NOVA SCOTIA DEPARTMENT OF MINES AND ENERGY

MAP 90-10

GEOLOGICAL MAP OF

WINDSOR

(N.T.S. SHEET 21A/16 WEST HALF and PART of 21H/01)

NOVA SCOTIA

L.J. HAM

SCALE 1:50000

Miles 1 0 1 2 Miles

Kilometres 1 0 1 2 3 4 Kilometres

NOVA SCOTIA DEPARTMENT OF MINES AND ENERGY

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1991

LEGEND

CARBONIFEROUS (after Moore and Ferguson, 1986)

- ECW — WINDSOR GROUP: gypsum, red shale and limestone
- ECH — HORTON GROUP: sandstone, siltstone, arkose and conglomerate

DEVONO-CARBONIFEROUS

- DClgBB — BURNT BLANKET LEUCOGRANITE: white, cream, buff, fine grained, equigranular, biotite (<2%)*, muscovite (3-5%)
- DClgLL — LAKE LEWIS LEUCOGRANITE: white, cream, fine- to medium-grained, equigranular (locally porphyritic with phenocrysts of quartz and feldspar), biotite (<2%), muscovite (2-3%)
- DClmGR — GOLD RIVER LEUCOMONZOGRANITE: buff, pink, fine grained, equigranular, biotite (<2-6%, average 4%), muscovite (3-5%)
- DClmPL — PANUKE LAKE LEUCOMONZOGRANITE: light grey, buff, reddish, predominantly fine- to medium-grained, variable texture (predominantly porphyritic with phenocrysts of quartz, plagioclase and alkali feldspar +/- cordierite, locally equigranular), biotite (2-7%, average 4%), muscovite (2-5%), +/- cordierite
  - DClmPL — light grey to buff to red, predominantly fine grained, equigranular, biotite (4-7%) muscovite (trace-1%), +/- cordierite
  - DClmPL — whitish-grey to light buff-brown, porphyry with coarse grained phenocrysts of quartz, plagioclase, alkali feldspar phenocrysts +/- biotite +/- cordierite, biotite (<2-5%), muscovite (2-<5%)
- DClmNR — NEW ROSS LEUCOMONZOGRANITE: light- to whitish-grey, pinkish-grey, predominantly medium- to coarse-grained, predominantly megacrystic (5-25%), locally equigranular, biotite (3-7%), muscovite (trace-3%), cordierite (trace-3%), minor xenoliths (<1%)
  - DClmNR — white, buff, medium grained, equigranular, biotite (2-5%), muscovite (trace-3%), typified by low biotite content compared to main New Ross leucomonzogranite and light brown almost translucent biotite
- DCmgS — SHERWOOD MONZOGRANITE: whitish-grey, medium- to coarse-grained, seriate to megacrystic (5-10%), biotite (8-10%), muscovite (trace-1%), cordierite (trace-1%), minor xenoliths (<1%)
- DCmgGL — GASPEREAU LAKE MONZOGRANITE: whitish-grey, medium- to predominantly coarse-grained, megacrystic (2-15%), biotite (10-15%), trace muscovite and cordierite, xenoliths are common (1%)
- DCgdGL — GASPEREAU LAKE GRANODIORITE: same as above, but composition is granodiorite
- DCmgST — SALMONTAIL LAKE MONZOGRANITE: whitish-grey, fine- to coarse-grained, variable texture (seriate, megacrystic 0-10%), predominantly megacrystic, biotite (12-15%), trace muscovite and cordierite, xenoliths are common (1%)
- DCgd — GRANODIORITE: bluish-grey, medium- to coarse-grained, megacrystic (5-10%), biotite (13-15%), trace muscovite, xenoliths are common (1%)
  - DCgd — dark grey, medium grained, slightly porphyritic with phenocrysts (<5%) of quartz and plagioclase, biotite (15-20%), contains numerous xenoliths
- DCmgmp — MAFIC PORPHYRY: light brown, dark brownish-grey, fine grained, porphyritic with phenocrysts of quartz, plagioclase, alkali feldspar, biotite (12-20%), trace muscovite, contains abundant xenoliths

ORDOVICIAN-DEVONIAN (after Moore and Ferguson, 1986 and personal communication)

- SN — NEW CANAAN FORMATION: andesite, siltstone and slate
- SK — KENTVILLE FORMATION: shale, siltstone and slate
- OSW — WHITE ROCK FORMATION: slate and subordinate siltstone, quartzite and volcanic rocks

CAMBRO-ORDOVICIAN

MEGUMA GROUP (greenschist facies; Taylor and Schiller, 1966; geology after Faribault, 1916, 1931)

- €OH — HALIFAX FORMATION: finely laminated slates and siltstones, minor quartz wacke
- €OG — GOLDENVILLE FORMATION: greenish-grey greywackes and minor interbedded slates

UNKNOWN AGE

- gn — GNEISSIC ROCKS: greenish-grey, black fine grained gneiss, containing quartz, plagioclase, biotite, cordierite, muscovite, minor alkali feldspar (+/- sillimanite)

* percentages based on visual modal estimates

SYMBOLS

(not all symbols occur on map)

- Rock outcrop, area of outcrop, probable outcrop, float
- Geological boundary (defined, approximate, assumed, defined by till clasts)
- Geological boundary-gradational (< 100 m; > 100 m)
- Exposed intrusive contact (arrow pointing toward younger unit, age relation not determined)
- Unconformity (hatching on younger side)
- Limit of mineralogical or textural variation
- Bedding (horizontal, inclined, vertical, overturned, dip unknown, younging direction unknown)
- Anticline (defined, approximate)
- Syncline (defined, approximate)
- Preferred orientation of feldspar megacrysts (horizontal, inclined, vertical, dip unknown)
- Schistosity, gneissosity, cleavage, foliation (horizontal, inclined, vertical, dip unknown)
- Breccia
- Schlieren banding (horizontal, inclined, vertical, dip unknown) poorly developed isolated bands and well developed (thin and heavy lines respectively)
- Lineament (from air photos)
- Fault (defined, approximate, assumed, inclined, vertical)
- Fault (sinistral, dextral)
- Shearing and intense fracturing, fracture cleavage (horizontal, inclined, vertical, dip unknown)
- Joint (horizontal, inclined, vertical, dip unknown)
- Dyke or vein: ALBI-albitite; APPG-aplite with minor pegmatite; DIAB-diabase; ELVA-elvan; LUGR-leucogranite; LUMZ-leucomonzogranite; LUPO-leucoporphyry; MIAP-mica aplite; PGAP-pegmatite with minor aplite; PEGM-pegmatite; PEGMZ-zoned pegmatite; PORP-porphyry; QTZ-quartz (indicated if mineralized); all unlabelled dykes are aplites; < 1 m-thin lines, > 1 m-heavy lines (inclined, vertical, dip unknown)
- Stockwork (type indicated) — QTZ
- Sheeted complex (type indicated) — QTZ
- Area of abundant dyking (type or map unit indicated) — DCgd
- Greisen: < 1 m, > 1 m (indicated if mineralized) — g, cp
- Megacryst rich area — m
- Xenoliths (> 1 m, > 10 m, concentration of xenoliths) map unit indicated when known
- Diamond-drill hole (reference number from N.S.D.M.E. Open File Report 86-021) — 109
- Trench, shaft
- Mineral occurrence (commodities indicated at top; number on bottom refers to marginal notes or N.S.D.M.E. mineral occurrence cards) — X U, Cu 1
- Mine or Quarry — Sn
- Mine or Quarry (abandoned) — Sn
- Alteration: ALB-albitization; CHL-chloritization; DES-desilicification; HAA-high alumina; HEM-hematization; KAO-kaolinitization; LIM-limonitization; POT-potassic (which include biotitization and K-feldspathization); SAU-saussuritization; SIL-silicification; intense and pervasive in capitals, slight to moderate in lower case — HEM, hem

LIST OF COMMON MINERAL ABBREVIATIONS

ad-andalusite; am-amethyst; ap-apatite; as-arsenopyrite; at-autunite; bo-bornite; ca-calcite; cc-chalcocite; ks-cassiterite; cp-chalcopyrite; ch-chlorite; cd-cordierite; cy-chrysocola; fl-fluorite; gn-galena; gr-garnet; he-hematite; il-ilmenite; ka-kaolinite; ma-malachite; mn-manganese minerals; mo-molybdenite; mu-muscovite; po-pyrrhotite; py-pyrite; sh-scheelite; sl-sillimanite; sp-sphalerite; se-sericite; to-torbernite; tr-tourmaline; wo-wolframite.

Planimetric base produced by the SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES. Updated from aerial photographs taken in 1980. Culture check 1981. Published in 1983. Updated 1986 from mapping.

Geological information east of Highway 14 was compiled from N.S.D.M.E. Map 87-7 (Ham and Horne, 1987).

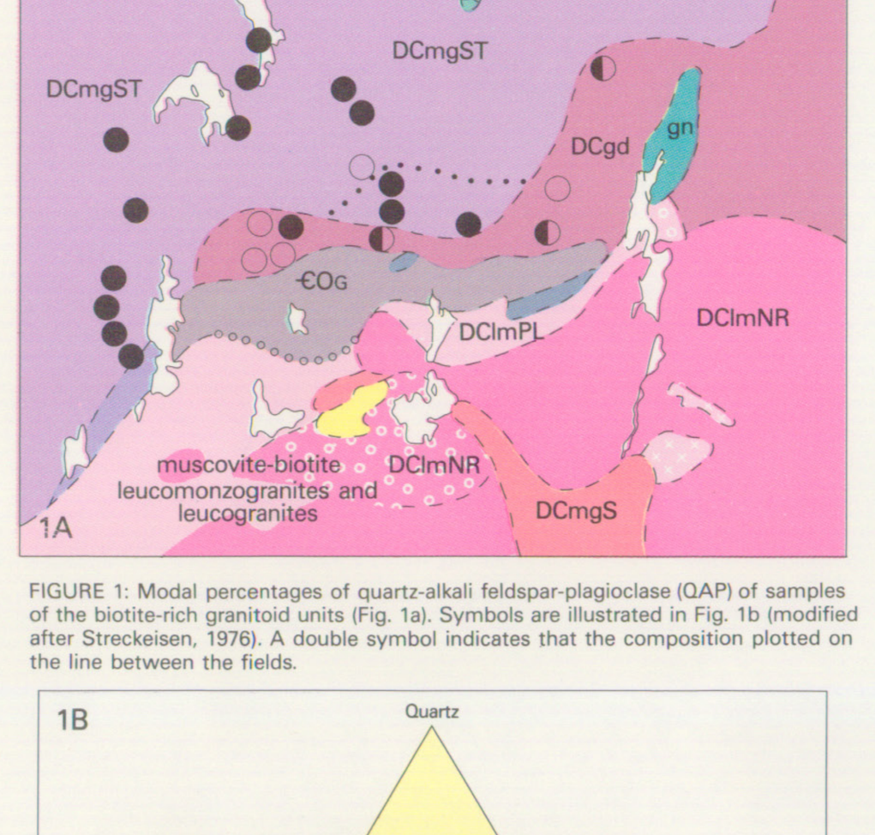
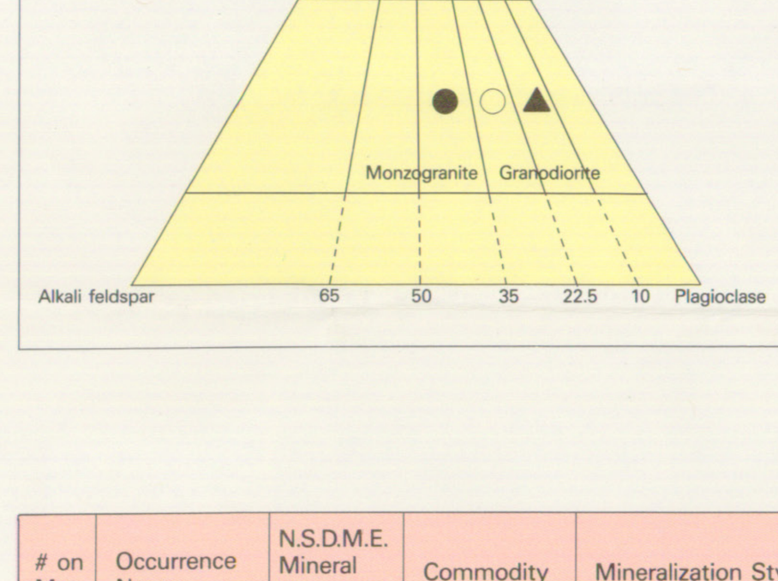


FIGURE 1: Modal percentages of quartz-alkali feldspar-plagioclase (QAP) of samples of the biotite-rich granitoid units (Fig. 1a). Symbols are illustrated in Fig. 1b (modified after Streckeisen, 1976). A double symbol indicates that the composition plotted on the line between the fields.



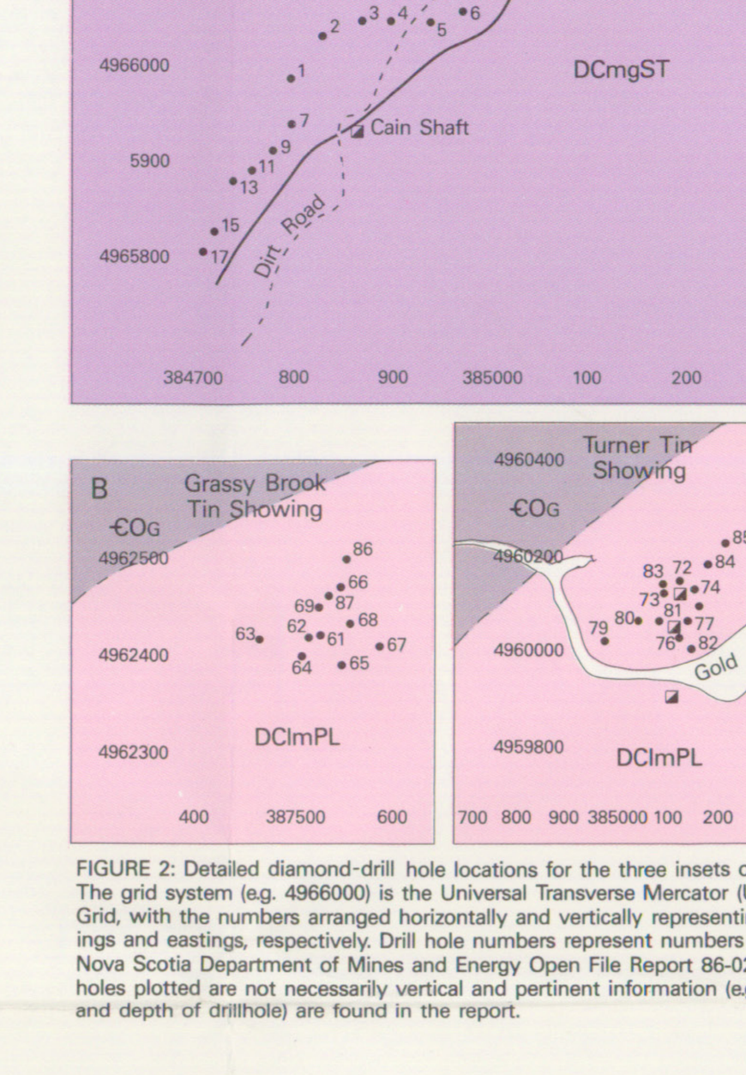
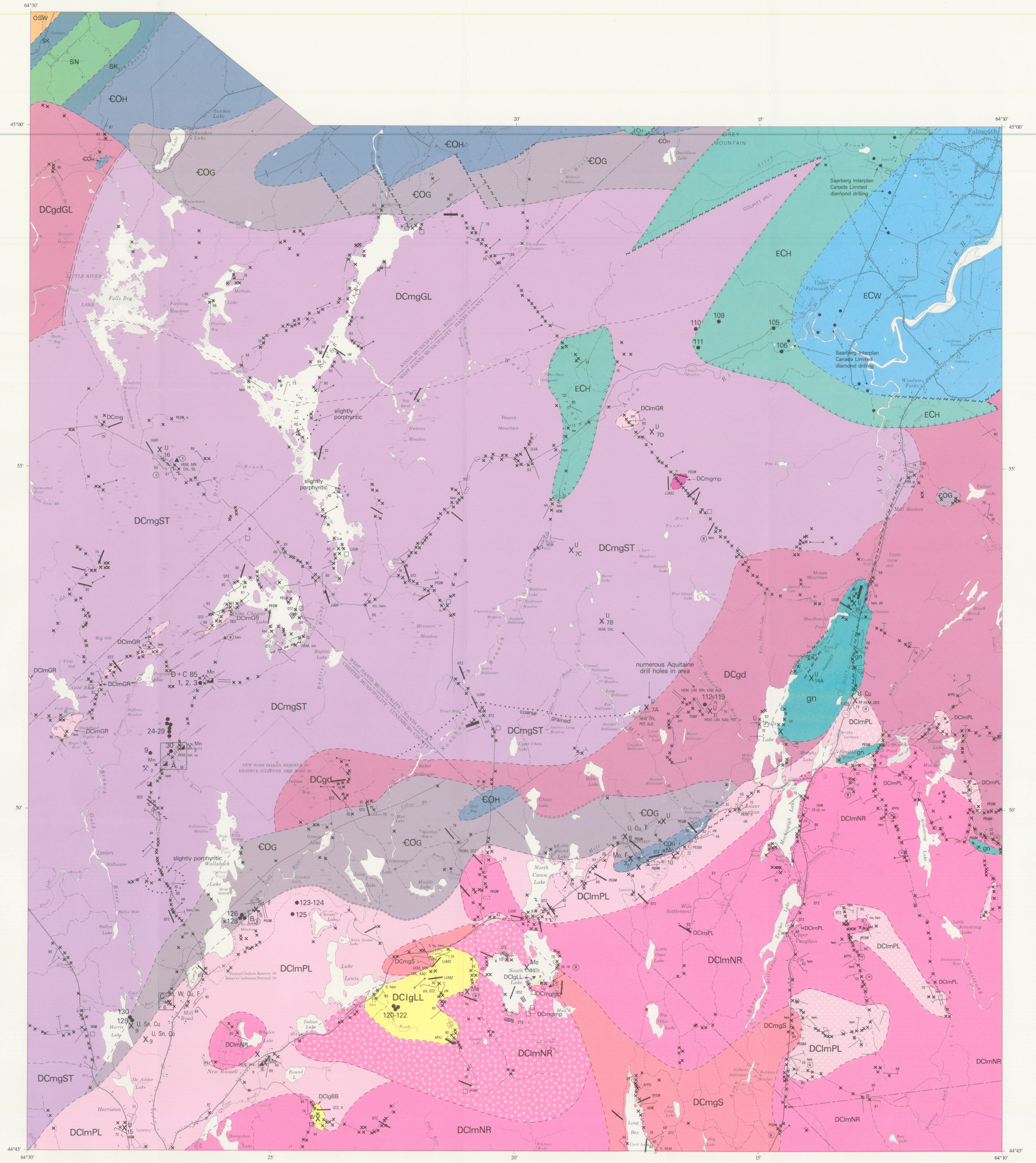
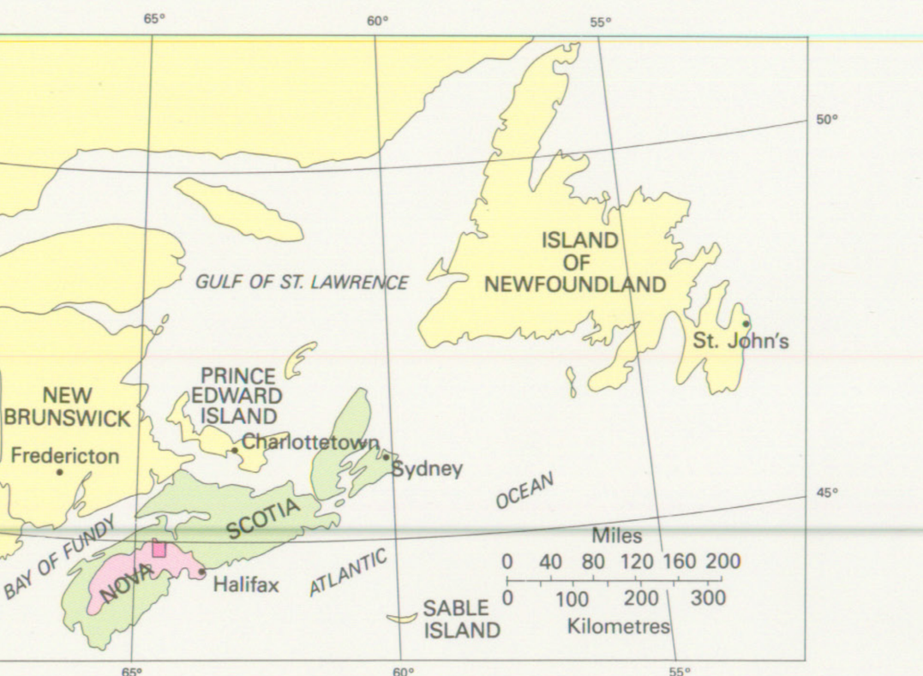
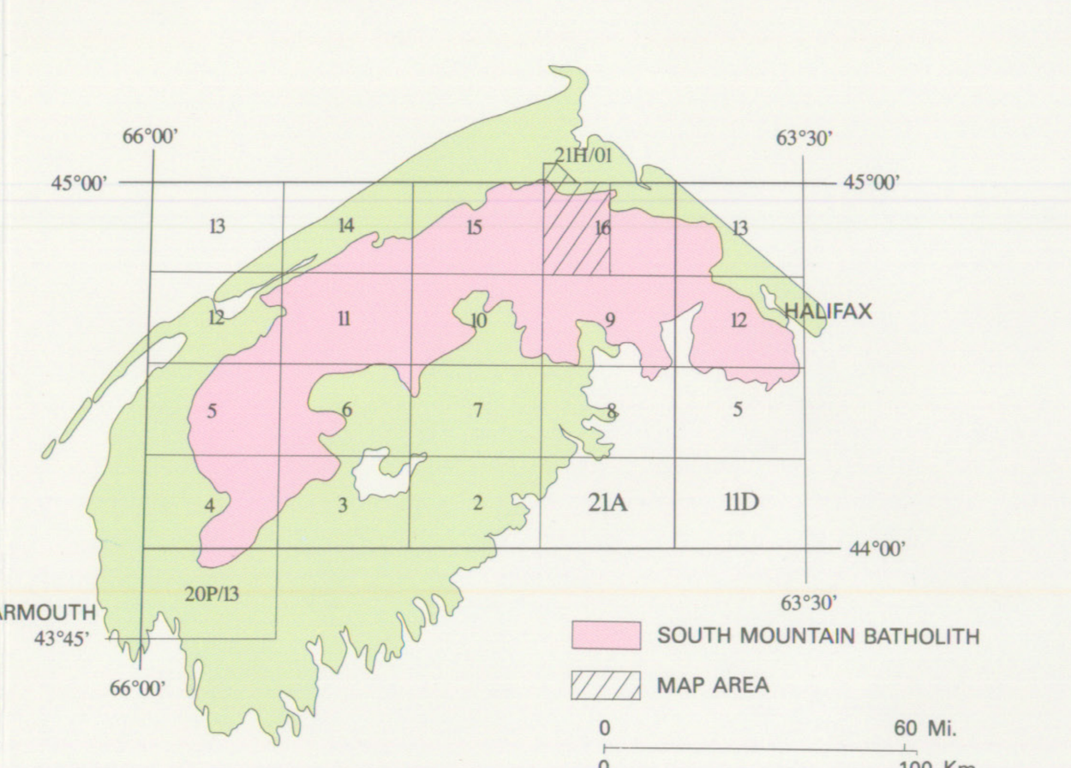


FIGURE 2: Detailed diamond-drill hole locations for the three insets on map. The grid system (e.g. 4966000) is the Universal Transverse Mercator (U.T.M.) Grid, with the numbers arranged horizontally and vertically representing northings and eastings, respectively. Drill hole numbers represent numbers from Nova Scotia Department of Mines and Energy Open File Report 86-021. Drill-holes plotted are not necessarily vertical and pertinent information (e.g. dip and depth of drillhole) are found in the report.





Location Map



DESCRIPTIVE NOTES

Introduction

The map sheet is underlain by three dominant rock types: Cambro-Ordovician Meguma Group metasedimentary rocks, Devono-Carboniferous granitoid rocks of the South Mountain Batholith (SMB), and Carboniferous sedimentary rocks of the Horton and Windsor groups. Rocks of the Ordovician-Devonian White Rock, Kentville and New Canaan formations underlie the most northern part of the study area on map sheet 21H/01 and their geology is modified after Moore and Ferguson (1986 and personal communication).

The pre-granitic rocks of the map sheet include the Meguma Group consisting of greywackes and slates of the Goldenville Formation and slates and siltstones of the Halifax Formation (Schenk, 1982). The geology of these units is modified after Faribault (1916, 1931) and Moore and Ferguson (1986 and personal communication). The granitic rocks are in either sharp intrusive or faulted contact with the Meguma Group. Contact metamorphic minerals (e.g. cordierite, andalusite) occur adjacent to the granite/metasediment contact.

Geological mapping focused on the granitic rocks of the SMB. These rocks include granodiorite[1], monzogranite[1], leucomonzogranite[2] and leucogranite[3]. Eleven different granitoid units were identified, based on grain size, texture, modal mineralogy and field relations. Systematic staining of alkali-feldspar with sodium cobaltinitrite was used to determine the quartz-alkali feldspar-plagioclase content of each unit and, hence, its proper classification according to the scheme of Streckeisen (1976).

Carboniferous sedimentary rocks of the Horton (ECH) and Windsor (ECW) groups lie unconformably or in faulted contact with the Meguma Group and granitic rocks in the northwestern portion of the study area. Lithological information and contact relationships were compiled from Moore and Ferguson (1986).

Unit Descriptions and Field Relationships

The granitic rocks exposed on the southern portion of 21A/16W, and extending southward onto 21A/09, appear to form a discrete plutonic centre within the SMB referred to as the New Ross Pluton (NRP; MacDonald et al., 1987). This pluton, composed of muscovite-biotite monzogranite to leucogranite, intruded an envelope of biotite-rich rocks (granodiorite and biotite monzogranite). The granitoid rocks listed below are described in order of decreasing mafic content.

MAFIC PORPHYRY[4] (DCmgmp):

The DCmgmp is of limited extent and occurs as xenoliths (?) within the leucocratic, muscovite-bearing units on South Canoe Lake and as a small plug (<1 km²) within the granodiorite (DCgd) along a power line northwest of Hemlock Hill. These fine grained, porphyritic (with minor feldspar phenocrysts (1-2 cm) rocks are characterized by a high biotite content (12-20%) and brown to blackish-grey colour.

GRANODIORITE (DCgd):

The DCgd underlies the east-central portion of the study area and is host to the Millet Brook uranium deposit (mineral occurrence 7, Table 1). The granodiorite is predominantly bluish-grey, medium- to coarse-grained and megacrystic[5] (5-10%). Biotite content ranges from 13-15% and normally occurs as large (3-5 mm) grains within the groundmass. Trace amounts of muscovite are found as alteration products of biotite and feldspars. Small xenoliths (generally <30 cm) of variable composition, showing a range of shapes and degrees of assimilation, constitute 1% of most DCgd outcrops.

One variation of this unit occurs in the study area, in the eastern portion of the map sheet (Ham and Horne, 1987). This variation is dark-grey, medium grained, slightly porphyritic with phenocrysts of quartz and plagioclase and contains a high biotite content (15-20%). Numerous xenoliths (metasedimentary ?) are common throughout this variation.

In addition to the Millet Brook uranium deposit, other uranium showings in the Millet Brook area (e.g. Upper Salter Lake, mineral occurrence 7A, Table 1) occur within DCgd.

SALMONTAIL LAKE MONZOGRANITE (DCmgST):

The unit underlies most of the northern portion of the map sheet. The biotite monzogranite is whitish-grey, fine- to coarse-grained (predominantly medium grained) and megacrystic (generally 5%). Grain size and texture, however, are heterogeneous on both outcrop and regional scales. Grain size ranges from fine to coarse and texture varies from seriate to slightly megacrystic (0-3%) to megacrystic (5-10%). Modal quartz-alkali feldspar-plagioclase (QAP) compositions for this unit are between monzogranite and granodiorite, but the modal average is monzogranite. This compositional heterogeneity is illustrated in Figure 1, which shows that different compositions occur geographically close to each other, sometimes within the same outcrop.

The unit has a high biotite content (12-15%), but contains only trace muscovite and cordierite. Small (<30 cm) xenoliths of probable metasedimentary origin are common.

This unit is host to the past-producing manganese mines (mineral occurrence 1 and 2, Table 1) and several uranium showings in the Millet Brook area (e.g. mineral occurrences 7B, 7C, 7D, Table 1; numerous showings outlined on the map) and elsewhere in the map sheet (mineral occurrence 16, Table 1).

GASPEREAU LAKE MONZOGRANITE (DCmgGL) and GASPEREAU LAKE GRANODIORITE (DCgdGL):

The Gaspereau Lake monzogranite (DCmgGL) comprises the northern margin of the granitoid rocks, next to the granite/metasediment contact. The biotite monzogranite is whitish-grey, medium- to coarse-grained and megacrystic (2-15%). Biotite content ranges from 10-15% with only trace amounts of muscovite and cordierite. DCmgGL is distinguished from DCmgST by a more homogeneous texture and a coarser grain size, and could represent a border facies of DCmgST. DCmgGL extends westward to 21A/15, where the rocks are texturally similar and have the same biotite and muscovite contents (MacDonald and Ham, 1988). These latter rocks, however, are predominantly granodioritic in composition and a division is possible only on the basis of point counting stained slabs. A gradational contact between the granodiorite (DCgdGL) and the monzogranite (DCmgGL) is assumed. Xenoliths of metasedimentary origin occur in minor amounts.

SHERWOOD MONZOGRANITE (DCmgS):

The Sherwood monzogranite is well exposed along Highway 14 in the southeast portion of the map sheet, where it forms the core of the monzogranitic units that comprise the NRP. This whitish-grey, seriate to megacrystic (5-10%) biotite monzogranite contains biotite (8-10%) and trace to 1% muscovite and cordierite. Minor amounts of xenoliths (<1%) are found within the unit.

A plug or large xenolith (3 km x 2 km) of DCmgS outcrops along the New Ross-Vaughan highway east of Lake Lewis. At this location, it is surrounded by three units including New Ross leucomonzogranite (DClmNR), Lake Lewis leucogranite (DClgLL) and Panuke Lake leucomonzogranite (DClmPL).

NEW ROSS LEUCOMONZOGRANITE (DClmNR):

The New Ross leucomonzogranite is distinguished from preceding units primarily by: a lower biotite content (3-7%), a higher proportion of muscovite (trace-3%) and cordierite (trace-3%) and increased saussuritization and/or hematization of the feldspars, which gives the rock an orange-pink colour. It is medium- to coarse-grained and predominantly megacrystic (5-25%), although locally textures include equigranular or pegmatitic or seriate. Fine grained dykes, pegmatite, pods of porphyry and abundant quartz swarms occur close to contacts with other units and within contact embayments. Intense hematization, manganese staining and development of fluorite occur close to the contact with the Lake Lewis leucogranite. A sharp, exposed contact with DCmgS on South Canoe Lake exhibits a chilled margin within the DClmNR and megacrysts of alkali feldspar within DCmgS are terminated at the contact.

A textural variant (medium grained and equigranular; represented on the map by the drop-out pattern) occurs in the South Canoe Lake area. Biotite is characteristically light brown and translucent within this textural variant and quartz veins as stockworks are common. A sharp intrusive contact between the unit and the Lake Lewis leucogranite (DClgLL) is observed on the shoreline of South Canoe Lake and also seen in drill core from the Grassy Brook showing (Shea and Wallace, 1963; mineral occurrence 5, Table 1) with DClgLL intruding DClmNR. However, the contact between these two units also appears gradational along a road that runs north-south, parallel to the western shoreline of South Canoe Lake.

PANUKE LAKE LEUCOMONZOGRANITE (DClmPL):

The DClmPL is best exposed along the New Ross-Vaughan highway. The leucomonzogranite is characterized by variable texture and composition. The majority of the unit is light grey, buff, or reddish and fine- to medium-grained, and ranges from slightly porphyritic to equigranular. Biotite occurs in amounts of 2-7% (average of 4%). Local areas, usually intensely hematized, approach leucogranitic composition (<2% mafics), as a result of muscovite completely replacing biotite. Muscovite is present (2-5%) and cordierite occurs in trace amounts. Phenocrysts of predominantly quartz and plagioclase, alkali feldspar +/- biotite +/- cordierite are common. Strong pervasive hematization in other areas is common. Pegmatite dykes and pods occur within the unit.

Both gradational and sharp contacts are observed between the unit and the New Ross leucomonzogranite. In fact, DClmPL may in some cases represent a textural variation of DClmNR.

Two variants of DClmPL occur within the study area. The first is light grey to buff, fine grained, equigranular, and contains biotite (4-6%) and muscovite (trace-2%). It occurs in the eastern portion of the map sheet. Minor development of a porphyritic texture occurs as pods within this otherwise homogeneous leucomonzogranite. Moderate to locally intense pervasive hematization is common. Locally, rocks altered to episyenite composition are found within a mineralized (U, Cu) outcrop along Highway 14 north of Vaughan. (Logothetis, 1984; mineral occurrence 14B, Table 1).

The second variant is light grey to buff porphyry with a fine- to medium-grained groundmass and phenocrysts of alkali feldspar, plagioclase, quartz eyes and less commonly biotite and cordierite. Biotite contents are 3-5% and muscovite is generally present in amounts ranging from trace-2%. This textural variant occurs in the southeastern portion of the study area in close association with DClmNR.

The unit is host to numerous known and new mineral occurrences in the New Ross area (Table 1).

GOLD RIVER LEUCOMONZOGRANITE (DClmGR):

The unit is a fine- to medium-grained, equigranular, cream- to pink-coloured leucomonzogranite that occurs as several north-east-trending elongate bodies, intruding the DCmgST in the western portion of the map area. Biotite content ranges from <2% in local areas to 6% (average 4%) and muscovite content ranges from 3-5%. Northeast-trending shear zones and fractures occur in this area and the coincident form of these bodies suggests intrusion along pre-existing linear structures. These leucomonzogranitic bodies are similar to rocks intersected at depth (>350 m) in drill-hole D.&C. 85-3 at the Dean and Chapter Mine (O'Reilly, 1987). Contacts with the biotite monzogranite (DCmgST) are sharp, as observed within the drill core. Intense, pervasive hematization is common.

A small plug (1 km²) of DClmGR intrudes DCmgST along a powerline northwest of Hemlock Hill, adjacent to mineral occurrence 7D shown on the map. Biotite and cordierite phenocrysts occur within the groundmass and muscovite content ranges from 3-5%. Manganese staining is common along northeast- and north-trending fractures.

LAKE LEWIS LEUCOGRANITE (DClgLL):

The Lake Lewis leucogranite is best exposed along the New Ross-Vaughan Road. A small body (<1km²) of leucocratic porphyry has intruded the equigranular DClmNR on South Canoe Lake. The unit is white to cream, fine- to medium-grained, equigranular and contains <2% mafics. The groundmass may contain small, rounded, bluish quartz eyes and minor biotite and muscovite clots. Quartz vein stockworks, minor pegmatite and aplite dykes are common within the unit. Sharp, intrusive contacts with DClmPL are observed in drill core (Shea and Wallace, 1963) and intrusive contacts with DClmNR and DCmgS are observed in outcrop on South Canoe Lake. Aplite and pegmatite (with minor black tourmaline) occur within DClgLL parallel to the contact with DClmNR exposed on South Canoe Lake. Megacrysts of alkali feldspar within DCmgS are terminated by DClgLL at the contact. Conversely, west of South Canoe Lake, a gradational contact between DClgLL and the equigranular DClmNR is observed.

Uranium, fluorite (blue, green and purple) and molybdenite mineralization occur within this leucocratic body (mineral occurrences 11 and 12, Table 1), along hematized fractures and shear planes and as disseminations throughout the groundmass.

BURNT BLANKET LEUCOGRANITE (DClgBB):

The unit is exposed along a road east of Round Lake. This white to cream, fine grained, equigranular leucogranite contains <2% mafics and 3-5% muscovite. Intense alteration (saussuritization and sericitization) is common within the unit. Small blades of wolframite (<1cm) occur within the matrix of one outcrop (mineral occurrence 13, Table 1). A larger body of DClgBB is exposed on map sheet 21A/09 to the south and also has mineralization associated with it (Corey, 1988).

APLITE AND PEGMATITE:

Aplite dykes, rarely with pegmatite, are common in DCgd and occur in minor amounts in DCmgST. Minor aplites and aplite/pegmatite dykes have been noted within the coarser grained monzogranitic units. These dykes are usually less than one metre in thickness. Tourmaline occurs in aplites and pegmatites within all units, although it is most abundant in dykes cutting DClmPL. Polymetallic mineralization is commonly associated with these pegmatite and, less commonly, aplite dykes (e.g. Walker Moly, Turner Tin, Wallaback Tin Prospect; Table 1).

GNEISSIC ROCKS (gn):

An inlier of greenish-grey to black gneissic rock occurs within DCgd along Highway 14 and Falls Lake in the east of the study area. This inlier (2.5 km x 6.5 km) is elongated north-south and was previously mapped as Meguma Group (Faribault, 1931; McKenzie, 1974; Purdy, 1983). Although some rocks of this inlier resemble the greywackes and slates of the Goldenville Formation in their general appearance and mineralogy, gneissic banding and at least four stages of intense local deformation occur within some outcrops. This style and intensity of deformation is not known to occur within the Meguma Group rocks (P. K. Smith, personal communication, 1987). This inlier is host to numerous uranium showings (e.g. mineral occurrence 14A, Table 1).

LEMINSTER INLIER

A large (approximately 25 km by 5 km), northeast-trending inlier of folded Meguma Group strata underlies the central portion of the map sheet, at the contact between biotite-rich rocks to the north and the muscovite-bearing leucocratic monzogranitic rocks to the south. The rocks are predominantly massive, grey-green quartzite and greywacke, with minor thinly-bedded slate and schist, of the Goldenville Formation. A thin band (500 m) of hornfels, schists and minor slates of the Halifax Formation occurs in the Leminster area (e.g. Purdy, 1983). Xenoliths of 'gneissic-textured' rocks are found within the surrounding granite. Fine-grained granitic dykes have intruded the metasediments along fractures and joints trending 120°. Some fracturing and slickensiding occurs close to the contacts with the granitoid rocks. Numerous areas in a gravel pit 1 km northwest of Lower Vaughan contain elevated radiometric responses within the metasediments, slickensides (trending 70-80°) and clay and manganese alteration.

One small (2 km x 0.5 km) band of Halifax Formation rocks occurs within the Leminster Inlier, west of North Canoe Lake. This observation is based on vertical gradient response which is similar to patterns from areas of the Meguma Zone underlain by Halifax Formation rocks (Geological Survey of Canada, 1984).

STRUCTURAL GEOLOGY

The majority of the biotite-rich granitoid rocks (DCgd, DCmgST, DCgdGL, DCmgGL) are massive and undeformed, although dominant northeast-trending structural linears are common. Within the DCgd hosting the Millet Brook uranium deposit and several other uranium showings, numerous northeast-trending slickensided shear zones occur and most mineralization is associated with these shear zones. Additionally, a uranium showing west of Black River Lake occurs within a northwest-trending shear zone (mineral occurrence 16, Table 1). One area along the New Ross-Vaughan highway within DClmPL represents a small fault, with silicification, brecciation and shearing. Falls Lake and Falls River outline a fault that is manifested by intense fracturing, slickensides and shearing within the gneissic rocks of the Hemlock Hill complex.

Horne et al. (1988) outline dominant northwest-trending (140°) joint sets within all rock units. These joints are often filled with numerous quartz veins, aplites and minor pegmatite. Jointing is blocky and better developed in the fine-grained leucomonzogranite and leucogranite units.

MINERAL OCCURRENCES

Most past exploration activity within the SMB has been concentrated around the New Ross-Vaughan area (e.g. Dean and Chapter Mine, Cain and Riddle Mine, Walker Molybdenum Prospect, Turner Tin Prospect). The Millet Brook uranium deposit was discovered by Aquitaine Company of Canada Limited in 1977 and much activity (e.g. prospecting, trenching, geological mapping, geochemical and geophysical surveys, drilling) has concentrated on this deposit. Several showings were also discovered during the course of the field mapping. These known and new showings and their main features are summarized in Table 1. Detailed location maps for areas with numerous drill holes around the New Ross-Vaughan area are given in Figures 2a, b and c.

[1]GRANODIORITE-MONZOGRANITE-SYENOGRANITE: After Streckeisen (1976).

[2]LEUCOMONZOGRANITE: A rock of monzogranitic composition with less than 6% combined mafic minerals.

[3]LEUCOGRANITE: A rock of monzogranitic composition with less than 2% combined mafic minerals.

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

[5]MEGACRYST: A nongenetic term for a crystal that is significantly larger than the surrounding groundmass. In the South Mountain Batholith, megacrysts are predominantly subhedral to euhedral alkali feldspar, and rarely plagioclase, crystals (generally between 2.5-7 cm in length) in medium- to coarse-grained rocks (adj. megacrystic).

[6]Nova Scotia Department of Mines and Energy mineral occurrence card number.

TABLE 1: Mineral occurrences

# on Map	Occurrence Name	N.S.D.M.E. Mineral Occurrence Number	Commodity	Mineralization Style	Host Rock	Remarks	Hydrothermal Alteration	Major References
1	Manganese Mines-Dean and Chapter	A16-06[6]	Mn Fe	-fault and fracture controlled	DCmgST	-northeast-trending mineralized lenses	hematization	Douglas and Campbell (1942), Weeks (1946), Bishop and Wright (1974), O'Reilly et al. (1982) -numerous N.S.D.M.E. assessment reports
2	Manganese Mines-Cain, Riddle and Marpic Shaft	A16-07 A16-08	Mn Fe	-fault and fracture controlled	DCmgST	-parallel, northeast-trending mineralized lenses, variable in width up to 180 cm	hematization	Douglas and Campbell (1942), Weeks (1946), Bishop and Wright (1974), O'Reilly et al. (1982) -numerous N.S.D.M.E. assessment reports
3	Leminster #1	A16-09	Mo F (mo, bi, as, he) **	-disseminations within qtz-calcite veins -minor flecks within pegmatite within DClmPL	€OG DClmPL	-qtz-calcite veins that intruded Meguma Group	hematization	Nova Scotia Department of Mines and Energy, Open File Report 86-021
3A	Leminster #2		Mo (mo, gn, sp, po, fl, cp)	-veinlets and disseminations within qtz-calcite veins -disseminations within aplite and pegmatite segregations	DClmPL €OG	-mineralization occurs within andalusite schists (€OH) and leucomonzogranite	hematization, brecciation, kaolinization	Aquitaine and Kidd Creek Mines internal report
4	Walker Moly	A16-10	Mo Cu Zn F W (mo, fl, wo, ks, bo, cp)	-mineralized zone at contact of pegmatite and DClmPL	DClmPL	-variable texture -banding of minerals	greisen, associated minerals	Walker (1911), Eardley-Wilmot (1925), Cameron (1951), Slipp (1951), Charest (1976), Farley (1979), O'Reilly et al. (1982), N.S.D.M.E. assessment reports
5	Wallaback Tin Prospect (Grassy Brook, Mitchell Prospect)	A16-11	Sn F (ks, as, py, sp, fl, cp)	-pegmatite near granite/metasediment contact -fracture-controlled greisens	DClmPL	-two northwest-trending tin-bearing pegmatites	greisen, hematization	Faribault (1931), Douglas and Campbell (1942), McCartney (1957), Shea and Wallace (1963), Mulligan (1975), Charest (1976), O'Reilly et al. (1982), N.S.D.M.E. assessment reports
6	Turner Tin (New Ross)	A16-12	Sn U Cu W Zn F (to, at, ks, cp, as, py, sp)	-disseminations, in veins of qtz, greisen and qtz porphyry -four major veins: Discovery, Elephant, Turner and Elvan	DClmPL	-variable texture, scattered pegmatitic segregations -veins en-echelon, displaced to present position by faulting	qtz greisen, hematization, chloritization, sericitization	Faribault (1909, 1910, 1911), Wright (1912), Douglas and Campbelll (1942), Cameron (1950), McCartney (1957), Shea and Wallace (1963), Charest (1976), Farley (1979), O'Reilly et al. (1982) -numerous N.S.D.M.E. assessment reports
7	Millet Brook Uranium Deposit	A16-13	U Cu Fe F W (to, at, cp, bo, cc, gn, sp, wo, pitchblende)	-fracture controlled, shear zones; two main zones C1, C2, numerous other zones -total reserves for deposit 1,000,000 tons of U_3O_8 (0.15-0.20%)	DCgd	-northeast-trending, vertical shear zones -parallel, en-echelon vertical bodies, width of up to 90m -leucomonzogranite intersected at depth	hematization, potassic, sodic and calcic alteration	numerous N.S.D.M.E. assessment reports, numerous Aquitaine and Kidd Creek Mines internal reports, Chatterjee et al. (1982, 1983) Chatterjee and Strong (1985)
7A	Upper Salter Lake		U (to, at, py)	-fracture controlled, shear zones; one main zone A-9 -mineralized zone 240 m along strike (0.12% U_3O_8 over 5.4 m)	DCgd/ DCmgST	-northeast-trending shear and fracture zones	hematization, chloritization, calcic and soda alteration, kaolinization	Aquitaine and Kidd Creek Mines internal reports, Chatterjee et al. (1982)
7B	Bennett Lake South		U (to, as, py pitchblende)	-fracture controlled, shear zones	DCmgST	-north- and northeast-trending vertical fracture zones -leucomonzogranite intersected at depth	hematization, chloritization	Aquitaine and Kidd Creek Mines internal reports
7C	Bennett Lake North		U (to)					
7D	Powerline		U (to, at, as, bo, py)	-fracture controlled, shear zones -disseminations in a series of east-trending veins associated with northeast-trending fractures	DCmgST	-northeast-trending fractures, few east-trending fractures -leucomonzogranite intersected at depth	hematization, limonization, kaolinization	Aquitaine and Kidd Creek Mines internal reports
8	Leminster	A16-14	U F (at, to, fl, py)	disseminations within qtz-calcite veins	€OG	-qtz-calcite veins that intruded Meguma Group rocks	hematization	Nova Scotia Department of Mines and Energy, Open File Report 86-021
9	Harris Lake		U Sn Cu Mo Pb (py, cp, ma, cc, ks, at)	-intersection zones of cross-cutting fractures and qtz greisen	DClmPL	-mineralization occurs at depth in brecciated and fractured zones	greisen	54-L-37(01), 37(05) N.S.D.M.E. assessment reports
10	Conrad Road		Mo F U (mo, fl, at)	-fracture fillings, disseminations	DClmPL	-greisen pods and pegmatitic segregations common within outcrop	hematization	
11	South Canoe Lake #1		Mo F (mo, fl)	pegmatite	DClgLL	-molybdenite as fine disseminations (<3mm) -fluorite along 125-140° fractures	minor greisenization	
12	South Canoe Lake #2		Mo (mo)	disseminations	leuco-granite dyke	-45 cm wide dyke, abundant quartz and greisen veins within outcrop	greisen, kaolinite	
13	Round Lake		W (wo)	disseminations	DClgBB	-small blades of wolframite	sericite	
14	Falls Lake River		U (at)	fractures	DClmPL	-fine-grained leucomonzogranite dykes within Hemlock Hill Complex	hematization	
14A	Hemlock Hill		U (to, at, py)	-disseminations -north-and northeast-trending fracture fillings	gn	-mineralization occurs at depth -numerous leucomonzo-granite dykes (<2m) and pegmatite bands (<1m) at depth	hematization chloritization, calcic alteration	Aquitaine and Kidd Creek Mines internal report
14B	Vaughan		U (to, at)	-open space and fracture fillings	DClmPL	-mineralized outcrops cut by later north (010°)-trending qtz and marcasite veins	hematization, albitization, desilicification	Chatterjee (1983), Logothetis (1984)
15	Harriston		U (at, to)	fractures	DClmPL	-visible torbernite and autinite along fractures	hematization	
16	Black River Lake		U As (at, to, as, py)	-fractures, disseminations within shear zone	DCmgST	-visible autinite along fractures, shear zone	hematization, brecciation, silicification	Logothetis (1984)
	Numerous fluorite occurrences (Leminster, Canoe Lake)	A16-03 A16-04 A16-05 A16-06	F	fractures, disseminations	DClmPL	-numerous fluorite occurrences along New Ross-Vaughan highway	hematization greisen	O'Reilly et al. (1982) -numerous N.S.D.M.E. assessment reports -many new occurrences

**mineral abbreviations listed in symbol legend

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ACKNOWLEDGMENTS

The author would like to thank colleagues at the Nova Scotia Department of Mines and Energy, including M. C. Corey, R. J. Horne, M. A. MacDonald, P. W. Finck, R. M. Graves, G. A. O'Reilly, D. J. Kontak, P. K. Smith and A. K. Chatterjee for their assistance and discussion. The author was assisted in the field mapping by M. A. Shaw, B. J. Jennings and I. Campbell. The author gratefully acknowledges the personnel of Aquitaine Company of Canada Limited and Kidd Creek Mines, particularly D. J. Robertson, for their assistance and use of their air photos, drill core, maps and reports for the Millet Brook uranium deposit and surrounding area.

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Canada-Nova Scotia Mineral Development Agreement