MARGINAL NOTES

LOCATION AND ACCESS

The Sapawe Lake area includes McCaul and Hutchinson Townships, the southern third of Ramsay-Wright Township and adjacent unsurveyed territory. The area is located about 176 km west of Thunder Bay and about 10 km east of Atikokan. Highway 11 and the Canadian National Railway cross the southern portion of the mapped area. A network of logging roads connected to Highways 622, 623, and 633, the Atiko Gold Mine road, a number of cottage roads connected to Highway 11, and the highway itself, afford excellent access to the western, central and southern sections of the area. A well maintained gravel road (the Premier Lake road) provides excellent access to the eastern section of the area. Water transportation via the Lower Seine Lake and Reserve Bay portions of Marmion Lake, provide access to the northern section of the area. The Sapawe Lake area covers about 432 km² bounded by Latitudes 48°42'30"N and 48°52'N and Longitudes 91°13'W and 91°33'W.

MINERAL EXPLORATION

Mineral exploration in the area has concentrated on iron, gold, and recently base-metals and cobalt. Iron exploration has been centred on the Atikokan Iron Range. The largest known occurrence is the Atikokan Iron Mine (property 16) located just east of Sapawe Lake. This mine was operated by the Atikokan Iron Company Limited, between 1907 and 1911, during which time 90 680 tons of ore were mined using 5 tunnels, 3 shafts with crosscuts and 2 open cuts. The mine ceased operations in 1912 due to impurities in the ore. Several similar occurrences, including the Mark (property 13), the Garland (property 12), the Pattison (property 10) and the Sapawe Lake prospect (property 27), are all part of the Atikokan Iron Range. These occurrences have been investigated for iron either by geological mapping, trenching, geophysical surveying, diamond drilling, or adits, as recently as 1970.[1]

Exploration for gold in the Sapawe Lake area has been essentially confined to the granitic rocks (Marmion Lake Batholith) north of the metavolcanic belt, and the rocks of the metavolcanic belt, or the contact zone between the granitic rocks and the metavolcanics. Within the granitic rocks exploration dates back to the 1880s, when the Sunbeam Gold Mine (property 18) was discovered. This mine was worked until 1904, by which time 650 tons of ore had been milled, to a value of $4875.00 (Ferguson et al. 1971, p. 252). Gold was also discovered before the turn of the century on the southeastern shore of Tyrrell Lake, on property known as the Jack Lake Mine prospect (property 32). Exploration on this property has occurred as recently as 1961, when Fidelity Mining Investments Limited diamond drilled 699.2 m². Other gold discoveries within the Marmion Lake Batholith include the Minto Mine occurrence (property 31), located about 7 km south of the Sunbeam Mine property, the R71 vein occurrence (property 7), located on this mining location on the northeastern shore of Osinawi Lake, and a number of veins in the Reserve Island area of Marmion Lake (properties 1 and 17). Exploratory work on the Minto Mine occurrence property included stripping, trenching and sinking a 20 m shaft between 1903 and 1905. Work on the other occurrences varied from stripping and trenching to sinking a 19 m shaft[2].

Several gold occurrences have been found within the metavolcanic belt or in the contact zone between the metavolcanic belt and the granitic rocks of the Marmion Lake Batholith. The most notable, and the only recent producer, is the Atiko Gold Mines Corporation (property 4). Formerly the Sapawe Gold Mine, this past producer, located just south of Osinawi Lake, produced $173420 worth of gold and silver from 33016 tons of ore between 1964 and 1966 (Riddell 1967, p. 51). The shaft is 310 m deep, with levels at 52 m, 97 m, 159 m, 219 m and 280 m (Riddell 1967, p. 52). This work was carried out by Lindsay Explorations Limited and Sapawe Gold Mines Limited.

In 1974, this property was acquired by the Atiko Gold Mines Corporation, an affiliate of Bayard Resources Limited of Montreal. Magnetic and detailed geological surveys were completed on the property that year. The following year, some mine building restoration and additional claim staking was undertaken; however, work was discontinued at that point[2]. As of December 31, 1979, renewal of activity on the property has been limited to mine rehabilitation cost estimates. The Canadian Mines Handbook, 1975-76, (under Sapawe Gold Mines Limited) estimates 30 000 tons of 1.0 ounce gold per ton. Three grab samples collected from the mine dump by C. R. Larsen indicated up to 0.05 ounce gold per ton and 0.29 ounce silver per ton[1].

Numerous gold occurrences have been discovered between the southwestern corner of McCaul Township and the Mac Lake area in eastern Hutchinson Township. These include, from west to east, the Olcott occurrence (property 26), the Agnico-Eagle prospect (property 2), the Whitehead veins occurrence (property 5), the Mammoth vein occurrence (property 30), the Gray veins occurrence (properties 19 and 29), and the McWilliams veins occurrence (property 20). Exploratory work on these occurrences varied from stripping and trenching on the Hill, Gray, McWilliams and Whitehead, to diamond-drilling, on the Olcott, Agnico-Eagle, and Mammoth, to the production of 21 ounces of gold and 13 ounces of silver from 350 tons of material from the J. J. Walsh Mine[3].

Recently, properties along the Atikokan Iron Range, have been investigated for their base-metal and cobalt potential. In 1970-71, The Hanna Mining Company Limited evaluated their Mark and Garland occurrences (properties 13 and 12 respectively). Diamond-drilling, detailed geological mapping, and a number of geophysical surveys were conducted on the Mark occurrence. Work on the Garland occurrence included geological mapping and various geophysical surveys[3]. During 1970 Kerrins Exploration and Monteagle Minerals Limited combined efforts and acquired large sections of ground along the Atikokan Iron Range and conducted both airborne and ground geophysics[3]. In 1978 Sherritt-Gordon Mines Limited, diamond-drilled the Sapawe Lake prospect (property 27), and conducted metallurgical tests on the core. At the time of writing, Steep Rock Iron Mines Limited holds the option on the Sapawe Lake prospect and are conducting geophysical surveys and diamond-drilling.

Two mafic to ultramafic intrusions are known to exist within the metasedimentary belt of the map-area. One intrusion (property 14), is located just south of Plateau Lake. The other intrusion (property 6), is located in the southeastern corner of Hutchinson Township, about ¼ km west of Kawene Lake. These hornblendite to pyroxenite bodies (Larsen 1974), possess copper, nickel, and platinum group metal potential. Exploratory work on the Plateau Lake intrusion prospect consists of the sinking of a number of pits, geophysical survey, and limited diamond-drilling conducted by Andowan Mines Limited in 1948, (Shklanka 1969, p. 203). Ten grab samples collected from the occurrence by C. R. Larsen resulted in mean assays of 0.82% Cu, 0.27% Ni, 0.03% Co, 0.004 ounce Pd per ton, and 0.005 ounce Pt per ton[1]. The Kawene Lake intrusion prospect was investigated by diamond-drilling in 1957 by Sogemines Development Company Limited, and in 1970 by Canadian Addicks Mining Corporation. Ground geophysical surveys and a geological survey were carried out by The Hanna Mining Company in 1966 and an airborne electromagnetic survey was conducted over the property by The Canadian Addicks Mining Corporation in 1970[2].

Other significant exploration activities in the area are:

1) geological and geophysical survey in 1948, by Duvay Gold Mines Limited in an area just northeast of Nym Lake (property 11).
2) geological and geophysical survey conducted by Northern Canada Mines Limited in an area just southeast of Plateau Lake, (property 22), in 1948[2].
3) 325 m of diamond drilling by F. K. Landry in 1954, in the Niobe Lake Narrows area (property 15)[2].
4) 253 m of diamond drilling between Nickleby and Niobe Lakes conducted by Elmer Corrigan in 1957 (property 9)[2].
5) a prospecting program completed in 1960 by Pickering Metal Mines, in an area southwest of Singleton Lake (property 23)[2].
6) 309 m of diamond drilling by Almada Exploration Limited, on the south shores of Singleton Lake in 1967 (property 3)[2].
7) electromagnetic and magnetic surveys in the Mac Lake area, completed by Noranda Exploration in 1974 (property 21)[2].
8) electromagnetic and magnetic surveys carried out by Roger Thew, in 1973, in an area just southeast of Plateau Lake (property 28)[2].
9) limited diamond drilling carried out by Albert Carruthers in an area just west of Highway 623 in 1976 (property 8)[2].

GENERAL GEOLOGY

This description is after McIlwaine and Chorlton (1973) and McIlwaine and Hillary (1974).

Precambrian rocks underlie the entire area. These rocks can be divided into three major units:
1) the east-west trending metasedimentary belt,
2) a parallel metavolcanic belt with associated intrusive rocks, and
3) granitoid rocks.

The metasediments are separated from the metavolcanics by the Quetico Fault. The granitoid rocks are concentrated in three main masses; a migmatitic complex located south of the metasedimentary rocks, a relatively homogeneous pluton intrusive into the non-migmatitic metasediments, (the Sapawe Stock), and a batholitic mass north of the metavolcanics (the Marmion Lake Batholith).

The belt of metasediments extends east-west across the entire width of the map-area and ranges from 3050 m to 4270 m in width. The northern part of the belt is dominantly metamorphosed wacke which grades southwards, with increasing metamorphism, into quartz-biotite schist. In the north sedimentary structures such as graded-bedding and scour were observed locally. The gradation from quartz-biotite schist to a metawacke is a function of increasing distances from the southern granitoid migmatitic complex. Locally, near the Quetico Fault, sericite schist is developed in the metasediments. Local migmatitic zones are present in the southern portion of the metasedimentary belt. Intruding the metasediments are small ultramafic bodies composed mainly of pyroxenite and hornblendite (Larsen 1974). These intrusions vary greatly in texture, and are commonly very coarse grained.

The metavolcanic belt is dominantly intermediate to mafic in composition, and is composed mainly of massive and porphyritic flows, flow breccia, and pyroclastic units. Chlorite schist is common. Numerous gabbroic bodies occur within the metavolcanic belt. Rocks of the felsic units range in composition from rhyolite to dacite and lie in a narrow zone along the southern edge of the belt. These are mainly pyroclastic rocks with minor flows. The southern margin of the metavolcanic belt is characterized by a zone of metamorphosed sulphide-facies ironstone. This ironstone formation, which forms part of the Atikokan iron range, is discontinuous along it's strike length and is up to 100 m wide. Hawley (1929) considered these deposits to be of hydrothermal replacement type. Grabowski (1975) suggested that they are a distal sedimentary facies of the Steep Rock Lake iron deposit.

Age relationships between the three main masses of granitoid rocks are not clear. The granitoid rocks of the southern migmatitic complex comprise an early, fine-grained, homogeneous grey equigranular biotite granodiorite to quartz monzonite phase followed by a medium-grained equigranular to porphyritic biotite, muscovite granite to quartz monzonite. This latter is the most abundant phase. Late stage pegmatite dikes, with local tourmaline, cut the earlier phases. The contact zone is characterized by numerous xenoliths and infolded zones of metasediments.

Locally, the homogeneous granitoid rock grades into mappable heterogeneous migmatitic units. The Sapawe Stock is composed of four major phases, grading from an amphibolite, to a diorite, to a porphyritic monzonite and a non-porphyritic quartz monzonite (Hillary 1974). All phases, except the porphyritic phase, are equigranular. Hornblende is the main mafic mineral. All phases have abundant xenoliths, many of which are cognate. Only the southern margin of the Marmion Lake batholith occurs within the map-area. The batholith is a metamorphosed high level intrusion which is composed mainly of fine- to medium-grained, biotite-chlorite trondhjemite, and quartz diorite. Later phases, occurring as small discrete plutons, are composed of granodiorite and quartz monzonite. These small plutons are evident in the Marmion Lake-Lower Seine Lake area. They are generally more coarse grained than the earlier phases. Aplite and pegmatite dikes occur locally but not as commonly as in the southern migmatitic granitoid complex. Complex hybrid zones with abundant xenoliths occur within the batholith. The contact zone between the Marmion Lake Batholith and the adjacent metavolcanics is complex and relationships are commonly obscure and contradictory.

STRUCTURAL GEOLOGY

This description is after McIlwaine and Chorlton (1973) and McIlwaine and Hillary (1974).

The dominant structural feature of the area is the Quetico Fault which separates the metavolcanic belt from the metasedimentary belt. Other faulting in a northeasterly direction is evident, especially along the western shore of Lower Seine Lake, where local shearing was found.

An east-northeast-striking and steeply dipping foliation is strongly developed in the metavolcanics and metasediments. A similar direction of foliation is developed in the southern migmatitic granitoid complex; this is most evident in the contact zone.

Bedding in the metasediments is evident away from the granitoid contact and is generally parallel to sub-parallel to the foliation. Top determinations from graded-bedding and scour marks suggest that a major fold in the form of an anticline, with an easterly plunging axis, has developed along the northern part of the sedimentary belt, adjacent to the Quetico Fault.

ECONOMIC GEOLOGY

Two types of gold mineralization appear to be present in the Sapawe Lake area; those hosted by the Marmion Lake Batholith, and those hosted by the contact zone between this batholith and the metavolcanics. This contact zone consists of a complex of felsic intrusive and metavolcanics that can be over one kilometre in width and, in places, encompasses the entire width of the metavolcanic belt. In both types of mineralization the gold is concentrated in quartz or quartz-carbonate veins, or both, within shear zones and is associated with varying amounts of silver, copper, lead and zinc.

The Marmion Lake Batholith Type gold mineralization is generally associated with northeast-southwest-trending lineaments along which extensive shearing and alteration have occurred. Wilkinson (1980) states that the gold-bearing veins are hosted by saussuritized and carbonatized massive trondhjemite within the shear zones. It is therefore suggested that emphasis, during exploration, be placed in mapping these lineaments and locating the massive trondhjemites.

The Contact Zone Type gold mineralization is associated with east-west-trending shear zones, parallel to the common foliation of the metavolcanics. The gold appears to be associated with quartz and carbonate stringers and stockworks that crosscut the main vein. Exploration for this type of gold mineralization should concentrate on mapping the contact zone in detail in order to locate the gold-bearing shear zones.

Metric Conversion factor: 1 foot = XX16.0.3048 m

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[1]Analyses by the Ministry of Natural Resources Geoscience Laboratories, Toronto.

[2]Assessment Files, Regional Geologist's Office, Ministry of Natural Resources, Thunder Bay.

[3]Regional Geologist's Files, Ministry of Natural Resources, Thunder Bay.

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METAL AND MINERAL ABBREVIATIONS

Ag	Silver
Au	Gold
Co	Cobalt
cp	Chalcopyrite
Cu	Copper
Fe	Iron
Ni	Nickel
py	Pyrite
qv	Quartz vein
S	Sulphide

Ontario

Ministry of Natural Resources
Hon. Alan W. Pope, Minister
W. T. Foster, Deputy Minister

Ministry of Northern Affairs
Hon. Leo Bernier, Minister
Art Herridge, Deputy Minister

ONTARIO GEOLOGICAL SURVEY
PRELIMINARY MAP P.2388 (REV)
GEOLOGICAL SERIES

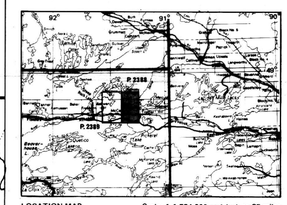
SAPAWE LAKE AREA
EAST PART
RAINY RIVER DISTRICT

Scale 1:15 840

Mile ½ 0 ½ Mile

Metres 100 0 0.2 0.4 0.6 0.8 Kilometre

NTS References: 52 B/11,14
ODM-GSC Aeromagnetic Maps: 1122G, 1123G
ODM Geological Compilation Map: 2115



LOCATION MAP Scale: 1:1,584,000 or 1 inch to 25 miles

LEGEND[a]

PHANEROZOIC
CENOZOIC
QUATERNARY
PLEISTOCENE AND RECENT
Glacial till, sand and gravel, clay, altered organic material

UNCONFORMITY

PRECAMBRIAN
MIDDLE TO LATE PRECAMBRIAN (PROTEROZOIC)
MAFIC INTRUSIVE ROCKS

10 — 10 Unsubdivided; 10a Fine- to medium-grained equigranular diabase; 10b Porphyritic diabase

INTRUSIVE CONTACT

EARLY PRECAMBRIAN (ARCHEAN)
FELSIC PLUTONIC ROCKS[b]
MARMION LAKE BATHOLITH

9 — 9 Unsubdivided; 9a Fine- to medium-grained biotite quartz-diorite, trondhjemite; 9b Porphyritic fine- to medium-grained biotite-quartz diorite, trondhjemite; 9c Coarse-grained amphibole-quartz diorite, trondhjemite; 9d Pink, coarse-grained amphibole-quartz monzonite, granodiorite; 9e Porphyritic, pink, coarse-grained amphibole-quartz monzonite, granodiorite; 9f Aplite; 9g Pegmatite; 9h Quartz porphyry; 9i Hybrid mixed granitoid; 9k Foliated biotite-quartz diorite, trondhjemite

INTRUSIVE CONTACT

SAPAWE STOCK

8 — 8 Unsubdivided; 8a Amphibolite; 8b Diorite, quartz diorite; 8c Porphyritic monzonite; 8d Quartz monzonite

INTRUSIVE CONTACT

MIGMATITE COMPLEX GRANITIC ROCKS

7 — 7 Unsubdivided; 7a Fine- to medium-grained muscovite-quartz monzonite, granite; 7b Fine-grained biotite-quartz monzonite, granite; 7c Porphyritic quartz monzonite, granite; 7d Porphyroblastic granitoid; 7e Pegmatite

INTRUSIVE CONTACT

ULTRAMAFIC INTRUSIVE ROCKS

6 — 6 Hornblendite, pyroxenite

INTRUSIVE CONTACT

MIGMATITIC ROCKS

5 — 5a Metasedimentary migmatite; 5b Quartz-feldspar-biotite schist; 5c Granitoid

METASEDIMENTS

4 — 4 Unsubdivided; 4a Quartz-feldspar-biotite schist; 4b Wacke; 4c Conglomerate; 4d Sericite-chlorite, sericite schist; 4e Amphibolite schist; 4f Migmatite; 4g Ironstone

INTRUSIVE CONTACT

MAFIC INTRUSIVE ROCKS

3 — 3 Unsubdivided; 3a Porphyritic gabbro; 3b Fine-grained gabbro; 3c Coarse-grained gabbro; 3d Diorite

INTRUSIVE CONTACT

METAVOLCANICS[b]
Felsic to Intermediate Metavolcanics[c]

2 — 2 Unsubdivided; 2a Massive flows; 2b Porphyritic flows; 2c Tuff; 2d Sericite-chlorite, sericite schist; 2e Felsic breccia

Mafic to Intermediate Metavolcanics[d]

1 — 1 Unsubdivided; 1a Massive flows; 1b Pillowed flows; 1c Gabbro; 1d Chlorite schist; 1e Pyroclastic rocks; 1f Amygdaloidal flows; 1g Porphyritic flows

NOTES
a This is basically a field legend and may be changed as a result of subsequent laboratory investigations.
b Numerical order does not imply age relationships among these rocks.
c Rhyolitic to dacitic.
d Basaltic to andesitic.

LIST OF PROPERTIES AND OCCURRENCES

1. Adco Explorations Limited (Reserve Island occurrences).
2. Agnico-Eagle Mines Limited (Agnico-Eagle prospect).
3. Almada Exploration Limited [1967].
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11. Duvay Gold Mines Limited [1948].
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13. The Hanna Mining Company (Mark occurrence).
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18. Moore, E. F. (Sunbeam Gold Mine).
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20. Noranda Exploration Company Limited (1974), (McWilliams veins occurrence).
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28. Thew, R. [1973].
29. Wicheruk, M. (Gray vein No. 2 occurrence).
30. Wicheruk, M. (Hill veins occurrence).
31. Wicheruk, M. (Minto Mine occurrence).
32. Wicheruk, M., and Hoffman, B. H. (Jack Lake Mine prospect).

SYMBOLS

- Glacial striae
- Geological boundary, position interpreted
- Small bedrock outcrop
- Fault, assumed
- Area of bedrock outcrop
- Fault zone, shear zone, schist zone (width indicated)
- Bedding, top unknown (inclined, vertical)
- Jointing; (horizontal, inclined, vertical)
- Bedding, top indicated by arrow; (inclined, vertical, overturned)
- Vein, vein network (width indicated)
- Lava flow; top in direction of arrow
- Shaft, depth in feet
- Quarry
- Test pit
- Adit
- Foliation; (horizontal, inclined, vertical)
- Sand and gravel
- Lineation with plunge
- Geological boundary, observed

SOURCES OF INFORMATION

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Atikokan Area, District of Rainy River, Ontario Department of Mines, Map 49a, 1939, scale 1:63 360

Crooked Pine Lake Area, District of Rainy River, Ontario Division of Mines, Preliminary maps P.1101 and P.1102, 1976, scale 1:15 840

Finlayson Lake Area, District of Rainy River, Ontario Department of Mines, Preliminary maps P.542 and P.543, 1969, scale 1:15 840

Kenora-Rainy River Surficial Geology, Department of Lands and Forests, Map S185, 1965

Base-map derived from Forest Resources Inventory maps, Lands and Waters Group, Ontario Ministry of Natural Resources.

Magnetic declination approximately 3°20'E in 1979.

CREDITS

Geology by W. H. McIlwaine and assistants 1973, 1974, with additional information by C. R. Larsen, 1979. Geology is not tied to survey lines

Marginal notes by C. R. Larsen.

Every possible effort has been made to ensure the accuracy of the information presented on this map; however, the Ontario Ministry of Natural Resources does not assume any liability for errors that may occur. Users may wish to verify critical information; sources include both the references listed here, and information on file at the Resident or Regional Geologist's office and the Mining Recorder's office nearest the map-area.

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