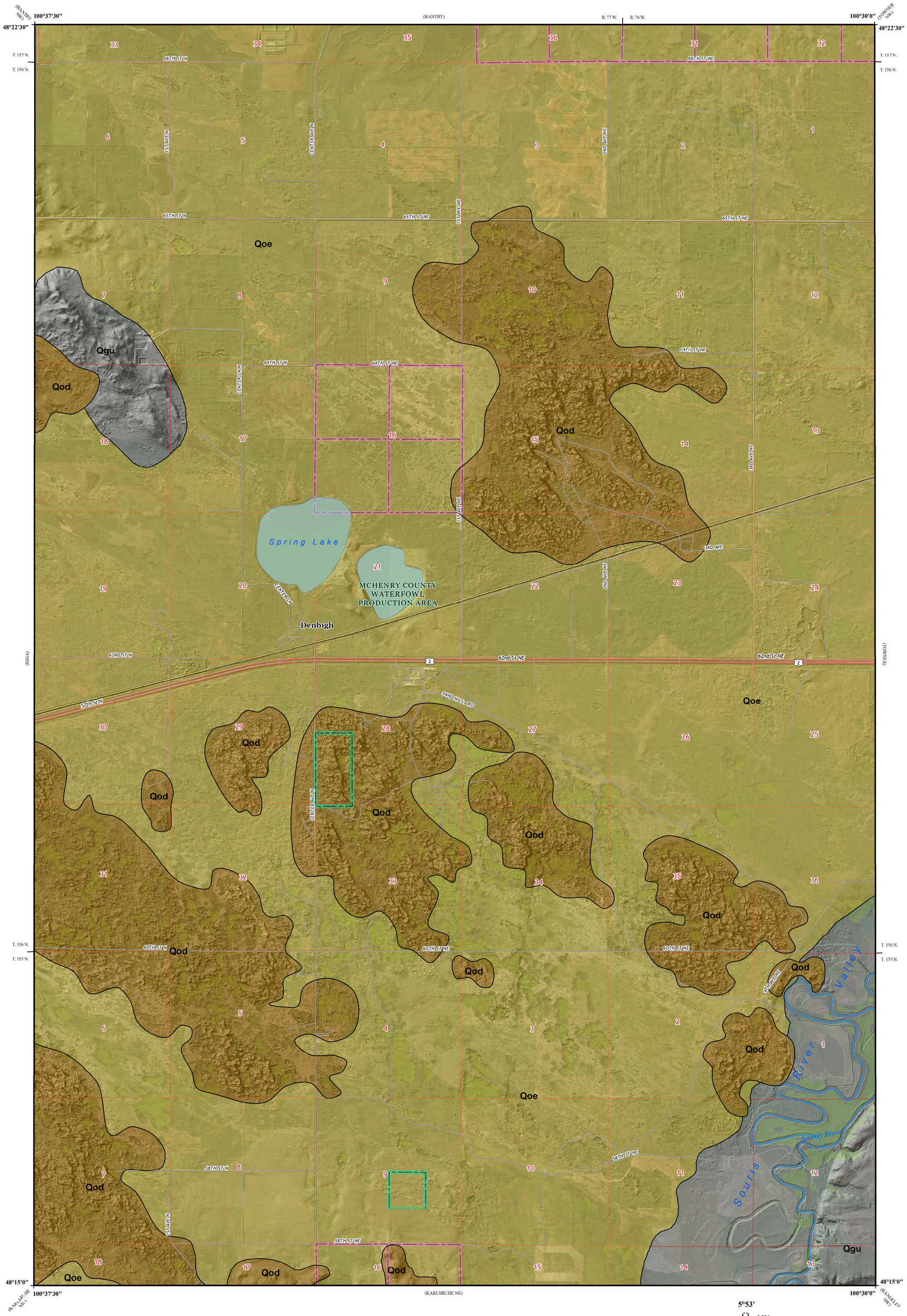
North Dakota Geological Survey
24K: Dnbh - s

Edward C. Murphy, State Geologist
Lynn D. Helms, Director Dept. of Mineral Resources

Eolian Sand Deposits
Denbigh Quadrangle, North Dakota



Fred J. Anderson

2019

UNIT DESCRIPTIONS

QUATERNARY SYSTEM

HOLOCENE

OAHE FORMATION

Qod — Yellow-brown, quartzose, well sorted, medium to very-fine grained, eolian sand accumulated in high-relief dunes with maximum relief up to 72 feet.

Qoe — Gray-brown, quartzose, well sorted, medium to very-fine grained, eolian sand as undulating tabular sheet sands with low-relief dunes. Relief commonly from zero to ten feet.

Qgu — **Quaternary Geology Undifferentiated**

Surface Trust Land

BLM Surface and Mineral Lands

Deposits of eolian sand occurring within the Denbigh Quadrangle are depicted on this map at a scale of 1:24,000. Eolian sand in this quadrangle is found in high-relief dune fields and low-relief undulating tabular sheet sands with occasional low dunes, which cover 94% of the quadrangle. These eolian sands are sourced from within the former Glacial Lake Souris lake plain and as such are difficult to distinguish mineralogically from underlying glaciolacustrine sands. Sand mineralogy consists dominantly of quartz with lesser amounts of feldspar (microcline and albite) with minor amounts of clays. Carbonates are generally absent within these sands and are non-reactive to 10% HCl in the field. Poorly developed paleosols are common. Dunes are oriented parallel to prevailing northwesterly winds and are vegetation stabilized with blowouts common. These dunes are currently inactive. Quaternary glacial and fluvial deposits associated with the Souris River are found in the southeastern portion of the quadrangle. High-dune fields cover 49.7 square miles in the quadrangle and were delineated from LiDAR elevation data overlain with 2016 NAIP aerial imagery. Groundwater is shallow throughout the map area and commonly occurs at depths ranging from three to 11 feet outside of the high-dune areas.

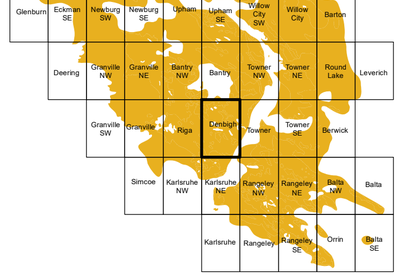
Geologic Symbol

Boundary between high and low dune areas.

Other Features

Water — Highways — Local Road

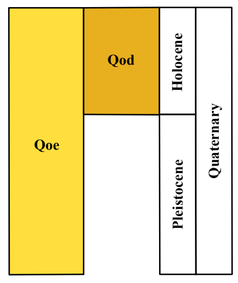
River — Railroad — US Route

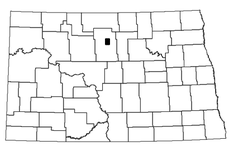


Adjacent Eolian Sand 24K Quadrangles

CORRELATION OF MAP UNITS

Eolian Sediment





Denbigh Quadrangle, North Dakota

Scale 1:24,000

0 0.5 1

Miles

Lambert Conformal Conic Projection
North American 1983 Datum
USGS 7.5 Minute Topo Map

Standard Parallels 48°15'0"N, 48°22'30"N
NGVD 1988

5°53'
MN

2017 Magnetic North
Declination at Center of Sheet

The quadrangles in this series have been produced in support of the exploration for suitable sources of proppant sand for use in the hydraulic fracturing of oil wells in the Williston Basin.