of Labor and Statistics
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- <http://www.governing.com/topics/energy-env/north-dakotas-oil-boom-blessing-curse.html#previous>
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- <http://www.energyfromshale.org/hydraulic-fracturing-fluid>
- <http://www.halliburton.com>
- Various Oil Related Presentations



This marker outside Tioga marks the spot where oil was first discovered in North Dakota on April 4, 1951.

