GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 86 B/14 (West Half)

LEGEND

PRECAMBRIAN

- 11 — Unfoliated, pink microgranite
- 10 — Coarse-grained quartz-feldspar pegmatite, commonly with tourmaline
- 9 — Foliated, white tourmaline microgranite; 9a, area having abundant country rock inclusions
- 8 — Strongly foliated biotite-gneiss with local dioritic variations, especially in west; 8a, migmatites with host rocks dominant
- 7 — Foliated porphyroblastic granite; 7a, migmatites with host rocks dominant

upper section:
- 6 — Thin-bedded quartz-feldspar sandstone, slate and quartz sandstone
- 5 — Thin-bedded quartz-feldspar sandstone and slate
- 4 — 'Salt and pepper' quartz-feldspar sandstone with ribs and lenses of calc-silicates

lower section:
- 3 — Limestone; 3a, calc-silicates associated with the limestone
- 2 — Banded hornblendic rocks with lenses of pillow lava
- 1 — Graded units of subgreywacke and slate; 1a, mylonitized subgreywacke and slate

Boundary of metamorphic zones
Low grade metamorphic zone . . . L
Medium grade metamorphic zone . . . M
High grade metamorphic zone . . . H

Note - lithology of sediments as given in legend is as in low grade metamorphic zone. Lithology in other zones is as shown below.

Low	Medium	High
Subgreywacke	Feldspar-quartz-biotite granulite (with some cordierite and a little staurolite)	Same as medium grade but characterized by presence of cordierite and sillimanite
Slate	Cordierite-feldspar-quartz biotite schist	
Quartz-feldspar sandstone	Quartz-feldspar granulite	
Quartz sandstone	Quartzite	

Gneisses with cordierite and sillimanite occur only in zones of migmatites

Drift-covered area
Geological boundary (observed, approximate, assumed)
Limit of geological mapping
Bedding (inclined, overturned)
Axial-plane cleavage
Foliation of gneissose rocks
Lineation (plunging, vertical)
Fault, approximate
Ground-trace of axial-plane of major anticlinal fold
Ground-trace of axial-plane of major synclinal fold

Geology by J.V. Ross, 1958

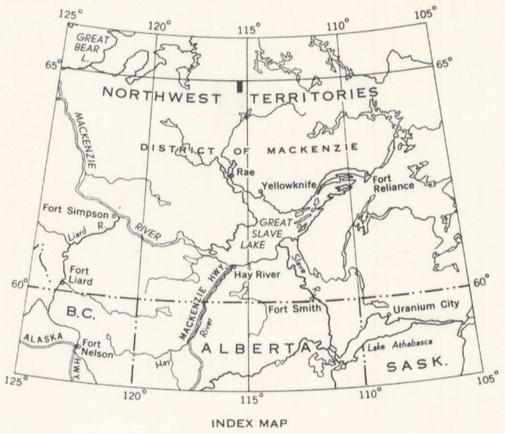
Portage
Stream (position approximate)
Rapids
Marsh
Rock, reef or small island

Cartography by the Geological Survey of Canada, 1959

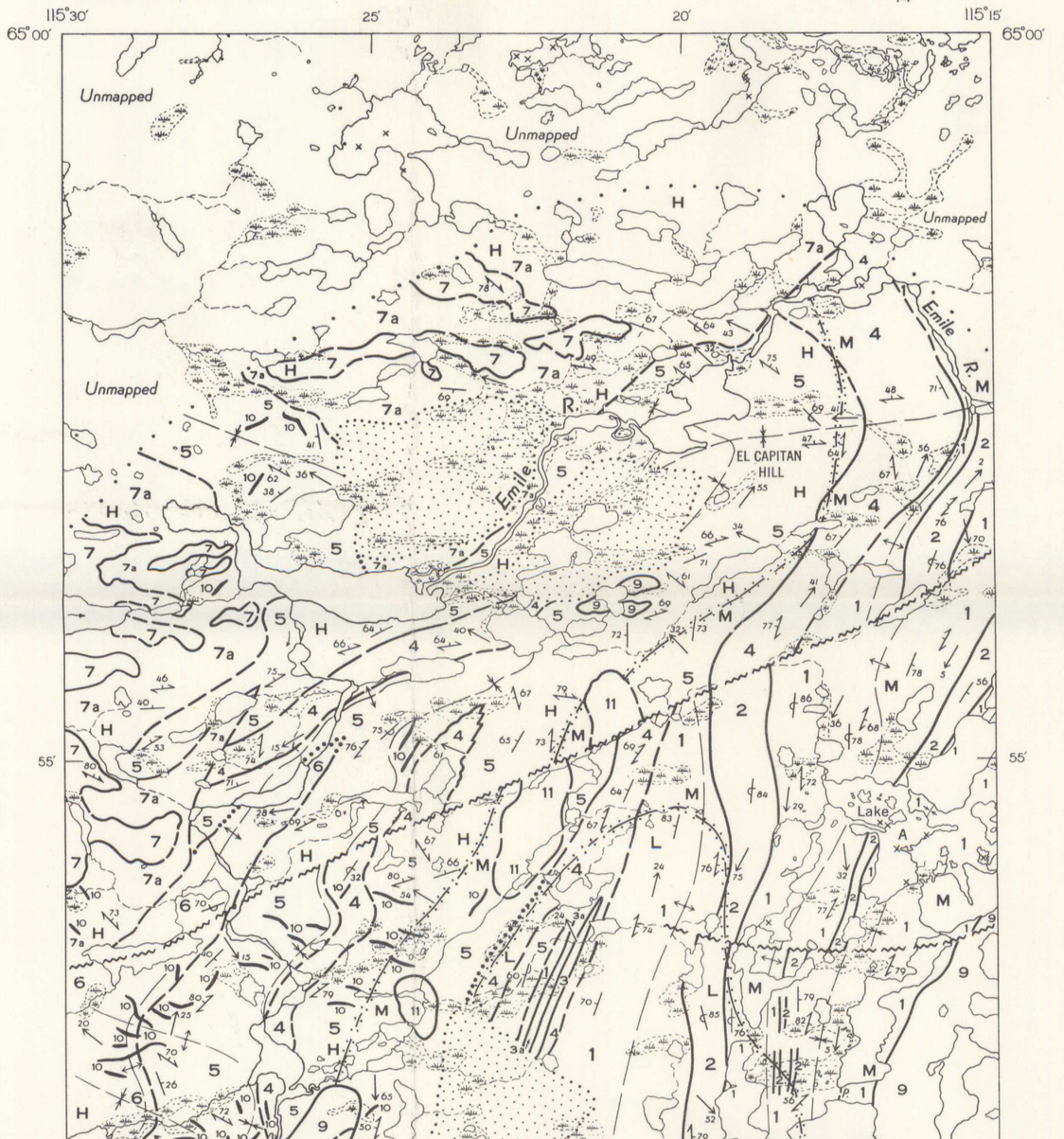
Approximate magnetic declination, 37° 30' East

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

In response to public demand for earlier publication, Preliminary Series maps are now being issued in this simplified form, thereby effecting a substantial saving in time. There is no loss of information, but the maps will be clearer to read if all or some of the map-units are hand-coloured.



INDEX MAP



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MAP 30-1959
GEOLOGY
MESA LAKE
DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES

Scale: One Inch to One Mile = 1/63,360

1 1/2 0 1 2 3 Miles

COPIES OF THIS MAP MAY BE OBTAINED FROM THE DIRECTOR, GEOLOGICAL SURVEY OF CANADA, OTTAWA

DESCRIPTIVE NOTES

The average elevation is about 1,200 feet above sea-level, with local relief of approximately 400 feet. The highest points are underlain by hornblendic and gneissic rocks. Trees are absent except for sparse growth along the low-lying valley of the Emile River.

The succession can be divided conveniently into upper and lower sections, with younger rocks to the west. The lower section, in the east, is characterized by a thick, monotonous series of subgreywacke-slate units (1), with two distinct horizons; while the upper section, in the west, comprises sediments that are typically thin-bedded and show rapid variation of rock-type across the strike. Within the lower section there are two distinctive horizons - hornblendic rock (2), and limestone (3). This hornblendic rock unit is mainly composed of strongly banded rocks with lenses of deformed pillow lava. The limestone is relatively pure, with many ribbons of quartz, each approximately 1 inch to 2 inches thick, parallel to the bedding. Sediments comprising the upper part of the succession are mostly slates and quartz-feldspar sandstones with horizons rich in calc-silicate bands and lenses (4 and 5). These pass up into interbedded slates, quartz-feldspar sandstones and quartz sandstones (6).

All the rocks are metamorphosed in varying degrees. The least altered are subgreywackes with interbedded slates (1), impure sandstones, slates and quartz sandstones (4, 5 and 6). The subgreywackes are well bedded and consist mainly of feldspar, quartz, chlorite and a little white mica. The quartz-feldspar sandstones contain more quartz and less feldspar than the subgreywackes, and the quartz sandstones consist of quartz and a little green biotite. These sedimentary rocks grade into more metamorphosed types consisting of feldspar-quartz-biotite granulites (granular metamorphic rock), feldspar-quartz-cordierite mica schist and quartzite. In turn, these more metamorphosed types grade into coarse-grained gneisses containing cordierite and sillimanite. Degree of metamorphism of the sediments increases to the north and west and this metamorphism is believed to have been contemporaneous with the deformation. Three zones are shown, characterized by the presence of index minerals chlorite, biotite-cordierite, and cordierite-sillimanite. In the northwest corner of the map-area metamorphosed sediments are intimately mixed with granitic material resulting in the formation of migmatites with the host rock dominant (7a). Associated with these migmatites are large patches of coarse, foliated porphyroblastic granite (7), whose porphyroblasts are aligned parallel to the foliation of the migmatites. Migmatites (8a) also occur in the southeast corner of the map-area and pass westwards into strongly foliated biotite-gneiss (8). This biotite-gneiss is in part porphyroblastic and has dioritic variations on its northern and eastern margins.

Throughout the area the succession shows evidence of deformation along three fold-trends. The first fold-trend was along northerly axes with a shallow plunge to the south. Undisturbed first fold structures are seen around Lake A., and evidence of this first northerly trend is found throughout the area. Evidence of fold-trends along northwesterly and northeasterly axes, later than the first fold-trend, is found in nearly all outcrops. These two fold-trends appear to be complementary and show overlapping time relations. Sliding is associated with the development of these cross-folds. Slides, which are not shown on the map, occur along incompetent-competent boundaries and in one instance a northerly trending fold-axis developed into a slide during the later folding.

Bodies of white, foliated tourmaline-microgranite (9) were intruded during the last stages of folding. These intrusions have zones of inclusions at their margins (9a); they have little or no thermal effect on the country rocks; and they have associated pegmatites (10) that commonly carry crystals of tourmaline up to 1 inch long. Bodies of a pink, unfoliated microgranite (11) were also intruded, possibly at a later date than the white granite.

Several faults of relatively small displacement occur within the map-area. These all strike in an easterly direction and dip vertically. They are all characterized by a right-hand tear-component with some amount of vertical displacement.

No item of economic interest was observed within the map-area.

MAP 30-1959
MESA LAKE
NORTHWEST TERRITORIES
SHEET 86 B/14 (West Half)

5.1.5
A, Geol. Mesa Lake, NWT.
Map 30-1959