

# Final Report

Lake Pieman

China Coal Resources Pty Ltd

Title: EL 15/2007

Reporting Period From: 23 July 2014

To: 22 July 2015

Licensee: China Coal Resources Pty Ltd

Address: Suite 2, 3b Macquarie Street, Sydney NSW 2000

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## Abstract

EL15/2007 is located 15km west of Renison Bell tin mine and approximately 30km west of Rosebery in western Tasmania. Access is limited and topography rugged with much of the tenement comprising the steep sides of the Pieman valley.

ASF Resources Limited entered into a joint venture with China Coal Geology Engineering Corporation to explore for polymetallic mineralisation. The project is managed by China Coal Resources Pty Ltd (CCR) which is exploring for epigenetic base metal mineralisation associated with Devonian granite emplacement with Renison Bell type mineralisation and skarn mineralisation being the primary exploration models.

Work completed in 2012-2013 included:

- Trenching (10 trenches for 284m)
- Soil sampling (590 samples) in three areas

Work to date by China Coal Resources has not outlined any significant surficial geochemical anomalies within the Crimson Creek Group and as such no further work will be carried out and the tenement will be surrendered.

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# Introduction

## EXPLORATION RATIONALE

In 2011, ASF Resources Limited entered into a joint venture with China Coal Geology Engineering Corporation to explore for polymetallic mineralisation over the tenement under the joint venture company China Coal Resources Pty Ltd (CCR).

The joint venture is exploring for epigenetic base metal mineralisation associated with Devonian granite emplacement with Renison Bell type mineralisation and skarn mineralisation being the primary exploration models.

## GEOLOGICAL SETTING

The geology of the EL is dominated by the Neo-Proterozoic (1000-750Ma) Oonah Formation, a sequence of greywacke, pelites, siltstones and quartz sandstones. This unit was probably the precursor to the Dundas Trough. In the NE sector of the tenement, the overlying early Cambrian Success Creek Formation is present: a sequence of sandstones, siltstones, volcanoclastics with minor carbonate beds and tholeiitic basalts.

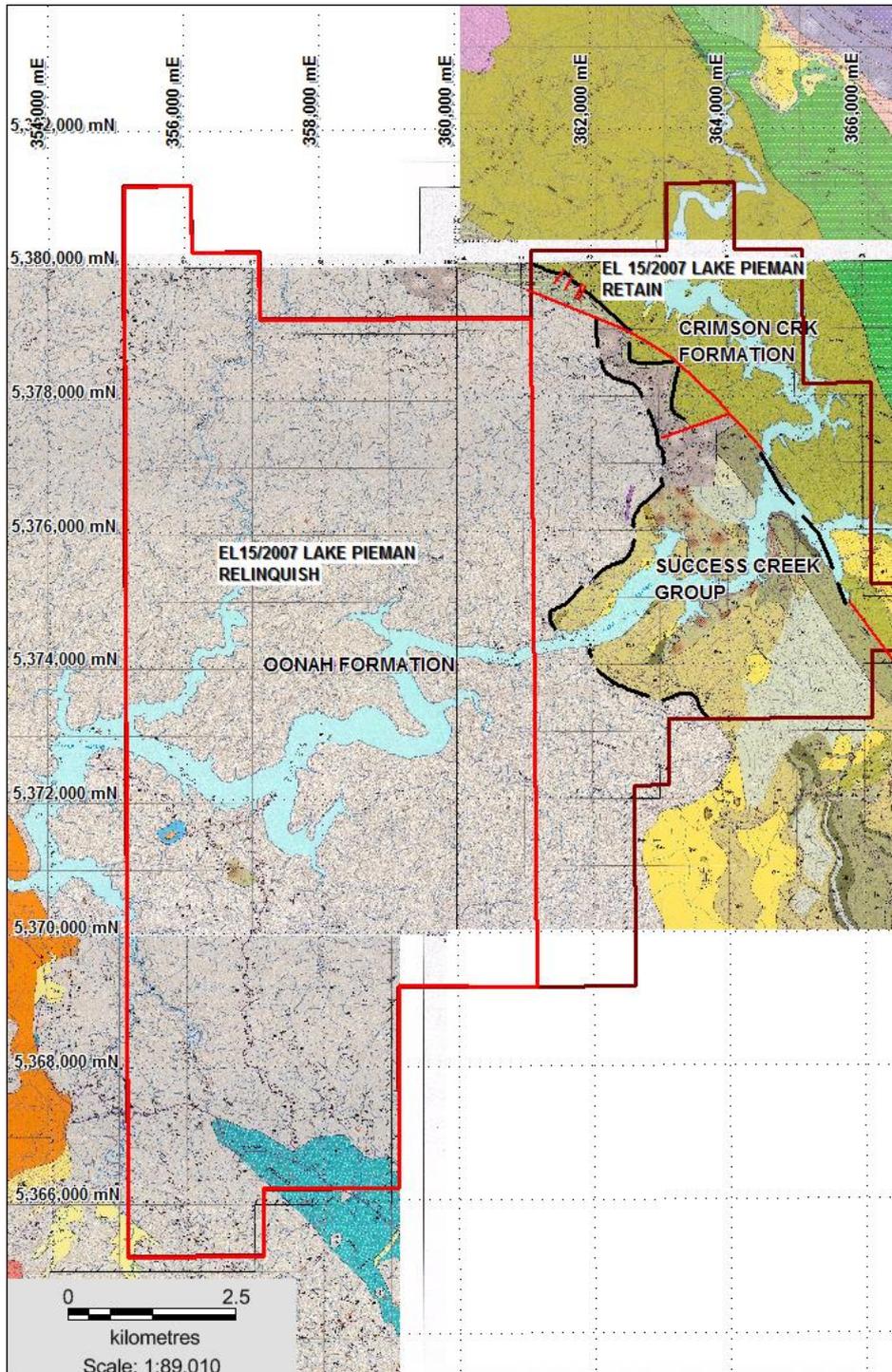
Intrusive rocks in the tenement are represented by Oonah Formation gabbro in the southwest and a few diabase veins in the east. Granite is seen in a small number of locations with the exposed area of about 15m<sup>2</sup>. The weathering surface of granite is pale tan with a massive structure, mainly composed of feldspar and quartz, with the grain size of 2-5 mm. Feldspar has been weathered to kaolin, with clear quartz grains. Diabase veins are mainly distributed in the east of the tenement. They have a fine grained texture and massive structure with the main minerals being pyroxene and plagioclase (usually <0.5mm grain size). Accessory minerals are sparsely disseminated iron pyrite and chalcopyrite with a grain size less than 0.1 mm and less than 0.1% content.

The strike of the strata in the tenement is mainly NW-SE and to a lesser extent, E-W and N-S direction while the overall basin structure includes three direction groups: NW, NE and EW.

Based on the regional and local geological characteristics, CCR's exploration targets are iron ore, copper, zinc and tin of epigenetic vein and skarn styles as well as volcanogenic deposits.

To the immediate south of the tenement, tin mineralisation is developed within the aureole of the Devonian Heemskirk Granite both as veins associated with tourmaline and as alluvial deposits (Laffers, St. Dizier and Tasman River). Similar tin deposits occur to the immediate north of the tenement associated with the large Livingstone Creek Devonian granite batholith. The large replacement tin deposit of Renison Bell is located approximately 5km to the east of the tenement eastern boundary.

Within the EL, the only known mineral occurrences are alluvial tin workings at the Eureka alluvial tin field near Heemskirk Falls, two minor lead prospects and two pyrite prospects.



**Figure 1:** EL15/2007 Geology showing the relinquished portion

The relinquished portion of EL15/2007 is dominated by turbidites of the Oonah Formation which are the oldest group of rocks within the tenement. The retained portion of the tenement comprises mudstones, siltstones and cherts of the Success Creek Group which are overlain by the siltstones and carbonates of the Crimson Creek Group.

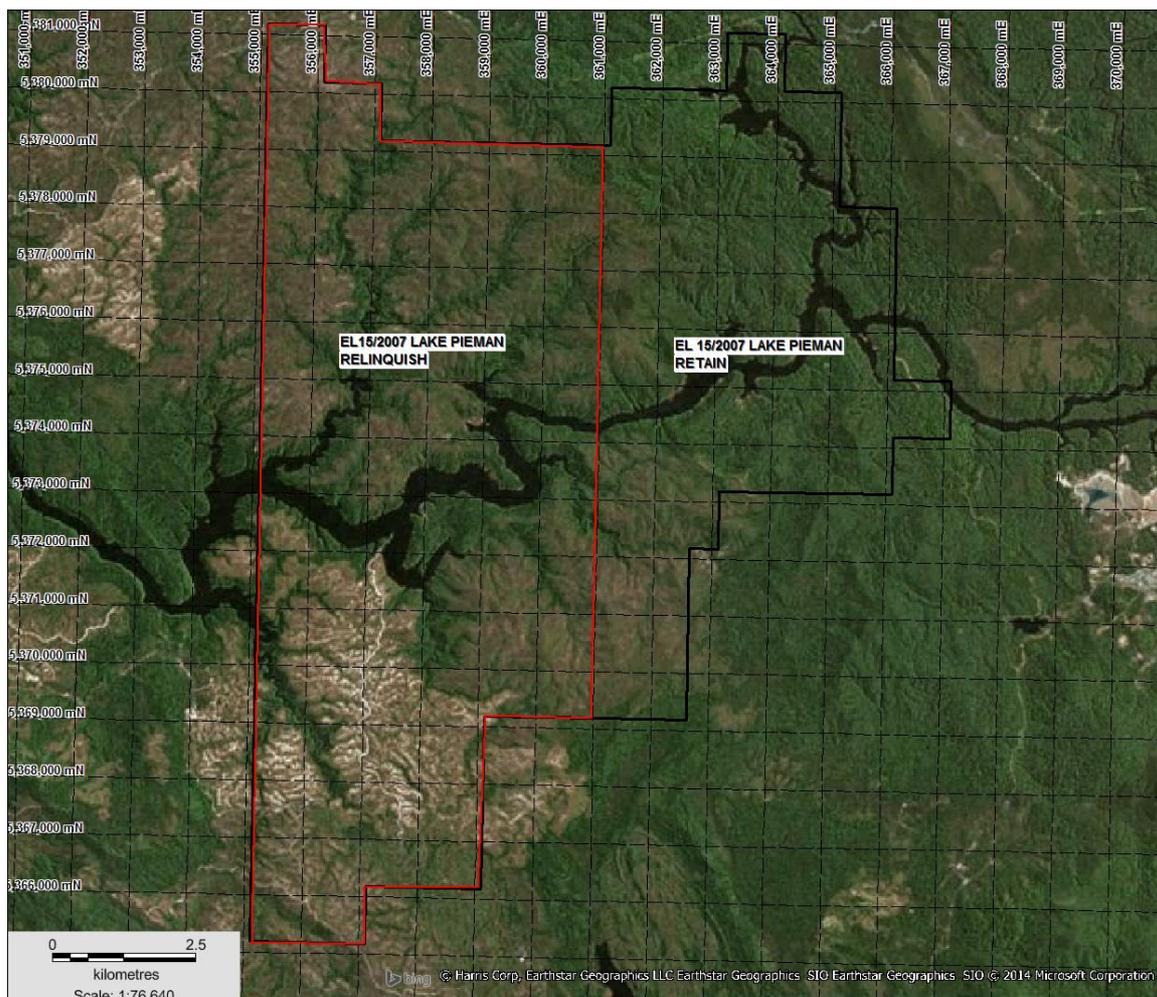
## LICENCE

EL15/2007 (Lake Pieman), comprising 249km<sup>2</sup> was granted to ASF Resources Pty Ltd (“ASFR”) on 23 July 2007 (Table 2). ASFR subsequently formed a joint venture with China Coal Geology Engineering Corporation (“CCGEC”) to explore the tenement by the formation of an Australian joint venture company, China Coal Resources Pty. Ltd (“CCR”). Title has been transferred from ASFR to CCR. Under the terms of the joint venture, CCGEC will fund \$1.2M of exploration to earn 55% of CCR. If the results of this exploration are favourable, CCGEC may fund an additional \$1.5M of exploration to earn an additional 20% equity in CCR with further expenditure being joint funded by the partners on the basis of their equity share in CCR.

The licence was reduced from 118km<sup>2</sup> to 41km<sup>2</sup> in 2014 (Figure 1) and if the renewal is granted the tenement will expire on 22 July 2015. The decision has been taken not to extend the licence beyond July 2015.

Tenement	Area (km <sup>2</sup> )	Reduced to (km <sup>2</sup> )	Grant Date	Final Date
EL15/2007	118	41	23/07/2007	22/07/2015

**Table 1:** EL15/2007 Licence Details



**Figure 2:** Reduction of EL15/2007 in 2014

## LOCATION

EL15/2007 is located 15km west of Renison Bell tin mine and approximately 30km west of Rosebery in western Tasmania (**Figure 3**). The West Coast Highway, A10, borders the eastern side of the tenement while the Pieman Road, 245, provides limited access to the northern sector of the tenement. The Zeehan-Granville Harbour road provides limited access to the southern areas of the tenement. The Pieman River and Dam traverses the centre of the tenement area. Access is limited and topography rugged with much of the tenement comprising the steep sides of the Pieman valley.

The tenement is thickly vegetated with vegetation varying from button grass and heath through thick tea tree scrub and mature eucalypt forest. Altitude difference throughout the tenement is 300-400m. The GDA94 Coordinate System is used in this work and a 13.5° east declination correction was applied for compass bearings.



**Figure 3:** Location of EL15/2007

## Review of Previous Work

### PRIOR TO CURRENT TENEMENT

Historically there has been relatively little exploration undertaken over much of the area covered by EL 15/2007. The degree of overlap with prior tenements has been minimal; covering only small regions along the fringes of the present day licence, and in some instances exploration coverage may not have extended over these areas. Table 2 provides a brief summary of work completed by former tenement holders where overlap has occurred. A more detailed description of the nature of work and subsequent findings follows.

Company	Period	Licence	Target	Exploration Activities
RGC Exploration	1989 – 1992 1993 - 1994	42/1987	Base metals, tin	C-horizon soil sampling, aeromagnetics, geological mapping & rock chip sampling. Diamond drilling at Sylvester (SY002 – SY016)) and one stratigraphic drill hole (PL001) at Parting Lake. Down hole SIROTEM survey of SY016. Feasibility study of Sylvester Prospect
Cavenridge P/L	1990-1994?	23/1990	Granite	Detailed review of previous exploration and follow-up field reconnaissance
Cavenridge P/L	1990-1994?	29/1992	Granite, tin	As above
Bruce Resources N.L.	1995	12/1994	Chromite, gold, osmiridium, platinoids & tin	Detailed literature search & assessment of prior exploration
JV : Goldstream Mining N.L. & Titan Resources	1995 - 1999 2000	43/1994	Proterozoic iron formation-hosted lode gold	Stream sediment sampling & aeromag survey of entire licence. Detailed follow-up of anomalous areas incl. stream sediment & soil sampling, & diamond drilling (8 cored DDH) Airborne heli-EM survey
Adamus Resources Ltd	2002 - present	18/2002	Ni, Platinoids & Au	Review of previous exploration & aeromag results with follow-up stream sediment sampling and analysis

**Table 2:** Previous Work by Other Companies over EL 15/2007

RGC Exploration commenced work on EL 42/1987 in 1989 with a program including c-horizon soil sampling, aeromagnetics, detailed geological mapping and rock chip sampling. This EL had a small area of overlap in its top NW corner with EL 15/2007. Two areas were chosen for more detailed follow-up – Parting Lake and Comstock (later named Sylvester) - and grids were established to cover the areas. During 1990/1992 diamond drilling was undertaken at Sylvester: to test a 1.2 km Zn-Pb-(Sn-Au) anomaly (holes SY002 & SY003) associated with ironstones and decomposed carbonates of the Upper Oonah Formation, and to test the source of two intense magnetic anomalies associated with the Balstrup Fault (SY004 & SY005). These delineated a significant base metals skarn, and a further 10 holes were completed to test the extent of the deposit. Exploration ceased in 1992, however, when drilling failed to identify any such extension. A single stratigraphic hole (PL001) was drilled at Parting Lake to test for potential base metal / stanniferous replacement deposits above a gravity defined granite cupola, however the hole failed to intersect significant carbonates.

In 1992 the northern half of the EL (which included the overlap with EL 15/2007) was relinquished. Work on the remaining tenure included a down-hole SIROTEM survey of DDH SY016 and a feasibility study of the Sylvester Prospect was undertaken. In 1994 joint venture partners were sought, unsuccessfully, and in 1995 the remainder of the EL was relinquished.

During the early 1990's, Cavenridge Pty Ltd carried out an exploration program in the Mt Heemskirk area on EL 23/1990, which was subsequently expanded toward the west coast to become EL 29/1992. The top NE corner of these EL's was co-incident with EL 15/2007. Their target was the mineralized Devonian-Carboniferous Heemskirk Granite for dimension stone as well as tin and base metal potential. A detailed review of previous exploration and results was undertaken, together with some field reconnaissance, and based on favourable projections, recommendations for future work programs were proposed. It appears from subsequent reports, however, that no further investigations eventuated, and the EL was relinquished around 1995.

Located to the NE of EL 15/2007, Bruce Resources NL commenced exploration over EL 12/1994 during 1995. Overlap with the present day EL 15/2007 is confined to a very small corner in the top NE section. Again, work comprised a detailed literature search and assessment of past exploration, with interest primarily focused on chromite, gold, osmiridium, platinoids and tin. The ultramafic rocks were regarded as being highly prospective for platinoids, gold and chromite while the Mt Lindsay tin skarn was considered indicative for the area to host granite related mineralization. Despite optimistic projections for the area's potential, it appears that no further investigations proceeded and the tenure was relinquished in 1995.

Following the granting of EL 43/1994 to Joint Venture partners Goldstream Mining NL and Titan Resources NL in February 1995, an extensive exploration program was commenced. This tenement was located to the NW of EL 15/2007, and again the area of overlap is extremely small compared to the overall size of the EL. The primary target was Proterozoic iron formation-hosted lode gold. Work undertaken prior to 1999 included stream sediment sampling and an aeromagnetic survey of the entire licence, which highlighted three areas of interest; Lefroy Ridge East and known historical workings at Rocky River and Lucy Spur. The prospects were followed up with detailed stream sediment sampling, soil sampling and diamond drilling. A total of eight cored drill holes were completed over the three prospects, however with only low order gold anomalies identified, no further work was undertaken. In late 1999 approximately half of the EL (NW portion) was relinquished. In 2002 an airborne heli-EM survey was flown in conjunction with Mineral Resources Tasmania (MRT), targeting Cu-Zn bearing massive sulphides associated with the Savage River magnetite deposits. Follow-up investigations failed to identify any further areas of interest, and after extensive testing of all anomalies showed no economic mineralization, the remainder of the EL was relinquished in 2002.

Goldstream Mining also held several other tenements to the north and east of EL 43/1994 during the 1990's and beyond. In closest proximity to EL 15/2007 were EL 42/1996 and EL 22/1998, to the immediate north, however neither of these were coincident, and consequently have not been included in this review.

EL 18/2002 which is located to the NE of EL 15/2007, was granted to Adamus Resources Ltd in 2002. Their principal target focused on primary nickel, platinoid and gold mineralization. As can be seen in the EL Map for 2003 in Appendix 1, overlap occurred in the NE corner of EL 15/2007. Following a review of historic exploration data and publicly available aeromagnetic data, Adamus carried out a stream sediment sampling program from drainages to the west of Serpentine Ridge. All samples were

analysed for low-level Au, Pt and Pd, and Cr, Cu, Ni and S. A review of these results led Adamus to identify some areas within the tenement as non-prospective, and a total area of some 40 sq km was identified for release in 2004. Included in this relinquished zone was the overlap portion with EL 15/2007. Adamus continue to have tenure for the remaining areas of the EL.

## DURING CURRENT TENEMENT TERM 2007-

### 2008

Exploration completed (Derriman & Lee, 2008) included:

- Review of geological setting and mineralisation
- Compilation of previous exploration data

### 2008-2009

Exploration completed (Derriman, 2009) included:

- All available open file GIS data was assembled for review in Mapinfo.
- A brief field visit to the project area was made by ASF Resources staff to review the geology and magnetic character of the rocks with an iron rich skarn model in mind.

### 2009-2010

Exploration completed (Derriman, 2010) included:

- All available open file GIS data was assembled for review in Mapinfo.

### 2010-2011

Exploration completed (Zhang & Zhang, 2012) included:

- Stream sediment sampling (287 samples)
- Geological traversing
- Rock chip sampling (30 samples)

### 2011-2012

Exploration complete (Zhang & Zhang, 2012) included:

- Interpretation of stream sediment sampling
- Track work suitable for access by ATV (5.2kms and 3 bridges) and grid cutting (24 line kms)

2012-2013  
TRENCHING

In 2012 a program of trenching was planned involving 7 trenches for a total distance of 125m (Figure 4). Trenches were dug and extended to 10 trenches in August 2012 for a total metreage of 284m. The trenches are situated primarily within the Crimson Creek Formation.

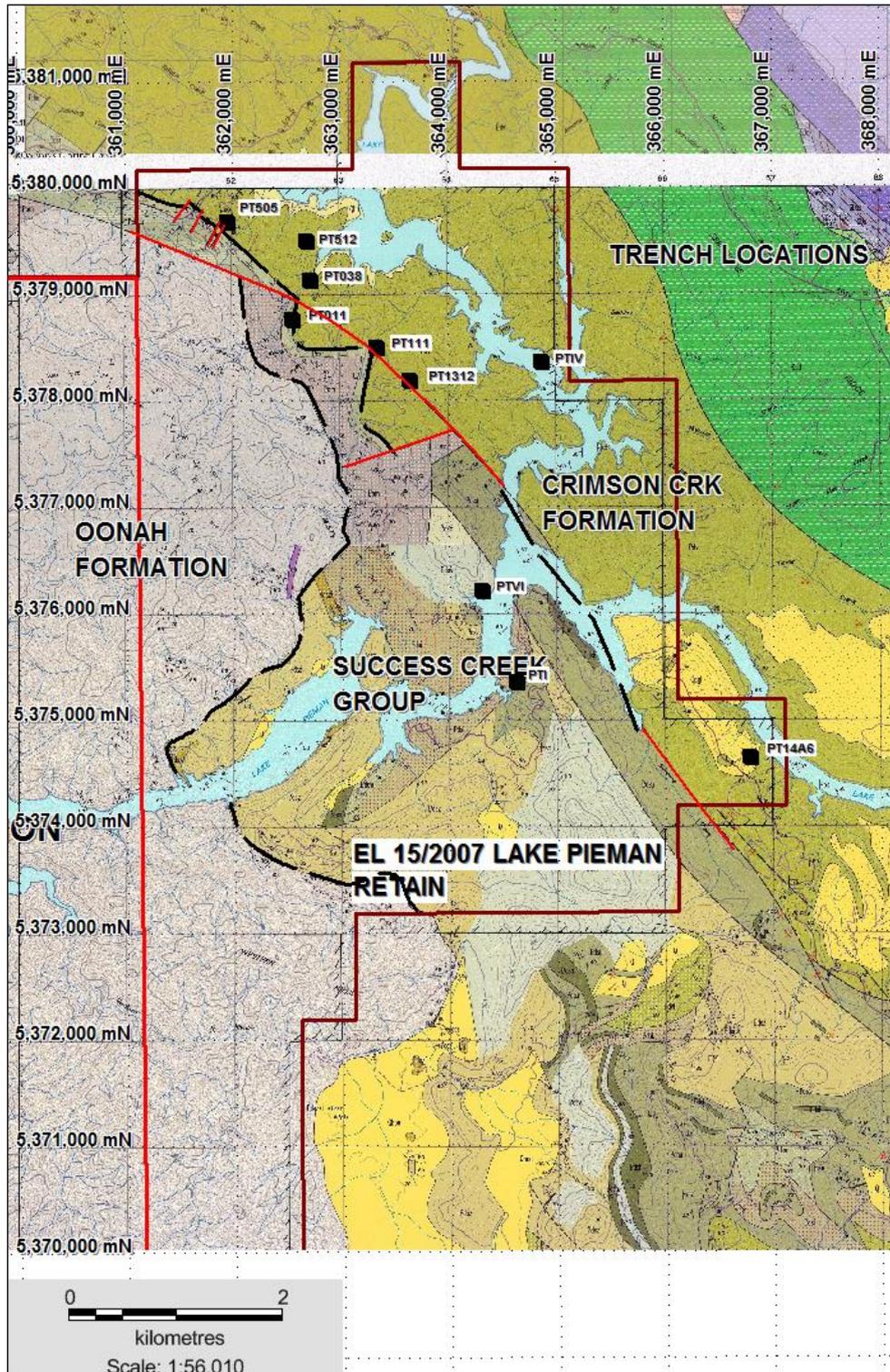


Figure 4: Location of Trenches on Geology

**Trench PT505** (North end of tenement) indicated that the main lithology is white, yellow, purple and red mudstone and red sandstone, in addition to quartz veining within a fault and silicification in the East trench. Assay results were surprisingly low from strongly silicified hematite mineralization (best Fe 18%, Cu 100ppm, Pb 173ppm, Zn 100ppm).

**Trench PT038** (1Km south of PT505) main lithology is red, black, yellow and brown siltstone, in which fine quartz vein can be seen. Best assays were Fe 28%, Cu 183ppm, Mn 245ppm and Pb 43ppm.

**Trench PT111** (1Km south of PT505) shows a lithology mainly composed of argillaceous siltstone with fine bedding and stratabound pyritic mineralisation up to 2mm thick.

**Trench PTI** (Within the Success Creek Group at the southern boundary) lithologies are mainly dark grey mudstone and layered siltstone. Ferruginisation within irregular fractures was observed.

Observations from the trench sampling indicate that the Crimson Creek Group within the eastern portion of EL15/2007 comprise siltstone and mudstone.

## SOIL SAMPLING

Soil sampling has been completed in the North, Central and South areas (**Figure 5**). Sample numbers 1 to 6 in line 18 of the North area were not collected due to the difficulty in accessing the road at the western tip.



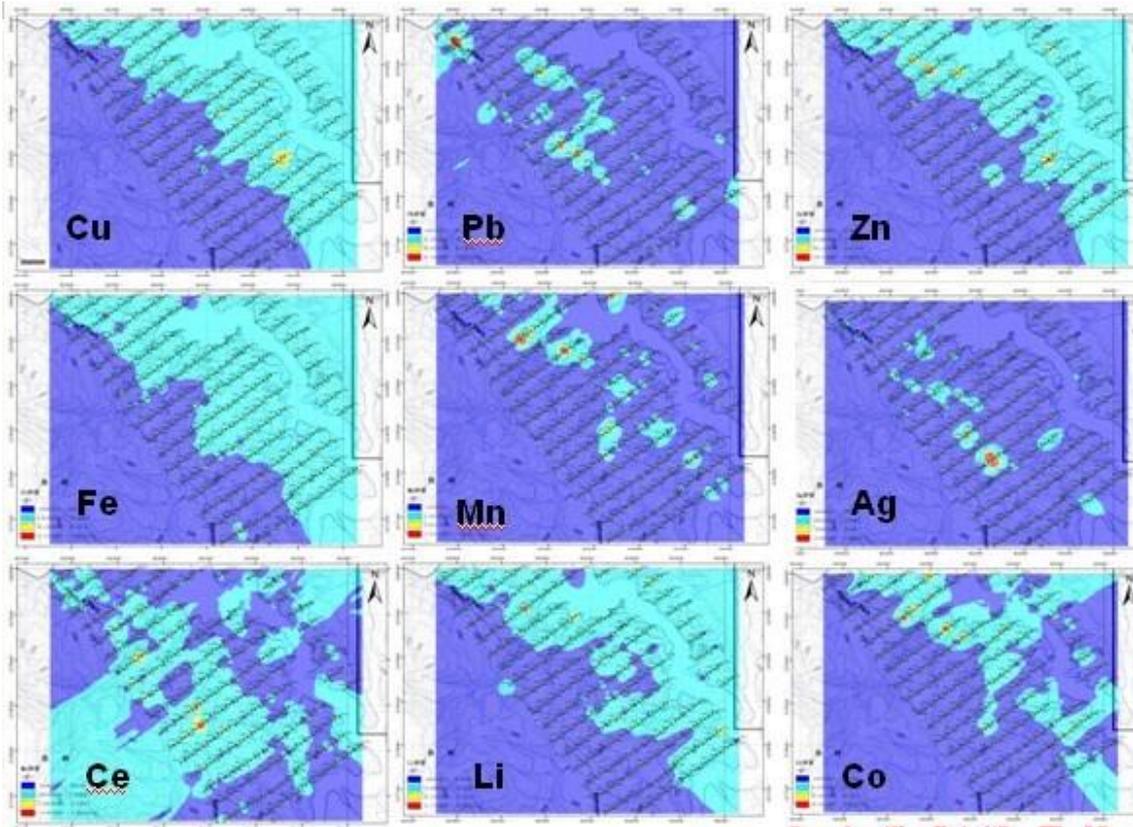


Figure 6: Multi-Element Soil Geochemical Anomaly Map in the North of Lake Pieman

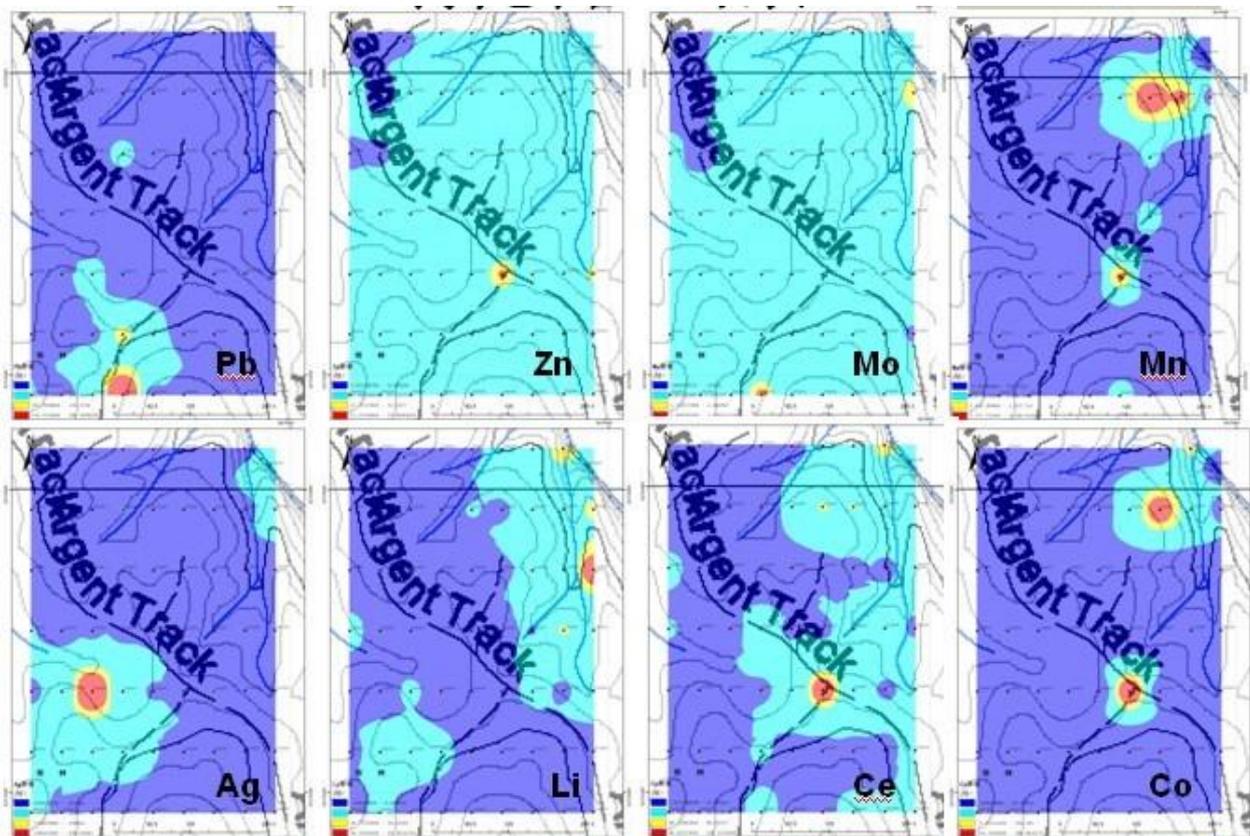


Figure 7: Multi-Element Soil Geochemical Anomaly Map in the South of Lake Pieman

2013-2015

There was no field based exploration in this period

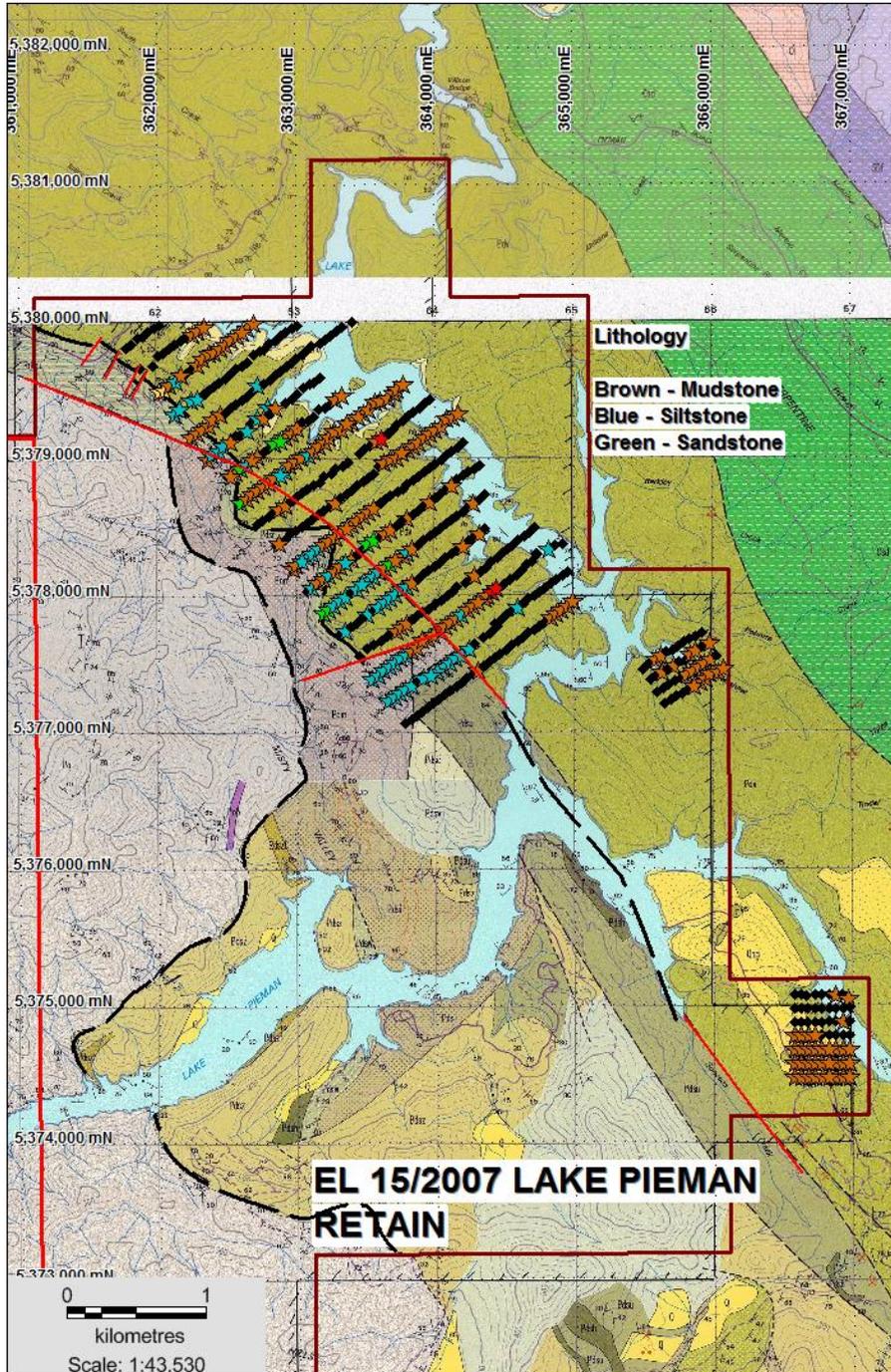


Figure 8 Lake Pieman Soil Grids and Geology

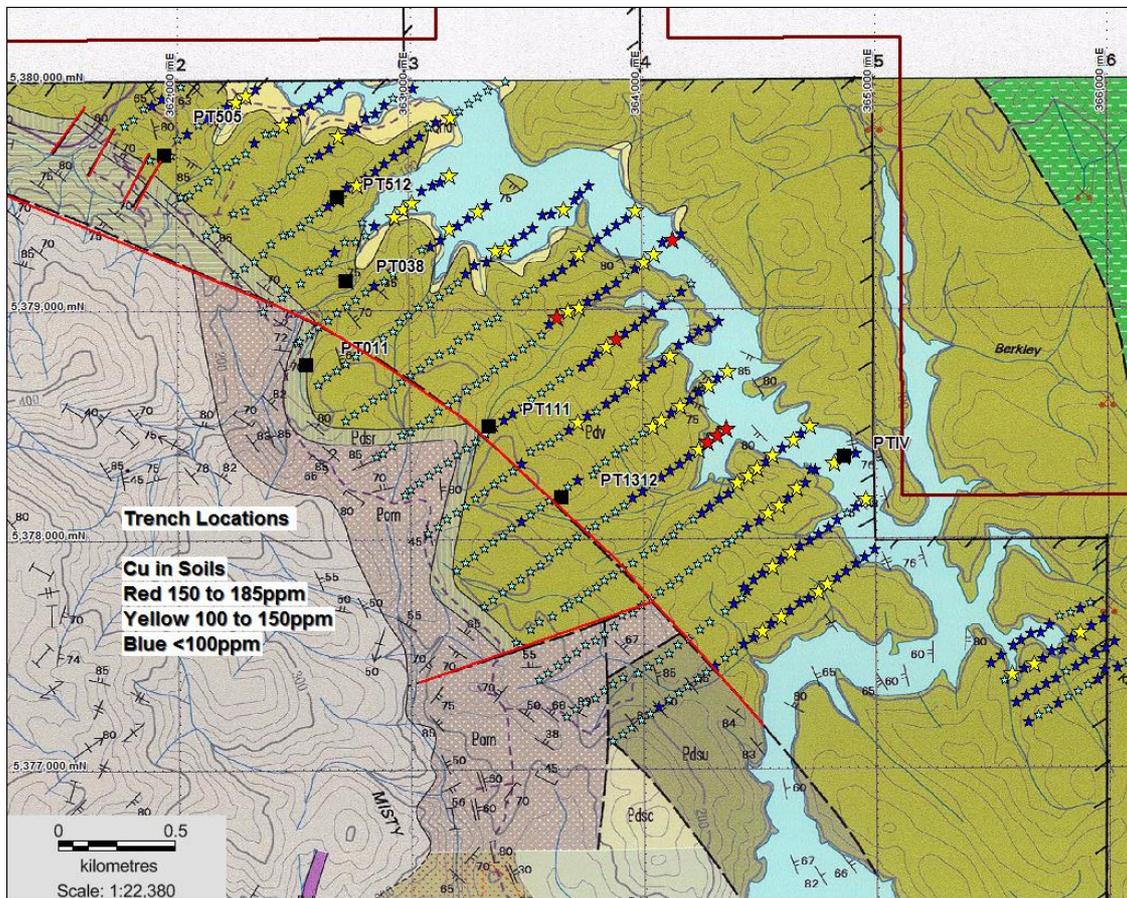


Figure 9 Lake Pieman North/Central Soil Grids, Trench Locations and Geology

## Conclusions

The results of the surficial geochemical sampling within the Crimson Creek Group were disappointing and of a low tenure. No further field based exploration is warranted and as such the tenement will be surrendered

## Expenditure During 2013-2014

Exploration Category	Description of Activity	Quantity	Expenditure (AU\$)
Office Administration	Project Management		3,500
Authority Management	Tenement Management		2,845
Office Activities	Reporting		1,500
Field Activities	Geological Mapping		
	Sampling		
	Equipment Hire		

	Accommodation/Field Camp		
	Travel		
	Landholder Liaison		
	Other - Nominate		
	Geophysics		
	<i>Airborne</i>		
	Type		
	<i>Ground</i>		
	Type		
	Drilling (program cost)		
	RAB/AC		
	RC		
	Diamond		
	Other		
Laboratory	Describe Analyses/Tests		
Salaries/Wages	Employees		
	Consultant		33,123
		Grand Total	37,720

**Table 3: 2013 -2014 Expenditure Table**

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## Keywords

File Name	
Location Name:	Lake Pieman
Earth Science Related Terms:	Geological Mapping
Environment of Mineralisation:	
Commodities:	Iron ore, Copper, Zinc and Tin
Exploration Methods:	Soil sampling, trenching
Stratigraphic Name:	Oonah, Success Creek and Crimson Creek Formations
Lithologic Name:	Mudstone, Siltstone and Sandstone
Geological Province:	Dundas Trough
Geological Age:	Cambrian

**Table 4:** Key words associated with EL 15/2007