EL 14/2015 “Mt. Sunday”
Annual Report on Exploration
Nov. 2018 to Nov. 2019
- Zebs Minerals Pty Ltd

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Abstract

Exploration during the reporting period consisted of (1) a thorough compilation of previous work with a fully costed exploration programme in summary report for investors, and (2) attempt to dovetail VTEM survey onto similar work being done in the state for other explorers but ran out of summer weather.

A number of visits were made by potential interested partners including Hunan Gold (China).

Table of Contents

1.0 Introduction

1.1 Exploration Rationale

Zebs Minerals Pty Ltd is exploring the Balfour Copper Belt for copper, gold and tin as well as any other commodities of value.

1.2 Location and access

EL 14/2015 “Mt. Sunday” lies in Tasmania’s west coast south of Smithton in the Balfour area.

Access to the tenement is via the Bass Highway to Smithton from Burnie and then on to Balfour via the Western Explorer Highway and the Balfour track. Access within the tenement is very difficult with no vehicular tracks.

1.3 Land status and usage

All of the land within the licence is owned by the crown.

The majority of the licence area is part of the Arthur-Pieman Conservation area with the Donaldson River Nature Recreation Reserve running down the eastern side of the tenement.

1.4 Tenure

The tenement, EL 14/2015 was granted to Zebs Minerals Pty Ltd on 15th November 2016 for a period of five years and applies to all Category 1 minerals. The licence covers 244 square kilometres**.**

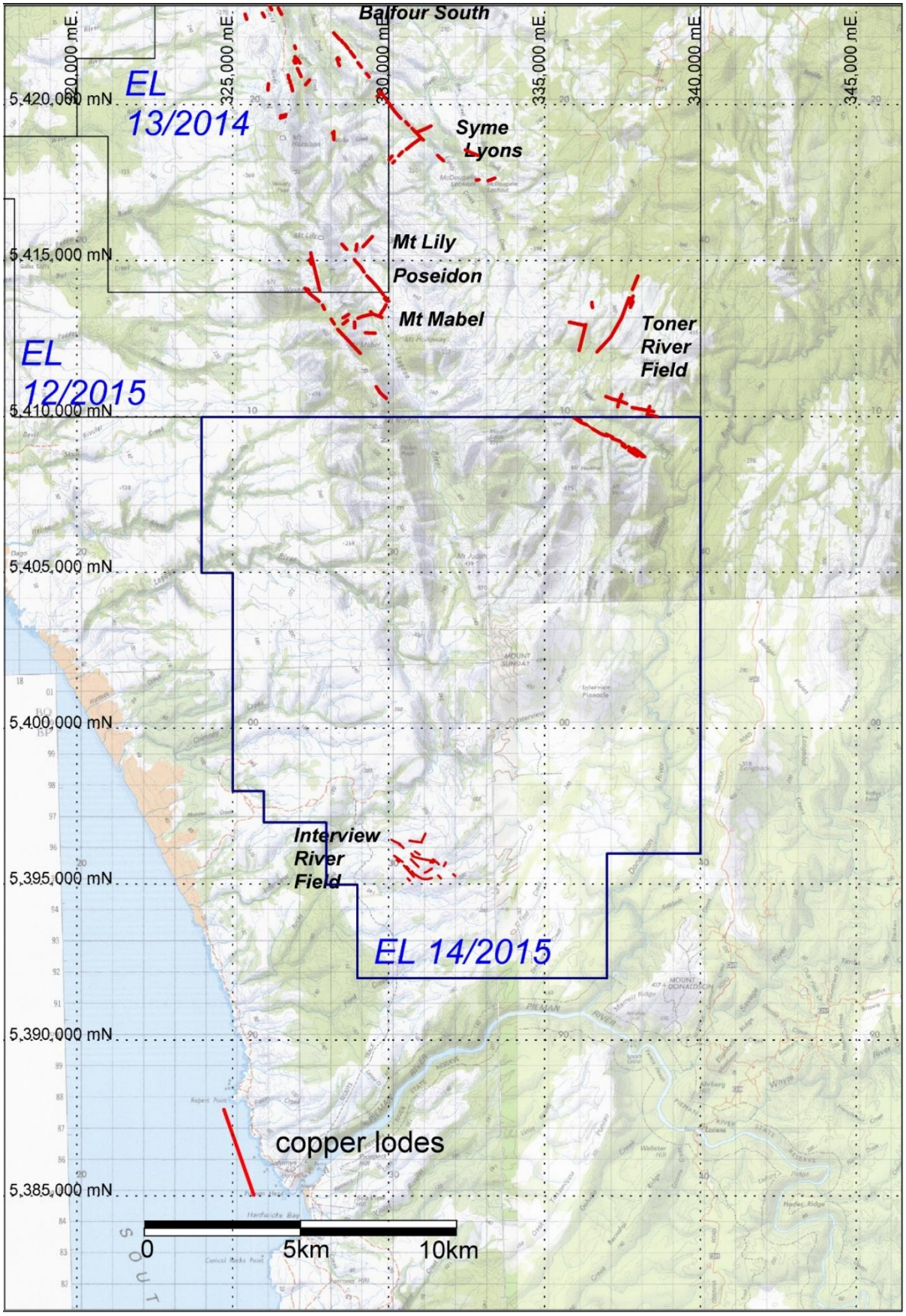

Figure 1.1: Location of EL 14/2015 "Mt. Sunday".

1.5 Geology

The following is taken from Hansen (2018). For further detail see appendix A.

"Geologically, the area consists of thick sequences of near vertical sedimentary material of Proterozoic age with minor patches of remnant overlying Tertiary basalt and sediments. Devonian Granite intrusions occur near the coast and are inferred to underlie the sediment package to the west. The area has been subjected to numerous episodes of structural deformation over time giving place to the faults and fractures required for fluid movement. The Tin and Tungsten of the Specimen Hill area was derived from the mineralising fluids generated during the intrusion of the granites. This same episode was the catalyst for the remobilisation and concentration of the copper, seen at surface and mined historically, which is predominately confined to a series of cross cutting faults along the main structural trend. The structural feature which dominates the area is the northwest-southeast trending Balfour thrust fault which has a strike length of approximately 35kms. The Balfour copper trend can be traced along this structure from the Mt Balfour copper mine in the north to the South Mine at the south of the trend at the least, with the potential to extend through to the Toner River and Interview River areas." (Hansen, 2018)

2.0 Summary of Previous Work

2.1 Prior to Current Tenement

The following is taken from Hansen (2018). For further detail see appendix A.

"The first mineral discovery in the Balfour region occurred in the early 1880's with the discovery of alluvial Tin. Tin was worked on a small scale within several workings in and around the area to later be known as Specimen Hill. Alluvial tin was worked for a period of some twenty years prior to the discovery of copper in Cassiterite Creek in 1901 (Ward, 1911). Once discovery of copper was made most of the future prospecting in the area for many years was centred on copper with only minimal tin prospecting and mining continuing over the period up until the 1980's.

Copper was prospected in the area extensively from 1901 to the early 1920's when the copper price dropped. Mining began in earnest in 1906 and peaked around 1917. The Murray's Reward mine (now within ML 1/1976) did not start production until 1910. The Murray's Reward mine is recorded as the largest producer in the Balfour field and along with the Balfour Central continued mining until around 1917, producing a recorded 6,380 tonnes of copper during its operating life. Thereafter, mining in Balfour was sporadic with only two other periods of recorded production being 1929 to 1941 with production of 3.8 tonnes of copper and most recently in 1990 where the lease holder at the time extracted 133 tonnes from a small open pit cut into the top of Murray's Reward (Taheri, J. & Bottrill, R.). The copper recovered was sold to Copper Mines of Tasmania in Queenstown at an average grade of 25% Cu (M. Lann, pers. Comm.).

Prospecting and mining were extensive over an area of approximately 17km in length during its peak in the Balfour field." (Hansen, 2018)

Prospecting of the Toner River and Interview River Fields is detailed in Ward (1911).

Modern exploration of the area covered by the tenement is extremely limited with Bell (1972) detailing a stream sediment sampling programme along the coastal plan and Gouge (1983) detailing work on the Interview River Copper Field.

"The Copper Reward and Silver Reward workings have been. developed on narrow (maximum exposed width 0.5 metres), steeply-dipping hydrothermal veins occurring within the Interview Siltstone, and possibly genetically related to the nearby Interview River Granite: Relatively rich copper and silver-lead ore are associated with the respective workings, and further prospecting may be warranted as the area has been inadequately appraised geologically. However, there is certainly no indication that major ore bodies outcrop in the area, and the massive, 'recrystallized' quartzites (which locally carry pyrite and haematite) are not regarded as hydrothermal 'lodes' (Bell, 1972)".

Gouge (1983) describes the Copper Reward mine to be on a 0.6m wide quartz+copper (chalcopyrite + copper oxides) vein which assayed 10.5% Cu.

2.2 During Current Tenement - Zebs Minerals Pty Ltd (2014 – 2019)

There has been no active field work on the tenement with work to date consisting of:

(1) Thorough compilation of previous work, preparation of fully costed exploration programme and summary report for investors.
(2) Plan VTEM airborne EM survey.

3.0 Exploration completed during the reporting period

Exploration during the reporting period consisted of:

(3) Thorough compilation of previous work, preparation of fully costed exploration programme and summary report for investors.

(4) Sought to dovetail VTEM survey onto similar work being done in the state for other explorers but ran out of summer weather.

4.0 Discussion of Results

The fully costed exploration programme and summary report for investors is included as appendix A.

The area for VTEM surveying is shown in figure 4.3.

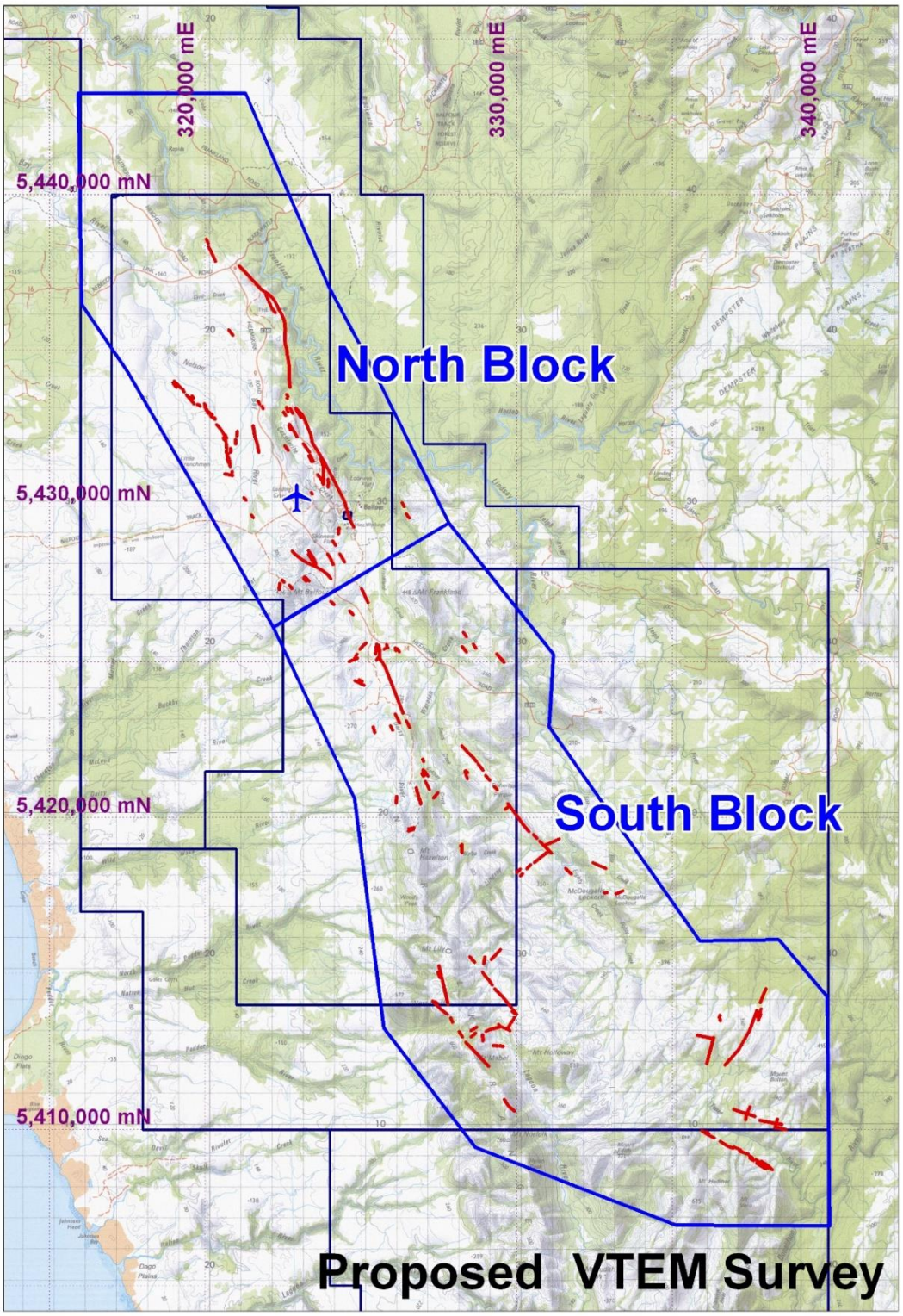

figure 4.1: Proposed VTEM survey area. Survey was initially proposed to be flown in two blocks for cost purposes though better if flown together.

5.0 Conclusions

The following conclusion is taken from the summary report in appendix A. Note that it refers to the whole of the Balfour belt and not just EL 14/2015.

Zebs Minerals Pty Ltd has secured the Balfour copper belt 100% and has the opportunity to screen the whole belt for high grade at or near surface high grade shoots.

Zebs Minerals is looking for copper resources to mine. Options include full processing on-site with generation of copper ingots through to direct shipping higher grade material, perhaps after a crushing/screening/rock sorting process.

Processing options remain open and will depend on the size and grade of the discoveries.

The following programme is discovery focussed and is adequate to discover all significant copper resources.

The generally open and lightly vegetated nature of the country lend itself to quality geophysical surveying.

Discoveries will require a second round of resource definition drilling which has not been costed and will depend on the size of the discoveries.

1. A regional VTEM (or comparable new generation system available) is planned for the whole of the belt. At a 50m line spacing, optimal for the target geometry, this is approximately 5,000 line kilometres and will cost approximately A$1 million (a cheaper option would be 100m line spacings which would cost ~A$600,000). The survey will take approximately 2 weeks of flying but must be flown in the summer for environmental (Wedge Tailed Eagles and Orange Bellied Parrots flight path) and weather reasons.

   A$1,000,000

2. VTEM anomalies are to be followed-up with DigiAtlantis ground EM surveys. Assuming 20 anomalies require follow-up. Each will require up to two loops depending on results from the first loop. Total cost approximately A$10,000 per survey is A$200,000.

   A$200,000

3. All ground EM anomalies to be drilled. Assuming 10 airborne EM anomalies are confirmed by ground EM and require drilling with a single (nominally) 250m drill hole each, i.e. 2,500m metres in total. Total cost A$625,000.

   A$625,000

4. All drill holes are to be down hole EM surveyed at A$15,000 per survey. Total cost A$150,000. Follow-up drilling of five of these with 2 x 250m holes each is 2,500 metres to be down hole surveyed again A$150,000.

   A$150,000

5. In the Murrays Reward mine area it is proposed to ground EM survey 1-2km north and south of the mine requiring 500m x 500m loops for each step A$60,000. In addition it is proposed to drill a 500m hole beneath the Murrays Reward workings and survey the hole by down hole EM A$140,000. This work should inform any decisions regarding further drill targeting.

A$200,000

6. There is an argument for surveying the section between Murrays Reward and The Clump with 3D IP, however, it is unclear as to how well IP will distinguish copper and graphitic material in faults. Ideally a small orientation survey should be run over the drilled area to see if further surveying is justified. `

A$100,000

7. The remaining 4,500 metres of drilling in this first round will be apportioned depending on results from the work above. Some meterage should be kept for deeper conceptual large tonnage targets with targeting based on geophysics and a 3D structural model to be developed.

A$1,125,000

Total **A$3,340,000**

These costs are based on optimal work with successful results. The body of work could be scaled back by reducing the size and/or line spacing of the VTEM survey and/or the number of ground surveys, down hole surveys and drill holes. However, it is considered that a **minimum of A$2,000,000** would be required.

6.0 Environment

There are no outstanding environmental issues.

7.0 Expenditure

	$
Geology	1,000
Geochemistry	0
Geophysics	1,000
Remote Sensing	0
Drilling	0
Gridding	0
Land Access	0
Rehabilitation	0
Feasibility Studies	0
Other	13,500
Administration	500
Total	**16,000**

8.0 References

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Appendix A: Balfour Copper Project

BALFOUR PROJECT

Grant MacDonald,

May 2019

Executive Summary

Company, Projects and Tenements

Zebs Minerals, a privately owned Tasmania company has a 100% holding of all tenements over 100% of the Balfour copper belt with 5 tenements, including a mine lease, covering a total of 955.7 square kilometres.

The Balfour copper project boasts high grade copper lodes over 35+ kilometres of strike in a highly favourable geological setting and is a potentially world class copper province.

Historic mining (1901-1917) produced at grades of 12-35% copper discrete veins within a up to 15m lode channel, however, the extensive nature of the copper mineralisation demands a source at depth of some size which is yet to be located.

Previous explorers including Rio Tinto have been drawn to the regions potential for large sacle resources as well as the high grade shoots such as Murrays Reward. ACI drilled 26 holes with better results including;

- 29.26m @ 1.12% Cu (DDH16)
- 37.03m @ 0.86% Cu (DDH14)
- 11.58 @ 0.72% Cu (DDH13)
- 12.7m @ 1.18% Cu (DD97BC9)
- 7.16m @ 0.95% Cu (DDH17)

Current JORC Resources

There are no JORC resources as yet. Early drilling defined a 0.5 million tons at 0.8% copper resource where historic production was at 12-35% copper. Drilling

Target Models

Zebs Minerals Pty Ltd are targeting :-

- High grade copper lodes

  e.g. Murrays Reward historic production at 12% - 35% Cu

- and Mt Isa style copper in silica+dolomite rock

  e.g. Mt Isa 225Mt @ 3.3% Cu

- or SEDEX style copper

  e.g. White Pine/Kona Dolomite 1,685Mt @ 0.72% Cu

  or Udokan 1,200Mt @ 2.0% Cu

The lode material at The Clump and Murrays Reward is a silica+dolomite rock possibly analogous with Mt Isa style mineralisation hosted in silica+dolomite altered sediments adjacent to a thrust.

CRA/Rio Tinto pursued a SEDEX model until a corporate decision saw their withdrawal. They developed the following model;

Source – number of options

- Native copper (in Kannunah basalt, Togari Group) – favoured option
- Red beds (in Rocky Cape Group)
- Intrusives (Interview River Granite) - unlikely

Fluid pathways - numerous

- Balfour area structurally complex

- Major reverse faults, cross-cutting structures, bedding plane faults

Traps – number of options

- Pyrrhotitic chloritic siltstone and/or
- Carbonaceous units upper Rocky Cape Group
- other Chemical traps

Proposed Work

1) Airborne VTEM (or similar new generation EM system) survey of whole belt at 50m line spacings. Survey is approximately 5000 line kilometres and will take 2-3 weeks but can only be flown in the summer months. **A$1,000,000**

2) Ground follow-up anomalies from (1) with Digi Atlantis EM system. (say) 20 anomalies. **A$200,000**

3) Drill ground EM anomalies from (2). (say) 10 anomalies warrant drilling at 250m/hole **A$625,000**

4) Survey each new hole from (3) with downhole EM. **A$150,000**

5) Ground EM surveys to north and south of Murrays Reward mine. **A$60,000**

6) Drill 500m drill hole beneath Murrays Reward mine and carry out downhole EM survey. **A$140,000**

7) Orientation Induced Polarisation survey. **A$100,000**

8) Drill deeper large tonnage exploration holes and apportion remaining drilling metreage according to results. **A$1,125,000**

Total A$3,340,000

These costs are based on optimal work with successful results. The body of work could be scaled back by reducing the size and/or line spacing of the VTEM survey and/or the number of ground surveys, down hole surveys and drill holes. However, it is considered that a **minimum of A$2,000,000** would be required.

Table of Contents **pages**

Tables **page**

Figures **pages**

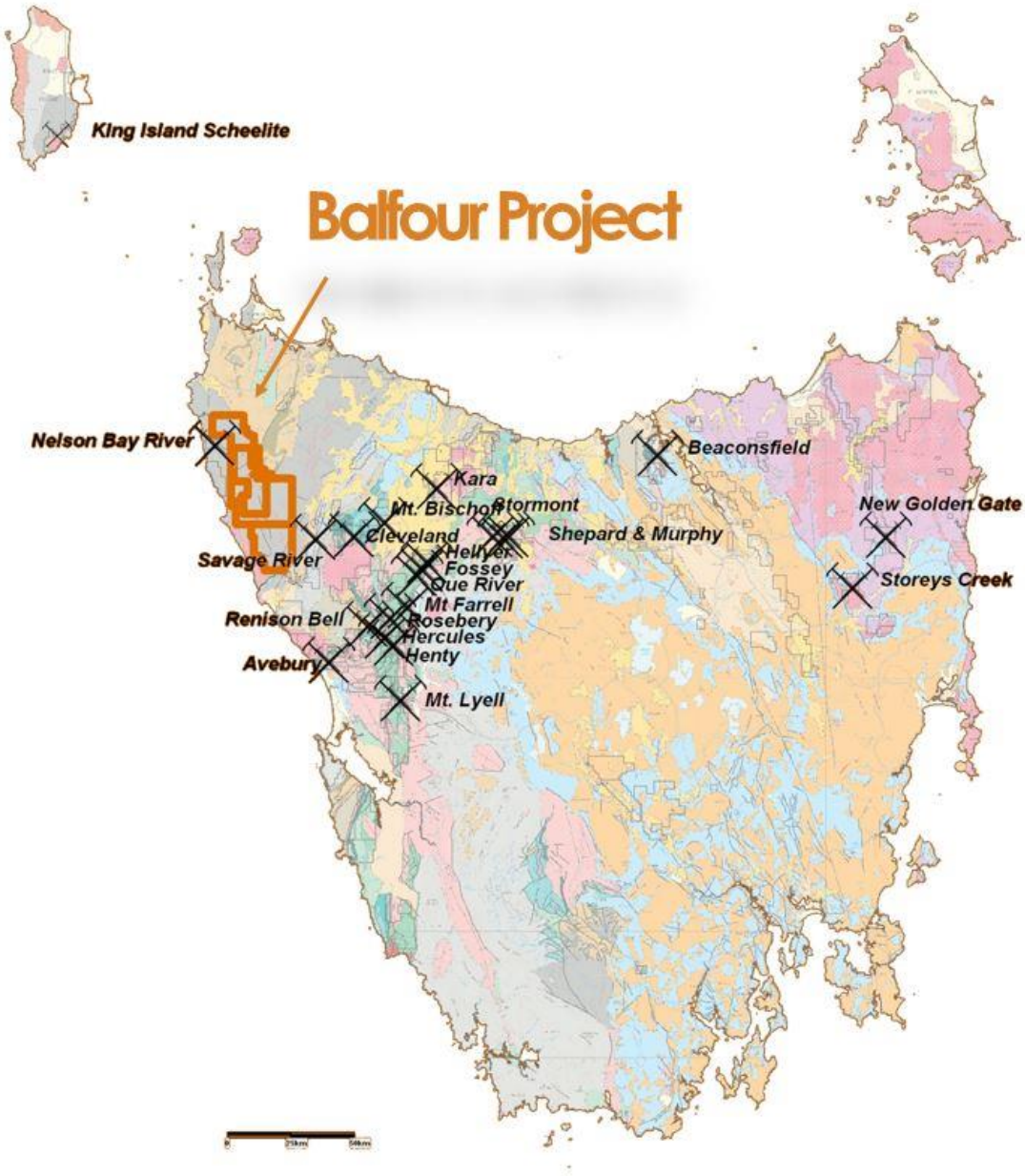

figure 1.1: The Balfour project location

1.0 Introduction

The Balfour Project is an exciting new mineral opportunity in Tasmania, a highly mineralised province by world standards.

Tasmania's pre-mining resource base (historic production + current resources) = US$125B worth of minerals including 11.1 million ounces of gold. 314 million ounces of silver and 3.4 million tons of copper.

Zebs Minerals, a privately owned Tasmania company has a 100% holding of all tenements over 100% of the copper belt. Zebs hold 955.7 square kilometres in 5 tenements including a mining lease over the Murrays Reward mine.

The project boasts high grade copper lodes over 35+ kilometres of strike in a highly favourable geological setting and is a potentially world class copper province.

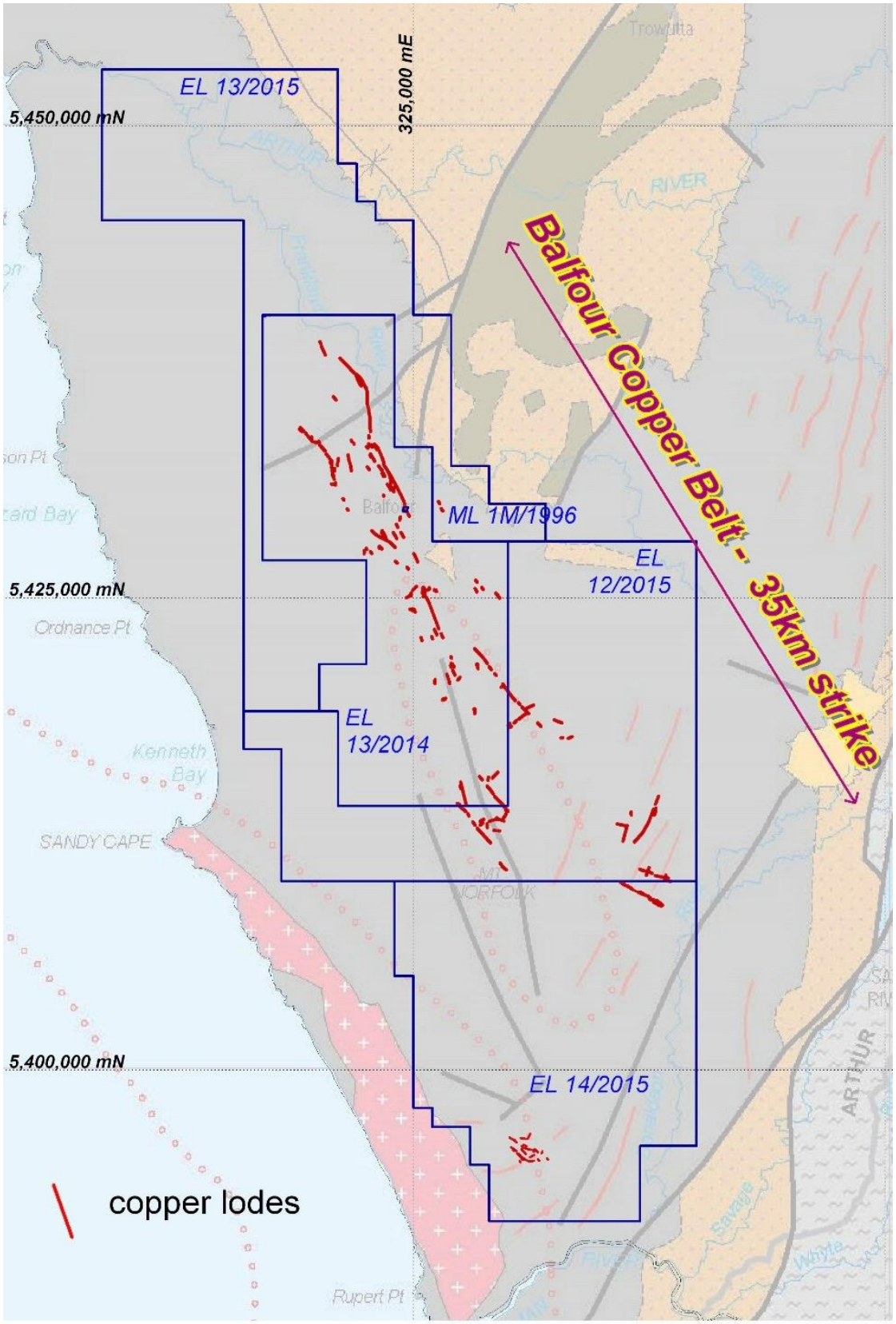

figure 1.2: Zebs Minerals Pty Ltd's tenement holdings over the Balfour copper belt on simplified geology and with known copper lodes shown.

2.0 Geology

2.1 Regional Geology

The Geology of NW Tasmania is structurally dominated by the Smithton Syncline formed through Proterozoic extension and Paleozoic compression (Everard *et al*, 2007). The NW Tasmanian Geology is separated from the geology of Western Tasmania by the 510Ma Arthur Lineament, a major east dipping NNE trending thrust lineament (see figure 2.1).

The N-NW trending Balfour thrust/shear is associated with partial inversion of the Rocky Cape and Togari Groups west of the syncline axis. The NNE trending Roger River Fault is a basin wide, long lived structure located in the east of the syncline that has controlled basin sedimentation since the Proterozoic (see figures 2.1 and 2.2).

The Smithton Syncline is flanked and underlain by the Early Neoproterozoic (1000- 750Ma) Rocky Cape Group. The Rocky Cape Group is considered to represent autochthonous basement (Seymour *et al* 2006) and consists of over 10km of marine shelf siliciclastic sandstone, siltstone, black shale and minor dolomite.

The Lower Rocky Cape Group is comprised of the Pedder River Siltstone, conformably overlain by the Lagoon River Quartzite followed by the 3500m thick Balfour Sub Group which has been divided into four formations, Skinners Flat Siltstone, Cassiterite Creek Quartzite, Emmett's Creek Shale and the Looney's Flat Siltstone. The Balfour Sub Group is overlain by the Cowrie Siltstone, a planar, black carbonaceous and locally pyritic siltstone and shale sequence.

The Rocky Cape Group is unconformably overlain by the late Neoproterozoic (750- 520Ma) Togari Group and its correlates (Ahrberg Group, Timbs Group, Success Creek Group, Crimson Creek Formation). The Togari Group in the Smithton Basin can be subdivided into four main phases of sedimentation. The basal member is the discontinuous Forrest Conglomerate Quartzite and overlying Black River Dolomite. The Black River Dolomite consists of fossiliferous dolomite, chert, shale, siltstone and polymictic conglomerate and varies from 300m thick in the west to over 800m in the east.

The overlying Kanunnah Subgroup (700 – 570Ma) is a thick sequence of mafic rift volcanics and associated volcaniclastic and siliciclastic sediments.

The Smithton Dolomite overlies the Kanunnah Subgroup and is comprised of a 1500m thick sequence of unfossiliferous dolomite and limestone. A renewal of deepwater siliciclastic sedimentation resulted in the deposition of the Salmon River Siltstone. The last two phases of the Togari Group are only found near Rocky Cape.

Early Deformation (D1) of the Rocky Cape and Togari Groups is evident as minor microstructures in the Rocky Cape Group. The next two phases of deformation (D1 and D2) are associated with the 510Ma Tyennan Orogeny. D2 is represented as open upright east west trending folds west of the Roger River Fault. The Devonian Tabberabberan Orogeny is expressed as the prominent D3 phase of deformation. D3 is represented as NW trending NE vergent folding and axial planar cleavage associated with NE directed thrusting that partially inverted the stratigraphy of the Rocky Cape and Togari Groups (Everard *et al*, 2007). One thrust hosts the copper mineralisation of the Balfour District. Late D3 transpression resulted in clockwise rotation of early D3 folding to an N-S trend adjacent to the Roger River Fault. Late NE trending strike slip faults in the Balfour area are associated with Sn-W mineralisation at Specimen Hill. D4, also of Devonian age is expressed as upright north trending folds in the core of the Smithton syncline and as NE trending reverse faults in the Temma area.

Devonian-Silurian post orogenic granitoids outcrop on the coast north of the Pieman River and have been interpreted to extend eastwards at approximately 2km depth below the Balfour district (Leaman, 1988).

Post Proterozoic cover rocks are generally restricted to minor, thin Tertiary to Recent, gravels, sands, and chert. Minor remnants of Tertiary basaltic flows are located at the Balfour Township, the Clump and near Temma. The basalts range from basanite, through alkali olivine basalts to tholeiite (Everard *et al*, 2007).

2.2 Mineralisation

Known mineralisation of the Balfour District consists of fault vein related copper deposits, Sn-WO3 vein mineralisation and associated placers and massive magnetite bodies.

Copper Mineralisation.

Copper mineralisation of the Balfour District is located along a 35km long lineament from the Clump in the north to the Toner River in the south with over 60 occurrences noted (figure 1.2). Most of the mineralisation is hosted in pyritic carbonaceous and/or chloritic shale of the Balfour Sub Group. The mineralisation consists of veins, disseminations, replacements, breccia infillings and semi-massive pods occupying dilational zones in a persistent NNW striking, west dipping reverse fault. Primary mineralogy consists of quartz-pyrite-chalcopyrite-carbonate and chlorite and is hosted in pyritic and chloritic shale and siltstone. Murray's Reward was the largest producer in the field and contained supergene pods of covellite and digenite.

The fault zone is broad and up to 15m wide, 25m in parts, with hangingwall and footwall shears and lodes not uncommon. The rock within the ore zone is a silica+dolomite rock with chalcopyrite in veins and disseminations and splashes.

Drilling by ACI in the 1970's identified a small pre-JORC resource of 0.5Mt @ 0.8% Cu.

Geochemical, isotopic and geological evidence suggest the deposits were formed by granitic or meteoric hydrothermal fluids remobilizing copper into the fault structures (Taheri and Botrill, 2003). The possible source of the copper is unknown but is likely to be the native copper contained in the Spinks Basalt of the Kanunnah Subgroup.

Tin-Tungsten Mineralisation

The Balfour Field produced at least 125t of Sn metal from the early 1880's until 1942 with minor production continuing until the 1980's. The majority of the production was from alluvial workings in Cassiterite Creek and its tributaries and from Emmett's Creek.

Sn-WO3 mineralisation of the Balfour District is constrained mainly to within 2km of the Specimen Hill Prospect just west of Balfour. The association of tin-tungsten mineralisation with Devonian granites is well established in Tasmania, although the nearest outcropping granite is the Interview Granite located 30km SW. Interpretation of the regional gravity data has identified a potential granite ridge within 2km of the surface immediately west of Balfour. The Haines survey suggests the granite may be within 200m of the surface although the lack of thermal metamorphism suggests it may be further away. There are at least ten Sn-WO3 occurrences in the Balfour Field, all but one are located within a 2km radius of the main Specimen Hill Prospect. The Sn mineralisation is restricted in comparison to the extensive Cu mineralisation along the Balfour Lineament.

2.3 Summary

In summary the Balfour copper belt has highly favourable copper geology with a major structural triple point where the Roger River Fault (basin bounding fault), regional thrust fault 'Balfour Copper Trend' (inverting failed extensional basin) and Balfour Transform. And with a Devonian granite (fractionated) ridge at 1km depth.

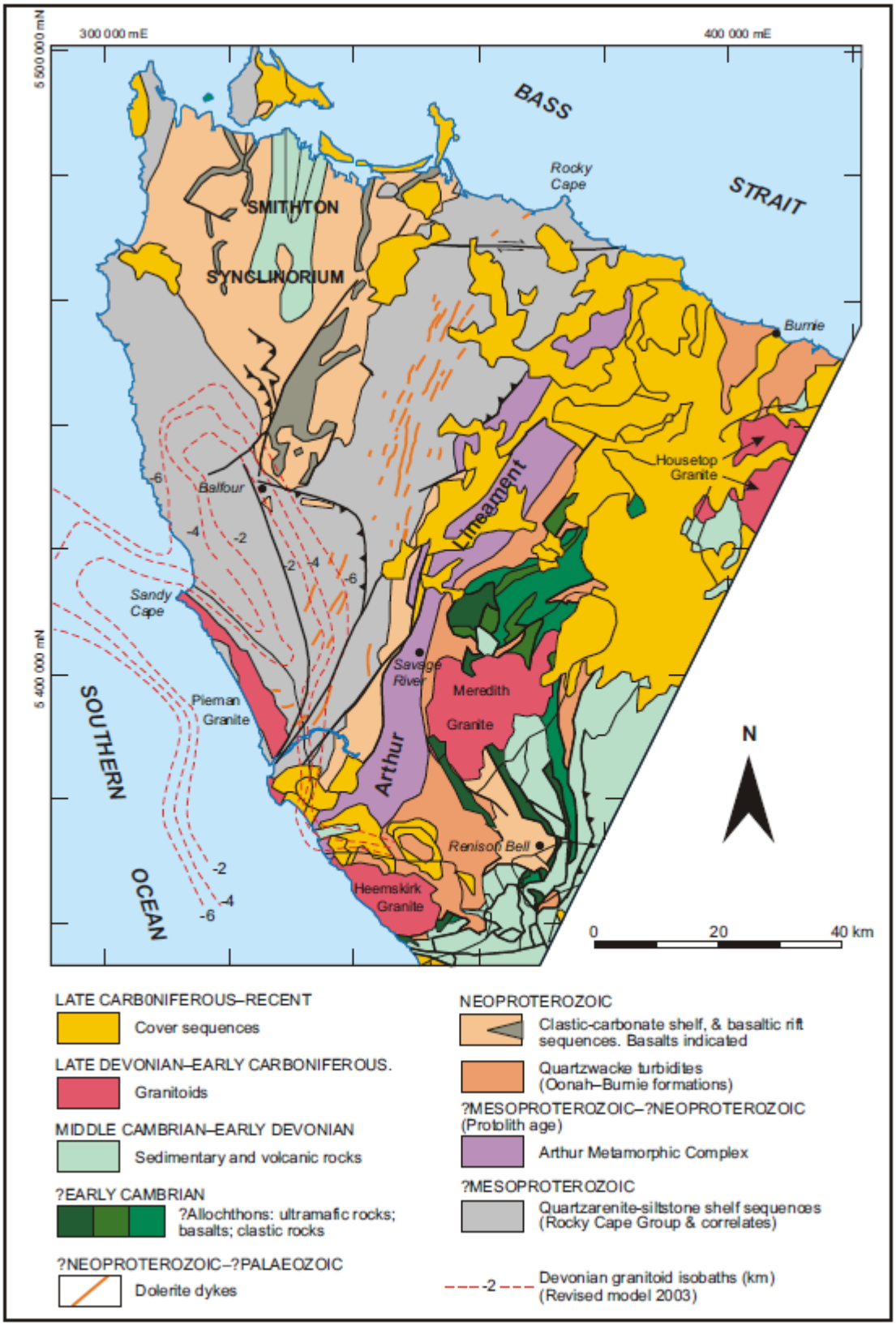

figure 2.1: 1:500,000 scale geology of northwest Tasmania showing the Smithton Synclinorium (or Trough), Arthur Lineament, granite depth contours and Balfour (Taheri and Bottrill, 2004).

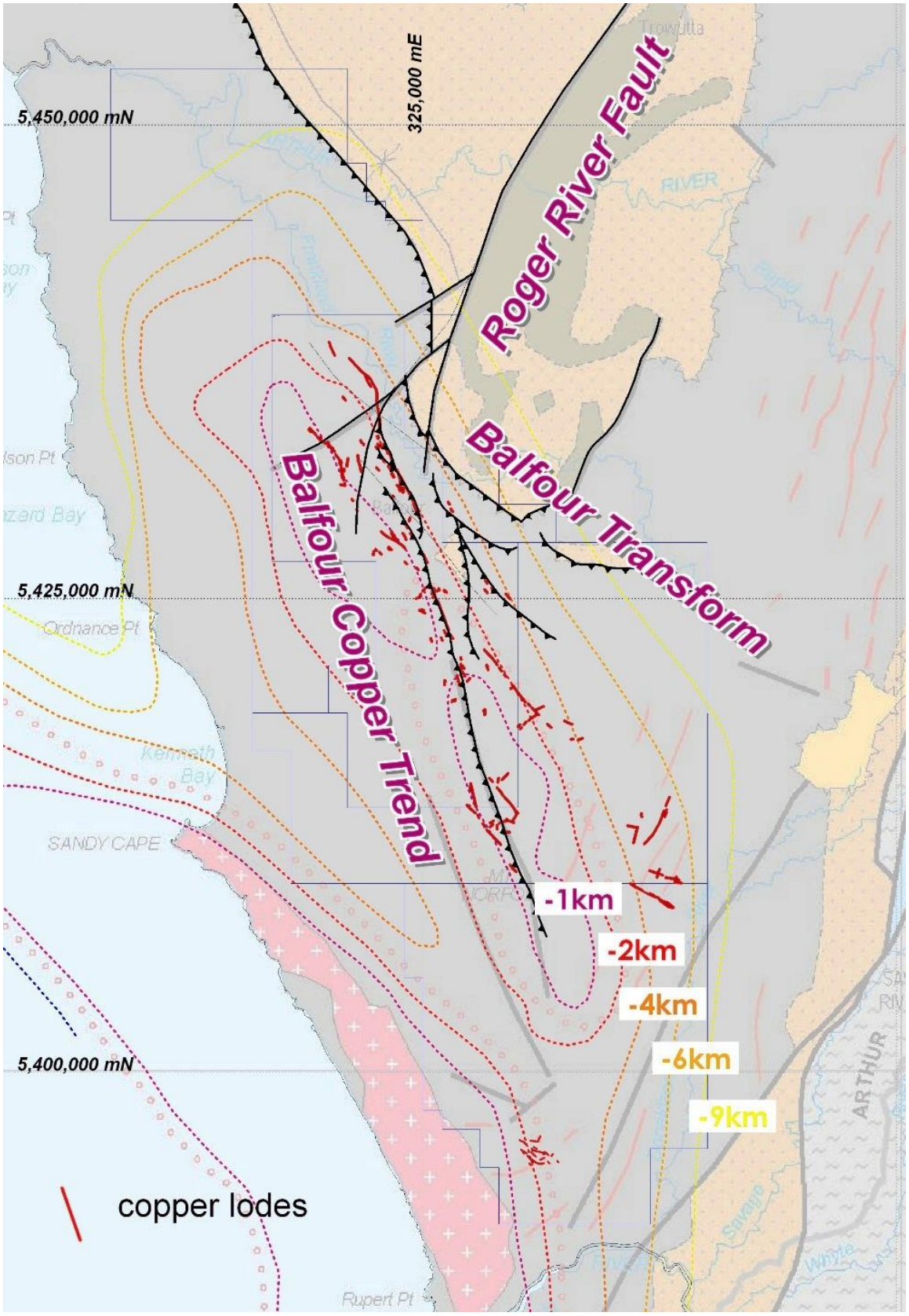

figure 2.2: Simplified geology of the Balfour showing the positions of the major structural elements. Coloured dashes are depth contours to granite and define a shallow ridge coincident with the Balfour Copper Trend. The contours are after and indicate the granite at <1km, shallower than Leamans <2km.

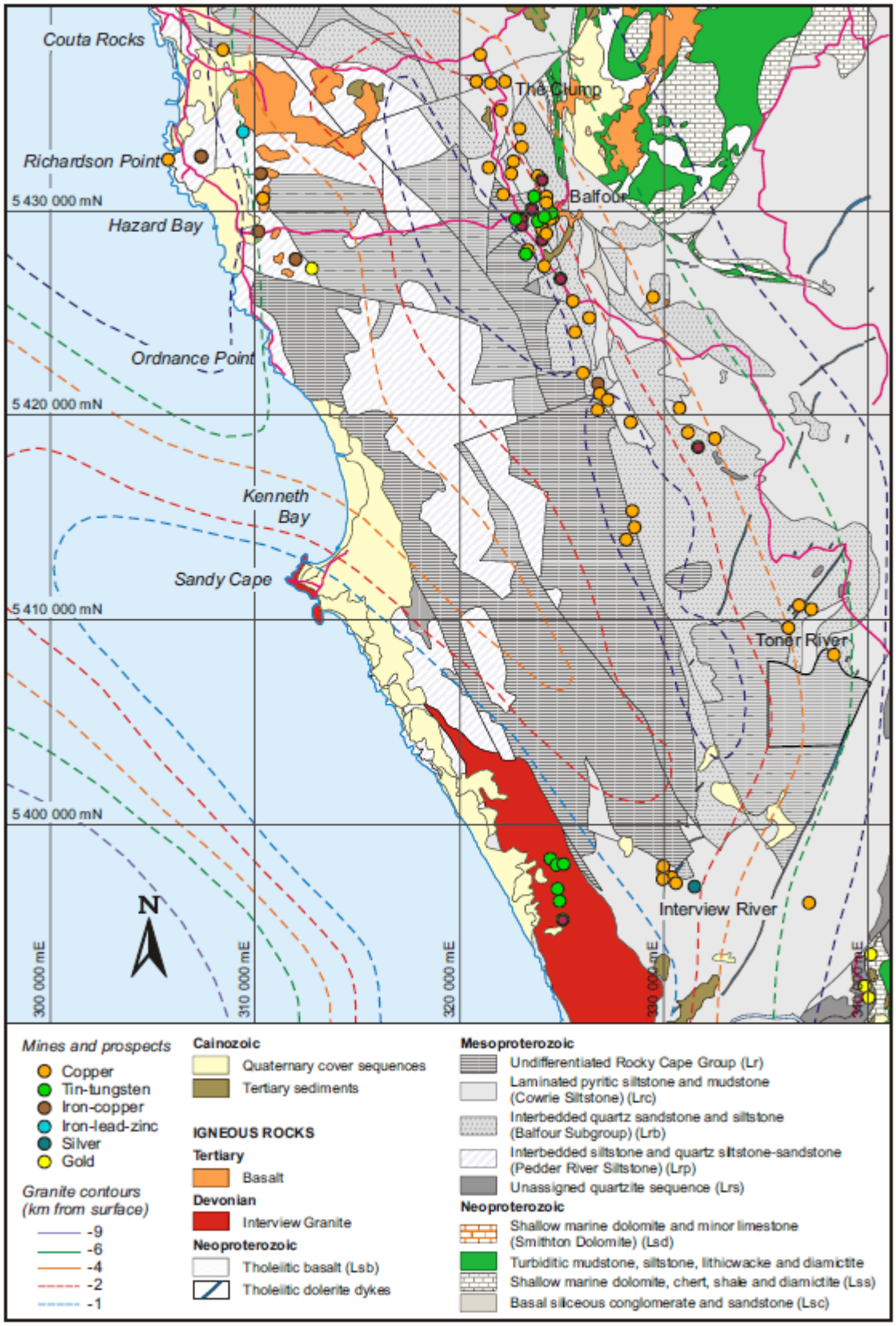

figure 2.3: Local geology of the Balfour copper belt (orange dots) showing the distribution of such units as the Balfour Subgroup and Cowrie Siltstone referred to in text (Taheri and Bottrill, 2004).

3.0 Mining and Exploration History

3.1 Historic Activity

Copper was first discovered in the Balfour region in 1901 in Cassiterite Creek whilst exploring for alluvial tin. This discovery point and the ground around eventually became the Murray's Reward Mine.

The bulk of production was until 1914, when the war interfered with mining here as elsewhere, and essentially ceased in 1917. Small scale operations persisted up to the late 1940's. The first modern exploration specifically for copper in the area didn't occur until the late 1960's.

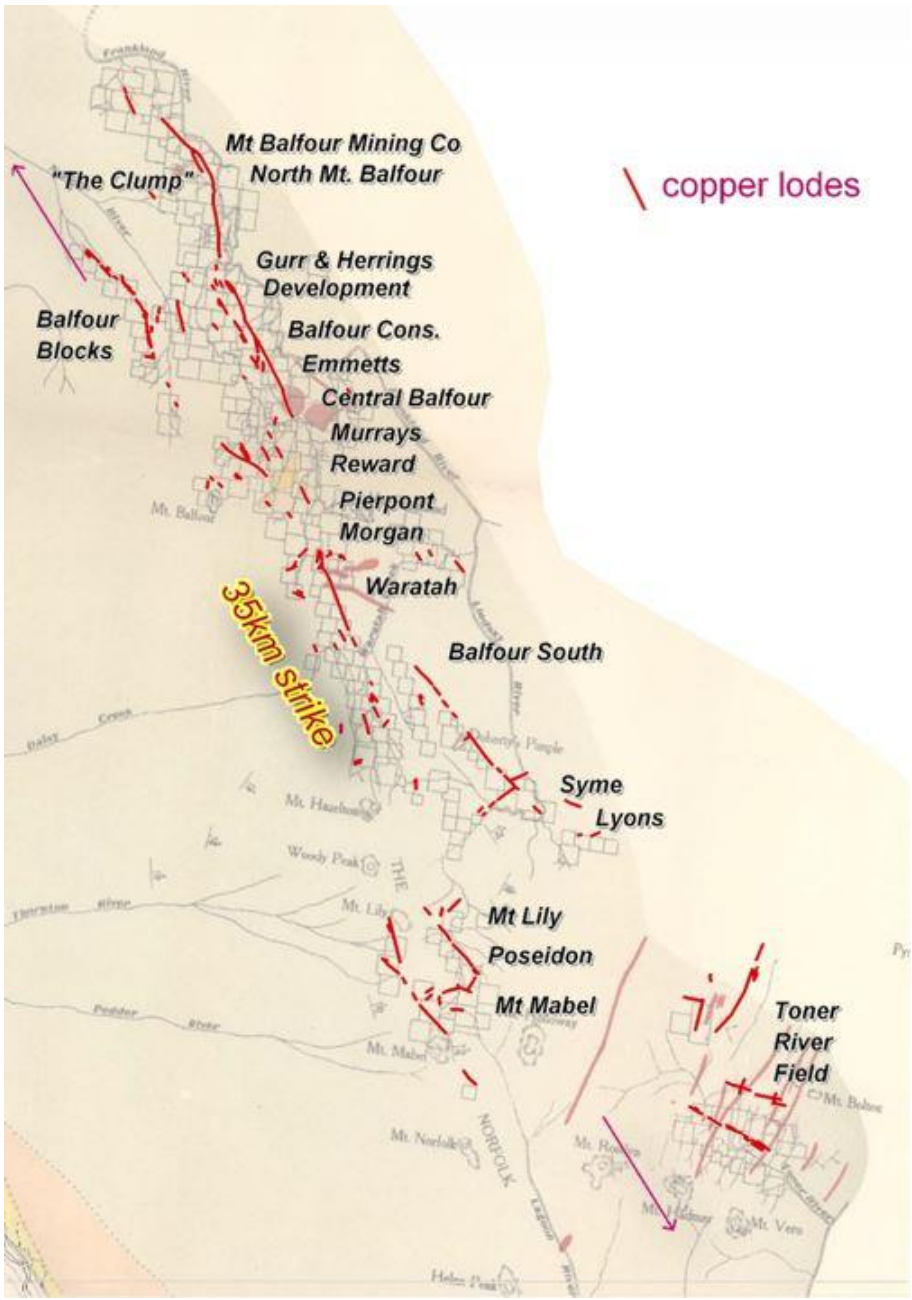

figure 3.1: The extent of the activity when visited in 1911 by Ward showing all of the mine leases and the copper lodes of the 35 long Balfour copper belt.

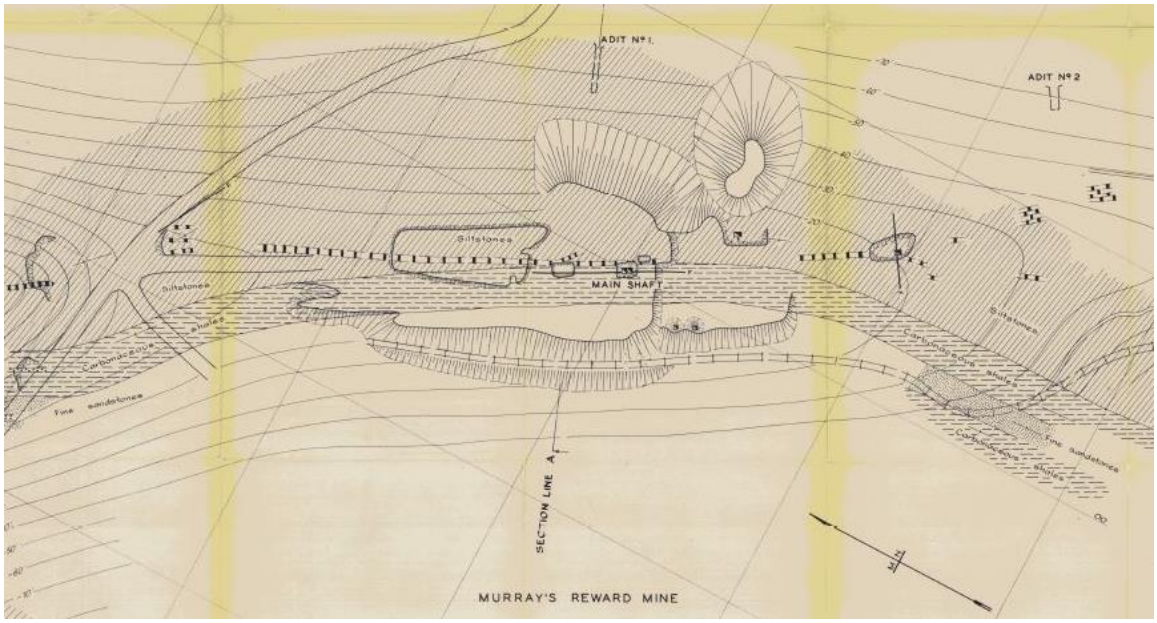

figure 3.2: Section of a 1911 plan of the Murrays Reward mine showing surface features and line of the lode (dashed line).

Murrays Reward was the most developed of the mines with shaft access to 70m metres depth and four levels. The mine produced 6,860 tonnes of copper as ore during its operations.

Historic production is reported at grades 12% - 35% copper it is with at least some of the ore (M. Laan, *pers. comm.*) occurred in a shoot of massive chalcopyrite such as the sample below.

M. Laan also reports recent bulk sampling of 133t which was sold to Mt. Lyell at an average grade of 24.5% copper.

The copper field was visited on two instances by government geologists, the first by Ward (1911) when the field was in full swing, and second by Thomas and Henderson (1943).

Recently government geologists Taheri and Bottrill (2004) have produced a report on "The nature and origins of copper and tin-tungsten deposits in the Balfour-Temma area, northwest Tasmania".

figure 3.3: No.1 adit Murrays Reward mine

figure 3.4: No.2 level Murrays Reward mine

figure 3.5: Murrays Reward shaft now collapsed.

figure 3.6: Adit at The Blocks

figure 3.7: Shaft at The Blocks with quartz+copper vein in wall of shaft.

figure 3.8 Copper oxides malachite and azurite in a shear lode at South Balfour.

3.2 Recent Exploration

There has been some exploration for tin in the Balfour area but that work is not discussed.

ACI Ltd carried out the first concerted effort of modern exploration for copper over a period of six years, from 1968 – 1974 exploring the Balfour copper trend from The Clump (Mt Balfour Mine) in the North to Balfour South workings in the south.

Exploration was continued by a private company, Soloriens Mining Pty Ltd between 1988 -1992.

CRA Exploration Pty Ltd returned to the area for a four year period, 1993 – 1997, this time looking for large scale sedimentary hosted base metal copper deposits where previous exploration efforts had focused on the tin potential just to the west at Specimen Hill.

ACI Ltd – 1968 -1974

ACI Ltd carried out the most comprehensive exploration program over the entire strike length of the Balfour trend between Mt. Balfour (The Clump) and Balfour South over a period of approximately four and a half years. They began their exploration program in late 1969. By early 1970 they had completed several grids, geological mapping, geochemical sampling as well as an induced polarization survey completed by McPhar Geophysics.

The IP survey indicated several strong anomalies along the strike length. Further detailed work was focused in three main areas being;

The Clump - 14 lines of IP

The Blocks - 8 lines of IP

Murray's Reward/Central Min - 14 lines of IP

At The Clump ACI recognised an anomalous area extending approximately 1,000m along strike and some 20-70m wide. They noted that graphite in the area probably influenced the results with regard to the potential strike and width but did not believe it was sufficient to discourage further work. At the Blocks prospect they found two anomalies, one classified as definite and another they thought probable, approximately 350m minimum in strike length and corresponding with existing historical copper workings.

Definite anomalies were found on all lines over the Murray's Reward/Central Mine prospect with a strike length of approximately 700m and correlating very well with existing historical copper workings, although again they estimate that graphite in the area could be exerting a minor influence (McIntyre, M.H.).

They also suggested that further work was required between the Blocks and The Clump prospects as there were several strong anomalies indicated.

ACI was fortunate enough to be able to access the old workings at The Clump, Murray's and Central and able to sample the underground workings. The results were summarised as;

- The Clump Mine – ore zone up to 20m in width with grades of Cu up to 3.53% and silver up to 22g/t.
- Murray's Reward - graded 7.9% Cu over 1.5m.
- Central Mine – up to 0.27% Cu in the mineralised zone.

Geological mapping and sampling of the underground workings indicated the potential to locate mineable grades and tonnes of copper in the area of the historical mines.

Between 1970 and 1973 the company drilled a total of 37 diamond drill holes into eight separate projects along a 17km strike length. Most holes hit the targeted ore zone and intersected copper

mineralisation, though sub-economic, encouraging the company to keep exploring for another twelve months. Drilling was difficult particularly in the shallower holes and near to the expected ore zones.

During the period of exploration, it was suggested that the copper was derived from a sedimentary source but this potential source was never pursued and all drilling targeted shallow supergene enriched copper lodes near to existing historical workings. It is doubtful that any drill holes were targeted in the cross-cutting fault zones where the best opportunity for this deposit type could be located or that the drill holes had a close enough spacing to properly test the prospects.

Soloriens Mining Pty Ltd – 1988-1992

During their first year of operation, Soloriens completed a data review principally of ACI Ltd data for copper and CRA Pty Ltd for tin. They also completed a gravity survey in conjunction with the Tasmanian Government over the area with results assessed by Leaman Geophysics. It was determined that the gravity densities could represent a granite spine near to surface and that known mineralisation could be associated with it. No work was completed during year two and the company was actively seeking a joint venture partner.

A programme of water and plant sampling was undertaken. These were tested and it was noted that the lichens and algae specific to the area had a tendency to concentrate Cu, Ag & Au, though in small amounts. Samples were also collected from the Murray's Reward mine and sent to the CSIRO labs to have an isotope study to determine the age of the mineralising fluids. The results were inconclusive with both Proterozoic and Devonian age suggested.

Rio Tinto Exploration Pty Ltd – 1993-1997

Rio Tinto (then CRA Exploration Pty ltd) had explored the area of Specimen Hill for tin from 1977-1983. At that time no exploration for copper was undertaken in the Balfour region.

In 1992, CRA applied for and was granted EL18/92. The sole purpose of this move back to north-western Tasmania was to explore for copper in the Balfour area.

The company was targeting the potential source of the known and extensive copper mineralisation.

They surmised, based on experience and studies of similar copper deposits around the world, that the source of the copper at Balfour was most likely stratiform or stratabound deep seated ore bodies potentially created by replacement of pyrrhotite, in pyrrhotite rich sediments, with copper (Menpes, S.A.). Early work by CRA indicates that copper mineralisation postdates movement on the Balfour and Roger River faults.

During the latter period of exploration CRA modified their concept with regard to the source of the copper mineralisation as being multiple large bodies down dip of the Balfour fault. CRA recognised the numerous east-west cross cutting faults and their relationship with the existing higher grade workings. They came up with the model exhibited in figure 3.9.

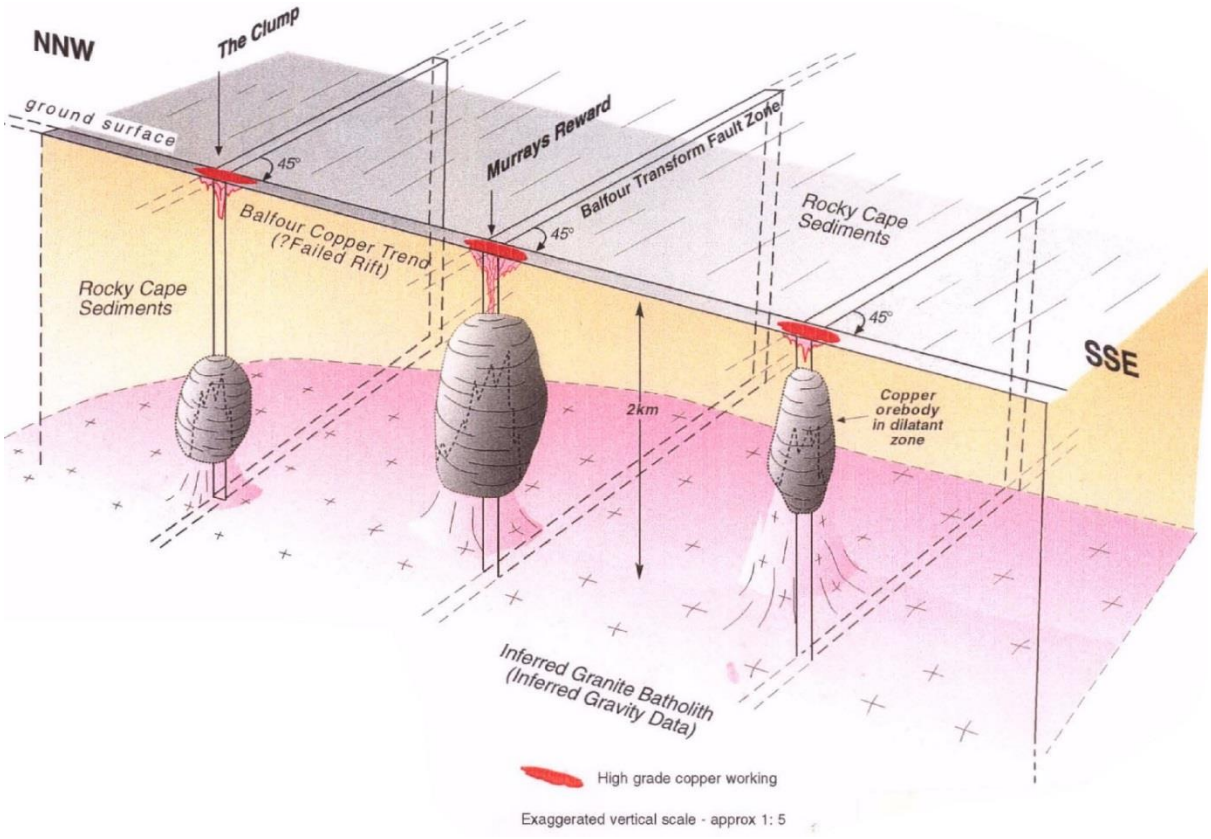

figure 3.9: CRA Proposed Model of Copper ore body

CRA planned and drilled diamond drill hole DD97BC10 to test the theory of the deep seated ore bodies. The hole was planned to a depth of 500m. However, the hole was only drilled to 82.1m due to hydraulic lock of the drill rods forcing abandonment of the hole. A new drill hole, DD97BC11 was planned some 90m to the north east as a second attempt to intercept the gravity anomaly. This hole was completed at a depth of 464.5m.

CRA determined that they had intersected the gravity anomaly at approximately 400m but noted the core was no different than anywhere else in the hole. They also noted that they had gone through a mineralised zone at 146.6m that was remarkably similar to the main Murray's Reward ore zone.

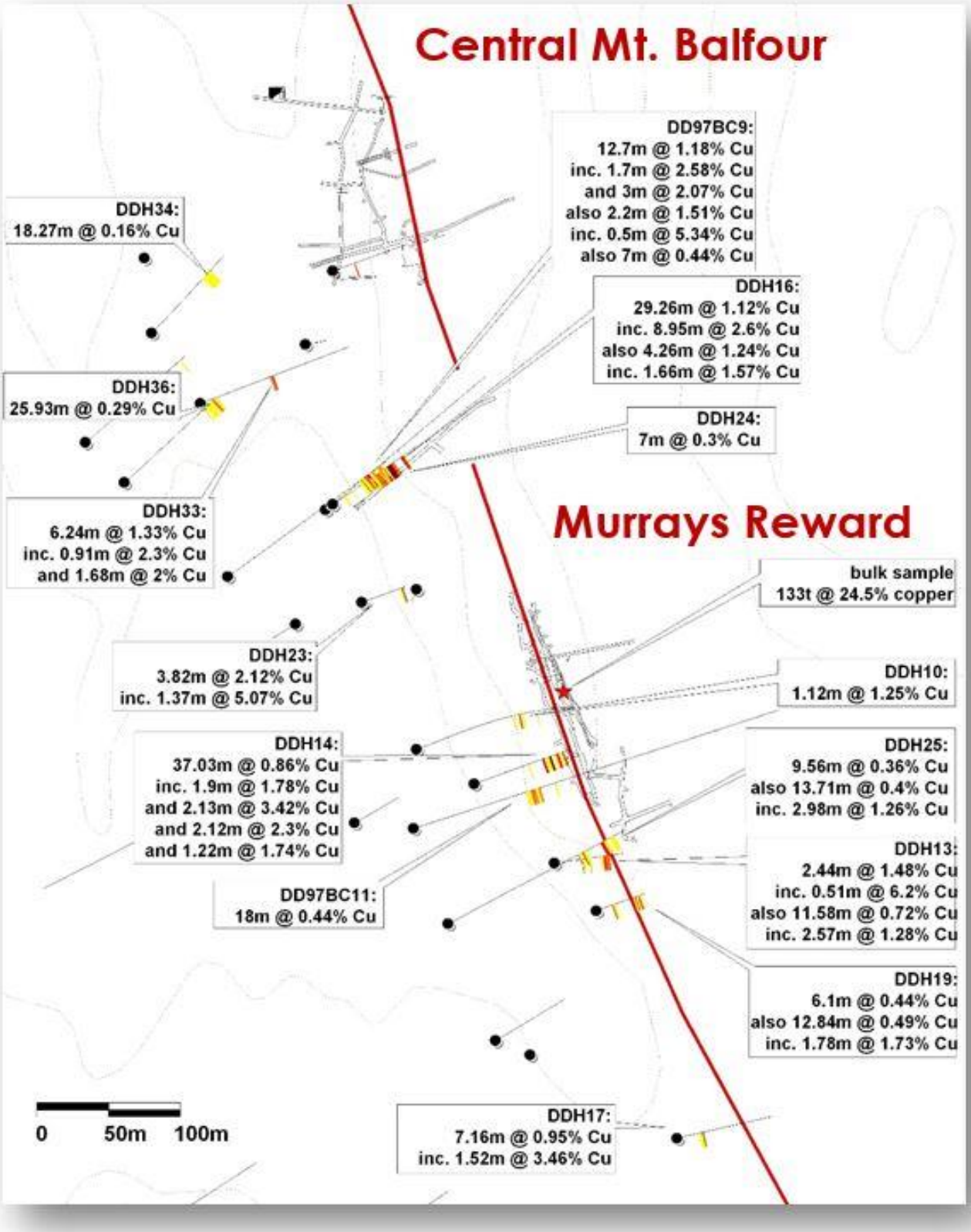

figure 3.10: Plan of drill holes (black dots) and traces (black lines) around the old mine workings of the Murrays Reward and Central Mt Balfour mines. Colour coded copper grades are shown on the drill traces where above 0.1% – for legend see figure 3.11 below.

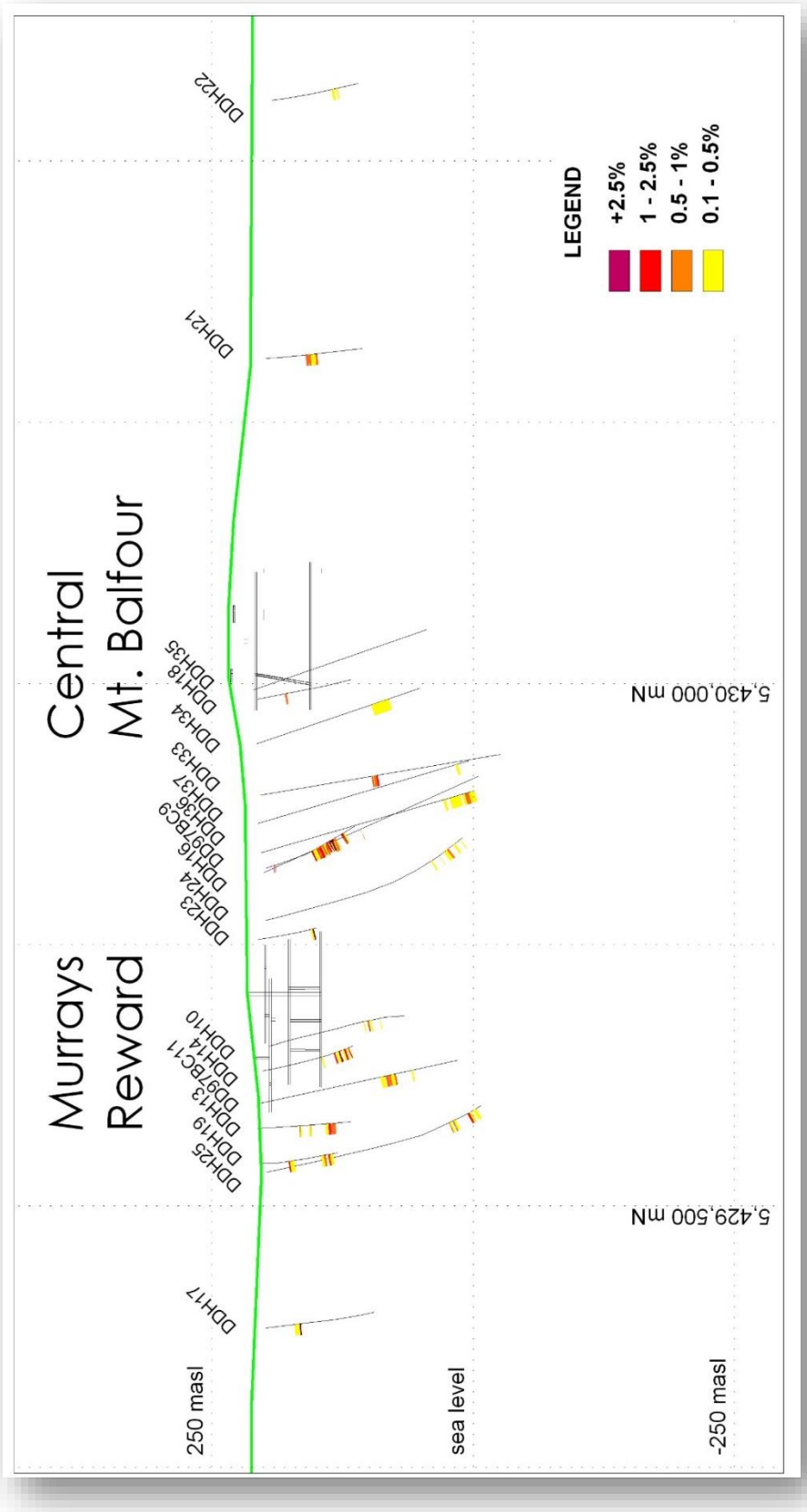

figure 3.11: Long section view (looking due west) of the Murrays reward and Central Mt Balfour mines showing drill traces with colour coded copper grades on drill traces where copper >0.1%.

Table 3.1: Better Copper Intersections

hole_id	from	to	int	% Cu
DDH1	56.2	74.58	18.38	0.27
DDH3	71.47	84.43	12.96	0.44
DDH6	178.3	190.84	12.54	0.20
DDH7	74.06	77.57	3.51	1.05
inc.	76.06	77.57	1.51	2.09
DDH9	197.35	198.92	1.57	1.52
DDH13	43.58	46.02	2.44	1.48
inc.	44.04	44.55	0.51	6.20
also	71.94	83.52	11.58	0.72
inc.	75.51	78.08	2.57	1.28
DDH14	68.58	105.61	37.03	0.86
inc.	84.43	86.33	1.9	1.78
and	91.14	93.27	2.13	3.42
and	98.76	100.88	2.12	2.3
and	104.39	105.61	1.22	1.74
DDH16	54.87	84.13	29.26	1.12
inc.	72.18	81.13	8.95	2.60
also	91.9	96.16	4.26	1.24
inc.	93.06	94.72	1.66	1.57
DDH17	30.48	37.64	7.16	0.95
inc.	36.12	37.64	1.52	3.46
DDH19	25.9	32	6.1	0.44
also	60.66	73.5	12.84	0.49
inc.	68.37	70.15	1.78	1.73
DDH21	42.05	55.2	13.15	0.62
DDH23	56.99	60.81	3.82	2.12
inc.	59.12	60.49	1.37	5.07
DDH24	206.7	213.7	7	0.30
DDH25	202.9	212.46	9.56	0.36
also	228.33	242.04	13.71	0.40
inc.	228.33	231.31	2.98	1.26
DDH33	118.11	124.35	6.24	1.33
inc.	118.11	119.02	0.91	2.30
and	122.67	124.35	1.68	2.00
DDH34	121.15	139.42	18.27	0.16
DDH36	195.85	221.78	25.93	0.29
DD97BC9	55.3	68	12.7	1.18
inc.	55.3	57	1.7	2.58
and	64	67	3	2.07
also	70.4	72.6	2.2	1.51
inc.	71.5	72	0.5	5.34
also	78	85	7	0.44
DD97BC11	142	160	18	0.44

Zebs Minerals Pty Ltd – 2014 - present

Zebs Minerals Pty Ltd secured the project and reviewed previous exploration including geophysics drilling a deep hole at a gravity feature believed to represent a potential copper source. The hole did not penetrate any copper bearing rocks. Downhole EM did not locate any significant off-hole conductors.

4.0 Target Models and Prospects

4.1 Introduction

The Balfour copper belt is a potentially world class province bearing similarities with major copper deposits around the world.

figure 4.1: World map (in copper plate) showing the major copper provinces in the world. Balfour shares common features with a number of these.

The areal extent of the copper lodes of the Balfour Copper Belt demands the presence of a copper rich source at depth beyond these surface lodes.

There are a range of possibilities for large tonnage deposits aside from the potential for further high grade shoots on individual lodes.

Zebs Minerals Pty Ltd are targeting :-

- High grade copper lodes

  e.g. Murrays Reward historic production at 12% - 35% Cu

- and Mt Isa style copper in silica+dolomite rock

  e.g. Mt Isa 225Mt @ 3.3% Cu

- or SEDEX style copper

  e.g. White Pine/Kona Dolomite 1,685Mt @ 0.72% Cu

  or Udokan 1,200Mt @ 2.0% Cu

4.2 High Grade Lodes

figure 4.2: Massive chalcopyrite from the high grade shoot at Murrays Reward (M. Laan) – note coin for scale.

The Murrays Reward mine reportedly followed a high grade shoot from surface to the No. 4 level when the mine stopped in 1917. M. Laan (pers. comm.) reports that the lode was still favourable at this level at a depth of 70m below the surface.

This lode continues at depth and is a worthy target. It should also be a conductor and thus discoverable by EM. Drilling by ACI in the 1970's intersected the copper lode structure south of the shaft. New drill holes should be targeted north of the shaft and be surveyed by downhole EM.

However, there are excellent chances for other high grade shoots of this calibre at or near to the surface along the 35 kilometre belt of copper bearing lodes and faults. New generation airborne EM e.g. VTEM, as a first pass should detect the presence of any near surface conductors with ground EM defining initial targeting and downhole EM targeting follow-up drilling.

Systematic EM surveying all drill holes targeted even on broad lower grade copper targets may also reveal off-hole conductors due to copper concentrations.

High grade copper at surface mineable by open-cut with low strip ratios is the target here.

4.3 Large Tonnage Deposits

However, in addition to the discrete generally smaller high grade shoots which must exist in the belt, the prize of locating the potential source rock for all of this copper remains. Previous explorers, especially CRA, were drawn to the Balfour area for the large tonnage lower grade copper deposit which may have sourced the copper in the high grade lodes, or been produced by the same fluids.

The extent of the copper mineralisation, and its consistent chemistry, call for an underlying low grade stratiform (?) source, or alternatively for a lower grade large tonnage deposit.

Mt Isa Style

There are similarities in mineralogy and style between Balfour and Mt Isa. Mt Isa's 225 million tons of ore at 3.3% copper consists of chalcopyrite in a silica+dolomite alteration zone (see figure 4.2) which overprints shales and siltstones in the hangingwall to a thrust with mafic volcanics in the basement.

This geology is essentially analogous with Balfour. Of significance is the silica+dolomite association as the host gangue which is the host rock to mineralisation at Mt Isa.

Jackaman (1974) argues forcefully that the up to 15m thick (and up to 25m when bodies of siltstone were included) silica+dolomite rock encountered in the underground level at The Clump (now collapsed) is a concordant stratiform unit. If so this unit is extensive at depth and along strike and could represent a major deposit.

Where intersected in drill holes near Murrays Reward the unit appears to be sheared and have faulted discordant contacts though there is still room for conjecture.

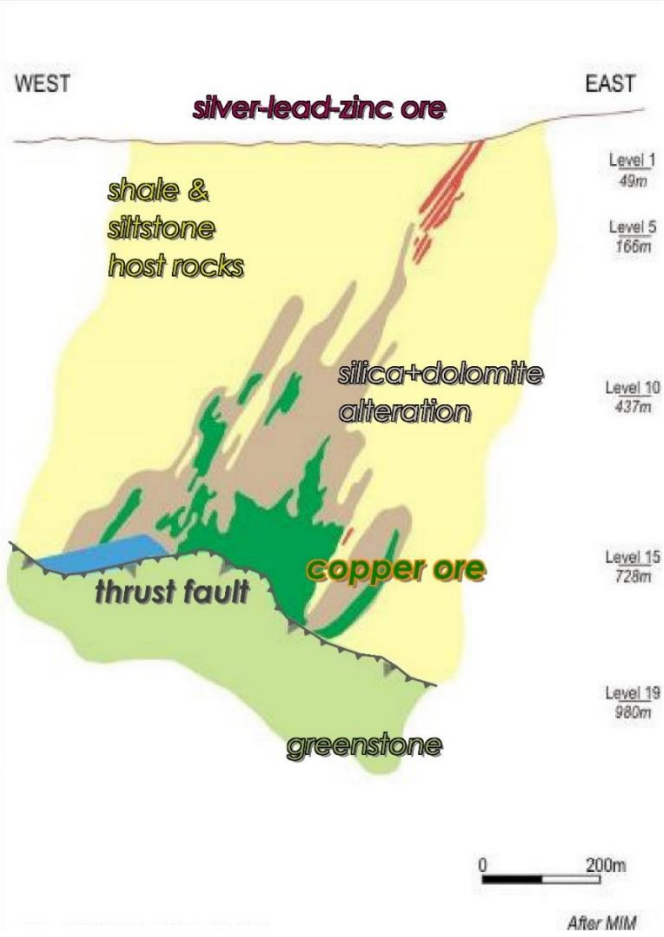

figure 4.3: Representative cross-section though the Mt Isa copper orebody showing its geological setting.

Balfour copper is characterised in part by broad lower grade zones e.g.

- 29.26m @ 1.12% Cu (DDH16)
- 37.03m @ 0.86% Cu (DDH14)
- 11.58 @ 0.72% Cu (DDH13)
- 12.7m @ 1.18% Cu (DD97BC9)
- 7.16m @ 0.95% Cu (DDH17)
- 18.0m @ 0.44% Cu (DDH97BC11) in figure 4.3)

which are also more typical of Mt Isa ores.

figure 4.4: DDH97BC11 - CRA/Rio Tinto (tray from 151.1m to 158.2m) part of 142m–160m, 18m @ 0.44% Cu showing silica+dolomite alteration with chalcopyrite. Similar style of mineralisation to Mt Isa.

Exploration should target the silica+dolomite rock with drilling and possibly IP geophysical surveys.

SEDEX Copper

CRA/Rio Tinto recognised the potential of the Balfour Copper Belt for large tonnage SEDEX-type copper deposits

They saw the high grade lodes as remobilised from depth from a large lower grade yet still potentially payable primary source.

CRA/Rio Tinto also saw that the copper lodes are generally associated with magnetic highs and that the magnetic highs are associated with the Balfour Copper Trend Thrust.

CRA/Rio Tinto identified two sedimentary boundaries between oxidising and reducing sedimentary rocks conducive to ore formation. The first contact is between the Lagoon River Quartzite and the overlying carbonaceous siltstone of the Balfour Subgroup which is marked by a magnetic pyrrhotite bearing siltstone which extends for 60km along strike (see figure 4.4).

The second contact is that between the carbonaceous and pyritic siltstones and the chloritic siltstone in the section between Murrays Reward and The Clump.

Such deposits may manifest themselves in regional geophysical data e.g. gravity (see figure 4.5).

CRA/Rio Tinto ceased exploration at Balfour due to a corporate change in direction (Hammersley Iron in the Pilbara).

Thus the SEDEX model being pursued is:

Source – number of options

- Native copper (in Kannunah basalt, Togari Group) – favoured option
- Red beds (in Rocky Cape Group)
- Intrusives (Interview River Granite) - unlikely

Fluid pathways - numerous

- Balfour area structurally complex
- Major reverse faults, cross-cutting structures, bedding plane faults

Traps – number of options

- Pyrrhotitic chloritic siltstone and/or
- Carbonaceous units upper Rocky Cape Group
- other Chemical traps

There is considerable evidence of copper in the Kannunah basalt (also called the Spinks basalt in some reports) and the plumbing system is extensive. There are numerous combinations of favourable strata and structures where large tonnage deposits may have formed.

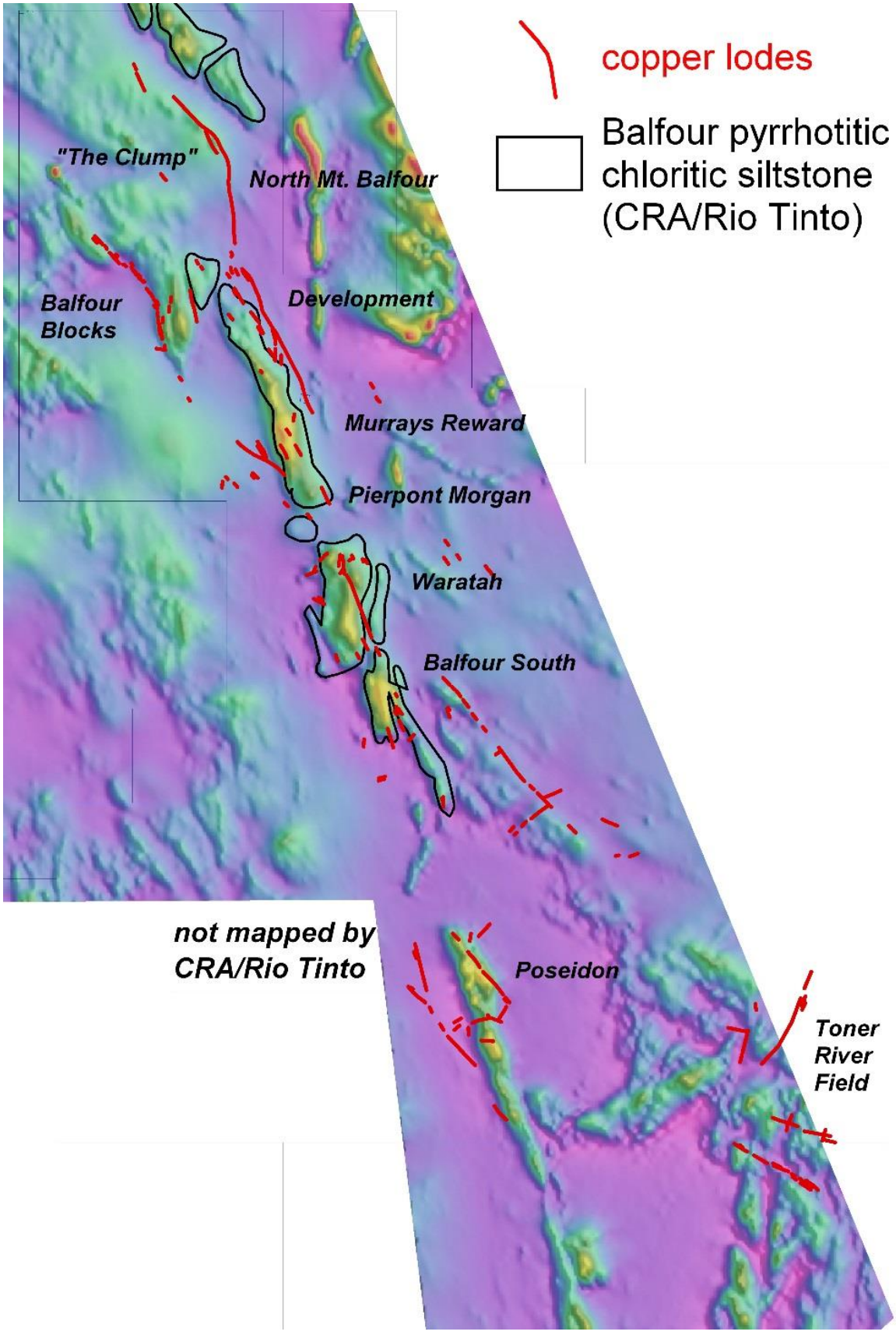

figure 4.4: Regional aeromagnetics image – 1st vertical derivative showing the extent of the pyyrhotite bearing siltstone unit as mapped by CRA/Rio Tinto.

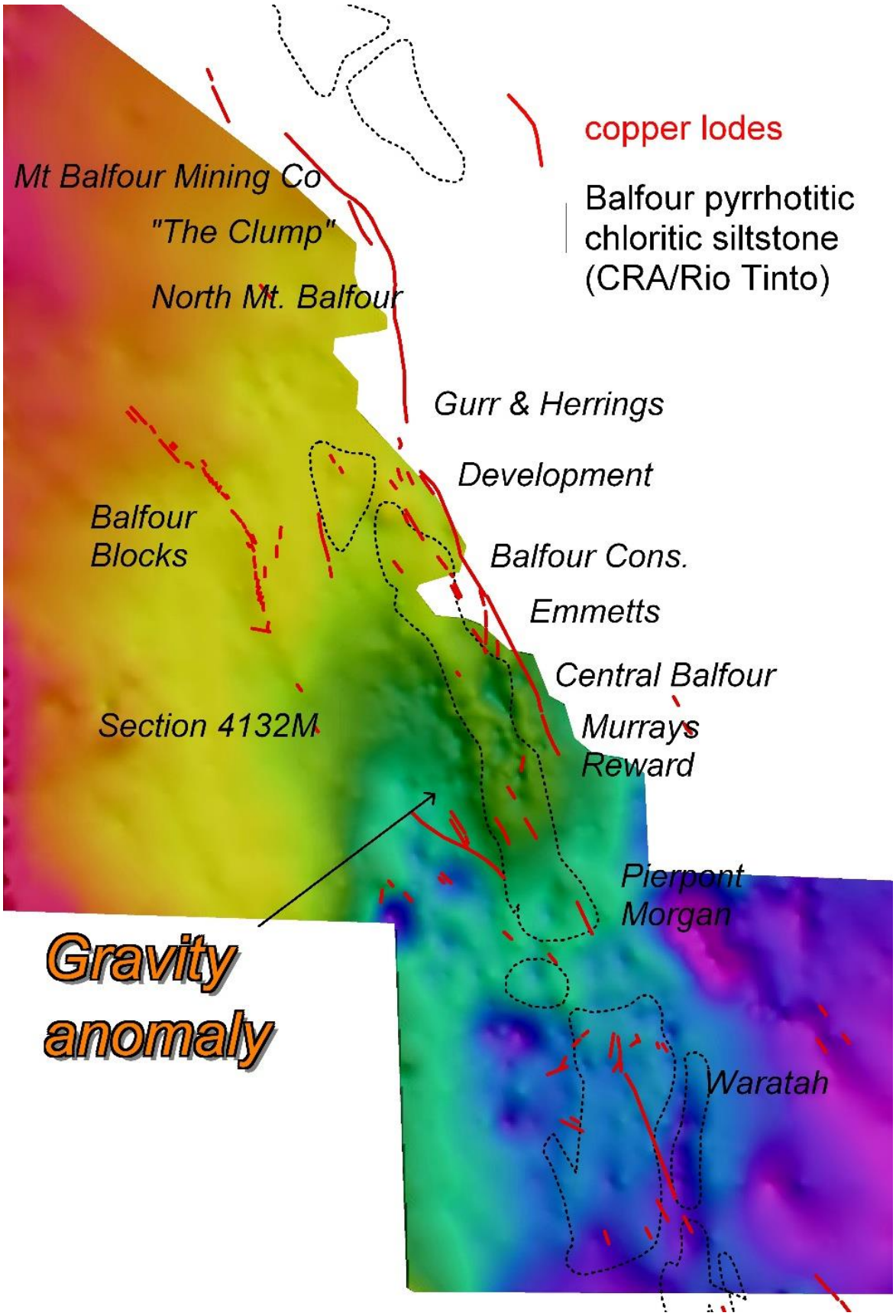

figure 4.5: Regional gravity data set showing gravity anomalism parallel but offset to the west. Gravity low probably represents a ridge of granite. Note association between pyyrhotitic siltstone and gravity high – also magnetics.

5.0 Proposed Exploration

5.1 Introduction

Zebs Minerals holds the whole of the Balfour copper belt and has the opportunity to thoroughly screen the belt for near surface high grade lodes and sub-surface lower grade deposits.

5.2 VTEM and DigiATLANTIS Ground and Downhole Electromagnetic Surveys

Zeb Minerals is planning to fly an airborne EM survey over the length of the copper belt and to follow up on the ground with its wholly owned DigiAtlantis ground EM system

The copper belt has not been surveyed with new generation airborne systems such as VTEM. A survey was planned for 2018/19 has been postponed until the following summer due to the excessive cost of standby days on the windy west coast.

figure 5.1: Looking southward towards Mt Donaldson over typical Balfour country.

The area to survey is ~300 square kilometres if the whole belt is flown. At a line spacing of 50m, which is considered optimal given the relatively short strike length that high shoots may have, this is approximately 6,000 line kilometres. It may be acceptable to fly at 100m line spacings to reduce the cost but this will be less than ideal.

In general high grade copper lodes should be good conductors. Discriminating them from graphitic shears may require a little more work. However, the country is relatively level with the higher points still rounded, and mostly covered with buttongrass and heath, making for good flying conditions for optimal EM coupling with subsurface conductors.

The survey will also supply magnetic data though quality aeromagnetics data does exist.

It is expected that the VTEM (or other) survey will locate a number of anomalies to be followed up with ground surveying.

Zeb Minerals also owns a new DigiAtlantis ground and downhole EM survey (figures 5.2 and 5.3) instrument with emitter, receiver and probe. Anomalies defined by the airborne survey will be ground surveyed using the DigiAtlantis.

Anomalies confirmed (and refined) by the ground EM survey will be diamond drilled (with oriented diamond core to allow for structural interpretation) with a single (nominally) 250m hole for each anomaly.

Holes drilled at the anomalies defined by the ground EM survey will be down hole EM surveyed with off-hole conductors drilled.

This will give Zeb's Minerals the first opportunity to thoroughly screen the whole of the copper belt before utilising its own ground and downhole EM surveying in a timely and cost efficient manner.

This surveying should reveal all high grade lodes e.g. Murrays Reward, and any other higher concentrations of copper.

figure 5.2: DigiAtlantis EM system surveying hole at Balfour

figure 5.3: DigiAtlantis EM system surveying hole at Balfour

5.3 Induced Polarisation

ACI utilised induced polarisation as their geophysical tool in exploring the Murrays Reward and The Clump areas with some apparent success. However, it is not clear as to whether the survey was seeing the chalcopyrite or the graphitic fault zone.

The author has seen the utility of modern induced polarisation, particularly new generation 3D surveying, and would like to trial this methodology with smaller orientation surveys over known mineralisation/drilling to test its effectiveness. A successful trial may see some monies diverted towards a larger survey from drilling, or new monies required.

5.4 Drilling

All anomalies defined by ground EM follow-up will require diamond drilling. Zebs is proposing a drilling programme of 10,000m being made up of nominally 250m holes, with some deeper holes targeting large tonnage lower grade resources, though these will be adjusted results dependant. The limited extent of drilling is apparent in figure 5.5.

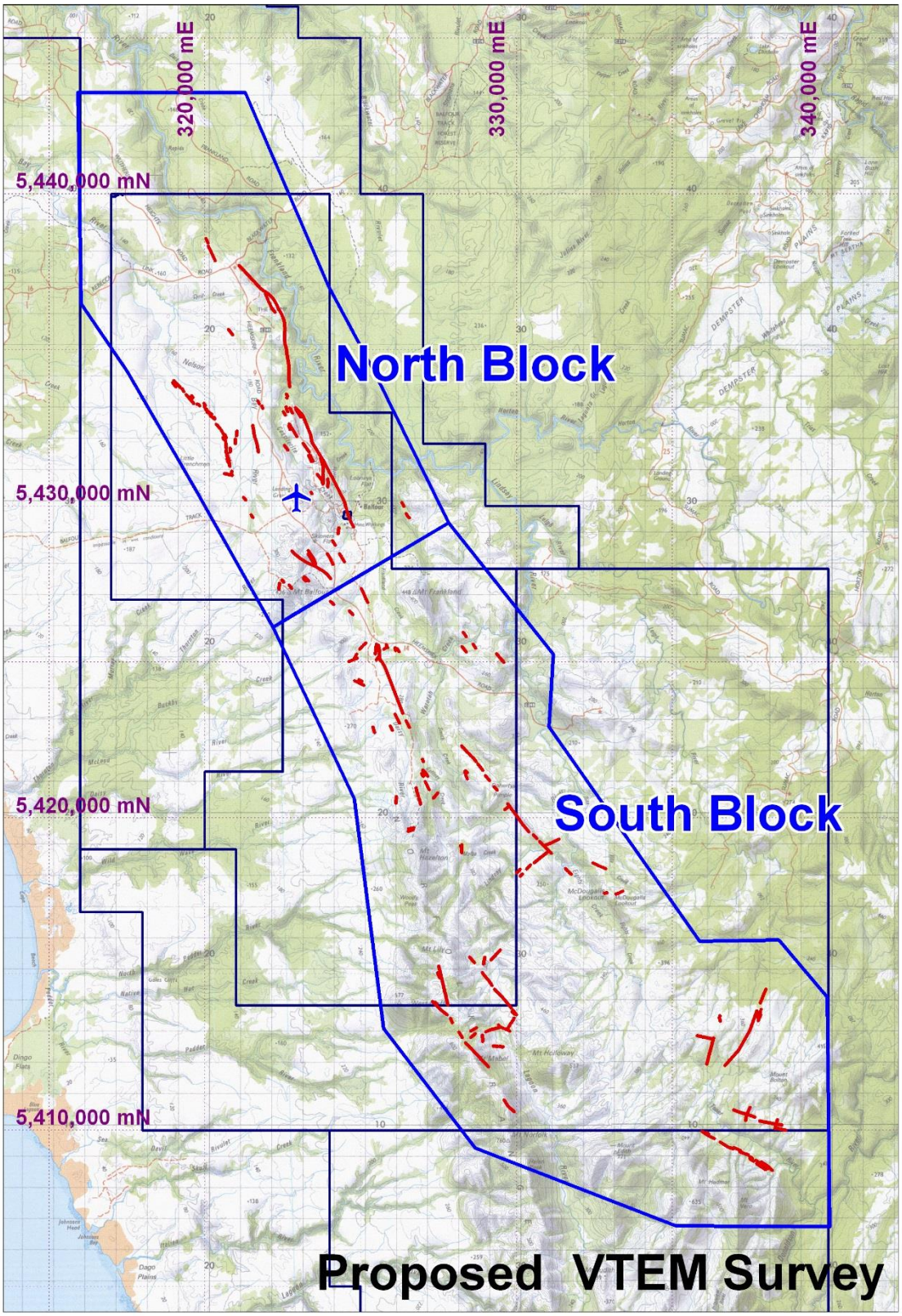

figure 5.4: Proposed VTEM survey area. Survey was initially proposed to be flown in two blocks for cost purposes though better if flown together.

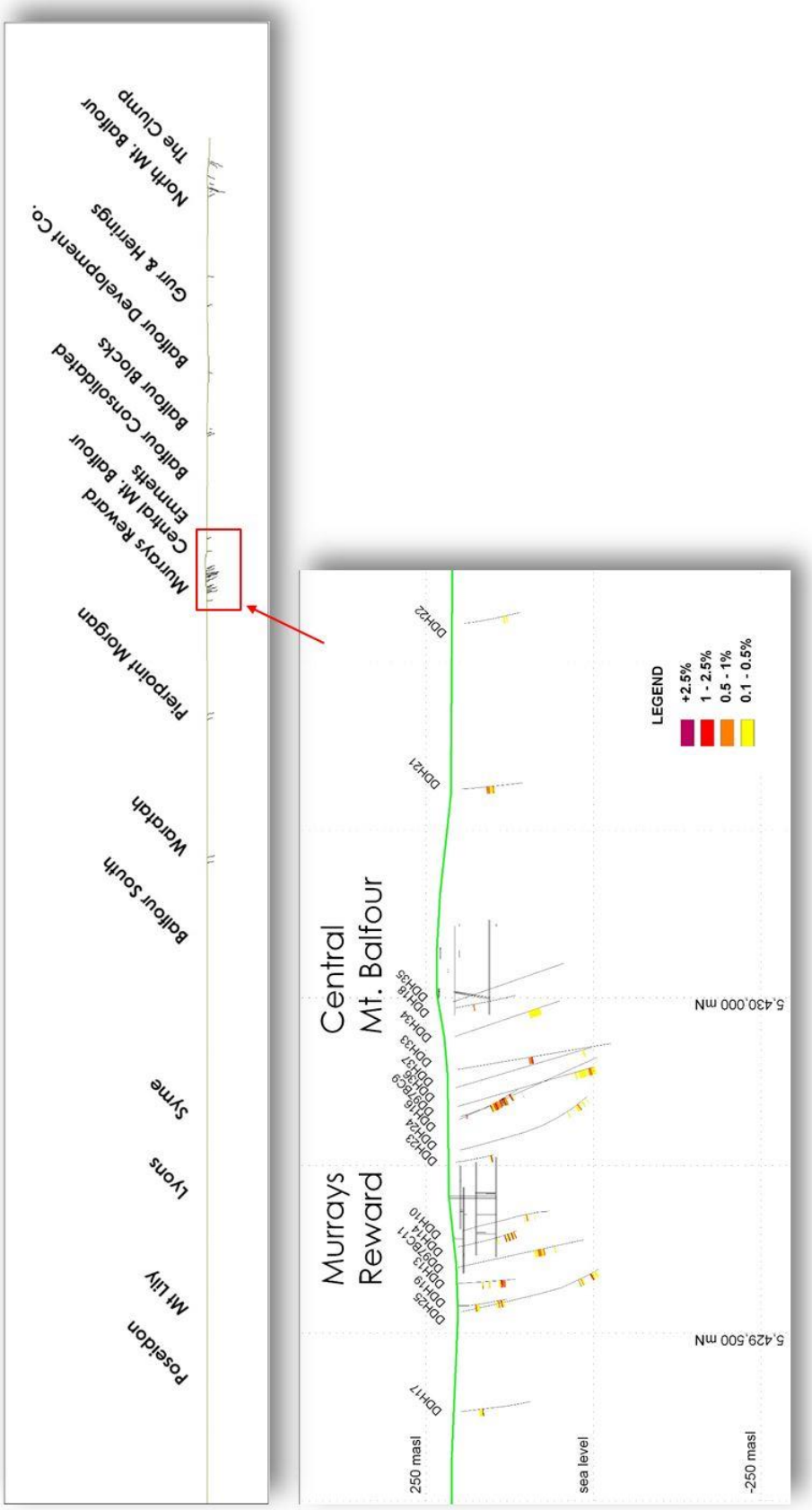

figure 5.5: Long section view looking due west showing drill traces and copper grades.

6.0 Summary

Zebs Minerals Pty Ltd has secured the Balfour copper belt 100% and has the opportunity to screen the whole belt for high grade at or near surface high grade shoots.

Zebs Minerals is looking for copper resources to mine. Options include full processing on-site with generation of copper ingots through to direct shipping higher grade material, perhaps after a crushing/screening/rock sorting process.

Processing options remain open and will depend on the size and grade of the discoveries.

The following programme is discovery focussed and is adequate to discover all significant copper resources.

The generally open and lightly vegetated nature of the country lend itself to quality geophysical surveying.

Discoveries will require a second round of resource definition drilling which has not been costed and will depend on the size of the discoveries.

8. A regional VTEM (or comparable new generation system available) is planned for the whole of the belt. At a 50m line spacing, optimal for the target geometry, this is approximately 5,000 line kilometres and will cost approximately A$1 million (a cheaper option would be 100m line spacings which would cost ~A$600,000). The survey will take approximately 2 weeks of flying but must be flown in the summer for environmental (Wedge Tailed Eagles and Orange Bellied Parrots flight path) and weather reasons.

   A$1,000,000

9. VTEM anomalies are to be followed-up with DigiAtlantis ground EM surveys. Assuming 20 anomalies require follow-up. Each will require up to two loops depending on results from the first loop. Total cost approximately A$10,000 per survey is A$200,000.

   A$200,000

10. All ground EM anomalies to be drilled. Assuming 10 airborne EM anomalies are confirmed by ground EM and require drilling with a single (nominally) 250m drill hole each, i.e. 2,500m metres in total. Total cost A$625,000.

    A$625,000

11. All drill holes are to be down hole EM surveyed at A$15,000 per survey. Total cost A$150,000. Follow-up drilling of five of these with 2 x 250m holes each is 2,500 metres to be down hole surveyed again A$150,000.

    A$150,000

12. In the Murrays Reward mine area it is proposed to ground EM survey 1-2km north and south of the mine requiring 500m x 500m loops for each step A$60,000. In addition it is proposed to drill a 500m hole beneath the Murrays Reward workings and survey the hole by down hole EM A$140,000. This work should inform any decisions regarding further drill targeting.

    A$200,000

13. There is an argument for surveying the section between Murrays Reward and The Clump with 3D IP, however, it is unclear as to how well IP will distinguish copper and graphitic material in

faults. Ideally a small orientation survey should be run over the drilled area to see if further surveying is justified. `

A$100,000

14. The remaining 4,500 metres of drilling in this first round will be apportioned depending on results from the work above. Some meterage should be kept for deeper conceptual large tonnage targets with targeting based on geophysics and a 3D structural model to be developed.

A$1,125,000

Total **A$3,340,000**

These costs are based on optimal work with successful results. The body of work could be scaled back by reducing the size and/or line spacing of the VTEM survey and/or the number of ground surveys, down hole surveys and drill holes. However, it is considered that a **minimum of A$2,000,000** would be required.

7.0 References

(note codes in [ ] refer to Mineral Resources Tasmania's Database)

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