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Location and Access: The centre of the map-area is approximately 52 miles southeast of Kenora, 48 miles north-northwest of Fort Frances, and 24 miles northeast of Nestor Falls air base. Canoe portages between the larger lakes were in good condition in 1972. Mineral Exploration: The area has attracted prospectors and mining companies in the search for gold since the beginning of the present century, and also for the base metals, copper and nickel, since 1950. In the early 1900s, gold occurrences at the western end of Sullivan Bay of Rowan Lake (Reliance showings), and the Monte Cristo showing were explored by adit, shallow shafts, and trenching. Renewed staking activity throughout much of the map-area took place in 1936 at which time Lakeport Gold Mines Limited did additional trenching and drilled 9 holes for a total of about 5,000 feet in the vicinity of the Monte Cristo showing he Reliance quartz vein gold showings were re-examined in 1944 by Sylvanite Gold fines Limited under option. The company did some trenching and drilled 7 holes Gold occurrences discovered southeast of Wampum Lake in 1939 were tested by Wampum Gold Mines Limited in 1940 and 1941. The company carried out a program of trenching and the drilling of 35 surface holes. A shaft was sunk to 200 feet, and about 400 feet of lateral workings were driven. A ground magnetic and elec tromagnetic survey of the Wampum deposit was carried out by R. Runzer in 1968. In 1960, Noranda Mines Limited discovered a gold occurrence between Cameron Lake and Beggs Lake. The company carried out geological mapping, ground geophysical surveys, trenching, and drilled 42 holes. In 1972, Zahavy Mines Limited drilled 2,584 feet in 7 holes located in the vicinity of Noranda gold showings. Exploration for base metals was concentrated mainly in the north-central Rowan Lake-Denmark Lake area from 1952 to 1957. During this time, a considerable amount of exploration work involving ground geophysical surveys, geological mapping, trenching, and diamond drilling was carried out by a succession of claim holders and optionees among whom were Denrow Mines Limited, Noranda Mines Limited, and Selco Exploration Company Limited. Copper and nickel occurrences associated with the ultramafic intrusive-metavolcanic complex on the northern shore of Isinglass Lake were examined by Dome Exploration (Canada) Limited under option agreement in 1955. Dome Exploration Canada) Limited carried out geological and ground geophysical surveys, and rilled 6,010 feet in 11 holes. In 1970 and 1971, Canadian Nickel Company also nvestigated the same area by geological and geophysical surveys and by drilling .1 holes for a total of 4,026 feet. General Geology: The map-area is included in regional geological surveys by Burwash (1933) and Thomson (1935). An interpretation of the geology of part of the northern quarter of the map-area is given by Johnston (1960). A geological survey by Davies (1967) of the adjoining Atikwa Lake area extended south of the northern boundary of the present map-area to the Fourth Base Line, and included the area of Denmark Lake and the northwestern arm of Rowan Lake. The metavolcanics are the oldest rocks within the map-area. They are products a mafic-felsic volcanic cycle which was initiated by a vast effusion of pillowed and massive flows of basalt and andesite composition. The latter part of the cycle s represented by an assemblage of mafic, and felsic to intermediate pyroclastics, and subordinate volcanogenic sediments. The volcanics and their associated sediments evidently accumulated in a dominantly aqueous depositional environment. Pillowed mafic flows are present throughout much of the volcanic pile: on e map, they are seen to be conspicuously abundant north of Sullivan Bay, and in ne area of Shingwak Lake. Porphyritic mafic flows containing large feldspar chenocrysts ('leopard rock') are useful locally as horizon markers. North of Rowan ake and Isinglass Lake, large areas are underlain by recrystallized basalt and indesite lavas that are fine- to medium-grained, dense, dark grey to black rocks hat commonly exhibit relict pillow rims. These rocks, described as 'blackjack ava' in the field, are particularly susceptible to fracturing and shattering. Most of the rocks within the report area have been metamorphosed to middle or upper greenschist facies rank. Metamorphic grade may be higher near granitic ntrusive contacts and here, mafic lavas are commonly recrystallized, weakly oliated amphibolite rocks The mafic to intermediate tuffs (grain size), less than 2 mm) were mapped s such on the basis of their dark green colour and high chloritic content. They re commonly banded, or layered, and may contain isolated volcanic bombs. Tutfs containing pyroclastic fragments up to 64 mm in size, are described as lapillipillowed and massive basalt and andesite flows, and with felsic pyroclastic units. compositional mixtures of mafic and felsic pyroclastic material are attributed to reworking of originally water-lain ash material. The tuffaceous sedimentary rocks are an integral part of the pyroclastic sequence and are best described as 'tuffwacke' (map unit 2n). Certain chlorite tuff zones contain abundant octaheral crystals of magnetite. A thin, weakly banded magnetite-quartz iron formation occurs on an island in the northeastern part of Rowan Lake. Three occurrences of hert, noted on the map, are spatially associated with magnetite-bearing mafic suffs. Mafic pyroclastic breccia consisting of large (size greater than 64 mm) lasts of basalt and scoria in a mafic tuff matrix is exposed about 2,000 feet 610 m) south of Bog Bay, near the western boundary of the map-area, and near the eastern boundary of the map-area in the vicinity of the tourist camp which is located about 3,000 feet (915 m) north-northwest of Wampum Lake. The coarse clasts of the felsic pyroclastic breccia rock units are mostly subrounded to subangular and composed of dacite to andesite porphyries; the matrix may consist of various amounts of lapilli and tuff fragmental material with the result that contacts between the coarse and finer pyroclastic phases are angular to angular blocks ranging up to 2 feet (61 cm) in size. The distribution of coarse to fine felsic pyroclastics in this area suggests that the centre (vent) or this particular episode of volcanic eruption is probably located within 1 mile west or northwest of Wampum Lake. Rhyolite and rhyodacite flows are found mainly in association with silicic

the result that contacts between the coarse and finer pyroclastic phases are gradational.

In the eastern part of Rowan Lake, felsic pyroclastic breccia contains subangular to angular blocks ranging up to 2 feet (61 cm) in size. The distribution of coarse to fine felsic pyroclastics in this area suggests that the centre (vent) for this particular episode of volcanic eruption is probably located within 1 mile west or northwest of Wampum Lake.

Rhyolite and rhyodacite flows are found mainly in association with silicic tuff and lapilli-tuff units. The felsic volcanic unit mapped as 'silicic tuff (quartz porphyry)' (map unit 2b) may in part be intrusive. On the island near the east entrance of Sullivan Bay the 'quartz porphyry' grades into silicic lapillituff and is evidently extrusive. At the western shore of Sullivan Bay, 'quartz porphyry' is shattered or fractured in a way that implies a diatreme or subvolcanic explosive mode of emplacement. Feldspar porphyry (map unit 4b) and quartz-feldspar porphyry (map unit 4c), mapped as intrusive rocks, may in part be extrusive or cogenetic with felsic extrusive rocks. The large feldspar porphyry plug exposed at the west-central boundary of the map-area, may be the remnant of a feeder pipe which supplied felsic material to higher levels in the volcanic sequence.

The concordant to subconcordant mafic sills that intrude the metavolcanics consist mostly of medium- to coarse-grained metamorphosed gabbro and leucogabbro (anorthositic gabbro). The sills appear to coalesce with larger masses of probably consanguinous mafic and ultramafic intrusive rocks in the northwestern part of the map-area. On the northern shore of Isinglass Lake, metaperidotite

and uralitized metapyroxenite are probably cogenetic ultramafic differentiates of

the larger gabbro body with which they are associated. A mafic intrusive-metavolcanic-granite complex occupies most of the northern part of the map-area between Rowan Lake and Rainmaker Lake; mixed, hybrid, and contaminated rocks are characteristic features of the complex and the subdivision f the rocks into appropriate rock units is difficult on the present scale of mapping. The complex includes large areas that are underlain by fine- to mediumgrained hornblende diorite and melanocratic quartz diorite. The nature of the contact between the diorite and gabbro rock units is obscure; in general, the diorites grade into quartz-hornblende gabbro and gabbro rock types. Melanocratic and gabbroic rocks that are penetrated by granite dikes and veins are described as gabbro agmatite (map unit 3g) or as granite agmatite (map unit 5g) where the mafic xenolithic component is respectively greater or less than 50 percent. In many places on the map, the distinction between these The Nolan Lake Stock consists mostly of relatively fresh, coarse-grained porphyritic quartz monzonite; syenitic and mafic contaminated phases exist mainly within the border zone west and north of Nolan Lake. Structural Geology: The axial trace of the large anticline, which closes in the vicinity of Shingwak Lake, trends N70E. A similar trend is inferred for the axial trace of an antiformal structure which closes in the vicinity of Nolan Lake, and which is occupied for the most part by the Nolan Lake quartz monzonite stock. compressed, or otherwise deformed, synclinal keel is localized through Sullivan Bay intervening the two large anticlinal fold structures. Complex small-scale folding is a characteristic feature of the banded or ayered volcaniclastic rocks exposed on islands and shores in the east-central and eastern parts of Rowan Lake. An analysis of these structures implies two mportant phases of deformation. Most earlier-phase small folds plunge S70W; hey may be parasitic on the large regional folds for which a similar attitude o the map-area may be the result of cross-folding or of drag-folding produced by Kink bands and associated crenulation folds modify earlier small-scale structures and are related to a later phase of deformation. The kink bands trend n two directions, N65W and N5E East of Newman Lake, steeply plunging lineations suggest that complex fold tructures in the vicinity have plunges that are vertical to subvertical. Sout rending, tight isoclinal folds are interpreted to exist in the northwestern part of the map-area, in the vicinity of Scott Bay The map shows the disposition of the important faults. A major zone of complex shearing, which strikes generally northwest through Cameron Lake, probably an extension of a similar feature recognized west of the present maparea. Relative movements connected with the shearing are obscure. Three faults which strike northwest through Cameron Lake and which appear to be associated

with the major shear zone, show right-hand strike-slip displacements. Economic Geology: Most of the known sulphide occurrences that contain significant opper-nickel mineralization have been found in the north-central part of the maparea in mafic flows and mafic to ultramafic intrusive rocks. The sulphide mineralization occurs typically as disseminated pyrite-pyrrhotite with minor or race amounts of chalcopyrite, pentlandite, and bornite. The oxide mineral malachite, which is moderately widespread in the area, is a useful indicator of copper mineralization. Favourable sites for mineralization are (1) in the ultramafic phases (peridotite-pyroxenite) of the mafic intrusive rocks, (2) in sheared zones developed at or near contacts between mafic intrusive rocks and mafic volcanics, and (3) in fractured, fault-localized zones in recrystallized metavolcanics (map unit 1d). Investigation of the copper-nickel occurrences on the northern shore of singlass Lake has been mainly concentrated in the vicinity of the original showng which was discovered in the early 1950s and is located about 2,300 feet north the largest island in the lake. According to a recent report by Canadian option on the R.V. Knappett property, the mineralization is irregularly distributed; no mineable deposits were outlined. The sulphide minerals (pyrrhotite, pyrite, chalcopyrite, and pentlandite) occur as blebs in metapyroxenite and to a esser extent in metabasalt and metagabbro. Canico further report that the "nickel-copper mineralization is associated with irregular parts of a few conformable, vertically dipping lenses of metapyroxenite. Over a width of 150 feet a series of 1 to 20 feet thick dikes or lenses of metabasalt and metagabbro alternate with a series of 5 to 30 feet thick lenses of metapyroxenite. trike of these lenses is 110° , and the dip 90° . The pyroxenite lenses plunge of Cu-Ni grade is low". Canico further reports that the best mineralized section encountered in one drill hole contained 0.51 percent copper and 0.40 percent nickel over 4 feet true width; in another drill hole the best section o ineralized metapyroxenite graded 0.28 percent copper and 0.32 percent nicke from 11 to 70 feet vertical depth, including a section from 21 feet to 25.2 feet grading 0.47 percent copper and 0.66 percent nickel. Similar results were Limited (Assessment Files Research Office, Ontario Division of Mines, Toronto, eport No. 12). The best drill intersection reported by Dome Exploration (Canada) Limited was 0.80 percent copper and 0.74 percent nickel over 10 feet, or 0.62 Many of the sulphide showings and occurrences of malachite appear to be ocalized along the system of closely spaced faults that strike N2OW in the vicinity of the northern arm of Rowan Lake. These and many other faults in the map-area evidently exert important structural controls for mineralization. Grab samples were taken by members of the present field party from several of the existing trenches on a sulphide showing which occurs in mafic metavolcanics in the north-central part of the map-area. The best result was from a grab sample Base Line) and which on analysis by the Mineral Research Branch, Ontario Division of Mines was found to contain 2.47 percent copper and 0.04 ounce gold per ton. Disseminated to massive pyrrhotite/pyrite, with minor visible chalcopyrite, xists in metabasalt along the northern shore of the small lake located at the orthwestern end of Loss Bay (of Rowan Lake). Three grab samples, taken at random by the author from a north-trending exploratory trench on the northeastern shore of the small lake, were analyzed by the Mineral Research Branch, Ontario Division Mines. The samples yielded 0.11 percent copper: 0.5 percent copper. 0.06 percent nickel, and 0.04 percent zinc; and 0.35 percent copper, 0.01 ounce gold A grab sample was taken by the author from a trench of disseminated pyrrho-/pyrite in mafic metavolcanics located on the eastern shore of the northern of Rowan Lake, 4,100 feet south of Mile 31.6 (4th Base Line); on analysis by e Mineral Research Branch, Ontario Division of Mines, the sample yielded 0.46 Several untested sulphide showings and occurrences of malachite staining wer found by members of the field party; two grab samples taken from a 3-foot wide malachite-stained showing containing minor amounts of bornite and azurite, in ilicified, pillowed metabasalt were sumbitted to the Mineral Research Branch, Ontario Division of Mines and on analysis yielded 0.43 percent copper and 1.62 percent copper respectively. This malachite showing is located on the northern shore of Rowan Lake, 5,800 feet south of Mile 30.4 (4th Base Line). Sulphide mineralization associated with drag folds in mafic metavolcanics was incountered by the author on the northeastern shore of a large island in the northcentral part of Rowan Lake; the showing is more precisely located at 9,500 feet south of Mile 29.1 (4th Base Line). The showing contains pyrrhotite, pyrite, chalcopyrite, magnetite, and bornite, and it has previously been tested by two mall pits. A grab sample taken by the author from one of the trenches was analyzed by the Mineral Research Branch, Ontario Division of Mines and was found

so contain 0.21 percent copper and 0.52 percent zinc. The drag folds may be associated with an assumed fault that strikes N40E through the channel that

eparates the large island from the mainland. The author suggests that further

A grab sample of malachite-stained talcose sericite schist locally occurring ${\bf n}$ the shear zone that strikes southeast through Cameron Lake, was taken by the

At the Wampum deposit, gold is found in association with disseminated pyrite

eet apart (Assessment Files Research Office, Ontario Division of Mines, Toronto, ile 63.2476; Tower 1942, p.210). The Wampum shaft is located in the north zone

which is situated on the northern limb of a steeply plunging synformal structure

thor and analyzed by the Mineral Research Branch, Ontario Division of Mines.

and narrow quartz-carbonate veins in schistose mafic metavolcanics. The small

granite intrusion located east of the Wampum shaft also contains disseminated pyrite. It is reported that there are two zones of mineralization about 1,000

ne sample was found to contain 0.16 percent copper and a trace of gold.

exploration in the vicinity of the above mentioned sulphide showing would be

near the contact with a metagabbro sill. A grab sample of quartz material taken from the Wampum dump by the author yielded 0.07 ounce gold per ton on analysis by the Mineral Research Branch, Ontario Division of Mines. Previous drilling in the 1960s by Noranda Mines Limited on its Cameron Lake property intersected gold 'values' along a strike length of about 400 feet. The gold 'values' were reported (Noranda company files) to occur in a highly silicied zone within carbonatized gabbro and sericitized tuff and to contain 0.219 nunce per ton gold across an unweighted average true width of 9.2 feet, representing an indicated 37,500 tons to a depth of 125 feet. Further gold 'values' e reported by Zahavy Mines Limited to have been intersected by holes drilled in 72 near the Noranda occurrence. Elsewhere in the map-area, numerous occurrences of gold are associated with wartz and quartz-carbonate veins and sulphide-mineralized schists and shear zones volcanic flows and pyroclastic rocks. Of about 30 samples collected by the author during the field season and nalyzed for gold content by the Mineral Research Branch, Ontario Division of ines, the most significant was a chip sample taken across a width of approximatringers and some pyrite. This sample contained 0.10 ounce gold per ton. The sample location, which is on patented ground (claim number K4712), is on the northern shore of an island, about 3,000 feet (915 m) southwest of the old shaft that was sunk on the Monte Cristo gold showings. Altered basalt and schistose uff units display a continuity of strike between the latter gold showing and the bove mentioned sample location and they may yet be found to contain economic gold deposits. At the Monte Cristo prospect, J.G. Cross reported (Thomson 1938) that he maximum width of auriferous rock at surface was determined as approximately 00 feet and that higher grade sections averaged 0.17 ounce of gold per ton. The est intersection in drill holes (drilled in 1937) was an interval of 15 feet averaging 0.20 ounce of gold per ton. Complex fold structures and shear zones that exist within the map-area may act as favourable controls for gold mineralization. Several of the known gold occurrences in the map-area that are spatially associated with such structures should be re-evaluated with respect to their gold potential. It is also recognized that gold and sulphide deposits in the map-area may be restricted to, or preferentially located along, certain volcanic stratigraphic horizons. In this respect, the current concept that many gold and sulphide deposits are formed by volcanic-exhalative processes may provide an important guideline for future exploration in the map-area. The pyroclastic rocks are avourable hosts for mineralization. Of significance are the gold occurrences

associated with felsic pyroclastics on the western shore of Sullivan Bay and the gold occurrences associated with mafic flows and pyroclastics of the Monte Cristo

prospect. Consideration of the nature of the volcanic stratigraphy would sugges

that occurrences of gold may be discovered on the northern shore or beneath the

Lake Lake coarse-grained phase medium-to fine-granged phase



HONOURABLE LEO BERNIER, Minister of Natural Resources
W. Q. MACNEE, Deputy Minister of Natural Resources

PRELIMINARY MAP P.831 GEOLOGICAL SERIES

ROWAN LAKE AREA

G. A. Jewett, Executive Director, Division of Mines

Scale 1 inch to ½ mile

NTS Reference: 52 F/5E

ODM-GSC Aeromagnetic Map: 1169G

ODM Geological Compilation Series Map: 2115

DISTRICT OF KENORA

E. G. Pye, Director, Geological Branch

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CENOZOIC QUATERNARY RECENT

RECENT

Swamp, stream, and lake deposits

(unconsolidated)

(unconsolidated)

PLEISTOCENE

Clay sand grayel boulder to

Clay, sand, gravel, boulder till (unconsolidated)
Unconformity

ECAMBRIAN
MIDDLE TO LATE PRECAMBRIAN (PROTEROZOIC)
MAFIC INTRUSIVE ROCKS

EARLY PRECAMBRIAN (ARCHEAN)
FELSIC INTRUSIVE ROCKS

6 Diabase

LATE FELSIC INTRUSIVE ROCKS

5a Granite

5b Porphyritic quartz monzonite²

5c Quartz monzonite²

5d Monzonite, monzodiorite, syenite

5e Pegmatite dikes and veins²

EARLY FELSIC INTRUSIVE ROCKS6

56 Pegmatite dikes and veins²
5f Contaminated monzonitic rocks²
5g Granite agmatite
5h Hybrid granite

Intrusive Contact

4a Granite, aplite
4b Feldspar porphyry³
4c Quartz-feldspar porphyry³
4d Felsite dikes and sills

Intrusive Contact

MAFIC INTRUSIVE ROCKS⁶

3a Leucogabbro, anorthositic gabbro
3b Gabbro, hornblende gabbro
3c Quartz gabbro, feldspathized quartz
gabbro
3d Amphibolitic gabbro (uralitized gabbro)
3e Pyroxenite, (uralitized pyroxenite)
3f Peridotite
3g Gabbro agmatite
3h Hybrid gabbroic rocks
3k Biotite-hornblende diorite and quartz
diorite

diorite

Bm Diorite

Intrusive Contact

Intrusive Contact

VOLCANICS
ELSIC TO INTERMEDIATE METAVOLCANICS AND
INTRAVOLCANIC (INTERCALATED) METASEDIMEN

INTRAVOLCANIC (INTERCALATED) METASEDIMENTS⁶

2a Rhyolite and rhyodacite

2b Silicic tuff ('quartz porphyry')⁴

2c Rhyolite-rhyodacite tuff

2d Dacite

2e Dacitic tuff

2f Rhyolitic lapilli-tuff

2e Dacitic tuff
2f Rhyolitic lapilli-tuff
2g Dacitic lapilli-tuff
2h Dacitic crystal lapilli-tuff
2k Pyroclastic breccia
2m Sericite schist (tuff-derived
2n Tuffaceous sediments (unsubdivided)
2p Tuff-argillite

MAFIC TO INTERMEDIATE METAVOLCANICS⁶
la Pillowed basalt and andesite lava
lb Massive basalt lava
lc Porphyritic (plagioclase feldspar)
basalt ('leopard rock')
ld Recrystallized, dense, brittle basalt

('blackjack lava')
le Pillow breccia, flow breccia
lf Tuff
lg Lapilli-tuff
lh Pyroclastic breccia
lk Amphibolitic basalt and andesite
lm Chlorite schist
lp Subvolcanic basalt and trap dikes

ank Ankerized rock

Fxd Fractured rock

This is basically a Field Legend and may be changed as a result of subsequent laboratory investigations.
 Units of the Nolan Lake Stock.
 May in part be extrusive.
 May in part be an autoclastic subvolcanic rock.
 The letter 'C' preceeding a rock unit number, for example 'C3b' indicates that the outcrop position

example 'C3b' indicates that the outcrop position and identification has been compiled from unpublished private company files or assessment files.

6. The prefix 'meta' is applicable to all rock types within these subdivisions.

7. For units 1 to 4, numerical order does not necessarily imply chronological order.

GEOLOGICAL AND MINING SYMBOLS

GEOLOGICAL AND MINING SYMBOLS

Geolog observ

Small bedrock outcrop.

Geolog positi

Bedding; (inclined).

Bedding; (inclined).

Bedding, top indicated by arrow; (overturned).

Bedding, top indicated by load cast, flame structures.

Bedding, top indicated by load cast, flame structures.

Lava flow; top (arrow) from pillows shape and packing.

Schistosity; (horizontal, inclined, vertical, dip unknown).

Lava flow; top (arrow) from anticline, sync with direction plunge.

Drill holes; (vertical, inc.)

Gneissosity; (horizontal, inclined).

Gneissosity; (horizontal, inclined).

Foliation; (vertical, inclined, dip unknown).

Banding; (horizontal, plunge.

inclined, vertical, dip

Lineation with plunge, (vertical).

Slickensides with plunge.

Kink bands.

Mineral occurrence.

Chalcopyrite q
Copper qcv
Epidote
Magnetite qv
Malachite S
Nickel talc
Zn

LIST OF PROPERTIES

(as held on 31st December 1972)

Aggressive Mining Limited

Amax Exploration Incorporated

Amax Exploration Incorporated

Canadian Nickel Company Limited
 Knappett, R.V.
 Lakeport Gold Mines Limited (Monte Cristo deposit)
 Longe, R.
 Loudon, D. (Wampum deposit)
 Zahavy Mines Limited
 Whitehead, Rupert

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Geology by L. Kaye and assistants, 1972.

Survey lines are shown only for property owned as of December 31, 1972 and coincide with survey lines shown on Claim Map M.2580.

Base map derived from Forest Resources Inventory, Ontario Division of Forests, with minor revisions by L. Kaye.

ODM-GSC Aeromagnetic Map 1169G, Caviar Lake Sheet.

Magnetic declination approximately 6°3'E, 1972.

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

Issued 1973.

e, L.
1973: Rowan Lake Area, District of Kenora; Ontario
Div. Mines, Prelim. Map P.831, Geol. Ser.,
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