GEOLOGICAL SURVEY BRANCH
DEPARTMENT OF MINES AND ENERGY
GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

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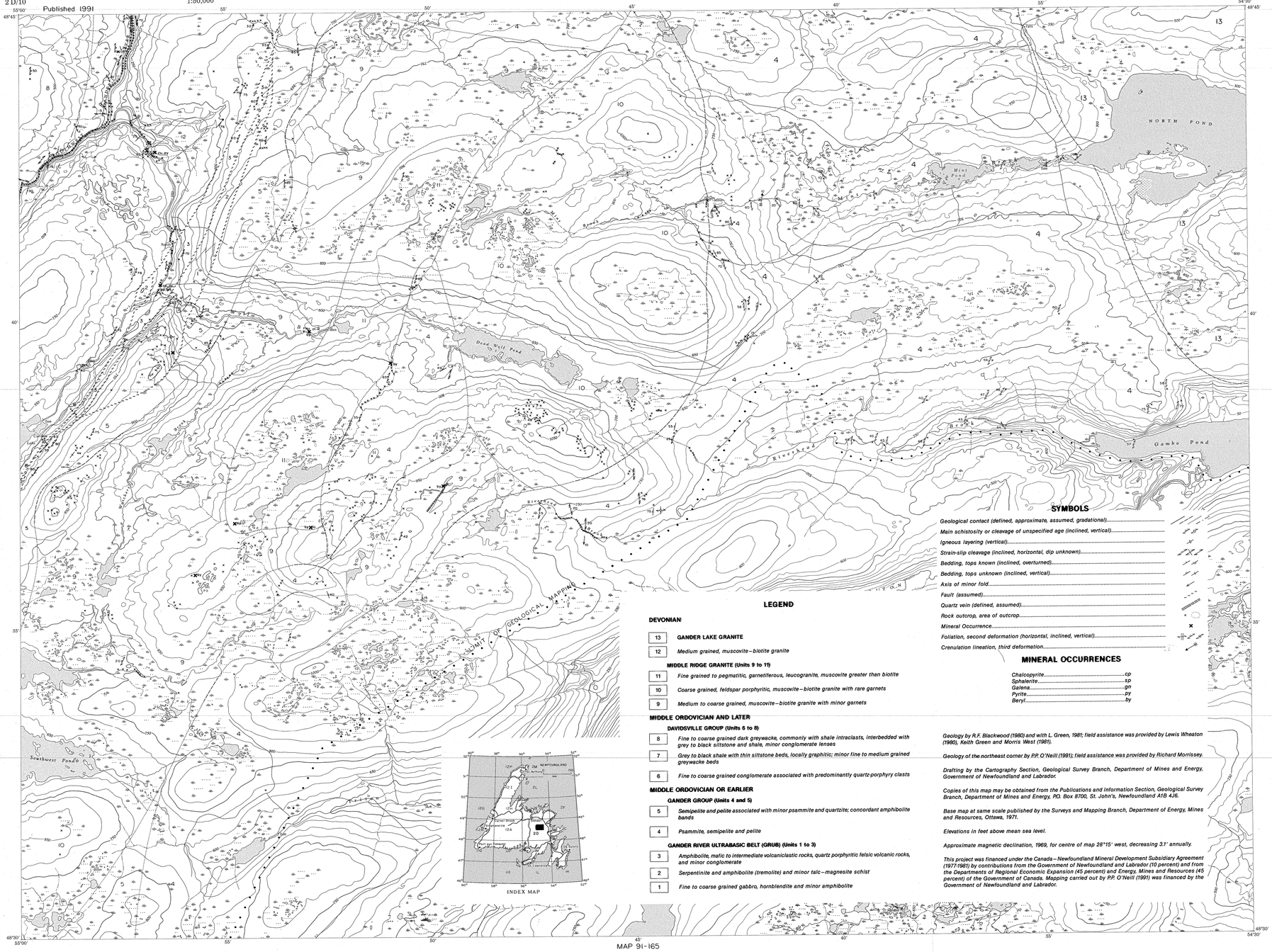

SYMBOLS

- Geological contact (defined, approximate, assumed, gradational)
- Main schistosity or cleavage of unspecified age (inclined, vertical)
- Igneous layering (vertical)
- Strain-slip cleavage (inclined, horizontal, dip unknown)
- Bedding, tops known (inclined, overturned)
- Bedding, tops unknown (inclined, vertical)
- Axis of minor fold
- Fault (assumed)
- Quartz vein (defined, assumed)
- Rock outcrop, area of outcrop
- Mineral Occurrence
- Foliation, second deformation (horizontal, inclined, vertical)
- Crenulation lineation, third deformation

LEGEND

DEVONIAN

13 **GANDER LAKE GRANITE**

12 *Medium grained, muscovite–biotite granite*

MIDDLE RIDGE GRANITE (Units 9 to 11)

11 *Fine grained to pegmatitic, garnetiferous, leucogranite, muscovite greater than biotite*

10 *Coarse grained, feldspar porphyritic, muscovite–biotite granite with rare garnets*

9 *Medium to coarse grained, muscovite–biotite granite with minor garnets*

MIDDLE ORDOVICIAN AND LATER

DAVIDSVILLE GROUP (Units 6 to 8)

8 *Fine to coarse grained dark greywacke, commonly with shale intraclasts, interbedded with grey to black siltstone and shale, minor conglomerate lenses*

7 *Grey to black shale with thin siltstone beds, locally graphitic; minor fine to medium grained greywacke beds*

6 *Fine to coarse grained conglomerate associated with predominantly quartz-porphyry clasts*

MIDDLE ORDOVICIAN OR EARLIER

GANDER GROUP (Units 4 and 5)

5 *Semipelite and pelite associated with minor psammite and quartzite; concordant amphibolite bands*

4 *Psammite, semipelite and pelite*

GANDER RIVER ULTRABASIC BELT (GRUB) (Units 1 to 3)

3 *Amphibolite, mafic to intermediate volcaniclastic rocks, quartz porphyritic felsic volcanic rocks, and minor conglomerate*

2 *Serpentinite and amphibolite (tremolite) and minor talc–magnesite schist*

1 *Fine to coarse grained gabbro, hornblendite and minor amphibolite*

MINERAL OCCURRENCES

- Chalcopyrite ..... cp
- Sphalerite ..... sp
- Galena ..... gn
- Pyrite ..... py
- Beryl ..... by

Geology by R.F. Blackwood (1980) and with L. Green, 1981; field assistance was provided by Lewis Wheaton (1980), Keith Green and Morris West (1981).

Geology of the northeast corner by P.P. O'Neill (1991); field assistance was provided by Richard Morrissey.

Drafting by the Cartography Section, Geological Survey Branch, Department of Mines and Energy, Government of Newfoundland and Labrador.

Copies of this map may be obtained from the Publications and Information Section, Geological Survey Branch, Department of Mines and Energy, P.O. Box 8700, St. John's, Newfoundland A1B 4J6.

Base map at same scale published by the Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa, 1977.

Elevations in feet above mean sea level.

Approximate magnetic declination, 1969, for centre of map 28°15' west, decreasing 3.1' annually.

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Roads: Routes:
loose or stabilized surface, all weather ... gravier aggloméré, toute saison ... 2 lanes or more / 2 voies ou plus ... less than 2 lanes / moins de 2 voies
loose surface, dry weather and unclassified streets ... ce gravier, temps sec et rues hors classe
cart track ... de ferre
trail or portage ... sentier ou portage

Scale 1:50,000 Échelle
Miles 1 0 1 2 3 Milles
Metres 1000 0 1000 2000 3000 4000 Mètres
Yards 1000 0 1000 2000 3000 4000 Yarges

This Provisional Map is equivalent to a standard map in accuracy of content.

Some names on this map are not yet official.
Corrections or additions are invited by the Surveys and Mapping Branch.

CONTOUR INTERVAL 50 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

MAP 91-165

DEAD WOLF POND
NEWFOUNDLAND

NOTES

The area around Dead Wolf Pond, the Southwest Gander River and the northeastern corner is accessible by all-terrain vehicles and 4-wheel drive off dilapidated 'woods' roads, which branch off the Trans Canada Highway in the vicinity of Gambo. The southwestern part of the map area was reached by aircraft.

Jenness (1963) mapped the Dead Wolf Pond (2D/10) area as part of the larger, one inch to four miles, Terra Nova map area. The northwest portion of the Dead Wolf Pond area was included in a geological map of the West Gander River (east half) area (Blackwood, 1981). The area is either heavily wooded or covered with bogs; exposure is very poor except for some river sections and the tops of some ridges. Till cover ranges from several centimetres to several metres in thickness.

The map area lies along the northeastern margin of the central Paleozoic mobile belt (Williams, 1964) of the Newfoundland Appalachians. It includes parts of the Gander and Botwood Zones (Williams *et al.*, 1974). Three broad geological subdivisions are defined in the map area. They are from east to west, (1) the Middle Ordovician or earlier Gander Group (McGonigal, 1973), (2) the Middle Ordovician or earlier Gander River Ultrabasic Belt (Jenness, 1958), and (3) the Middle Ordovician and later Davidsville Group (Kennedy and McGonigal, 1972). The Gander River Ultrabasic Belt, or GRUB, is a lithotectonic element that generally marks the boundary between the Gander and Botwood zones. The Devonian (?) Middle Ridge Granite (Strong *et al.*, 1974) and the Gander Lake granite intrude the Gander Group.

Units 1 and 2 are intimately associated and characterize the GRUB in this area. Although volcanic rocks of Unit 3 are spatially related to the GRUB and are here included within it, they could be more closely associated with the volcaniclastic component of Unit 4 or even be gradational with Units 6 and 7 of the Davidsville Group; contacts are not exposed. The gabbro in Unit 1 is not evenly distributed and is defined by hornblende and variable amounts of plagioclase. Locally, 2 to 3 cm wide leucogabbro bands are interlayered with 0.5 to 2 cm wide hornblendite bands. A fine banding, accentuated by weathering, is also locally developed in hornblendite. Parts of Unit 2 contain remnant primary olivine and was probably originally dunite. Amphibolite zones in Unit 3 commonly show a 0.5 to 1.5 cm banding with alternating bands being hornblende- or plagioclase-rich. The amphibolite varies from fine to coarse grained and probably represents mafic tuff or flows. White, quartz and quartz-feldspar porphyry bands are interlayered with the amphibolite and range in width from 50 cm to 4 m. The generally clear quartz phenocrysts are 2 to 6 mm across and occur in a fine grained felsic matrix; the porphyry bands are interpreted as felsic flows. Interbedded with the volcanic rocks are 1 to 10 m wide conglomerate bands with clasts that range from 2 mm to 8 cm in diameter. The clasts are mostly quartz porphyry with a distinctive blue hue marking the quartz phenocrysts. These are interpreted as volcaniclastic conglomerates. The main regional deformation is variably developed in the GRUB. In Unit 1, the amphibolite zones have a pronounced foliation whereas the gabbro and hornblendite are massive. Talc–magnesite schist zones represent the most foliated parts of Unit 2. Unit 3 is generally overprinted by a strong tectonic fabric along which there has been intense flattening and elongation; conglomerate clasts are geometrically oblate or prolate for different parts of the unit. Units 1, 2, and 3 are overprinted by amphibolite facies hornfelsing. Hornblende crystals are disoriented, felsic volcanic rocks are granoblastic, and fabrics are mimetic. Due east of the juncture of Dead Wolf Brook and Southwest Gander River, Unit 2 contains elongate olivine crystals which are 1 to 2 cm long and 1 to 2 mm wide. They are disposed in a radiating, criss-crossing pattern commonly with triangular shaped interstitial material. Nearly all the olivine is pseudomorphed by antigorite and the interstitial material is also altered to antigorite. The "spinifex-like" texture is interpreted to be metamorphic in origin (Evans and Trommsdorff, 1974), related to the intrusion of the Middle Ridge Granite.

The faults bounding the GRUB are interpreted to have variable displacement and thus would occur at different structural levels along strike. This would explain their apparent discontinuity as well as the local disappearance of the GRUB along strike. Also, in areas where fault movements have been restricted to a lower structural level than the rocks exposed, the Gander and Davidsville groups continue without interruption and are apparently conformable.

Unit 4 metasediments have been recrystallized in the aureole of the Middle Ridge Granite. Pelitic lamellae, 1 to 2 mm thick, are accentuated by the development of abundant biotite porphyroblasts. The main foliation may be composite since it transposes a fine mica orientation parallel to bedding. The large rafts in the Middle Ridge Granite are interpreted as roof pendants. Unit 4 and Unit 5 are conformable to the north (Blackwood, 1980), the main distiction between the two being the concordant amphibolite bands in the latter. The narrow bands are apparently gradational with the host metasediments; locally contacts are diffuse over 1 to 3 cm with amphibole becoming more profuse towards the mafic band. The amphibolites are interpreted to represent mafic volcaniclastics. The main fabric in Unit 5 is axial planar to small scale, variably plunging, isoclinal folds. Locally, a crenulation cleavage overprints the main, second fabric. Unit 2 is thoroughly recrystallized by the intrusion of the Middle Ridge Granite. The dominant, fine to coarse grained schistosity is entirely mimetic and the quartzofeldspathic component has generally been polygonized; large (0.5 to 1.0 cm across) cross-cutting porphyroblasts are common and include biotite, garnet, andalusite, cordierite, hornblende and staurolite.

Clasts in Unit 6 are 0.5 to 30 cm in diameter and are similar to the porphyry bands of Unit 3. Mafic patches in the matrix are minor but may indicate ultramafic, gabbroic or basaltic debris. Hence, Unit 6 is interpreted as a basal conglomerate to the Davidsville Group with an originally nonconformable relationship to the GRUB; it is possible, however, that the unit is part of Unit 3. Unit 6 appears to grade abruptly into Unit 7. Siltstone beds of Unit 7 are 2 to 12 cm thick and have sharp boundaries; locally, the shales are laminated. Greywacke beds are locally 15 to 25 cm thick but form a minor component of Unit 7. One occurrence of a concordant amphibolite band was noted in a small brook southwest of Caribou Lake. Unit 8 contrasts with Unit 7 by having an increase in graywacke beds that range from 5 to 60 cm in thickness. These beds are graded, with coarse, sharp bases that grade into laminated (2 to 6 mm thick) tops of siltstone and shale. The main foliation in the Davidsville Group is a slaty cleavage in the west, a phyllitic fabric in the centre and a fine grained schistosity in the extreme east, reflecting mimetic recrystallization with proximity to the Middle Ridge Granite. This foliation is axial planar to tight, gently plunging, recumbent folds that are overturned to the northwest in the area between the Southwest Gander River and the GRUB; elsewhere the axial planar fabric is generally steeply dipping. These recumbent folds are interpreted as having developed in response to the tectonic emplacement (thrusting) or the GRUB. This would suggest that faults bounding the GRUB dip to the southeast, having formed during thrusting or reverse fault movement to the northwest. A strain-slip fabric is generally superimposed on the main fabric in the Davidsville Group. The metamorphic grade varies from low greenschist facies in Unit 8 to low amphibolite facies in the easternmost parts of Units 6 and 7. In the latter, biotite, garnet, andalusite and/or cordierite porphyroblasts overprint the foliation.

Units 9, 10 and 11 of the Middle Ridge Granite represent phases based on variations in texture and composition. Unit 9 is mostly equigranular and the two micas are generally equally developed. Feldspar phenocrysts in Unit 10 range from 0.5 to 2 cm in length; the granite is locally glomeroporphyritic. Muscovite generally greatly exceeds biotite in Unit 11 and garnets are common. Minor tourmaline and beryl occur in parts of this unit. Aplite and pegmatite zones within Unit 11 have diffuse boundaries with the host leucogranite. The Gander Lake Granite (Unit 13) is very poorly exposed in this area. It is megacrystic, biotite-rich and homogeneous where exposed. The small plug of granite (Unit 13) which intrudes Unit 7 along Dead Wolf Brook is considered to be an apophysis of the Middle Ridge Granite; garnets were not noted in the plug. A whole-rock Rb-Sr isochron age of 370 ± 15 Ma has been obtained for the Middle Ridge Granite (Bell *et al.*, 1977).

Pyrite and chalcopyrite occur in a 1 m wide shear zone in the small granite plug (Unit 10) on Dead Wolf Brook. NALCO reported pyrite, chalcopyrite, sphalerite and minor galena in volcanic rocks (Unit 5) on the same brook (Potter, 1955). There the mineralization is disseminated in a 30 cm wide felsic host and associated with an aplite dike that cuts ultramafics (Unit 3) south of Dead Wolf Brook.

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