



ACN 162 743 991

---

*Sherlock Minerals Ltd*  
*c/- 169 Fullarton Rd, Dulwich 5065, South Australia*  
*email: [sherlock@sherlockminerals.com.au](mailto:sherlock@sherlockminerals.com.au)*

---

**COMBINED ANNUAL TECHNICAL REPORT  
SORELL PROJECT  
EL6/2013 & EL7/2013**

**SORELL PENINSULA, TASMANIA**

**For the period 22<sup>nd</sup> October 2016 to 21<sup>st</sup> October 2017**

**P.W. REID, G.L. ASCOUGH, B.J. VAN DER STELT  
27 SEPTEMBER 2017**

## **ABSTRACT**

The Sorell Project comprises two exploration licences, EL6/2013 & EL7/2013, located on the Sorell Peninsula in western Tasmania, approximately 30km south of the township of Strahan. Exploration is being undertaken for

- Massive sulphide mineralisation hosted within the Cambrian Mount Read Volcanic equivalent strata which are host to all of Tasmania's significant base and precious metal mines with accumulated resources of > 350 Mt of ore.
- Porphyry / Intrusive -style copper gold mineralisation at the Thomas Creek Prospect.
- Nickel-sulphide and platinum-group element mineralisation associated with middle Cambrian mafic and ultramafic rocks of the Hibbs Ultramafic Belt.

Work completed during the period included:

- Compilation and review of open-file geological, geochemical and geophysical datasets; target generation
- Preparations to undertake diamond drilling at Thomas Creek Prospect to test a combined Cu-Co-Au soil anomaly and IP targets
- Assessment of soil and geophysical targets at Hill 99 Prospect

At Thomas Creek, ore grade copper and gold mineralisation has been identified at the surface as a result of follow-up of anomalously high copper values in soils. High cobalt up to 0.36% has also been obtained from soil and weathered sap rock samples from Company and historical geochemical sampling. With the ongoing protracted negative investment climate for early stage mineral exploration in Australia, the Company has applied and was granted an exemption to defer the completion of the current work program till the end of the 2016-17 summer field season.

Proposed year 5 ground works comprise infill and extension of geochemical sampling over the Thomas Creek Prospect, infill IP geophysics and diamond drilling of the combined soil and IP targets. A Ground EM survey is planned for Henrietta prospect to accurately locate the source of the late time conductor to upgrade this prospect to drill ready status. Gold anomalism identified east of the Noddy Creek Prospect will be followed up with reconnaissance soil and rock chip sampling.

## CONTENTS

ABSTRACT.....	ii
1. BACKGROUND .....	1
1.1 Location and access .....	1
1.2 Authority history .....	1
1.3 Regional geology .....	3
1.4 Previous Investigations .....	6
1.5 Sherlock - Previous Exploration .....	8
1.5.1 Year 1 - 2013-14 .....	8
1.5.2 Year 2 - 2014-15 .....	10
1.5.3 Year 3 - 2015-16 .....	16
1.6 Exploration rationale.....	19
2. EXPLORATION COMPLETED DURING THE REPORTING PERIOD .....	19
2.1 Hill 99 - Prospect Targeting.....	19
2.2 Hill 99 - Untested VTEM Targets .....	22
2.3 Thomas Creek – Diamond Drilling.....	24
3. CONCLUSIONS.....	27
4. ENVIRONMENT .....	27
5. EXPENDITURE .....	28
REFERENCES .....	29

## FIGURES

Figure 1: Sorell Project location plan .....	2
Figure 2: Pre-Permian published geology and major mineral deposits .....	3
Figure 3: Sorell Peninsula published geology .....	5
Figure 4: Summary of airborne geophysical surveys .....	7
Figure 5: Thomas Creek - IP inversion model showing large chargeable target.....	9
Figure 6: Henrietta Nickel Target - Geological map with priority EM targets (red circles) ...	10
Figure 7: Sample locations – Regional .....	12
Figure 8: Track Cutter, Ian Rogers, with a pan of copper and iron sulphides from a Thomas Creek saprock sample.....	13
Figure 9: Pyrite (clear) and chalcopyrite (yellow) from panned concentrate sample at Thomas Creek.. ..	13
Figure 10: Henrietta / Hill 99 area, geochemical sample locations and airborne EM targets over 1VD aeromagnetic image.....	14
Figure 11: Alteration and fault architecture interpretation of Landsat 8 data over the Thomas Creek Area.....	15
Figure 12: Thomas Creek Prospect – Cobalt in Soil .....	17
Figure 13: Noddy Creek Area – elevated gold geochemistry .....	18
Figure 14 Pacific Nevada Mining Pty Ltd – Hill 99 Grid, Cape Sorell. IP Resistivity Gradient IP Survey.....	21
Figure 15 Quartz - Chalcopyrite Vein from drill hole H99-05.....	22
Figure 16 Sherlock processed – Pseudocolour reduced to pole aeromagnetic image with Airborne VTEM picks.....	23
Figure 17 Moderate late time airborne EM response target SW of Hill 99 Prospect coincident with magnetic high.....	23
Figure 18 Thomas Creek Prospect Drilling Work Program Area.....	25
Figure 19 Drill core photo from Thomas Creek showing mineralised	

limonite-haematite vein with elevated copper (0.2% Cu).....	26
Figure 20 Thomas Creek IP Anomaly on sections and plots of historic drill holes.....	26
Figure 21 North to South IP Line 369700E (central N-S IP traverse).....	27

**TABLES**

Table 1: Sorell Project tenement particulars .....	2
Table 2: Summary of exploration expenditure, Year 3, Sorell Project.....	28

## **1. BACKGROUND**

### **1.1 Location and access**

Exploration Licences 6/2013 and 7/2013 are located on the Sorell Peninsula in Western Tasmania, approximately 30km south of the township of Strahan. The tenements fall entirely within the Southwest Conservation Area and are abutted to the east by the Franklin Gordon Wild Rivers National Park, and to the northeast by the Macquarie Harbour Historical Site (Figure 1). The Southwest Conservation Area has been proclaimed by the Tasmanian Government as a Strategic Prospectivity Zone in recognition of the mineral potential of the area.

The area has a high annual rainfall of approximately 1750 millimetres. The natural vegetation is dominated by rainforest and related scrub, most dominantly *Nothofagus* rainforest. Additionally there are areas of wet eucalypt forest and woodland flora types, heathland and coastal vegetation complexes. *Bauera* scrub areas are very thick and generally impenetrable without prior line cutting work. Where tree canopy is high, undergrowth is significantly less and access over the ground can be achieved with some effort.

Access to the project area can be achieved via a coastal landing by boat or by helicopter from Strahan. Access within the project areas is achieved on foot via historical exploration tracks (all of which are currently unsuitable for vehicular egress) and cut lines. All maps and locational data provided in the report uses the GDA 94 reference datum.

### **1.2 Authority history**

The Sorell Project tenure comprises two granted Exploration Licences with a combined area of 226 km<sup>2</sup> (Figure 1). Exploration Licence EL7/2013 is held by Sherlock Minerals Pty Ltd, and Exploration Licence 6/2013 is held by Thylacine Resources Pty Ltd, a 100% owned subsidiary of Sherlock Minerals. Sherlock Minerals acquired Thylacine Resources through a share purchase agreement after the award of EL6/2013. Both tenements have been granted for a period of five years. In September 2015 Sherlock made a voluntary reduction of non-core licence areas where exploration works did not locate any prospects of interest. Tenement details are provided in Table 1.

TENEMENT	GRANT DATE	SIZE AT GRANT(km <sup>2</sup> )	SIZE AFTER Sept 15 REDUCTION (km <sup>2</sup> )
EL 6/2013	2/10/2013	225	135
EL 7/2013	22/10/2013	169	91
<b>TOTAL</b>		<b>394</b>	<b>226</b>

Table 1: Sorell Project tenement particulars

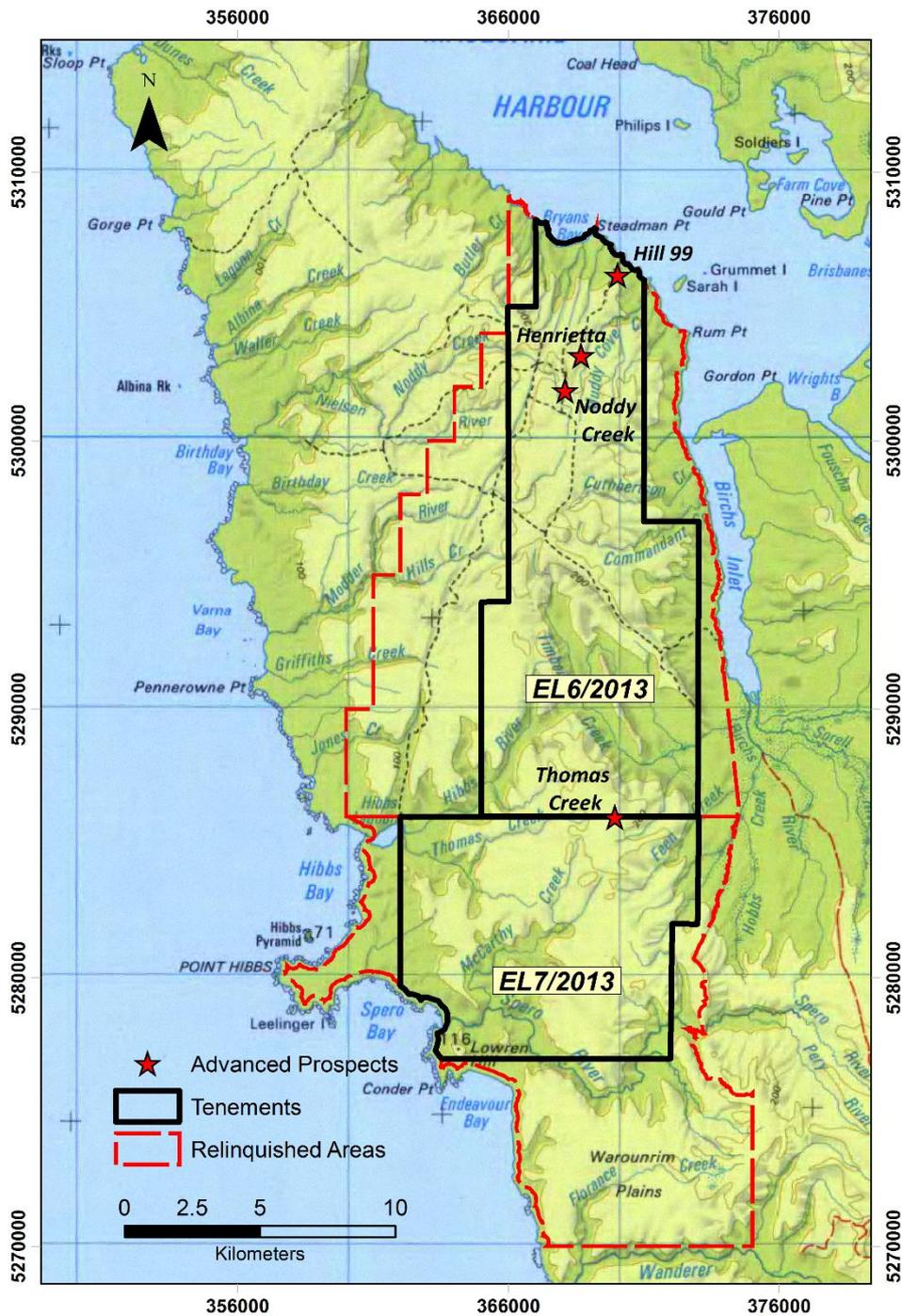


Figure 1: Sorell Tenements Project location plan

### 1.3 Regional geology

The Sorell Peninsula Project covers a broad swathe of Cambrian Mount Read Volcanic equivalent strata, which are host to all of Tasmania's significant base and precious metal mines and mineral occurrences (Figure 2). The Mount Read Volcanics have been a significant producer of base metals for most of the 20th Century, hosting five major deposits with accumulated resources of > 350 Mt of ore (McNeill, 2013).

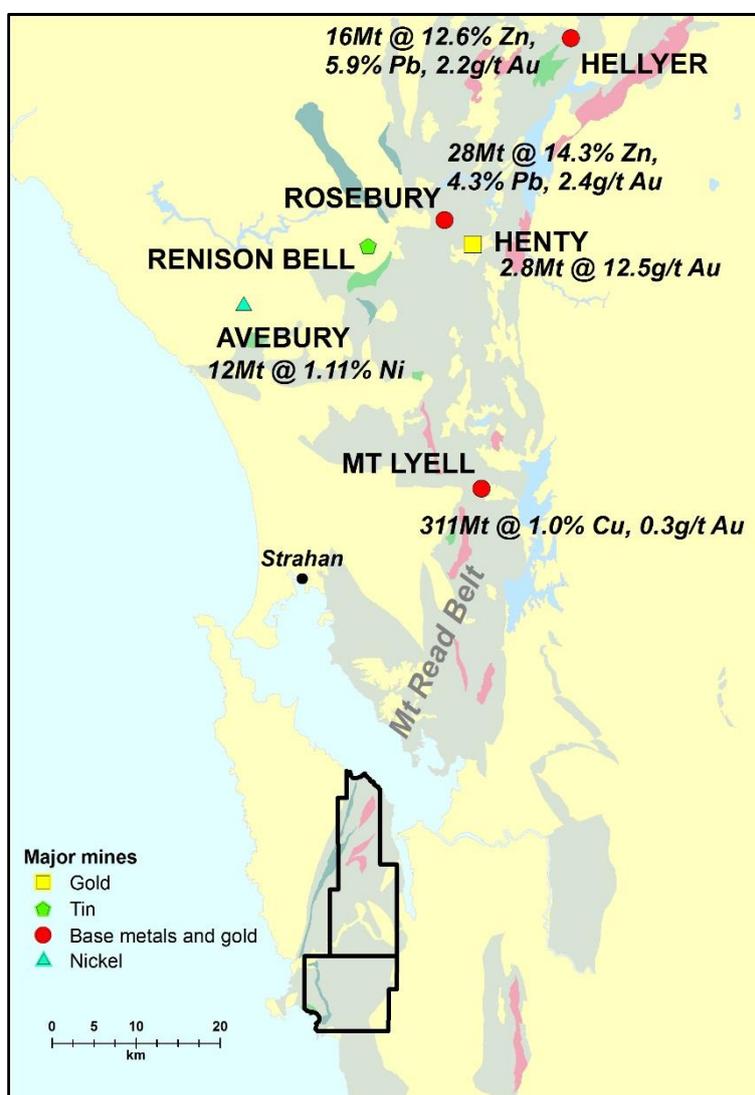


Figure 2: Pre-Permian published geology and major mineral deposits

The geology of the Sorell Peninsula has been described in unpublished company reports of BHP and Amoco/Cyprus, and in White's (1975) PhD thesis. Mapping in the late 1960's by BHP was largely based on coastal exposures and a few inland traverses, with a large component relying upon aerial photo interpretation. Subsequent explorers have relied heavily upon BHP's initial mapping, with a re-interpretation provided by Close and Reid (1995). Limited description of the regional geology is given in Corbett and Solomon (1989).

Regional mapping by the Mines Department at 1:50,000 has covered the area to the north of Varna Bay ("Macquarie Harbour" map sheet; McCleneghan and Findlay, 1989) and to the south of High Rocky Point ("Montgomery" map sheet; Brown, 1988). The Hibbs 1:50,000 sheet, encompassing the Thomas Creek area, lies between these and has been partially mapped but remains incomplete due to lack of funding. A report by Brown et al. (1991) supplements this mapping and provides the most extensive discussion and interpretation of the Sorell Peninsula geology thus far. Brown et al. (1991) recognised two Precambrian rock successions and six Eocambrian-Cambrian volcano-sedimentary associations in the region (Figure 3). These multiple-deformed associations are bounded by a series of NE to NNE-trending faults and the distribution of these associations is interpreted by Brown et al (1991) to result from thrust sheet stacking. Their structural model of "thin skinned tectonics" probably incorporates a pre-Ordovician thrusting event, reworked by late (Devonian?) thrusting. Thrusts are interpreted as eastward dipping with west/north-west thrust direction. Younger transcurrent faulting further disrupted the Point Hibbs Melange Belt.

The Cambrian andesites and rhyolites of the Noddy Creek Volcanics crop out in the southern portion of the Sorell Peninsula and are inferred to extend further south past Point Hibbs (Brown et al., 1991; Close and Reid, 1995). A series of diorite intrusions, and an extensive intrusive complex of diorites occurs within the southern portion of the Noddy Creek Volcanics, south west of the Timbertops Syncline.

The relationship of the Noddy Creek Volcanics to the Mt Read Volcanics is somewhat enigmatic. The Mt Read Volcanics crop out in a N-S trending belt to the east, and extends from Mount Darwin, disappearing beneath a Tertiary Graben to re-emerge further south in the D'Aguillar Range area. Corbett and Solomon (1989) have correlated the Noddy Creek Volcanics with the Mt Read Volcanics based on similar calc-alkaline composition, and suggest

the Noddy Creek Volcanics could be a smaller, separate arc or sub-arc west of the main Mt Read Belt. More recent work by Brown et al (1991) has suggested a more direct correlation based on geochemical similarities of the southernmost Noddy Creek Volcanics to volcanics of the Que River-Hellyer area.

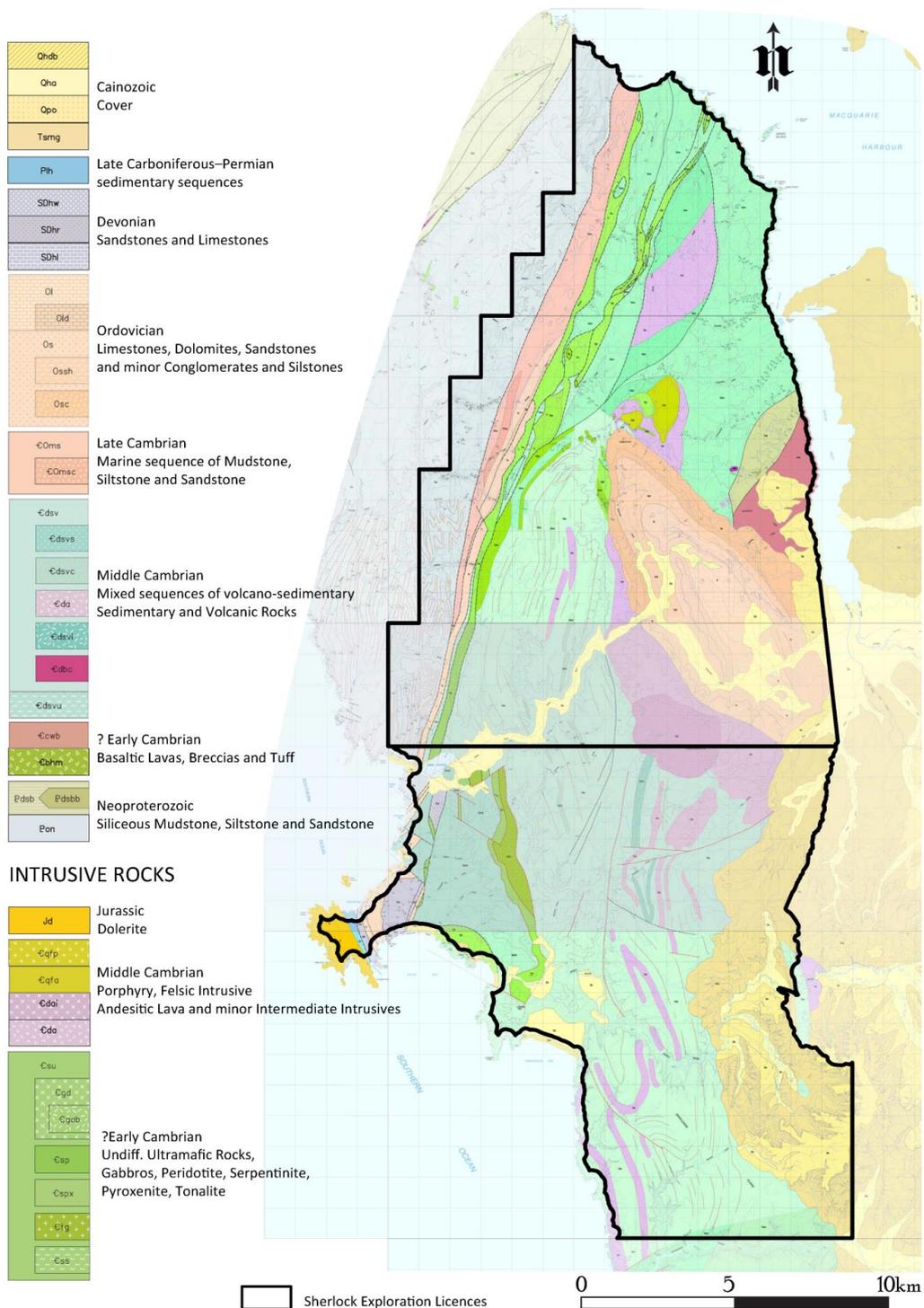


Figure 3: Sorell Peninsula published geology

## **1.4 Previous Investigations**

Mineral exploration in the Sorell Peninsula area has been undertaken by numerous explorers, with significant work including:

- 1956–1962 Lyell-EZ Explorations (LEE).
- 1964–1972 BHP Exploration.
- 1983-88 Amoco Minerals Australia Company (and JV partners).
- 1992-1998 Plutonic Operations limited
- 1998-2001 - Pacific-Nevada Mining Pty Ltd
- 2007 – 2012 MHM Metals

This work, alongside mapping undertaken by the state geological survey, has greatly improved the geological understanding of the area and has identified numerous area of interest including the Thomas Creek copper-gold prospect, the Hibbs ultramafic belt and the Hill 99 prospect.

Since the mid 80's explorers have undertaken numerous detailed airborne magnetic and electromagnetic surveys covering significant portions of tenements held by Sherlock (Figure 4). Reprocessing and reinterpretation of this data has greatly aided Sherlock in target identification. A detailed description of work undertaken by previous explorers is provided in the Company's 1st annual report (Reid et al, 2014).

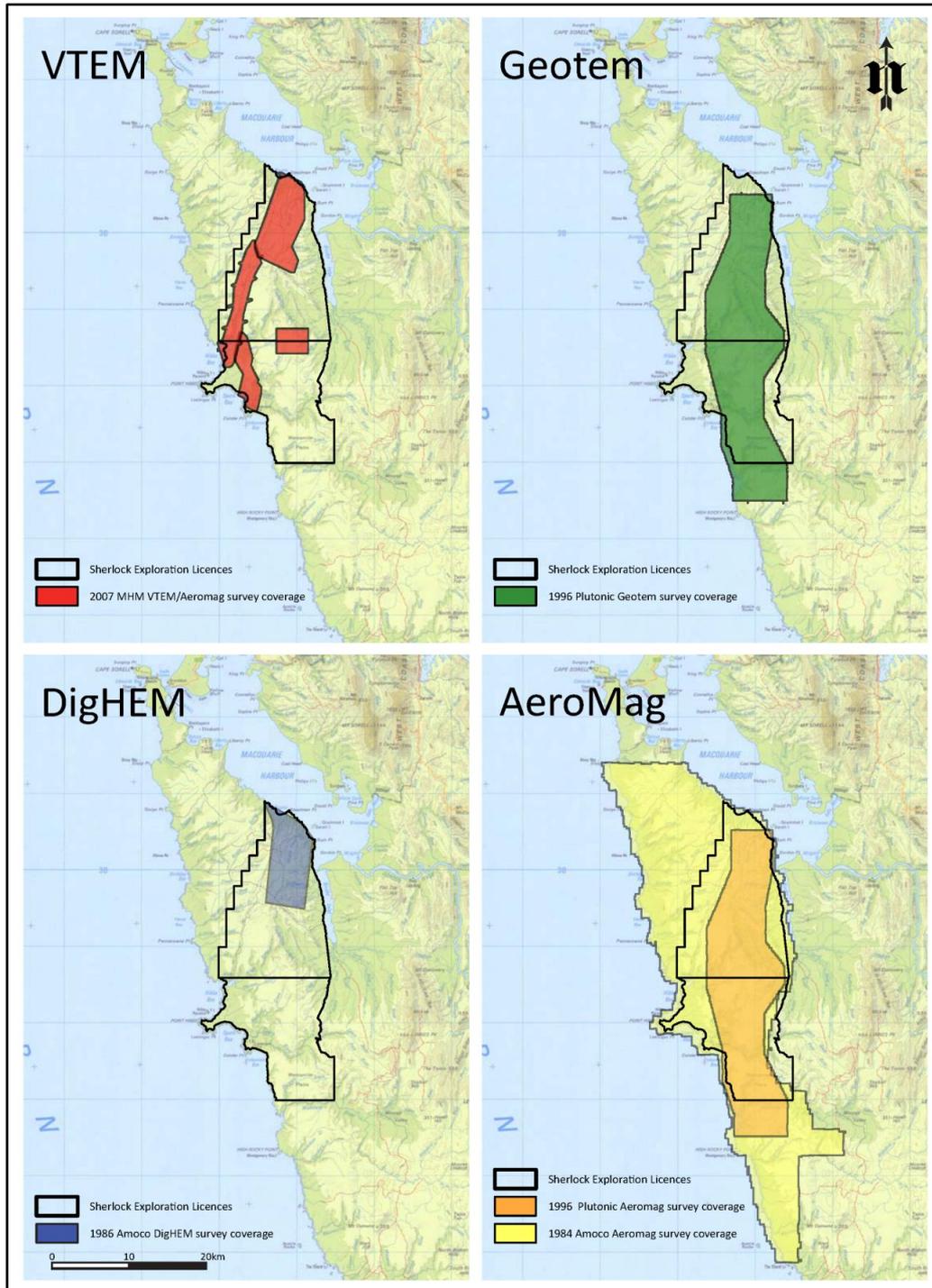


Figure 4: Summary of airborne geophysical surveys

## **1.5 Sherlock - Previous Exploration**

### 1.5.1 Year 1 - 2013-14

Exploration undertaken during the first year of tenure included:

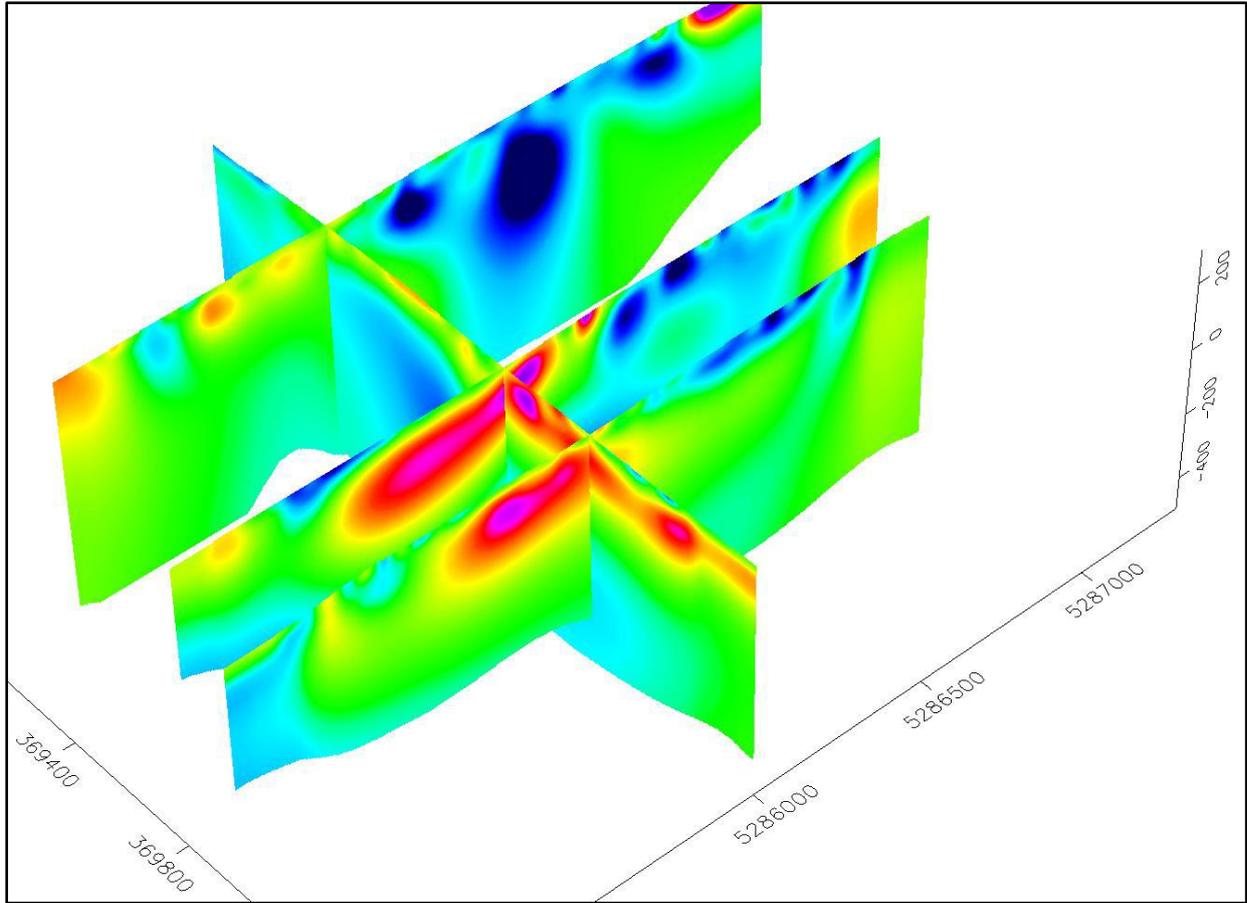
- Compilation and review of previous exploration
- Reprocessing of open-file airborne geophysical datasets; target generation
- Access line cutting (total 15 line-km)
- Dipole-dipole induced polarisation surveys (total 7.3 line km)
- Field reconnaissance
- Soil and rock chip geochemical sampling (total 97 samples)
- Geophysical modelling
- Petrological studies

At the Thomas Creek Prospect IP surveys revealed the presence of a significant chargeability anomaly approximately 300 m wide (open) and 500 m long at 100-200m depth. This does not appear to have been tested by historical exploration drill holes and is strongly recommended for drill testing (Figure 5).

Soil geochemical work at Thomas creek indicates highly weathered sap rock occurs below dark soils generally at 40 centimetres to 60 centimetres depth. It is interpreted the high rainfall environment may have leached much of the surface copper mineralisation. Narrow zones with higher copper values are always associated thicker sets of remnant vein material. This may explain why the chargeable anomaly starts at 100-200m depth indicating the depth of oxidation.

Within the Hibbs Ultramafic Belt, reprocessing and interpretation of historical airborne electromagnetic survey data identified a high amplitude conductive target, 'Henrietta', approximately 1.4 km in strike length (Figure 6). Preliminary field investigations at Henrietta located gossanous material with elevated nickel and platinum assays.

Within the Mount Read Volcanic equivalent strata, reprocessing and interpretation of historical airborne electromagnetic survey data has identified numerous conductive targets warranting field reconnaissance and ground EM follow-up.



*Figure 5: Thomas Creek - IP inversion model showing large chargeable target (red and magenta colours)*

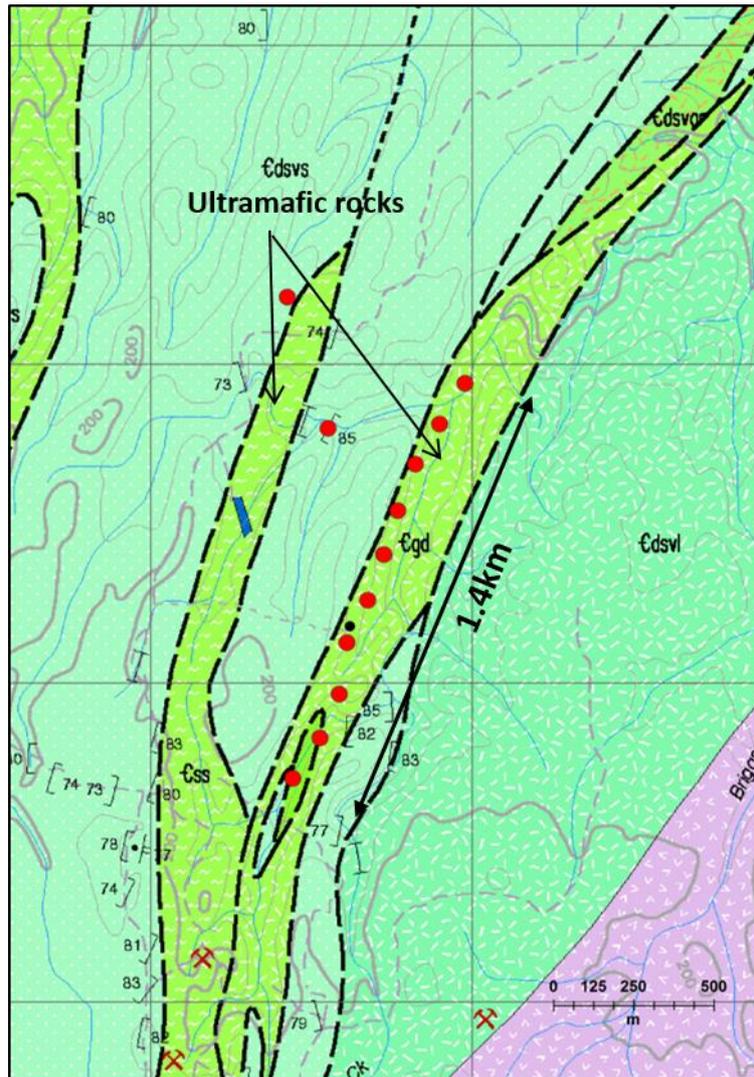


Figure 6: Henrietta Nickel Target - Geological map with priority EM targets (red circles)

### 1.5.2 Year 2 - 2014-15

Exploration undertaken during the 2<sup>nd</sup> year licence period included:

- Compilation and review of compiled geological, geochemical and geophysical datasets; target generation
- Track and line cutting (4.5km)
- Helicopter supported, geological reconnaissance of Birch's Inlet, Thomas Creek, Noddy Creek and Hill 99 areas.
- Soil and rock chip geochemical sampling
- Field reconnaissance mapping
- Processing of L8 Satellite imagery to identify potential areas of alteration and faults localising higher grade mineralisation

- Petrological studies
- Partial relinquishment of none core licence areas.
- Report compilation

The Thomas Creek Prospect has significant potential for economic copper-gold mineralisation and consequently field work during the year focussed largely on this area. A second focus area, accessed by boat, involved field mapping, soil and rock chip sampling of airborne EM targets at the Henrietta (Ni-PGE) Prospect and the Hill 99 (Cu-Zn-Au) Prospect areas in the north of the tenement group (Figure 7).

Historical high grade copper was re-discovered and sampled by Sherlock during the period at Thomas Creek. Below 50cm of peaty soil, fresh massive pyrite and abundant sulphides of copper over a 6 metre wide zone within weathered saprolitic bedrock were located. Geochemical analyses of the mineralised sap rock zone returned values ranging between 0.8% to 3.8% copper and 0.7 g/t to 1.3 g/t gold.

Petrological analysis of panned concentrate of the sulphides identified copper ores comprising predominantly of chalcopyrite but also include bornite, covellite and some chalcocite, with ubiquitous pyrite (Figures 8 & 9). Highly weathered host rock samples indicate the mineralisation occurs as a coarse stockwork of veins. The copper mineralisation under microscope shows evidence of extensive leaching and it is postulated this high grade zone is a remnant, and may indicate why the chargeable IP geophysical response becomes strong at about 100-200 metres where leaching is absent and primary copper mineralisation may still be present.

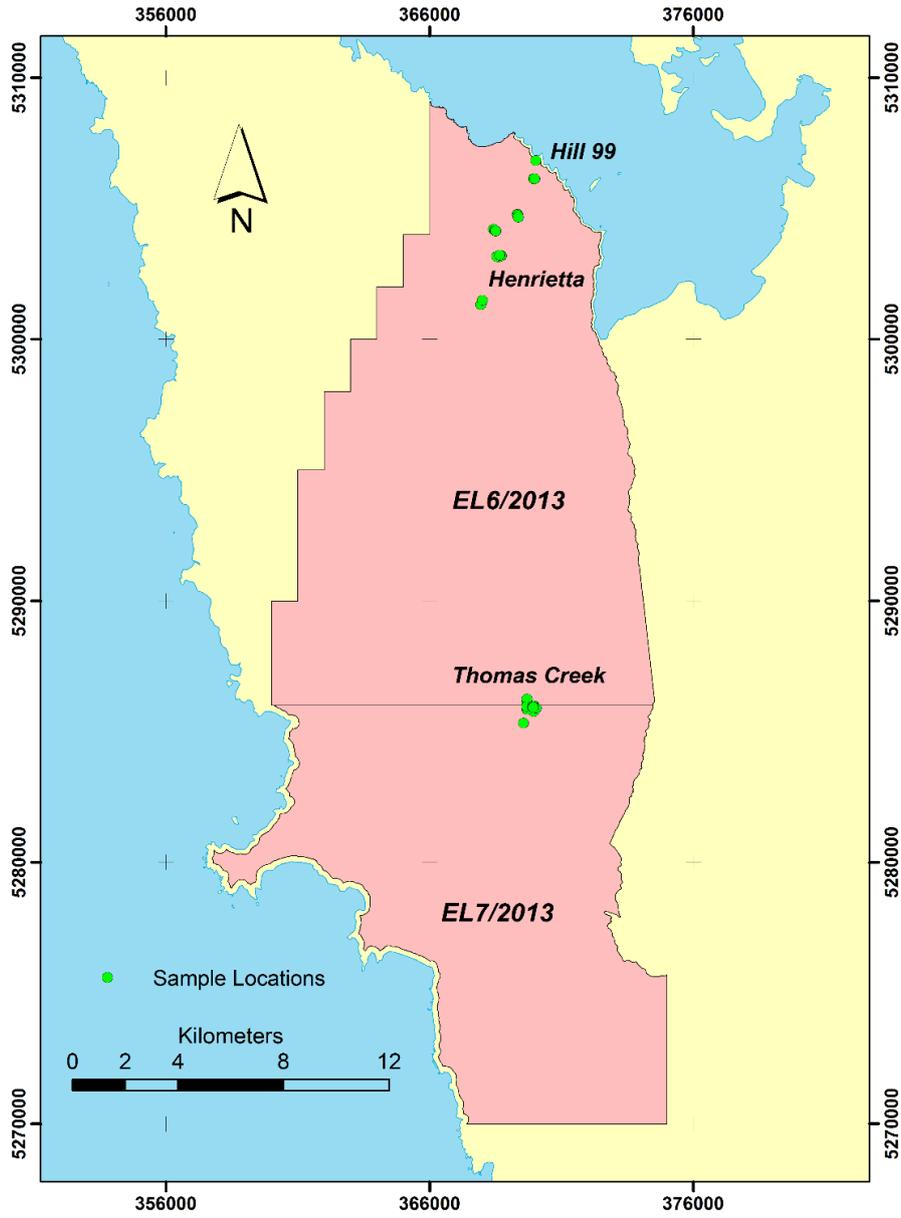
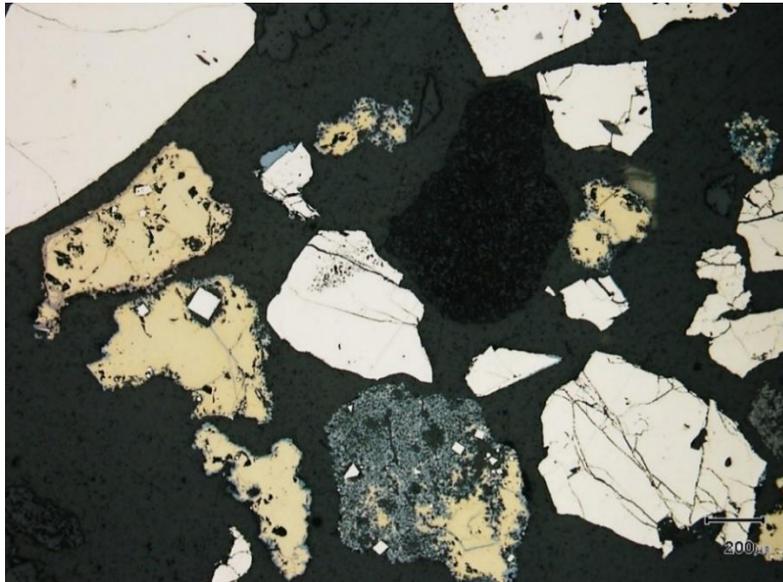


Figure 7: Sample locations – regional



*Figure 8: Track Cutter, Ian Rogers, with a pan of copper and iron sulphides from a Thomas Creek sap rock sample.*



*Figure 9: Pyrite (clear) and chalcopyrite (yellow) from panned concentrate sample at Thomas Creek. One chip of chalcopyrite (bottom, centre) largely oxidised to goethite. Note how fresh the pyrite is relative to the chalcopyrite.*

Access to the Henrietta and Hill 99 Prospects sites required a 4.5 km of line cutting to establish a walking track along an old BHP exploration road which starts near the coast at Asbestos Point and continues southwards through to the Noddy Creek area. Access to this new trail was made by boat and a fly camp was erected about 100m inland from a small beach on the western side of Asbestos Point.

Portable XRF sampling of soils and rare rock outcrops has confirmed highly elevated nickel geochemistry along the 1.3 km late time EM anomaly at Henrietta Prospect ranging between 0.1 and 0.6% Ni. Spot sampling of rocks for lab analysis returned elevated Ni in line with XRF readings, but did not return elevated PGE's or copper. XRF readings taken from the Hill 99 area, following up on targets generated from the reprocessing of historical airborne EM surveys failed to detect significant base metal anomalism (Figure 10).

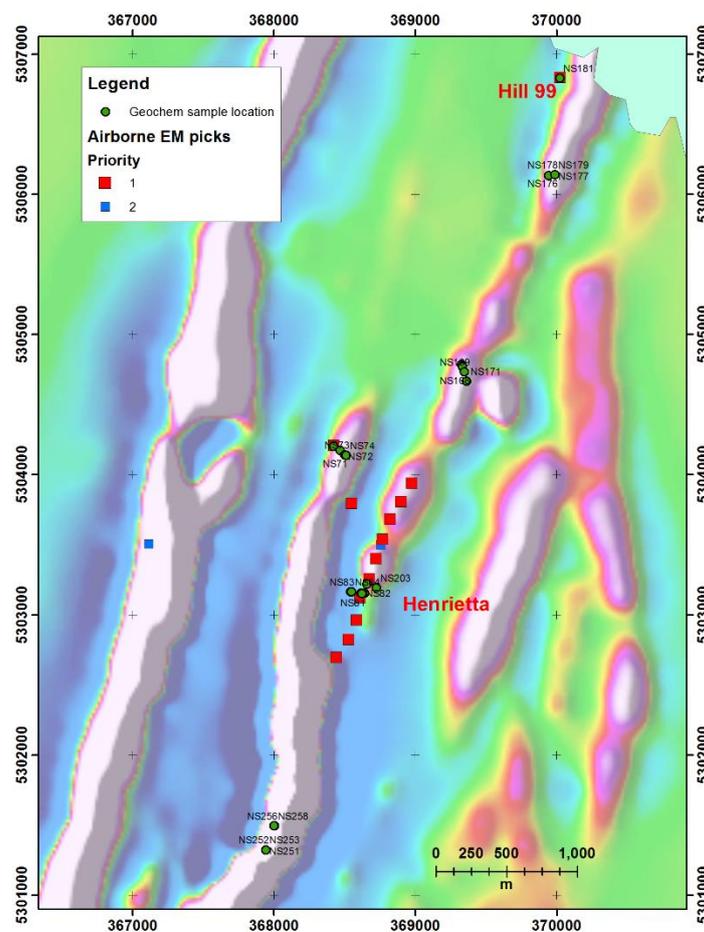


Figure 10: Henrietta / Hill 99 area, geochemical sample locations and airborne EM targets over IVD aeromagnetic image

The highest copper and gold grades at the world-class Mt Lyell Copper-Gold Deposit 55 kilometres north of Thomas Creek are found to occur where orthogonal faults intersect Mt Lyell fault structure. The Mt Lyell fault may have originally been a major extensional basin edge fault controlling the deposition of younger Ordovician-Devonian aged strata found along its eastern side and similarly a fundamental conduit for the high sulphidation event generating the mineralisation. A similar juxtaposition occurs in the Thomas Creek area where Ordovician aged sediments form a prominent NW trending syncline (Timbertops syncline) and appear to be in faulted contact along the Northern edge of the Thomas Creek Prospect.

Appraisal of Landsat 8 satellite imagery over Thomas Creek has highlighted a number of major fault intersections and possible mineral alteration zones in the vicinity of known surface mineralisation (Figure 11).

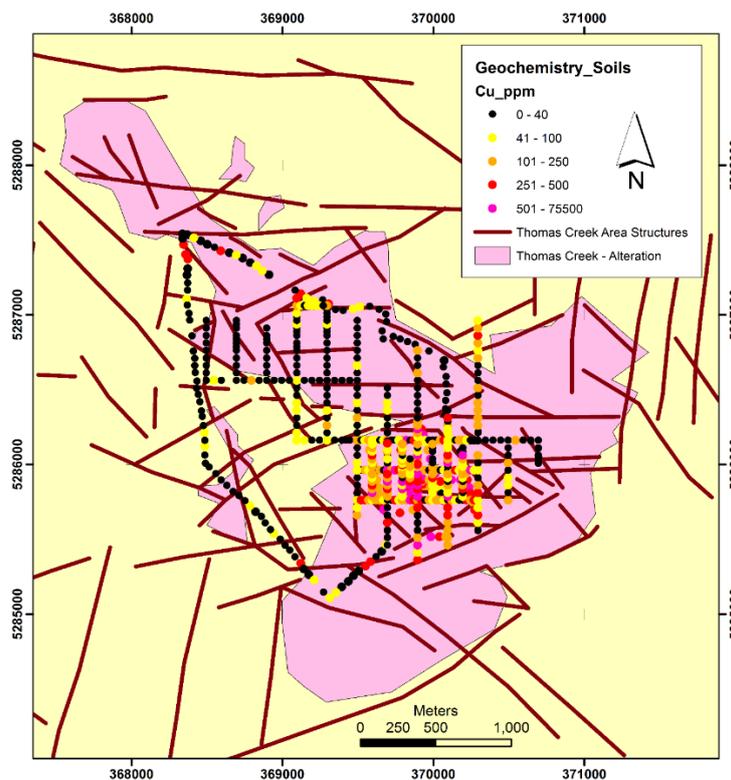


Figure 11: Alteration and fault architecture interpretation of Landsat 8 data over the Thomas Creek Area

### 1.5.3 Year 3 - 2015-16

- Preparations to undertake shallow diamond drilling over areas of high copper soil anomalism at Thomas Creek Prospect
- Assessment of cobalt anomalism at Thomas Creek
- Assessment of high gold soil geochemistry over the tenement group
- Application for exemption of conditions to defer ground activities due to the severe down turn in mineral exploration industry

Preparations ahead of the 2015/16 summer field season were made to undertake shallow diamond drilling, using a light weight portable drill corer. The drilling unit is cable of drilling BQ size holes to approximately 20 metres depth. Twenty holes were scheduled at an average depth of 15 metres per hole which will produce about 300m of core. The shallow diamond drilling is proposed across identified shallow copper mineralised areas and over the broader area of alteration at Thomas Creek. These ground works were later deferred due to the ongoing severe down turn in mineral exploration investment.

In June, Sherlock held talks with Mineral Resources Tasmania on options to defer future exploration obligations. The Company subsequently applied for a formal exemption of conditions requesting an exemption of the year 3 work program and associated expenditure through to the end of the coming 2016-17 summer field campaign, allowing the Company time to secure the additional finance needed to complete the ground exploration works as originally planned.

Company and historical cobalt soil geochemistry was digitised and interpreted in ArcGis for the Thomas Creek Prospect. The compilation highlighted high cobalt credits with the identified copper and gold mineralisation. Cobalt values peaked at 0.36% and are coincident with the highest copper and gold grades (Figure 12). As a rule of thumb cobalt grades were recorded at approximately 1/8<sup>th</sup> the grade of copper. With recent renewed interest in cobalt based on projected growth in demand for lithium Ion batteries, the associated cobalt credits could be an important metal credit to the Thomas creek ores.

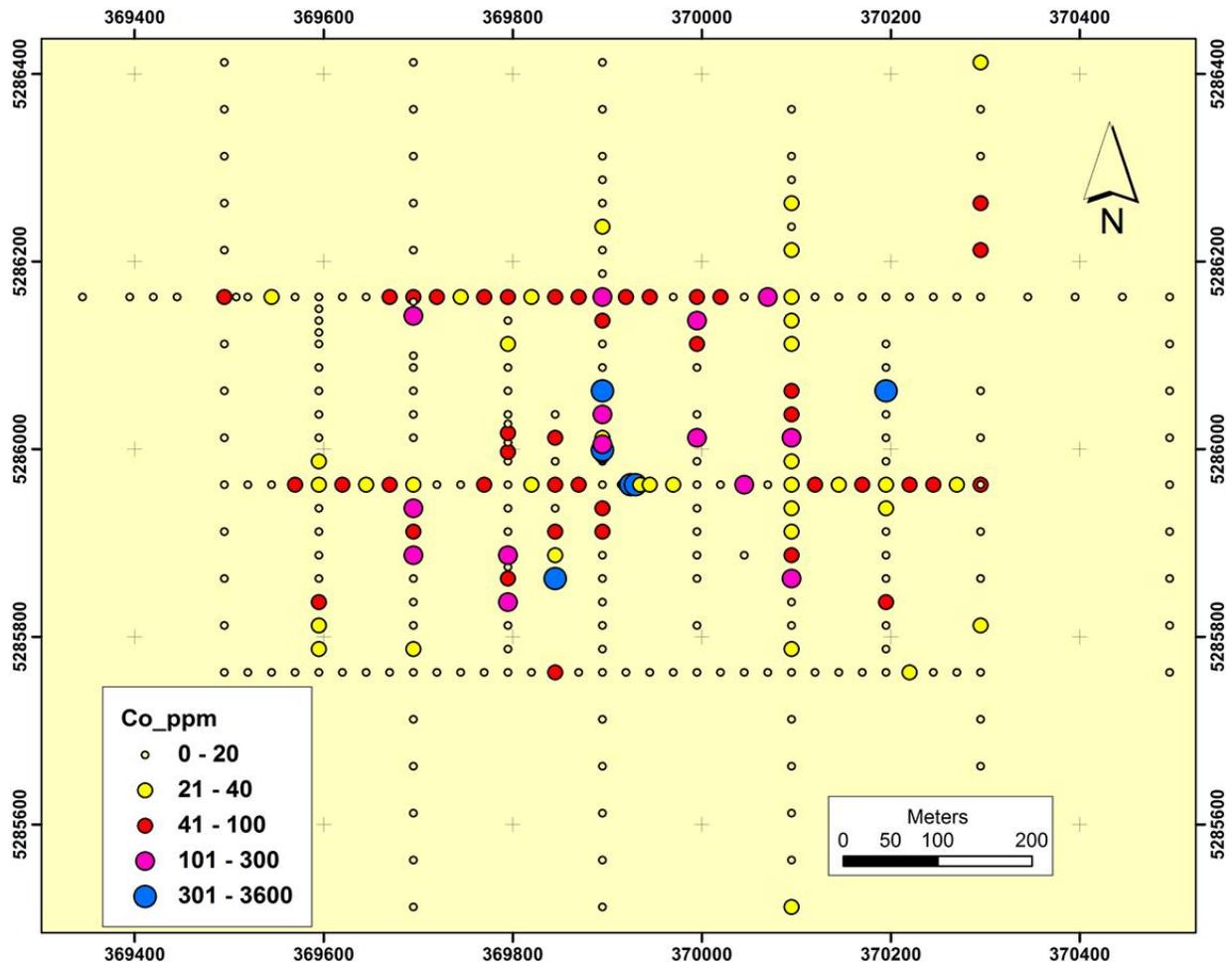


Figure 12 Thomas Creek Prospect – Cobalt in Soil

Historical gold soil geochemistry demonstrates elevated gold, east of the Noddy Creek Prospect area (Figure 13). It includes one stream sediment sample which returned 33 g/t Au. A reconnaissance program of soil and rock chip sampling is planned in to follow-up the gold prospectivity in this area.

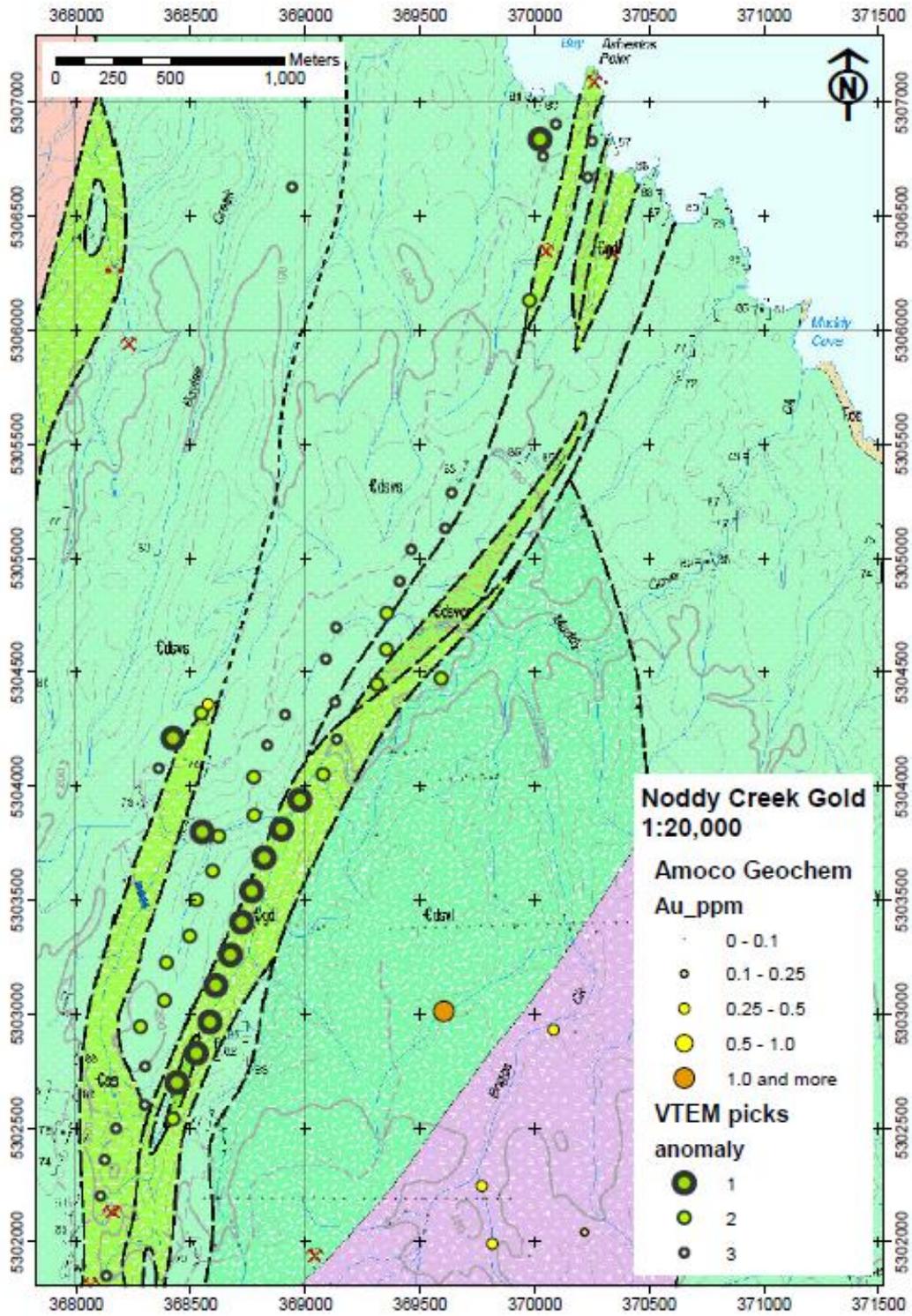


Figure 13 Noddy Creek area – elevated gold geochemistry.

## **1.6 Exploration rationale**

Exploration is being undertaken for a variety of commodities and styles of mineralisation commensurate with the variety of mineralisation found in western Tasmania. This includes:

- Massive sulphide mineralisation hosted within the Cambrian Mount Read Volcanics and its equivalents (i.e. Noddy Creek Volcanics) which are host to all of Tasmania's significant base and precious metal mines with accumulated resources of > 350 Mt of ore.
- Porphyry / Intrusive-style related copper gold mineralisation at the Thomas Creek Prospect.
- Nickel-sulphide and platinum-group element mineralisation associated with middle Cambrian mafic and ultramafic rocks of the Hibbs Ultramafic Belt.

## **2. EXPLORATION COMPLETED DURING THE REPORTING PERIOD**

The Company applied and was granted an exemption of work conditions due to the severe downturn in the mining exploration. The exemption covered the summer field season and continued through to the end of April 2017. Near the end of the exemption period plans were made to undertake a diamond drill campaign at Thomas Creek Cu-Co-Au Prospect, however these could not be finalised before the winter period and as such are now planned for the 2017-18 summer field season. As a consequence, no field work has been undertaken during the reporting period. Desktop studies continued whilst the Company sought the necessary funds needed to rekindle ground exploration activities.

### **2.1 Hill 99 - Prospect Targeting**

The Hill 99 Prospect, located near Asbestos Point on the southern shores of Macquarie Harbour (Fig 1), was identified by Pacific-Nevada Mining Pty Ltd in 1999 after a reconnaissance sampling programme located an outcrop of massive pyrite-quartz mineralisation. A subsequent soil sample campaign identified a copper-zinc anomalous (150-511ppm Cu and 150-684ppm Zn) zone extending inland along strike from the coastal pyrite-quartz mineralisation. The zone trends north-east and is broadly coincident with a topographic high. Sampling of gossanous float material along the grid lines returned sporadic anomalous gold up to 50ppb with 92ppb

Au also returned from a chlorite altered lithic siltstone. A single panned concentrate stream sample returned 5.1 g/t Au.

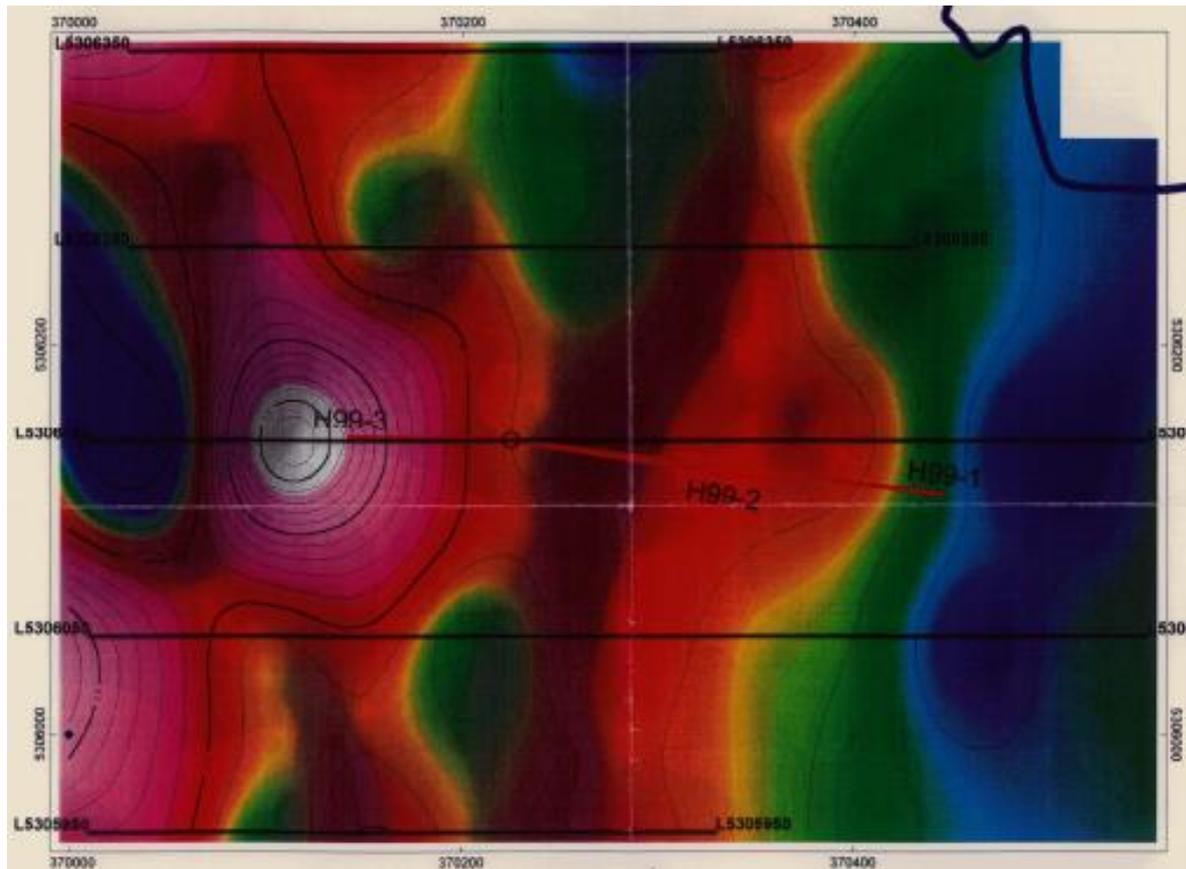
A subsequent gradient array IP survey carried out by Pacific Nevada over the Hill 99 grid identified a linear, moderate conductivity high coincident with the copper-zinc anomalous soil zone. A bullseye conductivity anomaly was also identified (Fig 14). A fixed loop ground EM survey failed to identify any conductive bodies of probable economic importance, however it did show a strong conductor forming off the western edge of the survey coincident with a prominent magnetic feature. The thick vegetation precluded the survey being extended further west at that time and this target remains untested.

Pacific-Nevada drilled three diamond drill holes totalling 669 m. The first two drill holes H99-01 & 02 targeted the Cu-Zn soil anomalies/alteration and mapped gossanous float and intersected a highly altered chlorite-carbonate-fuchsite volcanic rock of mafic to felsic origin with minor Cu, Zn and Au (best result 0.3m @ 0.59% Cu). H99-03 tested the coincident high phase and resistivity low anomaly modelled at 150m depth. Localised narrow zones of pyrite-chalcopyrite (i.e. 36 cm @ 1.05% Cu) mineralisation and quartz-carbonate-sphalerite-galena veining (i.e. 30 cm @ 0.17% Pb & 0.25% Zn) with intense fuchsite alteration were intersected before drilling was stopped due to hole instability approximately 30m above the IP target (Figure 14).

MHM Metals in 2011 drilled two further holes totalling 368m to follow up previous encouragement from Pacific Nevada's Drilling. Drill hole H99-04 tested strike persistency of mineralised intercepts from H99-01 and H99-02 and hole H99-05 tested the bulls eye IP anomaly identified by Pacific Nevada work. Geochemical results from hole H99-4 showed anomalous gold with peak values of 0.105, 0.182 and 0.105ppm Au are associated with fuchsite-quartz-sericite alteration of andesite and basalt from 155 to 172m. Copper from a 30cm massive quartz-chalcopyrite vein intersected at 177.6m returned a grade of 10.55% Cu, and 0.244% Zn (Figure 15). Anomalous elevated values of Ag (15.05ppm), Bi (0.26ppm), Co (358ppm) are also associated with this interval compared to the rest of the results

A geological and geochemical appraisal of the Hill99 target by MHM showed the stratigraphy comprises a suite of basalt, boninite, andesite, rhyolitic volcanics and gabbro. The rocks are

strongly altered by silica and quartz-carbonate veining, sericite and chlorite. Sulphides are present as pyrite, chalcopyrite, sphalerite and galena. Independent geochemical analysis suggested they are comparable to suite I of Crawfords (1992) stratigraphic proposal of the Mount Read Volcanics which hosts several major deposits including Mount Lyell (Cu-Au), Henty gold mine, and Rosebery (Pb-Zn-Ag).



*Figure 14 Pacific Nevada Mining Pty Ltd – Hill 99 Grid, Cape Sorell. IP Resistivity Gradient IP Survey. Pacific Nevada Drill traces in red.*



*Figure 15 Quartz - Chalcopyrite Vein from drill hole H99-05.*

## **2.2 Hill 99 - Untested VTEM Targets**

In 2010, MHM Metals commissioned a 100m line spaced Versatile Time Domain Electromagnetic Survey (VTEM) over several areas and took in the Hill 99 Prospect. Sherlock Minerals undertook reprocessing and interpretation of this data. Two moderate to strong late time conductors close to the known Hill 99 mineralisation have been identified (Figures 16 & 17). The targets appears to be part of the same conductive feature originally noted by Pacific-Nevada, forming off the western edge of their fixed loop ground TEM grid that was noted by the geophysicist as significant but not followed up. The EM target is coincident with the western side of linear magnetic anomaly.

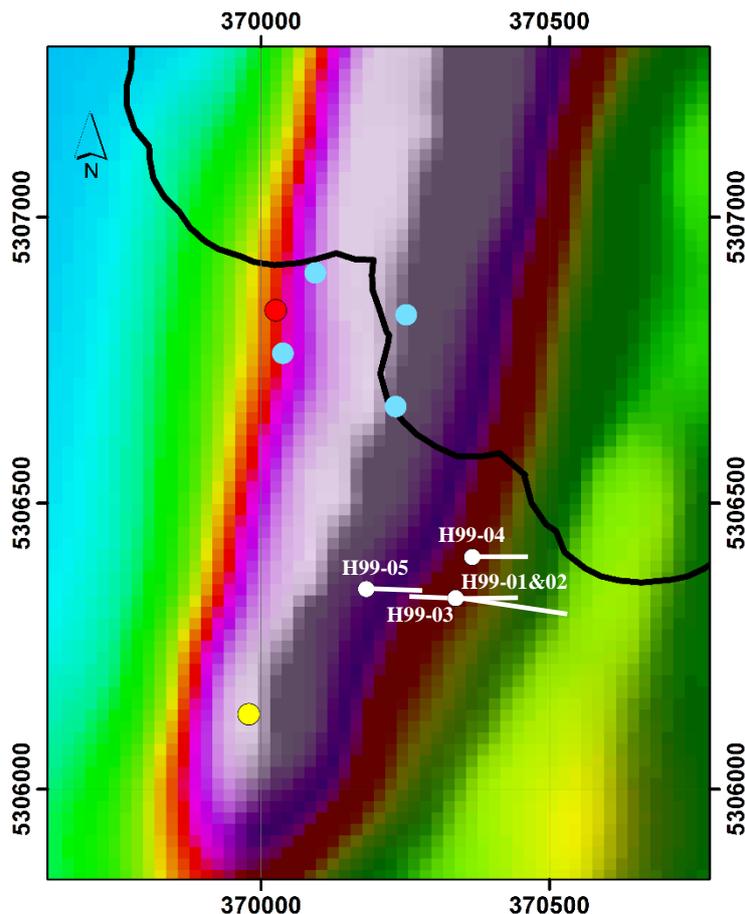


Figure 16 Sherlock processed – Pseudo-colour reduced to pole aeromagnetic image with Airborne VTEM picks (red = strong, yellow = moderate, blue = weak) and historical drill-hole collars. Note historical ground TEM survey near drill collars detected off grid conductor building west of H99-05.

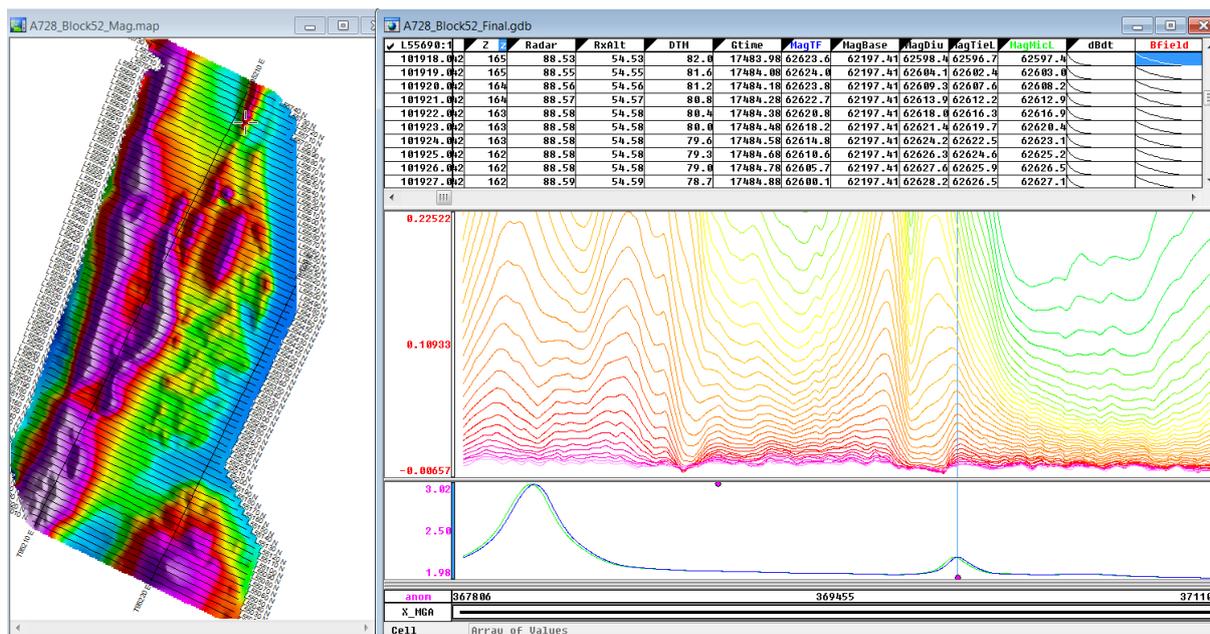


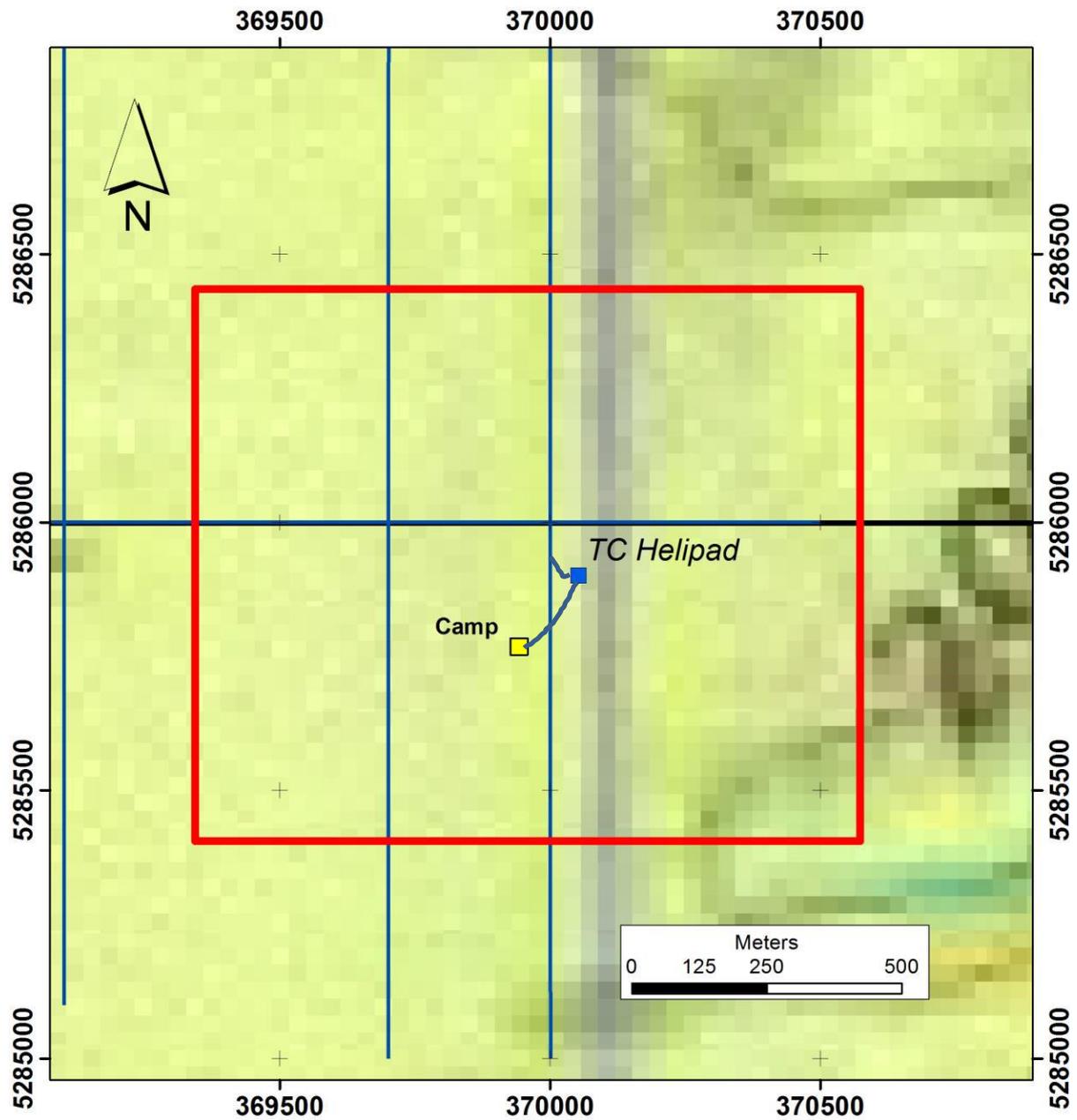
Figure 17 Moderate late time airborne EM response target SW of Hill 99 Prospect coincident with magnetic high.

### **2.3 Thomas Creek – Diamond Drilling**

In February 2017 a program of works was submitted to undertake diamond drilling at the Thomas Creek Prospect (Figure 18). The program consists of 2 angled holes to approximately to 250 metres depth each but with a provision to drill 2 extra holes dependent on early results. The drill campaign is helicopter based.

Historical shallow drilling of 8 shallow BQ sized holes completed in 1996 by Plutonic over the prospect area were angled 045° to the south (refer to Sherlock's 2004 annual report for background). Examination of the core, soil geochemical contours, and geophysics indicates the drilling was likely to be essentially along strike of the main mineralised vein sets which are interpreted to be striking NNE. Figure 19 is indicative, showing core parallel veining. In addition, the Plutonic drilling, which reached 60-90m vertical depth (if no uplift) does not test the IP anomaly which has been modelled to start at approximately 100 metres depth (Figures 20 & 21).

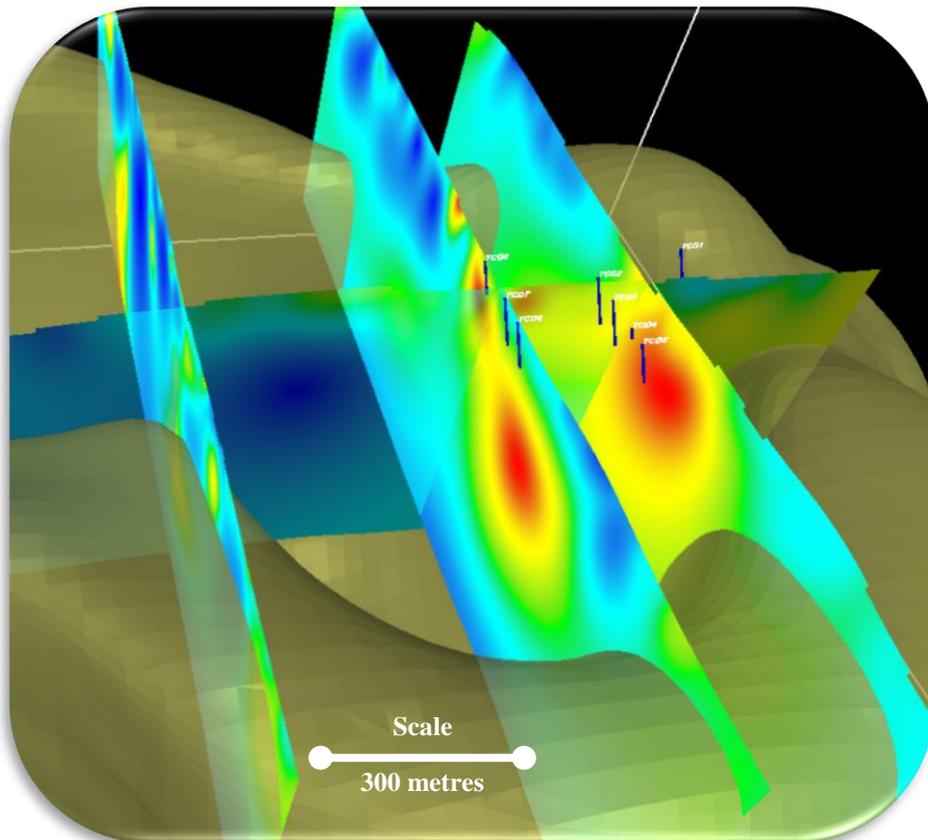
Sherlock has proposed angled holes dipping to the east in order to drill across the mineralised veins sets to obtain a better understanding of shallow grades of Cu-Co-Au mineralisation and to test the IP anomaly at depth (ie > 150 metres). High grade soil geochemistry sampling indicates wider vein sets may potentially contain economic grades of mineralisation at shallow depths above the main IP target.



*Figure 18 Thomas Creek Prospect Drilling Work Program Area. Blue lines are existing tracks cut for a previous IP geophysical survey. Final drill collar positions are to be defined but will occur within the red polygon shown. Short walking trails will be cut off the IP survey lines to the drill pad locations. Drill pads will be approximately 20 metres by 15 metres in size.*



*Figure 19 Photo of drill core from Plutonic Resources historical shallow BQ diamond drilling at Thomas Creek (core stored in the Hobart Core Library). Mineralised limonite-haematite vein with elevated Copper (0.2% Cu) in highly chlorite-sericite altered intermediate to felsic volcanic. Note vein orientated sub-parallel to hole orientation.*



*Figure 20 Thomas Creek IP Anomaly on sections and plots of historic drill holes. Note drilling does not reach top of the IP Anomaly.*

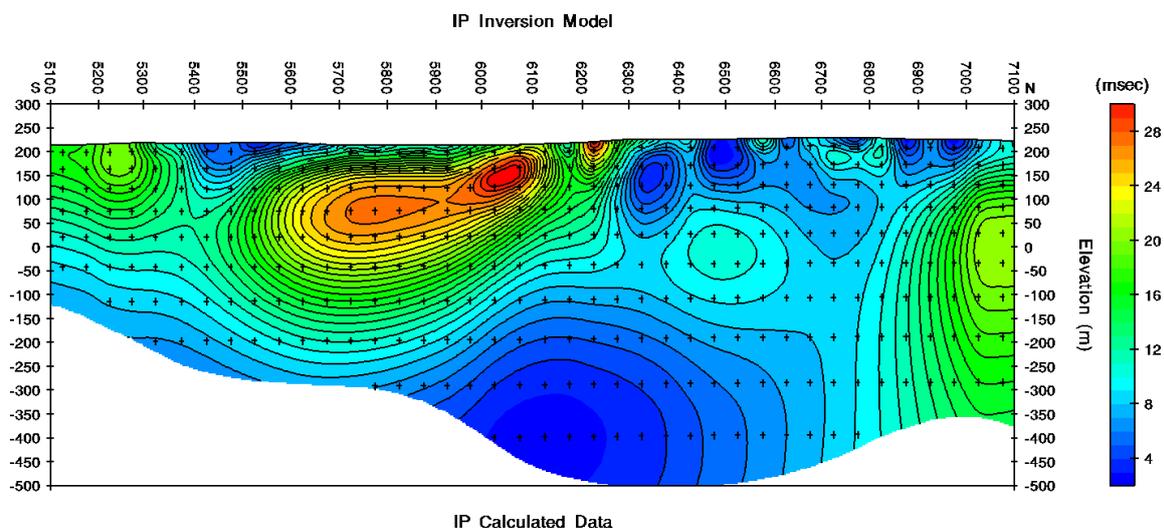


Figure 21 North to South IP Line 369700E (central N-S IP traverse). Note chargeable feature starts at about 120 metres vertical depth.

### 3. CONCLUSIONS

High grade copper mineralisation has been identified as a result of follow-up of high copper values in soils identified by previous explorers at Thomas Creek. A coincident large IP chargeable anomaly starts at approximately 100m depth below the high copper in soils. Reprocessing of 100m line spaced Versatile Time Domain Electromagnetic Survey (VTEM) data over the Hill 99 Prospect has located two moderate to strong late time conductors close to the known Hill 99 mineralisation.

With the ongoing protracted negative investment climate for early stage mineral exploration in Australia, the Company has applied to defer the current work program during the 2016-17 summer field season. Deep diamond drill testing of the Thomas Creek Cu-Co-Au prospect is now scheduled for the upcoming 2017-18 field season.

### 4. ENVIRONMENT

Prior to any field-based activities being undertaken, the appropriate PEWPS were submitted to Mineral Resources Tasmania for approval. A species search was undertaken via the online Natural Values Atlas. The search identified observations of six threatened species within the Exploration Licences, including the white-bellied sea-eagle, Tasmanian devil, swift parrot, orange-bellied parrot, azure kingfisher, and the Tasmanian wedge-tailed eagle. The most

significant of these is the orange-bellied parrot which is listed as critically endangered. None of the identified observations were within areas of proposed field activities. No ground disturbing works were undertaken during the period.

## 5. EXPENDITURE

Total expenditure for activities on ELs 6/2013 & 7/2013 during the 2016-2017 period are provided in Table 2.

<b>EL6/2013</b>		<b>EL7/2013</b>	
<b>Item</b>	<b>Total</b>	<b>Item</b>	<b>Total</b>
Geology	\$34,320	Geology	\$29,120
Geochemistry	\$0	Geochemistry	\$0
Geophysics	\$2,220	Geophysics	\$2,220
Other	\$8,374	Other	\$5,899
Administration	\$4,491	Administration	\$3,724
<b>Total</b>	<b>\$49,406</b>	<b>Total</b>	<b>\$40,963</b>

*Table 2: Summary of exploration expenditure, Year 4, Sorell Project.*

## REFERENCES

- Black, L. P.; Seymour, D. B.; Corbett, K. D.; Cox, S. E.; Streit, J. E.; Bottrill, R. S.; Calver, C. R.; Everard, J.L.; Green, G. R.; McClenaghan, M. P.; Pemberton, J.; Taheri, J.; Turner, N. J. 1997. Dating Tasmania's oldest geological events. *Record Australian Geological Survey Organisation* 1997/15.
- Brown, A. V. 1988. *Geological Atlas 1:50 000 series. Sheet 78 (7912S). Montgomery.* Department of Mines Tasmania.
- Brown, A. V.; Findlay, R. H.; McClenaghan, M. P.; Seymour, D. B. 1991. Synopsis of the regional geology of the Macquarie Harbour, Point Hibbs and Montgomery 1:50 000 map sheets. *Report Department of Resources and Energy Tasmania* 1991/21.
- Close, R.J. and Reid, R.O. 1995 Annual Report on Exploration Activity for the 12 months to August 1995. EL's 4/92 and 7/92. Sorell Peninsula. Unpublished Tasmanian Mines Department Report. *Plutonic Operations Ltd.*
- Corbett, K.D. 2001 New Mapping and Interpretation of the Mount Lyell Mining District, Tasmania: A Large Hybrid Cu-Au System with and Exhalative Pb-Zn Top. *Economic Geology Vol 96: 1089-1122*
- Corbett, K.D. and Solomon, M. 1989 Cambrian Mt Read Volcanics and Associated Mineral Deposits. In C.F. Burrett and E.L. Martin (Editors), *Geology and Mineral Resources of Tasmania. Geol. Soc. Aust. Spec. Publ. 15: 84-153*
- McClenaghan and Findlay, 1989 Macquarie Harbour. *Geological Atlas 1:50 000 series. Tasmanian Department of Mines.*
- McClenaghan, M. P.; Findlay, R. H. 1993. Geological Atlas 1:50 000 series. Sheet 64 (7913S). Macquarie Harbour. *Explanatory Report Geological Survey Tasmania.*

Reid, P.W, van der Stelt, B.J. and Ascough G.L. 2014. *Combined Annual Technical Report– Sorell Project EL6/2013 & EL7/2013, Sorell Peninsula, Tasmania, For the period 22<sup>nd</sup> October 2013 to 21<sup>st</sup> October 2014.* Unpublished Company Report, MRT Tasmania.

Reid, P.W, van der Stelt, B.J. and Ascough G.L. 2015. *Combined Annual Technical Report– Sorell Project EL6/2013 & EL7/2013, Sorell Peninsula, Tasmania, For the period 22<sup>nd</sup> October 2014 to 21<sup>st</sup> October 2015.* Unpublished Company Report, MRT Tasmania

Reid, P.W, Van Der Stelt, B.J. and Ascough G.L. 2016. *Combined Annual Technical Report– Sorell Project EL6/2013 & EL7/2013, Sorell Peninsula, Tasmania, For the period 22<sup>nd</sup> October 2015 to 21<sup>st</sup> October 2016.* Unpublished Company Report, MRT Tasmania

Reid, R. 2001. *Cambrian intrusion-related copper mineralisation at the Thomas Creek prospect, south western Tasmania.* M. Econ. Geology thesis, University of Tasmania, Hobart.

White, N.C. 1975 Cambrian Volcanism and mineralisation, south-west Tasmania. *PhD Thesis (unpublished), University of Tasmania*