

APPENDIX 2

EL43/2006 Gowrie Park – Western Sector Report on Prospect Reconnaissance for Work Program Planning

K Morrison October 2007

(See Digital File EL432006_200803_04_Appendix2.pdf)

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Introduction

An excursion to two areas with established broad scale base metal and polymetallic anomalism within the Cambrian volcanic rocks to the west of Gowrie Park was conducted from October 16-20, 2007. The aim was to assess the Lake Barrington and Cethana Alteration Zone (CAZ) prospects in terms of opportunities to test new ideas and under-explored sites during the 2007-2008 summer field season, in combination with the work program already defined for the eastern part of the EL.

The field trip was based at the village of Gowrie Park, using accommodation facilities described previously for the August 2007 excursion. The Lake Barrington prospect requires a 30 minute drive from Gowrie Park but the CAZ is only 5-10 minutes drive west of the accommodation.

Lake Barrington

The prospect is located on the wet eucalypt native forest covered steeply sloping western side of Lake Barrington, immediately east of and down slope from the Wilmot farming district which is developed on a Tertiary basalt plateau (Photos 1 & 2). The prospect is defined by a copper in soil anomaly which extends for some 700 metres along a SW-NE trending grid but has a definite focus along a NW-SE trend at the NE and upslope end of the anomaly. Four diamond drill holes from three pads have tested the NE edge of the copper anomaly by drilling normal to the NW-SE trend, intersecting broad zones of low grade copper mineralisation including patchy very narrow (< 1 metre) ore grade intervals of copper and minor gold. The Wilmot 1:25,000 geology sheet shows that the prospect is hosted by felsic volcanics and volcanoclastics which are in contact with an untested andesite unit at the SW end of the grid. The aim of the reconnaissance was to evaluate evidence for the main controls on the soil anomaly, the extent and style of any alteration and the nature of the southwestern andesite contact.

The three drill pads were located, confirming the collar pipe locations and azimuth directions (Table 1). Subcrop/outcrop coverage over the entire prospect is excellent and despite the steep slope with prominent Owen Conglomerate cliffs at the top, contamination by Owen talus is not a major problem for either mapping or soil sample quality over most of the prospect. No contamination exists from the Tertiary basalt. The rock type distribution comprises five broadly defined units, which from the NE upslope end are as follows:

- Polymict resedimented volcanoclastic-lithic granule conglomerate and sandstone
- Rhyolite lava and associated felsic juvenile volcanoclastic sandstones.
- An association of marine sedimentary rocks with a shale base and grading up through fine dacitic and fine quartz sandstones.
- Dacite lava.
- Andesite lava.



Photo 1. View to the northeast from Bell Mount, looking over the basalt plateau south of Wilmot, to the prospect area at right centre, on the steep western valley side of Lake Barrington.



Photo 2. View from the northwest corner of the prospect, looking south and down slope to Lake Barrington through the forest covering the main part of the soil anomaly.

One good quality outcrop within the dacite unit (Photo 3) shows a northerly strike and westerly dip. This was the only site where reliable bedding/primary layering was observed. Subtle support for a northerly strike to the dacite can be interpreted from the eastern edge of the soil zinc data, which appear to map the distribution of the dacite. If representative of the prospect rocks, the dacite shows conformability with the NW plunging anticline mapped on the Wilmot sheet, NE of the prospect, and also suggests that the Owen Conglomerate unconformably overlies the volcanic sequence.



Photo 3. Primary tuff band layering in massive coherent dacite lava (location in Table 1). The layering strikes north and dips west.

No evidence of volcanigenic or stratigraphically controlled alteration was seen in any unit. The dacite-andesite contact is abrupt with no intervening clastic unit seen and no evidence of either alteration or faulting at the contact. If the high soil zinc values are reflecting background levels within the dacite, then the andesite contact appears to trend NW-SE, suggesting a fault with an incised creek at the contact. The andesite is more deeply weathered than the felsic rocks and yields a more fertile red-brown ferrisol which supports a rainforest vegetation type (Photo 4). Where kernels of fresh andesite are preserved they exhibit fresh pristine unaltered lava textures, providing no incentive to extend the grid further SW.

Localised patchily pyrite altered rhyolite outcrops in the NW-SE trending creek (“Pyrite Creek”), at the NE edge of the most intense part of the copper anomaly (Table 1). No sulphide or alteration was seen immediately either side of the creek, suggesting a linear trend which is probably fault controlled. The shape of the copper anomaly suggests dispersion down slope, particularly when it is recognised that both the soil profile and the creek incision are Holocene landscape development products occurring contemporaneously since the last ice age. Pre creek incision, a mineralised structure would have been several metres higher than it is today. Pyrite was also noted in a dacite sample (Table 1), further SW along the grid and close to a possible secondary zone of

copper anomalism. Because there are only three grid lines extending this far to the southwest, and the upslope line is probably contaminated by Owen talus, it is not clear whether this anomaly represents another fault or a lobe of more distal soil anomalism sourced from “Pyrite Creek”.



Photo 4. Rainforest vegetation anomaly on andesite in small northwest trending creek at the contact with dacite lava (location in Table 1). The creek trend and the trend of soil zinc anomalism suggest a faulted contact but no direct field evidence of faulting was seen.

In conclusion the evidence points to the prospect being fault controlled, small in scale and restricted to the area already partly (but not thoroughly) drill tested. Although the priority here is assessing the geological potential, it is also worth noting that Lake Barrington is both an active hydro electric storage reservoir and the site of a world class rowing course. Environmental issues linked to the lake and the high value farm land immediately west of the prospect would be inevitable.

Cethana Alteration Zone

This impressive NW-SE trending belt of schistose sericitic felsic volcanics is the largest outcropping Tasmanian Middle Cambrian volcanogenic alteration system outside Mt Lyell, yet its exploration history to date is plagued by a lack of demonstrated ore metals and an interpretation of the exposed alteration as the footwall only part of the system. Potential is centred on a contact mapped on the 1:25,000 Cethana sheet, between the altered felsic and rhyolitic CAZ rocks and an association of andesite lavas and volcanoclastics.

Access to the area by vehicle and foot and the topographic and bush conditions are excellent for conducting exploration over a longer field season than is practical at Queenstown or Red Hills (Photo 5).



Photo 5. View looking south from 2 km west of Gowrie Park, through dry eucalypt native forest on Quaternary talus, in the area of previous RGC percussion drilling, close to the projected CAZ-andesite contact.

Outcrop coverage on the CAZ rocks is good but much of the contact area and the andesitic rocks mapped close to the contact are covered by Owen talus in the SE and Tertiary basalt in the NW (Photos 6 & 7).



Photo 6. View looking southeast across Owen talus mapped as CAZ-andesite contact.



Photo 7. View looking northwest along the trend of the CAZ-andesite contact and across the Dasher River valley towards Tertiary basalt cover, just visible as farm land at top left of photo. The scrub in the foreground is growing on Owen talus mapped as felsic volcanics.

Alteration intensity expressed as feldspar replaced by sericite and subsequent schistosity development appears to increase along strike to the SE within the CAZ, from about Staverton Road. In the SE part of the prospect the felsic schist is patchily exposed under Owen talus, as small escarpments with a NW-SE orientation and steep dip to the foliation (Photo 8). The Cethana sheet shows CAZ-andesite contacts on both Staverton Road and Days Road, about 1500 metres further along strike to the NW and projected under Tertiary basalt cover, however field checks revealed no andesitic rocks and no convincing contact on either traverse. Towards the NE margin of the CAZ in the Days Road-Staverton Road area, a schistose polymict quartz phyric volcanoclastic-lithic granule conglomerate with minor clasts of chert and hematitic silica outcrops and this could represent a thin top to the footwall volcanics and therefore be in the right stratigraphic position for a host horizon to mineralisation. The best exposure of the critical contact area seen on the excursion is down slope from Staverton Road, SE towards Dasher River. Here the schistose granule conglomerate is well exposed and appears to be interstratified with a green (?weakly chloritic) sericite schist with a remnant porphyritic feldspar texture poorly preserved. It is possible that these rocks have been mapped as andesitic volcanoclastics further to the NW where exposure is masked by the overlying basalt.

NE of these contentious rocks an unequivocal contact edge to the CAZ can be traced down slope from Staverton Road, where a feldspar hornblende quartz phyric crystal sandstone with patches of chlorite and a characteristic fresh, hard and dense outcrop preservation is patchily well exposed (Table 1) and marks the NE limit to the CAZ schists. The striking contrast in degrees of feldspar destruction and schistosity between



Photo 8. Steeply dipping sericite schist within the CAZ close to mapped contact which is not exposed (location in Table 1). The rock face trends NW-SE but there is no direct evidence as to the nature of the andesite contact.

the two units is strong evidence that the crystal sandstone is younger than the hydrothermal system and if the contact is not faulted in this area, then the stratigraphy youngs to the northeast. Texturally and by its characteristic outcrop form, the “Staverton Road crystal sandstone” is very similar to the Lynchard Tuff in the Henty-Queenstown region. The Lynchford Tuff is a near basal Tyndall Group marker horizon, particularly on the western side of the central volcanic belt where it marks the top of the recognised prospective stratigraphy. It also has an anomalous magnetic high signature due to its mafic content.

Conclusions - CAZ

There appears to be four possible explanations for the apparent lack of mineralisation and hanging wall alteration compatible with such a large volume of hydrothermal fluid migration and feldspar destruction in the CAZ stratigraphic footwall.

- The upper half of the system has been eroded off. This seems unlikely because there is no evidence of glaciation or a substantial thickness of Cainozoic fluvial sediments in the district and no reported clasts of mineralised or altered volcanics in the post Middle Cambrian sedimentary rocks.
- The upper half of the system has been faulted out and remains entirely hidden in the subsurface. This also seems unlikely given the strike length of the alteration zone and the relatively minor extent of fault dislocation and internal deformation shown by the CAZ and other Cambrian units in the region.
- The hydrothermal system expired during the footwall alteration phase and therefore failed to generate an ore body. This option can only be evaluated by eliminating all the others.
- The complete system is present but the host horizon and hanging wall alteration are relatively thin and subtle to distinguish in the exposed portion of the CAZ rocks. Under this scenario the weak mineralisation and hematite-silica alteration drilled by previous shallow percussion holes under Quaternary cover about 2 km SW of Gowrie Park represent the ore position along strike, but at a position well up-dip, from a predicted deep untested target. This option also requires the schist-andesite contact under Quaternary cover to be stratigraphic rather than faulted and, to be consistent with the field observations, most (possibly all) the andesitic rocks are younger than the mineralisation rather than being a key part of the target as per the RGC thinking at the time of their previous drilling.

The components of this option are nicely depicted on the graphic model constructed by Joel Kitto last week, which incorporates the results of previous drilling, the current field observations around the CAZ-andesite contact, together with a sensible interpretation of the magnetic data to allow for a northerly trending fault contact between the CAZ and the andesite lavas, well east of the prospective zone. This last point is important because the magnetics support a separation of the andesitic rocks mapped on the Cethana sheet in the prospect area, into a genuine andesite lava unit with a fault boundary on the western side and a more polymodal suite of volcanoclastics, some of which are andesitic, and some of which may be incorporated into the schistose felsic rocks of the CAZ.

A deep down-dip drill test of the CAZ-polymodal volcanoclastic unit contact area SW of Gowrie Park is the most attractive exploration target generated to date on the EL. Siting a single hole test carries risk of missing the target as even a relatively large massive sulphide body elongated into the foliation can be a small target in plan view. For example, a 20 million tonne ore body may have dimensions of about 100m x 50m x 1000m and yet if the base + precious metal ore grade was similar to Hellyer, Que River, Rosebery, Hercules or Tasman Crown (ie about 20% zinc equivalent), the value of that ore body would be approximately equivalent to a gold deposit of 20 MT @ 25 g/t Au.

A judgement is required on whether to immediately site a deep hole using the results of the previous shallow drilling alone, or whether to do more target generation work first. By analogy with Rosebery and Mt Lyell, the prognosed Gowrie Park deposit should have a pyrophyllite/topaz infra red spectral signature around the footwall stringer system, a conductive electrical geophysical signature on the ore body and a trace element vector signature within both the footwall and along strike in the host horizon. It is not practical to contemplate flying an infra red survey as part of the current program. The lack of a convincing geophysical anomaly from the RGC IP and EM surveys (with the possible exception of the VLF EM feature at the SE end of the CAZ trend, which needs explaining), suggests that an ore body down dip from the previous drilling would be >200-300 metres below surface, assuming the previous surveys were valid. The thallium, antimony and zinc concentrations of the host unit at Rosebery increase systematically along strike towards ore lenses (particularly thallium) and there is sufficient outcrop along the CAZ trend at Gowrie Park, both NW and SE of the central segment of the contact, buried under talus, to establish a vector if the method works at Gowrie Park.

TABLE 1 : EL 43/2006 Gowrie Park Reconnaissance October 2007

Register of Field Sites
(AGD 66 datum, by hand held GPS)

Site ID	Prospect	Easting	Northing	Description
Rock chip sample 1	Lake Barrington	431541	5415353	Dacite lava with weak green sericite selective feldspar ?hornblende phenocryst overprint, localised patches of pyrite silica limonite manganese oxide alteration
Rock chip sample 2	Lake Barrington	431252	5415120	Fresh andesite lava, abrupt contact with dacite lava but no direct evidence of fault, prominent soil vegetation anomaly, no alteration of andesite, dacite or contact.
Rock chip sample 3	Lake Barrington	431687	5415235	Dark grey weakly foliated marine shale at base of sedimentary sequence and at contact with dacite lava, unaltered.
Rock chip sample 4	Lake Barrington	431792	5415599	Silica pyrite altered quartz porphyritic rhyolite lava, outcrop in linear creek with steep sides, probable fault.
Rock chip sample 5	CAZ	431144	5408200	Fresh unaltered hard dense feldspar quartz mafics crystal sandstone, patchy chlorite, ?Lynchford Tuff correlate.
Drill pad Holes 1, 3	Lake Barrington	431843	5415634	Hole 1 Az to 225 grid, collared in dacitic crystal volcanic lithic sandstone, patchy manganese oxide.
Drill pad Hole 2	Lake Barrington	431814	5415748	Az to 225 grid, collared in quartz phyrlic juvenile volcanoclastic sandstone near contact with sedimentary sequence.
Drill pad Hole 4	Lake Barrington	431928	5415510	Az to 225 grid, collared in quartz phyrlic felsic lava.
Outcrop	Lake Barrington	431849	5415831	Polymict volcanoclastic lithic granule conglomerate/sandstone.
Outcrop	CAZ	433706	5407199	Sericite schist with total feldspar destruction, no visible sulphide, outcrop on small SE trending escarpment above creek, schistosity strike 310 grid 60° SW.
Outcrop	Lake Barrington	431652	5415411	Finely banded tuffaceous fine quartz sandstone near base of unit overlying rhyolite lava.
Outcrop	Lake Barrington	431515	5415336	Dacite lava with primary tuff band layering, strike 010 grid 50° W, suggesting prospect is on a NW plunging anticline.
Outcrop	CAZ	431073	5408174	Schistose polymict quartz phyrlic volcanoclastic granule conglomerate and green chloritic schist with outlines of porphyritic feldspar phenocrysts, near contact with mapped andesite unit.