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. Float-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–Philp Lake area (Assessment Files 2.2636, 2.2999, 2.3065, 2.3072, 2.3073, Resident Geologist's office, Red Lake). Sixteen boreholes 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 unsubdivided 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 in the Kirkness Lake area. Pillowed mafic metavolcanic rocks are observed east of Anderson Lake, however, mafic metavolcanic rocks comprise mainly fine-grained black amphibole gneiss. Many outcrops contain mesoscopic folds and are cut by granitic dikes. Intermediate metavolcanic rocks (heterolithic agglomerates, fine-grained gneissose rocks of possible tuffaceous origin), lean iron formation and garnet-bearing wacke are locally associated with mafic metavolcanic rocks. The thin supracrustal belt shown on the Kirkness Lake map (P.3174) 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 (P.3174, Kirkness Lake) and east of Anderson Lake (P.3175, 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 cuspate plutons north of Kirkness Lake and thin units in gneisses 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 blocky 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 leucogranite-granodiorite is also a widespread late intrusive rock and is made up of subequal 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 (salite) 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 interspaced 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 occur in the vicinity of Kirkness and Nungesser Lakes (Prest 1963). Glacial fluting and striae trend approximately 240 degrees.

METAMORPHISM

With the exception of biotite leucogranite-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 Philp Lake and east of Boughton Lake (P.3174, 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 Philp 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).

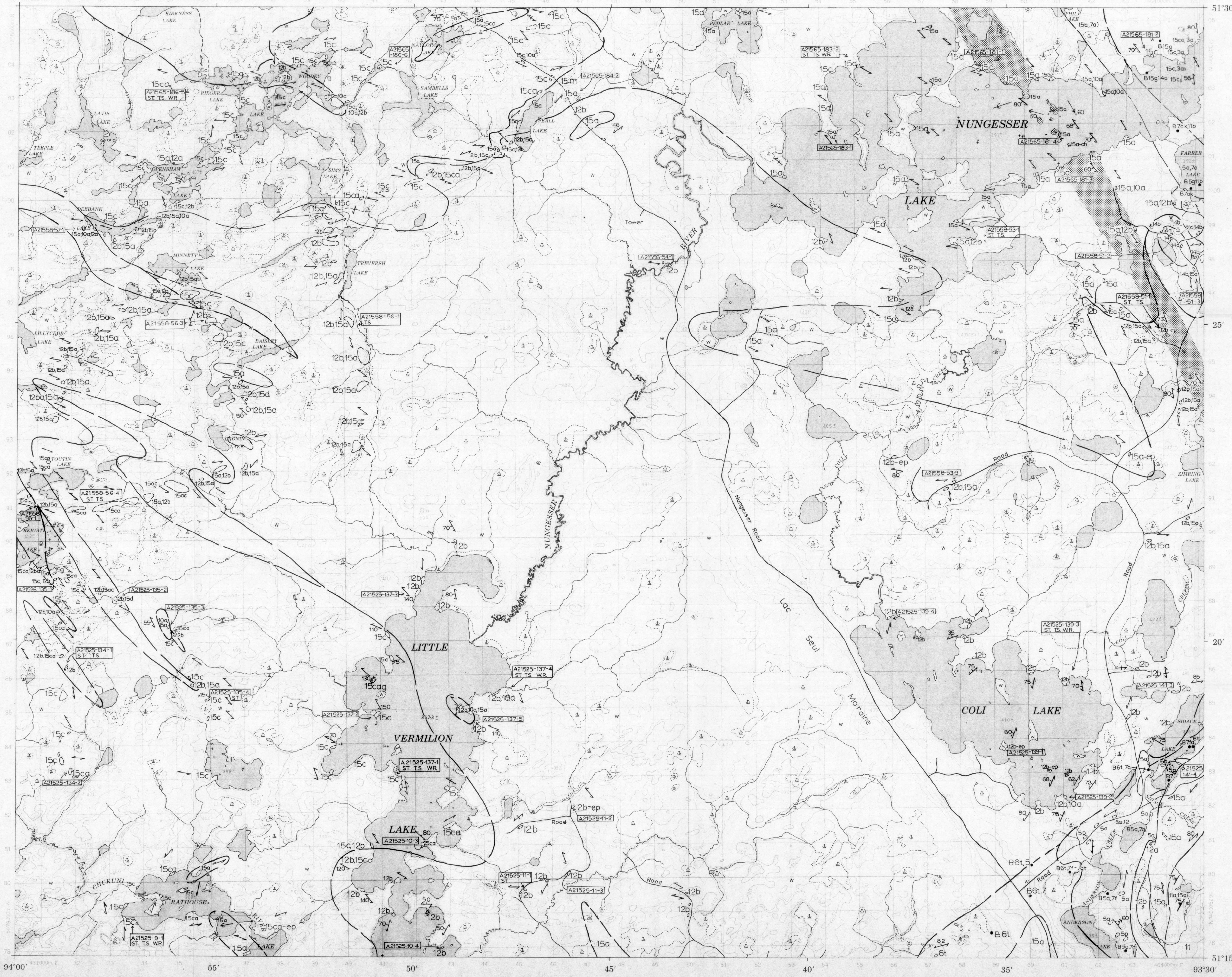
Epidote and chlorite in fractures, small faults and the Nungesser Deformation Zone indicate that late brittle deformation may have occurred under greenschist facies conditions.

STRUCTURE

The structure of the southern Berens River Subprovince is dominated by large, irregular to lobate plutons, 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 northwesterly 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 sheet fractures are found in some lakeshore exposures of leucogranite. Fractures with red alteration zones and epidote and chlorite fillings are common in hornblende tonalite to granodiorite.



Ministry of Northern Development and Mines
Ontario

Mines and Minerals Division
Ontario Geological Survey

MAP P.3175

PRECAMBRIAN GEOLOGY

NUNGESSER RIVER

Scale 1:50 000

1000 m 0 1 2 km

NTS Reference: 52 N/5

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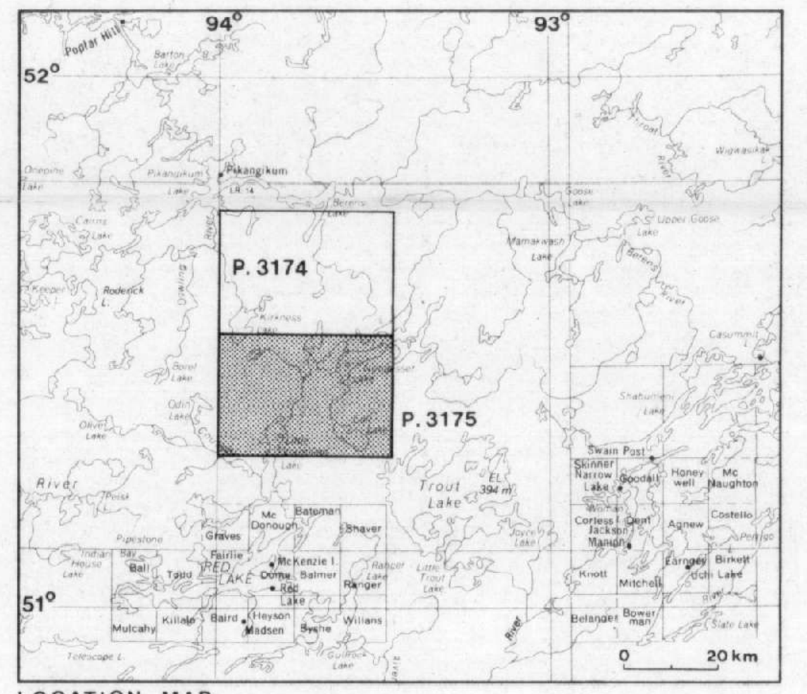

LOCATION MAP

LEGEND[abc]

LATE ARCHEAN

15 Granodiorite to Granite
- 15a Unsubdivided; pink, inequigranular, less than 15% biotite
- 15c K-feldspar megacrystic
- 15d Dikes
- 15g Gneissic
- 15h Hornblende bearing
- 15m Massive red granite
- 15p Pegmatitic

INTRUSIVE CONTACT

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 (salite)

INTRUSIVE CONTACT

MIDDLE TO LATE ARCHEAN

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

INTRUSIVE CONTACT

11 Tonalite to Granodiorite Gneiss
- 11a Felsic to intermediate; grey, less than 15% mafic minerals, short discontinuous layers
- 11b Mafic; dark grey, greater than 15% mafic minerals, pronounced continuous layering

INTRUSIVE CONTACT

10 Mafic to Ultramafic Rocks
- 10a Amphibolite; black, fine to medium grained, foliated, occurs as inclusions
- 10h Hornblendite-amphibolite; black, very course grained, massive

INTRUSIVE CONTACT

7 Metasedimentary Rocks
- 7a Wacke
- 7c Conglomerate
- 7f Iron formation

6 Intermediate to Felsic Metavolcanic Rocks
- 6a Unsubdivided
- 6b Breccia
- 6t Tuff

5 Mafic Metavolcanic Rocks
- 5a Unsubdivided
- 5g Amphibole gneiss
- 5p Pillowed

[a] *This is a field legend and may be changed as a result of subsequent laboratory investigations. Order within map units does not imply geochronological order.*

[b] *Unsubdivided means that the lack of clearly visible features does not allow a more precise classification using the listed modifier codes.*

[c] *The Marginal Notes, Legend, Abbreviations and Symbols are common to the Nungesser River and Kirkness Lake areas. Therefore, individual units, symbols, abbreviations, etc. may not be completely represented on this particular map.*

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MAP SYMBOLS

- Small bedrock outcrop
- Area of bedrock outcrop
- Geological boundary, observed
- Geological boundary, assumed
- Bedding, top unknown; (unknown, inclined, vertical)
- Pillowed 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; cataclasites, mylonites alteration, brecciation
- Glacial striae
- Borehole
- Sample Number; stain, thin section, whole rock chemical analysis, assay

The position of all boundaries and surveyed lines are approximate.

ABBREVIATIONS

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

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.

To enable the rapid dissemination of information, this map has received only a cursory edit. Discrepancies may occur for which the Ontario Geological Survey does not assume liability. Users should verify critical information.

Issued 1990.

Information from this publication may be quoted if credit is given. It is recommended that reference to this map be made in the following form:

Stone, D. and Good D. 1990. Precambrian geology, Nungesser Lake; Ontario Geological Survey, Preliminary Map P.3175, scale 1:50 000.