GEOLOGICAL SURVEY
UNIVERSITY OF MINNESOTA

MISCELLANEOUS MAP SERIES
M-33

Base from U.S. Geological Survey topographic map, 1960

SCALE 1:24 000

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

Geology mapped by D. M. Davidson, Jr., 1966, 1970 and W. C. Phinney, 1967, 1968

RECONNAISSANCE GEOLOGIC MAP OF ALICE LAKE QUADRANGLE, LAKE COUNTY, MINNESOTA

By
D. M. Davidson Jr.

EXPLANATION

UPPER PRECAMBRIAN

Duluth Complex

gr

Felsic series

gr, *granite, medium- to coarse-grained, granitoid texture. Contains quartz, K-feldspar, plagioclase, biotite and/or hornblende, and opaques. Unit occurs as; 1) thin dikes (1 meter or less wide), and 2) small plutons.*

t

Troctolitic series

Troctolite, coarse-grained, contains cumulus plagioclase (An_{55-65}) and olivine (Fo_{34}) together with subpoikilitic augite (En_{54} Fs_{22} Wo_{24}) and opaques. Primary foliation of plagioclase is well developed. Unit closely resembles unit ttp of the Tuscorora intrusion as mapped in the Long Island Lake quadrangle and similar units in the Gabbro Lake quadrangle. Unit occurs extensively throughout the northwest part of the Alice Lake quadrangle, but was not mapped.

tan / gan / an / og

Anorthositic series

tan, *troctolitic anorthosite, coarse-grained. Contains 80-90% plagioclase (An_{65-68}) and variable amounts of olivine, augite, and iron oxides in a poikilitic texture. Primary foliation of plagioclase is well developed. Unit is gradational with gabbroic anorthosite (gan).*

gan, *gabbroic anorthosite, coarse-grained. Contains 80-90% plagioclase (An_{65-68}) and variable amounts of augite, olivine, and iron oxides in a poikilitic texture. Primary foliation of plagioclase is well developed locally.*

an, *anorthosite, coarse-grained, contains greater than 90% cumulus plagioclase (An_{68-80}) and augite (En_{54} Fs_{22} Wo_{24}). Unit occurs as large inclusions in gabbroic and troctolitic anorthosite. Primary foliation of plagioclase is well developed locally.*

og, *ophitic gabbro, medium- to coarse-grained contains 60-70% cumulus plagioclase and both clinopyroxene and orthopyroxene to form an ophitic texture. Unit occurs as a border phase to gabbroic anorthosite (gan). Relative age uncertain.*

ang / g

Early mafic series

ang, *anorthositic gabbro, coarse- to medium-grained. Contains 70-80% cumulus plagioclase (An_{55-70}) together with poikilitic augite and oxides. Unit is gradational with gabbro (unit g) and occurs as inclusions in gabbroic anorthosite (gan).*

g, *gabbro, coarse- to medium-grained. Contains 60-70% cumulus plagioclase (An_{55-70}) together with poikilitic augite and oxides. Unit locally has well developed plagioclase foliation and contains layered subunits characterized by relatively high concentrations (80%) of magnetite.*

North Shore Volcanic Group

mv

North Shore Volcanic Group

mv, *metavolcanic rocks, fine- to medium-grained, granoblastic texture. Contains dominant cumulus plagioclase and varying amounts of poikilitic, green-brown hornblende, interstitial quartz, magnetite, biotite, and K-feldspar. Unit appears to have a sub-horizontal contact with underlying units. This unit represents metamorphic equivalents of several rock types in the North Shore Volcanic Group.*

Approximate areas of outcrop

Contact
Long dash where inferred; short dash where gradational; dotted where concealed

Strike and dip of foliation

Horizontal foliation

Strike of vertical foliation