



**Tim Callaghan – Resource and Exploration Geology**

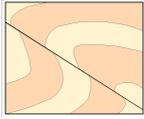
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**EL27/2007 AND EL40/2007  
EXPLORATION REPORT, 2011  
BALFOUR DISTRICT  
NW TASMANIA**

**Prepared for: Balfour Management Pty Ltd.**

**Tim Callaghan, September 2011**



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### **EXECUTIVE SUMMARY**

Exploration of EL27/2007 and EL40/2007 between October 2010 and October 2011 consisted of a downhole geophysical survey and interpretation of the Roaring 41 South Prospect (R41S), a review of the exploration potential for both EL's, and the commencement of reconnaissance work for the Sluiced Flat and Waratah prospects.

Modeling of DHEM and Magnetic data for R41S suggests the mineralised body is located near surface and does not extend below 100m depth. The modeled body is interpreted to plunge NW with limited strike extent. There is potential to further test the R41S prospect down plunge to the NW with a series of short holes 100m and one longer (250m) diamond hole.

A review of exploration concludes that the regional setting and intensity of mineralisation strongly implies the presence of mineralised granite located at depth below the Specimen Hill-Balfour area. Systematic historic and recent exploration derilling has tested the tin-tungsten and the copper mineralisation to a depth of 200m, identifying significant, but uneconomic mineralisation. The best target is considered to be the depth extension of the Balfour and Specimen Hill structures/mineralisation. Both MRT regional gravity and the Haines EL wide gravity surveys suggest the granite is shallower than 1km in depth and located just west of Specimen Hill. Several 1000m plus drill holes could be drilled to test the down plunge extent of the Balfour shear attempting to test the shear/granite contact. The exploration program would be expensive and high risk. However given the world class nature of the Tasmanian tin-tungsten deposits the potential return can be considered as high.

Apart from tin-tungsten mineralisation, there is the added potential to discover significant copper mineralisation, again at depth. The copper source is most likely to be the native copper contained in the Spinks Basalt but there remains a possibility for it to have been remobilized from a sediment hosted copper body, or for the shear hosted and replacement mineralisation to be more extensive and higher grade.

The Waratah-Sluiced Flat Prospect area has been selected for ground follow up and compilation of historic data. The prospect has been selected based mainly based on its structural, geophysical and geochemical similarities to the Balfour-Specimen Hill area, although it is obviously less well mineralised.



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### **1 INTRODUCTION**

A Joint Venture agreement to explore for tin and tungsten mineralisation on EL27/2007 and EL40/2007 between Pleiades Resources Pty Ltd (PRPL) and King Island Scheelite Ltd (KIS) was signed in February 2009. The EL's are located in NW Tasmania near the historic mining district of Balfour. The Balfour district covers a 35km line of intermittent copper mineralisation exploited since the early 1900's with significant tin-tungsten mineralisation located west of the copper lineament.

The EL's cover a Tertiary peneplain vegetated by open button grass plains to the west and wet sclerophyll and rainforest to the east where the topography is incised by the Frankland River drainage system. Access to the EL's is relatively easy via the Western Explorer Road and historic mining/exploration access roads (Figure 1).

A ground based gravity survey was completed in January 2009 by Haines Surveys Pty Ltd. An interpretation of the gravity survey and open file helicopter borne magnetic data acquired by MRT in 2002 identified several areas worthy of follow up.

The principal exploration target for 2009 was the known tin-tungsten mineralisation of the Specimen Hill Prospect. The geophysical interpretation (Bissett, 2009) has modeled a near surface granite cupola west of the Specimen Hill prospect and a buried magnetic body beneath the prospect. The Balfour Joint Venture drilled 4 diamond drill holes into the Specimen Hill Prospect, intersecting numerous thin tin-tungsten mineralised veins. However vein densities were low and a granitic source for the mineralisation is considered to be too deep to warrant continued exploration (Callaghan, 2009). The Specimen Hill Drill sites were rehabilitated during 2010.

A secondary target consisting of a coincident gravity-magnetic high in the NW of the tenements termed Roaring 41 South (R41S) was subject to ground geological investigation involving mapping, gridding and rock chip sampling in 2009. A ground magnetic survey and subsequent drilling program was completed in 2010. Massive magnetite-pyrite-siderite-chlorite hosted copper gold mineralisation was identified from the first drillhole R41S\_01. Geophysical modeling suggests the mineralisation is of limited extent and no further work has been completed on the prospect.



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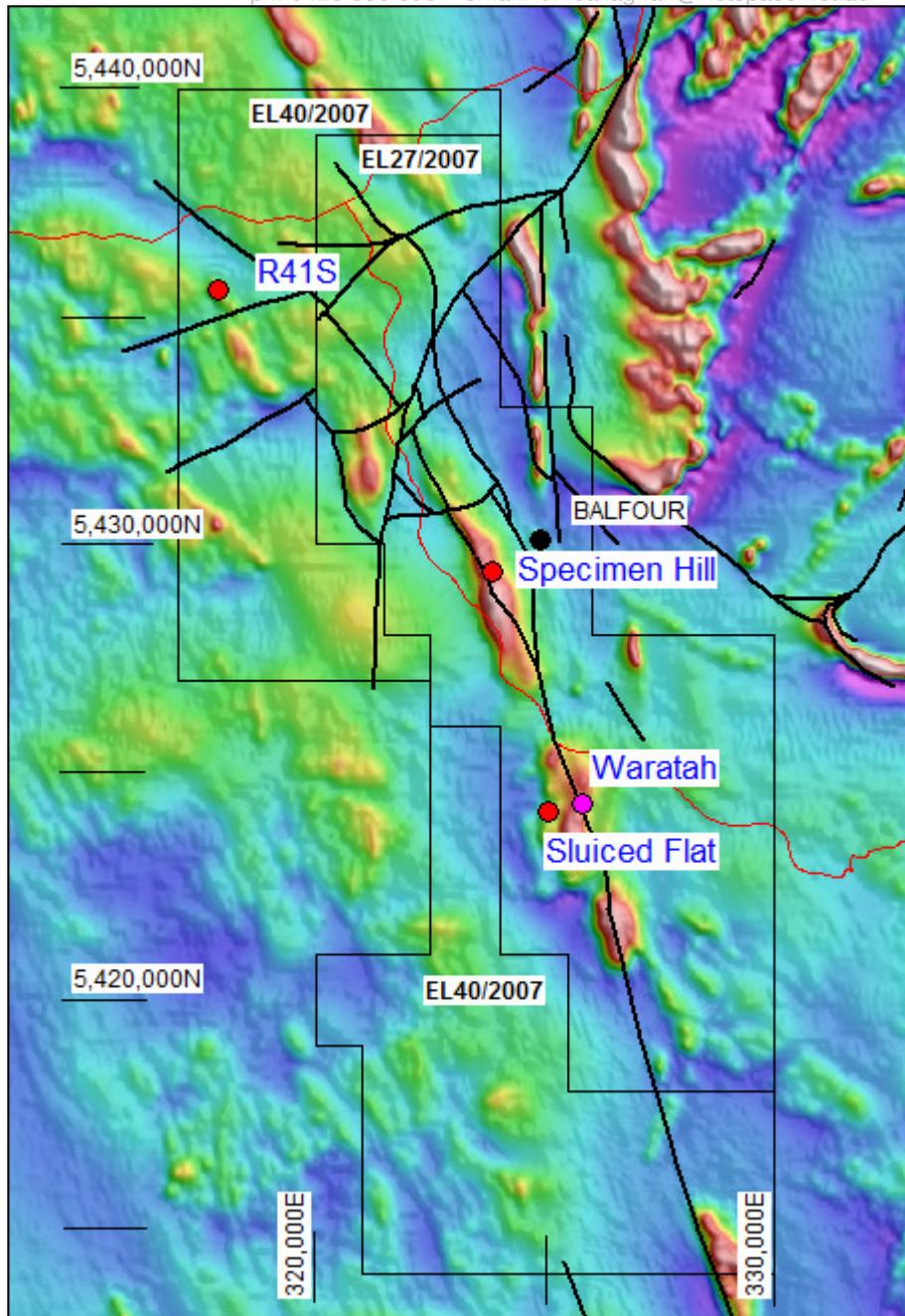


Figure 1. Balfour Tenement Location plan and Total Magnetic Intensity Image.



## 2 REGIONAL GEOLOGY

The Geology of NW Tasmania has been studied by many Geologists with the most recent Mineral Resources Tasmania report (Everard *et al*, 2007) summarized in this section.

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 (Figure 2). 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.

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 volcanoclastic 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



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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 -Temma 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).

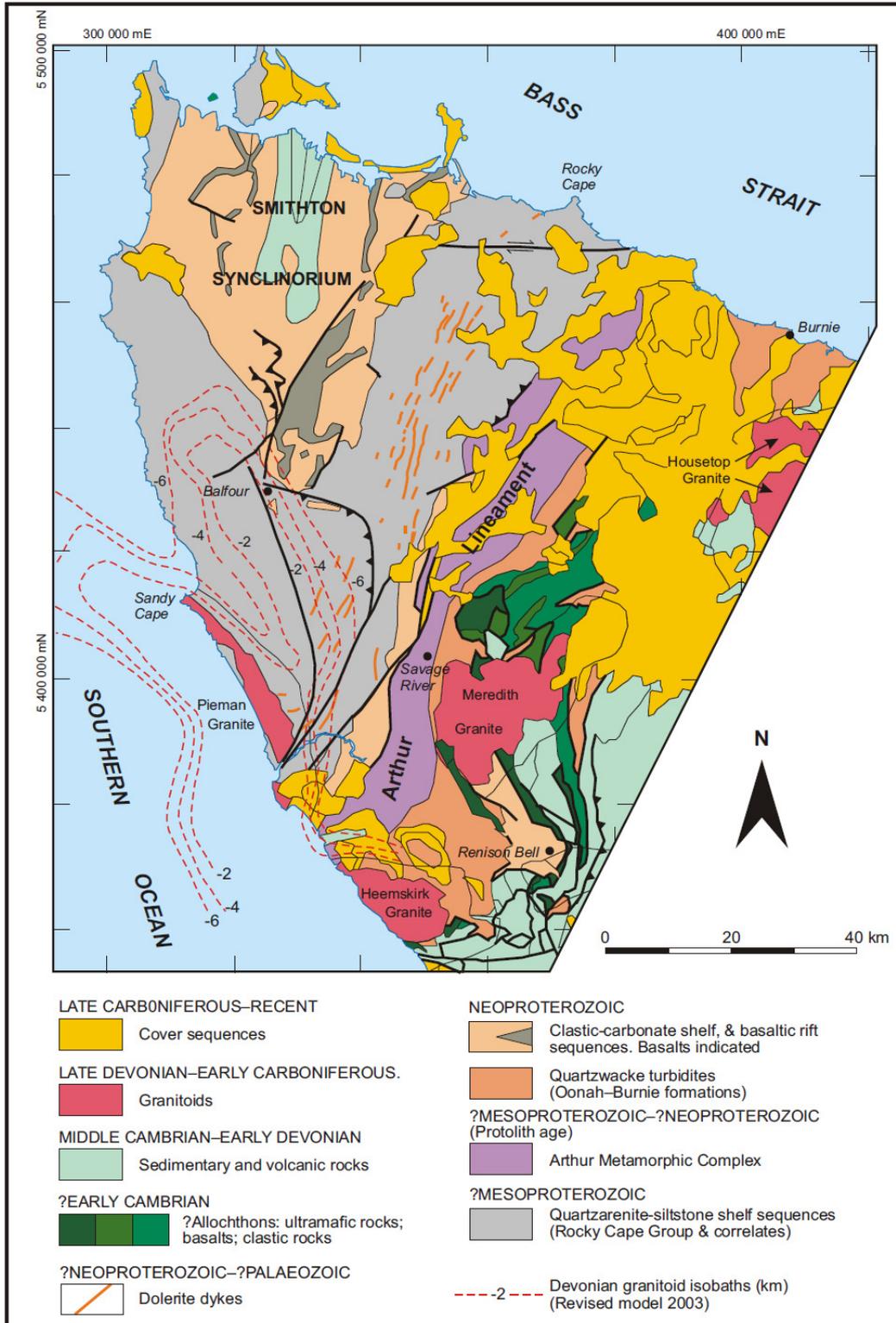


Figure 2. Regional Geology Northwest Tasmania (Everard *et al*, 2007).

## 2.1 District Mineralisation

Known mineralisation of the Balfour District consists of fault vein related copper deposits, Sn-WO<sub>3</sub> vein mineralisation and associated placers and massive magnetite bodies (Figure 3).



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### *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 3). 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. 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*

Sn-WO<sub>3</sub> 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-WO<sub>3</sub> occurrences in the Balfour Field, all but one are located within a 2km radius of the main Specimen Hill Prospect. The southern outlier is an unnamed prospect at 324,900mE, 5,429,300mN. The Sn mineralisation is restricted in comparison to the extensive Cu mineralisation along the Balfour Lineament.

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.

There are some reports of alluvial tin from the sluiced flat prospect but a hard rock source has not been identified.

### *Massive Magnetite-Sulphide*

Several massive magnetite-sulphide bodies are located 18km west and northwest of Balfour near Temma. The mineralisation occurs as magnetite dominated lodes with lesser hematite-chalcopyrite-tetrahedrite-sphalerite-galena-pyrite-Fe rich amphibole and Fe-Mn carbonates. The deposits appear to be fault related and are hosted within the Rocky Cape Group sediments. The primary lode assemblage is recognized as being pyrometasomatic skarn (Weber, 1983).

The only significant modern exploration of the lodes near Temma was completed by Geopeko (Herrmann and Sumpton, 1982, Weber, 1983). Metals appear to be erratically distributed and include maximum values of 2.2g/t Au, 22g/t Ag, 0.4% Cu and 1.8% Pb.



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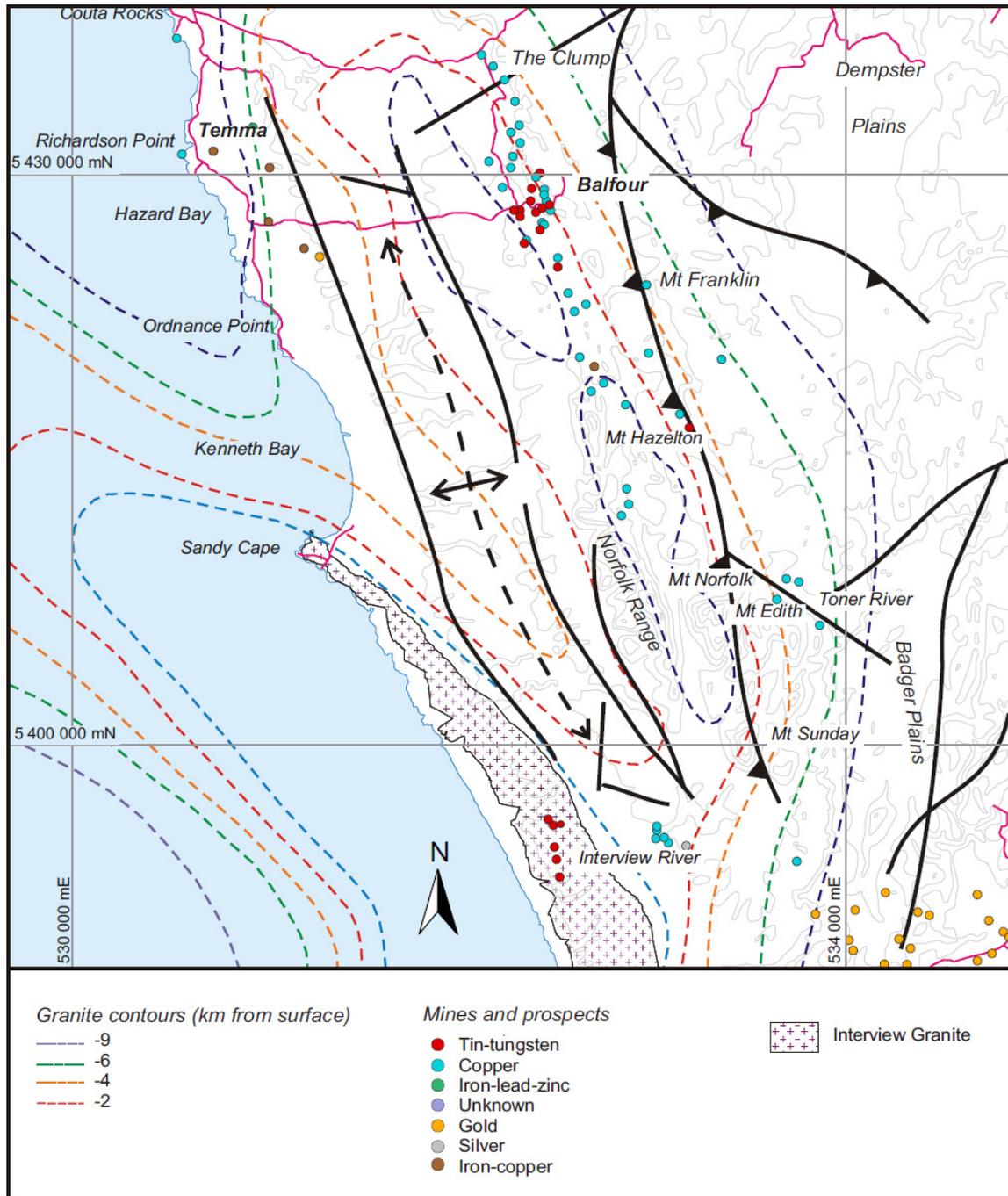


Figure 3. Granite Contours, Structure and Mineral deposits of the Balfour District, (Bottrill and Taheri, 2003).



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### **3 WORK COMPLETED, 2011**

#### **3.1 Roaring 41 South**

Fieldwork completed during the October 2010-2011 period included a 3 component downhole geophysical survey and modeling of the Roaring 41 South Prospect. The results were reported in last years annual report (Callaghan, 2010). Modeling of DHEM and Magnetic data suggests the mineralised body is of limited extent and is located near surface and does not extend below 100m depth. The modeled body is interpreted to plunge NW with limited strike extent.

#### **3.2 Exploration Review**

A review of the exploration potential of both EL's was completed in January 2011 (Callaghan, 2011). The review was completed to allow the JV partners to assess the project and plan a work program for the next few years. The full report is located in Appendix 1.

Conclusions from the review are summarised below:

1. *Compile Balfour drilling data and target 2-3 plus 1000m DDH on the Balfour shear below Specimen hill, adjacent to the interpreted Granite contact.*  
*Estimated cost \$800 000.*  
*Risk = High.*  
*Potential Return = High*
2. *Field check and compile historic data from Waratah-Sluiced Flat Prospects*  
*Estimated cost \$30 000.*  
*Risk = High.*  
*Potential Return = Low*
3. *Test down plunge potential of R41S.*  
*Estimated cost \$130 000.*  
*Risk = High.*  
*Potential Return = Moderate to Low*
4. *Acquire ground west of current projects to explore for Tennant Creek style Cu-Au and for Magnetite-Scheelite skarn mineralisation.*  
*Estimated cost \$50 000 (dependant on ERA process)*  
*Risk = High.*  
*Potential Return = Moderate*

The JV partners have agreed to follow up the recommendations for the Waratah Sluiced Flat area, recommendation 2.

#### **3.3 Waratah-Sluiced Flat**

Compilation of data has commenced and field investigations including mapping and stream sediment sampling is planned for October 2011.



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#### **4 DISCUSSION AND RECCOMENDATIONS**

The Balfour copper trend and tin-tungsten mineralisation on EL27/2007 has been extensively explored over the last 100 years. Given the level of exploration and caliber of previous explorers, it is unlikely that a significant body of mineralisation is located near surface.

However the regional setting and intensity of mineralisation strongly implies the presence of mineralised granite located at depth below the EL. The most intensely anomalous area is the Specimen Hill-Balfour area. Recent drilling has tested the mineralisation to a depth of 200m, identifying significant, but uneconomic mineralisation.

The best target is considered to be the depth extension of the Balfour and Specimen Hill structures/mineralisation. Both MRT regional gravity and the Haines EL wide gravity surveys suggest the granite is shallower than 1km in depth and located just west of Specimen Hill. Several 1000m plus drill holes could be drilled to test the down plunge extent of the Balfour shear attempting to test the shear/granite contact. The exploration program would be expensive and high risk. However given the world class nature of the Tasmanian tin-tungsten deposits the potential return can be considered as high.

Apart from tin-tungsten mineralisation, there is the added potential to discover significant copper mineralisation, again at depth. The copper source is most likely to be the native copper contained in the Spinks Basalt but there remains a possibility for it to have been remobilized from a sediment hosted copper body, or for the shear hosted and replacement mineralisation to be more extensive and higher grade.

Several of the southern more remote areas warrant some ground follow up, specifically the Waratah-Sluiced Flat Prospect area. This based mainly based on its structural, geophysical and geochemical similarities to the Balfour-Specimen Hill area, although it is obviously less well mineralised.

It is recommended that the historic drilling data of the Balfour lineament be compiled and a 3 dimensional geology model created to interpret the structural setting assisting target generation. If warranted several 1000m plus drill holes could be drilled to test the confluence of the major west dipping Balfour lineament below and west of the Specimen Hill Prospect.

EL40/2007 is less well explored. Much of the EL is covered by less interesting Rocky cape Group sediments and is much less geochemically anomalous. The R41S Prospect is the most significant mineralised feature identified on the EL to date. The body is clearly related to the Temma Ironstones located further west and north although significantly smaller. The Temma Ironstones had been previously recognized as carrying inconsistent base and precious metals. There are similarities between these ironstones and those of the Tennant Creek gold-copper mineralised ironstones. It must be remembered that only 1 in 100 of the Tennant Creek Ironstones is mineralised (Wedekind et al, 1989), so there remains the possibility of one, or part of one of the known prospects to host economic mineralisation.

There is potential to further test the R41S prospect down plunge to the NW with a series of short holes and one longer (250m) diamond hole.



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A review of the regional aeromagnetic data and historic exploration indicates potential test further mineralisation of this style west of EL 40/2007. Some of this area is held under EL by Shree Mining who are currently drilling the Nelson Bay River Prospect for its magnetite potential. The largest and most interesting area near Temma is held by Jaguar Minerals but the EL is due to expire this year. The ground immediately west of EL40/2007 is vacant and does contain a few discrete high intensity magnetic anomalies.

Although the Temma Ironstones are not known to host significant Scheelite, other granite related magnetite skarns in Tasmania host significant Scheelite mineralisation (e.g. Kara).

If this style of mineralisation is considered attractive to the BJV, the ground west of EL40/2007 should be acquired and all historic data compiled and reviewed.



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## **ADDITIONAL NOTES**

### ***STATEMENT OF INDEPENDENCE***

Tim Callaghan has no material interest or entitlement in the securities or assets of Balfour Management Joint Venture or any associated companies.

### ***LIMITATIONS AND CONSENT***

The report has been prepared for the Balfour Management Joint Venture using information collected by and historic information available to the Author at the time of writing. The opinions stated herein are given in good faith and with the belief that the basic assumptions are factual and correct and the interpretations reasonable.

This report is not intended for the use as a public document nor, in whole or in part, in a public document without written consent to the form and context in which it appears.

**All coordinates in this report are recorded in AMG66 Zone 55**



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## **Appendix 1**

### **Exploration Review**



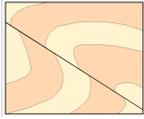
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PROSPECTIVITY REVIEW, 2011  
BALFOUR DISTRICT  
NW TASMANIA**

**Prepared for: Balfour Management Pty Ltd.**

**Tim Callaghan, January 2011**



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### EXECUTIVE SUMMARY

EL27/2007 covers a highly mineralised, and well explored area of northwestern Tasmania. The Balfour Copper Trend and Specimen Hill tin-tungsten mineralisation are the most prospective targets on the EL with prominent structural, geochemical and geophysical anomalies supported by significant drill hole intercepts. Despite the intensive exploration and historic mining activity, no significant economic bodies have been identified. Most significant targets have been tested near surface with the Specimen Hill, Murray's Reward and Central Balfour prospects tested to 200m depth.

Regional geophysical interpretation and the style and intensity of mineralisation indicate the proximity of a mineralised granite intrusion, most probably located at depth below the EL. The best remaining untested target on the EL is the depth extension of the Balfour and Specimen Hill structures/mineralisation. Both MRT regional and Haines detailed gravity surveys suggest the granite is above 1km in depth and located just west of Specimen Hill. Several 1000m plus drill holes could be drilled to test the down plunge extent of the Balfour Shear below Specimen Hill, adjacent to the interpreted granite intrusion. Given the world class nature of the Tasmanian tin-tungsten deposits the potential reward is high, as is the risk and cost of a deep drilling exploration program.

Apart from tin-tungsten mineralisation, there is the added potential to discover significant copper mineralisation, again at depth. The copper source is most likely to be the native copper contained in the Spinks Basalt but there remains a possibility for it to have been remobilized from a sediment hosted copper body.

Several other remote areas warrant some ground follow up, specifically the Waratah-Sluiced Flat Prospect area (Furious 50's), mainly based on its structural, geophysical and geochemical similarities to the Balfour-Specimen Hill area.

EL40/2007 is less well explored. Much of the EL is covered by less interesting Rocky Cape Group Sediments and is much less geochemically anomalous. The R41S prospect is the most significant mineralised feature identified on the EL to date. The body is clearly similar to the Temma Ironstones located further west and north although significantly smaller. The similarities between the ironstones and those of the Tennant Creek district was first noted by Geopeko in the early 1980's. It must be remembered that only 1 in 100 of the Tennant Creek Ironstones is mineralised (Wedekind et al, 1989), so there remains the possibility of one, or part of one of the existing bodies to host economic mineralisation. Although the Temma Ironstones are not known to host significant amounts of tungsten, other granite related magnetite skarns in Tasmania host significant Scheelite mineralisation (e.g. Kara).

There is limited potential to test the R41S prospect down plunge to the NW with several shallow (100m) and one deeper (250m) DDH.

Other magnetite hosted targets exist west of EL 40/2007. Some of this area is held as EL's by Shree Mining who are currently drilling the Nelson Bay River Prospect for its magnetite potential. The most prospective area for this mineralisation style is currently held by Jaguar Minerals although the EL is due to expire this year. The ground immediately west of EL40/2007 is vacant and does contain a few discrete high intensity magnetic anomalies.



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## **1 INTRODUCTION**

A Joint Venture agreement to explore for tin and tungsten mineralisation on EL27/2007 and EL40/2007 between Pleiades Resources Pty Ltd (PRPL) and King Island Scheelite Ltd (KIS) was signed in February 2009. The EL's are located in NW Tasmania near the historic mining district of Balfour. The Balfour district covers a 35km line of intermittent copper mineralisation exploited since the early 1900's with significant tin-tungsten mineralisation located west of the copper lineament.

The EL's cover a Tertiary peneplain vegetated by open button grass plains to the west and wet sclerophyll and rainforest to the east where the topography is incised by the Frankland River drainage system. Access to the EL's is relatively easy via the Western Explorer Road and historic mining/exploration access roads (Figure 1).

Exploration on the EL's involved an EL wide gravity survey and interpretation of open file aeromagnetic data. Three areas were identified for follow up exploration, Specimen Hill Sn-WO<sub>3</sub>, A gravity-magnetic high at R41S and a gravity low at Sluiced Flat. Four diamond drill holes were completed at Specimen Hill, one 500m long. Although no economic mineralisation was identified, numerous thin Sn-WO<sub>3</sub> veins were intersected as had been identified by earlier explorers BHP and Geopeko. Exploration then focused on the R41S prospect with the drilling of two holes identifying a small, near surface magnetite-carbonate vein with minor copper-gold mineralisation.

Expenditure for EL27/2007 was supposed to be \$750 000 however an oversight saw some of the committed expenditure spent on the adjoining EL40/2007 (R41S). It is a distinct possibility that EL27/2007, hosting the Balfour copper prospects and Specimen hill Sn-WO<sub>3</sub> prospects will have to be relinquished under the terms of Mineral Resources Tasmania (MRT) guidelines for ERA tenders.

After three years of exploration a prospectivity review has been requested by the JV partners for EL27/2007 and EL40/2007.



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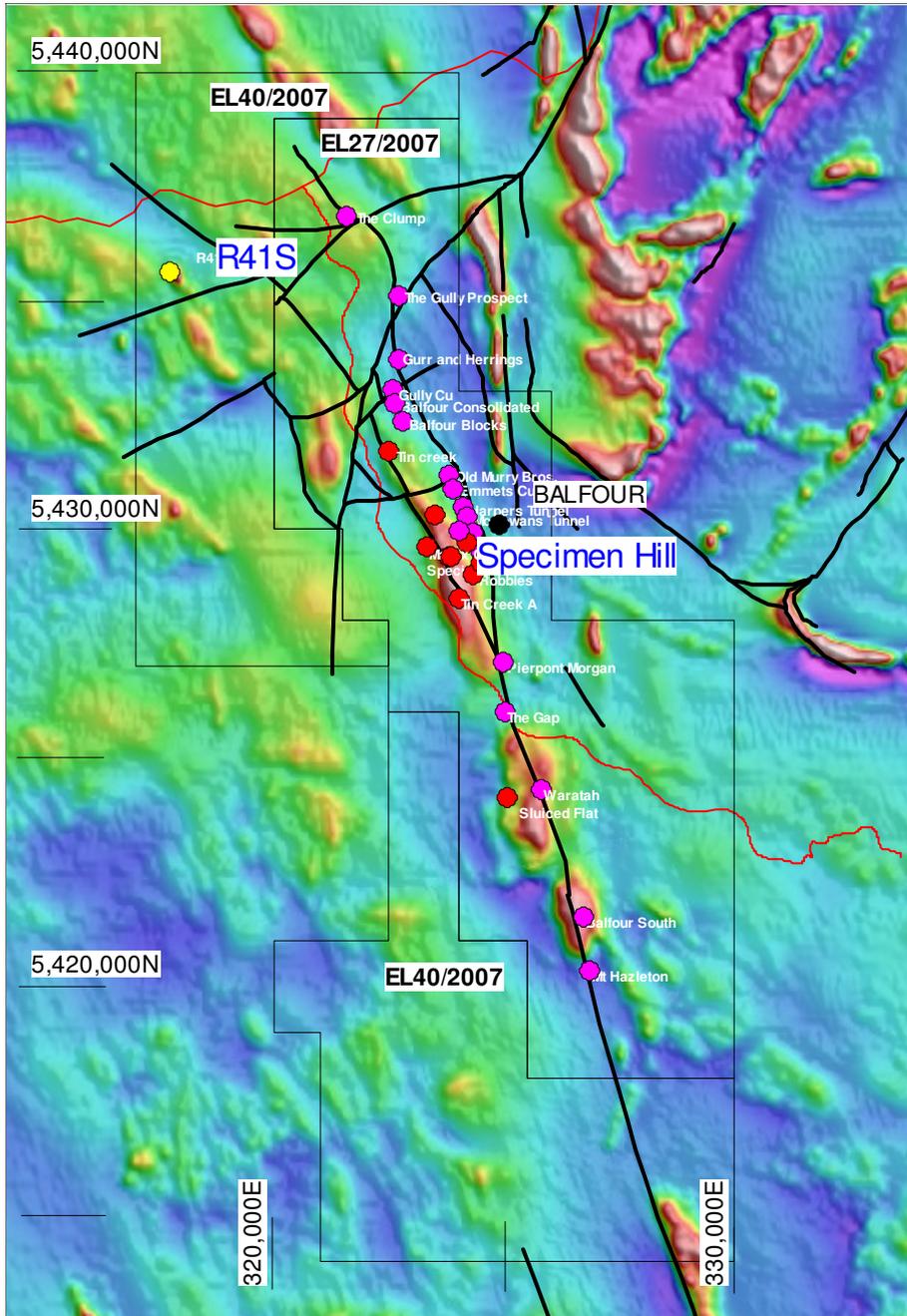


Figure 1. Balfour tenement location plan, total magnetic intensity image and known mineral deposits.

Purple = copper, Red=Sn-WO<sub>3</sub>, Yellow = Magnetite-Cu.



## 2 EXPLORATION HISTORY

Substantial Mining and Exploration activity has occurred in the Balfour district since the early 1880's. Actual metal production of both tin and copper is not well documented but 126t of tin metal is recorded in mines department records between 1907 and 1942, mainly from alluvial workings. Minor tin production from alluvial workings occurred until the collapse of the tin price in the late 1980's. Copper production was also fairly insubstantial with 6,380t of copper produced from the Murray's Reward and Central Balfour workings between 1906 and 1917. From 1917 to 1942 only 3.8tonnes of copper was produced. In 1990 a parcel of 130t at 24% Cu was transported to Mt Lyell by Martin Laan. None of the other copper prospects produced significantly.

Modern exploration has been intensive since the 1960's with many published and open file reports available from the MRT library. The most comprehensive and detailed exploration work is summarised below:

**BHP 1963-1965** - focused mainly on the Specimen Hill tin-tungsten potential. Geochemical and geological plans and maps are the most detailed for these prospects. Airborne and follow up ground magnetics and gravity surveys completed with the first recognition of the prominent magnetic anomaly under Specimen Hill. Four diamond drill holes were completed. Numerous thin high grade tin-tungsten veins intersected but the vein widths and densities were considered too low to be economic.

**BMR 1964 and 1966** - two fixed wing EM surveys.

**Pickand-Mather and Co. International 1965 – 1967** - completed extensive stream sampling across the Rocky Cape Group. Discovered the Temma Magnetite lodes and drilled two DDH.

**ACI 1968-1974** - in joint venture with Mt Lyell and Renison Ltd. investigated the potential of the Balfour copper trend. Comprehensive detailed adit and costean rock chip sampling, soil and stream geochemistry completed. IP geophysical surveys were completed over 12km of strike length, with detailed infill of more prospective areas.

Thirty seven drill holes for 5816.2m were drilled on eight prospects over a 17km strike length including Waratah (2), Pierpont-Morgan (2), Development (1), Gully (1), Murray's Reward (16), Central Balfour (3), Balfour Blocks (3), Cassiterite Creek (1) and the Clump (8). Quartz-dolomite-chalcopyrite zones were found to be up to 20m wide averaging 0.5% Cu. (A more detailed summary of the drilling follows in section 4.2).

**1974 ESSO** - Fixed wing EM and magnetic survey on 800m lines at 120m height over southern Arthur River area. Most anomalies attributed to graphitic shales now mapped as Cowrie Siltstone.

**1977 – 1985 CRA Exploration Pty Ltd.** - Commenced with regional helicopter supported stream sediment sampling focused on tin and base metals. Later focus prioritized heavily on the Balfour District, particularly Specimen Hill area for tin with geochemical sampling, geological mapping, magnetic, SP, DIGHEM and IP surveys culminating in drilling of 8 DDH. Numerous thin high grade tin-tungsten veins



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intersected but again the vein widths and densities were considered too low to be economic.

**1982 Geoex-MRT** - fixed wing aeromagnetic survey

**1988 - 1992 Solorien Mining Pty Ltd** - Regional gravity survey on 1km spacing and detailed gravity of Balfour and The Clump.

**1993 - 1997 CRAE-RIO** - Digital compilation of historic geochemistry, IP and drilling data (*unfortunately* the digital data was *not available for this review*). Further infill rock chip and soil sampling completed along with geological mapping of the Murray's Reward-Specimen Hill area (Nick turner, 1994) culminating in a further 3 DDH.

**1997 - 1998 Pacific Nevada** - Pacific Nevada identified the area as being prospective for sediment hosted and structurally controlled Cu and Au deposits. Airborne EM, stream sediment sampling and rock chip geochemistry completed. No conductors observed associated with cu mineralisation. Later exploration focused on the Nelson Bay River Magnetite prospect discovered earlier by Pickand-Mather and Geopeko. Two additional holes drilled intersecting magnetite-quartz-carbonate-amphibole skarn. Most metal concentrations other than iron were low.

**2004 - 2005 Jaguar** - Follow up of MRT 2002 helimagnetic and EM survey, specifically EM conductors west of Balfour copper mineralisation. Follow up ground EM culminated in drilling. The EM conductors were attributed to graphitic shales (hardly surprising). Two additional holes at Tatlow's Prospect detected low level tin mineralisation.

**2006 - Present Pleiades Ltd and Balfour JV** - EL wide ground based gravity survey and reinterpretation of MRT helimagnetic survey identified three target areas, Specimen Hill, Roaring 41 South (R41S) and Sluiced Flat. Four DDH's completed at Specimen Hill identifying numerous, thin tin-tungsten veins. Vein densities were too thin to be economic. Two DDH completed at R41S, one identifying magnetite-carbonate vein hosted copper gold mineralisation. Subsequent down hole magnetic and down hole EM surveys coupled with a reinterpretation of ground magnetic data suggest the bodies are small and have limited depth continuity.



### 3 REGIONAL GEOLOGY

The Geology of NW Tasmania has been studied by many Geologists with the most recent Mineral Resources Tasmania report (Everard *et al*, 2007) summarized in this section.

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 (Figure 2). 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.

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 volcanoclastic 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



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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 -Temma 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).



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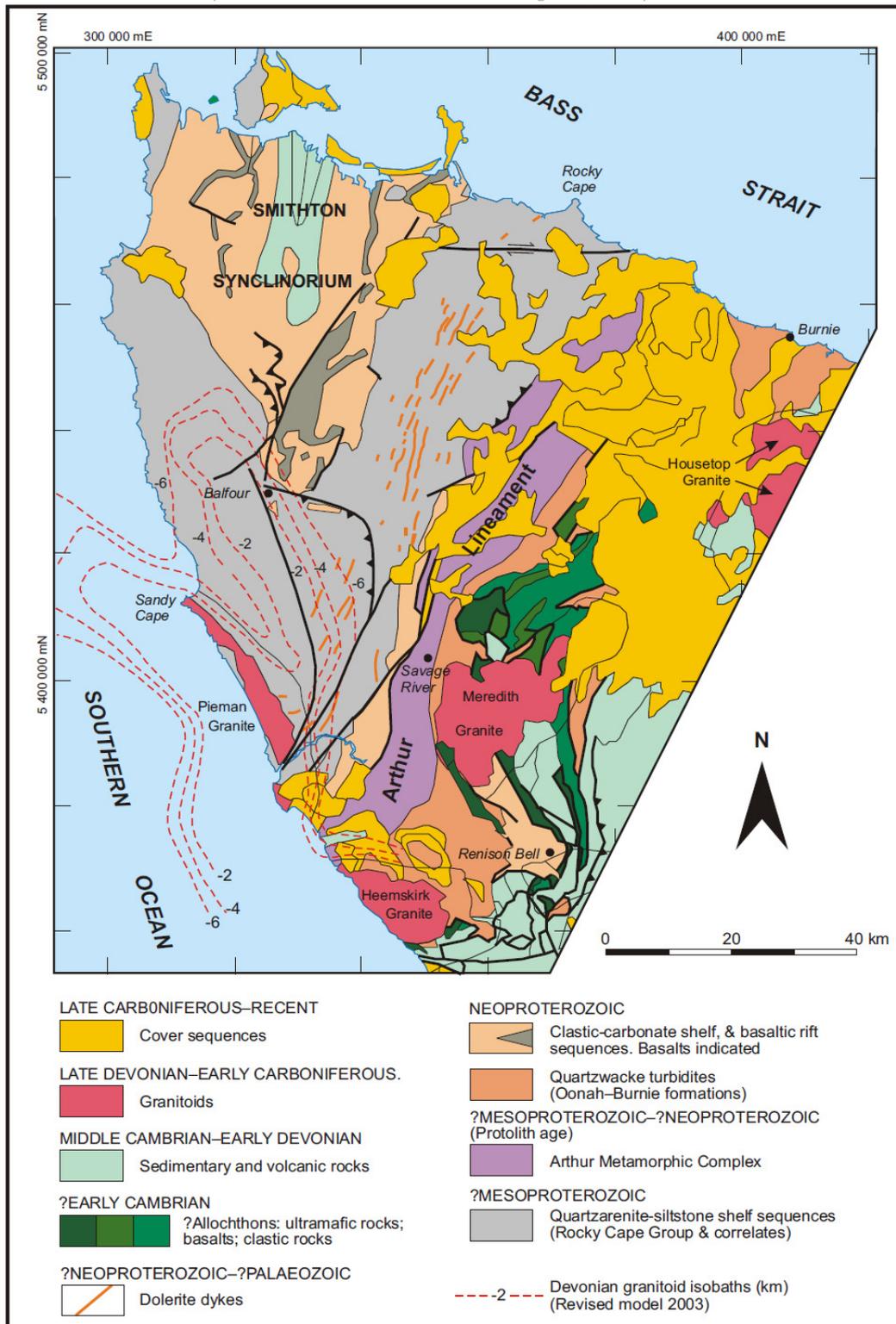


Figure 2. Regional Geology Northwest Tasmania (Everard *et al*, 2007).

### 3.1 District Mineralisation

Known mineralisation of the Balfour District consists of fault vein related copper deposits, Sn-WO<sub>3</sub> vein mineralisation and associated placers and massive magnetite bodies (Figure 3).



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### *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 3). 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. 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*

Sn-WO<sub>3</sub> 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-WO<sub>3</sub> occurrences in the Balfour Field, all but one are located within a 2km radius of the main Specimen Hill Prospect. The southern outlier is an unnamed prospect at 324,900mE, 5,429,300mN. The Sn mineralisation is restricted in comparison to the extensive Cu mineralisation along the Balfour Lineament.

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.

### *Massive Magnetite-Sulphide*

Several massive magnetite-sulphide bodies are located 18km west and northwest of Balfour near Temma. The mineralisation occurs as magnetite dominated lodes with lesser hematite-chalcopyrite-tetrahedrite-sphalerite-galena-pyrite-Fe rich amphibole and Fe-Mn carbonates. The deposits appear to be fault related and are hosted within the Rocky Cape Group sediments. The primary lode assemblage is recognized as being pyrometasomatic skarn (Weber, 1983).

The only significant modern exploration of the lodes near Temma was completed by Geopeko (Herrmann and Sumpton, 1982, Weber, 1983). Metals appear to be erratically distributed and include maximum values of 2.2g/t Au, 22g/t Ag, 0.4% Cu and 1.8% Pb.



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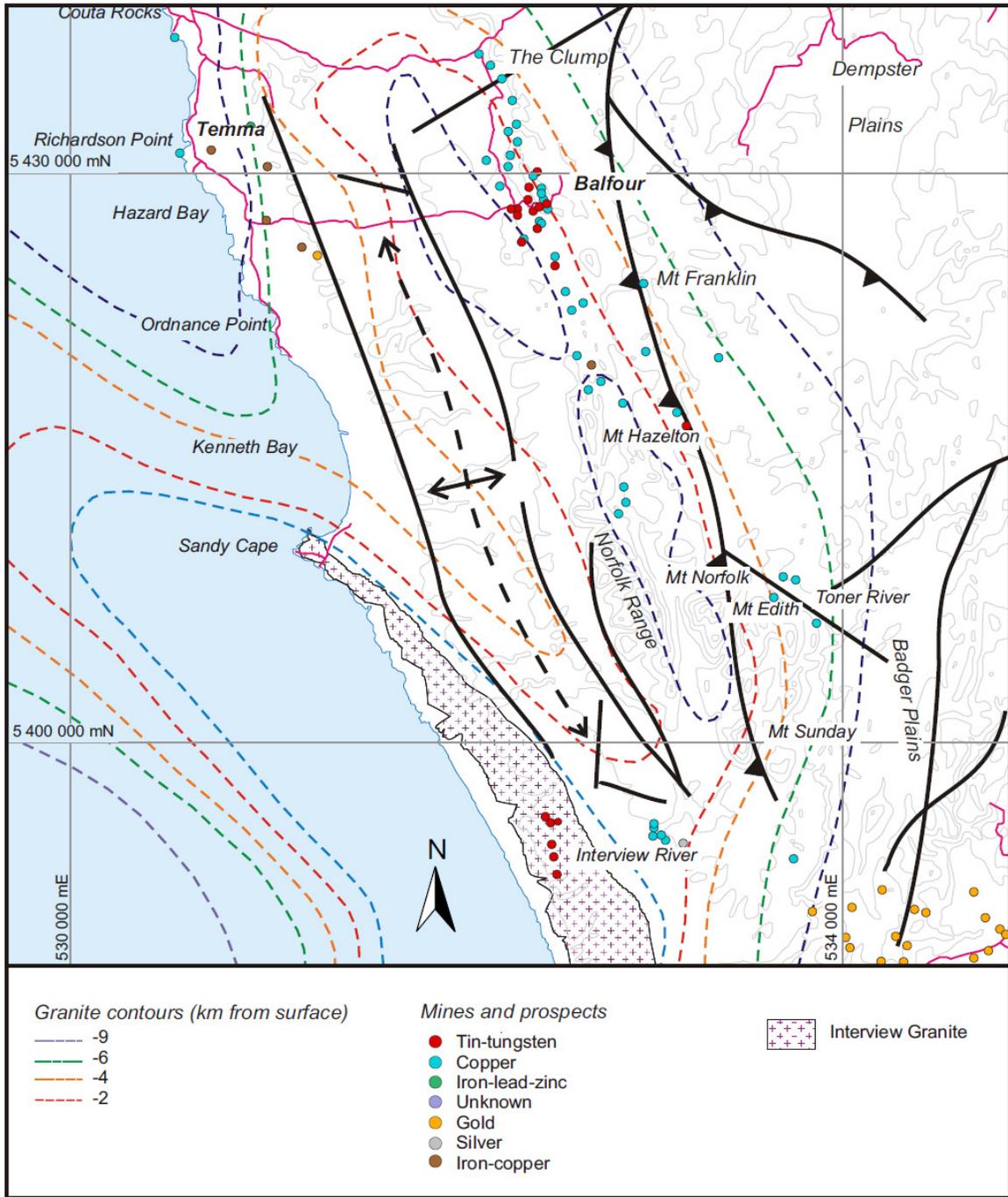


Figure 3. Granite Contours, Structure and Mineral deposits of the Balfour District, (Bottrill and Taheri, 2003).



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### 4 PROSPECTIVITY EL27/2007 AND 40/2007

#### 4.1 TIN-TUNGSTEN

The majority of the Tin-Tungsten deposits are concentrated around the main Specimen Hill Prospect and include the Skinners Flat, Tin Creek, Tatlow's and Peter's Ridge prospects. Minor alluvial tin was recovered from the Sluiced Flat prospect to the south (Figure 1). The district has been exploited for tin from the early 1900's through to the late 1980s with essentially all production from alluvial sources.

The Balfour - Specimen Hill area is clearly the most mineralised part of the district with numerous tin-tungsten and copper prospects clustered around a prominent NW shear system and an strong associated magnetic and IP high. The prospects are also adjacent to a regional gravity low (Figure 3) and local gravity low (Figure 5).

The Specimen Hill Prospect has been subject to three separate drilling campaigns focused on the Sn-WO<sub>3</sub> potential, BHP (1964-65), CRAE-Geopeko (1980-83) and now the Balfour Joint Venture in 2009. A single hole was drilled by Jaguar at the Tatlow's Prospect in the early 2000's. Earlier campaigns included extensive geochemical and geophysical campaigns over all known Sn-WO<sub>3</sub> prospects including soil and stream geochemistry, ground magnetics, EM, IP as well as geological mapping, costeaning and sampling.

A total of 15 drill holes have been drilled into the prospect. The prospect does contain sporadic ore grade Sn and WO<sub>3</sub> within the quartz veining (up to 10% Sn and 1% WO<sub>3</sub>). However vein density is unacceptably low with drill holes now testing the prospect to >200m depth.

The altered wall rock contains much less Sn and WO<sub>3</sub> at around 100-400ppm. The best intersections of bulked mineralised zones average about 0.1% combined Sn - WO<sub>3</sub>. For example:

BJV002 69.0 – 83.0 14.0m @ 0.2% WO<sub>3</sub>  
BJV003 229.0 – 243.0 14.0m @ 0.1% WO<sub>3</sub>  
BJV003 112.0 – 124.0 12.0m @ 0.1% Sn

Estimates of tonnage potential at Specimen Hill were made by Langford 1982 and Paterson 1996. The surface area of the mineralised breccia was in the order of 44,000m<sup>3</sup>. Using a minable depth of 100m and an SG of 2.5, a maximum possible open pit resource of approximately 10Mt could be contained if mineralised intersections were continuous. This however is not the case given most intersections of >0.1% combined Sn - WO<sub>3</sub> are a few tens of metres wide at best with most being 1-2m in width. It is highly unlikely that the top 100m of the Specimen Hill Prospect contains economic quantities of hard rock Sn-WO<sub>3</sub> mineralisation (even at today's prices).

Despite the thin and sporadic mineralisation at surface, the drilling results from all three programs can not be regarded as insignificant. There are numerous occurrences of Sn-WO<sub>3</sub> mineralisation between the west dipping Balfour shear and the east dipping thrust bounding the Cassiterite Creek Sandstone and the Skinners Flat Siltstone (Figure 4). The confluence of these two structures is a potential target but this is estimated to be over 800m deep. There is no doubt that the Balfour Field has endured at least two significant mineralizing events with prominent Cu and Sn-



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WO<sub>3</sub> mineralisation present. It is possible that the surface expression is the distal margins of a larger system and the possibility of a substantial deposit at depth remains. Whether this represents a viable target is entirely dependent on the grade which cannot be determined without drilling. Exploration will be expensive and success is not guaranteed.

The strike extent of the magnetic anomaly and associated anomalous geochemical anomalies/prospects has not been tested, particularly at depth.

The association of Sn-WO<sub>3</sub> mineralisation and granite intrusions is well documented. The fissure related copper mineralisation is also likely to be related to the granitic mineralizing system with the copper forming a distal halo around the proximal tin-tungsten mineralisation. Fluid inclusion and sulphur and oxygen isotopic studies (Taheri and Bottrill, 2004) suggest the copper mineralisation has been remobilized by granitic and meteoric/metamorphic fluids. Similar remobilized copper occurs on the periphery of the Renison Bell deposit with copper sourced from the hangingwall Crimson Creek Formation basaltic volcanoclastics.

The interpreted granite intrusion associated with the residual gravity low west of Specimen Hill remains untested (Figures 5). There is no evidence of thermal alteration or mineralisation associated with the anomaly and it is likely that the actual intrusion is deeper than the 200m used for the model. However there is a high probability that mineralised granite is located within 1km of the prospect and all gravity surveys suggest it is located just west of Specimen Hill.

The tin mineralisation is associated with a prominent magnetic high that is probably attributable to disseminated pyrrhotite in host sediments (Figure 6). Alternatively the strong magnetic anomalies may represent a deeper pyrrhotite rich body, possibly associated with the tin-copper mineralizing system.

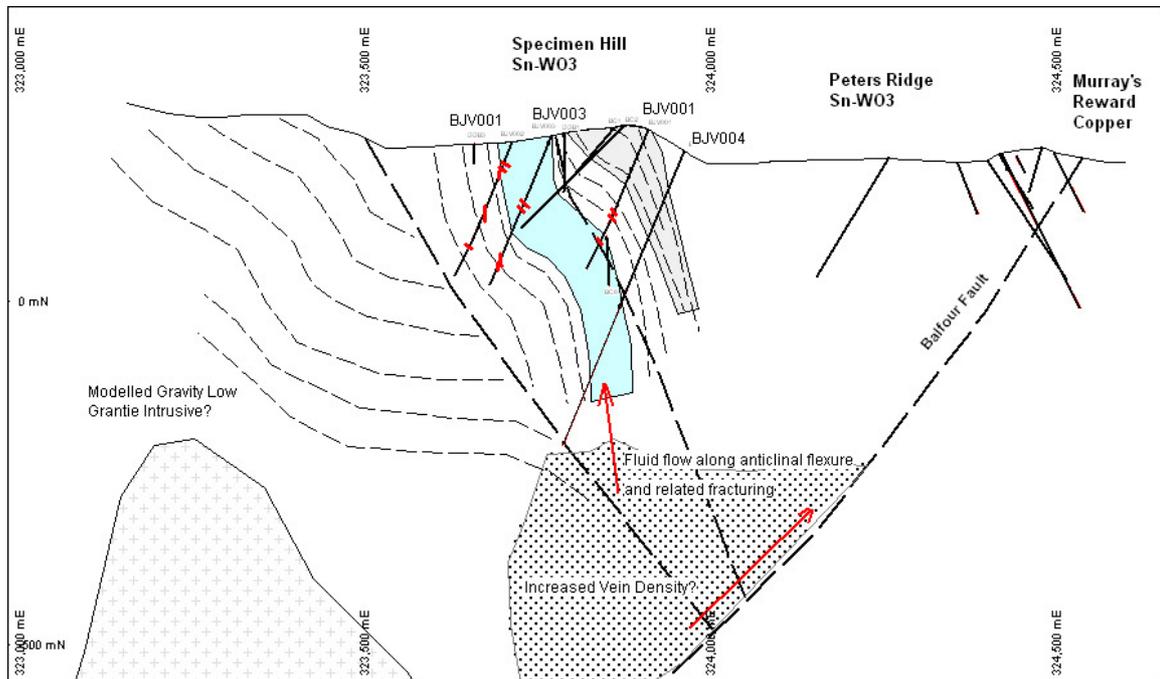
Finding economic tin-tungsten mineralisation near surface is unlikely as the area has been extensively explored to 100-200m. However the geological, geophysical and geochemical evidence all suggest a tin-tungsten rich granite body is located nearby. Deep exploration drilling targeted below and west of the Specimen Hill/Balfour mineral prospects is the only way of exploring. Exploration will be high cost with no guarantee of success, but the amount of mineralisation present at surface, and the presence of world class deposits (Renison Bell, Mt Bischoff and Dolphin) associated with the Tasmanian granites suggest the reward could be great.



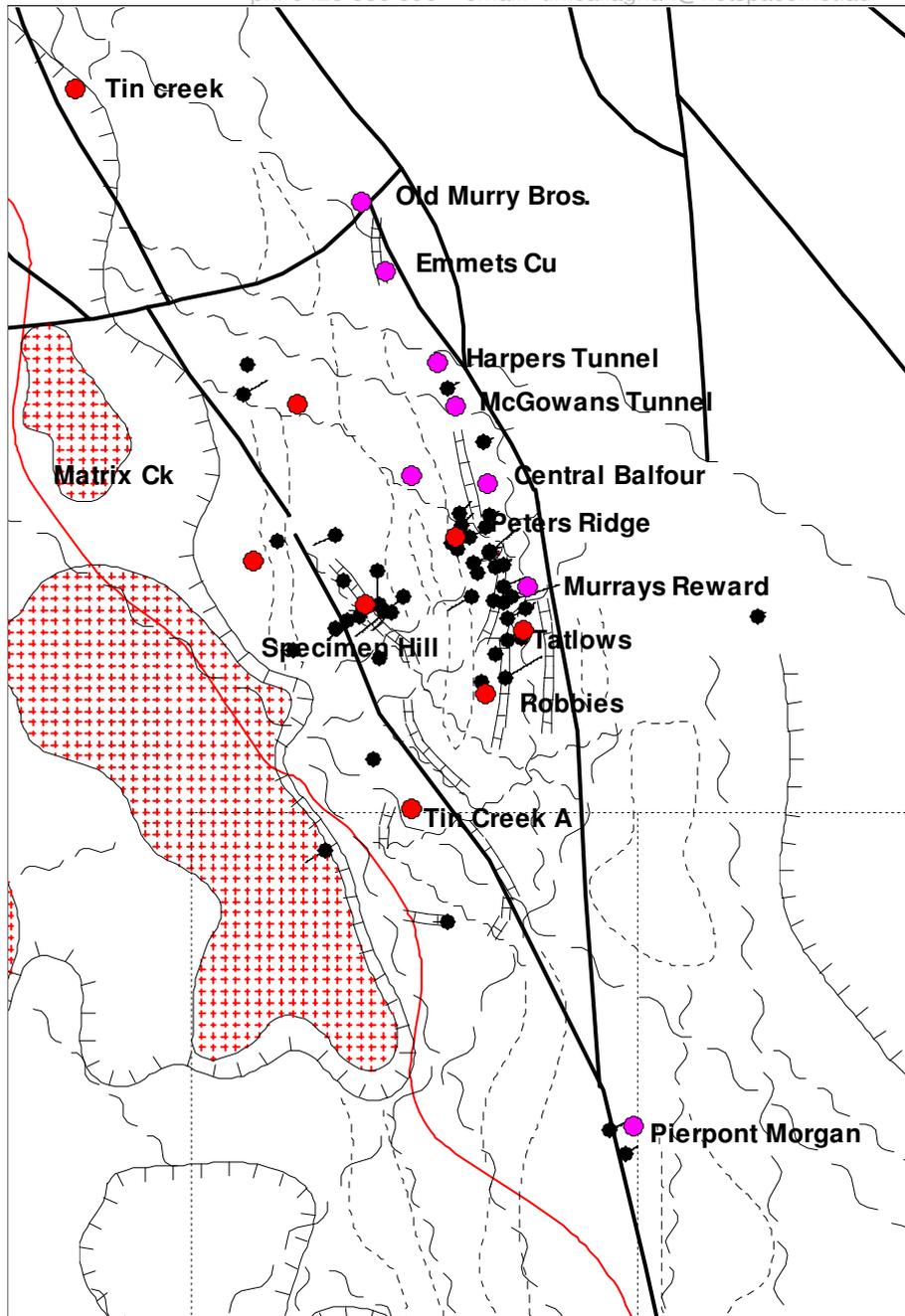
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**Figure 4. Section 5429350, Drill hole locations and Geology Interpretation. The tin mineralisation probably represents the distal margins of a deeper granite related mineralizing system. The Balfour copper mineralisation has been demonstrated to be due to Devonian granitic/meteoric fluids and is therefore likely to be part of the same mineralizing event.**



**Figure 5. Balfour-Specimen Hill gravity interpretation (red hatched = gravity low), mineralised prospects (purple = copper, red = tin) and diamond drill holes (black).**



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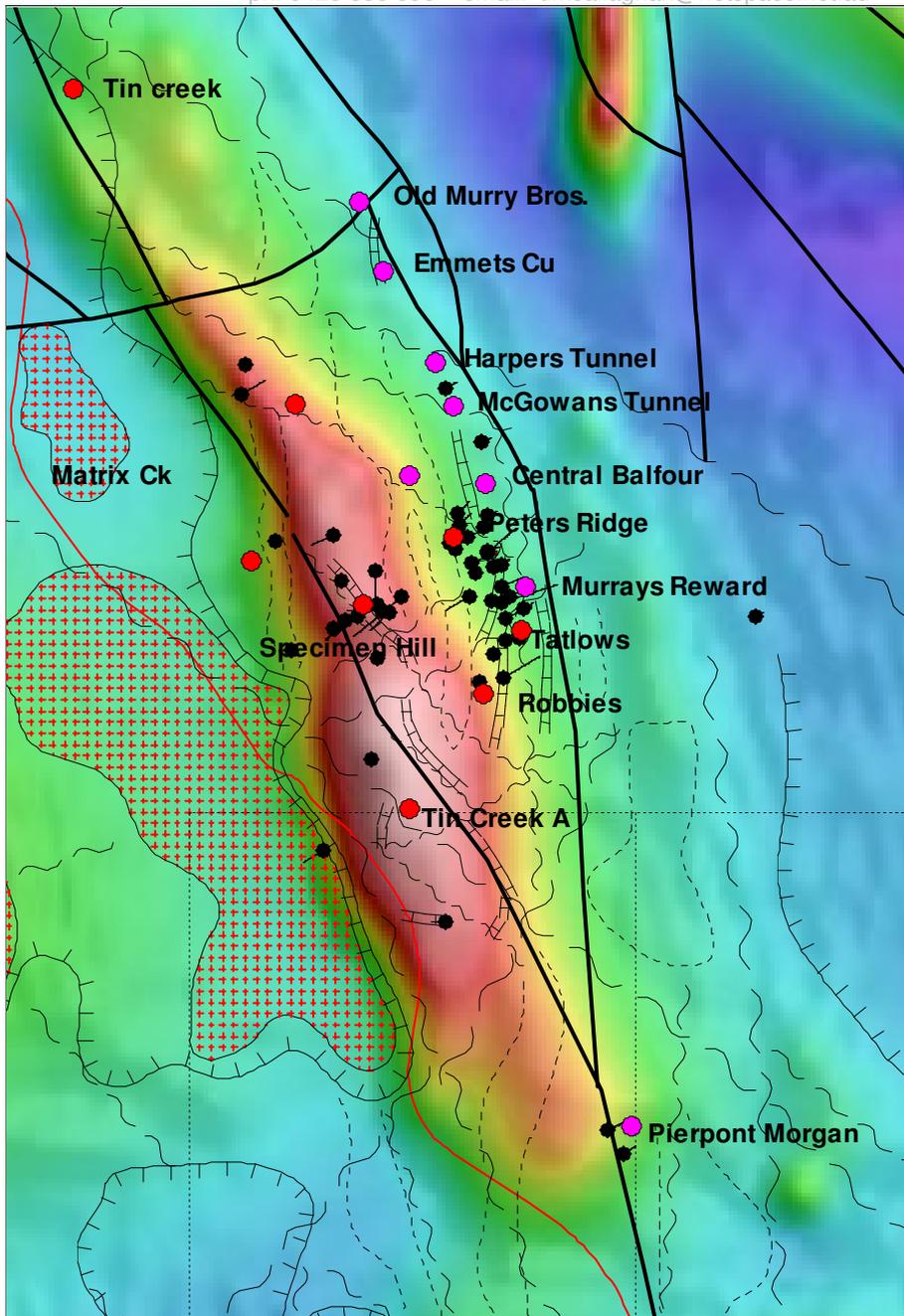


Figure 6. Balfour-Specimen Hill TMI, mineralised prospects (purple = copper, red = tin) and diamond drill holes (black).



## 4.2 FAULT HOSTED COPPER

The Balfour Copper Belt consists of a 30km NNW trending lineament of fault related copper-quartz-dolomite mineralisation ranging between 2-30m width (average 4m?). Mining commenced in the 1900's but was short lived with most production from small, near surface supergene enriched fissure related copper veins. The largest of the known deposits at Murray's Reward had an early, pre - JORC resource estimate of 0.5MT @ 0.8% Cu (MacIntyre, 1973). Some of the near surface resource was removed as a small gouging operation and trucked to Mt Lyell in the 1990's. Drilling of the Murray's Reward area is sufficient to outline the deposit to 200m depth.

Mineralisation is hosted in NNW trending, steeply west dipping thin shoots that are depth persistent. The small size and tonnes per vertical meter of the known near surface deposits suggest they are not likely to be commercially viable under current economic and cost structures.

The small copper deposits have been extensively explored by BHP, Geopeko, CRAE and ACI in successive exploration campaigns. The deposits have modest geochemical anomalies and are IP responsive. Most near surface prospect have been tested by at least one DDH (Figures 4, 5 and 6).

There is some speculation as to the source of the copper mineralisation. Early workers have postulated that the fissure related copper mineralisation may be remobilized from a deeper source of mineralisation. Taheri and Bottrill (2004) suggest the copper has been remobilized by granitic or meteoric fluids based on isotopic and geochemical evidence. The copper source is unknown but is likely to be the native copper contained in the Spinks Basalt of the Kanunnah Subgroup. The Kanunnah Subgroup is interpreted to lie below the Balfour district with the older Rocky Cape Group overlying in fault contact.

### *Central Balfour Mineralisation*

The Central Balfour Prospect is located approximately 3km north of Murray's Reward (Figure 6). It was systematically explored as part of ACI's drilling program, delineating a mineralised zone of approximately 800m length (MacIntyre, 1973). Although discontinuous, some significant copper mineralisation was intersected including:

<b>BHID</b>	<b>From (m)</b>	<b>Length (m)</b>	<b>Cu %</b>	<b>Comments</b>
DDH21	42.1	13.2	0.6%	Nth Central Balfour
DDH16	62.5	21.7	1.4%	Near Murray's Reward
DDH36	25.5	25.5	1.4%	Murray's Reward Splay

However there are numerous holes in and around these intersections with little to no mineralisation demonstrating the discontinuity of these fissure vein style deposits.

The current level of exploration suggests there is little potential for significant copper mineralisation within 200m of surface. However the depth potential remains



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untested. The Balfour Shear is obviously a conduit for mineralisation, most probably granite related. There is a possibility of Sn-WO<sub>3</sub> and Cu mineralisation increasing in intensity closer to the granite source.

### *The Clump*

The Clump Prospect is located about 9KM NNW of Balfour along the same structural trend. It consists of a number of historic workings that have been systematically explored by modern explorers. Eight drill holes were completed by ACI in the 1970's. Steep west dipping quartz-carbonate-sulphide veins were intersected but only low grade copper mineralisation was intersected.

DDH1, DDH28, ACI Section A - west dip lode low grade at depth 4.5m @ 0.05% Cu.  
DDH2, DDH7, ACI Section B - west dip 20m carbonate lode 0.15% Cu.  
DDH3, ACI Section C - qtz in graphitic sediments, max assay 0.7% @ 2.3% Cu  
DDH4, ACI Section D - 1.5m @ 1.5% Cu, 1m @ 0.2% Cu in siliceous sediments.  
DDH9, DDH27, Section E - Vertical to west dip lode. DDH27 5.7m @ 0.57% Cu,  
DDH9 sludge samples to 0.35 Cu.

The Clump prospect appears to be adequately drilled to demonstrate the thin, low grade mineralisation responsible for the geochemical and IP anomalies.

### *Emmett's Prospect*

Quartz ironstone ridge with old workings located 700m north of Central Prospect shaft. ACI re-dug old costeans, sampled the adit and drilled DDH22. No significant copper assays were returned.

### *Gap Prospect*

Conceptual CRA target based on demagnetized part of semi continuous magnetic high defined by Specimen Hill pyrrhotitic siltstone. Weak Soil Cu, As and Fe were returned but no significant mineralisation and alteration was identified.

### *Gully Prospect.*

ACI drilled one hole DDH11 near an adit driven from the Frankland River bank under the Balfour Shear. No significant mineralisation was identified.

### *Murray's Reward Mine*

Murray's Reward was the main producer in the Balfour Field and produced 6000t in the early 20<sup>th</sup> Century. Workings consist of 4 adits and open cut and several shafts and costeans. Steep west dipping quartz-carbonate sulphide mineralisation up to 20m wide contains some high grade copper lodes.

The prospect has been investigated by BHP, ACI and CRA over the last 40 years. Numerous rock chip geochemical samples return high copper and the mineralisation is IP responsive.

ACI drilled 19 diamond drill holes into the prospect with many mineralised intersections returned. CRA drilled a further 3 deeper DDH in the late 1990's. Some of the drill results are listed below.



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BHID	From (m)	Length (m)	Cu %
DDH10		1.1	1.3%
DDH33	118.1	6.3	1.3%
DDH34	136.2	3.2	0.3%
DDH35			nsa
DDH36	195.0	25.5	0.8%
DDH37	204.9	5.1	0.2%
DDH13		11.6	0.7%
DDH14	84.4	21.2	0.9%
DDH16	62.5	21.7	1.4%
DDH19		12.8	0.5%
DDH21	42.5	13.2	0.6%
DDH23	57.0	3.1	2.1%

Drilling at Murray's Reward demonstrates the moderately mineralised, steep west dipping fault related mineralisation. Mineralised grades, widths and geometry suggest the deposit is not sufficient to support a viable operation. Although the few deeper drill holes do not suggest mineralisation increases with depth (to 200m) whether mineralisation intensity increases down dip towards the postulated granitic body remains an untested possibility.

### *Mt Hazelton*

CRA defined IP anomalies coincident with aeromagnetic anomaly. A gossan associated with the IP anomaly contained anomalous copper and one float sample from an adit returned 6.5% Cu. One drillhole was completed but details have not been viewed. This prospect may require ground follow up.

### *Pierpont Morgan*

Old workings on quartz ridge 2.5km south of Murray's Reward. ACI sampled and drilled the prospect identifying quartz-dolomite shear hosted veining. No significant copper was identified.

### *South Balfour*

The South Balfour Prospect is located 8km South of Balfour and consists of a 20m wide structural zone with some high grade Cu veins and anomalous As and Au (to 1g/t). The prospect is associated with a prominent magnetic high on the Balfour shear. Old workings consist of an adit and a shaft. No drilling has been completed on this prospect. Apparently apatite has been identified in the quartz veining (Taheri and Bottrill, 2004). The area is under explored and warrants further investigation.

### *Waratah*

The Waratah Prospect located 7km south of Balfour is associated with a prominent quartz ridge and again a strong aeromagnetic high along the Balfour structural Lineament. Alluvial tin was allegedly recovered from the Sluiced Flat Prospect immediately east of the Waratah Prospect. ACI drilled two DDH, both detected no appreciable copper mineralisation. No gold assays were completed.

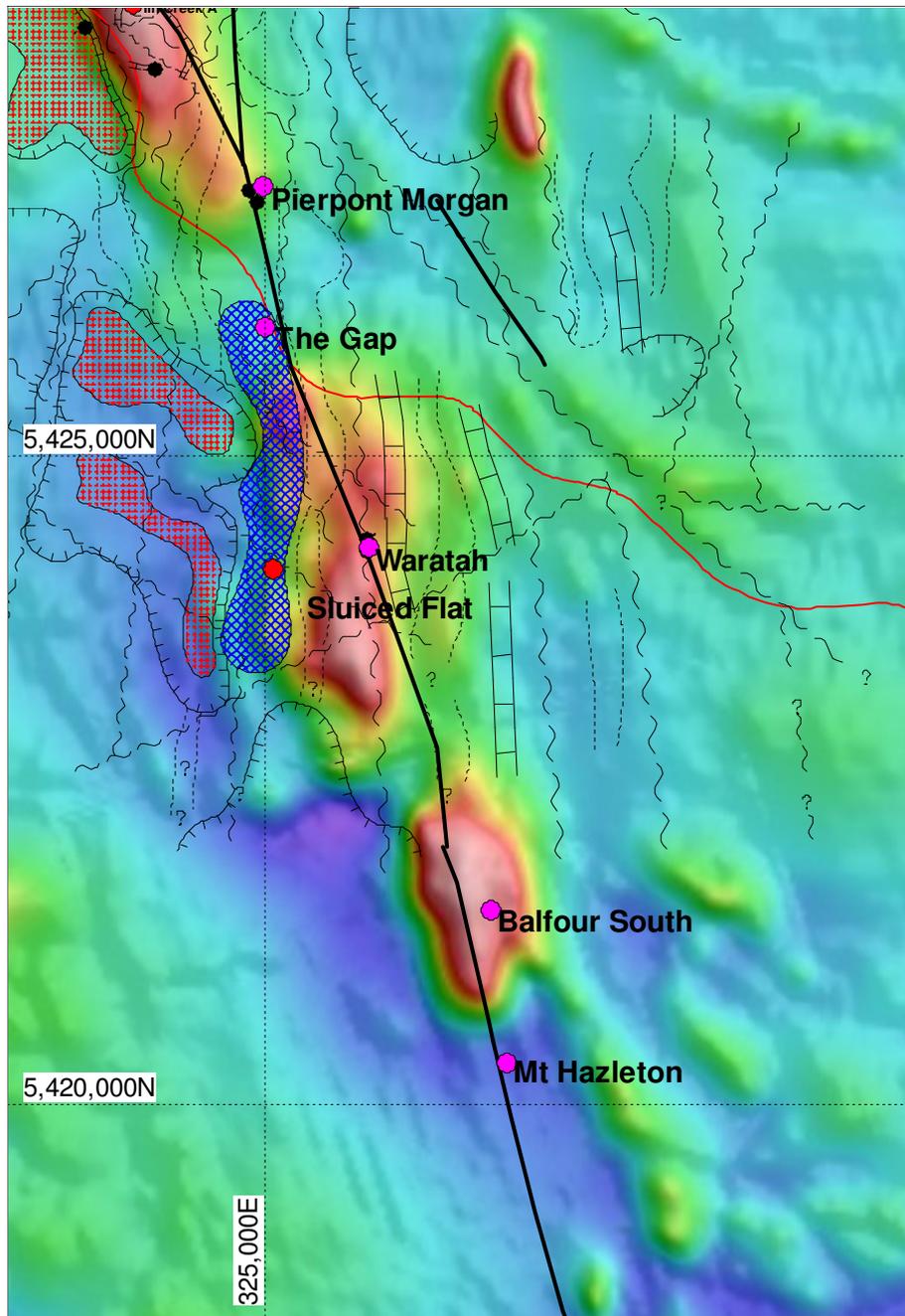


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The prominent magnetic anomaly and juxtaposition of copper mineralisation with tin mineralisation (alluvial) at Sluiced Flat is similar to the Specimen Hill prospect further north. (This area was re-named Furious 50's by Pleiades). The area is under explored and warrants at least some field investigation.



**Figure 7. South Balfour-Sluiced Flat, TMI and mineralised prospects (purple = copper, red = tin) and diamond drill holes (black).**



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#### **4.3 MAGNETITE-COPPER-GOLD**

Magnetite-siderite bodies are well known in the Temma district 10-15km's west and north of R41S. Some of these have been historically investigated, mainly by Geopeko in the early 1980's (Hermann and Sumpton, 1982, Weber, 1983) and later by Pacific Nevada (Newnham, 2000) and currently by Shree Minerals Pty Ltd. Exploration models for Geopeko and Pacific Nevada were based on Proterozoic Iron oxide copper-gold deposits, principally Tennant Creek Style replacement ironstones and breccia pipes. Shree are exploring for iron ore deposits NW of the EL at the Nelson Bay River Prospect.

The Temma Ironstones consist of magnetite-siderite-quartz, Fe rich amphibole, pyrite and chlorite lodes with a wall rock assemblage of biotite and garnet often replaced by retrograde chlorite alteration. The bodies are considered to be pyrometasomatic replacement of mafic intrusives and host sediments (Weber, 1983, Newnham, 2000).

The Nelson Bay River prospect is the largest of the three ironstones tested historically with a strike extent in excess of 3km. A drillhole into the Nelson Bay River Prospect, NR001 intersected 5.6m @ 0.4% Cu but the majority of the drill intersections into the ironstones and their alteration assemblage contained very low levels of base and precious metals.

Given the known mineralisation and host sequence, Tennant Creek Style iron-oxide copper gold mineralisation is a feasible exploration model for the R41S prospect and the other ironstones of the Temma district.

The size of the R41S modeled anomaly suggests both drill holes have not fully tested the magnetic source, with minor extensions interpreted along strike and down plunge to within 100m of surface.

On the negative side, the gold grades of the magnetite-pyrite zone intersected in R41S\_01 are one to two orders of magnitude lower than the Tennant Creek mineralisation (0.1g/t versus 1-60g/t). A small tonnage resource within the Arthur-Pieman Conservation area would need to be of high value to be of economic interest.

The higher metamorphic grade mineral assemblage (biotite-garnet) in R41S\_02 suggests it is closer to a larger intrusive or pyrometasomatic skarn, despite not intersecting any significant magnetite hosted mineralisation.

To fully test the prospect, several short holes of 100m length could be drilled along strike and down plunge to the northwest. A deeper hole testing the interpreted NW plunge of similar length to R41S\_01 (250m depth) would further test the prospect at depth under the broader, surface magnetic high extending NW.



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## 5 DISCUSSION AND RECOMENDATIONS

The Balfour copper trend and tin-tungsten mineralisation on EL27/2007 has been extensively explored over the last 100 years. Given the level of exploration and caliber of previous explorers, it is unlikely that a significant body of mineralisation is located near surface.

However the regional setting and intensity of mineralisation strongly implies the presence of a mineralised granite located at depth below the EL. The most intensely anomalous area is the Specimen Hill-Balfour area. Recent drilling has tested the mineralisation to a depth of 200m, identifying significant, but uneconomic mineralisation.

The best target is therefore the depth extension of the Balfour and Specimen Hill structures/mineralisation. Both MRT regional gravity and the Haines EL wide gravity surveys suggest the granite is shallower than 1km in depth and located just west of Specimen Hill. Several 1000m plus drill holes could be drilled to test the down plunge extent of the Balfour shear attempting to test the shear/granite contact. The exploration program would be expensive and high risk. However given the world class nature of the Tasmanian tin-tungsten deposits the rewards could be high.

Apart from tin-tungsten mineralisation, there is the added potential to discover significant copper mineralisation, again at depth. The copper source is most likely to be the native copper contained in the Spinks Basalt but there remains a possibility for it to have been remobilized from a sediment hosted copper body, or for the shear hosted and replacement mineralisation to be more extensive and higher grade.

Several of the southern more remote areas warrant some ground follow up, specifically the Waratah-Sluiced Flat Prospect area (Furious 50's), mainly based on its structural, geophysical and geochemical similarities to the Balfour-Specimen Hill area, although obviously less well mineralised.

It is recommended that the historic drilling data of the Balfour lineament be compiled and a 3 dimensional geology model created to interpret the structural setting assisting target generation. If considered warranted several 1000m plus drill holes could be drilled to test the confluence of the major west dipping Balfour lineament below and west of the Specimen Hill Prospect.

EL40/2007 is less well explored. Much of the EL is covered by less interesting Rocky cape Group sediments and is much less geochemically anomalous. The R41S Prospect is the most significant mineralised feature identified on the EL to date. The body is clearly related to the Temma Ironstones located further west and north although significantly smaller. The Temma Ironstones had been previously recognized as carrying inconsistent base and precious metals. There are similarities between these ironstones and those of the Tennant Creek gold-copper mineralised ironstones. It must be remembered that only 1 in 100 of the Tennant Creek Ironstones is mineralised (Wedekind et al, 1989), so there remains the possibility of one, or part of one of the known prospects to host economic mineralisation.



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There is potential to further test the R41S prospect down plunge to the NW with a series of short holes and one longer (250m) diamond hole.

A review of the regional aeromagnetic data and historic exploration indicates potential test further mineralisation of this style west of EL 40/2007. Some of this area is held under EL by Shree Mining who are currently drilling the Nelson Bay River Prospect for its magnetite potential. The largest and most interesting area near Temma is held by Jaguar Minerals but the EL is due to expire this year. The ground immediately west of EL40/2007 is vacant and does contain a few discrete high intensity magnetic anomalies.

Although the Temma Ironstones are not known to host significant Scheelite, other granite related magnetite skarns in Tasmania host significant Scheelite mineralisation (e.g. Kara).

If this style of mineralisation is considered attractive to the BJV, the ground west of EL40/2007 should be acquired and all historic data compiled and reviewed.

Summary of Recommendations:

5. Compile Balfour drilling data and target 2-3 plus 1000m DDH on the Balfour shear below Specimen hill, adjacent to the interpreted Granite contact.  
Estimated cost \$800 000.  
Risk = High.  
Potential Return = High
6. Field check and compile historic data from Waratah-Sluiced Flat Prospects  
Estimated cost \$30 000.  
Risk = High.  
Potential Return = Low
7. Test down plunge potential of R41S.  
Estimated cost \$130 000.  
Risk = High.  
Potential Return = Moderate to Low
8. Acquire ground west of current projects to explore for Tennant Creek style Cu-Au and for Magnetite-Scheelite skarn mineralisation.  
Estimated cost \$50 000 (dependant on ERA process)  
Risk = High.  
Potential Return = Moderate



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## **ADDITIONAL NOTES**

### ***STATEMENT OF INDEPENDENCE***

Tim Callaghan has no material interest or entitlement in the securities or assets of Balfour Management Joint Venture or any associated companies.

### ***LIMITATIONS AND CONSENT***

The report has been prepared for the Balfour Management Joint Venture using information collected by and historic information available to the Author at the time of writing. The opinions stated herein are given in good faith and with the belief that the basic assumptions are factual and correct and the interpretations reasonable.

This report is not intended for the use as a public document nor, in whole or in part, in a public document without written consent to the form and context in which it appears.

**All coordinates in this report are recorded in AMG66 Zone 55**



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