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GEOPHYSICAL - GEOCHEMICAL REPORT ACACIA MINERAL DEV. CORP. LTD.

Daisy, Ron, FF and J mineral claims, Alta Lake area, Vancouver Mining Division, B.C. Lat. 50°00'N Long. 123°06'W N.T.S. 92 J/3

AUTHOR: Glen E. White B.Sc., Geophysicist DATE OF WORK: Sept. 30 - Oct. 21, Nov. 16-23, 1976 DATE OF REPORT: December 6, 1976

# 92J/3E

MINERAL RESOURCES BRANCH ASSESSMENT REPORT NO



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#### INTRODUCTION

During the fall of 1976, a program of reconnaissance geochemical soil sampling, electromagnetometer and magnetometer surveying was conducted over a contiguous block of mineral claims in the Alta Lake area by Glen E. White Geophysical Consulting and Services Ltd. on behalf of Acacia mineral Dev. Corp. Ltd. of Vancouver, B.C.

The purpose of the surveys was to examine an area of pendant rocks containing several large quartz-carbonate bands and an old tunnel on the Daisy claims containing copper, gold and silver mineralization in the quartzcarbonate formation. Northair Mines Ltd., which is operating at 300 tons per day and producing a lead-zinc-copper-gold and silver concentrate, is on much the same rock formation some 8 miles to the north.

#### PROPERTY

The property covered by this survey as illustrated on Figure 1, consists of the Daisy 1-8, Ron 1-12, FF 1-8, and J 1-8 mineral claims staked under the two-post staking system.

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#### LOCATION AND ACCESS

The mineral claims are located on the east side of Daisy Lake between the Cheakamus River and Garibaldi Provincial Park, Vancouver Mining Division, B.C. Latitude 50°00'N, Longitude 123°06'W, N.T.S.92 J/3.

Access is via some 4 miles of good gravel base logging road which originates approximately 100 yards north of the Callaghan Creek bridge on Highway 99.

#### GENERAL GEOLOGY

The survey area lies on a north facing slope which drains into Daisy Lake and the Cheakamus River. The topography is generally steep which makes access and exploration difficult.

The very little geological information available for this region is shown on G.S.C. Maps 1711 and 42-1963. Essentially, the host rocks for the mineralization are sediments and volcanics of Triassic to Cretaceous age which have been enveloped by the Coast Range Cretaceous or earlier granodiorites and granites.

The sedimentary and volcanic rocks show variable degrees of metamorphism but are thought to form pendants or septas in the Coast Range batholith.

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The mineral discovery made by Northair Mines Ltd. on their Warman claims shows veins of quartz and carbonate in metamorphosed rocks bearing lead, zinc and copper mineralization with economically significant values of gold and silver.

The survey area appears to cover metamorphosed pendant rocks, andesites and schists with an intermingling of gneisses and minor diorite. A significant section of quartz-carbonate rocks can be seen along the logging road in claims Ron 11 and 12 where minor galena and chalcopyrite have been found.

#### SURVEY SPECIFICATIONS

#### Survey Grid

The survey grid consists of NE-SW directed lines spaced 400 feet apart, turned off at right angles from a NW-SE baseline. The baseline follows the Ron claim line and is some 10,400 feet in length. Some 25 line miles of survey grid has been established.

#### Geochemical Survey

Soil samples of the upper "B" horizon were obtained with mattocks or soil augers, depending upon the depth of the A<sub>o</sub> horizon, at 200 foot intervals along the grid lines for the reconnaissance surveying and 50 foot intervals for the detail surveying. The soil samples were then placed in soil envelopes provided by Chemex Labs Ltd. of North Vancouver, B.C. The samples were delivered to the above lab where -80 mesh sieving, digestion by hot perchloricnitric acid and analysis by atomic absorption were carried out under the supervision of professional geochemists.

Some 850 soil samples were obtained and analysed for p.p.m. copper, lead, silver and zinc. Both corrected and uncorrected p.p.m. value for silver were obtained as the amount of calcium interferrance is a good indicator of the presence of the quartz-carbonate viens.

#### The Magnetometer Survey

The magnetometer survey was conducted using a Scintrex MF-1 fluxgate magnetometer with an accuracy of  $\neq$  10 gammas. This instrument measures the vertical component of the earth's magnetic field. Corrections for diurnal were made by establishing survey loops of not more than 90 minutes duration.

#### The Electromagnetometer Survey

This survey was conducted using a Ronka EM-16 V.L.F. electromagnetometer. This instrument acts as a receiver

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only. It utilizes the primary electromagnetic fields generated by VLF marine communication stations. These stations operate at a frequency between 15 - 25 KHZ, and have a vertical antenna-current resulting in a horizontal primary field. Thus, this V.L.F. - E.M. measures the dipangle of the secondary field induced in a conductor.

For maximum coupling, a transmitter station located in the same direction as the geological strike should be selected, since the direction of the horizontal electromagnetic field is perpendicular to the direction of the transmitting station.

Readings were taken at 50 foot intervals and the data filtered in the field by the operator as described by D. C. Fraser, Geophysics Vol. 34, No. 6 (December 1969). The advantage of this method is that it removes the dc and attenuates long spatial wave lengths to increase resolution of local anomalies, and phase shifts the dipangle data by 90 degrees so that crossovers and inflections will be transformed into peaks to yield contourable quantities.

For this survey, the station at Jim Creek, Washington, was used.

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#### Self-Potential Survey

The self-potential method involves measurement at the surface of electric potentials such as developed by the oxidization of sulphide deposits. This survey was completed with a Fluke 8000A D.V.M. with an input impedance of 10 megohms in all ranges, a response time of one-half seconds, and a sensitivity of 0.1 millivolts.

#### DISCUSSION OF RESULTS

The copper geochemical map, Figure 2, shows a low background in the order of some 10 p.p.m.. Anomalous values have been contoured at 30, 60 and 120 p.p.m. levels. The reconnaissance survey detected a high of 386 p.p.m. and the detail surveying, 1000 p.p.m. Three areas of principal interest were delineated, claims Daisy 1 and 2, claims Daisy 3, 4 and 5, and claims Ron 7 and 9. A number of individual high values were also detected which, due to the wide sampling, could also prove to be of interest.

The copper anomaly on claims Daisy 1 and 2 is in the area of the old tunnel containing copper-gold and silver values, the highest of which ran 2 feet of Au .14 oz, Ag 3.3 oz, Cu 2.15%, as discussed by W. G. Stevenson in his report dated December 15, 1969. Thus, the geochemical values would indicate this zone is likely

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continuous for some 1200 feet. Area 2 on the Daisy 3 - 5 claims, shows more single value anomalies. However, they show excellent correlation with geochemical values of lead and zinc. Area three on the Ron 7 and 9 claims gives the strongest copper geochemical values. Geological investigation in this area gave no explanation for the anomaly other than it is downhill from a band of quartz-carbonate. However, previous exploration work in the general area has shown that strong copper anomalies can also be associated with the pendant granite contact zone.

The zinc geochemical map, Figure 3, shows weak background values in the order of 20 p.p.m., typical of other surveys in the general region. The area of Daisy 1 and 2 claims shows a weakly supportive zinc geochemical anomaly to the copper trend whereas the area of claims Daisy 3 to 5 show more positive northerly directed trends. The northern section of the survey grid contains a number of random anomalous values which when correlated with the less geochemically mobile element lead, indicate a number of coincident anomalies.

The lead geochemical map, Figure 4, shows a low background in the order of 10 p.p.m. Anomalous values have been contoured at 18, 24 and 30 p.p.m. The area of claims Daisy 3 - 5 shows well defined anomalies which correlate with geochemical values of copper and zinc while area one in claim Daisy 1, lead is very weak. Mineral claim Ron 5 shows some positive lead values which reached a high of 88 p.p.m. but do not correlate with the other elements. In area three, and Ron claims 11 and 12, the lead values trend in a northerly direction and contain two specific target zones, one in claim Ron 9 and the other in Ron 12.

The silver map, Figure 5, shows uncorrected silver values which varied from 0.2 to 2.6 p.p.m. Corrected silver values were also obtained which indicated that the only true silver value greater that 0.5 p.p.m. was at 0 - 2E which ran 1 p.p.m. Experience in the area has shown that the uncorrected silver values are a good indicator of the quartz-carbonate zone. The contours are biased in a NE-SW direction much the same as those of the copper, lead and zinc maps. This would indicate that the general trend of the lithology and possibly the quartzcarbonate system is NE-SW. Thus, the high lead values in Ron 5 may possibly be associated with a quartz-carbonate zone extending SW from Ron 8 as depicted by the silver contours.

Detail soil sampling was attempted over the three main areas of interest. However, due to the late season and weather problems, only the area of claims Ron 9 - 12

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was accessible. Plates 1 - 4 illustrate the values obtained. A high copper value of 1000 p.p.m. was obtained on line 205-11+50W. No evidence of causitive mineralization was observed during a reconnaissance evaluation of the anomalies. The high lead-zinc values on line 10S are in a steep ravine and may, though they are on trend, be in part due to ion concentration by ash from slash burning.

The electromagnetometer survey, Figure 6, illustrates a number of pronounced conductors detected in the area of mineral claims Daisy 3 - 8. The strongest of which gave a reading of 113% filtered dip angle. Readings in the order of 80% and over are considered strongly anomalous and usually reflect graphite or sulphide mineralization rather than structure. The responses are certainly much more pronounced than elsewhere in the survey area and thus may reflect a specific lithologic unit bearing graphite or sulphide mineralization such as an argillite or shale sequence. Artificial boundary lines enclosing the area of high readings appear to outline the nose of a fold with its axis trending NE-SW, parallel to the geochemical contour patterns.

The magnetic intensity map, Figure 7, shows considerable variations in magnetic intensity in the center and in the northeast corner of the survey area. The

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areas of high magnetic intensity indicate zones of higher magnetic susceptibility likely within an andesitic or basaltic rock type. Several of the linear anomalies may possibly be caused by andesitic or diabase dykes. The geochemical values appear to be somewhat discontinuous in the center area of high magnetic intensity which may indicate a thin volcanic flow cap.

The limited amount of self-potential surveying, Plate 5, shows no well defined voltage source.

Correlation of the geochemical and geophysical data located a number of anomalies which can be separated into copper-silver targets with weak zinc values such as in Daisy 1 and Ron 9 and 11, whereas the geochemical anomalies in claims Daisy 3 - 5 are composed of all four elements copper, lead, silver and zinc. The electromagnetometer survey located a number of strong conductors in the area of claims Daisy 3 - 6 which may be due to graphite and/or sulphide mineralization. Several of the conductors are in close proximity to the geochemical anomalies as at 885 - 3W and 925 - 15W. The NW extension of these zones may possibly be covered by volcanic cap rock as indicated by the high magnetic intensity values. The reconnaissance and detail geochemical soil sampling in the area of claims Ron 9 - 12 located a number of geochemical responses in the area of the known occurances of quartz-carbonate viens.

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#### CONCLUSION

During the fall of 1976, a program of geochemical soil sampling, magnetometer and electromagnetometer surveying was conducted over the Ron, Daisy, FF and J claims, Alta Lake area, B.C., on behalf of Acacia Mineral Dev. Corp. Ltd.

The surveys delineated three areas of interest, the first on claims Daisy 1 and 2 in the area of the old tunnel containing gold, silver and copper mineralization, the second on the Daisy 3 - 5 claims where there are coincident geochemical and electromagnetic conductors, and the third in the area of claims Ron 9, 11 and 12 where there are quartz-carbonate viens, a soil sample giving 1000 p.p.m. copper and lead-zinc values possibly associated with the quartz-carbonate viens.

#### RECOMMENDATIONS

It is recommended that areas 1 and 2 be further detailed with magnetometer, electromagnetometer and soil sampling to determine a specific target zone, whereas in area three, the quartz-carbonate zone and copper geochemical anomaly, should be examined by a limited amount of diamond drilling.

Respectfully submitted, GLEN E. WHITE GEOPHYSICAL CONSULTING & SERVICES LTD. B.Sc. Geophysicist

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#### APPENDIX

# Instrument Specifications

#### MAGNETOMETER

- A. Instrument
  - (a) Type Fluxgate
  - (b) Make Sharpe MF-1

# B. Specifications

- (a) Measurement Vertical Magnetic Field
- (b) Range =100 K gammas in 5 ranges
- (c) Sensitivity Maximum 20 gammas per scale division
- (d) Accuracy Ilo gammas

# C. Survey Procedures

- (a) Method One and one half hour loops
- (b) Corrections (i) Base

# (ii) Diurnal

(c) Station relationship - each station read for intensity of vertical magnetic field. -13-

# APPENDIX

# Instrument Specifications

#### ELECTROMAGNETOMETER

A. Instrument

(a) Type - Geonics VLF - EM
(b) Make - Ronka Em 16

#### B. Specifications

Measurement

 (i) Utilizes primary fields generated by VLF marine communication stations, measures the vertical field components in terms of horizontal field present.

(ii) Frequency range 15-25 KHZ

(iii) Range of measurement - in phase = 150% or = 90° - quadrature = 40%

(iv) Method of reading - null detection by earphone, real and quadrature from mechanical dials.

(v) Accuracy  $- \equiv 1\%$  resolution

C. Survey Procedures

- Method (a) Select closest VLF station perpendicular to traverse lines.
  - (b) In-phase dial measures degree of tilt from vertical position.
  - (c) Quadrature dial calibrated in percent null.
  - (d) Station plot plot values read at station surveyed.
  - (e) Kanually filter dip-angle data.

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# APPEND IX

#### Instrument Specifications

#### SELF-POTENTIAL

- A. Instrument
  - (a) Type D.V.M. 8000A-01
  - (b) Make Fluke Seattle, U.S.A.

# B. Specifications

- (a) Range ∠ 199.9 mv to 1199 v
- (b) Sensitivity 0.1 mv
- (c) Accuracy  $\frac{1}{2}$  0.1% of reading plus 1 digit
- (d) Input impedance 10 megohms all ranges
- (e) Response time 0.5 seconds
- (f) Temperature range  $-10^{\circ}$ C to  $55^{\circ}$ C
- (g) Weight 2.75 lbs.
- (h) Humidity 0-80% RH
- (i) Power 8 hr. rechargeable

# C. Survey Technique

- (a) Continuous profiling
- (b) Gradient profiling

#### STATEMENT OF QUALIFICATIONS

- Name: WHITE. Glen E.
- Profession: Geophysicist

Education: B.Sc. Geophysics - Geology University of British Columbia

Professional

- Associations: Associate member of Society of Exploration Geophysicists
  - Vice-President of B.C. Society of Mining Geophysicists.
- Experience: Pre-Graduate experience in Geology -Geochemistry - Geophysics with Anaconda American Brass.

Two years Mining Geophysicist with Sulmac Explorations Ltd. and Airborne Geophysics with Spartan Air Services Ltd.

One year Mining Geophysicist and Technical Sales Manager in the Pacific north-west for W. P. McGill and Associates.

Two years Mining Geophysicist and supervisor Airborne and Ground Geophysical Divisions with Geo-X Surveys Ltd.

Two years Chief Geophysicist Tri-Con Exploration Surveys Ltd.

Five years Consulting Geophysicist.

Active experience in all Geologic provinces of Canada.

# COST BREAKDOWN

Per	rsonnel	Date		Wages	<u>Total</u>
E.	MacKenzie	Sept 30- Oct	21/76	<b>.\$</b> 95/day	\$2090.00
T.	MacKenzie	.Sept. 30-0ct. 16-18, 22, 23	16, Nov.	85/dav	1870.00
D.	Berryman	Sept. 30-Oct.	21, Nov.	75 /dom	1900 00
L.	Durkin	Sept. 30-Oct.	16/76	67/day	.1139.00
J.	Behenna	.Nov. 16-18/76	••••••		225.00

Meals and Accomodations@ \$25/day/man2200.00
Vehicle 4x4 plus gas
Instrument lease - Mag and EM
Materials
Geochemical analysis
Supervision, interpretation, drafting
and reports
<sup>4</sup> otal <u>\$15,197.00</u>

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![](_page_29_Figure_0.jpeg)

![](_page_30_Picture_0.jpeg)