GEOPHYSICS

A controlled source audio magneto telluric (CSAMT) and gradient induced polarization (IP) resistivity survey was completed over the Mount Kasi mine area and the Done Creek and Grid West areas. The surveys were completed in 1992, using 10.0 metre station intervals by *Zonge Engineering Limited* to help further define drill targets in the mine area and locate other similar targets further north. Lines were surveyed in the mine area in order to provide a geophysical template in areas of intensive drilling. Initially lines 4700N, 4900N and 5000N were surveyed as they were known to contain zones of silicification recording high gold grades near surface, low gold grades throughout and at depth respectively.

In the mine area resistors were characterized as recording greater than 200 ohm/metres. Resistors in the northern area from 4900N to 5050N averaged 40 metres wide and were persistent at depth. Resistors to the south from 4800N to 4750N were flared at surface and non existent or very narrow at depth.

Similar patterns of resistivity were recorded at Done Creek and Grid West where strong persistent resistors up to 40 metres wide were located from 5420N to 5440N and at 5700N and 5750N. The surface patterns of these resistive bodies show the more persistent deeper to be narrow and elongate with offsets to the wider near surface zones of silicification.
The anomalous IP patterns at the mine area are likely to be a result of resistivity increase rather than the introduction of sulphide minerals whereas the IP effect further north on 5500N 4905E is more likely caused by a small increase in sulphides of around 5 to 7%.

In plan the resistive body at Done Creek measures some 40 metres in diameter and is centred on 5440N 4900E. The body shows a similar pattern to the resistors in the northern part of the mine area (5000N) which host high grade gold mineralisation both near surface and at depth. Drill hole DC4 intersected the south west margin of the resistive body and recorded 2 meters at 8.77 g/t gold and 1.5 metres at 4.6 g/t gold over a wide interval of moderately silicified pyritic and enargite rich leached breccias similar in lithology although less intensely silicified than the very high grade gold bearing boulders at surface.

The resistive bodies centred on line 5480 are computer interpreted as no survey was completed along this line.

Similar resistive patterns recorded at 5440N and 5700N represent more persistent silicification at depth and where drill tested at 5000N contain significant gold grades from surface to depth. In comparison the near surface silicified bodies at 4700N and 4800N and elsewhere in the Done and Grid West areas only contain significant gold grades near surface. The CSAMT survey has shown the potential to locate the higher grade feeder zones to the silicified structures. Further in fill survey lines are necessary to more finely tune target locations in some areas.

In 1996, according to SPL 1374, Mike Smith of Geo-instruments Sydney Australia preliminary commented on magnetic and radiometric maps of the region surrounding Mount Kasi.

The new airborne geophysical survey results provide detailed structural information of direct relevance to future exploration of the Mt Kasi district. The following description reflects an initial qualitative appraisal of the data prior to any geological input from staff of Mt Kasi Mining. Major NW-SE trending structural corridors are clearly evident together with secondary NE-SW trending and E-W trending structures which cross cut the NW-SE features.

The predominant NW-SE structural zone transecting the mine area displays a sinistral strike – slip displacement (NE side moved towards NW) based on correlation of magnetic blocks. The strong NW-SE structural grain is evident also in both the radiometric data and in the digital terrain model, however without evidence of movement direction.

The broad pattern of the recently acquired magnetic data and the digital terrain model suggest the possible existence of an eroded caldera complex with associated porphyry intrusive. The residual caldera topographic rim, which is also evident by accurate positive magnetic responses, is best defined on its northern and western sides, with complete breaching of the caldera edifice to the southeast. The low magnetic responses of the central portion of the inferred caldera suggests a more silicic, more felsic core. The same area is generally characterised by low radiometric responses and is cut by multiple structures

including all three of major directions described in the first paragraph. This structural setting, if verified by subsequent field mapping and interpretation, compares to that of numerous caldera – hosted vein gold deposit models.

In relation to Mt Kasi, the inferred caldera is centred approximately 5km NE of the mine, with the known resource-occurring within a major NW-SE structural corridor. The corridor is tangential to the "caldera" and cuts across the western boundary. Two NW-SE structures evident in the magnetic transect the mine area and the southern side of the mine site is truncated by an E-W discontinuity in magnetic units. A local centre of very low magnetic response immediately south of the mine may indicate intense hydrothermal alteration; the evaluation of the data in the vicinity of the mine requires geologic (and geographic) input from the mine staff.

Another area of low magnetic response occurs at SW of Mt Kasi and may represent a second felsic porphyry setting. The magnetic features flanking the low area are more strongly controlled by linear structures and there is less suggestion of accurate boundaries. The area of possible felsic porphyry is centred some 4km SSW of Mt Kasi and its associated NW-SE structural corridor forma one side of the domain of low magnetic susceptibility.

The general region between the two magnetic features described above is worthy of detailed investigation. T contains the NW-SE structural corridor which hosts the Mt Kasi mine. It contains linear NW-SE trending and NE-SE trending clusters of positive magnetic features. It is characterised overall by a strong total count radiometric signature, which, on inspection of the individual radio-element channels, is clearly due to potassium. The combination of magnetic alteration, potassium enrichment and complex structure located over and immediately NW of Mt Kasi suggests an area which requires detailed geochemical and geological appraisal.

These comments are preliminary and have not given due consideration to the character of the magnetic and radiometric data in the northern half of the survey area. Of particular interest are several other strong radiometric responses suggestive of high potassic

assemblages and other areas of low magnetic response which may reflect magnetic destruction by hydrothermal fluids.

Tavea Geophysics

SPL 1374 Tavea provides and excellent opportunity for locating gold mineralisation in proximity to the operating Mt Kasi mine.

The Kasi structural corridor which hosts the mine extends NW through the Tavea SPL while preliminary aeromagnetic and radiometric interpretation suggests a caldera represented as a magnetic low to the NE of Kasi.

Two gold prospects previously located by Placer Pacific Exploration occur in similar volcanic settings to Kasi. Reconnaissance geological investigations by Mt Kasi Limited at Tavea located old workings and brecciated silicified float. Previous assays recorded to 74 g/t gold. High sulphide bearing breccia boulders at Naravuka recorded to 378 g/t gold and low copper values.

CSAMT (resistivity) geophysical surveys are able to map out the geometry of the silicified bodies locating potential high grade feeders and associated near surface outflow zones. Close spaced reverse circulation drilling will initially test these zones for their gold bearing potential with later diamond drilling to understand the controls on mineralisation and further test the bodies at depth.

Low sulphidation gold bearing systems are also likely to occur in this SPL however their surface expression is likely to be for more subtle. Narrow veins at surface occur with restricted alteration selvages. Drill testing of these systems requires analysis of individual narrow veins and breccias recorded in diamond core.

The Kasi corridor and circular magnetic low features outlined by the aeromagnetic and radiometric surveys have located the mains areas of interest in the SPL. Geological mapping, geochemical rock and soil sampling and CSAMT (resistivity) geophysics in these areas

utilising the knowledge of the controls on gold mineralisation learnt from mining at Mt Kasi is likely to locate further areas of gold mineralisation. The occurrence of these in proximity to Mt Kasi will increase the longetivity of the mine.

According to Annual Report 1996 of SPL 1375, Zonge Engineering produced CSAMT smooth modelled resistivities depth slices at 25m, 50m, 75m, 100m and 150m at scale 1:5,000. The area south of Kasi including Nakoi, Vola and Koroikovu extends from 3040N to 4400N with Kasi south from 4400N to 4800N. Static corrected resistivities of greater than 156.1 ohm meters outline the more resistive zones while conductive areas show values of less than 12.9 ohm meters.

Drill testing of resistive zones at Kasi has penetrated silification while the conductive bodies commonly represent basalt.

Five resistive bodies have been outlined as Kasi south 4400N to 4800N from 5000E to 5100E.

Kasi south: 4400N to 4800N from 5000E to 5100E.
Koroikovu: 3600N to 4000N from 5050E to 5180E.
Vola: 3200N to 3400N from 5200E to 5350E.
Nakoi East: 3040N to 3200N from 4620E to 4760E.
Nakoi West: 3600N to 3900N from 4380E to 4500E.

Conductors occur to the west of the Koroikovu and Nakoi resistors.

The resistors trend northwest as narrow elongate bodies. At depth the southern resistors are more pronounced with the most intense resistors at Koroikovu (4200N 5200E).

A parallel resistor occurs west of Kasi south from 4650N to 5000N and 4800E to 484OE and becomes stronger at depth (75m)

Immediately north of Kasi the Kasi south (5200N) and Mango (5050N 4800E) resistors show similar characteristics to the resistors south of Kasi. In comparison the Done and Grid west resistors further north (5400N to 5800N) appear less resistive at depth.

Sections at 1:1000 scale for the area surveyed show the characteristics of the resistive zones that are outlined below.

Line	From	To	Notes on Characteristics of Resistive Zone
3040	4625	4645	10m cover, broad flaring to east at 20-50m depth
3040	4915	-	Blind 20m cover, one station, shallow flare to west
3120	4255	4625	30m cover, end of line, large depth extent, possible E reach to surface
3200	4685	4815	Very broad, possible Si flooding of host, 10-20m cover
3200	4885	4915	20m cover, probably limited depth extent
3360	4355	4385	40-50m cover, hence lower amplitude
3360	4855	4895	Strong resistor, 15-20m cover
3360	5025	-	Very narrow completely blind possible vein
3360	5185	5295	Broad zone of potential silica flooding of permeable host
3400	4355	-	Similar to 3360/4355 above
3400	4635	-	Only 5-20m cover but increasing resistivity with depth
3480	4325	4375	Broad covered resistor could be fault-bound fresh rock
3580	4785	4805	20m cover moderate resistor
3580	5155	-	Strong resistor on geological contact?
3580	5325	5385	Strong blind target, 20m cover, widens at depth
3600	4355	4375	Covered moderate resistor
3660	5075	5105	10-15m cover over potential silica breccias zone
3660	5285	5315	15-20m cover, moderate resistor
3680	4385	4425	Moderate resistor, may sub-crop near 4385
3740	5055	5095	Good target 10-15m cover
3760	4525	4535	Intriguing E-dipping vein-style feature, no exposure, adj

			conductor
3780	4575	-	Narrow deep +80m vein? /fracture?
3820	4935	4945	Very limited depth extent on covered zone
3820	5085	-	Possible feeder to shallow flat-lying outflow zone
3900	4985	5025	Limited depth extent
3900	5095	5185	Flat-lying “ledge” of? Silicification
3980	5025		15-20m cover over narrow zone of limited extent
3980	5115	5145	Broad covered resistor, limited depth extent
4190	4845	4855	Covered, limited extent
4190	4975	4995	30m cover to probable E-dipping strong target
4190	5155	5235	30-40m cover above strong and broad resistor zone
4270	4815	4835	Blind strong resistor at contact with conductor, 30-40m cover
4270	5055	5115	Broad E-dipping multiple resistors
4270	5165	5185	Blind E-dipping resistor, stronger at depth
4350	4805	-	Deep narrow vein/ fracture?
4350	4835	4865	May crop out at 4835
4350	5025		Strong resistor at 40m below surface
4430	4815	4835	Very strange conductor (clay) over resistor (deep target?)
4430	5065	5095	Strong resistor, possible silica breccias at 30-40m depth
4510	4775	-	Narrow vein/ fracture? Adjacent to strong conductors (clay alteration)
4510	4915	4935	Conductor over strong resistor as on L4430
4510	5135	5155	Moderate conductor, limited depth extent resistor
4830	4845	4855	Strong resistor may sub-crop at 4855
4830	5065	-	Narrow vein/ fracture
4900	4885	4905	Probable steep W-dipping zone limited depth extent
4900	4925		Narrow vein style response, stronger with depth
5000	4845	4865	Completely blind strong resistor under 40m cover
5000	5185		Very limited covered feature, not an attractive target
		-	There appears to be a substantial increase in the level of

North of 5000			erosion with subsequent fill of? Volcaniclastic, with weathering to around 25m in this cover unit
5080	4785	4815	Very deep strong resistor, 80-100m cover
5160	4795		Deep resistor
5200	4805	4815	Strong deep resistor 110m
5200	4895	-	Ditto, 90m
5200	5015	-	Ditto, 60m
5200	5055	-	Ditto, 60m
5200	5105	5115	Ditto, 80m
5200	5225	5235	Ditto, + 100m
5200	5295	-	Not fully defined at the end of the line
5240	5225	-	Deep narrow resistor, compare with Line 5200
5280	4715	-	Eroded resistive (siliceous) fractures under substantial cover
5280	4885	-	-
5280	4945	-	-
5280	5105	-	-
5280	5255	5265	-
5380	-	-	Many similar features to Lines 5200 and 5280

The company's identification of grid NW-SE faults offsetting units to the NW is supported. Note that "Kasi South" may correlate with Mango zone some 250m to the NW rather than "Mt Kasi". This would mean that the continuity to Mt Kasi to the SE and not yet covered by CSAMT data.

A preliminary interpretation of the aeromagnetic and radiometric data for SPL 1374 (Tavea) and SPL 1375 are as follows. The entire area was flown as one survey.

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associated NW-SE structural corridor forms one side of the domain of low magnetic susceptibility.

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