An Interpretation of IP/Resistivity data from the Glencoe Project, N.T. for Australasia Gold Limited

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DISCLAIMERS

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Inversion result for IP/Resistivity with interpretation for lines:

3,100E	1,200N - 2,650N	(1,450m)
3,300E	1,400N - 2,650N	(1,250m)
3,500E	1,400N - 2,650N	(1,250m)
3,700E	1,400N - 2,650N	(1,250m)
3,900E	1,400N - 2,650N	(1,250m)
4,100E	1,250N - 2,650N	(1,400m)
4,300E	1,250N - 2,650N	(1,400m)
4,500E	1,200N - 2,650N	(1,450m)
4,700E	1,650N - 2,600N	(950m)

Total line coverage: 11,650m

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1. Introduction.

The Glencoe Prospect is on the Pine Creek 1: 250,000 map sheet. It is approximately 55km north-west of Pine Creek and 16 km n0rth-north-east of Hayes Creek. Access is good along sealed roads. Mineral extraction has taken place from open pits but none of these are in operation today. The purpose of this electrical survey is to investigate the possibility of additional economic mineralization at depth or along strike. The airborne magnetic data was examined to see if there was a magnetic response associated with the prospect. The result was negative, which was a deciding factor in the exploration program, not to collect ground magnetic data. However, if required, a detailed ground magnetic survey can be organized at a later date; there may be a weak magnetic response which has not been recognized in the airborne magnetic survey.

2. Survey details

The apparent resistivity and chargeability data was collected using a dipole-dipole array with a 50m dipole to a depth of level n = 6. The line separation is 200m. The lines were arranged to avoid the open pits which are now full of water. Electrode positions on line 3,900E were moved slightly to avoid one of these pits Successive electrodes were moved laterally 5m, 10m, 20m, 10m and 5m between 1850N and 2050N . This had very little, if any, influence on the quality of the final data. Electrodes were also kept away from fences in the area; again this caused no detrimental effect to the result.

The basic data was processed using the UBC 2D Smooth Model Inversion software. The results are presented in the nine profiles which accompany this report.

3. Interpretation of the IP/Resistivity data.

The depth of investigation is at least 160m and perhaps 200m in many places. The regolith appears to be less than 50m in thickness and generally has a resistivity value of between 20 and 50ohm.m. These are reasonable conditions for an electrical survey. Bedrock appears to be of two types. In the north and south the bedrock resistivity is between 2000S.m and 3000S.m. These are termed “rock unit A” and “rock unit B” in the interpretation sections and plan. The central zone is generally around 500S.m but in some places is as low as 50S.m

The resistivity at a depth of 160m below the surface is shown in figure 1. The variation along strike in the grid east-west direction is quite marked and does not appear to be caused by the wide 200m line spacing. In an initial interpretation I invoked numerous faults to explain the variation in the resistivity as being caused by alteration. The fault direction was south-west to north-east in the local grid. This direction can be seen in the airborne magnetic data further to the south-west. However, the interpretation became far too complicated from a relatively small amount of data. If it is considered appropriate, faulting can be redefined at a later date, but at this stage it does not modify the interpretation in total and does not affect the proposed drill targets.

The chargeability at a depth of 160m below the surface is shown in figure 2. There are high values in a zone extending from 3100E 2150N to 4,500E 1950N and possibly extending beyond the survey in both directions. This zone is within the rock unit C but it does not appear to be conformable which may mean that there is an additional structural control. Two of the old open pits lie on this line of anomalous chargeability.

The interpretation of the resistivity and chargeability is shown in figure 3.
Comments on each line are given below.

Line 3,100E. The boundaries of the three interpreted rock units are not clearly defined; in fact the change is probably gradational. This observation applies to all the other lines. The high chargeability response is between 2130N and 2180N where it is close to the northern boundary of rock unit C. Two additional zones occur at 1950N and 2330N which may also require further investigation.
A suggested drill site to investigate the high chargeability is:

Location: 2230N
Azimuth: 45^o west of grid south
Inclination: -60^o
Depth: 200m

Line 3,300E. The zone of anomalous chargeability now lies well within rock unit C at 1955N to 1985N. The southern weaker zone, seen on line 3100E, may have merged with the main zone at this point. The northern weaker zone lies at 2200N to 2220N.
A suggested drill site to investigate the high chargeability is:

Location: 2030N
Azimuth: 45^o west of grid south
Inclination: -60^o
Depth: 150m

Line 3,500E. The resistivity of the rock unit C has dropped from about 1000Sm as seen on the two western lines to less than 50Sm on this line. The cause does not appear to be due to graphite or increased sulphide content as the chargeability is lower than that recorded on the two western lines. It may represent rock alteration or possibly fracturing with saline water infilling the fractures.
A suggested drill site to investigate the anomalous chargeability and low rock resistivity is:

Location: 2030N
Azimuth: grid south
Inclination: -60^o
Depth: 150m

Line 3,700E. The resistivity of rock unit is slightly higher at 200Sm, but still not as high as recorded on the two western lines. The chargeability between 1960N and 2020N remains high. A weaker zone of chargeability occurs between 1740N and 1780N.
A suggested drill site to investigate the main zone of anomalous chargeability is:

Location: 2050N
Azimuth: grid south
Inclination: -60o
Depth: 175m

Line 3,900E. The central zone of high chargeability lies between 1990N and 2030N within rock unit C which has a low resistivity of 50Sm.
A suggested drill site to investigate this response is:

Location: 2060N
Azimuth: grid south
Inclination: -60^{o}
Depth: 150m

Line 4,100E. The anomalous response on this line is very similar to that on line 3,900N. The chargeability is high and the rock resistivity is low at 50Sm.
A suggested drill site to investigate this response is:

Location: 2100N
Azimuth: grid south
Inclination: -60^{o}
Depth: 150m

Line 4,300E. The main zone of high chargeability is between 2020N and 2100N, a much broader zone than seen to the west and the highest values recorded in this survey. At this location the highest chargeability is not coincident with the lowest resistivity within rock unit C. There is a second zone of anomalous chargeability between 1700N and 1740N but the values are considerably lower.
A suggested drill site to investigate the main response is:

Location: 2110N
Azimuth: grid south
Inclination: -60^{o}
Depth: 175m

Line 4,500E. The main zone of anomalous chargeability has split in to two parts located between 1910N to 1970N and 2025N to 2055N. The chargeability values are moderately high and are associated with the slightly higher resistivity at the northern edge of rock unit C. There may also extensions further north into rock unit B. Further south there are two minor zones in rock unit A at 1355N and 1570N.
The geophysical signature on lines 4300N and 4500N is more extensive in the north-south direction than on lines to the west. This may be due to a structural influence which is not clearly defined in the current data.
The suggested drill sites to investigate the two main responses are:

Location: 2030N	Location: 2100N
Azimuth: grid south	Azimuth: grid south
Inclination: -60^o	Inclination: -60o
Depth: 200m	Depth: 130m

Line 4,700E. The continuation of the main chargeability zone is located between 2080N and 2130N. The amplitude of the chargeability is lower than on many of the lines to the west and it is related to the higher resistivity part of rock unit C. But, importantly the anomaly is still present suggesting continuation further east.
A suggested drill site to investigate this response is:

Location: 2160N
Azimuth: grid south
Inclination: -60^o
Depth: 150m

4. Conclusion and recommendations

The nine lines of IP/resistivity have located variations in rock type, one main continuous zone of anomalous chargeability and a number of subsidiary zones of chargeability. Clearly, the next step is to integrate the results of the survey with previous drilling and known geology to plan drill targets.
Based purely on the geophysical results drill sites have been suggested for the main IP response on each line. Not all of these will be drilled.
The top priority drill targets are located on lines 4,300E, 3,400E and 3,300E, in that order. It is understood that this may change with the integration of the geology.

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