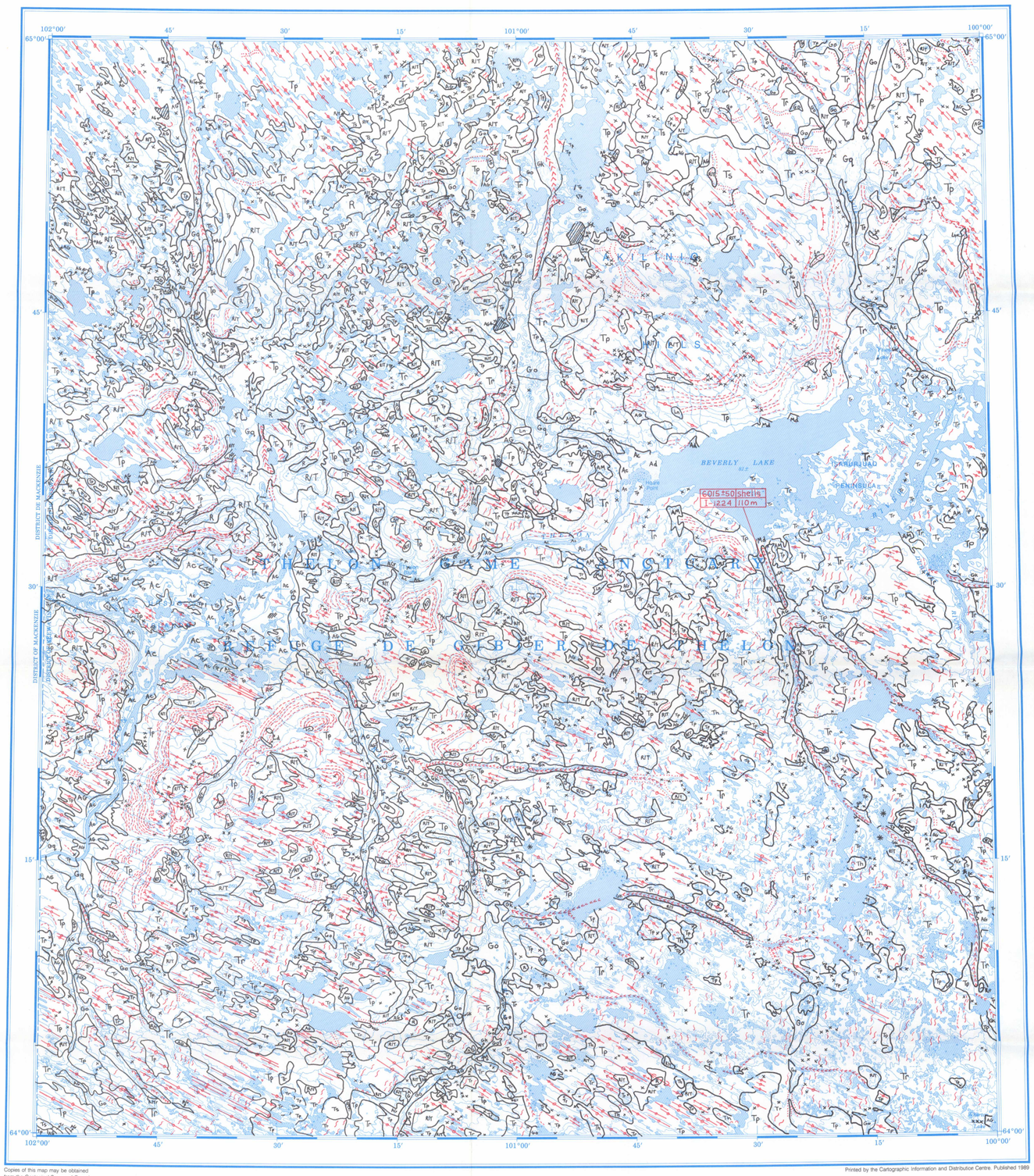
Energy, Mines and Resources Canada / Énergie, Mines et Ressources Canada

GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA



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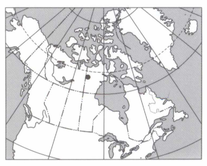


INDEX MAP

Canada

MAP 40-1989

SURFICIAL GEOLOGY

BEVERLY LAKE

DISTRICT OF KEEWATIN

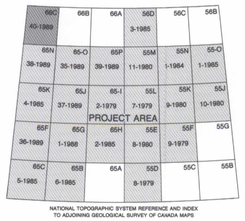
NORTHWEST TERRITORIES

Scale 1:250 000 - Échelle 1/250 000

Kilometres 5 0 5 10 15 20 Kilomètres

Universal Transverse Mercator Projection

Projection transverse universelle de Mercator



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO ADJOINING GEOLOGICAL SURVEY OF CANADA MAPS

LEGEND

Note: some map units and symbols shown in the legend may not appear on this map

SURFICIAL GEOLOGY

SURFICIAL DEPOSITS
QUATERNARY

NOTES

ALLUVIAL DEPOSITS: stream deposited material within modern active drainage systems; "modern" is defined as the period since retreat of the sea, proglacial lakes, or glacial ice.

Ac Alluvium: silt, sand, and gravel deposited in channels and on floodplains; may include alluvium in terraces which formed as streams cut to present level in glacial and marine sedimentary fill.

Ad Deltaic sediments: sand, gravel, and boulders deposited where modern streams enter lakes or Hudson Bay.

AM Alluvium and marine sand or silt, undifferentiated: occurs as flat areas consisting of modern alluvium mixed with silt and sand that were washed from slopes by wave action or deposited in the sea by meltwater streams.

AG Alluvium and outwash gravel, undifferentiated: occurs as flat areas in stream valleys or abandoned channels above marine limit.

Surface generally covered by fibrous peat on which mosses, sedges, and grasses grow. Surface characterized by frost polygons and thaw ponds related to vertical ice wedges extending to a depth of 2 to 3 m.

LACUSTRINE DEPOSITS: materials deposited in glacial lakes ponded on the western side of the Keewatin Ice Divide, and glacial deposits modified by lacustrine processes.

Ln Nearshore sediments: generally well sorted sand, gravel, cobbles, or boulders deposited as beaches, bars, spits, and ice-pushed ridges.

Surface characterized by sparse vegetation and orthogonal frost cracks.

Ld Deltaic sediments: sand, pebbly sand, and gravel deposited in glacial lakes by glacial or nonglacial streams and subsequently abandoned as glacial lakes drained.

Surface characterized by sparse vegetation and polygonal frost cracks.

MARINE DEPOSITS: materials deposited in the Tyrrell Sea and glacial deposits modified by marine processes.

Md Deltaic sediments: sand, pebbly sand, and gravel deposited in the Tyrrell Sea by glacial or nonglacial streams.

Mn Nearshore sediments: generally well sorted sand, gravel, cobbles, or boulders deposited as beaches, bars, spits, and ice-pushed ridges.

Surface characterized by sparse vegetation and polygonal frost cracks.

Mw Offlap sediments: thin sheet of sand deposited by a migrating shoreline; probably a lag developed by wave reworking of marine clayey sand or silty sand or glacial till.

Characterized in places by a surface mottled pattern resulting from periglacial processes or gullying by streams or tidal currents.

Mq (Ms | Mm) Offshore sediments: clay,silt and silty sand deposited in a deep water environment; may occur anywhere below marine limit but distribution is patchy above 60 m a.s.l.; thickest deposits generally occur in major river valleys or valleys with major eskers.
Ms, prominent striped pattern on airphotos.
Mm, mottled pattern on airphotos.

Difficult to differentiate on airphotos from units Tp and Ts. Surface vegetation is dominantly shrubs in turf circles around mudboils. Striped pattern (Ms) consists of dark and light stripes, 10 to 20 m wide, running downslope, and reflects vegetation differences. Mottled pattern (Mm) due to shrub- and mudboil-covered mounds, 5 to 10 m in diameter and less than 0.5 m high, surrounded by light coloured grass-sedge vegetation; likely has high ground ice content.

GLACIOFLUVIAL DEPOSITS: water-sorted sediments deposited in, around, or near a glacier, largely as a result of meltwater flow.

Gk Ice contact stratified drift: sand and gravel deposited near ice margins in, over, or around ice or in ice tunnels, commonly as eskers but includes isolated hummocky deposits of uncertain origin.

Many eskers are beaded or interrupted at irregular intervals by major bulges marking positions where deltaic or subaqueous fan deposition occurred during periods of slowed ice retreat.

Go | **Gq** Outwash: sand, gravel, and silt with terraced, hummocky, and kettled surfaces.
Go, sand and gravel deposited by subaerial meltwater streams in areas above local sea level or level of proglacial lakes; includes 1) sediment deposited between the esker ridge and valleysides, commonly over stagnant ice that forms temporary floor, 2) outwash fans, 3) outwash plains, and 4) materials on the floor or at the mouth of meltwater channels.
Gq, silt, sand, and fine gravel; distal fine sediment debouching from the subaqueous mouth of an ice tunnel; material settled preferentially in depressions between the esker ridge and valleysides.

Sparsely vegetated.

Gh Disintegration moraine: till, sand, and gravel, undifferentiated; occurs as short ridges or hummocks, probably deposited in holes and crevasses in stagnant ice; ridge orientation may form a reticulate pattern.

Vegetation is commonly sedge, grass, and moss growing on thin, fibrous peat. Surface characterized by thaw ponds and tundra polygons. Difficult to differentiate from unit AM.

Sparsely vegetated. Periglacial features vary from mudboils in till to frost cracks in sorted sediments.

TILL DEPOSITS: Poorly sorted sediments with distinctive forms deposited directly by glacial ice.

Tp | **Ts** Till plain: generally sandy, silty, noncalcareous grey till; includes areas of clay-rich red till.
Ts, prominent striped pattern on airphotos.

Surface characterized by 1-2 m diameter patches of bare or lichen-covered mud (mudboils) surrounded by elevated peaty rings on which grow shrubs, mosses, and grasses. At lake margins characterized by cobble-covered, 2 m wide ribs separated by 2 m wide boulder-filled troughs, generally trending downslope to a water depth of about 2 m. Striped pattern (Ts) thought to be due to solifluction of clay-rich till.

Tr Ribbed (Rogen) moraine: generally bouldery till, in places sand and gravel, forming hummocks and straight to sinuous ridges, generally less than 1 km long and 2 to 10 m high; ridges generally oriented at right angles and form trains parallel to direction of ice flow.

Individual ribs may be asymmetric in cross-section with steep side facing down-ice; trains of ribs pass laterally into drumlin fields and may be drumlinized in the transition zone. Surfaces have sparse vegetation and generally a heavy cover of large boulders and mudboils where composed of till, and marked by frost cracks where composed of gravel.

Th Hummocky till: till without significant boulder cover occurring as low, rounded hummocks; includes ridges of till that are minor end moraines or erosion remnants between subparallel meltwater channels.

Extensive areas are present in the region of the Keewatin Ice Divide and in some places adjacent to areas of ribbed moraine (Tr). Exact origin unknown; may have formed in association with stagnant ice and in some places from erosion of till surfaces by streams in anastomosing meltwater channels. Vegetation and periglacial features similar to those on till plain (Tp).

TM Till and marine silt, undifferentiated: till-cored landforms blanketed by marine sediments or marine deposits in depressions among till landforms.

ROCK
PRE-QUATERNARY

Precambrian intrusive igneous and metamorphic rocks, red volcanic rocks, and unmetamorphosed sediments.

R Surface comprises more than 80% outcrop.

Vegetation sparse, surface may be glacially rounded or covered by felsenmeer.

R/T | **R/Tr** Surface comprises 20 to 80% outcrop, or bedrock is mantled with an average of less than 1 m of the surficial deposit indicated.
R/AM
R/Ag
R/Mn
R/Mq

Geological boundary

Small bedrock outcrop

Drumlin or fluting

Crag and tail (direction of ice flow known)

Glacial striae (direction of ice movement known, unknown) location of measurement at centre of staff; older striation drawn with broken staff

Linear feature related to ice flow

Trend of ribbed or minor moraine ridges

De Geer moraines; straight, approximately 2 m high end moraine ridges built parallel to an ice front; possibly deposited annually by flowing ice submerged in a sea or lake

Hummocky moraine

Esker ; projected beneath water surfaces where known

Meltwater channel; steep-sided channel commonly cut in bedrock or till

Limit of marine submergence

Trend of nearshore ridges originating as beaches, bars, and ice-shoved ridges

Escarpment; generally in unconsolidated sediments

Area of ridges formed by pack-ice shove

Permanently drained postglacial lake basin; may include deposits of silty sediment with up to 15% organic carbon

Turbid lake; contains continual load of suspended sediment during ice-free periods; rarely occurs above marine limit and indicates instability or alteration of the active layer due to wave washing or solifluction processes

Eolian deposits; commonly formed where ice shove or bank failures have disrupted the vegetation mat over alluvial sand

Radiocarbon date (Date | Material | Lab no. | Elevation)

Geology by J.M. Aylsworth and M.D. Clarke, based on airphoto interpretation

(Striae measurements by J.G. Fyles, R.C. Shields, and J.A. Fraser, 1954)

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Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Base map, at the same scale, published by the Surveys and Mapping Branch in 1987

Copies of the topographical edition of this map may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa K1A 0E9

Mean magnetic declination 1989, 12°54' East, decreasing 24.4' annually
Readings vary from 10°30' in the SE corner to 15°22' in the NW corner of the map area

The proximity of the North Magnetic Pole causes the magnetic compass to be erratic in this area

Elevations in feet above mean sea level

DESCRIPTIVE NOTES

During deglaciation the ice front retreated eastward towards the Keewatin Ice Divide, damming a large glacial lake in Thelon River valley and Beverly Lake basin. A series of high level shorelines records a maximum lake level of 220 m in the west, dropping to 210 m in the east of this map area; shorelines continued to lower as progressively lower, northward draining, outlets became ice free. When the ice dam was breached, marine waters inundated the basin to some undetermined depth. As it is impossible to differentiate between marine and lacustrine beaches in the absence of shells, and as shells were only found at one location, at 110 m, the elevation of 120 m was arbitrarily selected to separate the lower marine deposits from the higher lacustrine beaches.

Recommended citation:
Aylsworth, J.M. and Clarke, M.D.
1989: Surficial geology, Beverly Lake, District of Keewatin, Northwest Territories; Geological Survey of Canada, Map 40-1989, scale 1:250 000