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REPORT ON THE
GEOLOGICAL SURVEY
ZAVITZ AND HINCKS TOWNSHIPS
LARDER LAKE M. D., ONTARIO
FOR
PAN-ORE GOLD MINES LIMITED

BY
BARRINGER RESEARCH LIMITED
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METROPOLITAN TORONTO
REXDALE, ONTARIO
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LIST OF DRAWINGS

<u>Dwg. No.</u>	<u>Title</u>	<u>Scale</u>
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8-403-2A & 2B	Geology	1" = 200'

1. SUMMARY

Pan-Ore Gold Mines Limited holds a group of 24 contiguous unpatented claims in Zavitz and Hines Township in Larder Lake Mining Division of Ontario. They are about 11 miles southeast of the Texmont nickel development and about 20 miles west of the Young-Davidson open pit gold producer near Matachewan.

The claim group has recently been covered by geophysical and geological surveys which are reviewed and reported respectively in the present report.

These surveys outline three main areas of interest concerning three different types of mineralization.

1) GOLD

A small complex granitic stock exists in the central part of the claim group, north of Moray Lake. It has a known gold association, and a grab sample taken by Noranda from a trench on an east-striking apophysis of the stock yielded 0.75 ounces per ton gold, 3.90 ounces per ton silver and 0.45 percent lead. An IP anomaly was found over this area, the chargeability of which increased with depth. It is recommended that the anomaly be drilled.

2) NICKEL

Ultramafic rocks are known to exist on the property and are reported in previous drilling to contain considerable disseminated sulphide mineralization (assays not reported). Results of current geological studies indicate that these rocks may be primitive in nature, coeval with ultramafics 11 miles to the northwest on which Texmont Mines have come to a pre-production stage.

The IP survey over the area of the known ultramafic has outlined 4 very good geophysical anomalies. Two of these have been recommended to be drilled in order to determine if the anomalies are caused by nickel-copper bearing sulphides.

3) COPPER - GOLD

An occurrence of copper - gold in cherty rhyolite breccia was known to exist on the west block of the Pan-Ore claims. Drilling by previous owners had intersected a 4.8 foot length of 0.91 percent copper and 0.03 ounces per ton gold, and a 4 foot length of 0.46 percent copper, 0.33 ounces per ton gold. Geophysical surveys (HEM) were not satisfactory for outlining the zone in the region of the copper - gold intersections - possibly because of the predominantly disseminated nature of the occurrence. Sampling and compilation done during geological studies indicate a probable increasing copper gradient to the east where HEM left some ambiguity in outlining the zone. At the western extent of IP coverage (some 1500 feet east of the copper intersection along the believed geological strike of formations) is an IP response coincident with an EM-16 anomaly. It is recommended that the known copper - gold mineralization be defined and extended eastward using IP. Two drill holes should be anticipated to test the trend, should results of the IP survey warrant.

A total of 1800 feet of drilling is recommended to test the three target areas.

Costs for the recommended programme may be expected to be: -

Geophysical survey (IP)	\$ 4,955.00
Drilling 1800 feet @ \$12.00 (all inclusive)	<u>\$ 21,600.00</u>
Total	\$ 26,555.00

2. INTRODUCTION

In January 1973, Barringer Research Limited submitted a preliminary report on the Zavitz and Hincks Townships property of Pan-Ore Gold Mines Limited (Ref. 1). It outlined three areas of possible economic mineralization:

- 1) Gold had previously been found associated with a small intrusive stock in the central part of the property. A grab sample (Ref. 6a) was reported to have yielded 0.75 ounces per ton gold, 3.90 ounces per ton silver and 0.45 percent lead.
- 2) An ultramafic body with reported asbestos fibre was known to exist on the south segment of the claim group and a sample of the ultramafic submitted by the staker contained small (0.128 percent) amounts of sulphide nickel.
- 3) Previous drilling in the northwest part of the property had cut a Cherty rhyolite breccia, one intersection of which assayed 0.91 percent copper and 0.03 ounces per ton gold across 4.8 feet. A second intersection yielded 0.46 percent copper and 0.33 ounces per ton gold over 4 feet. These assays were obtained by drilling at the east end of a weak EM conductor. No drilling further to the east has been done.

It was recommended that all three of these potential sources of economic minerals be further investigated by geophysics and geology. A programme of geophysical surveys was designed to fit the requirements of the individual mineral characteristics and environments. However, because of cost considerations, the IP survey was restricted in extent. Later findings indicated it would have been preferable to have more IP coverage.

These geophysical surveys and a geological survey were carried out in May and June of 1973 by Barringer Research Limited. Results of the geophysical surveys were presented in a report dated September 1973, by R. Caven, P. Eng., Senior Geophysicist of Barringer Research Limited.

The present report discusses findings of the geological survey and integrates it with results of the geophysical surveys.

3. THE PROPERTY

The Pan-Ore property consists of 24 contiguous unpatented claims in Zavitz and Hincks Townships, in the Sudbury and Temiskaming Mining divisions of Ontario.

The Zavitz Township portion of the group comprises 20 claims numbered:

- L. 353158 - 353167 inclusive
- L. 353169 - 353171 inclusive
- L. 354534 - 354539 inclusive
- L. 354621

Adjoining this group on the east are 4 claims in the Hincks Township, numbered:

- L. 344897
- L. 353130 - 353132 inclusive

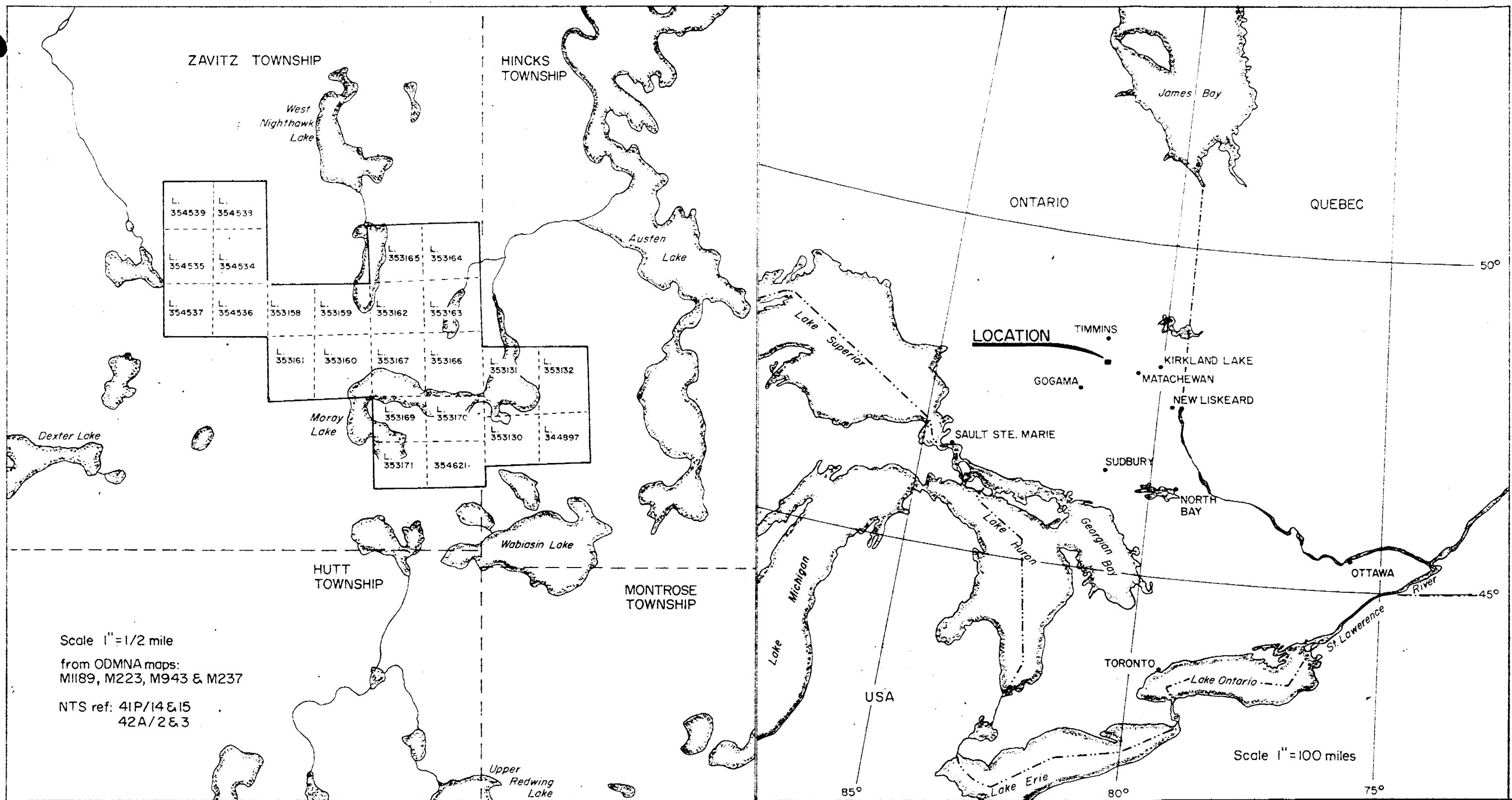
4. LOCATION AND ACCESS

The property is about 20 miles northwest of the Town of Matachewan and can be reached from there by Highway 566 which is a good gravel road, and other secondary roads connecting with it. The property can also be reached from Timmins - Porcupine by road, some 40 miles, (Dwg. 8-403-1).

The Ontario Northland Railway services Timmins - Porcupine and also the Town of Kirkland Lake, 30 miles east of Matachewan. The Canadian National Railway line connecting Sudbury and Geraldton is 40 miles to the southwest of the property.

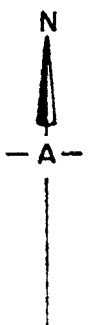
Moray Lake lies almost entirely within the claim group and is connected by Moray Creek to Austen Lake, a sizeable lake 1000 feet east of Pan-Ore. The latter is part of the Nighthawk River System.

Both Timmins - Porcupine and Kirkland Lake are centres for supplies and manpower.



Scale 1" = 1/2 mile
 from ODMNA maps:
 M1189, M223, M943 & M237
 NTS ref: 41P/14 & 15
 42A/2 & 3

Scale 1" = 100 miles



PAN-ORE GOLD MINES LIMITED		
ZAVITZ & HINCKS TOWNSHIPS, ONTARIO		
LOCALITY PLAN		
NOV. 1973		DWG. 8-403-1

Work undertaken by
BARRINGER RESEARCH LTD, Toronto, Canada.

5. PREVIOUS WORK

Portions of the property have been held and optioned at different times by various concerns. Assessment work files of the Toronto Branch of the Ontario Department of Mines, Ministry of Natural Resources, contain details of work done on different portions of the present Pan-Ore property by Voyager Exploration (1964) and Noranda Exploration (1965). O.D.M. Map P 455 refers to results of trenching done by Sylvanite Gold Mines Limited.

Voyager has filed results of an electromagnetic survey covering the cherty rhyolite lens in the northwestern part of the present Pan-Ore property. They subsequently drilled six shallow holes testing resulting anomalies. Salient features of this drilling are reported below.

Noranda Exploration in 1965 conducted magnetometer surveys over three different optioned groups which are part of the present Pan-Ore property. Targets provided by these surveys were subsequently drilled. Noranda put down about 8 drill holes, not all of which are pertinent to the present property. Salient results are discussed in the section on Economic Geology below.

6. AREA GEOLOGY

Early Precambrian flows, interflow sediments, and intrusives underlie the area.

Pyke (1972) describes two cycles of volcanism in the area. Each begins with ultramafic metavolcanics and develops through mafic to felsic metavolcanics and pyroclastics. Major folding is complex and the two sequences have not been everywhere distinguished from each other. The ultramafic base of the top sequence is seen trending north-south along the Bartlett-Geikie Township boundary (11 miles northwest of the Pan-Ore property) where it contains the Texmont Mines nickel deposit. The base of the first cycle is further west in Fripp Township. Iron formation is largely confined to the intermediate to felsic metavolcanics of the lower cycle, and variolitic and amygdaloidal flows occur almost exclusively in the upper sequence of mafic metavolcanics.

There are minor felsic epizonal intrusions (mainly in the lower cycle) which have gold associations and a large acid intrusive stock occupies the greater portion of Geikie Township to the north of Zavitz Township. Its southern portion lies within Zavitz.

The Pan-Ore property lies almost entirely within Pyke's legend division number 3 "Lower Felsic to Intermediate Metavolcanics", i.e. within the flows which constitute the upper part of the lower series. They would thus lie immediately below "Upper Ultramafic Metavolcanics" which, some 11 miles to the northwest, contain the Texmont Mines Limited.

The ultramafic rocks in Pan-Ore are classified by Pyke as intrusive and during the current geological survey serpentinization from the ultramafic was seen to invade the adjacent rhyodacite. One small outcrop, on the west central shore of Moray Lake, and mostly submerged, is a textured rock of gabbroic to ultramafic composition displaying what was believed to be "chicken track" spinifex. Logs of Noranda drilling (1965) (Ref, 6) at the east end of Moray Lake refer to "feather rock" which is spinifex (verbal communication). On the west group, drilling by Silvermaque - Voyager in four holes cut basic to ultrabasic rocks in close association with copper-mineralized, bleached rhyolite and rhyolite breccia.

The rocks are logged as, "diorite", "probably diorite" and "black rock probably peridotite". In one place a 242 foot intersection is described as containing 1 - 10 percent pyrrhotite scattered throughout the hole.

It would appear that the ultramafic rocks of the Pan-Ore property lie closely associated with rhyolitic rocks which are part of the top of Pyke's lower volcanic cycle. The ultramafics are concluded to be part of the same horizon of rocks as that of Texmont.

7. GEOLOGICAL SURVEY

Outcrops of the Pan-Ore property are generally few and most are disappointingly small. Information is very sketchy. Much of the property has suffered from over-harvesting of trees. Many of the trees spared in logging have consequently fallen in the winds, lying on unremoved slash. Large areas have had every tree knocked to the ground in preparation for re-planting and a few of these areas have been re-planted. Movement is consequently very slow and pacing inaccurate.

Results of the survey are presented on Drawing Nos. 8-403-2A and 2B.

In the region surrounding Zavitz Township, Pyke (Ref. 8b) has mapped two volcanic cycles, both of which begin with ultramafic metavolcanics and develop through mafic to felsic metavolcanics. He has placed the rocks of the Pan-Ore property within the felsic flows of the first cycle. The current geological survey associates some, if not all, of the ultramafic of the Pan-Ore property with rhyolitic rocks, and leads to the conclusion that the ultramafic may be part of the ultramafic base of the second cycle - the Texmont horizon.

The airborne magnetic map (Peterlong Lake Geophysical Paper 291) shows a relatively small magnetic low in an area just north of our north-central block of claims. This has been interpreted as an intrusive (dome). The detailed (ground) geophysics show that flow sequences apparently encircle this low, giving a U-shaped magnetic configuration swinging from northwest down to the area of the acid intrusive located in the central Pan-Ore block and then up to the north boundary in the northeast block of the property. Bedding directions seen in tuffs and agglomerates, and directions of the few contacts observed confirm the U-shape. Major faults cut the property in several directions and it is possible that considerable movement has taken place along some of them. Geology in the northeast part of the property, although not fully known, is obviously complex, and may be a result of both folding and faulting. Individual units are not continuously traceable along the U.

A most serious problem exists in that no top determinations adjudged reliable were seen. However, both Bright & Pyke (Ref. 6a and 8b) find tops in the northeast part of Pan-Ore are east and southeast.

Strikes observed in this survey are northeast in that immediate area. Proceeding west from there, strikes swing to east-west and then northwest. Thus tops in the northwest part of the property are assumed to be southwest. The horseshoe shaped geological configuration seemingly holds true for the north and central portions of the property but northeast of Moray Lake and south of the lake the U-shape apparently disappears and west-northwest-east-southeast strikes seem to prevail.

Rock types seen are briefly described below. A Table of Formations (Table I) also follows:

FIRST CYCLE

Basalt

This rock type occurs in the north part of the northeast block of Pan-Ore. It is a very black, fine-grained rock, probably pillowed. Its age is a debatable point because although it fits spatially into a basalt-dacite-rhyodacite-rhyolite sequence, it is also not far removed from an area of basalts mapped by Bright (Ref. 6a) as part of the upper sequence of flows and thus would overlies the nearby dacites and rhyodacites of the upper part of the lower sequence. It is here considered to be part of the lower cycle of rocks.

Andesite

This rock is seen only at the south end of a small lake north of Moray Lake towards the east boundary of the property. It is mapped as andesite, but may, in fact, be a form of the dacite. The rock has much associated quartz-carbonate. It is in contact with the rhyodacite-rhyolite but its relationship is not known and it is near an interpreted (by geophysics) major fault which trends east-west north of Moray Lake. Its position in the Table of Formations is only roughly assumed.

Dacite

This is a very dark rock designated by Bright as a dacite.

It is in contact with the basalt but the relationship could be ambiguous. It is a brown-weathering rock, with a slightly purple cast. It very occasionally has quartz-carbonate veinlets and is pillowed at least in places.

Mafic to Intermediate Tuff

This rock appears in the northwest block and in the central area, immediately northwest of the porphyry-granite intrusive. In this area it contains some agglomerate and where it is the wallrock of the granite-porphyry appendage, it contains sulphide.

Rhyodacite

This is a very dark coloured siliceous rock which may be pillowed and is occasionally vesicular. Its dark colour (black) is very much in contrast with the more rare overlying light coloured rhyolite.

Rhyolite and Rhyolitic Agglomerate

This rock is of very limited extent. It occurs in the central part of the northeast block and in the central part of the northwest block. In the latter location it is host for the sulphide occurrences. A light grey siliceous rhyolite or rhyodacite occurs at one location along the south shore of the small lake north of Moray Lake.

SECOND CYCLE

Ultramafic

This occurs and is exposed in the south part of the property. It displays cumulate and pseudo-flow features, has spinifex textures and is altered to asbestos locally. Noranda drilling refers to pyrrhotite blobs over considerable lengths of core. Ultramafic is also mentioned in Silvermaque-Voyager drilling as being adjacent on the south to the rhyolites with associated copper - gold mineralization. The two ultramafics have very different geophysical expression.

Intermediate (Variolitic?) Flows

These occur in the south part of the property, in proximity to the ultramafic. They are believed to overlie the ultramafic. Varioles are indistinct.

Feldspar Porphyry

This rock (including flow breccia) is to be seen along the south shore of Moray Lake. It is a dark blue-grey dacitic rock with euhedral phenocrysts of lighter coloured feldspar. The breccia seen along the shore is believed to be flow breccia but might be a tectonic breccia. This is a minor rock type.

FELSIC INTRUSIVES

These consist of a wide variety of granite, porphyritic and syenitic intrusives. One group involves the small granite-porphyry-syenitic plug in the central part of the property, together with dykes of various compositions which are seen to occur east of the stock.

Another sizeable granitic intrusive occurs at the westernmost part of the claim group. It is a quartz porphyry with a medium blue-grey matrix and quartz eyes and phenocrysts. Feldspar phenocrysts sometimes are present but often are indistinct.

Dykes of variable composition occur on the northwest block of the group, near the old trenches and former drilling.

MAFIC INTRUSIVES

Matachewan diabase dykes are seen to occur to the east of Moray Lake. Other dykes probably occur but because of lack of exposure, have not yet been recognized.

TABLE I

TABLE OF FORMATIONS

EARLY PRECAMBRIAN

Mafic Intrusives: diabase dykes, (undivided)

Felsic Intrusives: 1) late granitic rocks

Granitic intrusives (hornblende granite, various porphyries, syenite, etc.)

-----Intrusive Contact-----

2) early granitic rocks

quartz porphyry and quartz feldspar porphyry

-----Intrusive Contact-----

Second Cycle - Upper Metavolcanics	{	Feldspar porphyry (dacitic matrix)
		Intermediate (variolitic?) flows
		Ultramafic flow or intrusive
First Cycle - Lower Metavolcanics	{	Rhyolite and rhyolitic agglomerate
		Rhyodacite
		Mafic to intermediate tuff
		Dacite and silicious dacite
		Andesite
Basalt		

8. DISCUSSION OF GEOPHYSICAL SURVEYS

Several geophysical methods were used on this property in an attempt to suit the geophysics to the known targets as economically as possible. This was further complicated by changes in strike direction and consequently the line direction. The resulting picture is disjointed but the objectives were for the most part successfully attained. Results of these surveys are reported by R. Caven, P. Eng., (Ref. 10). An IP survey was done over areas of ultramafic rocks in search of disseminated nickel, and also over the granitic intrusive, in hope of finding disseminated (porphyry-type) mineralization or sizeable, sparsely mineralized veins. The less expensive EM method was used on the greatest part of the property where mineralization would most likely be of a massive, volcanogenic nature. An EM-16 was used in conjunction with the IP over the granitic intrusive to try to outline faults and shears.

8.1 MAGNETOMETER SURVEY

A magnetometer survey was completed over the entire property on 200 foot lines, particularly because of a serious lack of known geology. It was hoped that magnetics would help extrapolation between sparse outcrops, and also help to interpret other geophysical results.

8.2 IP SURVEY

The IP survey comprises both resistivity and chargeability surveys. Aside from its usual function the resistivity information outlined the overburden covered granitic plug and aided our knowledge of the general geology.

Chargeability has produced responses of interesting nature at three locations:

- (i) Line 16E at 12N (in the north central area). It coincides with sulphides (pyrite and pyrrhotite) seen mainly in wallrock of granitic dyke material spatially associated with the plug.

Blasting had been done at the location and it is believed that a spectacular assay of 0.75 ounces per ton gold, 3.90 ounces per ton silver and 0.45 percent lead from a Noranda Exploration grab sample was obtained from this trench. It was not discernible in the field whether the dyke material had intruded mineralized rock or whether it had introduced the mineralization into its host rock. The chargeability increases with depth and it is recommended that this target be drilled.

(ii) A long trend of response in the middle of the property, centred along the main base line just north of Moray Lake. The trend progresses south and east to the property boundary. It is believed associated with formational sulphides, graphite and some rhyolite breccia tested in a couple of places with drill holes put down by Noranda Exploration. Holes 1 and 8 mention the presence of minor chalcopyrite. No further work is recommended on this zone at the present time.

Possibly a western extension of the above (?) is a response on Lines 0, 4E and 8E. It shows up at depth, improving in quality with depth and having a geophysical character similar to that caused by massive sulphides further east drilled by Noranda (assay results unavailable). Although geophysics indicates the host rock is unlikely to be acidic, this response is located such that it might be along strike from a known copper occurrence in rhyolites in the northwest section of the property. This possible connection should be investigated by a geophysical method which would discern disseminated mineral (the copper may be of essentially disseminated nature) or mineral at depth greater than the range obtainable by the ground horizontal loop which covered the intervening area. Horizontal loop over the known copper occurrences did not produce a significant anomaly.

(iii) Areas within the ultramafic body which have coincident magnetic anomalies. There are a number of such areas but the principal targets are four, two of which have been selected as a sampling for drilling.

8.3 EM-16

The EM-16 survey indicated some conductors and R. Caven states (Ref. 10) that the most interesting of these coincide with IP anomalies.

8.4 HORIZONTAL LOOP EM

The horizontal loop EM gave a number of short conductors, only two of which were strong. Both of these have received some testing by trenching and shallow drilling. One is over the trench which contains massive pyrite-pyrrhotite near the copper occurrence previously drilled by Silvermaque-Voyager (see 2b above) in the northwest part of the property which yielded 0.91 percent copper and 0.03 ounces per ton gold over 4.8 feet; the other is over a trenched occurrence of massive sulphides in the northeast part of the property. There was no significant response over the Silvermaque-Voyager mineralization containing copper which, judging from the log, may be essentially disseminated in nature with pods of massive material. It is in bleached and brecciated cherty rhyolite. Concepts of geological trends in this area indicate that the horizon containing the copper intersections may be connected with an area of strong IP response accompanied by an EM-16 anomaly in an overburdened area just west of the northwest corner of Moray Lake. Drill logs also indicate, when plotted, an increase in copper content from west to east, the best intersection occurring in the easternmost hole.

It is therefore recommended that a further IP survey be used to determine the geophysical characteristics of the copper intersection and trace it to the east. Hopefully the survey would tell us:

- a) if the zone has any extent eastwards where it was not drilled.
- b) if it extends to the east, does it connect with the area near Moray Lake which gives rise to an extensive IP anomaly with a superimposed EM-16 anomaly.

This should provide sufficient geophysical background for evaluation of the Silvermaque-Voyager intersection and for location of a drilling if warranted.

9. ECONOMIC GEOLOGY

The property is situated in a greenstone belt about 30 miles southeast of the mining centre of Timmins, and about 20 miles northwest of Matachewan. It is known to have possibilities for economic mineralization of three types.

9.1 GOLD

Gold associated with porphyry. A small complex stock of granitic and syenite porphyry carries gold and silver and is apparently of similar environment to the syenitic porphyry at the Young-Davidson Mine 20 miles to the east which contained about 2 percent pyrite and ran 0.11 ounces per ton gold and some silver. It was mined by both underground and open pit methods.

An IP survey of the stock and its environs did not indicate any strongly anomalous conditions over the body of the intrusive although a slight increase in chargeability was observed over the eastern part. However, an apophysis to the northeast gave a well defined chargeability anomaly. Coincident with the anomaly is an old trench in which Noranda obtained a grab sample from a quartz vein running 0.75 ounces per ton gold, 3.90 ounces per ton silver and 0.45 percent lead. The geological survey noted the host rock to be a highly altered tuff (?) containing considerable pyrite and pyrrhotite. It is not known whether the intrusive cut and mineralized the host rock or whether it merely intruded a mineralized rock. Gold is more likely to be present in mineralization emanating from the intrusive body. Chargeability increases with depth. It is recommended that this anomaly be drilled.

9.2 NICKEL

Nickel associated with known ultramafic rocks. The Pan-Ore property lies about 11 miles southeast of the Texmont nickel deposit which is now being readied for production. The Texmont is a low-grade nickel deposit similar to that of the INCO-Noranda deposit being mined in Langmuir Township and also to the McWatters and Hart deposits near INCO-Noranda. These deposits are about 15 miles northeast of Texmont.

All are occurrences of disseminated sulphides in ultramafic flows or shallowly emplaced sills. INCO-Noranda and McWatters and Hart all are roughly coeval. Noranda Exploration drilling (1965), and, it is believed, the current field work indicate the presence of spinifex texture. Both Noranda and Silvermaque-Voyager drilling indicate a spatial relationship between ultramafic rocks and a rhyolite-sulphide-tuff horizon. The productive ultramafics of this type (INCO-Noranda, Hart, McWatters, Texmont) all have close spatial relationships with sulphide iron-formation and felsic rocks. The current geological survey places the ultramafic rocks in contact with rhyodacitic rock and also notes probable spinifex (chicken track type) and curved, possible flow features within the ultramafic.

These evidences indicate that the ultramafic may be the same age as that of the Texmont property rather than a later intrusion.

Sulphides are known to exist in the ultramafic rocks of the Pan-Ore property. Noranda drill logs note that the "feather rock" (spinifex) carries disseminated pyrite, slight pyrrhotite and slight chalcopyrite. The outcropping ultramafic was found to carry 3000 ppm total nickel of which 1280 ppm were in sulphide form.

The IP survey over the ultramafic has yielded 4 very good drill targets, two of which are recommended, as a sampling, for drilling. There was no IP response over the area of Noranda's hole No. 7 which reported some blobs of pyrrhotite. Although it is acknowledged that very strong IP responses are sometimes obtained over ultramafic bodies as a result of alteration (serpentinization) completely devoid of sulphide mineralization, the noting of sulphides in former drilling is good encouragement.

Published maps of the area note the occurrence of asbestos within the ultramafic rocks of the Pan-Ore property. This occurrence was examined and found lacking in quality and extent. Fibre is poor and the occurrence is small. If more of the ultramafic were exposed other fibre might be located, possibly of better grade. At the present time the occurrence is of no economic interest.

9.3 COPPER AND GOLD

Copper and gold associated with rhyolite and tuff horizons. Silvermaque-Voyager drilling (1964) on claims now forming the west group of Pan-Ore report an intersection of 0.33 ounces per ton gold and 0.46 percent copper over 4 feet and another of 0.03 ounces per ton gold and 0.91 percent copper over 4.8 feet. These intersections are reported in a zone of brecciated, dark to bleached rhyolite, mineralized with disseminated sulphides and narrow (up to 5 feet wide) zones of massive sulphides. The zone, outcrops further west where a couple of trenches were blasted into a sulphide zone. The more westerly trench was on barren sulphides (0.04 percent copper in a grab sample taken in the current survey). The more easterly trench carried minor copper (0.24 percent grab) and the two drill holes, mentioned above, contribute to the suggestion of increasing amounts of copper content in an easterly direction - the highest copper content (0.91 percent copper over 4.8 feet) in the easternmost hole drilled. Only the massive pyrrhotite-pyrite section (west) has good geophysical expression. In the immediate area of the old drill hole reporting the best copper assay, the zone has a very weak signature on the reconnaissance HEM survey - so weak that the zone was not clearly distinguished from geophysical "noise" or extraneous readings. Detailed HEM was required in order to trace the zone from the outcrop at the trenches to the drill intersection. This is due, at least in part, to the fact that the greatest part of the zone is of disseminated nature, and would be better outlined by IP.

Further east along the interpreted direction of strike in this area - near Moray Lake, is an IP response which is coincident with an EM-16 anomaly.

In view of the significant copper - gold content of the known mineralized zone and the apparent copper gradient to the east, it is proposed to use IP to first establish the IP response over the pyrrhotite-pyrite zone and also over the copper intersection, then attempt to follow this zone eastwards. Should an IP response be obtained which would indicate improvement in amounts of disseminated mineralization along the same zone eastwards, it would represent a very promising drill target. It must also be pointed out that the good intersection was cut at shallow depth (about 50 feet vertically) and should be tested by stepping back (to the northeast) and undercutting the area of the good intersection.

It is therefore, proposed to trace the zone using an IP survey eastwards some 1500 feet to meet the area previously covered by IP. Drill testing of the copper zone should therefore attend the results of the IP survey.

Other base metal possibilities are known to exist along one or more zones of rhyolite-tuff-graphite-sulphide which cut the eastern end of Moray Lake and trend southeast. Some segments have been tested by Noranda's drilling but some remain untested. Should Pan-Ore drilling be successful such that more work is planned, then these zones and anomalies should be reviewed.

10. CONCLUSIONS

10.1 GOLD

A small gold-bearing intrusive was known to exist centrally north of Moray Lake on the Pan-Ore property. Present studies have outlined its form and indicated it to be a complex of granite, syenite and porphyry. The Young-Davidson Mine in this area (20 miles to the east) is an occurrence of disseminated gold and silver mineralization within and beside a syenite porphyry intrusion. It has been mined both underground and by open pit method for its gold content. The intrusive on Pan-Ore is known to have an east-striking apophysis which is, at least partly, quartz dyke material. Considerable sulphide was seen around this dyke on surface.

An IP and coincident EM-16 anomaly occur. The anomaly is apparently on the same dyke and/or mineralized zone trenched by Noranda who have reported a grab sample from this trench carrying 0.75 ounces per ton gold, 3.90 ounces per ton silver and 0.45 percent lead. Chargeability increases to depth and this target is recommended for drilling.

10.2 NICKEL

In the light of new regional mapping and certain details brought to light during current studies of the property, it is now believed that the ultramafic rocks of the Pan-Ore property are on or intruded shallowly near the same horizon which houses the Texmont development some 11 miles to the northwest.

Former drilling has also confirmed the presence of pyrrhotite mineralization within the ultramafic. The current geophysical survey has produced 4 good IP targets within this ultramafic. As a sampling, two are recommended for drilling. If encouraging results are obtained, attention can then be directed to the remaining anomalies.

10.3 STRATA-BOUND COPPER - GOLD

Former drilling reported an occurrence of copper-gold mineralization within brecciated bleached rhyolite.

One drill intersection reported 0.91 percent copper and 0.03 ounces per ton gold over 4.8 feet. A second intersection reported 0.46 percent copper and 0.33 ounces per ton gold over 4.0 feet. Old trenches were found west of these drill holes and grab samples of low grade and trace amounts were obtained. The overall picture indicates a possible increase of copper eastward, HEM geophysics was not an effective tool for tracing the copper intersection. The main geophysical response from this occurrence may be from disseminated mineral and an IP survey is indicated. The survey should obtain a response over the known occurrence and trace it eastwards, hoping for an increase in size and extent of mineralization. The survey would likely indicate a target or targets to be tested by drilling.

11. RECOMMENDATIONS

It is recommended that a single hole be drilled on the IP anomaly associated with the disseminated mineralization of the acid intrusive.

Two of four IP anomalies over the ultramafic body are recommended to be drilled at the present time.

Known copper-gold mineralization reported in former drilling in the northwest block of the Pan-Ore property has not been successfully traced with HEM. Because the mineralization may be chiefly disseminated with only disconnected massive pods and because of the encouraging grade of the drill intersections and an apparent increase of copper eastward, a limited IP survey is recommended to trace this zone to the east and outline the drill target or targets warranted by the occurrence.

Drilling footage is recommended as follows, without priority: -

Hole 1:	Line 16E, 10+50N, drilled grid north -45°	250 feet
Hole 2:	Line 16E, 28S, drilled grid south -45°	400 feet
Hole 3:	Line 36E, 22S, drilled grid north -45°	350 feet

Drilling to investigate strata-bound copper-gold (contingent on results of IP survey)	<u>800 feet</u>
	1800 feet

Costs of the recommended work are estimated as follows: -

Geophysical Survey (IP)		
6 working days @ \$380.00/day	\$2,280.00	
7 standby days (incl. travel, weather and camp set-up, @ \$325.00/day	2,275.00	
Mobilization and possible snowplough	400.00	\$ 4,955.00
Diamond drilling 1800 feet @ \$12.00/foot		<u>21,600.00</u>
Total		\$ 26,555.00

Diamond drill allowances are for one hole into each target. Successful intersections will entail a more extensive programme to outline the deposits.

BARRINGER RESEARCH LIMITED

M. L. Halladay

M. L. Halladay, P. Eng.,
Senior Geologist
Exploration Division



12. REFERENCES

1. Halladay, M. L., "Report on the Property of Pan-Ore Gold Mines Limited, Zavitz and Hincks Townships, Districts of Temiskaming and Sudbury, Ontario". Barringer Research Limited, report, January 1973.
2. Glover, J. E., Ed., Special publication No. 3, Geological Survey of Australia, "Symposium on Archaean Rocks".
3. C.I.M.M., "Structural Geology of Canadian Ore Deposits", special volume.
4. Irving, E., (Chairman) "The Ancient Oceanic Lithosphere", Earth Physics Branch, Vol. 42, No. 3.
5. Kilburn, et al, 1969, "Nickel Sulphide Ores Related to Ultrabasic Intrusions in Canada". Economic Geol. Mono. 4.
6. Ministry of Natural Resources, Ontario Department of Mines,
 - a) Map P. 455 "Zavitz Township", 1" = 1/4 mile.
 - b) Map 2046 "Timmins Kirkland Lake Sheet", 1" = 1/4 mile.
 - c) Assessment Work Files
 - d) Geophysics Paper 291 (Rev.) Magnetometer survey of Peterlong Lake, Ontario.
7. Naldrett, A. S., 1972, "Ultramafic Rocks, Their Classification and Potential as Hosts for Nickel-Sulphide Ores". C.I.M.M. paper, Ottawa, 1972.
8. Pyke, D. R., 1972, "Peterlong Lake Area, Districts of Temiskaming and Sudbury" in Summary of field work 1972, Ministry of Natural Resources, Ontario.
Map P. 810, Preliminary Geological Map, Peterlong Lake Area, 1" = 1 mile. O.D.M.
9. Rickaby, H.C., 1932, "Bannockburn Gold Area". O.D.M. Annual Report, Vol. XLI, Part II, 1932.

10. Caven, R., "Report on Geophysical Survey, Zavitz and Hincks Townships, Larder Lake Mining Division, for Pan-Ore Gold Mines Limited".
Barringer Research Limited, Report, September 1973.



42A03SE0114 2.1373 ZAVITZ

900

File 2.1373

RECEIVED

DEC 12 1973

PROJECTS SECTION

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey Geological

Township or Area Zavitz and Hincks Townships

Claim holder(s) Pan-Ore Gold Mines Limited

Author of Report M. L. Halladay

Address 304 Carlingview Dr., Rexdale, Ontario

Covering Dates of Survey June 18 - July 14, 1973
(linecutting to office)

Total Miles of Line cut 38.75

MINING CLAIMS TRAVERSED
List numerically

- L. 344897 (prefix) L. 354539 (number)
- L. 353130 L. 354621
- L. 353131
- L. 353132
- L. 353158 *Circled claim*
- L. 353159 *not covered*
- L. 353160 *all the*
- L. 353161 *rest 20 days*
- L. 353162
- L. 353163
- L. 353164
- L. 353165
- L. 353166
- L. 353167
- L. 353169
- L. 353170
- L. 353171
- L. 354534
- L. 354535
- L. 354536
- L. 354537
- L. 354538

If space insufficient, attach list

<u>SPECIAL PROVISIONS CREDITS REQUESTED</u>	DAYS per claim
Geophysical	
-Electromagnetic	
-Magnetometer	
-Radiometric	
-Other	
Geological	<u>20</u>
Geochemical	

ENTER 40 days (includes line cutting) for first survey.
ENTER 20 days for each additional survey using same grid.

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: 29 November 1973 SIGNATURE: M. L. Halladay
Author of Report

PROJECTS SECTION

Res. Geol. _____ Qualifications 2.1142

Previous Surveys 2.1290 geophysical 63.1649 geophysical
63.023 not for assessment credits 63.176 geophysical

Checked by _____ date _____

GEOLOGICAL BRANCH _____

Approved by _____ date _____

GEOLOGICAL BRANCH _____

Approved by _____ date _____

TOTAL CLAIMS _____

OFFICE USE ONLY L.D.

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations _____ Number of Readings _____

Station interval _____

Line spacing _____

Profile scale or Contour intervals _____
(specify for each type of survey)

MAGNETIC

Instrument _____

Accuracy - Scale constant _____

Diurnal correction method _____

Base station location _____

ELECTROMAGNETIC

Instrument _____

Coil configuration _____

Coil separation _____

Accuracy _____

Method: Fixed transmitter Shoot back In line Parallel line

Frequency _____
(specify V.L.F. station)

Parameters measured _____

GRAVITY

Instrument _____

Scale constant _____

Corrections made _____

Base station value and location _____

Elevation accuracy _____

INDUCED POLARIZATION -- RESISTIVITY

Instrument _____

Time domain _____ Frequency domain _____

Frequency _____ Range _____

Power _____

Electrode array _____

Electrode spacing _____

Type of electrode _____

Geikie Twp. (M. 320)

THE TOWNSHIP
OF
ZAVITZ

DISTRICT OF
SUDBURY

LARDER LAKE
MINING DIVISION

SCALE: 1 INCH = 40 CHAINS

LEGEND

- PATENTED LAND
- CROWN LAND SALE
- LEASES
- LOCATED LAND
- LICENSE OF OCCUPATION
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKEG
- MINES
- CANCELLED

NOTES

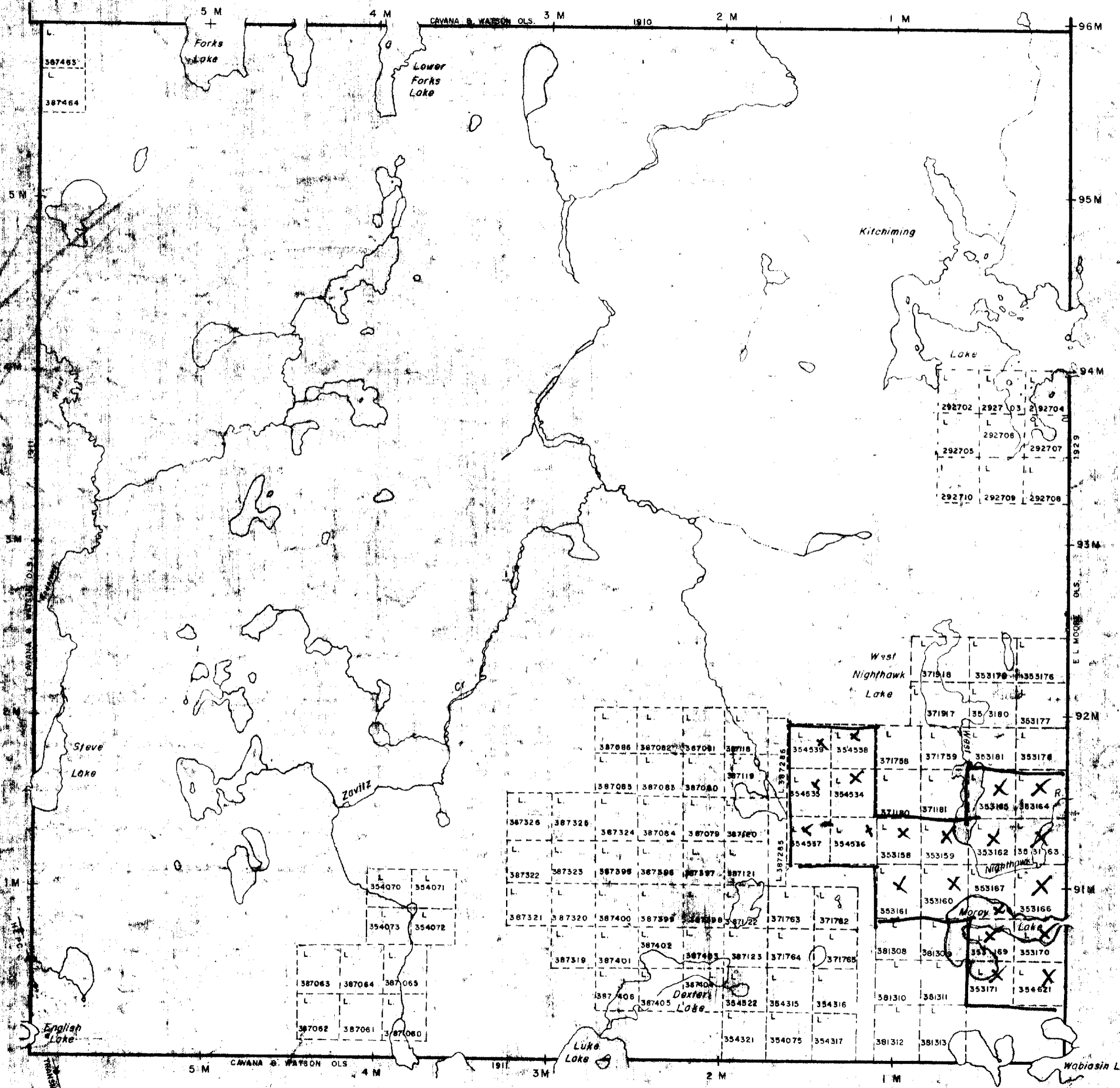
400' SURFACE RIGHTS RESERVATION AROUND
ALL LAKES AND RIVERS

MINING LANDS
DATE OF ISSUE
DEC 12 1973
MINISTRY
OF NATURAL RESOURCES

File 2.13B

PLAN NO. **M. 1189**

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH



English Twp. (M. 987)

Hincks Twp. (M. 223)

Hutt Twp. (M. 943)



THE TOWNSHIP
OF

HINCKS

DISTRICT OF
TIMISKAMING

LARDER LAKE
MINING DIVISION

SCALE: 1-INCH= 40 CHAINS

LEGEND

- | | |
|-----------------------|--------|
| PATENTED LAND | Ⓟ |
| CROWN LAND SALE | C.S. |
| LEASES | Ⓛ |
| LOCATED LAND | Loc. |
| LICENSE OF OCCUPATION | L.O. |
| MINING RIGHTS ONLY | M.R.O. |
| SURFACE RIGHTS ONLY | S.R.O. |
| ROADS | — |
| IMPROVED ROADS | — |
| KING'S HIGHWAYS | — |
| RAILWAYS | — |
| POWER LINES | — |
| MARSH OR MUSKEG | — |
| MINES | Ⓜ |

NOTES

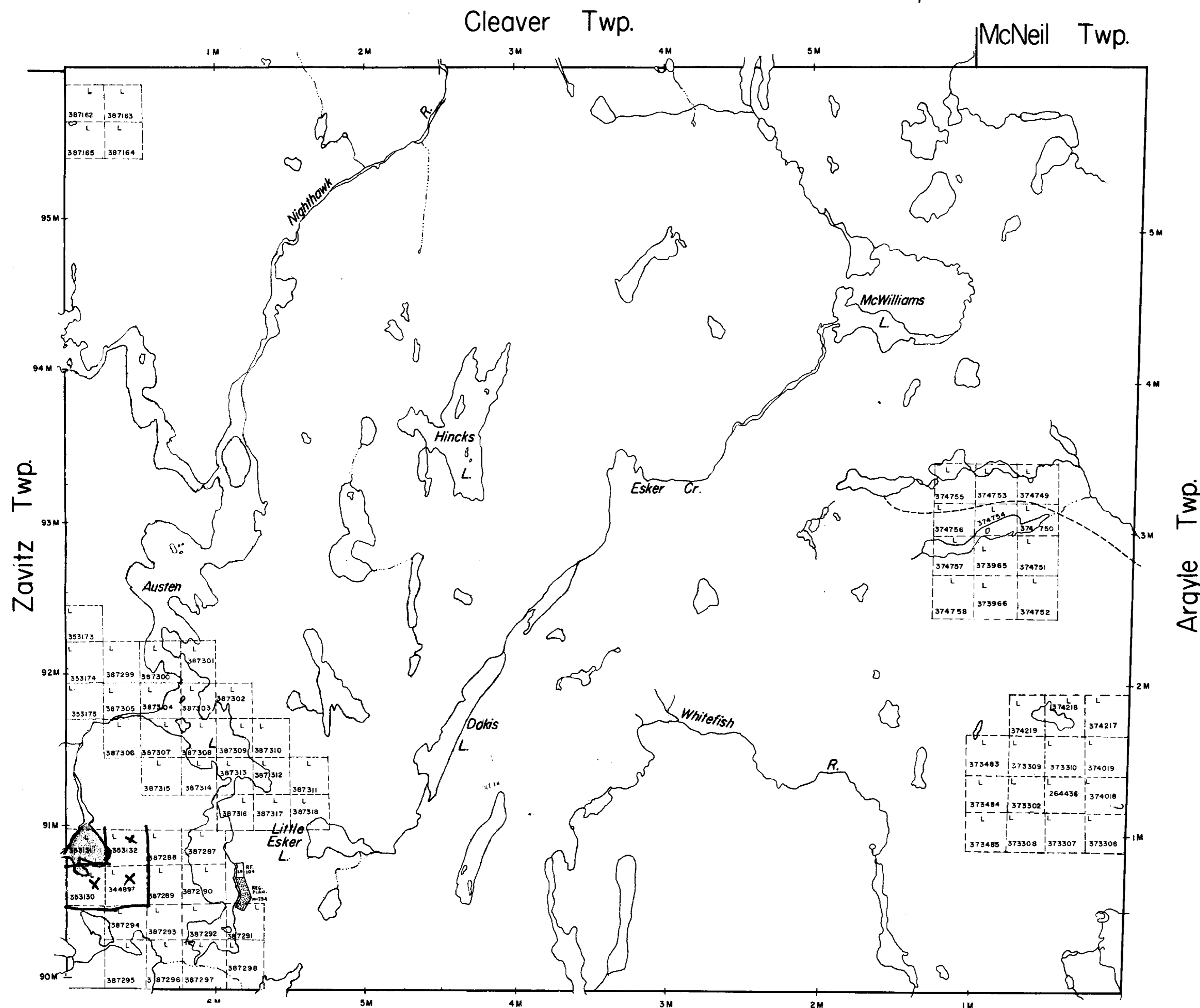
400' Surface rights reservation around all lakes and rivers.

MINING LANDS
DATE OF ISSUE
DEC 12 1973
MINISTRY
OF NATURAL RESOURCES

File - 2.1373

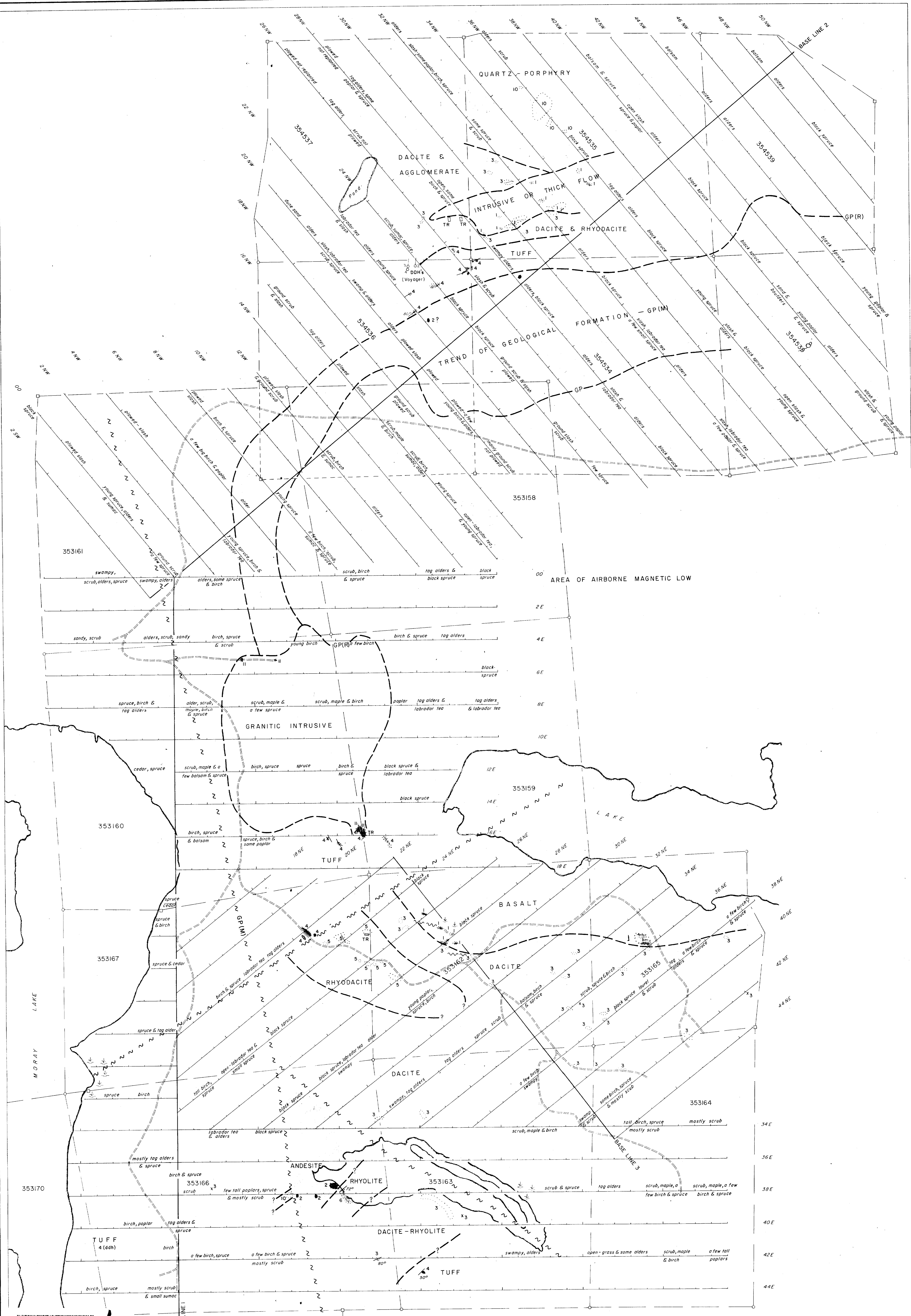
PLAN NO - M.223

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH



42A035E0114 2.1373 ZAVITZ

Montrose Twp.



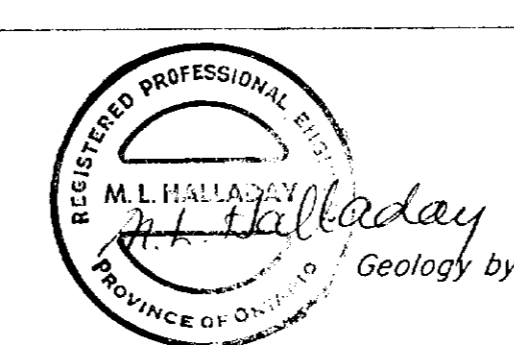
220

LEGEND
 EARLY PRECAMBRIAN
 MAFIC INTRUSIVE
 Diabase dykes (undivided)
 FELSIC INTRUSIVE-LATE GRANITIC ROCKS
 Granitic intrusive (hornblende granite, various porphyries, syenite, etc.)
 INTRUSIVE CONTACT-EARLY GRANITIC ROCKS
 Quartz porphyry and quartz feldspar porphyry
 INTRUSIVE CONTACT
 2nd Cycle-Upper Metavolcanics
 Feldspar porphyry (dacitic matrix)

2nd Cycle-Upper Metavolcanics (Cont.)
 Intermediate (volcanic?) flow
 Ultramafic flow or intrusive
 1st Cycle-Lower Metavolcanics
 Rhyolite and rhyolitic agglomerate
 Rhyodacite
 Mafic to intermediate tuff
 Dacite and silicious dacite
 Andesite
 Basalt

Rock outcrop, area of outcrop
 Geological boundaries, approximate
 Bedding, inclined
 Faults, approximate, assumed
 Inferred from geophysics, magnetics, resistivity
 Trench
 Claim post, located, unlocated
 Diamond drill hole
 Logging road
 Swamp

INDEX
 A
 B



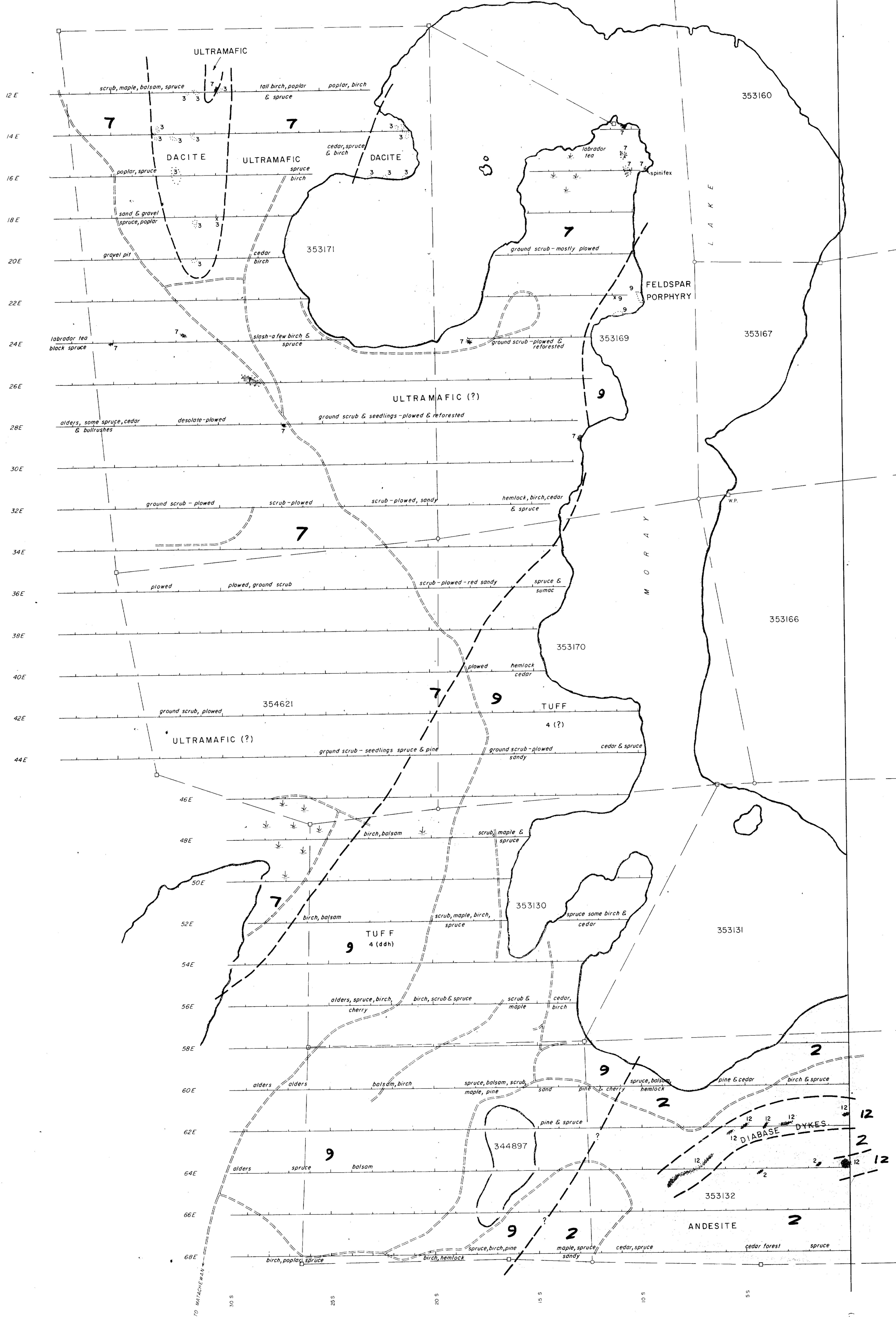
Work undertaken by:
BARRINGER RESEARCH LTD., Toronto, Canada

2-1373

PAN-ORE GOLD MINES LIMITED
 ZAVITZ & HICKS TOWNSHIPS, ONTARIO

GEOLOGY

NOV. 1973 Scale: 1" = 200' DWG 8-403-2B



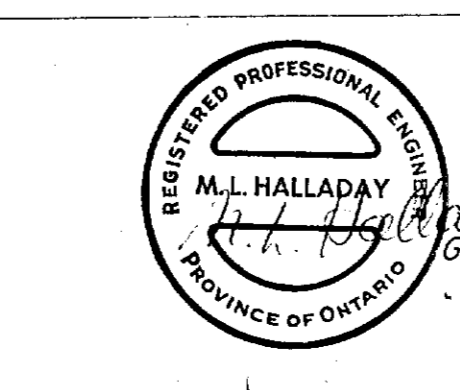
230

LEGEND
 EARLY PRECAMBRIAN
 12 Diabase dykes (undivided)
 11 Granitic intrusive (hornblende granite, various porphyries, syenite, etc.)
 10 Quartz porphyry and quartz feldspar porphyry
 9 Feldspar porphyry (dacitic matrix)

2nd Cycle - Upper Metavolcanics (Cont.)
 8 Intermediate (volcanic?) flow
 7 Ultramafic flow or intrusive
 6 Rhyolite and rhyolitic agglomerate
 5 Rhyodacite
 4 Mafic to intermediate tuff
 3 Dacite and siliceous dacite
 2 Andesite
 1 Basalt

Rock outcrop, area of outcrop
 Geological boundaries, approximate
 Bedding, inclined
 Faults, approximate, assumed
 Inferred from geophysics, magnetics, resistivity
 Trench
 Claim post, located, unlocated
 Diamond drill hole
 Logging road
 Swamp

INDEX



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PAN-ORE GOLD MINES LIMITED		
ZAVITZ & HINCKS TOWNSHIPS, ONTARIO		
GEOLOGY		
NOV. 1973	Scale: 1" = 200'	DWG. 8-403-2A

2.1373

BASE LINE No. 1 (bearing 90° T)