

### 2.3.5 Geophysics

#### 1. Gradient Array I.P.

Lines 184N-96N were surveyed with gradient array I.P. by Scintrex Pty. Ltd. in March-April, 1981. Arrays 1-3 covered the western half of the grid (lines 184N-112N) with most lines having a 400 m overlap with the eastern arrays. Lines 160N and 136N were repeated on adjacent western arrays to allow detailed evaluation of the western pyrite zone. Arrays 4-6 covered the eastern half of the grid (lines 184N-96N). (See Tables 26 and 27 in Appendix E for details of coverage).

Figures 35 and 36 present the contoured chargeability and apparent resistivity data from the gradient array survey. Overlapping values were averaged, in most cases, to allow uninterrupted contouring across array boundaries. Chargeability contours east of the eastern pyrite zone, however, were based on the eastern array values.

On the resistivity plan (Figure 35) there are only two zones of significance: the low on lines 120N-136N coincident with the western pyrite zone, and the low zone along the eastern flank of the grid coincident with Lower Cambrian black shales. Both of these zones produced Dighem airborne E.M. anomalies (Fraser, 1980) which are shown on the plan along with reinterpretation anomalies determined by Mitre Geophysics (Bishop, 1981). The lack of a resistivity low coincident with the eastern pyrite zone is disheartening as it indicates that the mineralisation is narrow and/or disseminated. Despite this Bishop (1981) picked weak responses from the Dighem data which coincide with the eastern pyrite zone (Mitre anomalies 160 n and 148 n).

On the chargeability plan (Figure 36) the two pyrite zones stand out and their extents can be readily gauged (anomalies S1 and S2). The highest response came from the eastern pyrite zone: 101 mV/V at 184N, 450 mE. The double peak on 168N may be due to black shales at 410 mE and pyrite at 450 mE.

Two lesser chargeability anomalies were recorded at 128N, 950'W (S3) and 152N, 850'W (S3 n). The latter overlies Jukes Formation and is possibly due to magnetite-hematite veins and disseminations or due to sulphides under a thin mantle of Jukes. Anomaly S3 occurs near outcrops of massive rhyolites and quartz crystal tuffs, neither of which showing mineralisation. The contour plan suggests that this anomaly is related structurally to the eastern pyrite zone (S2). However, the chosen contour (20 mV/V) is only slightly above background and the "folding" is a subjective interpretation of the data which simplifies the contour pattern. Further detailed work is required to evaluate this anomaly.

The Lower Cambrian black shales produced minor chargeability anomalies on the eastern ends of lines 184N-152N (S4).

#### 2. Dipole-Dipole I.P.

Dipole-dipole I.P. was conducted along lines 184N, 144N and 120N of the Selina Grid and lines 56N-40N of the Rolleston Grid (see Figures 37 to 41, Tables 28 and 29 in Appendix E and Appendix G for details).

Two superimposed setups were used on each of lines 144N and 120N to provide good anomaly definition without sacrificing depth of penetration.