

DESCRIPTIVE NOTES

Introduction

Bedrock mapping for this survey was restricted to granitic rocks of the South Mountain Batholith and Meguma Group metasedimentary rocks within the immediate contact aureole. Previously published geology maps of the area consist of a 1 in = 1 mi map by Faribault (1916) and a regional 1:500,000 compilation map by Keppie (1979). Within the map area the granitic rocks range in composition from biotite granodiorite¹ to biotite monzogranite¹, two-micamonzogranites, leucomonzogranite², leucogranite³ and syenogranite¹. It is important to note that the systematic staining of rock samples using sodium cobaltinitrite is critical in distinguishing the various types of granite.

Meguma Group country rocks include metagreywackes of the Goldenville Formation and metapelites of the Halifax Formation (Schenk, 1982). Geology for rocks of the Meguma Group is after Faribault (1916). In most cases contact with the South Mountain Batholith (SMB) is undeformed with regional structures sharply truncated by intrusion of the SMB. Metasedimentary inliers and xenoliths of variable composition (metasedimentary?) are common to most granitic rocks. The size and degree of assimilation of the xenoliths varies depending on the nature of the host granitoid.

In the northern contact area, along Highway 101, abundant Meguma Group xenoliths occur. Kyanite, sillimanite, andalusite, and cordierite, porphyroblasts have been observed (Jamieson, 1974) within

Unit Descriptions

Containing approximately 15% biotite and only trace amounts (if any) of muscovite, this unit is predominately medium- to coarsegrained, with up to 10% alkali feldspar megacrysts4. Although generally homogenous, a medium-grained equigranular marginal phase (DCgda) is exposed south of Mount Uniacke along Highway 101, and along the east side of Pockwock Lake. This marginal phase is characterized by abundant blue quartz and metasedimentary? (Meguma Group?) xenoliths of variable size and degree of assimilation. This unit is confined to large embayments in the granodiorite/Meguma Group contact area. Away from the contact, the granodiorite becomes increasingly coarser grained and megacrystic, implying that the marginal phase represents a chilled portion of the main body. The occurrence of abundant Meguma Group xenoliths throughout the granodiorite suggests that the level of erosion is very near the roof of the intrusion in this area. Varying degrees of alteration consisting of pervasive saussuritization and chloritization and fracture related hematization and kaolinization, were observed in both phases of the granodiorite.

SANDY LAKE MONZOGRANITE (DCmgSL)

This medium- to coarse-grained, alkali feldspar megacrystic monzogranite is confined to the lower third of the map sheet. It contains approximately 10% biotite with minor (trace - 1%) muscovite and cordierite. In comparison with the granodiorite, this unit contains considerably fewer and smaller xenoliths. The high abundance of megacrysts, low muscovite content and light green quartz are characteristic features of this unit. Alteration is generally similar to those observed within the granodiorite. Cordierite is invariably altered to pinite and may resemble chloritized biotite. Well developed (pseudo?)-rapakivi textures within the main body (DCmgSL) may indicate probable late stage "magmatic" albitization.

Contacts with the granodiorite are gradational; transition zones range up to one kilometre wide as observed at Big Indian Lake.

PANUKE LAKE LEUCOMONZOGRANITE (DCImPL)

This unit is comprised of two texturally distinct, but mineralogically similar phases.

1) A homogenous, light grey-pink, fine-grained, equigranular leucomonzogranite, containing approximately 4-6% biotite and 1% muscovite. It is best exposed on Bates Lake in the southwest corner ed. A sharp intrusive contact with the Sandy Lake monzogranite is ex-

2) A porphyritic⁵ phase characterized by having a fine- to medium - grained groundmass with medium- to coarse-grained phenocrysts of alkali feldspar, quartz and local development of large (1 cm) flakes of biotite. The unit contains approximately 3% of both biotite and muscovite, with trace amounts of cordierite.

Alteration effects within this unit are predominately a reddish colouration due to hematization. In the vicinity of Bates Lake, a gradational contact was observed between the two phases of this unit. Contacts of this unit with the Sandy Lake monzogranite are sharp and intrusive as observed on a lumber road west of Rafter Lake.

BIG INDIAN POLYPHASE INTRUSIVE SUITE (BIPI)-(DCmgBI)

The BIPI-suite has been divided into four mineralogically similar but texturally variable lithotypes. A description of each follows:

A. Medium- to predominately coarse-grained containing 4.5-7.0% biotite, trace-2.0% muscovite and cordierite, and trace garnet. This lithotype varies texturally from equigranular to seriate to slightly (<5.0%)

B. This porphyritic lithotype has medium- to coarse-grained phenocrysts of plagioclase, quartz, biotite and garnet. The biotite content varies from 2.0-8.5%. Garnet occurs as 1.0 cm, reddish brown, crystal aggregates and appears to have a antithetic relationship with biotite (i.e. the 8.5% biotite porphyry contains no garnet). Muscovite occurs as fine grained flakes in the groundmass and modal content varies from trace to 1.5%.

C. Fine- to medium-grained moderately equigranular, containing 4.5-6.0% biotite, 3.0% muscovite, 1% cordierite and 1-3.0% garnet. The garnets are texturally similar to those in lithotype B.

D. A fine-grained, saccharodial, leucocratic microgranite. Contains 3.0% biotite, trace-2.5% muscovite, 1-2.5% cordierite and 1-4% garnet. May vary to syenogranite in composition. This lithotype contains abundant gamets similar to those in lithotype B. In some instances they occur in thin (< 1.0cm wide) K- feldspar-rich veins. The cordierite occurs as minute (< 3 mm) pinitized crystals which may be mistaken for chloritized biotite flakes.

The BIPI-suite is located entirely within the biotite granodiorite (DCgdc). The above lithotypes display intimate spatial relationships and sharp irregular contacts. Small pegmatitic pods and dykes are associated with all lithotypes and commonly contain tourmaline. Garnets are the most reliable field criteria for distinguishing rocks of the BIPI-suite from other monzogranites in the area (Kontak and Corey, in press). The numerous granodiorite roof pendants containing abundant Meguma Group xenoliths of large dimension (some approach 25 m²) and low degree of assimilation suggest that the BIPI-suite intruded to a high level within the granodiorite phase of the SMB.

Alteration within the BIPI-suite includes variable degrees of albitization, hematization, tourmalinization, chloritization, biotization, greisenization and K-feldspathization. Intense shearing is observed both within the BIPI-suite and

at the contacts with the granodiorite. The BIPI-suite is abruptly terminated along a major northwest lineament south of Five Mile Lake. The occurrence of "polyphase" type rocks in map area 21A/16 (Ham and Horne, 1986) spatially related to an east-west fault, suggests displacement along one or both of the above structural features.

WALSH BROOK LEUCOGRANITE (DCIgWB)

The leucogranite is buff to pink fine- to medium-grained and moderately equigranular. It contains 2.0-4.0% muscovite and less than 2.0% biotite. This unit displays intense northeast fracturing with local shearing. Alterations consists of moderate to intense hematization, kaolinization and K-feldspathization. The latter alteration type may account for the presence of syenogranites with this unit. A sharp intrusive contact with DCgd is exposed in a quarry northeast of Walsh Brook.

Mineral Occurences

Mineral occurrences within this map sheet consist principally of previously documented, fracture related, intrabatholithic and peribatholithic occurrences of uranium phosphates. Refer to NSDME mineral occurrence cards. The most significant mineral showings are described below.

CHRISTIE LAKE W-Cu-Mo SHOWING(S)

West of Christie Lake (see inset map) beside a lumber road, coarse wolframite crystals (1-7 cm long) with disseminated scheelite, chalcopyrite and very minor molybdenite were discovered in exposed quartz veins. The veins are approximately north-south trending, steeply dipping (72 degrees east), irregular structures which vary in width from 2 to 10 centimetres. The veins are hosted by the microgranite lithotype and are exposed along strike for approximately 5 metres. Grab sample of vein material returned 3% WO3 and trace Cu, Mo, Au (525ppb). Two similar showings were discovered over a distance of 1 km east of the above showing. At one of these, small (< 10 cm²) pyrite and chalcopyrite bearing greisen pods were also observed in the

M.E.X. U-Cu SHOWING

This occurrence was discovered in 1979 by the Maritime Exploration Syndicate (M.E.X. Rankin, 1980). It is exposed in a quarry approximately five hundred metres north of the Christie Lake showing. It consists of finely disseminated torbernite, autunite, chalcopyrite and pyrite within an extensively hematized northeast trending shear zone. Mineralization is most concentrated along the shear zone within an intensely kaolinized and hematized biotite-rich (20%) granodiorite roof pendant. The type and style of mineralization is very similar to that found at Millet Brook N.S. (Chatterjee et al., 1981).

Rock types within the quarry encompass all phases of the BIPIcomplex. They exhibit extensive alteration, including intense high alumina hydrothermal alteration as reflected by the presence of andalusite, sillimanite, hercynitic spinel, cordierite, garnet, muscovite, biotite and tourmaline. A sample of this high alumina alteration contains approximately 25%, colourless to pink, andalusite crystals (< 1-2.5 cm long) associated with muscovite, cordierite, pyrite (5%), and minor fluorite.

BATES LAKE SHOWING:

Immediately east of Bates Lake, an extensively hematized and saussuritized porphyry is exposed. It (porphyry) contains an approximately one square metre, light green, quartz-muscovite, greisen pod with a well developed quartz stockwork. Small greisen boulders display coarse disseminations of chalcopyrite, arsenopyrite, and pyrite in quartz stringers.

¹GRANODIORITE, MONZOGRANITE and SYENOGRANITE: After Streckeisen

²LEUCOMONZOGRANITES: Monzogranitic rocks with less than 6% combined mafic minerals.

³LEUCOGRANITE: Granitoid rocks with less than 2% combined mafic minerals.

⁴MEGACRYST: A nongenetic term for a crystal that is significantly larger than the surrounding groundmass. In the SMB megacrysts are predominately subhedral to euhedral K-feldspar and rarely plagioclase; crystals range from

2.5-7.0 cm. in length.

⁵PORPHYRY: A rock with a predominantly finegrained groundmass and medium- to coarse-grained phenocrysts (i.e. bimodal grain size distribution). Phenocrysts rarely exceed 2.5 cm. adj. porphyritic.

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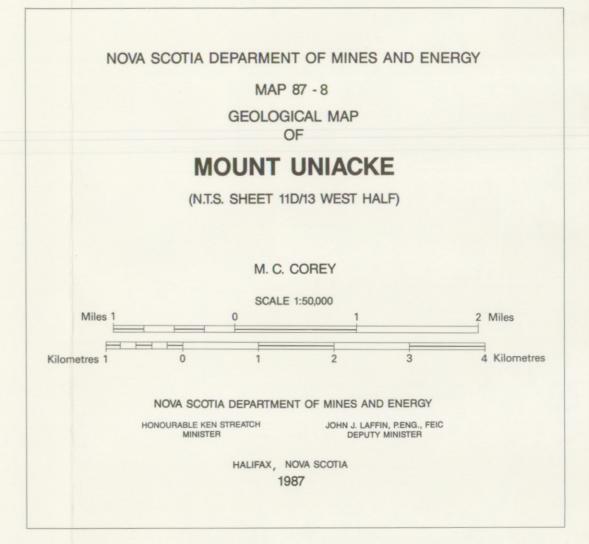
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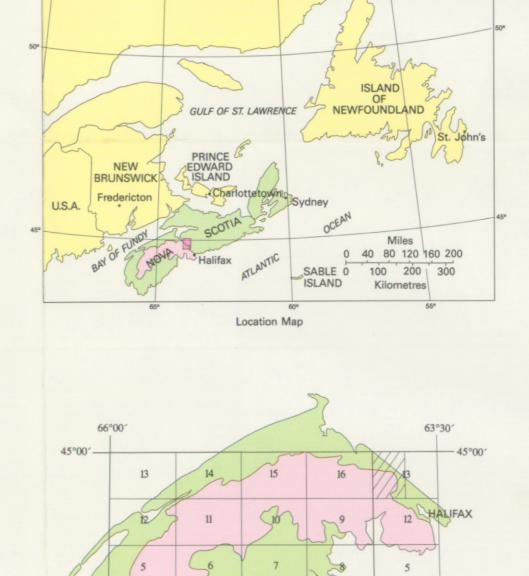
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YARMOUTH

21A

MAP AREA

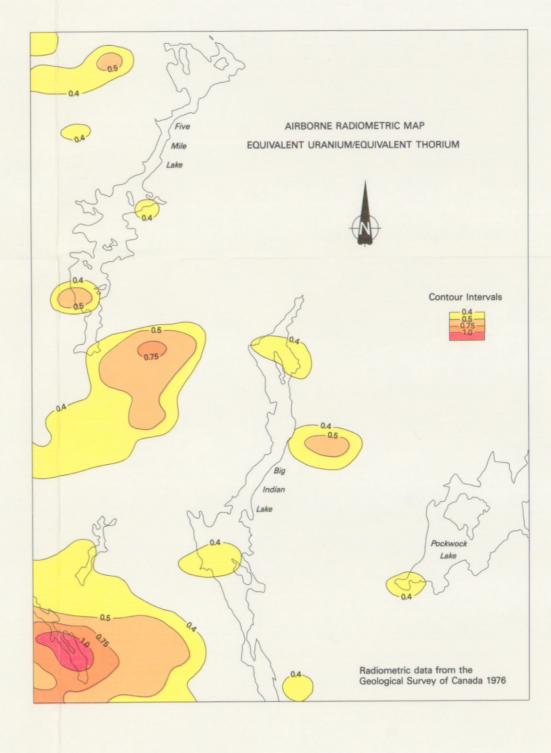
11D

63°30′

60 Mi.

100 Km.

SOUTH MOUNTAIN BATHOLITH



Maritime Resource Management Service Inc. Amherst, Nova Scotia

tr-tourmaline; wo-wolframite.

LEGEND

(1-2%), muscovite (2-4%)

PANUKE LAKE LEUCOMONZOGRANITE:

(trace-1%), ± cordierite

(trace-2%), ± garnet

(trace-3%)

numerous xenoliths

MEGUMA GROUP (after Faribault, 1916)

SYMBOLS

(not all symbols occur on map)

Rock outcrop, area of outcrop, probable outcrop,

Exposed intrusive contact (arrow pointing toward

Unconformity (hatching on younger side)......

Anticline (defined, approximate).....

Preferred orientation of feldspar megacrysts

Syncline (defined, approximate)......

inclined, vertical, dip unknown)......

Lineament (from air photos)....

Stockwork (type indicated)....

Megacryst rich area.....

Trench, adit, shaft...

Mine or Prospect

Sheeted complex (type indicated).....

Area of abundant dyking (type or map unit

map unit indicated when known.....

Diamond drill hole (reference number from

N.S.D.M.E. Open File Report).....

Fault (sinistral, dextral)...

younger unit, age relation not determined)......

unknown, younging direction unknown).....

(horizontal, inclined, vertical, dip unknown).....

Schlieren banding (horizontal, inclined, vertical, dip

Fault (defined, approximate, assumed, inclined,

Shearing and intense fracturing, fracture cleavage

Dyke or vein: ALBI-albitite; APPG-aplite with minor

pegmatite; DIAB-diabase; ELVA-elvan; LUGR-leuco-

granite; LUMZ-leucomonzogranite; LUPO-leucopor-

phyry; MIAP-mica aplite; PGAP-pegmatite with minor

PORP-porphyry; QTZ-quartz (indicated if mineralized);

all unlabelled dykes are aplites; < 1 m-thin lines, > 1 m-

Xenoliths (> 1 m, > 10 m, concentration of xenoliths)

Mineral occurrence (commodities indicated at top;

Alteration: ALB-albitization; CHL-chloritization; DES-

KAO-kaolinitization; LIM-limonitization; POT-potassic

(which include biotitization and K-feldspathization);

LIST OF COMMON MINERAL ABBREVIATIONS ad-andalusite; am-amethyst; ap-apatite; as-arseno-

sl-sillimanite; sp-sphalerite; se-sericite; to-torbernite;

pyrite; au-autunite; bo-bornite; ca-calcite; cc-chalcocite; ks-cassiterite; cp-chalcopyrite; ch-chlorite; cd-cordierite; cy-chrysocolla; fl-fluorite; gn-galena; gr-garnet; he-hematite; il-ilmenite; ka-kaolinite; mamalachite; mn-manganese minerals; mo-molybdenite; mu-muscovite; po-pyrrhotite; py-pyrite; sh-scheelite;

SAU-saussuritization; intense and pervasive in

desilicification; HAA-high alumina; HEM-hematization;

number on bottom refers to marginal notes or

N.S.D.M.E. mineral occurrence cards)....

aplite; PEGM-pegmatite; PEGMZ-zoned pegmatite;

Joint (horizontal, inclined, vertical, dip unknown)......

(horizontal, inclined, vertical, dip unknown).......

unknown) poorly developed isolated bands and well developed (thin and heavy lines respectively).....

Geological boundary (defined, approximate,

assumed, defined by till clasts)....

Geological boundary-gradational

< 100 m; > 100 m)....

CAMBRO-ORDOVICIAN

DEVONO-CARBONIFEROUS

PHASE B

