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LEGEND

CENOZOIC

MODERN

- Muck and peat
- Recent alluvium and glacial drift (shown only where bedrock outcrops are few or lacking)

PROTEROZOIC (LATE PRECAMBRIAN)

KEWEENAWAN

- 9 Diabase

ARCHEAN (EARLY PRECAMBRIAN)

POST-WINDIGOKAN

- 8 Granite, granite-gneiss, granite porphyry and allied rocks
- 7 Granodiorite, diorite, porphyritic anorthosite
- 6 Hornblende porphyrite
- 5 Peridotite, serpentine

WINDIGOKAN

- 4 Andesitic lava, pyroclastics
- 3 Conglomerate, arkose, greywacke, slate

KEEWATIN

- 2 Basalt, andesite, rhyolite, pyroclastics, minor amounts of sediments, iron formation; hornblende schist, chlorite schist, sericite schist; ferruginous carbonate; metadiorite, amphibolite and undifferentiated minor intrusives

COUCHICHING

- 1 Banded mica schist, paragneiss; slate, greywacke, impure quartzite

Iron formation

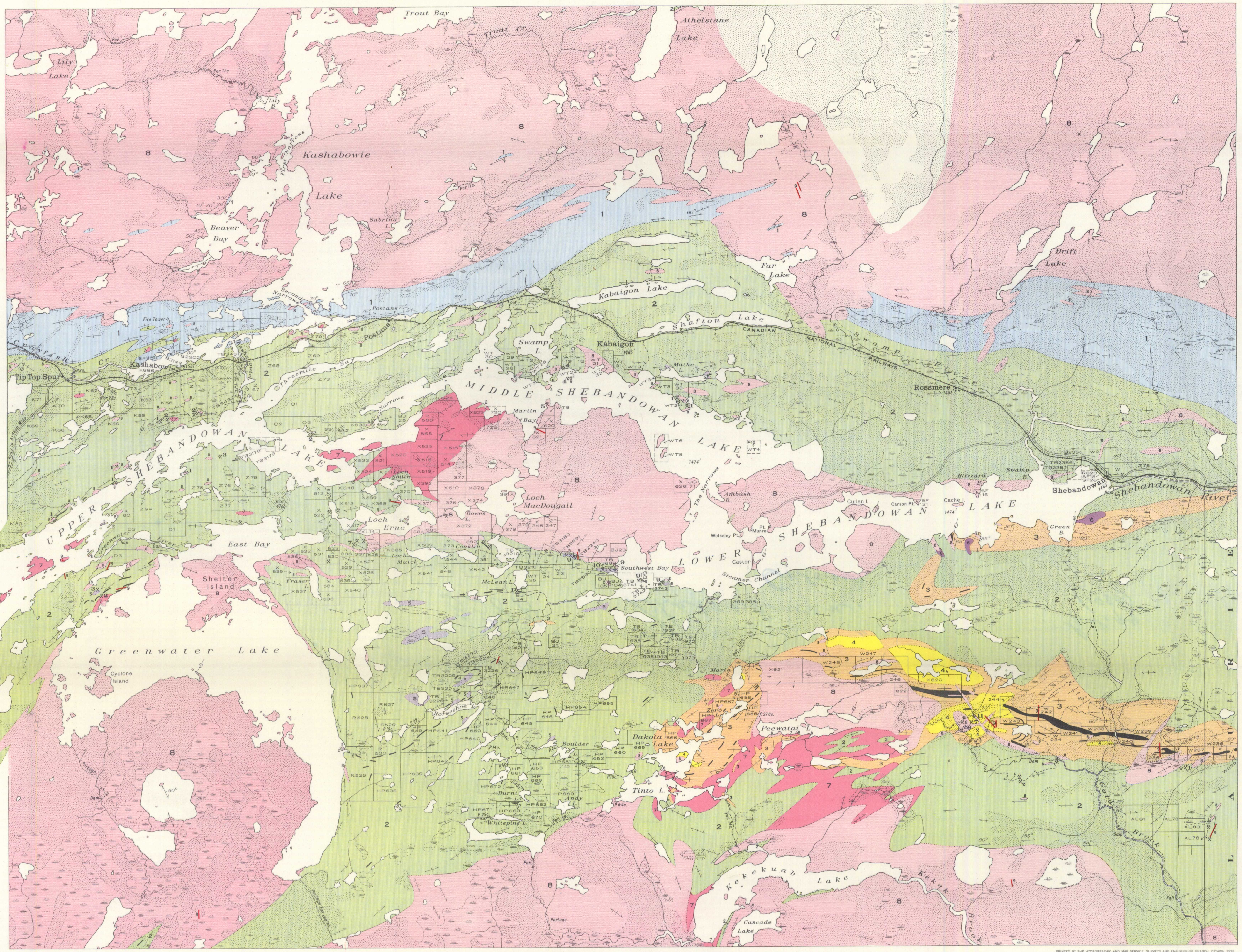
Geological boundary (defined, approximate or assumed)
Bedding (inclined, vertical)
Schistosity (inclined, vertical)
Glacial striæ
Pits and other workings
Road
Road not well travelled
Trail or portage

SOURCES OF INFORMATION

Compiled and reproduced from surveys by the Bureau of Geology and Topography, and from information supplied by Federal and Provincial Government Departments. Geology by T. L. Tanton, 1928, 1929, and 1931.

INDEX TO MINERAL OCCURRENCES

1. Chalcopyrite in quartz veins.
2. Copper-bearing sulphide replacement bodies.
3. Soapstone and talc.
4. Molybdenite in quartz vein.
5. Molybdenite, galena, chalcopyrite in quartz vein 6 to 14 inches wide, carrying gold and silver.
6. Barite seam in quartz vein.
7. Galena and chalcopyrite in quartz vein carrying gold and silver.
8. Fluorite and quartz in veins.
9. Copper-nickel sulphide replacement bodies carrying cobalt and platinum group metals.
10. Chromite in altered peridotite, found in drill core from depth.
11. Gold, visible in quartz vein less than 1 inch wide.



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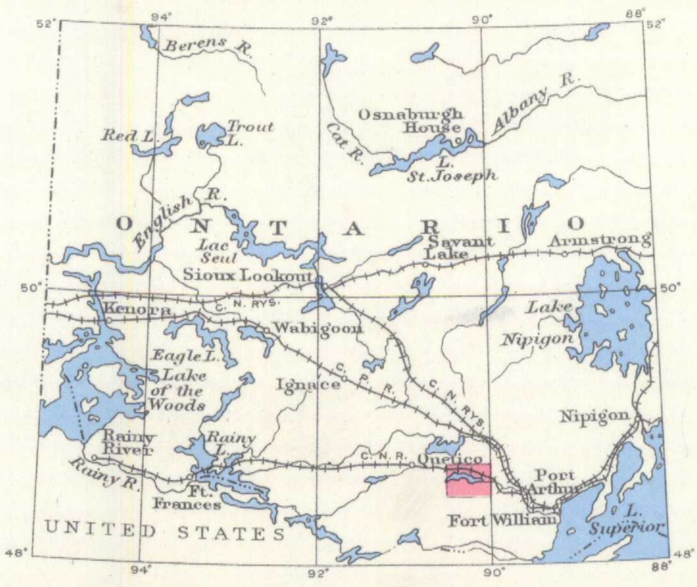

Scale, 1 Inch to 100 Miles

MAP 338A
(PROVISIONAL EDITION)

SHEBANDOWAN AREA

THUNDER BAY DISTRICT

ONTARIO

Scale, $\frac{1}{63,360}$ or 1 Inch to 1 Mile

Miles 1 ½ 0 1 2 3

Kilometres 1 0 1 2 3 4 5

TRUE NORTH
MAGNETIC NORTH

Approximate magnetic declination 2° East.

PHYSICAL FEATURES

The area is in the Canadian Shield and where crossed by the Canadian National Railways varies in elevation between 1474 and 1531 feet above sea-level. The greater part of the area is characterized by a succession of rocky, hummocky hills and ridges, rarely over 300 feet high and a scanty soil sheet consisting chiefly of glacial drift mostly collected in the low ground. In the northeastern and southwestern parts extensive and comparatively thick deposits of sand and clay cover all but the higher parts of the rock floor.

In the greater part of the area the scarcity of drift and the unevenness of the rock floor has produced numerous ponds and lakes of various sizes and shapes. The drainage between them is commonly by short streams on which there are falls and rapids. The area is in the Kaministikwia River basin; and dams have been erected at several places in order to regulate the flow and conserve the water for the power development at Kakabeka falls. Where the drift mantle is thicker there are extensive muskegs and fewer lakes.

Within the area, there are excellent canoe routes that may be used from May till October, inclusive. Game and fish are fairly plentiful. Except in fire-swept parts there is timber ample for camping, prospecting and mining purposes.

GENERAL GEOLOGY

The solid rocks are, for the most part, highly metamorphosed and folded strata and batholithic intrusives of Archean (Early Precambrian) age. A few diabase dykes (9), the youngest rocks in the area, are correlated with lithological similar Keweenawan intrusives of Thunder Bay region and are classified as Proterozoic (Late Precambrian).

The Couchiching (1) consists of steeply folded, banded mica schists, paragneisses, and, at considerable distance from granitic intrusives, of less highly metamorphosed sediments recognizable as slate, greywacke and impure quartzite. This essentially sedimentary group is overlain by Keewatin volcanics without pronounced unconformity; it is overlain unconformably by the Windigokan series (near Mabella, east of Shebandowan) and it is intruded by all granites and related igneous rocks that have been found in contact with it.

The Keewatin (2) is an assemblage of lava flows, chiefly of andesitic composition, and pyroclastic rocks, with some sediments including banded iron formation. These rocks are highly altered; large parts are schistose and judging from the attitude of the stratified members, the group has been highly folded. This dominantly volcanic assemblage is unconformably overlain by the Windigokan series and it has been invaded by the batholithic intrusives.

The Windigokan series consists of conglomerate, arkose, greywacke, slate and iron formation (3), with, locally, andesitic lavas and pyroclastics (4). This series occurs in belts that form the westerly continuations of belts previously mapped (Geological Survey publication No. 2069) in the eastern part of Matawin Iron range. These rocks have been metamorphosed and folded, and they unconformably overlie the Keewatin and, near Mabella east of Shebandowan, also the Couchiching; they are intruded by Algoman igneous rocks. The presence of granite pebbles in the Windigokan conglomerate indicates the existence or former existence of granite older than the Windigokan series but such intrusives have not been identified within the map-area.

The bodies of granite and related rocks (8) that come in contact with the Windigokan in this area show intrusive relations. It is inferred that the intrusives of the same character that occur throughout the map-area are of the same age, and all are grouped as the Algoman intrusives. The borders of the batholithic intrusives commonly occur within contact zones varying from a few feet to several thousand yards in width and within which there is either an intimate intermingling of the intrusive and intruded rock each identifiable but in masses too small to be separately mapped, or within which there are assemblages of metamorphic and igneous rocks that exhibit phases transitional between granitic rocks and amphibolites or schists that represent altered strata. Granodiorite, diorite and porphyritic anorthosite (7) are the igneous rocks commonly found in large, relatively homogeneous masses in contact zones of this type. Serpentine or altered peridotite (5) occurs in these zones in large and small masses that show no sharply defined igneous contact with the adjacent metamorphosed strata yet appear to interrupt the continuity of their structure in the manner of intrusive rocks.

Small masses of the several rocks characteristic of transitional contact zones of the batholithic intrusives occur also within areas of altered strata at considerable distances from exposed granitic batholiths and they may be in contact zones in the roofs of protuberances on concealed batholithic masses deep beneath them. Lamprophyre dykes up to a few inches wide occur locally in contact zones near porphyry intrusives.

The Keweenawan dykes (9) consist of massive, unmetamorphosed diabase. They intrude solid rocks representative of all other ages found in the area.

STRUCTURAL GEOLOGY

In the western part of the map-area an area of granite in the south is succeeded northward by a belt of Keewatin strata, this by a belt of Couchiching strata, (interpreted as older than the Keewatin because along the contact in the vicinity of Kashabowie the tops of vertically dipping beds of graded texture in the Couchiching are toward the Keewatin) followed by a belt of granite and granite-gneiss in which inclusions of Couchiching-like mica schists occur, beyond which to the north of the map-area, in the neighborhood of Lac des Mille Lacs, the same assemblage is crossed in reverse order: granite-gneiss, Couchiching strata, Keewatin strata and granite. This suggests that the middle belt of granite and granite-gneiss that extends east and west through Kashabowie Lake basin is intrusive into the crest of a major anticlinal structure and that the strata north and south are on the flanks of that anticline. A section along the eastern boundary of the area and followed north crosses the northern part of a granite mass, Keewatin strata, an east-west trending belt of Windigokan strata that occur in a syncline, Keewatin strata, a second belt of Windigokan strata that occur in a syncline (presumably shallower than the first because the lower members of the series only are present), Keewatin strata, and Couchiching strata followed by granite-gneiss and granite. Presumably the Windigokan strata occupy the troughs of minor synclinal folds superimposed on the southern flank of a major anticlinal structure. The trend of the Windigokan belt that lies nearest the Couchiching makes a considerable angle with the neighboring Couchiching-Keewatin contact and this may be due to some structural disturbance of the older strata before the Windigokan was deposited.

Minor folds and intricate crumplings have been observed in the Keewatin iron formation and at places in Windigokan strata.

Numerous minor faults have been observed and at some places these are occupied by either veins or intrusives. Faults of considerable displacement are inferred to exist where considerable and abrupt changes in the continuity of structures or belts of strata occur. Some of the abrupt changes in the continuity of strata occur at places occupied by dykes or linear masses of intrusives and along drift-covered linear zones.

ECONOMIC GEOLOGY

The Couchiching strata are not known to contain valuable mineral deposits.

The Keewatin contains iron, talc and soapstone deposits that have been derived from rocks originally forming part of this group; in it are sulphide replacement bodies carrying copper and, locally, also nickel, cobalt and platinum; and in it are veins in which have been found gold, silver, copper and lead.

The Windigokan contains iron formation; and as a repository for mineral deposits introduced by agencies operative during the time of invasion of the Algoman intrusives it has potential economic interest equivalent to the Keewatin.

The large masses of granitic intrusives are barren. A variety of minor intrusives that are regarded as of the same general age, notably of porphyry, granodiorite, diorite and peridotite, and that occur marginal to batholiths that invade Keewatin and Windigokan strata, contain mineralized veins and replacement bodies. These deposits usually occur at the borders of the intrusive and in the intruded rock adjacent. One or several of the following metals are known to occur thus in veins and replacement bodies: gold, silver, copper, lead, cobalt, nickel and molybdenum. An occurrence of chromite has been found in altered peridotite.

The Keweenawan intrusives in the area are not known to be accompanied by valuable mineral deposits.