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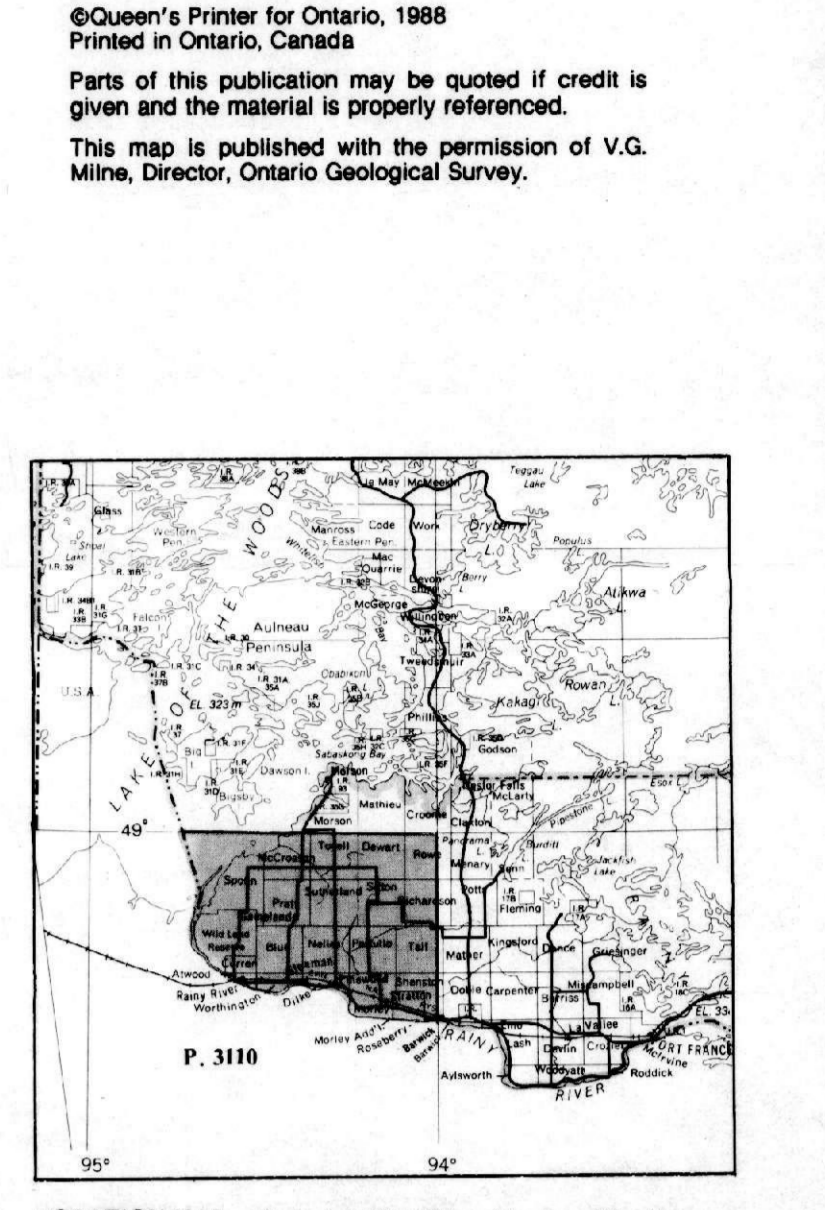
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- LEGEND**
- PHANEROZOIC**  
**QUATERNARY**  
 Pleistocene and Recent  
 Glacial, glacial-fluvial, post, lake and stream deposits
- UNCONFORMITY**
- PRECAMBRIAN**  
**PROTEROZOIC**  
**MAFIC INTRUSIVE ROCKS**  
 6 Unalutidized  
 8a Dabase  
 8b Granophyre
- INTRUSIVE CONTACT**
- ARCHAIC**  
**INTERMEDIATE TO FELSIC INTRUSIVE ROCKS (POSTTECTONIC)**  
 7a Hornblende tonalite  
 7b Quartz diorite  
 7c Potassium feldspar-phryc granodiorite  
 7d Plagioclase-phryc tonalite  
 7e Xenolith bearing hornblende monzonite
- INTRUSIVE CONTACT**
- INTERMEDIATE TO FELSIC INTRUSIVE ROCKS (PRE-TO SYNTECTONIC)**  
 6a Unalutidized  
 6b Granodiorite  
 6c Orthogneiss gneiss  
 6d Tonalite gneiss  
 6e Quartz monzonite  
 6f Quartzite  
 6g Hornblende monzonite  
 6h Pegmatite  
 6i Xenolith bearing gneiss (from intermediate volcanic rocks)  
 6n Tonalite
- INTRUSIVE CONTACT**
- METAMORPHOSED FELSIC TO INTERMEDIATE INTRUSIVE ROCKS**  
 5a Quartz porphyry  
 5b Feldspar porphyry  
 5c Feldite
- INTRUSIVE CONTACT**
- METAMORPHOSED MAFIC INTRUSIVE ROCKS**  
 4a Pyritic gabbro (hornblende phenoxyrite)  
 4b Fine-grained diorite
- INTRUSIVE CONTACT**
- METAVOLCANICS AND METASANDSTONES**  
**METASANDSTONES**  
 3a Unalutidized  
 3b Wacke, arenite (derived from volcanic material)  
 3c Tonalite wacke/arenite  
 3d Gneissose wacke/arenite  
 3e Chloritized siltstone  
 3f Gneissic schist
- METAVOLCANICS**  
**Intermediate to felsic Metavolcanics**  
 2a Unalutidized  
 2b Massive flow  
 2c Spherulitic flow  
 2d Tuff  
 2e Feldspar crystal tuff  
 2f Quartz-feldspar crystal tuff  
 2g Lapilli-tuff  
 2h Tuff breccia  
 2i Pyroclastic breccia  
 2j Pyroclastic (low hornblende) phenoxyrite bearing  
 2k Gneiss bearing  
 2l Schistose  
 2m Amphibolitized  
 2n Gneissose
- Mafic to Intermediate Metavolcanics**  
 1a Unalutidized  
 1b Fine-grained massive flow  
 1c Medium-grained massive flow  
 1d Plagioclase-phryc flow  
 1e Plagioclase-phryc (large phenocrysts) flow  
 1f Spotted mafic flow  
 1g Flow breccia  
 1h Amphibolite flow  
 1i Amphibolite/epidolite  
 1j Mafic tuff breccia  
 1k Mafic tuff breccia  
 1l Autoclastic breccia  
 1m Ultramafic massive flow  
 1n Pyroclastic (low hornblende) phenoxyrite bearing  
 1o Schistose  
 1p Amphibolitized  
 1q Gneissose

**NOTES**

a) This is a field legend and may be changed as a result of subsequent laboratory investigations.

b) The order of the metamorphic and metasedimentary units does not imply relative stratigraphic position.

For map codes with brackets, (a,b,c,d) the first code indicates the recognizable position, while the code in brackets indicates what the rock may be classified as.

**SOURCES OF INFORMATION**

Base map derived from Maps of the National Topographic System, Resident Geographer's Files, Ontario Ministry of Northern Development and Mines, Ontario Geological Survey, 1988.

ODM-GSC Aeromagnetic Maps 11820, 11830, 11740, and 11750.

Ontario Geological Survey, District of Rainy River, Rainy River Off-Lake-Burlington Lake Area, District of Rainy River, Ontario Division of Mines, 1979, scale 1:50,000.

Map 1854-2, by G.L. Fletcher and T.N. Irvine, 1954, scale 1:83,300.

Geologic map not to survey files.

Magnetic declination 6°0'E in 1987.  
 Mean conversion factor 0.3048 m.

**CREDITS**

Geology by W. W. Johns and Assistant, 1987.

Every possible effort has been made to ensure the accuracy of the information presented on this map; however, the Ontario Ministry of Northern Development and Mines does not assume any liability for errors that may occur. Users may wish to verify critical information on file at the Resident Geographer's Office and the Mining Recorder's Office of the District of Rainy River.

This project is part of the Canada-Ontario Mineral Development Agreement (COMDA), which is a subsidiary agreement to the Economic and Regional Development Agreement (ERDA) signed by the Government of Canada and Ontario.

Information from this publication may be quoted if credit is given, as is recommended where reference to the map is made in the following form:

Johns, W.W.  
 1988. Precambrian Geology of the Rainy River Area, District of Rainy River, Ontario Geological Survey, Map P.3110, Geological Series—Preliminary Map, scale 1:50,000. Geological Survey of Canada, Ottawa.

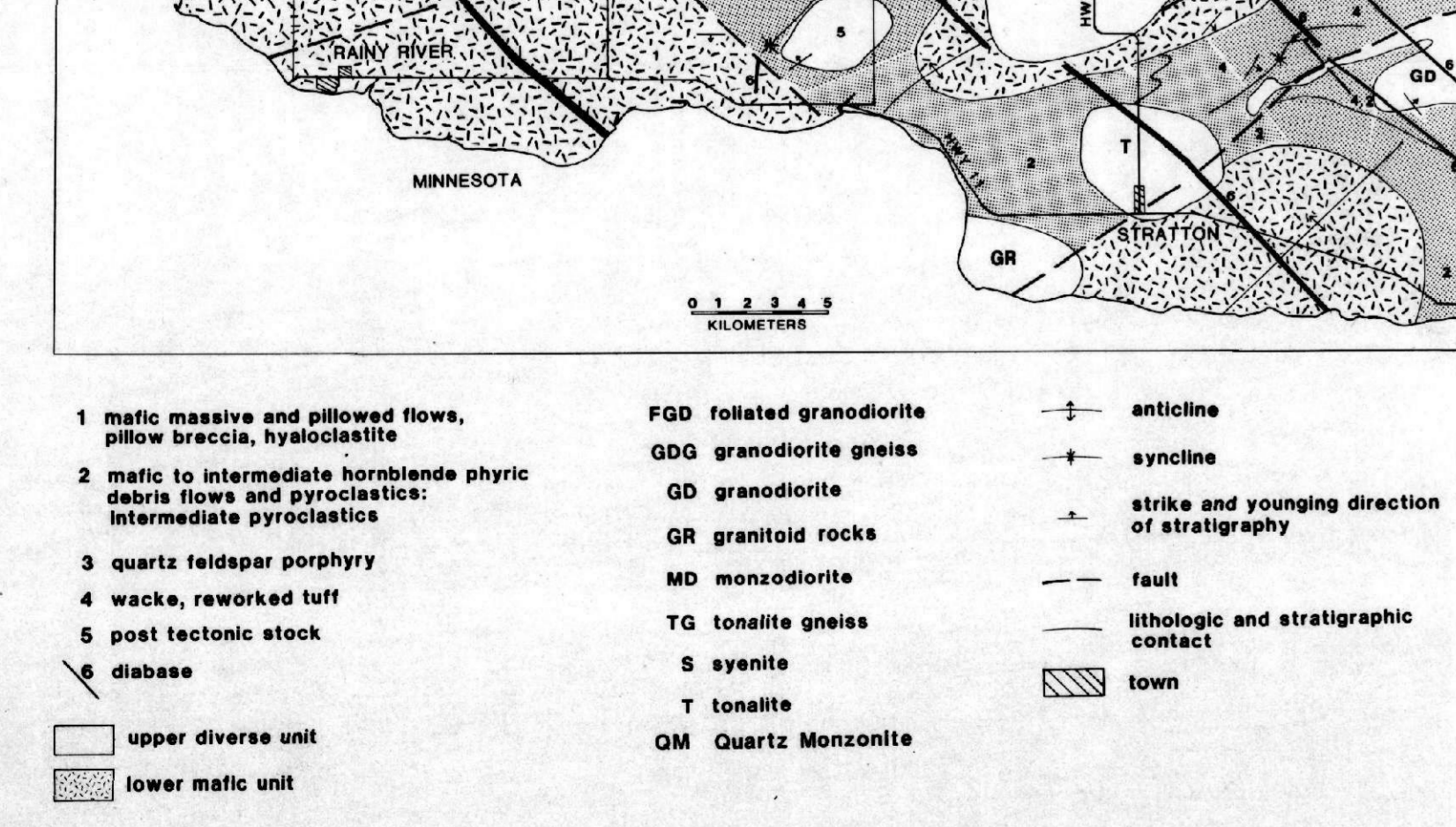
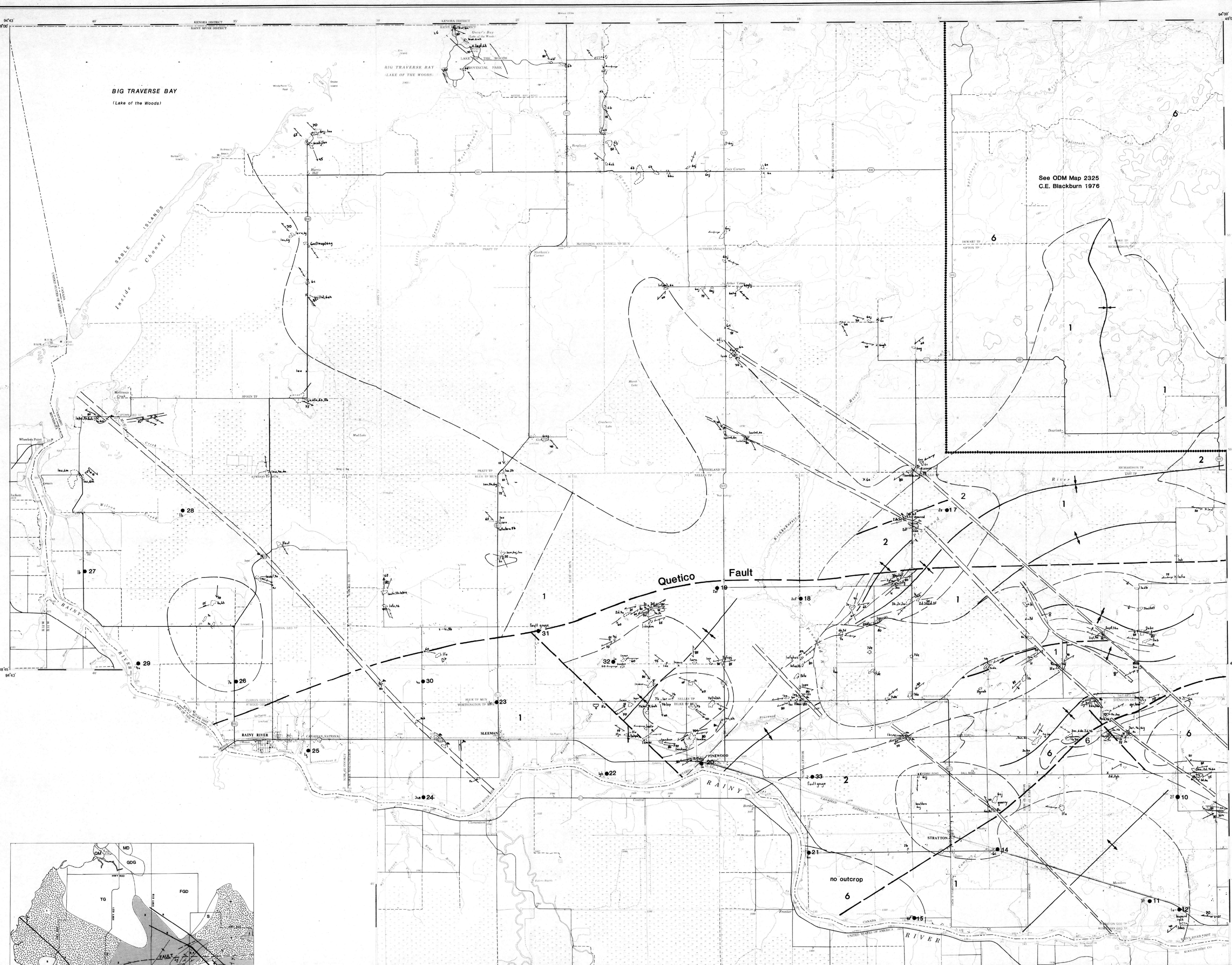


Fig. 1. Geology and stratigraphy of the Rainy River-District of Rainy River.

**INTRODUCTION**

The Rainy River area, once considered to be predominantly covered by Quaternary deposits, has been largely unexamined for mineral potential. A Quaternary geological survey was carried out by A.J. Bass in the summer of 1986 (Bass and Gray 1987) near significant outcrop of Archean supracrustal rocks. A reconnaissance geological survey was completed in this area in June 1987. Not all outcrops were examined by the author and existing data was used to make the interpretation.

The 1700 km<sup>2</sup> area is bounded by the Rainy River to the south, 49°01'N latitude to the north, Lake of the Woods to the west, and 84°02'W longitude to the east. The Town of Rainy River is in the southwestern portion of the area. Detailed access to the map area is provided by a grid network of roads that include provincial Highways 500, 817, 816, and 821, and interconnecting township and concession roads.

Fig. 1. Geology and stratigraphy of the Rainy River-District of Rainy River.

**GENERAL GEOLOGY**

The general geology in the map area was carried out in the northeast-trending by A.C. Lawson (1988). The Eno area to the east and part of the current map sheet were mapped in 1953 by Fletcher and Irvine (1954). C.E. Blackburn mapped the Old Lake-Burlington Lake Area to the northeast including part of the current map area (Blackburn 1976). A. J. Bass completed a Quaternary geological study of the area in 1986 (Bass and Gray 1987).

Known for north-trending Precambrian mafic dikes, the map area is underlain by Archean supracrustal and granitic rocks of the Rainy River area. An extensive mafic dike swarm is located in the Rainy River area. The mafic dike swarm is composed of hornblende monzonite, quartz diorite, and quartz monzonite. The mafic dike swarm is composed of hornblende monzonite, quartz diorite, and quartz monzonite.

Fig. 1. Geology and stratigraphy of the Rainy River-District of Rainy River.

**MINERAL POTENTIAL**

Two grab samples taken by the field party from large massive pyritic boulders found in the "Mafic Massifs" area (see map) were analyzed by the Geochemistry Laboratory, Ontario Geological Survey, Toronto. These samples contained, respectively, 3.20 g/t gold, 140 ppb platinum, 470 ppb palladium, and 1.00 g/t copper.

The site and shape of the massive sulfide boulders sampled includes gneiss, quartz, and iron sulfide (A.C. Lawson, 1988). The massive sulfide boulders are composed of gneiss, quartz, and iron sulfide.

Fig. 1. Geology and stratigraphy of the Rainy River-District of Rainy River.

**STRUCTURAL GEOLOGY**

The general trend of the volcanic rocks is northeast, which is consistent with the trend of the supracrustal rocks in the Old Lake-Burlington Lake Area (Blackburn 1976).

The Quetico Fault is a northeast-trending fault that separates the mafic dike swarm from the Archean supracrustal rocks. The Quetico Fault is a northeast-trending fault that separates the mafic dike swarm from the Archean supracrustal rocks.

Fig. 1. Geology and stratigraphy of the Rainy River-District of Rainy River.

**BASE METALS**

Quaternary maps (1971, p.88) note high base metal values in the mafic volcanic rocks, primarily diorite, quartz monzonite, and quartz monzonite. These mafic volcanic rocks are rich in the elements iron, copper, and nickel. The mafic volcanic rocks are rich in the elements iron, copper, and nickel.

Fig. 1. Geology and stratigraphy of the Rainy River-District of Rainy River.