



GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA

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MAP 1603A
SURFICIAL GEOLOGY
NORTH-CENTRAL MANITOBA

Scale 1:500 000

Kilometres 0 10 20 30 40 50

Transverse Mercator Projection, UTM 85N, Scale Factor 0.9994
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64 NW 1603A 64 NE 1613A

64 SW 64 SE 64 SH

63 NW 1603A 63 NE 63 SH

63 SW 63 SE 63 SH

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1603A (REVISED) IS AVAILABLE FROM THE GEOLOGICAL SURVEY OF CANADA

LEGEND

QUATERNARY

NONGLACIAL ENVIRONMENT

A ALLUVIAL DEPOSITS: gravel, sand and silt, 1-10 m thick, occur as terraces and plains that were formerly stream floodplains and deltas; occurs mainly adjacent to Nelson and Hayes rivers in the Hudson Bay Lowland

PROGLACIAL AND NONGLACIAL ENVIRONMENTS

W MARINE-GLACIOMARINE DEPOSITS: sand and gravel, silt and clay, deposited in "open" sea; transitional in part to the lake facies, with exception of beach ridges deposits largely buried by organic sediments up to 2 m thick

W1 MARINE SHORELINE DEPOSITS: sand and gravel, 1-3 m thick, occurs as beaches and bars derived largely from underlying A1 and glaciolacustrine

W2 MARINE NEARSHORE AND INTERTIDAL DEPOSITS: silt, sand and clay, 1-3 m thick, generally occurs as an upward coarsening of fine sequences, commonly overlies A1 but locally overlies lacustrine sediments

L GLACIOLACUSTRINE DEPOSITS: clay, silt, sand, and gravel deposited in closed Lake Agassiz; fine grained sediments occurring as either a continuous blanket or a patchy veneer; coarser facies occurring as bars, sills, and ridges of beaches

L1 GLACIOLACUSTRINE BASIN DEPOSITS: clay and silt, 0-15 m thick; contains gray and varved shales that are massive and laminar near surface and where thin; forms a nearly uniform blanket in low basins or occupies basins between bedrock hills

LM GLACIOLACUSTRINE SANDS: 1-2 m thick, largely covering all and including areas of A1 and rock

LR GLACIOLACUSTRINE SANDS: 1-2 m thick, largely covering all and including abundant rock outcrops

LI GLACIOLACUSTRINE SHORELINE DEPOSITS: sand, gravel, and rock ridges, up to 2 m thick, occur as beach ridges, bars, sills, and ridges of beaches; highest deposits are developed on and adjacent to glaciolacustrine sediments; extensive but thin rubble beach deposits occur on carbonate bedrock north and west of Lake Winnipeg

GLACIAL AND PROGLACIAL ENVIRONMENTS

G GLACIOLACUSTRINE DEPOSITS: sand and gravel, up to 30 m thick, deposited as ice contact stratification or as proglacial outwash

G1 GLACIOLACUSTRINE DEPOSITS: sand and gravel with variable sorting and composition; locally contains ice contact gravels; 1-10 m thick, occurs mainly as major sand and gravel systems consisting of broad valley ridges formed as interlobate moraines and as related narrow and extensive, surface of hummocks or mounds formed by lacustrine processes and locally overlain by beach ridges

G2 GLACIOLACUSTRINE CHANNEL DEPOSITS: sand and gravel, well sorted and well stratified, 1-15 m thick, occurs as plains and terraces within or adjacent to large valleys in which proglacial outwash was deposited

MORAINAL DEPOSITS: dominantly sandy and silty A1 deposited at the margin of an advancing glacier and forming an extensive, feature and composition variable; fills of northern provenance are sandy, silty, and highly calcareous; those of eastern provenance and in areas underlain by carbonate bedrock are less silty, somewhat less sandy, and are calcareous

M GROUND MORAINAL: sandy and silty A1, 1-4 m thick, occurs as a blanket with a sandy top that is generally calcareous and overlies 0.5 to 1.0 m of local silt, in places overlain by a veneer of clay, silt, sand, and gravel of mainly glaciolacustrine origin

M1 A1 and silty clay, silt, sand and gravel, up to 2 m thick, occurs as a discontinuous veneer over rock with abundant rock outcrops

M2 HOMOLOGY MORAINAL: 0.5-30 m thick, occurs as ridges, knobs, hummocks, and intervening depressions with local relief up to 30 m, includes and is associated with glaciolacustrine ice contact deposits in many areas

PRE-QUATERNARY

R ROCK: outcrops and rock thin cover by drift

RC QUATERNARY CALCAREOUS SANDS AND LACUSTRINE: banking bedded calcareous and rock rubble with patches of thin A1 and stratified sediments; nearly flat to gently rolling terrain

R1 IGNEOUS AND CRYSTALLINE METAMORPHIC ROCK: rhyolite, hood and lake topography; ridges, bars, and valleys controlled by bedrock structure and topography; stratified sandstones and A1 occur in local basins and are present as a thin patchy veneer on some igneous (local Precambrian Shield areas)

NOTE: organic deposits, commonly 1-3 m thick, cover the surficial deposits and bedrock in most low-lying, poorly drained parts of the region

Geological boundary
Dashed or dash-dot (see flow direction symbol, unknown)

Shore (see flow direction symbol, unknown)

Moraine ridge
Center (see flow direction symbol, unknown)

Center (see flow direction symbol, unknown)

Abandoned or undrifted channel (large, small)

Minor intersecting treatments or grooves

Beach

Escarpment or steep bank

Partly filled valley (large, small)

Line of ancient flooding

Geology by R.W. Klassen and J.A. Nettleton, 1971-1973
To accompany Memoir 419 by R.W. Klassen and J.A. Nettleton
Geological Cartography by P.P. Hermon, Geological Survey of Canada
Any revisions or additional geological information known to date would be welcomed by the Geological Survey of Canada
Base map assembled by the Geological Survey of Canada from maps published at the same scale by Survey and Mapping Branch 1974, 1977, 1979
Copies of the topographical editions covering this map area may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa, K1A 0S9
Mean magnetic declination 1984, 4702 East, decreasing 14.2 annually. Readings are from 0° 22' in the SE corner as 11° 12' in the NW corner of the map area
Elevations in feet above mean sea level