EXPLORATION REPORT

CANADIAN PACIFIC RAILWAY COMPANY

DEPARTMENT OF INDUSTRIAL DEVELOPMENT

1957

SUMMARY

During 1957, a total of four areas were explored in parts of Thunder Bay and Algoma Districts adjacent to or relatively close to their common boundary. These areas are the Hemlo-White Lake area, the Abbie-Iron Lakes area, the Hambleton-Deyohessara Lakes area, and the Kwinkwaga Lake area.

The Hemlo-White Lake area was mapped geologically, and the White Lake section of the same area was prospected. The remaining areas were prospected only.

Sulphide mineralization consisting almost solely of pyrite was noted in all the areas. Minor gold and silver values were found in some of these occurrences.

A major band of iron formation occurs between Abbie and Iron Lakes. The more important section is that lying within the District of Algoma in the vicinity of Iron Lake.

INTRODUCTION

Prior to 1957, the Department of Industrial Development of the Canadian Pacific Railway Company explored ten areas between Heron Bay on the east and Kenora on the west, i.e. north and west of Lake Superior. Since much of the territory adjacent to the Company's main line east of Heron Bay is believed to be geologically favourable for

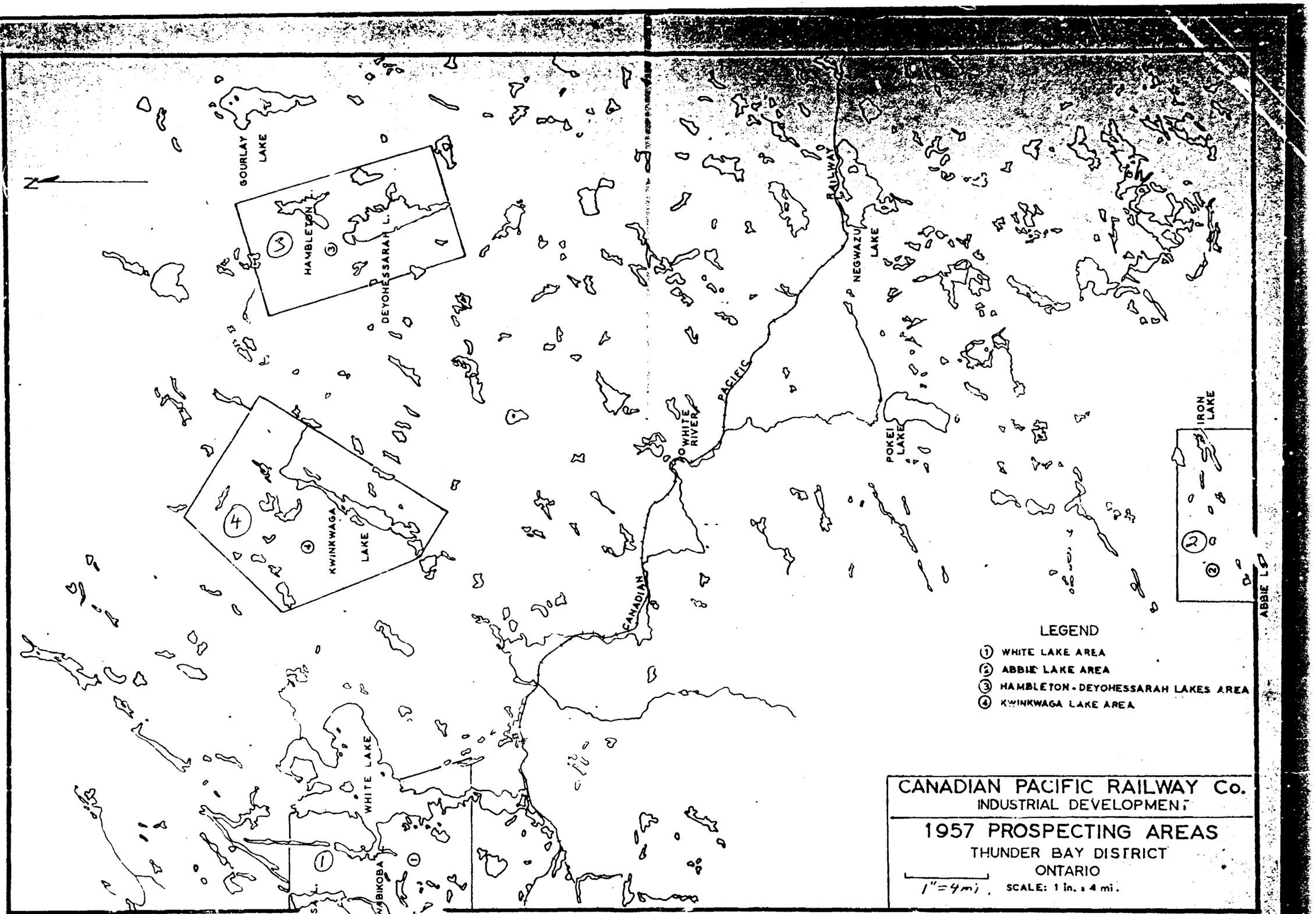
mineral occurrences, prospecting and geological mapping of certain sections commenced during the past year.

The 1957 exploration program consisted of two distinct phases, geological mapping and prospecting. This work was carried out by two separate two-man parties under the respective leaderships of mining engineer T. W. Page, a member of the staff of the Lakehead College, and veteran prospector A. E. Rissanen, Field Technician.

Geological mapping of the Hemlo-White Lake area was completed in the early fall by Mr. Page. The data obtained is contained in his report "A Geological Report on the Hemlo Area", which is appended.

Four areas, (a) the west side of White Lake, Thunder Bay District, (b) Abbie Lake and Iron Lake, respectively in Thunder Bay and Algoma Districts, (c) Hambleton-Deyohessara Lake area in Algoma District, and (d) Kwinkwaga Lake area in both Thunder Bay and Algoma Districts were prospected. This report deals mainly with the prospecting phase of the exploration and describes each area in turn.

The attached plans of the four prospecting areas do not contain the same geological detail as the Hemlo-White Lake area map since the exploration was principally reconnaissance preparatory to detailed studies if the information obtained so warranted. Certain data for the Abbie-Iron Lakes area was obtained from the Fourteenth Report, Ontario Bureau of Mines, 1905 by J. M. Bell.


GOURLAY LAKE
HAMBLETON
DEYOHESSARAH L.
KWINKWAGA LAKE
WHITE LAKE
WABIKOBA
CANADIAN
WHITE RIVER
PACIFIC RAILWAY
NEGWAZU LAKE
POKEI LAKE
IRON LAKE
ABBIE LAKE
LEGEND
1 WHITE LAKE AREA
2 ABBIE LAKE AREA
3 HAMBLETON - DEYOHESSARAH LAKES AREA
4 KWINKWAGA LAKE AREA
CANADIAN PACIFIC RAILWAY Co.
INDUSTRIAL DEVELOPMENT
1957 PROSPECTING AREAS
THUNDER BAY DISTRICT
ONTARIO
1"=4mi.
SCALE: 1 in. = 4 mi.

In addition to the above areas, some general reconnaissance prospecting was carried out in the vicinity of the Trans-Canada Highway right-of-way on both sides of the town of White River.

GEOLOGICAL MAPPING

HEMLO-WHITE LAKE AREA

The Hemlo-White Lake area situated southeast and northeast of Hemlo covers some 225 square miles. Hemlo is a station on the Company's transcontinental line 40 miles west of White River.

The discovery of gold at Hemlo station during the 1920's is the earliest recorded mining activity in the region. Very little prospecting took place until 1944 when a promising gold showing was located near Mileage 37. This discovery encouraged exploration in the area for a period of several years.

An east-west trending belt of predominantly sedimentary rocks in the southern part of the area is separated from a more northerly arcuate volcanic sedimentary belt by granitic rocks. The granitic rocks also bound the area on the south, northeast and northwest.

Most of the faulting and shearing in the area has occurred in the southern belt, where a strong regional movement has occurred in an east-west direction.

Although sulphides and other metallic minerals are present no deposits of economic importance were found. The strongest indications of mineralizing activity occur between Hemlo and Cedar Creek adjacent to the Trans-Canada Highway. Appreciable gold values have been found in this portion of the map area and present

the greatest promise for the discovery of commercial ore bodies. Attention is directed to the T. W. Page report "A Geological Report on the Hemlo Area" for details.

Prospecting

Each prospected area will be discussed in the order in which it was worked.

WHITE LAKE AREA

Location and Access

White Lake, a sizeable body of water approximately 11 miles long by ¼ to 5 miles wide, is situated 29 miles east of Heron Bay. It lies due north of Mobert and Regan, from which it is directly accessible by boat or canoe.

The area prospected covers approximately 27 square miles and extends from the west shore of White Lake westward to Theresa and Wabikoba Lakes, and southward along both shores of White Lake.

The Trans-Canada Highway, under construction, crosses White Lake narrows 2½ miles north of Regan. Some of the Ontario Paper Company access roads enter the western portion of the area.

General Geology

The main geological feature of the area is a band of altered volcanic rocks of Keewatin age up to 2 miles in width. The band trends northwest from the west shore of White Lake around the entrance to the long, narrow bay leading to Ravine Lake. The principal rock type is an amphibole gneiss, developed from andesitic and basaltic flows. More massive phases occur sparsely

and locally exhibit pillow or ellipsoidal structures. The altered volcanics are highly sheared and contorted near the granite contacts.

Very coarse grained amphibolite, cut by pegmatitic stringers, occurs along the west shore of White Lake immediately north of the narrows.

Remnants of a sizeable conglomerate horizon are located south of the volcanic belt and north of a belt of sedimentary quartz biotite gneiss. This horizon appears to have been at least 2 miles wide. The remnants are partly or completely enclosed by granite.

A mass of hornblendite intruded the volcanic belt between White Lake and the south end of Theresa Lake. This intrusion is less than one quarter mile wide, and has a strike parallel to the volcanics.

Economic Geology

Many rusty chloritic pyritiferous shear zones ranging in width from a few inches to forty feet were noted. Locally small amounts of pyrrhotite are present but no other sulphides were recognized.

Materials from all the shears were panned, and several samples were taken for assay. Only sporadic traces of gold were found and most of the shears are completely barren.

Several old pits and trenches were located in sulphide occurrences near the west end of the portage between White Lake

and Theresa Lake. No economic minerals were observed.

ABBIE-IRON LAKES AREA

Location and Access

Abbie Lake is in the Thunder Bay portion of the Sault Ste. Marie mining division. It is situated 2½ miles west of Mileage 29 on the boundary between Thunder Bay and Algoma Districts, and is approximately 28 miles south by west of White River, a divisional point on the Canadian Pacific Railway.

The only practical access is by float-equipped air craft from the air base on Tukanee Lake operated by White River Air Service.

Physiography

The topography is generally flat, but some hills in the west are 300 feet above the mean terrain. The iron formation west of Iron Lake forms a relatively high ridge with steep cliffs relieved by talus on the south side and more sloping faces on the north. Travel is not too difficult.

Abbie Lake is drained by Farwell Creek which in turn flows into the Pukaskwa River to Lake Superior.

History

Sometime prior to 1900, the Minnesota Iron Company explored narrow pockets of hematite within the iron formation ¼ mile west of Minnesota Bay on Iron Lake. The work consisted of stripping, test-pitting, the driving of three tunnels, and the sinking of one shaft. In addition, considerable other strippings and test-pitting was done at other locations along the iron

formation belt.

Shortly after 1900, the Algoma Commercial Company did some work on the Iron Lake portion of the range.

In more recent years the Algoma Central Railway examined the iron formation and sank a number of diamond drill holes. The cores from these holes remain at the sites.

General Geology

The age of several of the rock types is in doubt. The table of formations most generally accepted is as follows:

Keweenawan	-	diabase
Post Huronian	-	hornblende and biotite granite and gneiss; quartz porphyry
Lower Huronian	-	Dore Formation
Keewatin	-	Helen Iron Formation Michipicoten Schists

KEEWATIN

The Keewatin rocks are predominantly a greenstone series known as the Michipicoten schists, and an iron formation member called the Helen Iron Formation.

The green stones consist of pillow and highly altered lavas, agglomerate and bedded tuffs, rhyolite, massive andesite and basalt, chlorite and hornblende schists, feldspar porphyry and ferruginous, schisted carbonatized quartz porphyry. The porphyritic schist occurs on both sides of the main Helen Iron Formation, and is thicker on the north side. The schist on the south side rarely outcrops, and underlies a narrow valley between the iron formation and the Dore conglomerate.

The rhyolites were noted to the north and east of Abbie Lake.

Dioritic to gabbroic intrusives probably of Keewatin age intersect the Keewatin lavas north of Abbie Lake. The gabbro type is predominate.

The Helen Iron Formation

This area consists mainly of a magnetic grey to white banded chert augmented by varying amounts of magnetic jaspilitic iron formation (banded jasper) and sideritic cherts. Small pockets of good grade hematite occur within the Helen Formation ? west of Minnesota Bay on Iron Lake.

Quartzite, some slightly ferruginous, outcrops on Red Pine Point, and the north shore of Iron Lake.

The main iron formation band extends from Red Pine Point at the end of McDougal's Promontory to about 1¼ miles east of Abbie Lake, a distance of 4¼ miles. The width varies from 250 feet at Red Pine Point to about 1100 feet north of the end of Minnesota Bay. The formation terminates in narrow, discontinuous lenses near Abbie Lake.

LOWER HURONIAN

Dore Formation

This formation lies south of, and stratigraphically above the iron formation. It consists primarily of conglomerate with lesser amounts of greywacke and slate.

The conglomerate outcrops over a width of about three-quarters of a mile. The greywacke, up to one-quarter mile wide,

outcrops along the south side of the conglomerate.

POST HURONIAN

Few outcrops of granite and granite gneiss were encountered within the area prospected. It is obscured by sand plains north of Abbie Lake and only occurs along the southern edge of the area.

The granite is medium to coarse grained, with finer grained gneissic phases occurring along the contacts. It varies in colour from a light pink to a light grey and has either hornblende or biotite as accessory minerals.

KEWEENAWAN

Diabase dikes are common, especially along the iron formation zones where four of them cross the main iron band. These have all been eroded and are represented mainly by deep narrow valleys.

Northwest of Little Beaver Lake a large diabase dike becomes a sill-like mass apparently capping a high hill on the northern boundary of the area.

Structural Geology

The sedimentary formations have constant dips of seventy to eighty degrees to the south. The conglomerate bed along the south side of Abbie Lake contains quartz-filled transverse tension cracks. Shear zones are prevalent within the area and some of these are mineralized.

The strongest structural feature is the bed of Farwell Creek which is an apparent fault zone along the greywacke-greenstone contact.

Economic Geology

Samples of the iron formation were taken from the vicinity of Iron Lake, and assayed by the Steep Rock laboratory. Results are as follows:

Sample No.	% Fe	% Insol.	Rock
032	31.01	52.64	I. Fm.
033	28.65	55.54	I. Fm.
034	56.24	15.21	Hematite
035	38.90	44.40	I. Fm.
036	28.00	55.14	I. Fm.

Occurrences of sulphide mineralization are common, but none appear to have any importance.

A large shear in greenstone is located along the north shore of a lake one mile north of Abbie Lake. The shear is over one-quarter mile long and up to forty feet wide. Pyrite is the only recognizable sulphide mineral.

Minor pyrite was found in a shear on the shore of a very small lake one-quarter mile north of Abbie Lake. Traces of gold and silver were noted.

Trace gold occurs along the sheared contact between the greenstones and the Dore conglomerate immediately east of the penninsula at the east end of Abbie Lake.

A large carbonate shear containing quartz veins up to 2 feet wide, with both fine and coarse grained pyrite, trends easterly from the outlet of Spring Lake. The shear is approximately 50 feet wide.

Little Beaver L.

Ambrose L.

Iron L.

Minnesota Bay

TWP 33 R 26

Ore L.

Spring L.

Yoskovitch L.

Au Ag

Au

Abbie L.

Creek

Forwell

East

Pukeskawa R.

THUNDER BAY

ALGOMA

70°

80°

LEGEND

- Diabase
- Granite
- Conglomerate
- Greywacke
- Iron Formation
- Quartzite
- Greenstone
- Carbonate schist

CANADIAN PACIFIC RAILWAY Co.
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ABBIE LAKE AREA
ALGOMA & THUNDER BAY DISTS.
ONTARIO

Scale 1" = ½ mi.

1" = ½ mi.

HAMBLETON-DEYOHESSARA LAKES AREA

Location and Access

The Hambleton-Deyohessara Lakes area is situated in the eastern portion of Hambleton and Odlum townships in the District of Algoma. It lies approximately 18 air miles northeast of the town of White River. Access is from the White River Air Service base on Tukanee Lake, to the southern end of Deyohessara Lake a distance of 12 miles. The remainder of the area is readily accessible by canoe.

Physiography

In general, the topography around Hambleton Lake is much more rugged than around Deyohessara Lake. Steeply rising hills up to 400 feet in height form the southeast-shore of Hambleton Lake. On the west shore of Deyohessara Lake the hills are gently rolling with a maximum relief of 150 feet.

The lands around Shabotik River and Plate Lake consist of sand plains like park lands, covered with jackpine and containing well-defined game trails. Little outcrop was observed there.

The lakes drain north into the Shabotik River which in turn drains westward into the upper end of White Lake.

General Geology

The main rock types are Couchiching type schists and gneisses, Keewatin interbedded greenstones and sediments, and Algoman granites and related rocks. In addition, many Keweenawan diabase intrusions are found in the vicinity of Hambleton Lake.

The table of formations is as follows:

Keweenawan	-	diabase and minor diorite
Algoman ?	-	granite, gneissic granite, pegmatites
Keewatin	-	quartzite, greywacke intermediate to basic volcanics and related schists
Couchiching type	-	biotite schist, biotite garnet schist, micaceous paragneisses and granitic gneiss

COUCHICHING TYPE

These rocks are located in a north-westerly trending belt about 3/4 mile wide along the west side of Deyohessara Lake. The belt terminates at the northern end of the lake, but continues southward beyond the limits of the area described.

KEEWATIN

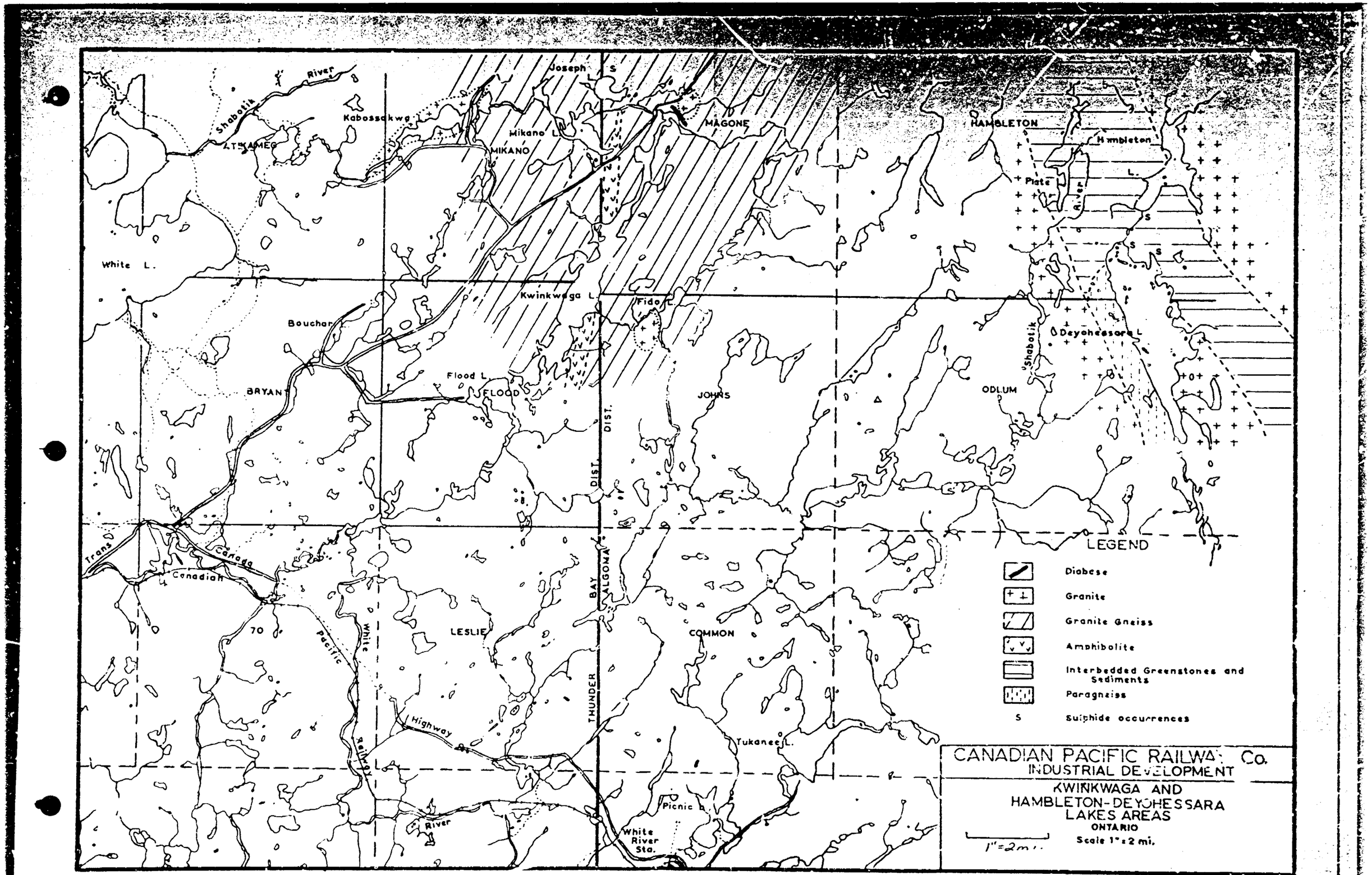
These volcanics and sediments comprise most of the bedrock of the area. They occur in a belt approximately 3 miles or more wide. The belt trends generally north-westerly through most of the area swinging more northerly north of Hambleton and Plate Lakes.

The Keewatin series consists principally of basic lavas ranging from andesite to basalt. Pillow lavas were observed west of Hambleton Lake and are often difficult to recognize due to intense deformation.

Quartzites and greywacke are interbedded with the greenstones. Minor paraschists such as mica garnet schist of the Couchiching type, are also present.

ALGOMAN ?

The main rock type is a massive, light pink to grey,


Joseph L.
Shabotik River
Kabossakwg L.
MAGONE
Mikano L.
MIKANO
HAMBLETON
Hambleton L.
Piate
White L.
Kwinkwega L.
Fido L.
Bouchan
Deyohessora L.
Shabotik
Flood L.
FLOOD
BRYAN
JOHNS
ODLUM
DIST.
Trans Canada
Canadian
70
Pacific
White River
LESLIE
COMMON
BAY
ALGOMA
THUNDER
Highway
Railway
Tukanee L.
Picnic L.
White River Sta.
LEGEND
Diabase
Granite
Granite Gneiss
Amphibolite
Interbedded Greenstones and Sediments
Paragneiss
S
Sulphide occurrences
CANADIAN PACIFIC RAILWAY Co.
INDUSTRIAL DEVELOPMENT
KWINKWAGA AND
HAMBLETON-DEYOHESSARA
LAKES AREAS
ONTARIO
1"=2mi.
Scale 1" = 2 mi.

medium grained granite. Local gneissic phases form the contacts with the older rocks. A wedge-shaped intrusion parallel to the areal trend occupies most of the bed of Deyohessara Lake. It intrudes from the south and is probably an off-shoot of the main granite mass.

The pegmatites, mainly composed of orthoclase, quartz and greenish-tinted muscovite, plus sericite are present. They vary in width from a few feet up to 20 feet, and strike approximately northwest.

KEWEENAWAN

Many dikes of olivine diabase up to 200 feet wide strike west from the west shore of Hambleton Lake.

Economic Geology

Pyrite was the only sulphide mineral seen in the area. Most of it was found in shears on the east side of the creek joining Deyohessara and Hambleton Lakes. It also occurs on the eastern shore of the northeast bay on Deyohessara Lake. Panning of these rusty shears did not yield gold values.

KWINKWAGA LAKE AREA

Location and Access

The Kwinkwaga Lake area embraces most of Minkano and Magone Townships, and lesser portions of Flood and Johns Townships, in Thunder Bay and Algoma Districts. Kwinkwaga Lake, 8 miles long by less than 1 mile in maximum width, is situated along the District boundary line approximately 12 miles north of White River.

Access is by White River Air Service from Tukanee Lake, or

by truck from Regan along the Abitibi Power and Paper Company roads. These roads form a network north-easterly from Regan, and the main road passes immediately west of Kwinkwaga Lake.

Drainage

Kwinkwaga Lake drains westward from its north end via the Kwinkwaga River into the Shabotik River and thence into White Lake.

General Geology

The most common rock type is gneissic granite, or granite gneiss, which underlies most of the area.

A red granite plug or stock is located at each of the following places: Kabossakwa Lake, Fido Lake, and at the north end of Kwinkwaga Lake. The one at Kabossakwa Lake may be a portion of the main granite intrusion in the region.

A band of Keewatin amphibolite, approximately ¼ mile wide, strikes slightly east of North through Kwinkwaga Lake and along the District boundary.

Economic Geology

The only mineralization noted was some pyrite about ¼ mile north of Joseph Lake.

Respectfully submitted,

(Sgd.) M. W. Bartley

January 27, 1958

Port Arthur, Ontario

M. W. Bartley, P. Eng.
Consultant

900 C RAILWAY COMPANY

DEPARTMENT OF INDUSTRIAL DEVELOPMENT

MONTREAL 3, QUE.
F. W. COLLINS,
MANAGER
G. McL. HUTT,
ASSISTANT MANAGER
R. L. SMALL,
ASSISTANT TO MANAGER

FILE No. M.100-3-7C

Montreal 3, March 25th, 1958.

Mr. C.P. Robertson,
Suite 406,
25 Adelaide Street West,
Toronto 1, Ont.

Dear Sir:

I have your letter of March 21st and am happy to know that you would like to have copies of our various maps covering areas in northwestern Ontario. These are going to you in care of our Mr. J.E. Whimster, Industrial Geologist at Toronto, who will be getting in touch with you in due course.

Yours very truly,

F W Collins

Manager.

GMH/DM

* 613 CPR Building Kingsway 3 o'clock

CANADIAN PACIFIC RAILWAY COMPANY

DEPARTMENT OF INDUSTRIAL DEVELOPMENT

MONTREAL 3, QUE.
F. W. COLLINS.
MANAGER
G. McL. HUTT.
ASSISTANT MANAGER
R. L. SMALL.
ASSISTANT TO MANAGER

FILE NO. M.100-3-7C

Montreal 3, March 28th, 1958.

Mr. Cameron Robertson,
Marlhill Mines, Ltd.,
Heron Bay South, Ont.

Dear Mr. Robertson:

Mr. D.J. Cross, Mining Recorder, Port Arthur, has suggested that you might be interested in a geological report on the Hemlo area made for us by Dr. Trevor Page under Dr. M.W. Bartley in 1957. I am also taking the liberty of sending you a report covering prospecting done in 1957 for us by Dr. Bartley. These are going to you under separate cover.

If you wish additional copies of either of these or of the contained maps I shall be very happy to send them to you and I will be happy to keep you on our mailing list for future reports if you should so desire.

Yours very truly,

F. W. Collins.

Manager.

GMH/DM