ARIS SUMMARY SHEET

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ASSESSMENT REPORT 18842   MINING DIVISION: Cariboo

ROPERTY: Wingdam
LOCATION: LAT 53 02 00 LONG 121 58 00
UTM 10 5876260 569295
NTS 093H04W

CAMP: 038 Cariboo - Barkerville Camp

LAIM(S): Free,Hy,Ram,Dam,Wing 2,Purdy,Rise 1-5,Clara,Matt
OPERATOR(S): Silver Sceptre Res.
AUTHOR(S): Konings, M.
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DONE: Geophysical
EMAB 410.0 km;VLF
Map(s) - 5; Scale(s) - 1:5000
MAGA 410.0 km
Map(s) - 2; Scale(s) - 1:5000
RELATED
EPORTS: 06295,07094,07540,07550,08269,09740,10640,10815,12738,12950,16113
17010,18558

SILVER SCEPTRE RESOURCES LTD.

REPORT ON
COMBINED HELICOPTER-BORNE
MAGNETIC, ELECTROMAGNETIC AND VLF-EM SURVEY
WINGDAM AREA
CARIBOO MINING DIVISION
BRITISH COLUMBIA

NTS 93H/4W

LAT. 53^{o} 02′ LONG. 121^{o} 58′

CLAIMS SURVEYED

FREE	7366	DAM	7933	RISE 1-5	9539-43
HY	7410	WING 2	8370	CLARA	9544
RAM 1-4	7785-88	PURDY	9525	MATT	9545

OWNER: RISE RESOURCES INC.
OPERATOR: SILVER SCEPTRE RESOURCES LTD.

BY
AERODAT LIMITED
May 7, 1989.

J8908

M. Konings
Consulting Geophysicist

COMPLETE LIST OF CLAIMS
COMPRISING THE LIGHTNING CREEK (WINGDAM) PROPERTY

CLAIM	RECORD	UNITS	DATE RECORDED	
MOST	7253	20	13 Jan 86	
LIGHT 1	7254	1	13 Jan 86	
LIGHT 2	7336	1	17 Feb 86	
LANCE	7365	8	25 Feb 86	
FREE	7366	20	25 Feb 86	
WING	7402	12	14 Mar 86	
HY	7410	4	20 Mar 86	
LAKE 1	7437	1	25 Mar 86	
LAKE 2	7438	1	25 Mar 86	
LIGHT 3	7482	1	7 Apr 86	
LIGHT 4	7483	1	7 Apr 86	
ANGUS	7512	20	14 APr 86	
RAM 1	7785	1	18 Jul 86	
RAM 2	7786	1	18 Jul 86	
RAM 3	7787	1	18 Jul 86	
RAM 4	7788	1	18 Jul 86	
DAM	7933	20	5 Sep 86	
WING 2	8370	20	29 Apr 87	
PURDY	9525	16	9 Dec 88	(Replaces Wingdam/7810)
RISE 1	9539	1	7 Feb 89	
RISE 2	9540	1	7 Feb 89	
RISE 3	9541	1	7 Feb 89	
RISE 4	9542	1	7 Feb 89	
RISE 5	9543	1	7 Feb 89	
CLARA	9544	20	12 Feb 89	
MATT	9545	20	6 Feb 89	
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1. INTRODUCTION

This report describes an airborne geophysical survey carried out on behalf of Silver Sceptre Resources Ltd. by Aerodat Limited. Equipment operated included a 4 frequency electromagnetic system, a high sensitivity cesium vapour magnetometer, a dual frequency VLF-EM system, a video tracking camera, and an altimeter. Electromagnetic, magnetic radar navigation and altimeter data were recorded both in digital and analogue form. Positioning data was recorded on VHS video film, as well as being marked on a photomosaic base map by the operator while in flight.

The survey area, is comprised of 1 contiguous block in central British Columbia and is situated about 40 kilometres east of Quesnel. The survey was flown on January 29, March 12, and March 15. Eight flights were required to complete the survey with flight lines orientated at an azimuth of 180° 360 and flown at a nominal spacing of 50 metres. Coverage and data quality were considered to be within the specifications described in the contract.

The purpose of the survey was to record airborne geophysical data over and around the Wingdam Area Property of Silver Sceptre Resources Ltd. A total of 410 kilometres of the recorded data were compiled on 1 map sheet and are presented as part of this report according to specifications outlined by Silver Sceptre Resources Ltd.

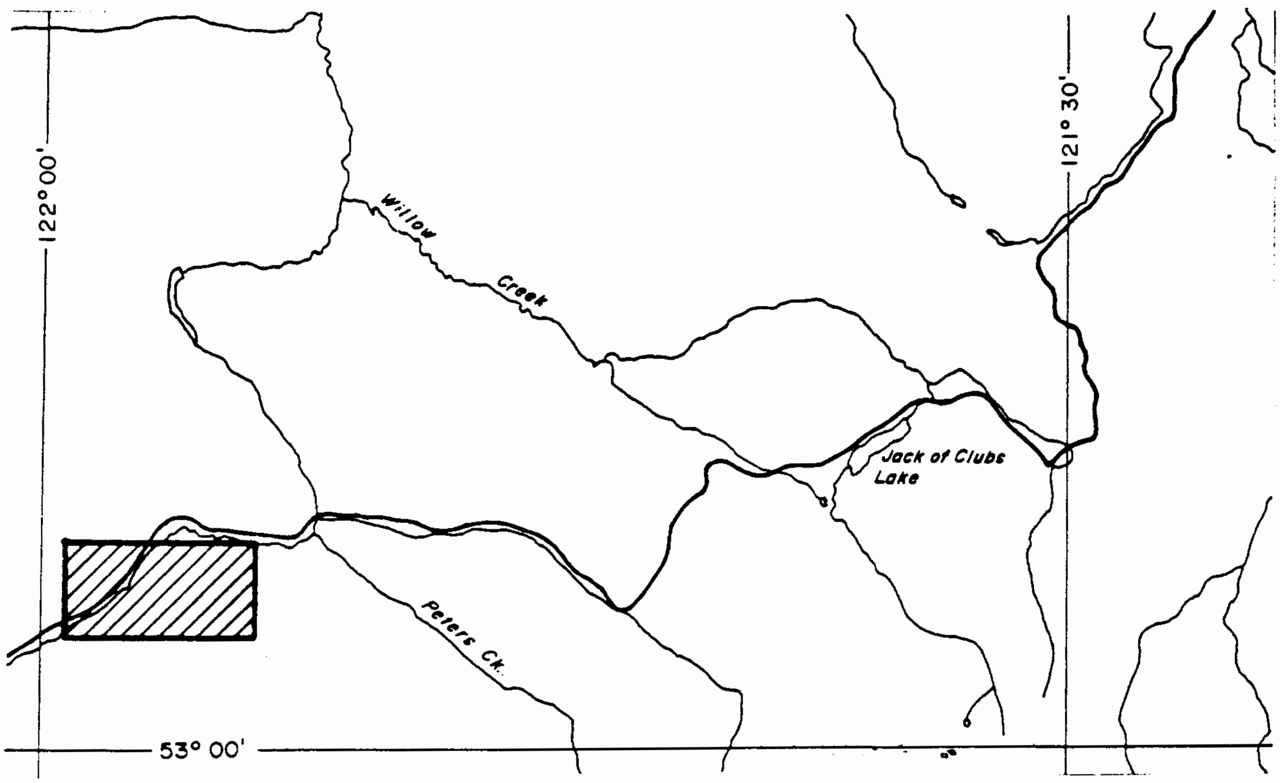
SUMMARY GEOLOGY (lithology, age, structure, alteration, mineralization, size, and attitude):

The property straddles the contact between Lower Paleozoic metamorphosed sediments of the Cariboo Group and Mesozoic, mainly volcanic rocks of the Quesnel Trough. The Cariboo Group, which is present in the eastern portion of the property, is comprised predominantly of clastic rocks. Rocks are compressed into northwesternly trending folds. Mineralization consists of pyrite bearing quartz veins.

REFERENCES TO PREVIOUS WORK Gonzalez, R.A. and Akhurst.K., 1988: Geochemical and Geophysical Report on the Wingdam (Lighning Creek) Prospect. Newton. D., 1988: Rotary Drilling.

2. SURVEY AREA LOCATION

The survey area is outlined on the index map shown below. It is centred between latitudes 53° 02' - 53° 03' 45" and longitudes 121° 53' 45" - 121° 59' 30". The area is located in the Wingdam area of British Columbia, and is covered by NTS sector 93 H 4. The property straddles Lightning River, and includes the settlement at Wingdam. An all weather road runs parallel to the river, and lumbering operations have opened up other parts of the survey area.



3. AIRCRAFT AND EQUIPMENT

3.1 Aircraft

An Aerospatiale A-Star 350 D helicopter, (C-GFHS), piloted by B. Curiston, owned and operated by Canadian Helicopters Limited, was used for the survey. The Aerodat equipment operator and navigator was V. Cole. Installation of the geophysical and ancillary equipment was carried out by Aerodat. The survey helicopter was flown at a mean terrain clearance of 60 metres, while the EM sensors have a ground clearance of 30 metres.

3.2 Equipment

3.2.1 Electromagnetic System

The electromagnetic system was an Aerodat 4 frequency system. Two vertical coaxial coil pairs are operated at 935 Hz and 4600 Hz and two horizontal coplanar coil pairs at 4175 Hz and 32 kHz. The transmitter-receiver separation was 7 metres. In phase and quadrature signals were measured simultaneously for the 4 frequencies with a time constant of 0.1 seconds. The electromagnetic bird was towed 30 metres below the helicopter.

3.2.2 VLF-EM System

The VLF-EM System was a Herz Totem 2 A. This instrument measures the total field and quadrature component of the selected frequency. The sensor was towed in a bird 12 metres below the helicopter. The transmitting station used was NSS, Annapolis, Maryland broadcasting at 21.4 kHz. This station is maximum coupled with E-W striking conductors and provides usable results for strikes + 45 degrees.

3.2.3 Magnetometer

The magnetometer employed a Scintrex Model VIW 2321 H8 cesium, optically pumped magnetometer sensor. The sensitivity of this instrument was 0.1 nanoTeslas at a 0.2 second sampling rate. The sensor was towed in a bird 12 metres below the helicopter.

3.2.4 Magnetic Base Station

An IFG (GEM 8) proton precession magnetometer was operated at the base of operations to record diurnal variations of the earth's magnetic field. The clock of the base station was synchronized with that of the airborne system to facilitate later correlation.

3.2.5 Radar Altimeter

A King KRA 10 radar altimeter was used to record terrain clearance. The output from the instrument is a linear function of altitude for maximum accuracy.

3.2.6 Tracking Camera

A Panasonic video flight path recording system was used to record the flight path on standard VHS format video tapes. The system was operated in continuous mode and the flight number, real time and manual fiducials were registered on the picture frame for cross-reference to the analog and digital data.

3.2.7 Analog Recorder

An RMS dot-Matrix recorder was used to display the data during the survey. In addition to manual and time fiducials, the following data was recorded:

Channel	Input	Scale
CXI1	Low Frequency Inphase	25 ppm/cm
CXQ1	Low Frequency Quadrature	25
CXI2	High Frequency Inphase	25
CXQ2	High Frequency Quadrature	25
CPI1	Mid Frequency Inphase	100ppm/cm
CPQ1	Mid Frequency Quadrature	100

Channel	Input	Scale
CPI2	High Frequency Inphase	200
CPQ2	High Frequency Quadrature	200
VLT	VLF-EM Total Field, Line NSS	25 %/cm
VLQ	VLF-EM Quadrature, Line NSS	25 %/cm
VOT	VLF-EM Total Field,Ortho NAA	25 %/cm
VOQ	VLF-EM Quadrature, Ortho NAA	25 %/cm
RALT	Radar Altimeter, (150 m. at top of chart)	100ft/cm
MAGF	Magnetometer, fine	25nT/cm
MAGC	Magnetometer, coarse	250nT/cm

3.2.8 Digital Recorder

A DGR 33:16 data system recorded the survey on magnetic tape. Information recorded was as follows:

Equipment	Recording Interval
EM System	0.20 seconds
VLF - EM	0.20 seconds
Magnetometer	0.20 seconds
Altimeter	0.50 seconds
Nav System	1.0 second
Power Line Monitor	0.10 seconds

3.2.9 Radar Positioning System

A Motorola Mini Ranger III, UHF radar navigation system was used for both navigation and flight path recovery. Transponders sited at fixed locations were interrogated several times per second and the ranges from these points to the helicopter are measured to a high degree of accuracy. A navigational computer triangulates the position of the helicopter and provides the pilot with navigation information. The range/range data was recorded on magnetic tape and on the analog records for subsequent flight path determination.

4. DATA PRESENTATION

4.1 Base Map

An orthophoto mosaic base at a scale of 1:5,000 was prepared as a base map for the project data. The final data is presented on an unscreened Cronaflex base. Recovery of a number of points ensures that the electronic navigation coordinates are accurately registered to the base topography.

4.2 Electromagnetic Anomaly Map

4.2.1 Flight Path

The flight path was derived from the Mini Ranger UHF radar positioning system. The distance from the helicopter to two established reference locations was measured several times per second and the position of the helicopter calculated by triangulation. It is estimated that the flight path is generally accurate to about 10 metres with respect to the topographic detail on the base map.

The flight lines have the flight number as an additional reference and the camera frame, time, and the navigator's manual fiducials for cross reference to both analog and digital data.

4.2.2 Electromagnetic Data Compilation

The electromagnetic data was recorded digitally at a sample rate of 10 per second with a time constant of 0.1 seconds. A two stage digital filtering process was carried out to reject major sferic events to reduce system noise.

Local sferic activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude, but leave a broader residual response that can be confused with geological phenomenon. To avoid this possibility, a computer algorithm searches out and rejects the major sferic events. The signal to noise ratio was further enhanced by the application of a low pass digital filter. It has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 0.25 seconds. This low effective time constant permits maximum profile shape resolution.

Following the filtering process, a base level correction was made. The correction amplitude of the various inphase and quadrature components is zero when no conductive or permeable source is present. The filtered and levelled data was used in the interpretation of the EM data.

4.2.3 Airborne EM Interpretation

An interpretation of the electromagnetic data was prepared showing peak locations of anomalies and conductivity thickness ranges along with the inphase amplitudes (computed from the 4600 Hz coaxial response). The peak response symbols may be referenced by a sequential letter, progressing in the original flight direction. The EM response profiles are presented on a separate map with an expanded horizontal scale across the geological strike.

4.3 Total Field Magnetic Contours

The aeromagnetic data was corrected for diurnal variations by adjustment with the digitally recorded base station magnetic values. No correction for regional variation (IGRF) was applied. The corrected profile data was interpolated onto a regular grid at a 25 metre true scale interval using a cubic spline technique. The grid provided the basis for threading the presented contours at a 2 nanoTesla interval. The aeromagnetic data have been presented with flight path and electromagnetic information on a Cronaflex copy of he photomosaic base map.

4.4 VLF-EM Total Field

The VLF-EM signals from NSS, Annapolis, Md., broadcasting at 21.4 kHz, were compiled as contours in map form and presented on a Cronaflex overlay of the photomosaic base map along with flight lines and anomaly information. The orthogonal VLF data was not utilized in the compilation due to station maintenance shutdown periods. The data was recorded on the analog records and on digital tape.

4.5 EM Resistivity Contours

The apparent resistivity was calculated from the 4175 Hz coplanar coil pair and the resultant contours are presented on a base map. The calculations are based on a half space model. This is equivalent to a geological unit with more than 200 metres width and strike length. In practice, conductors, conductive lithologies and surficial conductors often have lesser dimensions, at least in one of the three dimensions. Apparent resistivities are usually underestimated for these sources.

5. INTERPRETATION

5.1 Magnetic Interpretation

The magnetic data from the high sensitivity cesium vapour magnetometer provided virtually a continuous magnetic reading when recorded at two-tenth second intervals. The system is also noise free for all practical purposes. The sensitivity of 0.1 nT allows for the mapping of very small inflections in the total field, resulting in a contour map that is comparable in quality to ground data. Both the fine and coarse magnetic traces were recorded on the survey analog records.

The magnetic trends closely match the known regional geological trends striking in an east west direction. There are three main magnetic textures (or lithologies) in the survey area: elongated magnetic domains which probably correlate with sedimentary rocks; circular and elliptical shaped magnetic zones which match the usual definition of felsic intrusives; and a host lithology of low susceptibility contrast but variable magnetization zones. Crosscutting faults have added a level of complexity to the magnetic data which inhibit stratigraphic correlations.

Most magnetic zones in the survey area are elongated zones with strike directions which vary from the regional E-W directions. This is in part the result of faulting and intrusives, but the irregular lithologies may also signify the presence of volcanics. Folding appears only on a regional scale, and facies changes as seen in susceptibility changes along strike, are generally predictable. Structural deformation including folding, faulting and late fracturing is present throughout the survey area. There is no systematic correlation between the topography and the magnetic peaks and lows. The only exception to this conclusion are the cross faults, which have been weathered and eroded low to become linear valleys.

The irregularity of the magnetics may be attributed to thin mafic flows and related volcaniclastic sediments with a high magnetite content. Although the magnetic contours provide several potential breaks interpreted from magnetic discontinuities across strike, most are not substantiated by the EM interpretation, as conductors are generally continuous. This is not the case with the southeastern corner of the survey area, where the conductors are at least as discontinuous as the magnetics, inferring a complex structural composition.

There are no homogeneous nonmagnetic lithologies in the survey area, although there are less magnetic areas. These low susceptibility contrast zones generally do not have associated bedrock conductors.

5.2 Vertical Magnetic Gradient Contours

The high magnetic susceptibilities detected as total magnetic field amplitudes, make the recognition and exact positioning of subtle anomalies difficult. The vertical gradient data clearly removes the regional background levels and sharpens the residual anomalies. Closely spaced anomalies can be more easily separated, interpreted and modelled.

Breaks and offsets are more clearly defined and some faults and shears are recognizable as definite marker horizon displacements. These have been drafted on the interpretation maps but only in rare situations do they have a physiographic linear expression. Strike slip faults are not easily defined. Sometimes, they occur at the contact of major lithological units, such as volcanics and sediments. A linear magnetic (and calculated magnetic gradient) low can mark these zones. Several zones which have very continuous magnetic low expressions have been selected and are illustrated on the interpretation map. Resistivity low zones and VLF-EM conductors are associated with several of these expressions. However, a sharp contact can also cause these magnetic effects, and thorough ground evaluations are recommended to verify the interpretations.

Discrete magnetic anomalies with associated EM conductors are rare in the survey area. With the exception of the responses at line 180, 11:01, most of the conductors are not directly related to magnetic sources.

The "zero" contour level is a close approximation of the width of the susceptibility sources. If required, vertical gradient contour trends can be compiled into a pseudo geological map.

5.3 VLF-EM Total Field Interpretation

The VLF system results responded to bedrock conductors, and resistivity low zones. There were no obvious associations of linear responses with conductive overburden as might be expected from the Lightning River valley. These often have a similar appearance to bedrock conductors, and in the project area, they would have an orientation parallel to the regional lithologies, where there are low lying areas. The field strengths are low, partially the result of low primary field strengths. VLF peak field strengths are the result of maximum coupling angles with the primary field.

Almost every zone has a strike radial to the transmitter origin, a predictable result. There are deviations to this strike, most of which are substantiated by the EM profile results and resistivity contours. A number of VLF zones have no significant EM responses. At a first glance, these would be interpreted as fracture, fault and or shear zones, but magnetic correlations do not always substantiate this proposition. In this area, VLF-EM conductors have a distinct affinity for contact zones between magnetic and non magnetic lithologies.

On the interpretation maps, only those VLF zones which are interpreted as possible or definite bedrock conductors or structural zones have been plotted. As a rule, discrete EM conductors have no associated VLF-EM responses. This may be explained by the absence of current gathering effects in short strike length targets in the presence of low field strengths.

5.4 Electromagnetics

The electromagnetic data was first checked by a line to line examination of the analog records. The record quality was very good, with almost no noise spikes affecting the coaxial channels. The system noise during survey was typically within a 2 ppm envelope on the inphase channels and a smaller range on the quadrature channels. The short period of this noise is typical of bird flexing. This was removed by an appropriate filter. Instrument noise was well within specifications. Geological noise, in the form of surficial conductors, is present on the 3 high frequency coil pair profiles and to a minor extent on the 935 Hz quadrature.

Anomalies were picked off the analog traces of the low and high frequency coaxial responses and then validated on the coplanar profile data. These selections were then digitized, edited and replotted on a copy of the profile map. This procedure ensured that every anomalous response spotted on the analog data was plotted on the final map and allowed for the rejection and inclusion if warranted - of less obvious bedrock conductors. Each conductor or group of conductors was evaluated on the basis of magnetic and lithologic correlations as well as surficial features not obvious on the analog charts.

RESULTS

The survey results are composed of surficial responses, bedrock conductors and bedrock resistivity low zones. Bedrock response symbols were plotted on the maps, but obvious interpreted surficial zones do not have selected peaks. The same applies to broad bedrock resistivity contrasts. Discrimination between the near vertical bedrock conductors and horizontal surficial and bedrock resistivity contrasts was based on the profile shape characteristics of the coaxial and coplanar coil data channel peaks for all frequencies.

Surficial conductivity is present in local areas of the survey area, essentially coincident with some low lying valleys. The best example may be the meandering Lightning River in the northeastern part of the area. Some build-up of clay has occurred, and a consistent set of responses is exactly coincident. However, there are also zones of quadrature responses not related to low lying terrain which could have a bedrock origin. Bedrock sources may explain some of these resistivity contrasts, but no further consideration has been given to these zones in this preliminary evaluation.

All bedrock conductors should be explained, but several conductors stand out as unique in the survey area. These are recommended for detailed follow-up, and are discussed in more detail on the following pages. However, conductors are reasonably well distributed over all of the non intrusive lithologies in the survey area.

Bedrock conductors in the survey area have no distinct relationship to magnetic lithologies. Conductors are rare in the northern half of the survey area. Here, responses are characterized by low amplitudes and broad rounded peaks. Narrow resistivity contrasts are typically the proposed explanations. In the southern half of the block, there is at least one formational conductive horizon, and numerous isolated zones with a wide range of electrical conductivity qualities. As most of these are associated with high topography, there is no doubt about their bedrock origin. Along the Lightning River, there is the potential for cultural conductors, as in the case of the Wingdam settlement. Structural effects may be responsible for the discontinuities associated with the limited strike lengths of many of the apparently isolated conductors. In particular, the formational conductors in the southeastern sector of the area appear to have been severely dissected by crosscutting structures. The moderate to low amplitudes are caused by narrow conductors, generally less than 10 metres. Conductors have steep south to vertical inclinations, with almost no northward dipping bedding planes. As there is no correlation between the VLF-EM and bedrock conductors, priority should be given to the EM system results. Some of the VLF-EM conductors extend the strike length of the formational EM conductors. Targets have not been prioritized, but are classified into probable sources - Conductors and Resistivity lows. In addition, the interpretation symbology reflects the source quality and our confidence in a bedrock source.

Priority	1 -	definite bedrock	solid axes
	2 -	weak bedrock	dashed axes
	3 -	resistivity low and VLF-EM	dotted axes

CONDUCTOR I

Culture: north of road, no artificial effects.

VLF-EM: a weak VLF-EM zone extends the zone southward, intersecting a weak formational horizon south of the river.

Magnetics: the conductor lies on the flank of a 75 nT peak, and there is no association with the EM responses.

Structure: a strike slip fault or unconformity has been interpreted at the contact of the magnetic lithology and the less magnetic lithology to the north.

Comments: The conductive zone selected is composed of responses which do not form a distinct linear zone. The low amplitudes and apparent conductances infer a complex discontinuous zone.

CONDUCTOR II

Culture: the responses are associated with the settlement at Wingdam, lying 25 to 50 metres north of the road and power lines.

VLF-EM: no VLF-EM conductor at all

Magnetics: a 35 nT magnetic correlation with the conductor is present at line 180, the best EM response.

Structure: if the zone is a valid bedrock response then the conductor may be truncated at its western end by a fault.

Comments: The responses lie close enough to the settlement to be caused by fences, roads and grounded power lines. However, ground verification is recommended, as the zone has a local magnetic peak and an apparently curved but continuous axis.

CONDUCTOR III

VLF-EM: associated with the westward strike extension, but not the EM intercepts

Magnetics: associated with the south side of the iron formation.

Structure: at the western end of the zone, there is strike change and the possibility of a NNE striking fault. The conductor is terminated against this interpreted offset.

Comments: the conductor appears to be associated with the southern side of the magnetic lithology, while the VLF-EM and associated EM peaks to the north side may have a structural zone as an explanation. Follow-up surveys are recommended to cover the higher amplitudes associated with the selected segment with its structural complexities.

CONDUCTOR IV

VLF-EM: none, along westward extension, on the opposite side of a proposed shear zone.

Magnetics: none - magnetic low

Structure: the zone lies between two parallel NNE trending interpreted structures

Comments: the conductive responses are weak, but continuous. As this stratigraphic horizon has not been tested along strike, this zone should be evaluated.

CONDUCTOR V

VLF-EM: none

Magnetics: flanking

Structure: the eastern end of the zone may be truncated by a NNE fault.

Comments: On line 50 amplitudes are higher than most for an isolated intercept. Although the conductance is low, the zone should evaluated as a resistivity low with a potential sulphide or alteration source.

CONDUCTOR VI

VLF-EM: none

Magnetics: none

Structure: has a southward dip, and has all the characteristics of a formational conductor due to its uniform conductance characteristics. The horizon may correlate with the VLF-EM zone north of zone 3.

CONDUCTOR VII

VLF-EM: none

Magnetics: a near direct coincidence for 2 of 5 horizons within a zone. From magnetics, the same structural controls limit the geometry as for the EM horizons.

Structure: The conductors and magnetics are controlled by the same linear breaks

Comments: The southernmost zone, possibly the shortest, has the highest amplitudes, but lower conductance than the other zones. The proliferation of structure associated with the conductors upgrades the priority of each zone.

CONDUCTOR VIII

VLF-EM: none

Magnetics: a direct magnetic anomaly is associated with the conductor, but with 15 nT amplitude. At least part of the source is interpreted as pyrrhotite, but it is not necessarily the complete explanation.

Structure: the conductor has a very short strike but, possibly the result of faulting along Lovett Creek.

Comments: The selected conductor differs from most isolated conductors in the survey area due to an the magnetic coincidence, width and short strike length. Other formational conductors do not as a rule, have direct magnetic signatures.

CONDUCTOR IX

VLF-EM: none

Magnetics: direct but low amplitude

Structure: The magnetic discontinuities imply that there is almost unlimited potential for cross faults.

Comments: A single line response directly coincident with a one line magnetic anomaly with low amplitude. The broad profile from is usually associated with oblique strikes and shallow dipping or broad resistivity contrast.

CONDUCTOR X

VLF-EM: none

Magnetics: none - magnetic low with uncertain strike direction

Structure: discontinuous conductors and irregular magnetics leave potential for faulting

Comments: The conductor is narrow, flat dipping, and subparallel to the local magnetic lithologies. The conductor should be evaluated, as the host lithology has not been previously tested along strike.

CONDUCTOR XI

VLF-EM: none

Magnetics: none - along magnetic discontinuity

Structure: the conductor is coincident with a linear discontinuity between magnetic zones on either side of Lovett Creek

Comments: A weak but narrow conductor which straddles a magnetic lineation axis. The conductor profile is distinct, and originates from a narrow source, possibly alteration and/or a limited concentration of sulphides.

CONDUCTOR XII

VLF-EM: none

Magnetics: none, the conductor crosses a NNE trending magnetic dyke, but the EM amplitudes are apparently not affected.

Structure: the zone may be cut by a dyke between lines 155 and 156. A NNE fault may terminate zone and offset it to the north

Comments: The width of the zone has been deduced from the high amplitudes, while the SW dip is interpreted from the offset of the coaxial and coplanar peaks.

CONDUCTOR XIII

VLF-EM: none

Magnetics: none

Structure: a potential strike extension of zone XII but with narrow width, short strike length.

Comments: The profile shape is consistent with a narrow dipping source. As the conductor is isolated and in a structurally complex setting, ground explorations are warranted.

CONDUCTOR XIV

VLF-EM: none

Magnetics: none, the conductor is located around a complex zone of magnetic "dykes" which strike oblique to the usual E-W direction

Structure: the conductor axis is apparently folded around the end of a magnetic anomaly, possibly an intrusive.

Comments: The best shape and amplitude responses are located on line 162, but the strike extension past lines 160 and 163 is not certain.

CONDUCTOR XV

VLF-EM: none

Magnetics: none, the conductor is conformable with regional EW striking trends to the north and south.

Structure:

Comments: the responses on lines 176 and 177 are narrow, and characteristic of a narrow zone of weak mineralization or alteration. The zone was selected to draw attention to stratigraphy which is otherwise devoid of bedrock conductors.

Resistivity contrasts with an interpreted bedrock source have been presented on the interpretation map as linear, elongated zones presented as dotted axes. These are usually aligned with and coincident or adjacent to magnetic low zones. This interpretation may match the model for alteration zones associated with brecciation along significant faults and splays. The resistivity lows often are caused by sericite and pyrite. Local argillaceous zones are may produce similar results.

For each resistivity low, the airborne results should be integrated with geology and other results to determine the full significance of the results.

5.6 Resistivity Contours

The resistivity contours approximate the profile amplitudes and typically fall within a narrow range. Linear resistivity trends cover most of the survey area, but it is not possible to easily differentiate between bedrock conductors and resistivity low sources over a substantial part of the survey area. However, linear zones are invariably bedrock, while the rounded and irregular strike zones may outline mineralogy changes in the lithologies. From the calculated resistivities, it is usually possible to recognize favourable bedrock conductors and trends which might influence an exploration program. Bedrock conductors, due to their short spatial wavelengths, often are seen as minor inflections in regional patterns of overburden resistivity lows. The resistivity lows extend the strike length of some conductors.

6. CONCLUSIONS

Numerous conductors were detected by the survey, and this summary presents a selection which tends to favour the best conductivity as an indicator of sulphide concentrations. Many weaker conductors should also be compared with the geological model for mineralization and evaluated accordingly.

The selected EM response zones span a wide geological section. EM responses can be classified as formational, resistivity low and isolated targets. The isolated targets in particular are recommended for further work, although all conductors should be explained. Conductors in the interpreted volcano / sedimentary environment in the southern half of the area typically do not have direct magnetic associations, although there are several important exceptions at zones II, VII, VIII, and IX. The conductive responses of the lithologies in the northern part of the area are weak, broad and have diffuse sources. The explanations for conductors with high amplitudes are typically carbonaceous sediments. Alteration zones with minor sulphides are often very poor conductors, degrading into weak resistivity contrasts.

No significant conductors were detected in the interpreted intrusive domains. Structures in the survey area are very common and do not as a rule have any VLF-EM responses associated.

7. RECOMMENDATIONS

Bedrock EM responses in 15 locations have been selected for the purpose of qualifying further follow-up. Detailed geological mapping and sampling is recommended for every zone. With additional information, the explorationist may be able to explain some conductors and reject unfavourable geological environments. Geophysical surveys are warranted on zones which can not be adequately tested by surface sampling.

Although ground electromagnetic methods may be able to resolve most of the selected target zones, resistivity zones should be detailed with Induced Polarization to pinpoint chargeability anomalies. A combined magnetic/gradiometer survey may help to resolve local structures and magnetite depletion zones, to locate magnetic strata and to extrapolate mapping under areas obscured by surficial sediments and talus.

The selected conductors should serve as a starting point in ground explorations. There are many types of gold and base metal deposits which have no detectable airborne EM or VLF-EM response, but may have a ground EM or IP response.

Marcel H Konings, P. Eng
Geophysical Consultant
for
Aerodat Limited
May 7, 1989

APPENDIX I

GENERAL INTERPRETIVE CONSIDERATIONS

Electromagnetic

The Aerodat four frequency system utilizes two different transmitter-receiver coil geometries. The traditional coaxial coil configuration is operated at two widely separated frequencies and the horizontal coplanar coil pair is operated at a frequency approximately aligned with one of the coaxial frequencies.

The electromagnetic response measured by the helicopter system is a function of the "electrical" and "geometrical" properties of the conductor. The "electrical" property of a conductor is determined largely by its electrical conductivity, magnetic susceptibility and its size and shape; the "geometrical" property of the response is largely a function of the conductor's shape and orientation with respect to the measuring transmitter and receiver.

Electrical Considerations

For a given conductive body the measure of its conductivity or conductance is closely related to the measured phase shift between the received and transmitted electromagnetic field. A small phase shift indicates a relatively high conductance, a large phase shift lower conductance. A small phase shift indicates a relatively high conductance, a large phase shift lower conductance. A small phase shift results in a large inphase to quadrature ratio and a large phase shift a low ratio. This relationship is shown quantitatively for a non-magnetic vertical half-plane model on the accompanying phasor diagram. Other physical models will show the same trend but different quantitative relationships.

The phasor diagram for the vertical half-plane model, as presented, is for the coaxial coil configuration with the amplitudes in parts per million (ppm) of the primary field as measured at the response peak over the conductor. To assist the interpretation of the survey results the computer is used to identify the apparent conductance and depth at selected anomalies. The results of this calculation are presented in table form in Appendix II and the conductance and inphase amplitude are presented in symbolized form on the map presentation.

The conductance and depth values as presented are correct only as far as the model approximates the real geological situation. The actual geological source may be of limited length, have significant dip, may be strongly magnetic, its conductivity and thickness may vary with depth and/or strike and adjacent bodies and overburden may have modified the response. In general the conductance estimate is less affected by these limitations than is the depth estimate, but both should be considered as relative rather than absolute guides to the anomaly's properties.

Conductance in mhos is the reciprocal of resistance in ohms and in the case of narrow slab-like bodies is the product of electrical conductivity and thickness.

Most overburden will have an indicated conductance of less than 2 mhos; however, more conductive clays may have an apparent conductance of say 2 to 4 mhos. Also in the low conductance range will be electrolytic conductors in faults and shears.

The higher ranges of conductance, greater than 4 mhos, indicate that a significant fraction of the electrical conduction is electronic rather than electrolytic in nature. Materials that conduct electronically are limited to certain metallic sulphides and to graphite. High conductance anomalies, roughly 10 mhos or greater, are generally limited to sulphide or graphite bearing rocks.

Sulphide minerals, with the exception of such ore minerals as sphalerite, cinnabar and stibnite, are good conductors; sulphides may occur in a disseminated manner that inhibits electrical conduction through the rock mass. In this case the apparent conductance can seriously underrate the quality of the conductor in geological terms. In a similar sense the relatively non-conducting sulphide minerals noted above may be present in significant consideration in association with minor conductive sulphides, and the electromagnetic response only relate to the minor associated mineralization. Indicated conductance is also of little direct significance for the identification of gold mineralization. Although gold is highly conductive, it would not be expected to exist in sufficient quantity to create a recognizable anomaly, but minor accessory sulphide mineralization could provide a useful indirect indication.

In summary, the estimated conductance of a conductor can provide a relatively positive identification of significant sulphide or graphite mineralization; however, a moderate to low conductance value does not rule out the possibility of significant economic mineralization.

Geometrical Considerations

Geometrical information about the geologic conductor can often be interpreted from the profile shape of the anomaly. The chance in shape is primarily related to the change in inductive coupling among the transmitter, the target, and the receiver.

In the case of a thin, steeply dipping, sheet-like conductor, the coaxial coil pair will yield a near symmetric peak over the conductor. On the other hand, the coplanar coil pair will pass through a null couple relationship and yield a minimum over the conductor, flanked by positive side lobes. As the dip of the conductor decreased from vertical, the coaxial anomaly shape changes only slightly, but in the case of the coplanar coil pair the side lobe on the down dip side strengthens relative to that on the up dip side.

As the thickness of the conductor increases, induced current flow across the thickness of the conductor becomes relatively significant and complete null coupling with the coplanar coils is no longer possible. As a result, the apparent minimum of the coplanar response over the conductor diminishes with increasing thickness, and in the limiting case of a fully 3 dimensional body or a horizontal layer or half-space, the minimum disappears completely.

A horizontal conducting layer such as overburden will produce a response in the coaxial and coplanar coils that is a function of altitude (and conductivity if not uniform). The profile shape will be similar in both coil configurations with an amplitude ratio (coplanar:coaxial) of about 4:1*.

In the case of a spherical conductor, the induced currents are confined to the volume of the sphere, but not relatively restricted to any arbitrary plane as in the case of a sheet-like form. The response of the coplanar coil pair directly over the sphere may be up to 8* times greater than that of the coaxial pair.

In summary, a steeply dipping, sheet-like conductor will display a decrease in the coplanar response coincident with the peak of the coaxial response. The relative strength of this coplanar null is related inversely to the thickness of the conductor; a pronounced null indicates a relatively thin conductor. The dip of such a conductor can be inferred from the relative amplitudes of the side-lobes.

Massive conductors that could be approximated by a conducting sphere will display a simple single peak profile form on both coaxial and coplanar coils, with a ratio between the coplanar to coaxial response amplitudes as high as 8*.

Overburden anomalies often produce broad poorly defined anomaly profiles. In most cases, the response of the coplanar coils closely follows that of the coaxial coils with a relative amplitude ration of 4*.

Occasionally, if the edge of an overburden zone is sharply defined with some significant depth extent, an edge effect will occur in the coaxial coils. In the case of a horizontal conductive ring or ribbon, the coaxial response will consist of two peaks, one over each edge; whereas the coplanar coil will yield a single peak.

* It should be noted at this point that Aerodat's definition of the measured ppm unit is related to the primary field sensed in the receiving coil without normalization to the maximum coupled (coaxial configuration). If such normalization were applied to the Aerodat units, the amplitude of the coplanar coil pair would be halved.

Magnetics

The Total Field Magnetic Map shows contours of the total magnetic field, uncorrected for regional variation. Whether an EM anomaly with a magnetic correlation is more likely to be caused by a sulphide deposit than one without depends on the type of mineralization. An apparent coincidence between an EM and a magnetic anomaly may be caused by a conductor which is also magnetic, or by a conductor which lies in close proximity to a magnetic body. The majority of conductors which are also magnetic are sulphides containing pyrrhotite and/or magnetite. Conductive and magnetic bodies in close association can be, and often are, graphite and magnetite. It is often very difficult to distinguish between these cases. If the conductor is also magnetic, it will usually produce an EM anomaly whose general pattern resembles that of the magnetics. Depending on the magnetic permeability of the conducting body, the amplitude of the inphase EM anomaly will be weakened, and if the conductivity is also weak, the inphase EM anomaly may even be reversed in sign.

VLF Electromagnetics

The VLF-EM method employs the radiation from powerful military radio transmitters as the primary signals. The magnetic field associated with the primary field is elliptically polarized in the vicinity of electrical conductors. The Herz Totem uses three coils in the X, Y, Z configuration to measure the total field and vertical quadrature component of the polarization ellipse.

The relatively high frequency of VLF (15-25) kHz provides high response factors for bodies of low conductance. Relatively "disconnected" sulphide ores have been found to produce measurable VLF signals. For the same reason, poor conductors such as sheared contacts, breccia zones, narrow faults, alteration zones and porous flow tops normally produce VLF anomalies. The method can therefore be used effectively for geological mapping. The only relative disadvantage of the method lies in its sensitivity to conductive overburden. In conductive ground to depth of exploration is severely limited.

The effect of strike direction is important in the sense of the relation of the conductor axis relative to the energizing electromagnetic field. A conductor aligned along a radius drawn from a transmitting station will be in a maximum coupled orientation and thereby produce a stronger response than a similar conductor at a different strike angle. Theoretically, it would be possible for a conductor, oriented tangentially to the transmitter to produce no signal. The most obvious effect of the strike angle consideration is that conductors favourably oriented with respect to the transmitter location and also near perpendicular to the flight direction are most clearly rendered and usually dominate the map presentation.

The total field response is an indicator of the existence and position of a conductivity anomaly. The response will be a maximum over the conductor, without any special filtering, and strongly favour the upper edge of the conductor even in the case of a relatively shallow dip.

The vertical quadrature component over steeply dipping sheet-like conductor will be a cross-over type response with the cross-over closely associated with the upper edge of the conductor.

The response is a cross-over type due to the fact that it is the vertical rather than total field quadrature component that is measured. The response shape is due largely to geometrical rather than conductivity considerations and the distance between the maximum and minimum on either side of the cross-over is related to target depth. For a given target geometry, the larger this distance the greater the depth.

The amplitude of the quadrature response, as opposed to shape is function of target conductance and depth as well as the conductivity of the overburden and host rock. As the primary field travels down to the conductor through conductive material it is both attenuated and phase shifted in a negative sense. The secondary field produced by this altered field at the target also has an associated phase shift. This phase shift is positive and is larger for relatively poor conductors. This secondary field is attenuated and phase shifted in a negative sense during return travel to the surface. The net effect of these 3 phase shifts determine the phase of the secondary field sensed at the receiver.

A relatively poor conductor in resistive ground will yield a net positive phase shift. A relatively good conductor in more conductive ground will yield a net negative phase shift. A combination is possible whereby the net phase shift is zero and the response is purely in-phase with no quadrature component.

A net positive phase shift combined with the geometrical cross-over shape will lead to a positive quadrature response on the side of approach and a negative on the side of departure. A net negative phase shift would produce the reverse. A further sign reversal occurs with a 180 degree change in instrument orientation as occurs on reciprocal line headings. During digital processing of the quadrature data for map presentation this is corrected for by normalizing the sign to one of the flight line headings.

APPENDIX II

ANOMALY LIST

J8908 WINGDAM AREA, BRITISH COLUMBIA - EM ANOMALIES

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
4	1600	B	2	22.8	10.8	3.7	13	36
4	1600	C	2	15.8	9.1	2.5	19	34
4	1600	D	1	12.7	9.6	1.6	4	50
4	1610	A	2	8.3	3.9	2.6	14	56
4	1610	B	2	9.1	5.3	2.0	13	52
4	1610	C	2	7.5	3.6	2.5	20	52
4	1610	D	0	17.5	23.3	0.8	2	35
4	1620	A	2	53.7	41.9	2.5	4	28
4	1620	B	2	16.9	11.6	2.0	14	36
4	1620	C	3	20.7	8.1	4.6	13	40
4	1630	A	2	9.6	5.7	2.0	0	70
4	1630	B	1	13.2	11.5	1.3	0	55
4	1640	A	2	25.8	12.5	3.7	13	34
4	1640	B	1	18.2	16.9	1.4	16	28
4	1660	A	2	14.7	9.6	2.0	9	44
4	1670	A	1	6.8	5.8	1.0	13	51
4	1680	A	2	15.9	9.8	2.3	15	37
4	1680	B	1	10.0	7.5	1.4	15	43
4	1740	A	2	13.4	5.8	3.5	27	33
4	1760	A	2	6.8	2.4	3.7	28	50
4	1770	A	1	6.3	4.1	1.5	10	62

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J8908 WINGDAM AREA, BRITISH COLUMBIA - EM ANOMALIES

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
4	1440	E	0	5.8	10.8	0.3	9	36
4	1440	F	1	15.4	14.2	1.3	14	33
4	1450	A	1	12.7	10.6	1.4	1	50
4	1450	B	1	7.9	5.2	1.6	12	54
4	1450	C	1	9.1	5.7	1.8	20	44
4	1450	D	2	14.2	7.2	2.8	11	46
4	1460	A	1	12.7	10.1	1.5	12	41
4	1470	A	1	7.1	5.9	1.1	11	52
4	1470	B	1	9.4	5.7	1.9	7	56
4	1470	C	2	13.6	8.3	2.2	11	45
4	1480	A	1	14.0	13.8	1.1	0	54
4	1480	B	0	7.4	10.7	0.5	12	36
4	1490	A	1	6.7	4.8	1.3	16	52
4	1500	A	2	36.3	20.1	3.5	16	25
4	1500	B	0	9.5	12.4	0.6	0	48
4	1500	C	0	5.0	8.3	0.3	7	44
4	1520	A	1	14.5	11.9	1.5	7	42
4	1520	B	0	7.4	8.2	0.7	14	42
4	1540	A	1	32.2	33.4	1.4	17	17
4	1540	B	2	39.5	26.6	2.7	14	24
4	1540	C	0	8.3	14.0	0.4	15	28
4	1550	A	1	5.7	3.0	1.9	10	68
4	1560	A	3	48.3	23.9	4.4	16	21
4	1560	B	0	5.3	4.5	0.9	11	58
4	1570	A	2	10.0	5.0	2.6	7	58
4	1570	B	2	24.3	13.1	3.1	6	41
4	1580	A	1	20.1	17.2	1.6	13	30
4	1580	B	2	17.2	11.2	2.2	20	31
4	1580	C	3	34.0	14.7	4.7	16	27
4	1590	B	2	8.3	4.0	2.5	9	60
4	1590	C	3	14.1	5.2	4.4	0	66
4	1600	A	2	34.8	19.6	3.3	0	44

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J8908 WINGDAM AREA, BRITISH COLUMBIA - EM ANOMALIES

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
3	1330	A	3	24.8	7.0	7.5	0	57
3	1340	A	3	50.7	19.7	6.1	0	38
3	1340	B	3	56.6	30.1	4.2	1	34
3	1350	A	3	28.3	10.9	5.2	0	48
3	1360	A	1	16.5	16.6	1.2	0	43
3	1360	B	3	56.2	29.1	4.3	1	34
3	1360	C	2	56.2	35.2	3.4	3	31
3	1370	A	2	22.4	13.2	2.7	1	46
3	1370	B	3	34.9	13.9	5.3	0	50
3	1380	A	3	134.0	73.7	5.2	0	26
3	1380	B	2	80.6	51.8	3.7	1	28
3	1390	A	3	65.7	30.5	5.2	0	37
3	1390	B	4	53.7	15.3	9.4	0	46
3	1400	A	1	8.2	5.8	1.5	25	39
3	1400	B	2	8.6	3.9	2.8	14	55
3	1400	C	3	32.7	10.5	6.9	0	50
3	1400	D	3	31.3	13.9	4.4	3	42
3	1410	A	2	32.9	17.2	3.6	4	38
3	1410	B	4	62.6	16.4	10.9	0	44
3	1410	C	2	20.2	10.7	3.0	13	37
3	1410	D	2	16.7	7.7	3.4	14	41
3	1410	E	1	8.4	4.9	1.9	19	48
3	1420	A	2	13.6	7.6	2.5	26	30
3	1420	B	3	17.0	5.7	5.3	19	38
3	1420	C	4	17.1	3.3	11.3	1	58
3	1430	A	4	13.4	2.7	9.9	14	50
3	1430	B	4	22.5	5.4	9.1	9	44
3	1430	C	2	15.4	7.2	3.3	21	36
3	1430	D	2	14.1	8.2	2.3	21	34
4	1440	A	3	35.0	15.3	4.7	4	38
4	1440	B	3	37.5	14.1	5.8	11	32
4	1440	C	3	79.8	44.2	4.4	9	22
4	1440	D	1	21.2	16.7	1.8	11	33

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J8908 WINGDAM AREA, BRITISH COLUMBIA - EM ANOMALIES

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	AMPLITUDE (PPM) QUAD.	CONDUCTOR CTP MHOS	CONDUCTOR DEPTH MTRS	BIRD HEIGHT MTRS
3	1080	A	0	7.3	9.1	0.6	0	55
3	1090	A	2	9.2	5.3	2.0	16	48
3	1100	A	3	8.8	1.9	7.9	21	53
3	1100	B	3	13.2	4.7	4.5	8	54
3	1110	A	2	18.4	11.4	2.4	11	39
3	1110	B	1	18.5	13.4	1.9	11	36
3	1110	C	2	12.0	6.9	2.3	16	43
3	1120	A	1	6.5	4.5	1.4	35	35
3	1120	B	2	13.3	7.4	2.4	12	45
3	1130	A	1	12.7	10.5	1.4	7	44
3	1130	B	1	15.8	11.8	1.7	22	28
3	1130	C	1	9.7	8.5	1.1	28	28
3	1140	A	2	7.0	3.4	2.4	42	32
3	1140	B	2	7.7	4.2	2.1	11	59
3	1150	A	2	10.5	6.3	2.0	25	36
3	1150	B	1	7.0	4.9	1.4	37	31
3	1160	A	2	17.4	8.1	3.4	20	34
3	1270	A	3	13.0	4.5	4.7	0	62
3	1270	B	1	6.0	5.2	1.0	0	70
3	1270	C	2	10.2	5.6	2.3	21	42
3	1280	A	2	8.1	3.1	3.5	5	68
3	1280	B	3	23.3	7.6	6.1	4	48
3	1290	A	3	21.1	6.1	6.9	0	56
3	1290	B	1	13.4	8.9	1.9	0	55
3	1300	A	2	6.9	3.2	2.5	1	74
3	1300	B	3	26.8	12.4	4.0	1	45
3	1310	A	3	17.5	7.0	4.2	0	57
3	1310	B	3	14.3	5.7	4.0	12	48
3	1310	C	1	9.6	7.0	1.5	13	46
3	1320	A	3	30.7	13.2	4.6	2	43

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J8908 WINGDAM AREA, BRITISH COLUMBIA - EM ANOMALIES

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
3	670	A	2	7.5	3.3	2.8	35	38
3	670	B	2	8.9	3.7	3.2	31	39
3	670	C	3	11.6	4.2	4.2	12	52
3	670	D	2	15.8	8.2	2.9	4	51
3	680	A	2	15.1	7.3	3.1	1	56
3	680	B	2	10.2	6.0	2.1	15	47
3	680	C	1	12.3	8.0	1.9	12	45
3	680	D	0	6.0	5.5	0.9	8	57
3	680	E	2	10.7	6.3	2.1	19	42
3	690	A	2	9.8	4.1	3.3	26	41
3	690	B	1	6.6	3.8	1.8	10	62
3	690	C	3	11.1	3.9	4.3	2	64
3	1020	A	1	12.5	9.4	1.6	22	32
3	1020	B	2	16.2	8.6	2.8	13	41
3	1020	C	2	21.5	10.3	3.5	11	39
3	1020	D	2	30.2	22.8	2.2	9	30
3	1030	A	1	11.3	7.1	1.9	13	46
3	1030	B	2	10.6	5.2	2.7	4	60
3	1030	C	2	14.3	8.7	2.2	12	42
3	1030	D	1	13.3	10.3	1.5	10	43
3	1050	A	0	9.5	9.5	0.9	8	45
3	1050	B	0	7.3	7.1	0.9	10	49
3	1050	C	2	15.0	9.9	2.0	11	42
3	1050	D	1	12.3	10.4	1.3	0	58
3	1050	E	1	15.7	12.1	1.7	9	41
3	1050	F	1	13.7	11.8	1.3	14	36
3	1050	G	1	10.0	9.5	1.0	6	48
3	1060	A	1	9.4	6.6	1.6	14	47
3	1060	B	2	10.9	5.5	2.6	0	65
3	1060	C	1	10.4	6.6	1.9	15	45
3	1060	D	2	12.6	5.6	3.3	16	45
3	1060	E	0	9.6	11.4	0.7	9	40
3	1070	A	1	12.5	12.2	1.1	4	45
3	1070	B	0	7.7	13.9	0.4	4	37
3	1070	C	1	9.0	7.1	1.3	11	48
3	1070	D	2	16.1	9.5	2.4	12	41
3	1070	E	1	6.7	4.7	1.4	18	50

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J8908 WINGDAM AREA, BRITISH COLUMBIA - EM ANOMALIES

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
101	330	A	1	9.7	9.4	1.0	0	64
101	340	B	1	20.2	14.9	1.9	0	58
101	350	A	1	17.0	15.9	1.3	0	53
101	350	B	0	9.7	10.5	0.8	0	64
101	360	A	1	11.4	7.2	1.9	0	64
101	360	B	1	8.9	8.6	1.0	1	54
101	360	C	1	4.7	2.4	1.9	18	66
101	370	A	2	9.6	5.4	2.1	17	47
101	370	B	2	6.0	2.1	3.5	6	76
101	380	A	2	10.0	4.9	2.6	0	67
101	380	B	1	17.2	14.5	1.5	10	37
101	390	A	3	5.9	1.7	4.6	34	49
101	390	B	3	18.3	5.6	6.2	12	44
101	390	C	1	10.1	9.7	1.0	14	39
101	390	D	1	4.7	2.7	1.6	39	43
101	400	A	1	5.7	3.1	1.9	38	40
101	400	B	2	9.1	3.5	3.6	13	57
3	610	A	3	11.6	3.7	5.0	9	57
3	610	B	2	8.8	5.0	2.0	37	29
3	620	A	1	6.8	4.1	1.7	32	39
3	620	B	3	12.1	4.0	4.9	24	40
3	630	A	4	9.2	1.6	10.8	18	56
3	640	A	2	14.7	7.7	2.8	23	33
3	640	B	3	17.5	6.5	4.7	24	32
3	650	B	4	8.1	1.7	8.0	24	53
3	650	C	2	10.3	5.0	2.7	16	49
3	660	A	2	21.2	12.2	2.7	6	43
3	660	B	2	19.3	11.1	2.7	11	39
3	660	C	2	17.7	11.7	2.1	24	26
3	660	D	0	6.4	6.8	0.7	15	44
3	660	E	1	10.3	8.7	1.2	23	33

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J8908 WINGDAM AREA, BRITISH COLUMBIA - EM ANOMALIES

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
101	170	B	0	6.4	6.8	0.7	7	53
101	180	A	0	6.4	10.6	0.4	9	37
101	180	B	1	28.6	28.2	1.5	0	47
101	180	C	2	18.9	10.8	2.7	0	51
101	180	D	2	20.7	11.3	2.9	12	37
101	190	A	0	8.0	8.9	0.7	0	81
101	190	B	0	5.8	6.8	0.6	23	36
101	190	C	0	5.7	6.4	0.6	7	54
101	200	A	0	8.5	10.2	0.7	2	49
101	200	B	0	7.0	14.3	0.3	10	30
101	200	C	2	16.2	10.7	2.1	0	69
101	200	D	2	23.5	16.4	2.2	0	46
101	210	A	1	18.6	15.8	1.5	0	53
101	210	B	1	19.1	16.5	1.5	0	64
101	210	C	0	6.0	6.0	0.8	5	57
101	220	A	3	6.3	1.4	6.8	26	57
101	220	B	2	18.2	10.2	2.7	7	45
101	230	A	1	22.6	24.6	1.2	2	36
101	230	B	2	6.0	2.8	2.4	24	54
101	240	A	3	4.4	1.0	5.9	35	59
101	250	A	2	33.6	20.2	3.0	2	38
101	250	B	2	7.8	3.9	2.3	25	45
101	260	A	1	10.1	6.9	1.7	22	38
101	270	A	1	12.8	9.3	1.7	23	31
101	280	A	1	10.9	6.9	1.9	18	41
101	280	B	4	19.4	4.8	8.4	13	42
101	290	A	2	8.4	4.2	2.4	19	49
101	290	B	2	16.7	10.8	2.2	15	36
101	300	A	2	8.8	4.8	2.2	21	46
101	310	A	1	14.3	10.0	1.8	20	33
101	320	A	1	12.0	9.0	1.6	5	50

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J8908 WINGDAM AREA, BRITISH COLUMBIA - EM ANOMALIES

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
102	21	A	1	9.9	9.1	1.1	16	39
102	31	A	3	24.7	10.5	4.3	2	46
102	31	B	1	8.9	5.6	1.8	30	34
102	41	A	0	9.7	13.1	0.6	10	36
102	41	B	1	7.7	6.5	1.1	0	66
102	50	A	1	12.4	12.8	1.0	0	72
102	50	B	1	13.7	9.5	1.8	13	40
102	50	C	0	7.1	9.7	0.5	7	44
102	60	A	1	11.6	10.0	1.3	16	37
102	60	B	0	5.1	5.3	0.7	5	60
102	60	C	0	8.1	10.7	0.6	0	54
102	70	A	1	11.2	7.3	1.8	19	40
101	80	A	2	8.1	3.6	2.8	16	55
101	80	B	1	8.6	6.4	1.4	11	50
101	80	C	2	10.0	5.0	2.6	19	46
101	90	A	2	7.2	3.5	2.4	8	65
101	90	B	1	10.0	6.5	1.8	32	29
101	100	A	1	14.7	10.1	1.9	6	47
101	110	A	1	9.6	8.3	1.2	23	33
101	120	A	1	10.3	9.6	1.1	0	62
101	130	A	0	10.3	11.6	0.8	0	50
101	140	A	1	15.5	13.8	1.3	12	35
101	140	B	0	9.8	11.2	0.8	0	52
101	150	A	1	8.9	5.6	1.8	1	63
101	150	B	0	6.3	7.4	0.6	8	49
101	150	C	1	18.8	15.7	1.6	17	28
101	160	A	1	9.9	6.6	1.7	13	48
101	160	B	1	8.3	4.9	1.9	3	63
101	170	A	1	4.8	3.7	1.0	35	40

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

APPENDIX III

CERTIFICATE OF QUALIFICATIONS

I, MARCEL H. KONINGS, certify that: -

1. I reside at R.R. # 1, (Part E 1/2-L9-C6 Adjala Twp), Colgan, Ontario, L0G 1G0.

2. I am a qualified Geological Engineer, having received my academic training at the University of Toronto, specializing in Exploration Geophysics and having graduated in 1974.

3. I am a registered Professional Engineer of the Province of Ontario, in good standing.

4. I have been professionally engaged in my profession, the application of Mining Geophysical Methods to mineral exploration, continuously for 15 years in Canada and internationally.

5. I have been an active member of the Society of Exploration Geophysicists since 1977 and hold memberships in other professional societies involved in the mineral exploration industry.

6. The accompanying report was prepared from data supplied by Aerodat and public geological data forwarded by Silver Sceptre Resources Ltd.

7. I have no interest, direct or indirect, in the property described nor do I hold securities in Silver Sceptre Resources Ltd.

8. I hereby consent to the use of this report in a Statement of Material Facts of the Company and for the preparation of a prospectus for submission to the Ontario Securities Commission and/or other regulatory authorities.

Signed,

Colgan, Ontario
(416) 936-4853
May 7, 1989

Marcel H. Konings,
P. Eng.

APPENDIX IV

PERSONNEL

FIELD

Flown	Janaury - March, 1989
Pilot	B. Curiston
Operator	V. Cole

OFFICE

Processing	A.E. Valentini
	George McDonald
Report	M. Konings

APPENDIX V

COST STATEMENT
SILVER SCEPTRE RESOURCES LTD.
January 15 - March 31, 1989.

Shipments	$ 51.50
Supplies	34.67
Aerodat A/B Geophysics Contract	34,800.00
Consultant Fees	
Archean Engineering Ltd.	2,275.00
TOTAL COST	$37,161.17