



CR11654

**EPM 14275, PERCOL PLAINS  
NORTHWEST QUEENSLAND**

**SURRENDER REPORT FOR THE TERM ENDED 15 MARCH 2010**

**Data presented in  
GDA 94 Datum**

Prepared and Submitted by:

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**APRIL 2010**

## **SUMMARY**

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EPM14275 is 100% owned and managed by BHP Billiton Minerals Pty Ltd (BHPB).

This surrender Report describes all exploration work carried out by BHP Billiton Minerals Pty Ltd (BHPB) from the 16/03/2005 until 30/11/2009 within EPM14275, Percol Plains, Northwest Queensland.

EPM14275 is located approximately 40 km North northeast of the Cannington Mine in Northwest Queensland. The principle exploration target within this EPM is Broken Hill type (Bht) Pb-Zn-Ag mineralisation (e.g. Broken Hill or Cannington).

Exploration work carried out by BHP Billiton in this time includes:

- Ground gravity survey
- Airborne magnetic, ground gravity and FALCON™ gravity data analysis and target generation
- 1 diamond drill hole drilled in 2005, ESD5006
- 44 shallow air core holes by EXCO Resources

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## 1. INTRODUCTION

This Surrender Report describes exploration work conducted by BHP Billiton Minerals Exploration Pty Ltd (“BHPB”) from 16 March 2005 until 15 March 2010 on the tenement holding EPM14275, Percol Plains (“The EPM”), Northwest Queensland.

The tenement holding is located approximately 40 km north Northeast of the Cannington mine-site in Northwest Queensland (**Figure 1**).

The principle exploration target within this EPM is Proterozoic, Broken Hill type (BHt) Pb - Zn - Ag mineralisation (e.g., Cannington).

Exploration work carried out by BHPB in this time includes:

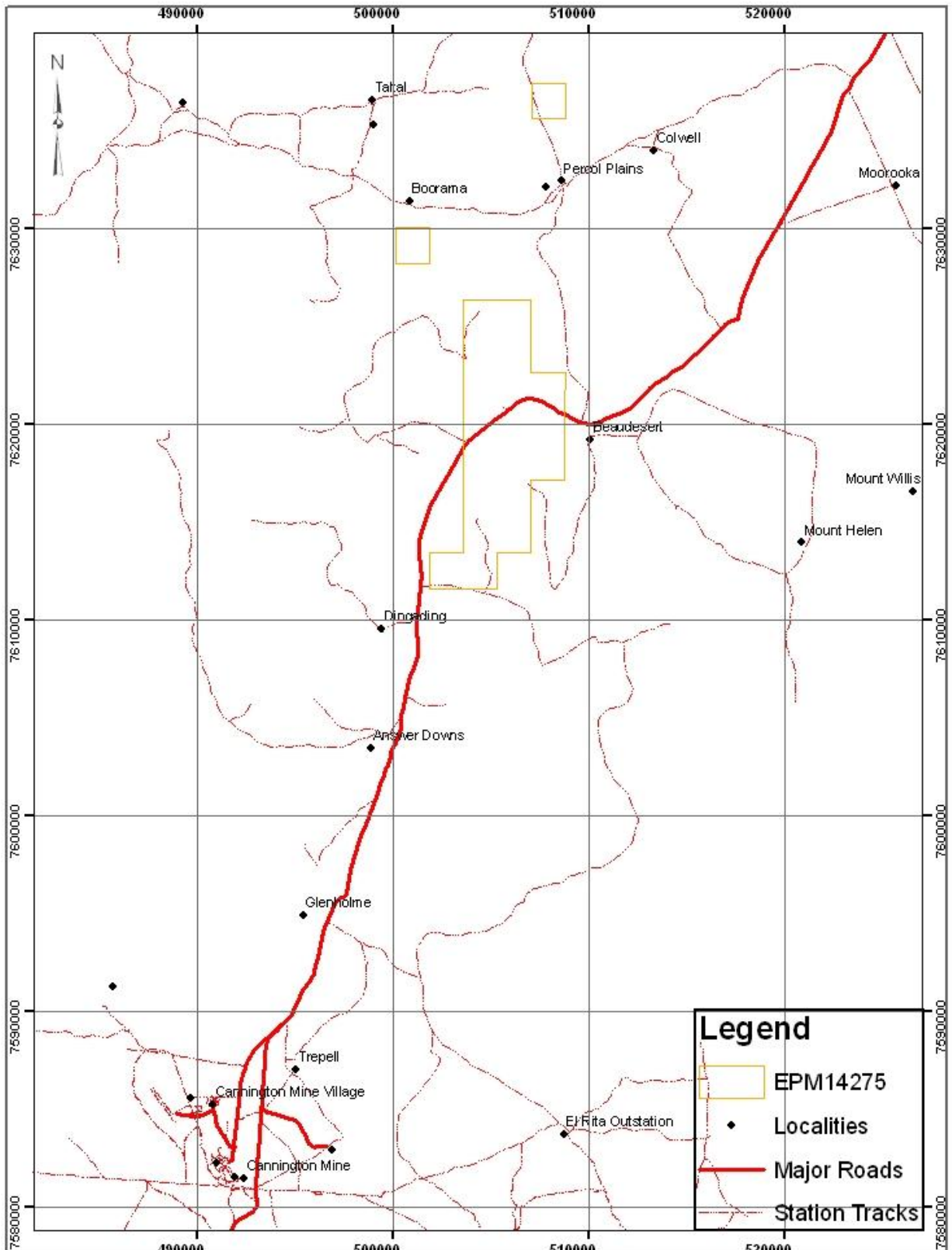
- Ground gravity survey
- Airborne magnetic, ground gravity and FALCON™ gravity data analysis and target generation
- 1 diamond drill hole drilled in 2005, ESD5006
- 44 shallow air core holes by EXCO Resources

## 2. TENURE

A tenement location map is included as **Figure 1**; tenement and sub-block details are shown in Table 1 below:

**Table 1: Tenement Details**

EPM	Name	No. Sub – Blocks	Grant Date	Expiry Date
14275	Percol Plains	21	16 March 2005	15 March 2010



### 3. GEOLOGY

In the Soldiers Cap Project area, the dominant lithologies in the Soldiers Cap Group are meta-siliciclastics which include planar bedded pelitic schists with graded bedding; thin units of cross-bedded immature quartzo-feldspathic meta-arenites and orthoquartzites; and intervals of more abundant interbedded basic volcanics and basic sills with minor carbonaceous schists, calc-silicates and quartzites.

Overall there is a distinctive absence of significant carbonate sequences or acid volcanics, and a dominance of immature clastics. Thin horizons of banded iron formation associated with small base-metal showings occur at restricted stratigraphic levels, generally within the Mt Norna Quartzite.

Metamorphic grade in the project area ranges from largely greenschist facies with abundant relict sedimentary textures in the north. However, metamorphic grade increases to the south and southeast towards Cannington, with metamorphic grade reaching to upper amphibolite facies, resulting in widespread sillimanite-K feldspar-bearing schists and migmatitic gneisses.

The differences in metamorphic grade and poor outcrop, complicates clear correlation of these higher grade metamorphic sequences with the previously defined Soldiers Cap Group around Cloncurry. Interpretation of unpublished regional magnetic surveys indicates that the higher metamorphic grade sequences within the Soldiers Cap Group extend for up to 50 kilometres under cover to the east and southeast.

Many of the lithostratigraphic units interpreted from the magnetic data, are not well represented in areas of outcrop. The Cannington Deposit occurs within these undercover extensions, and is interpreted to lie within broad litho-magnetic equivalents of the Mt Norna Quartzite of the Soldiers Cap Group. However, given lack of outcrop, complex deformation and high-grade metamorphism, detailed correlations are still uncertain.

Beardsmore et al. (1988) proposed an informal stratigraphic scheme for the Eastern Succession. Higher-grade metamorphics south of Cloncurry were assigned to the Fullarton River Group, overlain by components of the previously defined Soldiers Cap Group, with the two groups included in a newly defined Maronan Supergroup. However, type sections, critical age relationships and contacts have not been formally defined. Host lithologies evident in drilling from the Cannington area, are comparable with units of the proposed Fullarton River Group in this informal terminology. Based on broad litho-stratigraphic and geophysical similarities between the Soldiers Cap Group and the Fullarton River Group, the authors believe they are directly correlatable sequences.

Recent dating of a garnetiferous felsic gneiss from the proposed Fullarton River Group (some 30 km north of Cannington), has given an age of  $1677 \pm 9$  Ma (Page, 1993), which would imply an age equivalence with Cover Sequence 3.

A range of small Ag-Pb-Zn prospects with Broken Hill-type affinities occur within the outcropping higher-grade metamorphics within the Soldiers Cap Group (Dingo, Maramungee, Fairmile, Black Rock, Pegmont), as well as in under-covered equivalents (Altia, Maronan, Cannington). Interestingly, all of these prospects are hosted within psammite-rich packages that are correlated with the Mt Norna Quartzite.

Table 2 below, compares the lithology and geophysical expressions of the Soldiers Cap Group.

**Table 2: Lithostratigraphic and geophysical comparison between the Soldiers Cap Group and Fullarton River Group.**

Soldiers Cap Group			Fullarton River Group	
Stratigraphic Unit	Lithology	Geophysical Expression	Lithology	Geophysical Expression
Toole Creek Volcanics	Mafic volcanics, mafic sills interbedded with carbonaceous slates/phyllites. Minor BIFs at base	Non-weakly magnetic. Dense packages due to mafics. Regionally extensive formational conductors	Amphibolite intercalated with graphitic schist-gneiss	Non-weakly magnetic, although amphibolite commonly contain post-tectonic albite-magnetite-amphibole alteration. Dense packages due to mafics. Regionally extensive formational conductors
Mt Norna Quartzite	Well bedded. Graded bedding of feldspathic quartzite and wackes with subordinate pelitic mudstones/siltstone. Contains minor-moderate basic sills and thin BIFs	Non magnetic package with short-strike length magnetic units (basic sills and BIFs). Low-moderate density. Non-conductive	Intercalated pelites and psammities. Moderate amphibolite with minor BIFs	Non magnetic package with short-strike length magnetic units (basic sills and BIFs). Low-moderate density. Non-conductive
Llewellyn Creek Formation	Bedded quartz-mica psammite and pelite with graded turbiditic cycles	Non-magnetic. Density is low-moderate. Non-conductive	Pelitic and psammitic gneiss grading into migmatitic quartzo-feldspathic gneiss. Minor amphibolite	Non-magnetic. Density is low-moderate. Non-conductive

Jurassic to Cretaceous cover sediments are present over the EPM. The thickness of the cover sediments varies however it is usually roughly around 120m thick. Basal pebbly sands from a few to 30m thick change to monotonous mudstones with minor muddy limestone and black organic rich shale prior to intersecting the unconformity.

## 4. EXPLORATION WORK COMPLETED DURING THE PERIOD

### 4.1 Introduction

Exploration work carried out by BHP Billiton in this time includes:

- Ground Gravity survey
- Airborne magnetic, ground Gravity and FALCON™ gravity data analysis and target generation
- 1 diamond drill hole drilled in 2005, ESD5006
- 44 shallow air core holes by EXCO Resources

During December 2003 and January 2004, a *FALCON™* Airborne Gravity Gradiometer (AGG) survey was completed over Strathfield South and Human Ear. Area's encompassing the EPM. Density anomalies situated in structurally permissive areas proximal to the contact zone between the Mt Norna Quartzite and the Toole Creek Volcanics of the Soldiers Cap Group were favoured.

### 4.2 Ground Gravity Survey

In 2005 BHP conducted a GPS based ground gravity survey over the EPM. As shown in figure 2 below the gravity survey line covers ground being relinquished by BHP. The ground gravity survey was an exercise to back up airborne works. Ground gravity data is attached as Appendix 1 in GDA94 coordinates.

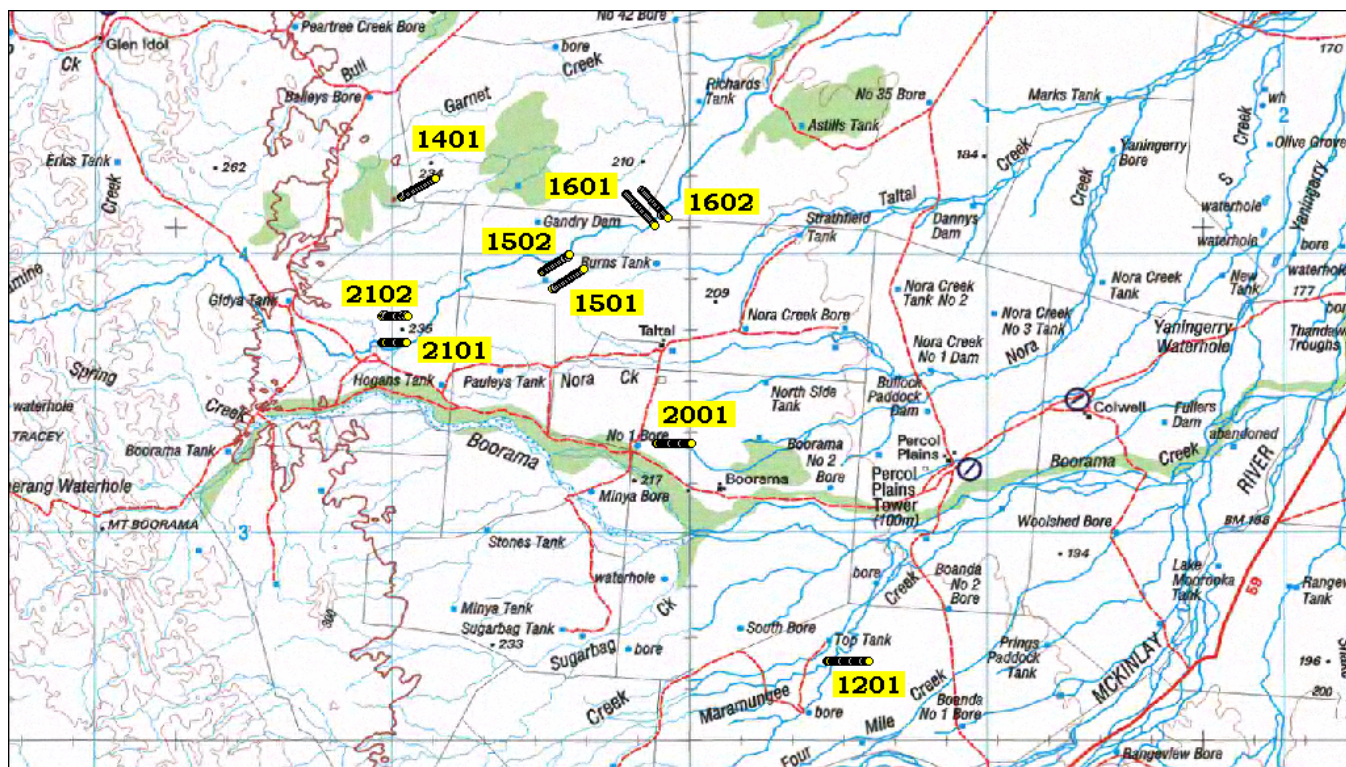


Figure 2: Ground gravity line through EPM14275, line within EPM14275 is 1201.



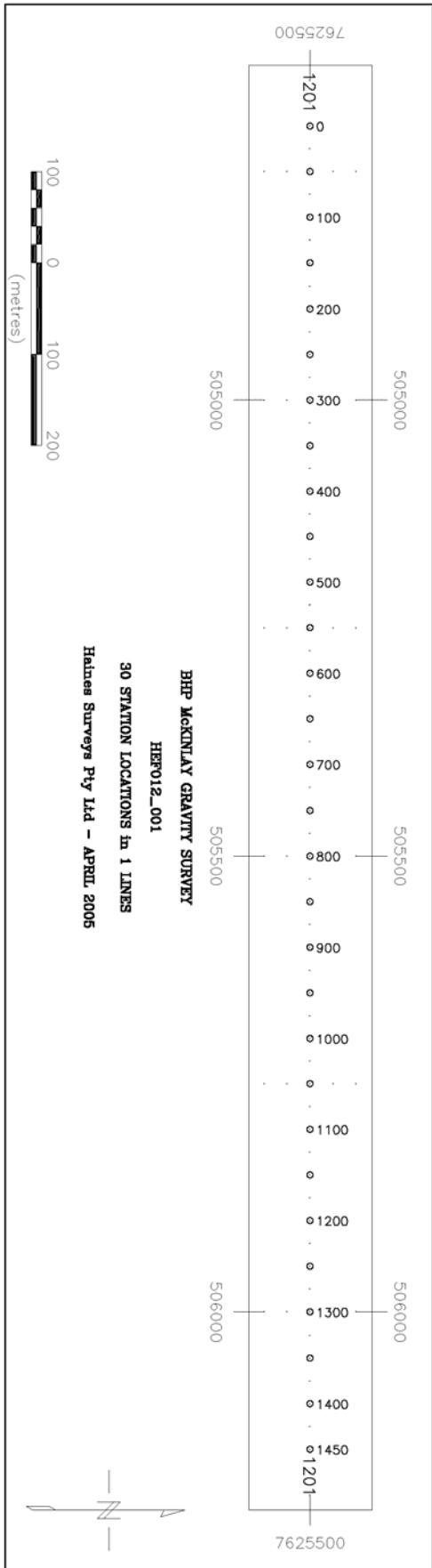


Figure 3: Ground gravity plot and station location for gravity line 1201 over target HEF\_012.

### 4.3 Airborne Magnetic, Ground Gravity and FALCON™ Gravity Data Analysis and Target Generation

Four exploration target areas were generated within the existing EPM boundaries; HEF-012, HEF-011, HEF-016 and EST-012. These targets were identified mainly by magnetic and gravity data due to the 116m thick blanket of Mesozoic sediments. HEF-016 was tested by AND027 in 1994 and BHP tested HEF-012 in May 2005 by ESD5006. No drilling has been conducted on the modelled magnetic and gravity features identified in HEF-011 and EST-012.

#### Target HEF012

HEF012 represents a good sized anomaly in the regional gravity data with a noisy but coincident magnetic anomaly. It is interpreted to lie within the nose of large dome (Mt Norna Quartzite) adjacent to major NW fault.

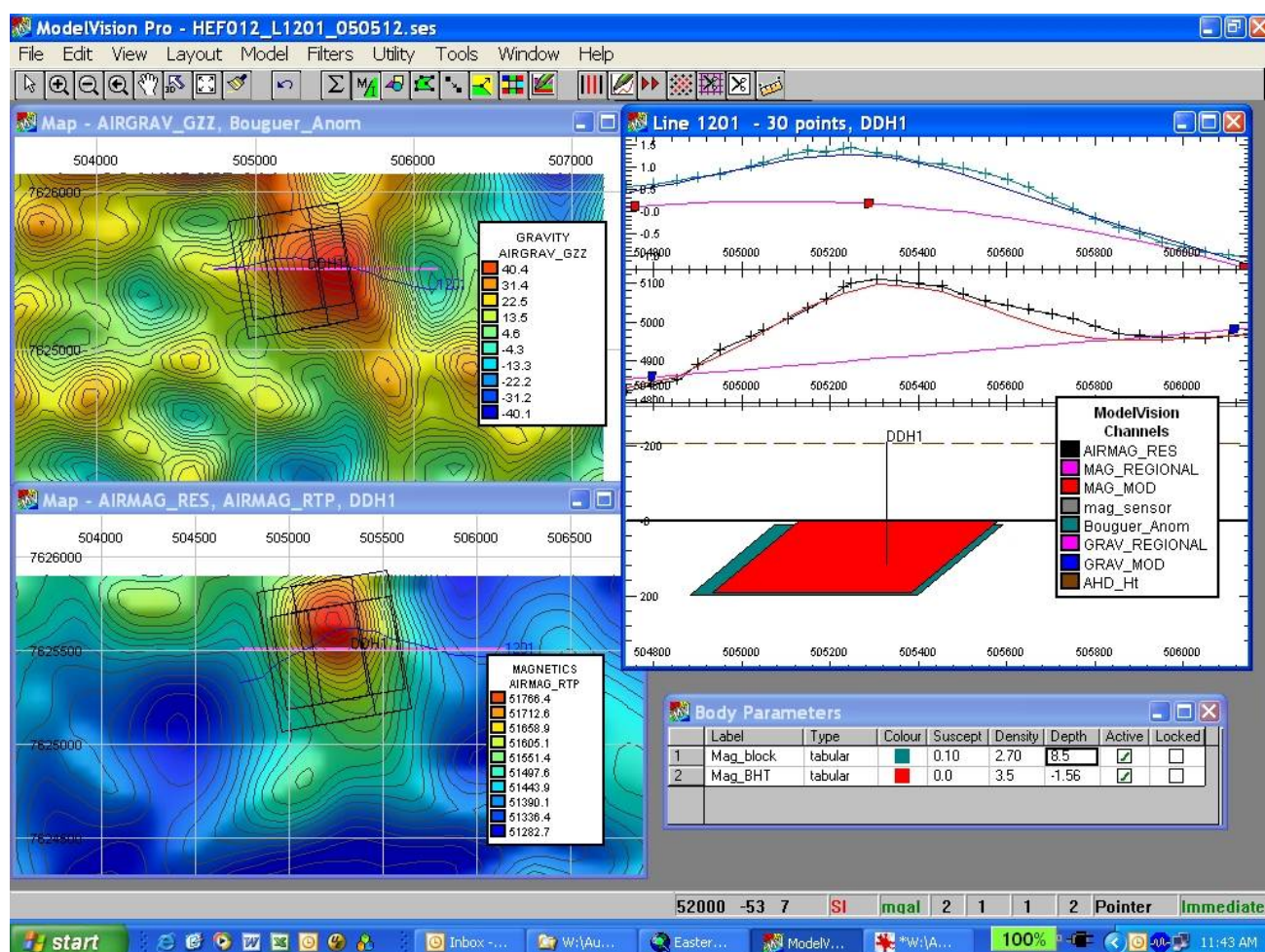


Figure 4. Ground Gravity and Magnetic Modelling HEF012

Modelling of ground gravity and magnetic data over the anomaly indicated a slightly offset gravity/magnetic anomaly (approx 1.2magal) of uncertain dip at approximately 200m below surface if modelled as a BHT. (Figure 4)

## 4.4 Drilling

### 4.4.1 BHPB Drilling

Several drill holes have been drilled on the EPM; BHPB drilled one of these in 2005, ESD5006.

Drill hole ES05006 was drilled vertically at 505450 E 7625685 N, GDA94. Under 116m of cover the hole entered weakly altered amphibolite and was terminated at 333.7m

A geological summary of ES05006 is outlined below:

0 – 2m	Soil
2 – 8m	Gravel (Recent creek deposit)
8 – 100m	Siltstone to black shale
100 – 108m	Sand – Sandstone of the cover sequence
108 – 116m	Gravel at the base of cover
116 - 333.7m	Amphibolite, with old weathering near the top then little to no alteration and very minor pegmatite to end of hole.

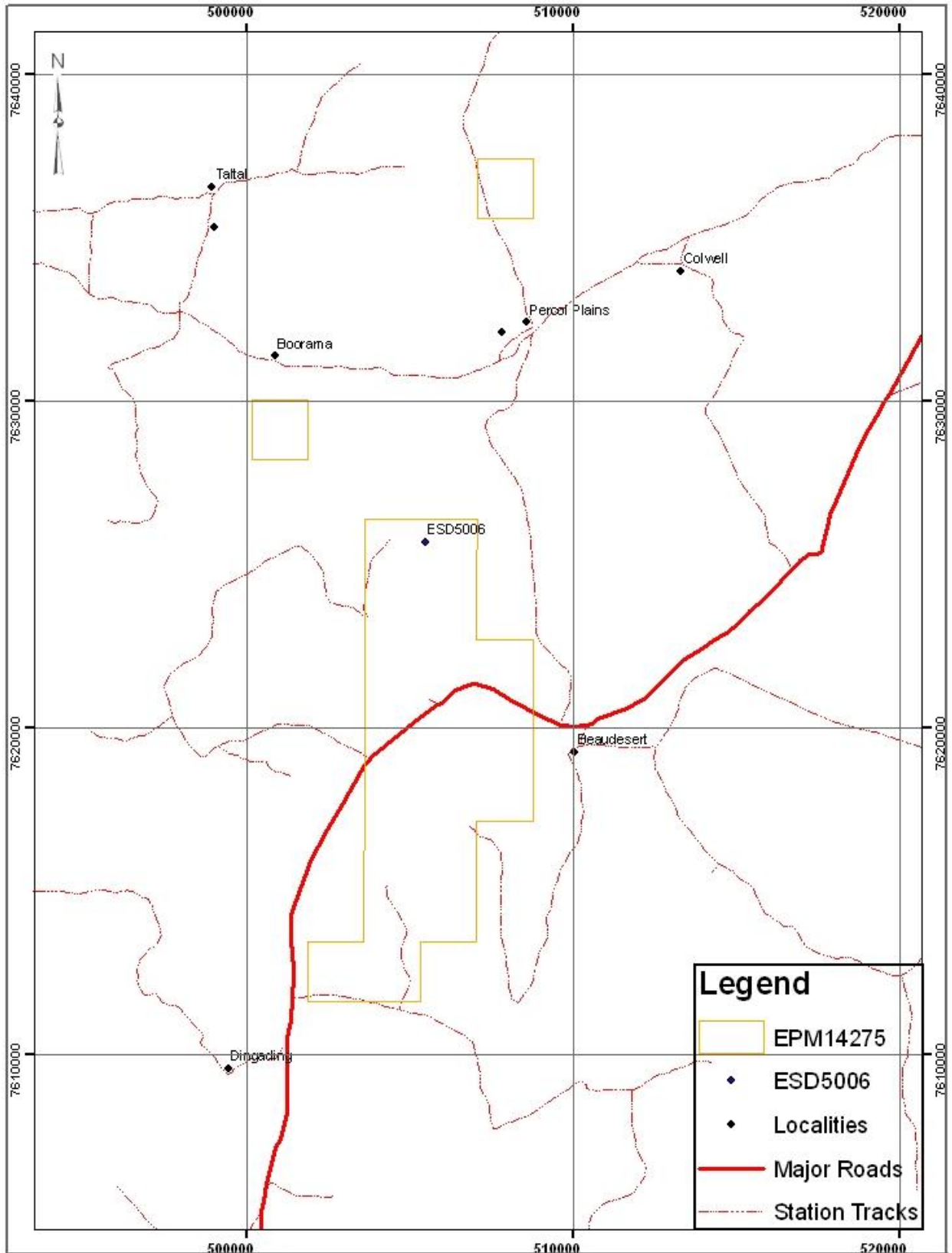
The amphibolite became moderately to strongly magnetic below the old weathering profile. The densities in the old weathering profile rose from 2.0 to 2.6 g/cc. deeper in the fresh weakly altered amphibolite the densities averaged 3.12 g/cc. The intersected amphibolite was sufficient to explain the gravity and magnetic anomaly.

Maximum geochemical values are reported from the upper portions of the basement and reflect weak supergene enrichment in weathered Amphibolite Max 463ppm Cu, 145ppm Zn and 1.2ppm Ag. Interestingly a single value (4m composite) of 111ppm Pb with a duplicate 211ppm occurs in weathered amphibolite at the unconformity. Below the weathered zone values for Cu are typical background values with an average of 117ppm Cu and 78ppm Zn.

Refer to appendix 2 for core photos, collar, assay and survey data for ESD5006. Figure 5 below shows ESD5006 drill hole location within the tenement, figure 6 shows a detailed hole plot and table 3 summarises ESD5006.

### 4.4.2 EXCO Drilling

EXCO Resources Ltd (“EXCO”) drilled 44 shallow air core holes totalling 880m. These holes were designed to test the shales and siltstones of the Toolebuc Formation for U mineralisation as part of the then existing access rights agreement between BHPBM and EXCO.



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 Minerals Exploration  
 Australia & South Asia Region

Author: D. Huisman  
 Date: 9/04/2010  
 Scale 1 : 150,000  
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**Relinquishment Report**  
**Percol Plains**  
**EPM14275**



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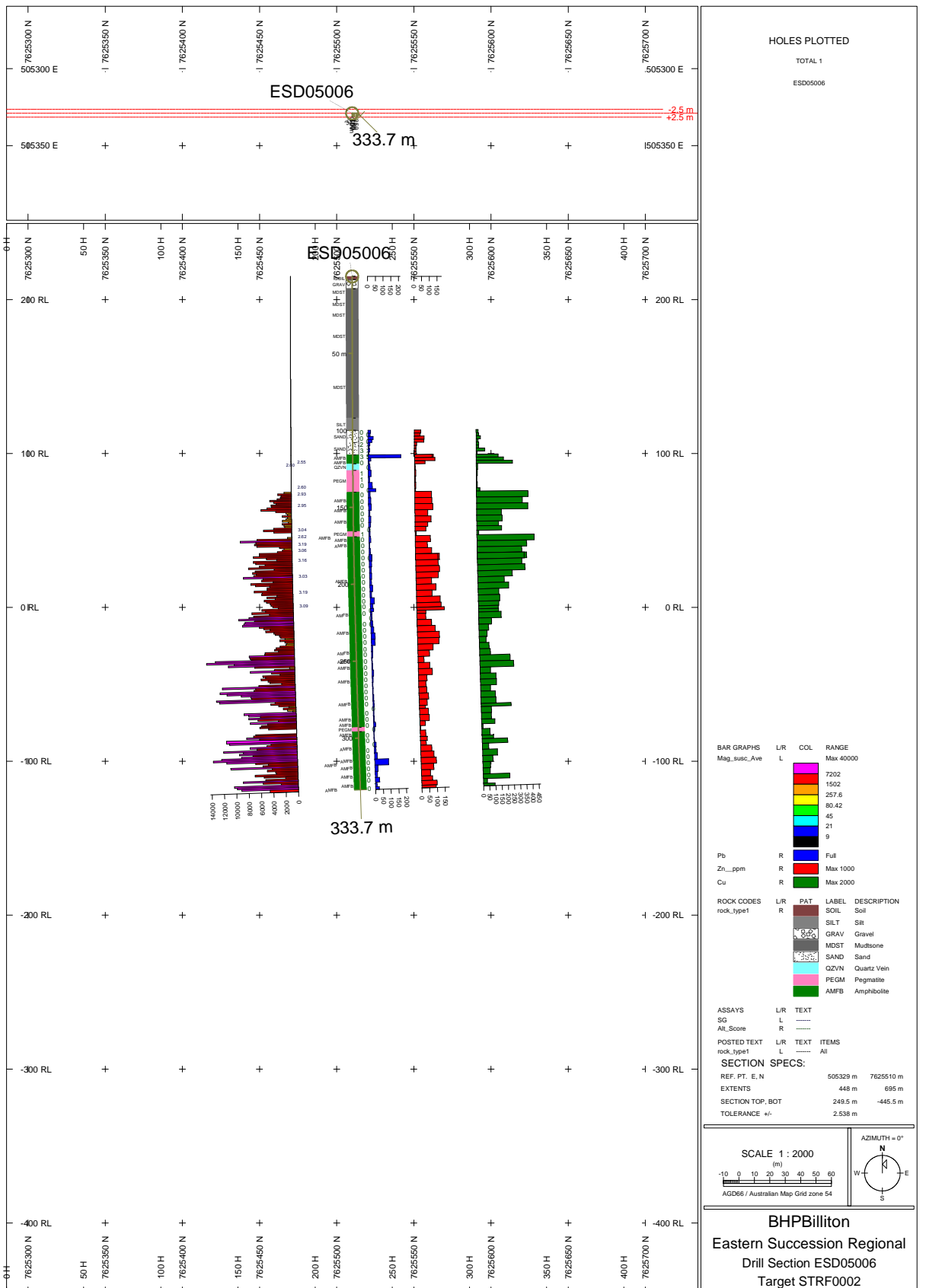


Figure 6: Detailed hole plot for ESD5006.

**Table 3: ESD5006 Summary.**

<b>Hole ID</b>	<b>Tenement</b>	<b>Collar GDA94</b>	<b>Depth (metres)</b>	<b>Geology</b>
ESD5006	EPM14275	505450 E	0 – 2	Soil
		7625685 N	2 – 8	Gravel (Recent creek deposit)
			8 – 100	Siltstone to Black Shale
			100 – 108	Sand – Sandstone of the cover sequence
			108 – 116	Gravel at the base of cover
			116 – 333.7	Amphibolite, with old weathering near the top then little to no alteration and very minor pegmatite to EOH.

## **5. CONCLUSION**

Airborne FALCON™ and ground gravity interpretation along with the airborne magnetic survey data identified many key exploration targets over the Strathfield South and Human Ear areas.

Four of these target areas were generated within the existing EPM boundaries; HEF-012, HEF-011, HEF-016 and EST-012. These targets were identified mainly by magnetic and gravity data due to the 116m thick blanket of Mesozoic sediments. HEF-016 was tested by AND027 in 1994 and BHP tested HEF-012 in May 2005 by ESD5006. No drilling has been conducted on the modelled magnetic and gravity features identified in HEF-011 and EST-012.

Following a desktop review and due to the amphibolite explaining the magnetic anomaly over target HEF-012 and the anomalous base metal figures occurring in the weathered zone at the unconformity. BHPM recommends no further work over the EPM.

**Appendix 1. GPS Based Ground Gravity Data**

**Appendix 2. ESD5006 Core Photos, Collar, Survey and Assay Data**