SUMMARY

The present magnetic and electromagnetic surveys have located several related magnetic and conducting zones which probably reflect the presence of sulphide and magnetite concentrations in ultra-basic intrusives. One conductor of interest without magnetic expression has been located as well. Five diamond drill holes have been recommended to examine these conductors.

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REPORT ON A MAGNETIC AND ELECTROMAGNETIC SURVEY IN THE VICINITY OF MARCEAU LAKE PORCUPINE MINING DIVISION, ONTARIO ON BEHALF OF CANDELA EXPLORATION COMPANY

INTRODUCTION

During September and October, 1965, a combined magnetic and electromagnetic survey was carried out on a property in the vicinity of Marceau Lake, Ontario, on behalf of Candela Exploration Company. The surveyed area comprises the following claims:

P-53946 - 53954 incl.
P-54178
P-54181 - 54184 incl.
P-54187
P-55080 - 55081 incl.
P-55083 - 55100 incl.
P-55131 - 55132 incl.
P-67319 - 67322 incl.
As well as the northern one of the three "Peterson" claims.

The property is straddling the McArthur-Bartlett township boundary, approximately 20 miles south of Timmins. Access is by private road from Schumacher, or by aircraft from South Porcupine to McArthur Lake or Marceau Lake.

Traverse lines for the geophysical surveys were oriented approximately east-west, and located at 400' nominal centres. They were picketed at 100' intervals.

Previous work on the property included geological and reconnaissance geophysical surveying on the central part of the grid. Some zones of high magnetic intensity and several conductors were located. The results of these surveys are summarized in a report for Marceau Lake Explorations by G. L. Holbrooke, dated February 14th, 1964.

A Sharpe MF-1 fluxgate magnetometer was employed on the present magnetic survey. Appropriate corrections were made for diurnal

variations by returning at regular intervals to base stations previously established. Station interval was 100', with intermediate stations in areas of strong magnetic relief.

On the electromagnetic survey solid-state Turam equipment was employed. A description of the Turam method is found in "Appendix T". A primary frequency of 400 c.p.s. was used on the present survey.

GEOLOGY AND MINERALIZATION

A detailed description of the geology of the surveyed area is given in Holbrooke's report (see above). The larger, western part of the present grid is underlain by basic volcanics and sediments of Keewatin age. Intrusive granites and porphyries of Algoman age occur along the east boundary.

Ultra-basic intrusives occur as lenses and sills in the volcanics, mostly following the general N-S strike of the latter. Many are strongly serpentinized. Sulphide mineralization in the form of pyrrhotite with small quantities of copper and nickel minerals has been found in the ultra-basic formations.

DISCUSSION OF RESULTS

The results of the geophysical surveys are presented on two plates, on a scale of 1" = 400'. Plate 1 shows the magnetometer results, in the form of contours with a 200 gamma interval. Plate 2 shows the Turam data, in profile form, on the scales of 1" = 40% for the field strength ratio and 1" = 20° for the phase difference.

A -- Magnetometer Survey (Plate 1)

The area shows moderately strong magnetic relief in many locations, the main disturbed zone consisting of a number of approximately N-S striking lenses in the east portion of the grid. The magnetic highs (and lows; some bodies show reversed polarization) reflect the presence of shallow tabular bodies, probably ultra-basic intrusives. The depths of the magnetic poles calculated from the observations vary between 50 and 20', meaning that in several places the magnetic bodies are coming to surface.

The magnetic distortion may be partly due to pyrrhotite but concentrations of magnetite in the ultra-basic rocks are undoubtedly the major source and the two effects are inseparable.

Some magnetic distortion is clearly related to the power transmission line crossing the area.

B -- Electromagnetic Survey (Plate 2)

The results of the Turam survey show a series of conducting

zones, occurring mainly east of the base line. All represent shallow conducting bodies of high conductivity and rather limited dimensions. With few exceptions these are related to zones of high magnetic intensity. They are discussed in detail below.

Zone A

Relatively weak conductor related to a zone of moderate magnetic relief. The anomalies on lines 24N and 20N show influence of the magnetic permeability. Probably magnetite and minor sulphides.

Zone B

Consists of two separate short conductors without magnetic correlation. Probably caused by small lenses of sulphides.

Zone C

Strong conductor with reversed polarity, probably the result of a flat W-dip. Because of strength and good conductivity considered to be of interest. Conductor is open to south.

Zone D

Conductor directly coinciding with magnetic zone. The effect of permeability is evident in part of the conductor. Probably shallow lenses of magnetite and pyrrhotite.

Zone E

Conductor closely resembling D, on the same magnetic zone, although no effect of magnetic permeability is apparent in electromagnetic response. Approximate depth of conductor on line 40S is 20'; of magnetic pole, 40'.

Zone F

Conductor resembling D and E, coinciding with magnetic zone of inversed polarity. Response not affected by permeability. Depth of magnetic pole approximately 40'.

Zone G

Conductor coinciding with magnetic zone related to F, but of normal polarity. No permeability effect is apparent in electromagnetic response. Both zone G and zone F are probably due to a combination of magnetite and pyrrhotite. The depth of the current axis on line 72S is approximately 70', the magnetic depth 30'.

All conductors show very good conductivity ($1 < r/d < 4$ ohmcm/m) and seem to form rather short, thin lenses.

CONCLUSIONS AND RECOMMENDATIONS

The present geophysical surveys have located a number of magnetic zones as well as a smaller number of electrical conductors, many of which appear to be directly related to the magnetic pattern.

Taking into consideration the characteristics of these anomalies as well as the available geological information and the results of previous surveys, the present results indicate the occurrence of several zones of magnetite and sulphides (the latter probably mainly pyrrhotite) in the ultra-basic formations where a close relation between magnetic and electromagnetic distortion is found. The independent conductors, such as zone C, are more difficult to assess, but the high conductivity suggests they are due to sulphide concentrations.

The conducting bodies appear to be relatively small, although strike lengths up to 1000' are possible.

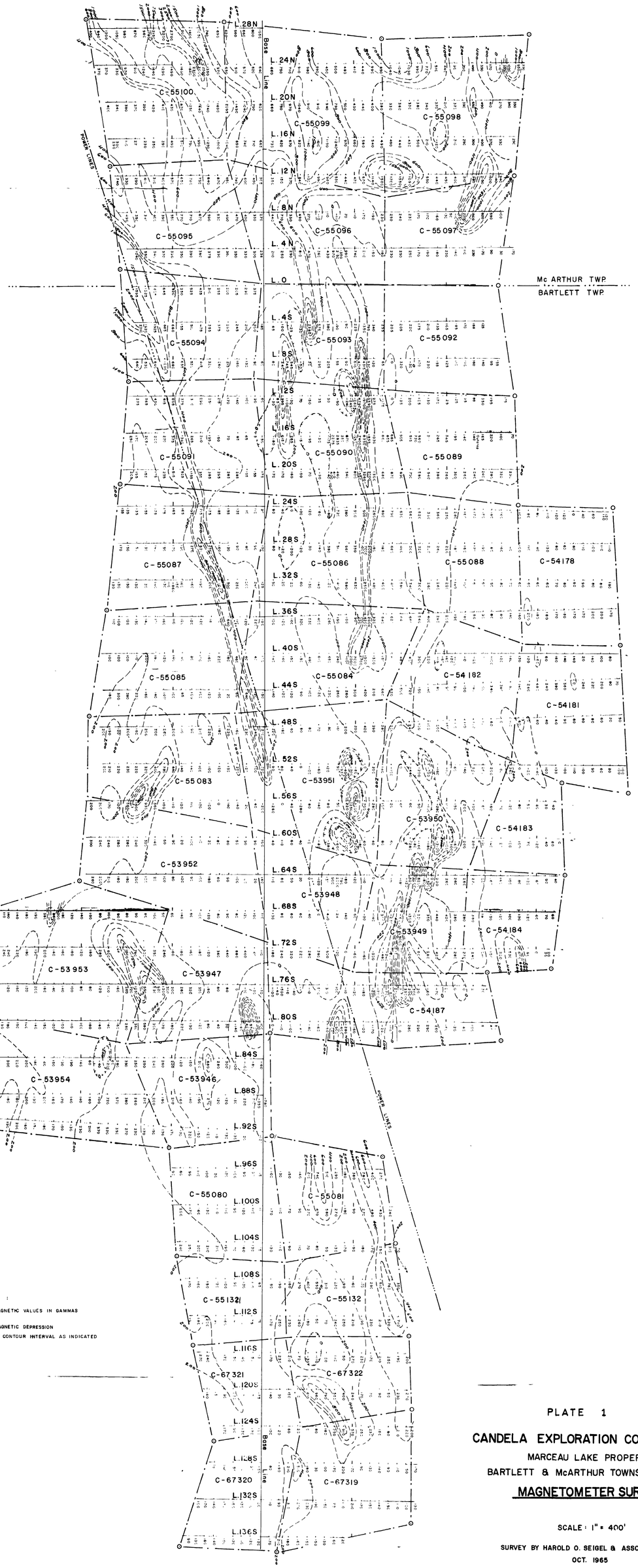
To sample the better conductors the following drill holes are recommended.

	Collar	Orientation	Dip	Length
Zone C DDH #1	2+00N 23+00E	N-80°E	45°	350'
Zone D DDH #2	8+00S 12+00E	Due West	"	300'
Zone E DDH #3	40+00S 12+00E	" "	"	"
Zone F DDH #4	60+00S 20+70E	" "	"	"
Zone G DDH #5	72+00S 16+50E	" "	"	"

Respectfully submitted,

Robbert A. Bosschart, Ph.D., P.Eng.

Toronto, Ontario.
October 19th, 1965.



LEGEND :

720 MAGNETIC VALUES IN GAMMAS

MAGNETIC DEPRESSION

MAGNETIC CONTOUR INTERVAL AS INDICATED

PLATE 1

CANDELA EXPLORATION COMPANY, LTD.

MARCEAU LAKE PROPERTY

BARTLETT & McARTHUR TOWNSHIPS, ONTARIO

MAGNETOMETER SURVEY

SCALE : 1" = 400'

SURVEY BY HAROLD O. SEIGEL & ASSOCIATES, LTD.

OCT. 1965

200

LOCATION PLAN

SCALE: 1" = 2640'

LEGEND:

0·60 — 1·00 —N→ 1·40 RATIO

-20° — 0° — +20° PHASE

CONDUCTOR

NOTES: Observations plotted at midpoint between coils.
Coil separation 100 feet.
Lines shown thus -×-×- are adjustment for difficulties in accurate adjustment of Ratio Amplitudes due to power line interference near Turam transmitter cable.

PLATE 2

CANDELA EXPLORATION COMPANY, LTD.

MARCEAU LAKE PROPERTY
BARTLETT & McARTHUR TOWNSHIPS, ONTARIO

TURAM ELECTROMAGNETIC SURVEY

SCALE: 1" = 400'

SURVEY BY HAROLD O. SEIGEL & ASSOCIATES, LTD.
OCT. 1965