

First Exploration Renewal Report Vale River EL 33/2005

For the Period 23/05/2007 to 22/05/2009

Prepared for Manasia Pty Ltd.

by

Simon Tear

BSc (Hons), ARSM, PGEO, MAusIMM, MIOM3, Eur Geol

Hellman & Schofield Pty Ltd

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13th November, 2009



Hellman & Schofield Pty Ltd

Technical specialists to the minerals industry

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Summary

Manasia have commissioned Hellman & Schofield to undertake a data compilation and review exercise for their Vale River licence EL 33/2005 in NW Tasmania. The outcome of the work has generated a list of exploration targets for a variety of commodities accompanied by a proposed ground-based exploration strategy and budget.

The Vale River exploration licence, EL 33/2005, covers an area of 107km² and is located about 50km south of the port of Burnie in North West Tasmania. The western margin of the licence is located about 5km east of the old Hellyer Mine. Road access is via the sealed Cradle Mountain Link Road from the Lyell Highway. Access to other parts of the tenement will be by unsealed roads constructed for previous exploration and may be in a state of disrepair. It is likely that helicopter support will be required for access to some of the potential target areas.

The geology of the licence starts with Precambrian basement metasediments in the east which are in contact with Cambrian-aged Mt Read Volcanics units to the west. These rocks are overlain by younger conglomeratic sandstone and limestone sequences. The Mt Read Volcanics unit hosts several major orebodies in the West Coast minerals field including Hellyer, Que River, Rosebery and Hercules (all Zn, Pb, Ag, Cu, Au), Henty (Au), and Mt Lyell (Cu, Au). The north eastern part of the licence is interpreted to have part of the buried Devonian Dolcoath Granite at depths of <500m. In addition there are large areas of Tertiary basalt cover and localised zones of Quaternary cover.

Mineralisation within the licence area is restricted to small scale base metal veining and breccias zones within the basal Cambrian volcanics. Three main prospects named Heap of Rocks, Carter's and Speeler Creek have been delineated and diamond drill testing at two of them has revealed interesting although uneconomic lead-zinc mineralisation. Other commodities include small scale auriferous quartz veins at Eldorado. Commodities immediately peripheral to the licence include copper, molybdenum 'uranium' and tin.

Modern exploration of the area began in the late 1960's with work by previous explorers comprising stream & soil geochemistry and airborne EM/magnetic surveys with ground follow up testing on identified anomalies. There has been very limited diamond drilling on the bulk of the licence area with a total of three holes for 472m. Drilling on the western margin of the licence by Aberfoyle includes another four holes for 1510m. Exploration fatigue has been cited as a significant reason for exploration failure.

Work completed for this report involved a comprehensive literature review of many open file reports, compiling the relevant exploration information into a series of maps for target selection. In addition government data in the form of digital datasets, including the WTMRP airborne geophysical data, was also used to formulate a geological synthesis of the area.

The exploration target strategy is twofold involving locating anomalies in relation to their geology without any preconceived target commodity or mineral style and re-evaluating historical work to find areas that were not adequately tested. Another aspect of the exploration philosophy is that the targets are likely to be blind targets, particularly beneath the Tertiary basalt. Possible target mineralisation includes VHMS style base metal mineralisation of both the Mt Lyell and Rosebery types, along with Devonian-aged tin skarns.

From the data synthesis a total of nine primary exploration targets were developed with a further four subsidiary target areas. A ground based exploration programme, including additional ground base geophysics and drilling, has been designed with a two phase budget to test the targeted areas.

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1 Introduction

(includes contributions by David O'Connor in italics)

Manasia Holdings Pty Ltd was advised of its successful application for ERA 647 in a letter from Mineral Resources Tasmania ("MRT") dated 15 September 2005. The granted licence is numbered EL 33/2005 and carries an expenditure commitment of \$80,250 over the first two years.

EL 33/2005 is the relinquished portion of EL 28/2002 held by Adamus Resources Ltd. It is 107 sq km in area in 6 adjoining parts. The licence extends as a block of highly irregular shape from east of Lake Mackintosh in the general Tullah district northeasterly towards the Moina area, crossing four 1:25,000 geological map sheets: Block, Charter, Pencil Pine and Lea. It adjoins the Cradle Mountain – Lake St Clair National Park boundary that extends in an easterly direction from Mt Remus (Pencil Pine 1:25,000 sheet

The purpose of this report is to undertake a literature review of all relevant data for the Vale River area, held under licence by Manasia NL as EL 33/2005. This report has been produced with a substantial contribution from David O'Connor of Exergy Pty Ltd (Tasmanian-based geological consultancy) who completed earlier reviews of the licence for Manasia. The review includes searching and summarising previous competitor activity in the general area from reports digitally available online from the MRT Library. In addition government data in the form of digital datasets was also used to formulate a new geological synthesis for the area. From the data synthesis a series of exploration targets and target types was created, with the inclusion of a ground based exploration strategy and budget.

All figures in this report have the same projection of MGA94 Zone 55 except where stated.

2 Location

(includes contributions by David O'Connor)

The centre of this NE elongated exploration licence is located 10km east of the old Hellyer Mine and about 50km south of the port of Burnie in North West Tasmania (Figure 1). *EL 33/2005 lies predominantly within the Sophia 1:100,000 topographic sheet with some minor extension into adjoining sheets in the northeast.*

The EL is transected by the sealed Cradle link road in the north from which there is a degraded track to the south in the direction of Back Peak which is barely negotiable by FWD vehicle (Figure 2). Alternative access is by walking track west from Pencil Pine Lodge on the main sealed road south of Leary's Corner into the Cradle Mountain National Park. Some tracks of limited extent are shown on the Sophia sheet to the north of the main road north of Middlesex Plains and towards Lake Lea.

In the south of the licence generally between Mt. Romulus and Lake Mackintosh there exist no access tracks and previous exploration has involved operating from a base camp with helicopter support.

Figure 1 Manasia Tasmanian Licences Location Map

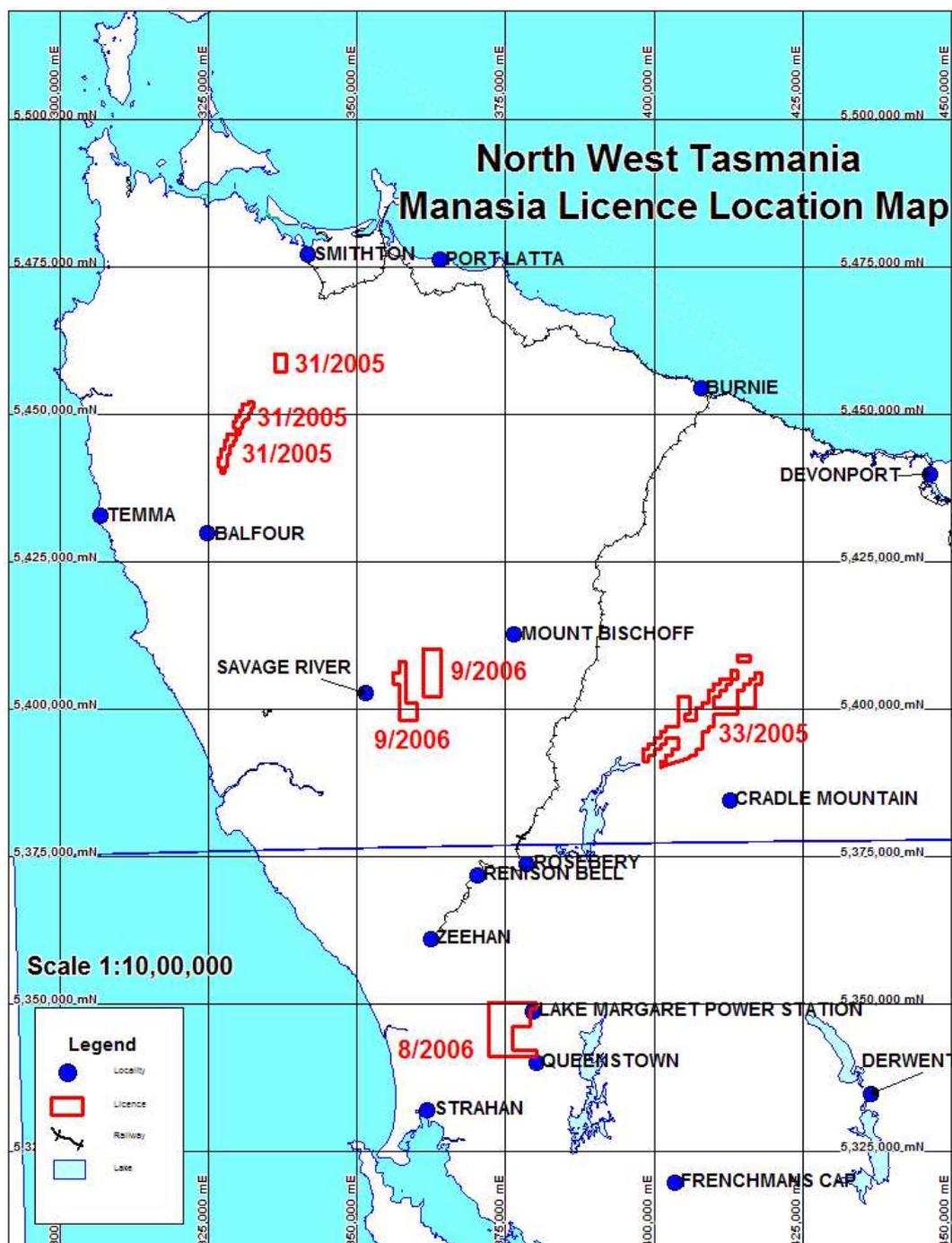
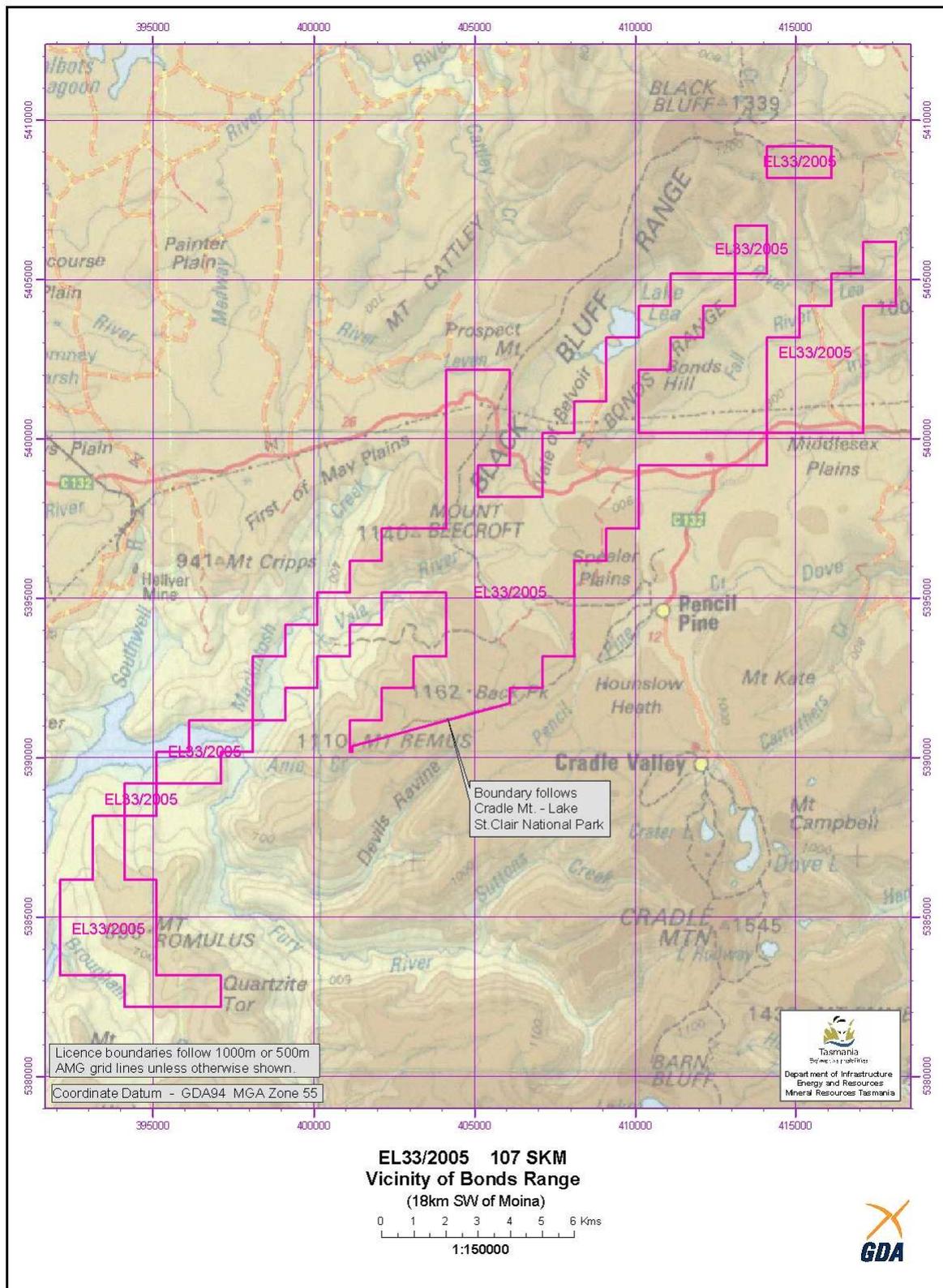


Figure 2 Vale River EL 33/2005 Location Map



(supplied by MRT)

3 Physiography & Vegetation

(includes contributions by David O'Connor)

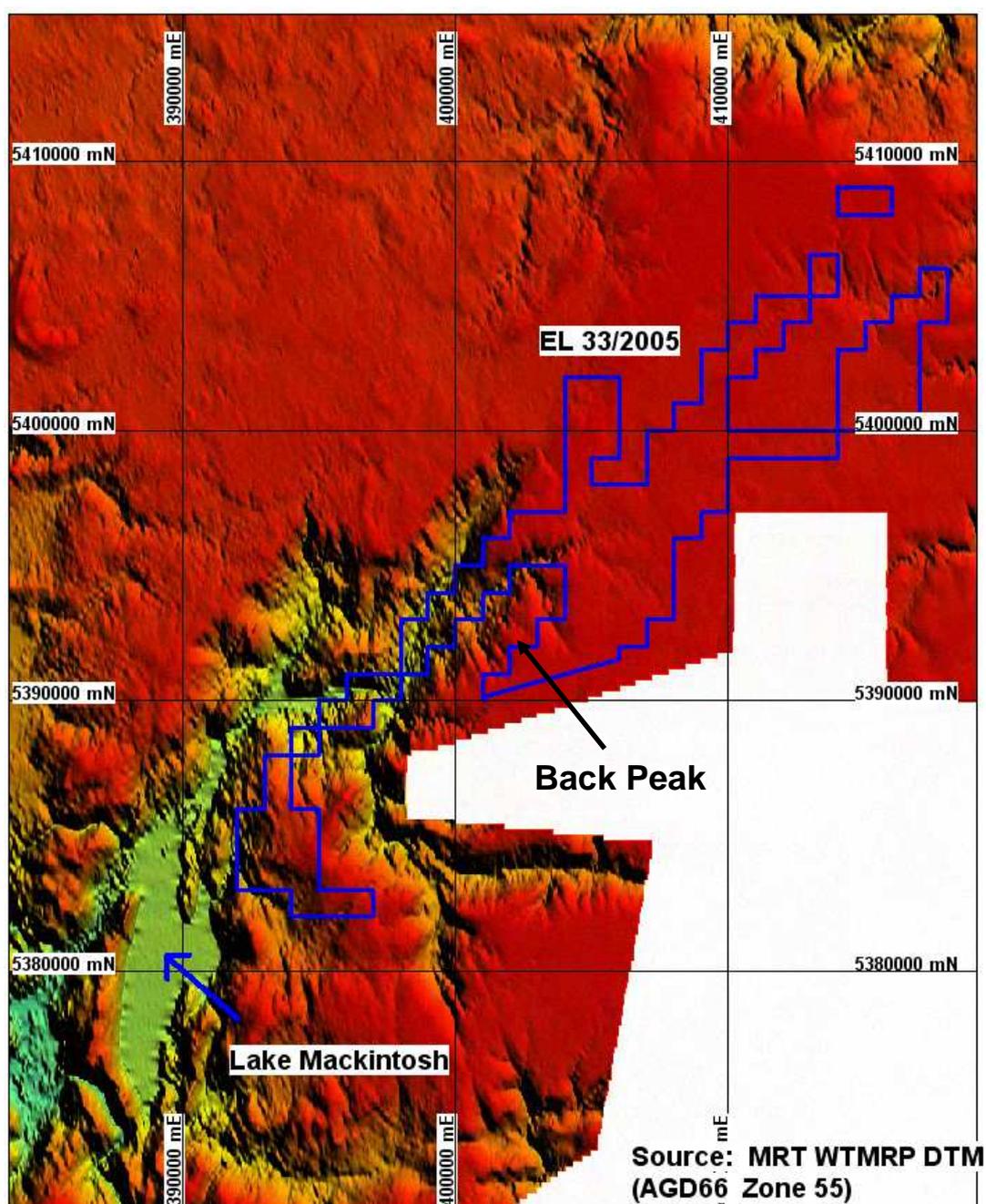
The topography is rugged and timbered with deeply incised valleys from Mount Romulus in the south through Mt. Remus and Mt. Beecroft (formerly Mt. Mayday) to the Black Bluff Range. To the east of this rugged belt and northeasterly from Back Peak the topography is considerably more subdued plateau country of predominantly poorly drained button grass that gives way to the basaltic flat lands of Middlesex Plains. The digital elevation model is constructed from geophysical data gathered as part of MRT's West Tasmanian Regional Minerals Program ("WTRMP") and is included as Figure 3.

Vegetation comprises dense forestry (temperate rainforest) making access very difficult, necessitating substantial track cutting in order to reach target areas.

Climate is temperate with substantial annual rainfall typical of Western Tasmania. Temperature ranges from just above freezing in winter to a likely maximum of 30°C in summer.

It is evident that any reconnaissance activities would require considerable walking and equipment-based activities such as auger soil sampling, ground geophysics and drill testing would be largely restricted to the summer season. Where old tracks are washed out and impassable by FWD vehicle it may be that trail bike could be a feasible alternative.

Figure 3 Vale River Digital Elevation Model



EL33/2005 Vale River Digital Topography

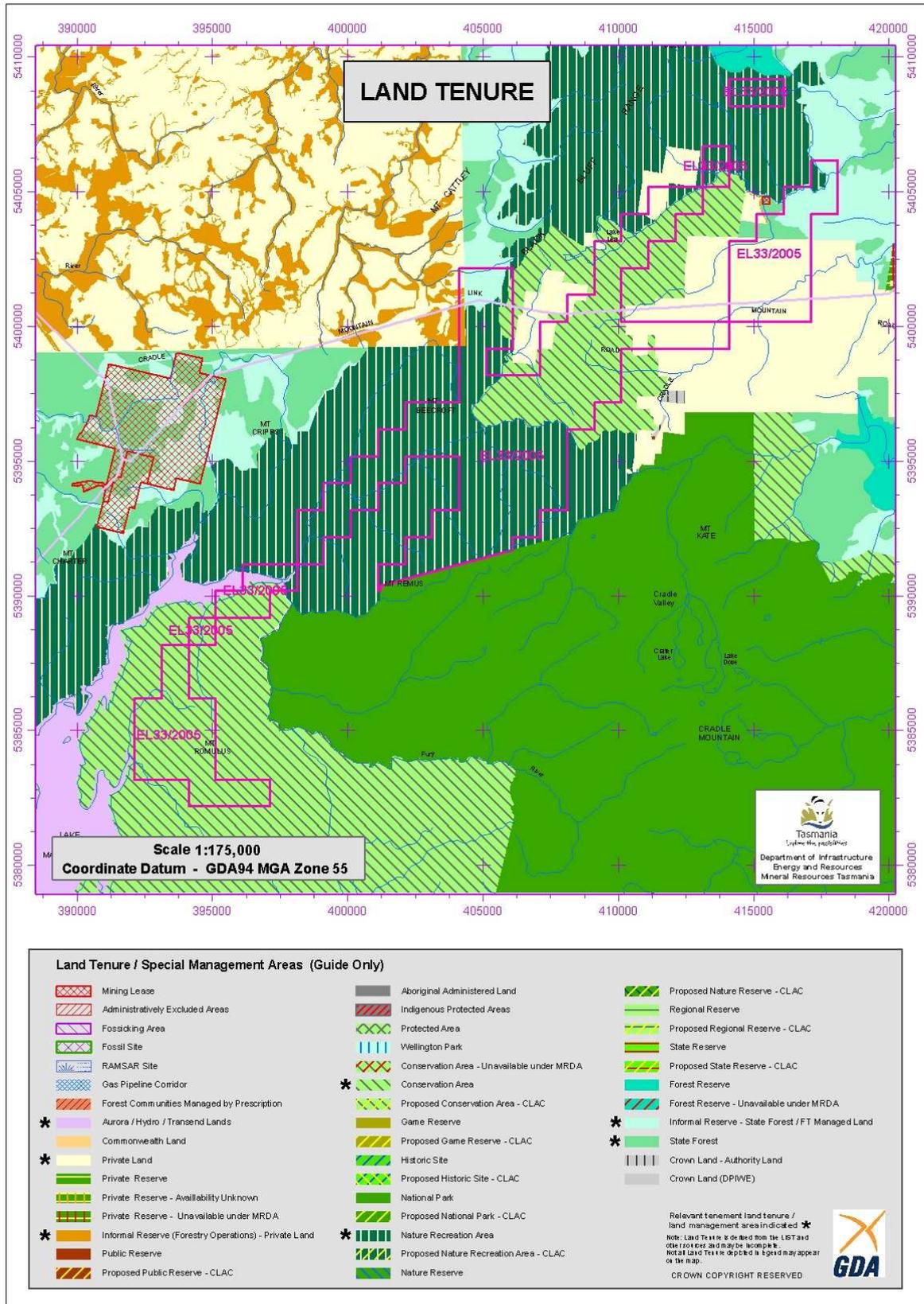
4 Tenure

The land tenure situation in Tasmania is based on a series of classifications that have resulted from the Regional Forestry Agreement (RFA). This act established, in conjunction with other stakeholders, which land is available for exploration and mining e.g. State Forest. Some of the main land use categories that are covered by the RFA, and which allow for mineral exploration and mining subject to a project activities review, are Nature Recreation Areas, Regional Reserves and Conservation Areas. These three categories can be regarded as the same for mineral exploration purposes; they have different objectives for other land users e.g. hunting, forestry etc. An exploration work programme that is planned within any of the above three categories triggers the Mineral Exploration Working Group (MEWG) which reviews the planned work programme, making recommendations and/or modifications to the plan. This group is convened by MRT on behalf of any applicant with the review process undertaken in a timely manner. Other land categories which allow mineral exploration/exploitation include a Forest Reserve which is not available for forestry use; and an Informal Reserve which is a forestry-related category that has a very minor impact on mineral exploration. The main areas where mineral exploration is not permitted are Nature Reserves, State Reserves and National Parks.

For the Vale River licence 40% of the tenement is Nature Recreation, generally in the central part of the licence with 40% classified as a Conservation Area, mainly in the southern and northern sections of the licence (Figure 4). The remaining 20% is split between Private Land (15%) and Informal Reserve (4%) and with 1% associated with the Hydro enterprises.

The latest downloaded Mine Lease information from MRT indicates that there are no mine leases within Manasia's tenements.

Figure 4 Vale River Land Tenure and Use Map



(supplied by MRT)

5 Geological Setting & Mineralisation

5.1 Regional Geology

Tasmania has been geologically divided by MRT into seven Proterozoic-Lower Palaeozoic regions or “Stratotectonic Elements”, each with a different geological history and economic mineral associations (Table 1). As a result of multiple subduction episodes these elements or terranes were welded together during geological history, which has produced the current geological framework. The Manasia Whyte River exploration licence lies within the Dundas element.

Table 1 Tasmanian Stratotectonic Elements

Element Name	Mineral Deposit Association
Rocky Cape	Savage River Iron Ore, Balfour Copper, Magnesite deposits
Dundas	Rosebery and Hellyer copper, lead & zinc mines, Mt Lyell Copper-Gold Mine, Henty Gold Mine, Renison Tin Mine, Avebury Nickel Deposit
Sheffield	Mount Bischoff Tin Deposit, tungsten skarns and numerous small scale skarn deposits & occurrences
Adamsfield-Jubilee	PGE mining
Northeast Tasmania	Beaconsfield Gold Mine, NE Tasmania Goldfields & Anderson’s Creek Nickel

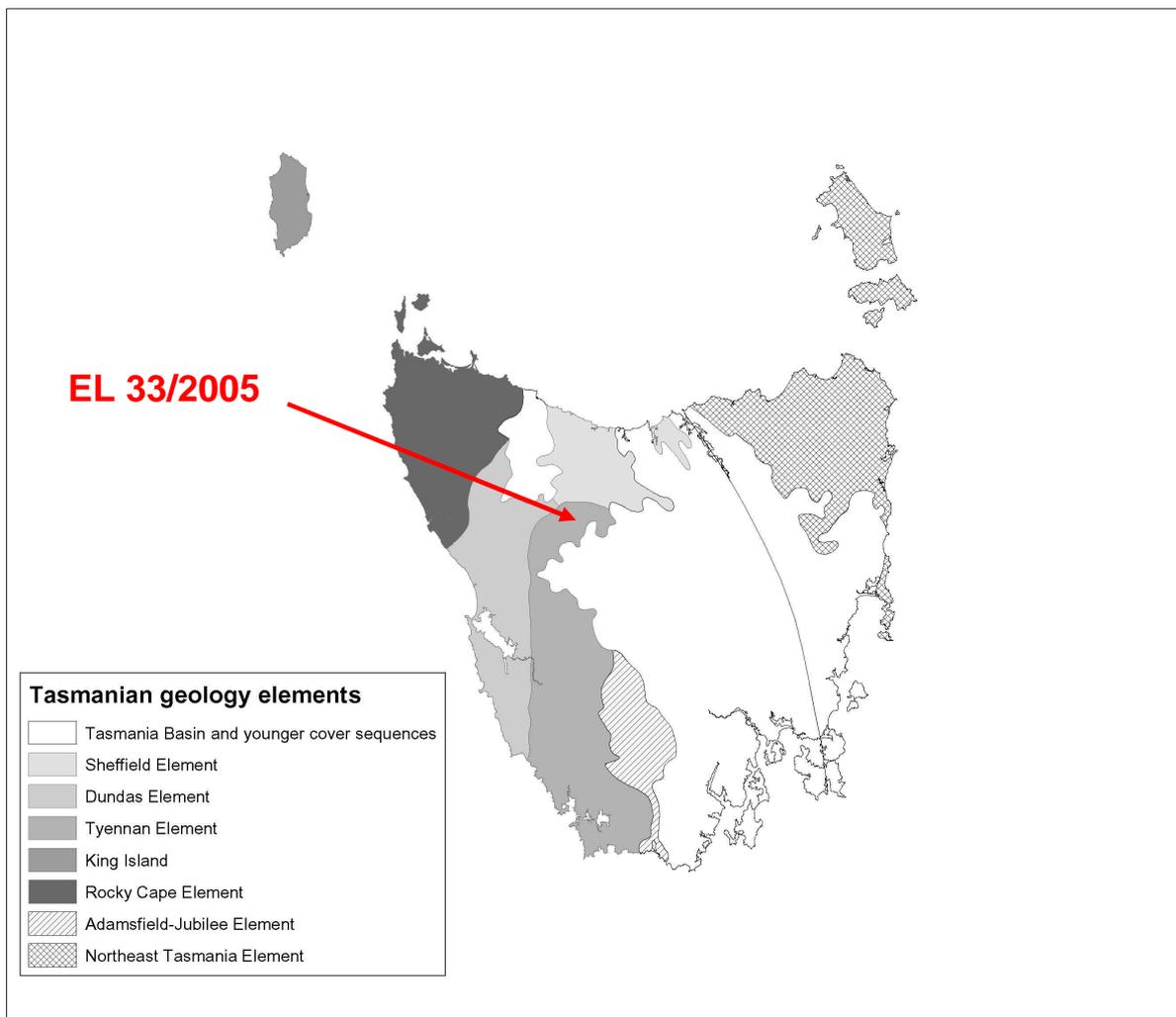
An abbreviated stratotectonic history of Tasmania is detailed below (see also Figure 5):

1. Formation of basement as Early Neoproterozoic shelf clastic sedimentation with an age range of 900-1000 million years ago (ma) followed by a major orogenic event at 760ma, which included granite intrusions. This produced the Rocky Cape Element.
2. A failed rift episode then followed with its associated clastic sedimentation and volcanic inputs ensued by a second, successful rift event that happened in the Late Neoproterozoic to Early Cambrian. This added an assortment of units including mafic lavas to the Rocky Cape Element.
3. An island arc-continent collision east or northeast of Tasmania occurred in the late Early Cambrian and the emplacement of a series of allochthonous slices across Tasmania, including oceanic assemblages (ultramafics and associated mafic lavas) and other units. This formed the Dundas, Sheffield, Tyennan and Adamsfield-Jubilee Elements.
4. A series of Mid to Late Cambrian clastic basins developed post-collision and were concomitant with major calc-alkaline volcanism – the Mt Read Volcanics (“MRV”) which contain a world class volcanogenic hosted massive sulphide (VHMS) province.
5. This was followed by Late Cambrian orogenesis comprising fold belt style tectonics at 500-510ma and includes some thrust stacking of units.
6. The establishment of a state wide clastic basin began in Late Cambrian times with initial basal conglomerates overlain by limestone lithologies followed by a gradually deepening marine clastic sequence up to Mid Devonian times. At the same time the Northeast Tasmanian Element developed as a turbiditic basin quite distinct from the other elements and lies east of an inferred subduction suture zone.

7. Cessation of sedimentation was caused by uplift and erosion associated with the Tabberabberan Orogeny (Mid-Devonian) and with a subsequent Late Devonian to Early Carboniferous phase of major granitic intrusions. This included the Heemskirk, Meredith and the Northeast Tasmanian Granites, with the first two causing modifications to the Cambrian morphology via structural overprints and hydrothermal alteration effects. These granite intrusions resulted in the formation of many skarn and vein deposits for tin, nickel, lead/zinc etc. The tectonism also resulted in the structurally controlled Henty gold deposit. In Northeast Tasmania the Devonian-aged intrusions and deformation are associated with gold mineralisation

8. Minor sedimentation including glacial deposits and coal measures occurred in the post-Devonian Tasmania Basin. Substantial amounts of dolerite and basalt were formed as a result of continental break up associated with Jurassic and Tertiary global events. Continental extension and rifting began in Mid Jurassic times with separation occurring in the Mid Cretaceous. Major Jurassic dolerites related to a Gondwana event occur as sills across Tasmania and are similar to the Karoo series in Africa.

Figure 5 Stratotectonic Elements for Tasmania (MRT)



A list of Tasmanian mineral deposits is provided in Table 2.

The tenement covers a portion of the northwestern margin of the Precambrian 'Tyennan' Craton, the flanking Cambrian island arc volcanic assemblage the Mount Read Volcanics, and overlying Owen Group conglomerates and sandstones of Late Cambrian age and Gordon Group limestone of Lower Ordovician age.

Structurally the area lies close to the junction between the Dundas and Sheffield Stratotectonic Elements and involves a complex arrangement of three structurally-bound elements within the Dundas Stratotectonic Element. These are:

1. Cambrian volcanoclastics and felsic lavas/intrusives associated with the Mt Read Volcanics.
2. A Cambro-Ordovician clastic basin.
3. A buried Devonian Granite.

Table 2 Major Mineral Deposits of Tasmania (Source MRT 2004)

Mine or Deposit	Mineral Style	Commodity	Tonnages (production + reserves)
Mt Lyell	Volcanic hosted disseminated	Cu, Au	135Mt @ 1.2%Cu and 0.4g/t Au
Rosebery	Volcanic hosted massive sulphide	Zn, Pb, Ag, Cu, Au	28Mt @ 0.6%Cu, 14.3%Zn, 4.3%Pb, 145g/t Ag & 2.4g/t Au
Hellyer	Volcanic hosted massive sulphide	Zn, Pb, Ag, Cu, Au	15.5Mt @ 0.4%Cu, 14.3%Zn, 5.9%Pb, 140g/t Ag & 2.2g/t Au
Que River	Volcanic hosted massive sulphide	Zn, Pb, Ag, Cu, Au	2.5Mt @ 0.45% Cu, 7.5%Pb, 13.6%Zn, 172g/t Ag and 2.8g/t Au
Hercules	Volcanic hosted massive sulphide	Zn, Pb, Ag, Cu, Au	2.6Mt @ 0.4%Cu, 16.7%Zn, 5.2%Pb, 159g/t Ag & 2.7g/t Au
Henty	Structurally controlled/vein	Au	0.5Mt @ 29g/t Au
Beaconsfield	Structurally controlled/veins	Au	1.085Mt @ 24.5g/t (production); 0.67Mt @ 24g/t (resource 1990)
Renison Bell	Skarn	Sn	28Mt @ 1.5% Sn approx
Cleveland	Skarn	Sn	10.3Mt @ 0.78% Sn and 0.45%Cu
Mt Bischoff	Skarn	Sn	10.32Mt @ 1.13% Sn
Queen Hill	Skarn	Sn	3.6Mt @ 1.2% Sn
Savage River	Massive magnetite	Fe	>330Mt @ 35%Fe
Mt Lindsay	Massive magnetite	Fe	20Mt @ 33% Fe
Nelson Bay	Massive magnetite	Fe	6.92Mt @ 38.2% magnetite
Main Creek	Magnesite	Mg	47.4Mt @ 43.4% MgO
Keith River	Magnesite	Mg	29Mt @ 42.8% MgO
King Island	Skarn	W	16.9Mt @ 0.78% WO ₃
Kara	Skarn	W	2.2Mt @ 0.8% WO ₃
Avebury	Skarn	Ni	14Mt @ 1.04%Ni
Melba Flats	Mafic hosted massive sulphide	Ni	7400t of ore @ 10% Ni & 5% Cu
Oceana	Carbonate hosted	Pb, Ag, Zn	2.15Mt @5.2%Pb, 1.63% Zn & 46g/t Ag
Mariposa	Carbonate hosted	Pb, Ag, Zn	0.57Mt @5.1%Pb, 1.92% Zn & 60g/t Ag
Zeehan Field	Lode/veins	Ag, Pb	0.19Mt Pb, 26Moz Ag, 71t Zn, 945t Cu & 5.3t Sn
Comstock	Carbonate Hosted	Zn, Pb	1.55Mt @3.0%Zn, 3.2% Pb & 66g/t Ag
Balfour	Structurally controlled	Cu	6177t of Cu Ore at 20-30% Cu
Grieves	Carbonate hosted and oxidised	Zn oxides	Small resource <1Mt

5.2 Local Geology

This geology of the licence consists primarily of a Cambro-Ordovician siliciclastic sequence juxtaposed with a Cambrian quartz feldspar porphyry body. The general strike of the Palaeozoic sequence is NE-SW. At the north eastern end of the licence there is a substantial amount of Tertiary Basalt that has masked the underlying Cambrian felsic volcanic sequences (Figures 6 with legend as Figure 7).

In detail, parts of the south eastern boundary of the licence contain Proterozoic rocks associated with the Tyennan Stratotectonic unit which corresponds to metamorphic basement. *The Precambrian rocks cropping out in the southeast consist principally of laminated and massive quartzites, psammopelites and minor carbonaceous mica schists which show multiple deformation textures and metamorphism to greenschist facies.*

Adjacent to this basement contact is a narrow band of unconformable Cambrian-aged quartzphyric, felsic volcanoclastics, lavas and intrusives belonging to the MRV. Historical formational subdivisions comprise *the Sticht Range Formation of predominantly siliciclastic sediments and the Back Peak Beds which is largely a rhyolitic volcanic sequence of massive fine-grained quartz crystal tuffs with interbedded massive or finely laminated vitric tuffs, tuffaceous siltstones, cherts and fine-grained porphyritic lavas. Occasionally observed soft sediment load structures in the laminated vitric tuffs suggest subaqueous deposition in comparison to the more massive crystal tuffs which appear to be more subaerial. The prospective volcanoclastics sequence of the MRV extends on a northeasterly trend for some 11 km from the National Park boundary a little to the south of Back Peak to the Cradle Link road (this belt of substantial past exploration interest is referred to for convenience as the Back Peak section). It is relatively narrowly developed for the most part being from 100-1500 metres wide, although it flares to a width of some 3km approaching the Cradle Link road in which direction it becomes concealed beneath Tertiary basalt. The belt generally dips moderately to steeply to the northwest.*

Overlying this unit is a large coarse-grained quartz-feldspar-biotite porphyry, the Bonds Range Porphyry ("BRP") of Cambrian Age, which is an upper part of the MRV. *This strongly developed and persistent unit attains a width of at least 2 km in the centre of the licence. It is reported to be quite massive and compositionally and texturally uniform in the Back Peak section, although further to the south at Ten Mile Creek it shows considerable variation across strike. It is generally interpreted as being a synvolcanic intrusive sill emplacement.* This unit appears to be a lot thinner in the NE across a mapped NW structure in the centre of the Manasia licence, although this NE area coincides with substantial Tertiary basalt cover.

A widespread Cambro-Ordovician siliciclastic unit, the Owen Group, including basal conglomerates, unconformably overlies the porphyry and other Cambrian units, possibly in structural contact. Localised deformation has produced open, upright to gently NE plunging fold axes within the siliciclastic sequence with subsequent erosion on anticlinal hinges exposing small inliers of the underlying Tyndall Group of felsic volcanics (Cambrian age). The unit is quite thin in the SW broadening out to a substantial thickness in the north of the area, suggesting a basin margin existed somewhere around Lake Mackintosh.

Overlying the Cambro-Ordovician clastic sediment package are early marine sandstones and later carbonates of the Ordovician Moina Sandstone equivalents and the Gordon Limestone respectively. Outcrops of the limestone are restricted to the north west margin of the licence and at the southern end of the licence, generally associated with synclinal hinges. In one instance there is a small outlier of the widespread Siluro-Devonian siliciclastic basin in one of these hinges. Further east there is a preponderance of the Early Ordovician marine clastic phases as opposed to the limestone, possibly indicating some form of basin controlling structure in the middle of the licence area.

Studies by MRT have indicated that a small outcrop of Devonian Granite, some 10km² about 10km east of the Manasia licence, represents the surface expression of a large E-W striking buried granite pluton known as the Dolcoath granite.

Tertiary basalts overlie large areas of Lower Palaeozoic rocks in what was presumably low lying ground of more easily eroded rocks.

There are minor occurrences of Quaternary material, generally associated with river valleys.

Structurally the area is complex with many of the units mentioned above potentially in faulted contact with each other. There is scope for major and localised thrusting to have taken place although this is not obvious from the published mapping.

There is considerable evidence in the airborne geophysical data for a series of late-stage cross-cutting NW to NNW striking brittle faults, perpendicular to the main lithological strike, across the whole of the licence area. The NNW trending Kauri Fault system has been mapped in the north eastern extremity of the licence. This Devonian-aged structure is believed to cut across the buried Dolcoath Granite at <1km depths. The fault may have a genetic relationship with Devonian-aged metal-bearing granite-related fluids and hence may have considerable scope to be spatially related to a variety of mineral deposit types.

A total magnetic intensity ("TMI") image for the airborne survey completed by MRT in 2001 is included for comparison as Figure 8.

Figure 7 Vale River MRT Geology Legend

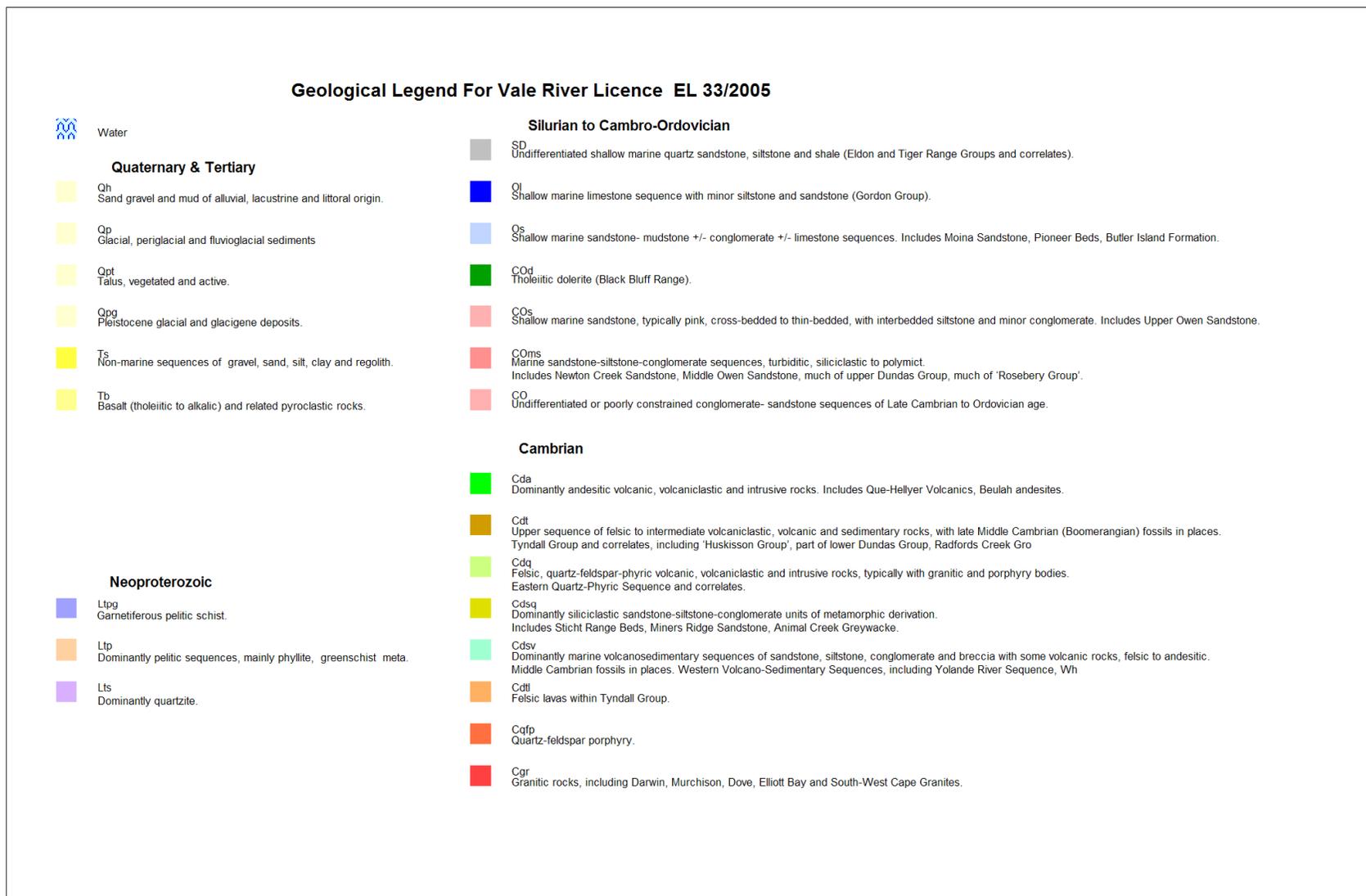
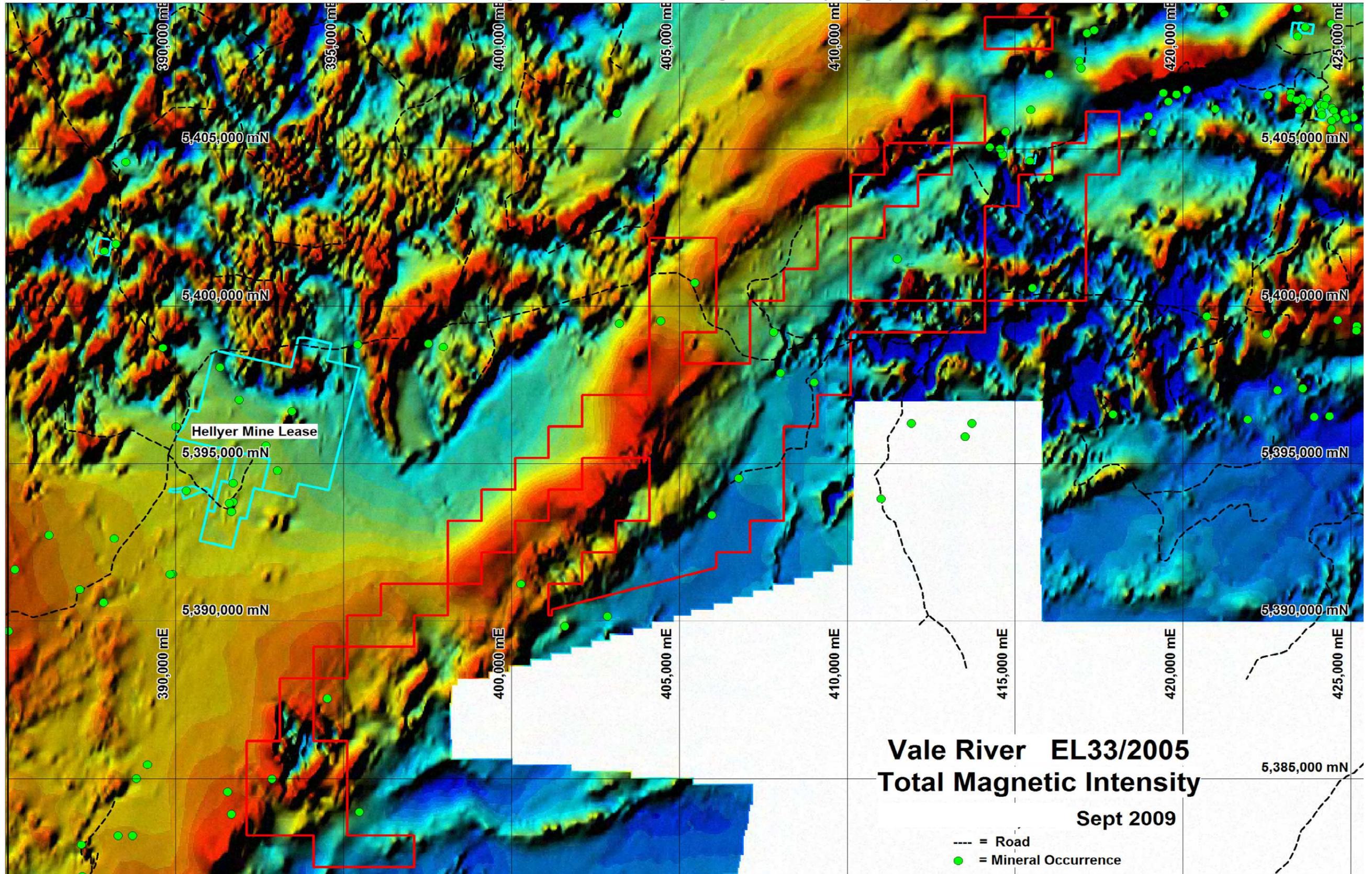


Figure 8 Vale River Total Magnetic Intensity Image (MRT)



(NW Sun Direction; image supplied by MRT)

5.3 Mineralisation

(contribution by David O'Connor in italics)

The Mount Read Volcanic belt is a highly mineralised suite of Cambrian rocks that is host to a number of major ore deposits in western Tasmania, including Hellyer, Que River, Rosebery, Hercules and Mt Lyell. In addition Tasmania is well recognised for hosting a series of Devonian-aged gold and base metal deposits generally as skarns and veins related to Devonian granites associated with the Tabberabberan Orogeny e.g. Renison, Mt Bischoff and Cleveland. Significant economic mineralisation in proximity to the Manasia licence includes the Hellyer and Que River VHMS deposits in the west and the Stormont/Moina gold-bismuth-tin-fluorite skarns in the east. Within the actual licence there are a relatively small number of mineral occurrences but there is a variety of commodities including lead, zinc, gold, copper and tin. Mineral occurrences immediately proximal to the licence boundaries include molybdenum, thorium/uranium and gold.

Historical mining is very limited, generally restricted to small scale trial mining from the late 19th and early 20th Centuries. The area was considered very prospective in the 1970's and 1980's with a succession of exploration companies working the area, but generally they encountered negative results using the standard exploration philosophies of the day.

Geopeko completed most of the work and identified two series of exploration target areas, namely the Prover series and the Mariner series. Minor mineralisation was encountered on most of these grids generally of lead and zinc mineralisation with some minor amounts of cassiterite in quartz veins.

The three lead/zinc prospects from the Prover series, Heap of Rocks, Carter's and Speeler Creek, which lie on a NNE line to the south east margin of the BRP, are hosted within a quartzphyric felsic volcanoclastics, lavas and intrusives. Minor mineralisation was recorded e.g. at the Carter's Prospect a small galena-sphalerite showing occurs in a shear zone in possible sheared Precambrian metasediments. Mapping and geochemical sampling at Carter's disclosed several lead anomalies extending over 600 metres in adjacent Cambrian shales and cherty tuffs with mineralisation as discontinuous quartz veins, small stockworks and breccia zones. Some Cambrian-age hosted minor galena-sphalerite was noted in quartz-filled fault fissures and breccia zones adjacent to Carter's prospect and in an outcrop in the south bank of Fleece Creek. The Speeler's Creek area is a distinct base metal stream geochemical anomaly. The Heap of Rocks area has been drilled with single hole; P-1 drillhole recorded 19m at 0.17% Pb and 0.17% Zn as weakly disseminated galena and sphalerite in host rock and discontinuous quartz veins.

At the north eastern extremities of the licence, but just off the licence, there are several occurrences of gold, copper and in one instance uranium associated with the Kauri Fault and the buried Dolcoath Granite. The Lea River uranium occurrence is described as a uranium and thorium anomaly hosted by a tuffaceous unit within a Cambrian quartz feldspar porphyry. Work by Tasminex in 1973 indicated that the anomaly was the result of surface secondary enrichment of the primary low grade tuffaceous unit. The published MRT map indicates that the area has Quaternary alluvium cover overlying Tertiary sands and basalts. The occurrence is in close proximity to copper-cobalt bearing quartz veins, up to 1m wide.

A major feature in the BRP is the Ten Mile Creek occurrence which consists of a 50m by 200m zone of substantial brecciation and stockwork with hematite alteration and interesting but low level gold values. This occurrence exists 1km beyond the Vale River licence.

Two small gold occurrences occur in Cambro-Ordovician siliciclastics in the middle of the licence on its north western margin. These two occurrences, one named Eldorado, coincide with a zone of demagnetisation of the rocks thought to be due to a major NW-striking cross fault.

Within the Pre-Cambrian rocks to the immediate south east of the licence boundary, there are two minor occurrences at Anio Creek and Mt Remus. The former is associated with gold/copper mineralisation whilst the latter consisted of trial workings for molybdenite. The area was subject to a detailed geophysical and geological study by MRT in 1994 which included airborne surveys. The prospects occur within the Cradle Mountain National Park, where mineral exploration and mining is off limits. At Anio Creek two distinct and discrete magnetic anomalies occur related to an airborne EM anomaly discovered by Geopeko, known as Anomaly 13. It should be noted that these EM anomalies do not show up as obvious mineralisation indicators in the MRT 2001 airborne magnetic survey. A narrow zone of breccia mineralisation including pyrite, chalcopyrite, sphalerite, magnetite and arsenopyrite yielded a rock chip sample of 1.9g/t gold and 1.06% copper associated with tourmaline alteration. The mineralisation is hosted in volcanoclastics of the Lower Cambrian Back Peak Beds and exhibits radiometric patterns attributed by MRT to alteration associated with a potential granite 'spine' of the buried Dolcoath Granite. Nearby is a narrow quartz sulphide vein striking 105°/60°N containing cassiterite. Modelling of the main geophysical anomaly has indicated a depth to the top of the anomaly of 100m and that the feature is likely to be a vertical pipe-like body. MRT also describe NW striking cross faults for the area, which have sedimentary-related aspects indicating basin margin faults with subsequent reactivation during Devonian times.

Mt Remus consists of a molybdenite/pyrite quartz vein which was the subject of small scale trial production during the earlier part of the 20th Century. Mineralisation also contains some chalcopyrite and pyrrhotite, that latter of which may be the source of the magnetic anomalies. Alteration associated with the mineralisation comprises tourmaline and allanite. This type of alteration is often associated with granite intrusions, and MRT link the mineralisation to a Devonian granite intrusion at depth. However tourmaline has been used by other explorers around the world as a distal indicator for VHMS ore horizons. MRT also suggest that the mineralisation could be related to Cambrian granites. In conclusion MRT suggest the anomalies and the style of mineralisation is enigmatic but it does indicate that there is scope for similar mineralisation within the south-western section of the Manasia licence.

The significance of the Mt Remus and Anio Creek anomalies is that they represent mineralisation previously unconsidered for the area and that any mineralisation will be subtly disguised.

Bass Metals announced to the Stock Exchange on 7 March 2007 that a diamond drill hole at its Iris River Prospect had intersected "shallow base metal sulphide mineralisation over a 4.3 metre downhole interval, possibly representing a new Pb-Zn-Ag-Cu discovery". On 23rd March it reported strong assay results (including Au) for the intersection namely 3.5m @ 5%Pb, 1.1% Zn, 4oz/tonne Ag and 1.1g/t Au from 88m. The mineralisation consisted of a stockwork of sulphide veins containing galena, sphalerite, chalcopyrite hosted by a chlorite-altered quartz feldspar porphyry. A second shallower diamond drill hole from the same collar site intersected anomalous metal values in an alteration zone, which was more diffuse. A third hole drilled to test a nearby but separate target also intersected weakly anomalous metal values. Subsequent drilling unfortunately did not prove to be successful in locating economic mineralisation and the project was downgraded and eventually the ground was relinquished.

Just beyond the south west margin of the licence lies the White Hawk Lead Mine hosted by the Gordon Limestone. This area was investigated by CRAE in the mid 1990's for Irish-style Pb/Zn mineralisation but discouraging results from mainly surface sampling led to a cessation of the programme. When last visited by the Author the mine was under water due to the dam levels of Lake Mackintosh. *EL 33/2005 takes in several square kilometres of the northern continuation of the limestone adjacent to the Lake and extending along the west bank of the Vale River although devoid of any mineral showings on the 1:25,000 geology sheets.*

Of some possible interest is Devonian granite-related quartz vein and carbonate skarn type of mineralisation as exemplified by the Moina tin/tungsten/bismuth/molybdenum mineral field.

Several small gold and bismuth prospects and mines hosted by Owen Group rocks are present a little beyond the northeastern corner of the EL block and include the Devonport and Stormont showings. Exposed granites bodies in the wider region are the Dolcoath Granite to the north-east and the Birthday Granite to the southeast. An east-west trending concealed granite ridge is interpreted from gravity data to underlie the northernmost part of the EL. While it is likely that any Devonian age deposit would be of vein-style and in all probability rather small it could nevertheless be of a high grade. Absence of limestone rock types in this northern part militates against potentially larger tonnage skarn and pyrrhotite replacement style deposits.

In summary it is important to note that there are localised zones of similar scale and style base metal mineralisation associated with the basal Cambrian and even the top of the Neoproterozoic. The mineralisation appears small scale, disjointed and scattered but it may be part of a bigger mineral system with the chance to find a bigger, more coherent accumulation of mineralisation.

6 Previous Competitor Activity

(contribution by David O'Connor in italics)

The discovery of the Que River and Hellyer deposits, 20km to the west, in the 1970s and 80s was the impetus for considerable exploration of the MRV in the Back Peak area. The majority of the work was completed by Aberfoyle (as Paringa), Geopeko, Cyprus, Alcoa and Billiton (Table 3). The exploration was driven by the use of stream geochemistry and airborne EM with the latter used to identify conductors which were then subject to ground follow up including mapping and prospecting, B and C soil horizon geochemistry and ground geophysics. This produced the Prover and Mariner exploration grids. In general though, the follow up ground fieldwork often failed to generate strong anomalies/targets for subsequent diamond drilling. As a result very little drilling has been undertaken. To date no-one has used the recent WTMRP airborne geophysical data to assist with geological interpretation and target selection.

The majority of past work was completed by Geopeko in various joint ventures with Aberfoyle, Union Mining and Cyprus. A map detailing previous exploration is included as Figure 9 and a full listing of previous explorer's reports relevant to the area is included in Appendix 1. It should be noted that a simple rectangular search of MRT's Company Report database for the EL33/2005 returned over 300 reports. The Bass Metals work was completed on the ground surrounded by the current Manasia licence, but many of the anomalous areas detected by them appear to run onto the Manasia ground e.g. Lea River and Tiger Plains.

Table 3 Summary of Competitor Activity for EL33/2005

Company	Date	Licence	Work Done	MRT Re-ports	Comment
Union-Geopeko-Cyprus	1974-83	10/74	Stream & soil geochemistry, DIGHEM, ground geophysics	83-2015 82-1880 81-1581	Comprehensive exploration over most of the area
Aberfoyle-Geopeko-Cyprus	1970-87	2/70	Stream & soil geochemistry, HEM, DIGHEM, ground geophysics inc IP &EM, trenching & diamond drilling	84-2147 82-1881 86-2553	Comprehensive exploration over most of the area
Billiton	1987-89	90/87	Stream & soil geochemistry, diamond drilling	88-2890	Focussed on the Prover area
RGC	1984-90	41/83	Literature review	86-2619 84-2310	Comprehensive review
Alcoa	1978-83	2/78	Soil geochemistry, DIGHEM, ground geophysics	83-2033	Comprehensive early stage coverage
Aberfoyle	1987-89	106/87	Diamond drilling	89-3006 89-2948	Off licence to west &SW
CRAE/Aberfoyle	1984-1993	24/84	Stream & soil geochem, ground mag, diamond drill	92-3396 89-3050	Detailed Ten Mile Creek
Adamus/Bass Metals	2002-08	28/02	Desktop studies, satellite interpretation, soil geochemistry, ground geophysics and diamond drilling	07-5472 08-5585 09-5779	Peripheral to current licence

Details of relevant airborne geophysical surveys are included in Appendix 2 whilst exploration report summaries by David O'Connor with relevant maps from some of the open file reports are included in Appendices 3 and 4 respectively. A map showing anomalism associated with the historical work is included as Figure 10.

Diamond drilling has comprised the following (Table 4):

Table 4 Summary of Diamond Drilling EL33/2005

Prospect	Company	Hole ID	Metres	Comment
Heap of Rocks	Geopeko	P-1	156	19m @ 0.17%Pb & 0.175 Zn
Speelers Creek	Cyprus	MT-86-1	150	0.6m @ 0.26% Pb beneath basalt
Speelers Creek	Billiton	BPD-88-1	166	2.6m @ 0.2% Pb and 0.2% Zn in black siltstones in volcanics
Southwell River	Aberfoyle	MAC20	398	Tyndall Group volcanoclastics beneath 49m of Tb
South Hadfield	Aberfoyle	MAC16	367	Rhyolite/rhyodacite with barite veining at top of hole
South Hadfield	Aberfoyle	BDP-10	321	Tyndall Group volcanoclastics beneath 209.6m of Tb and 30m of Tertiary weathering
Proximal to licence				
Mariner 6	Geopeko	DDH1	97	Not reviewed
Mariner 2	Tasminex	?	31	Hole details unknown
Iris River	Bass	BDR001 to 007	831	BDR001 3.5m @ 5%Pb, 1,1% Zn, 124g/t Ag & 1.1g/t Au in chloritic feldspar porphyry
Ten Mile Creek	CRAE	TMC1-4	154	Weakly anomalous
Southwell River	Aberfoyle	MAC22	424	Tyndall Group volcanoclastics beneath 122m of Tb and 24m of Owen Conglomerate

The following are extracts from two reports completed by David O'Connor and cover the exploration history for the licence. Additional details of individual reports are included in Appendix 3, whilst selected maps from various reports are included in Appendix 4.

6.1 Union-Geopeko-Cyprus EL10/74

The EL was granted to Union Oil Corporation in December 1974 who undertook exploration from 1974-5. A joint venture was formed with Geopeko Ltd in 1977 who assumed management and Aquitaine Australia became a third partner in 1980. The area of the EL was reduced to 52 sq km in February 1983 and the reduced area was relinquished in total later the same year. Between 1974-83 Geopeko-Union Oil Development Corp carried out considerable exploration on EL 10/74 which adjoined EL 2/70 to the north, involving extensive stream sediment sampling in the early stages and soil sampling and some ground geophysics follow up. I have not been able to appraise in detail the ground coverage but it is likely that it quite thoroughly evaluated the present EL 33/2005 to the north of the Cradle Link road. The 1980 helicopter DIGHEM II survey also extended over EL 10/74 and overflew all of the northern part of the present EL except for the northeastern-most extremities. Geopeko identified and evaluated a number of geochemical, EM and magnetic targets (Mariner series 1-7) in this work some of which were located over porphyry in the Bond Range and others more clearly of Devonian age significance. Since compiling this report it has been ascertained that two of these anomalies (Mariners 5 and 7) are located in EL 33/2005 and they are considered in a later second report which deals with the ground north of the Link road.

6.2 Aberfoyle-Geopeko-Cyprus EL2/70

EL 2/70 was initially explored by the Aberfoyle group with Geopeko and then Cyprus Australia entering as JV partners at later stages.

In 1969-1970 Paringa Mining and Exploration Co. Ltd (Aberfoyle group) examined further soil sampling extended the anomalous zone northeast and southwest of Carter's prospect over a total strike length of 5.5 km.

In February 1972 a helicopter-borne electromagnetic (HEM-400) and magnetometer survey was carried out by McPhar Geophysics Pty Ltd which revealed two EM anomalies within the present EL 33/2005: Anomaly 9 over basalt terrain a little to the south of the Cradle Link road and Anomaly 12 within the Speeler Creek grid area. Ground follow-up of over 1973-74 showed them to be due to Tertiary basalt and groundwater.

In February 1975 four lines of induced polarization (IP) surveying were carried out on behalf of Cominco Exploration Pty Ltd over the lead soil geochemical anomalies identified by Paringa. Weak frequency effect anomalies were registered beneath soil anomalies over the Cambrian suite on two lines (7300N and 2100N, locations not established at the time of writing)

In 1978 mapping of four bulldozer trenches excavated on grid lines covered by the IP survey showed some quartz-chlorite veinlets carrying disseminated sulphides in weakly sheared and largely barren rhyolites. It was concluded that the soil anomalies were not sourced by stratiform sulphide mineralisation.

In 1979 new JV partner Geopeko commenced a comprehensive exploration program. A large scale stream sediment program (-80 mesh analysed for Cu, Pb, Zn, Fe, Sn, W, and every fourth sample for Au) covering all readily accessible streams draining the MRV was undertaken in 1979-80 which confirmed Paringa's results in the overall anomalous layered volcanic sequence.

The two main prospects delineated by the stream sediment sampling Prover 1 (Heap of Rocks) and Prover 3 (Speeler Creek) were assessed in detail by weathered bedrock (C horizon) auger sampling. At Prover 1 an open-ended geochemical anomaly was outlined over a zone 900m x 100m (25m x 200m stations) with Pb values of the order 500-2000 ppm in a 100 ppm background coincident with favourable fine-grained tuffaceous sediments interbedded with lithic (crystal) tuffs and porphyritic lavas. At Prover 3 weathered bedrock sampling follow-up on 100m spaced lines outlined anomalous lead geochemistry to 3000 ppm within favourable lithologies, with the eastern portion of the grid blanketed by Tertiary basalt precluding reliable sampling.

In April 1980 the ground was included within a helicopter DIGHEM II EM/magnetics survey (results reported in MRT 81_1581). No obvious strong conductors were located within the favourable layered volcanics sequence to a depth of approximately 50 metres. Two very weak conductors (Prover 5 and Prover 6) were further evaluated by ground follow-up with moving source TURAM ("MST") and some ground magnetics and auger sampling. Prover 5 to the south of Prover 1 was not substantiated and Prover 6 along the southern strike extension of the Carter's Prover 2 geochemical anomalies was apparently also within the noise level of the MST unit. Other dubious and superficial responses were Prover 7 a little north of the Link road (weak DIGHEM responses and magnetics anomalies) considered to be consistent with traversing weathered basalt with moderate and variable conductivity, and Prover 8 at the southern end of the Vale of Belvoir where anomalous aeromagnetic effects were attributed to weakly magnetic pyroclastics in a "window" in Owen Group conglomerate.

In April/May 1982 Geopeko drilled diamond drillhole DDH P1 (collar 10,000E c.10, 270N dip - 50° to 130° mag) to 156 metres at Prover 1 (Heap of Rocks) to test the best geochemical zone.

Minor lead-zinc mineralised quartz veins were cut within cherty tuffaceous units from 74-88m. This zone did not correlate with the surface indications and a fault offsetting was suspected.

In 1984-85 Cyprus Minerals Australia (the new operator of the Aberfoyle-Geopeko JV) carried out a ground EM-37 electromagnetics survey involving seven loops over the Heap of Rocks, Carter's and Speeler Creek prospect areas (results reported in MRT 85_2515). This represented a refinement over and greater depth penetration than the 1980 DIGHEM survey. No strong conductors resulted but some lower order responses were identified: two at Speeler Creek (subsequently tested by drillholes), one at Carter's and one at Heap of Rocks (both subsequently considered to be unsupported by geochemistry/geology). Rock chip and bedrock soil (10m spacings) geochemical sampling were carried out within the EM-37 anomalous areas to attempt to firm up drilling targets. Soil sampling at 20-25m intervals was extended over the earlier Paringa and Geopeko delineated geochemically anomalous zones with a particular interest in Au values. In general the tenor and consistency of the earlier survey results were downgraded.

In September 1986 Cyprus drilled diamond drill hole MT-86-1 (collar 11,700E 9,935N dip -50° to 142°mag) to 150 metres at Speeler Creek prospect to test the up-dip source projection of an EM-37 anomaly (Anomaly 1) concealed by Tertiary basalt cover. Weakly disseminated Pb-Zn was intersected in altered pyroclastics, with the best intersection being 0.2m at 0.26% Pb, 2.5 g/t Ag. The highest gold value was 0.11 g/t over the interval 10-13m.

6.3 Billiton EL90/87

From 1987-89 the Back Peak area was held by The Shell Co. of Australia (Billiton Australia) under EL 90/87. Exploration initially involved verifying by stream sediment sampling and repeat auger bedrock sampling the earlier delineated geochemical anomalies where inconsistent analyses (especially Au) had previously been reported. The stream sediment program involved sampling at 20 sites selected to achieve a density coverage of one sample per 1-2 sq km. No new prospects were generated but the geochemically anomalous nature of the Heap of Rocks - Carter's area was reaffirmed. Anomalous values were ground-resolved with the exception of sample 55/17 (0.9 ppb (?) Au by BCL, 560 ppm Ba) from a tributary of the Iris River draining the Speeler Creek prospect. Limited C horizon weathered bedrock sampling at Heap of Rocks (line 9800N) and Carter's (lines 9750E and 10350E) downgraded earlier Paringa-Geopeko results. Billiton after reviewing all the available geochemical and EM-37 data selected EM Anomaly 2 at Speeler Creek prospect for drill testing. Diamond drill hole BPD 88-1 (collar 10,800E 9,875 N dip -50° to 132°mag) was drilled to 166 metres in Nov/Dec 1988. Some minor pyrite, sphalerite and galena was present in volcanoclastics between 155-166m and a peak gold assay of 2m of 0.02 g/t was registered. A strong fault zone between 130-141m was considered the probable source of the EM-37 anomaly.

6.4 RGC EL41/83

EL 41/83 of 112 sq km extending from Black Bluff in the west to east of Mt Stormont in the east and taking in the earlier EL 10/74 was held by Renison Goldfields Consolidated Pty Ltd from the beginning of 1984. The licence was reduced to 56 sq km in 1985 and finally relinquished at the end of 1990. That Company performed a useful review of prior exploration results but had very little field involvement itself.

6.5 Alcoa EL2/78

Exploration of EL 2/78 by Alcoa Australia-Shell Australia during 1978-83 overlapped the southern part of EL 33/2005 westerly from Mt Romulus. The Cambrian volcanoclastic sequence is absent here and Bond Range Porphyry is in direct contact with the Precambrian. The porphyry itself is concealed beneath Tertiary basalt to a considerable extent. A helicopter DIGHEM survey flown in early 1981 detected several anomalies within the area of EL 33/2005 (Anomaly No. with Grid/Area Name bracketed, from p.7 of Speijers, 1982 (MRT 82_1825) :

2 (Romulus West)

3 (Romulus West)

13 (Backwater)

14 (Fury Flats)

15 (Mackintosh)

16 (Lower Brougham)

17 (Romulus West)

18 (Romulus West)

Confirmation was sought by ground geophysics and soil geochemical sampling. Anomalies 2, 17 and 18 are possibly sourced in underlying Bond Range Porphyry. Some further limited follow-up was recommended by Speijers on anomalies 2 (power auger drilling or pitting) and 18 (additional ground geophysics to recover the DIGHEM II anomaly) but at the time of writing it needs to be ascertained from subsequent reports (see Smyth, W. D., 1983 MRT 83_2033 and any others) whether this work was carried out.

6.6 Bass Metals

EL 33/2005 was originally part of Adamus's EL 28/2002. The retained part of the latter licence was joint ventured in 2005 with Bass Metals who acted as JV manager. Initial work by Bass included undertaking a data compilation of all available data for the general area. Bass also acquired Aster satellite data and processed the image to identify alteration signatures for typical Tasmanian VHMS style mineralisation i.e. Rosebery/Hellyer & Mt Lyell types. Processing of the data was hampered by both vegetation and cloud cover. However a series of alteration trends was identified most of which occurred off the Bass licence area and partially on the Manasia licence and hence follow up work was not an option. Bass also used an in-house data interrogation system supplied by Geoinformatics based on a Monte Carlo simulation to generate the VHMS style targets of the Rosebery/Hellyer and Mt Lyell types. This used the various datasets to locate preferable target areas based on a number of proscribed parameters. A series of targets were generated but again most of them appeared to be off the Bass licence and partly on the Manasia licence. Understandably not much specific follow up was undertaken.

Bass also adopted traditional exploration methods following up previous anomalism generated by earlier explorers. This involved testing targets with a mixture of soil sampling, ground geophysics and diamond drilling (examples of the work are included in Appendix 3). The main areas of interest were Iris River (previously Mariner 3), Lea River and Tiger Plains. All of these areas are close to the licence boundary with Manasia. At Iris River substantial anomalous base metal stream sediment data from historical exploration warranted follow up diamond drilling. Drillhole BDR001 resulted in 3.5m at 5%Pb, 1.1% Zn, 124ppm Ag and 1.1g/t Au but a further six diamond drillholes failed to match the encouragement offered by hole BDR001. However the anomaly is hosted rocks which extend on the EL 33/2005.

At Lea River, a single IP survey line over a coincident airborne EM conductor and magnetic anomaly identified two conductive units associated with an interpreted position for the Kauri

Fault 300m north of the Manasia licence with the fault interpreted to extend onto the licence. No follow up drilling was completed.

At Tiger Plains Bass completed a small soil sampling grid over outcropping Cambrian Tyndall Group volcanoclastics identifiable as a discrete magnetic feature in the airborne data. The soil survey terminated at the licence boundary with Manasia's ground. The anomaly is a single line feature which is open to the north i.e. onto the Manasia ground.

6.7 Others

Adamus Resources Ltd held the ground north of the Cradle link road as EL 28/2002 (Bonds Range) of which the portion relinquished in 2005 has been taken up by Manasia Holdings as EL 33/2005 (Vale River). The retained part of EL 28/2002 (which includes the Iris River Prospect) is now subject of a joint venture 60% Bass Metals – 40% Adamus Resources of which Bass Metals is the manager.

Some exploration was apparently carried out by Aberfoyle Resources on its EL 106/87 where it coincided with EL 33/2005 at its eastern extremity in the vicinity of Lake Mackintosh. Mention made by Brooks, S., 2005 of a drill hole MAC 16 drilled to 367.4 metres at Fury Flats needs to be followed up by checking references made to earlier reports in McNeill, A.W., 1989 (MRT 89_2948). The hole is described as having targeted possible hanging wall alteration in the Central Volcanics Complex of the MRV. Its location was probably outside EL 33/2005 but its wider significance for testing what was apparently Bond Range Porphyry may be of interest. The location is also not presently known of a second hole MAC 20 drilled to 397.5 metres "on the Mackintosh Creek" that tested for presence of mafic volcanic units beneath Tertiary basalt cover but it is probably well outside EL 33/2005.

David O'Connor has provided summary statements on the merits of the mentioned prospects which are included here.

Most interest has centred on the volcanics and volcanoclastics of the MRV Back Peak Beds that extend for 11 km northeasterly from Mt Remus to the Cradle Link road. Three principal prospect areas have been delineated in this Back Peak section: Heap of Rocks, Carter's and Speeler Creek. Features of these prospects have been well summarised by Randell, J. P., 1988a (MRT 88_2890).

Salient features of the Heap of Rocks prospect compiled by Billiton include noting that EM-37 Anomaly 5 (Cyprus Minerals) on line 9800E which was not drill tested was interpreted to have a source of 50-100m below surface which may be coincident up-dip with some anomalous surface geochemistry. However, a fault is inferred to explain an apparent offset in the surface geochemistry which could be the source of the weak EM response so the position is somewhat problematic. Billiton's assessment of the EM-37 results additionally suggested weak and possibly fairly deep (unstated but presumably 100m or more) anomaly on line 9500E from 10150N to possibly 10250N gain with up-dip anomalous surface geochemistry. I recommend that there still exists some potential for discovery to the west of the Peko drill hole DDH P1 (on line 10000E) to approximately line 9400E. Induced polarisation surveying should be carried out on lines 9500E, 9700E and 9900E (fill-in of lines 9400E, 9600E and 9800E if required) to seek strongly disseminated mineralisation associated with small high-grade massive sulphide lenses and resolve a target for drill testing.

Former explorers of Carter's Prospect suggest that the area is of limited interest and it is the Cambrian geology on the western side that holds more attraction. Of the three anomalous geochemical zones present two have associated weak coincident untested EM effects which are considered to be shallowly seated. Anomaly 4 appears to be suspiciously related to the Pre-

cambrian unconformity contact, but Anomaly 3 has better possibilities and I recommend two lines of induced polarisation surveying on 10150E and 10350E (fill-in of lines 10250E and 10450E if required) to resolve a target for drill testing.

At the Speelers Creek grid prospect area two diamond drill holes have tested EM effects (Anomaly 1 by MT 86-1, and Anomaly 2 some 800m to the southwest by BPD 88-1) coincident with anomalous geochemistry. It is noted that hole BPD 88-1 did not test the recommended best geophysical position on line 10900E but instead was targeted on the strongest geochemistry on line 10800E. The description of the Anomaly 2 source as being a possibly deep seated weak-moderate strength conductor remains unresolved after BPD 88-1 intersected only traces of disseminated pyrite (with minor pyrite, sphalerite and galena mineralisation present at the end of the hole). I recommend that a geophysicist reinterpret the EM-37 data to determine whether a valid drilling target still remains.

The MRV Bond Range Porphyry unit has attracted some gold interest in the Ten Mile Creek area (outside EL 33/2005) but that mineralisation appears to be quite restricted in extent and offer next to no encouragement elsewhere, including within the extensive porphyry development in EL33/2005 northeast of Mt Remus.

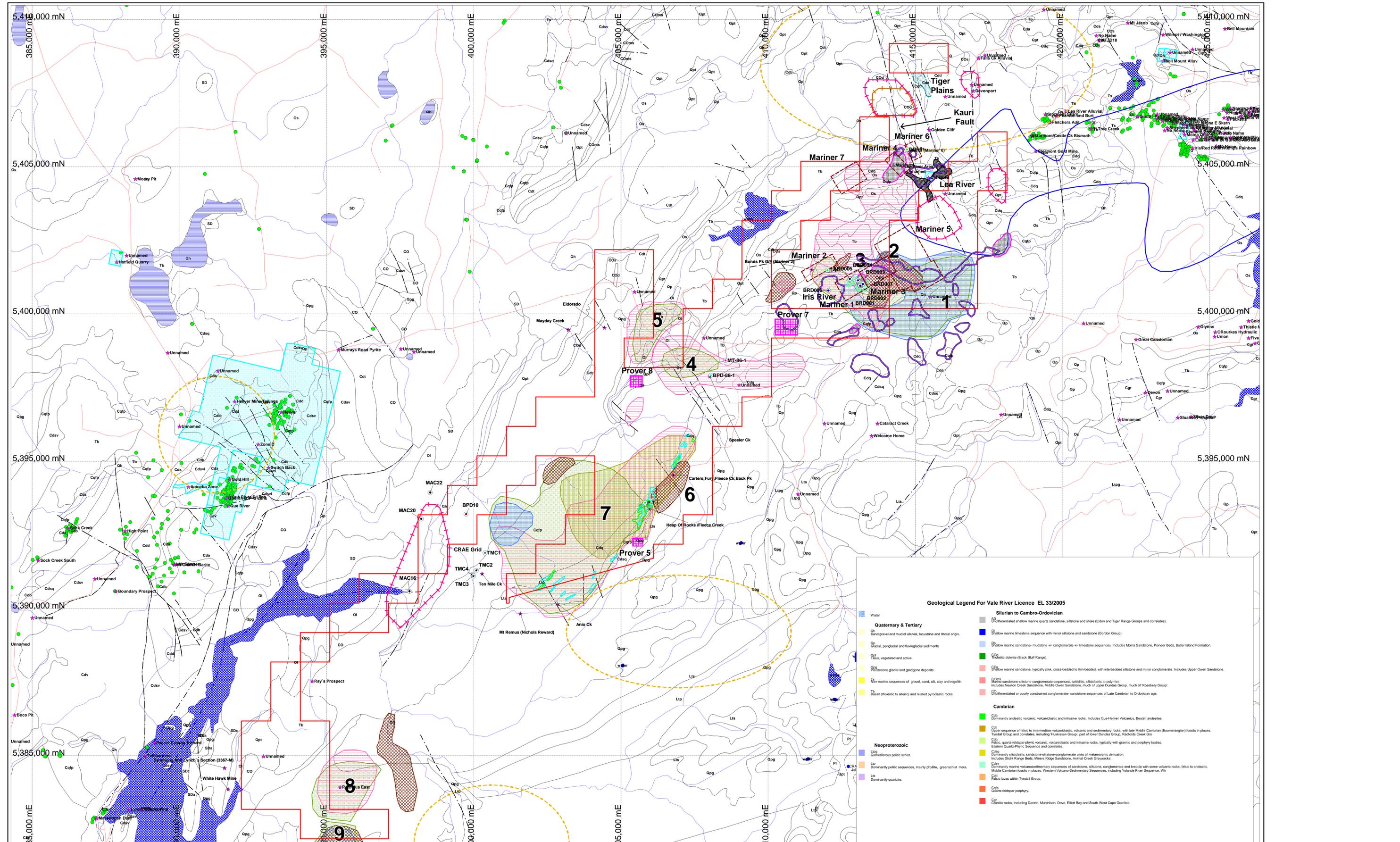
The Owen Group sequence north of the Cradle Link road has some potential for Devonian-age Moina-style gold-tin-tungsten deposits in view of the shallow-seated granite body present, the mapped faults capable of acting as channel ways for mineralising solutions, and the (off EL) widespread known mineral showings. It is recommended that an aerial photograph interpretation of faults and lineaments and geological field assessment be undertaken in conjunction with a reassessment of available stream sampling data, although this is only of a low order priority.

The Mariner 5 prospect to the north-east of the Iris River Prospect shows strongly anomalous tin-tungsten-gold values which might express a Devonian tin-bearing granitic stock at depth possibly concealed beneath Tertiary basalt cover. Some interesting geophysical indications are also present and it is recommended that further exploration is justified to locate such a mineralised source which has eluded previous exploration.

While investigating exploration data relating to Mariner 5 it was learned that the Mariner 7 prospect also lies within EL 33/2005. This prospect was first identified by anomalous lead-zinc geochemistry within an altered pyroclastic Cambrian volcanics sequence favourable for hosting a Mt Read Volcanics type massive sulphide orebody. A subsequent helicopter DIGHEM survey delineated an approximately coincident EM anomaly, however, ground follow-up involving IP surveying failed to provide substantiation and there exists some doubt as to whether it was satisfactorily located and tested. It is recommended that in view of the unsatisfactory resolution and the favourable geological environment more work is justified to confirm and locate the originally indicated EM anomaly and source.

Figure 9 Vale River Previous Exploration Work

Figure 10 Vale River Previous Exploration Work Anomaly Map



Geological Legend For Vale River Licence EL 33/2005

Quaternary & Tertiary	
Water	Water
Q1	Sand gravel and mud of alluvial, lacustrine and fluvial origin.
Q2	Glacial, periglacial and fluvio-glacial sediments.
Q3	Clay, vegetated and active.
Q4	Clay, vegetated and active.
Q5	Pleistocene glacial and glacio-genic deposits.
Q6	Non-marine sequences of gravel, sand, silt, clay and regolith.
Q7	Tuff (tholeiitic to alkalic) and related pyroclastic rocks.

Silurian to Cambro-Ordovician	
OS	Differentiated shallow marine quartz sandstone, siltstone and shale (Eldon and Tiger Range Groups and correlates).
OS1	Shallow marine limestone sequence with minor siltstone and sandstone (Gordon Group).
OS2	Shallow marine sandstone-mudstone +/- conglomerate +/- limestone sequences. Includes Moira Sandstone, Pioneer Beds, Butler Island Formation.
OS3	Clastic dolerite (Black Bluff Range).
OS4	Shallow marine sandstone, typically pink, cross-bedded to thin-bedded, with interbedded siltstone and minor conglomerates. Includes Upper Owen Sandstone.
OS5	Sandstone-siltstone-conglomerate sequences, turbiditic, silicified to polymict. Includes Newton Creek Sandstone, Middle Owen Sandstone, much of upper Dundas Group, much of Roseberry Group.
OS6	Differentiated or poorly constrained conglomerate-sandstone sequences of Late Cambrian to Ordovician age.

Cambrian	
CDA	Commonly andesitic volcanic, volcanoclastic and intrusive rocks. Includes Que-Helley Volcanics, Beulah andesites.
CU	Upper sequence of felsic to intermediate volcanoclastic, volcanic and sedimentary rocks, with late Middle Cambrian (Boomeranger) fossils in places. Includes Tindal Group and correlates, including Healdston Group, part of lower Dundas Group, Backfords Creek Gneiss.
CD	Felsic quartz-feldspar-phryic volcanic, volcanoclastic and intrusive rocks, typically with granitic and porphyry bodies. Includes Store Range Beds, Miners Ridge Sandstone, Animal Creek Greywacke.
CD1	Dominantly silicified sandstone-siltstone-conglomerate units of metamorphic derivation.
CD2	Dominantly marine volcanosedimentary sequences of sandstone, siltstone, conglomerate and breccia with some volcanic rocks, felsic to andesitic. Middle Cambrian fossils in places. Western Volcano-Sedimentary Sequences, including Valeado River Sequence, Wh.
CD3	Felsic lavas within Tindal Group.
CD4	Quartz-feldspar porphyry.
CD5	Granitic rocks, including Darwin, Murchison, Dove, Elliot Bay and South-West Cape Granites.

Neoproterozoic	
NS1	Graniferous pelitic schist.
NS2	Dominantly pelitic sequences, mainly phyllite, greenschist meta.
NS3	Dominantly quartzite.

Historical Anomaly Legend

EL33/2005	Mineral Occurrence	Aster Alteration Anomaly	Copper Stream Sediment Anomaly	Tiger Plains Soil Anomaly
Mine Lease	Drillhole Collar MRT Database	Airborne Magnetic Anomalies	Lead Stream Sediment Anomaly	Lead Soil Anomaly >300ppm
creek	Drillhole 2007 Bass Metals	Airborne Thorium Anomalies	Zinc Stream Sediment Anomaly	Zinc Soil Anomaly >150ppm
lake	Drillhole 1988 Billiton	Airborne EM Conductor	Gold Stream Sediment Anomaly	Geopko/Paringa 1978
swamp	Drillhole 1986 Billiton	Mt Lyell Style Anomaly	Tin Stream Sediment Anomaly	Geopko/Paringa 1978
road	Drillhole 1982 Geopko	Rosebery Style Anomaly	Geological Fault	Lithological Boundary
	Drillhole 1982 Cyprus			
	Drillhole 1982 Geopko			
	Drillhole 1989 Aberfoyle			
	Drillhole 1989 Mines Dept			
	Drillhole 1992 CRAE			

MRT Published geology
Map Projection MGA94 Zone 55

Hellman & Schofield Pty Ltd

EL 33/2005 Vale River Project

Previous Exploration Anomalies

Drawn by : S.J.Tear November 2009 Scale 1:40000

7 Exploration Potential

The area included by EL 33/2005 has seen considerable exploration over the past thirty odd years. It has been comprehensively covered by reconnaissance stream sediment sampling and airborne geophysics with ground follow-up investigation of generated anomalies. The latter has involved geological mapping, rock chip sampling, soil and weathered bedrock geochemical sampling and diamond drilling. With such regional assessment programs and careful follow-up of the indications obtained by several major explorers it is considered that there is no scope remaining for a new broad reconnaissance approach by a small explorer.

Manasia has an opportunistic approach to target commodities rather than restricting the exploration search to one particular commodity and this report has been prepared with this philosophy in mind. In assessing the exploration potential of the Vale River licence, a key element has been a reinterpreted geological map based on the relatively new airborne geophysical data supplied by MRT. This data cross referenced with historical work was used to evaluate potential exploration opportunities.

The area contains a variety of geological elements that could result in several different types of target commodity. The principal targets, in no particular order, are:-

1. Intrusion related gold deposits ("IRGS") in the NE sector of the licence proximal to the proposed outline of the Dolcoath Granite. (Morrison et al 2003)
2. U-Cu-Co skarn or vein type bodies associated with the Kauri Fault and the buried Dolcoath.
3. Volcanic hosted massive sulphide deposits of the Hellyer/Rosebery/Mt Lyell type.
4. Devonian skarn-type mineralisation, typical to Western Tasmania, particularly above the buried granite in the NE of the licence.
5. Vertical mineralised pipes of base metal and/or gold mineralisation associated with buried granites; possibly a new type of mineralisation associated with Tasmania (from MRT work at Anio Creek)
6. Fe-Ox copper-gold orebodies associated with hematitic stockwork zones in the BRP.
7. Irish-style lead/zinc deposits within the Gordon Limestone.

The exploration potential of EL 33/2005 is based on a collection of concepts. These include new ideas for old areas eg blind deposits, new data used to develop new geology eg the new WTMRP airborne data and any new discovery will be represented by subtle anomalies with old data perhaps requiring a greater level of geological interrogation. A number of new opportunities have appeared. For example the new airborne magnetic data can see through the Tertiary basalt into the underlying Cambrian MRV, which has often proved to be a barrier to past exploration. At this stage an open mind should be kept as to the exact type of mineralisation that may be found and that follow up fieldwork should examine all anomalies identified in this report.

The amount of past exploration completed over the licence and its surrounding areas is substantial and needs to be re-appraised in greater detail than this report will allow before undertaking any new ground-based exploration programmes.

A key aspect of Manasia's exploration philosophy is attempting to find mineralisation that does not outcrop ie blind mineralisation. As such this tactic has a higher risk attached to it. There may be some opportunity for a blind discovery in the north east of the tenement underneath the

Tertiary basalt cover. There might also be the opportunity beneath the Cambro-Ordovician siliciclastics of blind Cambrian hosted mineralisation. In addition some of the known surface mineralisation and anomalism may represent buried economic mineralisation. The initial strategy and the subject of this report has been to review and assess the recent MRT airborne geophysical data in order to identify anomalies in relation to their geology. Open file review including using geochemical data, has been undertaken in order to assist with the identification of any areas for detailed follow up exploration work.

8 Recent Work

Recent work was focussed on compiling data to produce a new geological interpretation. This has included a review of the relatively new MRT airborne geophysical data, both total magnetic intensity (“TMI”) and first vertical derivatives (“1VD”) with the view to generate a new geological map. Magnetic characterisation of delineated domains is included below as Table 5.

Table 5 Characterisation of Magnetic Domains

Unit	Magnetic Character	MRT Unit	Comment
1	Bland; low relief	COs, OI & SD	Upper Cambrian clastics
2	Broad magnetic high	Cos, Os	Variably related to different parts of the Cambro-Ordovician stratigraphy i.e. Owen Conglomerate; could include a magnetic top of porphyry unit in the western half
3	Variable relief; moderate anomaly	Cqfp	BRP quite distinct from domain 5
4	Bland; low relief	Ltp & Lts; Cdsq & Cdq	Neoproterozoic and basal Cambrian
5	Nondescript	Cqfp, Os, OI & Qha with some Tb	Different intrusive phase for the BRP and a small Ordovician syncline cored by the Gordon limestone
6	Small discrete magnetic high in a sea of lows	Cdtl, CO & Cda	Doesn't match with the geology
7	'Speckled' anomaly pattern with discrete magnetic highs possible related to underlying Cambrian	Tb	Tertiary basalt, but area underlain by Cambrian rocks
8	2 phase anomaly; bland zone with 'rim' of higher magnetic relief	Mixed Cqfp, Cdq, Cos & Os	The bland zone is rocks underlain by the Dolcoath Granite; higher relief is marginal Os
9	Magnetic trough and high	Os, OI & Tb	Core of a syncline; high might be due the basalt or underlying COs
11	Magnetic high similar to unit 6	Os & Tb	Top of Cambro-Ordovician clastics
12	Weakly magnetic feature with some moderate relief	Mixed sequence Cda, Cdt, Cqfp, Cdq, Cos & Tb	Very non-descript, that doesn't really resemble other domains
13	Strong magnetic high	Cdt, Cdtl, Cos & Tb	Highest amplitude magnetic feature in the area
F1	Moderately obvious break in TMI data		Possibly marks the SW termination of the Bond's Range Porphyry
F2	Moderately obvious break in TMI & 1VD data		No obvious lateral displacement but tends to line up with cross structures from Hellyer-Que River area
F3	Moderately obvious break in 1VD data		Possibly not much lateral movement but major facies thickness variation across fault e.g. Bond Range Porphyry
F4	Obvious break in TMI & 1VD data		Possible 4km of dextral movement, post Cambrian but pre Cambro-Ordovician
F5	Obvious break in TMI & 1VD data		Possible 4km of dextral movement, post Cambrian but pre Cambro-Ordovician
F6	Obvious break in TMI & 1VD data		Associated with a lot of mineral occurrences on the eastern side of the Dolcoath Granite

A map of the magnetic domains is shown below draped onto the MRT airborne TMI image, *tmi_nwsun* (Figure 11). Other geophysical data from the same work programme include the RGB total count radiometric data and the products of the Dolcoath airborne EM survey including apparent chargeability. The main images used for the reinterpretation of geological units were the NW and NE shaded TMI images. The 1VD images were used for delineating the main structures for the general licence area with *tmi_1vd_nwsun* included below as Figure 12; the EM data helped define the extent of the Tertiary basalt although coverage by this survey is limited to the eastern third of the Manasia licence. H&S believe it is possible in the magnetic data to see through the basalt into the underlying Neoproterozoic-Cambro-Ordovician sequences. The combined results of the image interpretation have been used to produce a magnetic domain interpretation that appears to contradict some of the original geological mapping. This map also shows what are believed to be the major NW cross cutting structures for the area.

The 1VD structural interpretation highlights a series of WNW, NW and NNW structures; with the WNW and NNW structures probably a conjugate pair/reidal shears that cross cut the geology. These are presumed to be steep angle faults related to the Tabberabberan Orogeny. In the east of the licence there is an increase in the frequency of the structures and some sense of movement is given by observing the Tertiary basalt outcrops. Movement seems to have involved a shuffling of blocks with up to 5km of offset. Included in this area of increased faulting is the NNW-striking Kauri Fault, which has been an established structure from past exploration and is visible, albeit subtly, in the TMI and 1VD data. It would appear that the Lea River 'uranium' occurrence lies close to an intersection of the NNW-striking Kauri Fault and a much larger WNW fault. A radiometric anomaly associated with the occurrence appears to have been dextrally offset by 4.3km. Unfortunately this movement has placed the other half of the radiometric anomaly on the other side of Manasia's licence and hence off the licence. However the fault structure does transect the licence and was the subject of exploration by Bass Metals via IP geophysics, which produced two chargeable anomalies neither of which was followed up by drilling.

Another interpreted major fault is a 15km long NNE striking structure that runs down the centre of the right fork of the Manasia licence. This feature is prominent in the TMI and 1VD and radiometric data. It is interesting to note that the three lead/zinc occurrences of Heap of Rocks, Carters and Speeler Creek all lie on this structure, generally hosted by basal Cambrian volcanics/volcaniclastics (Cdq).

A WNW to E-W striking structure from the magnetic data occurs between the two licence forks and trends eastwards where it extends onto Manasia's licence. This structure is close to the Bass Metals Iris River prospect and is juxtaposed with the same Cdq unit. The magnetic signature intensifies as it passes onto the Manasia licence despite it being covered by Tertiary basalt.

The south western branch of the F2 feature from the magnetic domain map is intriguing in that it appears to continue across the Cambrian terrane boundary and intersects the Hellyer Mine. It also seems to mark a subtle change in the magnetic signature of the BRP. The line of the interpreted fault passes through the Fury Flats and Mackintosh prospects (Alcoa's 1970's work) where some significant soil sample anomalism and EM Max-Min conductors were encountered. Unfortunately only part of the area is on Manasia's licence and the extent of Lake Mackintosh could preclude any future exploration. However it should be checked as the Pb/Zn anomalism at Fury Flats is significant i.e. 770/890ppm Pb/Zn maximum values and 250/550ppm Pb/Zn at Mackintosh prospect. Both occurrences are hosted by the Gordon Limestone and have the accompanying rather dismissive comment "these values are typical of the Gordon Limestone". The author has substantial experience of the Gordon Limestone and would suggest that the level anomalism is not that common and that the prospects should not be dismissed at this stage.

Figure 11 Vale River Airborne Magnetic Domains

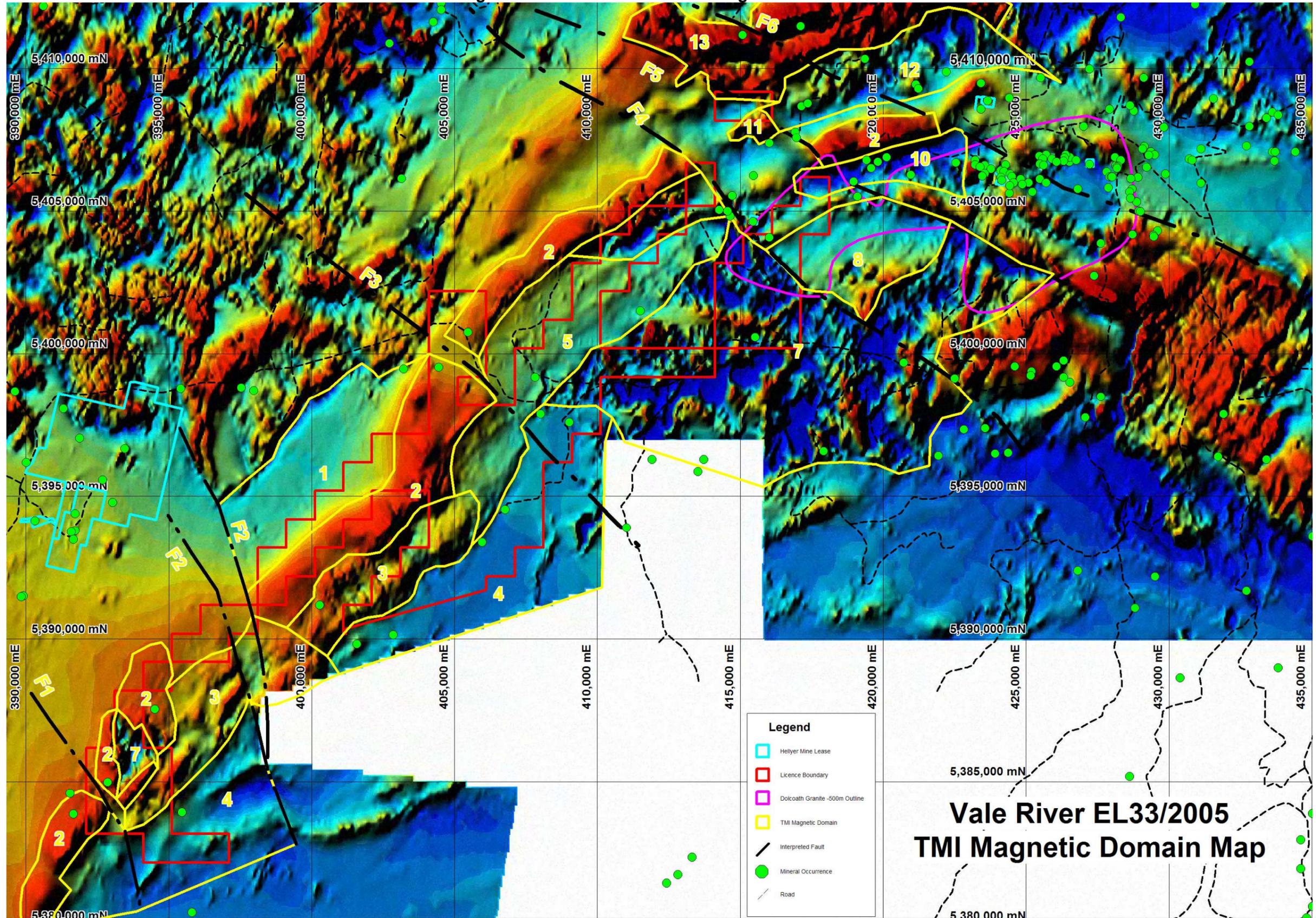
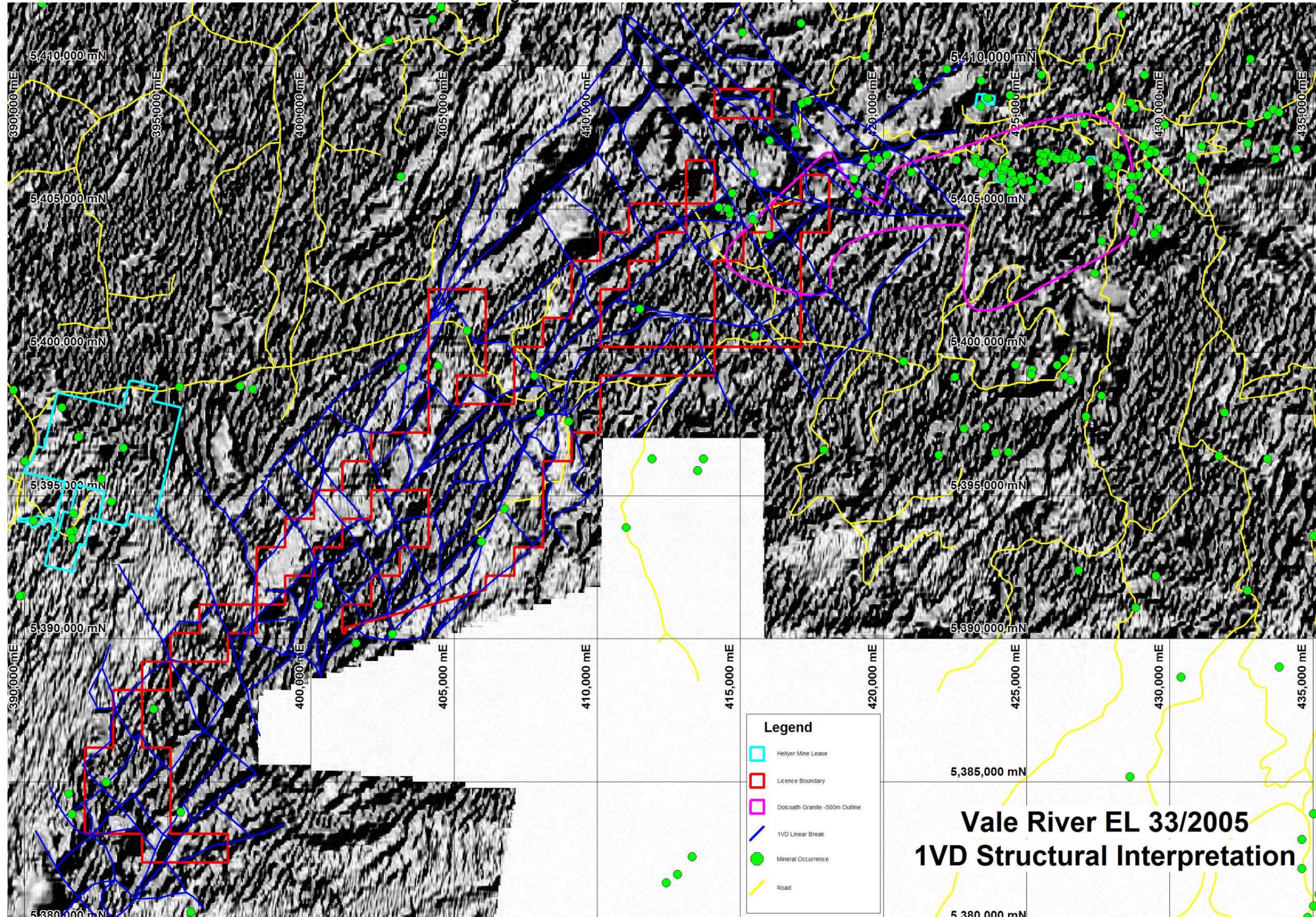


Figure 12 Vale River Structural Interpretation



As a result of interpreting the 2001/2 MRT WTMRP airborne data a new geology map has been created and is included below as Figure 13.

From the reinterpreted geology, which has been somewhat simplified, it is possible to see that the Neoproterozoic appears to be relatively magnetically bland, with only minor lithologic-related features that reflect fault offsets associated with the NW cross faults.

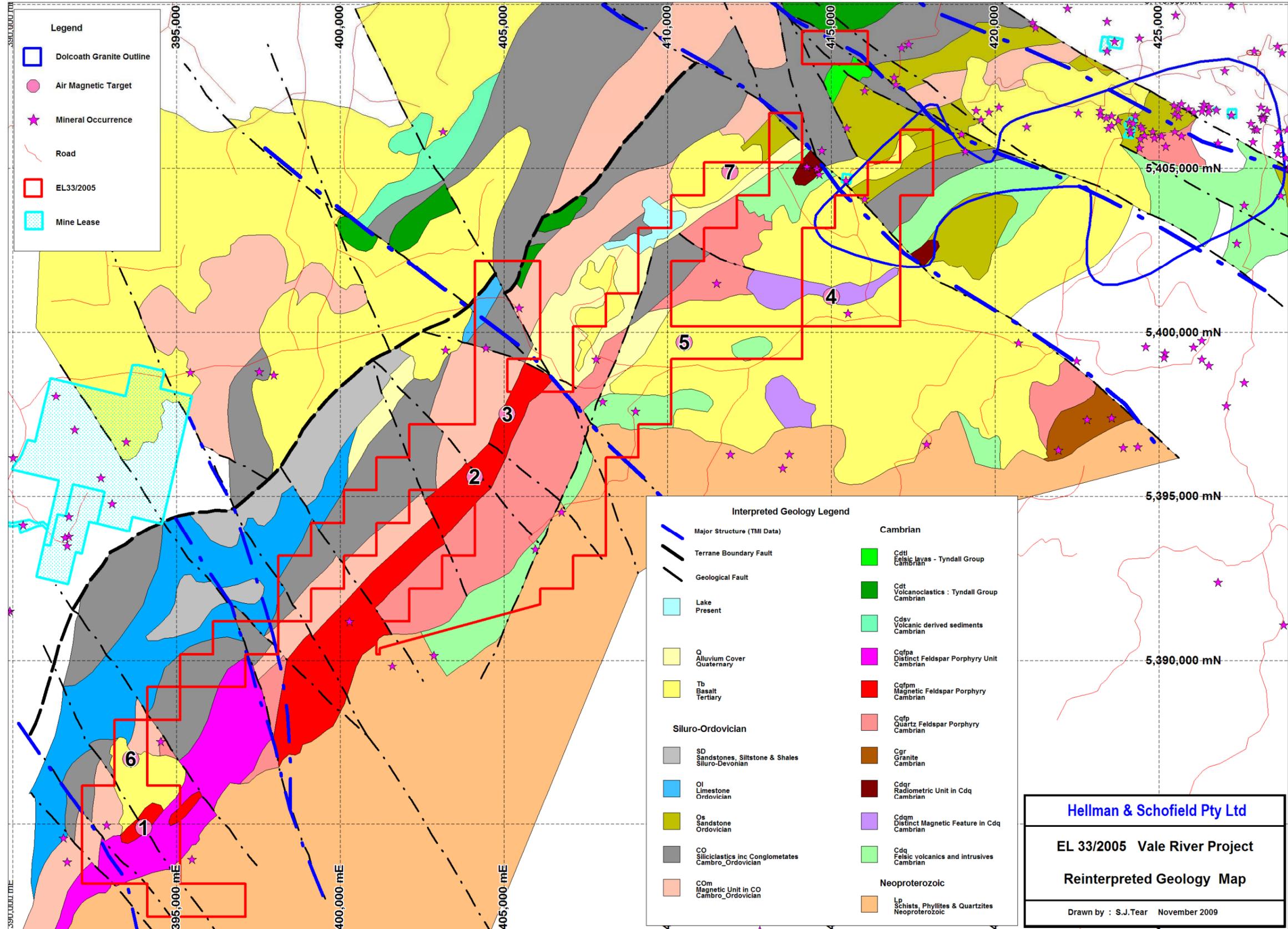
The Cambrian sequences, generally the basal volcanics and volcanoclastics and the BRP can be distinguished by a combination of the TMI and the radiometrics data. The upper Tyndall Group, which appears in the NE part of the Manasia licence contains distinctive high amplitude magnetic units. The Cambrian porphyries and volcanics are interpreted as being either unconformable with the Neoproterozoic or in faulted contact, the latter is the preferred option for the south western half of the licence.

In the south western half of the licence there is the broad outcrop of the BRP which appears to have some internal geological complexity based on the geophysical data; possibly due to multiple phases or zoned alteration. For example the Ten Mile Creek area contains an intensely hematitic alteration zone within a 2 km long alteration zone of chlorite and hematite. There is low grade anomalous gold and copper mineralisation associated with the alteration, with the whole alteration package possibly analogous with Mt Lyell.

There appears to be a strongly magnetic NW margin unit to the porphyry, which could be an upper fractionated part of the porphyry or it could be an upper Cambrian volcanic sequence similar to magnetically distinct Tyndall Group seen further to the north east. Along strike to the SW of the main porphyry body there is an inferred change in the porphyry unit with lenticular magnetic bodies on a NNE strike that is markedly different from the main porphyry body. This unit becomes more evident further SW with the orientation of the magnetic features reverting to a more traditional NE/SW direction. However it might be suggested that the immediate proximity of a small outlier of Tertiary basalt may have had a thermal metamorphic effect on the porphyry causing the generation of the distinct higher amplitude magnetic bodies rimming the basalt outcrop. The existence of the small basalt outlier is also considered of interest; is it a feeder pipe or did it form on a weathered surface where the weathering had been more pronounced for some unknown reason possibly alteration and /or mineralisation? If it is a feeder pipe then there may be an opportunity for nickel sulphide mineralisation of the Nor'ilsk type.

The overlying Cambro-Ordovician clastic sedimentary unit contains a moderate to strong amplitude magnetic zone at its base. This could be due to the sediments being derived from erosion of the up-faulted magnetic zone of the BRP and that the contact is an unconformity, although it is possible that the contact is a faulted one. This magnetic unit is extensive, appearing throughout the licence albeit much thinner in the east. The upper part of the Cambro-Ordovician sequence is magnetically non-descript. There is some fault repetition of the Cambro-Ordovician sequence in the north of the licence area and this may be associated with the reactivation of a presumed Cambrian terrane boundary fault striking NE/SW. The location of the terrane boundary is not well defined in the geophysics and its definition here is based on stratigraphic relationships and the spatial distribution of the Tertiary basalt. There is evidence for a Cambrian-aged (+?Ordovician) basin bounding fault in the central part of the licence as the Cambro-Ordovician sequences in the eastern half licence are different in thickness and seemingly composition (i.e. magnetic signature) to those in the western half.

Figure 13 Vale River Reinterpreted Geology Map



The separation of the Gordon Limestone from the overlying Siluro-Devonian clastics and the underlying magnetically dull Cambro-Ordovician is difficult to see in the airborne data. This meant a reversion to the MRT mapped geology to delineate these units. However it should be noted that the deep drilling completed by Aberfoyle on the western margin of EL33/2005 intersected Tyndall Group sediments beneath variably thick Tertiary basalt. This is in considerable conflict with the published geology and suggests that the terrane boundary is much further east and offers potential for a revised geology backdrop to the airborne magnetic interpretation. The Aberfoyle drilling was designed to intersect the Hellyer target stratigraphy which it failed to do and failed to intersect significant mineralisation.

The eastern area of the licence is a more complex arrangement of Cambrian and Early Ordovician sequences further complicated by the overlying Tertiary basalt and Quaternary cover. The Tertiary basalt is well characterised in the TMI, EM and radiometric data with a distinct low amplitude speckled effect, a high chargeability and dark colouration respectively. The plateau nature and high elevation to the topography might support the idea of a thick basalt sequence.

From the historical mapping there appears to be small inliers of Cambrian rocks within the basalt some of which are coincident with higher amplitude magnetic anomalies. The implications of this are firstly the Cambrian 'windows' may indicate that the basalt is not of excessive thickness throughout the licence. Secondly the occurrence of discrete and coherent high amplitude magnetic anomalies in the basalt may indicate relatively near surface Cambrian rocks possibly with blind mineralisation. Elsewhere in Tasmania it has been possible to see through the basalt into the underlying Lower Proterozoic/Neoproterozoic. In the Vale River area this has been more difficult which may be due to the lack of a magnetic signature of some of the older rocks or that the basalt has a much greater thickness in certain areas. Further magnetic modelling may elucidate more information on these anomalies and particularly if these linear magnetic features are actually feeder zones for the basalt with a consequent implication for possible nickel mineralisation.

The radiometric total count data highlights the BRP as a light coloured unit. The Quaternary cover also gives a similar light coloured signature and separation of the two is difficult. The SW end of the porphyry undergoes a significant colour change within Manasia's licence which coincides with the change in magnetic signature. The Tertiary basalt shows up as dark brown coloured unit but the occasional light patch is attributed to rocks of a similar type to the basal Cambrian Volcanics and/or the BRP.

A distinctive strong light coloured radiometric anomaly corresponding to the Lea River 'uranium' occurrence was noted adjacent to the Kauri Fault.

In all instances the new geology map should be field validated.

Problems with the new geological interpretation include:

- The current MRT maps have been used to guide the interpretation particular in referencing the magnetic domains. However the historical and more detailed prospect mapping has not been used. The intention was to provide a broader geological framework for assessing historical work and its associated anomalism with the new airborne data. As a result new insights to the geology of the area have now been gained but require fine tuning by incorporating more detailed geological information. This report will highlight a number of anomalous areas, probably too many to allow for systematic ground based exploration other than cursory field checks.
- The boundaries for the magnetic domains/new geological units are considered crude, actual contacts may need additional finessing from detailed historical exploration.

- Magnetic domain 11 is a Cambrian inlier (from MRT and Bass Metals' work) but looks magnetically similar to the easternmost Domain 2 unit, the Cambro-Ordovician magnetic unit. If they are the same unit then there is an associated dextral sense of movement on an interpreted major WNW structure of 2.5km.
- The magnetic domain 2 exhibits variation in the continuity of its magnetic amplitude, which maybe due to lithological changes. There seems to be a stronger basal unit to it which has been broken out in the new map as a magnetic porphyry unit. This may not be justified.
- An area within the Cradle Mountain National Park was not flown and this has hindered the interpretation as the Manasia licence borders the park boundary.
- The Tertiary basalt has made geological interpretation and lithological boundary definition difficult in the NE area of the licence.
- It is difficult to decide from the geophysical data on the boundaries between the Cambro-Ordovician siliciclastics, the Gordon Limestone and the Siluro-Devonian siliciclastics.
- The Aberfoyle drilling on the west of the licence contradicts the MRT geology, and it also appears to contradict historical mapping with a limestone unit, presumed to be the Gordon Limestone, mapped as dipping 25° west approximately 800m away from drill-hole BPD10.

Identifying and hopefully understanding anomalies in datasets is a key element of target recognition for this report. A study of the TMI has elucidated a list of targets that are detailed in Table 6. The anomalies should be field checked irrespective of the supposed host geology.

Table 6 List of Airborne Magnetic Targets

Target No	Name	MGA94 E	MGA94 N	Comment
1	Romulus South	394000	5384900	1.76km by 0.3km ; NE-SW striking; maybe related to the Tertiary basalt
2		404100	5395600	Messy high amplitude anomaly
3	Prover 8	405100	5397500	Linked to Target 2 (see below)
4	East Iris River	415000	5401100	2-3km long feature
5	Prover 7	410500	5399700	
6	Ray's prospect West	393600	5387000	1.9km long by 0,3km wide feature; NW strike; could be Tb related
7		411900	5404900	1km long feature with NE/SW strike; hosted by Tb

Appendix 5 contains details of a brief review by Mitre Geophysics (Tasmania) of some aspects of the geophysical data covering EL 33/2005. In the review they raised doubts about the follow-up testing of the Mariner 7 DIGHEM II anomaly by IP and it was considered that a ground EM technique was first required to establish that the response was genuine and an accurate location.

Following on the announcement by Bass Metals of strong assay results from drill hole BRD001 at the Iris River Prospect a rapid evaluation was undertaken of Manasia's closely adjacent ground by taking 7 stream sediments samples for geochemical analysis. Analyses were carried out for Cu Pb Zn and Ag by Genalysis Laboratory Services of Perth. A sample from Elgar creek was clearly anomalous for Zn (184 ppm) and Ag (the only silver detected in the seven samples), and elevated Zn (158 ppm) in a sample downstream tended to confirm that anomalous result.

Of the remaining samples taken from other creeks one that is broadly sourced from the south-western projection of the Iris River prospect also showed anomalism although of a lesser order in Zn (136 ppm).

It was subsequently ascertained from reviewing reports at MRT library that Elgar creek had previously been established to be strongly anomalous in a range of elements including Sn, W and Au and was within the prospect which had been formally designated Mariner 5. The limited sampling program undertaken independently confirmed the anomalous character of Elgar Creek and provided some additional constraints on the earlier exploration results as well as serving as useful ground familiarisation of the Mariner 5 area.

A float sample of limonitic quartz vein from the Mariner 5 "window" at 8950N, 11750E analysed (ppm) 0.18 Au, 55 Ag, 700 Bi, 470 Cu, 390 Pb, 70 Sn. A panned concentrate of a gravel sample from the same location assayed 1.8% Sn. A panned concentrate of a stream sediment at 8950N, 11850E assayed 0.14% Sn, 0.23 ppm Au

A review of the stream sediment database supplied by MRT as part of its regional data package indicates a series of geochemical anomalies for the licence. The identification of anomalies is based on visual comparison of recorded values rather than any statistical threshold basis. Only -80 mesh stream sediment sampling has been reviewed for copper, lead, zinc, gold and tin. This work has outlined a series of coherent anomalies which are listed below with further details in Table 7 and Figure 14.

1. Broad low grade copper and zinc stream sediment anomalism (Anomaly 1) with localised and peripheral small discrete tin anomalism (Anomaly 2) associated with an area of small, discrete magnetic anomalies beneath possibly thin Tertiary basalt cover. This area is along strike from Bass Metals' Iris River prospect. The copper and zinc anomalism is slightly higher than the average background for the basalt.
2. North of anomalies 1 and 2 lies a large area of low grade lead anomalism (Anomaly 3). The reason for this is unknown at this stage, but might be survey related. Although work by David O'Connor seemed to confirm the tenor anomalism in selected areas.
3. An E-W lead anomaly (Anomaly 4) with localised coincident zinc appears to match outcropping basal Cambrian (the Cdq host unit to the Heap of Rocks mineralisation) and includes the Speeler Creek mineralisation. The anomaly also covers a major fault locus.
4. Smaller scale low grade Pb/Zn anomalies associated with poor sample density occur in the west of the licence generally hosted by Cambro-Ordovician siliciclastics (Anomaly 5).
5. A large area of coherent lead anomalism associated with the NNE structure and the mineralisation associated with Speeler's Creek, Carter's and Heap of Rocks (Anomaly 7). The lead anomalism has an associated zinc anomaly at its southern half and a gold anomaly linked to its northern half. There are localised areas of mutually exclusive copper and tin anomalism (Anomaly 6). The anomalism appears to be spatially related and indicates possibly mineral zoning within the BRP and Basal Cambrian volcanic and volcanoclastic sequences. The discrete copper anomaly at the south western end of the overall anomaly is of particular interest bearing in mind its proximity to the Ten Mile Creek hematite zone and the suggestion of possible Mt Lyell style mineralisation associated with chlorite alteration.
6. The extreme SW corner of the licence comprises an anomaly of coincident lead and zinc values associated with the Neoproterozoic rocks of the Romulus East prospect (Anomaly 8). This anomaly lies immediately east of the Manasia licence, but a lack of coverage offers potential for the anomaly to continue onto the Manasia licence. A second

multi-element anomaly occurs south of this anomaly and south of Manasia's licence as a strong coincident tin, copper and zinc feature hosted by Neoproterozoic rocks (Anomaly 9). The anomaly is presumed to be associated with the exposed Devonian granite, the Birthday Granite, of Granite Tor further to the south beyond the licence.

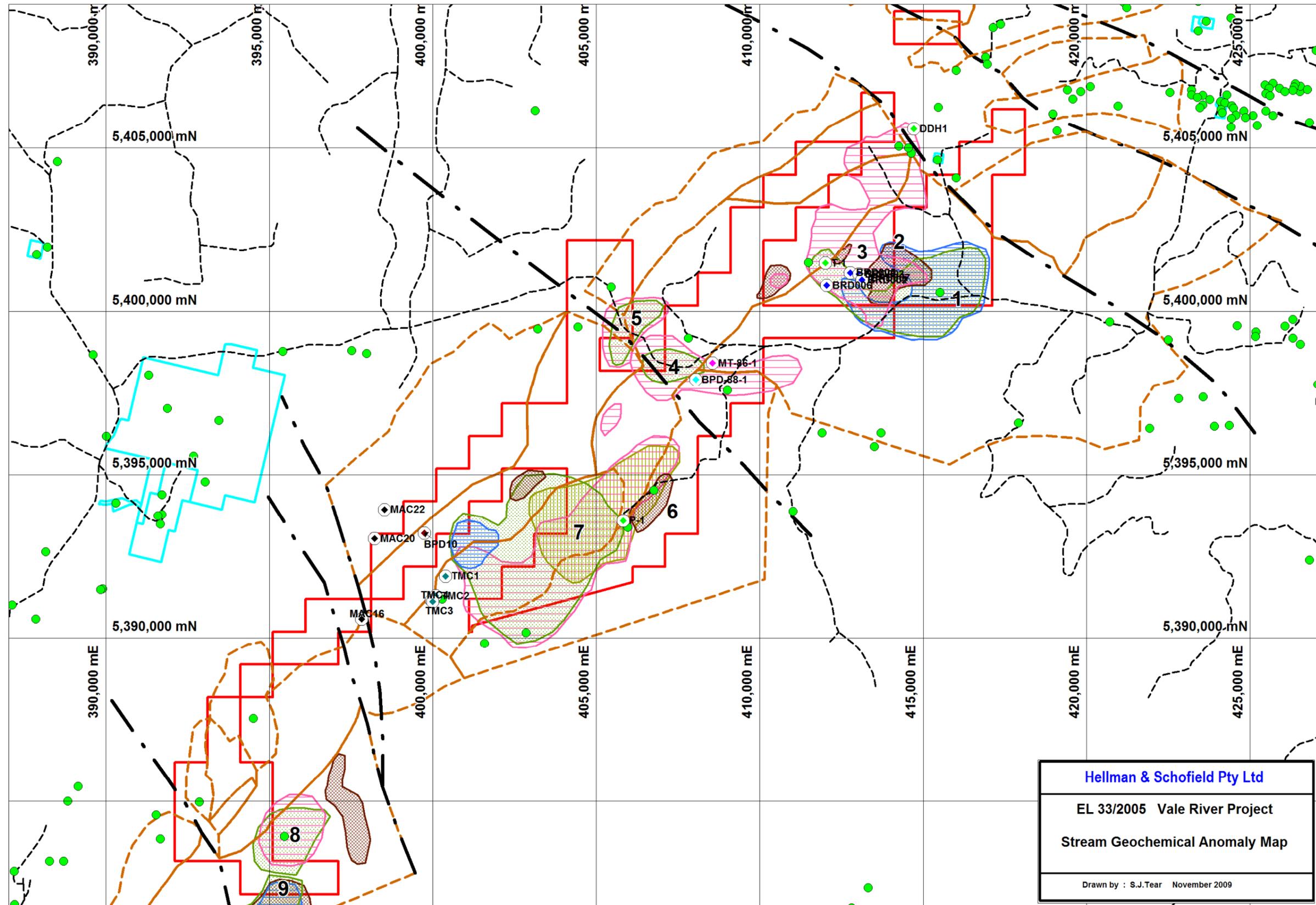
Table 7 List of Geochemical Anomalies

Anomaly No.	Element	Location	Rating	Host Unit	Comment
1	Cu & Zn	West Iris River	Moderate	Basalt overlying feldspar porphyry	Values due to basalt?
2	Sn	Iris River	Strong	Quartz Feldspar porphyry	Unusual anomaly associated with Cambrian inliers
3	Pb	Greater Iris River area	Moderate	Range of units	Generally not on licence
4	Pb (+Zn)	Speeler Ck	Moderate	Cdq and Tb	
5	Pb & Zn	Eldorado	Weak	Alluvium, magnetic feldspar porphyry & COs	Poor coverage
6	Sn	Carter's & Heap of Rocks	Strong	Neoproterozoic	On periphery of Anomaly 7
7	Pb (+ Au) (+Zn)	Carter's & Heap of Rocks & beyond inc Anio Ck	Moderate	Quartz Feldspar porphyry;	Large area, fault bounded; Au in NE and Zn in SW
8	Pb & Zn	Romulus East	Weak	Neoproterozoic	Poor coverage
9	Sn, Cu & Zn	Granite Tor	Strong	Neoproterozoic	Poor coverage within the Manasia licence

It is important remember that there must be caution with geochemical sampling in proximity to any outcropping Tertiary basalt as the unit is not regarded as prospective and is likely to have shed sediment that will mask subtle geochemical anomalies derived from Palaeozoic rocks.

In addition geochemical sampling work in the 1980's by Cyprus and Billiton, particularly soil sampling appeared to be unable to match the Paringa soil sampling in anomaly levels. This was attributed to the Paringa sampling being B horizon (generally 18-24') as opposed to the latter C horizon sampling. This might be perceived to considerably down grade any soil sampling anomalism associated with the earlier work.

Figure 14 Vale River Geochemical Anomalism



All the targets included in this report are regarded as high risk with no certainty in the existence of economic mineralisation. Many of the anomalies are small in size or weak in intensity but nevertheless should be field checked with a non-prejudiced mind. The reader is reminded that the Avebury magnetic anomaly remained untested for at least ten years and the significance of the relatively anomalous soil geochemistry was not appreciated until after its discovery. Not only that but the perceived geological model for the magnetic anomaly was vastly different from the subsequent drilling outcome.

A review of the revised geology and the geophysical datasets has led to a series of targets for possible economic mineralisation which are detailed below in no particular order of importance.

Of particular importance is the NNE structure associated with Speelers Ck, Carter's and Heap of Rocks and the reference by MRT to the cross cutting NW striking faults possibly being basin margin faults. The intersection of these structures may be critical for larger scale mineralisation and may offer the possibility of a change in strike to that which has been drilled in the past. Also the mineralisation at Iris River appears to be in similar rocks but is related to strong E-W magnetic features within the Manasia licence rather than linked to a NNE-striking fault.

Target 1

- The target comprises two isolated but co-joined sub-blocks separated from the main licence body.
- The open-ended Tiger Plains Pb/Zn soil anomaly lies immediately to the south of the EL33/2005 licence boundary. The anomaly is undrilled and is hosted by Cambrian Tyndall Group rocks, the Cdtl unit (approximately the age of rocks hosting the Henty gold deposit)
- Interpretation of the airborne magnetic data indicates a convergence of major WNW-striking structures.
- These faults appear to have controlled the geometry of the buried Dolcoath Granite and may have acted as fluid conduits for possible hydrothermal mineral fluids from the granite.
- The sub-blocks lie 1km north west of the Devonport gold occurrence which occurs along the strike of one of the WNW fault structures.
- There has been no effective stream sediment sampling of the area
- The host unit appears to be a magnetically distinct feldspar porphyry of the Cdt unit, but the magnetic data appears to indicate a limited size to the unit, which would impact negatively on the size of any potential mineralisation.
- The target area lies proximal to both a Rosebery-style and Mt Lyell-style exploration signature as per the Geoinformatics work.
- The area lies within an interpreted VHMS alteration signature from the Aster satellite data.

Target 2

- The area is along strike, <1km, to the SE from the Bass Metals' Lea River IP anomaly, which is associated with small scale airborne EM and magnetic anomalies. The Bass Metals area was formerly explored by Geopeko as part of the Mariner 6 anomaly.
- A WNW striking structure, possibly a basement feature is associated with the IP anomaly and this fault may have had some control on the western margin of the Dolcoath Granite.
- This structure merges with the Kauri Fault system close to small gold mineral occurrences. The geological target is the structure for possible intrusive-related gold mineralisation, either in the structure itself or beneath the Tertiary basalt on the south west side (downthrow) of the fault. There is some evidence that these faults were active in pre-Tertiary times.
- Immediately to the south west on the downthrow side of the structure lies a Rosebery-style exploration signature (Geoinformatics) hosted in Tertiary basalt.

Target 3

- A significant magnetic anomaly hosted partially by Ordovician sandstones and Tertiary basalt.
- The basalt's magnetic signature is unusual.
- There are indications that the basalt may be relatively thin.
- It is the Mariner 7 target from the Geopeko exploration of the earlier 1980's. David O'Connor has suggested that the work completed was inconclusive in explaining the Dighem anomaly (exploration fatigue is cited).

Target 4

- A strongly magnetic E-W striking feature, 2km in length, is in association with a small but discrete tin stream sediment anomaly
- Also present is broader scale copper and zinc stream sediment anomalism
- The area is hosted by Tertiary basalt, but with inliers of Cambrian Cdq units possibly indicating shallower than expected basalt.
- The western part of the target lies 800m east and along strike from Bass Metals' Iris River base metal discovery.

Target 5

- A major NNE striking structure from geological, geophysical and geochemical interpretation. The NNE fault direction is considered unusual for the area and has base metal anomalism associated with it i.e. Speelers Creek, Carter's and Heap of Rocks.

- The target is associated with basal Cambrian volcanics and volcanoclastics.
- Three sub-targets are identified, although the whole structure should be considered.

Target 5a – Carter's/Heap of Rocks

- A small but discrete tin geochemical stream sediment anomaly rimming a large weakly anomalous gold stream sediment anomaly
- The area has had no historical drilling at Carter's
- Surface Pb/Zn geochemical anomalism coexists with airborne EM conductors
- Diamond drilling at Heap of Rocks reported 19m at 0.17% Pb, 0.17% Zn; only one drillhole completed
- Mineralisation at Carter's is described as being hosted by a NW cross structure

Target 5b – Speeler's Creek

- Coincident Pb/Zn stream sediment anomalism
- Drilling indicated narrow zones of low grade lead/zinc mineralisation hosted by a black shale within basal Cambrian volcanics and volcanoclastics (similar to Rosebery?).
- Hosted by basal Cambrian Cdq as per other anomalies and known mineralisation in the general area.
- A major cross cutting NW structure, passes through the target and possibly may be a basement feature
- Geophysical interpretation indicates the possibility of a fault locus

Target 5c – Prover 5

- A Dighem electromagnetic anomaly untested by drilling; past work has suggested a failure to locate the anomaly on the ground and hence the EM anomaly remains untested
- Proximal to the major NNE structure and hosted by basal Cambrian
- A significant stream sediment anomaly occurs downstream from the EM anomaly

Target 6

- E-W striking interpreted structure associated with the Eldorado gold mineral occurrence.

- Close to a fault locus of WNW/NW structures.
- A small high amplitude magnetic anomaly lies just off the licence to the south west about 1km away from the proposed target fault. This magnetic feature may be a cultural effect.

Target 7

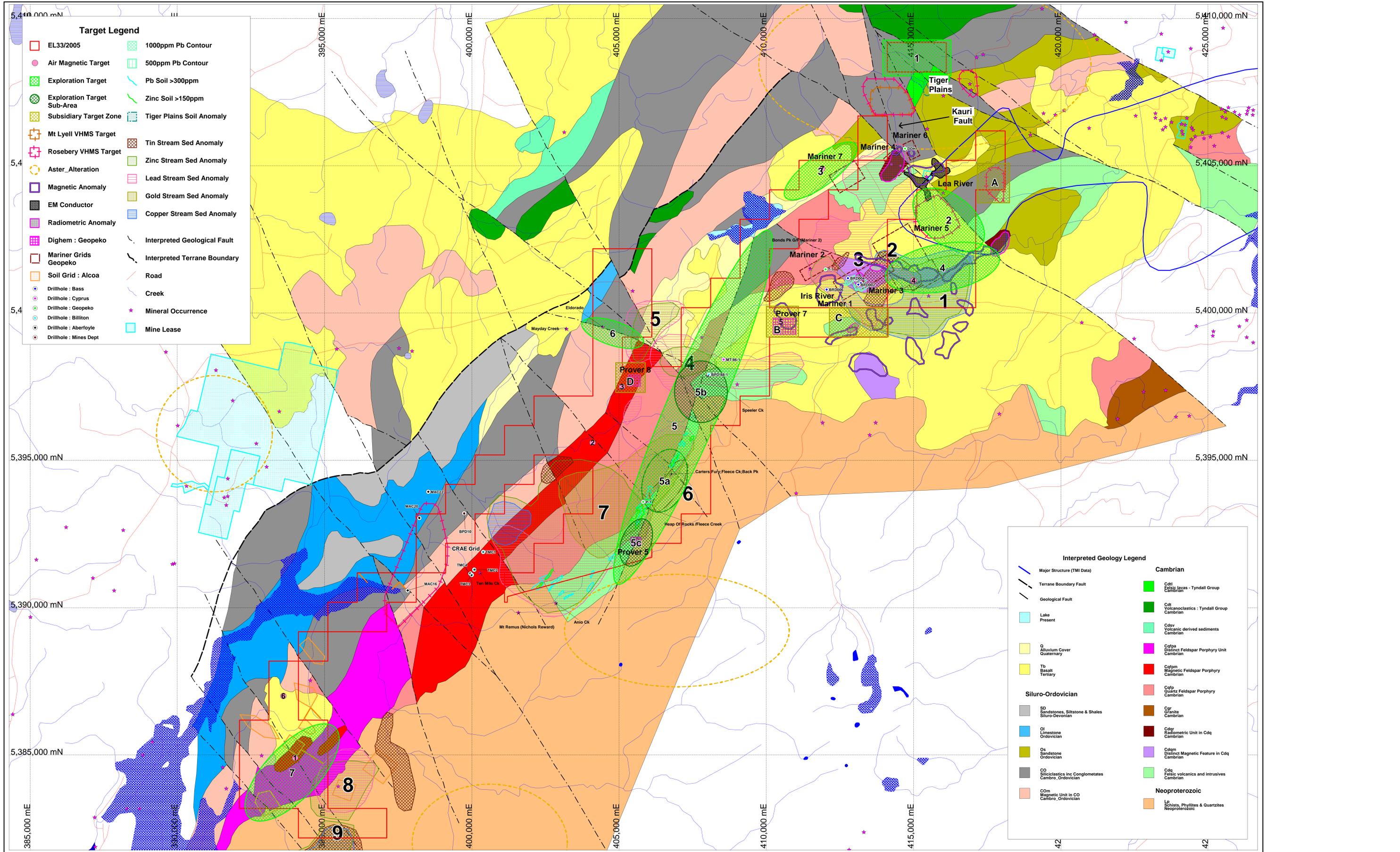
- A distinct change in the magnetic nature of the BRP with some higher amplitude and distinct magnetic features. The variation in the porphyry may be due to different lithologies or the effect of alteration or even mineralisation
- Three NW cross faults occur in the area, the most northerly appears to have a strike extent that reaches the Que River base metal deposit. The area also coincides with an increase in frequency of NW striking structures.
- The area has moderate to weak stream sediment coverage. Immediately to the SE within Neoproterozoic rocks there appears to be strong multi-element stream sediment anomalism. The nature of the anomalism is suspicious and may indicate different sampling methods coupled with different analytical methods. Alternatively there may be a strong influence from the southern granite body.

The primary targets are considered to be Targets 4, 5 and 2.

Subsidiary Targets

1. NE corner of licence with a Rosebery style exploration signature (Geoinformatics work). The target is underlain by Tertiary basalt, which may be thinner than usual.
2. The Prover 7 Dighem electromagnetic anomaly coincident with a small discrete airborne magnetic anomaly hosted by Tertiary basalt. The anomaly was written off as weathered basalt but may require further inspection.
3. Comprises small discrete airborne magnetic anomalies one coincident with a small airborne EM anomaly and partially coincident with anomalous copper and zinc stream sediment sampling. Host units are a mixture of Cambrian Cdq and Tertiary basalt, possibly implying that the latter is thinner than expected.
4. The Prover 8 Dighem electromagnetic anomaly hosted by distinctly magnetic Cambro-Ordovician siliciclastics or possibly Tyndall group volcanoclastics. The anomaly is close to a major NW cross cutting structure and may lie upstream of a weak but coincident Pb/Zn stream sediment anomaly. A magnetic anomaly is attributed to "Fe in pyroclastics" above the BRP; copper is reported in a limonitic rock chip (0.16% Cu) and soil sampling indicates an open ended anomaly to the south of the exploration grid. There may be possibilities of Mt Lyell style mineralisation.
5. Another Rosebery style exploration signature (Geoinformatics) to the west of the CRAE gold mineral occurrence at Ten Mile Creek. The area is also associated with a change in the magnetic signature of the BRP and a NW cross structure appears to have a strike extent that reaches the Hellyer base metal deposit. The anomaly may be downgraded by the Aberfoyle drilling which has tested the northern and south tips of the Geoinformatics anomaly.

Figure 15 Vale River Target Map



Hellman & Schofield Pty Ltd

EL 33/2005 Vale River Project

Target Map

Drawn by : S.J.Tear November 2009 Scale 1:40000

9 Proposed Work

Manasia's exploration plans and strategies for this tenement recognise that previous exploration work has reduced the possibility of grassroots exploration. A substantial amount of exploration work has been completed including airborne EM, magnetics and radiometrics, detailed mapping and geochemical sampling, ground based geophysical surveys and minor diamond drilling.

Anomalous areas identified in this report should be subject to a series of site visits that may include reconnaissance mapping and some geochemical sampling, which may require helicopter support. Encouraging outcomes will result in detailed mapping and geochemical sampling (if feasible due to the basalt cover) and ground geophysical surveys e.g. ground magnetic, ground EM and/or IP, aiming to delineate drill targets. In addition a review and field inspection of all known deposits/mineral occurrences within the licence should also be undertaken to firmly establish the geological nature and potential of any occurrence to indicate possible previously unrecognised significance for mineralisation.

Drilling will initially be of a reconnaissance style moving to a detailed diamond drilling campaign whenever results are favourable.

The following work programme is advised (Table 8):

1. Site visits to the following places:
 - West Ten Mile Creek
 - Backwater
 - Romulus
 - Eldorado
 - Lea River East
2. Detailed prospect compilations should be completed for the following areas with accompanying site visits:
 - Heap of Rocks and Carter's
 - Speelers Creek
 - Mariner 5 and 7
 - Prover 5, 7 and 8
 - (it may be a worthwhile option to also do the remaining Mariner grids)
3. A continuation to the north of the Bass Metals 'C' horizon soil sampling grid at Tiger Plains. This should include two E-W lines about 500m long with 25m sample spacing. It is suggested that the two sub-blocks be covered with detailed stream sediment sampling and/or reconnaissance soil sampling on a 50m grid.
4. An IP survey line should be completed south of the Bass Metals work at Lea River to see if the conductive zones are continuous onto Manasia's ground which can be tested by drilling.
5. Anomalism associated with the Speeler Creek, Carter's and Heap of Rocks prospects should be plotted up to see if the anomalies have been explained and if there are additional targets warranting further ground based investigations.

6. Magnetic modelling of the discrete anomaly 500m east of Bass Metals Iris River Prospect. The modelling should allow for the delineation of a drill target.
7. Prospecting/mapping of the structure associated with the Eldorado mineral occurrence should be completed. This may include a couple of N_S oriented reconnaissance soil sample lines.
8. Some of the areas listed for site visits, prospecting and/or mapping may require additional ground magnetic surveys to help delineate drill targets.
9. Some of the areas with more substantial amounts of past exploration work may require additional electrical exploration methods to help delineate drill targets.

Consideration may have to be given to applying for additional ground around EL33/2005, generally the old Bass Metals licence, as many anomalies on either licence often appear at the licence boundaries.

Table 8 Proposed Work Programme

Target No	Prospect	Work proposed	Sampling Details
1	Tiger Plains	Stream sed sampling 'C' horizon soil sampling Mapping IP geophysics	20 samples 2 days 2 lines 40 samples 2 days 2 lines 1km long
2	Lea River	IP geophysics Drilling	3 lines 1km long 500m apart 1 hole for 200m
3	Mariner 7	Ground magnetics Ground EM	3 lines 1.5km long 3 line km
4	Iris River East	Ground magnetics IP Geophysics Drilling	3 lines 1.5km long 3 lines 1km long 2 holes for 400m
5a	Carters/Heap	Mapping & prospecting IP Geophysics Drilling	3 days 3 lines 1km long 1 hole for 200m
5b	Speelers	Mapping & prospecting IP Geophysics	2 days 3 lines 1km long
5c	Prover 5	Mapping & prospecting IP Geophysics Ground EM	2 days 3 lines 1km long 3 line km
6	Eldorado	Site visit & prospecting Soil Sampling	1 day 3 lines 25m spacing 30 samples
7	Romulus	Site visit & prospecting Stream sed sampling Ground magnetics	2 days 50 samples; 4 days 10 lines 1km
Subsidiary	Targets		
A	Lea River East	Site visit & prospecting	1 day
B	Prover 7	Site visit & prospecting Ground magnetics	1 day 3 lines 1km long 200m spacing
C	Iris River South	Site visit & prospecting Ground magnetics 'C' horizon soil sampling	1 day 6 lines 1km long 3 lines 50 samples
D	Prover 8	Site visit & prospecting Ground magnetics 'C' horizon soil sampling	1 day 3 lines 1km long 3 lines 50 samples

(note no account has been made for helicopter support)

A budget for this work has been supplied in Table 9.

Table 9 Budget for Proposed Work Programme

Work Activity	No of Samples	Line Kms	Days	Cost A\$
Phase 1				
Additional data compilation			10	10,000
Geophysical processing			4	5,000
Site visits/Mapping			17	15,000
Stream Sediment Sampling			7	5,000
Line Cutting			10	15,000
Soil Sampling			15	30,000
Geophysical Surveys			10	50,000
Reporting			10	10,000
			Sub-total	\$140,000
Phase 2				
Line Cutting			10	15,000
Follow up Geochemistry			8	15,000
Geophysical Surveys			10	50,000
Drilling			200/m	160,000
Reporting			10	10,000
			Sub-total	\$250,000
			Total	\$390,000

10 Conclusions

Manasia has commissioned Hellman & Schofield to undertake a data compilation and review exercise for their Vale River licence EL 33/2005 in NW Tasmania. The outcome of the work has generated a list of exploration targets for a variety of commodities accompanied by a proposed ground-based exploration strategy and budget.

The centre of this exploration licence is approximately 10km east of the old Hellyer Mine and about 50km south of the port of Burnie in NW Tasmania. The licence is an elongated NE-SW with several prongs. Road access is via the sealed Cradle Mountain Link Road from the Lyell Highway. Access to other parts of the tenement will be by unsealed roads constructed for previous exploration and may be in a state of disrepair. It is likely that helicopter support will be required for access to some of the potential target areas.

The geology of the Vale River licence involves a complex arrangement of five structurally-bound elements. These are:

1. Part of the Late Proterozoic high to moderate metamorphic grade Tyennan Block.
2. Lower Cambrian volcanoclastics and quartz feldspar porphyries associated with the Mt Read Volcanics.
3. Sections of the Upper Cambrian Tyndall Group, also part of the MRV.
4. A structurally bound Ordovician-Siluro-Devono clastic basin.
5. Tertiary basalt cover over large areas.

In addition the north eastern part of the licence is interpreted to have part of the buried Devonian-aged Dolcoath Granite at depths of <500m.

Mineralisation within the licence area is restricted to small scale base metal veining and breccias zones within the basal Cambrian volcanics. Other commodities include small scale auriferous quartz veins at Eldorado. Commodities immediately peripheral to the licence include copper, molybdenum 'uranium' and tin.

Modern exploration of the area began in the late 1960's with work by previous explorers comprising stream & soil geochemistry and airborne EM/magnetic surveys with ground follow up testing identified anomalies. There has been very limited diamond drilling on the bulk of the licence area with a total of three holes for 472m. Drilling on the western margin of the licence by Aberfoyle includes another four holes for 1510m. Exploration fatigue has been cited as a significant reason for exploration failure.

Work completed for this report involved a comprehensive literature review of many open file reports, compiling the relevant exploration information into a series of maps for target selection. In addition government data in the form of digital datasets, including the WTMRP airborne geophysical data, was also used to formulate a geological synthesis of the area.

The exploration target strategy is twofold involving locating anomalies in relation to their geology without any preconceived target commodity or mineral style and re-evaluating historical work to find areas that were not adequately tested. Another aspect of the exploration philosophy is that the targets are likely to be blind targets, particularly beneath the Tertiary basalt. Possible target mineralisation includes VHMS style base metal mineralisation of both the Mt Lyell and Rosebery types, along with Devonian-aged tin skarns.

From the data synthesis a total of nine primary exploration targets were developed with a further four subsidiary target areas. A ground based exploration programme has been designed with a two phase budget to test the targeted areas.

11 Expert Competency

Hellman & Schofield Pty Ltd (“H & S”), a geological consulting company based in Sydney, Brisbane and Perth, Australia, prepared this geological report at the behest of the directors of Manasia. Simon Tear, a Consulting Geologist, has a BSc (Hons) in Mining Geology from The Royal School of Mines, London, U.K. and has over 26 years worldwide experience in the mining & mineral exploration industry. He is a member of the IMM (22 years), the AusIMM (12 years) and the Institute of Geologists of Ireland (PGEO and EurGeol, both 15 years). He was Team Leader for CRAE Pty Limited’s Tasmanian exploration program from 1995-1996. That program successfully explored Western Tasmania, accounting for nickel and lead/zinc discoveries.

The Author’s Tasmanian experience consists of:-

- Led the CRAE field team in the discovery of the Avebury Nickel deposit (1996).
- Devised and executed CRAE’s and Noranda Pacific’s carbonate hosted base metal programmes in the Gordon Limestone near Zeehan (1995-6 and 2001 respectively).
- Undertook exploration on CRAE’s Balfour copper licences in NW Tasmania (1996)
- Worked on the Lynchford/Sulphide Creek gold project for CRAE (1996) and Shree Minerals (2008).
- Project generation for sediment hosted gold targets for CRAE in Northern Tasmania (1996)
- Consulting Geologist for the Zeehan Zinc Ltd Comstock Ni & base metal projects (1999-2007)
- Nickel project generation for Tasmania for Falconbridge (2002)
- Literature Study and Resource Assessment of the Nelson Bay Iron Project for Zelos Resources NL (2006-7)
- Literature Study of the Mt Bertha Project for Zelos Resources NL (2006)
- Literature Study and Resource Assessment of the Adamsfield PGE Project for Zelos Resources NL (2006)
- Literature Study of the Whyte River Project for Manasia (2009)

Other relevant experiences include:-

- Industry supervision of a MIRO sponsored research project into Platinum Group Mineralisation in the Unst Ophiolite, UK
- Exploration experience in Cambro-Ordovician island arc related volcanic terranes similar to the Mt Read Volcanics in SE Ireland; explored around the Avoca Copper Mine (very similar scenario to Mt Lyell).
- Nine years of Lower Palaeozoic gold hosted exploration experience, mainly field related, including vein and ‘Slate Belt’ styles.

- Independent Geologists Report for Zinico (now Zelos) Resources NL successful IPO in 2005.

The above experiences and qualifications make Simon Tear adjudged to be a competent person under the JORC Code and has completed this report in accordance with the VALMIN Code.

The digital geological and geophysical information used in this report was supplied by the directors of Manasia. Additional open file information was sourced from Mineral Resources Tasmania via their websites and through personal communication. H&S has relied upon and assumed without verification the accuracy and completeness of all information provided and cannot take any responsibility to guarantee its accuracy.

Limitations and Consent

This assessment has been based on data, reports and other information made available by Manasia or otherwise obtained through publicly available sources. A draft copy of this report has been provided to Manasia for comment as to errors of fact, omissions or incorrect assumptions. H&S has no reason to believe that the information provided by Manasia is misleading or that any material facts have been withheld.

The opinions expressed herein are given in good faith and H&S believes that any assumptions or interpretations are reasonable.

This report is provided to Manasia for the purpose of assessing its Vale River exploration licence. Neither the whole nor any part of this report, nor any reference thereto, may be included in, or with, or attached to any document or used for any purpose without H&S's written consent to the form and context in which it appears.

Respectfully submitted,

Simon Tear

BSc (Hons), ARSM, PGEO, MAusIMM, EurGeol, MIMM
Consulting Geologist
Hellman & Schofield Pty Limited

13th November 2009

12 References

Some selected general references are included here for additional information.

Author	Initial	Year	Title
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Burrett	C	1989	The Geology & Mineralisation of Tasmania
Martin (eds)	L		
Morrison	KC	2003	The Dolcoath Granite: A Gold Exploration Target Record 2003/16
Reed	AR		
Turner	NJ		
McClenaghan	M	1996	Combined Interpretation of New Aerial-Survey Geophysical Datasets for NW Tasmania, UR1996_16
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Calver	CR		
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A list of references for the Vale River Licence compiled by David O'Connor is included:

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Van Den Bogaart, R. and Buckland, G. L. 1978 EL 10/74 Progress Report. Geopeko Ltd, Union Oil Development Corp. (78_1264)

Appendix 1
Open File Listing of Competitor Reports

Downloaded **File name**

[00_4430 - Annual report for the period ending 31 July 1999 - Bulgobac Hill EL 37/89 and Bulgobac River EL 19/94](#)

McNeill, A.W., Parfrey, O.

[00_4467 - Annual Report - Mt Charter -EL10/98 - P.E. June 2000](#)

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[03_4899 - Tube No 8: Mariner 1977-82 \(EL 10/1974\)](#)

Green, D.

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McNeill, A.W., Skirka, M.
- YES** [06 5397A - Bonds Range Project EL28/2002 Six month Progress Report 31/1/2006 to 31/7/2006](#)
Hart, S.
- YES** [06 5397C - ASTER Alteration Mineral Mapping, Northwest Tasmania, Australia](#)
Agar, B.
- YES** [06 5398 - Annual Progress Report 8/8/2005 to 7/8/2006, Wilmot Project, Tasmania](#)
Jones, A.
- [07 5421 - Bulgobac \(Boco Siding\) EL4/2000, Sixth and Final Annual Report for the period ending 15/12/2006](#)
McNeill, A.W., Skirka, M.
- YES** [07 5472 - Annual Report for period 31/1/2006 to 30/1/2007, Bonds Range Project, Tasmania](#)
Turnbull, C.
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YES

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Anon

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[27_0036 - The Housetop Area Laurel Creek and Blythe River Districts](#)

Pearson, A.

[32_0050 - The Occurrence of Cobalt and Vanadium in Mt. Remus Pyritic Ore.](#)

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[57_0189 - Field Work Mackintosh Quadrangle 44](#)

Anon

[58_0256 - Exploration Notes and Proposals for Future Work](#)

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[60_0305 - Cambro-Ordovician Sedimentation and Tectonism in West Tasmania. Age and Control of Mineralisation and Results of the Exploration](#)

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Hespe, A.M.

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- YES** [89_3006D - Interpretation Report, UTEM Survey, Murrays Road Grid, Mackintosh EL 2/70](#)
Silic, J.
- YES** [89_3006E - Interpretation Report, UTEM Survey, Hellyer Adit, Mackintosh EL 2/70](#)
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- YES** [89_3006F - Interpretation Report, UTEM Survey, Southwell Grid, Mackintosh EL 2/70](#)
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[92_3327A - Updated Aeromagnetic Interpretation of Bulgobac Hill](#)

Leaman, D.E.

[92_3340 - Exploration Licence 39/85 Bulgobac River Tasmania Progress Report for Year Ended 14 February, 1992](#)

Richardson, S.M.

[92_3355 - Mackintosh District EL 106/87 Tas Progress Report for the Period April 1991 - April 1992.](#)

Richardson, S.M.

[92_3396 - Results of Core Drilling Program Completed February 1992](#)

Newnham, L.A.

[93_3410 - Partial Relinquishment Report](#)

Wallace, D.B.

[93_3441 - Annual Report 1993](#)

Richardson, S.M.

[93_3484 - Annual Report EL 20/92 - Moina Area - 1992-93](#)

Newnham, L.A.

[94_3533 - Exploration Licence 39/85 Bulgobac River](#)

Richardson, S.M.

[94_3537 - Exploration Licence 106/87 Lake Mackintosh Tasmanian Progress Report for the Period April 1993 to February 1994](#)

Richardson, S.M.

[94_3584 - A List of Transparencies from EL 2/78, Granite Tor Area, Tasmania](#)

Anon

[94_3599 - EL 20/92 Moina Area-Northern Tasmania, Annual Report 1993-94.](#)

Newnham, L.A.

[94_3620 - List of Transparencies from the Getty-EZ-Lyell Compilation of Central Western Tasmania.](#)

Anon

[94_3630A - RL 8810 Moina Area-Report on Drilling Program-May to July 1994 - Attachment to Annual Report.](#)

Newnham, L.A.

[94_3645 - Exploration Licence 14/91 Mt. Tor, Tasmania. Progress Report for the Period October 1993 to September 1994.](#)

Richardson, S.M.

[95_3674 - Aeromagnetic and electromagnetic maps from an INPUT survey of the Bulgobac-Rosebery Areas.](#)

Anon

[95_3719 - Exploration Licence 106/87 Lake Mackintosh Tasmania Progress Report for the Period February 1994 to February 1995](#)

Richardson, S.M.

[95_3728 - Exploration Licence No 42/92 Loongana Annual Report May 1994-May 1995](#)

Vicary, M.J.

[95_3762 - Pasminco Exploration EL 37/89 Partial Relinquishment Report Bulgobac Hill](#)
Purvis, J.G.
[95_3764 - Annual Report Moina EL 20/92 - 1994-95](#)
Newnham, L.A.
[95_3788 - EL 14/91, Mt Tor. Partial Relinquishment Report 1995.](#)
Richardson, S.M.
[95_3798 - EL 13/94 Mt Cattley Progress Report 1994-95](#)
Richardson, S.M.
[96_3817 - Progress Report October 1994 to October 1995 Mt Tor EL 14/91](#)
Richardson, S.M.
[96_3818 - Annual Report December 1994-95, Bulgobac River, EL 19/94](#)
Lorrigan, A.N.
[96_3839 - EL 106/87 Lake Mackintosh-Progress Report February 1995-1996](#)
Richardson, S.M.
[96_3853 - Annual Report May 1995-1996 - Tasmanian Base Metals Project EL 42/92 Loongana](#)
Gregory, D.
[96_3863 - EL 20/92 Moina Area Stormont Mine Drilling Program 1995-96](#)
Newnham, L.A.
[96_3878 - Final Report EL 3/95 Hatfield River, Tasmania](#)
McNeill, A.W.
[96_3913 - Annual Report - P.E.24/1/96 - EL 56/94, Mackintosh River, Tasmania](#)
Menpes, S.A.
[96_3921 - Relinquishment Report - EL 14/91 - Mount Tor](#)
Hicks, D.J.
[96_3925 - Relinquishment Report - EL 13/94 Mt Cattley](#)
Hicks, D.J.
[96_3930A - Report of Drilling Program Jan-Feb 1996: - RL 8810 Moina Area](#)
Newnham, L.A.
[97_3956 - Annual Report - EL 19/95 - Bulgobac River - P.E. October 1996](#)
Dibben, S.M.
[97_3966 - Final Report - EL 18/96 Myalla and EL 35/96 Sister Creek. May to Dec.1996](#)
Duncan, D.McP.
[97_3991 - Progress Report Feb 1996-Feb 1997, EL 106/87 - Lake Mackintosh](#)
McNeill, A.W.
[97_3991A - Review of Drill Targets and Update of Structural Model of the Mackintosh Basin - NW Tasmania - EL 106/87](#)
Anon
[97_4015 - Annual Report - EL 20/92 - Moina Area](#)

	Newnham, L.A. 97_4030 - Annual Report (Renewal) for P.E. July, 1997 - EL 20/92, Moina
YES	Newnham, L.A. 97_4063 - Annual Report - Bulgobac River, EL 19/94
YES	Murphy, F.C. 98_4113 - Final Report - EL 56/94
YES	Russell, S.A.J. 98_4116 - Relinquishment Report - EL 106/87 - Lake Mackintosh, Tasmania
YES	McNeill, A.W. 98_4254 - Annual Report - Bulgobac Hill, EL 37/89 and Bulgobac River, EL 19/94, P.E. Oct 1998
YES	Parfrey, O. 99_4350 - Progress report 8 May 1998 TO 8 May 1999 - EL 32/97, Leven River
YES	Anon 99_4360 - Annual Report to 11th September 1999 on EL 20/92 Moina area.
	Anon 99_4374 - Implications of Karst for Proposed Limestone Quarry Sites - Mt. Cripps Karst Area
YES	Grimes, K.G. 99_4401 - Progress Report for the period 16 October 1998 to 16 October 1999 - EL 11/98 `Mount Cripps`
YES	Anon 99_4410 - Annual Report - Mt Charter EL 10/98 - P.E. June 1999
YES	McNeill, A.W. UR2003_17 - A review and interpretation of the Lower Palaeozoic geology of the Que River-Sheffield area, with particular reference to the Cambrian volcanic sequences
YES	Corbett, K.D., McClenaghan, M.P. UR2006_06 - The geochemistry of Tasmanian Devonian-Carboniferous granites and implications for the composition of their source rocks
YES	McClenaghan, M.P. 97_4085 - Joint Venture Annual Report - Burns Peak - EL 44/88
NA	Dibben, S.M., Murphy, F.C., Weber, G.B. UR1973_95 - A radioactive anomaly in central northern Tasmania
YES	Collins, P.L.F. TR18_10_13 - The Devonport Gold Mine, Black Bluff
YES	Collins, P.L.F. ASR1995_03 - Devonport mine near Black Bluff
	Bell, P.

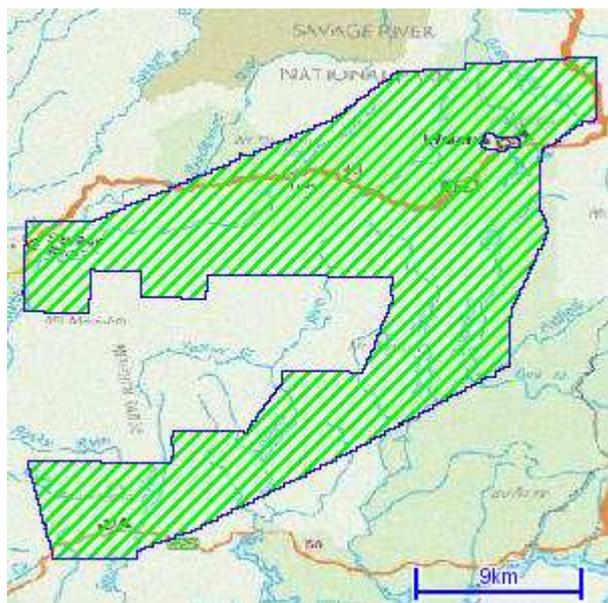
Appendix 2
Details of Relevant Airborne Surveys

Mineral Resources Tasmania - Airborne Survey Details

Survey Name	2002 Meredith Granite (WTRMP EM)
State	TAS
Operator	Tasmanian Geological Survey
Contractor	Geo Instruments Pty Ltd
Processor	Geo Instruments Pty Ltd
Custodian	Tasmanian Geological Survey
Start Date	29 November 2001
End Date	27 March 2002
Total Km	3026
Survey Type	Regional
Vessel Name	VH-RTV AS-350B
Vessel Type	Helicopter
On/off shore	Onshore
Crystal Volume (l)	
Upward Crystal Volume (l)	
Mean AGL (m)	81.000
Description	
Data Sampled	Electromagnetics, Elevation, Magnetics
Digital Data Sampled	Electromagnetics, Elevation, Magnetics

Tie Spacing Tie Numbers
2000m 70011-72031

Traverse Direction Spacing Numbers
90 200m 10011-12352



Mineral Resources Tasmania - Airborne Survey Details

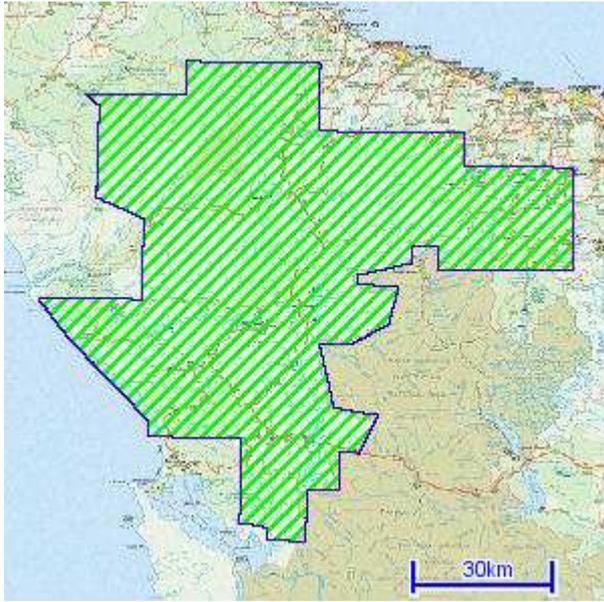
Survey Name	2001 West Tasmania (WTRMP Area C)
State	TAS
Operator	Tasmanian Geological Survey
Contractor	Geo Instruments Pty Ltd
Processor	Geo Instruments Pty Ltd
Custodian	Tasmanian Geological Survey
Start Date	05 January 2001
End Date	22 March 2001
Total Km	43535
Survey Type	Regional
Vessel Name	VH-JWF Bell 206B3
Vessel Type	Helicopter
On/off shore	Onshore
Crystal Volume (l)	16.800
Upward Crystal Volume (l)	
Mean AGL (m)	76.000
Description	
Data Sampled	Elevation, Magnetics, Radiometrics
Digital Data Sampled	Elevation, Magnetics, Radiometrics

Tie Spacing Tie Numbers

2000m 70021-71051

Traverse Direction Spacing Numbers

90 200m 10011-17375



Mineral Resources Tasmania - Airborne Survey Details

Survey Name	1981 West Tasmania
State	TAS
Operator	Tasmanian Geological Survey
Contractor	Geoex
Processor	Geoex
Custodian	Tasmanian Geological Survey
Start Date	22 May 1981
End Date	18 March 1982
Total Km	14710
Survey Type	Regional
Vessel Name	VH-RKZ, VH-ESE Cessna
Vessel Type	Plane
On/off shore	Onshore
Crystal Volume (l)	
Upward Crystal Volume (l)	
Mean AGL (m)	197.000
Description	Precise levelled version available.
Data Sampled	Magnetics
Digital Data Sampled	Magnetics
Tie Spacing	
Tie Numbers	
10000m	9000-10000
Traverse Direction	
Spacing Numbers	
90	500m 0-8900



Mineral Resources Tasmania - Airborne Survey Details

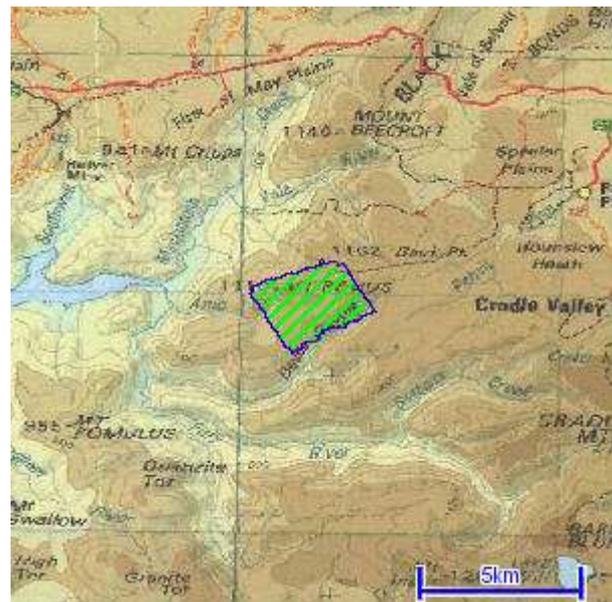
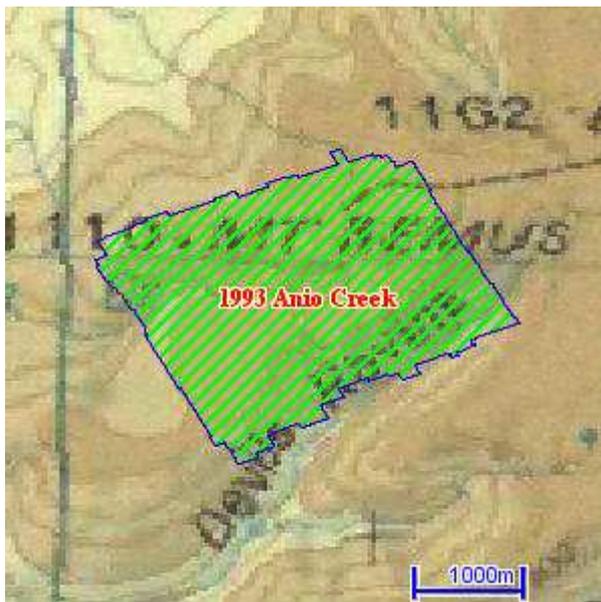
Survey Name	1993 Anio Creek
State	TAS
Operator	Tasmanian Geological Survey
Contractor	Geo Instruments Pty Ltd
Processor	Geo Instruments Pty Ltd
Custodian	Tasmanian Geological Survey
Start Date	21 November 1993
End Date	21 November 1993
Total Km	100
Survey Type	Detailed
Vessel Name	VH-FHB Bell 206B3
Vessel Type	Helicopter
On/off shore	Onshore
Crystal Volume (I)	16.800
Upward Crystal Volume (I)	
Mean AGL (m)	81.000
Description	
Data Sampled	Elevation, Magnetics, Radiometrics
Digital Data Sampled	Elevation, Magnetics, Radiometrics

Tie Spacing Tie Numbers

500m 950010-950040

Traverse Direction Spacing Numbers

154 100m 50010-50320

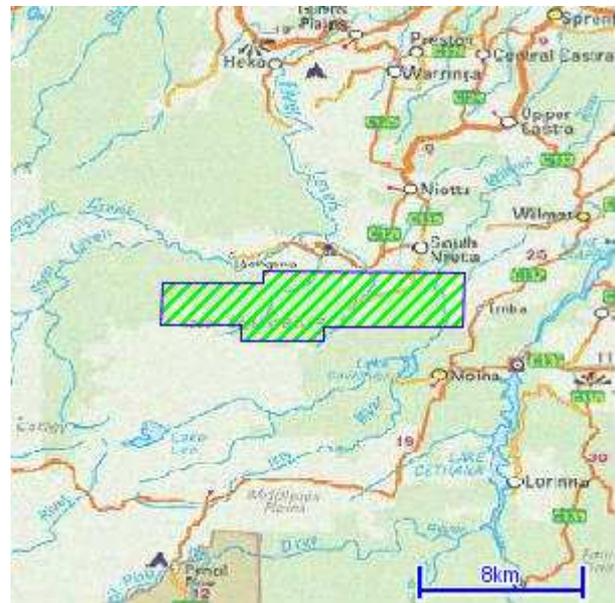
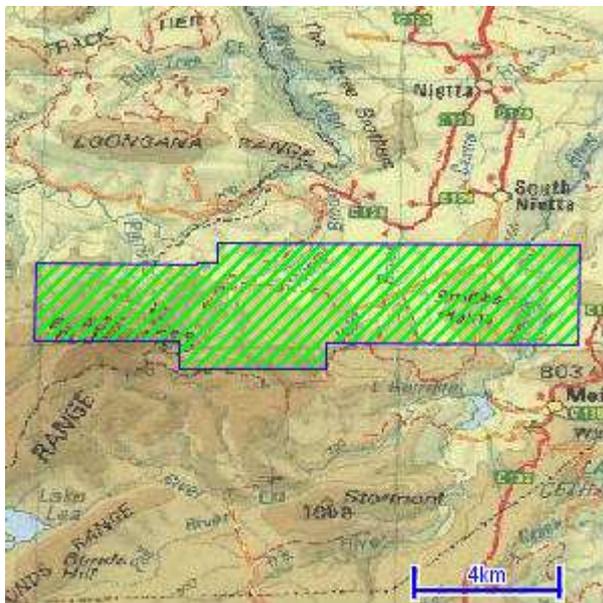


Mineral Resources Tasmania - Airborne Survey Details

Survey Name	2008 Wilmot VTEM
State	TAS
Operator	Bass Metals Limited
Contractor	Geotech Airborne Pty Ltd
Processor	Geotech Airborne Pty Ltd
Custodian	Tasmanian Geological Survey
Start Date	23 March 2008
End Date	28 March 2008
Total Km	295
Survey Type	Detailed
Vessel Name	VH-IPW AS350B3
Vessel Type	Helicopter
On/off shore	Onshore
Crystal Volume (I)	.000
Upward Crystal Volume (I)	.000
Mean AGL (m)	112.000
Description	Mean coil/bird terrain clearance 75m
Data Sampled	Electromagnetics, Elevation, Magnetics
Digital Data Sampled	Electromagnetics, Elevation, Magnetics

Traverse Direction Spacing Numbers

90 200m 30010-30250



Appendix 3
Historical Exploration Report Summaries
David O'Connor

Union Oil Development Corporation, 1974-5 McGregor-Dawson, J. L. 1975 (MRT 75_1113) (Includes report "Geophysical Survey on Tasmanian E.L. 10/74 - Black Bluff December 1974 through February 1975" by B. K. Salisbury)

The exploration rationale was to investigate Cambrian-age acid volcanic lithologies of potential economic interest in the Bond Range district for occurrence of volcanics-hosted massive sulphide metal deposits of the type found in the Mt Read Volcanics arc. The prospective rocks become concealed beneath Tertiary age basalt of the Middlesex Plains to the east.

Initial stream sediment sampling disclosed a geochemically anomalous zone which was designated Area B and subsequently renamed Mariner 1. Rock chip and soil sampling confirmed significant Pb and Zn anomalies within the broadly anomalous zone which trends easterly across the present Adamus/Manasia common EL boundary.

Geological mapping disclosed Cambrian acid lavas and pyroclastics "considered highly considered favourable for the presence of massive Cu-Pb-Zn sulphide mineralisation".

A reconnaissance pole-dipole IP/resistivity survey disclosed anomalism on Line D at "Mariner 1, eastern" at a position midway between Wagner and Elgar creeks (see Plan 3 - Anomalous Areas A-G, which is Plan 7 in MRT 75_113). The anomaly was described as broad shallowly derived and reaching to depth. Soil sampling over the IP response revealed two separate weak lead anomalies, however, the presence of partial basalt cover could have resulted in some masking.

Note: Nomenclature is somewhat confusing and it is noted for purpose of clarification that the original Mariner 1 geochemical anomaly was subsequently extended to the northeast by further work and subdivided into (from west to east) Mariner 1 Zone C, Zone B and Zone A. Still later there was a renaming of these three zones to become the Mariners 1, 3 and 5 prospects respectively. Mariner 5 prospect lies entirely within Manasia's EL 33/2005 (i.e. east of grid line 414 000 E) and Mariner 3 overlaps into EL 33/2005 at its eastern end. Mariner 1 which includes the Bass Metals Iris River prospect is entirely within the Adamus EL.

The reconnaissance stream sediment sampling program also disclosed two anomalies (Area C) from separate creeks 400 metres apart which drain the north-western slope of Bond Range (see Plan 3A which overlaps and adjoins Plan 3 on the north side). This Area C was later renamed Mariner 7.

Geopeko 1977-78 Van Den Bogaart R. and Buckland G. L. April 1978 (MRT 78_1264)

A stream sediment sampling program covering the Bond and Black Bluff Ranges was carried out within EL 10/74. Streams were sampled every 200 metres and the -80 mesh fractions were analysed for Cu Pb Zn Fe Mn Ag Cd Ba As and Sn.

The sampling coverage included Mariner 1A (subsequently renamed Mariner 5) where two streams approximately one kilometre apart - for ease of reference herein called Wagner (the western, within Adamus EL) and Elgar (the eastern, within Manasia EL) - showed anomalous Cu Pb Zn and Sn values (see Plans 4 5 6 7 showing stream sediment geochemical analyses, which are respectively plan page nos. 1251-4 in MRT 78_1264). Sn (peak of 2000 ppm) and Cu (peak of 100 ppm) were very strongly anomalous within background values of the order of Sn 10 ppm and Cu 5 ppm)

Consideration of all drainage results from across Mariners 1A 1B and 1C suggested a chemical (i.e. mineralogical) zonation of Sn-Cu-Mn (1A) to Pb-Zn-Cd-Cu-Mn (1B) to Cu-Zn-Cd-Mn (1C). Plan 8 (which is Fig. 4 in MRT 78_1264) highlights the anomalous Sn and Cu results within the wider metal zonation context.

The zonation, along with favourable extrusive volcanic lithologies and alteration style, was considered to offer encouragement for economic mineralisation to be present.

Geopeko 1977-78 Mudge, S. T. 1978 (MRT 78_1294)

Mudge designated Mariner 3 prospect as the portion of the field grid bounded by lines 9900E and 11700E. The field grid is at an acute angle to the local EL boundary which is on AMG 414000mE and Manasia's ground extends roughly east of line 11000E.

Follow up geophysical surveys of the Line D IP anomaly (above) involved VLF-EM, SP, IP and magnetics methods considered appropriate for locating a massive base-metal sulphide deposit of the Mt Read Volcanics type.

The ground magnetics survey was reasonably effective in outlining the extent of basalt cover (see Plan 9 - Contours of Total Magnetic Field Intensity, which is Drawing No. 3327 in MRT 78_1294).

A zone of strong VLF-EM effects (based on the NW Cape transmitter signal) was observed across lines 10700E, 10900E and 11000E with an extension indicated on line 11500E (see Plan 10 - Contours of Filtered in-phase VLF EM, which is Drawing No. 3861). There were strong approximately coincident SP effects (see Plan 11 - Contours of Self Potential, which is Drawing No. 3849 in MRT 78_1294).

An incomplete line-coverage dipole-dipole IP survey showed strongly anomalous effects on lines 10700E and 10900E, and lesser order but interesting effects on line 11500E (at 9550N coincident with an VLF-EM anomaly and apparently sourced beneath the basalt cover) (see Plans 12 13 14 - Induced Polarisation Pseudosections for Lines 10700E, 10900E and 11500E respectively, which are Drawing Nos. 3855, 3858 and 3857 respectively in MRT 78_1294).

The results of the several geophysical surveys are conveniently shown in composite plan form as Plan 15 - Diagrammatic Summary of Results, which is Drawing No. 3862 in MRT 78_1294.

Mudge recommended a diamond drill test of the SP (plus VLF-EM and IP) anomaly on line 10900E

Mudge's report contains considerable detail which is beyond the scope of the present report but which should be reviewed by a geophysicist prior to Manasia commencing any geophysical fieldwork.

Geopeko, to April 1979 Buckland G. L. 1979b

This Memorandum of fourteen pages dated 25/4/79 from G L Buckland to R R Large re Mariner 3, EL 10/74 is cited in Herrmann 1980b but is not in the MRT library.

Herrmann states that two costeans excavated over the Mariner 3 geophysical anomalies disclosed sparse, narrow, irregular quartz-pyrite-chalcopyrite veins associated with zones of clay-sericite alteration of feldspars in porphyry. Selected grab samples were moderately anomalous in Cu Pb Zn and Sn.

The diamond drill test recommended by Mudge was carried out and DDH M3-1 was drilled immediately west of the EL boundary to 137.5m The hole intersected quartz-feldspar-biotite porphyry with sparsely distributed quartz-(muscovite)-pyrite-minor chalcopyrite veinlets and local alteration essentially similar to that exposed in the costeans.

It was concluded from the work that the mineralisation, alteration and geochemical pattern represented "epithermal" vein mineralisation "probably emanating from a shallow-seated Upper Devonian granitic stock".

Geopeko, April 1979 to December 1979 Herrmann W. 1980b (MRT 81_1523)

Herrmann commented on the zonal distribution of geochemically anomalous copper, lead, zinc and tin recognised in soils and streams across Mariners 1, 3 and 5. He considered that the zonal arrangement of lead, lead-zinc, zinc, copper-tin anomalies from west to east appeared to fit the concentric metal zonation to be expected around a vein-type tin deposit. The identification of high grade thermally metamorphosed rocks approximately 3 km to the north (Mariner 4 area) suggested the presence of a shallow-seated granitic intrusive which could have implications for tin-tungsten mineralisation in the district. Herrmann suggested that a tin deposit could exist beneath basalt cover at the eastern end of the grid at Mariner 5.

Since the costeaning and diamond drilling had failed to locate mineralisation capable of explaining the high Sn values present in Wagner and Elgar creeks continuing exploration was directed at discovering a source.

To confirm the apparent metal zonation and define the area of greatest tin potential a new round of stream sediment sampling was carried out at twenty-seven sites in Wagner and Elgar creeks and adjacent streams. Panned concentrate samples were analysed for Sn W and Au and -80 mesh fractions for Cu Pb Zn Sn and W.

The analyses of -80 mesh fractions of three consecutive samples from Elgar creek were strongly anomalous in Sn (235 ppm, 95 ppm and 145 ppm against a background of 5 ppm) (see Plan 16 - Fig. 6 in MRT 81_1523). Sn W and Au analyses of panned concentrate samples from the same sites were highly anomalous (up to 3.5% Sn, 430 ppm W and 18.5 ppm (i.e. 18.5 g/t) Au (see Plan 17 - Fig. 4 in MRT 81_1523). Three short streams to the east of Elgar creek that had not cut as far back into the covering Tertiary basalt (thereby exposing the Cambrian) were not anomalous.

Lesser magnitude though still clearly anomalous Sn W and Au values were registered in Wagner creek.

A panned concentrate sample of gravel overlying a small "window" of altered quartz-feldspar-biotite porphyry abutting the southern side of Elgar creek returned 1.02% Sn and 1.7 g/t Au (see Plan 16). However, Sn values of soil samples taken from a grid established over the window were of a low order and did not appear to explain the elevated values present in

Elgar creek. Three short S.P. traverses across the window did not register any significant effects.

Continuing search for a postulated sub-basaltic tin source involved a ground magnetics survey with the objective of identifying other "windows" or areas of thin basalt cover. Some possible windows interpreted from new magnetics data in the region of the head of Elgar creek (S T Mudge, September 1979, Internal Memorandum to R R Large - not sighted) were tested by Jacro power auger drilling (8 holes). All holes penetrated hard basalt which could not be penetrated to any great depth (maximum hole depth 6.5m). Subsequently two vertical percussion holes were drilled to 14m and 10.3m but drilling again had to be abandoned in hard basalt. The drilling failed in its objective of determining whether the basalt thickness was less than the 25m which could allow effective Induced Polarisation surveying to test for a sub-basaltic metalliferous source.

Geopeko, February 1980 to June 1981 Pemberton J. 1981 (MRT 81_1581)

A helicopter DIGHEM II electromagnetic/resistivity/magnetic survey covering the Black Bluff EL was flown in February-March 1980. Data and anomaly delineation/ rating by the contractor is included in an Appendix to MRT 81_1581 and geological assessment by Geopeko described in later reports.

A field gravity survey took in the Mariner 5 area (described in following report).

Geopeko, June 1981 to June 1982 Pemberton J. 1982 (MRT 82_1880)

J Sumpton's report on the earlier gravity survey (Appendix 1 of MRT 82_1880) interpreted an arcuate granite contact below the basalt on the Mariner 5 grid on the basis of a steeper slope in the Bouguer gravity contour plan decreasing from west (Cambrian) to east (less dense granite). A conjectural plot of the interpreted gravity contact position is shown in Plan 18 (Fig. 12 - Induced Polarisation Chargeability, from MRT 84_2310, with the interpreted gravity contact taken from Fig. 14). Pemberton considered the interpreted contact prospective in conceptual terms for possible granite-related vein/stockwork tin-tungsten mineralisation and recommended a drill hole be sited to test the porphyry adjacent to the granite; however, Sumpton was of the opinion that the contact was too imprecisely locatable on the data to allow a drill hole test to be made of it.

No significant EM anomalies from the DIGHEM II survey were identified in the Mariner 5 area. (Note: Fig. 10 in Roberts 1984 does show an anomaly plot at Mariner 5 close to Elgar creek which should be re-evaluated: see Plan 18. Even though it might be weak it could be significant in light of the interesting exploration data in the vicinity.)

An apparently significant grade 4 anomaly (scale maximum 6) designated 220B was detected in an area of rugged relief at the northern end of Bond Range within the present EL 33/2005 which was designated Mariner 7 prospect (see Plan 19 - DIGHEM EM Responses, which is Fig. 10 in MRT 84_2310). The location coincided with a known stream sediment Pb anomaly (210 ppm) and follow-up stream sediment sampling confirmed the Pb anomalism (180 ppm and 370 ppm) and an association with altered acid pyritic tuffs and tuffaceous siltstones. C horizon soil sampling at 25m sample intervals in the area of the DIGHEM II anomaly (taken to be centred on approximately 10300N, 9650E) produced no geochemical signature.

Sumpton commented on the DIGHEM II anomaly as follows:

“Mariner 7 is a low amplitude airborne electromagnetic anomaly detected during the 1980 DIGHEM II survey. A copy of the multiplot from that survey showing the anomaly (220B) is presented in plan 10. The high in phase to quadrature ratio implies that if the anomaly is “real” and not the result of system noise, that it has a high conductance and is therefore an attractive target.”

Pole-dipole IP surveying on lines 10250N, 10300N and 10350N failed to detect any anomalous response. Sumpton commented:

“Given the small amount of coverage thus far and the imprecision in the flight path recovery of the survey aircraft it cannot be confidently stated that the survey has covered the position of the E-M anomaly. Nevertheless the failure to locate a conductor on this survey may point to the fact that the weak airborne response is attributable to instrumental noise.”

Geopeko, Final Report on EL 10/74 Pemberton J. 1983 (MRT 83_2015)

In a review of the work carried out at Mariner 5 prospect Pemberton remarks (p 5) on the lack of success using magnetics, SP and percussion drilling to penetrate basalt concealing possible vein mineralisation associated with a sub-basalt Devonian granitic stock. The imprecision in the position of an arcuate granite contact indicated from gravity data precludes making a drill hole test of the contact with any confidence.

Mariner 7 prospect is summarised by Pemberton as follows (p 7-8):

“A grade 4 DIGHEM II anomaly in Cambrian volcanics led to the investigation of Mariner 7. In Union Oil’s original stream sediment and rock chip sampling program anomalous Pb was found in a stream and Cu, Zn in a crystal tuff in the vicinity of the DIGHEM II anomaly. The regional stream sediment survey conducted by Geopeko and a follow up survey confirmed the earlier results with up to 370 ppm Pb in one sample. Reconnaissance geology revealed a zone of altered pyritic acid tuffs and grey tuffaceous siltstones in the vicinity of the DIGHEM II anomaly (see Pemberton, 1981).

In late 1981 a grid was cut to cover the DIGHEM II and stream sediment anomalies. A hand held power auger was used to take C horizon geochemical samples every 25m. Samples were assayed for Cu, Pb, Zn, Ag, Fe, and Mn. The grid was mapped at 1:2500 scale and three lines of IP were covered using the pole-dipole array because of steep terrain to the west.

The volcanics consist of a steeply dipping sequence of north-easterly striking crystal lithic tuffs and epiclastic sediments. A variety of chloritic and sericitic volcanics outcrop in the vicinity of the DIGHEM II anomaly. This area was regarded as highly prospective but the lack of a geochemical signature and the IP survey not having any response downgraded the anomaly.

Two areas of anomalous Pb geochemistry (950 ppm and 805 ppm) were associated with a chloritic quartz feldspar crystal tuff with high Fe content.

The work done on Mariner 7 does not satisfactorily explain the DIGHEM II anomaly. Given the small coverage of the IP survey and the lack of precision of the flight path recovery it is

possible that the anomaly was not covered. It is also possible that the weak airborne response is attributable to instrumental noise.”

Renison Goldfields Consolidated Roberts P. A. 1986 (MRT 86_2619)

A sample (no. T3522) from near the Iris River (5399450N, 413350E) assayed (ppm) 1.31 Au, 33 Ag, 330 Cu, 2400 Pb, 1400 As, 50 Bi . The analysis is shown in the Analyses tables but is not commented on in the text of the report. From its plotted location it looks to be of a piece of float rather than from an outcrop.

Roberts presents a set of 1:25,000 plans which conveniently summarise exploration activities and significant results at Mariners 3 5 and 7. His Fig.10 shows plots of two DIGHEM II EM anomalies in the Mariner 5 area which are not commented upon in the geological reports and have apparently been discounted.

Appendix 4

Selected Maps from Open File Reports

Bass Metals Press Releases & Open File Reports
Billiton – Prover Area Summary Map (TCR 88_2890)
Goldfields - Mariner Area Summary Map (TCR 87_2758)
Cyprus - Prover Area Summary Map (TCR 85_2515)
Geopeko - Mariner Area Summary Map(TCR 83_2015)

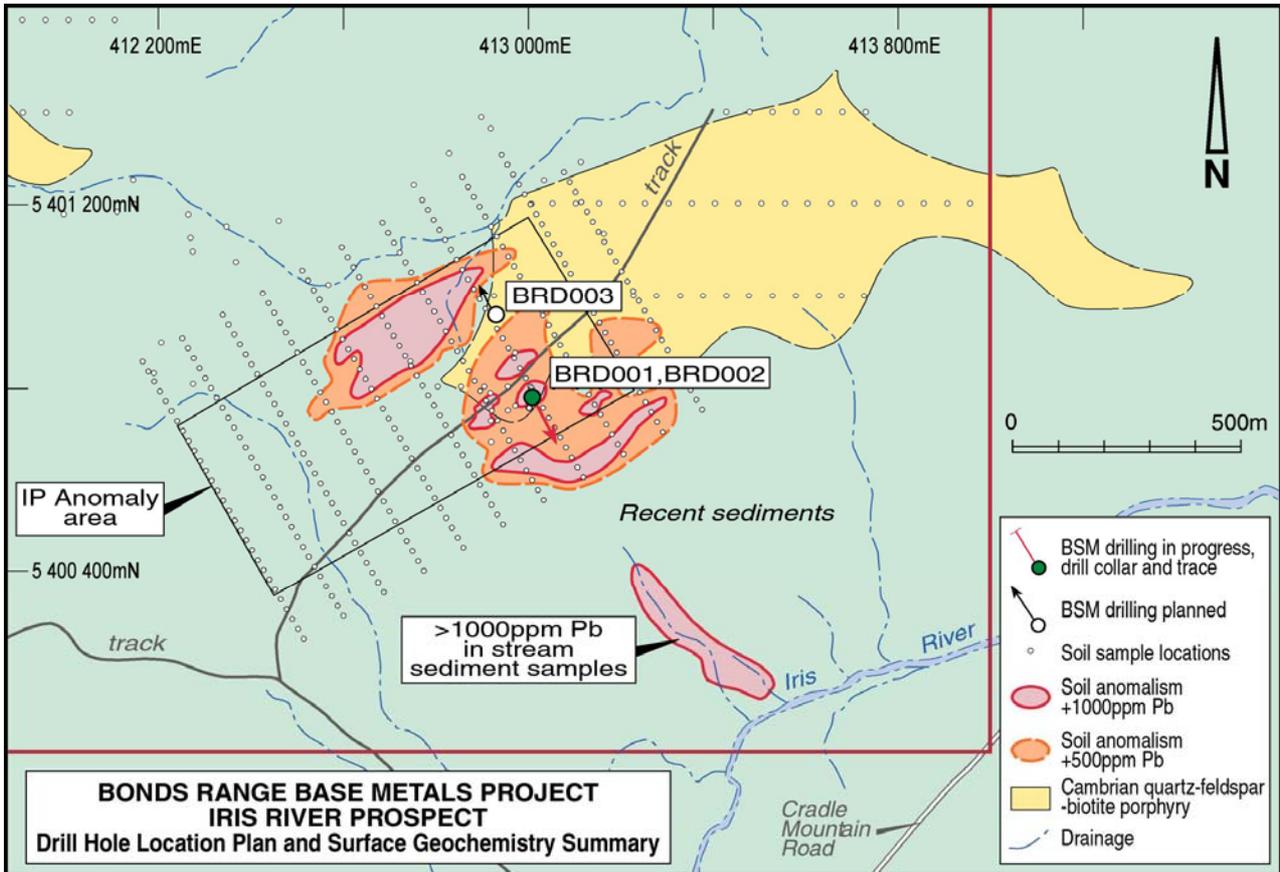


Figure 1: Iris River Prospect Summary Plan

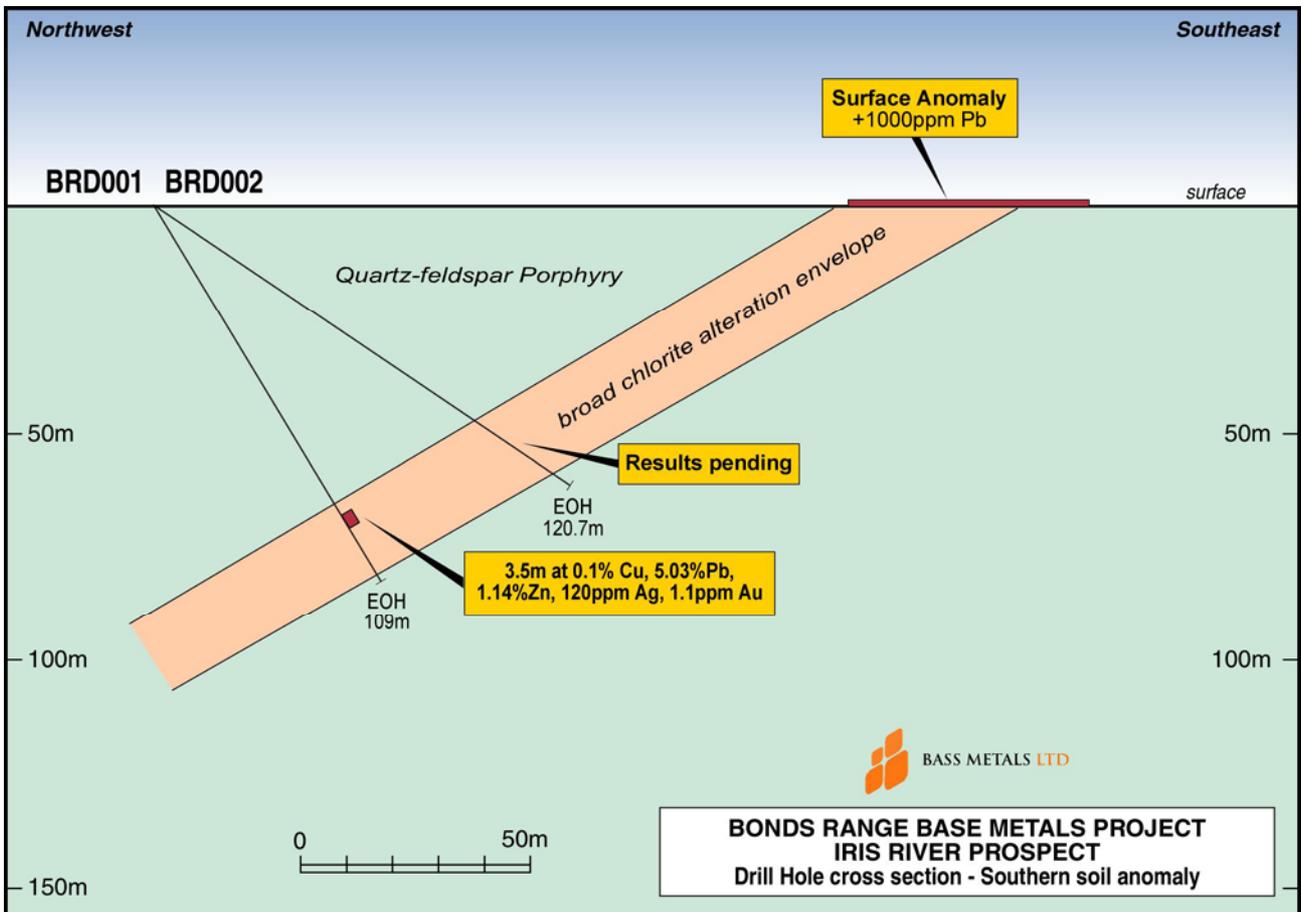
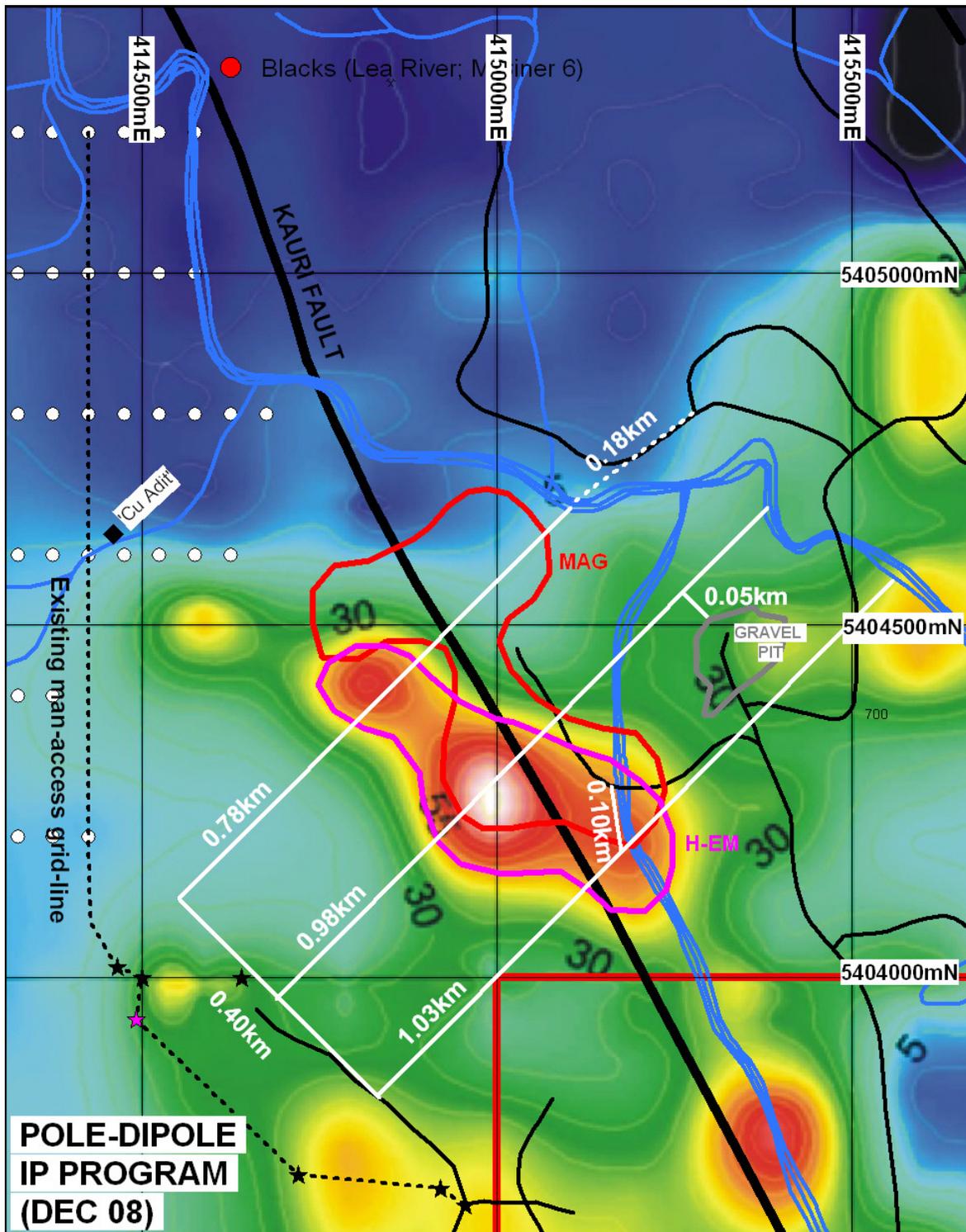


Figure 2: Drill cross section for BRD001 and BRD002.

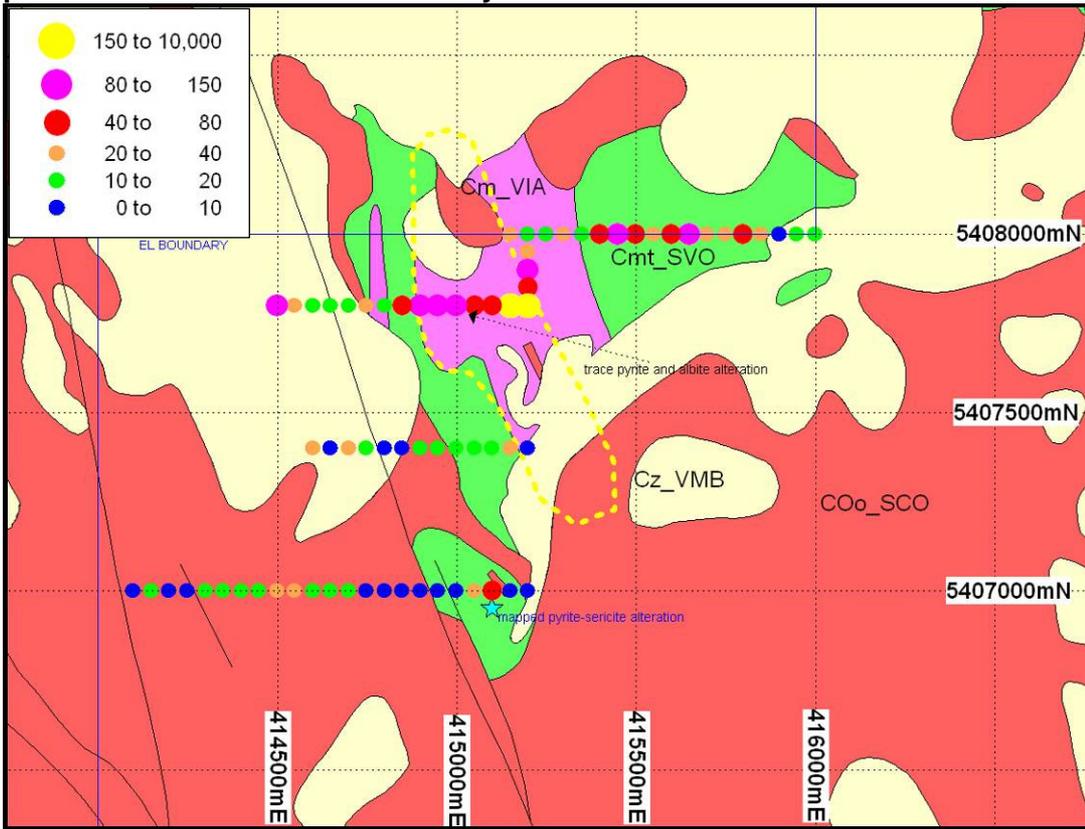
Figure 7. Image illustrating the IP grid (white) proposed to test the coincident EM/Magnetic anomaly in the Lea River area. Background image is EM. Red polygon indicates the coincident magnetic anomaly. Grid system is AGD66/AMG66.

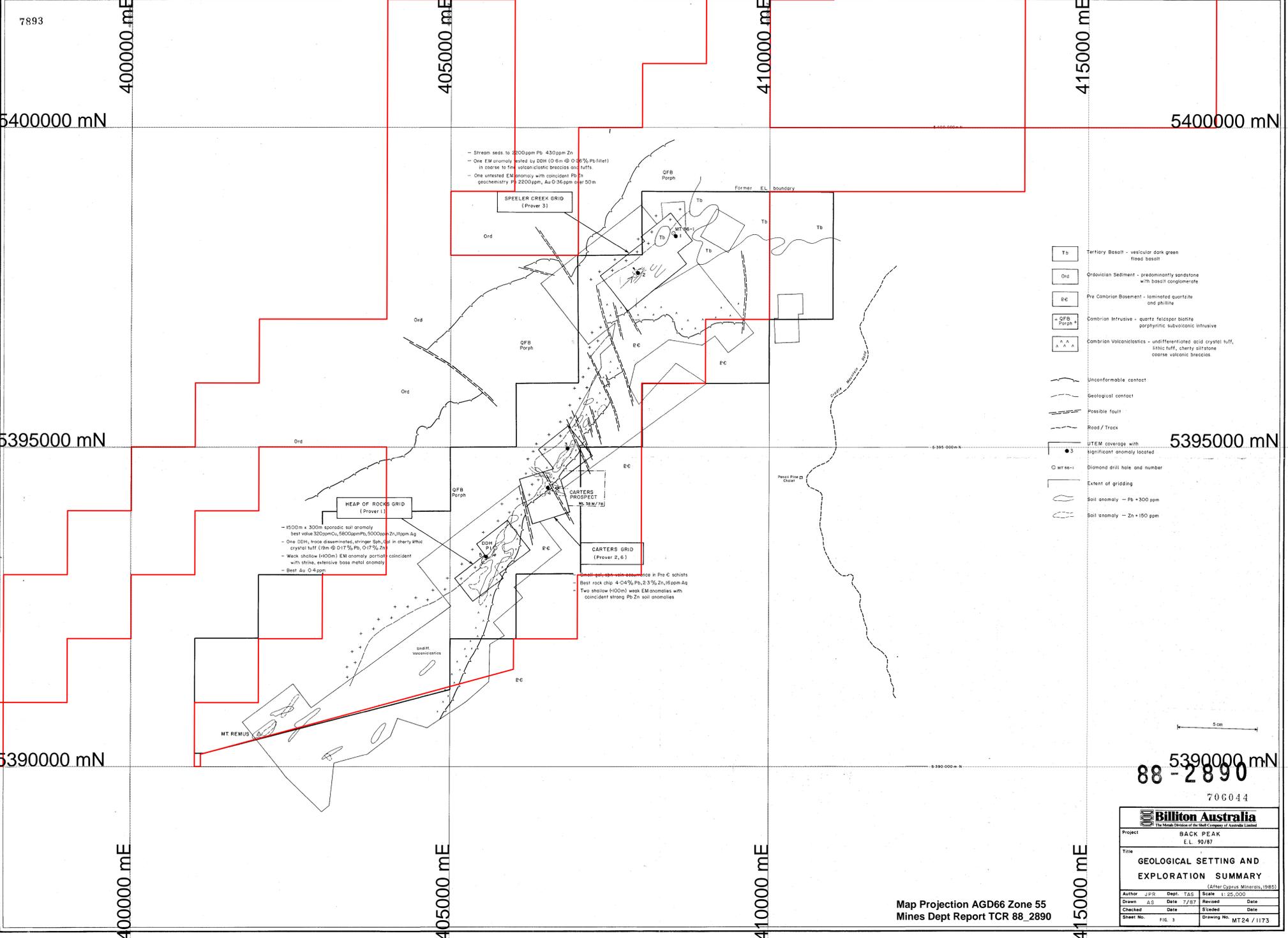


The Black's Mine area (ca. 1900) approximately 1km to the northwest of the target area (Figure 8) comprised quartz-specular hematite-pyrite veins which carried free gold. The veins were hosted in the Moina sandstone ('Tubular Sandstone' of Twelvetrees – 1913) which also hosts the nearby Stormont Gold deposit and further afield, the Beaconsfield Gold Mine.

Sampling from the mine, whilst active, yielded between 3 and 14dwt (4.7 – 21.8g/t)Au and more recent sampling of material on the mine dumps by Geopeko geologists yielded a best result of 68g/t

Figure 3. Tiger Plains Soil grid coloured for Pb (ppm), yellow dashed polygon indicating potential extent of the soil anomaly.





- Stream sed. to 2200ppm Pb, 430ppm Zn
 - One EM anomaly, best by DDH (0.6m @ 0.17% Pb, 0.17% Zn) in close to the volcanoclastic breccias and tuffs
 - One untreated EM anomaly with coincident Pb Zn geochemistry Pb 2200ppm, Au 0.36ppm over 50m

- 1500m x 300m sporadic soil anomaly
 best value 300ppm Cu, 1600ppm Pb, 3300ppm Zn, 11ppm Ag
 - One DDH, trace disseminated, stringer SpH, Gal in cherty lithic crystal tuff (9m @ 0.17% Pb, 0.17% Zn)
 - Weak shallow (400m) EM anomaly parallel with strike, extensive base metal anomaly
 - Best Au: 0.4ppm

- Best rock chip: 4.04% Pb, 2.3% Zn, 16ppm Ag
 - Two shallow (400m) weak EM anomalies with coincident strong Pb Zn soil anomalies

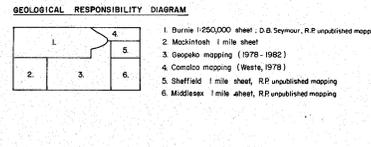
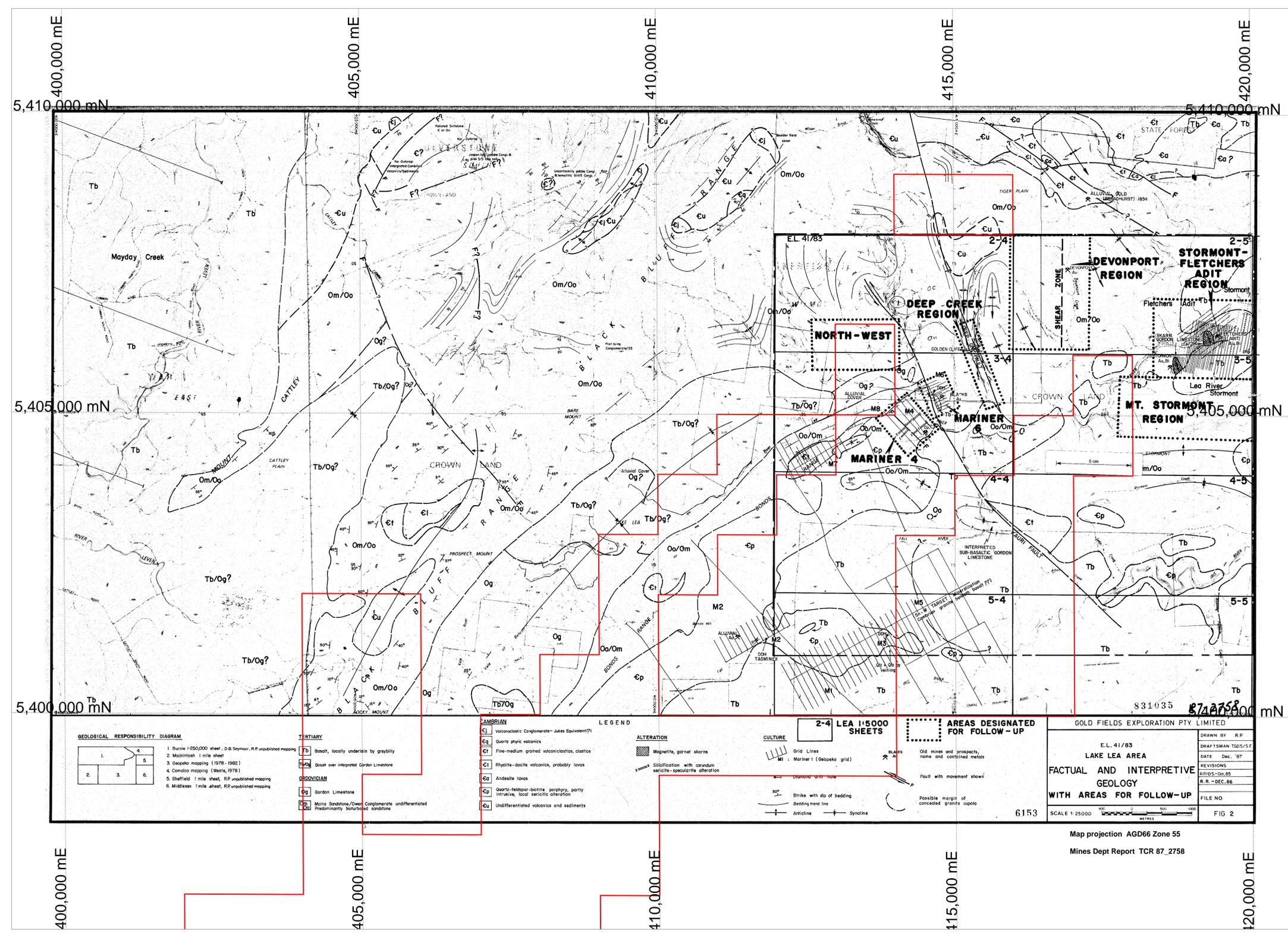
- Tb Tertiary Basalt - vesicular dark green trace basalt
- Ord Ordovician Sediment - predominantly sandstone with basalt conglomerate
- EC Pre Cambrian Basement - laminated quartzite and phyllite
- QFB Porph Cambrian Intrusive - quartz feldspar biotite porphyritic subvolcanic intrusive
- A A A A Cambrian Volcanoclastics - undifferentiated acid crystal tuff, lithic tuff, cherty siltstone coarse volcanic breccias
- Unconformable contact
- Geological contact
- Possible fault
- Road / Track
- UTEM coverage with significant anomaly located
- Diamond drill hole and number
- Extent of gridding
- Soil anomaly - Pb + 300 ppm
- Soil anomaly - Zn + 150 ppm



88-2890
 706044

Map Projection AGD66 Zone 55
 Mines Dept Report TCR 88_2890

Billiton Australia <small>The Metals Division of the BHP Company of Australia Limited</small>			
Project	BACK PEAK E.L. 90/87		
Title	GEOLOGICAL SETTING AND EXPLORATION SUMMARY		
<small>(After Cyprus Minerals, 1985)</small>			
Author	JPR	Dept.	TAS Scale 1:25,000
Drawn	AS	Date	7/87 Revised Date
Checked		Date	5/87 Date
Sheet No.	FIG. 3	Drawing No.	MT 24 / 1173



- TERTIARY**
- Tb Basalt, locally underlain by graybill
 - Oo/Om Basalt over interpreted Gordon Limestone
- ORDOVICIAN**
- Og Gordon Limestone
 - Oo Malina Sandstone/Owne Conglomerate undifferentiated sandstone

- AMBRIAN**
- Cj Volcanoclastic Conglomerate - Jukes Equivalent(?)
 - Cq Quartz phytic volcanics
 - Ct Fine-medium grained volcanoclastics, clastics
 - Ci Rhyolite-dacite volcanics, probably lavas
 - Ca Andesite lavas
 - Cp Quartz-feldspar-biotite porphyry, partly intrusive, local sericitic alteration
 - Cu Undifferentiated volcanics and sediments

- LEGEND**
- ALTERATION**
- Magnetite, garnet skarns
 - Silicification with corundum, sericitic-spicularite alteration

- CULTURE**
- Grid Lines
 - Mariner I (Geopko grid)
 - Diagonal grid lines
 - Strike with dip of bedding
 - Bedding trend line
 - Anticline
 - Syncline

- AREAS DESIGNATED FOR FOLLOW-UP**
- Old mines and prospects, name and contained metals
 - Fault with movement shown
 - Possible margin of concealed granite cupola

GOLD FIELDS EXPLORATION PTY. LIMITED

E.L. 41/83
LAKE LEA AREA

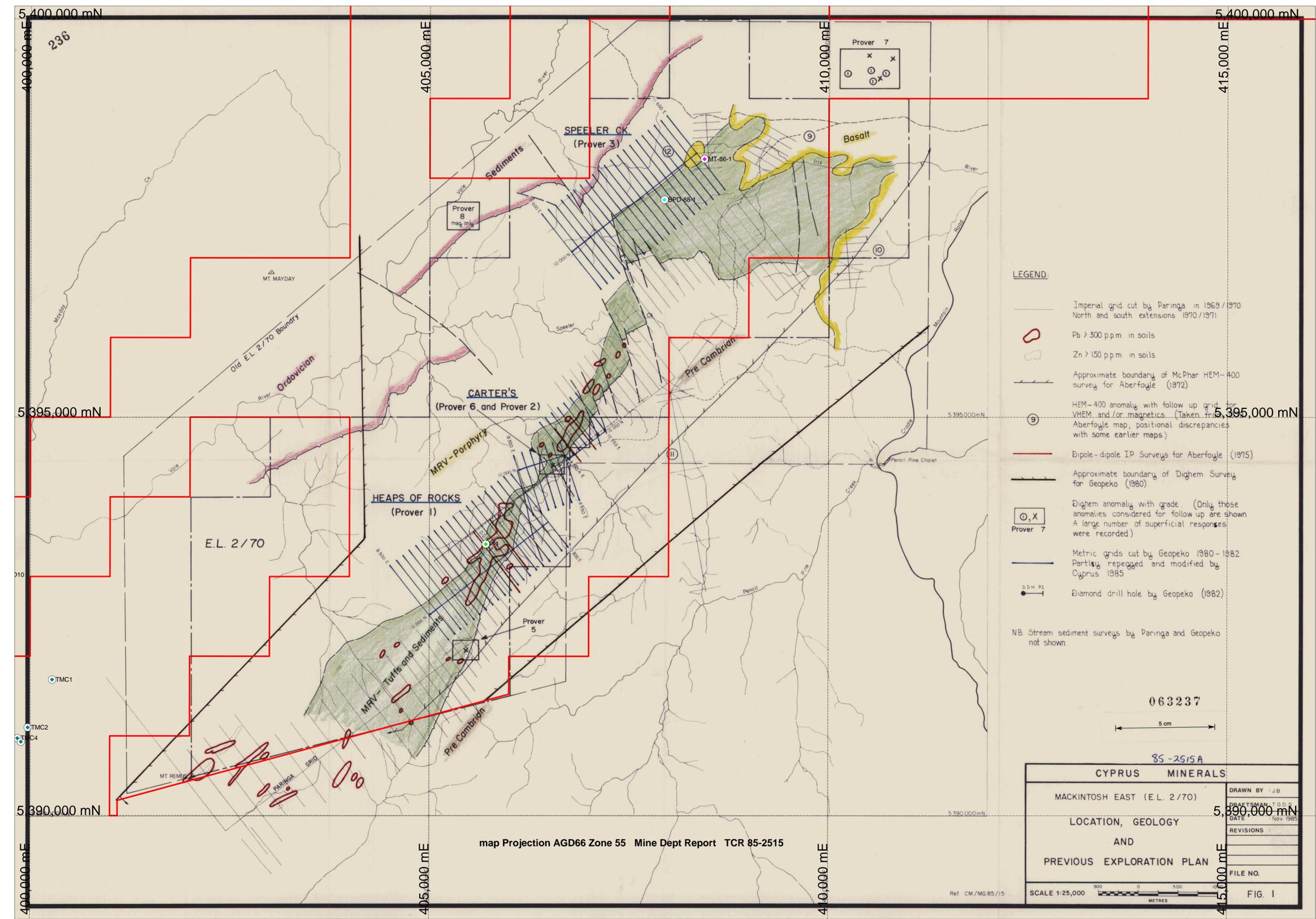
FACTUAL AND INTERPRETIVE GEOLOGY WITH AREAS FOR FOLLOW-UP

6153

SCALE 1:25000

Map projection AGD66 Zone 55
Mines Dept Report TCR 87_2758

DRAWN BY	R.P.
DRAFTSMAN	TG25/S/E
DATE	Dec. '87
REVISIONS	
R.P. - Oct. 85	
R.R. - Dec. 86	
FILE NO.	
	FIG 2



map Projection AGD66 Zone 55 Mine Dept Report TCR 85-2515

- LEGEND:**
- Imperial grid cut by Paringa in 1969/1970 North and south extensions 1970/1971
 - Pb > 300 ppm in soils
 - Zn > 150 ppm in soils
 - - - Approximate boundary of McPhar HEM-400 survey for Aberfoyle (1972)
 - HEM-400 anomaly with follow up grid for VHEM and/or magnetics. (Taken from Aberfoyle map, positional discrepancies with some earlier maps)
 - Dipole-dipole IP Surveys for Aberfoyle (1975)
 - - - Approximate boundary of Digheem Survey for Geopeko (1980)
 - Digheem anomaly with grade. (Only those anomalies considered for follow up are shown. A large number of superficial responses were recorded)
 - Metric grids cut by Geopeko 1980-1982 Partly repegged and modified by Cyprus 1985
 - Diamond drill hole by Geopeko (1982)

NB Stream sediment surveys by Paringa and Geopeko not shown.

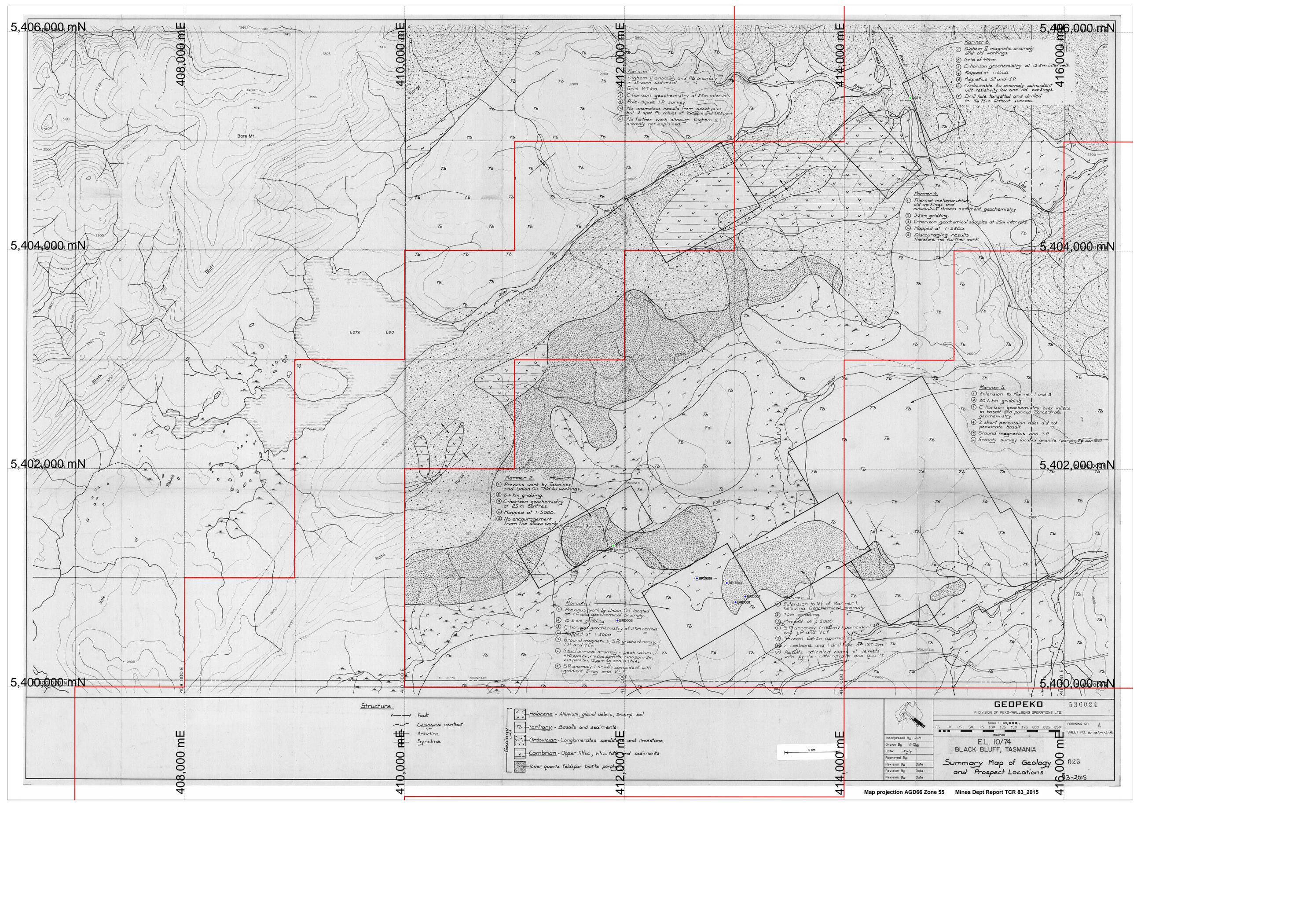
063237



85-2515A	
CYPRUS MINERALS	
MACKINTOSH EAST (E.L. 2/70)	
LOCATION, GEOLOGY	
AND	
PREVIOUS EXPLORATION PLAN	
SCALE 1:25,000	FIG. 1

DRAWN BY	JJB
DRAFTSMAN	T.G.D.S.
DATE	Nov 1985
REVISIONS	
FILE NO.	

Ref CM/MG 85/15



Mariner 7
 ① Dighem II anomaly and Pb anomaly in stream sediments
 ② Grid of 4 km
 ③ C-horizon geochemistry at 25m intervals
 ④ Pole-dipole IP survey
 ⑤ No anomalous results from geophysics but 2 spot Pb values of 750ppm and 800ppm
 ⑥ No further work although Dighem II anomaly not explained

Mariner 6
 ① Dighem II magnetic anomaly and old workings
 ② Grid of 4 km
 ③ C-horizon geochemistry at 12.5m intervals
 ④ Mapped at 1:1000
 ⑤ Magnetics SP and IP
 ⑥ Contourable Au anomaly coincident with resistivity low and old workings
 ⑦ Drill hole targeted and drilled to 75m without success

Mariner 4
 ① Thermal metamorphism, old workings and anomalous stream sediment geochemistry
 ② 3.2 km gridding
 ③ C-horizon geochemical samples at 25m intervals
 ④ Mapped at 1:2500
 ⑤ Discouraging results, therefore no further work

Mariner 5
 ① Extension to Mariner 1 and 3
 ② 20.6 km gridding
 ③ C-horizon geochemistry over inliers in basalt and panned concentrate geochemistry
 ④ 2 short percussion holes did not penetrate basalt
 ⑤ Ground magnetics and SP
 ⑥ Gravity survey located granite / porphyry contact

Mariner 2
 ① Previous work by Tasminex and Union Oil - old Au workings
 ② 6.4 km gridding
 ③ C-horizon geochemistry at 25m centres
 ④ Mapped at 1:5000
 ⑤ No encouragement from the above work

Mariner 1
 ① Previous work by Union Oil located on IP and geochemical anomaly
 ② 10.6 km gridding
 ③ C-horizon geochemistry at 25m centres with IP and VLF
 ④ Mapped at 1:5000
 ⑤ Ground magnetics, SP, gradient array, IP and VLF
 ⑥ Geochemical anomaly - peak values 440 ppm Cu, 10,000 ppm Pb, 400 ppm Zn, 240 ppm Sn, 15 ppm Ag and 0.7% As
 ⑦ SP anomaly (-50mV) coincident with gradient array and VLF

Mariner 3
 ① Extension to NE of Mariner 1 following geochemical anomaly
 ② 7 km gridding
 ③ Mapped at 1:5000
 ④ SP anomaly (-180mV) coincident with IP and VLF
 ⑤ Several Cu-Zn opamates
 ⑥ 2 costans and 1 drill hole 137.5m
 ⑦ Results indicated zones of veinlets with pyrite, calcopyrite and quartz

Structure:

- Fault
- Geological contact
- Anticline
- Syncline

- Geology:**
- Holocene - Alluvium, glacial debris, swamp soil
 - Tb - Tertiary - Basalts and sediments
 - Ordovician - Conglomerates, sandstone and limestone
 - v - Cambrian - Upper lithic, vitric tuff and sediments
 - lower quartz feldspar biotite porphyry

Interpreted By	J.H.
Drawn By	R. Lee
Date	July
Approved By	
Revision By	Date
Revision By	Date
Revision By	Date

GEOPEKO 536024
 A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
 Scale 1:10,000
 0 25 50 75 100 125 150 175 200 225 250
 metres
 E.L. 10/74
BLACK BLUFF, TASMANIA
Summary Map of Geology and Prospect Locations 023
 03-2015

Appendix 5
Extract of Mitre Geophysics Assessment of Vale River



Est. 1980
Mitre Geophysics Pty Ltd

MANASIA

Investigation of EL33/2005 and EL9/2006 Geophysics

July 2008

DRAFT

Author: Kate Godber
Date: 17 July 2008
Submitted to: D. O'Conner, A. Obaid
Copies to: Mitre Geophysics, Hobart

Priority 1: EL 33/2005 Vale River EL Prospects

Block Sheet

Dighem anomalies

Iris River

Lea Sheet

Mariner 5 and 7

Back Peak Run:

Speele Creek Pb-Zn

Carter's Cu-Pb-Zn Back Peak District

Heap of Rocks Cu-Pb-Zn. All in acidic volcanics

Marriner 5 Prospect

Existing exploration includes 20.6km of gridding, C horizon geochemistry over inliers in basalt an panned concentrate geochemistry, Dighem, an excellent SP anomaly, VLFEM anomalies, and ground magnetics. There is strong results for tin and gold in Elgar Ck. There is one moderately interesting Dighem anomaly within this zone – anomaly 219B. The remainder of the EM anomalies are low amplitude/low conductivity and very near surface so therefore uninteresting. 219B has a real component of 2ppm and a quadrature component of 1ppm, conductivity (MHOs) of 10, depths of 250ft. This is not a particularly interesting Dighem anomaly, and should only be chased if there is some very good geological evidence for further mineralisation. Having said that, the depth indicates that this is a bedrock conductor rather than something associated with the basalt overburden.

Marina 5 could be usefully targeted with ground geophysics to delineate a potential (hopefully pyritic) halo surround the Sn-W veins. Once concern was that the thickness of overlying basalt would significantly degrade the effectiveness of any geophysical surveys applied in this area. It was suggested that shallow seismic could be used to test the thickness of basalt prior to any geophysical testing. Unfortunately, the basalt is too fractured for this to be effective – it refracts all the sound energy rather than reflecting it – so shallow seismics is not a good option. However, MRT did do a study on basalt thickness in the Warratah area in 1987 including a lot of test drill holes. The results and report from this study would be relevant to this basalt thickness.

A better geophysical option may be surface IP. The developments in IP technique over the past two decades are very significant. There has been an approximately quadrupling of transmitter power/receiver sensitivity with the consequent increase in depth of penetration and resolution from a mere 200m to over 500m. The technique is often applied in three dimensions as well in the configuration called 3D-Pole offset dipole IP. 3DIP effectively gives a three-dimensional picture of the subsurface chargeability and resistivity structure. That we resurvey lines 11000E up to 12200E with 100m spaced 3D-dipole IP. We should extend the length of the lines to 1600m (with a distant pole) to ensure complete coverage. The results from this survey would be much better than that old frequency domain IP anomalies, and have better resolution and depth of investigation.

Marinner 7

Marriner 7 is a possible tin-tungsten-gold prospect with lesser possibility of Pb-Zn. There are three Dighem anomalies within the Marinner 7 zone. The best of these is called 220B, followed by 223B. 220B has a real component of 3 ppm, quadrature component of 0 ppm, conductivity 38 Mhos, and apparent depth of 252 feet. 223V had a real component of 3, and quadrature component of 1 ppm, cond MHOS of 16, and an apparent depth of 223m. Marriner VHMS Cu-Pb-Zn

Sumpton commented on the Dighem II anomaly as follows: "Mariner 7 is a low amplitude airborne EM anomaly detected in the 1980 DIGHEM II survey. A copy of the multiplot from that survey showing the anomaly (220B) is present in plan 10. The high inphase to quadrature ratio implies that if the anomaly is "real" and not the result of system noise, that it has a high conductance and is therefore an attractive target." Pole-dipole Ip surveying on lines 10250N, 10300N and 10350N failed to detect any anomalous response."....."Given the small amount of coverage thus far and the imprecision of the flight path recovery of the survey aircraft it cannot be confidently stated that the survey has covered the position of the EM anomaly. Nevertheless the failure to locate a conductor on this survey may point to the fact that the weak airborne response is attributable to instrumental noise."

Realistically, this anomaly has not been tested. Mariner 7 is an EM response over volcanics in the middle of the licence. It is a questionable response (possibly three lines of IP; the source was not found. This follow up is inadequate; an EM technique must be used to determine whether a response is genuine (and if so to properly locate it on the ground). Since the rocks in the area were considered prospective (acidic, altered pyritic tuffs) and stream and rock sampling returned anomalous lead values, further investigation is suggested.

Back Peak Run

The past 2 decades have seen significant advances in the airborne EM techniques. The depth of penetration and ability to resolve targets have at least doubled if not trebled. Therefore an excellent exploration technique for the Back Peak run would be to re-fly the airborne EM. In this environment, we can expect that a significant massive sulfide or Ni-deposit will show up in the EM results.

Other Tasmanian companies are running airborne EM surveys in the 2008-2009 summer season. This provides an opportunity for Manasia to piggy-back and cost share on the AEM, hopefully significantly reducing expenses.

Southern Portion of Vale River EL.

There are several 1981 Dighem II anomalies (from Shell survey) within the southern part of the Vale River EL. These are designated anomalies 2,3, 13, 16, 17, and 18.

Anomaly 2 is a weak single point anomaly possible an edge response, photo shows are covered to T_b, probably underlain by Cambrian rocks. Covered by ground EM –VLF – 20m spaced. Subject to field intensity fluctuations during survey. No distinct anomalies pinpointed with VLFEM. Maxmin EM system later appear to location anomaly at 2260. Ground magnetics at 10m spacings showed the noisy magnetic basalts and also two mag highs representing high Cambrian bedrock. The Dighem anomaly appears to have been recovered on ground. Mag suggest it is either related to the edge of the basalt or it is a basement Cambrian sulfide occurrence. Suggest power auger holes to penetrate the glacial overburden. No further geophys recomm.

Anomaly 3 is two closely assoc anomalies. Both very weak – thin broad horizontal sheet response. Mag contour indicates the response is at the edge of the basalt sheet. There are outcrops of suspected Cambrian granites 300m west and 500m south. The anomaly is probably overlying ordovician Gordon limestone and Owen Conglomerate. Ground EM-VLF was carried out over this anomaly at 20m stn spacings. 4 dip angle anomalies were found. The first two overly alluvials – i.e. edge effects or conductivity basal alluvials. The trend is northeast and it is likely that they corresponds to the eastern Dighem anomaly. Therefore the Dighem anomaly has been covered and appears to be caused by edge effect or basal alluvium. The western DigHEM anomaly has not been recovered with certainty. The three soil geochem anomalies should be investigated.

Anomaly 13 (Backwater) is a single point Dighem anomaly at line 24-527. The photo geological plan shows it to be on fluvial glacials overlying the Gordon Limestone. Weak surface anomaly to the southeast is included in the gridded area. Ground EM VLF readings were taken on all lines. No anomalies could be convincingly correlated on all lines though some anom corresponded with mag features. Most features are associated with rising ground/slope charges and are therefore probably correlated with changes in basement rock type rather than mineralisation. It has not been possible to conclusively recover the DIGhem anomalies on the ground, though likely spot VLF em anomalies were found. Things were made difficult by that lack of geological control. Line 600n should be surveyed with the Maxmin system in an attempt to recover the AEM anomalies.

Anomaly 14 (Fury Flats) is a broad resistivity anomaly, possible of surficial origin. Has a NNE trend. Overlies and extensive alluvium deposit over the Gordon Limestone.

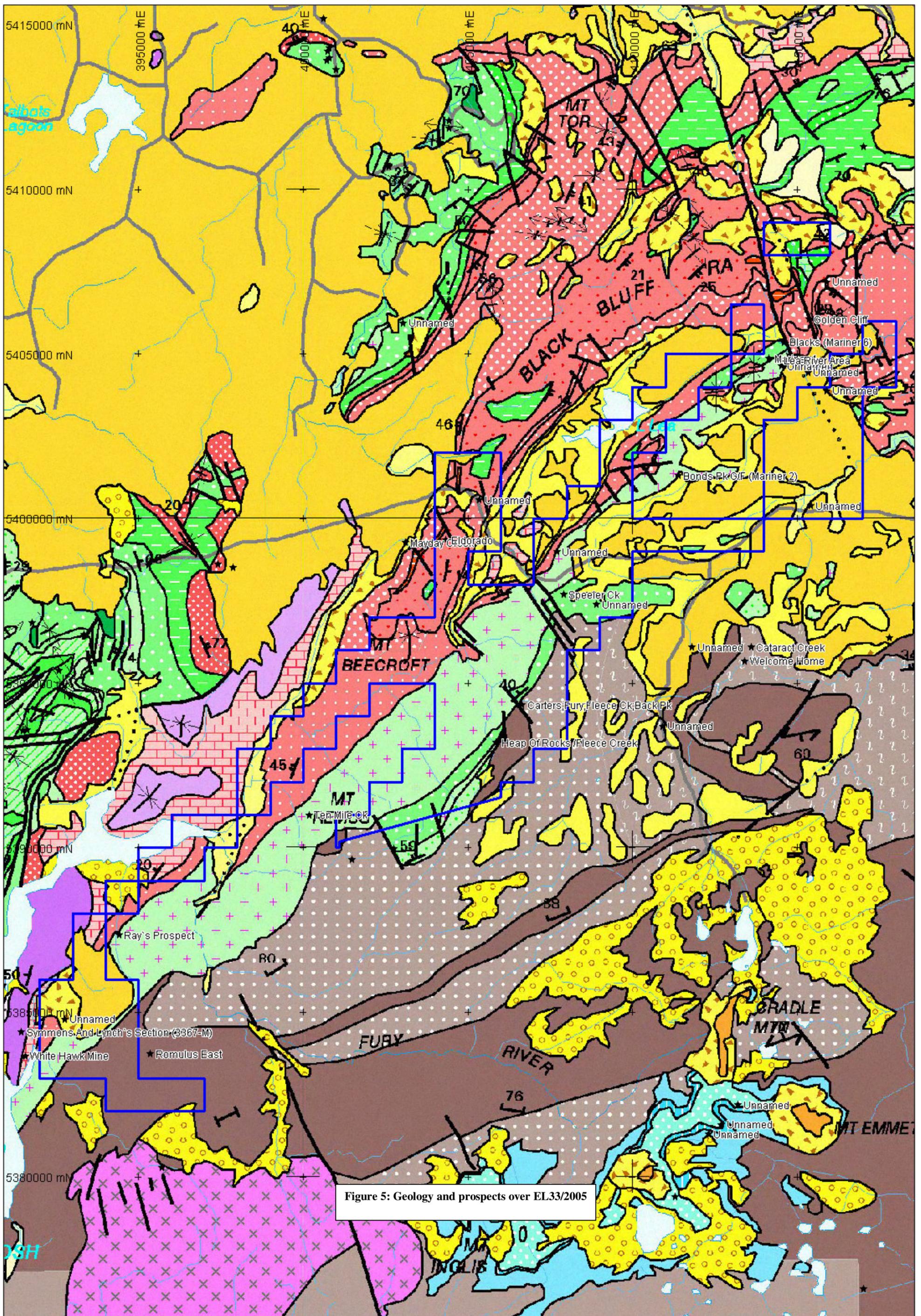
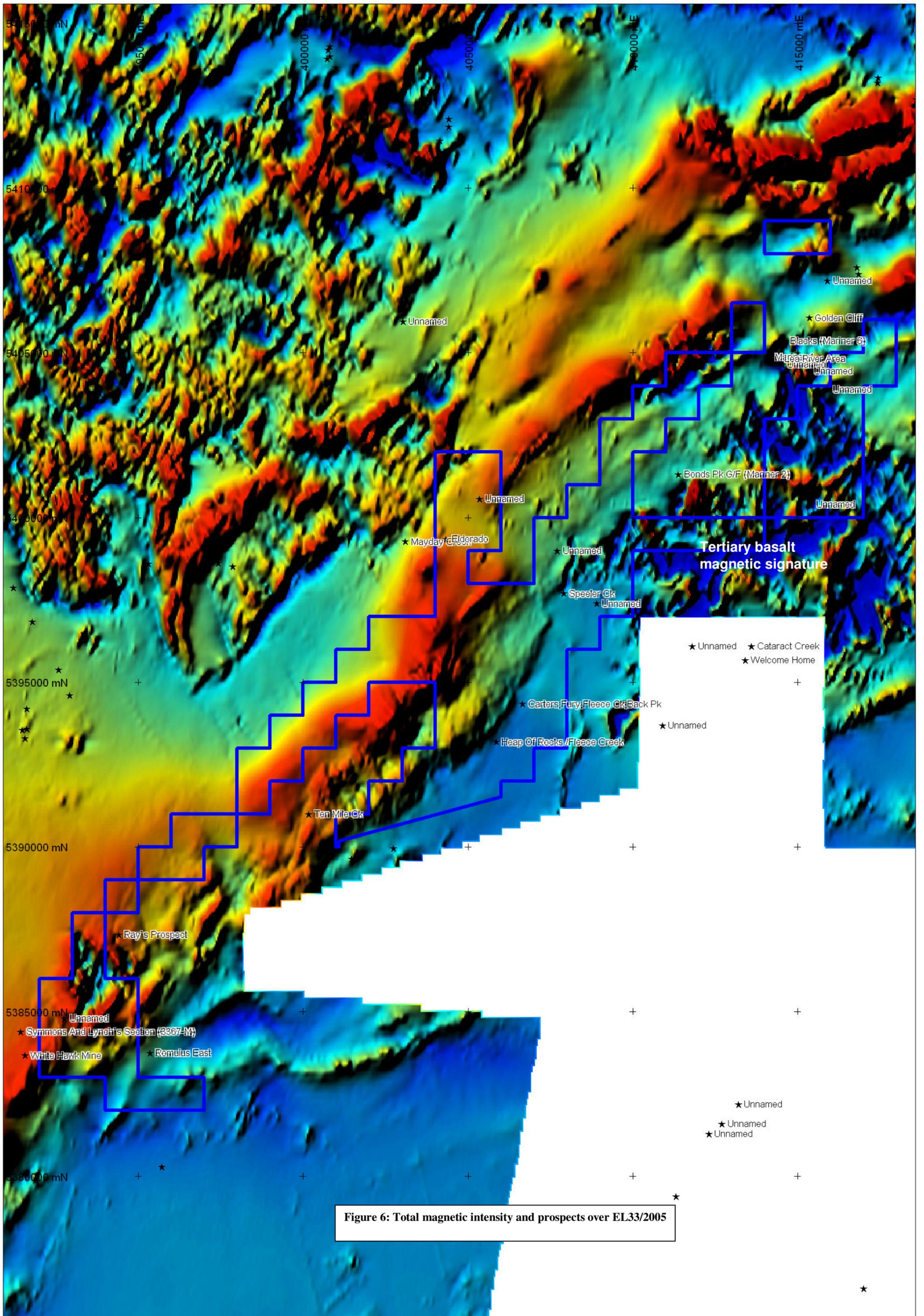


Figure 5: Geology and prospects over EL33/2005



Appendix 6
Anio Creek Figures (MRT TCR UR1994_15)

Anio Creek Total Magnetic Intensity

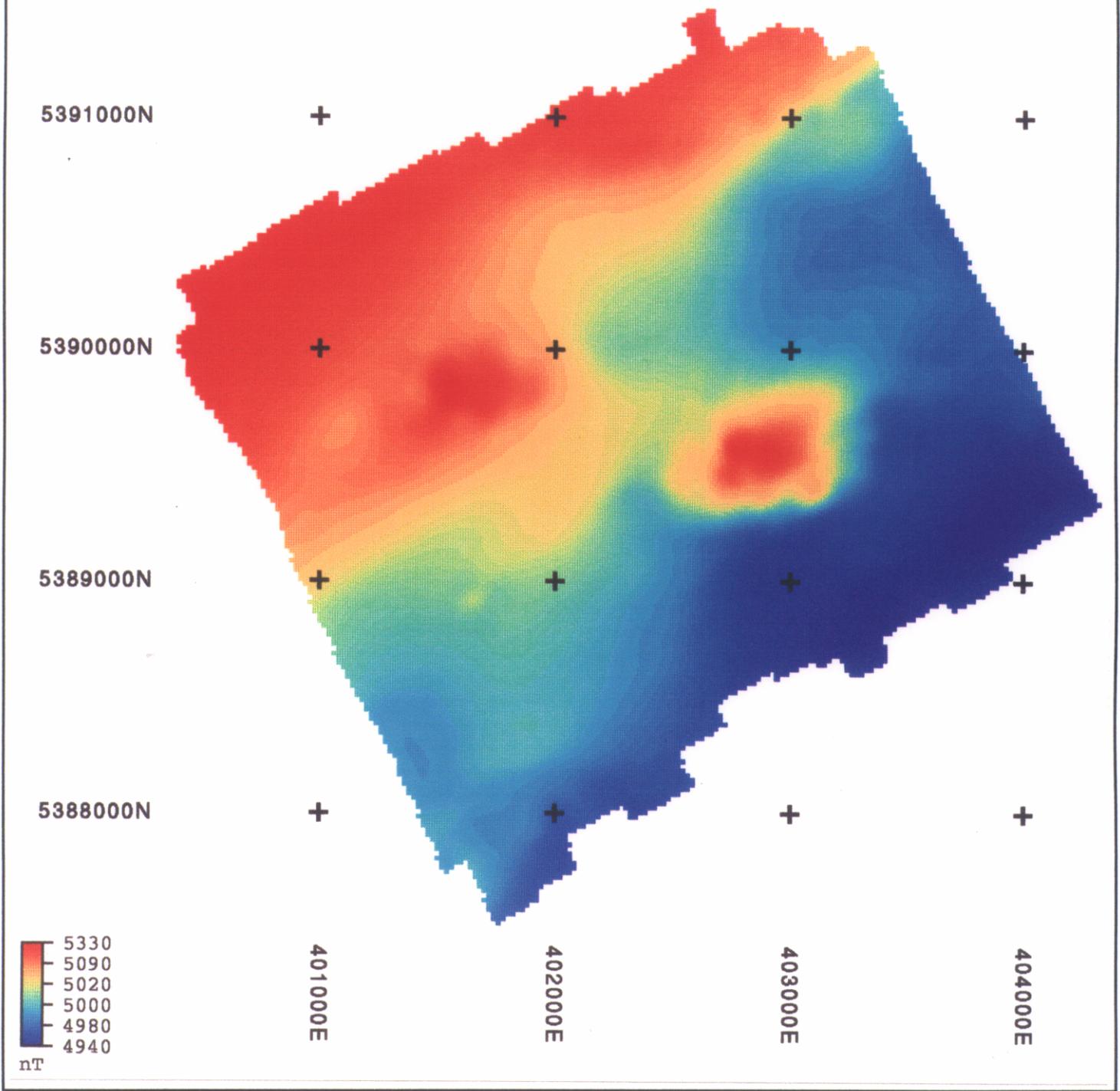
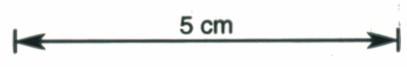
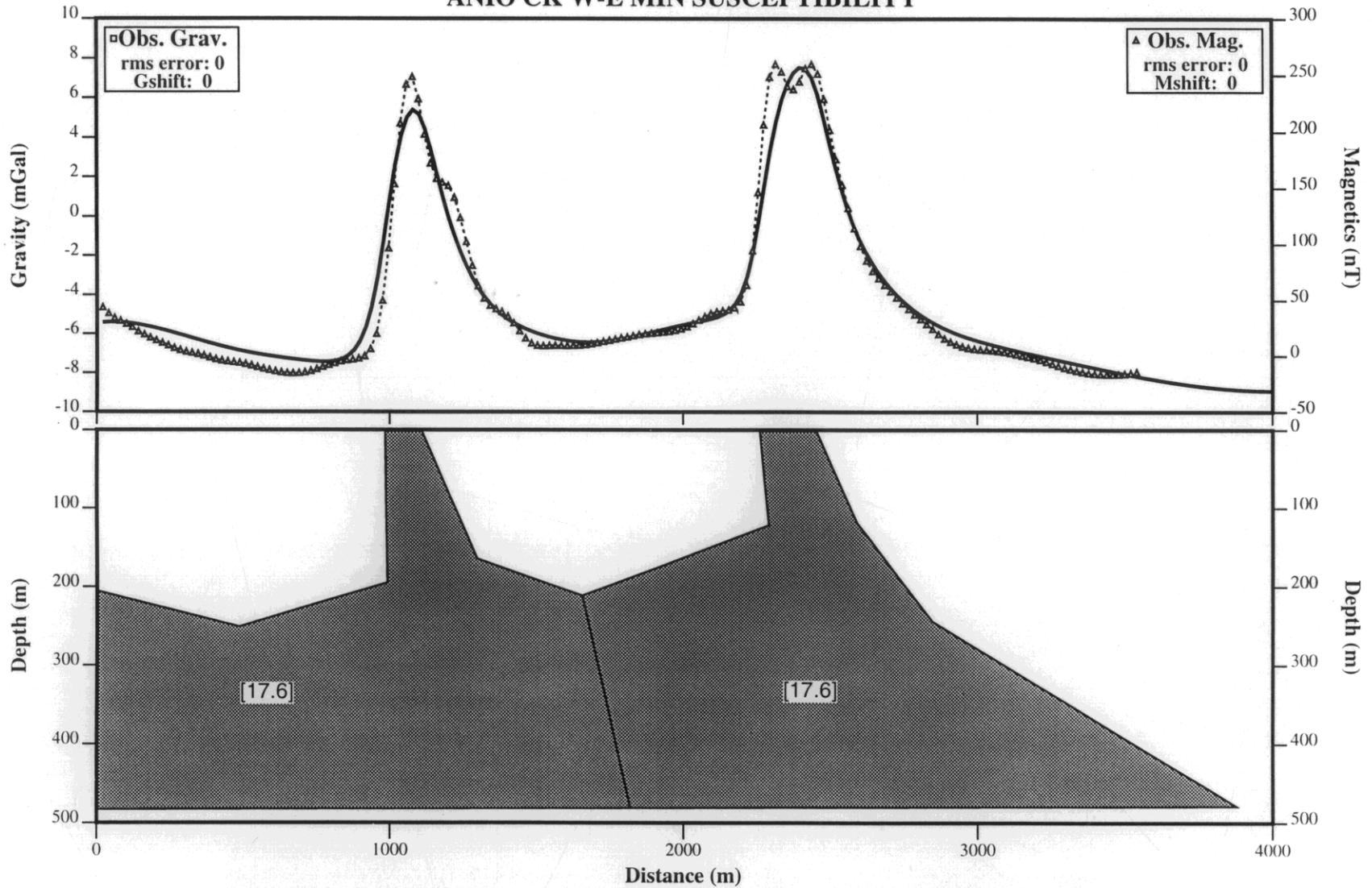


Figure 3

Anio Creek — total magnetic intensity

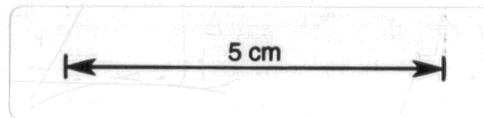


2D GRAVITY AND MAGNETICS MODEL ANIO CK W-E MIN SUSCEPTIBILITY



Model File:ANWE1.MOD Obs. Magnetic:ANWEMAG.OBS Date:06-20-1994 Time:08:21:44

Figure 10. Anio Creek Section W-E. Minimum Susceptibility. Values in square brackets are magnetic susceptibilities [$\times 10^{-3}$ SI]



Glossary

Abbreviation	Explanation & Units of Measure
cm	Centimetre - 100 centimetres = 1 metre
g	Gram - 1000 grams = 1 kilogram
g/t	Gram/tonne, 1g/t = 1ppm
km	Kilometre - 1 kilometre = 1000metres
m	Metre
ma	Million years ago
oz	Troy ounce - 12 troy ounces = 1 Avoirdupois pound (lb), 1oz = 31.103477g
sq.km.or km ²	Square kilometre - an area equal to 1000 metres by 1000 metres
t	Tonne - a metric tonne, 1 tonne = 1000 kilograms
ppm	Parts per million, 1ppm = 1 g/t
ppb	Parts per billion, 1000ppb = 1 ppm
Ag	Silver
Au	Gold
Cu	Copper
Fe	Iron
Ir	Iridium (a platinum group element)
Ni	Nickel
Os	Osmium (a platinum group element)
Pb	Lead
Sn	Tin
W	Tungsten
Zn	Zinc
Technical Name	Explanation of Term
Adit	Horizontal passage from the surface into a mine.
Aeromagnetic survey	An aerial survey made for the purpose of recording magnetic characteristics of rocks.
Allochthonous	A block of rock (any scale) transported to its current position usually by tectonic forces
Alluvial	Deposited by a stream or river. Said of a placer deposit formed by the action of running water.
Alteration	Change in the mineralogical and chemical composition of a rock, generally produced by hydrothermal fluids or by weathering.
Amphibole	A calcium, iron, magnesium silicate mineral usually dark green
Andesite	A dark coloured, fine-grained, usually extrusive rock of intermediate composition. The fine-grained equivalent to gabbro.
Ankerite	An iron, magnesium carbonate mineral
Anomaly	Value higher or lower than the expected norm.
Archaean	Geological era >2400 million years old
Arsenic	A common element associated with gold; elemental analysis used as a pathfinder for gold mineralisation
Auriferous	Gold bearing.
Autochthonous	A block of rock (any scale) that was formed in its current position and was not transported
Basalt/basaltic	A fine-grained dark extrusive volcanic rock with a low silica content.
Base metal	Generally a non-ferrous metal inferior in value to the precious metals; usually and especially copper, lead, zinc and nickel.
Bifurcating	A single structure which splits into two
Biotite	A rock forming mineral of the ring silicate group
Breccia	A coarse-grained rock consisting of angular broken rock fragments held together by a fine-grained matrix, distinct from conglomerate.

Technical Name	Explanation of Term
Brownfield	Of exploration; generally an area with previous work undertaken, often close to a mine or deposit
Calc-alkaline	Calcium-rich feldspar igneous rock
Cambrian (Cambro-)	A geological time period from 435 to 395ma
Carbonaceous	Containing carbon - often of organic origin.
Carboniferous	A geological time period ranging from 345 and 280 million years ago.
Chalcopyrite	A sulphide of copper and iron.
Cassiterite	A tin mineral comprising tin and oxygen as tin oxide
Channel sample	A sample obtained by cutting a rectangular channel across a rock face: more representative than a chip sample or a grab sample.
Chert	A quartz-rich sedimentary rock formed by chemical precipitation
Chlorite (-ic)	Iron rich alteration mineral
Clastic	of sediments derived by erosion of landmasses
Cleavage	A rock fabric of fine fractures imparted during deformation
Colluvial (-ium)	A general term applied to loose and incoherent deposits usually at the foot of a slope.
Complex	A stratigraphic unit that includes a mass of structurally complicated rocks.
Conformable	One package of sediments lying on top of another with no discernible difference in bedding angles
Conglomerate	A sedimentary rock formed by the cementing together of rounded, water-worn pebbles, distinct from breccia.
Craton	A major structural unit of the Earth's crust characterised by a large stable mass of crystalline rock
Detection limits	In laboratory analysis the lowest and highest level at which an element concentration can be accurately measured
Devonian	A geological time period from approximately 410 to 345 million years ago.
Dip	The angle that a stratum or planer feature such as a fault makes with the horizontal, measured perpendicular to the strike and in the vertical plane.
Disseminated	Descriptive of mineral grains which are scattered throughout the host rock.
Dolerite	An igneous iron-rich rock usually found as dykes
Dunite	An igneous ultramafic rock composed 90% of olivine minerals
Dyke	A tabular igneous intrusion which cuts across the bedding or other planer structure in the enclosing rock.
Epithermal	A deposit formed by low temperature hydrothermal fluids at shallow depths in the earth's crust; associated with volcanic rocks
Evaporitic	Relating to minerals form from evaporation of shallow seas and lakes e.g. salt, gypsum
Exposure	A place where rocks can be seen in situ
Facing	Used to describe which way the sedimentary rocks are younging
Fault bounded	A group of rocks that are constrained by geological faults
Feldspar	A common group of aluminium silicate minerals.
Felsic	Igneous rock composed mainly of light coloured minerals like quartz and feldspar (opposite of mafic; synonymous with acid); relatively high in silica and alumina and low in iron and magnesium.
Fissure vein	A cleft or crack in solid rock, commonly filled with mineral matter different from the enclosing walls.
Fluviatile	Of sediments deposited within a river system and its flood plain
Fold belt	A somewhat linear or curvilinear group of rocks, of sub-continental scale, that have suffered a common history of deformation (folding) and other geological events, such as mineralisation.
Formation	A (named) succession of sedimentary beds having some common characteristics.
Gabbro	A mafic intrusive igneous rock.
Galena	Lead sulphur mineral
Garnet	A calcium, iron, magnesium silicate mineral with different extra elements producing different colours
Geochemical sampling	Systematic collection of rock or soil samples in order to study their chemistry.

Technical Name	Explanation of Term
Geochemical survey	A systematic study of the variation of chemical elements in rocks or soils.
Geochemically anomalous	An area having elevated levels of specified elements in rocks or soils.
Geophysics	Study of the earth by quantitative methods.
Geoscientific	A term used to describe a range of disciplines related to the study of the earth
Geosynclinal	Relating to a major structural and sedimentological unit of the Earth's crust which exhibits substantial deformation
Glacial deposits	Accumulation and deposition of debris associated with glacier movements
Glaciomarine	A sediment derived from glacial deposits formed offshore
Gondwana	A supercontinent that existed in the Mesozoic Era
Graben	A downthrown block between faults
Grade	Average quantity of ore or metal in a specified quantity of rock.
Granite (-ic)	Course-grained felsic igneous rock containing quartz and feldspar.
Granulite	Usually a high grade metamorphic rock with a granular texture
Greenfield	Of exploration; generally were there has been no previous work or only very minor amounts
Greenschist	A moderate to low grade of regional metamorphism, usually involves the formation of green chlorite
Ground EM	An electromagnetic (EM) ground based geophysical method for detecting sulphide mineral accumulations
Ground magnetic survey	Surface geophysical survey investigating variations in the earth's magnetic field intensity.
Group	The formal stratigraphic unit next in rank above Formation. A Group contains two or more associated Formations with significant features in common.
Hydrothermal	Of, or pertaining to, heated waters which transport minerals in solution.
Igneous	Rocks formed from solidification of molten material either at surface (volcanic) or at depth (intrusive).
Induced Polarisation ("IP")	A surface electrical geophysical surveying method.
Inlier	A collection of older rocks (or a region) surrounded by a much younger sequence of rocks
Intermediate	Descriptive of igneous rocks lying midway between acid and basic (or felsic and mafic) in composition
Intrusive	An igneous rock mass emplaced in a largely molten state within surrounding older rock.
Island Arc	A chain of islands formed by volcanic activity related to subduction
Isoclinally	Of a fold where the two fold limbs are strongly deformed to be parallel
Jurassic	A time period from approximately 205 to 141 million years ago.
Limestones	Calcium carbonate-rich sedimentary rocks
Lithological competency contrast	Packages of rocks that display different physical properties when deformed; usually associated with structurally controlled deposits
Lithology (-ies)	The same as rock type, the description of rocks.
Lode	Aggregate of minerals in a mineral deposit.
Mafic	Igneous rocks with dark colouration due to high magnesium and iron content (opposite of felsic; synonymous with basic.
Magma chambers	Cavernous area formed and filled by molten rock deep within the earth
Magnesite	Magnesium carbonate mineral (listed as MS on the included maps)
Magnetite	An iron oxide mineral that is magnetic
Mesoproterozoic	A geological era from 1000 to 1600ma
Meta-	A prefix indicating that the rock-type has been metamorphosed
Metalliferous	Of or pertaining to metals; metal-rich or metal-bearing.
Mineral occurrence	An existence of a mineral accumulation; can range in size from a small solitary vein to a large mine
Mining lease ("ML")	A tenement on which mining may take place.
Molybdenite	A very soft silvery mineral of molybdenum and sulphur
Mudstone	A fine grained sedimentary rock in which the proportion of clay and silt are approximately equal.
Neoproterozoic	A geological era from 570 to 1000ma

Technical Name	Explanation of Term
Obduction	A process that causes large blocks of rocks (many kms) to be scrapped off a subsiding geological plate (from subduction) and welded on to the opposite plate
Olivine	A calcium, iron, magnesium silicate
Ophiolites	Iron and magnesium-rich rocks formed on the seafloor and magma chambers, and then caught up in subduction
Ordovician	A geological time period from 500 to 435ma
Orogeny	A major phase of upheaval in the earth's crust
Ounce (oz)	Refers here to a troy ounce which is a unit of measure for precious metals, there are 12 troy ounces to one avoirdupois pound
Outcrop	Rock that comes to surface; can be covered by unconsolidated material and not visible
Palaeo-	A combining form meaning old or ancient.
Palaeoproterozoic	A geological subdivision of the Proterozoic era 1800Ma to 2400Ma
Palaeozoic	A geological era from 570 to 250ma
Palladium	A precious metal usually associated with ultramafic rocks (a platinum group element)
Pelite	A metamorphosed fine grained siltstone or mudstone
Permian	A time period from approximately 280 to 248 million years ago.
Permo-Carboniferous	Strata not differentiated between the Permian and Carboniferous systems, particularly in regions where there is no conspicuous stratigraphic break and fossils are transitional.
Phanerozoic	Part of geological time represented by rocks in which the evidence of life is abundant i.e. from 540Ma to present day
Phyllite	A metamorphosed fine grained siltstone or mudstone usually with a strong cleavage
Placer deposit	River derived sediment rich in economic minerals e.g. gold, diamonds
Platinum	A precious metal usually associated with ultramafic rocks
Platinum Group Elements (PGE)	A group of rare and precious metals; includes platinum, palladium, rhodium, ruthenium, osmium and iridium
Platinum Group Minerals (PGM)	Minerals containing platinum group elements
Pluton	A high level, cylindrical mass of granitic rock which was emplaced at low temperature in a near solid state.
Polymetallic	A number of different metallic species, applied to a vein or other type of deposit.
Porphyry (-itic)	An igneous rock in which large crystals ("phenocrysts") are scattered through a matrix of smaller crystals ("groundmass"); rocks displaying such textures.
Precious metals	Includes gold, silver and the platinum group metals.
Proterozoic	A geological eon from 570 to 2500ma
Province	A geological region with a common theme
Pyrite	Common iron sulphide mineral.
Pyroxene	A calcium, iron, magnesium silicate
Pyroxenite	An igneous ultramafic rock composed mainly of pyroxene minerals
Pyrrhotite	A magnetic iron sulphide mineral
Quartz	A mineral composed of silicon and oxygen.
RC Drilling	Reverse Circulation Drilling - A percussion drilling technique in which the cuttings are recovered up the inside of the drill rods to minimize contamination from the wall of the hole.
Radiometric Data	Data that measures the concentrations of certain different radioactive isotopes found within rocks; usually an aerial survey
Regional metamorphism	Large scale alteration of existing rocks by fluids generated by being buried, heated and deformed
Reserve	The economically mineable part of a resource.
Resource	An estimate of the total amount of a commodity or mineral in a given place, province, country etc.
Rhyolite	An acid igneous extrusive rock

Technical Name	Explanation of Term
Rifting	Splitting and separation of very large landmasses thro' geological forces
Rock chip sampling	Obtaining a sample, generally for assay, by breaking chips off a rock face.
Schist	Regionally metamorphosed rock characterised by parallel arrangement of mineral constituents
Sericite	A fine grained form of mica formed by the chemical alteration of other minerals.
Serpentinite	An ultramafic rock that has been wholly altered to serpentine mineral
Shaft	A vertical or steeply-inclined excavation used for access to a mine.
Shale	A very fine grained clastic rock
Silicic	Said of a silica rich igneous rock or magma.
Silicified	The introduction of, or replacement by, silica, which may replace existing minerals
Siltstone	Sedimentary rock composed of silt-sized particles.
Silurian (Siluro-)	A geological time period from 570 to 500ma
Sinistral	Used to describe apparent fault movement in this case to the left
Sinter	Silica deposited by hot springs
Skarn	Metamorphosed calcareous sediment into which silica and other elements, often including metals, have been introduced from an adjoining intrusive body.
Soil geochemistry	A systematic sampling and chemical analysis of soils.
Sphalerite	A sulphide mineral of zinc and iron, the main ore mineral of zinc.
Splay	A subsidiary fault that splits off from a main fault
Stratiform	Monomineralic layers usually parallel to bedding and sediment deposition
Stratigraphy (-ic)	The study of stratified rocks and the rock beds relationships
Stratotectonic	A unique combination of stratigraphy and structural history for a particular large section of rock mass
Stream sediment geochemistry	Systematic sampling and chemical analysis of sediments within drainage channels.
Strike	Trend or direction of rock strata in a horizontal plane; to extend in that direction.
Structurally controlled	A general term for geological features formed by faulting and/or deformation
Structure	A general term used to describe a linear feature e.g. a vein, fault, dyke, fissure
Subduction zone	A region where oceanic crust descends into the Earth's mantle.
Suite	A particular arrangement of associated rock types
Sulphide	A mineral compound characterised by the linkage of sulphur with metal.
Swamping'	An image effect on a geophysical map whereby a large and intense magnetic anomaly masks subtle geological detail on the surrounding imaged data
Syncline	A basin shaped fold in the rocks
Syn depositional fault	A fault penetrating deep into the earth that is moving whilst sedimentation is going on; often related to orebody formation
Synvolcanic	Movement of a fault during volcanic activity
Tectonic	General term descriptive of all movement of the Earth's crust caused by directed pressures.
Tectonic suture	A linear feature or zone that marks the welded junction of two geological plates (can be terranes)
Tenement	A land use instrument issued by state governments for regulation of mineral exploration and mining.
Terrane	A term to denote a group of formations with a linked heritage
Tertiary	A geological time period between 65 and 2 million years ago.
Tholeiite	A type of basalt of distinct mineral composition
Thrust stacking	A sequence of shallow dipping faults overlying each other
Triassic	A time period from approximately 251 to 205 million years ago.
Tuff (-aceous)	Volcanic ash strata (derived from weathering of, or containing, tuff strata).
Turbidite	A quartz-mica sediment deposited in a rapid fashion at great distances offshore

Technical Name	Explanation of Term
Ultramafic	Igneous rocks containing a high proportion of iron and magnesium silicate minerals with no quartz
Unconformable (-y)	Descriptive of rocks on either side of an unconformity.
Unconformity	Lack of parallelism between rock strata in sequential contact, caused by a time break in sedimentation.
Vein	Generally tabular mineral deposit, usually relatively narrow and occurring between well defined walls.
Volcanic hosted massive sulphide	A major accumulation of sulphide minerals, usually pyrite, sphalerite and galena, within and parallel to the stratification of volcanic material
Volcanic(s)	Pertaining to volcanoes, a rock produced by volcanic activity.
Volcaniclastics	A clastic rock containing material derived from volcanic source rocks.
Younging	The direction to which the youngest rocks occur in a sedimentary layered sequence