Manitoba
Energy and Mines
Geological Services

Mineral Deposit Series Report No. 22

Mineral Deposits and Occurrences in the Flintstone Lake Area, NTS 52L/11

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INTRODUCTION

This report and accompanying map are part of a Mineral Deposit Series presenting a uniformly organized and up-to-date collation and analysis of information on mineral occurrences in the Province of Manitoba. The series is intended: (1) to provide explorationists with a geoscientific data base that can be used in mineral exploration; and (2) to provide a technical data base for other government users in resource evaluations, formulation of mineral and land use policies and the initiation of regional development programs.

METHODOLOGY

The documentation program was initiated in the main mining districts of the province under the 1984-1989 Canada-Manitoba Mineral Development Agreement. Compilation of the manuscripts continued under the Canada-Manitoba Partnership Agreement on Mineral Development. Under this project mineral deposit geologists of the Geological Services Branch have attempted to inspect and evaluate each known mineral occurrence. These site visits ranged from a preliminary half day or less search of an area for old workings, to extensive geological mapping of selected occurrences for a week or more. In addition, for each occurrence the geologists have attempted to synthesize available data from published and unpublished sources. The Manitoba Mineral Inventory Card Index and the cancelled Assessment Files have been used extensively in the preparation of the report. Mineral occurrences represented by cancelled assessment file compilation are identified as such under the heading 'Name'. Information for all other occurrences was acquired primarily by field examination supplemented by cancelled assessment file compilation.

Deposit versus Occurrence

Throughout this report mineralization is referred to as a deposit if tonnage and grade figures are known; all other mineralization is referred to as an occurrence.

Massive Sulphide versus Solid Sulphide

The use of 'massive sulphide' in the geological literature is confusing in that it is not always clear whether the authors are referring to a 'massive sulphide deposit' (*cf.* Sangster, 1972) or a section of sulphide-rich rock. In this publication 'massive sulphide' will be used in reference to a deposit type, *i.e.*, a volcanogenic massive sulphide deposit type, rather than the nature of the mineralization. A volcanogenic or sedimentogenic massive sulphide deposit can contain a sulphide lense that locally contains as little as 10% sulphide minerals by volume. The alteration zones that are an integral part of many massive sulphide deposits rarely contain more than 50% sulphide minerals. Consequently, the use of 'solid sulphide' for 75% to 100% and 'near solid sulphide' for 50% to 75% sulphide minerals is adopted in place of the commonly used term 'massive' to describe the textural aspects of a sulphide mineralization.

FORMAT OF MINERAL DEPOSIT MAPS

Location:

One of the incentives spurring the mineral deposit documentation was the absence of accurate location maps for known mineral occurrences. Inaccurate land bases have previously resulted in failure to find old workings, surveys conducted in wrong areas, and even cancellation of intended surveys by explorationists. Consequently, considerable field time has been spent in establishing occurrence locations and attempts have been made to display exact locations both on the map and in the accompanying report.

The location number of the map is a unique reference number that will be used both in the report and the geologists' unpublished data base. Where the volume of occurrence/deposit data within a 1:50 000 NTS map sheet is large enough to be more efficiently presented by dividing the map sheet in half or into quadrants (*cf.* Map MDS87-1, NTS 63K/13 SE) reference numbers will be consecutive only within the individual map sheet.

Deposit Types:

In order to maintain a mineral deposit classification, which will be useful to both explorationists and metallogeneticists, a simplified descriptive classification was selected. This classification is based on the use of common deposit types for the classification of both deposits and occurrences. The classification of mineralization is based on the premise that the mineral explorationist requires information on metals and types of mineralization in an area as well as on the economic deposits (past, present and future producers).

All deposits and occurrences are classified according to the Deposit Type classification in Table 1.

The deposit type displayed on the map represents the mineralization with the greatest economic potential, for example a disseminated narrow chalcopyrite layer is emphasized rather than a much thicker solid pyrite-graphite layer.

Mineralization:

A symbol is used to denote the percentage and/or type of mineralization present. At some localities more than one type of mineralization is present. The type of mineralization displayed in the symbol represents the mineralization with the greatest economic potential as indicated by the deposit type symbol. It should be noted that in the context of this report a "sulphide facies iron formation" is equivalent to a "sulphide stratum". For a discussion of sulphide stratum the reader is referred to Gale *et al.* (1980).

Host Rocks:

In general, this description refers to the immediately underlying and overlying rock types. When several rock types are present in an extensive zone of mineralization, the most common rock types are indicated.

TABLE 1: MINERAL DEPOSIT TYPES

STRATABOUND MASSIVE SULPHIDE TYPE DEPOSITS
- a) Volcanic rock associated
- b) Sedimentary rock associated
- c) Alteration zone associated with a or b

CHEMICAL SEDIMENT TYPE DEPOSITS
- a) Sulphide facies iron formation
- b) Oxide facies iron formation
- c) Carbonate facies iron formation
- d) Silicate facies iron formation
- e) Other chemical sediments

VEIN TYPE DEPOSITS
- a) Single vein
- b) Multiple veins or lenses
- c) Stockwork

MAGMATOGENIC TYPE DEPOSITS ASSOCIATED WITH MAFIC/ULTRAMAFIC ROCKS
- a) Disseminated
- b) Layered
- c) Net textured
- d) Podiform

DEPOSITS WITH PORPHYRY AFFINITIES
PEGMATITE TYPE DEPOSITS
CLASTIC SEDIMENT TYPE DEPOSITS
REPLACEMENT TYPE DEPOSIT
DISSEMINATED MINERALIZATION - NOT CLASSIFIED

Elements:

This description allows for a maximum of three metals present in increasing order of abundance by volume. The precious and base metals are indicated in preference to elements such as iron and carbon.

In some cases it has been more efficient on the map and in the report to make reference to an area of mineralization rather than individual deposits or occurrences. All mineralization in the area delineated by a dotted line on the map is referenced in the report under the location number within that area.

FORMAT OF MINERAL DEPOSIT REPORTS

Location:

Each deposit or occurrence description contains the unique deposit reference number, deposit or claim name where applicable, UTM coordinates, general area description, the reference number of the airphoto on which the deposit can be located and a brief description of method(s) of access.

Exploration Summary:

This section provides a summary of the extent of exploration. Information for this section was compiled from Mineral Inventory Cards, cancelled Assessment Files, and maps and files from the Mining Recording Office.

Geological Setting:

In this section the general geology of a deposit or occurrence is described. The information levels of the descriptions vary considerably and depend largely upon the extent of geological mapping during the documentation project. For further details the reader should consult the references cited.

Mineralization:

A detailed description of the mineralogy, host rocks and mineralization-related alteration provide the readers with the opportunity to make their own evaluation of the significance of a mineral occurrence or deposit.

Geochemical Data:

Most geochemical data included in this report are summarized from assays listed in drill logs submitted to fulfill assessment requirements. In addition, samples collected for geochemical analysis from site visits are described in this section.

Classification:

In this section the geologist may indicate the reasons for the classification appearing on the Mineral Deposit Map. For those localities containing more than one deposit type, the deposit types not shown on the map are documented here.

References:

These include both published and unpublished sources. For published and assessment report information the reader should obtain desired material directly from the source. The mineral deposit geologists will endeavour to supply copies of unpublished material on a deposit by deposit basis. References listed at the end of each occurrence description may also include sources of additional information not directly cited in the text.

ABBREVIATIONS

The following abbreviations are used throughout the occurrence descriptions:

AEM	airborne electromagnetic
A.F.	assessment file(s)
apy	arsenopyrite
DDH	diamond-drill hole(s)
EM	electromagnetic
f.g.	fine grained
g/t	grams per tonne
HLEM	horizontal loop electromagnetic
MAG	magnetic
MDS	Mineral Deposit Series
P.R.	Provincial road
v.g.	visible gold
VLF-EM	very low frequency electromagnetic

ACKNOWLEDGMENTS

B. Lenton and M. Pacey drafted the figures using Autocad software; E. Truman supervised drafting of the map that accompanies this report. S. Henrie prepared the printer-ready copy with desktop publishing software. R.G. Gaba and P. Theyer carried out field examinations of most of the occurrences. G.H. Gale and W.D. M^{c}Ritchie provided technical review; K.J. Ferreira edited the manuscript.

NOTE: This mineral deposit report and the accompanying map are intended to be active documents that can be updated as new information becomes available. Although revisions of the publication are anticipated, any additional unpublished information may be obtained by contacting the author or the Director, Geological Services Branch.

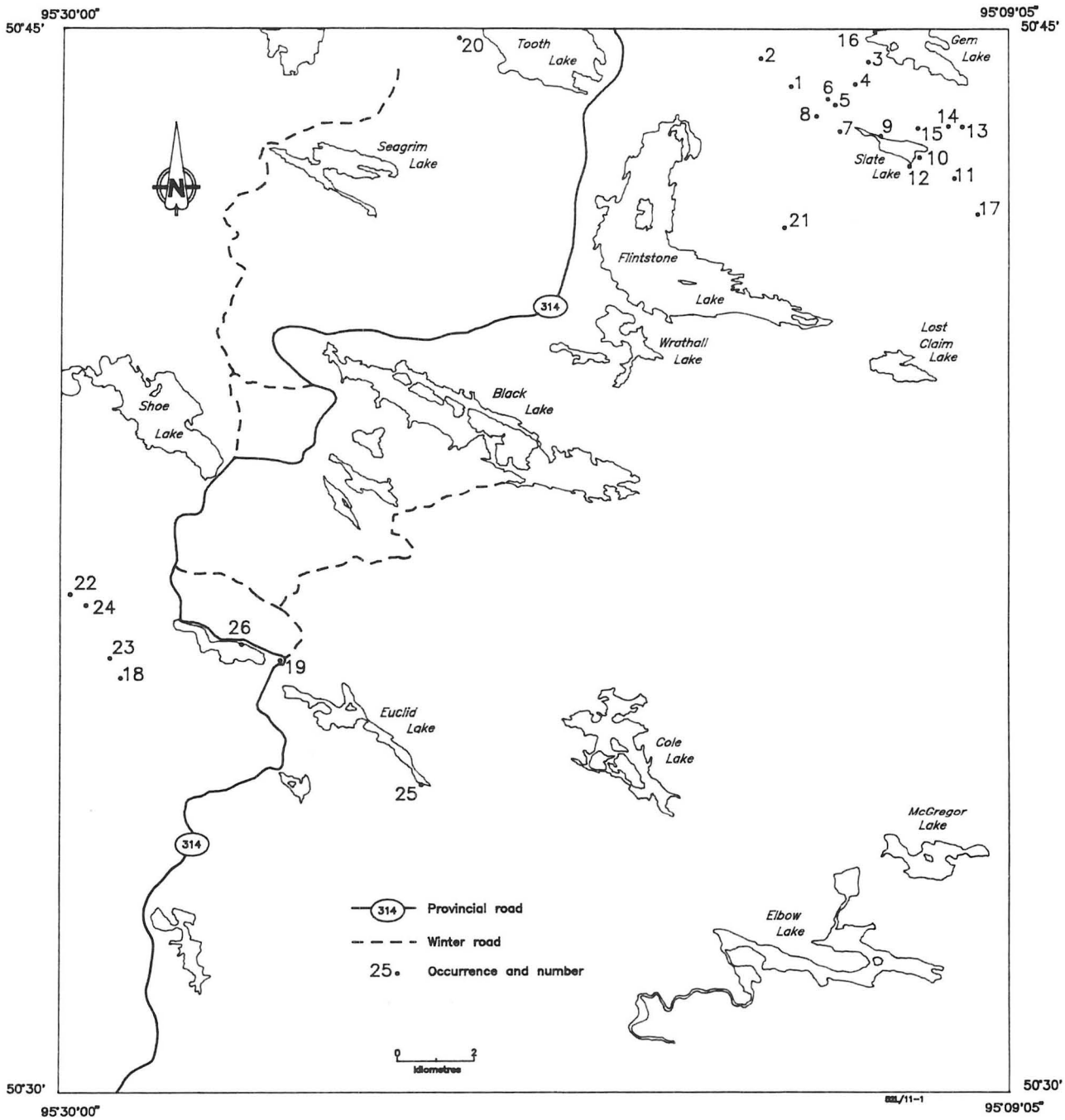

Figure 1: Location of mineral deposits and occurrences (NTS 52L/11).

GEOLOGY OF NTS AREA 52L/11

The geological base for mineral deposit map sheet NTS 52L/11 is compiled from several geological maps:

1. Geology of the Wanipigow River-Manigotagan River region, 1:63 360 scale by Weber (1971a);
2. Geology of the Wanipigow-Winnipeg Rivers region, SE Manitoba, 1:253 440 scale by M^{c}Ritchie (1971a);
3. Flintstone Lake, 1:31 680 scale by M^{c}Ritchie and Weber (1971); and
4. Pointe du Bois, NTS 52/L, 1:250 000 scale by Manitoba Energy and Mines (1987).

The map area is underlain by supracrustal and intrusive rocks of the northern Uchi and the southern English River tectonostratigraphic domains (Wilson and Brisbin, 1962) of the Archean Superior Structural Province of southeast Manitoba.

According to M^{c}Ritchie (1971b), the following tectonic units underlie the area of this map sheet from north to south:

1. Rice Lake greenstone belt,
2. Manigotagan gneissic belt,
3. Pine Falls plutonic complex, comprising the Maskwa Lake batholith and the Black River igneous rock suite, and
4. Bird River greenstone belt.

East-southeast-trending supracrustal rocks of the Rice Lake greenstone belt that underlie the northeastern part of the map area are separated from the Manigotagan gneissic belt to the south by the northwest-striking Manigotagan Fault. The Pine Falls plutonic complex is separated from the genetically related Maskwa Lake pluton to the south by a wedge of northwest-striking supracrustal rocks thought to be part of the Bird River greenstone belt.

The supracrustal rocks of the Rice Lake greenstone belt comprise dominantly volcanic rocks of the Rice Lake Group, overlain by sedimentary rocks of the San Antonio Formation and intruded by the Ross River Pluton and felsic and mafic dykes. The lower part of the Rice Lake Group is subdivided into the Bidou Lake and the Gem Lake subgroups comprising volcanic and derived sedimentary rocks (Campbell, 1971; Weber, 1971b). Both subgroups are overlain by sedimentary rocks of the Edmunds Lake Formation, the youngest formation of the Rice Lake Group (Campbell, 1971). The majority of the Rice Lake greenstone belt is metamorphosed to greenschist facies. Lower amphibolite facies assemblages in the vicinity of the Manigotagan gneiss belt are thought to result from regional metamorphism (M^{c}Ritchie and Weber, 1971). A regional east-southeast structural trend is defined by the Manigotagan Fault on the southern flank of the Rice Lake greenstone belt. According to Weber (1971b), there are three styles of folds in the Rice Lake greenstone belt: large scale isoclinal folds, large and small scale similar folds, and large and small scale symmetrical folds. Rocks of the Rice Lake Group are steeply inclined to near vertical and have a east- to southeast-trending regional foliation.

South and southwest of the Rice Lake greenstone belt, the Manigotagan gneissic belt consists of arenaceous greywacke, quartzite, sandstone and minor shale layers (M^{c}Ritchie, 1971). A lithologic and metamorphic gradation is evident from low grade metasedimentary rocks in the north to high grade migmatites and paragneisses in the south. A complex history of faulting and folding that included four periods of folding followed by development of at least two phases of extensive west- northwest- striking fractures has been established in the Manigotagan gneissic belt. Campbell (1971) correlated the paragneisses of the Manigotagan gneissic belt with the Edmunds Lake Formation of the Rice Lake greenstone belt. Trueman *et al.* (1975) correlated the Flanders Lake Formation of the Bird River greenstone belt with paragneisses of the Manigotagan gneissic belt, implying that the Edmunds Lake Formation (Rice Lake greenstone belt) and the Flanders Lake Formation (Bird River greenstone belt) are equivalent.

The Pine Falls plutonic complex comprises the Black River igneous suite and the Maskwa Lake pluton. The Black River suite is a highly variable rock unit that occurs as a pluton and as 10 to 100 m thick sills, which locally underwent anatexis and re-intrusion into paragneiss and migmatites of the Manigotagan gneissic belt (M^{c}Ritchie, 1971). The Maskwa Lake pluton is a highly heterogeneous batholith that contains quartz monzonitic, granodioritic, granitic and xenolith-contaminated phases in the Cat Lake region. Igneous and supracrustal rocks in the Cat Lake-Euclid Lake area, including peridotite, pyroxenite, gabbro and basalt, are thought to be part of the Bird River greenstone belt that intruded the northeastern flank of an east-plunging anticline.

Mineral deposits and occurrences located within NTS area 52L/11 include:

a) Gold-bearing vein type deposit (*e.g.*, Location 17, Diana Mine)
b) Magmatogenic chromite deposit (*e.g.*, Location 25)
c) Magmatogenic Ni-Cu deposit (*e.g.*, Location 23, New Manitoba)
d) Lithium, beryllium and cesium deposits in granitic pegmatites (*e.g.*, Location 26).

Gold vein type deposits occur in supracrustal rocks of the Rice Lake greenstone belt located in the northeastern quadrant of the map. The principal deposit is the Diana Mine (Location 17) where gold-bearing quartz veins are hosted by layer-parallel shears in pillowed basalt, mafic tuff, gabbro and quartzitic sedimentary layers.

Abundant visible gold in light- to dark-grey chert-looking quartz veins, hosted by detrital rocks, was observed in the Lily Lake area (Location 1) (Theyer and Gaba, 1986) and at Location 2 (Theyer, 1987). Light- to

dark-grey quartz veins are common in the pyroclastic and detrital rocks between Gem, Slate and Finger lakes, but gold appears to be restricted to specific quartz veins in the area south and northwest of Lily Lake.

Chromite occurs disseminated and in densely mineralized layers in peridotite underlying a low graben-type structure southeast of Euclid Lake (Location 25) (Bannatyne and Trueman, 1982).

Base metal deposits occur in rocks of the Bird River sill, a mafic to ultramafic rock sequence that intrudes rocks of the Bird River greenstone belt. The most notable of these is the New Manitoba (Location 27), a Ni-Cu deposit in a gabbro outlier of the Bird River sill (Davies *et al.*, 1962).

Lithium, beryllium and cesium have been reported in a pegmatite group centred in the vicinity of Cat Lake (Location 26) (Cerny *et al.*, 1981).

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MINERAL DEPOSITS AND OCCURRENCES: FLINTSTONE LAKE AREA (NTS 52L/11)

LOCATION: 1

NAME: Beaver Gold (Lily Lake)

UTM: 5622708N/342472E

ACCESS: Via boat, portaging from Gem Lake to Banksian Lake and then to Lily Lake via the Manigotagan River. Shallow water and abundant water-borne vegetation may be hazardous to float planes attempting to take off or land on Lily Lake.

AREA: South of Lily Lake (Fig. 1-1)

AIRPHOTO: AS85054-61

EXPLORATION SUMMARY:

A review of the exploration history is given in Mineral Inventory Card 52L/11 Au2.

The area of this occurrence was first staked prior to 1927 and was restaked in 1927, 1934 and 1936. From 1948 to 1951 approximately 191 m^3 of rock samples were extracted from test pits (Mineral Inventory Card 52L/11 Au2). Russell (1952) mapped the geology and described the occurrence. The area was restaked in 1954 and test pits were excavated by L. Helgason (Mineral Inventory Card 52L/11 Au2). In 1959 Starbird Mines Limited conducted geological mapping (1:4 800) and a MAG survey (A.F. 91322). An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey were flown under contract for the Cerro Mining Corporation of Canada in 1971 (A.F. 91687). International Mine Services prospected the property in 1985. The area was mapped and sampled by staff of Manitoba Energy and Mines (Theyer and Gaba, 1986; Theyer, 1987) and the regional geological setting was investigated by Weber (1987). The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

Gold-bearing quartz veins are hosted by feldspathic wacke, interbedded siltstone and wacke, oxide facies iron formation and polymictic conglomerate of the Edmunds Lake Formation (Fig. 1-2; Weber, 1971; Theyer and Gaba, 1986; Gaba, 1987).

Grey to greyish white, cherty to glassy, erratically distributed quartz veins generally less than 5 cm thick are concordant to fold crests, troughs or limbs and slightly discordant to the strike of the foliation of the feldspathic wacke. In the immediate vicinity of the quartz veins, the feldspathic wacke is characterized by a 1 to 3 cm thick, bleached alteration rim. Feldspathic grit and ankerite are common accessories of the mineralized veins.

Theyer (1987) distinguished two types of quartz veins in the area of Gem, Banksian and Lily lakes:

a) younger, white, generally thick (0.2-2 m), non-mineralized quartz veins more than several metres long, and

b) light to dark grey, very fine grained, cherty, generally deformed quartz veins commonly mineralized with sulphides and preferentially located in wackes and related rocks of sedimentary origin. Theyer (1987) reported that analyses of wacke and arkose that contain Au-bearing quartz veins, from the area south of Lily Lake and from an outcrop north of Lily Lake, suggest that gold is concentrated within grey quartz veins.

Weber (1987) observed that the mineralized quartz veins south of Lily Lake appear to be locally restricted. They appear to be associated with a northwesterly trending mylonite zone and are not associated with an extensively developed system of white quartz veins that are barren of sulphides.

Pits and trenches in the Lily Lake area are concentrated on five discrete zones (Fig. 1-2):

Zone 1a, located approximately 10 m south of central Lily Lake (Fig. 1-2, 1-3), was investigated with five trenches (4 x 4 x 1.5 m; 4 x 1 x 0.4 m; 1 x 1 x 0.5 m; 1 x 0.75 x 0.5 m; 4 x 2 x 1.25 m). The trenches expose tightly folded feldspathic wacke to siltstone of the Edmunds Lake Formation that hosts glassy, whitish-grey to blue quartz veins several metres long. Alteration in the vicinity of the quartz veins is shown by the presence of ankerite, sericite, chlorite and minor quantities of pyrite and arsenopyrite. **Zone 1b**, located approximately 50 m south of central Lily Lake (Fig. 1-2, 1-4), was investigated with seven trenches (2.5 x 2 x 1 m; 5.5 x 3.5 x 3 m; 2.5 x 1.75 x 1 m; 3.5 x 1 x 1 m; 1.75 x 1.75 x 0.5 m; 1 x 1 x 0.4 m; 1 x 1 x 0.5 m). Brecciated glassy grey to bluish-grey quartz veins and lenses containing ankerite, sericite and K-feldspar are hosted by feldspathic wacke interlayered with siltstone. The veins are parallel and subparallel to the foliation of the host rock. **Zone 2**, located approximately 0.3 km southeast of Lily Lake (Fig. 1-2), was investigated with seven trenches (4 x 2 x 1.5 m; 2 x 1 x 1 m; 2 x 1 x 1 m; 3 x 1 x 1 m; 2 x 1 x 2 m; 1 x 0.5 x 0.2 m; 3 x 1 x 0.2 m). Discontinuous, milky to grey-blue, glassy to sugary quartz veins are hosted by foliated, interlayered feldspathic wacke and siltstone of the Edmunds Lake Formation. The quartz veins contain sericite and minor amounts of ankerite. **Zone 3,** located approximately 0.35 km southeast of Lily Lake (Fig. 1-2),

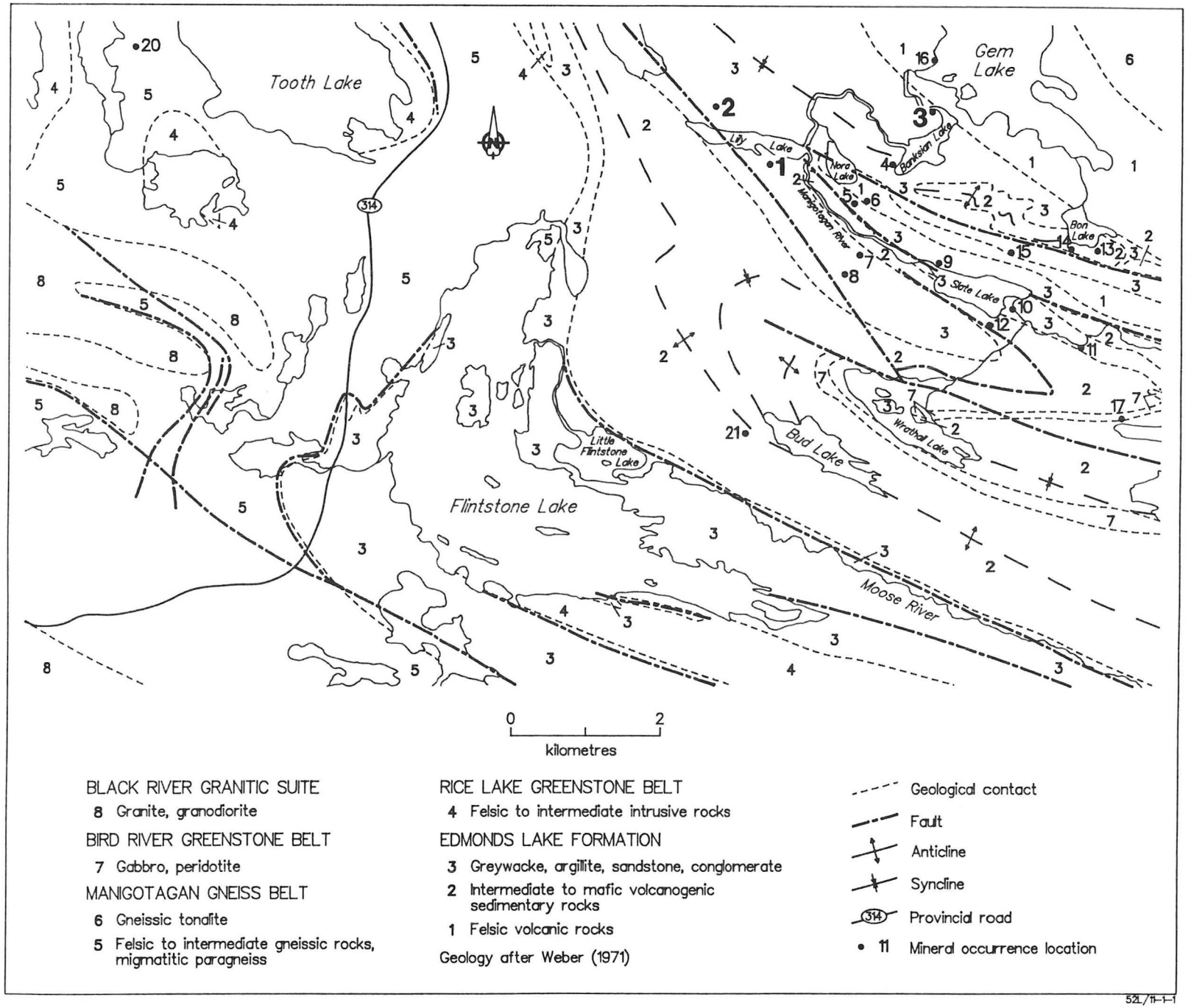

Figure 1-1: Geological setting of occurrences 1 (Beaver Gold), 2 and 3.

was investigated with five trenches (1.5 x 1 x 0.5 m; 2 x 1.5 x 0.5 m; 1.5 x 1 x 1.5 m; 2 x 1 x 1.5 m; 2 x 0.5 x 1 m). Discontinuous grey, cherty-looking quartz veins and pods with sharp to slightly diffuse contacts are hosted by well foliated feldspathic wacke of the Edmunds Lake Formation. The quartz veins are generally oriented 10° to 15° to the strike of the foliation. **Zone 4**, located approximately 0.45 km southeast of Lily Lake (Fig. 1-2), was investigated with one trench (1 x 1 x 0.2 m). Grey, glassy quartz veins are in sharp contact with feldspathic wacke of the Edmunds Lake Formation. **Zone 5**, located approximately 0.55 km southeast of Lily Lake (Fig. 1-2), consists of shallowly pitted outcrops. Foliated and drag-folded feldspathic wacke of the Edmunds Lake Formation hosts grey glassy quartz veins up to 20 cm thick and 10 m long. *En echelon* tension gashes occupied by grey quartz are abundant.

MINERALIZATION:

Zone 1a is characterized by minor concentrations of arsenopyrite in feldspathic wacke adjacent to quartz veins that are barren of sulphides. Zone 1b is characterized by approximately 1% disseminated pyrite associated with flakes and blebs of native gold concentrated in minute fractures. The host rock in the immediate vicinity of the veins contains 5 to 20% arsenopyrite.

Zone 2 is characterized by 1 to 3% disseminated pyrite in quartz veins and approximately 1 to 3% arsenopyrite in the host rock in the vicinity of the quartz veins.

Zone 3 is characterized by quartz veins containing up to 10% arsenopyrite, 3% pyrite, 2% galena, 1% sphalerite and traces of native gold. The host rock in the vicinity of the quartz veins contains up to 40% arsenopyrite and 2% pyrite.

Zone 4 is characterized by quartz veins containing up to 3% arsenopyrite and traces of pyrite. The wall rocks straddling quartz veins contain up to 20% arsenopyrite and traces of visible gold.

Zone 5 is characterized by quartz veins containing up to 5% arsenopyrite and 2% pyrite. The wall rock in the immediate vicinity of the quartz veins contains up to 3% arsenopyrite and 1% pyrite.

GEOCHEMICAL DATA:

Table 1-1 lists Au assay results of the samples collected in the Lily Lake area.

CLASSIFICATION:

Vein type deposit; multiple veins and lenses.

Table 1-1: Gold analyses of rock samples from occurrence 1

Location (Zone)	Sample	Type	Au assay (ppb)
1a	B 100	chip, 1 m long	1130
1a	B 101	chip, 1 m long	390
1a	B 102	chip, 1 m long	290
1a	B 103	chip, 1 m long	760
1b	B 104	chip, 10 cm long	4570
1b	B 105	grab	590
2	B 106	grab (v.g.)	36.6 g/t
2	B 107	grab	570
2	B 108	grab	350
3	B 109	chip, 1 m long	16.5 g/t
3	B 110	chip, 1 m long	1070
3	B 111	chip, 1 m long	5050
3	B 112	chip, 1 m long	1170
3	B 113	chip, 1 m long	3700
3	B 114	chip, 1 m long	416
3	B 115	chip, 1 m long	10
3	B 116	chip, 1 m long	75
4	B 117	grab	4250
4	B 118	grab	290
5	B 119	chip, 1 m long	550
5	B 120	chip, 1 m long	1350
5	B 121	chip, 1 m long	102
5	B 122	chip, 1 m long	24

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Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

Weber, W.

1987: Geological investigations in the Lily Lake area; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 108-109.

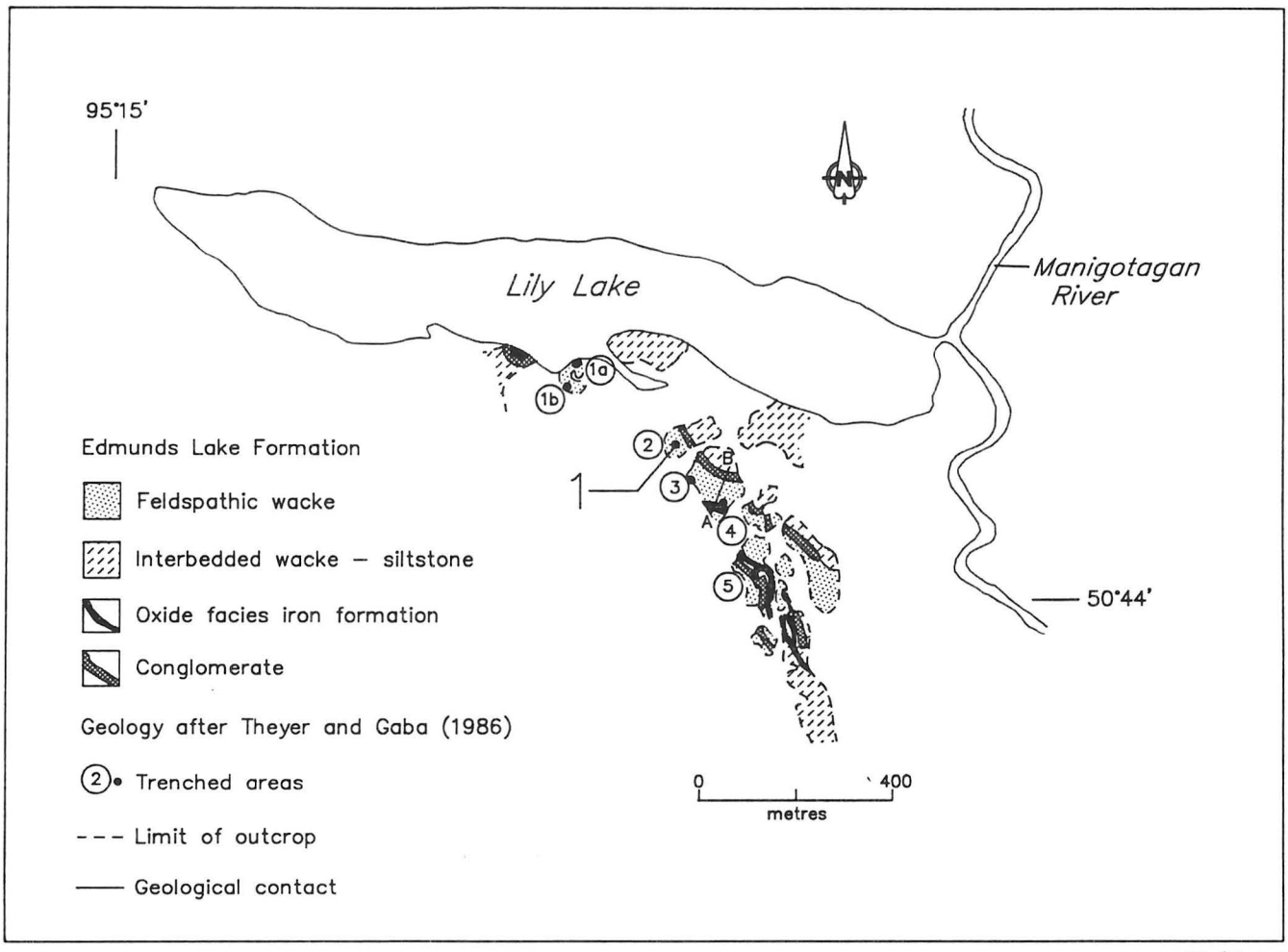


Figure 1-2: Detailed geology at occurrence 1 (Beaver Gold).

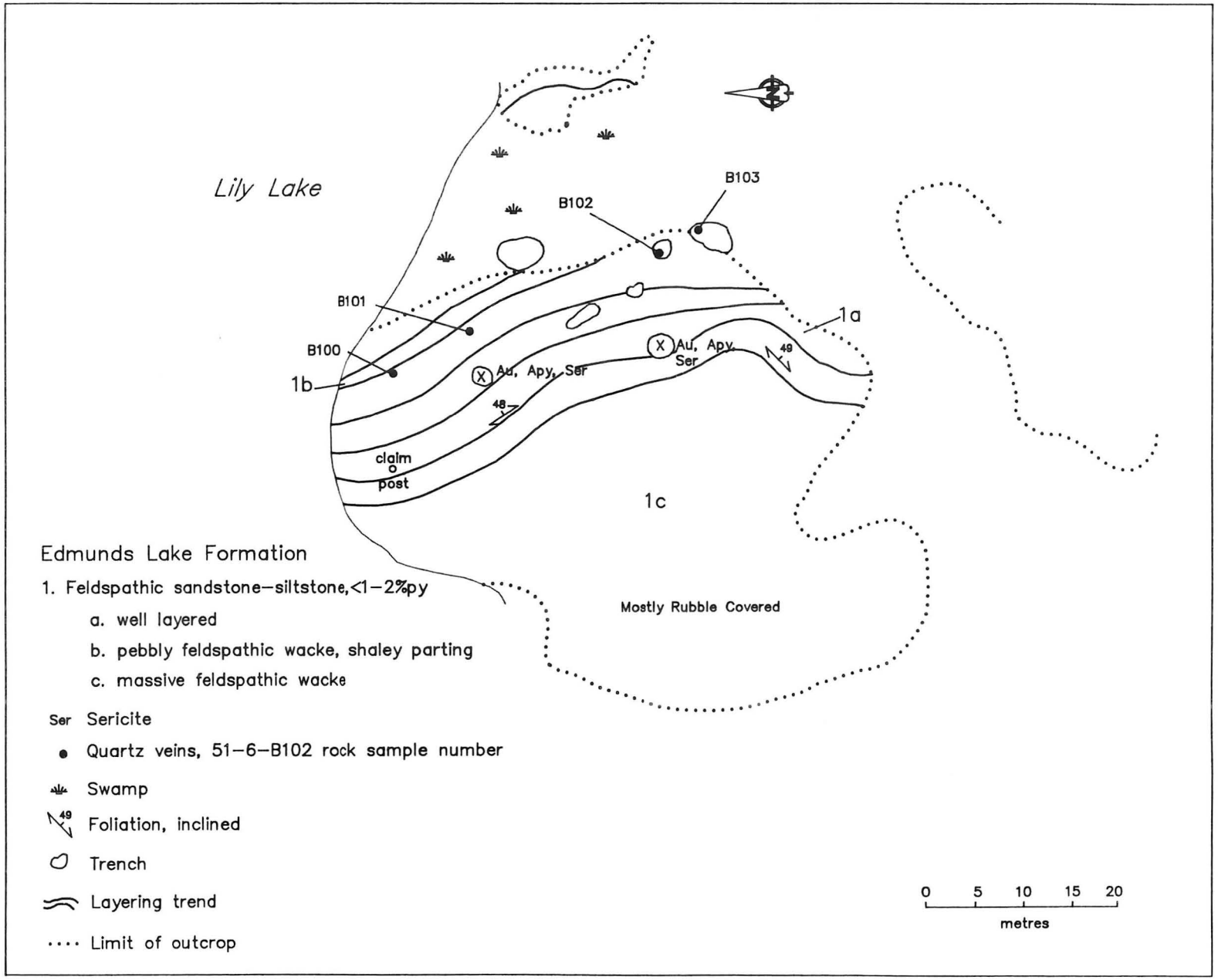


Figure 1-3: Geology and location of trenches at Zone 1a of occurrence 1 (Beaver Gold).

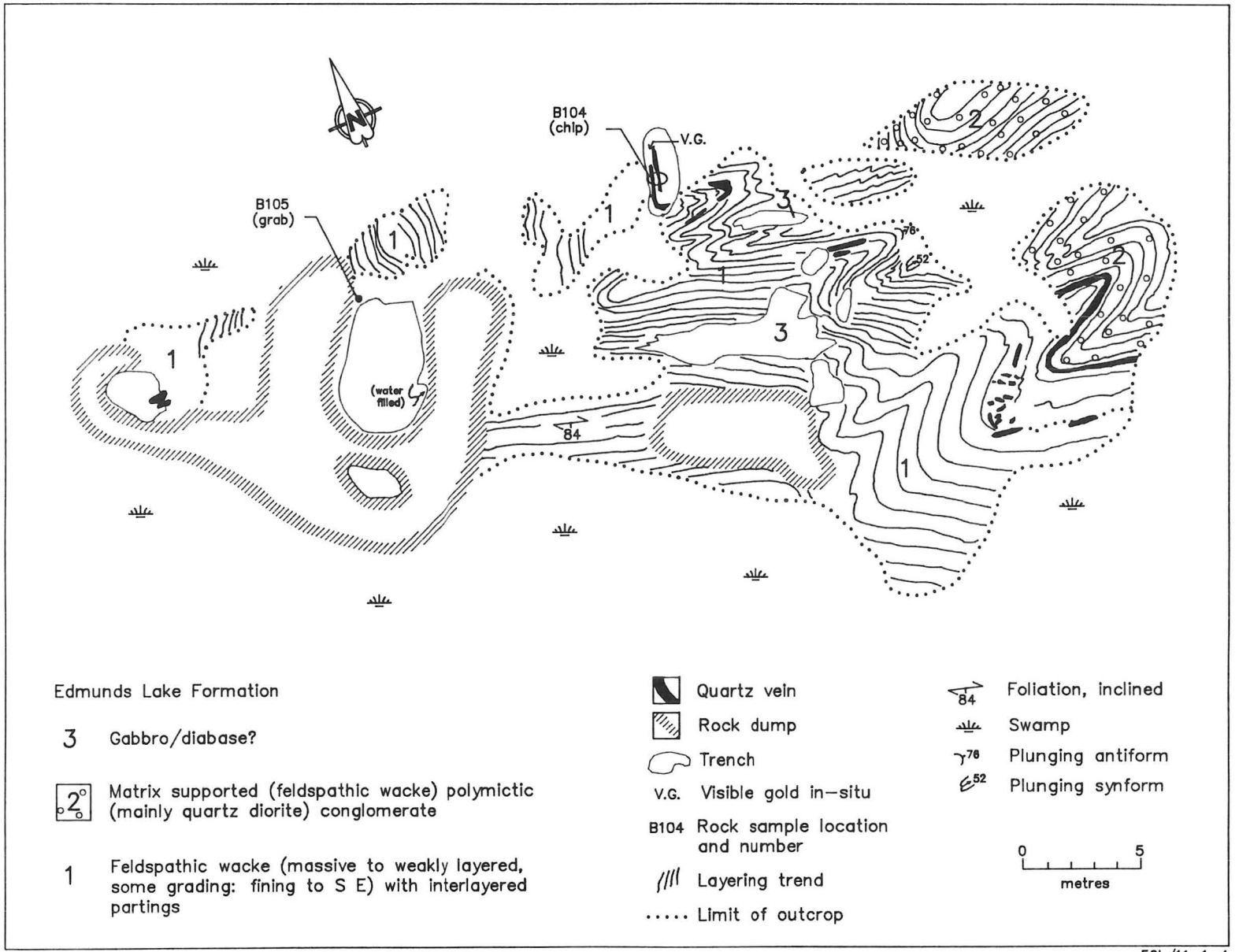


Figure 1-4: Geology and location of trenches at Zone 1b of occurrence 1 (Beaver Gold).

LOCATION: 2

NAME:

UTM: 5623475N/341717E

ACCESS: From Gem Lake portage to Banksian Lake and thence to Lily Lake via the Manigotagan River. Shallow water and abundant waterborne vegetation may be hazardous to float planes attempting to take off or land on Lily Lake.

AREA: Southwest of Gem Lake; approximately 1 km north of Lily Lake (Fig. 1-1)

AIRPHOTO: AS85054-61

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for the Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Geological mapping (1:2 500), rock sampling and a MAG and VLF-EM survey of the area of Gem Lake, Banksian and Lily lakes were undertaken by OreQuest Consultants Limited on behalf of Tarron Resources Limited in 1986 (A.F. 93110). The area is open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by intensely shear-folded and altered arkose and greywacke, interbedded with green to grey siltstone of the Edmunds Lake Formation (Fig. 1-1; Weber, 1971). The rock sequence hosts 1 cm to 1 m thick, discontinuous, grey to blue quartz veins. The wall rocks of the quartz veins are characterized by alteration zones several metres thick that consist of bleached and silicified rock layers with fractures mineralized with abundant tourmaline (Theyer, 1987).

MINERALIZATION:

Quartz veins contain 1 to 5% arsenopyrite.

GEOCHEMICAL DATA:

Table 2-1 lists Au and As assay results from the samples collected in the northwestern Lily Lake area. Rock samples of discrete and discontinuous quartz veins located north of Lily Lake collected in 1985 on behalf of OreQuest Limited contained 240 ppb to 42 130 ppb Au (A.F. 93110).

Table 2-1: Concentrations of Au and As in chip samples of quartz veins, northwestern Lily Lake area

Sample number	As (ppm)	Au (ppb)
18	1400	84
19	1304	380
20	7936	1050
21	4995	122
22	65	6
23	1179	21
24	1333	7
25	2635	45

CLASSIFICATION:

Vein type deposit; multiple veins and lenses.

REFERENCES:

Assessment Files 91677, 91687, 93110; Manitoba Energy and Mines, Mines Branch.

Theyer, P.
1987: Mineral deposit investigations in the Rice Lake greenstone belt; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, p. 113-114.

Weber, W.
1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

LOCATION: 3

NAME:

UTM: 5623300N/344552E

ACCESS: Via boat from Gem Lake and portage to Banksian Lake.

AREA: Adjacent to Banksian Lake (Fig. 1-1)

AIRPHOTO: AS85055-113

EXPLORATION SUMMARY:

Six trenches (4 x 4 x 0.5 m; 2 x 2 x 0.5 m; 1.5 x 1.5 x 0.5 m; 3 x 0.5 x 0.25 m; 1.5 x 1 x 0.25 m; 3 x 3 x 1 m) were observed in this area. An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for the Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by shear-folded conglomeratic sandstone and siltstone of the Edmunds Lake Formation (Fig. 1-1; Weber, 1971). Glassy, grey to black quartz veins that pinch and swell extend for a few metres to more than 150 m along strike, occupy fold-related dilational zones, and have sharp contacts with the host rock.

MINERALIZATION:

One to 5% disseminated pyrite, minor pyrrhotite and up to 2% arsenopyrite are concentrated at the margins of quartz veins.

GEOCHEMICAL DATA:

Russell (1952) stated that rock samples from pits at Banksian Lake returned "positive gold values". Three grab samples, collected from quartz veins containing minor pyrrhotite, arsenopyrite and up to 2% pyrite contained 9 ppb, 15 ppb and 18 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins and lenses.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Russell, G.A.

1952: Geology of the Lily Lake-Kickley Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 50-3, 17p.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

LOCATION: 4

NAME:
UTM: 5622705N/344156E
ACCESS: By boat from Gem Lake to Banksian Lake

AREA: Adjacent to southwestern Banksian Lake (Fig. 4-1)
AIRPHOTO: AS85055-70

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Three trenches (10 x 2 x 1 m; 1 x 1 x 0.5 m; 2 x 1 x 1 m; Fig. 4-2) were located in this area in 1986. Geological mapping (1:2 500), rock sampling, and a MAG and VLF-EM survey of the area of Gem Lake, Banksian and Lily lakes were undertaken by OreQuest Consultants Limited on behalf of Tarron Resources Limited in 1986 (A.F. 93110). The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by foliated feldspathic wacke, interlayered with cherty siltstone and siltstone of the Edmunds Lake Formation (Fig. 4-1; Weber, 1971). These rocks host a southeast-striking, discontinuously exposed, grey, glassy quartz vein approximately 140 m long and up to 2 m thick (Fig. 4-2).

MINERALIZATION:

Russell (1952) reported that pits near Banksian Lake "returned positive gold values". Theyer and Gaba (1986) described gold-bearing quartz veins adjacent to Banksian Lake. Up to 5% pyrite occurs in the wall rock adjacent to the quartz vein. Minor disseminated pyrite and arsenopyrite occur in the vein quartz.

GEOCHEMICAL DATA:

A grab sample from the wall rock of the northern trench (Fig. 4-2) with up to 5% pyrite contained 1130 ppb Au. A grab sample of the quartz vein from the southern trench contained 450 ppb Au. Rock samples collected from the southern trench by OreQuest Consultants Limited contained 10 to 1330 ppb Au (A.F. 93110).

CLASSIFICATION:

Vein type deposit; single quartz vein.

REFERENCES:

Assessment Files 91677, 91687, 93110; Manitoba Energy and Mines, Mines Branch.

Russell, G.A.
1952: Geology of the Lily Lake-Kickley Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 50-3, 17p.

Theyer, P. and Gaba, R. G.
1986: Mineral deposit investigations in the Rice Lake greenstone belt; **in** Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 120-124.

Weber, W.
1971: Geology of the Long Lake-Gem Lake area; **in** Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

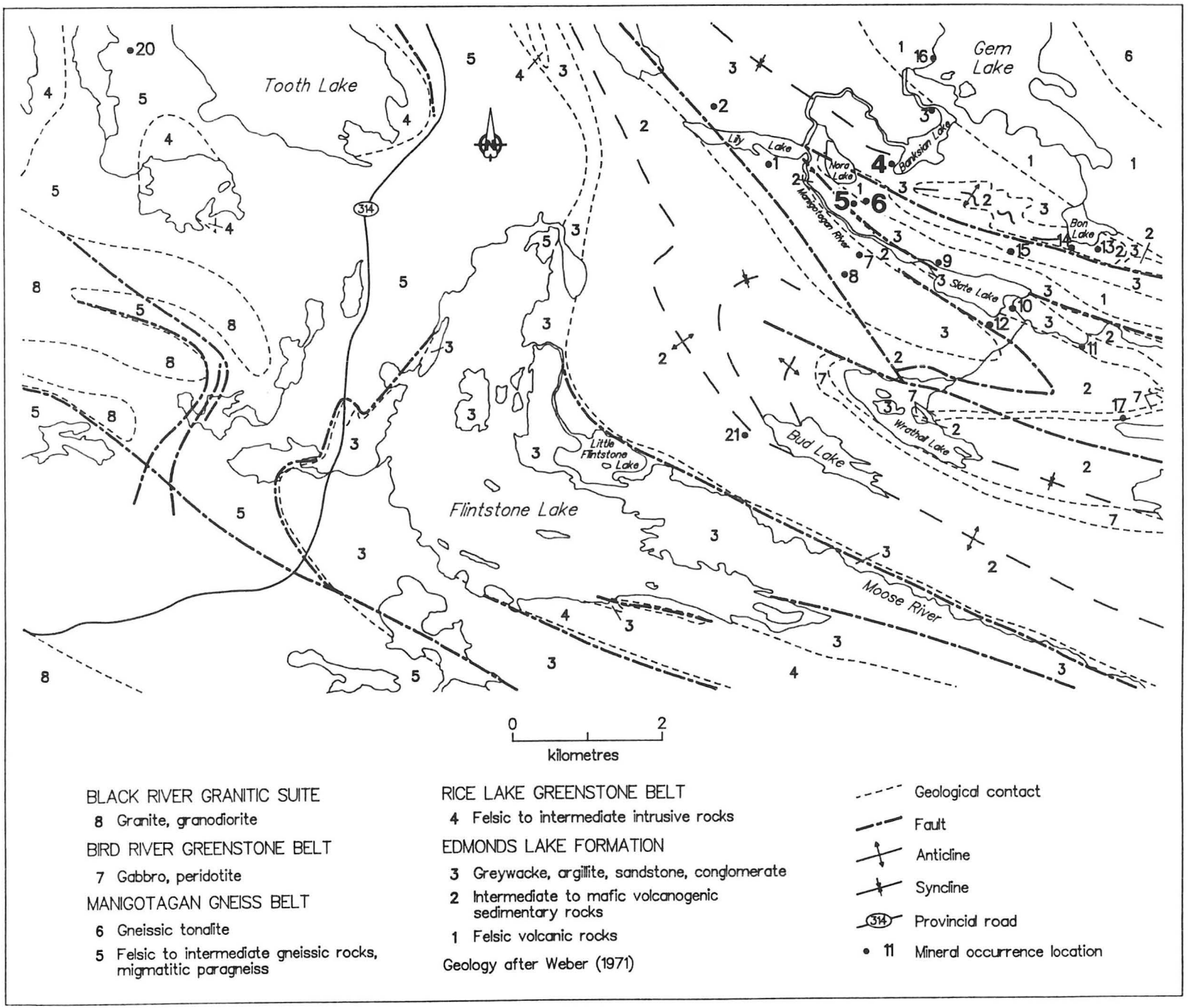


Figure 4-1: Geological setting of occurrences 4, 5 and 6.

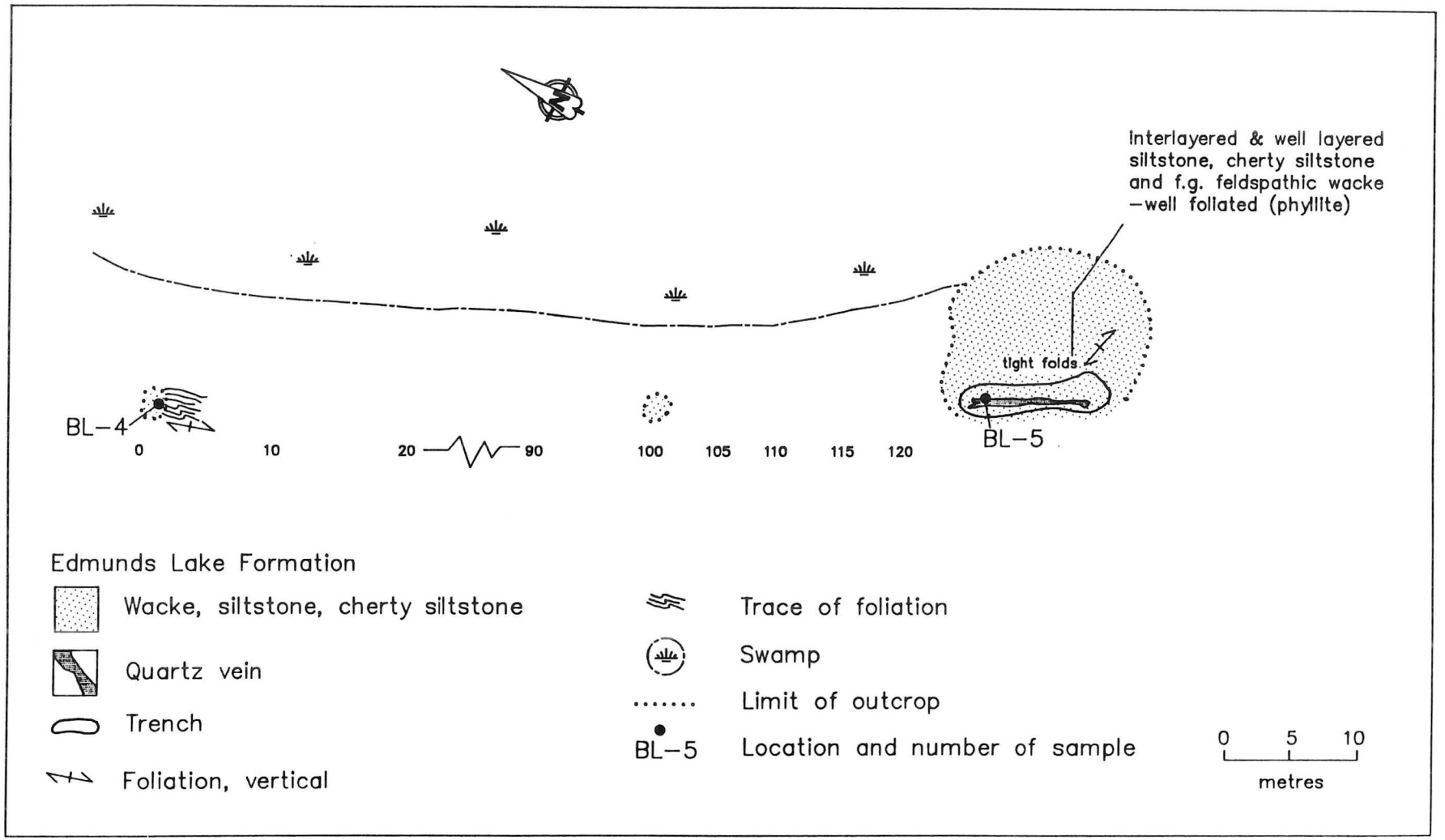


Figure 4-2: Geology and location of trenches at occurrence 4.

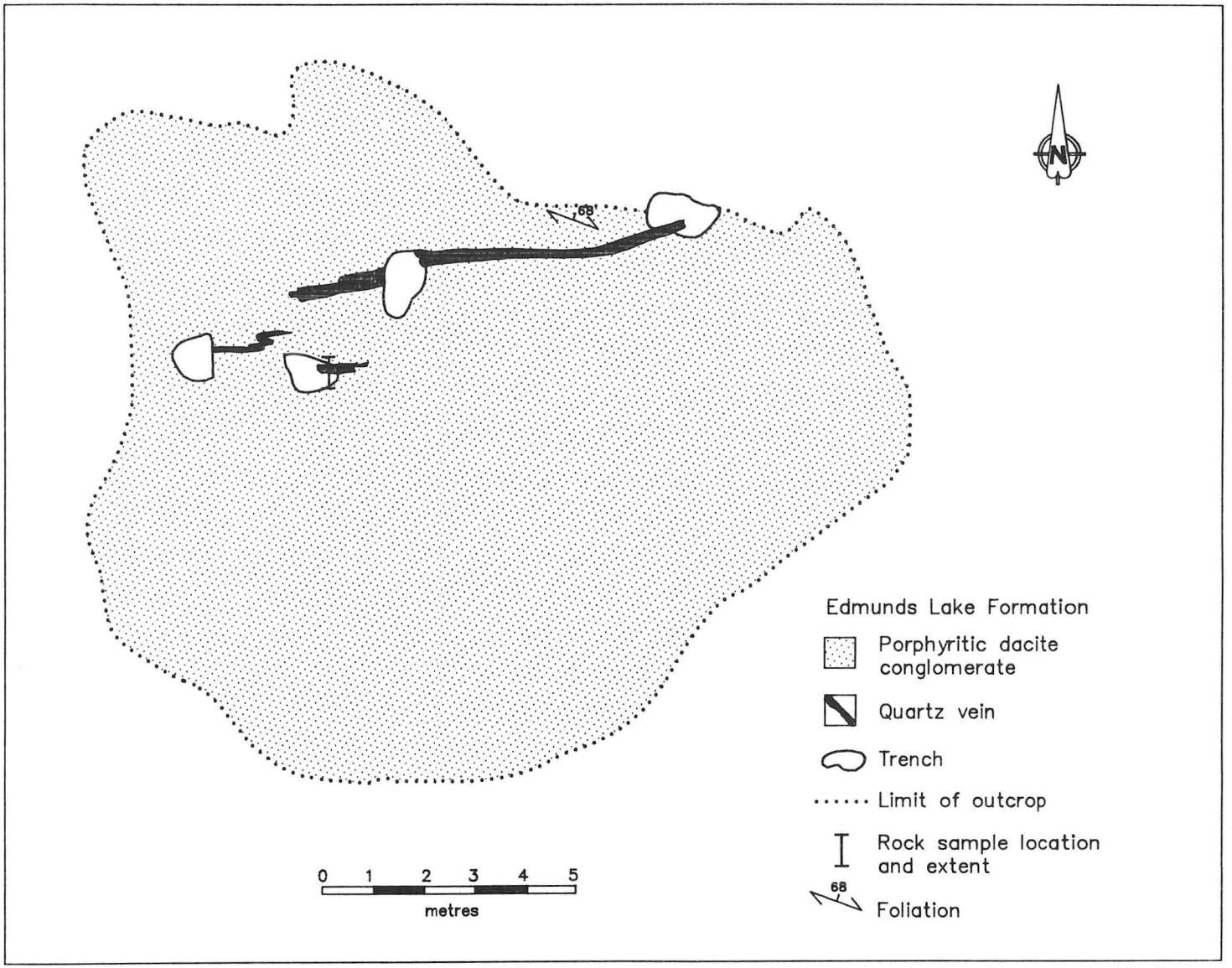


Figure 5-1: Geology and location of trenches at occurrence 5.

LOCATION: 5

NAME:

UTM: 5622156N/343649E

ACCESS: Traverse the Gem Lake portage to Banksian Lake and continue to the occurrence via the Manigotagan River and traverse.

AREA: 0.3 km south of Nora Lake (Fig. 4-1)

AIRPHOTO: AS85055-69

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Four trenches (1.5 x 1.5 x 1 m; 2 x 1 x 1 m; 2.5 x 2 x 1.5 m; 2 x 1.5 x 2.5 m) excavated in quartz veins were observed in this area in 1986 (Fig. 5-1). The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

The area is underlain by pebble to cobble conglomerate of the Edmunds Lake Formation (Fig. 4-1; Weber, 1971). White quartz veins, which are up to 0.8 m thick, and locally glassy, strike approximately 080° and contain chloritized and sericitized relicts of the host rock.

MINERALIZATION:

The host rock contains traces of disseminated pyrite. The quartz veins are barren of metallic minerals.

GEOCHEMICAL DATA:

A grab sample of the quartz vein from a trench contained 2 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

LOCATION: 6

NAME: Nora 2
UTM: 5622358N/343457E
ACCESS: From Gem Lake, portage to Banksian Lake and to Nora Lake via the Manigotagan River.

AREA: 0.4 km southeast of Nora Lake (Fig. 4-1)
AIRPHOTO: AS85055-69

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Four badly exposed trenches (1 x 1 x 1 m; 2 x 8 x 2.5 m; 2 x 1 x 1 m; 5 x 1 x 1 m; Fig. 6-1), obscured by muck and vegetation were observed in this area in 1986. The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

The area is underlain by dacitic agglomerate of the Edmunds Lake Formation (Fig. 4-1; Weber, 1971). Discontinuous, poorly discernible pods of milky white quartz characterize the wall rock of most of the trenches.

MINERALIZATION:

Up to 1% disseminated pyrite and traces of arsenopyrite occur in the quartz veins. The host rock is barren of metallic minerals.

GEOCHEMICAL DATA:

A grab sample of quartz vein from a trench contained 18 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.
1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

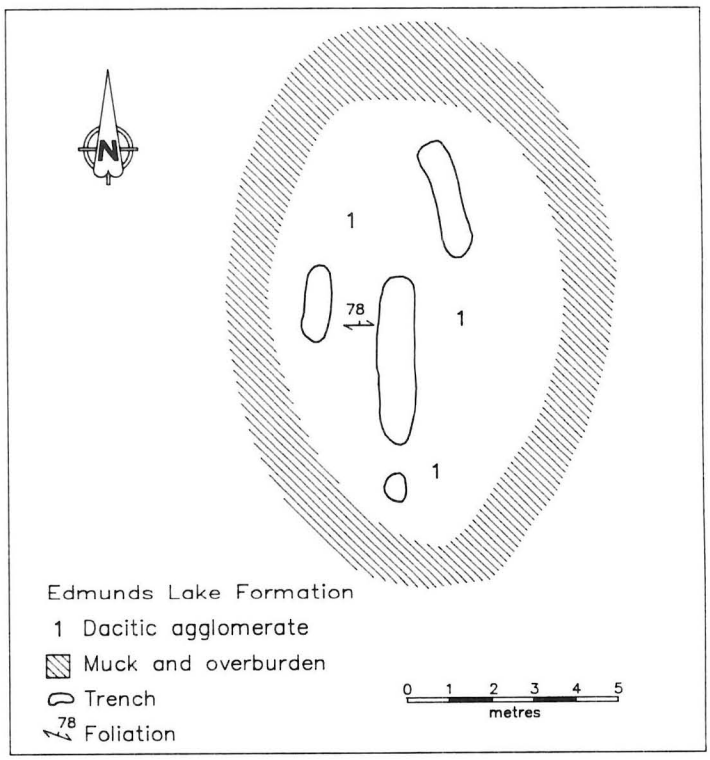


Figure 6-1: Geology and location of trenches at occurrence 6.

LOCATION: 7

NAME:

UTM: 5621490N/343748E

ACCESS: From Gem Lake, portage to Banksian Lake and to Nora Lake via the Manigotagan River.

AREA: Nora Lake; south of Gem Lake (Fig. 7-1)

AIRPHOTO: AS85055-69

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. One trench (1 x 2 x 1 m), surrounded by glacial debris, was observed in this area in 1986. The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

The area is underlain by silicified, well foliated siltstone to argillite of the Edmunds Lake Formation (Fig. 7-1; Weber, 1971). Carbonate veinlets oriented parallel to the foliation are common.

MINERALIZATION:

The host rock is characterized by intensive iron oxide stains and 2% pyrite veinlets up to 1 mm thick by up to 2 cm long.

GEOCHEMICAL DATA:

A grab sample of siltstone-argillite with carbonate and pyrite veinlets contained 1 ppb Au.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

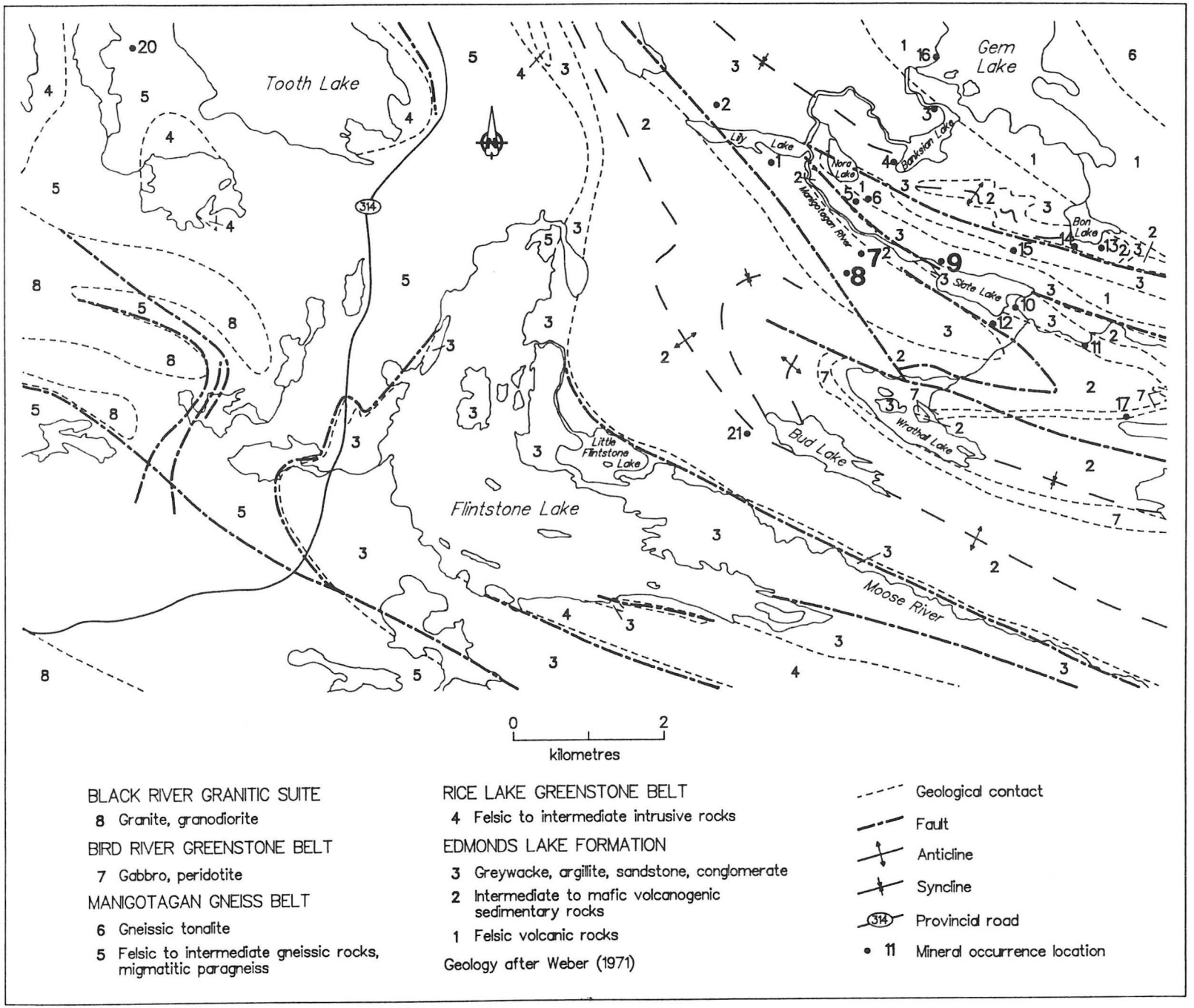


Figure 7-1: Geological setting of occurrences 7, 8 and 9.

LOCATION: 8

NAME:

UTM: 5621933N/343159E

ACCESS: From Gem Lake, portage to Banksian Lake and thence to Nora Lake via the Manigotagan River.

AREA: 1 km south of Nora Lake (Fig. 7-1)

AIRPHOTO: AS85055-69

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. One trench (1.5 x 1 x 1 m) was observed in this area in 1986. The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

The area is underlain by siltstone to quartz wacke of the Edmunds Lake Formation (Fig. 7-1; Weber, 1971). Locally, carbonatized zones contain off-white to grey, <2 cm thick, discontinuous, sinuous quartz veins.

MINERALIZATION:

Up to 2% pyrite occurs in the quartz veins. Up to 8% pyrite occurs also in limonite-stained vuggy and porous zones of the siltstone.

GEOCHEMICAL DATA:

A 1 m long chip sample of carbonatized shale with up to 2% pyrite from the east side of the pit contained 25 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins. Remobilization and supergene pyrite enrichment.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

LOCATION: 9

NAME:

UTM: 5621342N/344787E

ACCESS: From Gem Lake, portage to Banksian Lake and then boat to Slate Lake via the Manigotagan River.

AREA: Adjacent to Slate Lake (Fig. 7-1)

AIRPHOTO: AS85055-116

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Three trenches (5 x 2 x 0.5 m; 1 x 1 x 0.5 m; 1 x 1 x 1 m) were observed in this area in 1986 (Fig. 9-1). The area is currently open for staking (1994).

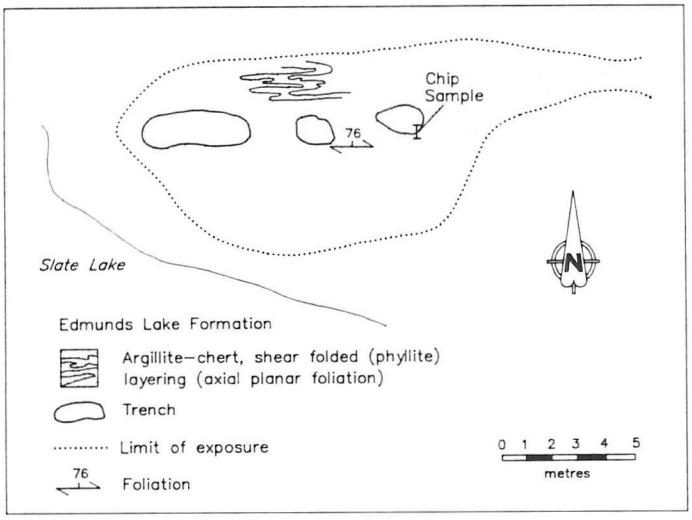


Figure 9-1: Geology and location of trenches at occurrence 9.

GEOLOGICAL SETTING:

The area is underlain by foliated, grey to black argillite of the Edmunds Lake Formation (Fig. 9-1; Weber, 1971). Grey to white, glassy, discontinuous quartz veins, 1 to 5 cm long and up to 1 cm thick, are in sharp contact with the host rock.

MINERALIZATION:

Approximately 1% pyrite is disseminated in the host rock and the quartz veins.

GEOCHEMICAL DATA:

A 1 m long chip sample, including quartz veinlets and host rock, contained 3 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

LOCATION: 10

NAME:

UTM: 5620759N/345781E

ACCESS: From Gem Lake, portage to Banksian Lake and to Slate Lake via the Manigotagan River.

AREA: Adjacent to eastern Slate Lake (Fig. 10-1)

AIRPHOTO: AS85055-116

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Two trenches (2 x 1 x 0.5 m; 5 x 2 x 1 m) were observed in this area in 1986. The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by foliated grey to black argillite-siltstone of the Edmunds Lake Formation (Fig. 10-1; Weber, 1971), which hosts grey to black, discontinuous quartz pods and veinlets.

MINERALIZATION:

Approximately 1% pyrite is disseminated in quartz veins.

GEOCHEMICAL DATA:

A grab sample of quartz with approximately 1% pyrite and minor host rock fragments contained 1 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

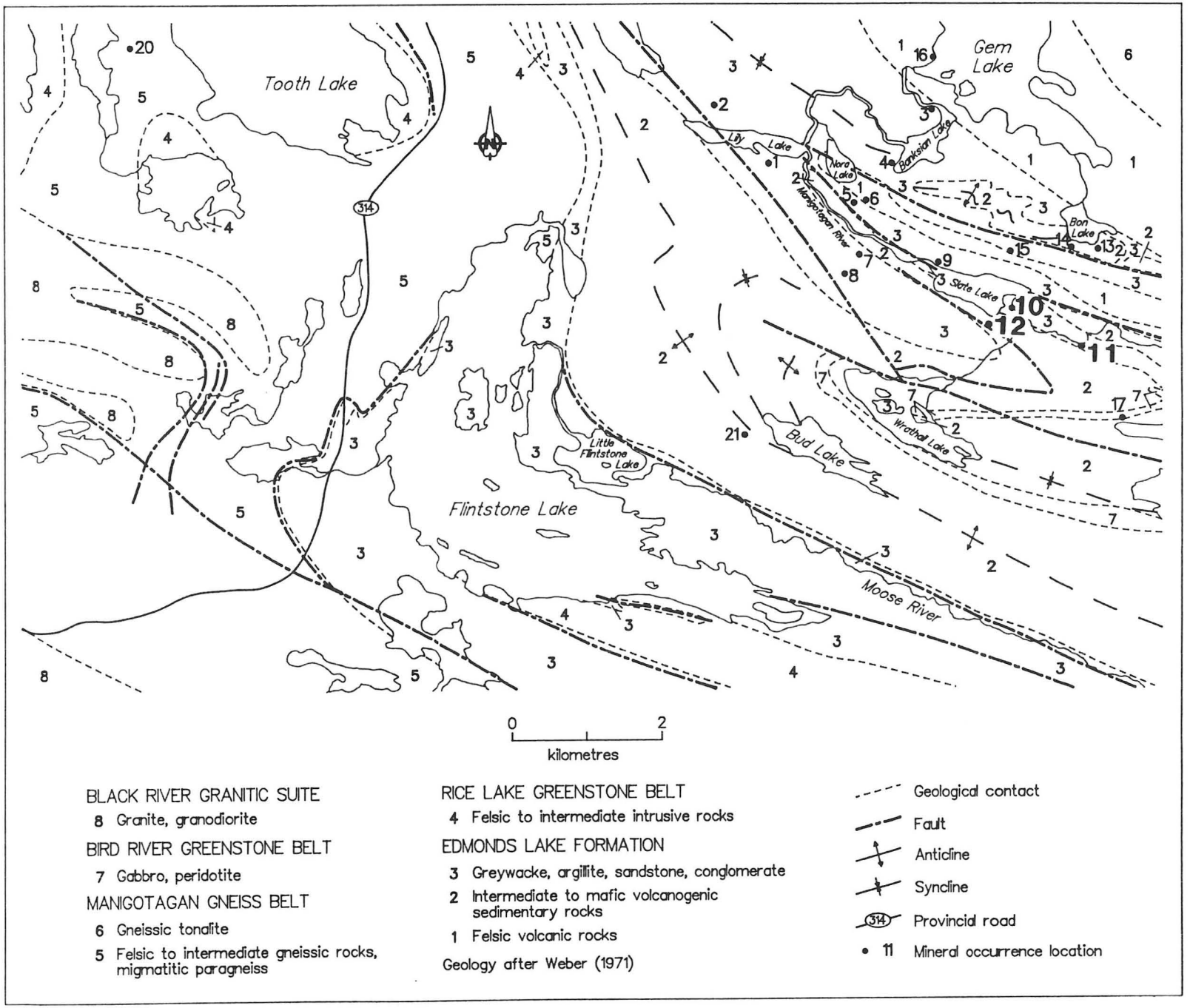


Figure 10-1:Geological setting of occurrences 10, 11 and 12.

LOCATION: 11

NAME:

UTM: 5620212N/346688E

ACCESS: From Gem Lake, portage to Banksian Lake and to Slate Lake via the Manigotagan River

AREA: 1.2 km southeast of Slate Lake (Fig. 10-1)

AIRPHOTO: AS85055-116

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Five trenches (4 x 2 x 5 m; 1 x 1 x 1 m; 3 x 4 x 2 m; 1 x 1 x 0.5 m; 1 x 1 x 0.5 m), the first of which may have been an exploration shaft, were observed in this area in 1986. The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by dacitic lapilli tuff and foliated chloritized andesite of the Edmunds Lake Formation (Fig. 11-1; Weber, 1971) that hosts three, grey to white, quartz veins approximately 0.5 m thick (Fig. 11-1). The northern vein is approximately 8 m long, and the southern vein is exposed over approximately 16 m. The quartz veins contain disseminated chlorite, ankerite and sericite.

MINERALIZATION:

Approximately 1% pyrite is disseminated in the quartz veins.

GEOCHEMICAL DATA:

A channel sample from the northern quartz vein with approximately 1% pyrite contained 330 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

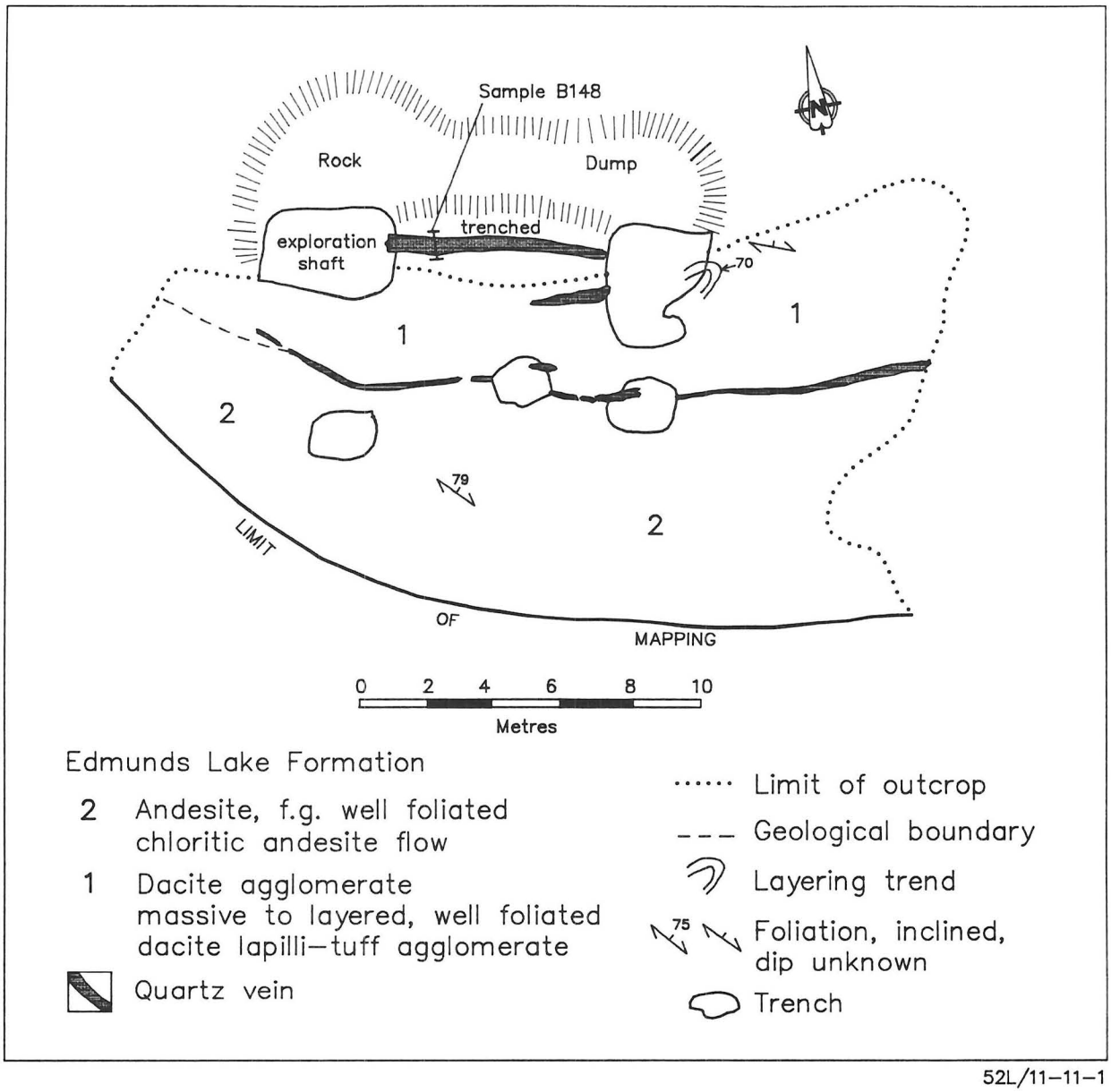


Figure 11-1: Geology and location of trenches at occurrence 11.

LOCATION: 12

NAME:

UTM: 5620535N/345511E

ACCESS: From Gem Lake, portage to Banksian Lake and to Slate Lake via the Manigotagan River.

AREA: Adjacent to Slate Lake (Fig. 10-1)

AIRPHOTO: AS85055-116

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. One trench (2 x 4 x 1.5 m) was observed in this area in 1986. The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by volcanogenic sedimentary rocks of the Edmunds Lake Formation (Fig. 10-1; Weber, 1971) that hosts discontinuous white, glassy quartz veins up to 5 cm thick and 1 m long. The quartz veins contain and are rimmed by chlorite and ankerite.

MINERALIZATION:

Up to 5% disseminated pyrite occurs in the immediate vicinity of the quartz veins.

GEOCHEMICAL DATA:

A chip sample of quartz vein and adjacent host rock mineralized with approximately 5% pyrite contained 2 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.
1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba, (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

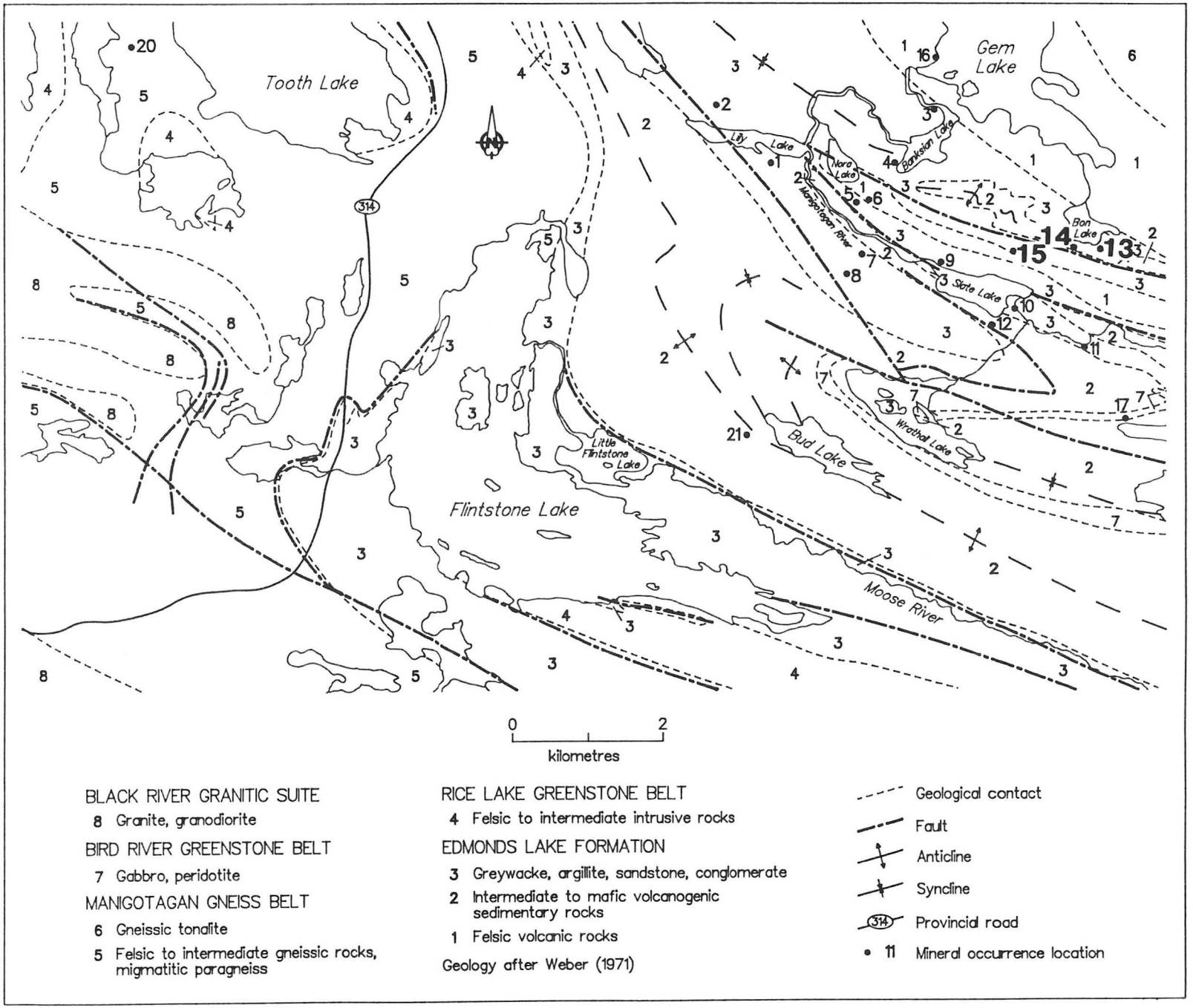


Figure 13-1:Geological setting of occurrences 13, 14 and 15.

LOCATION: 13

NAME:

UTM: 5621516N/346955E

ACCESS: Traverse to Lake Bon from southern Gem Lake.

AREA: South of Lake Bon (Fig. 13-1)

AIRPHOTO: AS85055-131

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Five trenches (2 x 2 x 2.5 m; 4 x 1.5 x 1.5 m; 1 x 0.5 x 0.5 m; 6 x 2 x 3 m; 8 x 2 x 1 m) were observed in this area in 1986. The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by volcanogenic sedimentary rocks of the Edmunds Lake Formation (Fig. 13-1, 13-2; Weber, 1971) that host several-mm to 1 m thick, white to grey, glassy quartz veins.

MINERALIZATION:

Up to 1% disseminated euhedral pyrite occurs in the immediate vicinity of the quartz veins.

GEOCHEMICAL DATA:

A chip sample (Sample number B151; Fig. 13-2) of the quartz vein and the adjacent host rock contained 1 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{C}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

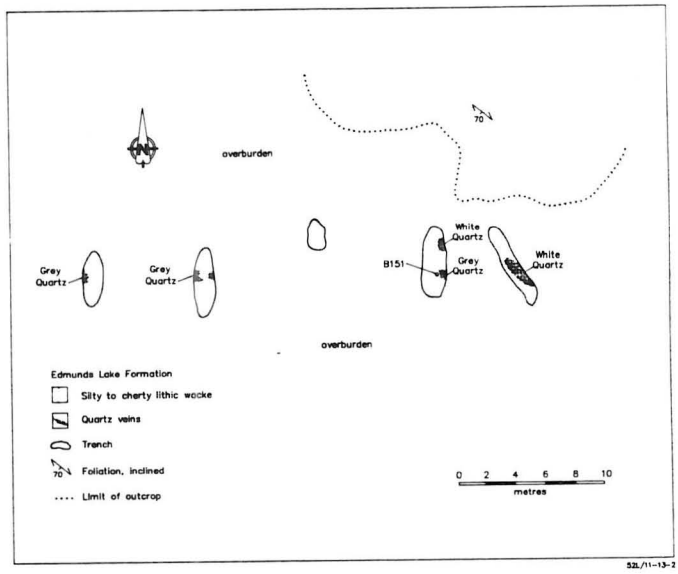


Figure 13-2: Geology and location of trenches at occurrence 13.

LOCATION: 14

NAME:

UTM: 5621530N/346576E

ACCESS: Traverse to Lake Bon from southern Gem Lake.

AREA: South of Lake Bon (Fig. 13-1)

AIRPHOTO: AS85055-131

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. Five trenches (5 x 1 x 1.5 m; 5 x 1 x 0.5 m; 2 x 2 x 0.5 m; 5 x 3 x 1.5 m; 3 x 3 x 1 m) were observed in this area in 1986. The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by volcanogenic sedimentary rocks of the Edmunds Lake Formation (Fig. 13-1; Weber, 1971), which host grey to black, glassy quartz veins up to 2 m thick.

MINERALIZATION:

Up to 8% disseminated pyrite occurs in rusty patches along the margin of the quartz veins.

GEOCHEMICAL DATA:

A grab sample containing quartz vein and wall rock mineralized with up to 5% pyrite contained 1 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

LOCATION: 15

NAME:

UTM: 5621509N/345767E

ACCESS: Traverse to Lake Bon from southern Gem Lake.

AREA: West of Lake Bon (Fig. 13-1)

AIRPHOTO: AS85055-131

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. One trench (1.5 x 1.5 x 1.5 m) was observed in this area in 1986. The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by lithic wacke and pebble to cobble conglomerate of the Edmunds Lake Formation (Fig. 13-1; Weber, 1971), which host 0.5 to 6 cm thick, up to 2 m long, grey to white, sugary to glassy quartz veins.

MINERALIZATION:

Up to 2% pyrite is disseminated along the margin of the quartz veins.

GEOCHEMICAL DATA:

A grab sample containing quartz vein material and wall rock, mineralized with up to 2% pyrite, contained 1 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.

1971: Geology of the Long Lake-Gem Lake area; In Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

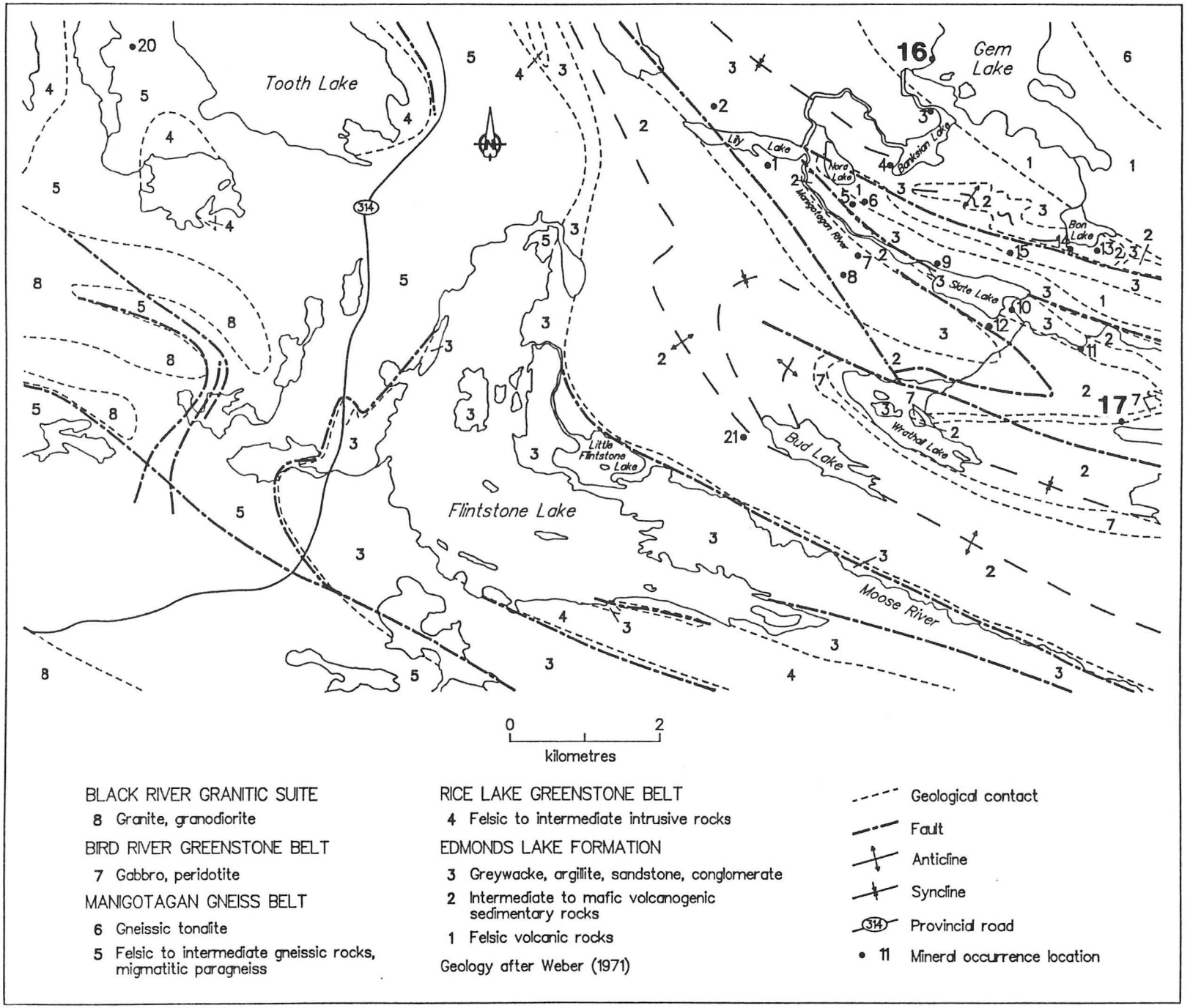


Figure 16-1:Geological setting of occurrences 16 and 17.

LOCATION: 16

NAME:
UTM: 5624093N/344741E
ACCESS: Via Gem Lake.

AREA: Gem Lake south (Fig. 16-1)
AIRPHOTO: AS85055-131

EXPLORATION SUMMARY:

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. One trench (6 x 1.5 x 1 m) was observed in this area in 1986. The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by felsic lapilli tuff of the Gem Lake Formation (Fig. 16-1; Weber, 1971), which hosts milky white, glassy quartz veins up to 1 m thick and up to 5 m long with red to orange margins.

MINERALIZATION:

Up to 5% pyrite veinlets and minor chalcopyrite occur in the quartz veins.

GEOCHEMICAL DATA:

A chip sample of the quartz veins with traces of pyrite and pyrrhotite contained 5 ppb Au.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91677, 91687; Manitoba Energy and Mines, Mines Branch.

Weber, W.
1971: Geology of the Long Lake-Gem Lake area; in Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, p. 63-106.

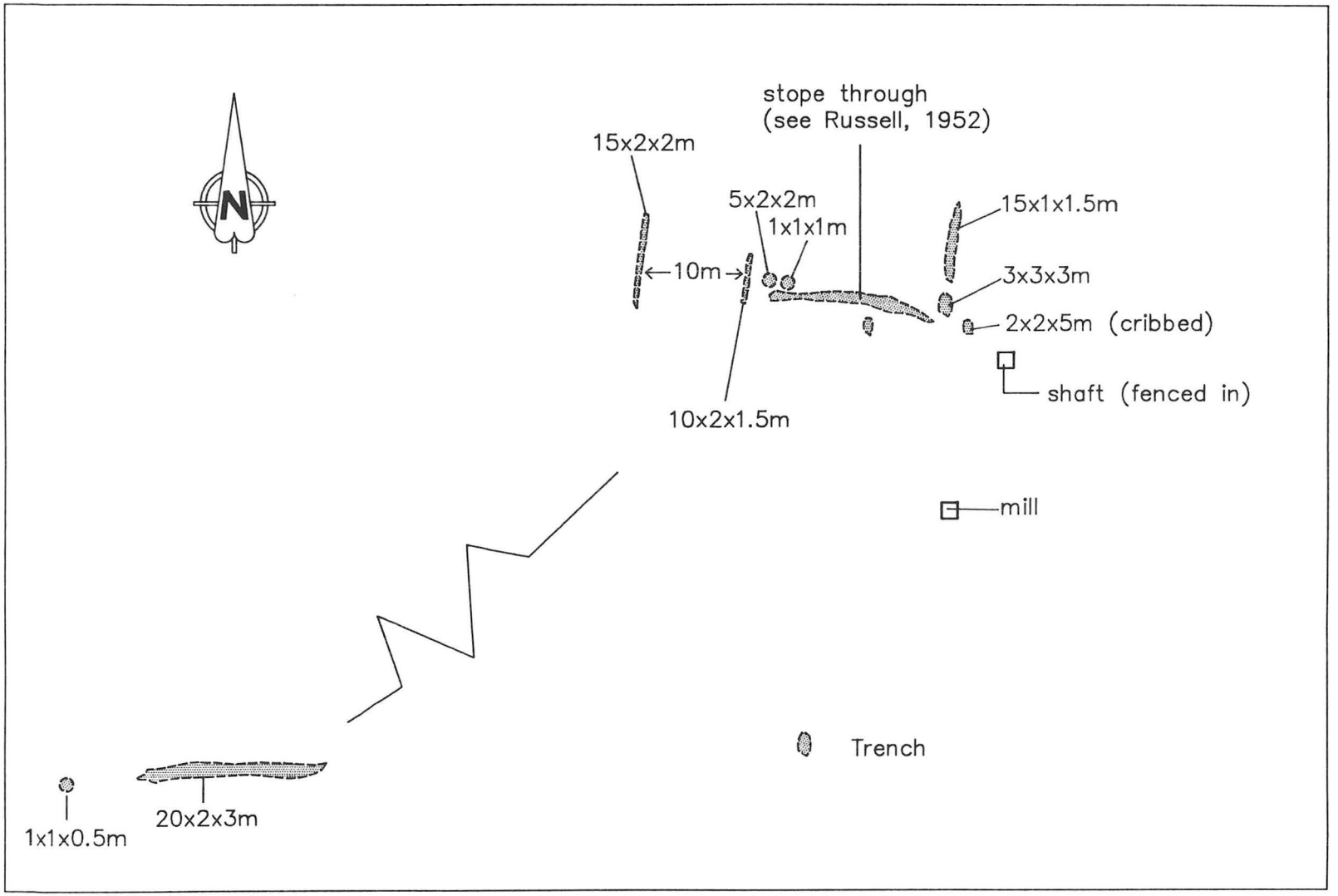


Figure 17-1:Location of trenches and drill holes at occurrence 17 (Diana Mine).

LOCATION: 17

NAME: Diana Mine
UTM: 5619286N/347262E
ACCESS: Via float plane to Kickley Lake.

AREA: Kickley Lake (Fig. 16-1)
AIRPHOTO: AS85055-130

EXPLORATION SUMMARY:

A detailed exploration history of the deposit is given in Mineral Inventory Card 52L/11 Au1. The area of this occurrence was first staked in 1926. Gem Lake Gold Mines sunk a shaft to a depth of 160 m before 1931 (probably 1930, inconclusive records). In 1931, the shaft was deepened to 237 m and a 9 tonne/day mill installed. Mining operations were suspended in March 1932 after the beneficiation of 88 tonnes of ore. An assessment report of this property (Anonymous, dated Dec. 21, 1933) stated that after reviewing assay records, production records and all other pertinent available records, "The Gem Lake mine is a gold prospect with indications of ore shoots at surface, the 76 m level and the 152 m level, but no ore at the 38 m, 114 m, 190 m and 228 m levels".

In 1934, Diana Gold Mines Limited installed a 40 tonne/day mill and undertook surface drilling (13 diamond-drill holes, 1184 m) and trenching in the vicinity of the mine (Fig. 17-1); (A.F. 91397). Records of additional surface and underground drilling (23 diamond-drill holes, 1820 m) (undated) are in A.F. 92178. Until mine closure in 1936, 24 799 tonnes ore were mined and produced 199.79 kg Au was produced. Consolidated Diana Gold Mines Limited acquired the property in that year and produced 15.83 kg Au. Surface clean-up operations (1940-41) yielded an additional 3.02 kg Au. Table 17-1 summarizes the history of gold production from this deposit.

An airborne radiometric survey by Geophysical Engineering and Surveys Limited (A.F. 91677) and an AEM and MAG survey for Cerro Mining Corporation of Canada (A.F. 91687) were flown over this area in 1971. A joint venture between Rock Ore Exploration and Development, Gigantes Exploration Company and Selco Mining Corporation drilled 3 holes in 1974 and carried out a geophysical survey in 1977. Mutual Resources optioned the property from Canhorn Mining Corporation in 1987.

The area is currently staked and in good standing until February 1996.

Table 17-1: History of gold production at the Diana Mine (Mineral Inventory Card 52L/11 Au1).

Years	Au (kg)	Ag (kg)
1928-1932	16.95	1.24
1934-1936	199.79	11.66
1937-1938	15.83	unknown
1940-1941	3.02	0.31
Total	235.59	13.21

GEOLOGICAL SETTING:

The area of the occurrence is underlain by a mafic dyke that intrudes intermediate to mafic volcanogenic sedimentary rocks (Fig. 16-1; Weber, 1971). Russell (1952) mapped pillowed basalt, mafic tuff, gabbro and quartzite intruded by intermediate to mafic dykes at the occurrence.

MINERALIZATION:

Early exploration uncovered quartz veins in a large mafic dyke that contains 15.5 g/t gold exposed for a length of 34 m with an average width of 2.4 m (Wright, 1932). The metallic minerals in the ore are pyrite, chalcopyrite, pyrrhotite, galena, sphalerite and gold, according to an anonymous and unnumbered report that deals with the metallurgy of the gold ore of the Diana Mine by The Ore Dressing and Metallurgical Laboratory of the Department of Mines in Ottawa dated May 1936. Gold occurs as finely divided grains in quartz.

GEOCHEMICAL DATA:

A chip sample of the quartz veins with traces of pyrite and pyrrhotite contained 5 ppb Au.

A 68 kg bulk sample, analyzed in 1936 by The Ore Dressing and Metallurgical Laboratory of the Department of Mines in Ottawa, yielded 51.42 g/t Au, 8.57 g/t Ag, 0.04% Cu and 0.03% Pb.

CLASSIFICATION:

Vein type deposit; multiple quartz veins.

REFERENCES:

Assessment Files 91397, 91677, 91687, 92178; Manitoba Energy and Mines, Mines Branch.

Mineral Inventory Card 52L/11 Au1; Manitoba Energy and Mines, Geological Services Branch.

Russell, G.A.
1952: Geology of the Lily Lake-Kickley Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 50-3, 17p.

Wright, J.F.
1932: Geology and mineral deposits of a part of southeastern Manitoba; Geological Survey of Canada, Memoir 169, 150 p.

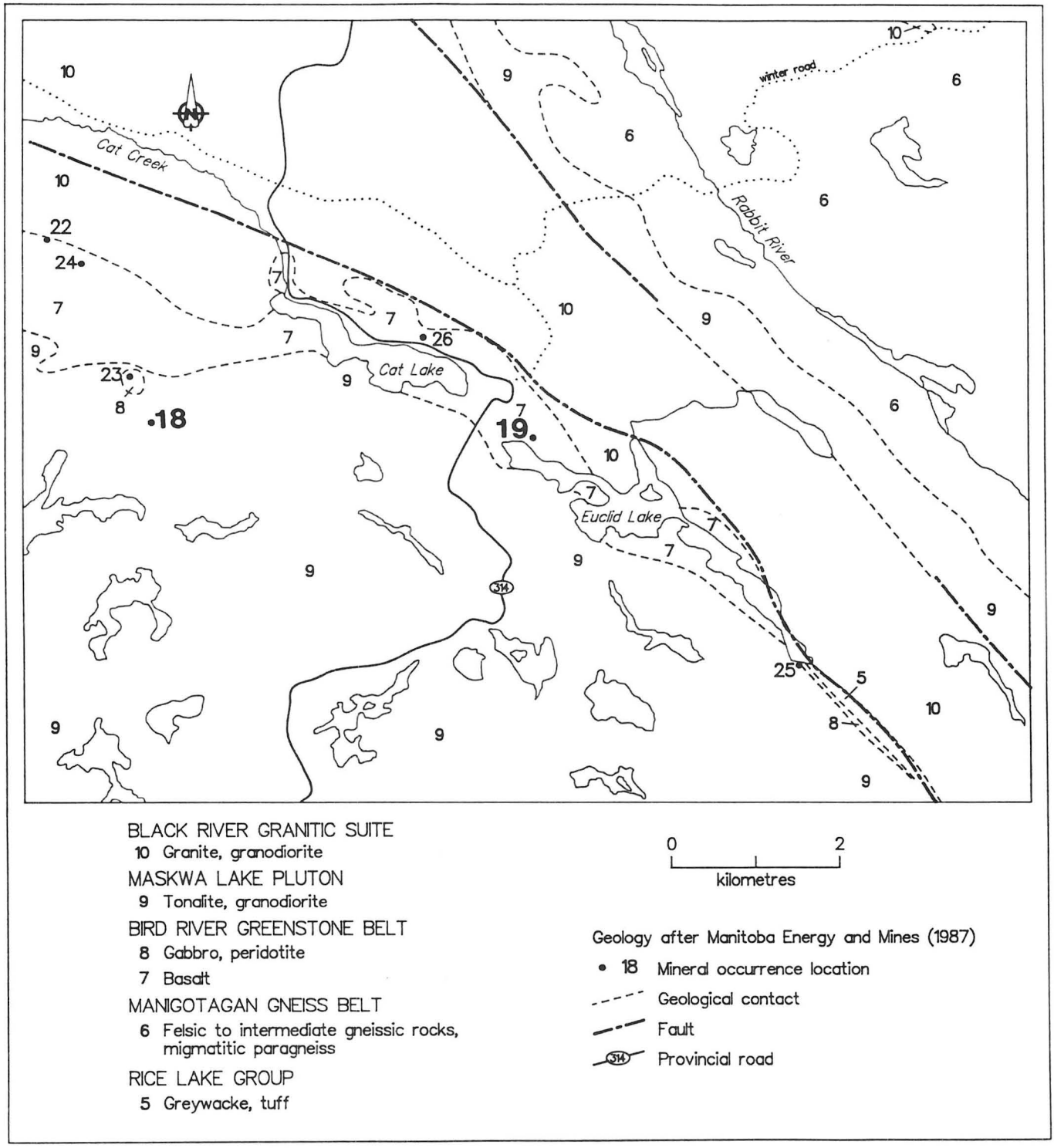


Figure 18-1: Geological setting of occurrences 18 (Beaver Group) and 19.

LOCATION: 18

NAME: Beaver Group (A.F. - Mineralization intersected by diamond drilling)

UTM: 5607872N/324633E

ACCESS: Via P.R. 314 to Cat Lake and a trail to the New Manitoba Mine (Location 23).

AREA: 2.5 km southwest of Cat Lake (Fig. 18-1)

AIRPHOTO: A24670-158

EXPLORATION SUMMARY:

Geological mapping of the Beaver Group of claims in 1955 defined occurrences of pyrrhotite and chalcopyrite that were investigated with three drill holes in 1957 (A.F. 91766). An airborne radiometric survey was flown over the area by Geophysical Engineering and Surveys Limited in 1971 (A.F. 91677). The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

The area of the occurrence is underlain by heterogeneous tonalite and granodiorite of the Maskwa Lake Pluton that intrude supracrustal rocks of the Bird River greenstone belt (Fig. 18-1; Manitoba Energy and Mines, 1987). DDH 1 intersected 206 m of granodiorite, gabbro and basalt. DDH 2 intersected 92 m of diabase, gabbro, quartz diorite, and chlorite schist. DDH 3 intersected 92 m of gabbro, granite and granodiorite (A.F. 91766).

MINERALIZATION:

The following mineralization was intersected by drill holes:

DDH 1: specks of pyrite.

DDH 2: up to 1% pyrite between 25.2 m and 26.7 m; an unquantified 1 cm thick chalcopyrite seam at 26.6 m depth.

DDH 3: minor chalcopyrite and pyrite in rusty fractures from 1.2 to 8.5 m; minor chalcopyrite in fractures from 8.6 to 22.4 m depth (A.F. 91766).

GEOCHEMICAL DATA:

No data available.

CLASSIFICATION:

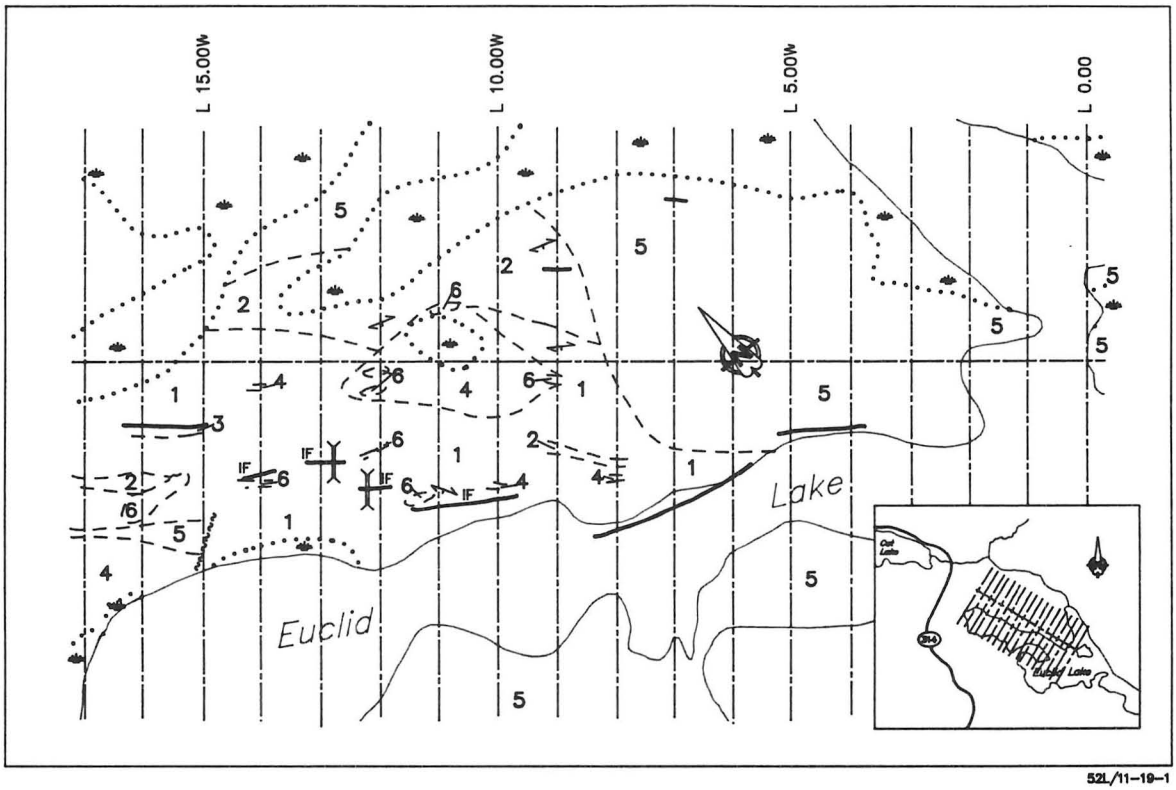
Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91677, 91766; Manitoba Energy and Mines, Mines Branch.

Manitoba Energy and Mines

1987: Pointe du Bois, NTS 52L; Manitoba Energy and Mines, Bedrock Geology Compilation Map Series, Preliminary Edition, 1:250 000.



0 100 200 300
metres

BLACK RIVER GRANITIC SUITE
- 6 Pegmatite
- 5 Granite

BIRD RIVER GREENSTONE BELT
- 4 Gabbro
- 3 Peridotite (serpentinized)

RICE LAKE SERIES
- 2 Quartz–biotite schist and gneiss, occasionally garnetiferous, occasionally with hornblende
- 1 Andesite, massive, pillowed, tuffaceous

- Geological contact, assumed
- Axis of magnetic anomaly
- IF Iron formation
- Fault
- Trench
- Schistosity, inclined, dip unknown
- Swamp

Geology after Petak (A.F. 92607)

Figure 19-1: Geology and location of trenches at occurrence 19.

LOCATION: 19

NAME:

UTM: 5608185N/328768E

ACCESS: Via P.R. 314 to Cat Lake and traverse east to Euclid Lake.

AREA: Adjacent to Euclid Lake (Fig. 18-1)

AIRPHOTO: A23707-113

EXPLORATION SUMMARY:

The area was investigated by Cominco in 1932. In 1969, the area was restaked, followed by a MAG and EM survey conducted on behalf of Gunnex Limited (A.F. 91765). A regional AEM survey undertaken in 1971 on behalf of Hudson Bay Exploration and Development Company Ltd. included this area (A.F. 91338). An airborne radiometric survey was flown over the area by Geophysical Engineering and Surveys Limited in 1971 (A.F. 91677). A geological survey and sampling program to investigate two geophysical anomalies was completed on behalf of Gunnex Limited in 1972 (A.F. 91768). Geological mapping at 1:40 scale was undertaken in 1984 (A.F. 92607) to determine the cause of magnetic anomalies traced in a MAG survey by Independent Exploration Services Ltd. on behalf of Dynamic Mining Exploration Limited in 1983 (A.F. 92608). Two trenches expose oxide facies iron formation (Fig. 19-1). The area is currently withdrawn from staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by the Rice Lake Series of the Bird River greenstone belt, consisting of mafic intrusive, extrusive and minor interlayered sedimentary rocks (Fig. 18-1, 19-1). The mafic volcanic suite comprises andesitic pillowed and massive flows and is commonly associated with tuff and hornblende gabbro. The sedimentary rocks are mainly fine grained quartz-biotite schist and gneiss. Layers of oxide facies iron formation, 1 to 3 m thick, are intercalated with the sedimentary rocks. A narrow (<5 m thick) layer of serpentinized peridotite, exposed for approximately 120 m along strike, is associated with oxide facies iron formation (A.F. 92607).

MINERALIZATION:

Minor pyrrhotite, pyrite and chalcopyrite are disseminated and in lenses in association with green pyroxene, garnet and magnetite in a northwest-trending zone approximately 1 km long by 200 m wide. Oxide facies iron formation contains minor pyrrhotite in places (A.F. 92607).

GEOCHEMICAL DATA:

Geochemical data are tabulated in Table 19-1.

Table 19-1: Geochemical analysis of rock samples from occurrence 19.

Sample	Length (m)	Ni (%)	Cu (%)	Au (g/t)	Ag (g/t)
1	3.6	tr.	0.04	tr.	tr.
2	2.1	tr.	0.19	tr.	tr.
3	1.5	tr.	0.20		
4	3.6	tr.	0.05		
5	3.9	0.01	0.03		
6	3.9	tr.	0.03	tr.	tr.
7	2.1	tr.	0.05		
8	3.6	0.02	0.04		
9	3.6	0.03	0.14		
10	3.0	nil	0.01		
11	3.0	0.01	0.12	tr.	tr.
12	3.0	tr.	0.01		

CLASSIFICATION:

Chemical sediment type deposit; oxide facies iron formation.

REFERENCES:

Assessment Files 91338, 91677, 91765, 91768, 92607, 92608; Manitoba Energy and Mines, Mines Branch.

Manitoba Energy and Mines

1987: Pointe du Bois, NTS 52L; Manitoba Energy and Mines, Bedrock Geology Compilation Map Series, Preliminary Edition, 1:250 000.

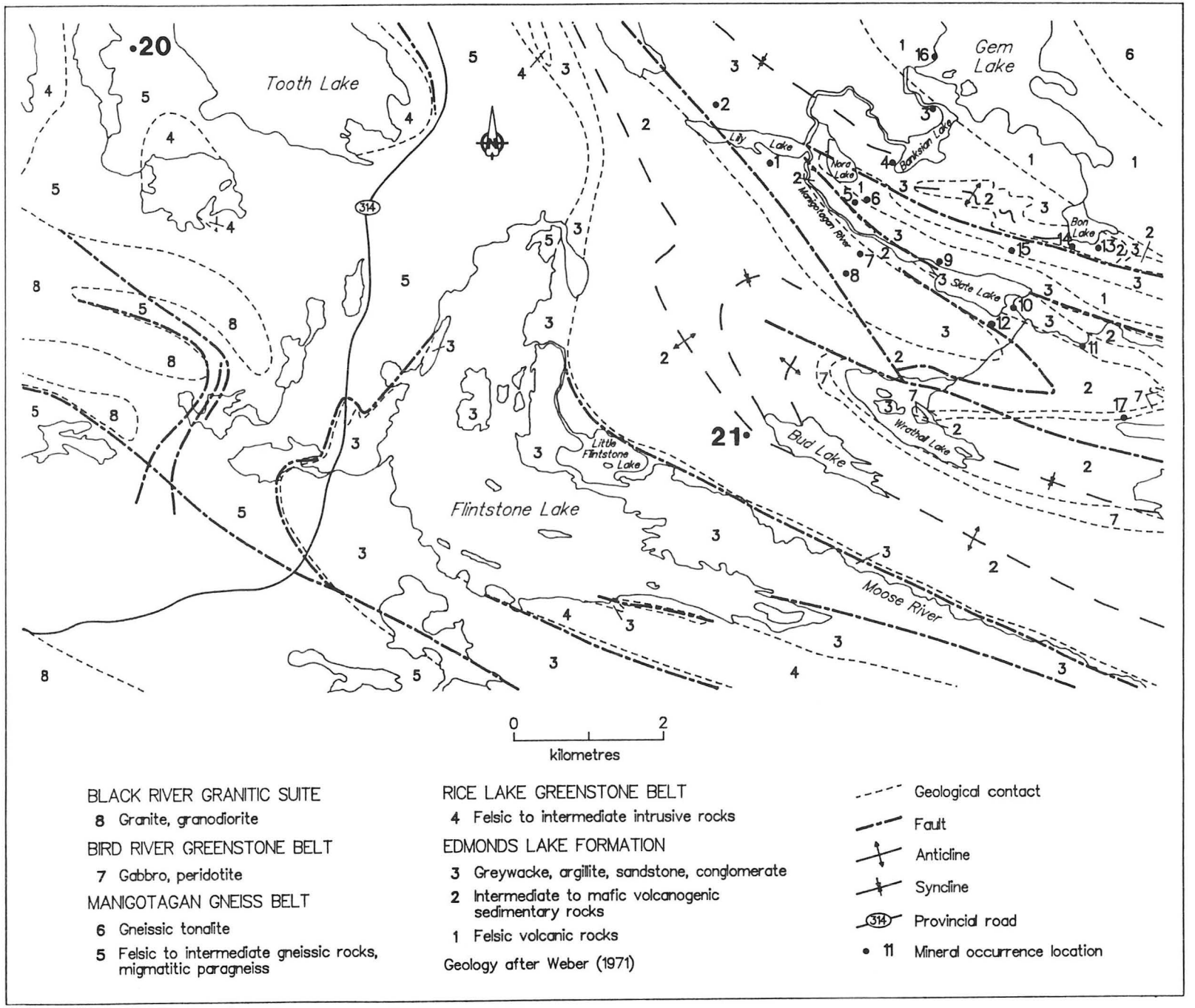


Figure 20-1:Geological setting of occurrence 20 (Moose) and 21.

LOCATION: 20

NAME: Moose (A.F. - Mineralization intersected by diamond drilling)

UTM: 5624225N/333955E

ACCESS: Via float plane to Tooth Lake and traverse 0.5 km west (Fig. 24-1).

AREA: West of Tooth Lake (Fig. 20-1)

AIRPHOTO: AS85054-83

EXPLORATION SUMMARY:

The mineral occurrence was first staked in 1937 and restaked a number of times until 1965. Trenching and drilling of three holes took place in 1966 (A.F. 91333). An airborne radiometric survey was flown over the area by Geophysical Engineering and Surveys Limited in 1971 (A.F. 91677). The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by intermediate gneisses of the Manigotagan gneiss belt (Fig. 20-1; M^{c}Ritchie and Weber, 1971). Hornblende metasomatism of rocks adjacent to pegmatites overprints the earlier sedimentary fabric (M^{c}Ritchie and Weber, 1971).

DDH 1 intersected 115 m of altered hornblende diorite, sedimentary rocks and granite. DDH 2 intersected 42 m of altered hornblende diorite and sedimentary rocks. DDH 3 intersected 40.2 m of altered hornblende diorite and sedimentary rocks (A.F. 91333).

MINERALIZATION:

Unquantified amounts of chalcopyrite and molybdenite were documented in altered hornblende diorite in all three drill cores (A.F. 91333).

GEOCHEMICAL DATA:

No data available.

CLASSIFICATION:

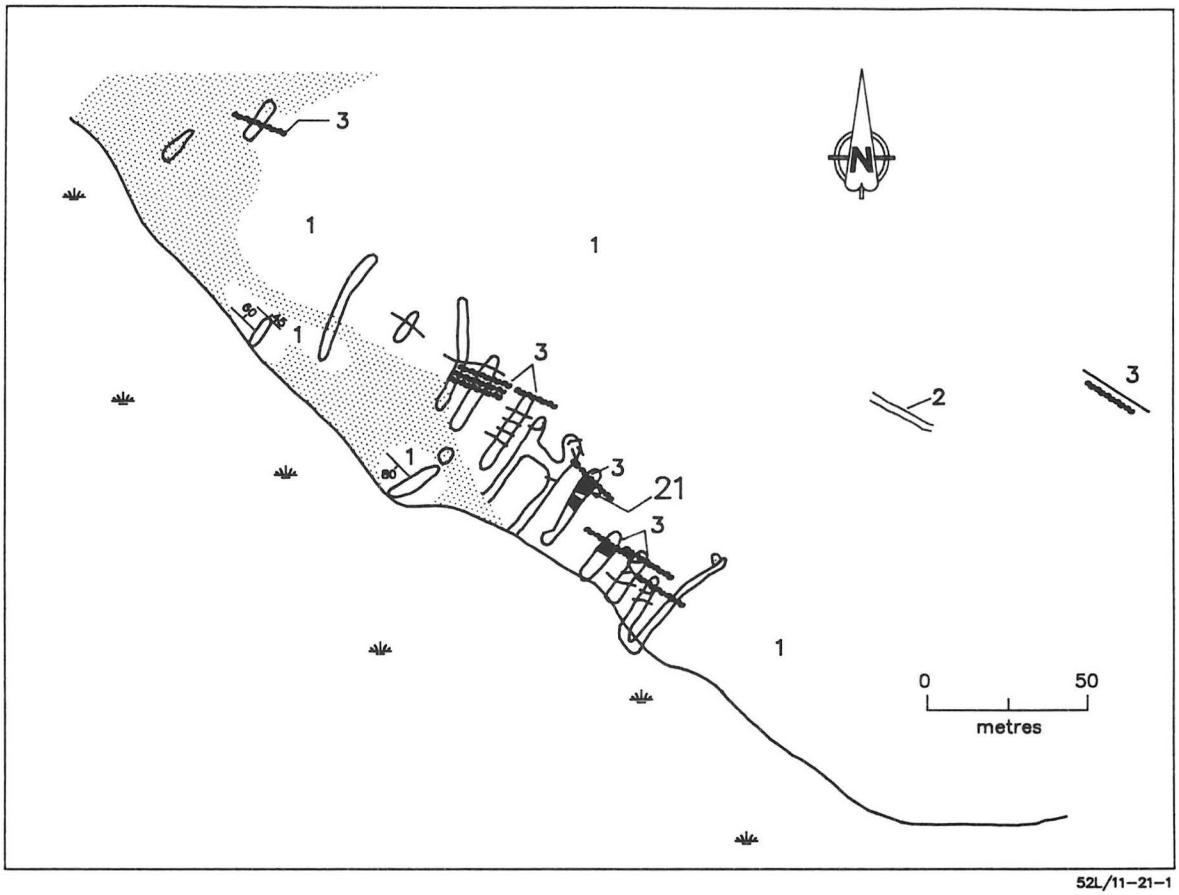
Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91333, 91677; Manitoba Energy and Mines, Mines Branch.

M^{c}Ritchie, W.D. and Weber, W.

1971: Flintstone Lake; In Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, Geological Map 69-4, 1:31 680.



3 Shear and quartz

2 Porphyritic diorite dyke in chloritic tuff

1 Sheared chloritic tuff some massive diorite

Drift cover

Quartz vein

Geological contact assumed

Trench

80 Bedding

Shear zone

Swamp

21 Occurrence location and number

Geology modified after Russell (1952)

Figure 21-1: Location of trenches at occurrence 21.

LOCATION: 21

NAME:

AREA: 4.5 km east of Flintstone Lake; Bud Lake (Fig. 20-1)

UTM: 5619097N/342213E

AIRPHOTO: AS85054-55

ACCESS: Via P.R. 314 to Flintstone Lake and traverse approximately 4.5 km east to the vicinity of Bud Lake (Fig. 20-1).

EXPLORATION SUMMARY:

The former GX group of claims (Wright, 1932), later described as the Pixie claims (Russell, 1952), includes a northwest-striking shear in mafic volcanic rocks. The silicified and sulphide-bearing rocks within the shear in the area south of Bud Lake were intensely prospected before 1932 by sixteen large (up to 15 x 2 x 5 m) trenches and pits (Fig. 21-1). Canadian Nickel Company Limited conducted an AEM survey of the area in 1947, and prospected anomalies in 1948 (A.F. 92512). An AEM and MAG survey was conducted by Canadian Nickel Company Limited in 1960 (A.F. 92512). An airborne radiometric survey was flown over the area by Geophysical Engineering and Surveys Limited in 1971 (A.F. 91677). Canadian Nickel Company Limited continued investigations in 1982, with a HLEM, MAG, geological mapping and sampling program (A.F. 92512). Aberford Resources undertook a geological reconnaissance and rock sampling program in 1984, concentrating on the area east of Flintstone Lake (A.F. 92918). The area is currently open for staking (1994).

GEOLOGICAL SETTING:

The area of the occurrence is underlain by Rice Lake Series mafic to intermediate volcanic and intercalated sedimentary rocks (Weber, 1971; Fig. 21-2). The volcanic rocks are generally dark green to light green-grey pillowed basalt, with rare amygdaloidal varieties. The sedimentary rocks consist of fine grained chlorite-carbonate schists, thinly bedded greywacke and interbedded argillite. Polymictic pebble conglomerate occurs south of Wrathall Lake. Gabbro and feldspar porphyry intruded the sedimentary rocks in several localities (A.F. 92512). Trenches exposed grey to white tourmaline-rich quartz veins hosted by sheared basalt, mafic tuff and extremely sheared limonitic and chloritized schist, suspected to be brecciated pillow basalt or mafic fragmental rocks (Fig. 21-1; A.F. 92918).

MINERALIZATION:

Quartz veins in the Pixie group contain minor disseminated pyrite and chalcopyrite. Visible gold was observed in the quartz veins (A.F. 92918). A layer of rusty weathering quartzose sedimentary rocks with "abundant" pyrite occurs in the quartz veins in the vicinity of the trenches (Wright, 1932; Russell, 1952; A.F. 92918). Less than 1% pyrite is common as finely disseminated grains or rare euhedral crystals. Chalcopyrite was observed as rare specks. Less than 1% arsenopyrite occurs in feldspar porphyry.

GEOCHEMICAL DATA:

Fifty-six grab samples were collected in the Flintstone Lake area on behalf of Canadian Nickel Company Limited. The highest gold analysis was 40 ppb (Fig. 21-2). The other samples contained <5 ppb Au, with the exception of one analysis of 30 ppb Au and one of 10 ppb Au (Fig. 21-2; A.F. 92512).

Analytical results of rock samples collected for Aberford Resources from the trenches in the Pixie group of claims were described as "depressingly low", returning 24 ppb Au or less (A.F. 92918).

CLASSIFICATION:

Vein type deposit; multiple veins.

REFERENCES:

Assessment Files 91677, 92512, 92918; Manitoba Energy and Mines, Mines Branch.

Russell, G.A.
1952: Geology of the Lily Lake-Kickley Lake area; Manitoba Mines and Natural Resources, Mines Branch, Publication 50-3, 17p.

Weber, W.
1971: Geology of the Wanipigow River-Manigotagan River region; In Geology and geophysics of the Rice Lake region, southeastern Manitoba (W.D. M^{c}Ritchie and W. Weber, eds.); Manitoba Mines and Natural Resources, Mines Branch, Publication 71-1, Geological Map 71-1/4, 1:63 360.

Wright, J.F.
1932: Geology and mineral deposits of a part of southeastern Manitoba; Geological Survey of Canada, Memoir 169, 150p.

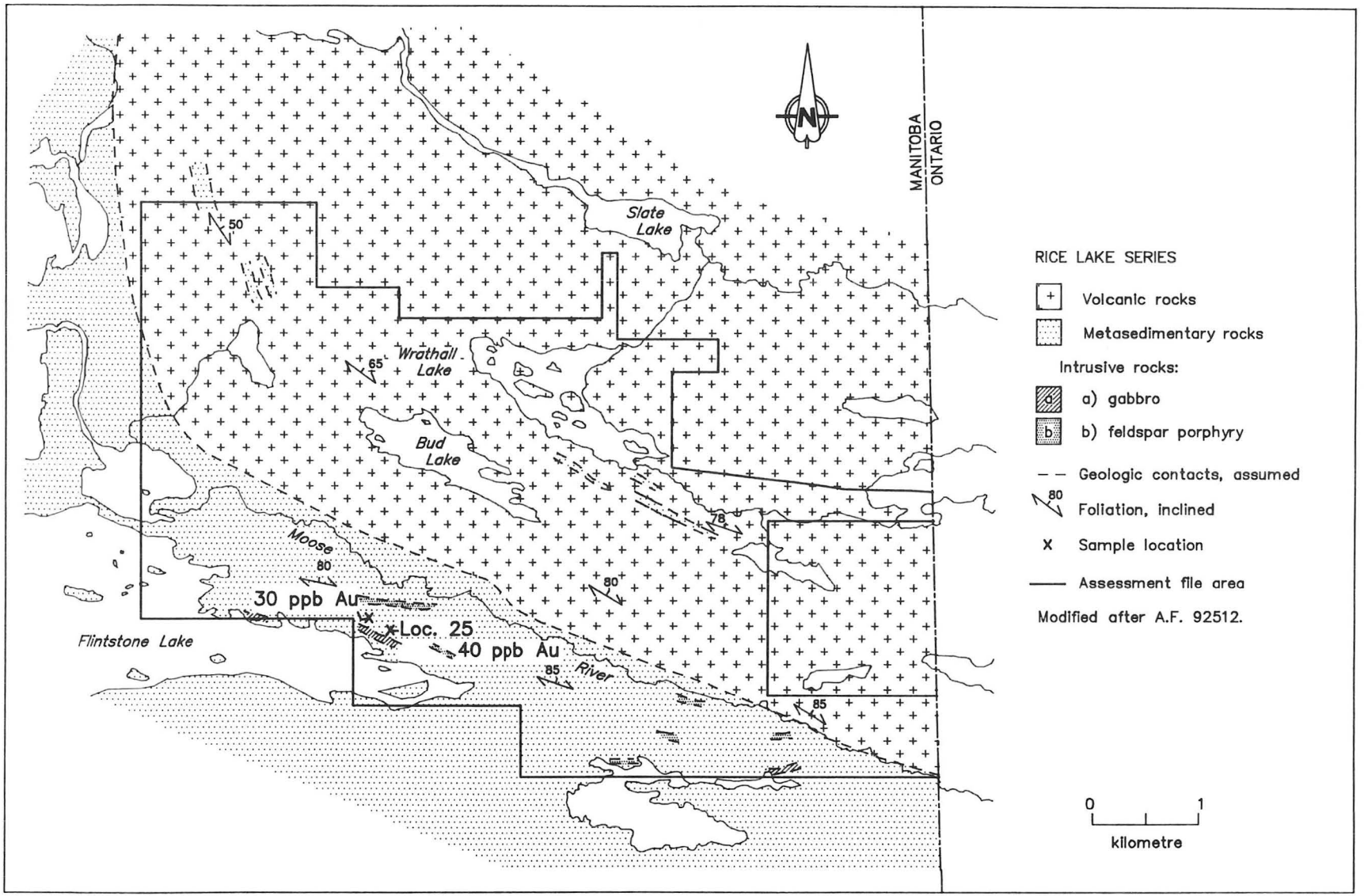


Figure 21-2:Location of rock sampling sites at occurrence 21.

LOCATION: 22

NAME:

UTM: 5610070N/323426E

ACCESS: Via a logging road branching off P.R. 314 at the northwestern end of Cat Lake.

AREA: West of Cat Lake (Fig. 22-1)

AIRPHOTO: A24670-160

EXPLORATION SUMMARY:

The area of the occurrence was surveyed and trenched by M.G. Smerchanski in 1956 (A.F. 91338; Fig. 22-2). An airborne radiometric survey was flown over the area by Geophysical Engineering and Surveys Limited in 1971 (A.F. 91677). The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

The area of the occurrence is underlain by Rice Lake Series mafic to intermediate volcanic and sedimentary rocks intruded by gabbroic and granitic stocks (Fig. 22-1, 22-2; Manitoba Energy and Mines, 1987; A.F. 91338).

MINERALIZATION:

Unquantified amounts of chalcopyrite, pyrrhotite and pyrite are reported to be present in the gabbro (A.F. 91338).

GEOCHEMICAL DATA:

No data reported.

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91338, 91677; Manitoba Energy and Mines, Mines Branch.

Manitoba Energy and Mines

1987: Pointe du Bois, NTS 52L; Manitoba Energy and Mines, Bedrock Geology Compilation Map Series, Preliminary Edition, 1:250 000.

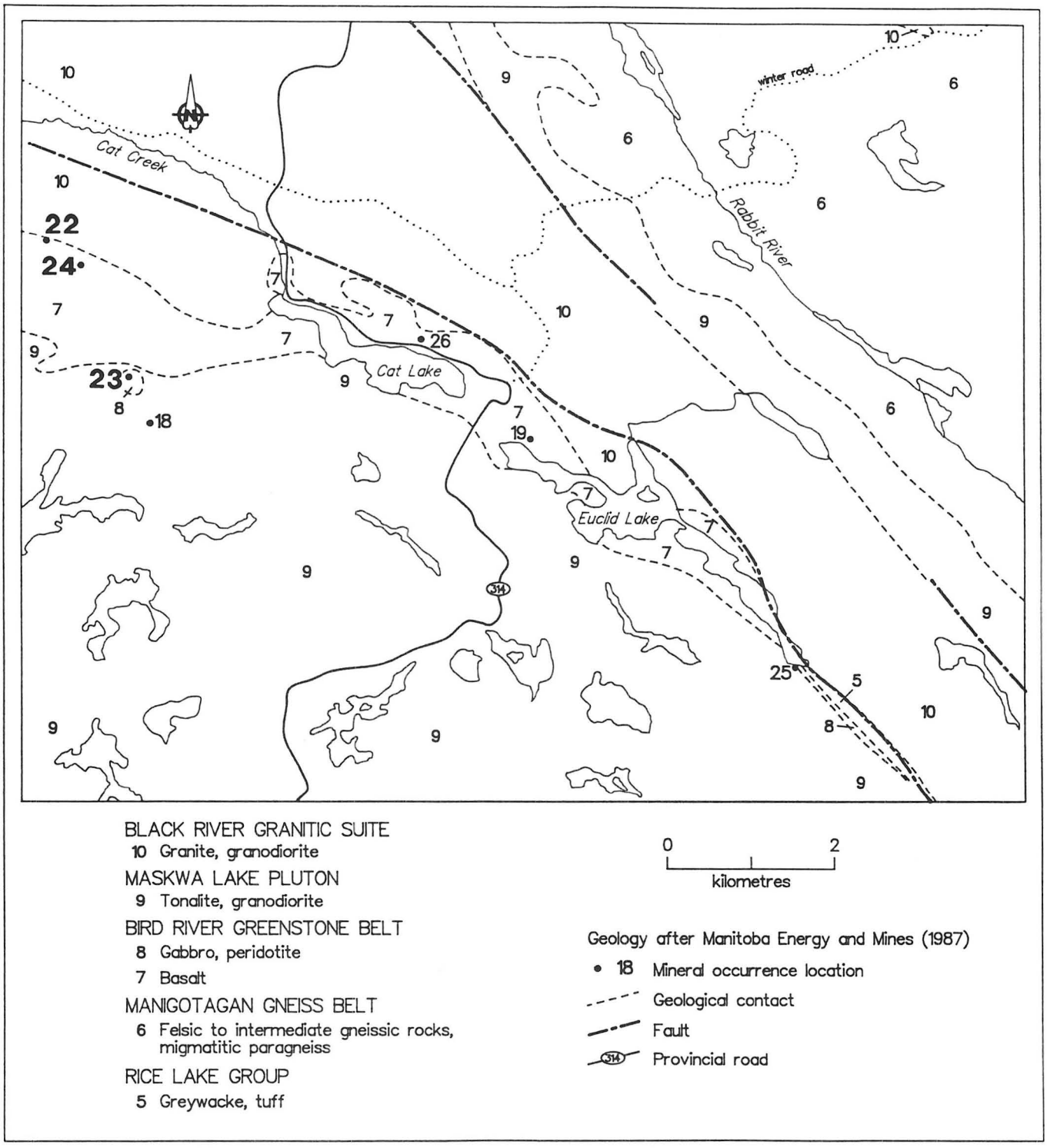


Figure 22-1: Geological setting of occurrences 22, 23 and 24.

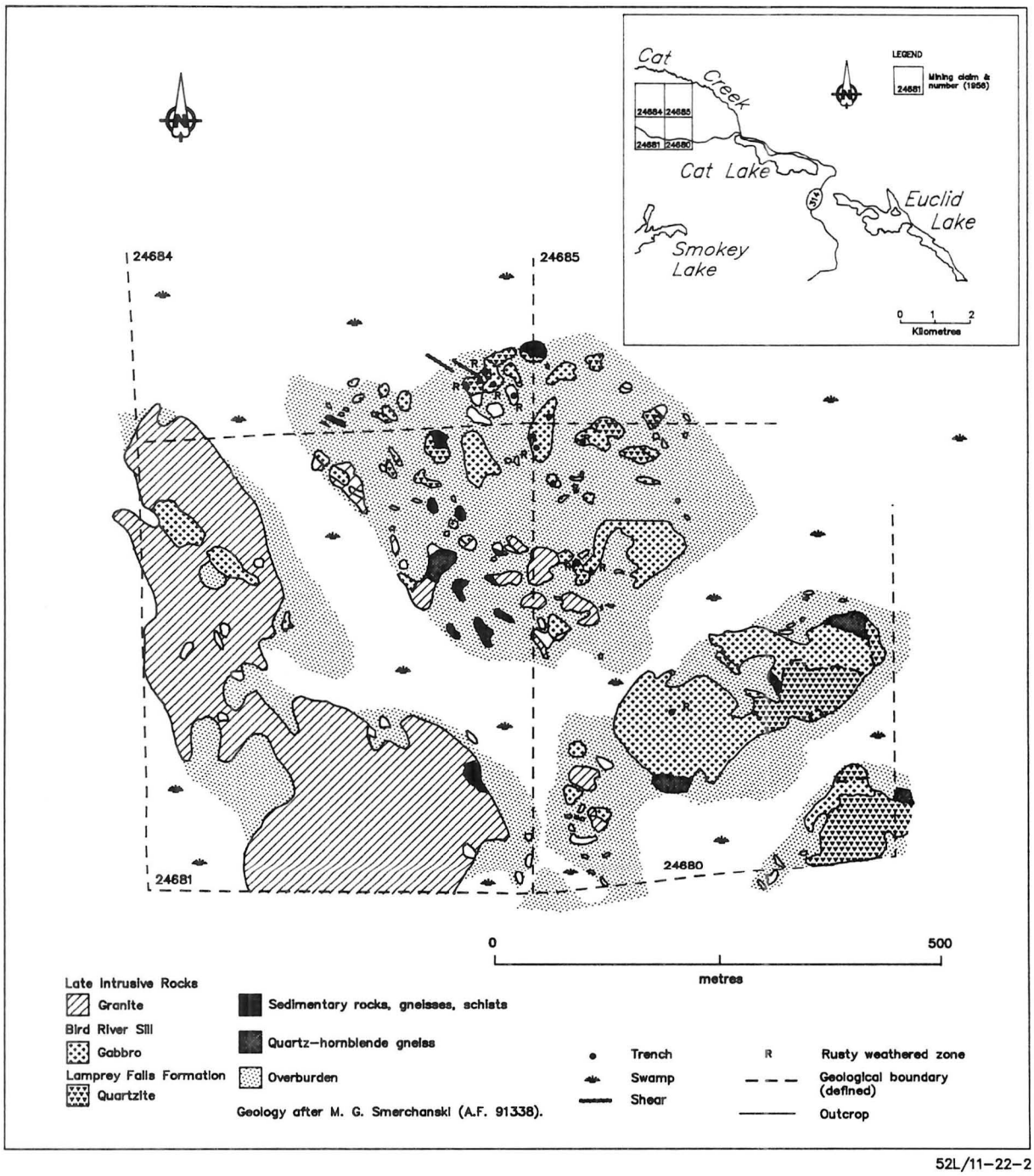


Figure 22-2: Geology and location of trenches at occurrence 22.

LOCATION: 23

NAME: New Manitoba Mine
UTM: 5608375N/324398E
ACCESS: Via a logging road branching off P.R. 314 at the northwestern end of Cat Lake.

AREA: 1.5 km west of Cat Lake (Fig. 22-1)
AIRPHOTO: A24670-160

EXPLORATION SUMMARY:

A detailed exploration history of the deposit is given in Mineral Inventory Card 52L/11 Cu1. The area of the occurrence was surveyed and trenched in 1943. The New Manitoba Mining and Smelting Company Limited acquired the property in 1955 and completed sinking a 192 m deep shaft in 1957. Construction of a 900 t/day concentrator was halted in 1957 due to a decrease in nickel prices. The property remained dormant until 1971 when Cat Lake Mines Limited undertook a geophysical survey and a drilling program on the property (Mineral Inventory Card 52L/11 Cu1). An airborne radiometric survey was flown over the area by Geophysical Engineering and Surveys Limited in 1971 (A.F. 91677). Mapping and channel sampling for Pt and Pd was undertaken by staff of Manitoba Energy and Mines (Theyer, 1986). The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

The area of the occurrence is underlain by a gabbroic complex that is part of the Bird River greenstone belt (Fig. 22-1; Manitoba Energy and Mines, 1987). The gabbroic rocks are surrounded and intruded by granodioritic and tonalitic rocks. Contact metamorphism at the contact of the gabbro and granite is evidenced by pervasive feldspar recrystallization and growth of pegmatitic phases or very fine grained phases characterized by an abundance of micaceous minerals on fractures (Theyer, 1986).

MINERALIZATION:

Disseminated pyrite and pyrrhotite, 1 to 30%, occur in mineralized zones, 8 to 18 m wide and up to 50 m long, within the gabbro (Theyer, 1986).

GEOCHEMICAL DATA:

Ore reserve data vary greatly; in 1957, "reserves" calculated to a depth of 130 m were quoted as 1 800 000 tonnes grading 0.33% Ni and 0.75% Cu (Davies *et al.*, 1962). After 1971, "reserves" were estimated at 587 000 tonnes grading 0.24% Ni and 0.58% Cu (Canadian Mines Handbook, 1959).

The best assay results of an ore beneficiation test performed on 145 tonnes of rock from this location are given in Table 23-1. Assay results of unspecified rock samples from the third mine level are listed in Table 23-2. Platinum and Pd analyses of channel samples collected across the thickness of the mineralized zones are presented in Table 23-3.

Table 23-1: Results of an ore beneficiation test from occurrence 23 (New Manitoba) (Mines Branch, Ottawa).

Product	Cu (%)	Ni (%)
Feed	0.64	0.2
Cu conc.	30.39	0.25
Ni conc.	1.59	2.94

Table 23-2: Assay results of rock samples from the third mine level from occurrence 23 (Corporation Files, New Manitoba Mining and Smelting Company Limited).

Sample No.	Cu (%)	Ni (%)
1	0.69	0.34
2	0.88	0.41
3	1.01	0.41
4	0.63	0.47
5	0.75	0.35
6	0.88	0.33

Table 23-3: Pt and Pd analyses of channel samples collected in 1986 across the thickness of mineralized zones from occurrence 23 (New Manitoba) (Theyer, 1986).

	Pt (ppb)	Pd (ppb)
Channel NF-A		
0-2 m	10	4
2-4	10	<2
4-6	10	13
6-8	10	10
Channel NF-B		
0-2 m	<10	8
2-4	10	33
4-6	20	48
6-8	10	42
8-10	20	62
Channel NF-C		
0-2 m	40	68
2-4	20	47
4-6	20	38
6-8	30	12
8-10	10	26
10-12.4	30	59

CLASSIFICATION:

Magmatogenic type deposit associated with mafic/ultramafic rocks.

REFERENCES:

Assessment File 91677; Manitoba Energy and Mines, Mines Branch.

Canadian Mines Handbook 1959; Southam Magazine Group, Don Mills Ontario.

Davies, J.F., Bannatyne, B.B., Barry, G.S., McCabe, H.R.
1962: Geology and mineral resources of Manitoba; Manitoba Mines and Natural Resources, Mines Branch, MRD 2, 190p.

Manitoba Energy and Mines
1987: Pointe du Bois, NTS 52L; Manitoba Energy and Mines, Bedrock Geology Compilation Map Series, Preliminary Edition, 1:250 000.

Mineral Inventory Card 52L/11 Cu1; Manitoba Energy and Mines, Geological Services Branch.

New Manitoba Mining and Smelting Company Limited, Corporation File; Manitoba Energy and Mines, Mines Branch.

Theyer, P.
1986: Platinum group elements in southeastern Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1986, p. 125-130.

LOCATION: **24**

NAME: Acme Group

UTM: 5609780N/323816E

ACCESS: Via a logging road branching off P.R. 314 at the northwestern end of Cat Lake.

AREA: West of Cat Lake (Fig. 22-1)

AIRPHOTO: A24712-160

EXPLORATION SUMMARY:

"Extensive trenching" was reported in the area, according to a geological report that also contains a MAG survey by Falconbridge Nickel Mines Limited dated 1951 (A.F. 91099). An airborne radiometric survey was flown over the area by Geophysical Engineering and Surveys Limited in 1971 (A.F. 91677). The area is currently staked and in good standing until July 1995.

GEOLOGICAL SETTING:

Location 24 is situated within basalt of the Bird River greenstone belt (Fig. 22-1; Manitoba Energy and Mines, 1987). The area of the occurrence reportedly is underlain by "amphibolite, feldspathized andesite" that is intruded by granite (A.F. 91099).

MINERALIZATION:

Unquantified amounts of pyrrhotite and chalcopyrite occur in "poorly mineralized zones". The zones are lenticular and the largest reported size is 12 x 60 m (A.F. 91099).

GEOCHEMICAL DATA:

The "grade" (of rock samples?) is reported as <1% Ni and Cu combined (A.F. 91099).

CLASSIFICATION:

Disseminated mineralization - not classified.

REFERENCES:

Assessment Files 91099, 91677; Manitoba Energy and Mines, Mines Branch.

LOCATION: 25

NAME: Euclid Lake
UTM: 5604846N/332339E
ACCESS: Via P.R. 314 to Cat Lake and thence to Euclid Lake via Cat Creek.

AREA: Euclid Lake (Fig. 25-1)
AIRPHOTO: A23707-138

EXPLORATION SUMMARY:

A detailed exploration history of the deposit is given in Mineral Inventory Card 52L/11 Cr1.

Chromite was found at Euclid Lake by Fritz and Albert Zeemel in 1942. An eleven-hole (1185 m) diamond drilling program that defined two parallel chromite-rich layers separated by chromiferous peridotite was undertaken for Gunnar Gold Mines Limited in 1943. A magnetometer survey was followed up by a ten-hole (1861 m) diamond drilling program that traced the chromite-rich layers over a strike length of 610 m. An AEM survey was flown by Hudson Bay Exploration and Development Company Limited in 1971 (A.F. 91686) and an airborne radiometric survey was flown by Geophysical Engineering and Surveys Limited in the same year (A.F. 91677). Dynamic Mining Exploration Ltd. commissioned a re-investigation of earlier data and feasibility study by David S. Robertson and Associates Limited in 1981. Ilam Associates Limited (1988) evaluated the chromite reserves of the Bird River Sill as part of a Federal-Provincial cost-shared initiative to assess the feasibility of using Bird River Sill chromite as feedstock for the production of stainless steel. The area is currently covered by an Explored Area Lease (1994).

GEOLOGICAL SETTING:

Chromite occurs as stratabound layers, lenses and disseminations in the stratigraphically upper part of a layer of serpentinized peridotite near the contact with the stratigraphically overlying gabbro to the northeast (Fig. 25-2). Bateman (1942) correlated this mafic-ultramafic rock sequence with the Bird River Sill, suggesting that the portion of the Bird River Sill between Bird Lake and the Winnipeg River occupies the southern limb and the Euclid Lake sequence is preserved in the northern limb of an east-plunging anticline. Greywacke and tuff northeast of the mafic-ultramafic intrusion are considered part of the Rice Lake Group (Manitoba Energy and Mines, 1987; Fig. 25-1). Springer (1950) described the chromite-bearing outcrop at Euclid Lake: "The gabbro-peridotite contact lies beneath a small stream flowing into the (Euclid) lake. On the south side of the stream chromite-bearing peridotite abuts against granite which has destroyed the lower part of the sill. Disseminated and dense chromite may be seen in the few feet of peridotite exposed".

MINERALIZATION:

Chromite occurs as stratiform, disseminated to massive aggregates of euhedral to subhedral, subrounded crystals up to 3 mm diameter in a magnetite-rich serpentinized peridotite matrix. Gait (1964) classified the chromites of the Bird River Sill as three groups based on the ratio of chromite crystals to matrix: a) densely packed crystal aggregates, b) less densely packed aggregates, and c) disseminated crystals in a matrix of oval serpentinized olivine crystals. Conventionally accepted nomenclature distinguishes between "chromitite" (>85% chromite) and "chromiferous layers" (25 to 85% chromite).

A number of chromite crystals contain subrounded to rounded silicate inclusions up to 0.8 mm diameter and, in places, minute drop-shaped sulphide inclusions. Most chromite crystals are characterized by an alteration rim consisting of an Al_2O_3 and MgO impoverished zone, plainly visible as a lighter-coloured phase on polished chromite crystal sections. Chromite crystals are, in places, also characterized by silicified fractures. Cryptic layering is manifested by variations in the Cr_2O_3 *vs.* MgO ratio. Chromite crystals in chromite-rich layers tend to contain >40% Cr_2O_3 and >2% MgO, whereas chromite-poor layers are characterized by chromite crystals containing <37.5% Cr_2O_3 and <2% MgO (Weiser, 1988).

Trueman and Macek (1971) and Bannatyne and Trueman (1982, p. 35) published the results of drillhole information made available by courtesy of Albert Zeemel: "Several thin layers of dense to disseminated chromite are separated by layers of low grade chromiferous peridotite" and "the main chromite occurrence was determined to be 373 m long."

GEOCHEMICAL DATA:

Theyer (1981) sampled chromite-bearing peridotite. Bannatyne and Trueman (1982) calculated an average concentration of 4.57% Cr_2O_3 for the chromite of the Euclid property. Watson (1985) assumed an average of 4.56% Cr_2O_3 in his ore calculations (Ilam Associates Ltd., 1988). Cr to Fe ratios in the chromite are quoted as 1.1:1 by Gait (1964) and 1.2:1 to 1.5:1 by Bateman (1943).

Reserve estimates for the Euclid Lake property by Davies (1958), Bannatyne and Trueman (1982) and Watson (1985) are tabulated in Table 25-1.

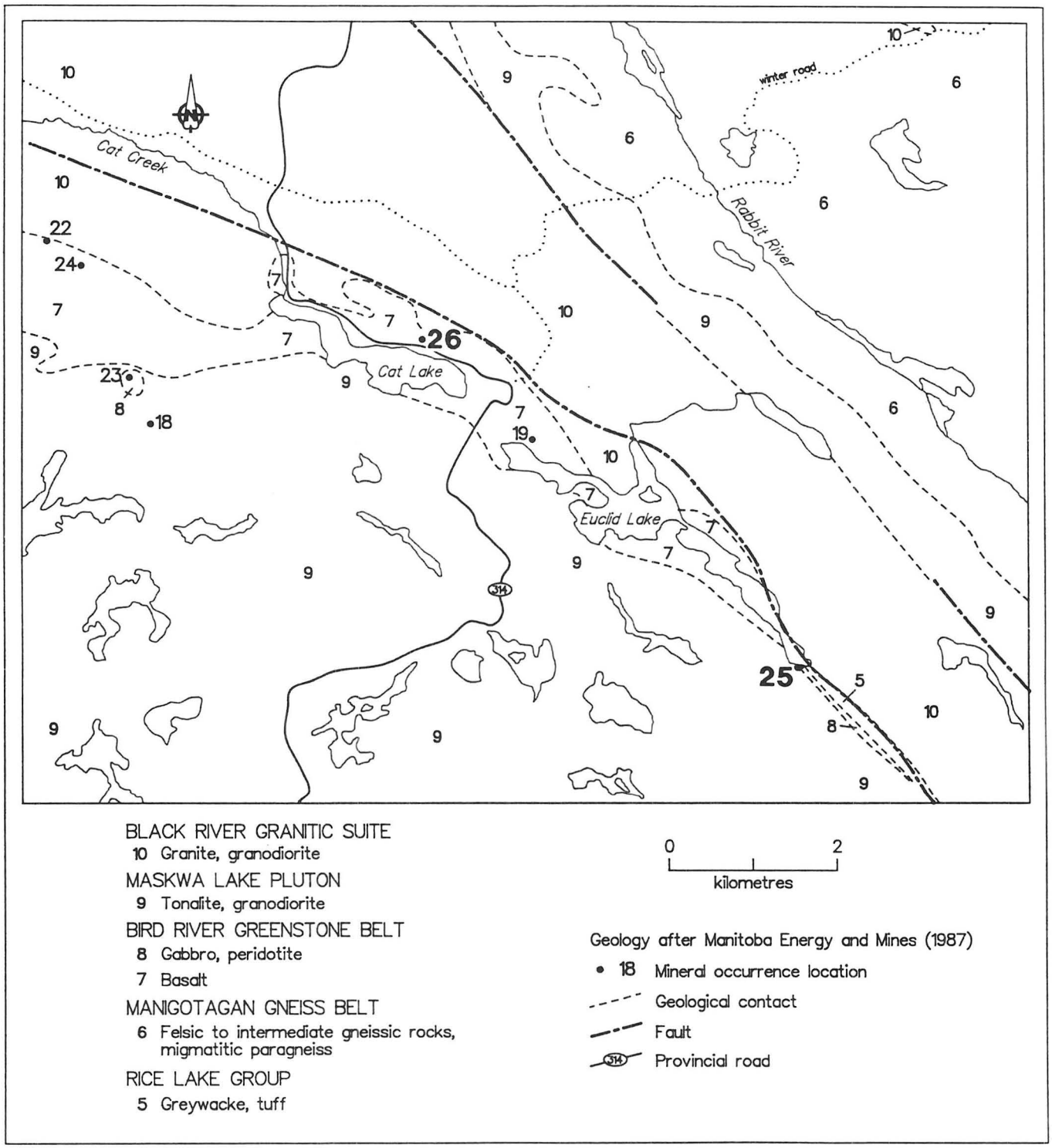


Figure 25-1: Geological setting of occurrences 25 and 26.

CLASSIFICATION:

Magmatogenic type deposit associated with ultramafic rocks.

REFERENCES:

Assessment Files 91677, 91686; Manitoba Energy and Mines, Mines Branch.

Bannatyne, B.B. and Trueman, D.L.

1982: Chromite reserves and geology of the Bird River Sill, Manitoba; Manitoba Energy and Mines, Open File Report OF82-1, 73p.

Bateman, J.D.

1943: Bird River chromite deposits, Manitoba; The Canadian Institute of Mining and Metallurgy, Transactions, v.46, p. 154-183.

Davies, J.F.

1958: Chromite deposits of southeastern Manitoba, Canadian Mining Journal, v.79, n.4, p. 112-114.

Gait, R.I.

1964: The mineralogy of the chrome spinels of the Bird River Sill, Manitoba; University of Manitoba, M.Sc. Thesis (unpublished), 64p.

Ilam Asssociates Limited

1988: An evaluation of the chromite reserves in the Bird River Sill, southeastern Manitoba; Manitoba Energy and Mines, Mines Branch, 99p.

Manitoba Energy and Mines

1987: Pointe du Bois, NTS 52/L; Bedrock Geology Compilation Map Series, Preliminary Edition, 1:250 000.

Mineral Inventory Card 52L/11 Cr1; Manitoba Energy and Mines, Geological Services Branch.

Springer, G.D.

1950: Mineral deposits of the Cat Lake - Winnipeg River area, Lac du Bonnet Division, Manitoba; Manitoba Mines and Natural Resources, Mines Branch, Publication 49-7, 14p.

Theyer, P.

1981: Mineral deposit studies - Superior Province a) Island Lake b) Bird River Sill; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1981, p. 74-77.

Trueman, D.L. and Macek, J.J.

1971: Ultramafic Project: Geology of the Bird River Sill; Manitoba Mines and Natural Resources, Mines Branch, Preliminary Map 1971A-1, 1:31 680.

Watson, D.M.

1985: Chromite reserves of the Bird River Sill; Manitoba Energy and Mines, Open File Report OF85-8, 22p.

Weiser, T.

1988: BMFT-Förderungsvorhaben BZ 0200 LO "Technisch-wissenschaftliche Zusammenarbeit zwischen Kanada und der Bundesrepublik Deutschland" Projekt 87/7: Untersuchungen über die Verteilung der Platingruppenelemente im Bird River Complex, Manitoba, Canada. (Investigation of the distribution of platinum group elements in the Bird River complex, Manitoba, Canada; German Canadian technical-scientific cooperation agreement).

Table 25-1
Chrome ore reserve estimates from occurrence 25 (Euclid Lake)
(modified after Bannatyne and Trueman, 1982; Davies, 1958; Watson, 1985).

	Davies (1958), Bannatyne & Trueman (1982)		Watson (1985)	
	Measured	Indicated	Measured	Indicated
Length (m)	373.4	373.4	373	373
Avg. thickness (true)	30.8	30.8	22.6	22.6
Depth (m)	305	122	122-244	122-224
Volume (m^3)	1 405 090	1 405 090	1 030 711	1 030 711
m^3/t	0.3094	0.3094	0.30	0.30
Avg. grade (Cr_2O_3)	4.6	4.57	4.57	4.56
Ore tonnage	9 981 851	4 541 400	4 541 400	3 435 703
Cr_2O_3 tonnage	207 542	207 542	156 668	156 668

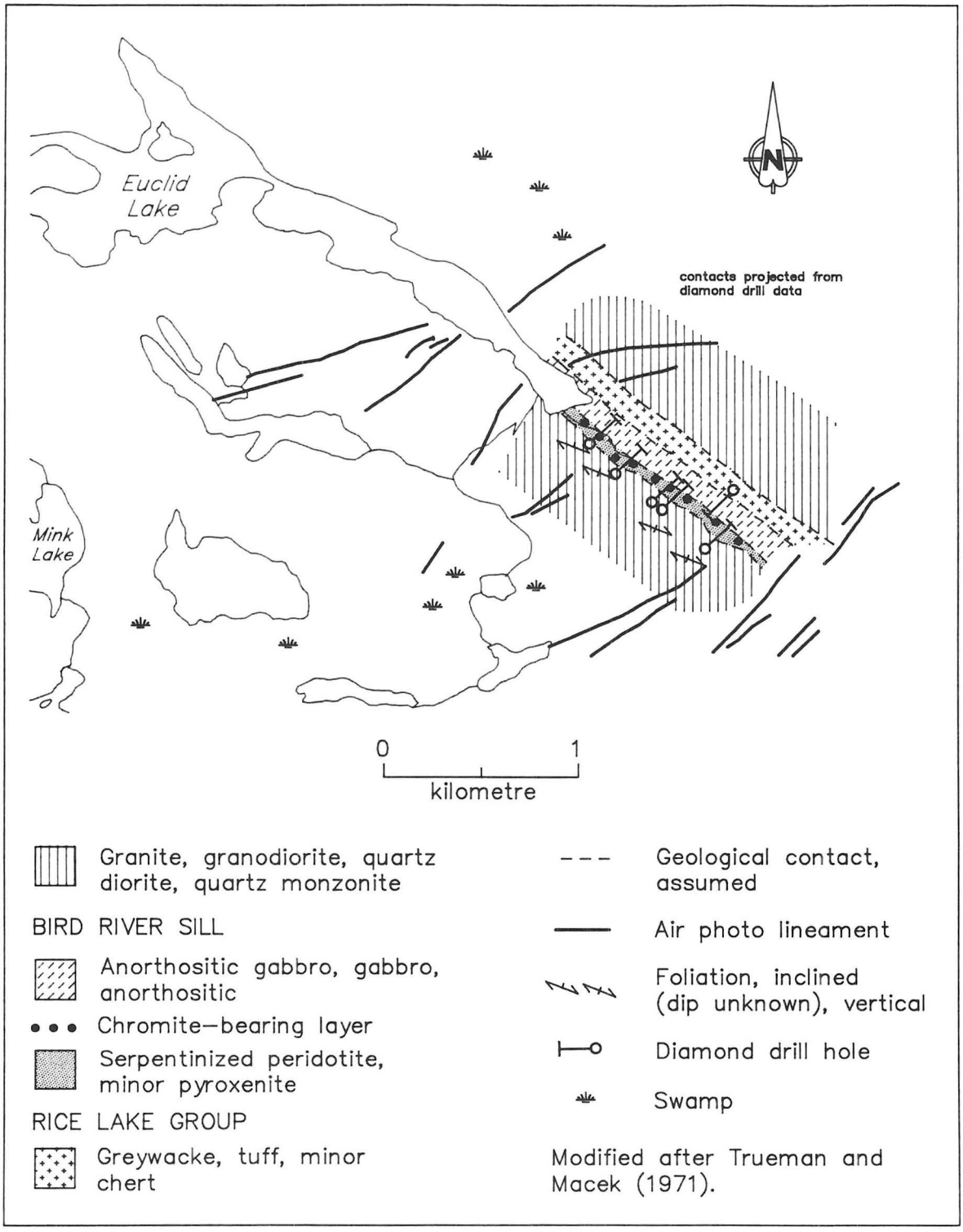


Figure 25-2: Geology and location of drill holes at occurrence 25.

LOCATION: 26

NAME:

AREA: Vicinity of Cat Lake (Fig. 25-1)

UTM: 5608656N/327802E

AIRPHOTO: MB86019-17

ACCESS: Via P.R. 314 to Cat Lake.

EXPLORATION SUMMARY:

In 1944, Hudson Bay Mining and Smelting Company Limited mapped the geology (1:31 680 scale), trenched, and drilled six holes (475 m) on the Eagle-Irgon pegmatite (A.F. 91767). In 1955, Combined Developments Limited mapped the geology (1:2 400 scale) on the Lac claim group south of Cat Lake and the Central pegmatite group in search of lithium-bearing pegmatites (A.F. 91310). In 1956, M.G. Smerchansky mapped the geology (1:2 400 scale) of the Leo claims approximately 1.5 km north of Cat Lake to search for lithium-bearing pegmatites (A.F. 91337). In 1955, Combined Developments Limited conducted geological mapping (1:2 400 scale) and and drilled one hole (151 m) on the Bon claim group approximately 1 km north of Cat Lake (A.F. 91308). In 1952, geological investigations of an area approximately 4.5 km north of Euclid Lake included prospecting, outcrop stripping and diamond drilling (39 holes, 396 m) in search of lithium-bearing pegmatites (A.F. 91309). In 1978, Tantalum Mining Corporation of Canada Limited conducted geological mapping (1:1 200 scale), geochemical surveys and diamond drilling (23 holes, 768 m) to study the Mapetre and the Central pegmatite dykes (south of Cat Lake) (A.F. 92681). The area of the Eagle-Irgon pegmatite is currently under lease (1994).

GEOLOGICAL SETTING:

The area north and northeast of Cat Lake is underlain by tonalite and granodiorite of the Maskwa Lake pluton, granite and granodiorite of the Black River suite and basalt of the Bird River greenstone belt (Fig. 25-1; Manitoba Energy and Mines, 1987). Cerny *et al.* (1981) distinguished four pegmatite groups (Eagle-Irgon, Beryl-Tourmaline, Cat Lake and the Central Claim groups) in the Cat Lake pegmatite district (Fig. 26-1) based on the degree of igneous differentiation and the content of Rb, Cs, Li, Ta and Nb.

MINERALIZATION:

The Eagle-Irgon pegmatite group, located north and west of Cat Lake, consists of west-northwest to west-striking, vertically dipping, lenticular pegmatite dykes intruded into basalt. The Eagle pegmatite dyke, the largest body, is approximately 1100 m long if continuous, and attains a maximum thickness of 12 m. The Irgon pegmatite is an east-striking pegmatite dyke up to 18 m wide, exposed for approximately 365 m. It is a partially banded, fine- to coarse-grained, white pegmatite estimated to contain up to 20% spodumene, with a small zone assessed to contain an exceptionally high (50%) concentration of spodumene (Springer, 1950). The Eagle-Irgon group is characterized by an extreme lithium enrichment, in the absence of any other mineralization of economic significance (Cerny *et al.*, 1981).

The Beryl-Tourmaline group is an array of north-striking, steeply dipping, small (15 m long by <1 m thick) pegmatites in the vicinity of the Eagle-Irgon Group (Fig. 26-1). Although characterized by the presence of Be and B, this group is economically insignificant, due to the small number and size of the pegmatite bodies (Cerny *et al.*, 1981).

The Cat Lake pegmatite group occurs between Cat and Euclid lakes. The pegmatites are generally concordant to the foliation of the host basalt. They have Li and Be mineralization with traces of Nb and Ta (Cerny *et al.*, 1981).

The Central Claim pegmatite, located south of Cat Lake (Fig. 26-1) in tonalite of the Maskwa Lake Pluton, is in excess of 500 m long and ranges from 1.10 to 7 m width. The Central Claim pegmatite is distinctly zoned, although most of the primary zoning is obliterated due to metasomatism. Its hanging- and footwall contacts are sheared and lined with biotite. It strikes parallel to a prominent north-striking lineament that is visible on airphotos. A lineament associated with pegmatites of the Cat Lake group terminates at the northeast corner of the Central Claim pegmatite. A linear geochemical Li anomaly extends west of the southwest end of the Central Claim pegmatite (Cerny *et al.*, 1981).

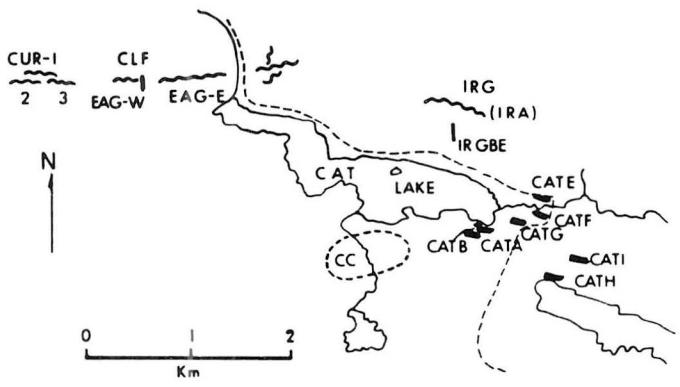


Figure 26-1: Location of the Eagle-Irgon, Beryl-Tourmaline, Cat Lake and Central Claim pegmatite groups. Eagle-Irgon group: CUR-1, CUR-2, CUR-3, EAG-W, EAG-E, IRG. Beryl-Tourmaline group: CLF, BET, IRGBE. Cat Lake group: CATA, CATB, CATE, CATF, CATG, CATH, CATI. Central Claim group: CC.

MINERALIZATION:

Drill holes in the Eagle-Irgon pegmatites intersected up to 30% spodumene in up to 2.5 m thick pegmatitic veins (A.F. 91767). Notable drillhole intersections of the Eagle pegmatite include:

DDH 1 intersected several pegmatite veins from 60.2 m to 80.1 m depth with up to 25% spodumene and Li_2O concentrations ranging from 0.56% to 1.57%.

DDH 2 intersected ten <1 m thick pegmatite veins from 8.2 m to 84.9 m depth containing up to 30% spodumene.

DDH 4 intersected three pegmatite veins up to 4 m thick from 71.3 m to 81.6 m depth that contain up to 25% spodumene.

DDH 6 intersected a pegmatite vein at 55.1 m to 55.1 m depth containing up to 20% spodumene.

Notable drillhole intersections from the Central Claim pegmatite include:

DDH CL-1 intersected a spodumene zone with aplite patches from 18.7 m to 19.2 m depth.

DDH CL-4 intersected aplite with abundant apatite from 4.9 m to 7.1 m depth.

DDH CL-16 intersected a spodumene zone from 27.4 m to 28.1 m depth; the lower 10 cm of this intersection is characterized by lepidolite alteration (A.F. 92681).

An east-striking pegmatite dyke, approximately 30 m long by 1 to 2 m thick containing K-feldspar, quartz and muscovite, occurs approximately 0.65 km south of the Central Claim pegmatite (A.F. 91310).

GEOCHEMICAL DATA:

According to Cerny *et al.* (1981), the Eagle-Irgon group contains significant concentrations of Li; the Beryl-Tourmaline group contains Be and B; the Cat Lake group has concentrations of Be and traces of Li, Nb and Ta. The Central Claim pegmatite contains Li, Be, Nb and Ta; they state that this group has the greatest potential to contain significant quantities of Nb and Ta in this area.

Drill core from the Central Claim pegmatite contained 0.001 to 0.048% Ta_2O_5 (A.F. 92681).

CLASSIFICATION:

Pegmatite type deposits.

REFERENCES:

Assessment Files 91308, 91309, 91310, 91337, 91767, 92681; Manitoba Energy and Mines, Mines Branch.

Cerny, P., Trueman, D.L., Ziehlke, D.V., Goad, B.E. and Paul, J.
1981: The Cat Lake-Winnipeg River and the Wekusko Lake pegmatite fields, Manitoba; Manitoba Energy and Mines, Economic Geology Report ER80-1, 215p.

Manitoba Energy and Mines
1987: Pointe du Bois, NTS 52/L; Bedrock Geology Compilation Map Series, Preliminary Edition, 1:250 000.

Springer, G.D.
1950: Mineral deposits of the Cat Lake - Winnipeg River area, Lac du Bonnet Division, Manitoba; Manitoba Mines and Natural Resources, Mines Branch, Publication 49-7, 14p.