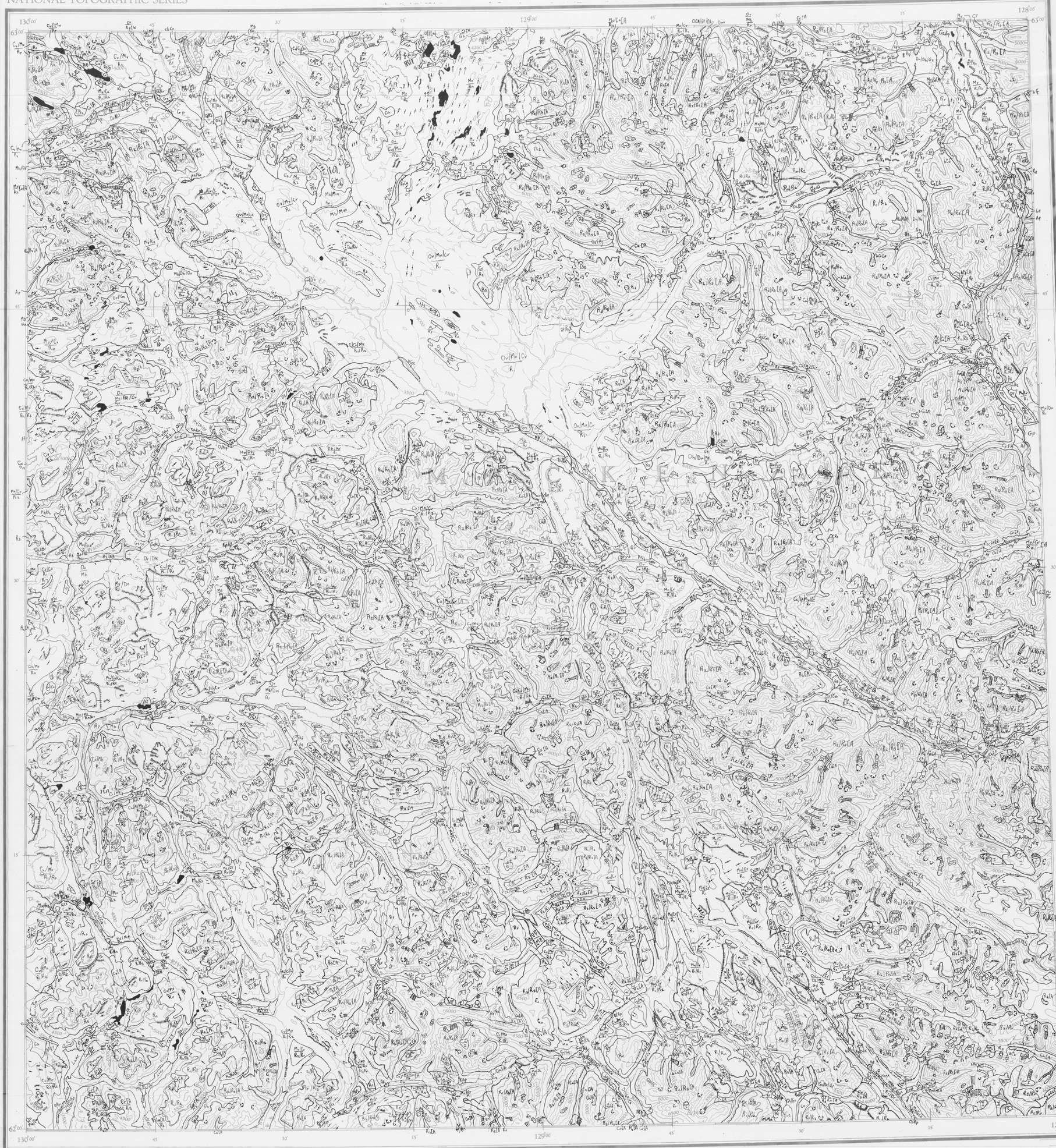
NATIONAL TOPOGRAPHIC SERIES — FIRST EDITION — CANADA, SHEET 105 I



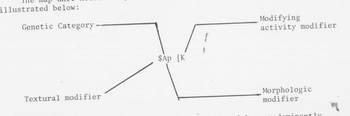
GEOLOGICAL SURVEY OF CANADA — COMMISSION GEOLOGIQUE DU CANADA

DEPARTMENT OF ENERGY, MINES AND RESOURCES
MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES

LEGEND

This map subdivides the terrain of the Nahanni map area according to the genesis of the earth materials that directly underlie the surface, the morphology of these materials, their texture (coarseness or fineness) and the ongoing processes that are actively modifying these materials.

The map unit notation system is built around a genetic designator as illustrated below:



The above unit indicates an alluvial (flood) plain with a predominantly silty texture being actively modified by thermokarst. The activity modifier applies to all of the units to the left of it.

Compound Units. Areas where two map units cannot be mapped separately due to the resolution limitations posed by the map scale are denoted as follows:

Ap/Lp

This unit is about half alluvial plain and half lake plain.

Ap/Lp

This unit is three quarters alluvial plain and one quarter lacustrine plain.

Stratigraphically Stacked Units. Where the stratigraphy of map units is known, the map unit is denoted as follows:

Mv/Cv
Rr

This unit consists of approximately equal parts of thin morainal (till) and colluvial material overlying bedrock which has a ridged morphology.

Genetic Category

A - Alluvial deposits: Sand and gravel with local silt, clay and organic materials. Alluvial fans (Af) may contain significant deposits of debris flow diamictons and grade upslope into colluvial fans which are predominantly composed of debris flow diamictons.

C - Colluvium: Unsorted sediments ranging from clay to boulders derived by physical and chemical weathering processes from the underlying or nearby bedrock units. Transport is typically through creep or solifluction. Talus slopes (hCa) accumulate through the freefalling, rolling or tumbling of coarse debris from adjacent cliffs or steep slopes or by snow avalance deposition.

D - Drift: Morainal, glaciofluvial and glaciolacustrine deposits too small to differentiate at the present scale of mapping.

G - Glaciofluvial deposits: Sand and gravel with local accumulations of silt and clay.

I - Glacial ice.

L - Lacustrine and glaciolacustrine deposits: Sand, silt and clay with local deposits of gravel.

M - Morainal deposits: Till, stony clayey, silty clayey, and loamy in texture.

O - Organic deposits: Bogs and fens.

R - Bedrock Pre-Cambrian to Mississippian clastics and carbonates locally intruded by Mesozoic quartz mozonite.

Textural Modifiers

S - sandy
s - silty
c - clayey
b - bouldery
r - rubbly

Morphologic Modifiers

a - apron
b - blanket[1]
c - channeled
d - delta
f - fan
h - hummocky
m - undulating
n - streamlined by ice
p - floodplain, plain, may be locally pitted in the case of Gp units
r - ridged, or ridge
v - veneer[2]
t - terrace
1 - slope of 5-15° - used only with R
2 - slope of 15-35° - used only with R
3 - slope of >35° or cliffs - used only with R

Activity Modifiers

A - Avalanching
k - Thermokarst activity, thaw lakes or palsen
E - Eroded, closely spaced gulleys

Symbols

- Geological boundary (defined, approximate, gradational)
- Streamlined bedrock ridge, former ice flow direction unknown
- Streamlined bedrock ridge, (arrowhead indicated direction of former ice flow)
- Esker (former water flow direction established, not established)
- Lateral or end moraines of late Wisconsinan age or Neoglacial advances
- Small melt water channel (may form a map unit boundary)
- Large melt water channel (may form a map unit boundary)
- Landslide (arrows indicate direction of movement. Serrated pattern indicates position of the head of the landslides scarp).
- Rock glacier
- Cirque
- Lake

[1]blanket - a continuous covering >1 m in thickness
[2]veneer - a thin discontinuous covering ≤1 m in thickness

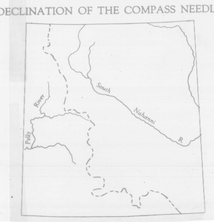
NOTES

The Nahanni map area was extensively glaciated during the Wisconsian-age McConnell glaciation. An extensive ice cap formed over the Ragged Range and less extensive ones formed over smaller ranges to the north and west in the map area. Ice flow was generally away from the Ragged Range up the Nahanni Valley. Ice crossed the divide into the Natla River drainage basin and across the Yukon River divide into the headwaters of the Ross, Pelly and MacMillan Rivers. During deglaciation, ice stagnated in many valleys. As a result, complexes of stagnant ice-glaciofluvial deposits such as eskers and kame terraces are common features in many of the large valleys of the map area. Evidence for a local re-advance of valley glaciers from the Ragged Range into the Nahanni and Flat River valleys is present in the form of lateral moraines in these areas. The moraines lie about 300 m above valley floors and well below the upper limits of ice reached during the McConnell glacial maximum. Radiocarbon dating indicates that the Nahanni River - Natla River divide in the area of O'Grady Lake was ice-free by 9400 ± 150 y.B.P. (years before present)(GSC-3533) and by 8840 ± 90 y.B.P. (GSC 3108). A period of glacial advance occurred over the past few centuries and terminated perhaps 100 years ago leaving lateral and end moraines up to a kilometre or more beyond the snouts of present glaciers. This was the most extensive advance for which evidence remains since the deglaciation of the area at least 10,000 years ago.

Discontinuous permafrost is found throughout the map area. The potential for thaw problems following disturbance of surface vegetation and soil horizons exists along all valley bottoms underlain by fine sediments or organic deposits and along valley margins underlain by fine colluvial sediments. Up to three distinct generations of rock glaciers are present in mountainous areas. Most of these features are partly or totally active. Movement of up to 3 m per year can be expected on the surfaces of these features. Solifluction and snow and rock avalanching are the dominant mechanisms of material transport on mountain slopes. The potential for flooding exists on alluvial plains and alluvial and colluvial fans. Colluvial fans and alluvial fans built out below drainage basins of less than about 20 km² are subject to inundation by debris flows.

Geology by L.E. Jackson, Jr. 1980, 1981

THE DECLINATION OF THE COMPASS NEEDLE, 1954



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Aerial photography by the R.C.A.F. 1949

Universal Transverse Mercator Projection.

Contour interval 500 Feet
All Elevations in Feet above Mean Sea Level.

NAHANNI

YUKON TERRITORY - NORTHWEST TERRITORIES

Miles 5 0 5 10 15 20 Miles
Kilometres 5 0 5 10 15 20 25 30 Kilometres

North American Datum 1927

NOTE: On the above index the sheets published are shown tinted green.