

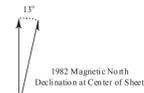


# Lignite Reserves

## Watford City 100K Sheet, North Dakota

Culbertson	Williston	Stanley
Sidney	Parshall	
Glendive	Grassy Butte	Killdeer

Adjoining 100K Maps



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The Watford City 100K sheet encompasses most of McKenzie County and contains approximately 618 million tons of mineable lignite. This reserve is spread throughout the map, but more than half of this tonnage comes from the Red Wing Creek and Bowline Creek deposits (Ts.147&148N, Rs.101-103W). The Johnsons Corner deposit (Ts.149 & 150N, Rs. 96 & 97W) is the only other deposit in this sheet that contains more than 100 million tons of mineable lignite (Murphy, 2006). Most of the coals in these deposits are less than 10 feet thick. The thickest mineable coal is 15 feet and occurs in the Johnson's Corner deposit. The Harmon coal is 54 feet thick in this area, the thickest known coal in North Dakota. The Harmon bed is more than 50 feet thick in several areas west of the North Unit of the Theodore Roosevelt National Park (Ts.147&148N, Rs.101&102W.) The Harmon bed is 400 to 700 feet deep in this area, too deep for conventional surface mining (Murphy and Goven, 1998). Because of its depth and thickness, the Harmon bed has been explored for its coalbed methane potential. Burlington Resources drilled four wells into this lignite in 2001, but recovered little methane.

According to the records of the North Dakota Public Service Commission, 20 coal mines operated at one time or another in this map area. Most mines were located in the central and northeastern portion of the map sheet. The available information indicates the majority of these were small surface mines that operated between the late 1920s and the late 1950s.

References  
Murphy, E.C., 2006, The lignite reserves of North Dakota: North Dakota Geological Survey Report of Investigation no. 104, 141 p.  
Murphy, E.C., and Goven, G.E., Thick coals in Dunn and southern McKenzie counties, North Dakota: North Dakota Geological Survey Open-File Report no. 98-3, 31 p.

### UNIT DESCRIPTIONS

Geology Undifferentiated

Economic Coal Deposits

Economic coal deposits are those that meet the minimum criteria established by coal companies operating surface mines in North Dakota. These economic criteria include a minimum cumulative coal thickness of ten feet-typically occurring in less than two beds, a minimum individual bed thickness of at least 2.5 feet, a ratio of overburden to coal thickness of not more than 10:1, a minimum of 25 feet of overburden, and a maximum depth to coal of approximately 150 feet.

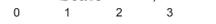
### Geologic Symbols

- Extent of Local Lignite Reserves
- Data Points
- Abandoned coal mine plotted from the records of the Abandoned Mine Land Division of the North Dakota Public Service Commission.

### Other Features

- Water
- River/Stream
- Marsh
- Stream - Intermittent
- Theodore Roosevelt National Park
- Fort Union National Historic Site
- Federal Land Boundaries
- Federal Highway
- County Boundary
- State Highway
- Paved Road
- Unpaved Road
- Section Corner

Scale 1:100,000



Miles

Mercator Projection 1927 North American Datum

Standard parallel 47°30' Central meridian 103°30'

Shaded Relief - Vertical Exaggeration 9x

The North Dakota Geological Survey can publish on demand 1:24,000 scale quadrangle maps (24k - c series) of the mineable coal deposits in the Watford City 100K sheet. These maps would include information on mineable coal thickness.

Note: This map was expanded beyond the normal Watford City 100K sheet to include an additional width of two miles to the Montana border.

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