

Surface Geology

Solberg Butte Quadrangle, North Dakota

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EXPLANATION

Water

Gravel Pit

QUATERNARY SYSTEM

HOLOCENE

OAHE FORMATION

Sand, silt, clay, gravel, and organic debris; all postglacial sediment deposited on the landscape; includes river sediment, windblown sediment, and lake sediment.

Alluvium and overbank sediment

Sand, silt, clay, and disseminated organic debris; obscurely bedded, dark colored; locally abundant gastropod and pelecypod shells including *Valvata tricarinata*, *Sphaerium* sp., and *Pisidium* sp.; commonly more than 3 feet (1 meter) thick.

HOLOCENE/PLEISTOCENE

Colluvium

Unconsolidated sediment, mostly fine sand, silt and clay; obscurely bedded, dark colored; deposited primarily by slope wash and mass movement as an apron at the base of bedrock uplands. Commonly up to 15 feet (4.6 meters) thick.

PLEISTOCENE

COLEHARBOR GROUP

The Coleharbor Group includes all sediments in North Dakota associated with deposition by Pleistocene glaciers.

Draped glacial sediment

Light olive-brown to olive-brown; unsorted; unbedded; calcareous; shaly; lignite fragments common; contains abundant cobbles and surface boulders of mostly crystalline lithologies, with minor amounts of limestone, dolostone, and more rarely, local bedrock types; undulating to hilly surface; discontinuous; thin; lacks hummocky topography owing to postglacial erosion; deposited on a non-glacial surface as a thin mantle draped over, and only slightly modifying, the pre-existing topography by a pre-Late Wisconsinan glacier (Napoleon Advance). Parts of this unit in the southeast corner of the map may be covered by a patchy, thin (< 5 feet [1.5 meters]) veneer of windblown sediment.

Collapsed outwash

Moderately well-sorted, light to dark olive brown, low-angle flat bedded to high-angle cross-bedded silt, sand, and gravel; calcareous; shaly; bouldery in places; gently undulating to rolling surface, pitted by steep-sided, bowl-shaped depressions (kettle holes) formed by the melting of detached blocks of buried ice; deposited as outwash by meltwater flowing through the Apple Creek and Random Creek meltwater channels.

TERTIARY SYSTEM

PALEOCENE

Bullion Creek Formation

Nonmarine sandstone, siltstone, claystone, and lignite; generally brightly colored yellow, brown and gray; poorly to well-cemented sandstone; unbedded to sharply bedded siltstone and claystone; nonfissile; commonly thinly laminated. Maximum thickness in the map area is about 60 feet (18 meters). The contacts between the Bullion Creek, Slope and Cannonball Formations were inferred from elevations of contacts in adjacent quadrangles.

Slope Formation

Nonmarine interbedded sandstone, siltstone, claystone, and lignite; predominantly drab, brownish gray and yellowish brown; poorly to well-cemented, plane and crossbedded sandstone; unbedded or thinly laminated, nonfissile siltstone and claystone. Maximum thickness in the map area is about 100 feet (30 meters). May be covered by a thin (< 5 feet [1.5 meters]) veneer of glacial sediment.

Cannonball Formation

Marine sandstone and mudstone. Grayish green to yellowish brown, medium to fine grained, generally poorly cemented sandstone; contains scattered ironstone concretions and dark mineral grains that impart a "salt and pepper" appearance; commonly capped by a two-to-three-foot-thick, well-cemented, lenticular sandstone. Light to dark gray to black mudstone; fissile; commonly banded with lenses of white to yellowish brown silt and very fine sand; forms smooth, rounded slopes. Maximum thickness of the Cannonball Formation is about 300 feet (91 meters) in this map area. May be covered by a thin (< 5 feet [1.5 meters]) veneer of glacial sediment.

Geologic Symbols

Geologic contact

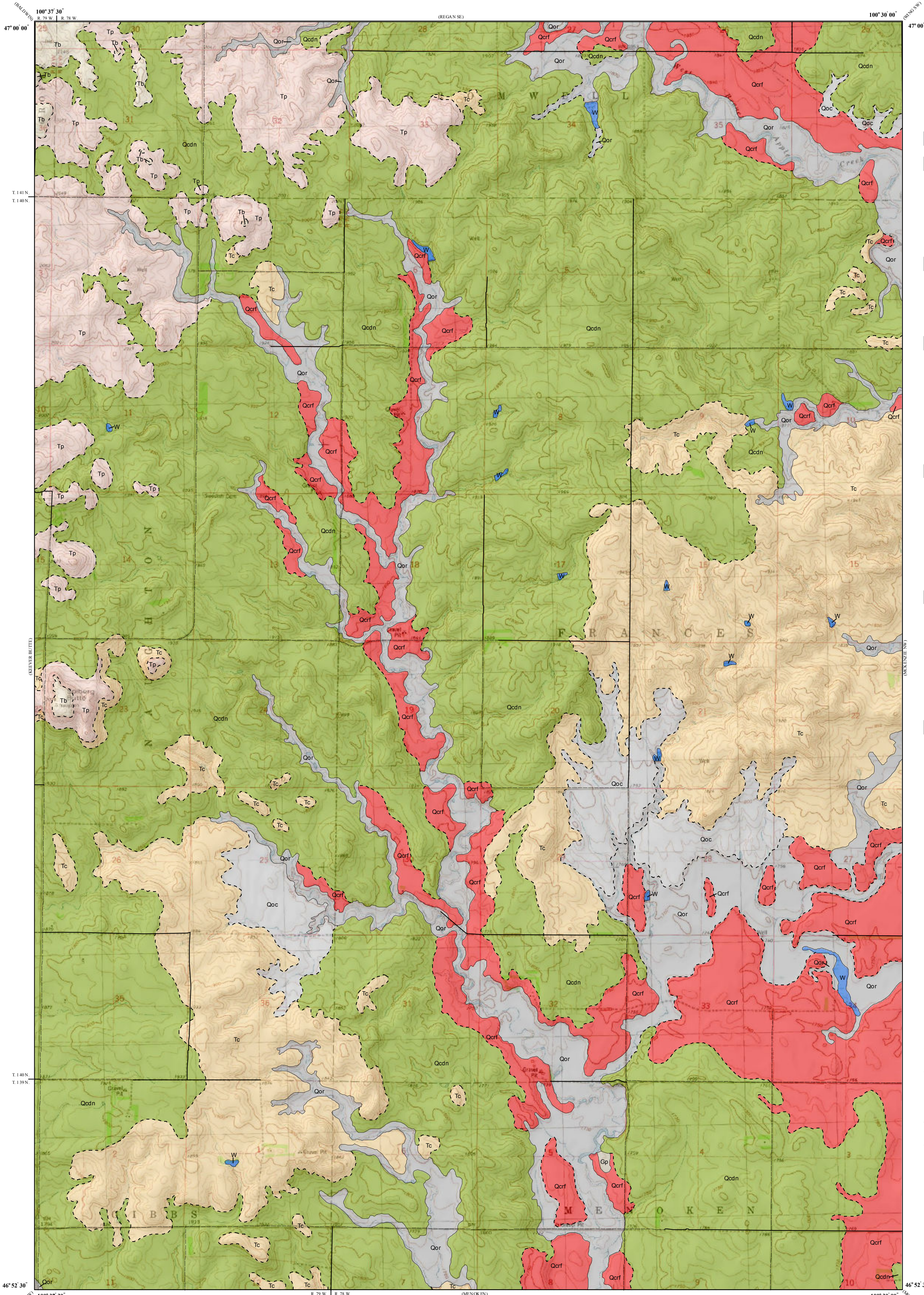
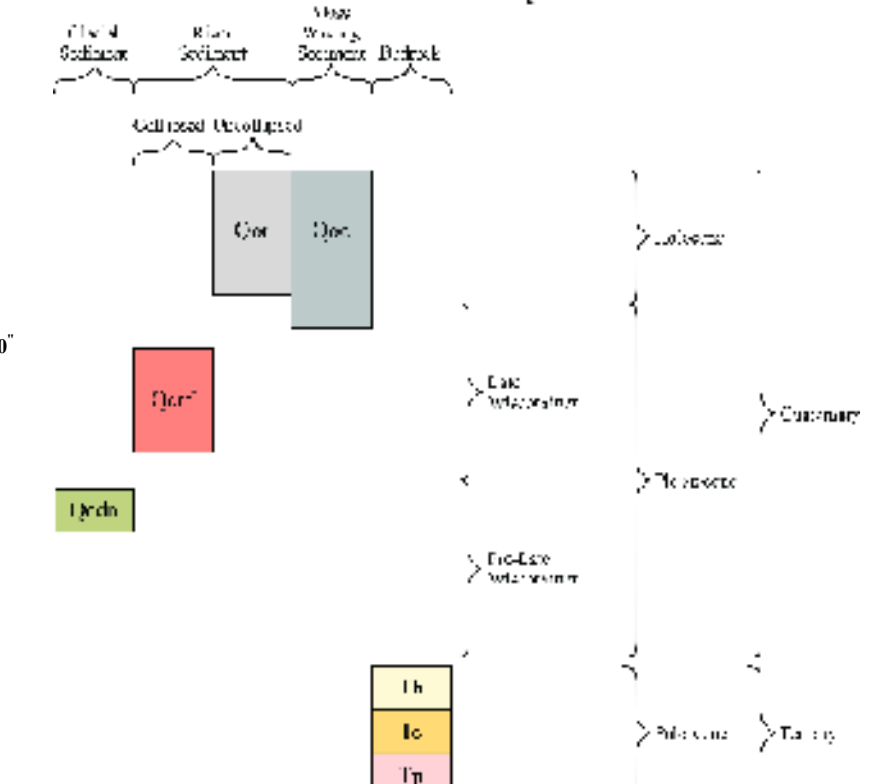
Geologic contact (inferred)

Other Features

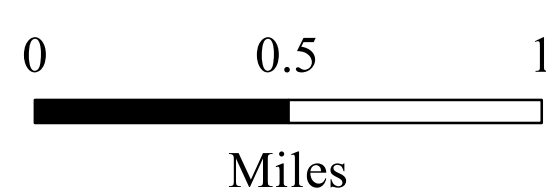
Paved Road

Unpaved Road

Correlation Of Map Units



Scale 1:24,000



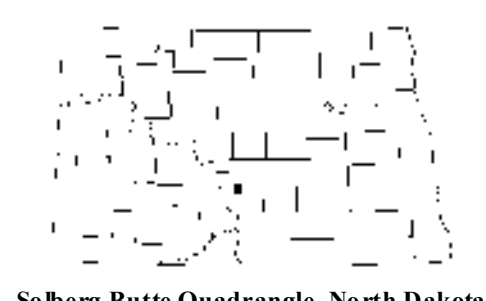
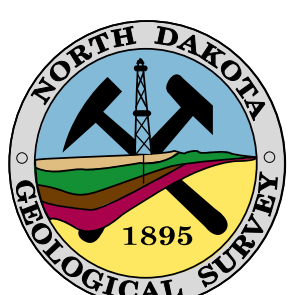
Miles

Lambert Conformal Conic Projection Standard Parallels 46° 52' 30" and 47° 00' 00"
1927 North American Datum NGVD 1929
USGS 7.5 Minute Topographic Map Contour Interval 10 Feet

11° 00'

MN

1975 Magnetic North
Declination at Center of Sheet



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