GEOLOGY OF THE UPPER MAGPIE RIVER AREA

ALGOMA DISTRICT, ONTARIO

T. W. Page, P.Eng.

Port Arthur, Ontario
December 1, 1958.

SUMMARY

The Upper Magpie River Area includes the southeasterly section of a belt of northeasterly trending volcanic and sedimentary rocks of early Precambrian age. This belt in general occupies the drainage basin of the Kabinakagami River. The area lies some 30 miles northeasterly from White River, Ontario.

Volcanic agglomerates are enclosed by interbanded flows and tuffs which are in turn flanked by sedimentary quartz-biotite gneisses. Granite gneiss bounds these rocks to the southeast and southwest.

Within the central and southeasterly portion of the map area all members have been folded into a steeply plunging syncline with axial plane trending southeasterly such that it protrudes from the main belt. Two complementary fault planes striking northeast and northwest intersect near the centre of the area. Both show horizontal displacement.

A few minor occurrences of metallic mineralization were found but none was indicative of economic possibilities.

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LOCATION AND ACCESS

The Upper Magpie River Area lies some 30 miles northeast of White River station on the Canadian Pacific Railway from where it is most readily reached by air transportation. An alternative route is by canoe from Swanson siding on the Canadian Pacific Railway eight miles west of Franz Station. This route, also of some 30 miles, follows up through Esnagi Lake thence west into Mosambik Lake and into the Magpie River.

The map area covered by this report lies between Mosambik Lake on the east and the height of land between the Magpie and Kabinakagami rivers on the west. The area covered is approximately 100 square miles.

Generally rugged terrain with high hills and ridges marks the height of land between the Magpie and Kabinakagami rivers. The northeast portion is generally low and swampy, a characteristic that continues easterly past Mosambik Lake to Esnagi Lake. A series of rocky ridges trends southeastward from the south central section of the area past the south end of Mosambik Lake.

GENERAL GEOLOGY

The map area embraces the south and southeasterly portion of a belt of volcanic and sedimentary rocks generally outlined by the watershed of the Kabinakagami River. The main section of this belt is well exposed on Kabinakagami Lake, 30 miles due north of Franz.

The upper portion of the Magpie River, trending in a northeasterly direction, occupies the central section of the area. Along this drainage basin the most notable feature is an assemblage of volcanic agglomerates and tuffs. These rocks trend northeast in the northern part of the area and southeast in the southern part, indicating a steeply plunging synclinal structure whose axial plane strikes in a southeasterly direction.

Flanking the volcanic members described, and lying between them and the enclosing granite, is an assemblage of gneissic rocks of sedimentary and tuffaceous origin.

Within the central portion of the synclinal structure and extending northeastward are a series of intermediate to basic flows with some intercalated horizons of sedimentary origin.

It is believed that the principal rock types of this area are generally of the same age, the agglomerates and tuffs representing a period of more violent volcanic activity.

In all cases the rock types described pass out of the map area to the southwest and northeast.

Generally massive biotite granite borders the entire south-

east border of the map area.

The various rock types have been grouped in age relationship as follows:

Diabase
Granite
Agglomerate, tuffs and flows
Sedimentary gneiss and volcanics

SEDIMENTARY GNEISS AND VOLCANICS

This series of rocks ranges from predominantly sedimentary gneisses in the southwest portion of the area to gneisses of tuffaceous origin in the central and northeastern portion of the area. The northwest portion is occupied principally by flow type rocks.

The sedimentary members are a medium-to dark-grey rock, normally of fine texture, composed essentially of quartz and biotite. This contrasts with the generally coarser, lamellar texture of the tuffaceous members. The latter in most instances display a fragmental texture, although the fragments are squeezed and drawn out in elongate form. Many of the more basic varieties could be generally classified as amphibolite gneisses.

In the northwest section of the map area the rocks are mainly intermediate to basic flow types. Pillow structures are quite common. These rocks form the high hills and ridges along the height of land between the Magpie and Kabinakagami rivers. Toward the contact with the agglomerates, tuffaceous and sedimentary members are in evidence. In texture and composition these latter are similar to

those found in the south and east section of the map area.

The flow types tend to be fairly massive, fine-grained, dark colored rocks.

AGGLOMERATE TUFFS AND FLOWS

Agglomerates and coarse tuffs are well displayed along the shores of Wejinabikun Lake and on the lakes to the north and south. These are classic examples of violent volcanic activity. Horizons containing bombs up to 12 inches long embedded in a coarse tuffaceous matrix stand out with exceptional clarity on many exposed rock surfaces along the lake shores. The intervening material is medium- to coarse-grained tuff of gneissic te. re. Both the larger fragmental material and the tuffaceous matrix display a mottled light greenish-gray color. Likewise, both are composed of feldspathic fragments embedded in a finer light colored matrix and separated by elongate fragments of dark minerals, mainly hornblende. The band described narrows to a few hundred feet before passing under the swampy area north of the map area. On the southwest limb of the synclinal structure the band is over a mile wide where it passes out of the map area.

GRANITE

With the exception of the area around Kabiskagami Lake, the bounding granite mass is generally a medium-grained biotite granite gneiss dipping westerly and northerly at approximately 50 degrees.

In the vicinity of Kabiskagami Lake and the lake to the northwest, the granite tends to be more massive and of a grey to pinkish color. It is a normal biotite granite. Dip is around 50 degrees in a westerly direction.

DIABASE

Normal diabase dikes cutting all other formations are found at intervals throughout the entire map area.

MINERALIZATION

Two minor occurrences of mineralization were found. One is in a fault zone at the north end of the small lake west of Kabiskagami Lake where the fault surfaces have been mineralized with quartz and specular hematite.

The second is in the north central section of the map area approximately midway between the two small lakes shown on the accompanying map, where a north striking rusty zone some three feet wide occurs on the side of a ridge. Finely disseminated pyrite is the only metallic mineral present.

No economic significance can be attached to either of these occurrences.

STRUCTURE

Two structural features are apparent in the map area, the synclinal fold in the south section and the pronounced fault system striking northeast and northwest across the map area.

As shown on the accompanying map, dip and formational contacts indicate a synclinal fold swinging out from the main belt into the enclosing granite in a southeasterly direction.

Two major and complementary faults are in evidence. A northeasterly fault zone is followed by the Magpie River through most of its course in the area. Horizontal displacement of approximately 600 feet has occurred. The complementary, northwesterly striking fault passes just north of Wejinabikun Lake. A horizontal displacement of approximately one-quarter mile has taken place. Numerous other parallel faults occur in the area, being reflected in the northeasterly and southwesterly trending ridges.

CONCLUSION

The Upper Magpie River Area is a small portion of a large belt of volcanic and sedimentary rocks generally occupying the watershed of the Kabinakagami River.

Much of the area mapped is a synclinal structure protruding southeasterly into the enclosing granite mass. Rocks of the area range from sedimentary gneisses to tuffs and agglomerates and volcanic flows.

Very little evidence of mineralization was found. In general the area mapped does not appear favorable for the occurrence of mineral deposits of economic worth. Lack of any general

mineralization and "tight" appearance of the rocks without hydrothermal alteration effect lead to this conclusion.

Respectfully submitted,

(SGD.) T.W. Page

T. W. Page, P.Eng.

Approved:

(SGD.) M. W. Bartley,

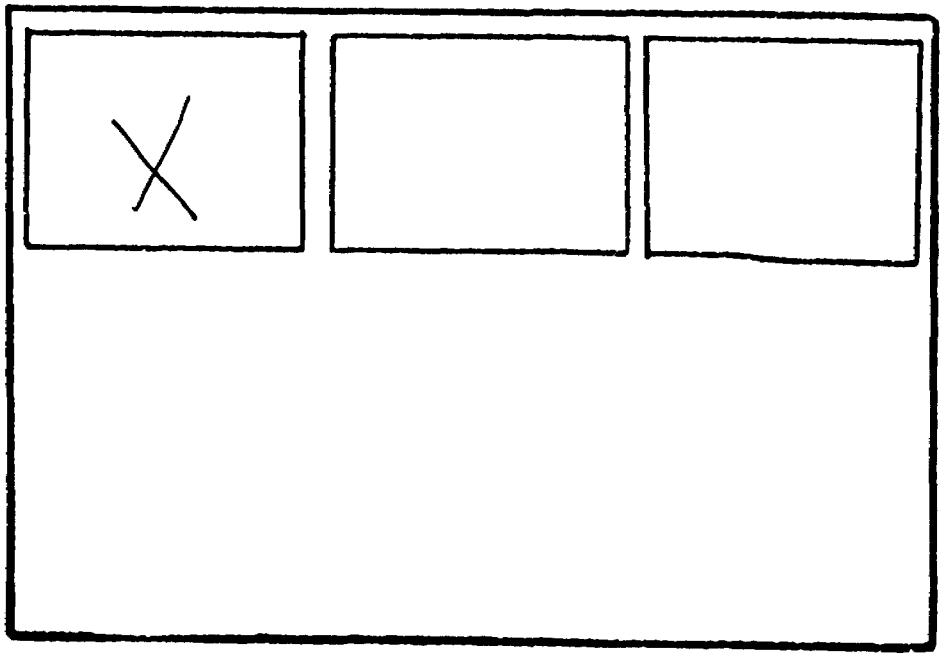
M. W. Bartley, P.Eng.

Port Arthur, Ontario
December 1, 1958

SEE ACCOMPANYING MAP(S) IDENTIFIED AS

DOUCETT - 0010 - A1 #1

LOCATED IN THE MAP CHANNEL IN THE FOLLOWING SEQUENCE (X)



N

LEGEND

- DIABASE
- GRANITE
- TUFF & AGGLOMERATE
- SEDIMENTARY GNEISS & VOLCANICS
- STRIKE & DIP
- FAULT
- PORTAGE
- GEOLOGICAL BOUNDARY DEFINED, ASSUMED & APPROXIMATE

SUMMARY

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KEY SKETCH SHOWING MAP AREA

WEJINIBIKUN LAKE

KABISKAGAMI LAKE

MOZAMBIK LAKE

ESNAGI LAKE

PRELIMINARY GEOLOGICAL MAP OF

KABINAKAGAMI - MAGPIE RIVER AREA

CANADIAN PACIFIC RAILWAY CO.
DEPARTMENT OF INDUSTRIAL DEVELOPMENT.
SCALE: 4" = 1 MILE
NOV. 15 1958

BRECKENRIDGE

LIZARD

ERMINE

Kabinakagami L.

Nomeigos L.

STRICKLAND

NAMEIGOS

Mountain L.

MOSAMBIK

CARNEY

Josefin Cr.

Honeymoon Falls

Esnagi L.

Mosambic

Nomaigos R.

STRICKLAND TOWER

Wojinabikon L.

Kabiskagami L.

Magpie R.

Kabinakagami

Upper Magpie

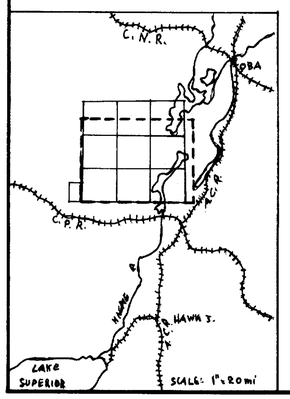
Anaharea L.

DOUCETT

CUDNEY

Esnagi L.

LOCATION MAP



SYMBOLS

- CONTACT DEFINED
- CONTACT, APPROXIMATE
- CONTACT, ASSUMED
- MINERAL OCCURENCE
- STRIKE & DIP OF BEDDING & SCHISTOSITY
- STRIKE & VERTICAL DIP
- TRAIL, TOTE ROAD OR PORTAGE

LEGEND

- DIABASE DIKES
- 4 — GRANITE, GRANITE GNEISS, GRANODIORITE, PEGMATITE & OTHER RELATED ROCKS
- 3 — UNDIFFERENTIATED (a) VOLCANICS INCLUDING PILLOW LAVA AGGLOMERATE & TUFF, BIOTITE, HORNBLENDE & CHLORITE SCHISTS & (b) SEDIMENTARY TYPES, MAINLY QUARTZ BIOTITE SCHIST & GNEISS BUT INCLUDING BIOTITE HORNBLENDE SCHIST & GNEISS
- 2 — BIOTITE & HORNBLENDE GNEISS
- 1 — STRIPED SEDIMENTS, INTERBANDED QUARTZ & BIOTITE HORNBLENDE GNEISS

A.C.R. FILE Rep. "C.P.R.", Copied April/61 H.a.L.

CANADIAN PACIFIC RAILWAY CO.
INDUSTRIAL DEVELOPMENT

KABINAKAGAMI LAKE AREA
ALGOMA DISTRICT
ONTARIO
SCALE: 1" = 1 mile

DATE: 21/11/58

DOUCETT 0010-A1 #2