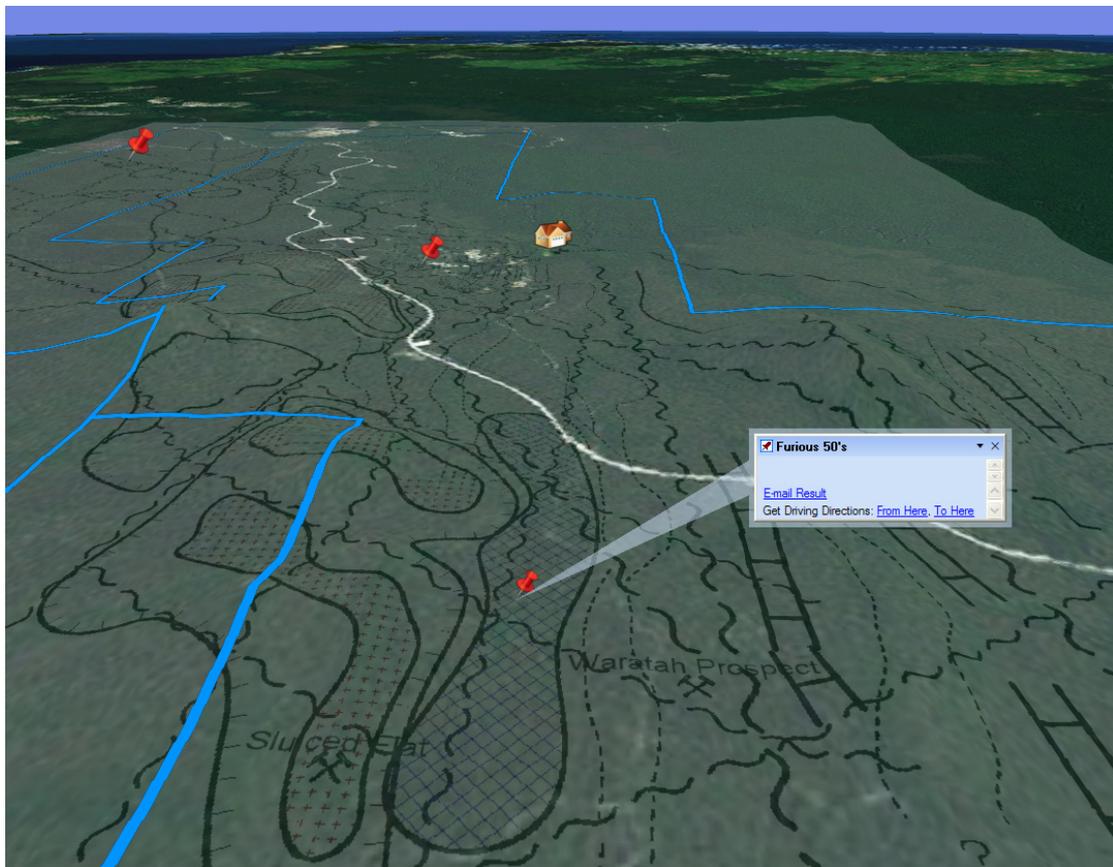


Balfour Project

Tasmania

Furious 50's Magnetic Data Modelling



Prepared for Pleiades Resources Pty Ltd
by
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1. SUMMARY

Correlations are drawn between the geophysical setting of the Furious 50's (Sluiced Flat) and Specimen Hill regions in the gravity survey interpretation report by A Bisset. This report concluded that the magnetic unit immediately east of Sluiced Flat showed the best potential for discovering a repeat setting of mineralisation similar to that discovered at Specimen Hill. Modelling of this magnetic unit was undertaken with a view to characterising the distribution of magnetic sources as well as understanding depth to tops of sources.

Magnetic data for modelling was sourced from the Arthur-Pieman survey that was flown in 1996. Details of this survey are presented in Table 1. Data from this survey had no altitude data and consequently an assumption has been made for a constant sensor altitude of 90 metres above ground level as per the flight record specifications. This is a critical assumption as it affects depth estimates for any subsequent modelling.

Table 1: Arthur-Pieman geophysical survey specifications

Survey Name	Arthur-Pieman
Date Acquired:	April 1996
Flight Line Spacing:	200 m
Flight Line Direction:	East-West
Magnetic Sensor Height:	90 metres AGL

Summary findings from the modelling are;

- The resulting models indicate a complex array of subsurface bodies at varying depths and magnetic susceptibilities
- Bodies west of a north-south structural break model with depths to top that are much shallower than those east of this break
- A major NE-SW structure identified in the gravity interpretation is corroborated in the magnetic modelling

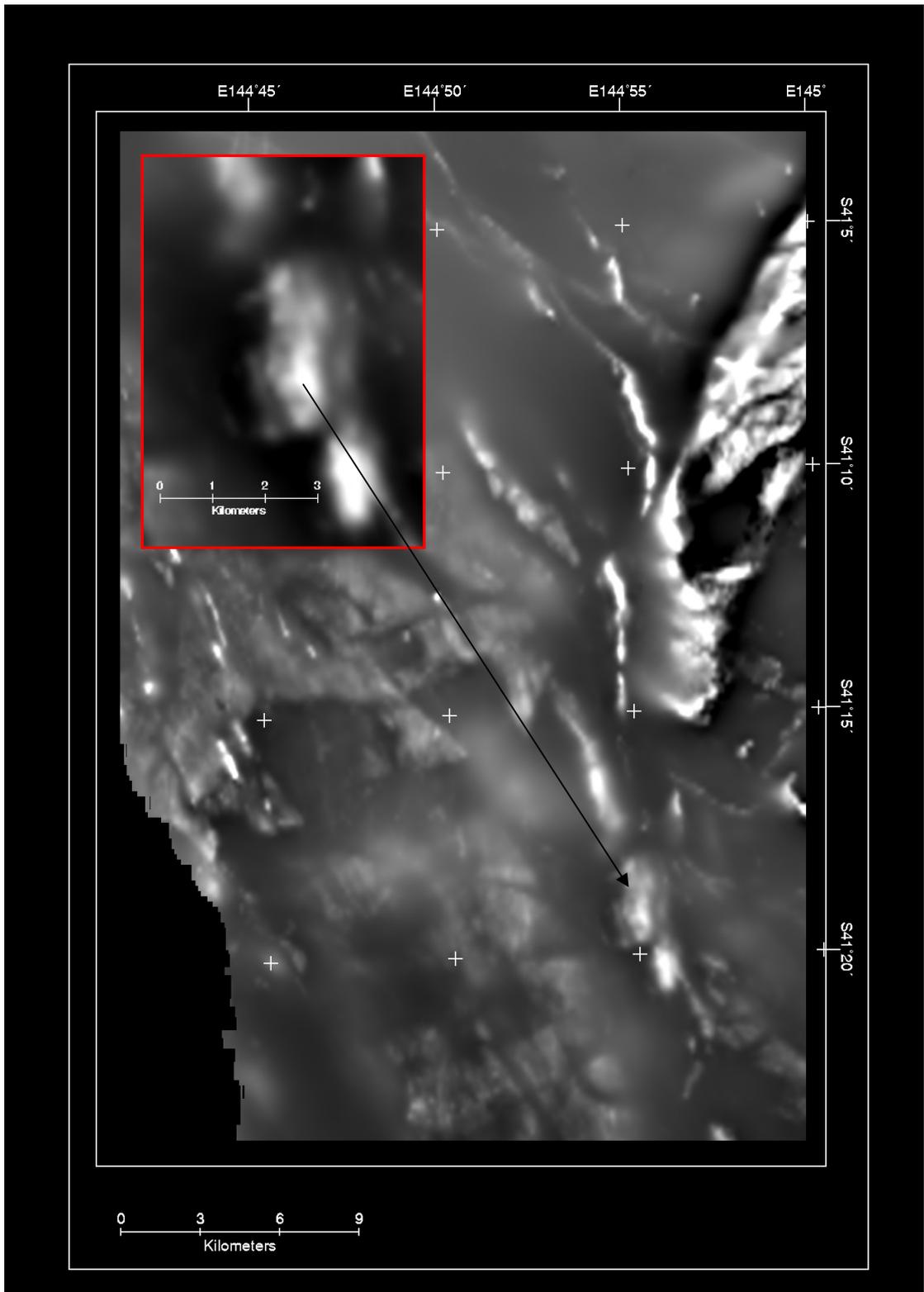


Figure 1: Regional magnetic image (TMI RTP) of the Balfour region with inset showing the Furious 50's magnetic unit

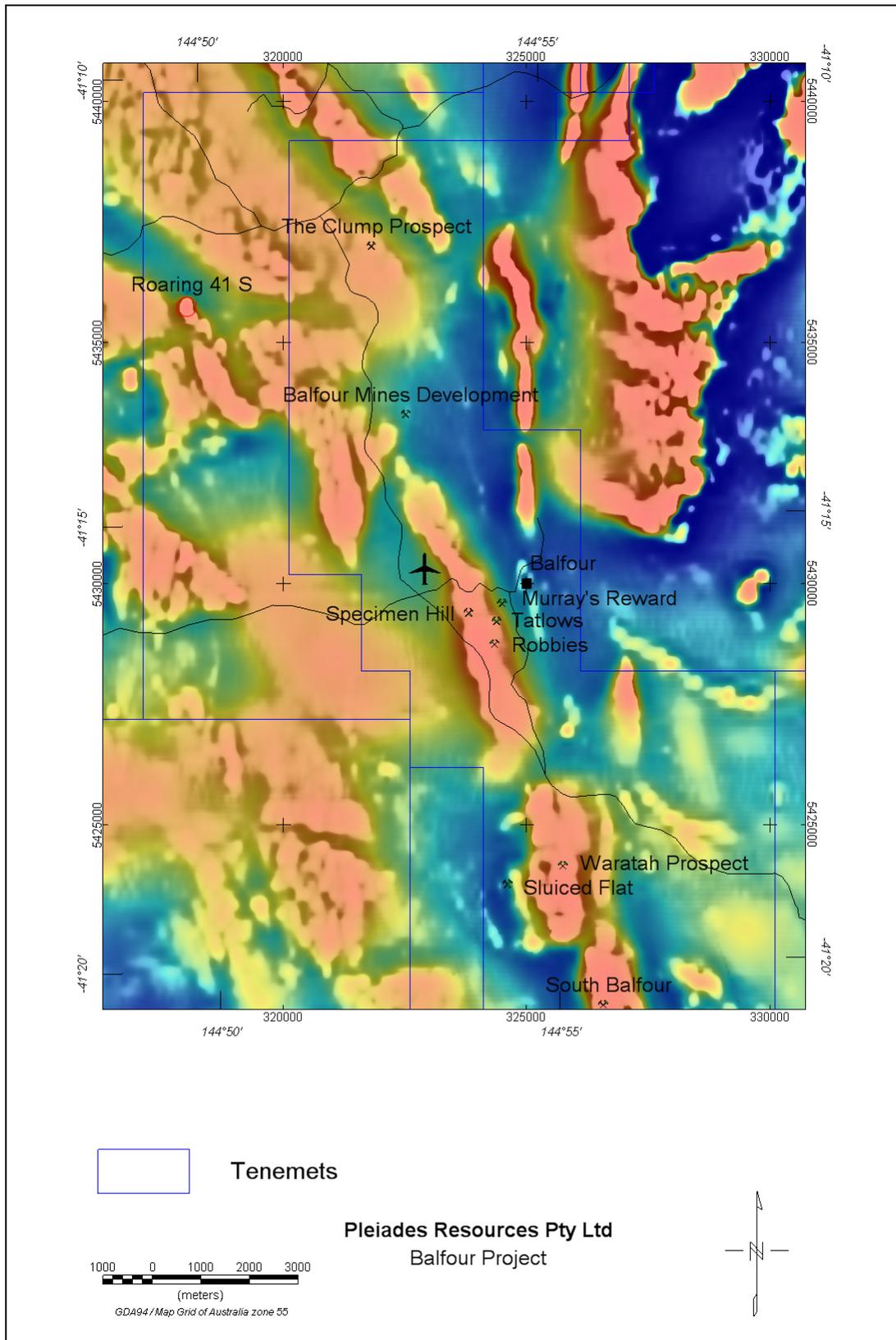


Figure 2: Colour magnetic image (TMI) with a first vertical derivative added back as intensity

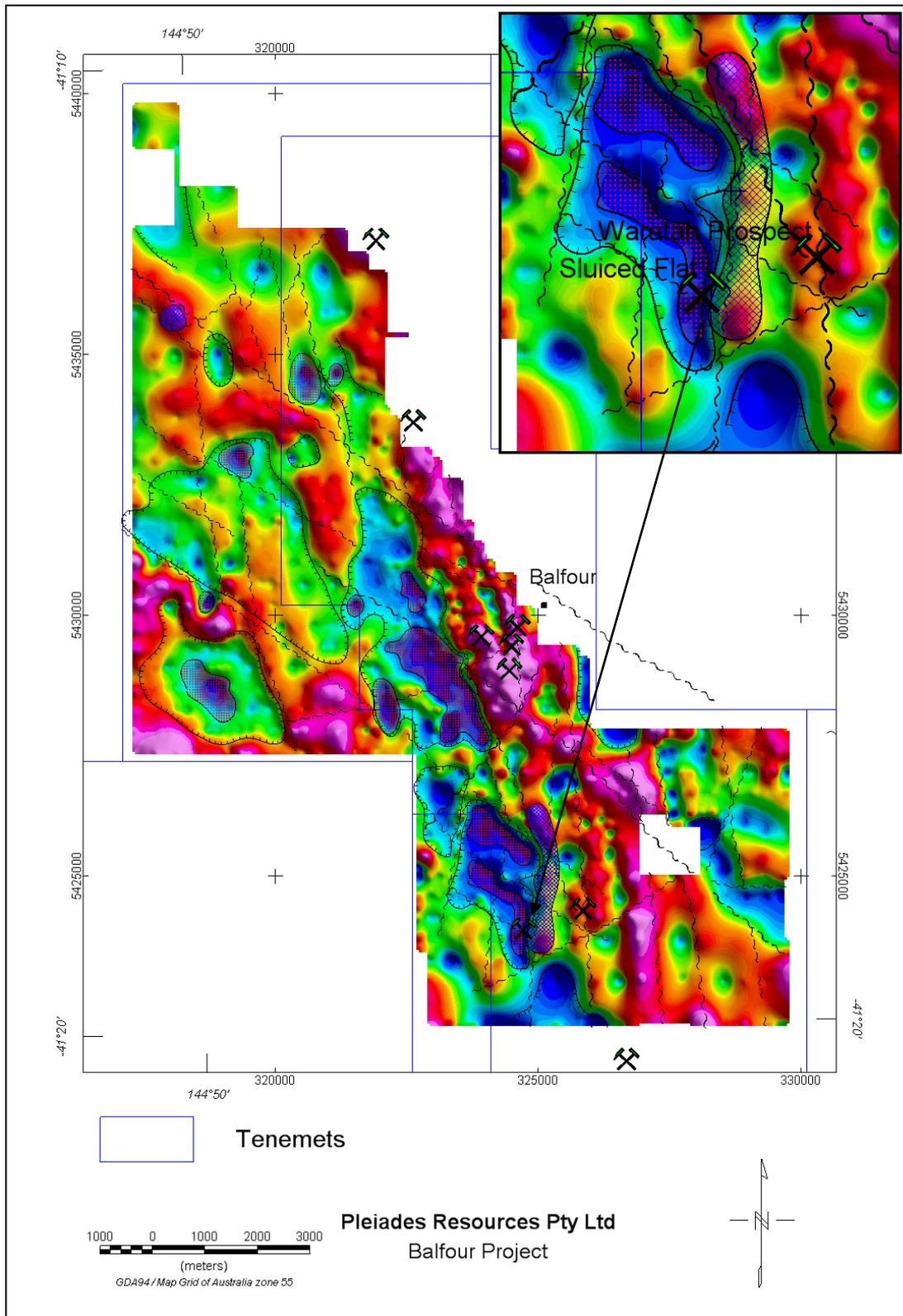


Figure 3: Residual gravity image with interpretation showing location of Furious 50's (inset).

2. MODELLING RESULTS

A complex collection of magnetic bodies was generated to account for the gross features in the airborne survey data set. It was not practical to generate a precisely fitting model along each of the flight lines in the time allotted and a sufficiently accurate model was generated so as to give reasonable estimates of depth to top and magnetic susceptibility for each body. The main focus was along the western margin of the magnetic unit where several bodies define the gross distribution of magnetic source rock. Little attention has been given to the eastern margin with only a couple of bodies were implemented in the modelling to account for gross variations in the magnetic field. A plan view of models over airborne magnetic data (reduced to the pole) is shown below as Figure 4.

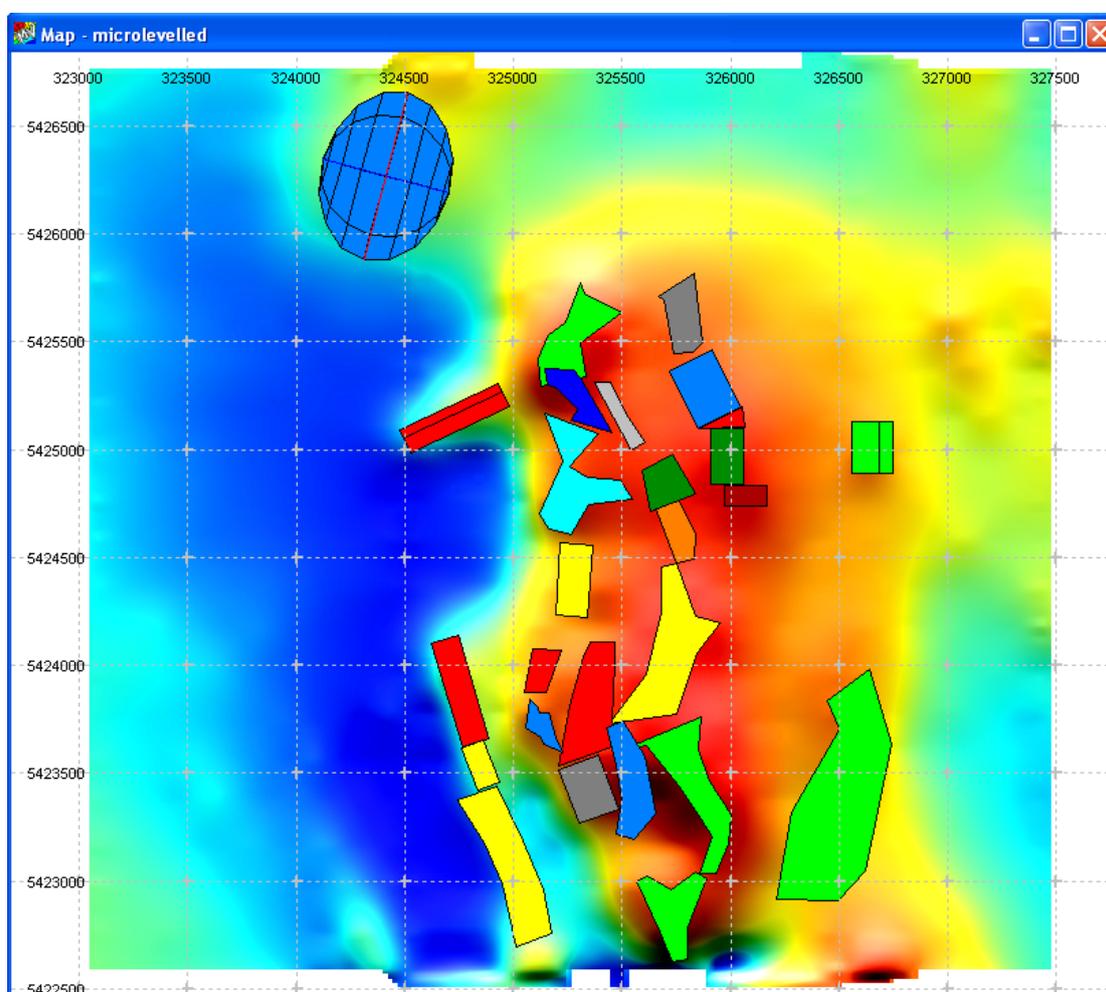


Figure 4: Plan view of TMI image (RTP) with magnetic models overlain.

A summary table of depths and magnetic susceptibilities is given in Table 2 and a plan view of the models with labels is shown in Figure 5. Note that two of the largest

bodies in this model are not visible (bodies 2 and 19) and are only used to account for a regional component in the magnetic field (Figure 6). Similarly, body 18 on the eastern margin was used to account for a broad magnetic field as was the sphere in the far north (simply labelled Body), however both these models are shown in the images.

Table 2: Depth to magnetic source and associated susceptibility

Name	Depth	Susceptibility ($\times 10^{-5}$ SI)
Body	470	600
Body 1	110	3100
Body 2 (not shown)	470	1500
Body 3	95	1700
Body 4	120	1900
Body 5	160	2000
Body 6	200	4000
Body 7	180	1300
Body 8	60	1400
Body 9	130	2800
Body 10	145	7000
Body 11	40	700
Body 12	115	4000
Body 13	140	2800
Body 14	45	1000
Body 15	320	2700
Body 16	260	4000
Body 17	35	400
Body 18	450	3000
Body 19 (not shown)	560	1000
Body 20	310	2900
Body 21	220	2500
Body 22	110	2000
Body 23	100	4000
Body 24	190	3000
Body 25	150	2000
Body 26	115	2600
Body 27	150	6000
Body 28	200	7000

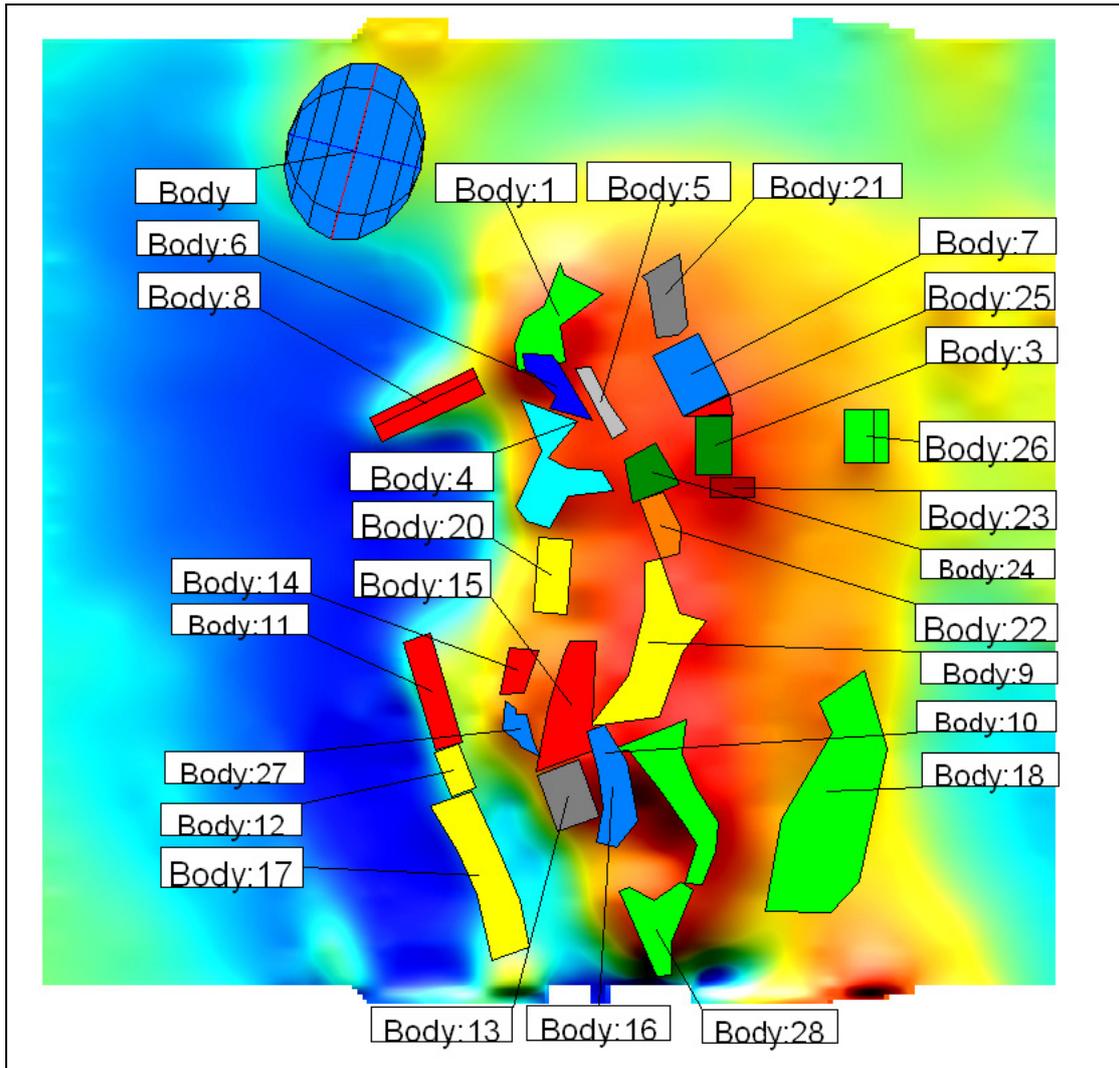


Figure 5: Plan view of TMI image (RTP) with magnetic models and label names overlain.

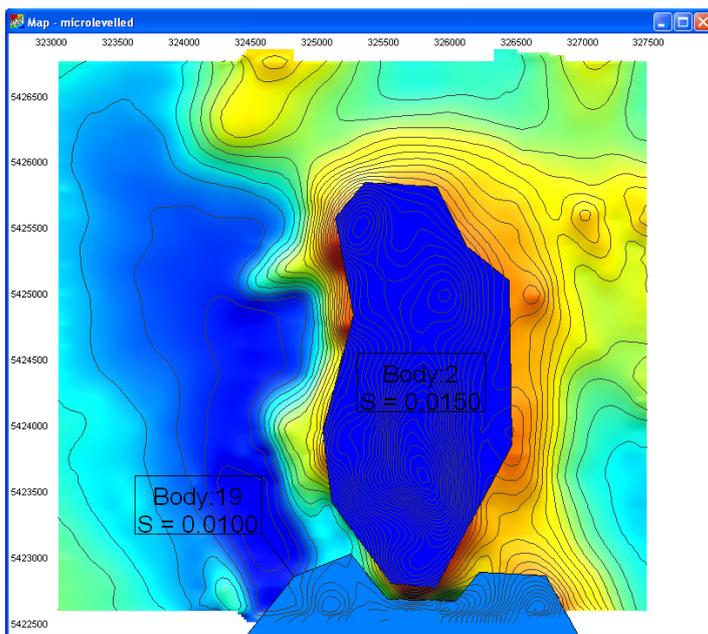


Figure 6: Two deep magnetic bodies used to generate a regional component in the magnetic field. These bodies are not shown in any of the cross-sections.

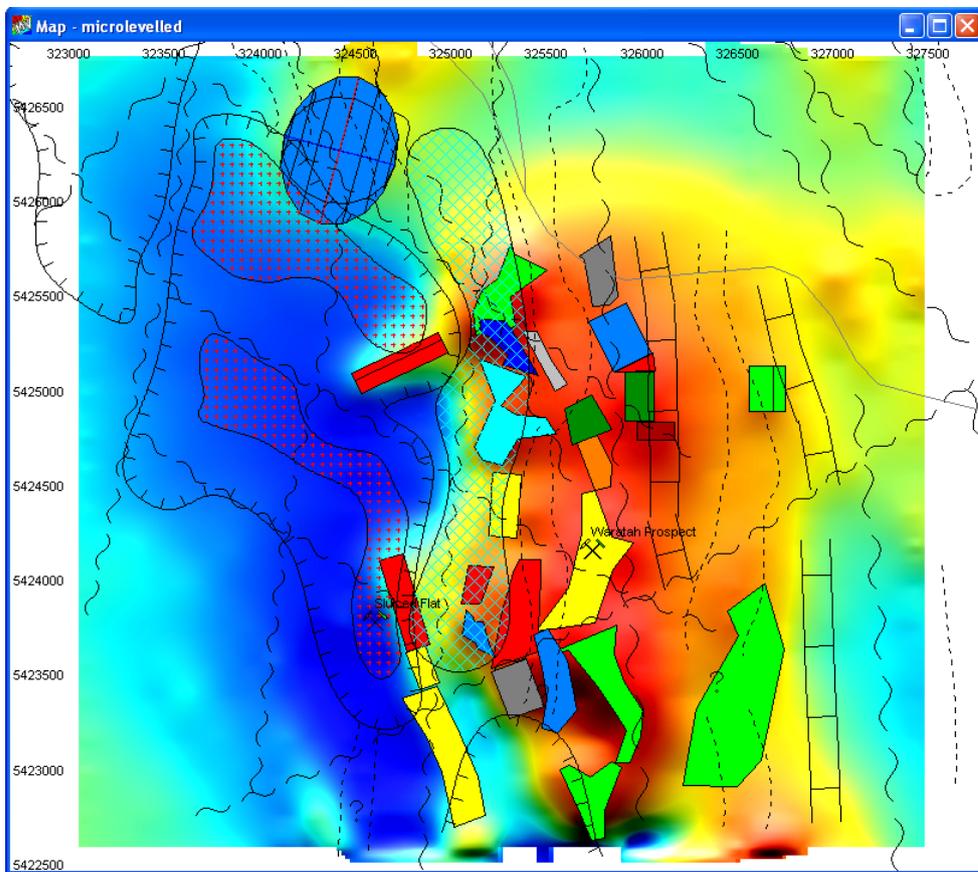
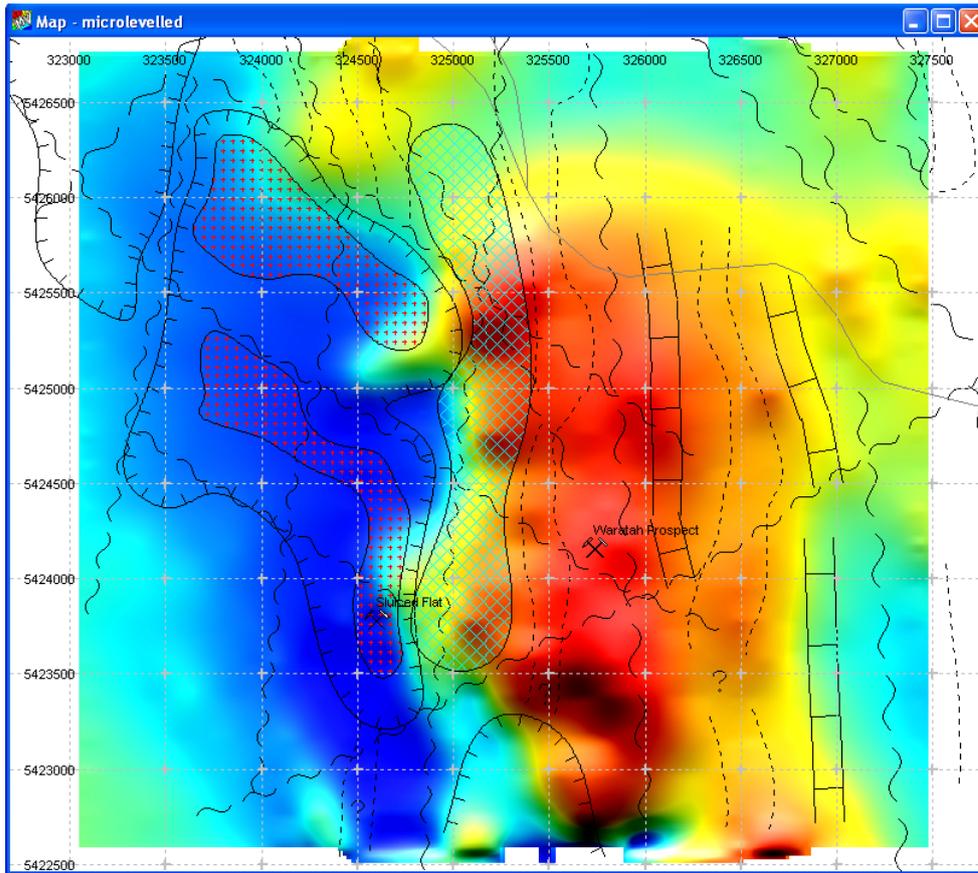
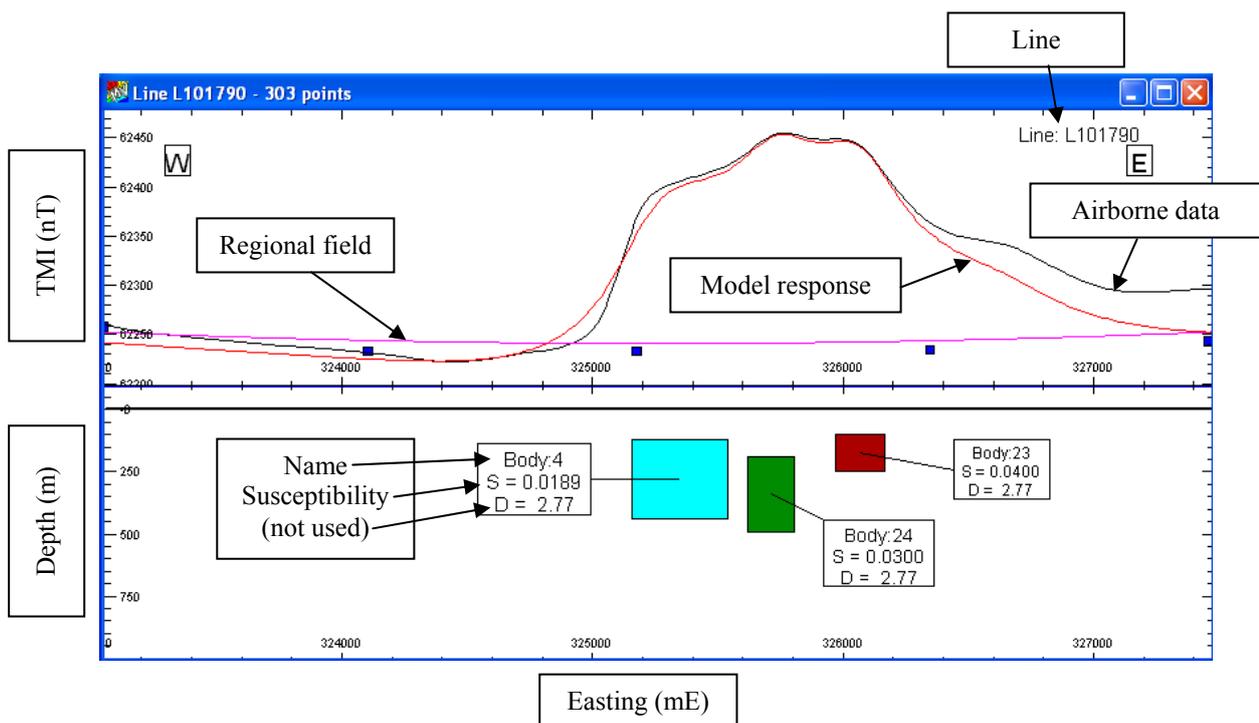


Figure 7: TMI image (RTP) overlain by the gravity survey interpretation without magnetic models (top) and with models (bottom).

The following images are of cross-sections along each flight line of the magnetic airborne survey. Each cross-section shows;

- a regional magnetic field (pink line),
- the airborne survey profile (black line),
- the magnetic profile generated from the models (red line),
- the models themselves as they intersect the flight path and
- cross-sections are presented in a 1:1 aspect ratio for depth verses distance.

Terrain variations within the localised area were considered minimal in comparison to depth of models. Due to a lack of any flight altitude information it was impossible to accurately generate models that included the surface terrain. An assumption of a constant 90 meter flying altitude was made in all modelling.



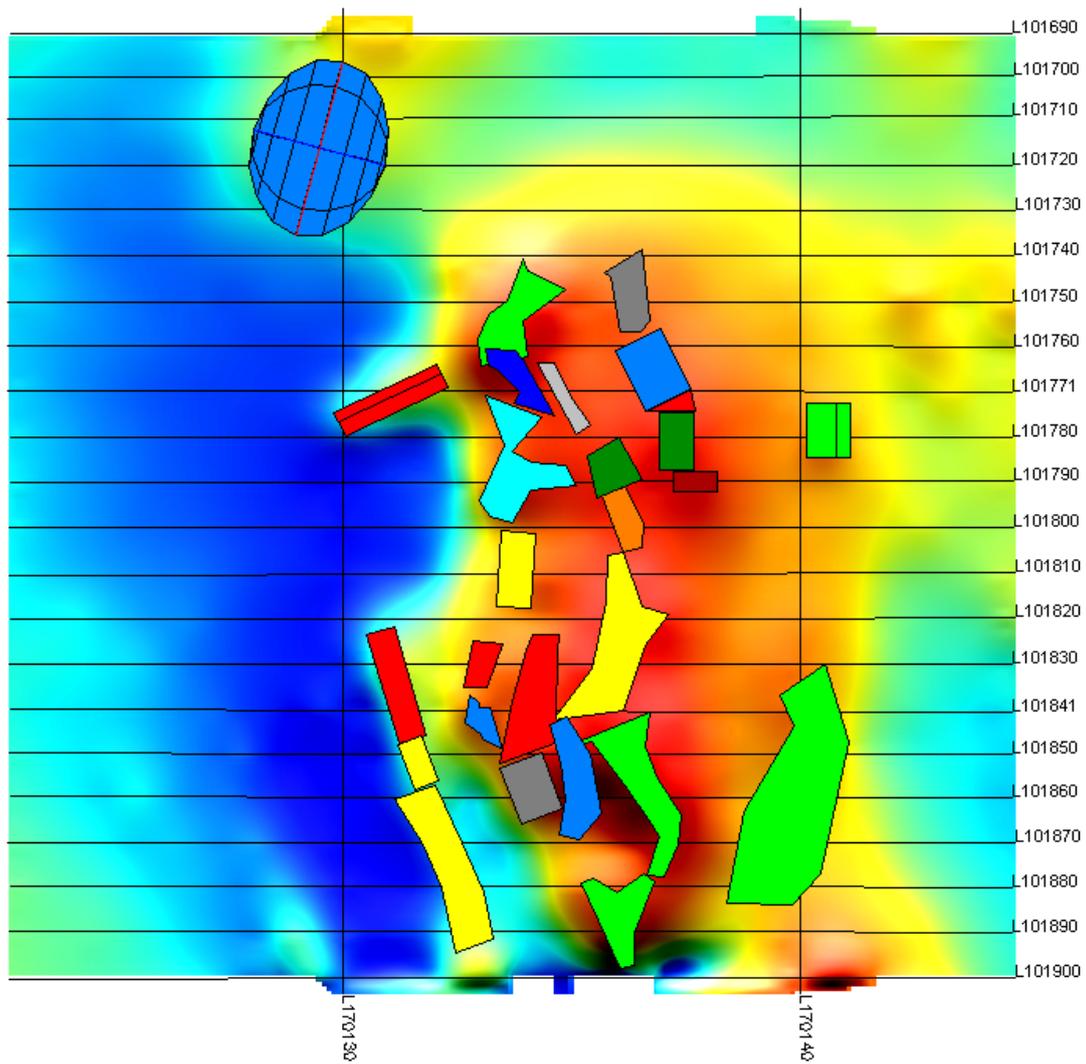
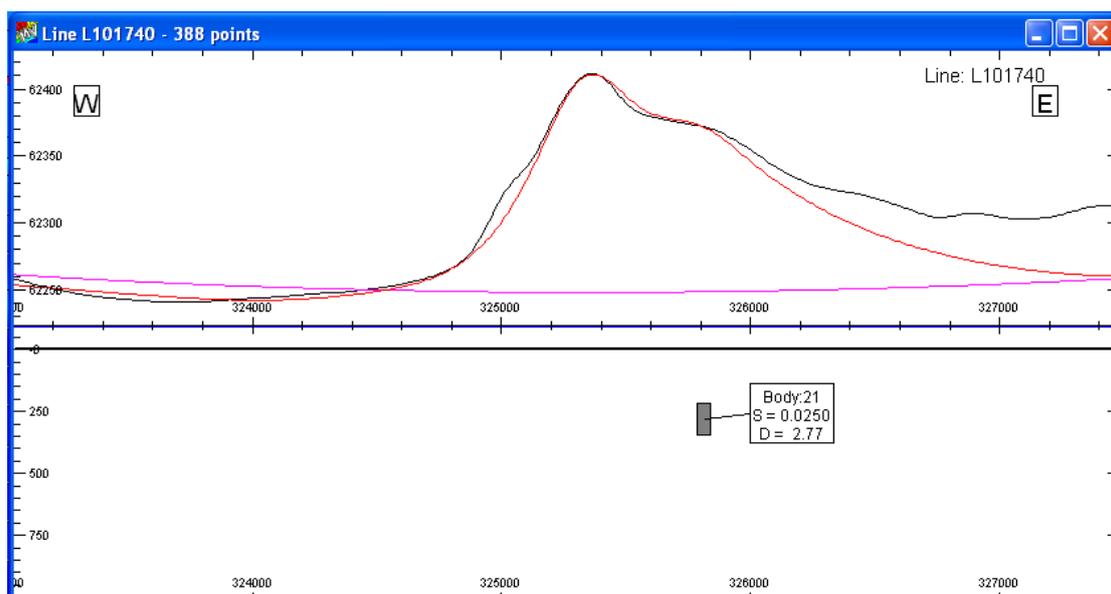
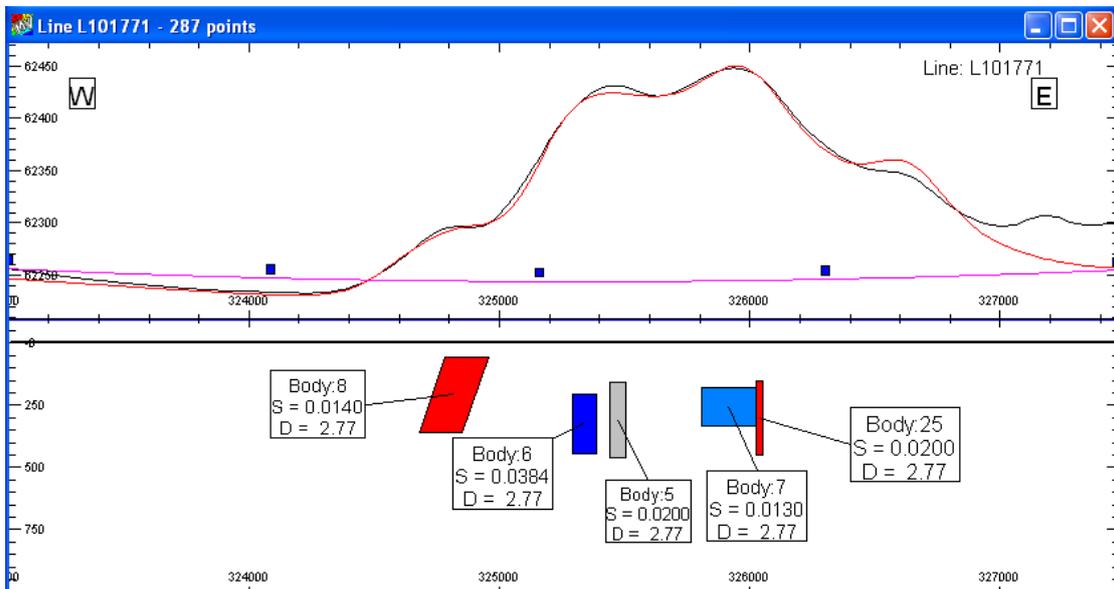
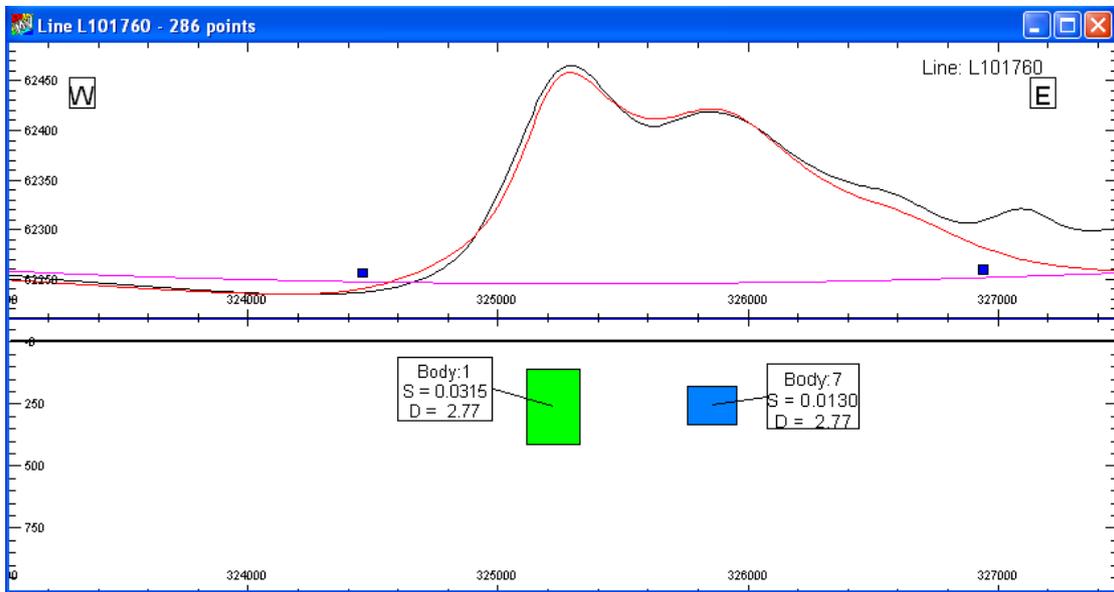
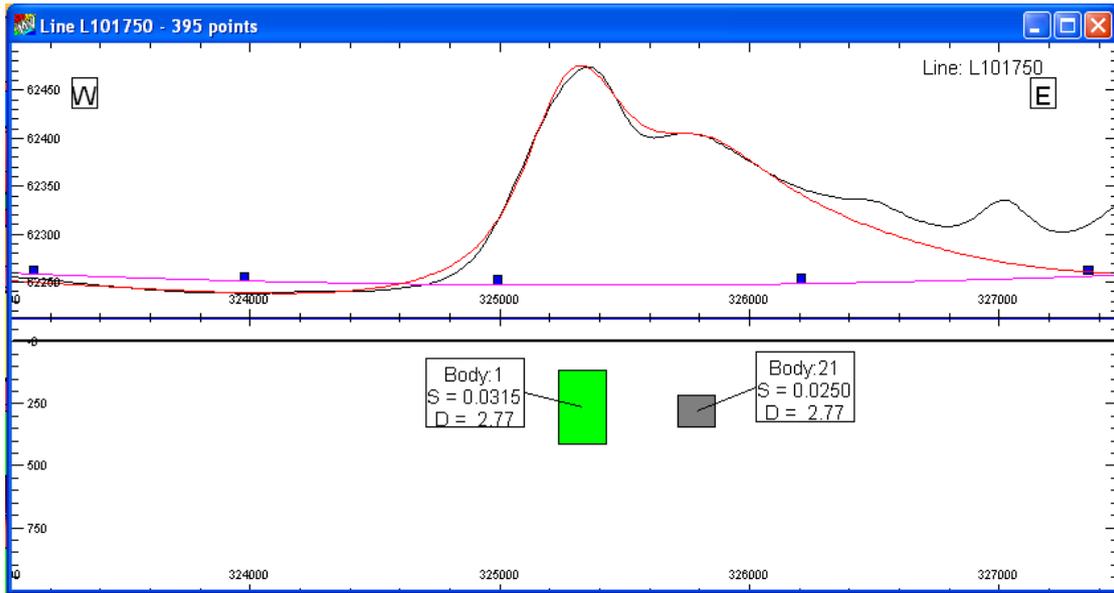
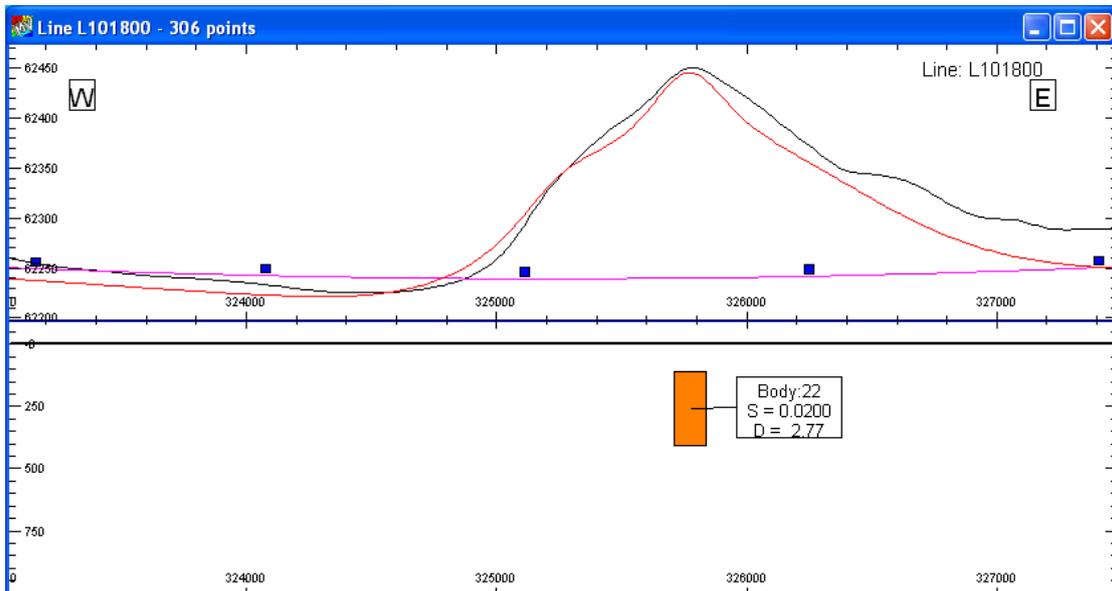
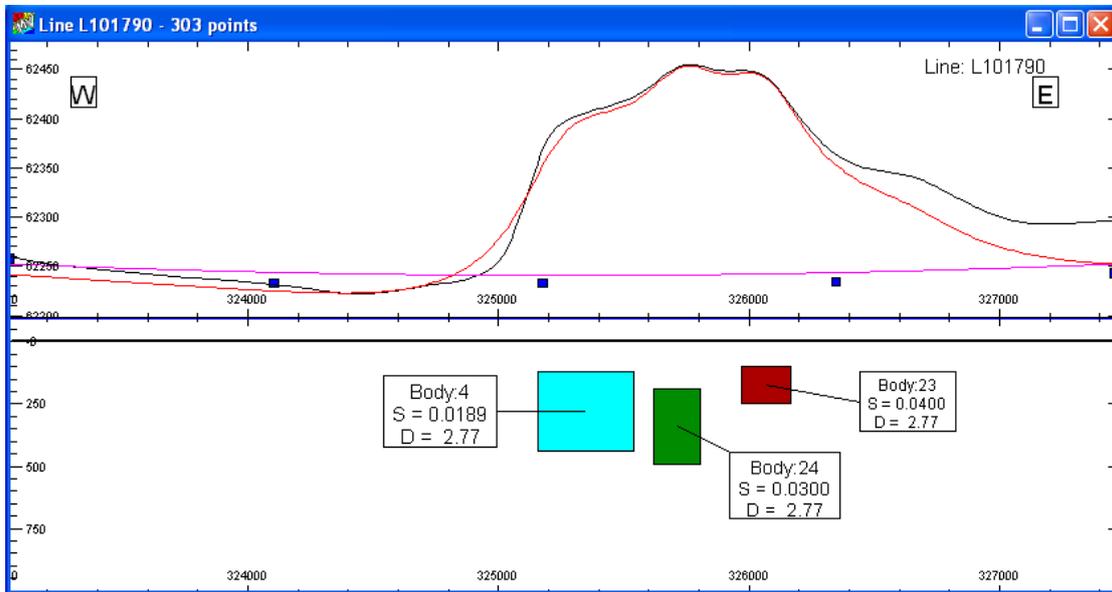
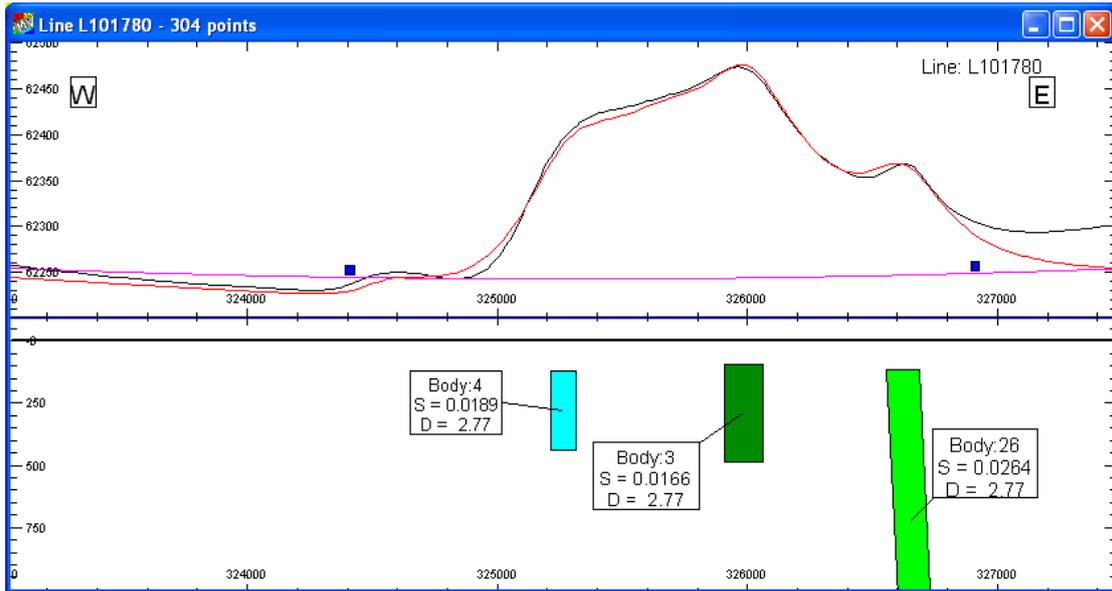
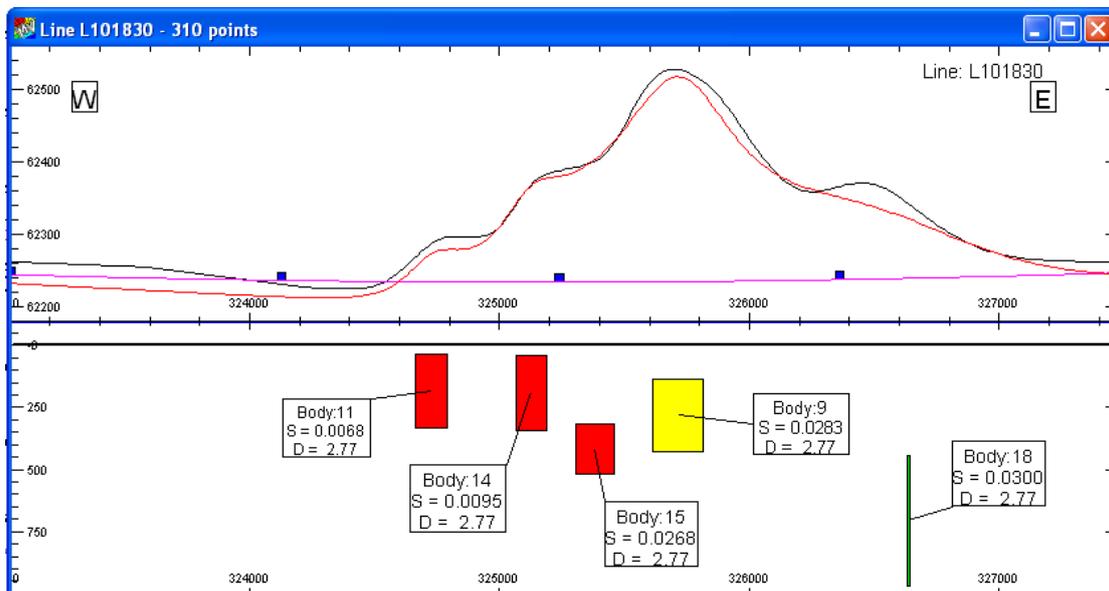
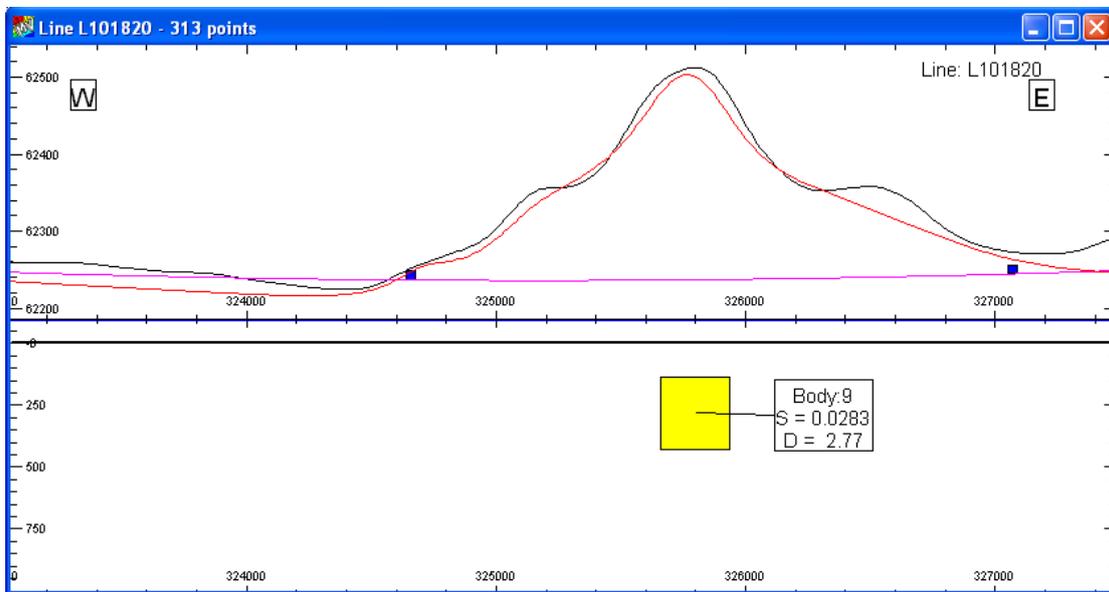
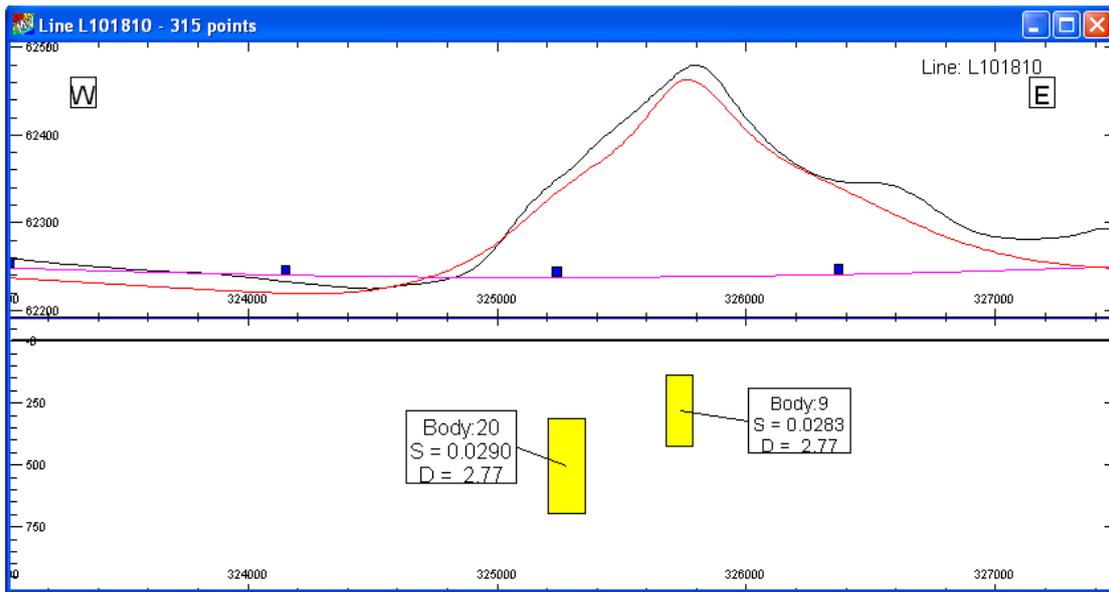


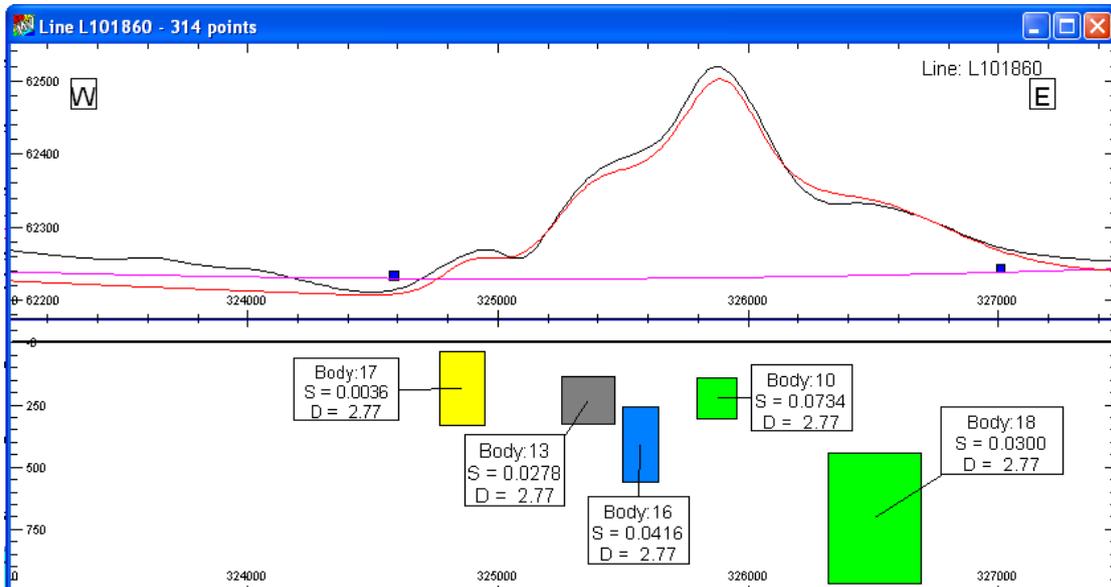
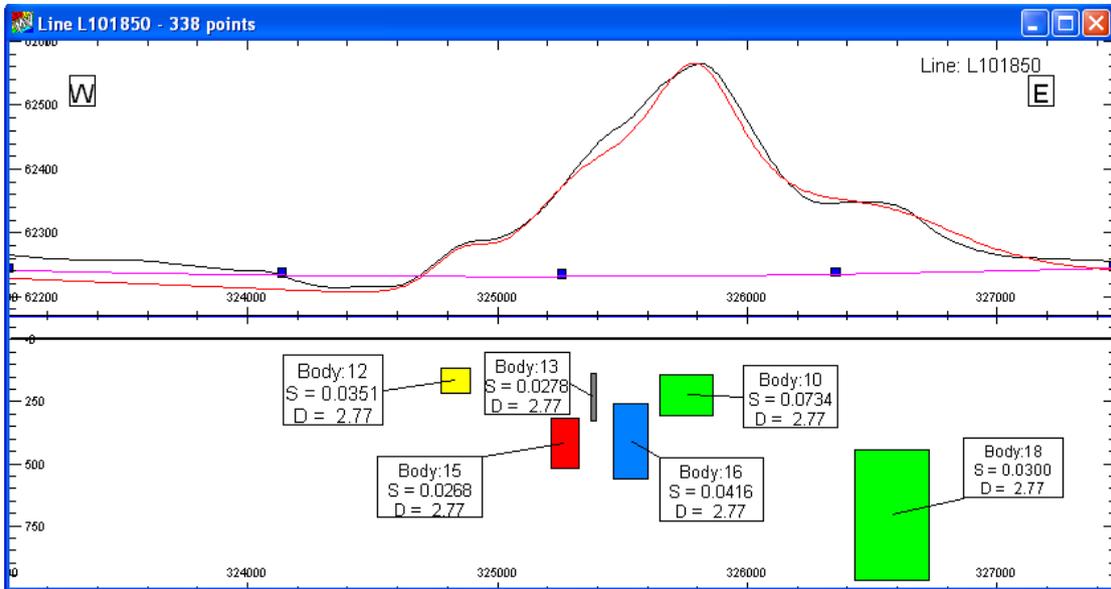
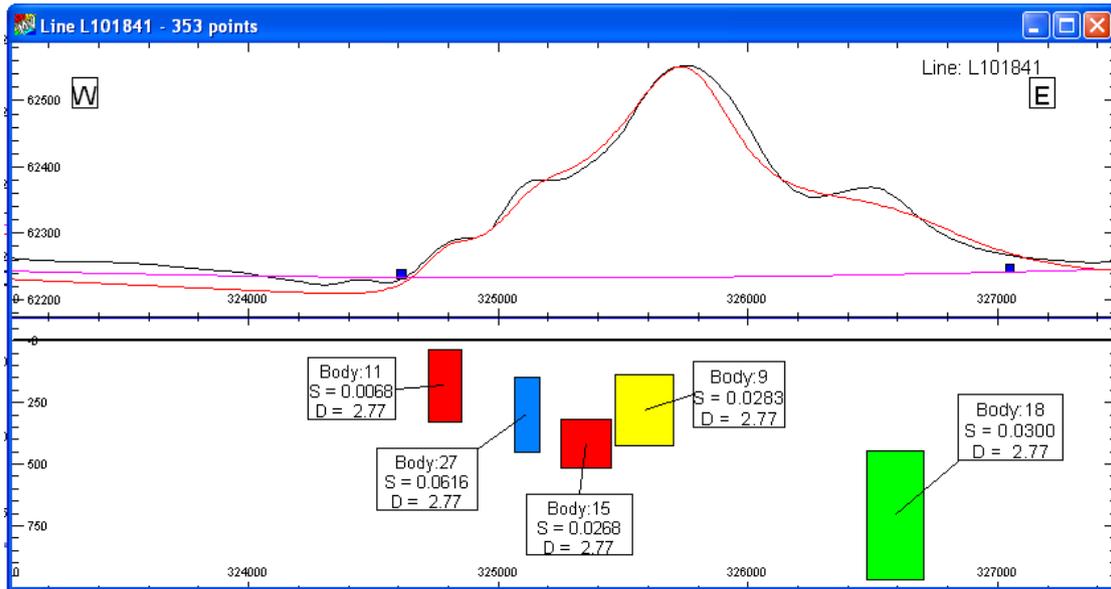
Figure 8: Flight path of the Arthur-Pieman magnetic survey over theoretical models. Cross-sections are shown for flight Lines 101740 through to 101890.

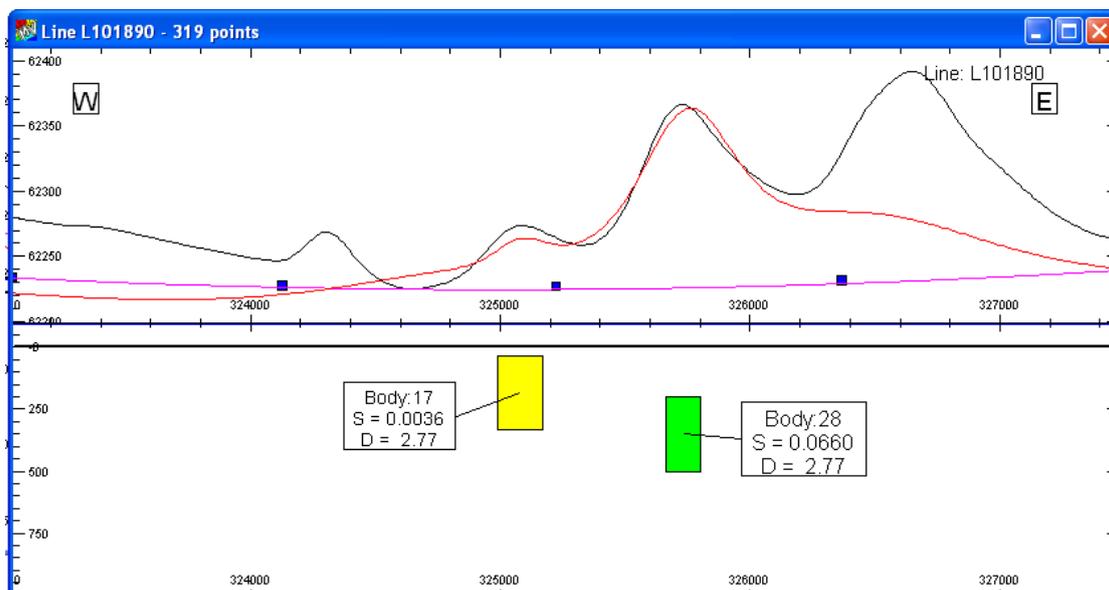
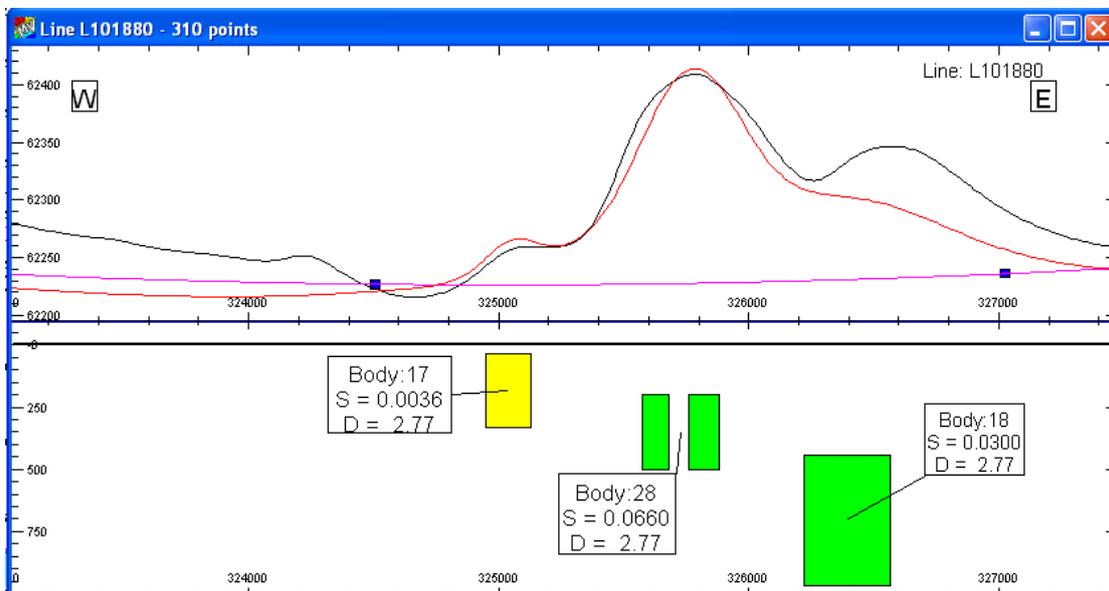
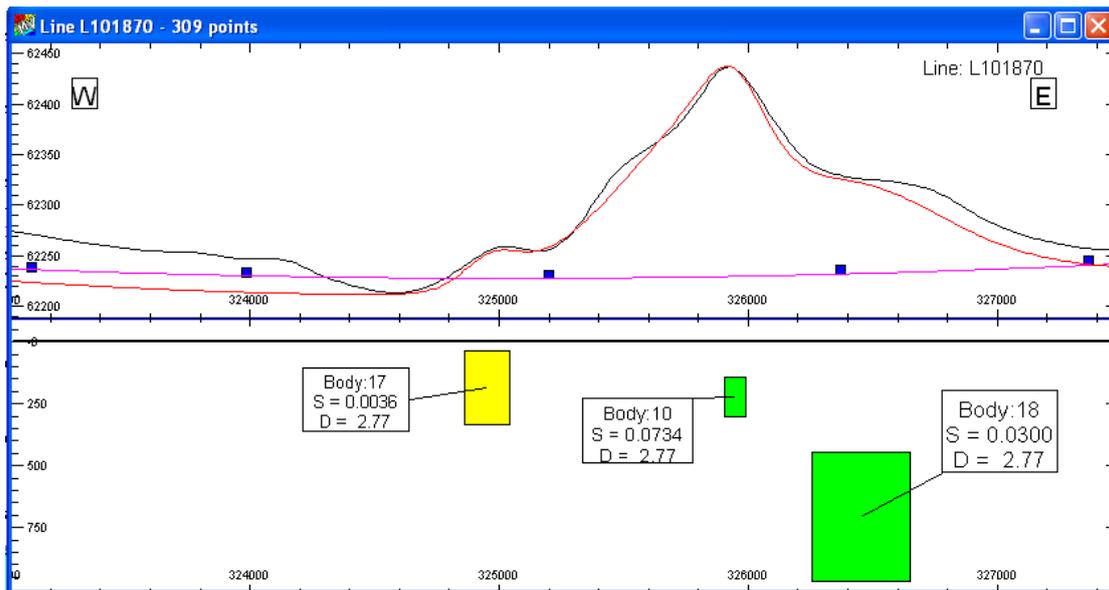












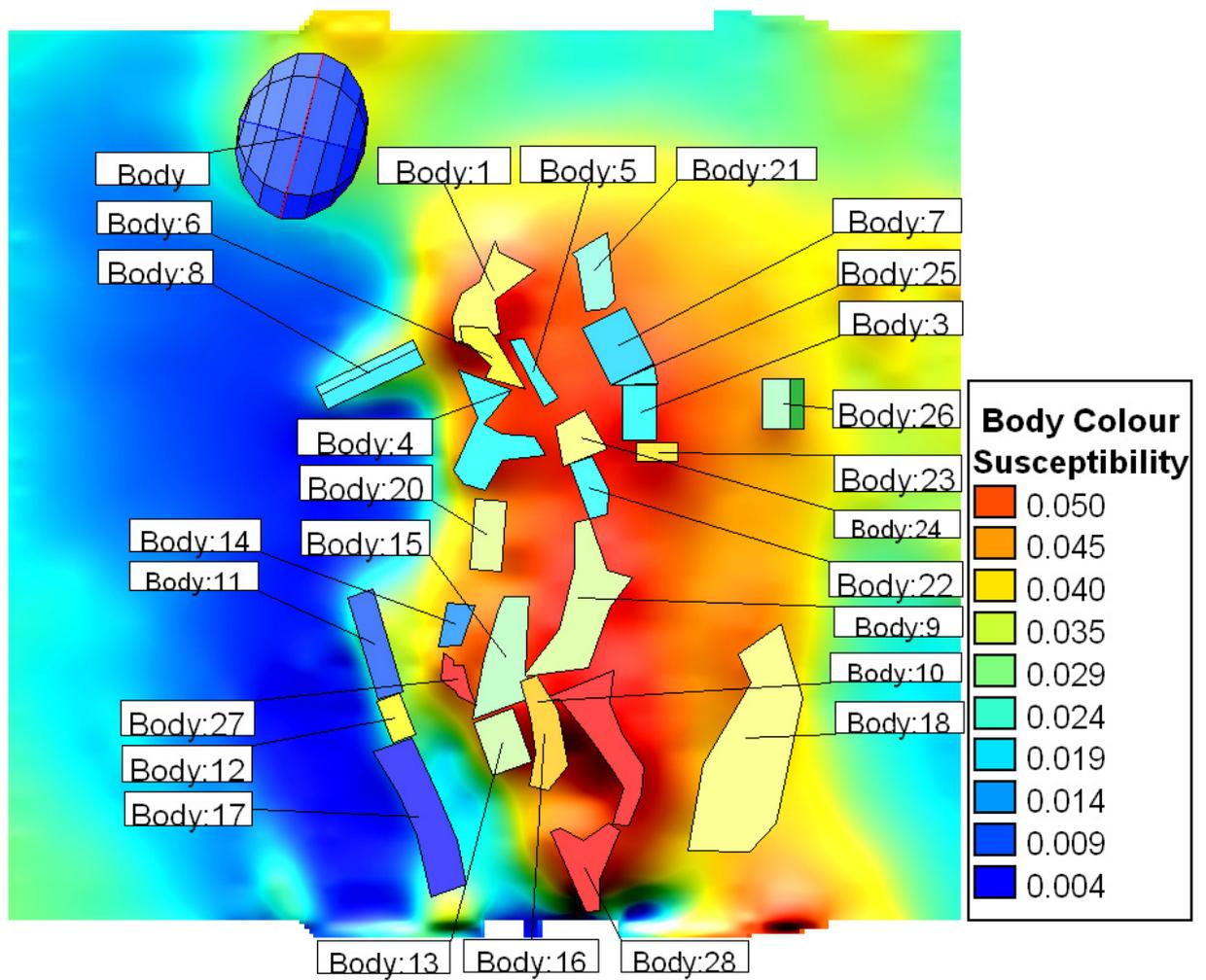


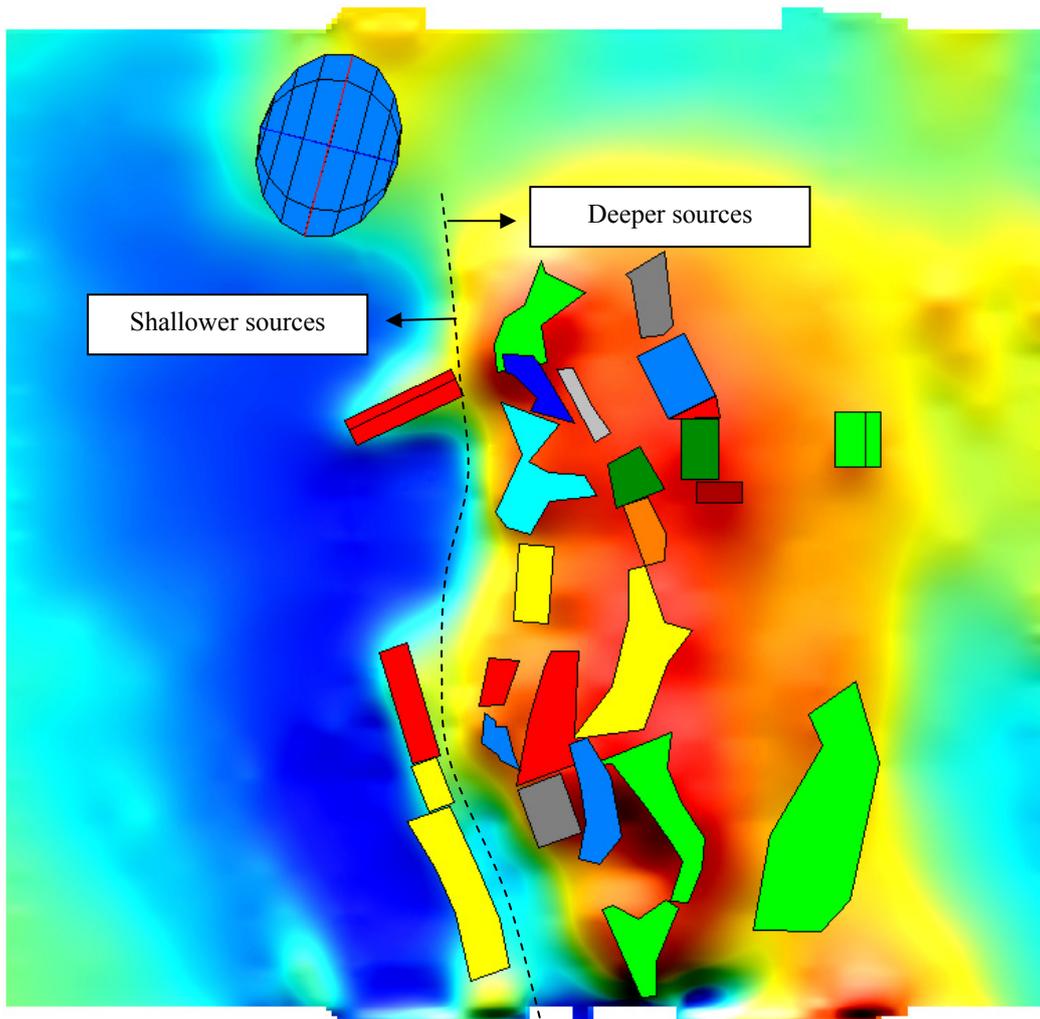
Figure 9: TMI image (RTP) overlain by the magnetic models which are coloured according to magnetic susceptibility (SI units)

In Figure 9 above each of the models has been coloured according to magnetic susceptibility ranging from blue (lowest value) to red (highest value). There is some indication of units with like susceptibilities being grouped together which in turn could indicate a similar geological unit.

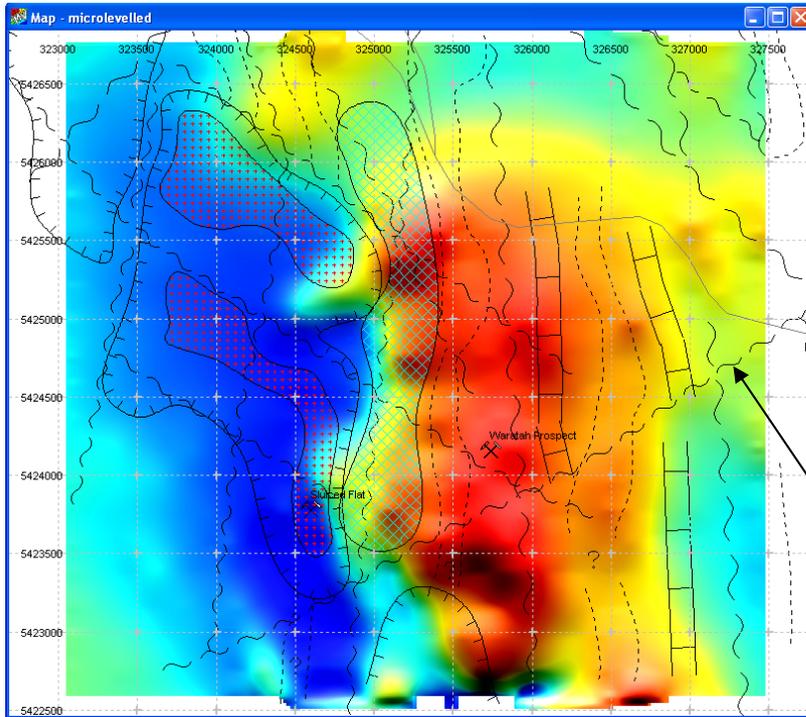
3. COMMENTS

This portion of magnetic stratigraphy is a relatively complex assemblage of magnetic sources with a variety of depths and susceptibilities. A 3D perspective of the models is shown in Figure 10. The following comments are made on the resulting model.

Sources west of a probable north-south structural break are modelling with shallow depths.



A fault identified in the gravity interpretation forms a natural break in the magnetic models. It was found that bodies on either side of this fault generally could not cross this line and they also had to have different susceptibilities to accurately reflect the airborne survey data. Similar features are likely to exist elsewhere in the data but this seemed to be the most obvious.



Magnetic bodies naturally break across this line

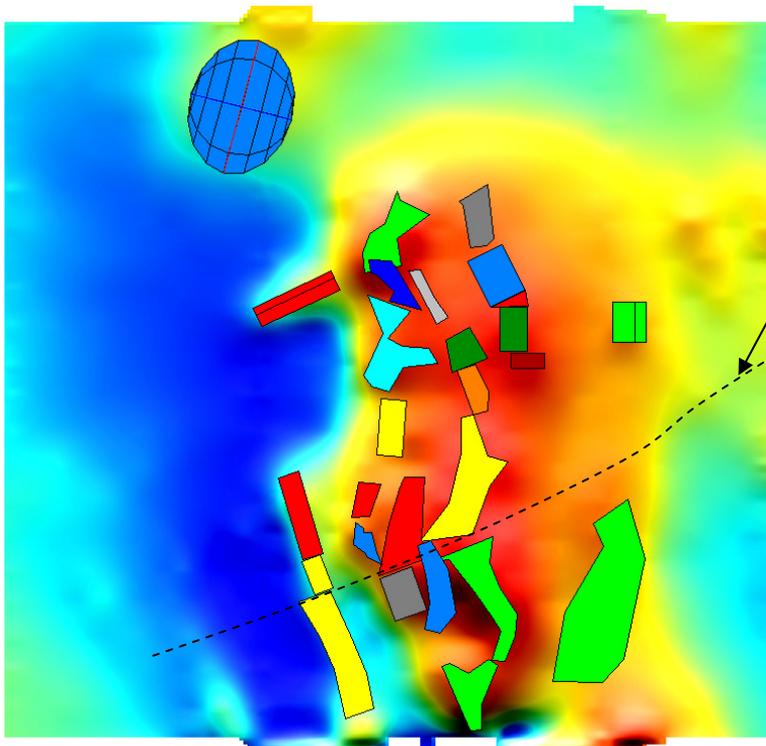


Figure 10: A series of 3D perspective views of the final magnetic model for the Furious 50's area

