REPORT ON
THE DETAILED GROUND GEOPHYSICAL SURVEY
COVERING CLAIM GROUP NO. 7
CARLING LAKE AREA - ONTARIO

C. C. Huston & Associates
2001-80 Richmond Street West
Toronto, Ontario
SUMMARY

Detailed ground geophysical surveys using magnetic and induced polarization instruments have been carried out over the nine claims comprising Claim Group No.7, Carling Lake Area, Patricia Mining Division, Ontario.

CONCLUSIONS

Scintrex Limited, the I.P. contractor, in their report on the survey concluded the following:

(a) The portion of the survey covering the lake did not show any anomalies.

(b) One anomalous zone from 500 feet to 1,000 feet wide was indicated on the land portion of the survey, extending from line 2N-20E to line 18N-11E, showing values up to 16.0 milliseconds above background. This intrinsic chargeability is equivalent to an average metallically conducting content of approximately 1% to 2% by volume.

The magnetic intensity pattern indicated within the claim group is essentially nondescript, with maximum intensities in the order of 1,700 gammas recorded. There is no discernable correlation between the magnetic and I.P. result recorded.

As the interpreted conductor, indicated in the lake in March, 1969 in a reconnaissance E.M. survey, is not encountered by either the I.P. or the magnetic survey, it is concluded that this conductor is due to other causes than sulphide mineralization.
RECOMMENDATIONS

Limited prospecting in the indicated I.P. anomalous area is recommended as a follow-up investigation to the geophysical surveys.

INTRODUCTION

From office studies of all available data, i.e. government geological maps, aeromagnetic maps, aerial photographs and property reports, an area of 136 square miles, located approximately 40 miles north east of Sioux Lookout, Ontario, was selected to be covered by an airborne magnetic survey. The area is underlain by Precambrian Hybrid Gneisses and Metasediments.

A contract was awarded to the Lockwood Surveys Corporation Limited who carried out the airborne magnetometer survey over the selected area in September, 1968, using a Beech Queenair equipped with a Gulf Magnetometer.

The map covering this airborne magnetic survey studied in conjunction with photo-geological interpreted structures, indicated a number of anomalous zones believed worthy of further investigation. Ground reconnaissance traverses, using magnetic and electromagnetic instruments, were carried out and in one instance, indicated a conductor located beneath the waters of Carling Lake. A nine claim group (Claim Group No.7) were subsequently staked to acquire this conductor.

A-picket line grid at 400 feet intervals for control of detailed ground geophysical surveys was cut over the 9 claims comprising Claim Group No.7. Detailed ground geophysical surveys were then carried out using a Saigel dark VII time-domain (pulse-type) induced polarization unit and a Sharpe MF-1 Fluxgate Magnetometer.
The surveys in question were initiated with the commencement of line cutting on December 6th, 1969 and were finished on January 26th, 1970 when the magnetic survey was completed.

LOCATION AND ACCESS

Claim Group No.7 is located in the Carling Lake area of the Patricia Mining Division, being about 40 miles north-east from Sioux Lookout, Ontario.

The claim group in question must be reached by float or ski-equipped aircraft, both of which are based at Sioux Lookout, Ontario.

WORK DONE

Claim Group No.7 consists of 9 claims (See Key Map), the claim numbers and recorded holder being:

H. H. Brown (Licence S 2770)
2001-80 Richmond Street W., Toronto 110, Ontario.

Pa 210809, Pa 210810, Pa 210811, Pa 210812,
Pa 210813, Pa 210814, Pa 210815, Pa 210816,
Pa 210817.

The assessment work performed on these claims was done under the direction of -

C. C. Huston & Associates,
2001-80 Richmond Street W., Toronto 110, Ontario.

This work consisted of detailed ground magnetic and Induced Polarization surveys using pre-cut picket lines at 400 feet centres for control. All work was carried out between December 6th,
1969 and January 26th, 1970 inclusive and covered all the claims listed above.

No detailed geological mapping has been done to date on this claim group. The main geological map and report of the ground area is:

O.D.M. Geological Report No. 32, 1965
Highstone Lake - Lake Area

These geophysical surveys are the only exploration and development work that have been performed on this claim group.

A discussion of the surveys and the results obtained, follows:

1. Magnetometer Survey

(a) Instrument

The magnetometer survey was carried out using a Sharpe MF-1 Fluxgate magnetometer.

The Sharpe MF-1 Fluxgate magnetometer is a vertical field fluxgate magnetometer featuring ruggedness and stability. The instrument is self-levelling and a self-nulling circuit permits rapid accurate measurement of the earth's magnetic field from a meter, without adjustments or calculations.

The self-levelling feature of this electronic magnetometer eliminates the need for bulky tripods and time consuming fine levelling procedures. Further, the instrument is relatively insensitive to orientation. Since the instrument can be adjusted electronically to cancel vertical magnetic fields from plus 100000 gammas, there is no need for auxiliary magnets or complicated altitude adjustments.

The operation of the MF-1 magnetometer is very simple. The reading of the meter was set to 500 gammas at the chosen base station. This can be done to an accuracy of 5 gammas. As successive stations are occupied, the instrument is held roughly level and the increase or
decrease in the vertical component of the earth's magnetic field is read directly from the meter. Five ranges are available and on the most sensitive range, the accuracy is ± 5 gammas. The above ranges can be reversed in polarity as a simple function of the on-off switch. A precision potentiometer permits cancelling the earth's field up to ± 100,000 gammas.

(b) Procedure

When carrying out the survey, the operator starts out at the main base station in the morning to "zero" in his instrument. From there he proceeds from station to station on the chained picket lines, taking readings at 100 ft. station intervals. During the course of the survey, the operator repeats readings at the "base" station so that the diurnal variation of the earth's magnetic field can be determined. The magnetic readings obtained are corrected for this diurnal variation, plotted on the accompanying map and contoured at an appropriate interval. This map also shows the locations of the E.M. conductors.

In all, 8.2 miles of picket line were cut and 412 magnetic stations established during the survey.

(c) Results and Interpretation

The magnetic intensity pattern is essentially nondescript with maximum intensities in the order of 1,700 gammas. Any isolated highs are believed due to minor local changes in the accessory magnetite content of the underlying bedrock.

2. Induced Polarization Survey

The report submitted by Seigel Associates Limited, the Induced Polarization Survey contractor, is herein enclosed.
PERSONNEL

The following personnel have been associated with this geophysical survey:

**Line Cutting & Chaining**

- M. Chisel
- B. Gordon
- H. Brown
- N. Firth

**Magnetometer Survey**

- P. Cooper

**Induced Polarization Survey**

- J. S. Bortnick
- C. Simard
- P. Cooper
- M. Chisel
- B. Gordon

**Draughting**

- P. Cooper
  - Seigel Associates Ltd.

**Report**

- N. Firth
- J. Klein

**Typing**

- M. Davies

All of which is respectfully submitted.

C. C. HUSTON & ASSOCIATES

N. Firth, P. Eng.

NF:md
July 1, 1970.
ENGINEER'S CERTIFICATE


I, Norman Firth, of the City of Burlington in the Province of Ontario, hereby certify that:


2. I am a graduate of the University of Toronto with a degree of B.A.Sc. and have been practising my profession since 1950.

3. I am registered as a Professional Engineer in the Province of Ontario.

4. The accompanying report is based on personal supervision of the geophysical survey carried out on Claim Group No.7 during December 1969 and January 1970.

N. Firth, P. Eng.
REPORT ON AN
INDUCED POLARIZATION SURVEY
CARLING LAKE, NORTHWEST ONTARIO
ON BEHALF OF
C. C. HUSTON 1969 SYNDICATE

by

Jan Klein, M.Sc., P. Eng.,
Geophysicist.

RECEIVED
Feb. 14, 1970

TORONTO, Ontario
February 1970
SUMMARY

An induced polarization survey over a block of nine (9) claims in the Carling Lake area, Northwest Ontario, was executed over lines 400' apart. Station interval was 100'.

The gradient array used with a potential electrode spacing of 100' revealed a background of the Precambrian rocks level up to 8 milliseconds. The resistivity values range from 3,000 to 20,000 ohmmetres.

Even though strongly hampered due to extremely difficult ground contacts, one anomalous zone has been outlined by the present survey. It has been recommended that the area of this anomalous zone should be mapped for information leading to its nature, if this has not already been done. Drilling would be predicated upon the results of the geologic mapping.
INTRODUCTION

During the period January 7th - 24th, 1970, a geophysical party directed by Messrs. J. S. Bortnick and C. Simard, carried out an induced polarization survey on claims located in the Carling Lake area, Patricia Mining Division, on behalf of C. C. Huston 1969 Syndicate.

The claims covered include the numbers 210809 to 210817 inclusive. The centre of the property is about 45 miles northeast of Sioux Lookout. Access to the property is by bushplane. Figure 1 on the scale of 1" = 660' shows the property location in relation to the local topography. (See as well the location plan on Plate 1.)

The grid lines were striking east-west and cut at 400' intervals. Picketing was every 100'. A total of about 7 line miles were covered during the present survey.

DESCRIPTION OF METHOD AND INSTRUMENTATION

A Seigel Mark VII time-domain (pulse-type) induced polarization unit was employed on the present survey. This instrument features a 2.5 KW solid state transmitter and a "Newmont type" remote triggered receiver, with current-on and current-off capabilities of 2.4, and 8 seconds. The 2 seconds current-on and current-off times were employed throughout the present survey. The normalized transient polarization voltages are integrated from 0.45 seconds to 1.1 seconds after the interruption.
FIGURE 1

GRID & CLAIM PLAN

C. C. HUSTON 1969 SYNDICATE

CARLING LAKE AREA, ONTARIO

CLAIM GROUP No. 7

SCALE: 1" = 660'
of the primary pulse. This is the chargeability measurement. It is expressed in units of milliseconds. The delay of 0.45 seconds before measuring the transient voltages remaining in the ground effectively suppresses any electromagnetic induction transients.

The physical phenomena utilized in the induced polarization method, field procedures and the nature of the results obtained over several base metal deposits Pine Point, Northwest Territories, are described in the accompanying article entitled "Discovery Case History of the Pyramid Ore Bodies, Pine Point, Northwest Territories, Canada".

Besides the chargeability, i.e. the induced polarization factors (in milliseconds), the resistivity was also measured, in units of ohmmetres. The gradient array was employed during the present survey using current electrode and potential electrode spacings of 6000' and 200' respectively.

The gradient array has a good depth penetration and reduces the effect of masking. It has a high degree of resolution for small bodies. It has no "depth control" but its results are relatively easy to interpret, being similar to horizontal magnetic field anomaly forms.

PRESENTATION OF DATA

Plate 1 on the scale of 1" = 200' shows the chargeability results in profile form. The chargeability values are plotted on a vertical scale of 1" = 5 milliseconds and the resistivity values on a logarithmic scale of 1.33" = a factor of 10, (datum level is 1,000 ohmmetres).
The chargeability results (and in a lesser degree, the resistivity results) are divided in two groups. The first group shows the results obtained with excellent ground contact (potential electrode circuit less than 30,000 ohms). These readings are presented using a circle and the chargeability values are inter-connected by a heavy solid line. The second group shows the results obtained with poor ground contact. These readings are presented using a dot and the chargeability values are interconnected using a heavy broken line.

**DESCRIPTION OF RESULTS**

As already mentioned, the results are divided in two groups.

The first group represents the results obtained using an excellent ground contact, e.g. all the readings obtained over the lake and a small part of the readings obtained on higher ground fall in this category.

The second group includes most of the results obtained on higher, generally rocky ground. The inadequate ground contact was due to winter conditions together with too small a type of potential electrode. Many of the readings in this group are unreliable specially when alternatively a high and low reading were encountered (e.g. west ends of Lines 26N and 30N). Proper ground contact necessitates making physical contact with soil or water below the frost line. On rocky ground, with little soil cover, this is sometimes difficult even in summer and more difficult in the winter.

The chargeability background level over the lake ranges from 2-3 milliseconds, which is considered as being normal for non-mineralized
sediments. An increase in chargeability level is observed along the most western part of Lines 2N, 10N and 14N. This increase (up to 5 milliseconds) possibly reflects a change in rock type underneath the lake bottom or a decrease in thickness of "overburden" (lake and lake bottom sediments).

The maximum value obtained over the lake is 8 milliseconds, (L2N - 17W) which, using a background level of 5 milliseconds, is not considered to be significant. The resistivity values show also an increase (3,000 to 10,000 ohmmetres) coincident with the chargeability values which supports the idea of a shallowing of the lake. A small high up to 5.5 milliseconds occurs at 14N - 1W and 10N - 1E.

On Lines 2N, 22N, 26N and 30N a gradual increase in chargeability and resistivity values was encountered towards the eastern shore of Carling Lake. This again, is likely due to a shallower water-sediment cover of the basement rocks. It is, therefore, suggested that the background level of the basement rocks is in the order of 8 milliseconds or more.

The resistivity values over the high ground range from 5,000 to 20,000 ohmmetres. An anomalous zone extends over at least 2400' length from Line 2N - 20E via Line 6N - 15E, Line 10N - 12E, Line 14N - 10E (and possibly Line 22N - 13N).

The width of the zone varies between 500' and 1,000'. The strongest peak occurs on Line 6N at 15E where a value as high as 16 milliseconds was encountered. This is equivalent to 1% - 2% by volume of metallically conducting content.
The readings are strongly hampered in certain portion of this area by inadequate ground contact. Therefore, no definite outline of the anomaly can be given. The results of the sections of lines west of the lake and north of Line 22N east of the lake are virtually too distorted to be discussed.

CONCLUSIONS AND RECOMMENDATIONS

The induced polarization survey over a claim block near Carling Lake, Northwestern Ontario, can be divided into two parts.

The part covering the lake does not show any anomalies. The chargeability level ranges from 2 to 5 milliseconds with coincident changes in the resistivity level from 3,000 to 10,000 ohmmetres, likely reflecting a change in depth of the lake bottom.

The chargeability level over the higher ground is likely 8 milliseconds or over. The resistivity values are as high as 20,000 ohmmetres. The readings were strongly hampered due to insufficient ground contact of the potential electrodes. However, one anomalous zone is observed, extending from Line 2N - 20E to Line 18N - 11E and showing values up to 16.0 milliseconds (Line 14N - 11E). This is approximately 8 milliseconds above background. This intrinsic chargeability is equivalent to an average metallically conducting content of approximately 1% - 2% by volume.

It is, therefore, recommended to map in detail the anomalous area east of the lake between lines 2N and 22N for any evidence relating to the source of the anomalous I.P. response. If this examination should
yield favourable results, either of a direct or indirect nature, then exploratory drilling could be laid out on the basis of the present geophysical data.

Respectfully submitted,

Jan Klein, M.Sc., P.Eng.,
Geophysicist.

SFIGEL ASSOCIATES LIMITED
TECHNICAL ASSESSMENT WORK CREDITS

<table>
<thead>
<tr>
<th>Type of Survey and number of Assessment Days Credits per claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOPHYSICAL</td>
</tr>
<tr>
<td>Airborne □ Ground X</td>
</tr>
<tr>
<td>Magnetometer .......................................................... 20 days</td>
</tr>
<tr>
<td>Electromagnetic ................................................................ 10 days</td>
</tr>
<tr>
<td>Radiometric ........................................................................ 10 days</td>
</tr>
<tr>
<td>Induced Polarization ..................................................... 40 days</td>
</tr>
<tr>
<td>GEOLOGICAL ........................................................................ 10 days</td>
</tr>
<tr>
<td>GEOCHEMICAL ...................................................................... 10 days</td>
</tr>
<tr>
<td>SECTION 84 (14) ................................................................ 10 days</td>
</tr>
<tr>
<td>Special Provision □ Man days □</td>
</tr>
</tbody>
</table>

NOTICE OF INTENT TO BE ISSUED

□ Credits have been reduced because of partial coverage of claims.

□ Credits have been reduced because of corrections to work dates and figures of applicant.

□ NO CREDITS have been allowed for the following mining claims as they were not sufficiently covered by the survey:

- PA 210809 to 17 Inclusive

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40;
SPECIAL PROVISION

ASSESSMENT WORK DETAILS

Type of Survey: Induced Polarization

Chief Line Cutter or Contractor: N. Firth, 2001-80 Richmond Street W., Toronto, Ontario

Party Chief: J.S. Bortnick, Seigel Associates Limited

Consultant: C.C. Huston & Associates, 2001-80 Richmond Street W., Toronto, Ontario

COVERING DATES

Line Cutting: Dec 6 - 12, 1969

Field Geology or Geophysics: Jan 7 - 24, 1970

Office: May 20 - 21, 1970

INSTRUMENT DATA

Make, Model and Type: Seigel Mark VII Time-Domain I.P. Unit

Scale Constant or Sensitivity: 2.5 Kw Transmitter, I.P. Factors in milli seconds.

Or provide copy of instrument data from Manufacturer's brochure.

Total Number of Stations Within Claim Group: Number of Miles of Line cut Within Claim Group: 8.2

ASSESSMENT WORK CREDITS REQUESTED

Geological Survey: Days per Claim

Geophysical Survey: 40 Days per Claim

MINING CLAIMS TRAVERSED

Pa 210809 Pa 210810 Pa 210811 Pa 210812 Pa 210813

Pa 210814 Pa 210815 Pa 210816 Pa 210817

TOTAL: 9

DATE: June 23, 1970

SIGNED: P. Eng.

Special provision credits do not apply to Radiometric Surveys.
SPECIAL PROVISION

ASSESSMENT WORK DETAILS

Type of Survey: Magnetic

A separate form is required for each type of survey.

Chief Line Cutter or Contractor: N. Firth, 2001-80 Richmond Street W, Toronto, Ontario.


COVERING DATES:

Line Cutting: Dec 6 - 12, 1969

Field Geology or Geophysics: Jan 25 - 26, 1970

Office: May 19 - 21, 1970

INSTRUMENT DATA:

Make, Model and Type: Sharpe MF-1 Fluxgate Magnetometer

Scale Constant or Sensitivity: Five gammas

Or provide copy of instrument data from Manufacturer's brochure.

Total Number of Stations Within Claim Group: 412

Number of Miles of Line cut Within Claim Group: 8.2

ASSESSMENT WORK CREDITS REQUESTED:

Geological Survey: Days per Claim

Geophysical Survey: 20 Days per Claim

MINING CLAIMS TRAVERSED:

Pa 210809 Pa 210810 Pa 210811 Pa 210812
Pa 210813 Pa 210814 Pa 210815 Pa 210816
Pa 210817

TOTAL: 9

DATE: July 31, 1970

SIGNED: [Signature]

P. Eng.

Special provision credits do not apply to Radiometric Surveys.

Mr. W.A. Buchan,
Mining Recorder,
Court House,
Sioux Lookout, Ontario

Re: Mining Claim No. PA. 210309 et al,
Carling Lake Area

Dear Sir:

The Induced Polarization assessment work credits as shown on the attached list have been approved as of the date above. Please inform the recorded holder and so indicate on your records.

Yours very truly,

Fred W. Matthews,
Supervisor,
Projects Section.

cc. Mr. Harvey H. Brown,
2001 - 80 Richmond St., W.,
Toronto 110, Ontario.

cc. Mr. H. L. King,
Resident Geologist,
808 Robertson Street,
Kenora, Ontario.

FWM/mr
See accompanying map(s) identified as 52J 11 SW 0010 A1-#1

Located in the map channel in the following sequence (x)

X X
CARLING LAKE - SCHIST LAKE AREA

MAGNETOMETER SURVEY

CONTOUR INTERVAL 100 GAMMAS

SCALE: 1" = 200'

CARLING LAKE - SCHIST LAKE AREA

MAGNETOMETER SURVEY

CONTOUR INTERVAL 100 GAMMAS

SCALE: 1" = 200'