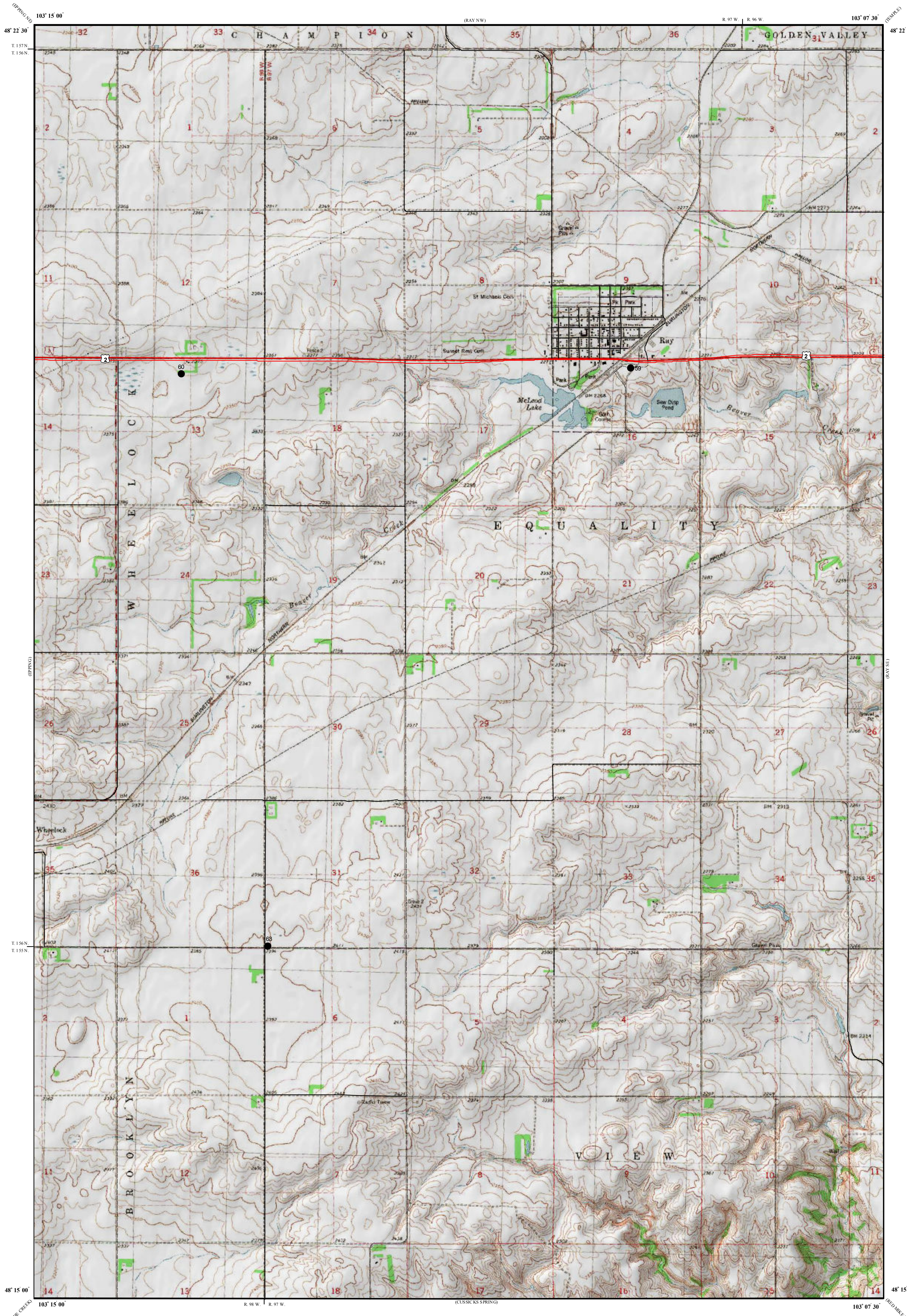


Lignite Reserves

Ray Quadrangle, North Dakota

Edward C. Murphy
2008



UNIT DESCRIPTIONS

GU Geology Undifferentiated

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

● Drill Hole Numbers

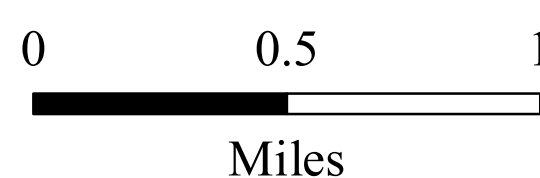
Other Features

— US Highway

— Paved Road

--- Unpaved Road

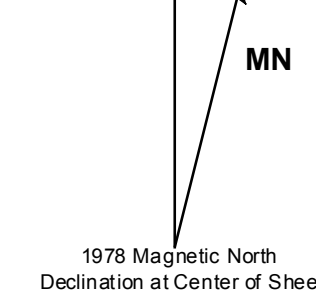
Scale 1:24,000



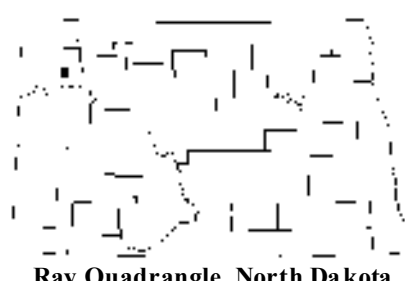
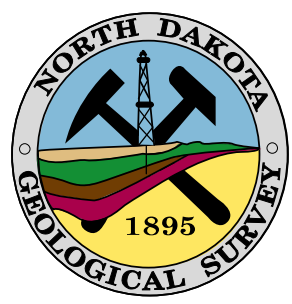
Miles

Lambert Conformal Conic Projection Standard Parallels 48° 15' 00" and 48° 22' 30"
1927 North American Datum NGVD 1929
USGS 7.5 Minute Topographic Map - Contour Interval 10 Feet

13° 30'



1978 Magnetic North
Declination at Center of Sheet



Ray Quadrangle, North Dakota