A Turam electromagnetic survey was carried out for CAM Mines Limited on the north half of Lot 6, Con. VI in Murphy Township, Ontario, in July and August, 1964. The property is located 10 miles north of Timmins, adjacent to the northeast end of Bigwater Lake which is accessible by road from Timmins.

The purpose of this survey was to locate sub-surface conductors which might prove to be sulphide bodies of economic importance.

Several conductive zones were located; however, due to the inductive method used, these conductors may be due to current concentrations in the overburden. The accompanying map shows the results obtained and the area surveyed.

Method and Interpretation of Results

This survey was carried out with the Turam method, an inductive electromagnetic method using a fixed primary source in the form of a large horizontal loop or long grounded cable, energized by an alternating current at 660 c.p.s. The receiving system consists of two coils 100 feet apart, connected to a compensator which measures field-strength ratios and phase differences in degrees between successive points on traverses outside and perpendicular to a long side of a rectangular loop or grounded cable. The presence of conductors is indicated by abnormal field-strength ratios and phase differences. Both the phase difference readings and the reduced field-strength ratios are plotted as curves at points mid-way between the coil positions. The reduced ratios are the measured ratios divided by the normal ratios.
The normal ratios can be calculated from the geometry of the primary loop and from the location of the points at which the readings were taken in relationship to the loop or from the distance from a grounded cable.

The relative amplitudes of the field-strength ratios and phase differences are a measure of the conductivity of the conducting bodies, i.e., the response of good conductors will show mainly field-strength ratio distortion, of poor conductors predominately phase distortion. A typical curve over a conductor shows field-strength ratio readings greater than unity together with negative phase readings.

Readings were taken along previously cut and chained lines 200 feet apart. An area north of the base line and to the west of the creek could not be surveyed because of very wet ground.

Due to the lake to the south and wet ground to the north, primary loops could not be used. Grounded cables were used for the inductive source.

RESULTS

No conductors were located south of the base line. The 4 or 5 conductors located north of the base line should be viewed with caution as the grounded cable inductive source gives rise to galvanic currents which are channelled through conductive sections of the overburden. These currents concentrations in conductive overburden are indistinguishable from good conductors in the bed rock.

RECOMMENDATIONS

After the ground is frozen, the lines north of the base line
should be completed. The whole area north of the base line should be covered with a horizontal loop survey with a 300 foot coil interval. The maximum penetration of such a survey would be in the order of 200 feet which would probably be satisfactory as outcrops were observed on the property.

The indicated conductors should not be drilled until they are confirmed with a horizontal loop survey.

MOREAU, WOODARD & COMPANY LTD.

J. A. Woodard
Cam Mines Limited  
Suite 607  
80 Richmond St. W.  
Toronto 1, Ont.  

TO ACCOMPANY TURAM ELECTROMAGNETIC SURVEY REPORT ON THE NORTH  
HALF LOT 6, CON. VI, MURPHY TOWNSHIP, DISTRICT OF COCHRAINE, ONT.  

In October, 1964, we re-surveyed 4 lines north of the  
base line on which anomalous readings were obtained in the previous  
grounded cable Turam survey. The E.M.Gun (horizontal loop) method  
with a 300 foot coil separation was used for this check survey.  
Two frequencies, 3520 and 880 c.p.s. were used. Readings with  
the higher frequency were quite variable due to the conductive  
overburden. The readings at the 880 c.p.s. frequency were rel- 
atively neutral indicating that the conductors indicated by the  
Turam survey were caused by the conductive overburden.  

Further work on the property should be postponed until  
the ground is frozen.

MOREAU, WOODARD & COMPANY LTD.

[Signature]

J. A. Woodard
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**IN-PHASE READINGS . . . . . . LEFT**
**OUT-OF-PHASE READINGS . . . . . RIGHT**
**COIL INTERVAL . . . . . . . . . . 300 FEET**

**E.M. GUN (HORIZONTAL LOOP)**
**CHECK SURVEY**
**CAM MINES LIMITED**
**MURPHY TWP. PROPERTY**
**(TO ACCOMPANY MAP 64-18)**

**DATE: SEP. 1964**

1 INCH = 200 FT.
REPORT ON THE
INDUCED POLARIZATION
AND RESISTIVITY SURVEY
IN MURPHY TOWNSHIP
PORCUPINE MINING DISTRICT, ONTARIO
FOR
CAM MINES LTD.

1. INTRODUCTION

At the request of Dr. J. D. Bateman, President of the Company, a brief induced polarization survey has been carried out on a property near Timmins, Ontario on behalf of Cam Mines Ltd. The claim group is located in the north half of Lot 6, Con. VI, Murphy Township.

A previous Turam Electromagnetic Survey had been carried out on the property, and two conductors were indicated. The induced polarization tests were planned in order to determine if the source of the E.M. anomaly was ionic, such as overburden or faults, or metallic such as sulphide mineralization.

2. PRESENTATION OF RESULTS

The induced polarization and resistivity results are shown on the following enclosed data plots. The results are plotted in the manner described in the notes preceding this report.
Also enclosed with this report is Dwg. Misc. 2208, a plan map of part of the Cam Mines Ltd. Property. The definite and possible induced polarization anomalies are indicated by solid and broken bars respectively on this plan map as well as the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the induced polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the spread length; i.e. when using 200' spreads the position of a narrow sulphide body can only be determined to lie between two stations 200' apart. In order to locate sources at some depth, larger spreads must be used, with a corresponding increase in the uncertainties of location. Therefore, while the center of the indicated
anomaly probably corresponds fairly well with source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

3. DISCUSSION OF RESULTS

There are no anomalies indicated by the induced polarisation results. The very small variations in the effects measured could be due to errors in the measurement or very small amounts of metallic mineralisation in the underlying rocks.

Very larger I.P. effects are measured in the Timmins Area from massive sulphide mineralisation such as that at the new T.G.S. Orebody. Elsewhere in the area we have located relatively narrow zones (50 to 100 feet) containing 10 to 15% sulphide mineralisation. These zones did not give rise to definite E.M. anomalies, but the I.P. effects were ten to twenty times greater than those measured in the tests on the Cam Mines Ltd. property.

The E.M. anomalies on the Cam Mines Ltd. are not due to significant concentrations of metallic sulphide mineralisation. However, the resistivity results on the lines surveyed suggest that the E.M. conductors may be due to a valley in the bedrock causing a thickening of the conductive overburden. The apparent resistivities at depth are fairly uniform on the part of the area surveyed. However, the measurements of the near-surface resistivity (measurements for n=1) show a zone of
low values extending northwest-southeast across the area surveyed.

On Line 6E for instance, it can be seen that the zone of low surface resistivities extends from about 4N to 8N. The zone of low resistivities has been interpreted from the data plots, and is shown on the plan map, Dwg. Misc. 2208. It can be seen that the E.M. conductor axes correlate with the edges and center of the low resistivity zone.

On the basis of these results, no further work seems to be warranted in this area.

McHAR GEOPHYSICS LIMITED

Philip G. Hallof

Geophysicist

Dated: December 16, 1964
McPHAR GEOPHYSICS LIMITED
INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLOTTING POINT

ELECTRODE CONFIGURATION

X - 200

ANOMALOUS ZONE
POSITIVE ANOMALOUS ZONE
NOTE

LOGARITHMIC CONTOUR INTERVAL

CAM MINES LIMITED
N1/2, LOT 6, CON. VI, MURPHY TWP, PORCUPINE M.D. ONTARIO.
Scale - One inch = 200 Feet

FREQUENCY 0.31 - 5 CPS
DATE SURVEYED NOV/1964
APPROVED
DATE 12/11/64
McPhar Geophysics Limited

Induced Polarization and Resistivity Survey

Electrode Configuration

100

PLOTTING POINT

Anomalous Zone
Possible Anomalous Zone

Note: Logarithmic Contour Interval

Cam Mines Limited

N 1/2, LOT 6, CON. VI, Murphy Twp, Porcupine M.D. Ontario.
Scale: One inch = 200 Feet
McPHAR GEOPHYSICS LIMITED
INDUCED POLARIZATION AND RESISTIVITY SURVEY

ELECTRODE CONFIGURATION

ANOMALOUS ZONE
POSSIBLE ANOMALOUS ZONE

NOTE
LOGARITHMIC CONTOUR INTERVAL

CAM MINES LIMITED
N 1/2, LOT 6, CON. VI, MURPHY TWP, PORCUPINE M.D. ONTARIO.
Scale—One inch = 200 Feet
ANOMALOUS ZONE
POSSIBLE ANOMALOUS ZONE
NOTE
LOGARITHMIC CONTOUR INTERVAL

McPhar Geophysics Limited
Induced Polarization and Resistivity Survey

P0/2π
(100 M F EET)

Cam Mines Limited
N 1/2, LOT 6, CON. VI, Murphy Twp., Porcupine M.D. Ontario.
Scale - One inch = 200 Feet

Frequency 0.31 - 5 CPS
Date surveyed: NOV/1964
Approved:

DATE: 12/19/64
McPhar Geophysics Limited

Induced Polarization and Resistivity Survey

ELECTRODE CONFIGURATION

PLOTTING POINT

MCPhar Geophysics Limited

Induced Polarization and Resistivity Survey

Anomalous Zone
Possible Anomalous Zone

Logarithmic Contour Interval

Cam Mines Limited

N 1/2, LOT 6, CON. VI, Murphy Twp, Porcupine M.D. Ontario.

Scale—One inch = 200 Feet

Date Surveyed Nov./1964

Approved

Date 12/14/69

Frequency 0.51 – 5 CPS
LEGEND

- no
- 10° PHASE.
- 0.80 RATIO

CONDUCTOR
SHALLOW CONDUCTIVE ZONE (MAY BE DUE TO TOPOGRAPHY)

GROUNDED CABLE:
ON BASE LINE FOR STATIONS 15 TO 135
AT 6.5 FOR STATIONS 13 TO 13.5

TURAM ELECTROMAGNETIC SURVEY
MOREAU, WOODARD & CO., LTD.
FOR
CAM MINES LIMITED
NORTH HALF LOT 6, CON. VI
MURPHY TOWNSHIP
DISTRICT OF COCHRANE
ONTARIO
SCALE: 1 INCH = 200 FEET
DRAWN BY: J.W.
DATE: AUG 1964

64-18