

Surface Geology

Lehigh Quadrangle, North Dakota

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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.

QUATERNARY/TERTIARY SYSTEM

QTa Sand and Gravel Deposits
Poorly sorted, iron stained, locally iron cemented sand and gravel. Contains pebbles and cobbles of locally derived material (mudstone, sandstone, concretions, silicified wood, flint, silcrete, chalcedony), recycled glacial erratics, and lesser quartzite and porphyry (derived from the Black Hills or Rocky Mountains). Occasional small to medium boulders or local sandstone and mudstone. Occurs as esker-like ridges, a veneer that caps hilltops, and deeply eroded deposits with no distinctive topographic expression. Fluvial (channel) sediment up to 60 feet thick.

TERTIARY SYSTEM

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 silicious bed (Taylor Bed) in this area.

PALEOCENE

FORT UNION GROUP

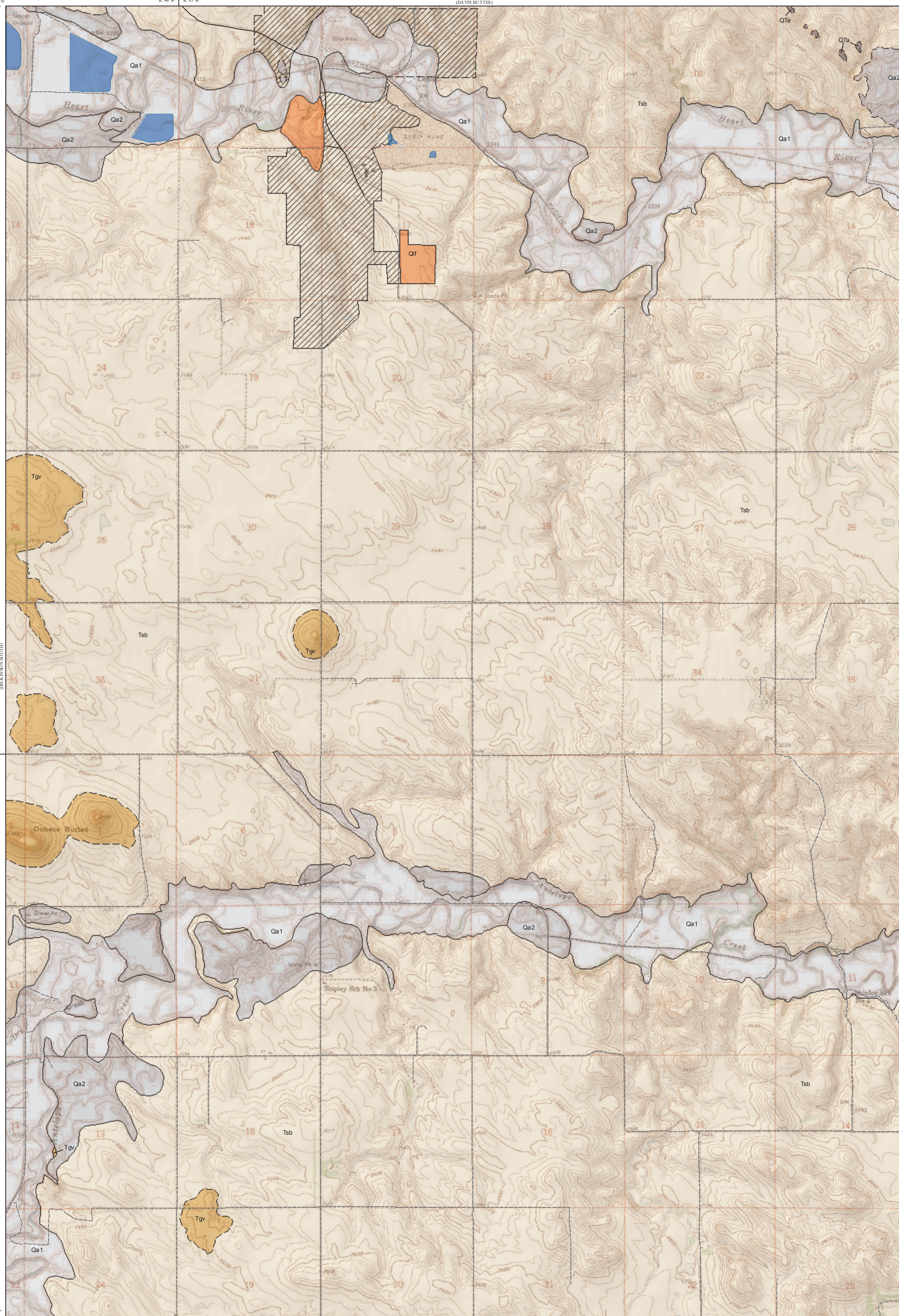
Tsb SENTINEL BUTTE FORMATION
Gray to brown, variably lithified siltstone, mudstone, claystone, sandstone, and lignite. Calcite-cemented sandstone and mudstone concretions are common, as are siderite nodules. In this area, the contact with the Golden Valley Formation appears conformable and gradational.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

Geologic Symbols

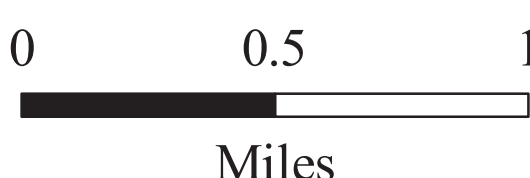
- Known contact between two geologic units
- - - - Approximate contact between two geologic units
- ▨ Area underlain by abandoned underground lignite mine.

Other Features

- Water
- Paved Road
- - - - Unpaved Road

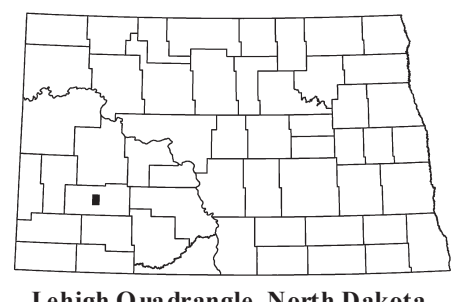
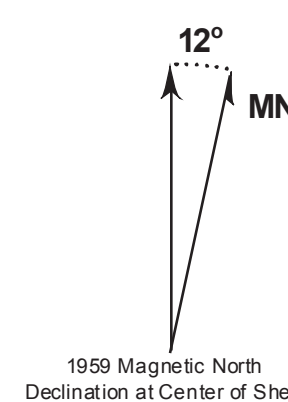


Scale 1:24,000



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
Roads and Hydrologic Layers Rectified to 2003 NAIP Digital Orthophoto



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