Exploration History and Potential of

ELs 102/87, 55/89 and 12/92

Queenstown, Mt Darwin and Queenstown South

Tasmania

For RGC Exploration Pty. Ltd.
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1 SUMMARY

Mineral exploration of the ~130km2 area of combined ELs 102/87, 55/89 and 12/92, over the past decade, has been both extensive and intensive.

BHP's approach was based on blanket TEM surveys to search for conductive VHMS deposits upto 200-300m below surface. During the years 1988-91 nearly all the exposed prospective parts of the Mount Read Volcanics (apart form some small areas mainly of the Central Volcanic Complex (CVC) at King River and Intercolonial Spur) were covered at 200m line spacing. Only two significant conductors, at Thomas Currie Rivulet and Comstock Valley, were defined and drill tested and both were found to be due to carbonaceous units in Ordovician Gordon Limestone.

RGC's exploration programme since 1992, has been more geologically driven, aimed at identifying hydrothermal alteration zones and favourable horizons and drilling conceptual geological targets. The major focus has been at the Garfield prospect where 12 drill holes outlined subeconomic Prince Lyell type disseminated chalcopyrite-pyrite+/-magnetite mineralisation grading ~0.3% Cu and 0.1g/t Au over an area of about 100m x 250m and depth to 200m.

A single hole into a similar target at the Penghana prospect did not intersect significant mineralisation.

Three holes drilled at West Sedgwick to test the Lynchford Member favourable horizon above a footwall alteration zone, and a single stratigraphic hole to test strike extensions of a favourable black shale horizon at Beatrice, likewise did not intersect mineralisation.

Moderate exploration potential exists for VHMS deposits at the base of the Tyndall Group, 1.5km northwest of Garfield prospect, where sericite-pyrite alteration associated with weak Pb-Zn geochemical anomalies exists in the footwall zone beneath a black shale unit, and TEM coverage is barely adequate.

Moderate potential remains for significant depth extensions to known mineralisation at Garfield, beneath GAR 001 & 002 close to the NE trending fault but there is no convincing indication of an increase in grade and further drilling of this zone is considered have low (economic) priority. There is slight to moderate potential for discovery of additional zones of Garfield type low grade mineralisation on strike extensions north of the existing Garfield drill holes (based on IP and magnetic data and reported alteration) but the likely low grades also make this a low priority target.

At Crown Hill, in the western sector of the West Sedgwick area, there are discrete, stratabound looking gradient array IP chargeability anomalies, of ~1.2km strike length adjacent to sills? of Suite II type andesite, which have not been adequately tested. This area has moderate potential for Garfield

type Cu-Au deposits and unknown to moderate potential for stratiform VHMS deposits. Further investigation, including examination of the core of existing holes WS 1 & 2 and alteration study, is recommended.

There is moderate potential at the Beatrice area, offset by a low-moderate findability factor, for stratiform VHMS deposits associated with a regionally Pb-Zn anomalous black shale unit which may be a distal correlate of the (Henty-Comstock) Lynchford Member favourable horizon.
A programme of stratigraphic drilling, alteration zonation studies and DHEM, involving four holes totalling 1600m, is recommended for consideration.

Moderate potential for shallow low grade gold mineralisation of uncertain style, associated with a quartz-pyrophyllite?-pyrite alteration zone of about 200 x 300m, exists at the Mountain Maid prospect near Mt Huxley. An untested shallow IP anomaly corresponding to the alteration zone provides an easy target for a low key, low priority, shallow diamond drilling programme to determine the style and grade of mineralisation.

There is slight to moderate probability that the Lynchford Member of the Tyndall Group exists (unrecognised) along the eastern edge of the Huxley-Nasty Knob area adjacent to the Great Lyell Fault in a favourable geological setting possibly similar to that at Comstock. Reconnaissance mapping and assessment of alteration style is required to check the stratigraphic correlation and evaluate further exploration potential.

An untested IP chargeability, resistivity and magnetic anomaly associated with strong K-feldspar alteration just north of the Jukes Proprietary workings warrants a low key, low priority, shallow diamond drill hole to assess the source of the anomaly and potential for mineralisation extending to significant depths below and adjacent to the King Tunnel.

2 INTRODUCTION

ELs 102/87 (Queenstown), 55/89 (Mt Darwin) and 12/92 (Queenstown South) cover a 30km long segment of the Mt Read Volcanics between Lake Margaret and Slate Spur (Figure 2) which has been explored since1992, by RGC Exploration P/L in joint venture with BHP Minerals Ltd., principally for polymetallic volcanic hosted massive sulphide (VHMS) and Mt Lyell type disseminated copper-gold deposits.

The area was part of EL 9/66 between 1966 and1987 and it has been extensively explored for base metal and copper-gold deposits mainly by companies associated with Mt Lyell (MLMRC and GFEL) applying systematic mapping, soil and stream sediment geochemical and gradient array IP survey techniques which culminated in diamond drilling programmes at a number of prospects.

In the period 1988-90 BHP carried out blanket TEM surveys which covered most of the prospective volcanic sequences at 200m line spacings and was considered to be effective for detection of conductive massive sulphide deposits to depths of 200-300m. Very few significant bedrock conductors were located; only two were drilled and both were found to be due to carbonaceous zones in Ordovician limestone.

RGC's exploration philosophy in operating the joint venture since 1992, has been to carry out detailed geological mapping to identify hydrothermal alteration zones and favourable horizons (most especially the Lynchford Member at the base of the Tyndall Group which hosts VHMS deposits at Comstock and gold deposits at Henty) to develop conceptual geological targets for testing by drilling,beyond the effective depth range of electrical geophysics.

This report presents a summary and review of the past decade of exploration by BHP and RGC, and discussion of remaining exploration potential, especially with respect to VHMS and Mt Lyell type Cu-Au deposits. Prepared under a contract arrangement for RGC Exploration P/L, it is based entirely on appraisal of company progress reports; no new exploration data have been generated.

3 EXPLORATION HISTORY

3.1 Garfield and Clark Valleys

~1900 Prospecting efforts around the turn of the century resulted in the discovery of:

Flannigan's Flat: Alluvial gold and auriferous quartz veins in slate below the alluvial deposits.

Sailor Jack's Py-Qtz-Au veins in sandstone at faulted contact between Denison Group and CVC.

Snake Spur: Py-Cpy in altered volcanics west of faulted contact with Denison Group.

Early 1970s Partial coverage by Mt Lyell Co. and EZ Co. including reconnaissance gridding, soil sampling and stream sediment sampling did not produce significant anomalies.

There was considerable early exploration by various companies, including BHP, which involved mapping and adit sampling and culminated in several drill holes to test weak Cu-Au mineralisation at Lake Jukes and Prince Darwin areas. Four drill holes to test anomalies arising from IP surveys over five small areas at East Darwin and Jukes Pty., intersected low grade mineralisation indicating some supergene enrichment at adit levels.

Late 1970s Extensive regional mapping, stream, soil and rock geochemical surveys, and gradient array IP surveys by GFEL indicated the presence of several black shale and chert horizons within the felsic lava dominated sequence on the Mt Darwin ridge; these were considered favourable for VHMS deposits but geochemical results were discouraging - the best result from rock chip sampling was 2250ppm Pb in black shale.

1984-87 GFEL carried out -80# stream sediment geochemical surveys with analysis for Cu,Pb,Zn,Ag,Sn,W & Au. A strong Au(Ag,W,Cu) anomaly (to 4.5g/t Au) in the headwaters of the Garfield River was interpreted to originate outside the licence? - (EL9/66); the Cu,W signature suggests Jukes-Darwin type mineralisation as the source.

Numerous other drainage anomalies were detected in the range 0.1 - 1g/t Au but only one base metal anomaly at 330ppm Pb which was attributed to minor galena-pyrite veinlets in volcanics.

Follow up at Flannigan's Flat and Snake Spur including gridding, rock, soil and Wacker geochemical sampling discovered spotty Au anomalies to 0.4g/t at Flannigan's and a broad anomalous

zone of >0.1g/t with two linear zones upto 0.46g/t Au at Snake Spur. The latter was tested with two diamond core holes, SS1 & SS2, which failed to indicate significant mineralisation or DHEM responses (Figure 3). A two loop UTEM survey recorded several early time responses attributed to weak surficial conductors in the gold anomalous zone.

Sericite-pyrite alteration was mapped on the west side of the ridge dividing the Currie and Garfield Rivers.

GFEL's gold exploration in the Mt Darwin - Intercolonial Spur area did not produce significant results. This area was subsequently explored, in the mid 1980s, by EZ-Norgold specifically for epithermal gold mineralisation. It resulted in the re-discovery of Norm's Prospect, which carries upto 6.7g/t Au in a quartz-pyrite vein which is upto 1.5m in width and traceable for several hundred metres along strike (now in Platsearch's EL 50/94).

1988-90 BHP acquired extensive exploration tenure under ELs 102/87 and 55/89 extending ~30km from South Darwin Peak to Mt Sedgwick and including a small separate area at Moxon Saddle (Figure 1). The exploration philosophy was based on the use of blanket TEM coverage over favourable volcanic sequences, with backup geological reconnaissance mapping and rock chip geochemical sampling, to search for conductive VHMS deposits at upto 300m below surface. Geochemical results were generally disappointing and supported the opinion that near surface deposits were unlikely to exist.

BHP's UTEM surveys involved about 93 line km in the Garfield Valley and 110 line km in the Clark Valley, covering Central Volcanic Complex (CVC) felsic volcanics on the western side of the Mt Darwin ridge and the adjacent overlying Yolande River Sequence (YRS) correlates to the west, for about 10km of strike length, on 200m line spacing and 50m station spacing (Figure 2). The surveys were considered to be effective in (potentially) detecting moderate conductors to depths of 200-300m.

The Clark Valley UTEM survey detected a number of weak surficial conductors (upto channels 7 to 6) which were attributed to black shale units; no indications of VHMS type conductors were recorded.

The Garfield UTEM survey indicated two conductive zones in the northern part of the area surveyed:

a) The Heli conductor (on the ridge between Thomas Currie Rivulet and Flannigan's Flats) was covered by follow up UTEM surveys and interpreted to be due to surficial effects, and

b) The Currie conductor was resolved into two surficial zones and a third zone called Thomas conductor which was responsive in Channels 9-5 over a strike length of ~800m. Black shales beneath Denison Group cover were considered as a possible source but the time constant of 0.3ms and conductance of 9 Seimens indicated a higher conductivity than black shales elsewhere in the Garfield area and a massive sulphide source could not be ruled out. Accordingly, the Thomas anomaly was tested by drill hole TC1 and found to be due to carbonaceous bands in unmineralised Gordon Limestone.

1991-92 RGC entered JV agreement with BHP and took over operation of exploration.

The cut line grid was extended some 3km south to 5315000N covering the southern end of the YRS volcano-sedimentary exposure. Soil geochemical sampling (every second line @ 400 x 50m spacing) and geological mapping were carried out over the entire grid.

The CVC on the eastern side was interpreted as being dominated by massive feldspar phyric lavas (subdivided into three groups on basis of phenocryst content) and minor bedded black shaly units. The YRS in Garfield and Clark River valleys and on the ridge between Garfield and Thomas Currie Rivulet appears to overlie the CVC and comprises mostly qtz+feldspar phyric lavas, volcaniclastics and greywacke-mudstone with minor hornblende phyric andesites which are petrographically and geochemically similar to MRV Suite II type andesites at Crown Hill and Anthony Road. The Tyndall Group (TG) to the west, is locally conformable on YRS and consists of volcanolithic conglomerate (containing clasts of qtz-feldspar phyric felsic volcanics and PreCambrian quartzite) volcaniclastic sandstone and grey siltstone, but evidently includes no feldspar crystal rich equivalents of the "Comstock Tuff".

Observations of hydrothermal alteration included:

- Mt-Q-Chl in CVC east of Clark Valley, related to Darwin Granite but not considered significant,
- Minor Q-Ser-Py in TG? near Flannigan's Flat,
- Q-Ser-Py in several small areas around margins of andesites, especially near 1800N which subsequently became known as the Gafrield prospect.

Analysis of soil and rock multi-element geochemical data (using RGC's "GAS" system) showed that the YRS and CVC "lavas"

are mostly rhyolitic, with Ti/Zr <10, and have an interesting dichotomy of immobile element concentration: the YRS rhyolites contain <220ppm Zr and CVC rhyolites are in the range 220-400ppm Zr; possibly indicating more "evolved" magmas in the former?

Cu, Pb, Zn geochemical data showed sporadic anomalies with best co-incidence at the "Garfield" andesite where values upto 0.48% Cu and 0.12g/t Au are associated with patchy but locally intense Q-Ser-Py alteration in andesites near a dextral NE trending fault.

1993 The Garfield prospect was remapped at 1:1000 scale and geochemical sampling infilled to 200 x 25m spacing. This showed that the andesite has a sheet like conformable form 20-150m thick (ie: sill or extrusive) within a sequence of qtz-feldspar phyric YRS lavas and volcaniclastics overlain (to west) by a feldspar phyric dacitic lava with similarity to CVC? The southern end of the andesite is dextrally offset about 400m by a NE trending fault and the zone of strongest alteration (upto 10% Py) occupies an area of ~100 x 200m within the andesite (especially near its upper, western contact) immediately north of the fault.

Infill geochem sampling produced results upto 330ppm Cu and 0.16g/t Au - surprisingly low in comparison to original results and leading to a conclusion that the geochemical expression is subtle (40-200ppm Cu) and original maxima were fortuitous.

Diamond core hole GAR001 tested the alteration zone north of the fault and slightly north of the best geochem anomaly. It intersected a steeply dipping sequence of feldspar phyric dacite, three intervals of andesite, quartz phyric rhyolite and rhyolitic volcaniclastics. The andesite unit in the interval 175-318m contains disseminated and stockwork Py-Cpy(Cb) veinlets with sericite-chlorite alteration selvedges in pervasively chloritised andesite. Sulphides are typically in the range 2-5%, locally 40% and there are patches of magnetite and coarse pink apatite. Short intervals of upto 3% Cu exist in a 105m (downhole) zone averaging 0.38% Cu; Pb and Zn are mostly <500ppm. The style of mineralisation appears to be similar to Prince Lyell (88Mt @ 0.9% Cu, 0.3g/t Au). DHEM in GAR001 did not record any conductive responses.

Ground magnetic and gradient array IP surveys, over an area of ~800 x 700m, indicated more or less coincident magnetic and chargeability anomalous zones over the mapped extent of alteration; the magnetic feature has a N-S strike of ~400m and the chargeability anomaly (~2-3 times background) extends to the north. The southern end of the magnetic anomaly appears to be terminated by the NE fault and a second anomaly south of

the fault corresponds to the dextral displacement interpreted for the andesite unit. Magnetic modelling suggested that GAR001 had been drilled too far west and had passed beneath the main magnetic source; it was recommended that another two holes be drilled to test the main source adjacent to the fault and 200m further north.

Eastern and southeastern parts of the exploration licences, including the Jukes-Darwin and Mt.Owen-Comstock Valley areas, were relinquished and subsequently picked up by Platsearch and CMT, respectively.

1994 Five diamond core holes explored the extent and continuity of grade of the Garfield prospect (Figure 3).

GAR002 was drilled to the east from similar collar location as GAR001 (evidently in disregard of the geophysical advice) to test mineralisation closer to the dextral "Garfield Fault". It intersected 110m @ 0.25% Cu, 0.07g/t Au in altered andesite.

GAR003 tested the IP chargeability zone 200m north of GAR001, it intersected similar mineralisation in andesite with 107m @ 0.24% Cu, 0.08g/t Au including 21m @ 0.89% Cu, 0.29g/t Au.

GAR004 tested the smaller magnetic feature displaced to the SW on the southern side of the Garfield Fault; it intersected interlayered andesite and rhyolitic volcaniclastics without significant mineralisation and alteration, the magnetic anomaly was attributed to disseminated (accessory?) magnetite.

GAR005 was drilled 400m to the west to test a regional-empirical concept (based on stratigraphic control of mineralisation at Henty, Comstock, Mt Jacob and Beatrice prospects) that the Garfield mineralisation could represent the footwall alteration system to stratigraphically higher sea floor exhalative VHMS mineralisation postulated to exist at the base of the Tyndall Group. The hole intersected a west facing sequence of felsic volcaniclastics and qtz-feldspar-biotite porphyry then passed through a faulted contact into TG hematitic volcanolithic conglomerate. Although weak sericite-pyrite alteration was observed in the YRS and base of TG, the concept was not advanced by the absence of significant mineralisation and any form of exhalative horizon.

GAR006 tested the northern end of the chargeability zone 200m north of GAR003 (ie: ~400m north of GAR001). The andesite was not intersected, apparently pinching out north of GAR003, but a minor stockwork of Py veinlets with traces of Sp & Gn was found in sericitic rhyolite at about the same

stratigraphic level to the mineralisation in the holes to the south. GAR006 established that significant mineralisation was restricted to an area of ~400 x 100m.

1995 Five short holes (GAR007 to 011, each ~40m) were drilled on the peak of the IP chargeability zone on lines 2000 to 2400N to test the conjecture that the disparity between soil geochemical and deep drill hole geochemical results indicated that copper grades increased with depth. All of the short holes intersected disseminated and veinlet style mineralisation with pyrite fresh at surface, carbonates leached out and no signs of supergene enrichment. The grades averaged 0.03 to 0.2% Cu, ie: a factor of 2 or 3 lower than the deeper holes, and supported the concept that grade increases with depth.

Accordingly, GAR012 was drilled (about 150m NW of GAR001) to test for higher grades at greater depth; the minimum target was stated to be ~50Mt @ 1.6% Cu, 0.5g/t Au. The result was disappointing. The andesite unit intersected in this hole is narrower and contains only weak mineralisation: 45m @ 0.07% Cu with a maximum of 0.44%.

Holes GAR 004, 005, 006 and 012 were surveyed by DHEM but no anomalous responses were recorded. Extension of IP survey 600m to the north showed that a weaker chargeability anomalous zone extended (and is still open) to the north. However, it was considered that the stronger anomalous zone to the south had been adequately tested and found to be of low grade and too small.

A detailed discussion of the style of mineralisation and isotopic data (Appendix 13 in Halley et al., 1996) leaves little doubt that the Garfield prospect is of similar type to the Prince Lyell deposit and has a similar Cu/Au ratio ~3000.

d34S ~+50/00 indicates a large component of rock sulphur (unlike VHMS and Darwin granite associated deposits ~7-170/00 where reduction of seawater SO4= is main source); and the small volume of andesite in the sequence suggests a direct magmatic input rather than leaching.

d18O ~+40/00 in Garfield magnetite was interpreted to indicate that the (early phase?) mineralising fluid had d18O ~+100/00, consistent with magmatic fluid rather than seawater (00/00).

d18O ~10-120/00 and d13C ~-2.50/00 in carbonates in Garfield sulphide veinlets are similar to carbonates from Rosebery, Hercules, Comstock and Henty suggesting that sulphides did precipitate from sea-water dominated system???

ENd isotopic ratios (~1.2 to 1.3) of Garfield apatites are similar to MRV Suite II andesites (Suite II & III have mantle signature ~+1 to -1; Suite I has crustal signature < -2) suggesting that apatite precipitated from fluids originating from andesitic magmas or leached from andesites by a seawater system. However, likely immobility of REE and small volume of andesites favours a magmatic source.

The Prince Lyell & Garfield type deposits were considered to represent mineralisation formed in the mixing zones of magmatic fluids and seawater convection.

The key exploration criteria are:

a) Suite II andesites as a magmatic fluid source,
b) Sheet like conformable disseminated-stockwork deposits,
c) Magnetite in some deposits (but not all; eg: Mt Lyell), magnetic geophysics for detection,
d) IP effective; EM and DHEM ineffective and
e) Surface geochemistry not reliable indicator; weak Pb,Zn halo at Garfield.

1996 Infill soil geochemical sampling (200 x 25m spacing) was carried out at Slate Spur where existing moderate Pb,Zn anomalies suggested potential for stratiform exhalative VHMS deposits stratigraphically higher than the Garfield mineralisation. However, the infill produced only spotty anomalous results upto a few hundred ppm, against a background of <50ppm; no favourable zone was outlined and further work was considered unjustified.

3.2 Penghana

1994 RGC's drilling at the Garfield prospect led to the recognition that mineralisation there was of Prince Lyell type associated with Suite II andesite and a magnetic anomaly. Examination of the regional aeromagnetic and geological data suggested a similar target existed at Penghana Hill, east of and stratigraphically lower than? the Madam Howards barite prospect.

The old West Sedgwick grid extending over the area was re-cut and covered by mapping, soil geochemical and ground magnetic surveys.

Mapping indicated that the hornblende-feldspar phyric "Horse Paddock Andesite" has a strike of ~1.6km, consists mostly of coherent intrusive? facies and is included in a bedded (YRS) sequence of fine to coarse felsic volcaniclastic sandstones and minor feldspar phyric lava. Only weak chlorite alteration was

observed in the andesite; soil geochemical data showed slightly higher base metal values in the andesite, maximum values were ~200ppm Cu & Pb and ~800ppmZn. Magnetic data indicated a N-S linear anomaly of variable intensity co-incident with the andesite outcrop; the magnetic variability was interpreted as indicating hydrothermal magnetite (rather than magmatic accessory).

Diamond core hole PEN001 was drilled to test the peak magnetic anomaly with associated weak soil geochem (214 Cu, 122 Pb, 290 Zn). It intersected a ~110m thick sill like body of andesite in a sequence of mass flow type volcaniclastic siltstones and sandstones; the andesite is weakly altered and apart from a fortuitous intersection of a single 0.5m vein of quartz-carbonate-epidote-chlorite-cpy-py-gn (1.7% Cu, 0.6% Pb) was essentially unmineralised.

DHEM did not detect any conductive response.

3.3 West Sedgwick

(pre 1989: as summarised by Wilde & Kerr, 1989)

1956-62 RTAE airborne EM and ground Turam surveys located a conductor near the MRV-QC contact at Zig Zag Hill. Follow up magnetic, soil & stream geochemical, gravity and IP surveys were carried out but the conductor was not tested.

1965-71 PMI re-surveyed the area with limited dipole IP.

1970s MLMRC covered most of the West Sedgwick area on various small grids with soil geochemical, magnetic and gradient array IP surveys and discovered a zone of anomalous chargeability and Cu-Pb-Zn soil geochemistry northwest of the #3 Dam (Figure 4). Three drill holes (WS 1-3) tested the zone but no significant mineralisation was intersected (maximum 1.5m @ 0.1%Zn in WS3). Two small additional areas of pyritic alteration were outlined at Upper Haulage and NE pyrite zones; the latter associated with a weak IP response (Figure 5).

1980s GFEL carried out stream sediment geochemical surveys and relocated the old Swan Creek alluvial goldfield.

The Zig Zag Hill area was re-surveyed with SIROTEM and a weakly conductive zone was tested by drill hole WS4 and attributed to a permeable fault zone.

1988 The entire West Sedgwick area (~17km2) was covered by BHP's UTEM survey involving 78 line km at 200m spacing and

11 Tx loops (Figure 1). The Great Lyell Fault (GLF) was detected as early time responses in the north eastern part (RTAE's Turam responses re-visited), a 400m wide strip along the western side was affected by power line interference but no significant bedrock conductors were identified (the "Tramway" pyrite zone tested by WS 1 & 2 was within the power line influence).

1991-94 RGC mapping recognised patchy quartz-sericite-pyrite alteration around the (stratigraphic) top of andesitic units in the Agglomerate Hill area. Soil and rock chip sampling failed to produce base metal anomalies but a zone of sodium depletion in soils! was claimed to outline the alteration system.

Re-logging of WS4 indicated the existence of pink limestone and hematite-carbonate alteration in andesite near the bottom of the hole; this was considered to be possibly exhalative carbonate analogous to that in the Lynchford Member at Comstock and it was proposed that WS4 should be deepened to investigate the favourable horizon at the top of the andesite sequence.

PVC casing in WS4 precluded its being deepened; WS5 was commenced as a deeper redrill but was abandoned due to drilling difficulties and WS6 (from the same site) was eventually cored to a depth of 380.8m, penetrating approximately 160m beyond WS4. The hole intersected Suite II type andesites with two major fault zones and passed up sequence into interbedded siltstones and felsic volcaniclastics followed conformably by the Comstock Tuff (feldspar crystal rich volcaniclastic sandstone). A slice of limestone and silicified rocks in the lower fault zone were not geochemically anomalous.

Surface mapping indicated that the favourable horizon (essentially limestone, shale and felsic volcaniclastics of the lower part of the Lynchford Member; between the Suite II andesites and Comstock Tuff) was disrupted by E-W faults which were probably syn depositional.

It was proposed to drill ~6 holes at ~400m spacings along the favourable horizon at depths ~300m (beyond TEM detection levels). Three such holes were drilled within the Mt Lyell mine lease ML30/M80 and not reported.

WS7, the fourth in the sequence proposed, was drilled to a depth of 499.2m, eastwards from the saddle east of Agglomerate Hill. It intersected a sequence of andesitic and basaltic lavas and mixed volcaniclastics with two broad (50-100m downhole) zones of strong quartz-sericite-pyrite alteration with Py locally upto 30%, and passed up sequence into black

siltstone followed by feldspar crystal rich sandstones of the Comstock Tuff. Systematic sampling of the altered zones showed disappointingly low base metal (<1000ppm) and gold values (rarely above detection limit).

Limited isotopic analyses from WS7 indicated whole rock d18O ratios of ~+130/00 and pyrite d34S ratios 15-460/00. The latter were interpreted to indicate that the sulphur was inorganically reduced from seawater sulphate at >240¼C but d18O data suggested alteration temperatures of ~200¼C. It was hypothesised that West Sedgwick WS7 alteration could represent the marginal mixing zones, between hotter hydrothermal fluids and entrained cooler seawater, analogous to the peripheral stringer envelope zone beneath the Hellyer deposit.

Downhole SIROTEM in WS6 and WS7 and Crone 3 component DHEM in WS7 did not record any conductive responses.

Surface mapping indicated that the pyritic alteration zone in WS7 petered out to the south and was terminated against a syn depositional fault to the north suggesting that the greatest potential lay down dip.

WS8 (652.1m) was collared at the same site as WS7 and designed to intersect the favourable horizon ~200m down dip; it intersected andesitic and dacitic volcaniclastics and lavas in a sequence rather different to WS7, with numerous faults and some pyrite veining in the lower part of the hole but without significant metal content and much lower alteration intensity than that in WS7. It seems that structural complications or fault offsets have displaced the favourable horizon (eastwards?) and it was not intersected in WS8.

3.4 Beatrice

1974-78 MLMRC carried out geological mapping, rock chip and stream sediment geochemical sampling followed by road construction, costeaning, gridding magnetics, soil geochemical, gradient array and dipole-dipole IP surveys which identified a major Pb-Zn anomaly ~1200m in length, associated with chargeable black shales at Itat Creek, and a broad chargeable zone to the northwest.

Cambrian felsic volcanics and shaly sediments are exposed in a 2 x 5km "window" south of Mt Sedgwick, surrounded by upper Tyndall Group and Denison Group conglomerates. The sequence appears to face west and the stratigraphically lowest units are feldspar phyric or aphyric felsic (dome like?) lavas and

"ignimbritic" volcaniclastics in the central eastern part of the window. These are conformably? overlain at Itat Creek by a ~90m thick unit of laminated black shale which is partly fault bounded to the west but seems to be conformably overlain by a very thick unit of coherent quartz-feldspar phyric rhyolite [subsequent interpretation by Boyd, 1994, suggested that the rhyolite was part of the Tyndall group and had been emplaced as a submarine lava onto/into unconsolidated shaly sediments; a 30m thick unit of shale in the northwestern area was considered to be intra rhyolite although earlier MLMRC interpretations suggested it was a shallow subsurface westerly continuation of the Itat Creek shale.]

1979-80 Four diamond core holes (MS 1-4) tested the Itat Creek anomaly over 600m of strike length and a fifth (MS5) tested the northwestern chargeable zone.

All of the holes intersected disseminated and veinlet galena-sphalerite-(pyrite-quartz-carbonate) mineralisation in black shales with minor mineralisation extending into the underlying felsic volcaniclastics.

Best intersections were:

Hole	Intersect (m)	Cu (%)	Pb (%)	Zn (%)	Ag (g/t)	Au (g/t)
MS1	6		1.2	1.9	6	
	2	0.1	2.7	5.1	22	0.2
MS2	3.9		0.6	0.8	8.5	
	7.3		0.3	0.7	5.4	
MS3	14		0.5	0.7		
MS4	4.8		0.2	0.8		
	8		0.2	0.8		
MS5	3.8		0.1	0.7		

The Zinc Ratios [100Zn/(Zn+Pb)] for mineralised intervals have mean ~65 and standard deviation ~7 which is exactly within the range for Tasmanian VHMS deposits.

1983 GFEL undertook mapping and core re-logging as part of a major review of prospects in EL 9/66. It was considered that previous drilling had not been fully effective (incomplete intersection of black shale unit in southern holes) and that there was still VHMS potential due to structural uncertainties (alternative interpretations suggested that shale at Itat Creek was either restricted to a small syncline, with no depth potential, or was dipping west and possibly continuous in subsurface with the shales intersected in MS5 to the NW).

The potential was also recognised for Red Hills type gold mineralisation (inferred resource ~1Mt @ 2g/t Au, 1.3% Pb,

4.6% Zn & 37g/t Ag) and further mapping and sampling was recommended but apparently not carried out.

Sampling of hematite-magnetite-chlorite-quartz veins in a central brecciated part of the "Beatrice dome" east of Itat Creek, returned assays <01.g/t Au.

1990 BHP conducted a four loop UTEM survey with readings at 50m spacings on lines 200m apart; most lines were read twice with different Tx loops , to avoid EM coupling problems. Only a few weak conductors were detected; they were attributed to lithological boundaries and faults and no further work was justified.

Re-logging of the drill core lead to the conclusion that the mineralisation was "partly vein related and partly replacive, and the abundance of associated K-feldspar alteration and absence of major silicification and pyrite suggests that this mineralisation is not of the target VMS style", (Wilde & Kerr, 1990).

1994-97 A review of the Beatrice prospect by RGC (involving another round of core re-logging and mapping!) indicated that the prospective shale unit extends for ~1km southwards under glacial cover - a "stratigraphic" exploration drill hole was proposed.

The hole MS6 (288.6m) was finally drilled in 1996, to intersect the favourable unit ~500m south of the previous drill holes and near the eastward projection of the E-W trending West Sedgewick Fault. The fault was favourably regarded as a possible synvolcanic growth structure but its principal effect is to terminate the southward extent of the favourable unit, against Denison Group conglomerates to the south.

MS6 intersected 150m of massive rhyolite, passed down through a ~50m assemblage of black (variously laminated and calcareous) shale with minor felsic volcaniclastics and a thin intrusive rhyolite before passing through a fault zone into sericitic pumiceous volcaniclastic sandstone-breccia and ended in feldspar phyric coherent dacite. Patchy weak mineralisation upto 600ppm Pb and 2500ppm Zn exists in the shale unit and pervasive sericite alteration with patchy minor disseminated pyrite exists in the footwall volcaniclastics below the shale units but the results were not sufficiently encouraging to justify further work on the Itat Creek zone in which the restricted strike length had by then been reasonably tested. Drilling and casing problems prevented DHEM logging of MS6; all previous holes

are blocked and cannot be surveyed by DHEM (without renovating the holes).

Discovery of an exposure of black shale in the south western part (~1km west of MS6) which probably correlates with that intersected by MS5 in the northwest, led to revival of the synclinal model with the favourable shale horizon extending beneath the western Beatrice area at upto ~300m below surface. The western shale exposure was considered as a VHMS target (weak IP and soil geochem anomalies) and the possibility of deepening of MS5 (which did not penetrate to the base of the shale unit) was floated.

3.5 Huxley

The Huxley area immediately south of the Mt Lyell mining lease has had a typical EL 9/66 exploration history including:

1969-76 MLMRC road construction, gridding, geological mapping, soil geochemical sampling, magnetics, chip sampling of Mt Ellen and Mountain Maid gold prospects.

1981-82 Helicopter Dighem survey produced one doubtful anomaly. Comprehensive stream sediment geochemical sampling survey detected minor gold anomalies.

1983-86 GFEL gridding, mapping and bedrock (power auger) geochemical sampling and dipole-dipole IP surveys recognised base metal geochemical anomalous zone near volcanics-Denison Group contact at Nasty Knob and four chargeability anomalies (Figures 8 & 9).

The best IP anomaly, near exposed base metal veinlets at Island Ridge, 600m south of Nasty Knob, was tested by diamond core hole HX1 which intersected a 60m thick unit of black shales and felsic volcaniclastic sandstone-siltstone with minor veiny mineralisation providing a best intersection of 22m @ 0.08 Pb, 0.27% Zn (with VHMS like Zinc Ratios). Downhole SIROTEM did not detect any offhole conductors.

1988-90 BHP carried out a 9 loop, 77 line km UTEM survey on 200m spaced lines over ~6km of strike between Mt Huxley and Nasty Knob; a central 400m wide strip was affected by power line interference. Apart from numerous early time responses attributed to lithological contrasts etc. a single late time anomaly was identified amongst a string of weaker responses along the Great Lyell Fault at Nasty Knob. A follow up detailed UTEM survey failed to detect a late time response and "no further work

could be recommended .... despite the fact that the area is highly prospective" (Kerr, 1990).

Trial IP surveys over the Mountain Maid and Mt Ellen gold prospects indicated that the former is associated with a very strong chargeability anomaly of ~30ms. (This southern area had not been covered by previous GFEL IP surveys in the Nasty Knob area.)

The Mt Ellen prospect had a broad complex chargeability response not clearly associated with mineralisation. Subsequent chip sampling of the Mt Ellen adits indicated values upto 5m @ 2.2g/t Au and 2m @ 4g/t Au in quartz veins in altered rhyolite.

1996 RGC followed up the Mountain Maid anomaly on the strength of its IP response and the misconception that BHP's 5m @ 2.2g/t Au was from there (in fact it was from Mt Ellen, Figure 10) with a programme of mapping which outlined a 200 x 300m zone of silica-pyrophyllite-pyrite alteration in an east facing sequence of CVC dacite lavas and breccias with minor volcaniclastics. Rock chip samples ranged upto 0.31g/t Au.

A small gradient and 100m dipole-dipole IP survey indicated several chargeable zones. The principal zone "CH4" extended for 600m and was open ended to north and south; modelling of the dipole-dipole data suggested the main chargeability feature was related to a steeply east dipping body of relatively limited (~150m) depth extent. Drilling was recommended and stable isotope work was proposed but no further work was mentioned in the 1997 report.

4 DISCUSSION of Exploration Potential

4.1 Garfield & Clark Valleys

The extensive coverage of virtually the entire strip of the Yolande River Sequence (YRS) and the western part of the Central Volcanic Complex (CVC) in the Garfield & Clark valleys by geological mapping, soil geochemical sampling and fixed loop UTEM, certainly appears to downgrade the potential for near surface VHMS deposits in the gridded area.

BHP considered that their UTEM surveys had "sterilised" the area to depths of 200-300m. Due to vagaries of electromagnetic coupling and the possibility of non conductive VHMS deposits, fixed loop TEM can not reliably sterilise ground but it is reasonable to conclude that there are no highly conductive

deposits near surface. However, the UTEM survey was focussed on the YRS and in most areas the western ends of the lines only just crossed the contact with the overlying Tyndall Group (TG) and, even so, were relatively remote from the transmitting loops (Figure 3). Since the TG contact is now recognised as a very favourable horizon for VHMS deposits, it is unfortunate that TEM was not optimised to cover it.

The "favourability" of this contact in the Garfield area is somewhat reduced in view of the absences of recognised exhalative? limestone and equivalents of the mudstones and feldspar crystal rich volcaniclastic units of the "Lynchford Member" which suggests a different environment of deposition to the Comstock-Henty type area or local erosion of the sequence prior to deposition of the conglomeratic "Zig Zag Hill Formation" correlate. The contact was tested in GAR005 close to a potential syndepositional fault and found to be unfavourable. It may be worth considering a geophysical review of the UTEM data to determine the adequacy of coverage but, in consideration of the litho-stratigraphic gap, there is not a strong case for extending the TEM coverage westward or step-out stratigraphic drilling at intervals along the length of the contact.

The most promising unexplored section of the TG contact appears to be north of 5325000N where BHP's mapping recorded black shale near the contact, pyritic chert near 5326400N and patchy zones of disseminated pyrite in the footwall units to the southeast. The existence of moderate Pb,Zn soil geochem values in this area, adjacent to Flannigan's Flat was recognised by RGC (1997) as a possible indication of seafloor sulphide mineralisation but evidently has not been followed up subsequent to discouraging results at the analogous Slate Spur area.

It may be a long shot but the coincidence of shales at the favourable horizon, alteration below it, soil geochemical anomalies and doubtful TEM coverage, supports the concept and it may justify further examination. An IP survey to map out the form and extent of pyritic footwall alteration and a stratigraphic-alteration drill hole through the favourable horizon above the most intense pyrite/chargeability zone (if any) would test it.

There are, of course, some doubts about the effectiveness of soil geochemistry in this environment (eg: Garfield) and the poor exposure and strong weathering are not helpful for recognising hydrothermal alteration in outcrop mapping. However, both techniques were fundamental in drawing attention to the Garfield prospect.

RGC's mapping recognised alteration in several small areas around andesites (subsequently explored at Garfield) and also in the TG? near Flannigan's Flat but a major shortcoming of this work was in its presentation as (uncoloured) "fact" maps on which it is difficult to see the alteration and with little if any interpretation showing the relationship between alteration zones, litho-stratigraphy and structure. Previous mapping by GFEL and later BHP recognised sericite-pyrite alteration on the ridge between Thomas Currie and Garfield valleys. The soil geochemical response there is not impressive but

RGC's extension gradient array IP survey (to ~5325500N) showed a semi continuous chargeable zone trending north from Garfield into this area.

BHP's mapping suggests that qtz-ser-Py+/-chl alteration exists to at least 5326000N. RGC high resolution magnetics indicates a weak magnetic anomaly centred at about 379500E 5326300N which may support the analogy with Garfield type mineralisation.

RGC geologists considered that the most chargeable zones had been tested at Garfield but, in view of the apparent stratabound nature of mineralisation, its association with andesite which is known to pinch and swell, and the extension of chargeability and alteration to the north, it is possible that there are additional foci of Garfield-Prince Lyell type mineralisation which could warrant testing. Modelling of the aeromagnetic data and further IP surveying to cover the northern area could be used to define drill targets but are limited in that the most magnetic zones are not necessarily those of highest Cu grade and IP may not detect deep mineralisation.

The Garfield prospect proper appears to have been adequately drilled to ~200m below surface and the rough indications are that grades ~0.2 to 0.4% Cu exist over widths of ~70-100m for ~250m strike length (ie: an inferred resource of ~12Mt @ 0.3% Cu). I have some doubts about the assumption that grade increases with depth but in any case the only hole to test the ~400m depth level (GAR012) supports the notion that mineralisation locally decreases to the north. This hole is some 200m north of the best intercepts in GAR001 & 002 which are closest to the fault. The zonation of mineralisation and alteration in existing holes is unknown (or at least not well described) and the control on mineralisation is uncertain (it is stratabound in andesite but why?).

It could be implied from the apparent southward vector of width & grade at ~200m depth levels that the fault exerted some syngenetic control on mineralisation. The dip and vertical displacement of the fault are unknown but assuming it is near vertical, the mineralised zone could be a roughly triangular sector extending to ~600-700m below surface. (Although S.Mudge's 1994 magnetic modelling suggested that the magnetic source had depth extent limited to ~250m there is no certainty of a relationship between magnetite content and grade.)

If the fault was an important control and grade does increase with depth (both speculative) then GAR012 was not well placed to test the proximal depth extent and grade. Another deep drill hole ~150m south of GAR012 and ~200m below the intercepts in GAR 001 & 002 would settle the matter (provided the fault does not have a shallow northerly dip!). However, there is not much room for a major increase in tonnage and the absence of DHEM responses in GAR001 & 012 does not offer any hope for a significant high grade zone at depth.

All considered, it must be conceded that the Garfield prospect has been well explored and no high priority targets remain to be tested.

At the risk of flogging it excessively, consideration could be given to the following low key programme, listed in decreasing order of priority:

- Extending IP coverage, magnetic interpretation and mapping to the north to identify possible targets associated with observed pyritic alteration which may be connected with the Garfield mineralisation.
- More detailed examination of zonation of alteration & mineralisation in existing drill core, probably including major element analysis, in an attempt to identify controls on and vectors to high grade mineralisation.
- Drilling an additional hole of ~500m to test beneath GAR 001 & 002.

4.2 Penghana

Early MLMRC grid based exploration did not cover the Penghana area with gradient array IP and although RGC's original proposal for exploration at Penghana included IP coverage it was not carried out and the prospect quickly progressed to drilling of the peak magnetic target.

There are, therefore, slight reservations about whether the most prospective (sulphide) zone was tested. However, in the absence of strong geochemical, alteration and TEM encouragement, the prospect has not got much to recommend further work. I think it was a good try but would not pursue the model further.

4.3 West Sedgwick

The principal target here is the NW strike extension of the Lynchford Member at the base of the Tyndall Group which is a VHMS favourable horizon by analogy with Comstock and Henty deposits. Patchy but strong quartz-sericite-pyrite alteration, with moderate gradient IP chargeability, exists in the underlying Suite II type andesites. The presence of these andesites, and their interpreted magmatic fluid connection with mineralisation at Prince Lyell and Garfield, presumably added to the prospectivity.

The favourable horizon extends for about 1.5 to 2km northwest of mining lease ML30/M80 before it is (presumably) truncated by the Great Lyell Fault; this segment is structurally complex and the horizon is displaced by several cross faults which may have had some syndepositional control. Two drill holes (WS 6 & 7) have tested the horizon on sections ~600m apart to depths ~200m below surface without intersecting significant mineralisation and a third, WS8, tested down dip of WS7 without finding the horizon.

No DHEM responses were recorded in these holes and the alteration intensity vector appears to be to the south (and possibly up dip?) into the ML.

The existing drill holes have tested the horizon above the most intense alteration and there does not seem to be any encouragement for chasing it north across the West Sedgwick Fault where footwall alteration and chargeability is weak.

The isotopic data supports an interpretation that the West Sedgwick alteration zone formed at the marginal seawater-hydrothermal mixing zone of a VHMS system; this is consistent with its location at the fringe of the giant Mt Lyell alteration system.

In consideration of the blanket coverage by IP and TEM geophysics, the reasonably spaced drill holes and discouraging DHEM results, and a plausible explanation for the pyritic alteration (possibly partly structurally controlled at the fringes of the greater Lyell system) it is concluded that the West Sedgwick section of the Lynchford Member has low potential for massive sulphide deposits and does not warrant further exploration.

MLMRC's gradient array IP showed a linear stratiform looking zone of moderate to strong chargeability extending from WS 1&2 north about 1km to Crown Hill. Most of this zone was influenced by power line interference and the TEM coverage may be doubtful. RGC's 1990s mapping and geochemical surveys did not extend far enough west to cover it.
Although a likely source may be black shales within the YRS and the southern end of the chargeable zone was possibly intersected by WS 1&2, it would be worth checking the previous data and possibly examining the core for alteration intensity before writing off this western sector.

The association with sill like bodies of Suite II andesites at Crown Hill suggests potential for mineralisation analogous to Garfield as well as stratiform VHMS deposits.
WS 1 & 2 were drilled to test beneath the Tramway pyrite zone: an exposure of quartz-sericite-pyrite schist which contains upto 0.7g/t Au. Discussion by Kerr (1990) noted doubts that the holes were deep enough to test under the Tramway zone and draws attention to "highly altered" andesite and "both the altered andesite and the [volcaniclastic] rocks above it are quite pyritic, with 1-2% disseminated pyrite and chalcopyrite veins visible over at least 75m of core". Base metal values are unfortunately low (maxima: 215ppm cu, 100ppm Pb, 188ppm Zn) but the IP chargeable zone extending to the north raises the possibility that there is more and better mineralisation in that direction.

4.4 Beatrice

Drilling in the Beatrice area has shown that low grade Pb-Zn mineralisation, mostly ~1% combined, with the "right" Zn Ratios but typically manifested as fine veinlets, is stratabound in association with a black shale/volcaniclastic unit over a strike length of 1.1km and probably similar lateral extent. The

latest interpretation of the stratigraphic order (Joyce et al., 1997) reinstates a 1983 concept which places the shale unit above feldspar phyric CVC volcaniclastics and dacite, and below a thick coherent quartz phyric rhyolite flow or sill assigned to the Tyndall Group.

Although the recent RGC reports do not stress it, the shale unit occupies the same stratigraphic position as the Lynchford Member (White & McPhie, 1996) which is now recognised as a regionally favourable horizon for VHMS-gold deposits and has been the focus of exploration as far afield as Clark Valley and Mt Jacob, and intensive drilling programs in the Comstock-Henty segment.

The lithostratigraphy at Beatrice varies from the Comstock-Anthony Road type area in that the distinctive, magnetic, feldspar crystal rich (andesite derived and rhyolite derived) massive volcaniclastic sandstones which are characteristic of the Lynchford Member and lower part of the overlying Mt Julia Member, appear to be absent. Also apparently missing, from the footwall sequence, are equivalents of the Suite II andesites which are prominent at Comstock-Anthony Road. Calcareous shales logged in MS6 may be a transitional facies to limestones in the Lynchford Member at Comstock-Anthony Road.

There are strong similarities to the Red Hills area where the latest drilling (of UTEM targets at the southern end by Aberfoyle in RH 18 & 19) intersected a west dipping and facing sequence of feldspar phyric dacite and volcaniclastics, black shale with peperitic rhyolite sills, feldspar crystal rich "Comstock Tuff" type volcaniclastic sandstone and massive coherent flow banded rhyolite. As at Beatrice, the Red Hills shale unit has been shown by drilling to contain ~1% levels of Pb+Zn, mainly as veinlets and low sulphide disseminations, over approximately 2km of N-S strike. A narrow intersection of ~2m high grade zinc rich massive sulphide, at the northern part of Red Hills (at a stratigraphic level slightly below the shale) makes it a tantalising prospect but the lack of extensive pyritic footwall alteration is problematic.

Red Hills is ~20km north of Beatrice, however, the likely stratigraphic correlation with the Lynchford Member and the apparently regional high background in Pb-Zn supports its favourability as a VHMS horizon. It is a reasonable conjecture that the Beatrice-Red Hills zone represents a deeper part of the early Tyndall Group basin, distal from the shallow margins where fossiliferous limestones and thick syn eruptive crystal rich sandstones were deposited at Comstock-Anthony Road. The widespread Pb-Zn anomalism suggests that hydrothermal circulation and sub marine sulphide precipitation was active and persistent.

The major question is where are the foci?
The key to locating centres of sea floor hydrothermal discharge may lie in mapping footwall alteration and identifying zonation and intensity vectors.

Drilling along the Itat Creek zone (5 holes scattered over 2km of strike) does not leave much room for large stratiform deposits (~500m gaps north and

south of MS6) in the eastern trace of the Beatrice syncline but the sub surface lateral extent and the western trace remains virtually untested. The probable persistence of conductive black shale in the favourable horizon could have masked moderately conductive VHMS deposits from the UTEM survey (petrophysical testing by BHP showed that the shale had conductivities at least twice that of felsic volcanics at Beatrice).

A shortcoming of the several previous reviews and reinterpretations of the Beatrice prospect is in the failure to produce a convincing model of footwall alteration. It has been more or less subjectively described and there appears to have been no major and immobile trace element study from which major component hydrothermal mass changes or degrees of sodium depletion and feldspar destruction could be estimated. One supposes that footwall alteration has not been visually impressive enough to justify it. However, R.Poltock (in GFEL's 1983 review) reported a 300m zone of silica-sericite-pyrite alteration in tuffs in the northern segment (Line 1800N; in MS4?) as a possible footwall alteration zone.

The regional favourability of the Lynchford Member for VHMS and Henty gold type mineralisation and the local Pb-Zn anomalism, suggests the Beatrice area offers potential for a logical extension, eastward of the Great Lyell Fault and into covered areas, of RGC's philosophy of step out drilling at intervals along the favourable horizon. The interpretative cross sections of Joyce et al. (1997) suggest the favourable horizon may be at depths ~300m in the synclinal hinge; the western limb remains virtually untested and we know very little about the intensity of footwall alteration.

A programme of "stratigraphic-alteration" drilling involving ~1600m with 2 vertical holes @ 500m into the footwall sequence below hinge of the syncline and 2 westerly holes @ 300m into the western limb, coupled with alteration studies to identify alteration vectors if any, and essential DHEM (including previous holes MS 1-5, after renovations), would effectively test the concept in the Beatrice area (Figure 7). Such drill holes must penetrate at least 50m into the footwall to provide alteration data and allow for optimal DHEM scanning of the favourable horizon.

Factors which offset the conceptual prospectivity are:

* the discouraging UTEM survey data (which, however, was possibly masked by conductive shales, beyond its depth range in the synclinal hinge and in any case never able to "sterilise" ground for zinc rich, weakly conductive deposits);
* existing IP data which just reaches the westward footwall zone but does not indicate any large pyritic alteration zone near surface;
* the apparent regional anomalism of the black shales which might indicate that sulphide precipitation was not focussed.

I rate the VHMS potential as moderate and the findability as moderate to low.

4.5 Huxley

RGC's relatively recent and apparently short lived interest stemmed from the association of anomalous gold and chargeability responses at the old Mountain Maid and Mt Ellen prospects.

However, there was a misconception that the former which had strong chargeability response had produced chip sample results upto 5m @ 2.2g/t Au when, in fact, it was the latter with a less defined IP response that had the high gold values (Figure 10). In any case RGC's work was limited to the Mountain Maid where a strong IP anomaly associated with quartz-pyrophyllite-pyrite alteration and weakly anomalous gold upto 0.3g/t was recommended for testing.

This drilling has not been carried out and it remains an obvious target for a near surface low grade gold resource. The association with pyrophyllite is unusual for Tasmanian VHMS systems (in which K-sericite is typical) and as far as I know, is not characteristic of Henty or Mt Lyell alteration. If the pyrophyllite has been correctly identified we are probably dealing with a different style of mineralisation. Unfortunately, the existing mapping does not show the outline of the alteration zone; it does not seem to be stratabound or associated with a specific structure.

Although the grades at Mountain Maid so far appear to be low, the alteration zone has appreciable size ~200 x 300m and given the uncertainties about mineralisation type I feel it can't be confidently written off without further examination. Rather than messing about with possibly inconclusive alteration and isotopic studies, I would favour drilling a couple of short core holes to test grade and continuity on the peak chargeability zones. Light weight rigs operated by Nick Poltock or Lance Stebbings would be adequate for the job and would cause minimal impact; the geophysical target is near surface and deep drilling is not called for at this stage.

BHP's sampling and Twelvetrees' (1900) inspection of the Mt Ellen workings appears to confirm that the gold is patchy in spaced, thin quartz veins on gently dipping joints in altered rhyolite; it is unclear whether the alteration is similar to that at Mountain Maid. Many gold-quartz vein occurrences elsewhere in Tasmania suggest that this style of mineralisation rarely bulks up to near economic size or grade.

I don't think it has much going for it and apart from some low key, shallow drill holes to test chargeable alteration at Mountain Maid, further pursuit of these old gold shows is not recommended.

The Cambrian MRV sequence in the Huxley area appears to be divisible into five main units:

* Interbedded felsic volcaniclastics including quartz crystal rich sandstone, siltstone and shales and quartz-feldspar porphyry sills of the YRS

exist along the western margin; they appear to dip steeply east under CVC but could be younger (as at Garfield).

* A central belt of massive rhyolitic lavas and felsic volcaniclastic breccias assigned to CVC.
* At Whip Spur, in the northern part of the central belt, the CVC is overlain, possibly in the core of a broad syncline, by andesitic volcaniclastics and intrusives which are probably of MRV Suite II composition .
* An eastern strip ~1km wide dominated by "altered" felsic volcaniclastic sediments with minor "ignimbrites" (pumice breccia?) and rhyo-dacitic lavas of CVC affinity. BHP reports (eg: Wilde & Kerr, 1989) referred to the altered volcaniclastic sediments as chlorite-white mica schists.
* A southeastern zone where CVC is overlain by extensive volcanolithic conglomerate assigned to the Tyndall Group, presumably a correlate of the Zig Zag Hill Formation and passing conformably up sequence to Denison Group conglomerate at Mt Huxley.

The facing and structure for the greater part is uncertain and evidently complex although gross lithological trends are sub parallel to the Great Lyell Fault (GLF) which forms the boundary with Denison Group siliciclastics to the east.

The 1983 GFEL review noted that significant base metal values were associated with small manganiferous gossans in dark volcaniclastic siltstone in imbricate fault wedges along the GLF contact at Nasty Knob. This was considered to be a VHMS favourable horizon extending to the south; it was reported that prominent sericite-chlorite alteration exists in the structurally complex zone near Nasty Knob but dwindles to the south (Purvis et al., 1983).

These coincidences of CVC, probable Suite II andesites, alteration and structurally complex slices of black siltstone with Pb-Zn-Ag geochemical anomalies close to the GLF, suggest a setting similar to that at Comstock at the northern end of the Mt Lyell field. It is possible that the VHMS favourable lower units of the Tyndall Group including the Lynchford Member shale-limestone and feldspar crystal rich volcaniclastic sandstone also exist along the eastern strip at Huxley but may not have been recognised due to poor exposure or complications along the GLF.

The existing geophysical data is not particularly encouraging: partial coverage by IP does not suggest prominent extensive chargeable zones near surface (therefore no pyritic footwall alteration) and complete UTEM coverage did not detect any large conductors except along the GLF.

Nevertheless, the potential for existence of the Lynchford Member favourable horizon warrants reconnaissance re-mapping of the eastern strip to assess the extent and intensity of alteration and improve the stratigraphic and structural interpretation. If alteration in the footwall looks encouraging then extension of IP surveys (to map out footwall pyrite distribution) or stratigraphic-alteration drilling through the favourable horizon should be considered.

4.6 Jukes Proprietary

I have only briefly read through RGC's 1996 report of investigations at Jukes Pty., without getting into the detail of previous work and alteration zonation.

The principal attraction is an untested zone of coincident high chargeability, magnetic susceptibility and strong K-feldspar alteration immediately downslope to the north of the Jukes Pty. workings where adits and several drill holes had intersected broad (supergene enriched?) mineralised zones ofupto several tens of metres at 1.5% Cu and 1.3g/t Au, associated with chlorite alteration. This area was not covered by BHP's UTEM surveys but a Genie SE-88 moving coil EM survey indicated a weakly conductive zone coincident with the chargeability anomaly.
However, the presence of the King (Hydroelectric) Tunnel at ~350m depth below the IP zone and the 200m "exclusion" territory around the tunnel limits the depth potential of mineralisation to an average of ~150m below surface. The King Tunnel itself, under the southern edge of the anomalous zone, is in unmineralised rock. These factors indicate a low tonnage potential which is the reason the IP target has not been tested to date.

The IP data presents a very tantalising target: modelling indicates a weakly conductive zone of ~50m wide at six times background chargeability within a broader zone of ~250m at two times background chargeability. (The magnetic data was not presented and does not appear to have been modelled.)

It is most likely that the IP is responding to a near surface patch of pyrite+/-magnetite mineralisation. The known copper-gold mineralisation at Jukes is mainly associated with intensely chloritised rocks, generally without much magnetite. There is, therefore, no strong case to suggest that the IP-Magnetic anomaly may be associated with high grade copper, but it would certainly be nice to know.

I would be tempted to drill a short diamond core hole (eg: ~40m N.Poltock style) into the IP target to check the style and grade. If the grade is high and the mineralised zone well focussed there may yet be potential for the zone to lie adjacent to the tunnel (IP modelling seems to suggest a northerly dip?) and extend below it beyond the exclusion zone.

It is rather a long shot in terms of tonnage and an uncertain style of mineralisation and I would not recommend sinking many exploration dollars into deep drill holes or additional surveys at this stage - better to test it at shallow depth and determine if the style and grade warrants chasing it down.

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