

# Surface Geology

## Dickinson South Quadrangle, North Dakota

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2005

### EXPLANATION

#### QUATERNARY SYSTEM

##### RECENT

##### Manmade Features or Deposits

**Qlf** Landfill Deposits  
Engineered landfill deposits and common garbage dumps.

##### OAHE FORMATION

**Qa1** Modern Alluvial Deposits  
Sand, silt, and clay deposited by modern streams and rivers. Gravelly where derived from coarse, older alluvial deposits. Includes river channel and floodplain sediments. Contains numerous truncated meanders and minor terraces. Local similarity to the Sentinel Butte Formation makes thickness determinations difficult; generally less than 20 feet thick.

##### RECENT/PLEISTOCENE

**Qa2** Alluvial Deposits  
Poorly sorted sand, silt, clay, and gravel. Forms planar terrace deposits, elevated relative to modern streams, that are dissected by modern alluvial deposits. Fluvial (channel and floodplain) sediment generally less than 30 feet thick.

#### TERTIARY SYSTEM

##### OLIGOCENE

##### WHITE RIVER GROUP

**Tgv** GOLDEN VALLEY FORMATION

##### Chalky Buttes Member

White to yellowish gray conglomeratic sandstone.

##### Bear Den Member

Grayish tan to gray, swelling claystone and mudstone. Generally silicified within the map area and locally pebbly.

##### EOCENE/PALEOCENE

**Tgv** GOLDEN VALLEY FORMATION

##### Camels Butte Member

Yellowish brown, micaceous, illitic and montmorillonitic siltstone, claystone, and sandstone.

##### Bear Den Member

Light gray to bright white kaolinic strata often divisible into 3 stratigraphic units: basal gray zone, middle orange zone, and a thin upper carbonaceous zone. Often capped by a siliceous bed (Taylor Bed) in this area.

##### PALEOCENE

##### FORT UNION GROUP

**Tsb** SENTINEL BUTTE FORMATION

Gray to brown, variably lithified siltstone, mudstone, claystone, sandstone, and lignite. Calcite-cemented sandstone and mudstone concretions are common, as are siderite nodules. In this area, the contact with the Golden Valley Formation appears conformable and gradational. Fluvial, lacustrine, and swamp sediment that form gentle, vegetated slopes. Only the upper 200 feet of the formation is exposed.

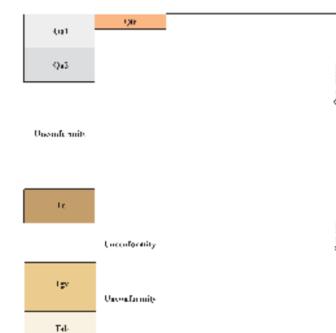
#### Geologic Symbols

- Known contact between two geologic units
- - - - Approximate contact between two geologic units

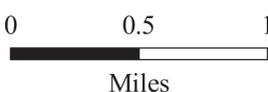
#### Other Features

- Water
- State Highway
- Paved Road
- Unpaved Road

#### Correlation of Map Units

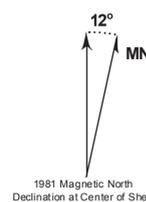


Scale 1:24,000



Miles

Lambert Conformal Conic Projection Standard Parallels 46° 45' 00" and 46° 52' 30"  
1927 North American Datum NGVD 1929  
USGS 7.5 Minute Topographic Map Contour Interval 10 Feet  
Road and Hydrologic Layers Rectified to 2003 NAIP Digital Orthophoto



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