## REPORT

ON

MAGNETOMETER AND ELECTROMAGNETIC

SURVEYS

OF THE

# MULLIETTE - BELL CLAIMS <br> CLERGUE AND STOCK TOWNSHIPS 

PORCUPINE MINING DIVISION

AND

WALKER AND TAYLOR TOWNSHIPS

LARDER LAKE MINING DIVISION

ONTARIO
D. R. Bell, B.Sc.

July 31, 1974.


1. Introduction:

A NcPhar vertical loop electromagnetic and magnetometer survey was comproted during the months of Anril and May of 1974, on the Morley Mulliette - David Bell claims, situated in Clergue and Stock Townships of the Porcupine Mining Division, and Walker and Taylor Townships of the Larder Lake Mining Division, Ontario.

The survey was performed by John J. Johnson, 112 Second Ave., Timmins, Ontario.
2. Location and Accessibility:

The claims are located on the mutual boundaries of Cleraue, Walker, Taylor and Stock Townshins, 42 miles east of Timmins, south of the village of Monteith. The claim group is cut in half by Highway ll. and access within this group is gained by numerous farm access roads and trails. The village of Monteith is one mile north of the property as is the Ontario Northland Railway.
3. Property:

Total number of claims - 24 unpatented mining claims.
Recorded Numbers - L372557-561 Inclusive
L372753-759 Inclusive
P372526-528 Inclusive
P372556
L372550-554 Inclusive
P372523-525 Inclusive
4. Ownership and Title:

The 24 unpatented claims within this survey arca are jointly held by Morley Mulliette and David R. Bell on an equal sharing basis; $50 \%$ each.

Mineral rights held by: a) Morley Mulliette, Suite 201, 95 King St. East, Toronto, Ontario.
b) David R. Bell, 672 Melrose Bivd., Timmins, Ontario.

## History:

Due largely to the area being overlain by clay, and scattered widespread outcrops, little exploration was carricd out in this area until 1938 when a landslide on the east bank of the Driftwood River exposed an outcrop which assayed 0.13 ozs. gold per ton.

In the spring of 1939 the Montclerg Mines Limited was incorporated. The property was optioned to the following companies which carried out diamond-drill programmes and a limited magnetometer survey.

Companies - 1939 Newmont and Anglo-Huronian Ltd.
34 holes for a total of 20,335 feet.

- 1941 Anglo-Huronian Ltd.

10 holes for a total of 6,672 feet.

- 1942 Howey Gold Mines Ltd.

1 hole for a total of
776 feet
a magnetometer survey.
This early work indicated an apparent gold bearing zone extending from 1500 feet west of the river to 2800 feet east of the river.

Subsequent to this work, the original company has been organized to Consolidated Montclerg Mines Limited, and no further work has been reported within this area.

The enclosed geophysical report covers the area immediately to the east and south of this previously explored ground.

## 6. General Geology:

Much of the claim area was mapped by H. D. Carlson, 1965 for the Ontario Department of Mines, and previously the general area was mapped by R. M. Ginn, 1959-1961 for the O.D.M. The map by H. D. Carlson, O.D.M. Preliminary Gcological Map No. P.308, shows the claim area to be underlain by sheared and foliated light and dark weathering intermediate to mafic metavolcanics, cut by a wide east-west trending Pipestone fault zone of a composition essentially that of a talcosemchloritic matrix.

Previous assessment work on the Montclerg Group by diamond-drilling has indicated North-South trending diabase dykes.

Structurally the metavolcanics have been isoclinally folded, with an east-west trending synclinal axis passing just south of Monteith. This has been structurally offset by a north-south fault. Extensive shearing, foliation and metamorphism has occurred with the schistocity following the general cast-west trend.

The gold in the Montclerg area is in arsenopyrite and appears lo be restricted in a silicified zone in the meta volcanics to the north of the talcose-chloritic Pipestone Fault Zone.

The picket lines were oricnted in a north-south direction such that the survey lines would be as near as possible at right angles to the formation.
7. Marnetometer Survey:
(a) Grid -

1. Baseline - bearing 090 E.
2. Crosslines - bearing 360 N and 180 S © 400 ft . intervals
3. Total line/miles - 22.75 miles.
4. Stations - 2089 .
5. Personnel - three (3) man crew supervised by John J. Johnson, 112 Second Ave., Timmins, Ontario.
(b) Survey Method -
6. Instrument - McPharmM700 Fluxgate magnetometer, a battery instrument which measures the vertical component of the earth's magnetic field.

Scale constant 20 gammas.
2. Theory of Method - the fluxgate magnetometer employs a saturable core system consisting of two highly permeable metallic strips about which primary coils have been wound. A low frequency field $\left(1 \mathrm{KH}_{2}\right)$ is applied to the coils through an oscillator. The field is sinusoidal and drives the strips into saturation during each half cycle resulting in an even change of permeability of these cores (at $\mathrm{KH}_{2}$ ). Any ambient magnetic field acting on this system yields a flux or phase variation which, when "gated" at the proper frequency (in this case the second harmonic), induces voltage pulses in an adjacent secondary winding. These pulses are amplified, fed into a phase dector and emerge as a D.C. Signal. This
signal is directly proportional to the strength of the ambient field and, therefore the strength of the field can be read on a voltmeter calim brated in gammas. The accuracy of the McPhar instrument is generally within $1 / 2 \%$ of full scale between 1000 and 10,000 gamma ranges and within $1 \%$ between the 10,000 and 30,000 gamma range.
3. Procedure - magnetic base stations were establised at $8+20 \mathrm{C}$ on Baseline $0+00$ Walker Twp., and Baseline $0+00$, $1+50 \mathrm{~W}$ Clecaue and Stock lwos, Readings were then taken at 50 ft . intervals on the crosslines, and check readings taken at a base station in order that a correction curve for the diurnal variation could be established. Using this curve, all readings were corrected for diurnal and instrument drift variations.

## 8. Electromagnetic Survey:

(a) Grid - same as for magnetic survey; Stations - 1060.
(b) Survey Method -

1. Instrument - McPhar SS-15 Vertical Loon EM System; a dual Frequency fixed source, tilt angle method.
2. Operating Frequency -1000 and 5000 C.P.S.
3. Operating Range - 2000 feet.
4. Transmitter Power - 300 watt supplied by gas-powered motor generator.
5. Transmitter - a mass-mounted, triangular cable loop about $10^{\prime}$ per side. The loop can be rotated about a vertical axis.
6. Receiver - a tuned pickmup coil assembly together with a transisterized amplifier with earphone outlet and a built-in clinometer for dip angle measurement.
7. Theory of Method - the basic principle is essentially that a horizontal electromagnetic field generated by passing an alternating through a wire loop will induce electrical "eddy" currents in any adjacent conductive media in the earth. The induced current in any conductor will in turn regenerate a secondary, electromagnetic field. The location and orientation of the principal axes of any secondary field and, hence, the location

## 8. Procedure -

and orientation of the source conductor can be determined by measuring tilt angles with a recciving coil. To do this the coil is rotated about a selected axis until a null position is obtained. This null position is essentially the orientation of the receiver coil producing minimum induction. The axis of orientation must be selected such that it is horizontal and lies in a direction parallel to the plane of the receiver coill and normal to the plane of the transmitting loop.

Sites for the transmitter locations are selected at convenient points throughout the property. The transmitter is set up and current is applied. The plane of the loop must be kept as nearly as possible in a dircction normal to the location of each receiver station. The person operating the receiver orients the coil about a vertical axes until a null point is established. The direction of the plane of the coil is now parallel to an axis which is normal to the plane of the transmitter loop. Next, the receiver coil is held in a horizontal position in this position.

If no secondary field is present a null will be obtained in the horizontal position. If such a field is present, its tilt angle is measured by rotating the coil until a null is received. The dip or tilt angle is read on a clinometer attached to the receiver apparatus.

The amount of tilt recorded at each station in plotted graphically on the line plane and connected by a curve.

A cross-over point is in theory, that point on the line where the curve changes from positive to negative, and in practice it is a point of inflection on the curve. This is due in part to distortion of the secondary field and to interference from other minor, conductors.
9. Results:
(a) Magnetometer Survey - the east-west magnetic trends reflect a
general pattern which might be related to the trend of the metamorphic fabric superimposed by the intense regional talcosechloritic Pipestone Fault Zone.

Intrusive diabase dykes exhibit a magnetic relief trending in a North-South direction and is sufficient in contrast to distinguish them from the older flows. This is exhibited on the Stock Twp. Group in claim P372525, and similarly on the Walker Twp. Group in claim L372754. This later magnetometer expression has been likely intensified within the Pipestone Fault, regionally metamorphosing the talc-chlorite schist along the diabase intrusive contact to a possible "magnetiterich" serpentinized rock.
(b) Electromacnetic Suryey - only one moderate conductor of any magnitude is indicated. This is in the north-west corner of Claim L372753 in Walker Twp. between lines $4+00 \mathrm{E}$ and $16+00 \mathrm{E}$; $24+00 \mathrm{~N}$. This anomaly does not reflect any magnetic expression, and a small outcrop some 100 ft . south of the anomaly indicates fine stringers of pyrite in a rhyo-dacite. This small exposure might indicate that the anomaly is due to the presence of massive or stringer sulphides.

A couple of very weak conductors reflecting a trend eastwest following the contact of the proposed Pipestone Fault. This is probably due to intense shearing and possible disseminated sulphides.

Conclusions:
The electromagnetic anomaly in the north-west corner of the Walker Township Group is in a geologically favourable environment for possible base metal potential. This area should be detailed with 200 ft. survey spacings. Due to the intense overburden and a local river passing over this area, diamond drilling would be recommended for this zone.

An induced polarization survey along the contact of the Pipestone Fault zone might further outline potential disseminated gold-sulphide horizones similar to those found on the adjoining Montclerg property.

It is recommended that following any successful results from the above conclusions, that diamond drill should be used to test the mineral potential of this property.

Respectfully submitted,


David R. Bell, B.Sc.
July 31, 1974 .

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COVERING DATES
Line Cutting_- April and May 1914
Field $\qquad$ Instrument work geological mapping, sampling etc.
Office


INSTRUMENT DATA
Make, Model and Type Ate Phon $55-15$ 2Osticel Carp
Scale Constant or Sensitivity _1000 C. PS
Or provide copy of instrument data from Manufacturer's brochure.
Radiometric Background Count
Number of Stations Within Claim Group
Number of Readings Within Claim Group
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Number of Miles of Line cut Within Claim Group -6.5 the les
Number of Samples Collected Within Claim Group

CREDITS REQUESTED
Geological Survey
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ASSESSMENT WORK DETAILS


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Field $\qquad$
Instrument work, logical mapping, sampling etc.


Or provide copy of instrument data from Manufacturer's brochure.
Radiometric Background Count
Number of Stations Within Claim Group
Number of Readings Within Claim Group
Number of Miles of line cut Within Claim Group -6 $6 \frac{56}{56}$
Number of Samples Collected Within Claim Group

CREDITS REQUESTED
Geological Survey
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Send in duplicate to:
FRED W. MATHEWS SUPER VISOR-PROJELTS SECTION DEPARTMENT OF MACS \& NORTHERN AFEARS
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ASSESSMENT WORK DETAILS


COVERING DATES

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Or provide copy of instrument data from Manufacturer's brochure.
Radiometric Background Count
Number of Stations Within Claim Group
Number of Readings Within Claim Group
Number of Miles of Line cut Within Claim Group- 16.25 Mile
Number of Samples Collected Within Claim Group

CREDITS REQUESTED
Geological Survey
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MINING CLAIMS TRAVERSED
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ASSESSMENT WORK DETAILS
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COVERING DATES
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Field__ Instrumom work, geological map

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Radiometric Background Count
Number of Stations Within Claim Group
Number of Readings Within Claim Group
Number of Miles of Line cut Within Claim Group- 1622020 nike
Number of Samples Collected Within Claim Group

CREDITS REQUESTED
Geological Survey
Geophysical Survey
Geochemical Survey


MINING CLAIMS TRAVERSED
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Stock Twp.

## THE TOWNSHIP OF <br> CLERGUE

DISTRICT OF
COCHRANE
porcupine MINING DIVISION
SCALE: I-INCH=40 CHAINS
LEGEND
PATENTED LAND
CROWN LAND SALE
LEASES
Leases
located land
LICENSE OF OCCUPATION
MINING RIGHTS ONLY
SURFACE RIGHTS ONLY
ROADS
IMPROVED ROADS
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MINES

NOTES
$400^{\circ}$ surface pights reservation around
all lakes and rivers.
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ontario
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH









