North Dakota Geological Survey
100K Series: Hzen - c

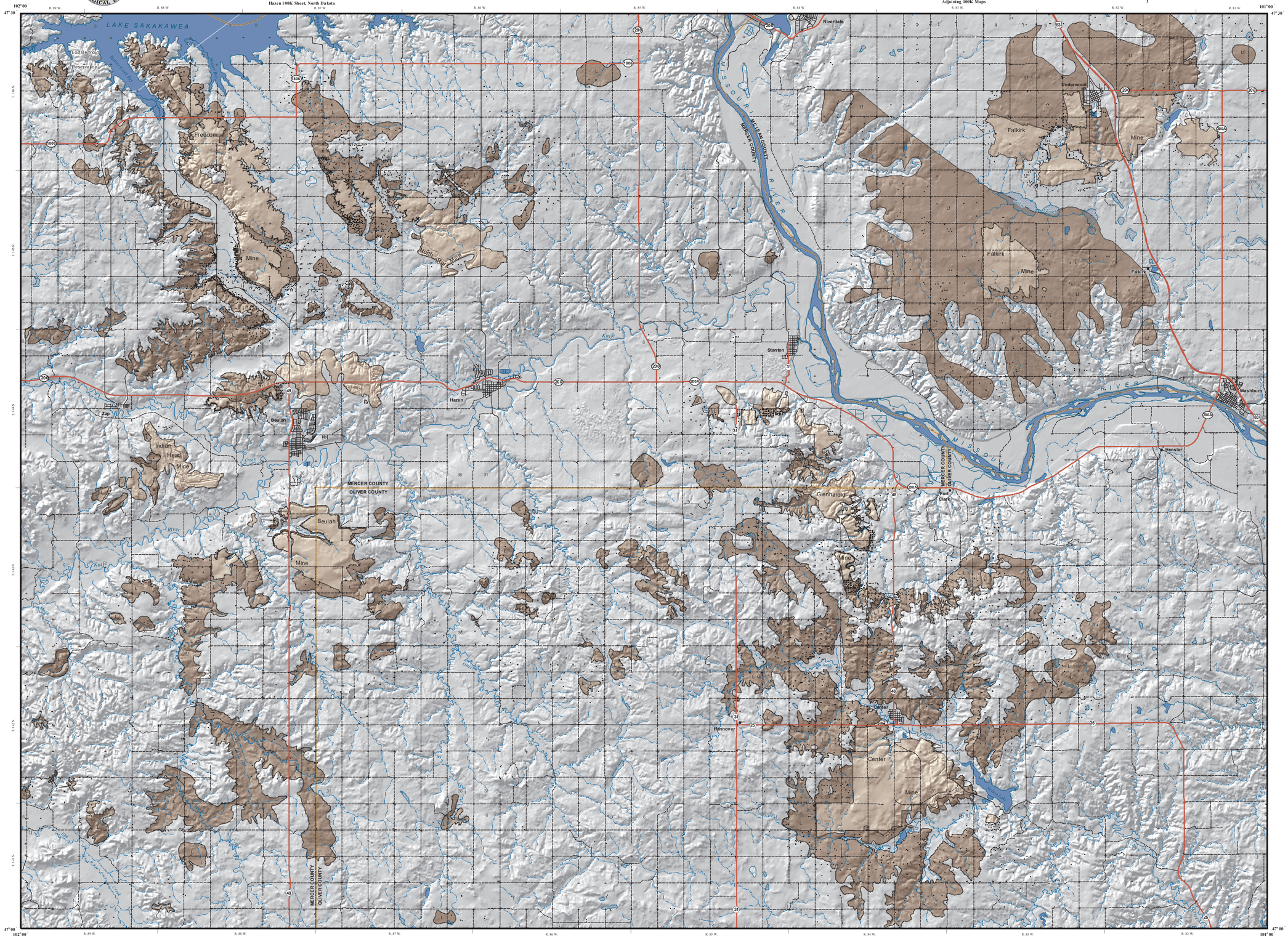
Lignite Reserves
Hazen 100K Sheet, North Dakota

Parshall	Garrison	Drake
Killdeer		Mc Clusky
Dickinson	Glen Ullin	Bismarck

Adjoining 100K Maps

12°
1979 Magnetic North Declination at Center of Sheet

Edward C. Murphy, State Geologist
Lynn D. Helms, Director Dept. of Mineral Resources



Edward C. Murphy
2007

The Hazen 100K sheet contains approximately 3.5 billion tons of mineable lignite. This reserve is spread throughout the county, but is somewhat centered around the three main mining of Beulah, Center, and Underwood. Four coal mines are currently operating in and around these mining centers. There are approximately 730 million tons of mineable lignite in the vicinity of the Freedom Mine (north of Beulah), 385 million tons of reserve adjacent to the Beulah Mine (south of Beulah), 880 billion tons within a seven-mile radius of the Center Mine, and 1.2 billion tons adjacent to the Falkirk Mine (Murphy, 2006).

The Beulah-Zap coal bed is, on average, about 18 feet thick in the vicinity of the Freedom Mine and the Beulah bed is 10 to14 feet thick south of Beulah. The Hagel bed is approximately 10 feet thick at the Center Mine where both it and the five-foot-thick Kinneman Creek bed are often mined. The Hagel bed has a maximum thickness of about 11 feet in the Falkirk Mine. Glacial sediments (primarily till) cover roughly half the surface of this map sheet. The Sentinel Butte Formation (Paleocene) is present at the surface in the southern portion of the map sheet and is generally covered by glacial sediments in the northern portion of the map area.

According to the records of the North Dakota Public Service Commission, 106 coal mines operated at one time or another in this area. Although the majority of these were small, a few were large operations. A large underground mine (Black Diamond Mine, Beulah Mine, Knife River Coal Mining Company Mine) operated north of Beulah from 1915 to 1953. The Knife River Coal Mining Company opened a surface mine in this area in 1952 and closed in 1974. In 1922 the Republic Coal Company opened Zap Colliery Company Mine or Dakota Colliery Company Mine which later became known as the Indian Head Mine. Most of the mining that took place at this site was surface, with only a small component of underground mining. The North American Coal Company took over the mine in 1957 and mining operations ceased in the early 1980s. The Glenharold Mine, located south of the town of Stanton, operated in southeastern Mercer and northern Oliver County. The surface mine opened in the early 1960s and closed in 1993.

Of the four surface coal mines currently operating within the Hazen 100k sheet, the Beulah Mine, having opened in the late 1960s, is the oldest. The Center Mine began operation in 1970, the Falkirk Mine in 1978, and the Freedom Mine in 1983.

References

Murphy, E.C., 2006, The lignite reserves of North Dakota: North Dakota Geological Survey Report of Investigation no. 104, 141 p.

UNIT DESCRIPTIONS

Geology Undifferentiated

Area of Mined Lignite

L — 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-typicallyoccuring in less than two beds, a minimum individual bed thickness of at least 2.5 feet, a ratio of overburden to coalthickness of not more than 10:1, a minimum of 25 feet of overburden, and a maximum depth to coal of approximately 150 feet.

L F — Economic Coal Deposits

The boundaries of these economic coal deposits were modified from a map provided by The Falkirk Mining Company.

Geologic Symbols

Extent of Local Lignite Reserves

Data Points

Includes coal exploration NDGS/USGS drill holes, sub-surface mineral drill holes, oil & gas wells, and NDSWC drill holes.

Other Features

Water	River - Perennial	US Highway
Water - Intermittent	Stream - Intermittent	State Highway
Water - Inundated	County Boundary	Paved Road
Section Corners	Reservation Boundary	Unpaved Road

Scale 1:100,000

0 1 2 3 4
Miles

Mercator Projection — 1927 North American Datum
Standard parallel 47° 00' — Central meridian 101° 30'
USGS NED 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 minable coal deposits in the Hazen 100k sheet. These maps would include information on minable coal thicknesses.

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