C. SALAMIS \& ASSOCIATES INC.
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ET, GAU YZUR DEE MONTE, QILDHO


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PROJECTS UNIT

Geophysical Surveys
Sam Project
BRASCAN RESOURCES LTD
Hanna - Reaume Twps
District of Cochrane - Ontario

## INTRODUCTION

An airborne geophysical survey was carried out in February 1975 over parts of Hanna and Reaume Townships approximately ten miles south of the town of Cochrane.

As a direct result of this a number of conductors were selected for staking and subsequent ground followmp with magnetic and electromagnetic techniques.

The airborne conductors are located under a thick layer of conductive overburden. For this reason the lower frequency Geonics EM-17 (820Hz) was used with a coil separation of 400 feet (exception was anomaly \#53C where a 600 foot coil separation was maintained).

A total of 16 airborne EM conductors were selected for examination. Twelve grids were cut with lines at 400 feet intervals. In the absence of concession lines the grids were located by tying in to physical features appearing on the mosaic such as creeks, roads, and the Frederick House River. The latter feature is the principal access into most of the conductors examined.

A total of 41.3 miles of line was cut and chained. This total includes access lines as well as base lines, and picket lines.

The magnetometer survey was carried out using a McPhar MF-1 fluxgate magnetometic.

A total of 30.2 line-miles of magnetics was performed. The electromagnetic survey totalled 29.2 line miles.

Field work was carried out between October 7 th and December 16 th.

The general map covering the area is Map \#2205. Timmins-Kirkland Lake (one inch to four miles) published by the Ontario Division of Mines. The most useful map is Preliminary Map \#P767 of Reaume township. This is part of the Timmins Data Series and incorporates all assessment data up to 1972 the date of publication. The map scale is a quarter mile to the inch.

The survey area is heavily drift covered and thus the geological map is based primarily on aeromagnetic interpretation together with limited drill hole information.

The area of interest is interpreted as underlain by intercalated mafic and felsic metavolcenic rocks bordered on the north and south by mafic to ultramafic sills.

The area is transected by a large number of $N W$ striking faults. ELECTROMAGNETIC SURVEYS

With few exceptions the EM conductors located are low amplitude. Fortunately the general noise level due to conductive overburden is small because of the operating frequency of the Geonics EM-17L. The imaginary component varies over very narrow limits. Resolution of the conductors is thus good in spite of their considerable depth. It should be emphasized that the depth of the anomalies as calculated from the phasor diagram is a maximum thus insuring that the recommended drill holes will adequately test the conductors.

The conductors examined by ground surveys are $28,26,550,23$, $24,25,53,15,16,17,61 B, 19,21,22,6,31$.

Additional $E M$ work is recommended for conductor $61 B$ near the base line and to the north-east, completion of grid on conductor \#22, and possibly extensions to conductors on grids 6 and 31. Within all of the grids surveyed only one drill hole was located (Conductor \#15). Thus all of the recommended targets remain untested.

Profiles of the two components measured (in phase and out of phase) are indicated on the enclosed maps. The map scale is one inch to two hundred feet.

Anomaly assignations are prefixed by the air EM number in each case.

A quantitative interpretation of all the conductors located is given in tabular form. The calculated widths, depths, and conductivity width is given along with specific recommendations in each case.

Of the thirty-nine conductors located eleven are designated as first priority drill targets with three selected as of secondary importance.

| Anomaly \# | Length <br> $f t$ | Width <br> $f t$ | Depth <br> $f t$ | Conductivity <br> Width <br> (mhos $)$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: |

Grid \#26

| $\begin{gathered} 26-1 \\ \left(16^{w}\right) \end{gathered}$ | $400{ }^{+}$ | $\left\langle 2^{150}\right. \text { cond }$ | ${ }_{r s}{ }^{280}$ | 70 | Nil | Two conductors Poor resolution |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} 26-2 \\ \left(24^{W}\right) \end{gathered}$ | 600 | 30 | 290 | 80 | 400 | Probable AEM Excellent cond. Drill hole |
| $\begin{gathered} 26-3 \\ \left(32^{W}\right) \end{gathered}$ | $200^{+}$ | 210 | 190 | 22 | Nil | Wide conductor Poorly defined |
| Grid \#55 |  |  |  |  |  |  |
| $\frac{55-1}{\left(60^{W}\right)}$ | 1000 | 40 | $\begin{gathered} 220 \\ 70(\text { Mag }) \end{gathered}$ | 54 | 200 | Drill hole on Lu $60^{W}$ Test Magnetic anomaly as well. |

## Grid \#23,24,25

| $\begin{gathered} 25-1 \\ \left(40^{E}\right) \end{gathered}$ | 1200 | $\begin{gathered} 110 \\ 90(\mathrm{Mag}) \end{gathered}$ | $\stackrel{170}{40(\mathrm{Mag})}$ | 70 | 300 | Drill hole on L-40 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} 25-2 \\ \left(52^{E}\right) \end{gathered}$ | $800^{+}$ | 100 | 240 | 57 | Flanking | Probable extension of 25-1 |
| $\begin{aligned} & 25-3 \\ & \left(40^{E}\right) \end{aligned}$ | 1200 | $\left(\begin{array}{c} 400 \\ (2 \text { conds. }) \end{array}\right.$ | $90^{140} \text { (Mag) }$ | 71 | 300 | Two conductors Test with 2 holes |
| $\begin{gathered} 24_{-1}-1 \\ \left(28^{\mathrm{E}}\right) \end{gathered}$ | $400^{+}$ | $\begin{gathered} 100 \\ 200 \text { (Mag) } \end{gathered}$ | $\begin{gathered} 200 \\ 40 \text { (Mag) } \end{gathered}$ | 60 | 50 | Drijl hoie on L-28 ${ }^{\text {E }}$ |
| $\begin{array}{r} 24-2 \\ \left(16^{E}\right) \end{array}$ | 400 | 60 |  |  |  | Weak conductor Probable overburden |
| $\begin{array}{r} 24-3 \\ \left(20^{E}\right) \end{array}$ | 400 | <20 |  |  | Nil | Drill only if 25-3 of interest |
| $\begin{array}{r} 23-1 \\ (0) \end{array}$ | $200^{4}$ | $<20$ |  |  | $50$ <br> Flanking | Edge of claims Drill only if 24-2 of interest |



Grid \#53


Grid 61 B


Grid 19

| $19-1$ | 400 | - | 180 | 110 | $\ldots$ | 60 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |


| Anomaly \# | Length ft | Wiath $f^{\prime} t$ | $\begin{gathered} \text { Depth } \\ \text { it } \end{gathered}$ | $\begin{aligned} & \text { Conductivity } \\ & \text { Width } \\ & \text { (mhos) } \\ & \hline \end{aligned}$ | Magnetics | Recommendations |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |

Grid 21 \& 22

| $\begin{aligned} & 21-1 \\ & \left(56^{\mathrm{E}}\right) \end{aligned}$ | $400^{+}$ | 200 | $\begin{gathered} 170 \\ 60(\text { Mag }) \end{gathered}$ | 90 | $\begin{aligned} & 150 \\ & \text { Flanking } \end{aligned}$ | Drill hole |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & 21-2 \\ & \left(44^{2}\right) \end{aligned}$ | 400 | 100 | 240 | 50 | Ni工 | Short conductor <br> Drill only if 2l-1 |
| $\left(24^{2}-\frac{1}{E}\right)$ | $400^{+}$ | 200 | 240 | 200 | Nil | encouraging <br> Complete EM <br> coverage on gria |

Gria $6 \& 31$

| $\frac{6-1}{(0)}$ | 200* | $<20$ | 280 | 115 | Nil | Poor resolution |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & 6-2 \\ & \left(8^{\mathrm{E}}\right) \end{aligned}$ | 1400 | 30 | 130 | 108 | 200 | Drill hole |
| $\left(\begin{array}{l} 6-3 \\ \left(8^{E}\right) \end{array}\right.$ | $400^{\circ}$ | < 20 | 28.0 | 215 | 100 | Target too small |
| $\begin{aligned} & 6-4 \\ & \left(12^{E}\right) \end{aligned}$ | $800^{+}$ | 80 | 170 | 160 | 80 Flanking | Possibly outside claims Drill hole after staking |
| $\left(16^{6-5}\right)$ | $200^{+}$ | < 20 | 250 | 90 | Nil | Poor resolution |
| $\begin{aligned} & \left.31-\frac{1}{2}\right) \\ & \left(28^{2}\right) \end{aligned}$ | $200^{+}$ | 250 | 250 | 115 | Nil | Near claim limit Poorly resolved |
| $\left(28^{-2}\right)$ | 200 | 160 | 320 | $106^{\circ}$ | Nil | As above |
| $\begin{aligned} & 31-3 \\ & \left(20^{\mathrm{H}}\right) \end{aligned}$ | 800 | 60 | 210 | 100 | $\begin{aligned} & 100 \\ & \text { Flanking } \end{aligned}$ | Near claim boundary. Drill hole |
| $\begin{aligned} & 31-4 \\ & (16 E) \end{aligned}$ | $200^{*}$ | $\pm 50$ | - | - | Contact ultramafi | of Drill only if 31-3 of ic interest. <br> (Probable continuation) |

Based on the quantitative interpretation of the Electromagnetic survey the recommended drill sites are as follows:

2st priority

| Anomaly | Drill Collar | Direction | Dip | Length |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | ft |
| 26-2 | I- $24^{W} \quad 2+50^{\text {S }}$ | $S-10^{\circ} \mathrm{E}$ | $45^{\circ}$ | 550 |
| 55-1 | L-62\& $70 \mathrm{~W} 1+30^{5}$ | S-250E | $45^{\circ}$ | 600 |
| 25-1 | $1-40^{\mathrm{E}} \quad 2+25^{\mathrm{N}}$ | South | $45^{\circ}$ | 550 |
| 25-3 | L-40 ${ }^{\text {E }} \quad 4+20^{5}$ | South | $45^{\circ}$ | 450 |
| 25-3 | L $-40^{\mathrm{E}} \quad 6+20^{\mathrm{S}}$ | South | $45^{\circ}$ | 600 |
| 24-1 | $\mathrm{L}-28^{\mathrm{E}} \quad 0+50^{\mathrm{N}}$ | South | $45^{\circ}$ | 550 |
| 16-1 | L-8 $8^{\text {E }} \quad 20 \pm 75^{\text {S }}$ | South | $45^{\circ}$ | 600 |
| 19-1 | $1-4^{E} \quad 0+25^{S}$ | S300 ${ }^{\circ}$ | $45^{\circ}$ | 500 |
| 21-1 | L-56 $6^{\text {E }}$ C+00 | South | $45^{\circ}$ | 650 |
| 6-2 | L-9, $10^{\mathrm{E}} \quad 4400^{\mathrm{N}}$ | $\mathrm{S}-25^{\circ} \mathrm{W}$ | $45^{\circ}$ | 400 |
| 6-4 | L-12. $90^{\text {E }} \quad 14400{ }^{\text {N }}$ | S-250 ${ }^{\text {W }}$ | $45^{\circ}$ | 500 |
| 31-3 | $\mathrm{L}-20^{\mathrm{E}}, 16+00^{\mathrm{S}}$ | South | $45^{\circ}$ | 470 |
|  |  |  | Total | $\overline{6420} \mathrm{ft}$ |
| Anomaly | Drill Collar | Direction | Dip | Length |
| 28-2 | $\mathrm{L}-36 \mathrm{~W} \quad 4+00^{\mathrm{S}}$ | South | $45^{\circ}$ | $650{ }^{\text {ft }}$ |
| 17-1 | L-16 $6^{\text {E }} \quad 34450^{S}$ | South | $45^{\circ}$ | 600 |
| $61-1$ | L-28 ${ }^{\mathrm{W}} \quad 25400^{\mathrm{N}}$ | South | $45^{\circ}$ | 500 |
|  |  |  | Total: | 2750 ft |

Grid \#28
The northern part of the grid is characterized by a magnetic high corresponding to the eastern extension of an ultramafic sill.

The southern two-thirds of the grid is characterized by a wavy profile of low amplitude indicative of volcanic rocks.

The three EM anomalies located do not have magnetic correlation. The strike of conductor 28-2 corresponds most closely to the strike of the magnetic maxima ( $\mathrm{S}-80^{\circ \mathrm{E}}$ )

The calculated magnetic depth on $4-16^{W}$ at $2^{S}$ is 62 ft .
Grid \#26 \& 55
The magnetics indicate an irregular sill-like intrusive approximately 200 feet wide in the southern part of both grids.

The profiles outside of the intrusive show the typical low amplitude wavy profile indicative of volcanic rocks.

Of the four conductive zones located within the two grids conductor 55-1 is the only one showing any magnetic correlation. The calculated depth of 68 feet from the magnetic profile differs considerably from the electric depth from the phasor diagram ( 220 ft ). Since the magnetic depth is considerably more reliable the inference is that we are dealing with conductive overburden over the bedrock source ascribed to conductor 55-1. The proposed drill hole is designed to cut both the fuil wiath of the magnetic anomaly as well as the conductor.

The magnetic responses over the conductors in this grid are the most significant obtained over the entire project area. Once more the magnetic depths are considerably less than the calculated electrical depths.

The magnetic maxima suggest the presence of a transverse fault striking $\mathrm{N}-15^{\circ} \mathrm{W}$ in the vicinity of Line $44^{\mathrm{E}}$. This could correspond to the diabase dyke near the Hanna-Reaume township line indicated on the geological map. A magnetic anomaly corresponding to an intrusive (gabbro) is located on L-24E.

A more rigourous interpretation of the magnetics should be made upon completion of the four recommended drill holes.

The calculated magnetic depths and widths are as follows:
Depth Width
$L-40^{E} \quad 2+00^{S} \quad 40 \quad 90$
$1-40^{\text {E }} 8+00^{S} \quad 90 \quad 90$
$=28^{\text {E }} 2+00^{\text {S }} \quad 40 \quad 200$
Grid - 53
Insufficient data available. Probably underlain by volcanic rocks. Grids $15,16,17$

Apart from a steadily increasing gradient to the south of the grid the magnetic pattern is quite uniform.

The grid is probably underlain by a thick section of uniform, unaltered voicanic rocks. Overburden is thick as indicated by both the EM and magnetic resuite.

Grid 61 B
The only prominent magnetic maxima is located in the vicinity of Conductor 61-1 on $\mathrm{L}-28^{W}$. Once more the grid is underlain by volcanic rocks. Grid - 19

The grid is underlain by volcanic rocks. Grids 21,22

As above, No distinative magnetic features.
Grids $6 \& 31$
The magnetics suggest that these grids are underlain by a sequence of NW striking volcanic rocks.

Drill holes within half a mile of the west boundary of the grias by Cerro and Kerr Addison cut narrow values of Copper, Nickel, and Zinc mineralization in shear planes near the contact of basic sills with intercalated felsic graphitic tuffs.

CONCLUSIONS AND RECOMMENDATIONS
A total of 16 Airborne EM anomalies were investigated by ground surveys.

Eleven of these are indicated as first priority drill hole targets while three are given a second priority. A total of 6420 feet of drilling is recommended for the former with a provision of 1750 feet for the latter.

While the program is in progress a few days of EM work should be allocated to complete grids 21 and 22 as well as anomaly extensions on the edge of some of the grids.

YONSTANTINE SALAMIS, P.ENG.

In the absence of outceop the recommended drilling program will serve to define the geological environment within the survey area.

The targets are all prime targets for the presence of base metal targets.

Respectfully submitted,

Pons seralanm
C.Salamis, Eng,

## TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS FTGNG LANDS SECTION

Type of Survey (s) Eledetromagnetic and magnetic
Township or Area Hanna and Reaume twos.
Claim Holder (s)

Survey Company C. Salamis, P. Eng.
Author of Report __C. Salamis, P. Ene.,
Address of Author Box 730, st. Sauveur does Montes, P.Q.
Covering Dates of Survey october 8 to December 18,
(lin cutting to office) 1975
Total Miles of Line Cut $\qquad$


AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)
Magnetometer $\qquad$ Electromagnetic $\qquad$ Radiometric $\qquad$
DATE: March 29, 1976 SIGNATURE: MAser/ Morin, P Ny. 63.1360 Author of Report or Agent

Res. Geol. Qualifications $* 63.1077$

Previous Surveys

(prefix)

## PEREIVED

 MAR 21977PROJECTS UNIT

MINING CLAIMS TRAVERSED List numerically
(See attached list)

GROUND SURVEYS - If more than one survey, specify data for each type of survey

| Number of Stations 1595 | Number of Readings 1595 |
| :---: | :---: |
| Station interval 100 feet | Line spacing $\quad 400 \mathrm{ft}$. |
| Profile scale _, |  |
| Contour interval |  |



| 4433000844 | Instrument Geanics Eid-17L |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Coil configuration Horizontel |  |  |  |
|  | Coil separation 400 and 600 feet |  |  |  |
|  | Accuracy |  |  |  |
|  | Method: $\quad \square$ Fixed transmitter | $\square$ Shoot back | $\square$ In line | $\square$ Parallel line |
|  | Frequency $\quad 820$ c.p.s. |  |  |  |
|  | Parameters measured in-phase and out-o | ecify V.L.F. station) ase componen |  |  |

Instrument $\qquad$
Scale constant $\qquad$
Corrections madc $\qquad$

Base station value and location $\qquad$

Elevation accuracy

Instrument $\qquad$
Method $\square$ Time Domain $\square$ Frequency Domain
Parameters - On time_ Frequency $\qquad$

- Off time $\qquad$ Range $\qquad$
- Delay time $\qquad$
- Integration time $\qquad$
Power $\qquad$
Electrode array
Electrode spacing
Type of electrode $\qquad$


## WESTERN MINES LIMITED

## SAM PROJECT

HANNA-REAUME TWPS.
GEOPHYSICAL SURVEYS, 1975
MINING CLAIMS TRAVERSED

| P. 428620 | P. 428645 |
| :--- | ---: |
| P. 428621 | P. 428646 |
| P. 428622 | P. 428647 |
| P. 428623 | P. 428648 |
| P. 428624 | P. 428649 |
| P. 428625 | P. 428650 |
| P. 428626 | P. 428651 |
| P. 428627 | P. 428652 |
| P. 428628 | P. 442504 |
| P. 428629 | P. 442505 |
| P. 428630 | P. 442506 |
| P. 428631 | P. 442507 |
| P. 428634 | P. 442508 |
| P. 428635 | P. 442509 |
| P. 428636 | P. 442510 |
| P. 428637 | P. 442511 |
| P. 428638 | P. 442513 |
| P. 428639 | P. 442514 |
| P. 428640 | P. 442515 |
| P. 428641 | P. 442518 |
| P. 428642 | P. 428643 |

Total Claims - 45














* $15,16,17^{\text {Tme copt }}$

Electromagnetic Surrey








