North Dakota Geological Survey

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Geologic Map of Rolette County, North Dakota

Dwight E. Deal

1971

Digitized from : Deal, D.E., 1971, Geologic maps of Rolette County: North Dakota Geological Survey Bulletin 58, Plate I, 1:125,000 scale , by Levi D. Moxness, Navin Thapa and Christopher A. Maike.

2022

EXPLANATION

QUATERNARY SYSTEM

HOLOCENE

OAHE FORMATION

Qop **Pond Sediment:** Organic clay: Temporary pond sediment.

Qos **Stream Sediment:** Organic silt with some clay, sand, and gravel: Overbank and channel deposits along modern streams.

PLEISTOCENE

COLEHARBOR GROUP

LAKE SEDIMENT

Includes lake sediment deposited on and surrounded by stagnant glacial ice, sediment of ice-marginal Lake Souris, other ice-marginal lake sediment, sediment not deposited on or in contact with stagnant glacial ice.

Qlc **Clay:** Dominantly offshore lake sediment; locally may include some nearshore and shoreline silt, sand, gravel, and mudflow sediment.

Qlm **Silt and Clay:** Glacial lake silt and glacial lake clay, undivided.

Qlmt **Thin Clay and Silt Over Till :** Glacial lake silt and glacial lake clay, undivided, with till commonly within 5 feet of the surface.

Qls **Silt:** Dominantly offshore lake sediment; locally may contain some clay or fine sand

STREAM AND LAKE SEDIMENT

Scoured and pitted stream sediment associated with ice-marginal Lake Souris and other stream sediment deposited during the last glaciation. Includes nearshore sediment associated with the margins of Lake Souris and other lakes which formed on stagnant glacial ice.

Qrss **Sand and Silt:** Of diverse origin, deposited in lakes or streams.

Qrst **Thin Sand and Silt Over Till:** Lake or stream deposits with till commonly within 5 feet of the surface.

Qrs **Sand:** Of diverse origin, dominantly stream sediment, some nearshore.

Qrgs **Gravel and Sand:** Sediment deposited in streams and lakes, some of which formed on glacial ice. Includes sediment in channels developed prior to the last deglaciation.

Qrg **Gravel:** Stream sediment.

GLACIER AND MUDFLOW SEDIMENT (TILL)

Glacially transported sediment; the major part of which was sheared into a superglacial position by active ice and then deposited by mudflows as the underlying ice melted; includes a small amount of sediment that was carried at or near the bottom of the glacier and underwent little or no lateral movement as the enclosing stagnant ice melted.

Qtsh **Shale-Rich Till:** Slightly stony mixture of clay, silt, and sand in approximately equal proportions (silt is usually dominant); stony fraction contains many lithologies but characteristically contains shale and lacks sandstone and lignite.

Qtss **Shale- and Sandstone-Rich Till:** Lithologically similar to Qtsh, but locally may have more or less clay; Stony fraction characteristically contains sandstone, lignite, and shale.

Qts **Thin Till Over Sand:** Five to 25 feet of shale- and sandstone-rich till over sand and gravelly sand.

Qtst **Stony Sand:** Of diverse origin, dominantly glacier sediment (very sandy till) with some stream-deposited silt and sand, portions of which may be wind-blown.

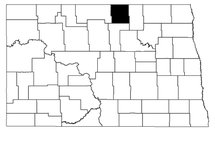
Geologic contact (Certain)

Geologic contact (Questionable)

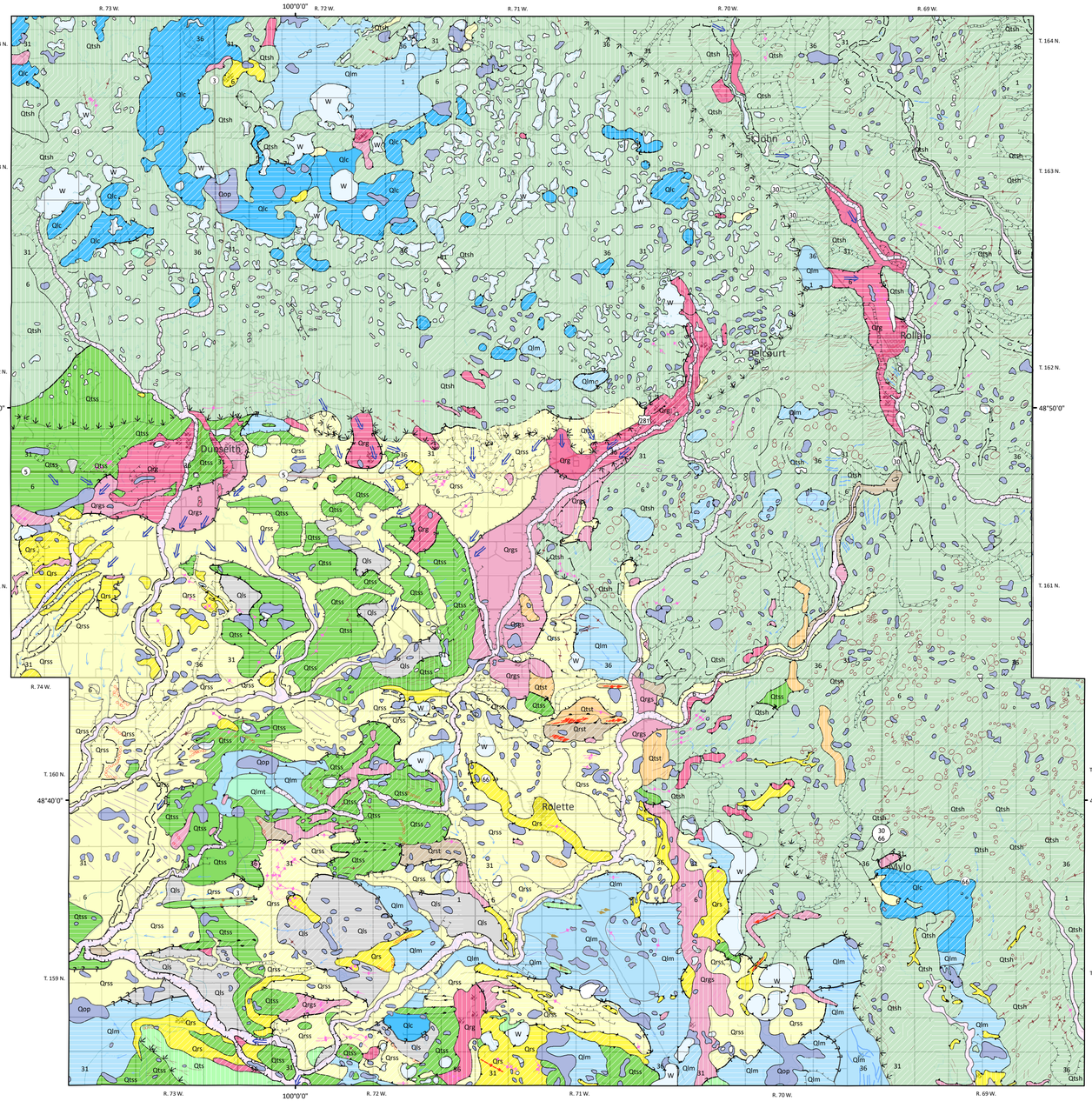
TOPOGRAPHY

(Figures indicate average maximum slope angles)

TOPOGRAPHY			
Flat <1°	**Undulating 1°-4°**	**Rolling 4°-7°**	**Hilly >1°**



Rolette County, North Dakota



ROAD CLASSIFICATION

Expressway — Local Connector

Secondary Hwy — Local Road

Ramp — 4WD

US Route — State Route

Scale 1:125,000

0 5 10 Miles

0 20,000 40,000 Feet

0 5 10 Kilometers

N W E S

Mercator Projection
North American 1983 Datum

GEOMORPHIC SYMBOLS

SLOPE SYMBOLS: May be combined for slopes that are believed to have a complex origin.

SCARP: Hatchures point downhill; used for slope tops of unspecified origin and for minor channels; includes both modern channels and some cut more than 10,000 years ago; reliability varies.

SLOPE TOP, ICE-CONTACT FACE: Arrow beads point down slope and toward the previous location of stagnant glacial ice; reliability varies.

SLOPE TOP, BURIED ICE-CONTACT FACE: As above but stagnant glacial ice was buried by sediment.

SLOPE TOP, MAJOR DRAINAGE CHANNEL CUT MORE THAN 10,000 YEARS AGO: Hatchures point downhill.

SLOPE TOP, EXISTING PRIOR TO THE LAST GLACIAL ADVANCE: Hatchures point downhill.

SLOPE TOP, SHORELINE OF GLACIAL LAKE SOURIS: Hatchures point downhill. Approximate elevation shown in feet; reliability varies.

BOTTOM OF SLOPE: Arrows point downhill; reliability varies.

F **FRECKLED:** Appearance on aerial photograph; may be caused by locally intense activity of burrowing animals.

FEATURES COMPOSED, OR WITH A SURFACE COVERING, OF TILL

STREAMLINED HILL: Till is shown if the hill is large enough to map at this scale; If the hill is too narrow, a line symbol is used; brown indicates Shale-Rich or Shale- and Sandstone-Rich Till, red indicates Stony Sand; elongate parallel to and arrow pointing in the direction of inferred ice movement.

ESKER (TILL): Shale-Rich or Shale- and Sandstone-Rich Till is shown if the hill is large enough to map at this scale; if the esker is too narrow the line symbol is used; a sinuous, sometimes branching, ridge assumed to follow the trace of a former stream developed on or within stagnant glacial ice; normally prominent on aerial photographs.

LINEAR TILL RIDGES: Brown indicates Shale-Rich or Shale- and Sandstone-Rich Till; red indicates Stony Sand; most either disintegration ridges or washboard moraines; may include some features that a re actually eskers; low ridges a few feet high; normally prominent on aerial photographs: may be difficult to see on the ground: normally elongate at right angles to glacier movement.

"CIRCULAR" DISINTEGRATION RIDGES: In Shale-Rich or Shale- and Sandstone-Rich Till; also called "doughnuts"; low ridges a few feet high; normally prominent on aerial photographs; may be difficult to see on the ground; dashed if covered with a veneer of lake clay.

FEATURES COMPOSED OF SAND OR GRAVEL

ESKER (STREAM): Similar to Eskers above except that they are known to contain stream sediment; may have a veneer of till.

POSSIBLE SHORELINE DEPOSITS: May be beach or bar deposits; may include some stream or wind deposits that nearly coincide with levels of glacial Lake Souris.

D **STABILIZED EOLIAN DUNES:** Vegetation-anchored wind-blown sand.

MISCELLANEOUS FEATURES

W **LAKES OR PONDS NORMALLY CONTAINING WATER :** May include some areas that would be shown as Pond Sedime nt in dry years.

LINEATIONS: On flat or undulating surfaces that were once beneath the surface of glacial Lake Souris; may be drag marks formed by wind-blown ice floating on the lake, wind-scour (deflation) features, or subglacial lineations caused by the advance of the Souris River lobe.

VERY LOW RIDGES: On fat or undulating surface of lake sediment: obvious on aerial photographs; very difficult to see on the ground; probably eskers or linear till ridges buried beneath a thin layer of lake clay or silt and clay.

MAJOR SCOUR MARKS: Formed by streams during the last deglaciation.

MINOR SCOUR MARKS: Otherwise like Major Scour Marks.

Gravel Pit

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Original cartography by S. R. Deal.
Updated cartography by Navin Thapa. Basemap updated using from USGS 7.5 Minute Topo Base. Modernized stratigraphic nomenclature by Levi D. Moxness.