



**MITHRIL**  
**RESOURCES LTD**

**EL29501 – PADDYS PLAIN**

**YAMBAH PROJECT**

**YEAR 2 ANNUAL AND FINAL REPORT**

**For the Period**

**20 December 2013 to 18 December 2014**

**Compiled by**

**Jim McKinnon-Matthews (General Manager)**

MAP REFERENCE: Alice Springs 250K - Sheet SG53-14  
Target Commodities: Copper, Gold, Lead & Zinc

Report submitted 30 January 2015  
All data provided is of GDA94 Datum, Zone 53.

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## **SUMMARY**

This report presents the work completed during the second (and final) year of tenure on the Paddy's Plain (EL29501) tenement, which forms part of the broader Yambah Project.

Work completed during the reporting period included a complete review of all data.

Following this review and given the move by the company to reduce its exposure in the NT due to financial constraints the tenement has been relinquished in its entirety.

Work completed by Mithril over the tenement in the two years included:

- Collection of 31 grab samples
- Heritage survey
- Ground EM Survey (5.6 line kilometres)
- Geological mapping

## CONTENTS

1.0	Introduction .....	4
2.0	Tenure.....	4
	Table 1: Summary of Paddy's Plain tenure.....	4
3.0	Geology.....	5
4.0	Previous Exploration .....	5
5.0	Work completed during the 2012-13 reporting period .....	9
5.1	Grab Sampling .....	9
5.2	Geological Mapping.....	10
5.3	Ground EM Survey.....	11
6.0	Work completed during the 2013-14 reporting period .....	12
7.0	Conclusions and planned work .....	12
	REFERENCES .....	12
	COPYRIGHT - AUTHORISATION OF PUBLICATION .....	12

## TABLES

Table: 1:	Summary of Yambah Tenure.....	4
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## FIGURES

Figure 1:	Location of Paddy's Plain Tenement .....	4
Figure 2:	Grab samples shown as black triangles. Regional TMI image in background.	10
Figure 3:	Geological map of Bessies Reward Prospect.....	10
Figure 4:	Location of GEM Survey.....	11

## 1.0 INTRODUCTION

This report details work completed on Mithril's Paddy's Plain Tenement which forms part of the broader Yambah Project (EL28175, EL28271 and EL28340) for the period ending 19 December 2014. The tenement is located east of Alice Springs, as shown in Figure 1.

Access to the tenement is via the Ross Highways, the Arltunga Tourist Drive and station tracks.

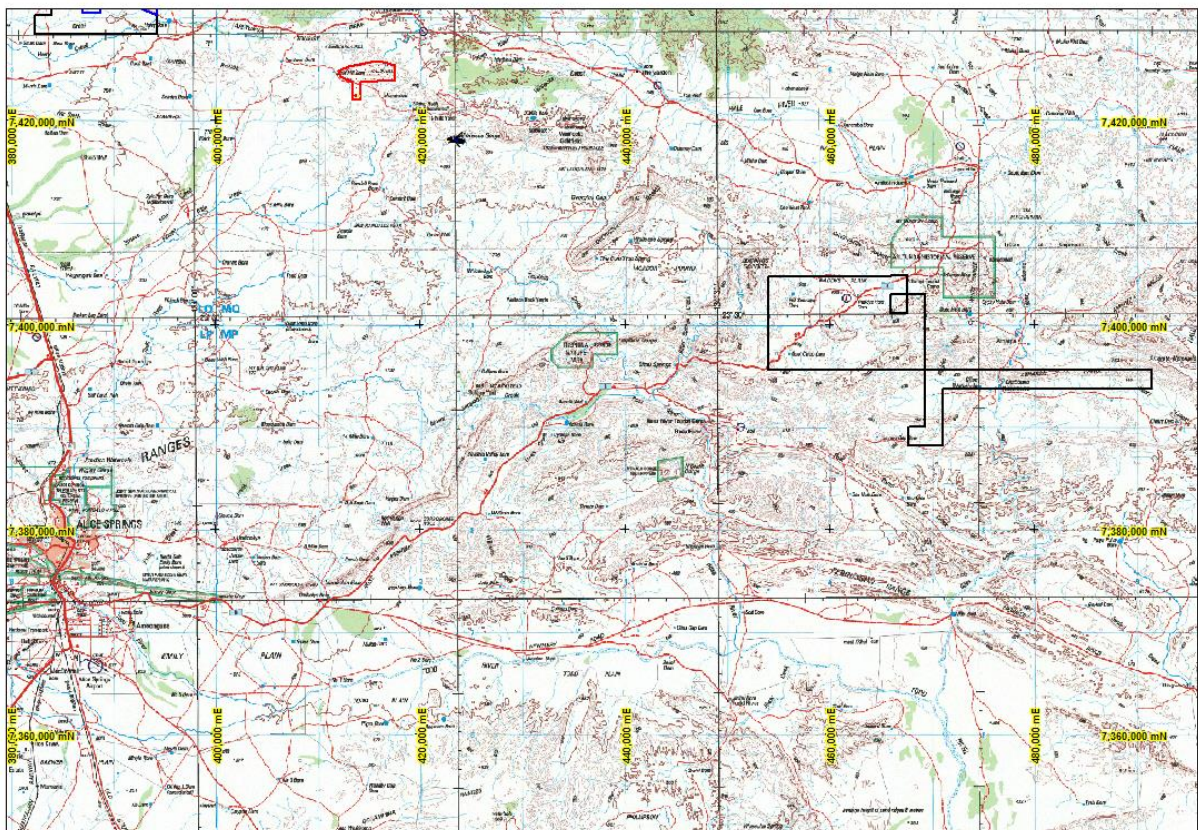


Figure 1: Location of Paddy's Plain Tenement.

## 2.0 TENURE

Tenure of the Paddy's Plain Tenement is summarised in Table 1.

Name	EL Number	Title Holder	Grant Blocks	Grant area (km <sup>2</sup> )	Grant Date
Paddys Plain	29501	Mithril Resources Ltd	60	188.9	20.12.2012

Table 1: Summary of Paddy's Plain tenure

### **3.0 GEOLOGY**

The Paddy's Plain tenement lies within the Aileron Province of the Arunta Region. Outcropping and interpreted basement geology is comprised of 'unassigned' units presumably occurring in the Palaeoproterozoic (1.8–1.7 Ga) Strangways Metamorphic Complex (SMC).

The tenement occupies a region of the Arltunga Nappe Complex (ANC) which is responsible for a structurally complex zone of interleaving Aileron and basal Amadeus Basin sedimentary sequences. The Hillsoak Bore Metamorphics (HBM) is the dominant unit outcropping across the tenement and occurs in the western part of the ANC. The HBM comprise marbles, calc-silicate rocks, andalusite schist, amphibolite, quartzite, sillimanite bearing metapelites and felsic gneiss (Scrimgeour, 2013). The dominant topographic feature in the northern part of the tenement is the extremely flat Paddy's Plain, consisting of recent Cainozoic gravels and sands.

Polymetallic Cu-Pb-Zn-(Ag-Au) mineralisation has been mapped over an area 1000m x 200m and is called the Bessie's Reward Prospect (Figure 3). Bessie's Reward outcrops within the HBM and is a subtle topographic hill, of mafic protolith, metamorphosed to upper Amphibolite facies (needle like minerals present - actinolite?). It is structurally complex with secondary malachite and azurite +/- galena commonly occurring along fractures/ shear zones. Typical grab samples return 4.29% Cu, 0.34% Zn, 0.52% Pb and 3.6g/T Ag.

### **4.0 PREVIOUS EXPLORATION**

#### **Tanami Exploration / Deep Yellow / Rum Jungle Uranium 2003-09 – EL 22918**

Exploration was primarily focused on the area around the historic Paddy's Jump-Up Uranium prospect in the eastern half of the tenement. However, for the majority of the seven years of tenure, most of the field work consisted solely of mapping, with some rock-chip and lag samples taken around existing prospects. In 2008, Rum Jungle submitted an exploration proposal to the Central Land Council for an 80 hole, 3000m RAB drilling program in the Paddy's Jump Up area, but Traditional Owners inspected the area in June 2008 and declared the area a significant sacred site thus preventing any exploration activity (the location of this sacred site is not supplied).

#### **Johnson's Well Mining / Gutnick Resources 2003-04 – EL10280 / EL10266**

A literature review of government open file data was completed to assess past exploration techniques and methodology over the "Rand Project", a joint venture between Gutnick Resources (manager) and Johnson's Well Mining. Previous exploration for gold was limited and the proposed exploration program involved the application and assessment of regolith and structural geology, geochemistry and geophysics. The exploration program was designed to locate a variety of gold and base metal targets given the lack of systematic past exploration in the area. Some 510 stream sediment samples were taken and a total of 70 rock chip samples were taken

from exposed outcrop during the stream sediment sampling program; however, none of this was conducted over EL10280.

**Rio Tinto Exploration 1996-98 – EL9330**

Exploration in the first year of tenure included a comprehensive review of previous work that identified several areas of anomalous base metal values for follow up and gaps in the sample coverage. This was followed up by a helicopter stream sediment survey that identified several areas of anomalous base metal values.

During the second and final year the contact between the Heavitree Quartzite and the Bitter Springs Formation was evaluated for potential strata-bound copper mineralisation. 275 RAB holes were drilled along this contact with some results showing low order base metal anomalism, all be it on other tenements in the region.

**Shandona Pty Ltd 1996-98 – EL8785**

Exploration in the first year of tenure included a comprehensive review of previous work and 49 Stream sediment samples were collected and manually panned for alluvial gold with varied results that failed to highlight any anomalous regions.

**Lutz Frankenfeld / Colin Rhode / Linc Enterprises 1988-92 – EL5786**

The tenement was originally included in a proposed public float that had to be abandoned due to unfavourable market conditions, thus delaying commencement of exploration. Work during the first year was limited to literature research and preliminary field reconnaissance. One grab sample of copper-stained sandstone taken east of “Paddy’s Hole dam” in the northeast corner of the area (Arltunga Prospect) was collected and analysed (see table below). No further information is supplied.

	Sample	Au_ppm	Cu_ppm	Pb_ppm	Zn_ppm	Bi_ppm	Ag_ppm	As_ppm
Arltunga	2a	0.25	5.10%	2300	3600	<10	300	5200

**Mules and Bruce / Pancontinental Mining / Central Rare Earths Corporation 1988-92 – EL5156**

An unsuccessful attempt was made to relocate the chromium occurrence shown on the 1:100,000 sheet north-west of Tommys Gap Dam in year one of tenure (Unnamed prospect 00597). Copper mineralization there (Tommy’s Gap) and east of Goat Camp Dam (Paddys Jump-Up) associated with marbles and calc-silicates was also examined but not considered prospective enough to warrant drilling. The whole of the licence area was covered by a stream sediment sampling program encompassing 213 catchments. This survey indicated several areas of anomalous base metal values but only encompassed a small area of the current EL.

### **MacMahon Construction 1987-88 – EL5270**

The focus of exploration was on Heavitree Quartzite, as it is said to be prospective for economic gold deposits when there are late east-west striking, steep dipping sets of quartz filled fault and breccia zones (see White Range Gold deposit). Reconnaissance prospecting was carried out on EL5270 and these features were found to be lacking. Due to the high degree of outcrop the area, it is deemed unprospective and was surrendered.

### **Tonto Pty Ltd 1988 – EL5129**

The licence area was said to be prospective for PGE mineralisation within late Proterozoic intrusive ultrabasic-basic rocks similar to those found in the Mordor igneous complex. Tenure was granted for six years and an exploration strategy was outlined, which included regions stream sediment sampling and rock chip sampling, but there is no report of any of this work or of when tenure was surrendered.

### **MacMahon Construction 1987-88 – EL4917**

Exploration conducted included a 7km by 3.6km ground mag. survey and rock chip sampling. Two relatively linear Banded iron formations were mapped and selected areas of interest were costeamed and sampled. Copper, Gold, Lead, Zinc, Silver and Asbestos were all detected or observed. These include fresh sulphide-bearing mineralisation with assays up to 3.75 g/t Au, 6% Cu, 15% lead, 25000 ppm Zn and 925 ppm Ag. The mineralisation was found to be confined to a narrow discontinuous lens about 15 cm thick and 40 m long. Costeaming also ruled out the possibility of any alluvial or elluvial Gold deposits, due to the shallow depth to fresh rock. The area had not been extensively explored but was relinquished because the extra effort could not be justified.

### **Peko Wallsend Operations / Petrocarb Exploration 1983-88 – EL3316**

The first year of tenure was focused on defining two existing Cu prospects that resided within the EL. The “Tommy’s Gap” Cu prospect is confined to a 100m wide, bow shaped zone, exposed on the northern slope of a Heavitree Quartzite ridge, where the majority of Cu is localised along faults and shears. Paddy’s Jump-Up prospect is associated with tremolite-actinolite pods or “Skarns” that are said to have originally been lenses of carbonate within more pelitic sediments. Rock chip samples from Paddy’s Jump-Up returned values of between 2.2% and 5% Cu.

Metasomatism caused by associated intrusive granites and dykes is believed to be the source of the mineralisation, which includes secondary malachite and azurite hosted along joints and fractures, with some pods even hosting galena and sphalerite (found within marble lenses). Drilling at Paddy’s indicated that the skarns are small pods of a discontinuous alteration zone, and are not associated with a larger, more conformable body.

### **Western Mining Ltd / Park and Athanasiou 1981-83 – EL2672**

The ground was selected primarily to explore for Gold and base metal mineralisation. Field activities were principally oriented toward detailed prospecting for Au mineralisation in areas of retrogressive metamorphism, and for Pb-Cu mineralisation in

sheared and folded gneissic rocks, adjacent to metamorphically retrogressed areas. A joint venture with Western Mining Corporation was entered after difficulties were experienced finding contractors. Western Mining subsequently undertook a stream sediment sampling programme to test for kimberlite and base metal indications.

**ESSO Australia Ltd. 1977-81 – EL1325**

After conducting an airborne radiometric survey, 41 anomalies were selected for ground follow-up, which involved ground spectrometer surveys and rock chip/soil sampling. From these, four prospects were identified, namely Atnarpa, M23, Arltunga and Paddy’s Jump-Up.

Detailed prospect evaluation included 1:2000 scale mapping over all prospects, scintillometer surveys and rock chip sampling on all four of the prospects targeting predominantly U and Cu mineralisation. Percussion drill programs were also conducted over the Arltunga and Paddy’s Jump-Up (U) prospects. Over the Arltunga prospect, a total of 48 vertical holes were drilled to depths varying from 4m – 73m and sampled along 1m intervals. Over Paddy’s Jump-Up, a total of 28 vertical holes were drilled to depths varying from 8m – 69m, and again sampled at 1m intervals. Best assay results from the drill program are shown in the table below and the location of these drill hole in displayed in.

Drilling failed to intersect any significantly high grade mineralisation and suggested that surface anomalism is due to supergene enrichment.

*Assay results from ESSO Australia drill program – EL1325*

Prospect	Hole ID	Sample No.	Interval (m)	Cu_ppm	Comments
Arltunga	# 6	67267	11-12	1300	
		67301	45-46	1200	
		67302	46-47	4400	55 ppm Ag
		67306	50-51	1300	
	# 7	67362	33-34	800	
		67363	34-35	1000	
		67364	35-36	840	
	# 11	68085	3-4	2600	
		68088	6-7	1200	
	# 16	68020	0-1	1200	
		68027	7-8	1200	
	# 17	68008	7-8	1300	>900ppm Cu from 7 – 17m
		68010	9-10	1000	
		68013	12-13	1300	
		68017	16-17	1500	



	# 20	68293	0-1	1200	
	# 21	68280	5-6	1000	
		68281	6-7	1600	
	# 22	68239	6-7	3400	>1000ppm Cu from 6–20m
		68242	9-10	1600	
		68243	10-11	2200	
		68244	11-12	1500	
	# 38	68440	6-7	1100	

### **CENTAMIN Ltd 1974 – EL49**

Exploration was initially focused on Cu, Au, Ag, Pb-Zn and scheelite, all of which had been previously reported in the region. Apart from Cu, all other commodities were dropped due to ineffective prospecting results. An area of approx. 10km<sup>2</sup> was identified as prospective for Cu, with numerous white Qz reefs hosting chalcopyrite and malachite, and traces of Ag. Drilling however failed to reproduce the high grades found at surface.

## **5.0 WORK COMPLETED DURING THE 2012-13 REPORTING PERIOD**

### **5.1 Grab Sampling**

31 grab samples were collected across the tenement (Figure 2), with the focus being on sampling the Bessie's Reward Prospect. Typical grab samples from this prospect returned 4.29% Cu, 0.34% Zn, 0.52% Pb and 3.6g/T Ag.

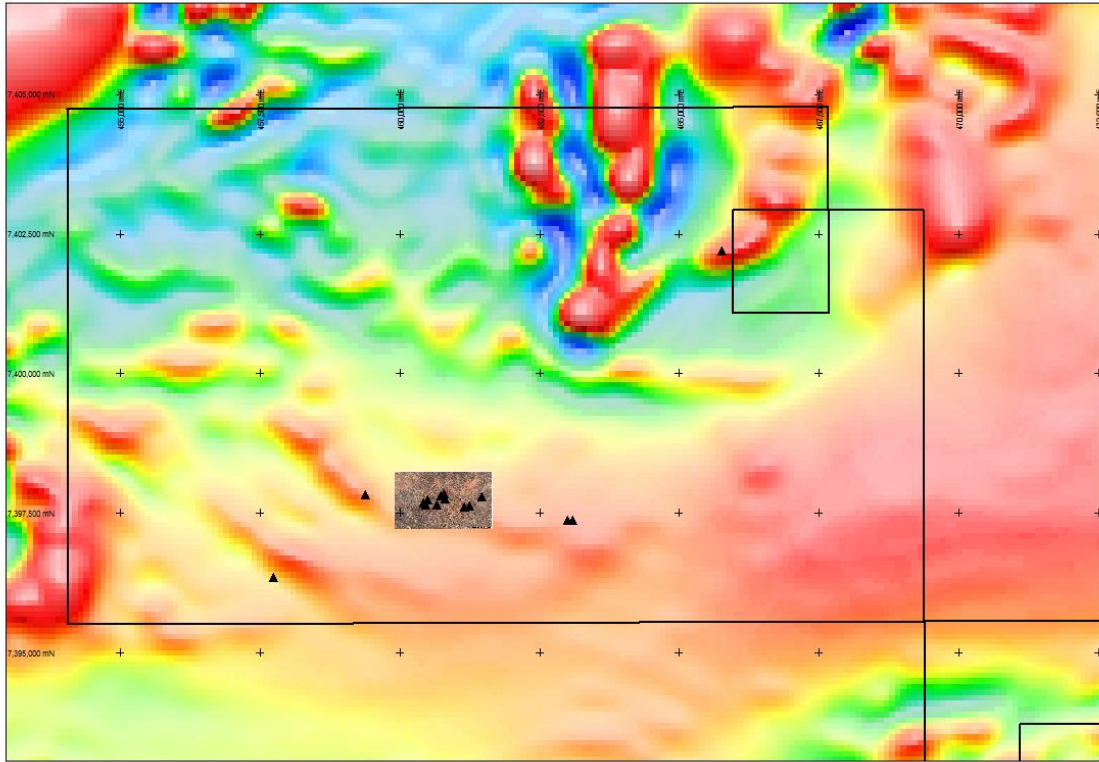


Figure 2: Grab samples shown as black triangles. Regional TMI image in background.

## 5.2 Geological Mapping

Prospect scale mapping was conducted over the Bessie's Reward Prospect (Figure 3). Secondary malachite and azurite +/- galena was mapped discontinuously over a strike length of 500m. Mineralisation is typically poddy and structurally complex and reports to mafic lithologies.

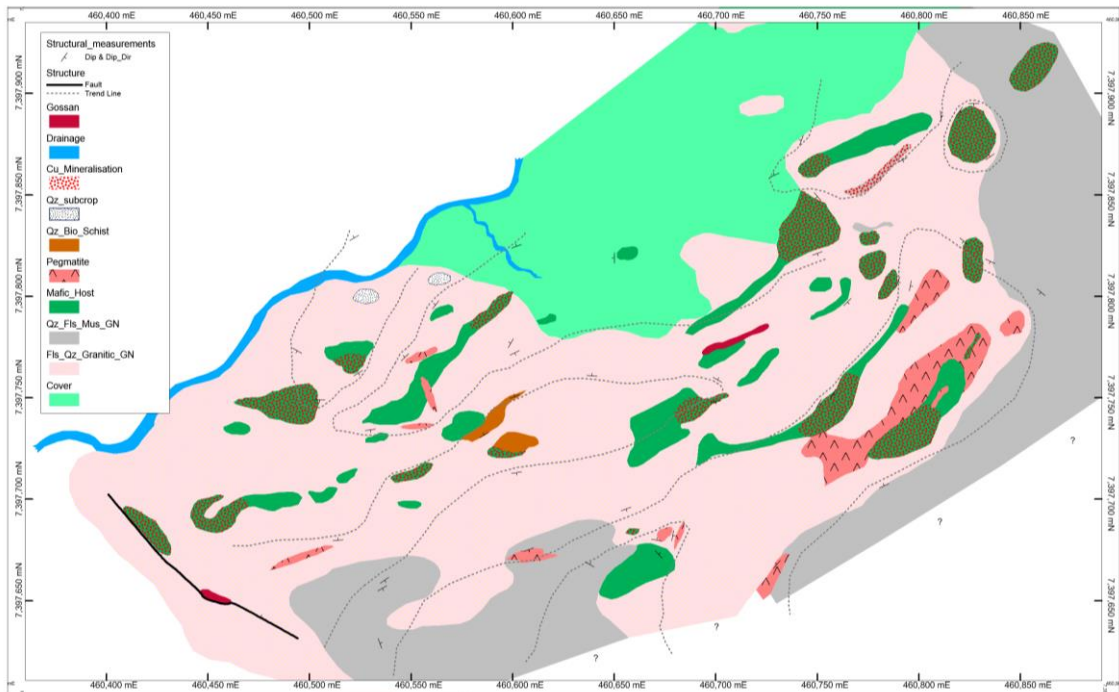


Figure 3: Prospect scale geology map of the Bessie's Reward Prospect

### 5.3 Ground EM Survey

A fixed loop time domain EM survey was conducted over the Bessies Reward Prospect (Figure 4) by Outer Rim Exploration during June 2013. 5.6 line kilometres were acquired with typical line spacing at 100m.

Early-time channels show a typical sharp gradient in the Z component at the loop edges, a negative to positive cross-over in the centre of the loop in the X component and either a broad negative or positive in the Y component depending on which side of the loop centre the line is. For 4400E, which is in the centre of the loop, there is neither a dominant +ve nor -ve in the Y early times.

The X and Y decay down to noise levels by about 10 msec (Ch 22) in most cases. The Z takes a bit longer to decay down to noise as the Z component sensor is more strongly coupled with the vortex currents in the ground, but we are well into noise levels by the last three channels in the Z (~80 msec). Unfortunately there are no anomalies to speak of, so suspect the mineralisation is not interconnected enough for eddy currents to form, or is in too small a volume to be energised sufficiently with a large fixed loop system.

A gradient array/ dipole-dipole IP survey may better image the mineralisation.

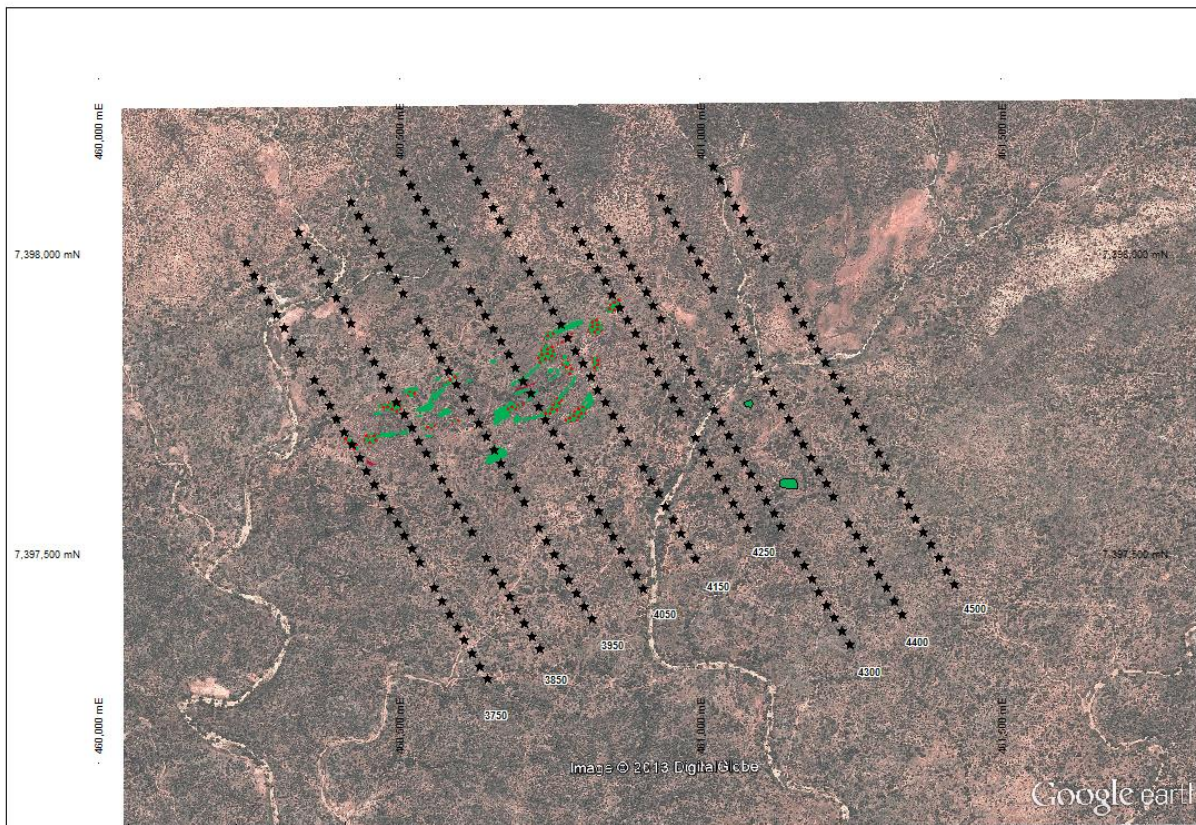


Figure 4: Location of Ground EM Survey over Bessie's Reward Prospect. Green polygons represent mapped mineralisation. Google earth imagery shown in background.

## **6.0 WORK COMPLETED DURING THE 2013-14 REPORTING PERIOD**

No field work was conducted during the reporting period. Work was restricted to a review of data collected over the tenement.

## **7.0 CONCLUSIONS AND PLANNED WORK**

Given the decision by the company to reduce its landholding in the NT due to budgetary constraints it was decided to relinquish EL29501 in its entirety prior to its anniversary date. Potential still exists at the Bessies Reward Prospect for a significant accumulation of disseminated base metal sulphides. An induced polarisation survey is still recommended to future explorers as the best geophysical method to explore for disseminated sulphides at depth at this location. A heritage survey completed by the AAPA over the immediate prospect area did not locate any sites of significance in the 2012-13 reporting year.

## **REFERENCES**

Scrimgeour IR, 2013. Aileron Province: in Ahmad M and Munson T.J. *Geology and mineral resources of the Northern Territory. Northern Territory Geological Survey, Special Publication 5.*

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