REPORT ON FULFA GROUP OF CLAYE.

PORT ARTHUR MINING DIVISION

PROVINCE OF ONTARIO, CANADA

FOR

CARRAVELLE MINES LIMITED

V. Wiersbicki,
Mining Geologist

Dated at Toronto
November, 1964
SUMMARY

This report deals with the Pulfa Group of claims situated 20 miles due south of Geco Mine in Manitouwadge. The area covered by this group of claims, in the vicinity of Dead Otter Lake, was found to be favourable for mineral deposition.

The geology and geophysics - both airborne and ground - are discussed in this report, and arguments are presented to show close resemblance of the Pulfa area to Manitouwadge area - both structurally and lithologically.
The property discussed in this report comprises one hundred and thirty-four contiguous mining claims Nos.:

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The property is controlled by Carravelle Mines Limited. The claims are unpatented and cover an area of about 5,300 acres.

LOCATION

Pulfa group of claims is situated north-west of White Lake - some 8 miles north of the junction of Highways 17 and 614 to Manitouwadge.

Theresa Lake is immediately to the east, Dead Otter Lake to the north, and Highway 614 passes almost along the western boundary of the property.
Access to the property is via the Highways mentioned above. A road connecting Highway 614 and Dead Otter Lake passes through the property.

Canadian Pacific Railway Line runs along Highway 614. A plane on floats can land and take off on both Theresa and Dead Otter Lakes.

**HISTORY**

Little is known about history of the property prior to 1961, except that, in this general area, there was some prospecting activity connected with the discovery of Manitouwadge deposits.

In 1961, claims were staked by Cecil von Klein and his associates, and the property was optioned to McIntyre Porcupine Mines Ltd. who has done some ground geophysical work over part of the area and investigated the showings by diamond drilling in 1962.

Carrabelle Mines Limited acquired control of the property in 1964.

**GEOLOGY**

**Geological Setting**

Keewatin volcanics and sediments occupy most of the area, with volcanics predominant in the north and sediments and pyroclastics in the south.

Granitic intrusion occurs north, around the shores of Dead Otter Lake, and in the south-west corner of the area.

The strikes of the Keewatin rocks are almost E-W over most of the area, but they seem to change abruptly to N-S in the western part of the area.

**Topography and Outcrops**

Topography of the area is fairly rugged with sporadic steep hills of outcrop or drift, with scarps and swammy draws.

Conspicuous low-lying drainage exists in the middle of the area where a NE-SW line of elongated lakes and swamps occurs.
Outcrops are fairly abundant in the area, especially in the north were high hills of volcanics occur.

### Table of Formations

3. Keweenawan Diabase
2. Algoman Granite and Syenite
1. Keewatin Volcanics and Sediments

1. Keewatin volcanics and sediments occupy most of the area, with volcanics predominant in the north and sediments in the south. Both can be subdivided into minor rock types grading into each other and similar to those described by E. G. Pye (O.D.M. Annual Report Vol. 66/3). Six major groups can be discerned:

   (i) sedimentary and metasedimentary rocks, including greywackes, quartz-biotite and muscovite-quartz schist and quartzites; they occur mainly in south of the reconnoitred portion of the area;

   (ii) iron formation, including some quartzites;

   (iii) tuffs interbedded with bands of volcanics;

   (iv) acid volcanics, occurring as lenses and intercalated with sediments;

   (v) basic volcanics, occurring in the northern part of the reconnoitred area and as lenses within sediments; pillow lavas, basalts, andesites, amphibolites; and

   (vi) coarse-grained basic rocks of gabbroic texture and composition; so far one showing was found in that type of rock peridotite was mapped on the northern shore of Theresa Lake

2. Acid intrusives comprise granite and syenite, and are found around Dead Otter Lake and in the south-western corner of the reconnoitred portion of the area. Acid dykes and porphyries are found in several locations.

3. Few scattered dykes of diabase were encountered.

### Structure

a. Folding

The strikes in most of the area are E-W and the dips vertical; in the west, however, the strikes seem to change to N-S and the dips to very steep east. This suggests a broad fold convex to the south-west.
This change of strike and the suggestion of the fold is very well reflected by the aeromagnetic contours which swing sharply north as Highway 614 is approached from the east.

b. Faulting

Several draws and scarps were seen in the area. Some are distributed along well-defined lines and are considered to be major structural features, possibly faults.

One such line, the line of elongated lakes and swamps in NE-SW directions, runs through the middle of the area. It seems that both geological formations and geophysical anomalies are discontinuous across this line. Another conspicuous line runs along the Highway 614 and is also considered to be a major structural feature.

Apart from those which were confirmed on the ground, several equally strong features are seen on the stereo-pairs. There are two locations where several of those features intersect - viz: one about half a mile west of Theresa Lake, and the other in the west and south-west part of the area.

Mineralization

There are six showings known to exist within the area. They consist of coarsely-disseminated sulphides, including chalcopyrite and nickeliferous pyrrhotite, or of stringers and veinlets of sulphides schistose rocks. A sample taken by Mr. von Klein in 1963 from showing No. 6 ran 0.56% Ni.

- Showing one: pyrite, pyrrhotite, chalcopyrite in gabbroic rock near contact with muscovite quartz schist;
- Showing two: pyrite, pyrrhotite, chalcopyrite in gabbroic rock near contact with quartz-biotite gneiss and associated with aplite dykes;
- Showing three: mainly pyrrhotite with traces of chalcopyrite;
- Showing four: zone five feet wide: chalcopyrite, sphalerite, galena with deeper copper-zinc mineralization to the north;
- Showing five: (discovered recently) chalcopyrite; and
- Showing six: (discovered recently) disseminated pyrite and nickeliferous pyrrhotite in iron formation between greywacke and acid volcanics.

Majority of known showings occur in the vicinity of contacts between major groups of sediments and volcanics, or lenses of volcanics within sediments. They are also in the vicinity and roughly aligned with a N-E striking zone between the fault and the string of small lakes.
In 1962 McIntyre Porcupine Mines Limited conducted some geological and geophysical investigations, including ground electromagnetic and magnetometer surveys.

There were 28 diamond drillholes drilled mostly over the four mineral showings known at the time. Thus, some of the showings were checked extremely well; the geophysical anomalies, however, seem to have received less attention as E.W. anomalies do not occur over the showings.

No major intersection was found in the drillholes, but sporadic values obtained in different sections reached up to 3.9% Cu. over 3 feet in drillhole D3-241-7; 0.9% Ni. over 1'4" in drillhole D3-241-1; similarly the highest value for Au. was .05 oz. per ton, Ag. 1.64 oz. per ton, and Zn. 2.18%.

The E.W. results show, apart from some minor discontinuous anomalies, one continuous ESE-WNW trend approximately through the middle of the area. The trend is over a mile long.

This feature was checked only by two holes at its eastern end — one hole 107' deep and the other 14' — and one hole some 3000' to the west which was also very shallow: 57'.

It is considered that deeper and more frequent checking of this mile-long anomaly with diamond drill boreholes would be fully justified.

CONCLUSIONS

1. (a) The rocks in the area consist of a band of Keewatin volcanics and sediments between the granitic intrusions.
   (b) Lithologically, the rocks are similar to the Manitouwadge suite.

2. Strikes in the area indicate a probability of existence of a fold — convex to SW.

3. (a) Aeromagnetic contours support the conception of such fold.
   (b) Structurally, therefore, the area also resembles Manitouwadge.

4. The showings and the drillholes indicate that mineralization is present in the area.

5. An E.W. anomaly — a mile long — occurs in the area and requires further investigation.

6. Several structurally favourable points emerge from correlation of ground geology, photogeology and aeromagnetics.
In view of the above, the area is considered very favourable for mineral deposition and the following is recommended:

1. To drill the E.N. anomaly at a minimum of 5 points, conveniently distributed over the whole strike length and aiming to intersect the conductor at a depth not shallower than 100 feet.

2. To conduct geological survey and ground geophysical survey over the western part of the area where the abrupt change of strike occurs, where the contacts, volcanics/sediments and sediments/granite, converge, and where several of the photogeological linears intersect.

3. To conduct geological survey and ground geophysical survey over the eastern part of the area where several photogeological linears intersect, and where ultrabasic rocks are suspected.

4. As a preliminary measure, a larger area — including the whole fold, as shown by aeromagnetics — may be covered by airborne geophysics, E.W. in particular.

5. The cost of the investigation recommended would be about $75,000.

V. Wierzbicki,
Mining Geologist

Dated at Toronto
November, 1964
TRADE HORN LIMITED

REPORT

ON

PRELIMINARY EVALUATION

OF

PILFA PROSPECT

W. Domzalski, Consultant
V. Wiersbicki, Consultant

Dated at Toronto
November, 1964
PRELIMINARY EVALUATION
OF
FULFA PROSPECT

1. Position

1.1 Fulfa Prospect, in its present entity, consists of 134 claims situated immediately south of Dead Otter Lake. Its southern boundary adjoins a group of small lakes where Amwri Creek originates, and it extends between Theresa Lake in the east and Highway 614 (running parallel to Jenny Creek), in the west.

1.2 Dead Otter Lake is about 5 miles north-east of White Lake, and the general area is referred to sometimes as White Lake Area.

The Location Map (Fig. 1) shows the position of the Prospect in relation to Lake Superior, Pic River and the C.P.R.

1.3 Fulfa Prospect lies 20 miles directly south of Ceco Mines in Manitouwadge.

2. Access

2.1 Access into the area is good. Highway 614 runs along the present western boundary of the Fulfa Group of claims. The highway connects Manitouwadge, some 18 miles to the north, with Highway 17, some 9 miles to the south. A short distance south from the south-west corner of the group of claims, a bush road, suitable for motor vehicles, branches off Highway 614 and leads past Small Michael Lake to Dead Otter Lake, traversing the Prospect.

2.2 Canadian Pacific Railway line runs along Highway 614, close to the western boundary of the Prospect.

2.3 Small aircraft fitted with floats can land on Dead Otter Lake and Theresa Lake.

3. Selection of the Area

3.1 Aeromagnetic map 2168 (Fig. 2), covering the White Lake Area, was published by the Department of Mines in 1963. During the course of the primary interpretation of the whole series of aeromagnetic maps covering this part of Ontario, an outstanding
magnetic feature was observed to exist west of White Lake. This feature is centred on Dead Otter Lake and extends to Black River in the west.

3.2 The examination of the aeromagnetic anomaly leads to the conclusion that the horseshoe-shaped feature reflects a structural condition of considerable interest. The shape of the anomaly is compatible with a conception of a fold, plunging in the direction somewhat north of east. There was little doubt that the anomaly reflected a folded structure within "Keewatin" rocks, with higher intensity anomalies due to their more basic members and possibly to iron formation. It was thought that another reason for certain portions of the magnetic feature may be sought in the presence of ultra basic rocks, like peridotite or pyroxenite -- an assumption subsequently found to be correct.

The low magnetic intensity area in the middle and around Dead Otter Lake was interpreted as an acid igneous intrusion, which also proved to be true.

In addition, some faults were postulated on the basis of the magnetic trends, as well as abrupt changes in the strike direction, in the western portion of the magnetic feature.

3.3 The aeromagnetic map was further examined in conjunction with the Ontario Department of Mines Annual Report, Vol. 41, Part 6: "Geology of the Heron Bay-White Lake Area," 1932, by J.E. Thomson, and its accompanying geological map No. 41j. This map, on the scale 1 inch = 2 miles, is of a very general nature, but nonetheless, it supplied some additional evidence which, coupled with that of the aeromagnetic map, made the area very attractive. The geological map showed that:

(i) steep southerly dips, within "Keewatin" rocks, northwest of Dead Otter Lake, swing into north-south strikes and easterly dips west of this lake;
(ii) porphyries are encountered in the area, and
(iii) peridotite outcrops on the western shore of Theresa lake.

Thus, changes of strike and dip shown on the geological map confirmed the deductions from the aeromagnetic map and revealed the feature as a possible synclinal fold plunging to east-north-east.
Ileridotite outcrop can be correlated with the magnetic anomaly sited on the northern shore of Theresa Lake.

3.4 Another decisive factor in designating the area as to potential value for further exploration was its proximity to the economic mineral deposits at Manitouwadge Lake. The area is definitely in the same metallogenic province.

Active mines are twenty miles to the north; mineralization occurs in the Pic River Area and Cirrus Lake Area to the west, and Heron Bay Area some 25 miles to the south-west.

The structure revealed by preliminary interpretation was almost identical with the Manitouwadge syncline to the north, and, as will be seen from subsequent examination of the area by the authors, the lithological types and the stratigraphic sequence are very similar to those serving as hosts to economic deposits in Manitouwadge.

4. Interpretation of Compiled Available Data - PHOTOGEOLGY

4.1 The preliminary interpretation was followed by the examination of the airphotographs and photogeological interpretation based on stero-pairs and mosaic (scale 1 inch = 1 mile).

4.2 The emerging photogeological trends are shown on the scale of 1 inch = 1 mile for comparison with the aeromagnetic map (Fig. 3) and on the scale 1 inch = ½ mile on the map entitled "Compilation of the Geological Data" (Fig. 4).

4.3 The predominant direction of the photogeological linears is north-east, with fair amount of linears trending north-west, and an outstanding feature aligned north-south in the western portion of the area near to Highway 614.

4.4 Photogeological linears, or at least some of them, are undoubtedly reflecting fracturing and faulting. This is borne out by magnetic evidence. In fact, practically all north-east trending linears and the north-south one correlate with magnetic trends considered to be expressions of faulting.

The north-east direction is also predominantly apparent on a regional scale in the district.
North-west trending photogeological linears are easily correlatable with magnetic trends in the western part of the area. Elsewhere, such correlation is not readily apparent.

4.5 The series of curved linears parallel to the "Keewatin"/granite contact (Fig. 4) represent most probably foliation. It is interesting to note that, if this is so, the foliation does not parallel the axial plane of the fold, but appears to be coincident with "the relict stratification" of the deformed rocks, i.e. "it is parallel to the layered structure of the Archean rocks". This is identical situation with that observed by K.G. Pye ("Geology of Manitouwadge Area", Department of Mines of Ontario, Annual Report Vol. 66, Part 8, 1957, pp. 45/49 and 57) over the Manitouwadge syncline.

5. Interpretation of Compiled Available Data

- Previous Investigation in a Part of the Area

5.1 A small portion of the whole area of interest, which is at the same time a part of the Pulfa Group of claims, was investigated in 1962 by McIntyre Porcupine Mines Ltd. The investigation consisted of reconnaissance geological mapping around locations of showings, and some ground electromagnetic and magnetic work.

5.2 The investigation was obviously prompted by the existence of showings and was concentrated around them. The investigation was carried out prior to the publication of the aeromagnetic map, and the outstanding structural features were not taken into account. There is also no evidence in the existing report that photogeological indications of structure were elucidated. Consequently, the work was not extended to include, in addition to showings vicinity, other structurally promising locations.

5.3 Nevertheless, the results of that investigation are very useful in the process of building of an overall structural and lithological picture and for planning further detailed work. To avoid fragmentization of evidence, the geological results of that investigation will be considered together with further geological data, including those acquired by the authors during their visit to the area in Summer 1964.
The ground electromagnetic work consisted of series of traverses 400 feet apart, along which the measurements were taken of the amplitude and phase of the resultant electromagnetic field. The equipment used was of the two horizontal coils type, but the report does not specify the frequency at which measurements were made. Also, there is no mention of what procedures were adopted to allow for the distortions caused by changes in the geometry of the configuration due to topography. Thus, certain measure of prudence has to be applied when evaluating the e/m results. Fig. 6 summarizes the e/m and magnetic results. The broken line traces the points where zero anomaly value was observed. With steeply dipping conductors, zero anomaly occurs when one of the coils is over the conductor. The width of this zone between two zero values is shown. This width will be equivalent to the coil separation for narrow conductors, but will be wider for conductors of appreciable thickness. The coil separation was 300 feet, so the width greater than that signifies a finite conductor thickness.

It is evident from the plot that there is an east-south-east trending conductive zone, fairly continuous and extending past the road. At the south-eastern corner of the area, this zone is paralleled by other of a less continuous character.

Results of the ground magnetic survey (vertical component) are shown as anomaly axis by a continuous line.

There are several continuous parallel magnetic trends in the eastern part of the portion of the area surveyed, but such expressions are lacking in its western part with an exception in the north-west corner.

Considering the e/m and magnetic results together, the following observations can be made:

(i) most e/m zones have a corresponding magnetic trend either continuous or intermittent;
(ii) in four places where iron formation outcrops are shown on Fig. 4, magnetic anomaly axes are directly correlatable;
(iii) there are several magnetic axes which are not accompanied by electromagnetic anomaly;
(iv) there is a change in the direction of trend of the e/m and magnetic anomalies to the west of the road and somewhat lesser number of e/m indications;
(v) no e/m anomalies exist over nor near showings;
(vi) magnetic anomalies are associated with some showings;
(vii) geophysical trends are parallel to geological strikes.

5.7 These observations prompt the following conclusions:
(i) magnetic anomaly trends of long strike extent are mostly due to iron formation bands, which are mineralized with disseminated sulphides at sections along their strike;
(ii) the showings, although containing values in copper and nickel, are of too small volume to cause appreciable e/m effect - and if any substantial mineralization is present, it must be at the depth beyond the e/m penetration, say greater than 150 or 200 feet (over-estimating the penetration);
(iii) some showings occur in iron formations, or in ultra basic rocks;
(iv) the change of trends in ground geophysical results occurs across a feature interpreted from photogeology and aeromagnetics as a fault;
(v) if a movement occurred along the fault in the approximate north-east direction on the west side, and the northern geophysical trends on the west side correlate with southern ones on the east side, then a continuation of geophysical trends in north-west direction can be expected north of the small portion of the area surveyed previously;
(vi) a continuation of geophysical trends can be expected in the eastern direction towards Theresa Lake.

5.8 Of the six showings known presently to exist in the portion of the area, only four were known at the time of the previous investigation and all four were drilled.

The drilling has proved that there is no immediate downward continuation of the mineralization below surface showings.
An indication of the conductor extending along a strike length of two miles was checked by two boreholes, of which one was very shallow.

5.9 It will be appropriate to conclude this review of the previous work by stressing the following points:

(i) at the time, no consideration was given to structural features emerging from aeromagnetics and photogeology;

(ii) investigation was concentrated on known showings which are not the only worthwhile targets within the area investigated, and certainly not the best-positioned targets as regards structure and stratigraphy in the greater area which is considered of interest;

(iii) this long, continuous conductor was not evaluated;

(iv) evaluation of the relationship of showings to the stratigraphy and lithology of the area should be completed; this requires some more detailed geological work.

6. Sources of Compiled Available Geological Data

6.1 The following discussion of the geology of the area is based on the data enumerated below in the chronological order:

(i) Ontario Department of Mines Annual Report Vol. 41, Part 6 (Geological map 41j) 1932: Heron Bay-White Lake Area; J.E. Thomson.


(iii) A geological Report on the Hemlo Area; 1957, Department of Industrial Development, Canadian Pacific Railway.

(iv) Previous investigation (paragraph 5) 1962.

(v) Aeromagnetic map No. 2168 and adjoining, 1963.

(vi) Geological reconnaissance carried out by the authors on behalf of Trade Horn Limited, Summer 1964.


(viii) Private communication: Ontario Department of Mines, Geological Branch; Toronto: Geological Survey of the
Black River Area. (The area surveyed by O.D.M. geological party in summer of 1964 adjoins to the west and overlaps the western fringes of the area of interest and it is understood that the remaining part of the "Julfa Prospect" is scheduled to be mapped geologically in summer of 1965.)

7. Geological Formations in Reconnoitred Portion of the Area

This paragraph refers mainly to the limited portion of the area within bounds shown on Fig. 4.

7.1 Keewatin volcanics and sediments occupy most of the area with volcanics predominant in the north and sediments in the south. Both can be subdivided into minor rock types grading into each other and similar to those described by E.G.Iye (O.D.M. Annual Report Vol. 66/8). Six major groups can be discerned:

(i) sedimentary and metasedimentary rocks, including greywackes, quartz-biotite and muscovite-quartz schist, quartzites; they occur mainly in south of the reconnoitred portion of the area;

(ii) iron formation, including some quartzites;

(iii) tuffs interbedded with bands of volcanics;

(iv) acid volcanics, occurring as lenses and intercalated with sediments;

(v) basic volcanics, occurring in the northern part of the reconnoitred area, and as lenses within sediments; pillow lavas, basalts, andesites, amphibolites;

(vi) coarse-grained basic rocks of gabbroic texture and composition; so far one showing was found in that type of rock; peridotite was mapped on the northern shore of Theresa Lake.

7.2 Acid intrusives comprise granite and syenite, and are found around Dead Otter Lake and in the south-western corner of the reconnoitred portion of the area. Acid dykes and porphyries are found in several locations.

7.3 Few scattered dykes of diabase were encountered.
8. Geology and Structure

This paragraph refers to a larger area of interest, extending beyond the bounds of the previously investigated portion, and covering the whole of the Pulfa Prospect.

8.1 A folded formation of Keewatin rocks forms probably a synclinal trough pitching to the east. Strikes are predominantly east-west in the southern and northern limbs, and north-south in the western part of the fold. There are vertical to steep northern dips in the southern limb which constitutes the Pulfa Prospect. The change of strikes is abrupt and associated with prominent fracturing (Fig. 4).

The trough of the fold is intruded by acid igneous rocks, granitic in character. Similar acid rocks are encountered further to the south. Still further to the south, between Amwri and Wabikoba Lakes, there is a wide band of sedimentary gneisses and quartzites, and some conglomerates occur in the vicinity of Wabikoba Lake (C.P.R. report).

8.2 Keewatin rocks consist of metamorphosed sediments and acid and basic volcanics.

Several contacts can be discerned. Proceeding south from Dead Otter Lake, they are:

(i) between granitic intrusives and what, on basis of present knowledge, appears to be predominantly basic volcanics;

(ii) between that group and a complex which includes paragneisses, in addition to basic volcanics;

(iii) between the latter group and a complex of gneisses and acid volcanics;

(iv) another contact with granite;

(v) contact with a band of paragneisses and quartzites;

(vi) another granite contact.

8.3 Within the Pulfa Prospect, a north-east striking fault which passes east of Small Michael Lake, displaces the formations contact (Fig. 4). On the basis of present mapping, the displacement appears to be to the south of the western side.

A series of faults (photogeology and aeromagnetics) parallel to that postulated above cross the unmapped parts of the area. Other systems of fractures were described in Para. 4.
8.4 An outcrop of peridotite exists on the northern shore of Theresa Lake, and it is thought to represent an ultra-basic intrusion which finds its expression in the magnetic anomaly at the eastern extremity of the southern limb of the fold. A photogeological surface expression of this intrusion is thought to exist (Fig. 4).

8.5 There are six showings within the area known and personally examined by the authors. They consist of coarsely-disseminated sulphides, including chalcopyrite and nickeliferous pyrrhotite, or of stringers and veinlets of sulphides in schistose rocks. Some assays of selected samples run up to 5.38% Cu and 0.5% Ni.

- Showing one: pyrite, pyrrhotite, chalcopyrite in gabbroic rock near contact with muscovite quartz schist
- Showing two: pyrite, pyrrhotite, chalcopyrite in gabbroic rock near contact with quartz biotite gneiss and associated with aplite dykes
- Showing three: mainly pyrrhotite with traces of chalcopyrite
- Showing four: zone 5 feet wide - chalcopyrite, sphalerite, galena with a deeper copper-zinc mineralization to the north
- Showing five: (discovered recently) chalcopyrite (up to 5.38% Cu)
- Showing six: (discovered recently) disseminated pyrite and nickeliferous pyrrhotite in iron formation between greywacke and acid volcanics (0.5% Ni.)

The majority of the known showings occur in the vicinity of contacts between major groups of sediments and volcanics, or lenses of volcanics within sediments. They are also in the vicinity and roughly aligned with a north-east striking zone between the fault and the string of small lakes (Fig. 3).

9. Lithological Similarities with Manitouwadge Rocks

9.1 Mineral deposits of Manitouwadge area contain pyrite, pyrrhotite and quartz, as well as one or more of chalcopyrite, sphalerite, galena and silver-bearing minerals. (Pye, Vol. 66/6, p.58) In Geo main zone, the host rock is muscovite quartz schist, which is a highly altered biotite sillimanite-quartz schist. Its principal constituents are quartz (75%) and muscovite, and it is a whitish, strongly foliated rock. (Pye, Vol. 66/6, p. 31 and 59)

In Willroy Mines, the host rock is also biotite-sillimanite muscovite schist for ore body No. 1 (Pye p. 101). Ore body No. 2 lies on contact of schist and iron formation band (Pye p. 102).
ore body No. 3 within a band of pyrrhotized iron formation enclosed in biotite-quartz-feldspar-gneiss (Pye p. 104); and ore body No. 4 also in mineralized iron formation (Pye p. 108).

9.2 Exactly the same suites of rocks occur among those which were observed during geological reconnaissance in the area (Fig. 4). This impression has been confirmed in a private communication with E.G. Pye.

10. The Mineral Potential of the Area

10.1 Structurally and lithologically, the area bears great similarity to that of known economic mineralization in Manitouwadge.

10.2 Known showings contain sulphides with values represented by copper, zinc, galena and nickel.

10.3 The fact that some showings were found to be only surface expressions of mineralization does not alter the basic mineral potential of the area. The description of the Manitouwadge area mineral occurrences (O.D.M. Annual Report 66/8, pp. 75 to 96) contains numerous examples of uneconomic occurrences, and mineralizations within a small radius of the economic ore bodies. This is true of great many mining districts.

10.4 In addition to the existence of favourable types of host rocks and necessary structural conditions, genetic situation is favourable regarding the presence of granitic intrusion in the heart of the area, and also indications of ultra-basic rocks important from the point of view of nickel occurrences.

11. Targets in the Area

11.1 In the portion of the area which was investigated in the past, the long continuous conductor trend requires some further elucidation. Its possible continuation to the east and geological trends at the eastern end of this area also require more detailed investigation.

The north-east linear in the western part of this area should receive further attention and further geological investigation should establish the contacts between metasediments/metavolcanics/granite.
11.2 Outside this limited area, the most interesting targets are:

(i) the east-west linear south of Small Michael Lake; they may be expressions of strike faults, which, at Gecco Mines, localise the massive sulphide mineralisation (O.D.M. Annual Report 66/8, p. 75)

(ii) probable fault line along the western boundary of the area, particularly in the vicinity of the intersection with north-east and south-east fractures (?)

(iii) vicinity of the abrupt changes of strike from east-west to north-south

(iv) intersections of the linear in the eastern part of the Prospect

(v) flanks of peridotite "plugs"

(vi) contacts sediments-volcanics-granite after they have been delineated

Briefly, the ore control is structural and stratigraphic, and the exploration must aim at the elucidation of those two controls.

12. Approach to Task

12.1 The techniques employed will consist of a balance blend of geological mapping and geophysics.

12.2 A lot depends on the exploration funds available, but an airborne electromagnetic survey over the whole structure would certainly provide some shortcuts to a more concentrated ground effort, and would earn its cost in subsequent savings of time and effort.

12.3 The actual program of work can be readily evolved, but as it will have to be measured by a financial yardstick, no grandiose plans should be made until a budget figure is available.

W. Domsalski, Consultant

V. Wierzbiicki, Consultant

Dated at Toronto
November, 1964
The magnetic data on this map were compiled from information recorded during the flight lines shown. The anomalies expressed by the magnetic contours are dependent on the variable magnetic intensities of the underlying rocks, and may be due, in part, to concentrations of magnetic ore minerals. By means of the magnetic anomalies, various rock bodies or structural features, such as faults or folds, may be traced into, or across, areas of few or no outcrops. In many instances, however, no interpretation of particular anomalies may be possible without further geological information.
PULFA PROSPECT

GEOPHYSICAL RESULTS OVER A PORTION
OF THE AREA OF INTEREST
SCALE: linch = ¼ mile

LEGEND:
- magnetic anomaly (over 2000 gammas) axis
- magnetic anomaly over 5000 gammas
- magnetic anomaly over 10,000 gammas
e/m anomaly (two horizontal coils at 300 feet separation)
trace of zero amplitude

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FIG. 6
Location map.

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scale: 1 inch = 8 miles