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## GEOPHYSICAL REPORT FROTON MAGETOMETER AND VLF EM-18 SURVEYS DAVIDSON-CARR PROPERTY ABH EAST GROUP

for<br>VILLENEUVE RESOURCES INC.



By: IAN SPENCE
FHANTOM EXPLORATION SERVIGES LTD.
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INTRODUCTION
Proton Magnetometer and VLF EM-18 surveys were carried out over the Davidson-Carr Property for Villeneuve Resources Inc. during the winter of 1988. The ABH West Clalm Group is comprised of 9 Patented claims and 64 unpatented claims (a complete list of the claims is included in Appendix A). Approximately 73 miles of grid was established over the group at a station interval of 100 feet along lines that were spaced every 400 feet. A Scintrex MP-2 Proton Magnetometer was used for the magnetic survey and $a$ Geonics EM-16 was used for the VLF Survey.

LOCATION AND ACCESS
The property is located approximately 140 miles to the north of the village of Ignace in Northwestern Ontario. Access to the claim group is provided by snow machine in the winter and boat in the summer. The nearest hamlet is Savant lake located along Highway 580 to the west of the property. The claim group itself is situated on the Northeast Arm of Sturgeon Lake.

The Proton Magnetometer
The Proton Precession Magnetometer is so named because it utllizes the precession of spinning protons or nuclel of the hydrogen atom in a sample of hydrocarbon fluid to measure the total magnetic field intensity. The spinning protons in a sample of kerosene behave as small, spinning magnetic dipoles. These magnets are temporarily polarized by application of a uniform magnetic fleld generated by a current in a coll of wire. When the current is removed, the spin of the protons causes them to precess about the direction of the ambient (earth's) magnetic fleld. The precessing protons then generate a small signal whose frequency is precisely proportional to the total magnetic fleld intensity and independent of the orientation the coil (sensor). The proportionality which relates frequency to the field intensity is called the gyromagnetlc ratio of the proton. The precession frequency, typically 2000 Hz , is measured as the absolute value of the total magnetic fleld intensity with an accuracy of 1 gamma.

The total magnetic intensity, as measured by the proton magnetometer is the magnetitude of the earth's fleld vector independent of of its direction. The measurement can be expressed as a length ( $50,0 D 0$ gammas) of the earth's fleld vector. A local disturbance, say 10 gammas, would add (or subtract) to the undisturbed fleld of 50,000 gammas In the usual manner of vector addition. Since the proton magnetometer measures only the magnitude of the resultant vector (whose direction is almost parallel to the undisturbed total field vector), that which is measured is very nearly the component of the disturbance vector in the direction of the undisturbed total field. Thus the change in total field intensity is called the anomaly.

The VLF EM-16
The VLF transmitting stations operating for communications with submarines have a vertical antenna. The antenna current is thus vertical, creating a concentric horizontal magnetic field around them. When these magnetic flelds meet conductive bodies in the ground, there will be secondary fields radiating from these bodies. The VLF EM-16 measures the vertical components of these secondary fields.

The VLF EM-16 is a sensitive receiver coverlng the frequency bands of the VLF transmitting
stations with means of measuring the vertical fleld components.

The recelver has two inputs with two recelving coils built into the instrument. One coll has a normally vertical axis and the other has a horizontal axis.

The signal from one of the colls (vertical axis) is first minimized by tilting the instrument. The tilt angle on the VLF EM-16 is calibrated as a percentage and not as a true dip. This is significant in the calculation of the Fraser Filter data since the larger numbers obtalned from the percentage meter will result in larger filtered values. The remaining signal in this coil is balanced out by a measured percentage of a signal from another coll, after being shifted $9 \emptyset$ degrees. This coll is normally parallel to the primary field. Thus, if the secondary fleld signals are small compared to the primary horizontal field, the mechanlcal tilt angle is an accurate measurement of the vertical real component, and the compensation $9 \varnothing$ degree signal from the horizontal coll is a measure of the quadrature vertical signal.

SURVEY PROCEDURE
The Proton Magnetometer
The magnetometer data was collected at 100 foot intervals using an Scintrex mp-2 Proton Magnetometer. The field data from the surveys was then referred to a base station recorder Scintrex MBS-2 which operated continuously throughout the survey. The purpose of the recorder was to correct the fluxuations in the earth's magnetic field as the survey took place. Data was corrected, then plotted on a map scale of $1^{\prime \prime}=400$ feet and contoured at 200 gamma intervals.

The VLF EM-10
The Cutler, Maine transmitter station was chosen because of its favourable orientation to the geology of the area.

VLF readings were taken at 100 foot intervals over the entire grid using the Geonics EM16 with both the dip angle and the quadrature being noted at each station.

To take a reading, the reference coll ("T") In the lower end of the handle is orlentated along the magnetic lines $9 \varnothing$ degrees to the station direction. This is achieved by swinging the instrument back and forth until a minimum sound Intenslty is heard. The quadrature dial is then adjusted until the sound level is further minimized.

The dip angle is then read from the inclinometer and the quadrature from the dial. The north direction was always faced when a reading was taken.

## LINECUTTING

Approximately 75 miles of line was cut over the 73 clalm property. Picket stations were established at 100 foot intervals along the grid lines. Line spacings were at 400 feet. The baseline was cut at 083 degrees azimuth to parallel the regional trends of the alrborne conductive trends. Grid lines were normal to the baseline at 353 degrees azlmuth.

## DISCUSSION OF RESULTS

Generally speaking all of the geophysical surveys yeldled meaningful information. The magnetometer survey delineated a number of anomalous trends which were probably due to interformational sulphide horlzons within a volcanic package. The VLF survey was also successful in defining these magnetic anomalles in terms of their conductivities.

The Proton Magnetometer Survey
The total field survey was extremely useful in outlining a number of magnetlc trends which occur on the claim group.

The complexity of these anomalies is evident at a glance. There seems to be a swing in the strike of the lithology in the shape of a backwards "c" from grid north to grid south.

There are a great many magnetic anomal!: on the property and these responses are likely d. for the most part, to interformational sulphides within an sequence of volcanic flows.
$A$ llsting of the magnetic and electromagnetic anomalles can be found in appendix "B".

The economic signifigance of these magnetic trends can only be evaluated by a geological mapping and sampling program.

The VLF EM-16 Survey
The VLF EM-16 survey was extremely useful in defining the conductivities of the magnetic trends. The only drawback is the topographic noise which thherently affects a high frequency survey such as this. Unfortunatly the property is located over a area where a great deal of these type of anomalles are produced (the Northeastern Arm of

Sturgeon Lake). A list of the major conductive responses can be found in Appendix " $B$ ".

CONCLUSIONS AND RECOMMENDATIONS

1) The Proton Magnetometer survey was successful in defining a number of magnetic horizons occuring on the property.
2) It is therefore recommended that a geological mapping and sampling program be conducted over the property in order to determine its economic potential.


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## APPENDIX

## LIST OF GLAIMS GOVERING THIS RETORT

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|  | PA 902154 |  |  |

## APPENDIX "B"

LIST OF ANOMALIES




## GEOPHYSICAL REPORT <br> PROTON MAGNETOMETER AND VLF EM-16 SURVEYS COUTOUR LAKE PROJECT ABH WEST GROUP <br> for <br> VILLENEUVE RESOURCES INC.



By: IAN SPENCE
PHANTOM EXPLORATION SERVICES LTD.

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4. VLF EM-16 FRASER FILTERED READINGS

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INTRODUCTION
Proton Magnetometer and VLF EM-16 surveys were carried out over the Davidson-Carr Property for Villeneuve Resources Inc. during the winter of 1988. The ABH West Clalm Group is comprised of 17 unpatented claims (a complete list of the claims is included in Appendix A). Approximately 18 miles of grid was established over the group at a station interval of 100 feet along lines that were spaced every $40 \varnothing$ feet. A Scintrex MP-2 Proton Magnetometer was used for the magnetic survey and Geonics EM-16 was used for the VLF Survey.

LOCATION AND ACCESS
The property is located approximately 140 miles to the north of the village of Ignace in Northwestern Ontario. Access to the claim group is provided by snow machine in the winter and boat in the summer. The nearest hamlet is Savant Lake located along Highway $58 \emptyset$ to the west of the property. The clalm group itself is situated on the Northeast Arm of Sturgeon Lake.

## THEORY OF OPERATION

The Proton Magnetometer
The Proton Precession Magnetometer is so named because it utillzes the precession of spinning protons or nuclei of the hydrogen atom in a sample of hydrocarbon fluid to measure the total magnetic field intensity. The spinning protons in a sample of kerosene behave as small, spinning magnetic dipoles. These magnets are temporarily polarized by application of a uniform magnetic fleld generated by a current in a coll of wire. When the current is removed, the spin of the protons causes them to precess about the direction of the ambient (earth's) magnetic field. The precessing protons then generate a small signal whose frequency is precisely proportional to the total magnetic field intensity and independent of the orientation the coil (sensor). The proportionallty which relates frequency to the field intensity is called the gyromagnetic ratio of the proton. The precession frequency, typically 200 Hz , is measured as the absolute value of the total magnetic fleld intensity with an accuracy of 1 gamma.

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The signal from one of the coils (vertical axis) is first minimized by tilting the instrument. The tilt angle on the VLF EM-16 is calibrated as a percentage and not as a true dip. This is significant in the calculation of the Fraser Filter data since the larger numbers obtalned from the percentage meter will result in larger flltered values. The remaining signal in this coll is balanced out by a measured percentage of a signal from another coil, after being shifted 90 degrees. This coil is normally parallel to the primary field.

Thus, if the secondary field signals are small compared to the primary horizontal field, the mechanical tilt angle is an accurate measurement of the vertical real component, and the compensation $9 g$ degree signal from the horizontal coll is a measure of the quadrature vertical signal.

SURVEY PROCEDURE
The Proton Magnetometer
The magnetometer data was collected at 100 foot Intervals using an Scintrex MP-2 Proton Magnetometer. The fleld data from the surveys was then referred to a base station recorder Scintrex MBS-2 which operated continuously throughout the survey. The purpose of the recorder was to correct the fluxuations in the earth's magnetic fleld ag the survey took place. Data was correoted, then plotted on a map scale of $1 "=490$ feet and contoured at 200 gamma intervals.

The VLF EM-16
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intengity $1 s$ heard. The quadrature dial is then adjusted until the sound level is further minimized. The dip angle is then read from the inclinometer and the quadrature from the dial. The north direction was always faced when a reading was taken.

## LINECUTTING

Approximately 18 miles of line was cut over the 17 claim property. Plcket stations were established at 100 foot intervals along the grid lines. Line spacings were at 400 feet. The basellne was cut at 025 degrees azimuth to parallel the regional geological trends. Grid lines were normal to the baseline at 205 degrees azimuth.

## DISCUSSION OF RESULTS

The magnetic survey was successful in defining a number of trends which occur over the clalm group. All of the magnetic responses are weak to moderate with values being generally between 300 to 1600 gammas above background. Responses such as these would indicate the an assemblage of disseminated to semi-massive sulphides of pyrite and pyrrhotite. The longer trends are likely the result of interformational sulphide bearing horizons within a volcanic package.

The best magnetic response occurs along the west shore of a narrow lake between lines $112+\varnothing \varnothing$ South at $3+\varnothing$ East and line $56+\varnothing$ South at $5+\varnothing \varnothing$ East. The measured strike length of this trend is 6400 feet however it continues off of the grid in both directions. It has spot highs and dipoles along its strike length about 300-1100 gammas above background. The best response along the trend is on line $52+\varnothing 0$ South where a reasonably broad 1400 gamma high occurs. A steep dip to the east is indicated at this point.

Another trend occurs approximately 800 feet below the trend described above. This trend has a measured strike length of 4000 feet although it appears to continue off of the grid in both directions. The best response is on line 56+øø South where the trend seems to be converging with the trend above it. It is found between line $92+\infty \varnothing$ South at $8+\infty \emptyset$ East and line $5 B+\varnothing \varnothing$ South at $8+5 \emptyset$ East. There is a break or discontinulty between lines $60+00$ and $68+60$ South of the trend which probably represents a break in the mineralization.

Another series of trends occur between line $76+\emptyset \emptyset$ South and line $8+\varnothing \varnothing$ South between $10+\emptyset \emptyset$ West and $16+\infty 0$ West. The trends in this area are generally between 2400 feet and 3200 feet in length. A number of shorter responses are attendant to these
major trends and seem to cut towards the longer lineations at an angle. This discordant nature of the magnetic horlzons may well be the result isoclinal folding.

A arcuate shaped anomaly occurs between llnes $44+\varnothing$ South at $6+\varnothing \varnothing$ West and $28+\infty \varnothing$ South at 4+øø West. This anomaly is interesting because of its morphology and shorter strike length. Its response is about 300 to 700 gammas above background and likely due to a disseminated sulphide assemblage.

There are a number of spot one line responses which occur over the grid. These responses are probably due to isolated sulphide lenses of pyrrhotite and pyrite within a volcanic pile.

VLF EM-16 Survey
The best response in terms of conductivity was conductor " $F$ " located between line $40+\varnothing 0$ South at $120 \varnothing$ West. This conductor is of moderate to good conductivity and approximately $4 \varnothing 0$ feet In length. It has correlating magnetic expression of 250 gammas and is possibllity due to a disseminated sulphide horizon within the volcanics.

Conductor "A" is located between lines $24+\varnothing \emptyset$ South at $6+\varnothing 0$ West and $12+00$ South at $13+\varnothing \emptyset$ West. The anomaly correlates with a narrow arm of a lake and it is probably due to that topographic feature. The nearest magnetic anomaly of 700 gammas is found of line $12+6$ South and it is doubtful that there is any correlation between this magnetic response and the VLF anomaly.

Conductor "B" is a weak, 2000 foot anomaly located on line $10 \emptyset+\varnothing 0$ South at 2200 East and $8 \varnothing+\varnothing \varnothing$ South at $14 \varnothing \varnothing$ East. The anomaly corresponds with the trough of a narrow lake whlch would account for the poor conductivies observed along its strike length.

Conductor "C" is another weak conductor located between lines $80+\varnothing \varnothing$ South at $11+\emptyset \emptyset$ West and $68+\emptyset \emptyset$ South at $8+\varnothing 0$ West. This conductor correlates with a lake shore and it is belleved to be the result of a topographic response.

Conductor "D is a weak conductor of $40 \varnothing$ feet located between lines $68+\varnothing \varnothing$ South and $72+\emptyset \emptyset$ South. This conductor has no magnetic correlation and belleved to be the result of a topographic response.

Conductor "E" is a weak conductor between 400 feet and 806 in length. It is located between lines $6 \varnothing+\emptyset \emptyset$ South and $64+\varnothing \varnothing$ South. This conductor has a 300 gamma flanking low assoclated with it and may be due to a weak bedrock response.

Conductor "G" $1 ;$ a two line conductor between 400 feet and 60D in length and weak conductivity. It is located between lines $108+00$ South and 112+øø South and has no associated magnetic trend. It is therefore believed that this conductor is due to a topographic feature.

There a number of one line and isolated responses present on the grid and it is felt that the majority of these conductors are the result of topographic features such as lakeshores ,bogs, etc.
overall the geophysical surveys were moderately successful in obtaining the goals that they set out to achieve.

## CONCLUSIONS AND RECOMMENDATIONS

1) The magnetometer Survey was the most Informative in terms of suggesting the presence structural features such as of folding indoor faulting. It also was successful in delineating a number of magnetic horizons on the property which will serve as a focus for further exploration.
2) The VLF EM-16 survey indicated that the majority of the magnetic horizons displayed very little conductivity. The one conductor of any Interest would be conductor " F ".
3) It is therefore recommended that a geological and geochemical program be conducted over the property in order to properly assess its economic potential. A more sophisticated geophysical method such as IP would be in order if a follow-up geochemical and geological warranted it.

RECEDED 14988

WHEE LANDS SECTION


APPENDIX
LIST OF CLAIMS COVERING THIS REPORT

## LIST OF CLAIMS COVERED BY THIS REPORT

PA 913483
PA 913484
PA 913485
PA 913488
PA 913488
PA 913490
PA 913491
PA 913492
PA 913493
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| 08/29/88 | villeneuve abh property | ain list | Page 1 |  |  |
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| ${ }^{\text {ABH }}$ | Villenelue resources | beckington lake pa | 902110 |  |  |
| ABH | villemelve resources | beckington lake pa | 902111 |  |  |
| ABH | villenelve resources | beckington lake pa | 902116 |  |  |
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| ABH | villenevve resources | beckington lake pa | 902118 |  |  |
| ABH | villenelve resources | beckington lake pa | 902119 |  |  |
| ABH | villeneuve resources | beckington lake Pa | 902120 |  |  |
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| ABH | villeneuve resources | beckington lake pa | 911620 |  | $\checkmark$ |





Credits Requested per Each Claim in Columns at right


Expenditures (excludes power stripping)
Type of Work Performed

Performed on Claims)

Calculation of Expenditure Days Credits
Mining Claims Traversed (List in numerical sequence)

Type of Work Performed

| Total Expenditures |  |
| :---: | :---: |
| $\$$ | Total <br> Days Credits |

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.



Total number of mining claims covered by this report of work.


Certification Verifying Report of Work
I hereby certify that I here a personal and intimate knowledge of the facts se v forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.
Name and Postal Address of Person Certifying


1362 (85/12)

Ontario

Ministry of
Northern Development
and Mines
Ministère du
Développement du Nord
et des Mines

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Mining Lands Section
3rd floor, 880 Bay Street
Toronto, Ontario M5S 1 Z8
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Telephone: (416) 965-4888

December 9, 1988

Your file: W8803-212 \&
W8803-235
Our file: 2.11669

Mining Recorder
Ministry of Northern Development and Mines
Court House
P.O. Box 3000

Sioux Lookout, Ontario
POV 2 TO
Dear Madam:
Re: Revised Notice of Intent dated November 21, $1 \$ 88$ R E C E IV E D
Geophysical (Electromagnetic \& Magnetometer) Survey submitted on Mining Claims Pa 902109 et al in Beckington Lake and Squaw Lake Areas

The assessment work credits, as listed with the above-mentioned Notice of intert, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

W.R. Cowan

Provincial Manager, Mining Lands
Nines \& Minerals Division
SH:pl
Enclosure
cc: Mr. G.H. Ferguson
Hining and Lands Commissioner
Resident Geologist
Toronto, Ontario
Villeneuve Resources Ltd.
188 Perreault Avenue
Val d'Or, Quebec
David Gliddon
Suite 603
J9P 2 H 5
199 Academy Drive
Thunder Bay, Ontario
P7B 51/2


Technical Assessment Work Credits

| Date <br> November 21, <br> Nover | File <br> 2.11669 |
| :--- | :--- |

"REVISED"

| Fecorded Holder | Villeneuve Resources Ltd. |
| :--- | :--- |
| Township or Area | Beckington Lake and Squaw Lake Areas |



Special credits under section 77 (16) for the following mining claims

20 days Electromagnetic
10 days Magnetometer
Pa 902129-33 913484-89-94

10 days Electromagnetic
5 days Magnetometer
Ра 911618 913488

## No credits have been allowed for the following mining claims

not sufficiently covered by the survey-insufficient technical data filed
Pa 913486-87

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; Geologocal - 40; Geochemical - 40; Section 77(19)-60.

Ministry of Northern Development and' "'ines

Technical Assessment Work Credits

| Date <br> November 21, <br> Noter | File <br> 2.11669 |
| :--- | :--- |


| Recorded Holder | Villeneuve Resources Inc. |
| :--- | :--- |
| Township or Area | Beckington Lake Area |


| Type of survey and number of Assessment days credit per claim | Mining Claims Assessed |
| :---: | :---: |
| Geophysical |  |
| Electromagnetic_32_ days |  |
| Magnetometer 16 $\qquad$ days | Pa 911678-79 |
| Radiometric_________ days |  |
| Induced polarization ___ days |  |
| Other_____ days |  |
| Section 77 (19) See "Mining Claims Assessed" column |  |
| Geological _____ days |  |
| Geochemical _______________days |  |
| Man days $\square \quad$ Airborne $\square$ |  |
| Special provision 区 Ground 区 |  |
| X Credits have been reduced because of partial coverage of claims. |  |
| Credits have been reduced because of corrections to work dates and figures of applicant. |  |

Special credits under section 77 (16) for the following mining claims
$\square$
No credits have been allowed for the following mining claimsnot sufficiently covered by the survey
X insufficient technical data filed

Pa 911625-26

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; Geologocal - 40; Geochemical - 40; Section 77(19)-60.

Evans Lake Area-6-2031


Squaw Lake Area- 6-31! 0

Beckington Lake Area G-2532















