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GEOLOGY OF THE DAYCHESSARAH LAKE AREA

ALGOMA DISTRICT, ONTARIO

CDN PACIFIC RAILWAY CO.

Port Arthur, Ontario
December 1, 1958

T. W. Page, P.Eng.

SUMMARY

The Daychessarah Lake Area, located 18 miles northeast of White River, Ontario, is underlain by sedimentary and volcanic rocks of early Precambrian age. These rocks form a narrow belt some four miles wide by 16 miles long striking slightly west of north. They undoubtedly represent a remnant of a more extensive series. The belt is enclosed on all sides and intruded by younger granites.

Sedimentary members consist mainly of quartz-biotite schists and gneisses together with a narrow band of conglomerate occupying the central section. Volcanic rocks, predominantly flow types on the east and tuffs and flows on the west, enclose the sediments. Fresh appearing pink granite bounds the southern end of the belt and intrudes the central portion. Elsewhere granite gneiss is the enclosing rock type.

No mineralisation of economic worth or indicative of such was found.

GEOLOGY OF THE DAYOHESARAH LAKE AREA

ALGOMA DISTRICT, ONTARIO

LOCATION AND ACCESS

The Dayohessarah Lake Area is located 18 air miles north-east of White River station on the Canadian Pacific Railway. It comprises an area 16 miles long by four miles wide with Dayohessarah Lake centred about midway.

Although it is possible to reach the area by canoe from White River, the route is long and tedious. Air transportation may be readily obtained through White River Air Services based at White River.

The western boundary is flanked by quite high rugged hills, a feature that is characteristic of the terrain through to White River. The central portion has been the main channelway of a large pre-glacial stream, the course of which extended through Hambleton Lake into Dayohessarah Lake and southerly into Kagingakog Lake. As a consequence, much of the area north and east of Hambleton Lake is low and sandy or swampy. South of Dayohessarah Lake a deeply dissected gravel plain extends southward out of the map area. Features such as eskers and kettle holes are prominent.

To the eastward the country is generally rolling with occasional high hills and ridges.

GENERAL GEOLOGY

Rocks of the Dayohessarah area consist in the main of a central belt of sedimentary schists, gneisses and conglomerates flanked to the east and west by volcanic flows and tuffs. The sedimentary members have in general undergone deeper erosion leaving a trough like depression which is in part occupied by Dayohessarah Lake and the morainal debris in the southern section of the area. Average strike throughout the area is a few degrees west of north and dips are at steep angles to the east.

Gray granite gneiss encloses the belt except in the south. In this section a coarse-grained, fresh-appearing pink granite cuts off the sedimentary and volcanic series.

An intrusive body of massive, pink biotite granite occupies the east central section of the area, being exposed along the northeast shore of Dayohessarah Lake.

Minor intrusives of peridotite and diorite in dike form are to be found around the northerly end of Dayohessarah Lake.

Geological succession of the rock types is tentatively listed as follows:

Diabase dikes
Pink granite
Granite gneiss
Peridotite and diorite dikes
Volcanics and sediments

SEDIMENTARY ROCKS

Sedimentary rocks in the Dayohessarah area are in the main confined to the central section adjacent to Dayohessarah Lake and southward. Quartz-biotite-schist is the predominant type with lesser amounts of conglomerate.

The quartz-biotite-schist, typical of the southern half of the area, is a fine-grained, schistose rock, light gray on fresh surface, weathering to a drab grayish-brown color. It is composed of approximately 50 percent quartz, 40 percent biotite and 10 percent feldspar. It appears to have originated from a fine-grained impure sandstone. Because of the relative softness of these rocks erosion has cut deep except where they were protected by the harder, more resistant volcanic types.

Along the west-central section of the area the sedimentary members have apparently undergone greater deformation. They are also lighter in color and of coarser texture. It is believed that these may represent a pebble conglomerate phase.

The north and northeast shore of Dayohessarah Lake is

characterized by the predominance of a quartzite conglomerate. Best exposures are found on the long curved point and the chain of islands in the northerly end of the lake. A squeezed conglomerate, containing quartzite cobbles up to six inches in length embedded in a matrix of quartz and biotite schist, is located on the point. The full width of this section cannot be determined as the larger portion lies under the waters of Dayohessarah Lake. No conglomerates were found along or near the southeast portion of the lake.

Closely associated with the conglomerate is a relatively thin and intermittent band of garnetiferous biotite schist. This rock type where exposed on the lakeshore stands out in contrast to surrounding types. Aggregates of garnet crystals are embedded in a fine matrix of dark-colored biotite schist. Weathering has removed much of the matrix, leaving the garnets protruding above the general rock surface. Outcrops as described are seldom more than a few feet in width yet are persistent enough in strike to be a feature in this locality.

Along the northwest contact of the sediments and volcanics some of the rocks mapped as sediments may actually be tuffs since in this section the contact is gradational into a tuffaceous series.

VOLCANIC ROCKS

Volcanic rocks of the area may be divided into two general

types. Those forming the western belt are predominantly a series of interbanded tuffs and flow types of intermediate composition. Those of the eastern belt, in particular the north half, are basic flow types with occasional pillow structures and a few horizons of interbanded basic tuffs.

Tuffaceous members in the western band are mainly a fine-banded dark gray to black rock that weathers to a medium gray color. In their present stage they are composed mainly of minute crystals of hornblende (60 to 80 percent) in parallel orientation together with fine granular quartz and feldspar. Segregation of the light and dark minerals creates the finely-banded appearance. Many exposures of this type found throughout the length of the western belt appear mainly as a fine-textured amphibolite gneiss.

The lavas in general are andesitic and massive. They display the same surficial appearance as the pyroclastics but lack the fine banding and the tendency towards schistosity.

Due to superior resistance to erosion the volcanic members of the western belt form the line of ridges along the western boundary of the map area. In general the contact area between these rocks and the enclosing granite is marked by a pronounced escarpment, the main granite body occupying the lower ground.

The eastern belt of volcanics is best exemplified in the

area adjacent to Hambleton Lake. Here again the volcanics form the higher hills and ridges, contrasting with the lower ground underlain by granite.

In the Hambleton Lake section and also in the section south of Strickland Lake the rocks are a dark greenish-black color on exposed surface and black on fresh surface. In general massive, the texture is aphanitic. Finely banded tuffaceous horizons are present but relatively scarce. Pillow structures were observed in several localities near Hambleton Lake. The majority of these rocks are classified as basaltic in composition.

GRANITIC ROCKS

Granitic rocks completely enclose the map area and except on the southern boundary bear a concordant relationship to the volcanic and sedimentary belt.

Light grey, banded biotite granite gneiss is the principal type along the entire eastern boundary. These rocks are medium-grained, markedly gneissoid, composed of quartz 15 percent, orthoclase 60 percent and biotite 25 percent. In most instances the dip is 70 to 80 degrees west.

Frequently in the immediate contact zone the granite gneiss has developed a more normal equigranular granitoid texture and contains feldspar of varying shades of pink, giving the

rock mass a pinkish hue. The color change in the granite is believed due to albitization extending outward from seams in the granite. Epidote lines many of these seams.

Along the western contact the granite tends to be a massive, medium-grained, normal type displaying little gneissosity until several hundred feet from the contact. In the main the rock is a light pinkish color on fresh surface. It appears that albitization has reached a greater state of development along this western border of the belt than along the eastern side. Dips along the western contact are between 50 and 60 degrees east.

The granite intrusive located on the east shore and islands of Dayohessarah Lake is a fresh-appearing, massive, light pink, medium-grained, biotite granite. It is composed of quartz 5 percent, orthoclase 75 percent and biotite 25 percent. Granite dikes in the area between Strickland Lake and the large bay on east central Dayohessarah Lake are similar.

The south end of the belt is intruded and terminated by a distinctive fresh-appearing, coarsely-crystalline pink to red granite mass in many places pegmatitic. Several low hills and ridges in the vicinity of the Tedder River are composed entirely of this variety of granite. It consists of reddish orthoclase and

quartz in about equal amounts. Rocks of a similar character form some of the high hills between the map area and White River.

BASIC INTRUSIVES

Basic intrusives of uncertain age but believed to be pre-granite occur only in the vicinity of the north end of Dayohessarah Lake and in the granite contact zone along Strickland Lake.

Two large peridotite dikes extend northward from the islands and northeast shore of Dayohessarah Lake. The rock is grayish-black on the fresh surface and displays a typical brownish weathered surface. Although highly altered, the massive structure and original medium texture are retained. Some specimens reacted to the dimethylglyoxime test for nickel but no significance is attached to this. The best exposures are on the portage between Dayohessarah and Hambleton Lakes.

In the granite contact zone on Strickland Lake several large dike-like forms of diorite were observed. Two diorite dikes were seen on Dayohessarah Lake. In the former case it is believed that the diorite is probably a hybrid rock resulting from granitization of basic remnants. The origin of the dikes on Dayohessarah Lake is not clear.

In both cases the diorites are medium-to coarse-

grained rocks, fairly fresh in appearance, and composed principally of hornblende and plagioclase feldspar.

DIABASE DIKES

The youngest rocks throughout the area are normal diabase dikes ranging in width from inches up to 100 feet.

STRUCTURE

The Dayohessarah Lake Area appears to be a remnant of one limb of an overturned anticline and is probably little more than a fairly shallow roof-pendant in the intrusive granite.

Dip determinations in the northern part of the area, in particular between Hambleton Lake and Shabotik River, are indicative of a disconformity between the eastern belt of basaltic flows and the westerly belt of sediments, flows and tuffs of intermediate composition. Reliable evidence can be obtained only in the northern section, since in the south the central granite intrusive and morainal debris obliterated and obscure much of the contact area. Lacking more conclusive evidence concerning the disconformable relationship, all volcanic members are shown on the accompanying map as being of equivalent age.

Several major faults occur within the map area. There are two general trends, one northeast-southwest and the other

northwest-southeast. The former is best exemplified by the fault striking through Strickland Lake, on which there is no apparent horizontal movement. The northwest-southeast fault trend is shown best by the rupture passing across Strickland Lake at the east end of the narrows. This fault is easily traced northwestward to Dayohessarah Lake and is believed to continue on beyond the west shore of this lake. Horizontal displacement is apparent in this case. Intrusion of the central granite stock is believed to be in part responsible for the folding of the conglomerate member of the sediments at the northern end of Dayohessarah Lake. A reflection of this folding may be responsible for the bulge in the belt south of Plate Lake.

CONCLUSION

Rocks of the Dayohessarah Lake Area consist of a relatively narrow remnant of volcanic and sedimentary types enclosed within an extensive granite mass. Pegmatite dikes are rare and metallic mineralization is limited to some very minor occurrences of pyrite. In general it appears that the belt lacks any prospect for locating mineral veins of economic interest.

Respectfully submitted,

(SGD.) T.W. Page
T. W. Page, P. Eng.

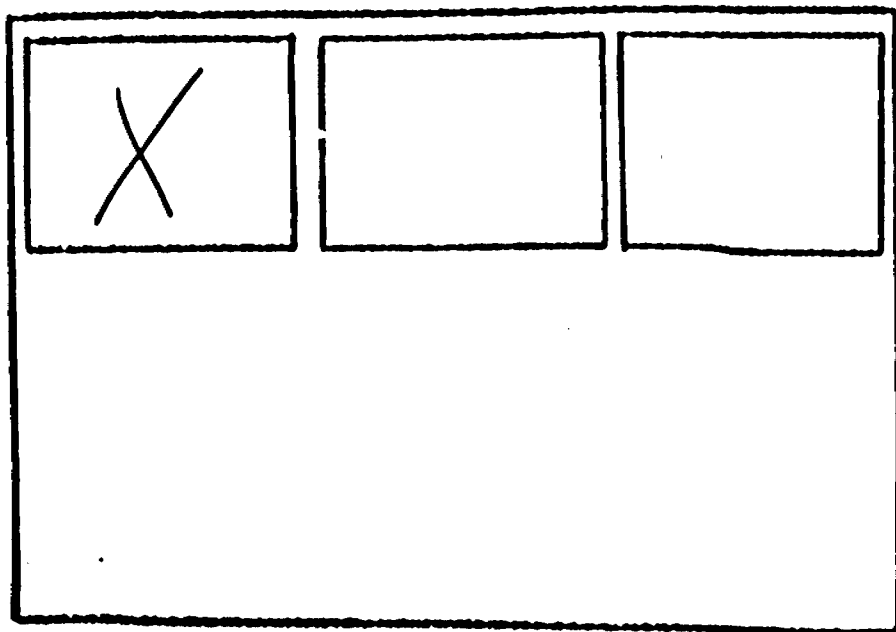
APPROVED: (SGD.) M. W. Bartley,
M. W. Bartley, P. Eng.

Port Arthur, Ontario
December 1, 1958

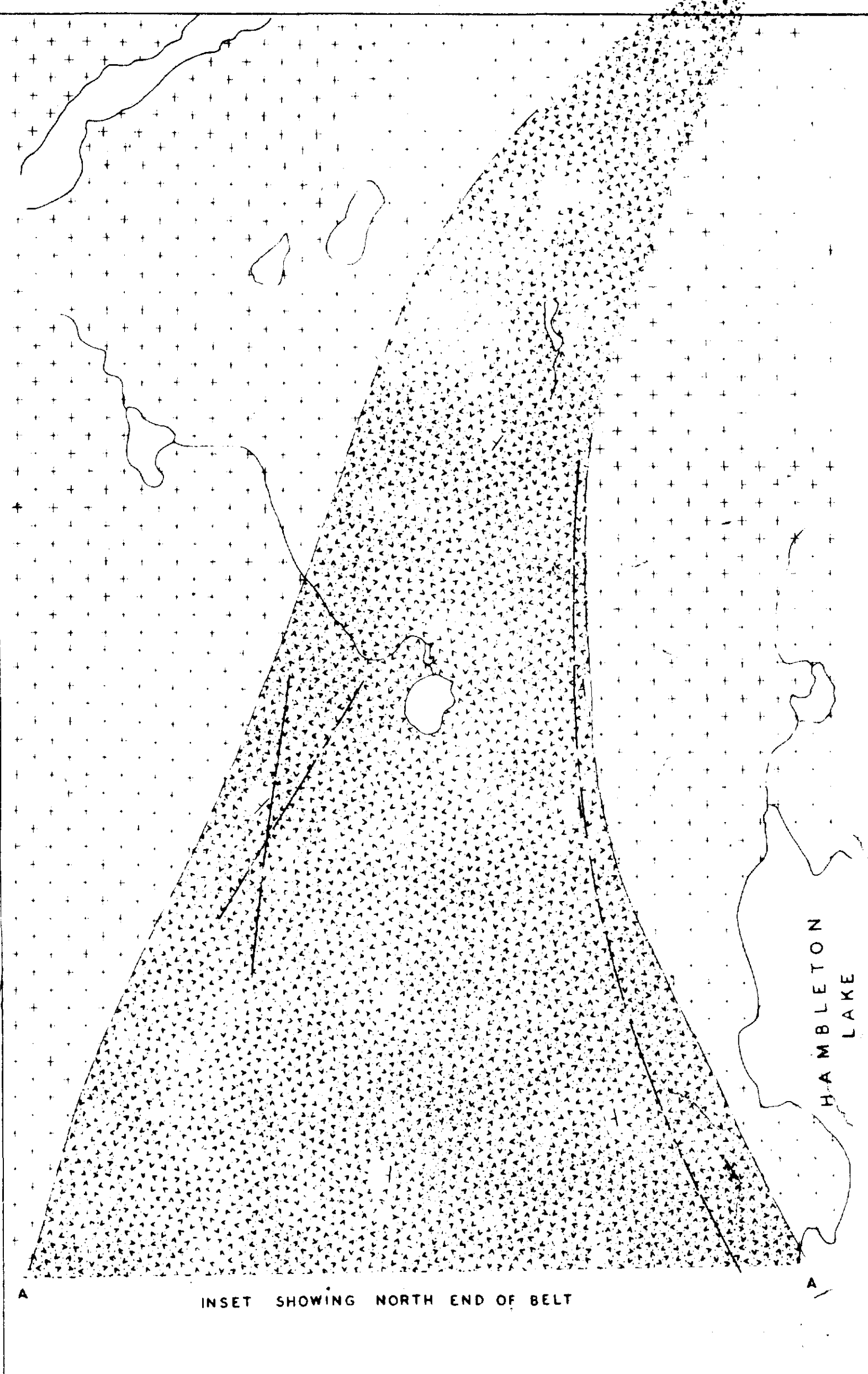
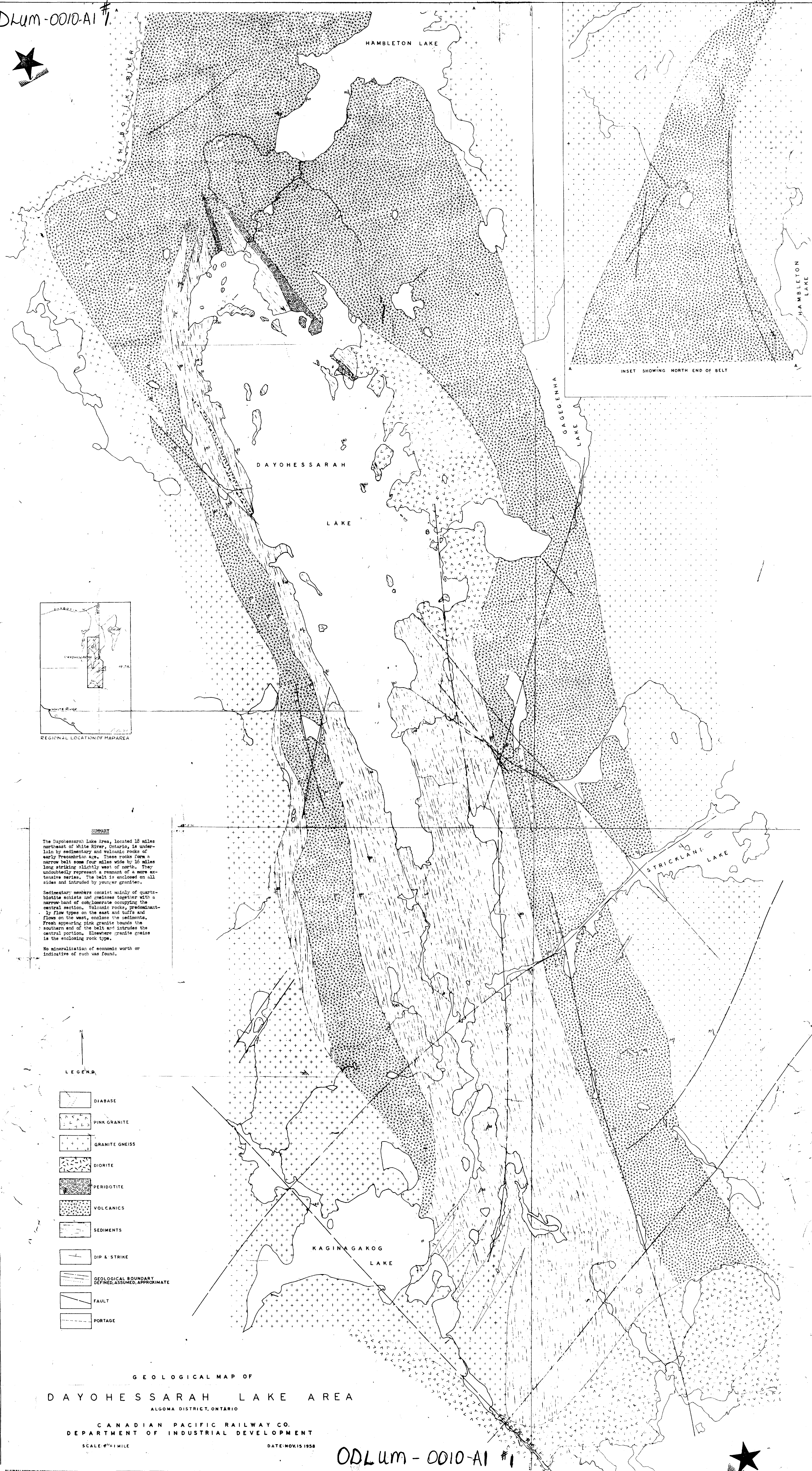
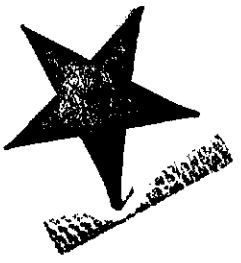
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MAP(S) IDENTIFIED AS

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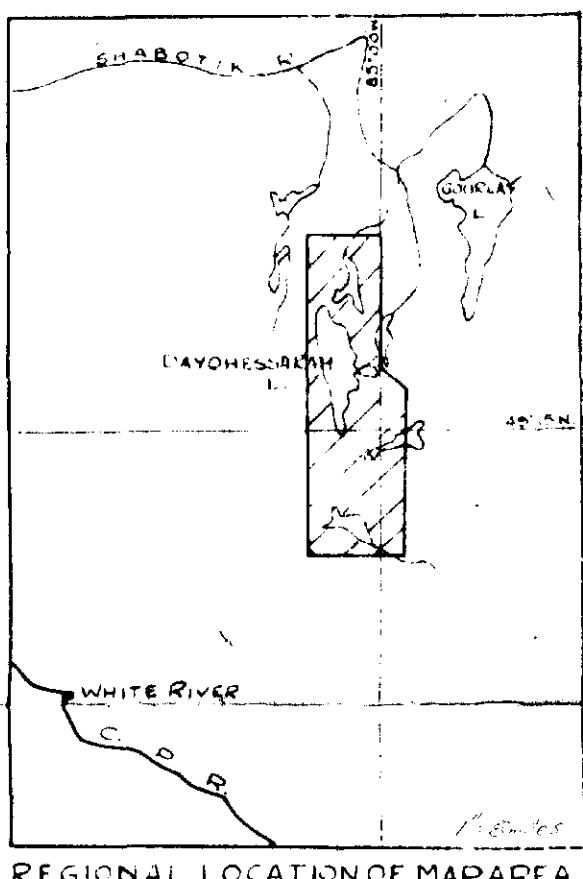
LOCATED IN THE MAP
CHANNEL IN THE FOLLOWING
SEQUENCE (X)



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INSET SHOWING NORTH END OF BELT



REGIONAL LOCATION OF MADOC

SUMMARY

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LEGEND

- DIABASE
- PINK GRANITE
- GRANITE GNEISS
- DIORITE
- PERIDOTITE
- VOLCANICS
- SEDIMENTS
- DIP & STRIKE
- GEOLOGICAL BOUNDARY DEFINED, ASSUMED, APPROXIMATE
- FAULT
- PORTAGE

GEOLOGICAL MAP OF DAYOHESSARAH LAKE AREA ALGOMA DISTRICT, ONTARIO

CANADIAN PACIFIC RAILWAY CO. DEPARTMENT OF INDUSTRIAL DEVELOPMENT

SCALE: 1"=1 MILE

DATE: NOV. 15 1958

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