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GEOLOGICAL REPORT

on

PAX INTERNATIONAL MINES LIMITED

NORTH GROUP

POWELL TOWNSHIP, ONTARIO

December 13, 1965

J.R. Mowat & Associates

MEMBER: GEOLOGICAL ASSOCIATION OF CANADA
ASSOCIATION OF PROFESSIONAL ENGINEERS, MANITOBA
CANADIAN INSTITUTE OF MINING AND METALLURGY

INTRODUCTION

The following report is based on a field examination of the property and available governmental data on the area. The field work was completed during the period of October 22nd to November 15th, 1965 by D.L. Wetmore, with the assistance of G. Wilson and A. Lafleur.

During the course of mapping, evidence of past exploration was observed. All trench and diamond drill hole locations have been plotted on the appended geological plan of the property.

The caved condition of most of the trenches, put down in early gold exploration, precluded a detailed economic appraisal. It is suggested that these areas, as well as those indicated by the geochemical survey, be closely examined next field season.

Specimens of all outcrops encountered were numbered and are on file at the Company office, Matachewan, Ontario.

PROPERTY

The North Group Property of Pax International Mines Limited comprises eighteen contiguous unpatented mining claims, numbered MR 37464 to MR 37481 inclusive.

LOCATION and ACCESSIBILITY

The property is located in Powell Township, Montreal River Mining Division, District of Timiskaming, Ontario. It lies approximately four and three-quarter miles north-west of the town of Matachewan. Highway 566 (Ashley Road) crosses the eastern claims of the property. Matachewan is connected by Highway 65 to Elk Lake on the Ontario Northland Railway; and, by Highway 66 to Swastika and Kirkland Lake, also on the Ontario Northland Railway. It is 29 miles and 34 miles respectively from Matachewan to Elk Lake and Swastika.

The Ryan Lake Property of Pax International Mines Limited lies immediately to the south of the North Group Property. The Ryan Lake Property is a past producing copper-molybdenum mine. At the present time work is in progress with the intent of proving sufficient ore reserves to resume mining operations on this property.

SERVICES, TIMBER, and WATER

Hydro-electrical power and telephone communications are available at the Ryan Lake Property approximately three-quarters of a mile to the south.

An ample supply of water is available on the property. Timber for mining purposes is available both on the property and in the general area.

TOPOGRAPHY

The topography consists of outcrop ridges and hills alternating with relatively low to swampy depressions. In most cases the lakes are surrounded by low, swampy ground. Drainage on the western section of the property is in a westerly direction towards Mistinikon Lake.

REGIONAL GEOLOGY

Table of Formations (From W.S. Dyer, 1935, p. 8)

QUATERNARY	
Plaistocene:	Glacial sands, gravel and till; fluviatiles.
PRE-CAMBRIAN -	
Keweenawan:	Quartz Diabase
	Intrusive Contact
Cobalt Series:	
	Conglomerate, greywacke, orgillite, arkose
	Great Unconformity
Matachewan:	Quartz diabase dikes
	Intrusive Contact
Timiskaming:	Quartzite, chert, argillite, greywacke, slate conglomerate, conglomeratic quartzite, conglomeratic greywacke.
	Erosional Unconformity
Keewatin:	Volcanics: Andesite, basalt, rhyolite, dacite, and their tuffs and agglomerates. Carbonate Schist. Sediments and iron formation (rare).

The general geology of the Matachewan Area is described by Dyer, O.D.M., (1935). His report and its accompanying maps show the Keewatin formation, consisting of volcanic flows and fragmentals, to be the oldest and most extensive formation in the map area.

Timiskaming sediments occupy two parallel easterly-trending synclines closely folded within the Keewatin. Steeply dipping conglomerates, quartzites, cherts and arkose strike from east to northeast.

A large number of stocks and dykes of igneous rock ranging in composition from basic diorite to granite, including syenites, syenite

porphyry, and locally monzonite, intrude the volcanic and sedimentary horizons and are regarded by Dyer to be of Algoman age.

H.L. Lovell, O.D.M., who mapped Powell Township in 1964, notes that the diabase is both pre- and post-Cobalt. The pre-Cobalt diabase is by far the most prolific with only the odd dyke noted to cut later flat-lying Cobalt sediments.

The major fault direction is parallel to north-south tension fractures developed during folding of the Timiskaming sediments. This is particularly manifested by the Mistinikon Lake Fault where movement of the east side has been to the north relative to the west. Parallel faults or tension fractures, many occupied by diabase dykes, are especially prevalent in the eastern half of the Township.

Older northeasterly trending lineaments are noted to parallel the old Keewatin axis. The axes of many of the older granitic intrusives trend to the northeast conformable with this system.

The gold and associated molybdenite-copper deposits are found in the early Pre-Cambrian rocks of Keewatin to Algoman age. Both Dyer and Lovell note that most of the gold deposits are closely related to one or more of the types of syenite porphyry. They are found either in the porphyries themselves or in the Keewatin adjacent to the porphyry. Lovell notes that gold is associated with pyrite, chalcopyrite, galena, sphalerite, specular hematite and molybdenite. He further notes that in certain cases (viz. Pax International Mines Ltd.) "molybdenite and chalcopyrite are in quartz veins (some of them in syenite) and along slip planes in basic intrusive rocks".

PROPERTY GEOLOGY

The consolidated rocks of the property are Pre-Cambrian in age. They consist of a fractured, acid to basic volcanic complex cut by irregular-shaped intrusive bodies of syenite and diabase. Several scattered occurrences of sedimentary rock are also present.

ROCK TYPES

Keewatin Volcanics: Andesite comprises the majority of this rock-type. It is characterized by a massive, dense, grey-coloured rock. Fracturing, jointing and faulting are present. Epidote and chloritic alteration are prevalent in some localities.

The andesite grades into more acid dactic and rhyolitic lavas on one hand; and, into more basic basaltic types on the other. Andesite is the more extensive of the two types. As noted on the geological map, volcanic fragmentals are also present on the property.

Collectively, the above formations may better be termed meta-volcanics or "greenstones" of the Keewatin type.

Timiskaming Sediments: As noted previously, only scattered occurrences of sedimentary rocks were observed on the property by the authors. Chert, greywacke and quartzite comprise this type. Folding and subsequent igneous activity have altered these original sedimentary formations. In contrast to Lovell's opinion those rock types exposed on the north central position of the grid are believed, with one or two exceptions, to be volcanic.

Haileyburian (?) Rocks: A greenish-black diorite forms a relatively homogenous mass of igneous rock located on the south western claims of the property. This rock type has undergone considerable

metamorphism as shown by the chloritization of ferro-magnesian minerals, and also by the presence of epidote along fracture surfaces.

Algoman (?) Intrusives: These acid intrusives range in composition from syenite, basic syenite, syenite porphyry (both red and dark), through to feldspar porphyry. Certain specimens related to nearby Algoman exposures have the appearance of a granodiorite.

Feldspathization of nearby older formations suggest that exposures of these intrusives may be the tops of more extensive formations at depth.

Matachewan Intrusives: North-south trending diabase dykes intrude all older formations on the property. This rock type is dark greenish-black in colour and varies in crystal size from intermediate to very finely crystalline. The very fine crystalline chilled margins of the diabase are hard to distinguish from the older adjacent basalt flows. Typical diabasic texture and degree of alteration aid in differentiating the two formations. Locally, considerable disseminated magnetite is found in the intrusive.

STRUCTURAL

Several faults and topographic lineaments traverse the property. The most prominent fault trace strikes N25°W and passes along the western side of the lake located on Claims MR 37466 and 37470. Lovell (1964) shows the relative displacement along this trace as the east side to the north with respect to the west side. Considerable cross fracturing, with the introduction of epidote, calcite, chlorite mineralization is evident along the zone. Similar fracturing and alteration is encountered along an inferred fault that strikes N10°W and intersects the aforementioned trace at the south end of the same lake.

An assumed fault striking N55°W is located along the north shore of the lake located in the south-west corner of the property. The presence of this structure is manifested in the geology of the area to the south of the lake. It shows up as a definite lineament on vertical air photographs. Topographically, this trace is manifested by outcrop cliffs and steep slopes along the northern lake shore.

An east-west trending lineament is suggested in the south-east corner of the property. Two diabase dykes appear to be offset with the south side being displaced to the west relative to the north. This type of late fracturing with displacement of the diabase along an east-west plane is well shown in the underground workings at Pax International. Numerous subsidiary lineaments may be observed through photo study of the area. The two major trends are N20o to N70o West and N20o to N70o East.

Examination of outcrops shows a general obliteration of original formational trends as a result of successive periods of movement and alteration. Fracturing as noted, has been multidirectional. Where one prominent fracture or joint system is present, the attitude has been so noted on appended plan.

ECONOMIC

No great continuous length of mineralization was observed during mapping, although widespread pyritization and local disseminations of chalcopyrite, and to a lesser degree molybdenite, were observed in some of the outcrops, especially on the northeastern and northwestern claims.

All economic minerals were observed in fractured volcanic and syenitic rocks, usually near contact areas between the two. Some remobilization of late stage mineral enrichment is suggested in the volcanics along diabase contacts. Latter formations are usually magnetite-rich, with accessory pyrite. In at least one instance (see Geochemical Survey) the diabase appears to have been fractured by late movement with late stage sulphide enrichment of the fracture area.

By and large, the trench areas noted on plan require rehabilitation. Observed mineralization is restricted to narrow disseminations of chalcopyrite in quartz-injected volcanics or syenite - syenite porphyry fracture zones. At these points mineral enrichment has apparently taken place in two stages, a relatively widespread salt and pepper dissemination of copper mineralization in a blue quartz type of silicification, followed by coarse chalcopyrite enrichment in white quartz fissure veins. The

continuity of such zones would have to be established by followup examination in conjunction with assessment of geochemical information, when ground conditions permit.

The overall economic impression gained from the geology is that mineral structures would tend to be lineal fissure filling types. Lateral and depth continuity would tend to be obstructed by repetitive dykes of diabase.

Respectfully submitted,

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Geol. Eng.

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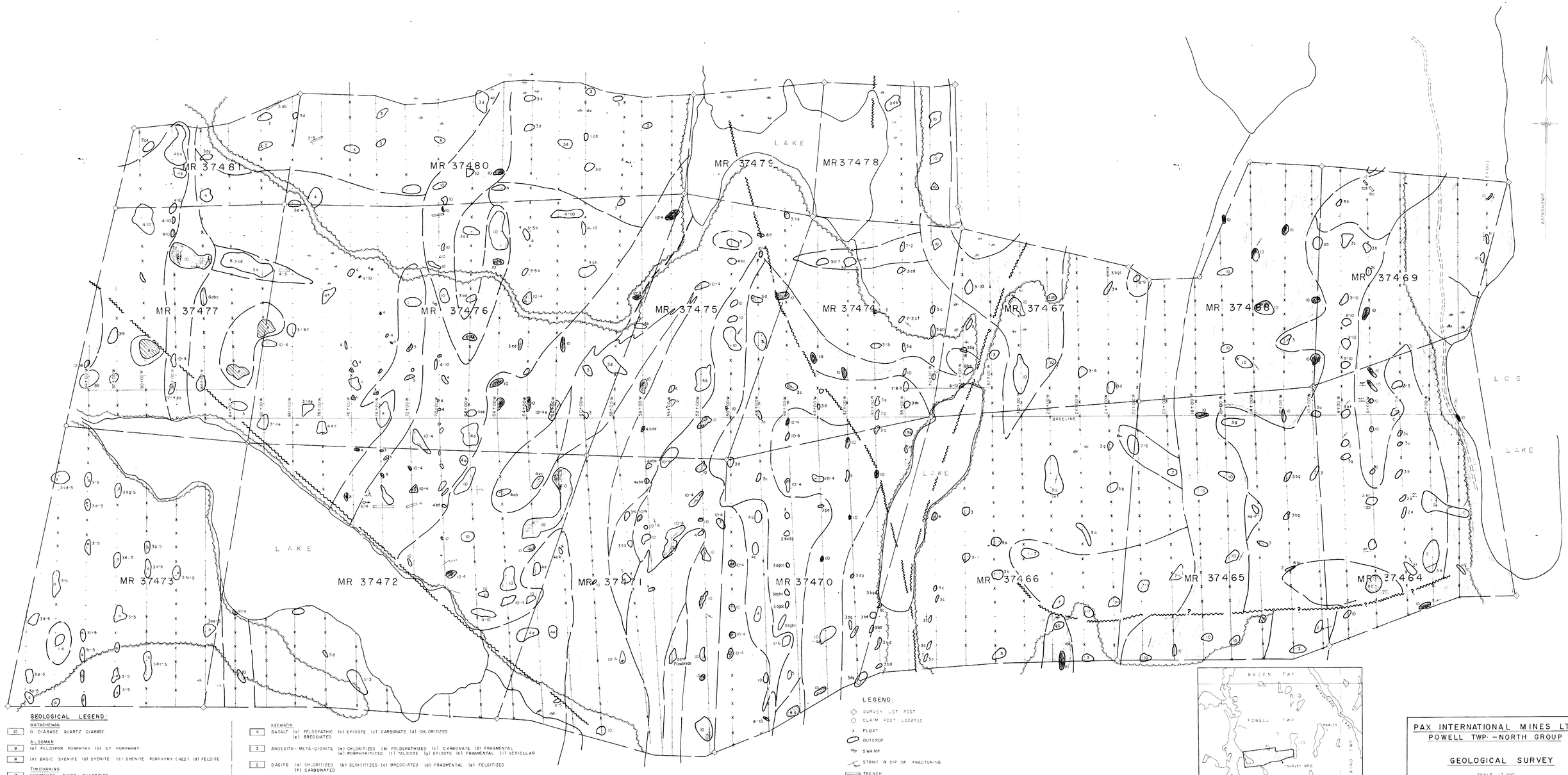
December 13, 1965



GEOLOGICAL LEGEND:

MATACHEWAN
10 DIABASE QUARTZ DIABASE

ALGOMAN
9 (a) FELDSPAR PORPHYRY (b) SY. PORPHYRY
8 (a) BASIC SYENITE (b) SYENITE (c) SYENITE PORPHYRY (RED) (d) FELSITE

TIMISKAMING
7 SEDIMENTS - CHERT, QUARTZITE

POST KEEWATIN (INTRUSIVES) ALT'N PRODUCT
6 PERIDOTITE (POSS ORG 3) (a) TALCOSE (b) CHLORITIC (c) SERPENTINIZED
5 DIORITE META-DIORITE (a) CHLORITIZED (b) CARBONATED (c) FELDSPATHIZED

KEEWATIN
4 BASALT (a) FELDSPATHIC (b) EPIDOTE (c) CARBONATE (d) CHLORITIZED (e) BRECCIATED
3 ANDESITE - META-DIORITE (a) CHLORITIZED (b) FELDSPATHIZED (c) CARBONATE (d) FRAGMENTAL (e) PORPHYRITIZED (f) TALCOSE (g) EPIDOTE (h) FRAGMENTAL (i) VESICULAR
2 DACITE (a) CHLORITIZED (b) SERICITIZED (c) BRECCIATED (d) FRAGMENTAL (e) FELSITIZED (f) CARBONATED
1 RHYOLITE - META-RHYOLITE (a) SERICITIZED (b) PORPHYRITIZED (c) BRECCIATED (d) FRAGMENTAL (e) EPIDOTE (f) CHLORITIZED

LEGEND:

- SURVEY LOT POST
- CLAIM POST LOCATED
- FLOAT
- OUTCROP
- SWAMP
- STRIKE & DIP OF FRACTURING
- TRENCH

SURVEY GRID PLAN

PAX INTERNATIONAL MINES LTD.
POWELL TWP. - NORTH GROUP

GEOLOGICAL SURVEY

SCALE 1" = 200'

DRAWN R.T. WILLIS	DATE Nov. 1968	J.R. MOWAT AND ASSOCIATES OTTAWA, CANADA
SURVEY	CHECKED	