

Allegiance Mining NL

ANNUAL REPORT

EL 37/2003 FEN CREEK AREA

YEAR ENDING JANUARY 2005

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1. EXPLORATION PHILOSOPHY and STRATEGY

Exploration Licence EL 37/2003 covers an area south of Trial Harbour considered prospective for nickel skarn deposits of the 'Avebury Style'; ie, nickeliferous mafic and ultramafic formations which have been altered and metasomatised by intrusion of the Heemskirk Granite.

Because of its close proximity to the Avebury Mine any such discovery within EL 37/2003 would be a commercially important addition to that operation.

Prospective targets are assessed as having a magnetic signature and the exploration strategy is based on:

- high resolution aeromagnetic surveying
- ground mapping and lithogeochemical sampling
- drilling

Future work on the Fen Creek licence will be strongly influenced by results on the adjacent Burbank prospect within EL 22/1997 and EL 28/1988.

2. WORK COMPLETED 2004-2005

The following work was completed:

- high resolution aeromagnetic survey
- ground inspection of magnetically anomalous areas

The aeromagnetic survey indicated that the outcropping ultramafic formation to the north of EL 37/2003 at Burbank may extend into EL 37/2003, but at considerable depth.

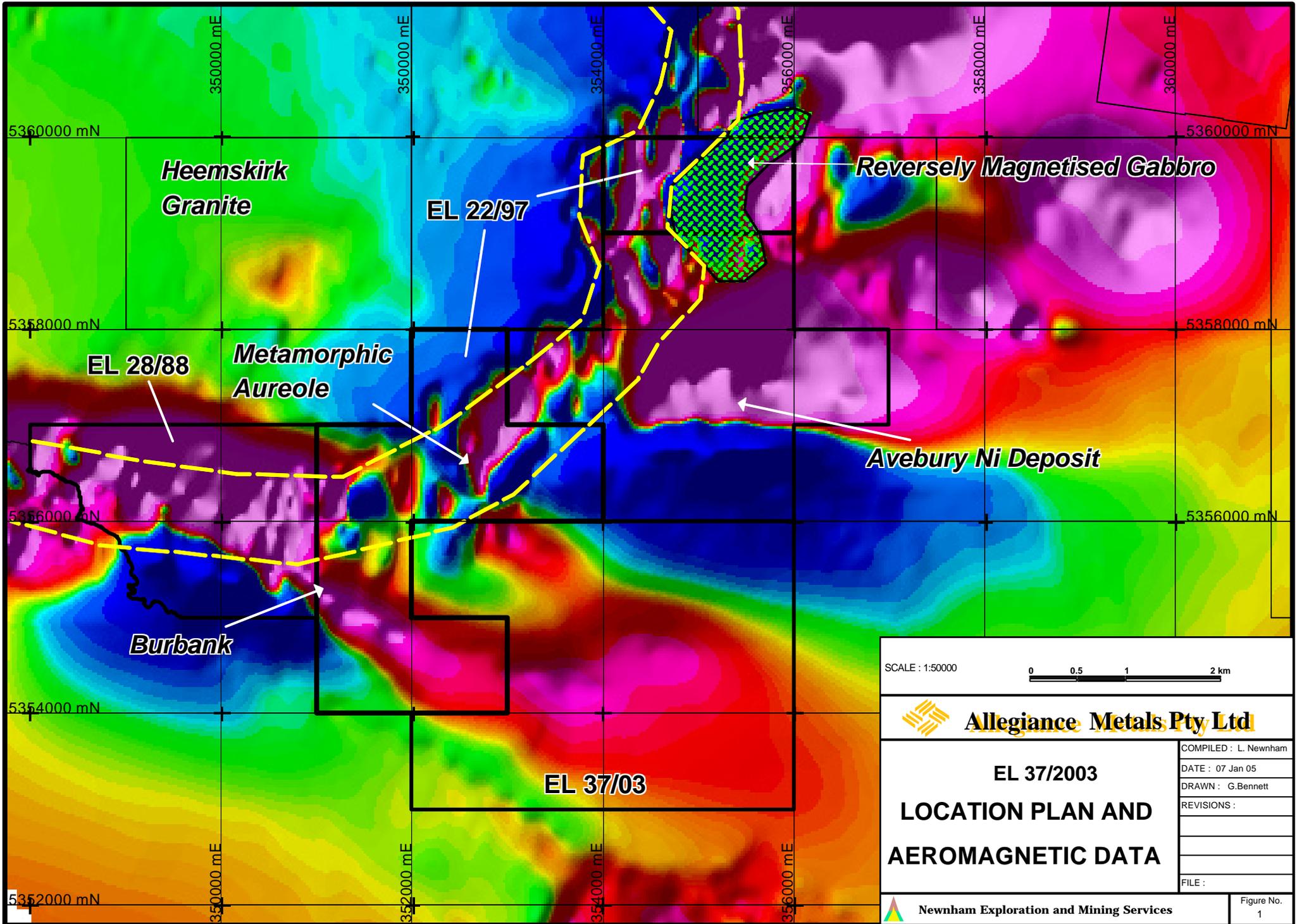
A copy of the aeromagnetic report is appended.

Ground field checking with helicopter support suggested the weakly magnetic anomalous areas were overlain by very bland younger siliceous sediments.

3. WORK PLANNED 2005-2006

Exploration on EL 37/2003 will be strongly influenced by the results of the drilling program on Burbank during summer 2004-2005.

Encouraging results from that program will lead to a heightened interest in the exploration potential of the deeper ultramafic along strike to the south-east of Burbank.



Appendix Aeromagnetic Report

Allegiance Metals P/L

**Helimag Survey in
Western Tasmania**

**by
Fugro Airborne Surveys**



**Quality Control Report
and
Preliminary Interpretation
by
Steve Webster P/L
February, 2004**

1 Introduction

An airborne magnetic and radiometric survey was conducted over the three areas in western Tasmania during January, 2004. The survey was contracted by Allegiance Metals P/L to **Fugro Airborne Surveys** (Fugro) and utilised a Jet Ranger helicopter, provided by **HeliAust Pty. Ltd.** from its Sydney base. The contract was prepared and supervised with quality control by Steve Webster P/L.

An **Operations and Processing Report** has been prepared by Fugro to outline the procedures taken to complete the project.

This report, by Steve Webster P/L, provides additional technical information on:

- i) equipment installation, operations and contract performance
- ii) certain processing procedures needed to enhance the data and map presentation
- iii) a preliminary interpretation of the results to verify that the data sets will meet the Allegiance Metals objectives to assist geological mapping and define exploration targets.

The survey areas are located in the west of Tasmania, as shown in figure 1. The survey flight plans are shown in figures 2 a-c, with East – West flight lines spaced 50m apart and North – South tie lines spaced 500m apart, except for the Zeehan/Trial Harbour area where lines are orthogonal to the above.

2 Survey progress

The survey areas are located in the West Coast district of Tasmania, Figure 1. The actual helicopter flight plans are shown in figures 2 a-c, with East - West flight lines spaced 50m apart for the **Renison East** and **Heazlewood** areas and North - South tie lines spaced 500m apart. For the **Zeehan-Trial Harbour** area the flight lines are oriented North – South at 50m spacing and tie lines flown East – West.

The survey equipment was installed at Sydney in the HeliAust Jet Ranger III aircraft in January, 2004. The magnetometer was in located in a stinger (as shown in accompanying photographs) mounted in the front of the helicopter to remove it as much as possible from the magnetic effects of the aircraft. These effects were further reduced by calibrations that allow real-time computations of the magnetic effects of aircraft maneuvers—described in the following section 3a.

The aircraft and crew mobilised to Tasmania on 13th January, 2004. The survey statistics, as itemised in the accompanying table 1, show that the progress of the survey included 8 production days (~3 – 6 hours/day) and 2 days were lost due to bad weather, Figure 2d. Aircraft maintenance problems were fixed in Hobart on 17 & 18th January and 2.5 days were lost due to these problems. Thus in operation mode the survey averaged 360 km per production day.

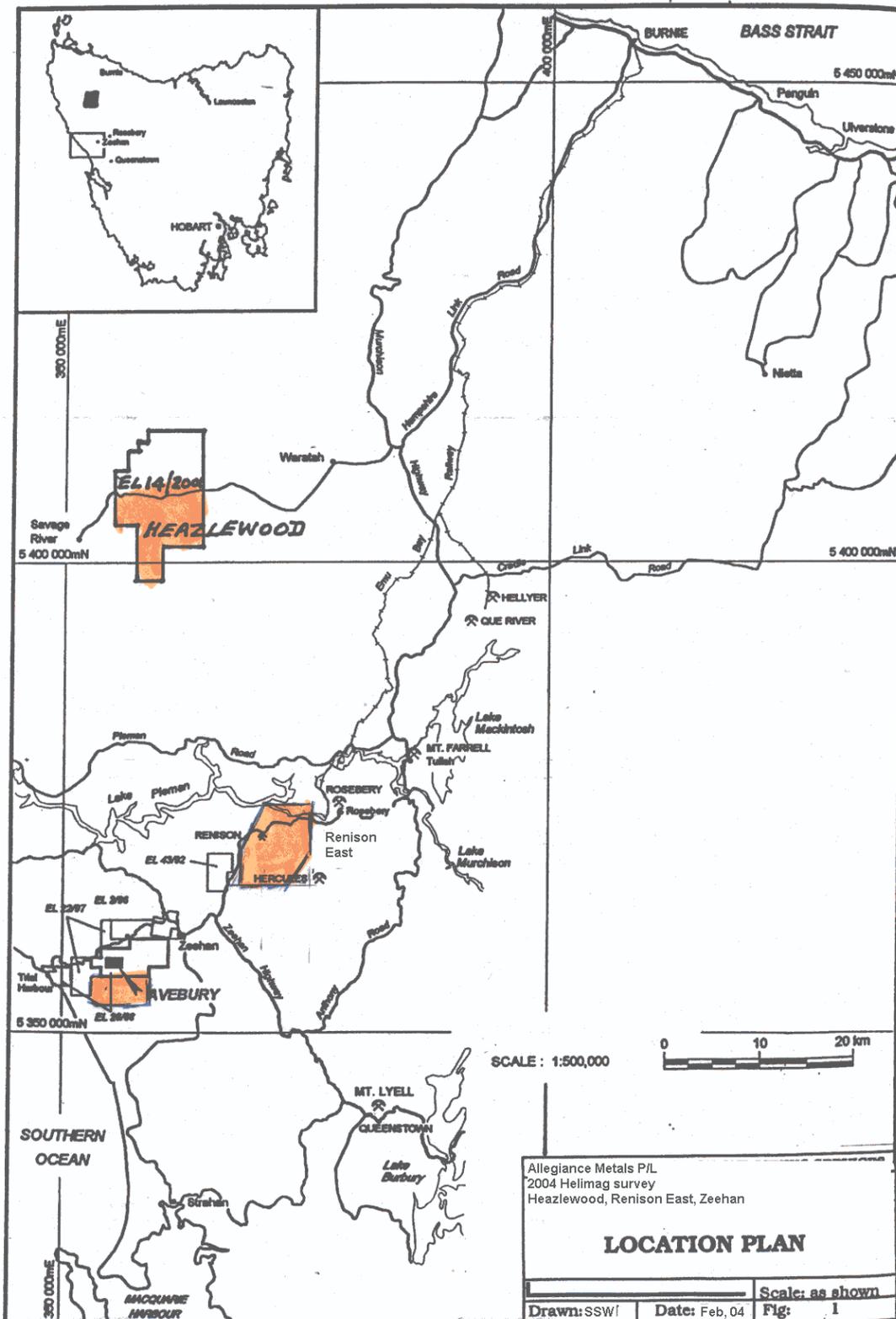


Figure 1. Location map of 2004 Helimag survey areas

Date	Flights	hours	Km. flown	total flown	Km remaining	Comments
13-Jan	1	1.4			2870	mob & calibrations
14-Jan	2,3 & 4	5.1	344	344	2526	
15-Jan	5,6 & 7	6.2	349	693	2177	
16-Jan	8	3.4	233	926	1944	
17-Jan				926	1944	helicopter repairs
18-Jan				926	1944	helicopter repairs
19-Jan	9 & 10	6.5	466	1392	1478	
20-Jan	11	0	0	1392	1478	weather
21-Jan	12	2.9	150	1542	1328	
22-Jan		0	0	1542	1328	repairs & weather
23-Jan	13 & 14	7.0	529	2071	809	
24-Jan	15 & 16	6.0	439	2518	352	
25-Jan	17	5.4	352	2870	0	

Table 1. 2004 survey operation statistics

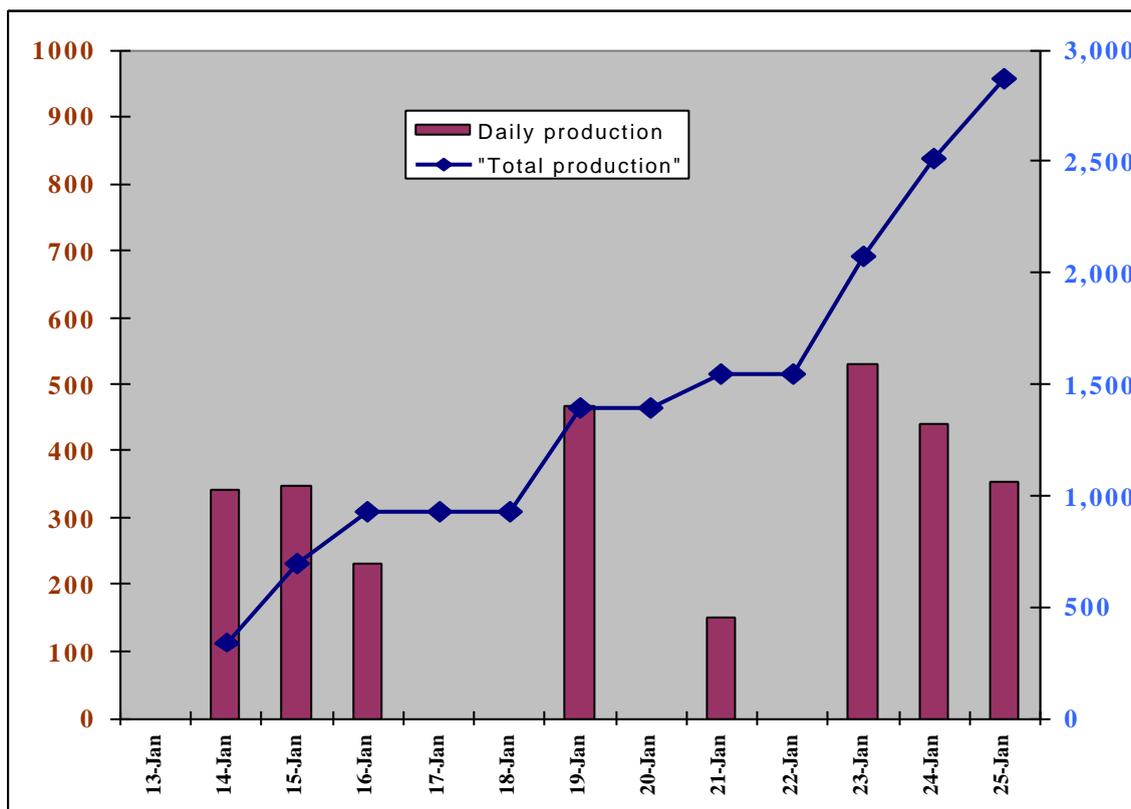


Figure 2d. Graph of daily and cumulative flight production



Figure 3a Helicopter with stinger instrument mount

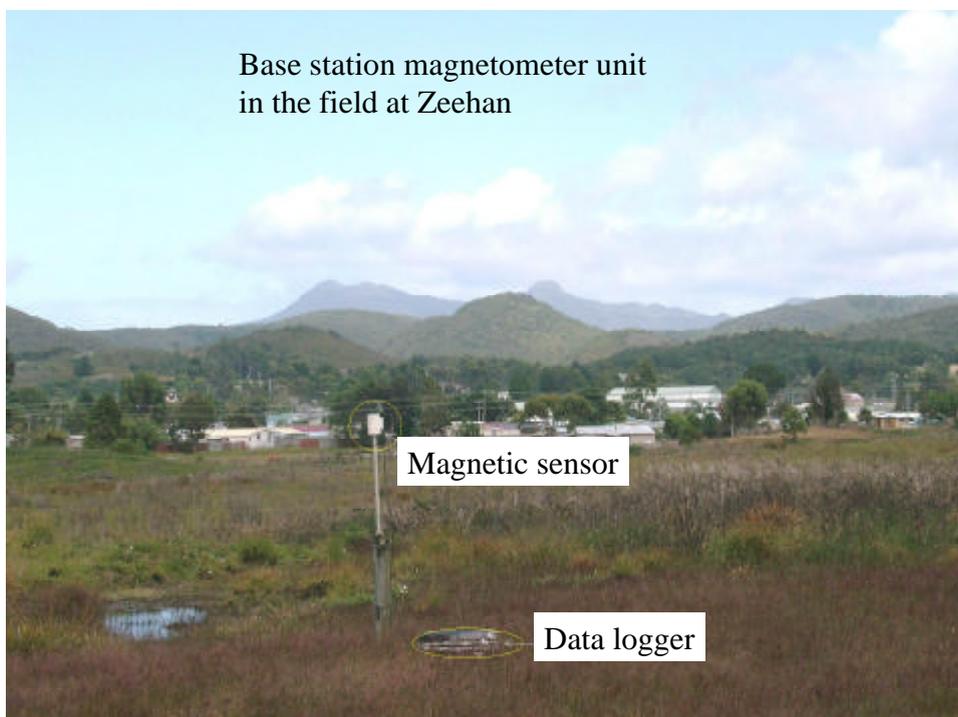


Figure 3b Base station magnetometer



Figure 3c Helimag data acquisition unit

Console of Fugro AS data acquisition system to record magnetic and GPS survey data. The compact unit is mounted behind the pilot's seat.

3 QUALITY CONTROL

a) Survey Aircraft Figure-of-Merit (FOM)

The only quantitative parameter utilised in airborne magnetic surveys as an estimate of survey data quality is the Figure of Merit (**FOM**). This parameter is an estimate of the compensation required to correct the airborne magnetic measurement for the effects induced by the aircraft manoeuvres as it acquires data.

The procedure to compute this parameter is described by Ward & Hood (1969) as follows:

“It is necessary to carry out a series of pitches and rolls of the aircraft in low gradient areas in order to separate the effects of the various components. The excellence of compensation of a given aircraft is measured by its *figure of merit*. This index is obtained by summing the amplitudes of the 12 magnetic anomalies recorded when the aircraft carries out 20° rolls, 10° pitches and 10° yaws peak-to-peak on N, E, S, and W headings.”

There is not a number cited in the literature as an absolute standard for this parameter and *quality control experts* variably quote a number from 1.2nT to 2.4nT.

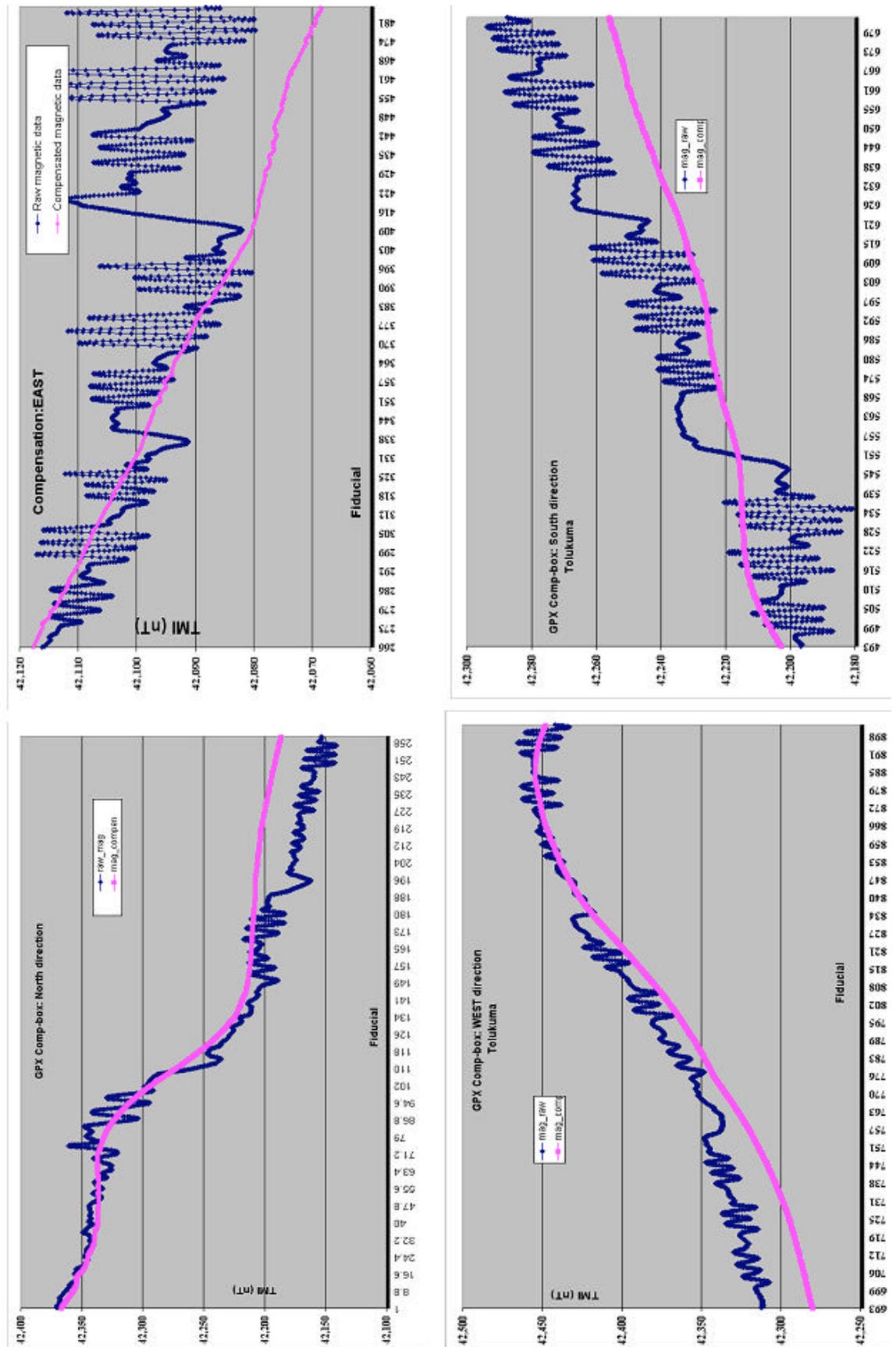
Fugro AS has a standard procedure, termed a ‘*compensation box*’, to estimate **FOM** and this requires the aircraft to be put through a set of 5 pitches (of 10° to 20°), 5 rolls (up to 10°) and 5 yaws along line and 5° and 10° from both sides of line direction. Thus five sets of readings are averaged for each manoeuvre in the four principal directions. For the **Allegiance Metals** project, the FOM determination was made at the start of the flying programme and the FOM value was less than 1nT.

The original FOM procedure was designed for regional and petroleum surveys where the magnetic data were to be used for mapping basement geology and required the effects of surface and shallow geology to be effectively eliminated. Thus the surveys were flown at relatively high altitude (in excess of 1,000 feet) and wide line spacing (equal to depth-to-basement) and the FOM was a measure of compensation to low frequency responses.

Modern surveys for mineral exploration, however, are designed to measure a wide range of responses from shallow sources through to basement and a new parameter needs to be introduced to quantify the compensation of high frequency anomalies. The standard ‘comp. box’ data can be analysed to derive the high frequency component of the manoeuvre noise and the reduction obtained by compensation. The data are high-pass filtered to remove the geology derived signal and the noise level is then computed by rms analysis.

For the Allegiance survey data, the averaged ‘raw’ FOM value is 0.82nT and compensated (average) FOM is 0.045nT. The absolute value of ‘raw’ FOM of less than 1nT is encouraging, but the noise reduction factor of 15 to 20 times reduction to less than 0.1nT is significant. To maintain this accuracy, for final corrected data, requires low noise levels in the raw magnetic data and high compensation parameters to reduce the noise to much less than the minimal anomaly signal.

Tolukuma, 2003: airborne geophysical survey
 magnetic compensation tests by GPX Airborne Surveys



4 Additional Processing--Reduction to Pole

Magnetic anomalies can vary considerably in pattern depending on several factors, including:

- i) inclination of the inducing Magnetic Field vector, which changes with latitude
- ii) the presence and attitude of any **magnetic Remanence** component
- iii) strike and dip of the magnetic source material.

The inclination of the earth's magnetic field varies from vertical at the poles to horizontal at the equator. As shown in the sketch, the lines of (Primary Field) force may be assumed to intersect the susceptible body at the angle of inclination and polarise the source to generate a secondary magnetic field. This secondary field will either add to or subtract from the Primary Field producing an anomaly that is measured by the magnetometer in the aircraft.

The resulting anomaly patterns for a symmetrical body may be grouped into three types, as shown in the accompanying sketch:

Polar: with vertical inclination, the secondary field will be adding to the primary field over the source and subtracting from the primary only at some distance from the source. Thus the pattern is for a strong *positive anomaly over the source* with a weak flanking negative aureole.

Equatorial: with a horizontal primary field the pattern will be reversed as the secondary field will add to the primary *over the source giving a negative anomaly* with a flanking positive aureole.

Mid-latitude: for other latitudes the primary field will be intersecting the polarisable body at an angle giving rise to an asymmetric secondary field that will be mainly positive at steep inclinations and mainly negative at shallow inclinations. The positive and negative pattern is termed a dipolar anomaly.

The *reduction to pole* technique is a filtering procedure that recomputes the observed data set to that which would have been observed if the inclination were vertical, ie at the pole. The result is to remove the negative component of the anomaly and re-locate the positive peak to a position over the source with a symmetrical shape. The RTP data set should be easier to interpret as the patterns are less complicated and superimposed anomaly patterns, ie shallow upon deep sources, more easily separated.

In the attached figure 3, showing part of the TMI and RTP data for western Tasmania (**inclination = -72° S**), there are two anomaly patterns that illustrate the benefit of the procedure:

Anomaly one is located to the east of Renison, and the anomaly pattern is a magnetic 'low' due to the Exe Granite. The RTP process results in the 'low' shifting to the south and becoming more symmetrical—typical of a non-magnetic granite signature.

Anomaly two shows the dipolar anomaly on the western side of the Huskisson Syncline, with the negative components in the TMI image changing shape but still present to indicate a dip to the north.

If there is a remanent component in the magnetic anomaly pattern then the RTP process will not totally remove the dipole pattern and an asymmetric anomaly will still be evident. There are several anomalous zones in the RTP data set that have residual dipole patterns. A strong 'negative' anomaly pattern is observed over the interpreted extent of the Pine Hill Granite and this 'low' is stronger than would be expected for the presence of non-magnetic granite. It is proposed that this intrusive has re-set remanent magnetism in the vicinity and increased the amplitude of the negative anomaly.

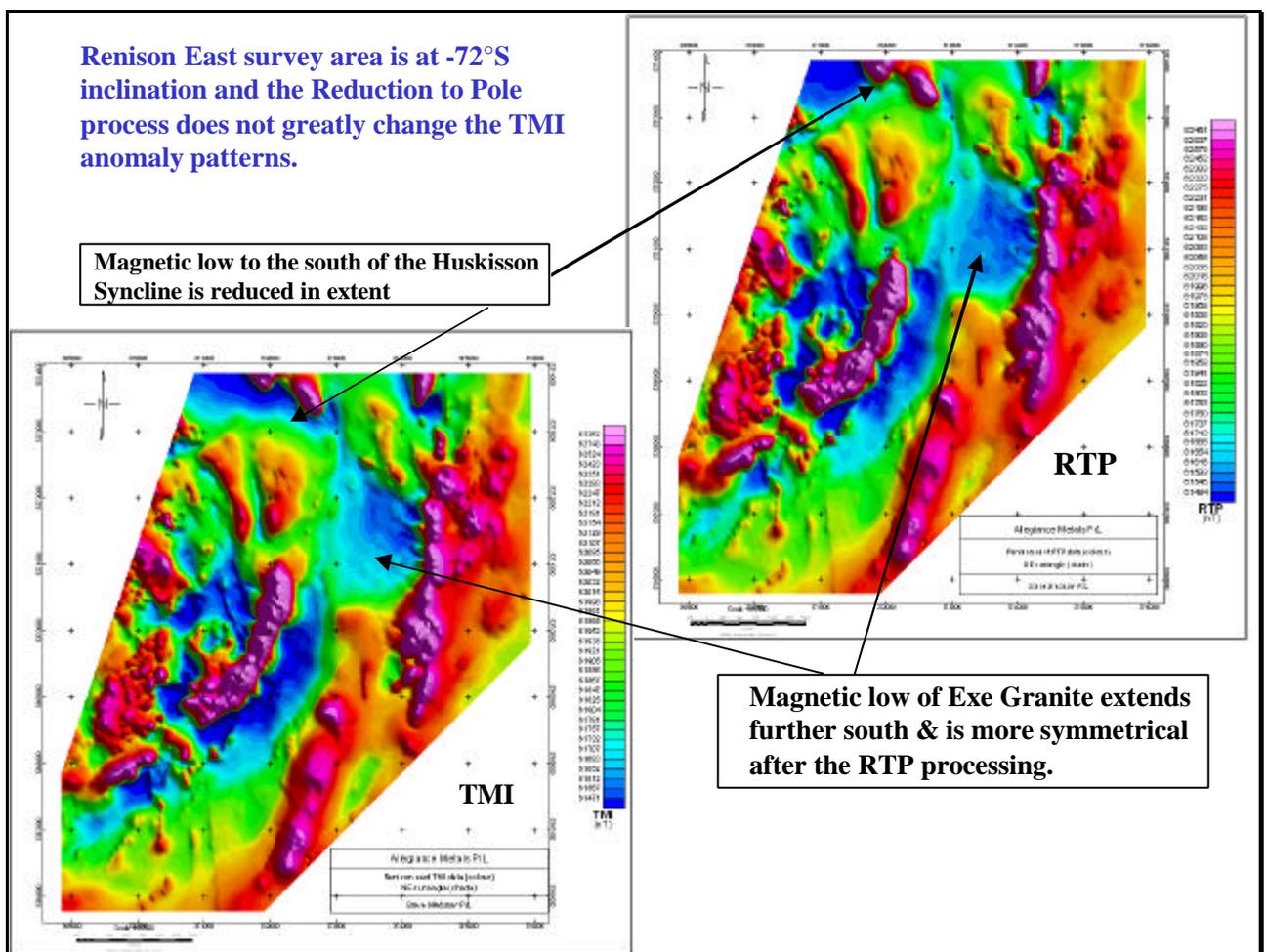


Figure 4. Comparison between Total Magnetic Intensity (TMI) and Reduced to Pole (RTP) magnetic images for the Renison East area survey area, illustrating the extent of changes in anomaly shape with RTP conversion.

5 Preliminary Geological Interpretation and Notes on Targets –
 5a Zeehan Trial Harbour

A new nickel deposit has been found to the south of Zeehan by Allegiance Mining NL. The ore generally occurs as high-grade pentlandite located in massive sulphides at the contact between altered ultramafic and country rock. The ore (pyrrhotite and pentlandite) has been mobilised out of the serpentinised nickeliferous ultramafic by the intrusion of Carboniferous granites and accumulated in trap-sites around the fringes of the ultramafic. As magnetite is also generated by the metamorphic effects of the granitoid, the ore is observed to be associated with magnetic anomalies, however, magnetic anomalies are also associated with non-mineralised geology.

As shown in figure 5a, the TMI magnetic data for the vicinity of the Avebury Ni deposit exhibits several strong anomalies that reflect known geology. The Heemskirk granite is weakly to non-magnetic but is surrounded by a strongly magnetic metamorphic aureole that reflects the erratic effects of the thermal alteration. Some geological units are altered to show high magnetism and others produce little response, giving a fragmental appearance to the aureole. Some ultramafic units in very close proximity to the granite have been modelled to show at least three-fold increase in magnetic properties where the serpentine has been altered to skarn material. Some of these zones will be highlighted for exploration attention.

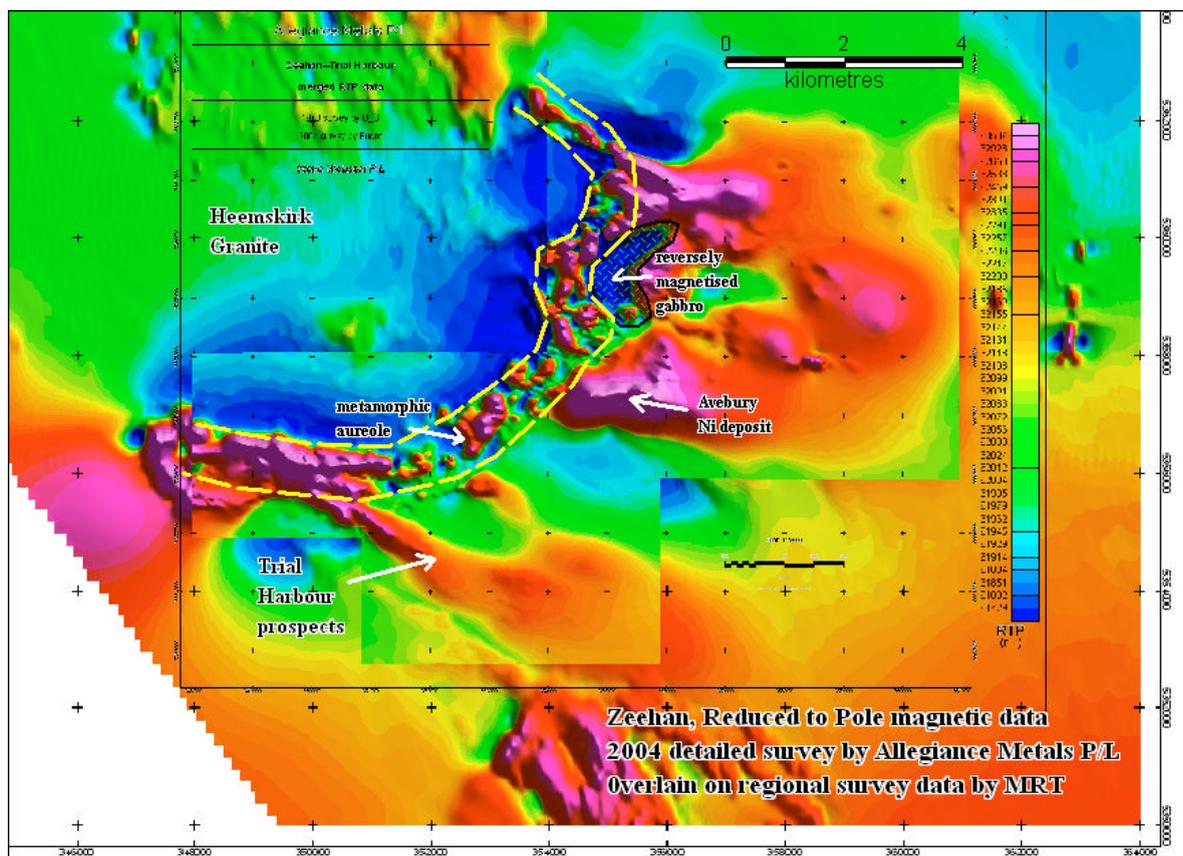


Figure 5a. TMI data for the vicinity of the Heemskirk Granite and the Avebury Ni deposit

The interpretation features marked on the TMI image (Fig 5a) are shown in Figure 5b superimposed on digital geology supplied by MRT.

For example, a gabbro unit to the north of Avebury exhibits a strong negative anomaly as the magnetic properties of this unit have been reset to oppose the earth's current magnetic field. The strong magnetic anomaly zone to the north of Avebury is due to magnetite generated, by the thermal effects, in sediments without any economic significance. Thus the presence of strong magnetic anomalies is not a sufficient condition for the presence of mineralisation and anomalies need to be screened prior to being chosen for exploration follow-up.

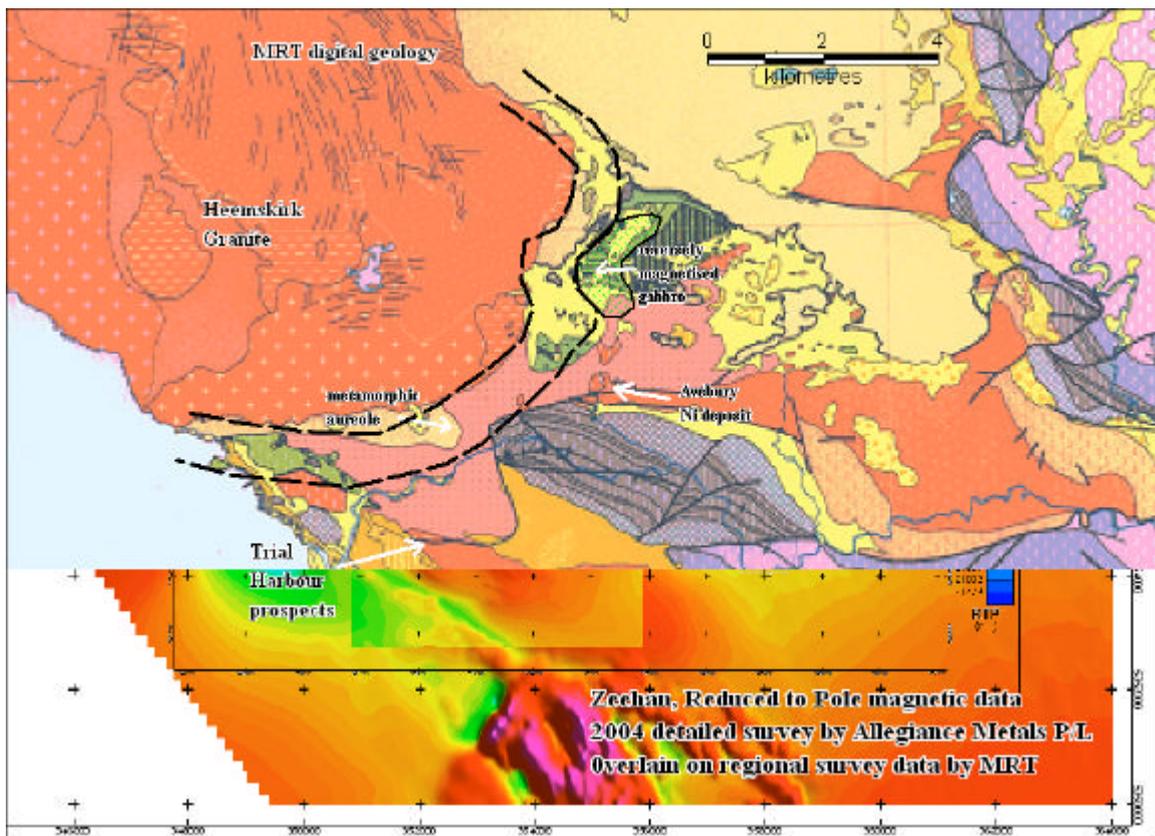


Figure 5b. Digital geology provided by MRT with magnetic data interpretation, from Fig 5a, superimposed.

The linear magnetic zone trending SE –NW, labelled the Trial Harbour Prospects, contains the Burbank zone of TMI anomalies (500 – 700nT) that have been modelled to ascertain physical properties and attitude of the magnetic sources. The zone can be divided into four magnetic sources, three of which are presumed to be ultramafics and the fourth is likely to be units of the Crimson Creek Formation, as shown in Figure 5c.

The susceptibility assumed for the three ultramafic units is relatively uniform, between 0.18 to 0.226 SI, which is consistent with values observed elsewhere for altered serpentinite in proximity to granite. The susceptibility assumed for the Crimson Creek model is lower, at 0.074 SI, but in the range observed when altered by thermal effects.

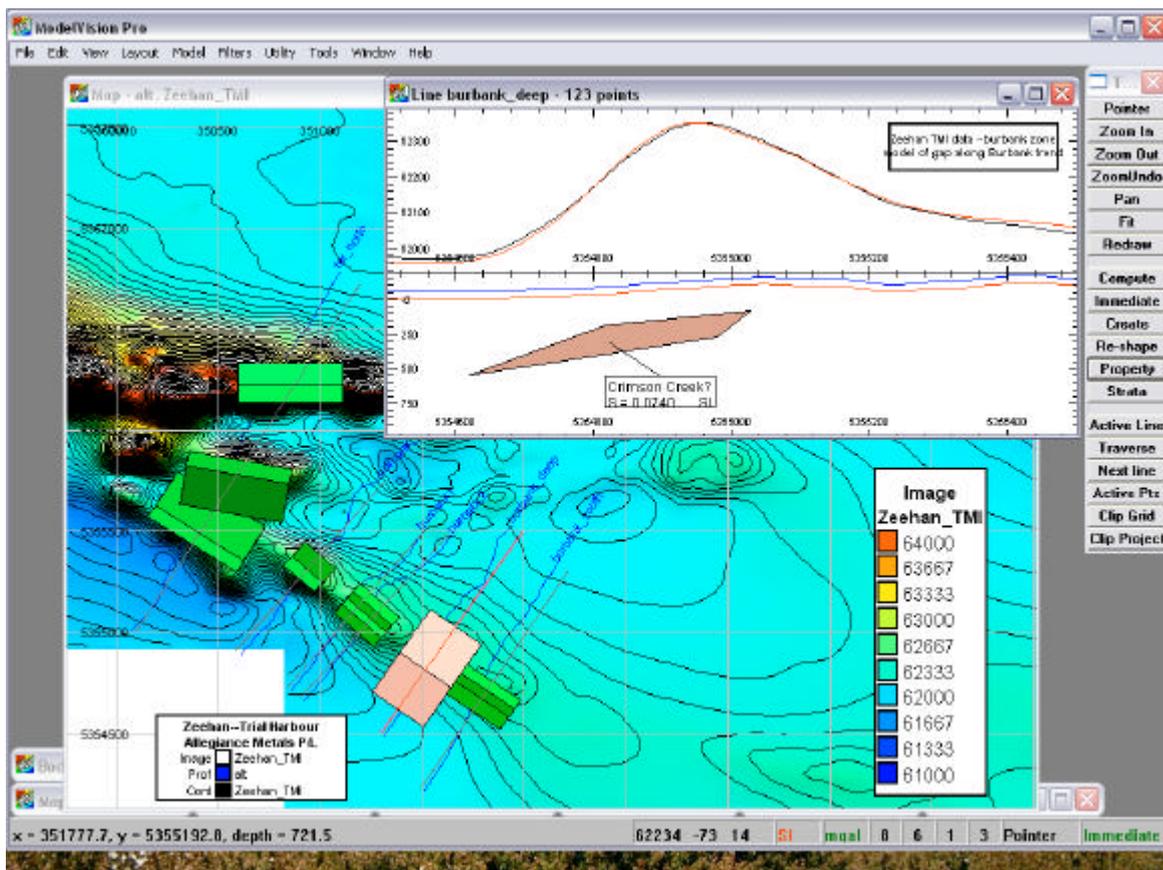


Figure 5c. Trial Harbour linear magnetic zone divided into four sources with model profile over Crimson Creek unit superimposed.

The interpreted depth for the various magnetic sources varies from very shallow in the north (<50m depth) to deep (>125 m) at the southern end of the zone. It is possible that the northern anomaly is actually due to multiple units, as shown in figure 5d, but the modelling is not able to resolve this interpretation from the option that the source is just of greater width. This ambiguity is caused by the inflection in the anomaly profile, which hints at the existence of a second source, being located where the topography may be affecting the data acquisition.

The interpreted depth to the assumed Crimson Creek unit (on the central traverse line) is estimated at the order of 250m, but that depth is difficult to ascertain as the anomaly is influenced by neighbouring strong (ultramafic) sources.

Proposed targets

- i) the magnetic source model geometry proposed in figures 5c - 5d needs to be checked against drilling results at Burbank over the past summer season for revision of the simple geometry. Thence further target zones could be proposed.
- ii) The contact metamorphic aureole around the Heemskirk granite contains some strongly magnetic ultramafic skarns, as modelled by the author in a report to MRT. These skarns may not fit exactly into the Avebury model, being too close to

the granite margin, however they still need to be checked for the presence of massive sulphide mineralisation in case an alternate model exists.

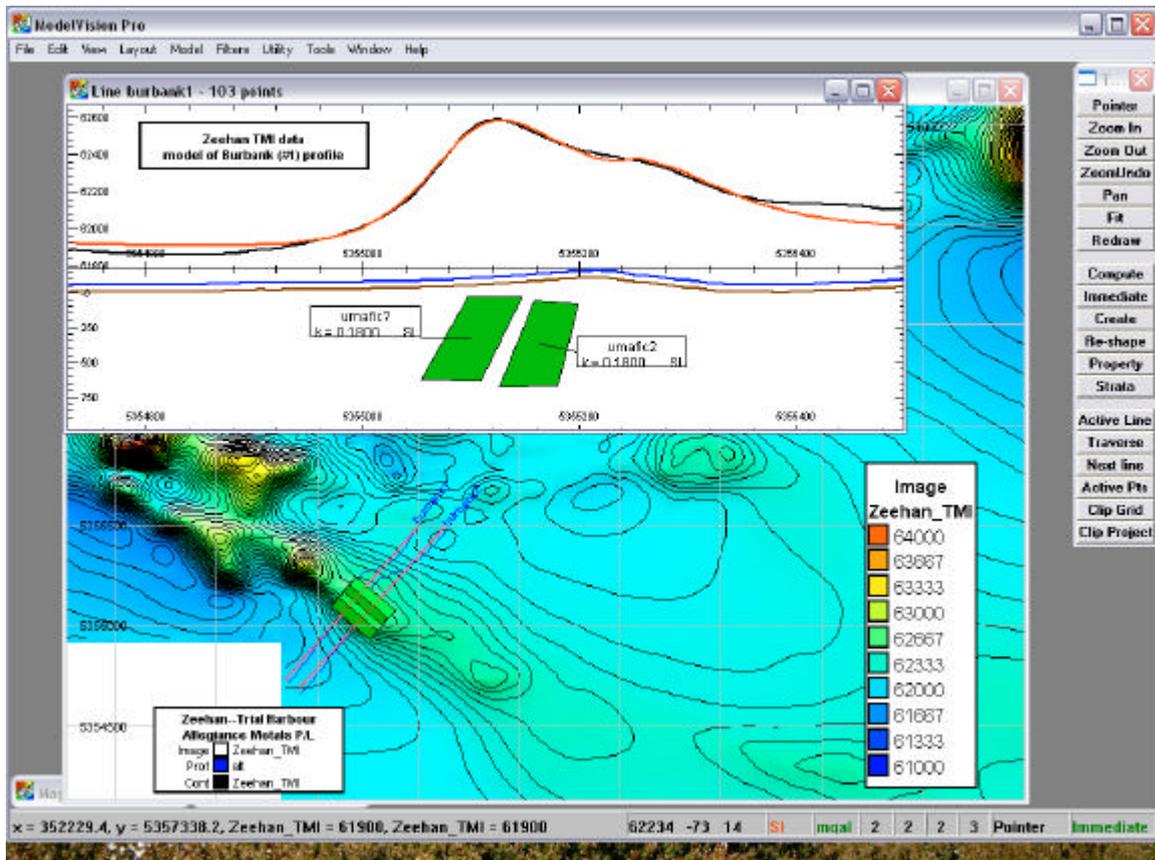


Figure 5d. Model of TMI data across Burbank zone showing the possibility of multiple ultramafic units.