

# GEOPHYSICAL REPORT 

 ON AVLF-EM SURVEY ON THE

## ODGEN TOWNSHIP PROPERTY

PORCUPINE MINING DIVISION, ONTARIO


9

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## INTRODUCTION

This report deals with the Geophysical work program (VLF-EM) carried out on the Ogden Twp. Property, located in Ogden Township, Porcupine Mining Division, District of Cochrane, Ontario (Fig 1).

The work Program conducted was carried out during March of 1998. It included reestablishing a number of grid lines and surveying them with VLF-EM.

The purpose of this exploration project was to follow-up a previously conducted total field magnetometer survey. When correlated with the magnetics, the VLF-EM surveys should help outline the various geological units and structures shown to extend through the survey area.

## LOCATION AND ACCESS

The Odgen Twp. Property is located in Ogden Township, Porcupine Mining Division District of Cochrane, Ontario. It is situated along the central portion of the eastern boundary between Ogden and Deloro Townships. In a straight line, the claim block is approximately 9 km South- South West of the City of Timmins (Fig 2).

Access to the property during the survey period was gained by taking Pine St. south from the City of Timmins for about 10 km . At this point a seasonal logging road heads west from Pine St. A 2 km ride on this road provides access to the North East portion of the block in the area of the \#4 post. The road then continues West, cutting across the entire block, thus providing excellent access to the entire project area.



## CLAIM STATUS

The Ogden Twp. Property is comprised of 5 unpatented mining claims ( 30 units), located in Ogden Township in the Porcupine Mining Division, District of Cochrane, Municipality of Timmins, Ontario (Fig 3). The following is a list of claims.

1155254-6 units
1189546-12 units
1189547-3 units
1189548-3 units
$1206604-6$ units

## PERSONNEL

The people who were directly involved in this work program are listed below:

Steve Anderson
Raymond Meikle Lanny Anderson

Timmins, Ontario
Timmins, Ontario
Timmins, Ontario

## PREVIOUS WORK

Some of the earliest reported work carried out on this property was done by John Reid in 1910. He reported gold values at that time, which ranged from $\$ 0.60$ to $\$ 20.67$ per ton. These assay results were apparently taken from a 5 foot channel sample. In 1940 the property was then re-sampled by Sylvanite Gold Mines, in an attempt to repeat the gold values obtained by Mr. Reid. Although most of the samples taken by Sylvanite Mines reported only trace values in gold, one sample which was not assayed contained visible gold. At this time, they felt that the property should be further tested with a stripping and trenching program. However because of the cost's involved at the time, this was never done.

This is the extent of previous work carried out on the property. It is because of the limited work conducted on the ground, as well as the reportedly high Au. assay results obtained by Mr. Reid, that this property was acquired.



## GENERAL GEOLOGY

The Ogden Township Property lies within the Abitibi Greenstone Belt. Locally, the property is shown to be underlain by felsic volcanics, as shown by Map 2205 Timmins-Kirkland Lake Geological Compilation Series..

Areas of outcropping within the project area were found to be made up of a sheared, carbonated chloritic schist. The shear zone strikes at roughly, north 80 degrees west, and is dipping 80 degrees to the north. All of the exposed outcropping within the block was found to be of the above mentioned rock type, varying only slightly as to the degree of shearing or carbonatization. Numerous Quartz veins are present within the shear, varying in width from a few millimetres to better than 1 meter. Overall the property was found to contains a favourable geological setting for gold deposition.

## WORK PROGRAM

The work conducted on the Ogden Township Property was carried out in March 1998. A total of 30 km . of the existing grid was cleaned out and re-chained and covered by the VLF-EM Survey. The following is a brief description of the VLF-EM method and the parameters used for the survey:

## VLF - EM Survey

An Geonics EM-16 instrument was used to survey the entire property. Both the Inphase (dip angle) and Quadrature values were recorded at 25 m intervals. Cutler Maine ( 24.0 KHz ) was used as the transmitter station.

While VLF stands for Very Low Frequency, it is for mineral exploration purposes a very high frequency compared to other commonly used Electromagnetic Surveys. The commonly used frequencies are in the order of 18-20 kilohertz. The VLF-EM technique employs fixed transmitter stations located at various places around the world to facilitate navigation. Because of this, one has a limited choice as to what transmitter station that can be used, depending on distance from and azimuth to the transmitter station.

For this survey, Cutler Main (NAA) was used. It has an operating frequency of 24.0 khz and an azimuth of approximately of 130 degrees TN from the property. Very briefly, the transmitting station emits a concentric, circular wave pattern, expanding about the transmitter dipole. Being thousands of miles away from the transmitter, we deal with the tangent of this wave pattern which in this case would have a direction normal to the azimuth of 130 degrees. Thus any conductors having a general E-W strike direction would be intersected by this signal which induces a signal in the conductor which in turn opposes the primary signal from the transmitter station. This elliptically polarizes the resultant field enabling detection of the conductor using a receiver coil to determine the attitude of the resultant field at various points along the grid lines.

The resultant field dips away from the conductor axis on both sides of the conductor producing a cross-over on the conductor axis. For an E-W conductor, a true cross-over would occur where the field dips south and changes to a north dip as you progress from south to north. For this survey, $a+/$-system is used where a $(+)$ dip angle means the field is dipping to the south (indicating anomaly is to north) and a (-) dip angle means the field is dipping to the north (indicating anomaly is to south). This is the case only if all readings were taken facing north as per this survey.

The quadrature values, while not useful alone, can help distinguish between bedrock conductors which generally have a smaller out-of-phase response than overburden or short wavelength conductors. Also, the polarity of the quadrature is diagnostic, ie; if the polarity follows or is the same sense as the In-phase it gives more credibility to the conductor. Reverse quadrature often indicate overburden responses.

The following parameters were employed for the survey:
Instrument - Geonics EM-16
Transmitter Station - Cutler Main (USA)

- Call symbol NAA

Frequency - 24.0 KHz
Azimuth to station - approx. 130 degrees TN
Reading Direction - All reading taken facing 040 degrees.
Station Interval - 25 m
Line Interval - 100 m
Data Presentation - Plan, profiled map No 1

- Plan, Fraser Filtered map No 2
- Scale - 1:5000
- profile scale $1 \mathrm{~cm}=20 \%$


## SURVEY RESULTS

The VLF-EM Survey outlined several conductors, most of which strike east-west. They are labelled "A" - "T" on both the VLF Profiled plan map and the Fraser Filtered VLF plan map, back of this report. A copy of the previously submitted magnetic survey is included in this report to correlate with the VLF-EM results.

Conductor "I" is a short conductor with a coincident magnetic anomaly of approximately 3000 nano-teslas. It is possibly the same conductive feature as conductor " K ". The magnetic map indicates a north-west low striking between the two at approximately 1500 e . It should be noted that Paradis Creek has a distinct north-west bend or offset in this vicinity. This proposed north-west fault is coincident with one shown on Fig. 4, OGS Map No. 2455.

Conductor " O " has a very strong magnetic correlation of up to 6000 nano-teslas.

## CONCLUSIONS AND RECOMMENDATIONS

The property should be considered highly prospective for gold mineralization due to the previous work done which outlined high Au values in the shaft area and the shear zone to the northwest.

An I.P. Survey is strongly recommended to test all of the VLF conductors as well as any disseminated mineralization which might not have an EM response.

The shaft area is on an east-west bedrock ridge which should be mechanically stripped to trace the veins and look for new ones. There are several other ridges on the property which should be prospected and mapped in detail.

## CERTIFICATION

## I, Steve Anderson of Timmins, Ontario hereby certify that:

1. I hold a three year Technologist Diploma from Sir Sandford College, Lindsay, Ontario, obtained in May 1981.
2. I have been practising my profession since 1979 in Ontario, Quebec, Nova Scotia, New Brunswick, Newfoundland, NWT, Manitoba,and Saskatchewan.
3. I have been employed directly with Asamera Oil Inc. Urangellschaft Canada Ltd.. Nanisivik Mines Ltd., R.S. Middleton Exploration Services Ltd., Rayan Exploration Ltd, currently with Vision Exploration.
4. I have based conclusions and recommendations contained in this report on knowledge of the area, my previous experience and on the results of the field work conducted on the property during 1998.

Dated this 20th day of March 1998 at Timmins, Ontario.


## APPENDIX A

## GEONICS EM-16 VLF RECEIVER

## VLF EM



## EMI6

One of the most popular and widely used electromagnetic instruments, the EM16 VLF receiver makes tho ideal reconnaissance EM. This can be attributed to its field reliability, operational simplicity, compactness and mutual compatibility with other reconnaissance instruments such as portable magnetometers and radiometric detec tors.

The VLF method of EM surveying. pioneered by Geonics, has proven to be a simple oconomical means of mapping geological structure and lault tracing. The applications are many and varied, ranging from direct detection ol massive sulphide conductors to the indirect detection of precious metals and radioactive deposits.

## FEATURES

- The EM16 is the only VLF instrument that measures the quad-phase as well as the in-phase secondary field. This has the advantage of providing an additional piece of data for a more comprehensive interpretation and also allows a more accurate determination of the tilt angle.
- The secondary lields are measured as a ratio to the primary field making the measurement independent of absolute lield strength.
- The EM16 is the only VLF receiver that can be adapted to measure VLF resistivity.


## Specifications

MEASURED QUANTITY in.phase and quad phase components of vertical mag. netic field as a percentage of horizontal primary tield. (i.e. langent of the till angle and ellipticity)

SENSITIVITY
RESOLUTION
OUTPUT
In-phase $: \pm 150 \%$ Quad phase: $\pm 40 \%$
$\pm 1 \%$
Nulling by audio tone. In phase indication from mechanical Inclinometer and quad-phase from a graduated dial.
PERATING FREQUENCY 15.25 kHz VLF Radio Band. Slation selection done by means of plug. In units.
OPERATOR CONTROLS ONOH switch, battery test push button, station seleclor switch, audio volumo control, quadrature dial, inclinomoter.
POWER SUPPLY 6 disposable 'AA' calls
DIMENSIONS
WEIGHT

## $42 \times 14 \times 9 \mathrm{~cm}$

Instrument: 1.6 kg Shipping : 5.5 kg

## VLF RESISTIVITY METER



## EMI6/I6R

The EM16R is a simple, button on attachment to the EM 16 converting it to a direct reading terrain resistivity meter. The EM IGR interfaces a pair of poten tial electrodes to the EM 16 enabling the measurement of the ratio of, and the phase angle between, the horizontal electric and magnetic fields of the plane wave propagated by distant VLF radio transmitters.

The EM16R is direct reading in ohm meters of apparent ground resistivity. If the phase angle is $45^{\circ}$, the resistivity reading is the true value and the earth is untlorm to the depth of exploration (i.e. a skin depth). Any departure from $45^{\circ}$ of phase in dicates a layered earth. Two layer interpretation curves are supplied with each instrument to permit an interpretation based on a two layer earth model.

This highly portable resistivity meter makes an ideal lool for quick geological mapping and has been used successtully for a variety of applicatoons

- Detection of massive and disseminaled sulphide deposits

Overburden conductivity and thickness measurements

- Permajros mapping
- Detection and delineation of industrial minerat deposits
- Aquifer mapping


## Specifications emsa attachment

| RED QUANTITY | - Apparent Resistivity of the ground in ohm meters <br> - Phase angle between $E_{X}$ and $H_{Y}$ in degrees |
| :---: | :---: |
| RESISTIVITY RANGES | - 10 - 300 onm.melers <br> - 100 - 3000 ohm meters <br> - $1000-30000$ ahm meters |
| Phase range | 0.90 degrees |
| RESOLUTION | - Resistivity: $\pm 2 \%$ full scale <br> - Phase $: \pm 0.5^{\circ}$ |
| OUTPUT | Null by audio tone. Resistivity and phase angle read Irom graduated dials. |

OPERATING FREQUENCY 15.25 kHz VLF Radio Band. Station selection by means of rotary switch.
INTERPROBE SPACING 10 meters
PROBE INPUT IMPEDANCE $100 \mathrm{M} \Omega$ in parallet with $0: 5$ picofarads
DIMENSIONS
$19 \times 11.5 \times 10 \mathrm{~cm}$.
(attached to side of EM16)
WEIGHT
1.5 kg (including probes and cable)

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 88(3), R.S.O. 1990

Transaction Number (o fico use) 09860.00229

Assessment Files Research Imaging
authority of subsections 65(2) and 66(3) of the Mining Act. Under section 8 of the se used to review the assessment work and correspond with the mining land holder. of Mining Recorder, Ministry of Northern Development and Mines, 6th Floor,

$42 \mathrm{~A} 06 \mathrm{NW} 2007 \quad 2.18344 \quad$ OGDEN 900
Instructions: - For work performed on Crown Lands before recording a claim, use form 0240.

- Please type or print in ink.



Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;

- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

4. Work to be recorded and distributed. Work can only be assigned to cains that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

$1, S t e v e$
Alasorsola , do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation $6 / 96$ for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Aggro Authorized porting

## 6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check ( $\sim$ ) in the boxes below to show how you wish to prioritize the deletion of credits:
$\square$ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
$\square$
$\square$
$\square$

$\square$ 2. Credits are to be cut back starting with the claims listed last, working backwards; or | 4. Credits are to be cut back equally over all claims listed in this declaration; or |
| :--- |



Note: If you have not indicated how your credits ate to be deREELCE followed by option number 2 if necessary.
For Office U

| Deemed Approved Dale | Date Notification Sent. |
| :--- | :--- |
| Dale Approved | Total Value of Credit Approved |

pOor:-

## Statement of Costs for Assessment Credit

| $69860 \cdot 50229$ |
| :---: |
|  |  |

Personal Information collected on this form is oblained under the authority of subsection $\mathbf{6 ( 1 )}$ of the Assessment Work Regulation ©/se. Under section 8 of the Mining Act, the information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questlons about this collection should be directed to the Chiel Mining Recorder, Ministry of Northern Development and
Mines, 6it Floor, 933 Ramsey Lake Road, Sudbury, Ontarlo, P3E 685.


1. Work filed within two years of performance is claimed at $100 \%$ of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at $50 \%$ of the Total Value of Assessment Work. If this situation applies to your claims, use the calculation below:

$$
\text { TOTAL VALUE OF ASSESSMENT WORK } \times 0.50=\quad \text { Total } \$ \text { value of worked claimed. }
$$

## Note:

- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a request for verification and/or correction/clarification. If verification and/or correction/clarification is not made, the Minister may reject all or part of the assessment work submitted:


## Certification verlifying costs:

 , do hereby certify, that the amounts shown are as accurate as may reasonably be determined and the costs were incurred while conducting assessment work on the lands indicated on
 MAR 28 1998

Ministry of
Northern Development
and Mines

June 5, 1998

STEVEN DEAN ANDERSON 780 MCCLINTON DRIVE TIMMINS, ONTARIO P4N-4P8

## Ministère du Développement du Nor et odes Mines

Geoscience Assessment Office 933 Ramsey Lake Road 6th Floor Sudbury, Ontario P3E 6B5

Telephone: (888) 415-9846 Fax: (705) 670-5881

Visit our website at:
www.gov.on.ca/MNDM/MINES/LANDS/mlsmnpge.htm
Dear Sir or Madam:
Submission Number: 2.18344
Status
Subject: Transaction Numbers):

W9860.00229 Deemed Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number (s). The attached summary page (s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice. Allowable changes to your credit distribution can be made by contacting the Geoscience Assessment Office within this 45 Day period, otherwise assessment credit will be cut back and distributed as outlined in Section \#6 of the Declaration of Assessment work form.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact Steve Beneteau by e-mail at benetest@epo.gov.on.ca or by telephone at (705) 670-5855.

Yours sincerely,


ORIGINAL SIGNED BY
Blair Kite
Supervisor, Geoscience Assessment Office
Mining Lands Section

## Work Report Assessment Results

| Submission Number: 2.18344 |  |  | Assessor:Steve Beneteau |  |
| :---: | :---: | :---: | :---: | :---: |
| Date Correspondence Sent: June 05, 1998 |  |  |  |  |
| Transaction Number | First Claim Number | Township(s) / Area(s) | Status | Approval Date |
| W9860.00229 | 1155254 | OGDEN | Deemed Approval | June 03, 1998 |
| Section: <br> 14 Geophysical VLF |  |  |  |  |
| Correspondence to: |  |  | Recorded Hol | /or Agent(s): |
| Resident Geologist |  |  | STEVEN DEA | SON |
| South Porcupine, ON |  |  | TIMMINS, ON |  |
| Assessment Files Library Sudbury, ON | rary |  |  |  |







DELORO TWP 部








LEGEND

| INSTRUMENT: EDA OMNI PROTON PRECESSION MAGNETOMETER <br> parameters measlired: earth's total magnetic field inano-teslas <br> READING INTERVAL: 25M <br> CONTOUR INTERVAL: 50 NANO TESLAS <br> diurnal correction method: recording omni base station <br> datum subtracted from all plotted readings: 58000 nano teslas <br> PEAK MAGNETIC HIGH: <br> PEAK MAGNETIC LOW: |
| :---: |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

TOPO LEGEND


| crient: WILLOW RESOURCES I NC |  |
| :---: | :---: |
| Property: OGDEN TOWNSHIP PROPERTY |  |
| dATA POST TOTAL FIELD | and contoured netometer survey |
| Procesases: SDA | Chected: SDA |
| Dote: FEBRUARY 1997 | Tomothip: OGDEN |
| Prouniec: ONTARIO | N.T. S. $42 \mathrm{~A} / \mathrm{SW}$ |
| Scole: 1: 5000 | Drouire: MAGOGD |

