



Bedrock Geologic Map of Richland County, North Dakota

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2025

BEDROCK GEOLOGY IN RICHLAND COUNTY

This map is a depiction of the unexposed bedrock geology found beneath the unconsolidated glacial cover across Richland County. Lithologic logs from test holes, water wells, driller's logs, and mineral exploration drilling were reviewed for bedrock geologic information consisting of bedrock depth and lithology. A total of 483 locations were selected based on the quality of the lithology recorded on the log and whether bedrock was encountered in the drill hole.

There are two different types of bedrock found in Richland County. Sedimentary sandstone and shale bedrock of Cretaceous age and igneous weathered granitic basement bedrock of Precambrian age. Shale bedrock and sandstone is found nonconformably overlying Precambrian basement rock across most of the county thinning from west to east and is the first bedrock that commonly occurs beneath the shallow cover of glacial deposits. Weathered Precambrian granitic basement rock can be found in isolated areas in the northeastern part of the county, along with isolated subcrops of sandstone closer to Wahpeton.

EXPLANATION

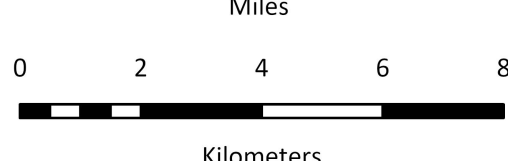
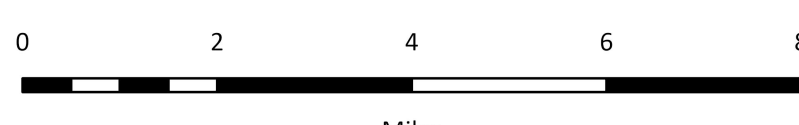
- Kn** NIOBRARA FORMATION: SHALE - Light-brown to dark-gray, calcareous; upper Cretaceous marine offshore sediment.
- Kc** CARLILE FORMATION: SHALE - Olive black to Gray-brown, silty, non-calcareous, waxy; upper Cretaceous marine offshore sediment.
- Kg** GREENHORN FORMATION: SHALE - Dark-gray, calcareous, some fish scale and plant fragments, occasional pyrite; upper Cretaceous marine offshore sediment.
- Kbs** SKULL CREEK-BELLE FOURCHE FORMATIONS (Undifferentiated): SHALE - Olive-black to brown and gray, occasional shell fragments, micaceous, massive, dominantly noncalcareous, varies from soft to hard; Mesozoic (Cretaceous) marine offshore sediments.
- Kik** INYAN KARA FORMATION: SANDSTONE - Light-gray to white, fine to coarse; river, lake, and lower Cretaceous nearshore marine sediment.
- pE** BASEMENT ROCK OF THE SUPERIOR PROVINCE: GRANITE (WEATHERED) - Dark to light-green and gray to white, highly weathered, soft greenish-pink-white kaolinic clay, quartz and feldspar grains common; Precambrian (Archean) basement rocks.
- Geologic contact (Known)

REFERENCES

- Bluemle, J.P., 1983, Geologic and Topographic Bedrock Map of North Dakota, North Dakota Geological Survey, Miscellaneous Map 25, 1:670,000.
- Baker, C.H., 1967, Geology and Ground Water Resources of Richland County, North Dakota, Part I - Geology, North Dakota Geological Survey, Bulletin 47, 39 p., 3 plates.
- Moore, W.M., 1978, A Preliminary Report on the Geology of the Red River Valley Drilling Project, Eastern North Dakota and Northwestern Minnesota, Bendix Field Engineering Company, Subcontract #77-159-E, 292 p.
- NDSWC, 2025, North Dakota Department of Water Resources Online Ground-Water Information Database, <https://mapservice.dwr.nd.gov/>
- Setterholm, D., and Tipping, R., 2005, Bedrock Geology of the Fargo-Moorhead Area, 1:400,000, in; Thorleifson, L.H., Harris, K.L., Berg, J., Tipping, R.G., Malolepszy, Z., Lusardi, B.A., Setterholm, D., and Anderson, F.J., 2005, Geological Mapping and 3D Model of Deposits that Host Ground-Water Systems in the Fargo-Moorhead Region, Minnesota and North Dakota, Minnesota Geological Survey: <https://conservancy.umn.edu/items/4d64344c-bbc7-4bc3-b73a-1400be5f2f60>

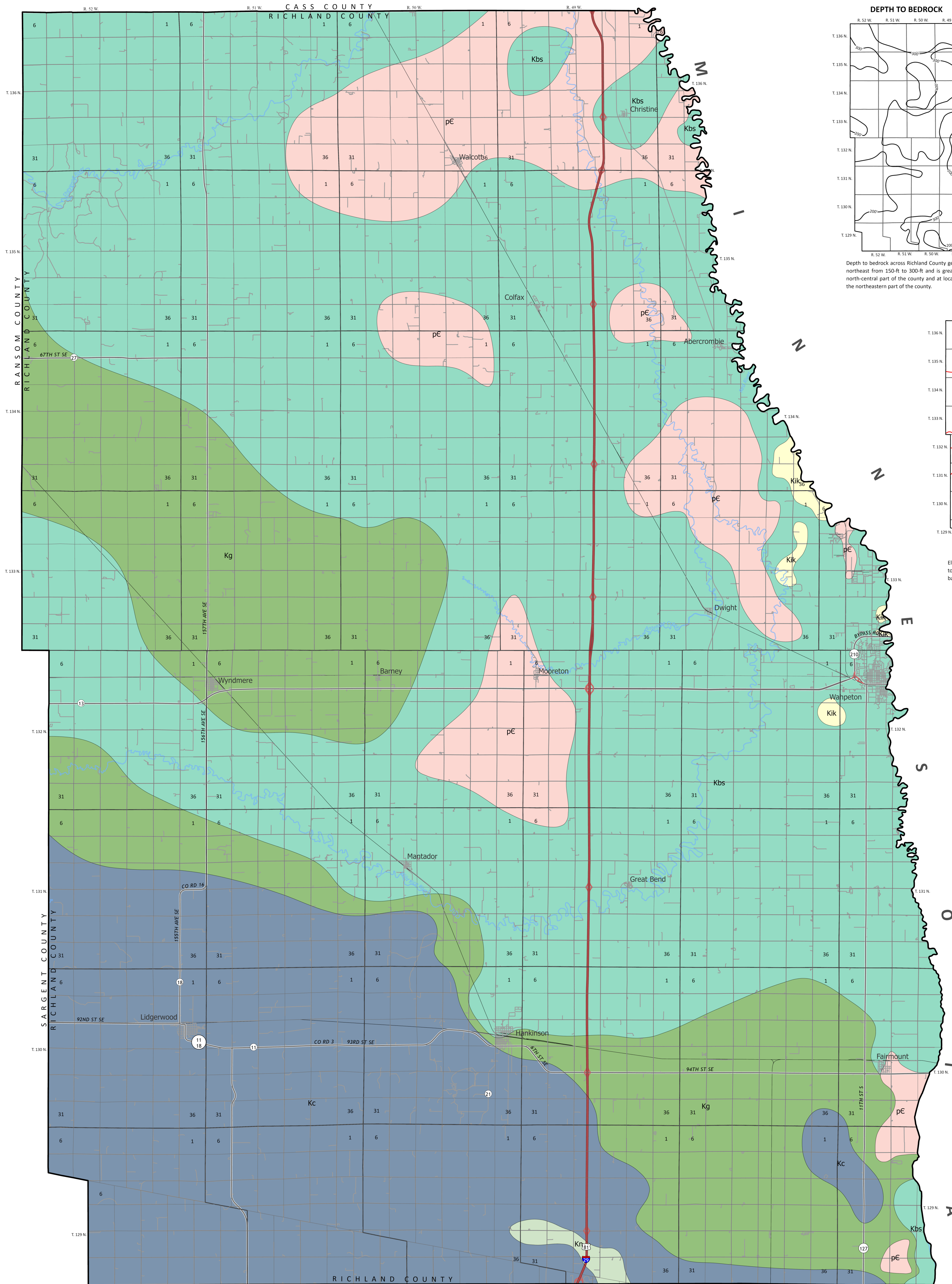


Scale 1:125,000

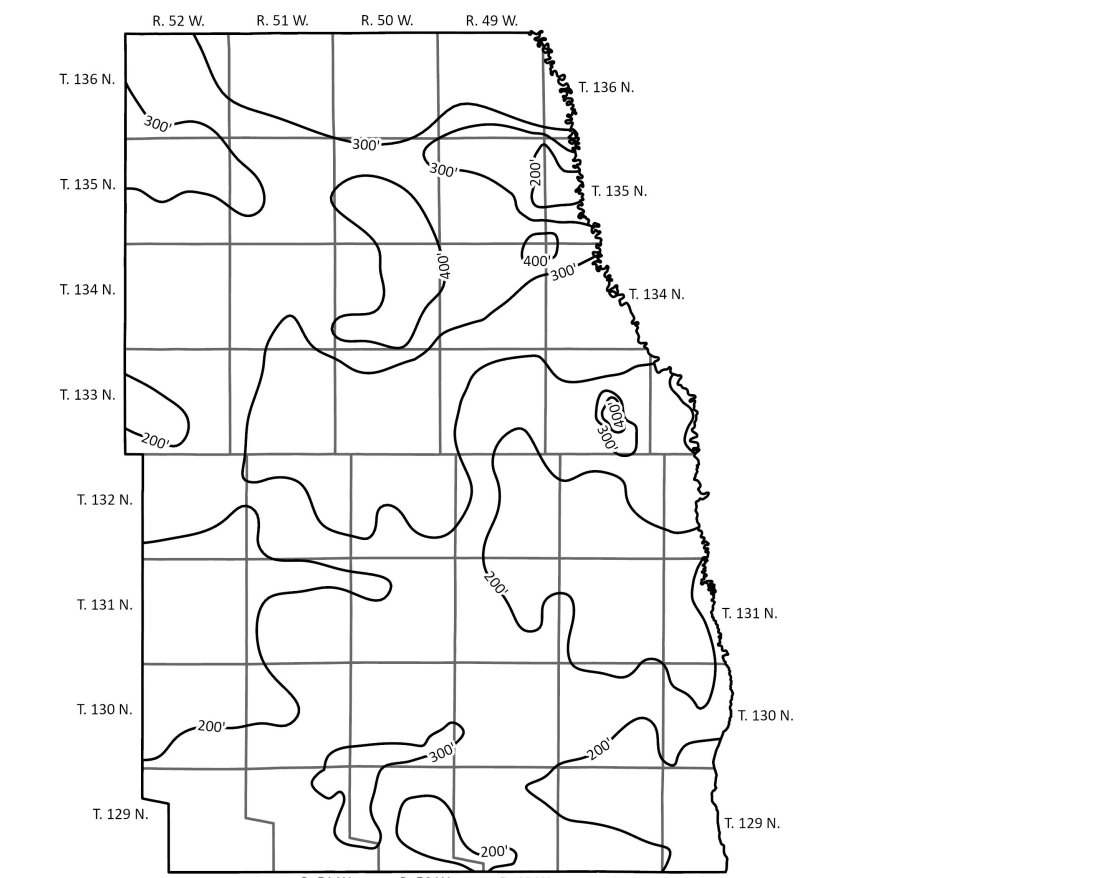


Mercator Projection
Standard Parallel 45°56'15"N

North American 1983 Datum
Central Meridian 97°0'0"W

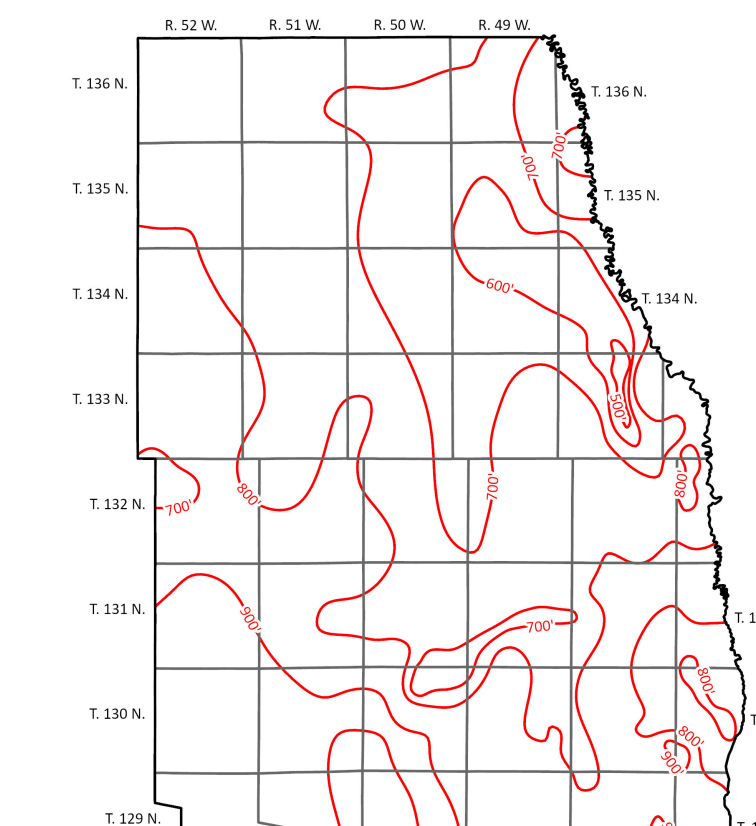


DEPTH TO BEDROCK



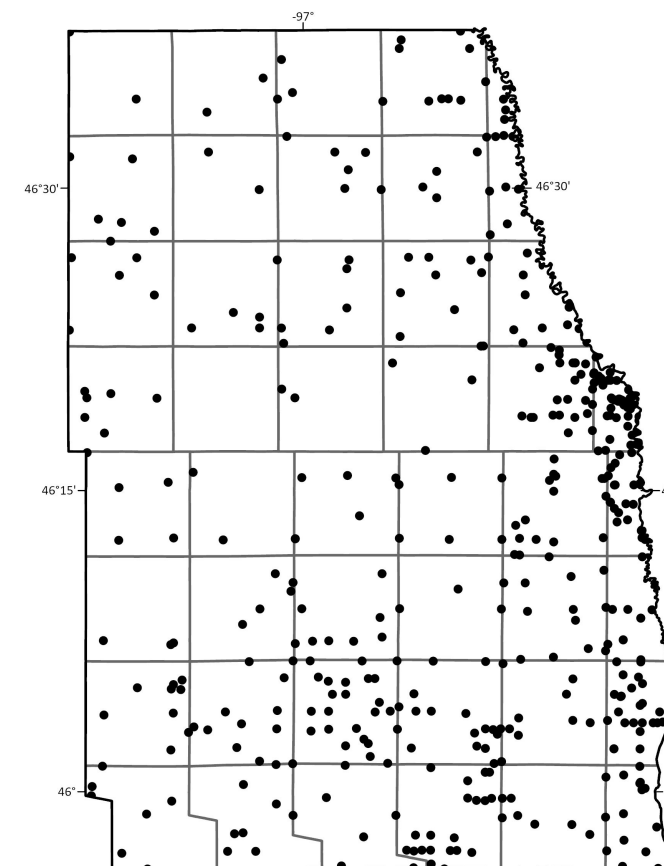
Depth to bedrock across Richland County generally increases to the north-northeast from 150-ft to 300-ft and is greater than 400 feet deep in the north-central part of the county and at locations close to the Red River in the northeastern part of the county.

BEDROCK ELEVATION



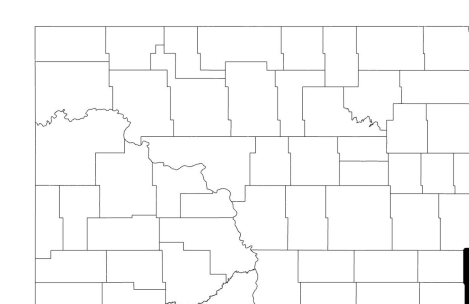
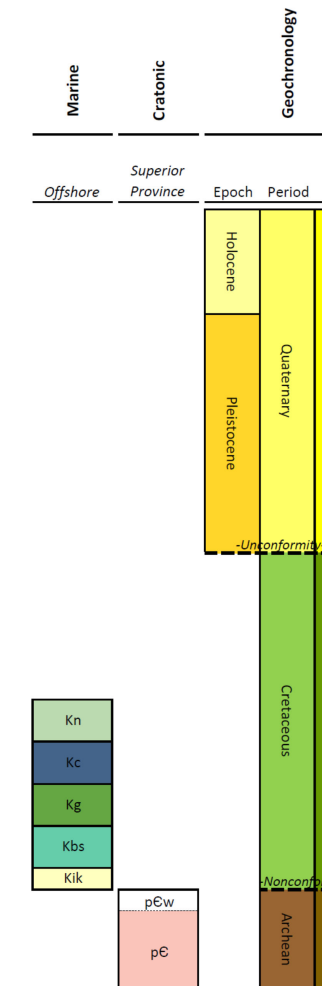
Elevation of the bedrock surface decreases from 900-ft in the southwest to 500-ft at its lowest in the east-central part of the county forming the base of the Wahpeton buried valley.

DRILLHOLE LOCATIONS



Locations of selected drillholes in Richland County.

CORRELATION OF MAP UNITS



RICHLAND COUNTY, NORTH DAKOTA