

LEGEND

weathering: felsic to intermediate composition: lapilli ash tuff (Apfb)

Intermediate to mafic composition

Lapilli ash tuff to bedded tuff

Silicate and sulphide-altered iron formation

minor conglomerate; white to tan weathering

numerous gabbroic dykes and sills

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SNARE FORMATION: Mafic volcanic rocks

intrusions possibly part of Providence Formation

erflow iron formation and pyrite-rich mudstone

Undifferentiated volcaniclastic rocks, undifferentiated amphibolite, syn-volcanic

Undifferentiated plagioclase-actinolite-hornblende-epidote to plagioclase-hornblende

volcanic rocks, schist and gneiss, including pillowed flows (Asnp), and massive flows

green to black weathering; undifferentiated amphibolite marginal to Obstruction Suite

ifferentiated tremolite-talc±cummingtonite schist, including massive and pillowed

(Asym), minor flow top breccias; subvolcanic gabbro to diorite dykes and sills; dark

CREDIT FORMATION: Heterogeneous komatiitic basalt-associated sequence

NORTH SHORE FORMATION: Orthoquartzite-associated sedimentary rocks

NEWBIGGING FORMATION: Lower felsic to intermediate volcanic rocks

hoquartzite to quartz arenite, lesser wacke and interbedded wacke-mudstone,

Quartz-feldspar-biotite ± hornblende schist, monomictic quartz-phyric lapilli ash tuff

(Anb), massive flows, fine-grained layered tuff; white to buff weathering; intruded by

hin layered flows, interlayered thin flows and sedimentary layers

quartz-feldspar intrusions, felsic garnet-sillimanite gneiss; white to light green

TEDA=-		Fault trace
TEROZO	DIC Undifferentiated Proterozoic diabase dykes; interpreted between outcrops using	
Pd	aeromagnetic data; north-northwest-striking - MacKenzie swarm; east-northeast-striking - Malley or MacKay swarm	Fault trace, predominantly sinistral strike-slip movement
HEAN		
	o Post-Deformation Plutonic Units (Unfoliated to Weakly-foliated)	Fault trace, relatively early, contact parallel
ĀY	YAMBA SUITE: Biotite monzogranite to granodiorite, minor syenogranite, common pegmatite (Ayp), unfoliated to weakly foliated; pink weathering	Shear zone (zone of distinctly stronger foliation development, pure shear or simple shear)
Aym	Intrusive margin of large batholith; panels of Ay intruding panels of strongly deformed tonalite, amphibolite and granite	Anticlinal axial trace (1st, 2nd or 3rd generation)
<u> </u>	torante, amprisone ara grante	Synclinal axial trace (1st, 2nd or 3rd generation)
Ат	TERMINUS SUITE: Biotite-muscovite monzogranite and pegmatite, common accessory phases include garnet and tourmaline, unfoliated; cream to pink weathering	Metamorphic isograds where known, ornament on high-grade side (based on field observations) first appearance of biotite
_	Biotite monzogranite, K-feldspar megacrystic to porphyritic, weakly to moderately	first appearance of cordierite and/or andalusite
Арх	foliated, foliation better developed on west margin; pink to brown weathering	first appearance of sillimanite
Syn- t	to Late Deformation Plutonic Units (Foliated, not strongly recrystallized)	transition to migmatite (first distinct appearance of leucosome, second cordierite common in leucosome)
Apa	Syenogranite intrusion with wide aplite marginal phase; poorly exposed	Outlines of outcrops visited during mapping
		Limit of mapping
Ав	BEAUPARLANT SUITE: Biotite ± hornblende tonalite to monzogranite, moderately to strongly foliated, weakly recrystallized; numerous gabbro dykes and xenoliths; late	Bedding, top known from cross-bedding, graded bedding, erosional features (inclined, overturned)
	monzogranite to syenogranite dykes and intrusions; white to grey or pink weathering	Bedding, top unknown (inclined, dip unknown)
Pre- to	o Syn- Deformation Plutonic Units (Moderately to Strongly Foliated, Recrystallized) MAFIC TO ULTRAMAFIC INTRUSIONS	Pillow lava, top known from pillow shapes, pillow shelves (inclined, overturned, dip unknown)
mg	Diorite to gabbro; multiple generations; within Asn, some may be coarse-grained flows	Pillow lava, top unknown (dip unknown)
mu	High-Mg gabbro, tremolite and cummingtonite bearing, in part syn-volcanic to Ac	Volcanic flow contact
		Igneous layering
\mp	Peridotite, strongly serpentinized	Cleavage, schistosity, gneissosity, layering of unknown origin; generations based on cross-cutting relationships at each outcrop (S _{main} - dominant fabric defined by peak metamorphic minerals-axial planar to F ₂ folds, post-S _{main} generation, early or unknown generation)
Āo	OBSTRUCTION SUITE: Biotite-hornblende monzogranite to syenogranite, moderately to strongly foliated, strongly recrystallized; pink to red weathering	Mylonitic foliation (associated with dextral, sinistral, unknown displacement)
A st	STARVATION SUITE: Biotite tonalite, moderately to strongly foliated, strongly recrystallized; numerous gabbro dykes and xenoliths; late monzogranite to syenogranite dykes and intrusions; white to grey weathering	Lineation, mineral stretching (associated with S _{main} , S _{main+1} foliation, mylonitic foliation)
Gneis	esic Units	Lineation, intersection (S _{main} -bedding intersection, S _{main} -S _{main+1} intersection)
igm	Granite migmatite; interlayered, foliated and gneissic biotitefigarnet monzogranite, intruded by monzogranite to syenogranite and pegmatite dykes, white weathering	Minor fold axis, fold generations interpreted on a regional basis S-asymmetry (1st, 2nd, 3rd, unknown generation) Z-asymmetry (1st, 2nd, 3rd, unknown generation) M or U symmetry (1st, 2nd, 3rd, 4th, unknown generation)
	•	Z-asymmetry (1st, 2nd, 3rd, unknown generation)
Āgt	Tonalite gneiss; compositionally banded gneiss with more uniform tonalite leucosome, amphibolite xenoliths and intrusions, late monzogranite to syenogranite intrusions	M or U symmetry (1st, 2nd, 3rd, 4th, unknown generation)
		Minor fold axial plane (associated with 1st, 2nd, 3rd or unknown generation minor fold)
Agg	Granitic gneiss; compositionally banded monzogranite to tonalite leucosome and biotite-hornblende melanosome, deformed granite layers, amphibolite xenoliths and intrusions, late monzogranite to syenogranite dykes and intrusions	Outcrop-scale fault or shear zone (dextral, sinistral, unknown separation)
Supre	acrustal Units	Outcrop-scale dyke or dyke set
Jupie	SHERPA FORMATION: Polymictic conglomerate-associated sedimentary sequence	Outcrop-scale vein or vein set
Asc	Polymictic conglomerate, interbedded conglomerate and sandstone	Mineral occurrences Gossan, gold, massive sulphide
Asx	Cross-bedded sandstone, interbedded sandstone and minor conglomerate	U-Pb date in Ma (z) - analysis on zircon (m) - analysis on monazite
Ass	Massive, medium-grained sandstone, interbedded sandstone and mudstone	Geochemistry sample Volcanic or mafic intrusive sample
		Mafic to ultramafic volcanic or intrusive sample, composition with
	ITCHEN FORMATION: Greywacke, siltstone, mudstone with no intercalated iron fomation	evidence for possible crustal contamination
Αı	Interlayered sandstone to mudstone, (A is) sandstone dominanted, thickly bedded; (A ig) paragneiss, migmatite, sillimanite-biotite-muscovite \pm garnet \pm cordierite, wholly or	

Table 1. Known age relationships between supracrustal rocks and gneissic and plutonic rocks in the Winter Lake belt and possible correlative units in the central Slave Province. Supracrustal Rocks Gneissic and Plutonic Rocks Yamba Suite (Ay (Yamba Suite - ca. 2582 Ma 1) ______ Terminus Suite (A⊤) Contwoyto Suite - ca. 2589 Ma 1) Sherpa Formation (As) (<2689-2548 Ma 2) (Keskarrah Formation - <2605 Ma 3) (Jackson Lake Formation - <2605±6 3) Beauparlant Suite (AB) ncession Suite - ca. 2608 Ma 1) Providence Formation (AP) (< 2625 Ma 4) ______ Indin Formation (A) (Yellowknife Supergroup turbidites - ca. 2670 - <2612 5,6) Obstruction Suite (Ao) (2645±1.6 Ma 7) _____ Starvation Suite (AsT) ?? (Olga Suite - ca 2650 Ma 1) ------Snare Formation (ASN) (Chan Formation - > 2722 Ma 3) Courageous Lake basalts- >2729 Ma 8) -----Credit Formation (Ac) (unknown age) ------Starvation Suite (AsT) ?? (Sleepy Dragon Complex granitoid gneiss and foliated tonalite ca. 2936-2819 Ma 9,10,11) North Shore Formation (ANS) (<3134 Ma 2) (Dwyer Formation quartzite - <2923 Ma 3) (Patterson Lake Formation - <2943 Ma 11) -----lewbigging (W margin - 3305±2 Ma 2) Formation (AN) (E margin - 3118+11/-8 Ma 2) onalite Gneiss (Agt) Granite Gneiss (Agg) (2667+7/-6 Ma 7) (Jolly Lake Complex gneiss crystallization age - 3325±8 Ma metamorphic zircons - 2723±3 Ma 11 1 (van Breemen et al., 1990; van Breemen et al., 1992), 2 (Villeneuve and van Breemen, 1994), 3 (Isachsen and Bowring, 1994), 4 (Mike Villeneuve (GSC), personal communication, 1994), 5 (Pehrsson, 1998), 6 summarized in (Isachsen and Bowring, 1994), 7 (Villeneuve et al., 1997), 8 (Villeneuve, 1993), 9 (Henderson et al., 1987), 10 (Lambert and van Breemen, 1991), 11 (Bleeker et al., in press)

based on their similar lithological character, rock associations and tectonostratigraphic position. Despite some uncertainty regarding their age, these volcanic rocks are distinctly older than the more common mafic to intermediate volcanic rocks in the Slave Province that were erupted generally between ca. 2.72 and 2.66 Ga (Isachsen and Bowring, 1994). The Newbigging Formation thus represents a distinctive group of old supracrustal rocks separate from the structurally overlying volcanic and sedimentary rocks.

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of similar thick units of predominantly pillowed, mafic volcanic rocks range from > 2722 ± 2 Ma for the Chan Formation volcanic sills, whereas some other gabbro intrusions cutting ca. 2.85 Ga Yamba Suite rocks must be significantly

INTRODUCTION The Winter Lake supracrustal belt is located in the central Slave Province (Winter Lake sheet - NTS 86A - east half), approximately 250 km north-northeast of Yellowknife, Northwest Territories. The purpose of the project was to condu 1:50 000 mapping to better define the supracrustal rock assemblages, the deformation history and the geological context of mineral occurrences found within the belt. The project is one component intended to complete mapping in proad north-south corridor between Yellowknife and the Coronation Gulf as part of the Slave NATMAP project (King, 1992). The four 1:50 000 maps (Open File 3676, Sheets 1 to 4) described in these notes connect maps of the supracrustal rocks in the eastern Point Lake area to the north (Bostock, 1980; King et al., 1980; Henderson, 1988; King and volcaniclastic units. The volcaniclastic rocks include lapilli ash tuff commonly containing 1-2 cm disk-shaped fragments Helmstaedt. 1989) with the northern extension of the Yellowknife domain in the Squalus Lake area to the south (Stubley rimmed or containing fine-grained sillimanite. At higher metamorphic grades this unit forms a garnet ± sillimanite. and Irwin, 1992). The formation and suite names proposed in these notes are based on nearby, formally-recognized quartz-feldspar gneiss. geographic names of lakes and rivers where possible, and otherwise, on informal lake names used during fieldwork. The field area was previously mapped by Fraser (1969) at the 1:250 000 scale and Rice et al. (1990) produced a supracrustal stratigraphy than the older felsic rocks, and it lacks the cross-cutting gabbro intrusions that are so common ca. 1:50 000 scale diagram and description of the late sedimentary sequence (Sherpa Formation). Mapping during the in the Newbigging Formation. Zircons from a sample of aphanitic felsic volcanic rock, interpreted to be an extrusive Beauparlant Suite (AB) present project concentrated on the Archean supracrustal rocks of the Winter Lake belt and their relationship to the flow, from south of Lake Providence (Sheet 4) suggest a poorly-defined crystallization age of < 2625 Ma (M. Villeneuve surrounding granitoid and gneiss terrains. A concurrent 1:250 000 scale regional bedrock mapping program in the (GSC), personal communication, 1994). Similar, relatively young felsic volcanic units have recently been identified Winter Lake - Lac de Gras area by Thompson and others (Thompson, 1992; Thompson et al., 1993; Thompson and elsewhere in the Slave Province. These include the 2616±3 Ma Ares rhyolite from the central part of the High Lake belt Kerswill, 1994; Thompson et al., 1995) encompassed both the Winter Lake belt and the (Henderson et al., 1995) and the 2612±1 Ma felsic tuff from Wheeler Lake area (Isachsen and Bowring, 1994), both of Courageous Lake belt to the east, as well as the intervening gneissic and granitoid units. The surficial geology of the which are found interlayered with turbidite sedimentary rocks. These young sequences may represent extrusive equivarea was mapped by Kerr et al. (1994). U-Pb dating of igneous and sedimentary rocks was undertaken by Mike Ville-

ROCK UNITS Supracrustal Units The Winter Lake belt is a narrow supracrustal belt that strikes approximately north-south. It has a broadly synformal geometry with similar rock types repeated on opposite margins of the belt and sedimentary rocks in the centre. The

supracrustal rocks belong to the Yellowknife Supergroup, defined by Henderson (1970) to include all the Archean supracrustal rocks in the Slave Province. At that time, supracrustal rocks of Archean age were believed to predominantly consist of volcanic and turbidite sequences formed between ca. 2,7-2,6 Ga. The supracrustal rocks in the Winter Lake area are subdivided into three major sequences (Hrabi et al., 1993; Hrabi et al., 1994), bound by major nconformities. No formal stratigraphic nomenclature has been established in the Slave Province to describe these important differences in the supracrustal rocks. Informal subdivisions of the Yellowknife Supergroup have been used in the past, using descriptive names such as Volcanic-Turbidite Series (VTS), pre-VTS and post-VTS (Padgham, 1992) or Yellowknife Supergroup, pre-Yellowknife and post-Yellowknife (Hrabi et al., 1993), although Bleeker et al. (in press) has recently proposed to formally name the oldest supracrustal rocks the Central Slave Cover Group. In the Winter Lake belt, the oldest sequence is represented by ca. 3 Ga felsic to intermediate volcanic rocks and a veneer of mature sedimentary rocks and iron formation. The relationship of these older supracrustal rocks to the surrounding gneissic units is poorly understood. The second sequence includes both volcanic rocks and turbiditic sedimentary rocks that, in general, closely approximate the range of rock types in the original definition of the Yellowknife Supergroup. This sequence comprises a wide range of rock types with ages of deposition spanning ca. 100 m.y. The youngest sequence is composed of coarse conglomerates and associated sedimentary rocks that unconformably overlie the other Archean supracrustal rocks.

DESCRIPTIVE NOTES

Basement-aged Volcanic Sequence - Newbigging Formation (An) Felsic to intermediate volcanic rocks are found at the tectonostratigraphic base of the belt on both east and west

margins where they form map units with maximum outcrop widths of 2.3 km and 1.5 km, respectively. Fraser (1969) recognized these as supracrustal rocks but included them with the more common mafic volcanic and turbiditic sedimentary rocks in the belt. The felsic volcanic unit (Unit 6) of Thompson and Kerswill (1994) includes both parts of this formation and the younger volcanic rocks of the Providence Formation. Although the few facing directions identified in this unit are towards the centre of the belt, the small number of these indicators combined with the presence of minor folds in the unit preclude a confident definition of the internal geometry of these units. On the west margin, the felsic volcanic rocks are dominated by light grey- to cream-weathering, fine-grained quartz-biotite-plagioclase ± hornblende schists, which commonly contain units of quartz-phyric lapilli ash tuff with rare angular, block-sized fragments. On the east margin, in addition to these rock types, fine-grained, layered tuff or epiclastic sedimentary deposits with beds 3-50 cm thick are also present, as are white- to pink-weathering massive, siliceous rhyolites. A distinctive characteristic of the formation on both sides of the belt is the large number of mafic dvkes and intrusions that cross-cut the unit. Xenoliths of felsic rocks form a large proportion of adjacent mafic intrusive units (Amg), such as the large intrusion located southwest of Newbigging Lake (Sheet 2). U-Pb dating of zircons indicate that these volcanic units represent some of the oldest supracrustal rocks in the Slave Province. A sample of red-weathering, massive felsic volcanic rock from the south shore of Newbigging Lake (Sheet 2), on the east side of the belt, yielded zircons with an age of 3305 ± 2 Ma, whereas a monomictic lapilli breccia with a fine-grained, schistose, quartz-biotite-feldspar ± hornblende matrix from the west side of the belt located southwest of Big Bear lake (Sheet 3) yielded zircons with an age of 3118 + 11/-8 Ma (Villeneuve and van Breemen, 1994). Both dates were interpreted to represent igneous crystallization ages for the units. Caution should be exercised since the lapilli breccia, despite being monomictic, is a volcaniclastic rock, and the 3305 ± 2 Ma age should be considered the maximum age for the unit. Although the apparent large age difference between the dated units remains to be resolved, the felsic to intermediate volcanic rocks of the Newbigging Formation were grouped into a single formation

Quartz-rich Sedimentary Sequence - North Shore Formation (ANS) Orthoquartzite is a distinctive member of a group of sedimentary rocks that are found as a relatively thin veneer pegmatite, is only able to constrain the age of deposition to between 2689 Ma and 2548 Ma (Villeneuve and van tectonostratigraphically above the Newbigging Formation. Although minor quartz-rich, epiclastic units are found within Breemen, 1994). the underlying felsic volcanic rocks, the thickest and most continuous units are found along the upper contact of the Newbigging Formation. Particularly distinctive, white-weathering orthoguartzite crops out on the north shore of Sherpa lake (informal name - Sheet 2). These were first identified by Thompson et al. (1992), who compared them to similar rocks in the Beniah Formation found to the south of the map area (Roscoe et al., 1989; Rice et al., 1990). The orthoquartzite includes massive facies, trough cross-bedded facies with subtle low-angle cross-beds, and minor granule

Ga) are well-documented in the western and central Slave Province (Henderson et al., 1987; Lambert and van Breeconglomerate. The formation also includes minor pebble conglomerate, wacke and wacke-mudstone. Along the west men, 1991; Isachsen and Bowring, 1994; Bleeker et al., in press). In the Winter Lake belt, stratigraphic and structural side of the belt southwest of Big Bear lake (Sheet 3), a unit of orthoquartzite and sulphide iron formation, up to 15 m observations suggest that the gneissic and plutonic suites range from pre-, syn- to post-volcanic in age, but there is thick, mantles the upper contact of schistose felsic volcanic rocks of the Newbigging Formation. To the south along the insufficient U-Pb dating to arrange the map legend on the basis of inferred ages of the plutonic suites. Instead, these

A sample of orthoquartzite from the north shore of Sherpa lake (Sheet 2) yielded eight single-grain fractions of

Heterogeneous Komatiitic Basalt Sequence - Credit Formation (Ac) A heterogeneous group of high-Mg tholeiitic to komatiitic basalts and associated volcaniclastic and sedimentary rocks is best exposed southeast of Credit Lake (Sheet 3 - west side of belt). Ultramafic intrusive rocks and high-MgO ocks of uncertain origin were previously identified in the Slave Province (Gibbins and Hogarth, 1986; Covello et al., Granitic Gneiss (Agg) 1988; Lambert et al., 1992), but this formation represents the first clearly identified extrusive unit of komatiitic basalt in the province (Hrabi et al., 1993). Since then, spinifex-textured, ultramafic komatiite has been reported in drill core from below Great Slave Lake south of Yellowknife (Royal Oak exploration personnel, personal communication, 1995), and in and Kerswill, 1994). The light pink-weathering and compositionally heterogeneous rock is composed of monzogranite the Hope Bay belt (Lindsay, 1997) The formation comprises tremolite-talc ± cummingtonite schist, pillowed komatiitic basalt, pillowed tholeiitic basalts, thin tholeilitic sheet flows, volcaniclastic units and silicate iron formation. The best exposures of the unit are west and by ubiquitous, late biotite monzogranite intrusions. Large mafic xenoliths or intrusions form distinctive units in the and southwest of Big Bear lake (Sheet 3), south of the Snare River valley and south of Sherpa lake (Sheet 2). On the gneissosity varies considerably. Away from the belt margins, the gneissosity is swirly and east margin, pillowed komatilitic basalts and schists dominate, but the section southeast of Credit Lake, on the west side of the belt, includes the complete range of rock types in this formation. The komatilitic basalts are differentiated from the adjacent tholeiltic basalts by their softer, light green-weathered surface and presence of light green, tremolite crystals. he sequence is intruded by medium- to coarse-grained gabbro, high-Mg gabbro intrusions and the largest serpenSnare River (Sheet 2) is interpreted to have a crystallization age of 2667 + 7/-6 Ma, although there is the possibility that tinized peridotite bodies in the map area.

1994), all the komatilitic basalts analysed to date have been contaminated by a component of older felsic crust (Hrabi et dated as 2723±3 Ma interpreted to have formed during a cryptic metamorphic event (Bleeker et al., in press). Dating I., 1995) and may be volcanic rocks produced during plume-initiated rifting of the underlying felsic volcanic units. On of one of the late felsic intrusions cross-cutting the gneiss suggests an igneous crystallization age of ca. 2.58 Ga with a the east side of the belt, high strain at contacts between the Credit Formation and the older felsic rocks of the Newbigging Formation suggests the units are now in structural contact with no original depositional contacts preserved. There is needed to corroborate the crystallization and metamorphic history of the gneiss protolith, but there are strong indiare no absolute age determinations for the komatiitic rocks in the map area, and no estimates of their age are known in cations that it includes older basement aged rocks. There is no evidence, however, that it represents in situ

Mafic Volcanic Sequence - Snare Formation (Asn) Homogenous units of pillowed to massive tholeiitic to calc-alkaline basalts form prominent north- to northeasttrending ridges that cross the Snare River along both margins of the supracrustal belt, and form a major domal structure northwest of Beauparlant Lake. An east-trending unit that was mapped on the eastern margin of the belt (Sheet 3) continues to Desteffany Lake (Thompson and Kerswill, 1994). In general, the Snare Formation corresponds to the mafic volcanic rocks in Unit 1 of Thompson and Kerswill (1994). The mafic volcanic rocks are green- to dark green-weathering and dark green on fresh surfaces. The unit is composed predominantly of pillowed flows and massive units. Flow-top breccias are rare. Detailed contact relationthin unit of recrystallized amphibolite that rims the margin of a foliated hornblende-biotite monzogranite in the northern biotite tonalite of the Starvation Suite (i.e. Sheet 2 - west side of belt) and may be structurally lower equivalents of this part of the map area (Sheet 4) has been included in this formation, but it is equally likely to be part of the younger suite. Providence Formation, Coarse-grained gabbro, differentiated mafic sills and minor peridotites intrude the mafi sequence. Some of the gabbroic intrusions in the underlying felsic volcanic rocks may be genetically related to the overlying extrusive mafic sequence, but no physical link was found between the two during this project. The mafic volcanic sequences are generally stratigraphically above the felsic volcanic rocks and beneath the turbiditic sedimentary rocks. On the west margin, the volcanic rocks form an east-facing home to the orthoquartzite and iron formation that mantle the top of the underlying Newbigging Formation or Starvation Suite tonalite. Along this margin, southwest of Big Bear lake, the mafic rocks separate the underlying Newbigging and North Shore formations from the overlying Credit Formation. On the east side of the belt, the mafic sequence structurally overlies the Newbigging, North Shore and Credit formations. Facing reversals indicate the sequence has been folded along the east margin, and the unit forms a large structural dome west of Beauparlant Lake. The base of the mafic sequence generally faces away from the underlying rocks, although one exception exists north of Beauparlant Lake (Sheet 3), where a folded sequence of mafic volcanic rocks and turbidites locally face towards the margin of the belt. Most contacts between the mafic volcanic rocks and the underlying formations are highly strained, but differences can be recognized on opposite sides of the belt. Along most of the west margin, both the upper and lower contacts of Starvation Suite (Ast) the Snare Formation are zones of strong foliation development. However, in the area southwest of Big Bear lake nformal name - Sheet 3), an original low strain contact is preserved along the lower contact of the mafic volcanic rocks. The Snare Formation overlies the orthoguartzite and iron formation of the North Shore Formation and layering is paralled in both formations. In contrast, on the east side of the belt the lower contact of the mafic volcanic sequence or the komatiitic basalts of the North Shore Formation is everywhere highly strained regardless of whether it overlies the North Formation, Newbigging Formation or the granitic gneiss. For reasons discussed below in the Structural Geology section, a relatively early deformation event is interpreted to be responsible for at least part of this strain. The composition of the mafic rocks are also distinct on opposite sides of the belt. Mafic rocks on the west margin have a relatively wide compositional range within the tholeittic to calc-alkaline fields. Some samples have distinct light are earth element (LREE) enrichment, a negative Nb anomaly, and a positive Th anomaly (Hrabi et al., 1995), that suggest either formation in a suprasubduction zone setting (Pearce and Peate, 1995) or contamination by a component of continental crust (Arndt and Jenner, 1986; Jochum et al., 1991). In contrast, the mafic rocks on the east margin are uniformly tholeiitic and the geochemical composition suggests neither the influence of a suprasubduction zone settin nor contamination by the underlying felsic rocks (Hrabi et al., 1995). The macroscopic characteristics of the mafic Obstruction Suite (Ao) volcanic sequence, however, do not allow a visual discrimination of the differences identified by trace element geochemistry. The rocks were therefore mapped as a single formation and the geochemical differences are noted where chemical analyses are available. The contact between the mafic volcanic rocks of the Snare Formation and the underlying North Shore and Newbigging formations in the area southwest of Big Bear lake is interpreted to be a locally-preserved, original unconformity developed between the mafic volcanic sequence and the underlying ca. 3.1-3.3 Ga felsic volcanic rocks and thin mantle of mature sedimentary and chemical sedimentary rocks. This interpretation is based on the contact relationships

the mafic volcanic rocks and the underlying formations, the distinctly lower strain that is only preserved along of the contact, and the variably contaminated nature of the mafic volcanic rocks in the Snare Formation above the contact. In contrast, a high strain zone defines a structural contact at the lower contact of the mafic rocks on the east

Mafic to Ultramafic Intrusions (Amg, Amu, Amp) side of the belt. Here, the mafic volcanic rocks are interpreted to have been faulted against the Credit Formation

A wide range of mafic to ultramafic intrusive rocks are found in the Winter Lake belt. Dark- to light greenkomatiitic volcanic rocks and the underlying North Shore Formation, Newbigging Formation and granitic gneiss during weathering, gabbro to diorite dykes, sills and larger intrusions cut most of the rock types in the map area. Detailed an early deformation event. In addition, the uniformly uncontaminated geochemical nature of these mafic volcanic studies in the Yellowknife area (Henderson and Brown, 1966; Helmstaedt and Padgham, 1986; MacLachlan and ocks suggests that they were free of influence of an underlying felsic crust and therefore may have been deposited in

Helmstaedt, 1995) and Sleepy Dragon Complex (Lambert et al., 1992; Bleeker et al., 1995) and sleepy Dragon Complex (Lambert et al., 1995). No rocks suitable for U-Pb dating were found in this sequence during mapping, and the age of the volcanism and of mafic intrusive activity has been documented, but the mafic intrusions were not divided into different generations on

Younger Volcanic Sequence - Providence Formation (AP) A thin unit of felsic and subordinate mafic volcanic rocks is found in the north half of the map area. No facing directions were recognized, but the unit is structurally above a thin amphibolite that rims the foliated monzogranite at Lake Providence. Elsewhere it is interlayered with the turbiditic sedimentary rocks. The felsic rocks are light-weathering, fine- to medium-grained felsic schists, and include both volcanic flow and The Providence Formation is clearly different from the Newbigging Formation. It is situated relatively higher in the

The centre of the Winter Lake belt is occupied by greywacke and mudstone turbidites that are typical of the Yellowknife Supergroup (Henderson, 1970). This unit opens into a broad expanse of similar rocks to the north, named the Itchen Formation by Bostock (1980), and to the east, in the Lac de Gras area (Thompson and Kerswill, 1994, Unit

At low and medium metamorphic grades, green-grey-weathering, muscovite-chlorite + biotite greywackemudstone and tan-weathering, cordierite-andalusite psammite-pelite weather recessively, whereas at higher grades, rusty brown-weathering, sillimanite psammite-pelite and migmatite are better exposed. Interlayered 10-100 cm, grade greywacke beds and 3-5 cm mudstone beds are common, although some areas are greywacke-dominated. Graded bedding is observed only at lower metamorphic grades, but bedding is preserved as aluminosilicate-bearing layers to higher grades. Iron formation is rare in this formation, only observed in the extreme northwest corner of the map, and this suggests that the vast majority of these rocks may be correlative with the Itchen Formation turbidites (Bostock, 1980). The turbidites are strongly folded, have few marker layers, and are often poorly exposed. These factors prevent outlining the internal geometry of the formation and preclude making accurate thickness estimates for the unit. Within the Winter Lake belt, the age of the younger volcanic rocks at < 2625 Ma provides a time marker within the curbidites but does not constrain the beginning or the end of deposition of these rocks. The age of deposition of similar rock types across the Slave Province is beginning to be better understood. Extensive turbiditic sedimentary rocks were Terminus Suite (AT) eposited during and after widespread calc-alkaline volcanism between 2.69-2.63 Ga in various parts of the Slave ating of interlayered volcanic units suggests some of the turbiditic sedimentation is as young as ca. 2.62-2.61 Ga in provide absolute time markers within the turbidite sequence, but not enough is known about the deposition of the ments were deposited essentially continuously from ca. > 2.69 Ga to ca. < 2.62 Ga.

Polymictic Conglomerate and Sandstone - Sherpa Formation (As) Fraser (1969) first recognized coarse, polymictic conglomerate deposits in the Winter Lake belt, and Rice et al. (1990) subsequently mapped the conglomerates and associated sedimentary rocks in more detail. This formation cor esponds to unit 7 of Thompson and Kerswill (1994). These rocks are preserved along the entire length of the belt, but are best exposed in a structural basin located west of Sherpa lake (informal name - Sheet 2). The formation contains a wide range of rock types. The coarsest facies is a massive, polymictic, dominantly clast-supported conglomerate containing clasts of foliated tonalite, relatively unfoliated tonalite and granite, gabbro, mafic volcanic rock and orthoquartzite. The largest observed granitoid clasts are > 1 m in length. Minor, thin sandstone beds in some outcrops define bedding in the coarse conglomerate. Beige-weathering, fine- to coarse-grained, commonly trough cross-bedded, feldspathic arenite to wacke form a significant proportion of the formation. Conglomerate and cross-bedded to massive sandstone are commonly interbedded, either as sub-equal proportions of cobble to pebble conglomerate and cross-bedded sandstone, or as cross-bedded sandstone with minor granule to pebble conlomerate lags at the base of beds. In addition, units of interlayered, planar-bedded sandstone and minor mudstone are present in the formation, most obviously in the core of the synformal basin west of Sherpa lake. The provenance of some of the conglomerate is very local and is illustrated by the increase in mafic clasts and matrix, where the conglomerate directly overlies mafic volcanic rocks. The apparent interfingering of the Sherpa Formation and adjacent mafic volcanic rocks led to the suggestion that the two were contemporaneous (Thompson et al., 1994). However, careful search for unambiguous facing direct the pillowed volcanic rock and the Sherpa Formation confirmed that the apparent interfingering of the units is, in fact, a STRUCTURAL GEOLOGY fold repetition. West of Sherpa lake, a narrow conglomerate unit is preserved with mafic volcanic rocks on both margins. Erosional features at the base of the conglomerates and a symmetrical change from mafic-dominated matrix at both contacts with the mafic volcanic rocks, to a feldspathic arenite matrix in the centre provide additional evidence that the it is significantly younger than the other supracrustal rocks and that it was unconformably deposited on them. ocks are correlative with the < 2.6 Ga polymictic conglomerate sequences in the Slave. At present, dating of zircons from clasts, detrital zircons from sandstone and conglomerate matrix, and of monazite in a cross-cutting two-mica

Plutonic and gneissic units pre-dating most of the oldest Yellowknife Supergroup supracrustal rocks (ca. < 2.95 west margin, similar rocks are present at the base of the mafic section, separating it along a highly strained contact from suites are grouped according to their state of deformation and recrystallization. Table 1 is intended to clarify the known and possible age relationships between the supracrustal units and the major gneissic or plutonic units, while preserving

It is recognized that some of the gneissic and plutonic suites are very likely to be stratigraphic or structural base ght range of ages, the absence of younger detrital zircons, and the similarity of the ages to the age of the underlying ment to the supracrustal rocks. The granite and tonalite gneiss (Agg and Agt) have the highest potential to be felsic volcanic unit suggest that the orthoguartzite was derived from the underlying felsic volcanic rocks, has a maximum basement-aged. In addition, some of the Starvation Suite units (i.e. Sheet 2 - west side of belt) are gradational to the age of ca. 3.13 Ga, and was deposited prior to the onset of any later volcanic events. Similar orthoquartzites elsewhere tonalite gneiss and are overlain by iron formation and minor orthoquartzite at the supracrustal contact, suggesting in the south-central Slave Province have maximum depositional ages of ca. 2.92 - 2.94 Ga (Isachsen and Bowring, some of these units may also be basement-aged. In contrast, other units with similar composition, rock associations and deformation and recrystallization state are also grouped in the Starvation Suite, but these appear to intrude and dismember the Snare Formation volcanic rocks (Sheet 1), suggesting they are late syn-volcanic in age. Additional U-Pb dating of prospective basement-aged units should be a priority in any future work in the Winter Lake belt.

This unit is found intermittently along the west side of the belt and forms part of a large gneiss-granitoid comple along the east side of the belt that separates the Winter Lake belt from the Courageous Lake volcanic belt (Thompson to tonalitic leucosome and biotite-hornblende melanosome with early granitoid intrusions that are strongly deformed and incorporated into the gneiss. The gneiss was subsequently intruded both by gabbro and guartz digrite intrusions Heterogeneous tonalite to granitic gneisses of this type have been interpreted to represent basement to Yelthis is a metamorphic age (Villeneuve et al., 1997). A component of a correlative gneiss (Unit 1 of Thompson and Based on geochemical analyses and limited Nd isotopic analyses (W.J. Davis (GSC), personal communication, Kerswill (1994)) from the north shore of MacKay Lake has an interpreted crystallization age of 3325 ± 8 Ma, with zircons stratigraphic basement to the supracrustal belt. The contacts between gneiss and supracrustal rocks are variably eformed and in some areas, such as south of the Snare River, a mylonitic fault zone structurally juxtaposed the mafic volcanic rocks against the gneiss.

Tonalitic gneiss is found on the west margin of the belt. It is a white to light grey-weathering, reflecting a more uniform tonalitic leucosome. The unit is distinguished from the granitic gneiss by the absence of the early, strongly deformed granitic dyke component. The quartzofeldspathic gneiss (Unit 1) of Thompson and Kerswill (1994) includes both the granitic gneiss and tonalite gneiss units. The tonalite gneiss contains a high percentage of amphibolite and is hips suggest that at least some of the massive mafic units represent cross-cutting dykes that fed subvolcanic sills. A layering varies from relatively straight to swirly. In many instances these gneisses seem to be gradational to the foliated grained sillimanite define the dominant foliation surfaces and metamorphic porphyroblasts grew synchronously with the

ayered with more gneissic equivalents of similar composition. It has been intruded by numerous pink, medium-grained pheric detachment and magma intrusion is responsible for this regional metamorphism. to pegmatitic biotite syenogranite to monzogranite. Although the granitoid migmatite has a gneissic texture, contact relationships suggest it is a much younger unit that intrudes the Providence and Indin formations. The unit is found at 2) of Thompson and Kerswill (1994) was interpreted to represent the product of partial melting and magmatic injection

PRE TO SYN-DEFORMATION INTRUSIONS

Intrusions of this suite are common along both margins of the belt including one close to Starvation Lake (Sheet - west side). They are generally composed of white-weathering, strongly foliated and recrystallized, medium- to parse-grained biotite tonalite. A notable characteristic of this suite is the abundance of amphibolite near the contact ith the overlying mafic volcanic rocks. Some of this amphibolite may represent xenoliths but many mafic dykes with chilled margins were observed. Individual dykes, however, could not be traced through the tonalité complex into the The Starvation Suite is generally correlated with part of Unit 3 of Thompson and Kerswill (1994). These tonalites have similarities to both the foliated, non-migmatized tonalites in the Sleepy Dragon Complex that preliminary dating suggest are ca. 2.95-2.93 Ga (Bleeker et al., in press) and to the tonalites of the Olga Suite in the Contwoyto Lake area King et al., 1992) which have an age of ca. 2650 Ma (van Breemen et al., 1992). Dating different parts of this suite is needed to establish whether it has a pre-volcanic, late syn-volcanic, or more than one age of intrusion.

Two distinctive oval plutons of strongly foliated, recrystallized hornblende ± biotite monzogranite to syenogranite are present along the shores of the northern end of Lake Providence near Obstruction Rapids. The plutons are strongly oliated and the foliation increases in intensity towards the margin of the plutons where a very strong foliation to gneissosity wraps around the perimeter of the pluton. Ma (Villeneuve et al., 1997). The Obstruction Suite intrusions are equivalent to Unit 4 of Thompson and Kerswill (1994). (GSC), Herb Helmstaedt (Queen's University) and Warren Hamilton (USGS) were very helpful. These intrusions resemble those of the Wishbone Suite in the Contwoyto area (King et al., 1992).

erations of mafic dykes are a common occurrence in the central Slave Province. In the Winter Lake belt, a similar range the time span represented by it are uncertain. Based on the age of immediately overlying or cross-cutting units, the age
the map. For instance, contact relationships suggest some gabbro intrusion within mafic volcanic rocks are early, syn-

co-magmatic magmas, as well as later cross-cutting intrusives.

n the Yellowknife belt (Isachsen and Bowring, 1994), to >2729 +8/-7 Ma for the lower part of the Courageous Lake younger. The numerous dykes, sills, intrusions and possible xenoliths in the gneissic complexes, the tonalitic Starvatio and Beauparlant suites and the Newbigging Formation likely represent a wide range of sources including xenoliths, Light green-weathering, light green, high-Mg gabbroic-textured intrusives are much less common. They intrude the komatilitic basalt-associated Credit Formation and the Newbigging Formation in the area west of Big Bear lake (Sheet 3). Considering the rare nature of this rock type, the spatial association and the compositional similarities to the komatiitic basalts suggests a genetic link between these intrusives and the komatiitic basalts is possible. Rusty-brown to light-green weathered, strongly serpentinized ultramafic intrusions intrude the gneissic complexes, Starvation Suite, Newbigging, Credit and Snare formations. The largest intrusions are found west of Big Bear lake (Sheet 3) forming part of the heterogeneous group of rocks in the Credit Formation. A genetic link between the ultra-

SYN- TO LATE DEFORMATION INTRUSIONS This suite comprises a variety of rock types that are variably foliated but are not strongly recrystallized. A distinctive member of this suite is a pluton of off-white weathering, medium-grained, variably-foliated biotite hornblende tonalite found at Beauparlant Lake (Sheet 3). Other intrusions in this suite comprise pink- to light red-weathering, medium- to

coarse-grained monzogranites to syenogranites with a variable proportion of chloritized biotite.

plutons have been dated but they are similar to the Concession Suite in the Contwoyto area (King et al., 1992) which has an age of ca. 2608 Ma (van Breemen et al., 1992). Svenogranite to Aplite (Apa) Southwest of Lake Providence, a poorly exposed intrusion consists of a core of weakly foliated monzogranite to

Thompson and Kerswill (1994) included the intrusions of the Beauparlant Suite with their Unit 3. None of these

syenogranite with a wide margin of variably foliated fine-grained to aphanitic quartz porphyry. This intrusion is spatially lated with the Providence Formation volcanic rocks, but no observations were made that prove it is a subvolcanic equivalent to this volcanism.

LATE TO POST-DEFORMATION INTRUSIONS Megacrystic to Porphyritic Monzogranite (Apx) wo plutons of biotite monzogranite containing distinctive megacrystic to porphyritic K-feldspar are present in the map area. These rocks are pink to brown-weathering, medium- to coarse-grained with abundant K-feldspar phenocrysts up to 1 cm in length. They range from very weakly to moderately foliated. Both the megacrystic monzogranite

Two-mica monzogranites intrude most of the supracrustal rocks. A large pluton adjacent to Terminus lake (inforrovince (Mortensen et al., 1988; van Breemen et al., 1992; Bleeker and Villeneuve, 1995; Pehrsson, 1998). Recent mal name - Sheet Two) forms part of this suite. It is a flesh-weathering, even-grained, biotite-muscovite ± garnet monzogranite. A second pluton on the north shore of Lake Providence intrudes migmatite grade sedimentary rocks and the High Lake and Wheeler Lake areas (Isachsen and Bowring, 1994; Henderson et al., 1995). The volcanic layers contains 1 cm biotite-garnet clots. These rocks are likely derived from the partial melting of the metasedimentary rocks (Davis et al., 1994), Tourmaline and fluorite are common accessory minerals where these rocks intrude mafic volcanic sedimentary rocks to determine whether there was a significant hiatus in deposition at any time or whether the sedi-rocks. Biotite-muscovite pegmatite, that commonly has a high percentage of garnet, are also associated with these rocks. The pegmatites both grade into the two-mica monzogranite and cross-cut it, indicating that the two rock types are

and two-mica monzogranites of the Terminus Suite are included in Unit 15 of Thompson and Kerswill (1994).

part of the same intrusive event. None of the intrusions of the Terminus Suite were dated, but the two-mica granites of the Contwoyto Suite in the Contwoyto Lake area (King et al., 1992) have an age of ca. 2585-2589 Ma (van Breemen et al., 1992). Late biotite monzogranite is found as a large batholith in the southwest of the map area near Tsan Lake (Sheet 1) as numerous smaller plutons throughout the map area. These rocks are directly correlated with the Yamba Suite in (van Breemen et al., 1992) in the Contwoyto Lake area.

the Contwoyto Lake area (King et al., 1992) as one intrusion just west of the map area (Unit 14 of Thompson and Kerswill (1994)) is continuous with the Yamba batholith (Bostock, 1980). The Yamba Suite has an age of ca. 2582 Ma These rocks are pink- to light red-weathering, medium- to coarse-grained biotite monzogranite to granodiorite with lesser syenogranite. They are typically weakly porphyritic and show substantial grain size variations. They are generally unfoliated, although in some areas a relict compositional banding likely represents almost completely digested xenoliths. Amphibolite and granitoid form more recognizable xenoliths as well. Along the margin of the large batholith in the southwest of the map area, the contact of the batholith is marked by an intrusive complex consisting of sheets of the biotite monzogranite intruding a strongly deformed assemblage of biotite tonalite, amphibolite and cross-cutting

The present distribution of rock units and overall geometry of the Winter Lake supracrustal belt is the result of a polyphase Archean deformation history modified by later (Proterozoic?) oblique strike-slip faulting. The structural relationships are best preserved in the sedimentary rocks of the Itchen and Sherpa formations, where the relationships conglomerate is coring a syncline and post-dates the adjacent mafic volcanic rocks. In addition, the Sherpa Formation between bedding and different cleavage generations are most recognizable easily recognized. In general, structural ocally cuts down through the turbidite sequence to the mafic rocks and does not record the earliest folds observed in elements can be correlated to those in the mafic volcanic rocks and some intrusive rock types. In the granitic gneiss ne turbiditic sequence. This suggests that the conglomerate sequence not only post-dates the mafic volcanism, but that complex, however, the complexly refolded geometry of gneissosity can not be correlated with the deformation events preserved in the supracrustal belt. At the contact of the gneissic complex, however, the gneissosity has been trans-Physical similarities to other polymictic conglomerate sequences and the structural relationships suggests these posed parallel to the margins of the supracrustal belt preserving the effects of deformation that also affected the belt. The earliest deformation features recognized are a generation of folds (F1) in the greywacke-mudstone that predate the formation of the dominant northeast-striking foliation (S₂). These outcrop-scale folds are recognized in a hinge area of a large F₂ synform. The F₁ folds are upright, with east-striking axial surfaces having no axial-planar foliation, but with both limbs obliquely cut by the S₂ foliation. Drawing accurate bedding form lines is not possible because of poor exposure in the low metamorphic grade rocks of the Itchen Formation but a representative F1 anticlinal trace is shown west of Sherpa lake. Isoclinal folds, revealed by facing reversals in parallel-striking beds of the turbidites may also be a esult of this deformation. The pre-D₂ folding in the turbidites is not present in the younger conglomerate-associated sedimentary rocks, suggesting that this deformation pre-dates the deposition of the conglomerates. On the east margin of the belt, the boundary between the mafic volcanic rocks and either the older felsic volcanic rocks or the granite gneiss terrain is a zone of high strain. Determining the timing of this zone is complicated by the fact that most contacts in the belt act as rheological contrasts and tend to concentrate strain during the main foliation-forming deformation event. This contact and the high strain zone are folded, however, by the D₂ folds, and within the noses of such folds a variably developed, layering-parallel foliation can be observed. These observations suggest an early fault The D₂ deformation event is responsible for the overall synformal geometry of the southern Winter Lake belt. The supracrustal rock units are deformed into variably-plunging folds (F2) with metre- to kilometre-scale wavelengths that al planes parallel to the length of the belt in the central part of the belt. The dominant foliation (S_2) is axial-planar e F_2 folds. In general, it sub-parallels the margin of the belt in the south half of the map area, where it strikes between 010-030° and dips steeply to the east. The dominant foliation (S₂) is east-striking and parallels the belt margin in the Desteffany belt where it is axial-planar to folds of turbidite and mafic volcanic rock. In the north half of the map area, where the metamorphic grade is high, the D2 foliation and bedding are transposed into a common foliation surface. North of Beauparlant Lake, where the belt begins to widen, the S_2 foliation often dips shallowly to the north and is

refolded around a later fold set (F₃). The F_3 folds are responsible for regional-scale refolding in the map area and are fundamental to understanding the regional distribution of supracrustal units. An example is found north of Beauparlant Lake where north-northeastding F_2 folds and the dominant foliation (S_2) are refolded into the east-trending Desteffany belt about a large scale F₃ antiform that is cored by the Jolly Lake complex (Thompson et al., 1993). The fold geometry is complicated, however, the movement along a fault near the fold closure. In addition, a weakly- to moderately-developed, north-trending s planar fabric variably overprints the shallowly-dipping S2 foliation in turbidites and conglomerates at several locations west of Lake Providence. This suggests an F3 synform folds the supracrustal belt west of Lake Providence. In the narrow part of the belt, south of Beauparlant Lake, the F3 fold generation cannot be distinguished from the dominant, upright F₂ folding, although D₃ deformation is probably responsible for further tightening of these folds. Minor east-striking crenulations associated with a weak crenulation cleavage are interpreted to have formed du ing a relatively late north-south compression (D4). This deformation likely accentuated the dome and basin pattern evident in the belt, particularly in the dome of mafic volcanic rocks north of Beauparlant Lake and the basin in the Sherpa formation, It is unlikely, however, that this deformation was strong enough to be solely responsible for the refolding pattern, as many of these structures plunge steeply to the north and south. It is more likely that some combination of periclinal folding during the dominant peak-metamorphic D_2 event or F_2 refolding of earlier F_1 folds is responsible for this pattern Strike-slip faults, post-dating all other structures and metamorphism, with strike lengths of hundreds of kilometres nodify the geometry of the belt. These faults have a sinistral oblique movement and are characterized by a strong foliation or mylonitic foliation, extensive hydrothermal alteration and brecciation. These faults have been mapped to the south (Stubley, 1990a; Stubley, 1990b), through the Beaulieu River volcanic belt (Lambert et al., 1992) and extend to the East Arm of Great Slave Lake. Mapping beyond the project area and extrapolation using aeromagnetic maps

offset metamorphic isograds in the Keskarrah Bay area (Henderson, 1988). METAMORPHISM Isograds defining the first appearance of biotite, cordierite ± andalusite, sillimanite and migmatite (first appearance found west of Sherpa Lake and north of Beauparlant Lake, and metamorphic grade increases to the west as well as to the north and south. Garnet is not ubiquitous but is found at medium to high grades, particularly where the turbidites intruded by a large number of late monzogranite to syenogranite intrusions. At a distance from the belt margin, gneissic are adjacent to mafic volcanic rocks and iron formation. Staurolite is only rarely present. Chlorite, micas and finerelopment of the dominant foliation, suggesting that the dominant foliation-forming deformation event overlaps in

indicate that these faults extend at least to Point Lake, where the most eastern fault is likely one of the late faults that

time with peak metamorphism. In the central Slave, similar metamorphic mineral assemblages are indicative of his temperature (Tpeak ~650-700) and low to moderate pressures (Ppeak ~5kbar) (Relf, 1992; Thompson and Kerswill, 1994). This high temperature-low pressure metamorphism has been attributed to high heat flow associated with early crustal thinning and radiogenic heat produced during overthickening of sialic crust (Thompson, 1989; Thompson and A complex of white-weathering granitoid is exposed north of Obstruction Rapids. It is composed of white- Kerswill, 1994). Alternatively, various researchers in the Contwoyto Lake area (King et al., 1992; Relf, 1992; Davis et weathering, strongly foliated, recrystallized biotite ± garnet monzogranite of variable grain size that is intimately inter-

Observations relating to the mineral potential of the Winter Lake belt complement those made by Thompson and Kerswill (1994) and Thompson et al. (1995). Massive sulphide mineralization is present within the homogeneous mafic volcanic section of the Snare Formation. Two representative examples of this type of mineralization include an exposure north of the Snare River valley, where a 1 m thick massive pyrite-pyrrhotite-bearing unit is interlayered with the mafic volcanic section, and an exposure south of Terminus lake, where a 15 m thick unit consisting of siliceous chemical sedimentary rocks with variable content of disseminated pyrite, pyrrhotite and chalcopyrite also includes a massive sulphide laver. In addition, cordierite-anthophyllite-tremolite schist present in the Credit Formation (Sheet 2 - northeast of Terminus lake) indicates pre-metamorphic hydrothermal alteration affected parts of the komatiitic basalt sequence. Another potential exploration target for VMS includes the younger felsic volcanic units of the Providence Formation found in the north half of the belt. Although apparently younger in age, this formation is at a similar tectonostratigraphic the massive sulphide mineralization, sulphide-bearing iron formation is present at both the base and top of the Snare Formation and it represents a viable target for gold mineralization. In contrast, most of the Itchen Formation turbidition sedimentary rocks do not generally have interbedded iron formation units, suggesting they have a low potential for Lupin-style gold mineralization. The presence of both the komatiitic basalts and the serpentinized peridotite intrusio within the map area suggest the possibility of magmatic nickel occurrences. Mapping to date, however, did not identify any intrusive bodies that have a significant thickness or any that are strongly differentiated.

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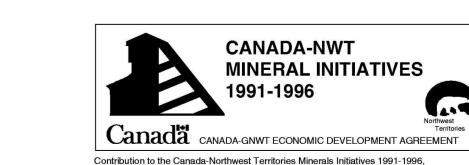
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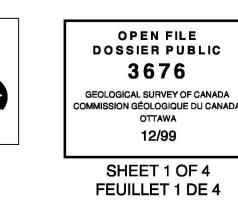
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