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MARGINAL NOTES

INTRODUCTION

The Nungesser River and Kirkness Lake areas extend 20 to 80 km north of the town of Red Lake in the District of Kenora. Access is by means of the Nungesser road and a network of log roads, many of which are currently being extended. Flood-equipped aircraft are required to reach many lakes at margins of the areas.

MINERAL EXPLORATION

Despite proximity to the Red Lake gold camp, little exploration has been done in the Nungesser River area. In 1977 and 1978, Dome Exploration Limited carried out an airborne magnetic survey and ground electromagnetic and magnetic surveys and identified a series of anomalies in supracrustal rocks of the Anderson Lake-Sidace Lake area and Farrer Lake. Philip Lake area (Assessment Files 2 2636, 2 2999, 2 3065, 2 3072, 2 3073, Resident Geologist's office, Red Lake). Shallow borings were subsequently drilled and defined zones of pyrite and pyrrhotite as probable sources for the conductive zones.

No exploration activity is recorded for the Kirkness Lake area.

GENERAL GEOLOGY

The Nungesser River and Kirkness Lake areas comprise part of the southern Berens River Subprovince. The surveyed areas are underlain by voluminous felsic to intermediate intrusions and small units of supracrustal and gneissic rocks of Archean age. The Red Lake belt of the Uchi Subprovince is situated 20 km to the south.

Horwood (1940) mapped the small belt of metavolcanic rocks at Anderson Lake during a survey of the Red Lake belt. Regional compilation maps (Donaldson 1969; Davies et al. 1968; Ayres et al. 1973) show largely unsubsided felsic plutonic rocks in the southern Berens River Subprovince. The present mapping, summarized by Stone (1988, 1989), distinguishes the main suites of plutonic, gneissic and supracrustal rocks in the area.

LITHOLOGIC DESCRIPTION

Mafic metavolcanic rocks are concentrated at Anderson Lake and in a thin belt that extends north to the Kirkness Lake area. Pillowed mafic metavolcanic rocks are observed east of Anderson Lake; however, mafic metavolcanic rocks comprise mainly fine-grained black amphibole gneisses. Many outcrops contain mesoscopic folds and are cut by granitic dikes. Intermediate to mafic gneisses (the orthic agglomerates, fine-grained gneissose rocks of possible tuffaceous origin), lean iron formation and garnet-bearing wackes are locally associated with mafic metavolcanic rocks. The thin supracrustal belt shown on the Kirkness Lake map (P3174) is composed of approximately equal proportions of metasedimentary migmatites and amphibole gneisses. Quartzofeldspathic gneisses of tonalitic to granodioritic composition are spatially associated with supracrustal rocks east of Berens Lake (P3174, Kirkness Lake) and east of Anderson Lake (P3175, Nungesser River). The gneisses display a prominent but discontinuous mineralogical layering and together with supracrustal rocks, are cut by several kinds of granitic dikes.

Felsic intrusive rocks that range in composition from tonalite and granodiorite to granite are widespread in both areas. Biotite tonalite to granodiorite is an early intrusive rock that occurs in cusped plutons north of Kirkness Lake and thin units in gneissic and supracrustal rocks. Hand specimens show a grey, medium-grained, weakly foliated quartzofeldspathic rock that contains 5 to 10 percent biotite.

A lobate batholith of hornblende tonalite to granodiorite underlies most of the Nungesser River area and intrudes the Red Lake belt to the south. This white to grey rock is coarse grained, locally potassium feldspar megacrystic and contains 15 to 25 percent biotite and prismatic aggregates of hornblende and biotite. Small (10 cm scale) lensoid inclusions of fine-grained mafic tonalite are common in outcrops.

A coarse grain size and abundant blocky megacrysts of potassium feldspar are distinguishing features of megacrystic biotite granodiorite to granite, which occupies several large irregular intrusions in the Kirkness Lake area. Pink biotite leucocratic granodiorite is also a widespread late intrusive rock and is made up of sub-equal volumes of quartz, plagioclase and potassium feldspar with usually less than 10 percent biotite. A small pluton of hornblende granodiorite to granite northwest of Kirkness Lake locally contains pyroxene (sillite) and is gradational to quartz monzonite and quartz syenite. It is among the youngest intrusion in the area.

SURFICIAL MATERIALS

Archean bedrock in most of the map area is unconformably overlain by gently undulating ground moraine interspersed with sand flats and muskeg swamps. The largest surficial feature is the lake-modified Lac Seul moraine that attains a height of 80 m and extends northwest of Anderson Lake. The moraine is disrupted at Kirkness Lake north of which it curves to the northeast. Numerous small north-trending moraines in the vicinity of Kirkness and Nungesser Lakes (Prest 1963). Glacial fluting and striae trend approximately 240 degrees.

METAMORPHISM

With the exception of biotite leucocratic granodiorite, all units are foliated and recrystallized and show mineralogy indicating that they have been both deformed and metamorphosed at amphibolite facies. The assemblage hornblende-plagioclase-quartz + epidote is widespread in amphibole gneisses of volcanic origin. Metasedimentary remnants have undergone partial melting and the assemblage garnet-biotite-cordierite-sillimanite-plagioclase-quartz is found in samples from Philip Lake and east of Boughton Lake (P3174, Kirkness Lake). The garnet-biotite geothermometer of Ferry and Spear (1978) gives a temperature of 582°C at 300 MPa pressure using garnet rim analyses for the Philip Lake sample. Crystallization pressures of 300 to 400 MPa are derived for hornblende tonalite to granodiorite using the hornblende geobarometer of Hammarstrom and Zen (1986).

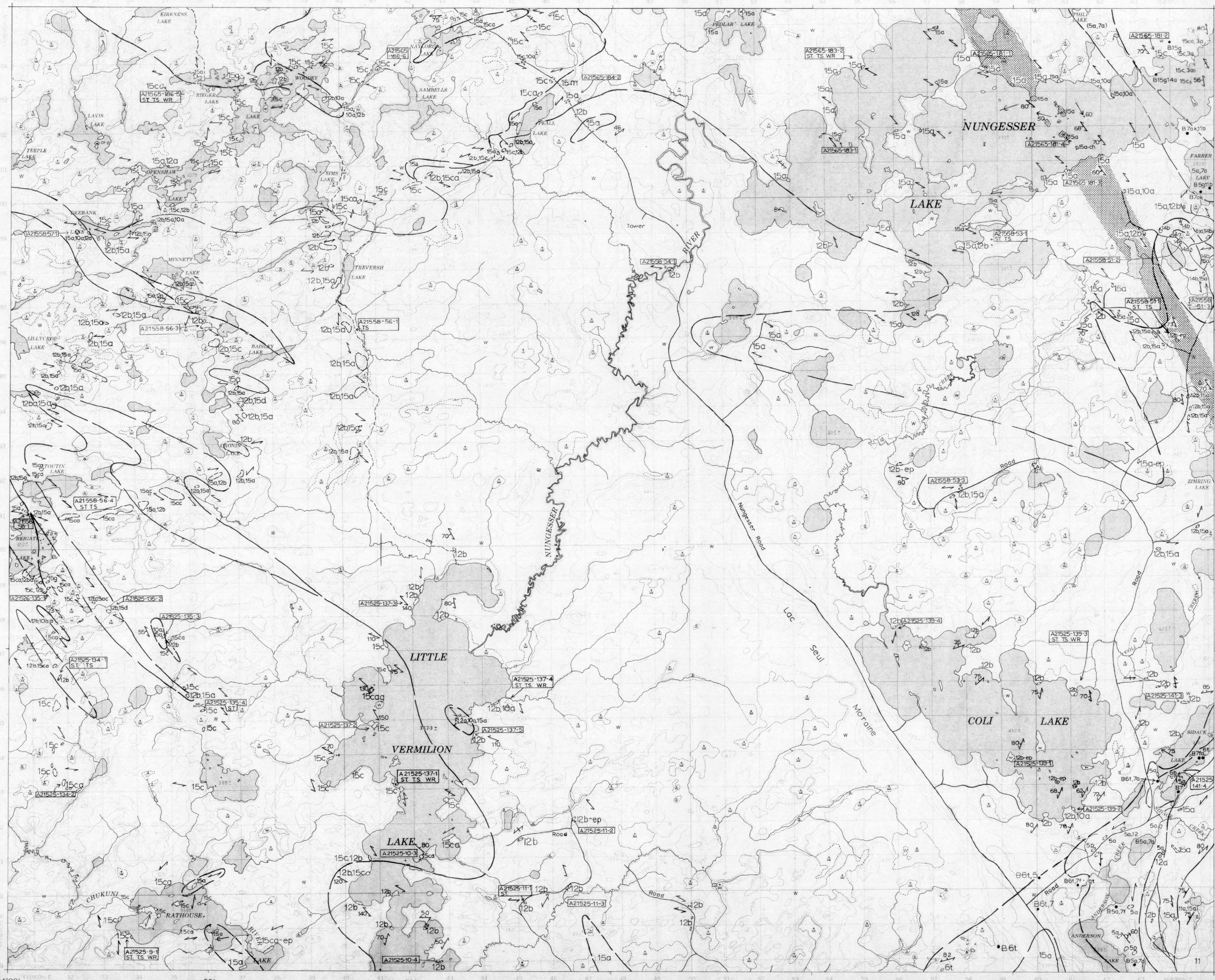
Epidote and chlorite in fractures, small faults and the Nungesser Deformation Zone indicate that late brittle deformation may have occurred under greenschist facies conditions.

STRUCTURE

The structure of the southern Berens River Subprovince is dominated by large, irregularly lobate faults, the youngest of which are mainly granitic in composition and have convex extensions and weakly developed mineral foliations. Older lithologic units, including supracrustal rocks, gneisses and tonalite, occur in belts and show prominent foliations that are mainly subparallel to adjacent boundaries of granitic bodies and have an overall north to north-westerly trend. East of Berens Lake, supracrustal rocks have well developed mineral lineations and mesoscopic folds that plunge at moderate angles to the southwest.

Plutonic rocks are strongly foliated and locally mylonitized and fractured within a 1 km-wide zone that strikes approximately 330 degrees through the Nungesser Lake area. This zone, the Nungesser Deformation Zone, coincides with a prominent linear aeromagnetic anomaly east of the present area (see Assessment File 2 2636, Resident Geologist's office, Red Lake) but dies out north of Nungesser Lake. Foliations within the zone dip westerly 50 degrees to 80 degrees and mineral lineations show highly variable orientation. The amount and sense of displacement on the zone is unknown.

All units are cut by subhorizontal fractures and usually more than one set of subvertical fractures that are typically spaced 1 to 3 m apart. Closely spaced (0.1 m), limonite-coated shear fractures are found in some lakeshore exposures of leucocratic granodiorite. Fractures with red alteration zones and epidote and chlorite fillings are common in hornblende tonalite to granodiorite.

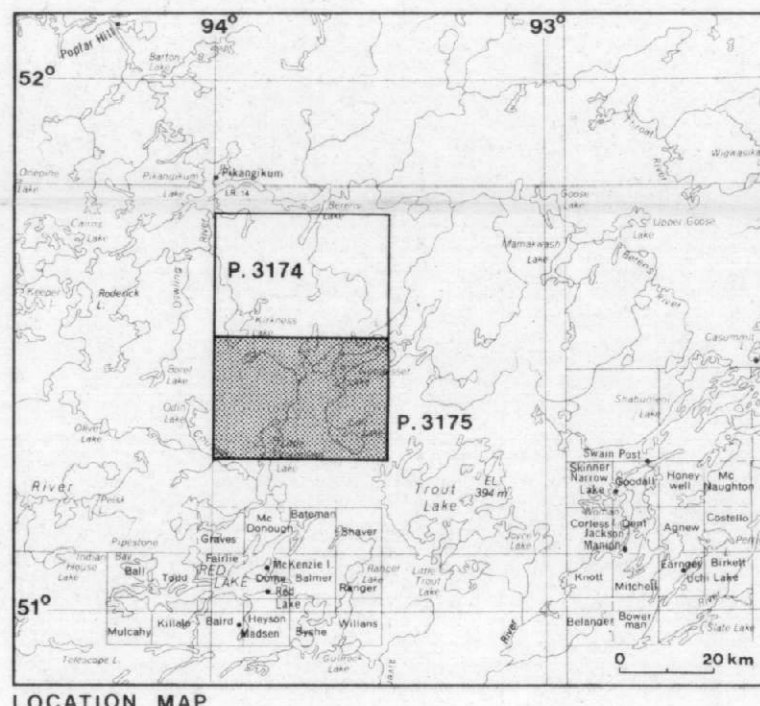


51°30'
51°30'
25'
20'
11'
93°30'



Mines and Minerals Division
Ontario Geological Survey
MAP P.3175
PRECAMBRIAN GEOLOGY
NUNGESSER RIVER

Scale 1:50 000
NTS Reference: 52 N/5
Queen's Printer for Ontario, 1990.
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LEGEND

- LATE ARCHEAN
15 Granodiorite to Granite
15a Unsubsided; pink, inequigranular, less than 15% biotite
15c K-feldspar megacrystic
15d Dikes
15g Gneissic
15h Hornblende bearing
15m Massive red granite
15p Pegmatitic
14 Mafic Plutonic Rocks
14a Diorite, quartz diorite; white to grey, greater than 15% hornblende, biotite
14b Quartz syenite, monzonite, quartz monzonite, quartz monzodiorite granodiorite, granite; pink to red, 15 to 30% hornblende, biotite, pyroxene (sillite)
12 Tonalite to Granodiorite
12a Biotite bearing; grey, less than 20% mafic minerals, fine to coarse grained
12b Hornblende bearing; grey, 10 to 20% mafic minerals, coarse grained

- MAP SYMBOLS
Small bedrock outcrop
Area of bedrock outcrop
Geological boundary, observed
Geological boundary, assumed
Bedding, top unknown
Pillow lava flow; top (arrow) from pillow shape and packing
Foliation, (unknown, inclined, vertical)
Gneissosity, (unknown, inclined, vertical)
Lineation with plunge
Drag folds with plunge
Deformation Zone; cataclases, mylonites alteration, brecciation
Glacial striae
Borehole
Sample Number, (see map symbols) whole rock chemical analysis, assay
The position of all boundaries and surveyed lines are approximate.

- ABBREVIATIONS
bio ..... biotite
ct ..... cordierite
ep ..... epidote
gt ..... garnet
py ..... pyrite
ra ..... radioactive minerals
sill ..... sillimanite

PROPERTIES
In October 1989, there were no claims held in the Nungesser River area.

SOURCES OF INFORMATION
Base map derived from map 52 N/5 of the National Topographic System, scale 1:50 000, with revision by D. Stone and D. Good.
ODM-GSC aeromagnetic map 7011G, scale 1:253 440.
OGS geological compilation Map 2175, scale 1:253 440.
Magnetic declination approximately 4°16' E in 1989.
Geology not tied to surveyed lines.

CREDITS
Geology by D. Stone, D. Good and assistants, 1988, 1989.
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Stone, D. and Good D. 1990. Precambrian geology, Nungesser Lake, Ontario Geological Survey, Preliminary Map P.3175, scale 1:50 000.

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