

This preliminary map is made up of the Tinney Hills (NTS 76J) and Overby Medium-grained, moderately to strongly foliated granite (Unit 9)

northeast of Yellowknife, in the District of Mackenzie. Bedrock mapping occupies most of the southeast corner of the map area east of the Ellice River 250,000) of the metamorphosed supracrustal and plutonic rocks, a fringe of the Garnet a common accessory, is almost invariably rimmed by biotite. Sillimanite Proterozoic Goulburn Group cover sequence, and outliers of the cover was cordierite and spinel are also present. Inclusions of mylonitic granulite occur in completed in 1985. The Gollburn Group was mapped previously by Campbell and this body that, elsewhere, is itself mylonitized. The granite is associated with a Cecile (1976). The area is important because a major part is underlain by prominent low in the aeromagnetic anomaly pattern. The preliminary age obtained metamorphosed sedimentary and volcanic rocks of the Yellowknife Supergroup, a is about 50 million years younger than the Proterozoic plutons described above. sequence with known potential for gold and base metal deposits elsewhere in the Slave Province. In fact, a rumber of occurrences of gold-bearing iron formation that occurs along the boundary between the Slave and Churchill Structural

geology characteristic of the Slave Province. the south (Frith, 1981, 1982) and in the Healey Lake (Henderson and Thompson, sample from the locality 12 km ESE of Crazy Bear Lake. 1982; Henderson et al., 1932; James, 1986) and Artillery Lake (Henderson and

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Macfie, 1986) map areas (Fig. 1) is also available.

framework of the area was recognized by Fraser (1964) in the course of reconnaissance mapping of a larger region. A pronounced angular unconformity separates the early Proterozoic clastic and carbonate rocks of the Coulburn Group (Campbell and Cecile, 1976, 1981) from Archean metasedimentary tocks and granite along the western limit of the area napped. These rocks were deformed and metamorphosed (Thompson and Ashton, 1984; Thompson and Frey, 1984) at low grade during an event that produced thrusts and folds in the cover (Tiriul, 1985). These were subsequently, locally, tightly folded and interlayered with basement thrusts (Thompson et al., 1985, 1986) that in some cases may be rooted in reactivated Archean structures. The sedimentology of these rocks has been linked to events in Wopmay Orogen to the west and to a rising source area in the direction of the Thelon Tectonic Zone (Campbell and Cecile, 1981; Hoffman et al. 1984).

Thompson et al. (1985) divided the metamorphosed supracrustal and plutonic rocks east of the main mass of Goulburn Group into the Bathurst and Ellice River Terranes on the basis of geology and geophysics in the south half of the area. Completion of the mapping has shown that the coincidence of parameters on which the terrane boundary was defined does not continue northward (Thompson et al., 1986). This information together with preliminary geochronological results indicates a different lithostructural subdivision of the area is needed.

Supergroup and the other by variably deformed and migmatized granitoid rocks (Fig. 2). The eastern part of the granitoid migmatite association can be further granulites. subdivided along a line marking the western limit of K-feldspar megacrystic carbonate-bearing, and qua tzofeldspathic rocks, mainly of supracrustal origin, is rocks are intercalated with the Yellowknife Supergroup, they are known to be Archean; but the age of the layers and lenses within the granitoid migmatite terrane is less well consumed. The uncertainty is greatest within the eastern part of the granitoid mi natite gneiss terrane. Preliminary geochronological THELON TECTONIC ZONE evidence for Archean plu onism and high grade metamorphism west of the megacrystic granodiorite line whereas, to the east, megacrystic granodiorite, two ther plutonic units, and a mylonitic pelitic gneiss from a granulite domain east of have been tentatively subdivided into a part designated A which is considered to be Archean and/or Proterozoic elements.

and Cecile, 1981; Tirrul, 1985; Grotzinger and Gall, 1986). The variably deformed and migmatized granite, granodiorite, and tonalite of Unit 1A,B are fine- to medium-grained rocks composed essentially of quartz, plagioclase, K-feldspar, biotite and/or hornblende. Textures range from homogeneous granitoid to agnatitic or schlieric migmatite to straight gneiss across tens of kilometres as well as at the outcrop scale. These variations reflect the superposition of one, two, or possibly, three regional metamorphic events and variable strain gradients that transform the rocks, locally, to mylonites. In many outcrops there is a history of crystallization, remelting, recrystallization and deformation, but except for granitic pegmatitic bodies clear-cut intrusive relations are rare. Basic gneiss and migmatite of probable supracrustal origin and hornblendite occur as inclusions; no pelitic or marble inclusions are known. The migmatitic aspect of much of this unit implies mid-crustal P-T conditions but low grade retrogression is wides read, particularly in high strain zones. Contacts are sharp but commonly, covered or tectonized. The mineralogy and textural variations of the migmatitic granitoid complex interpreted as basement to the Yellowknife Supergroup in the Healey Lake area (Henderson et al., 1982) are

presence or absence of metamorphic pyroxene, a basis that is inadequate for definition of rock units. On this map the occurrence of these minerals is indicated by a pyroxene zone boundary (see below). In the southern half of the area, homogeneous granitoid rocks that were lumped with the megacrystic granodiorite on earlier maps are now part of Unit 1A,B because a more rigorous definition of the megacrystic unit (Unit 8) is used here. The change from 1A to 1B occurs along is taken to mark the likely western limit of any occurrence of Proterozoic part the superposition of two or more orogenic events.

Unit 2A,B is a heterogeneous package of mafic gneiss, amphibolite,

metagabbro, pelitic schist/psammite, fine-grained quartzofeldspathic gneiss, rare quartzite, and calc-silicate gneiss/marble that, in part, are of volcanic and volcaniclastic origin. The relative proportions of each rock type vary greatly across the area. Rusty zones, usually pyritic, are typical but garnet-gruneritequartz gossan rocks are not usually present. The rocks may or may not be migmatized. Cross-cutting pink pegmatite is quite common in the eastern part of the area. This unit occurs as long narrow masses near or at the contact between the metasedimentary and granitoid migmatite terranes. In or close to the former, these rocks are considered to be part of the Late Archean Yellowknife Supergroup. Even though the lithologies and lithologic variation remain essentially the same the further eastward into the granitoid migmatite terrane these rocks occur the Supergroup. For this reason, the unit was subdivided into 2A and 2B along the line separate 1A and 1B. This lithologic association and its spatial relation to contact between the metasedimentary and granitoid migmatite terranes is very much like the Archean metavolcanic sequence that separates metasediments from

a presumed basement unit in the Healey Lake map area (Henderson et al., 1982). Southwest of Gordon Bay a very tough, white-weathering fine grained to aphanitic felsite (Unit 3) of uncertain origin forms layers in knotted schist of the Yellowknife Supergroup. At one outcrop of the northernmost occurrence, the rock has ghostly lenticles, suggestive of ignimbritic texture. Feathery, colourless to pale green amphiboles a few millimetres long occur on the foliation where it is developed or on fracture surfaces in more massive rocks. Pyrite cubes are usually present. The larger, southernmost body is aplitic and has a small dyke offshoot that cuts across bedding in the metasediment.

A felsic dyke intrudes the cordierite knotted schists on the small island near the tip of the peninsula west of Gordon Bay. The dyke contains clots of grey to black phyllites (graphitic?) several metres from the dyke also contain

Aside from the fact that the migmatites are very extensive, the metasedimentary rocks of the Yellowknife Supergroup (Unit 4) in the map area are typical of the lithologies and the low pressure metamorphism characteristic of the Slave Province (Thompson, 1978). Sub-cordierite/andalusite grade rocks occur adjacent to the unconformity west of Gordon Bay and in the southwest corner of the area. Grey to brown-weathering knotted schists containing cordierite andalusite, and/or staurolite grade up into sillimanite schist and gneiss. The most extensive unit in the western half of the map area is a biotite-rich, aluminosilicate-bearing migmatite. The migmatite isograd marks the appearance of more than 5-10 per cent leucosome. Using the terminology of Brown (1973 there is a transition up grade of the migmatite isograd from metatexite in which layering is still preserved with sillimanite biotite melanosomes and leucosome concentrated in pelitic layers, to irregular patches of diatexite, a homogeneous rock with wisps of melanosome scattered through a granitoid matrix. While biotite and sillimanite are almost upiquitous in the migmatites, cordierite and garnet are irregularly distributed. In some areas they are mutually exclusive and where they

occur together garnet is usually rimmed by cordierite or plagioclase. The metamorphosed hornblende-biotite tonalites and granodiorites of Unit 5 are medium-grained, variably foliated, relatively mafic rocks that weather dark gray to reddish-gray. Locally, migmatization has occurred. Where present, inclusions are usually mafic granitoid or amphibolite. Cross-cutting contact mica granite and pegmatite and east of Gordon Bay metasedimentary inclusions occur near a contact with Yellowknife Supergroup metasediments. An interesting aspect of Unit 5 is the tendency for it to occur near or at the transition from sillimanite to migmatite zones and along the contact between the metasedimentary and granitoid migmatite terranes. Differentiating weakly migmatized Unit 5 from the more homogeneous parts of Unit 1 is difficult, particularly if the outcrop is isolated in a sea of metasedimentary migmatite. For the purpose of this compilation, if migmatization is minor, the overall aspect of the outcrop is homogeneous, and there are no large masses of Unit 1 nearby, the outcrop is fact, Unit 5 but at present the extent to which that is true has not been

White weathering, relatively unfoliated masses of fine- to medium-grained thick sills to plutons several kilometres across are associated with white pegmatite, sillimanite zone metasediments, and adjacent migmatites in the metasedimentary migmatite terrane. In addition to quartz, plagioclase, potassium feldspar, muscovite, and biotite, accessory cordierite, garnet and/or sillimanite are common. Contacts of the larger plutons are locally diffuse with a transition from metasediments laced with leucogranite to leucogranite full of sillimanite schist or migmatite inclusions. These intrusive granites have weakly to moderate foliation that is approximately concordant with the regional foliation, even where the foliation is only gently dipping, east of Gambit Lake. Regional foliation wraps around plutons or boudinaged sills in many localities. They intruded to their present level during the main Archean phase of deformation and metamorphism. Unit 6a is a variation of the unit that has lower muscovite content and fewer metasedimentary inclusions and related pegmatites.

porphyritic and homogeneous clinopyroxene granodiorite that occurs along the line marking the western limit of megacrystic K-feldspar granodiorite. Hornblende rims on clinopyroxene and late biotite show it has been metamorphosed. Mafic gneiss and migmatite inclusions are common toward the contacts with Unit 1. At one point a decrease in grain size toward the eastern contact indicates this pluton may be intrusive into the migmatitic country rock. K-feldspar phenocrysts are present but not as prominent as they are in Unit 8. Preliminary zircon age data indicate a Proterozoic age of about 1950 Ma for this unit and for Unit 8 (O. van Breemen, pers. comm. 1986).

Unit 7 is a lense-shaped, relatively weakly foliated, unmigmatized,

Megacrystic K-feldspar-biotite granodiorite (Unit 8) is a distinctive massive to well-foliated, pinkish-gray weathering rock with characteristic phenocrysts of pink K-feldspar 0.5-10 cm long. Where it is strongly foliated, this unit is a spectacular pink and gray weathering rock with an augen texture made up of dark 10 cm long. Several small bodies occur like strings of beads along the major shear zones which cut through the eastern granitoid migmatite terrane. Contact relations with Unit 1B are not definitive but there is no evidence to suggest the plutons were subjected to the granulite facies metamorphism that altered adjacent rock units. The megacrystic granodiorite has been affected by a later metamorphism and related deformation that produced new biotite and epidote. Scattered outcrops of this distinctive rock occur near Ragged Lake. In the map area adjacent to the south, Frith (1982) described a large batholith of similar composition and texture. James (1985) and Henderson and MacFie (1985) have mapped a similar lithology 200 and 300 km farther south in the Thelon Tectonic

Metamorphosed iron formation recognized in the map area is made up mainly of garnet, quartz, grunerite, with variable amounts of hornblende, plagioclase magnetite, pyrrotite, pyrite, and traces of chalcopyrite. Usually marked by a gossan these rocks take the form of boudins or layers in the predominantly metasedimentary parts of the Yellowknife Supergroup. Commonly, thin layers of The following notes are derived, in part, from previously published reports amphibolite and/or fine-grained quartzofeldspathic rocks are associated. Assay (Thompson and Ashton, 1984; Thompson and Frey, 1985; Thompson et al., 1985, results from ten silicate-rich samples range from 5 ppb Au in 3 samples, 10-65 1986). Relatively recent work on the related geology in the area immediately to ppb in 5 samples to 415 ppb in a sample from west of Gordon Bay and 420 pbb in a

The malachite occurrence in Archean rocks is described in the section on Unit 3. In the Goulburn Group, the occurrence at Kenyon Lake is a sulphide bleb in argillite-carbonate rhythmites and the others are associated with late faults. The presence of Archean and Proterozoic elements in the geological pyrite. One example east of Gordon Bay is associated with a fault scarp.

The gossans noted on the map are rusty supracrustal rocks relatively rich in REGIONAL METAMORPHISM AND STRUCTURAL GEOLOGY

These aspects of the geology of the map area have been dealt with in a preliminary way in considerable detail in earlier reports. Studies of the metamorphism (P.H.T.) and geochronology (O.v.B.) are in progress and N. Culshaw is completing a report on the structural geology. In view of the limited space, only a few general comments will be made here. Right across the map area it is possible to divide the metamorphic history into an early high grade event and a later lower grade event. In the western parts of the granitoid migmatite terrane and in the metasedimentary migmatite terrane these events have been shown to be Late Archean and early Proterozoic espectively. This relationship was tentatively extrapolated across to the eastern edge of the area while recognizing that the high grade rocks east of the megacrystic granodiorite line (Fig. 2) could be older and/or younger than the Late Archean event. van Breemen's data indicates that granulite facies assemblages

east of Split Rock Lake, at least, are Proterozoic. The distribution of the granulite facies rocks is outlined by the pyroxene zone boundary. The term isograd has been avoided because bulk composition is not constant across the transition at many localities. Furthermore, the boundary is East of the relatively weakly deformed and very low metamorphic grade based, for the most part on field observations and for much of its length it Goulburn Group, the area can be divided into two main lithologic associations or terranes, one dominated by migmatized metasediments of the Yellowknife corresponds to a lithologic contact or shear zone. In the absence of comprehensive petrography, it is not known if the boundary, where properly controlled, is a

granodiorite and field observations of granulite facies rocks. The granitoid migmatite complex is texturally and compositionally similar on both sides of the line but to the west metamorphosed basic dykes and sills are much more common been differentiated despite the widespread migmatization and complex than they are to the east. A heterogeneous lithologic package of mafic, pelitic, deformation of these rocks. More specifically, it has been shown that gold-bearing meta-iron formation of the Lupin type is not restricted to the low grade parts of prominent near or at the contact between the metasedimentary migmatite and the Yellowknife Supergroup. These rocks occur at all metamorphic grades and the granitoid migmatite terranes and as lenses or layers within the latter. Where these gross stratigraphy with which they appear to be associated can be traced from Gordon Bay well into the migmatitic metasedimentary terrane.

The change from irregular and west- to northwest-oriented structures and irregular lithologic patterns in the Slave Province to the linear lithologic pattern with a pronounced N to NNE preferred orientation typical of the Thelon Tectonic Split Rock Lake yielded Proterozoic ages. Given this data and the possibility that

Zone is one of the original criteria for the Thelon Front, the eastern boundary of similar lithologic packages formed at different times in the map area, the granitoid migmatite association (Unit 1) and the heterogeneous supracrustal package (Unit 2) the Slave Province as defined by Wright (1967). In the Healey Lake area, the change is considered to be Archean (Henderson and Thompson, 1981). Results of change is considered to be Archean (Henderson and Thompson, 1981). Results of have been tentatively subdivided into a part designated A which is considered to be Archean with the degree of Proterozoic reactivition ranging from zero to very interest and a part designated B which may be considered to be a geochronological work up to now are consistent with the geological evidence for an Archean age for this change in the current map area and for the continuity of intense and a part designated B which may be composed of Archean, reworked

Archean rocks across the western boundary of the TTZ. The concordance of the tectonic history in the two areas supports the idea that a major north to northnortheast straight belt formed along the eastern edge of the Slave province at the

On the other hand, as noted above, in the eastern part of the granitoid The legend accompanying this map has a hybrid character with respect to time relations. Known Proterozoic rocks are placed over known Archean rocks but the detailed relations between units have yet to be determined. Rock units of the Goulburn deformation and metamorphism, is under study. Evidently, however, the Proterozoic orogenic events recognized in the Thelon Tectonic Zone (major crustal overthrusting, transcurrent shear zones, plutonic magmatism, high grade metamorphism) 200 km farther south (Henderson et al., 1982; Thompson and Henderson abstract, 1983; James, 1986; van Breemen et al., abstract, 1986) have also occurred in the northern segment of the zone. Whether the rocks presently exposed in the Thelon Tectonic Zone are new crust formed in the Proterozoic or Archean rocks subjected to variable degrees of Proterozoic reworking including remelting or a mixture of the two remains one of the major questions yet to be answered. If the supracrustal rocks in eastern part of the map area are Proterozoic the mineral exploration approach required may be different from those applied successfully in the Slave Province.

In the Tinney Hills-Overby Lake map area, the western boundary of the metasedimentary migmatites and the eastern granitoid migmatite terrane which corresponds with a marked change in the structure of the aeromagnetic anomaly map (Fig. 2). These changes, however, are not unique to the Thelon Front, imilar correspondence with quite a different orientation occurs 40 km farther Unit 1A,B includes the "pink" gneiss/migmatite/granitoid and pyroxene gneiss/migmatite/granitoid units described in earlier reports (Thompson et al., 1986). These lithologically and texturally similar units were differentiated by the either, for N to NNE oriented structures occur up to 35 km west of the preferred boundary in southern part of the area but these features die out to the NNE where they encounter structural trends bending around into the Thelon Tectonic Zone orientation. Although it is relatively easy to draw a western limit to the Thelon Tectonic Zone at 1:1 000 000 scale, at 1:250 000 the boundary is a composite feature with a gradational nature and the relative importance of geological and the megacrystic unit (Ont 3) is used here. The change from 1A to 1B occurs along the fairly arbitrary line that subdivides the granitoid migmatite terrane (Fig. 2) and is taken to mark the likely western limit of any occurrence of Protegozic.

Frith, 1982; Henderson and Macfie, 1985). These aspects of the boundary reflect in

1973: The definition of metatexis, diatexis, and migmatite; Proceedings of the Geological Association, v. 84, p. 371-382.

Campbell, F.H.A. and Cecile, M.P.
1976: Geology of the Kilohigok Basin; Geological Survey of Canada, Open
File Map, 332, 1:500 000 scale. 1981: Evolution of the early Proterozoic Kilohigok Basin, Bathurst Inlet-Victoria Island, Northwest Territories; in Proterozoic Basins of Canada, ed. F.H.A. Campbell; Geological Survey of Canada, Paper 81-10, p. 103-131.

1976: Stratigraphy and depositional history of the Upper Goulburn Group, Kilohigok Basin, Bathurst Inlet, N.W.T.; Unpublished PhO thesis, Carleton University, Ottawa.

1964: Geological notes on northeastern District of Mackenzie, Northwest Territories (Report and Map 45-1963); Geological Survey of Canada, Paper 63-40, 16 p.

1981: Geology of the Nose Lake-Beechey Lake Map Areas, District of Mackenzie; Geological Survey of Canada, Open File 785. 1982: Geology of the Beechey Lake-Duggan Lake Map Areas, District of Mackenzie; Geological Survey of Canada, Open File 851.

Geological Survey of Canada
1982: Magnetic anomaly map Thelon River, (1:1 000 000); Geological Survey of Canada, Map NQ 12-13-14-AM. Grotzinger, J.P. and Gall, Q.
1986: Preliminary investigations of Early Proterozoic Western River and

Burnside River Formations: evidence for foredeep origin of Kilohigok Basin, District of Mackenzie; in Current Research, Part A, Geological Survey of Canada, Paper 86-1A, p. 95-106. Henderson, J.B. and Thompson P.H.

1981: The Healey Lake map area and the enigmatic Thelon Front, District of Mackenzie; in Current Research, Part A, Geological Survey of Canada, Paper 81-1A, p. 175-180.

1982: Geology of Healey Lake map area (1:125 000 scale map and marginal notes); Geological Survey of Canada, Open File 860. Henderson, J.B., Thompson, P.H. and James, D.T.

1982: The Healey Lake map area and the Thelon Front problem District of Mackenzie; in Current Research, Part A, Geological Survey of Canada, Paper 82-1A, p. 191-195.

Henderson, J.B. and Macfie, R.J.

1986: Artillery Lake map area, District of Mackenzie: a transect across the Thelon Front; in Current Research, Part A, Geological Survey of Canada Paper, 86-TA, p. 411-416.

Hoffman, P.F., Tirrul, R., Grotzinger, J.P., Lucas, S.B. and Eriksson, K.A.

1984: The externides of Wopmay Orogen, Takijuq Lake and Kikerk Lake map areas, District of Mackenzie; in Current Research, Part A, Geological Survey of Canada, Paper 84-1A, p. 383-395.

1986: Geology of the Moraine Lake area, District of Mackenzie: a transect across the Thelon Front; in Current Research, Part A, Geological Survey of Canada, Paper 86-1A, p. 411-416.

1982: Proposals for time-classification and correlation of Precambrian

Archean regional metamorphism in the Slave Province - A new perspective on some old rocks; in Metamorphism of the Canadian Shield, ed. J.A. Fraser and W.W. Heywood; Geological Survey of Canada, Paper 78-10, p. 85-102.

Preliminary report on the geology of the Tinney, Hills-Overby Lake 1/2) map area, District of Mackenzie: a look at the Thelon Tector Zone northeast of the Bathurst Fault; in Current Research, Part Geological Survey of Canada, Paper 84-1A, p. 415-423. 1985: Tinney Hills map area, District of Mackenzie; Geological Survey of Canada, Open File 1155.

Thompson, P.H. and Frey, M.

1984: Illite "crystallinity" in the Western River Formation and its significance regarding the regional metamorphism of the early Proterozoic Goulburn Group, District of Mackenzie; in Current Research, Part A, Geological Survey of Canada, Paper 84-TA, p. 409-414.

Thompson, P.H. and Henderson, J.B. (abstract) Polymetamorphism in the Healey Lake map area - implications for the Thelon Tectonic Zone; in Current Activities Forum, 1983, Program with Abstracts, Geological Survey of Canada, Paper 83-8, p.

: Geology across the western boundary of the Thelon Tectonic Zone in the Tinney Hills-Overby Lake (west half) map area, District of Mackenzie; in Current Research, Part A, Geological Survey of Canada, Paper 85-1A, p. 555-572.

1985: Nappes in the Kilohigok Basin and their relation to the Thelon Tectonic Zone, District of Mackenzie; in Current Research, Part A Geological Survey of Canada, Paper 85-1A, p. 407-420.

Mackenzie and Keewatin (Operations Keewatin, Baker, Thelon); Geological Survey of Canada, Memoir 350.

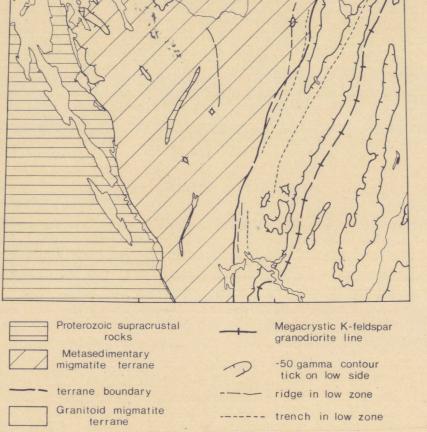


Figure 2: Distribution of metasedimentary migmatite and granitoid migmatite terranes in the map area with respect to -50 gamma contour on the 1:1,000,000 aeromagnetic map of the area (Geological Survey of eastern granitoid migmatite terrane marks the western limit of occurrences of megacrystic K-feldspar granodiorite and of field observations of granulite facies rocks. The preferred position for the

Thelon Front is along the metasedimentary/granitoid migmatite

contact where it trends northnortheast to north.

GEOLOGY TINNEY HILLS-OVERBY LAKE (West Half) DISTRICT OF MACKENZIE NORTHWEST TERRITORIES Scale 1:125 000

Kilometres 2 0 2 4 6 8 10 Kilometres Universal Transverse Mercator Projection © Crown Copyrights reserved

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MAP AREA

MAP AREA

200 km

Diabase dykes and sills. a) metadiabase, probably older than Goulburn

Undifferentiated Helikian sedimentary and volcanic rocks.

unconformity

unconformity

angular uconformity

Brown Sound Formation: ferruginous, calcareous mudstone; arkose;

bedded mudstone-carbonate rhythmites.

Amagok Formation: white to mauve coarse-grained arkose; minor conglomerate.

Kuuvik Formation: carbonate-mudstone rhythmites (> 50% carbonate);

thick-bedded mudstone and carbonate; stromatolitic and clastic

Peacock Hills Formation: red and green mudstone rhythmites; thin-

Quadyuk Formation: stromatolitic carbonate, clastic carbonate, minor mudstone.

11 Burnside River Formation: pink, white, red quartzite; red siltstone.

Western River Formation: quartzite, quartz pebble conglomerate, siltstone, stromatolitic carbonate, carbonate-mudstone rhythmite, argillite.

quartz, and two feldspars.

Mafic gneiss/migmatite inclusions locally prominent.

angular unconformity

(relation to underlying Archean rocks is clearly defined but there is no direct contact between Goulburn Group and Proterozoic plutonic rocks).

Garnet granite: white to pinkish grey-weathering, massive to strongly foliated or lineated, fine- to medium-grained, biotite-garnet granite.
Sillimanite, cordierite and spinel also present. Inclusions of high grade

metamorphic rocks (Unit 2B) and mylonites. 9a Monzodioritic phase.

Megacrystic K-feldspar-biotite granodiorite: gray to pink weathering feldspar (.5-10cm) occur in fine- to medium-grained matrix of biotite,

Clinopyroxene granodiorite: gray-weathering massive to weakly foliated,

fine- to medium-grained; clinopyroxene rimmed by hornblende is typical.

Two mica granite-granodiorite: white-weathering; massive to well

present. 6a; muscovite less prominent or absent, few inclusions.

migmatitic; pink feldspar pegmatites may be present.

metagabbro bodies occur in this unit.

Geological contact; defined, approximate, inferred.

· Fault down dropped side indicated.

Geology: K. Ashton 1983

Compilation: P.H. Thompson 1986

Drafting assistance P. Manojlovic 1986

Isograds: cordierite-andalusite; sillimanite; migmatite (> 5-10% leucosome).

Metamorphosed iron-formation; quartz-grunerite-garnet gossan rock.

Pyroxene zone boundary; coincides with lithologic and tectonic

R. Buchanan 1984, 1985 N. Culshaw 1984, 1985 P. Manojlovic 1985 D. Thompson 1984, 1985 P.H. Thompson 1983, 1984, 1985

F. Campbell 1974, 1975
M. Cecile 1974, 1975
R. Tirrul 1984
Goulburn Group west of main unconformity

depending on lithology); vertical inclined.

foliated, medium-grained, muscovite + biotite-bearing; locally rich in metasedimentary inclusions (Unit 4); white muscovite-feldspar pegmatites are commonly associated; cordierite, garnet, and sillimanite may be

Tonalite-granodiorite: dark gray or reddish-weathering, fine- to mediumgrained, massive to well-foliated, biotite-hornblende abundant; locally

phyllites; metagreywacke; b) knotted schist and metagreywacke with

cordierite, andalusite and/or staurolite; c) sillimanite schist, gneiss; d)

Felsite/aplite: white-weathering, very fine-grained to fine-grained layers in Unit 4; feldspar phenocrysts (?), pyrite and Fe-rich amphibole present

but not abundant; welded texture at one locality; inferred to be metatuff.

Heterogeneous mafic and pelitic gneiss: mainly fine- to medium-grained

predominate locally; fine-grained quartzofeldspathic gneiss, calsilicate gneiss/marble, rusty zones, metagabbro and/or layers of Unit 1A,B make

up a significant part of this unit at many localities. Quartzite is rare.

Migmatization and cross-cutting pink pegmatites are typical of some areas. Clino- and orthopyroxene occur in the eastern part of the area. A supracrustal origin is inferred for many of these rocks. A = Archean

Yellowknife Supergroup (degree of Proterozoic reworking ranges from zero to very intense) B = unassigned (Archean, reworked Archean and Proterozoic elements possible.

Variably deformed and/or migmatized granite to tonalite: a) massive to

foliated; b) migmatitic; c) gneissic (straight layering). Biotite and

hornblende are abundant; clinopyroxene and orthopyroxene occur in

eastern parts of the unit. Mafic gneiss inclusions locally abundant A = Archean (degree of Proterozoic reworking ranges from zero to very

intense). B = unassigned (Archean, reworked Archean, and Proterozoic

Principal planar fabric (foliation, schistosity or gneissosity (layering)

Thrusts in Goulburn Group north of Kenyon Lake after Tirrul (1985)

amphibolite and hornblende gneiss but pelitic gneiss and migmatite

18 Ellice Formation; quartz pebble conglomerate, quartzite.

Tinney Cove Formation; arkose, polymictic conglomerate.

GOULBURN GROUP

siltstone; thin vesicular basalt.