AUSTHAI GEOPHYSICAL CONSULTANTS LIMITED

Interpretive Summary

Down Hole Magnetic and EM Surveys

On the

Roaring 41 South Prospect

At

Balfour, Tasmania

For

King Island Scheelite Limited.

Conducted

November 2010

Contents

Introduction

The following is a review of Down Hole EM and magnetic data collected along holes R41S01 and R41S02 at the King Island Scheelite Limited, Roaring 41 South prospect in Balfour North west Tasmania during the period 17th to 18th November, 2010. The purpose of this review is to assess the quality of the data as well as to identify and model EM and Magnetic signatures that might be due to copper gold bearing magnetite-sulphide mineralization.

Digital data provided with this report includes the raw data, EM and Magnetic model bodies as DXF files as well as 3D block model files for displaying in 3Dviewer. Plan view and profiles are also presented as PDF files.

Project Area and Description:

The Roaring 41 South prospect (R41S) is located over Proterozoic Rocky Cape Group sediments approximately 10km northwest of the historic Balfour Township and Specimen Hill tin-tungsten prospect in the Balfour District in NW Tasmania (Figure 1.0).

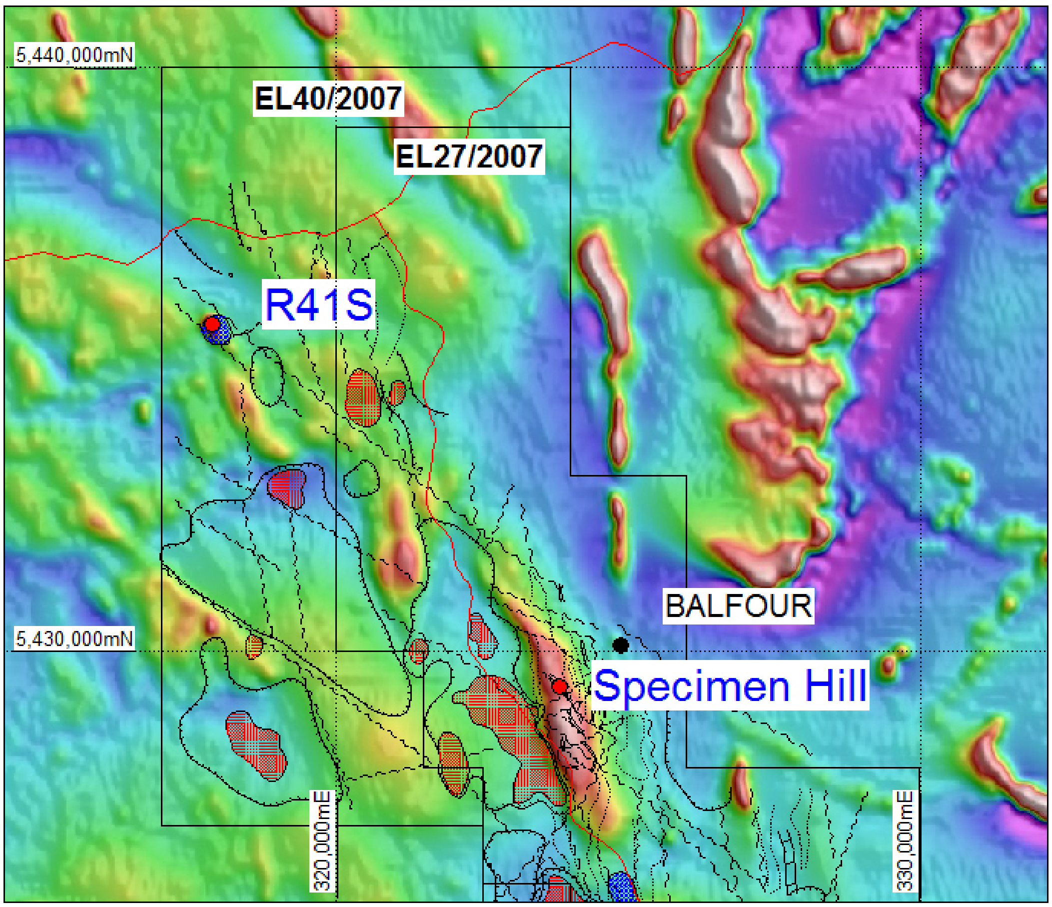


Figure 1.0: R41S location relative to the historic township of Balfour and the Specimen Hill tin-tungsten prospect on the total magnetic intensity (3D color image) and gravity interpretation superimposed (After: *DRAFT_ASX Announcement July 2010 BJV 2nd release v8.doc*).

A ground magnetic survey was conducted over the area and provided the detail to delineate the source area of greatest magnetic susceptibility for a known aeromagnetic feature. Modeling of the anomaly was completed by consultant Geophysicist Andrew Bisset and defined a steeply south-southwest dipping body of 0.3SI units (equating to a mass of approximately 10% magnetite) at a depth of 60m (Bisset 2010).

Two holes were planned based on this modeling. Drill hole R41S01 intersected magnetite, copper and gold mineralization between 50 and 60m, while drill hole R41S02 intersected copper and gold mineralization at depth (Figure 2.0).

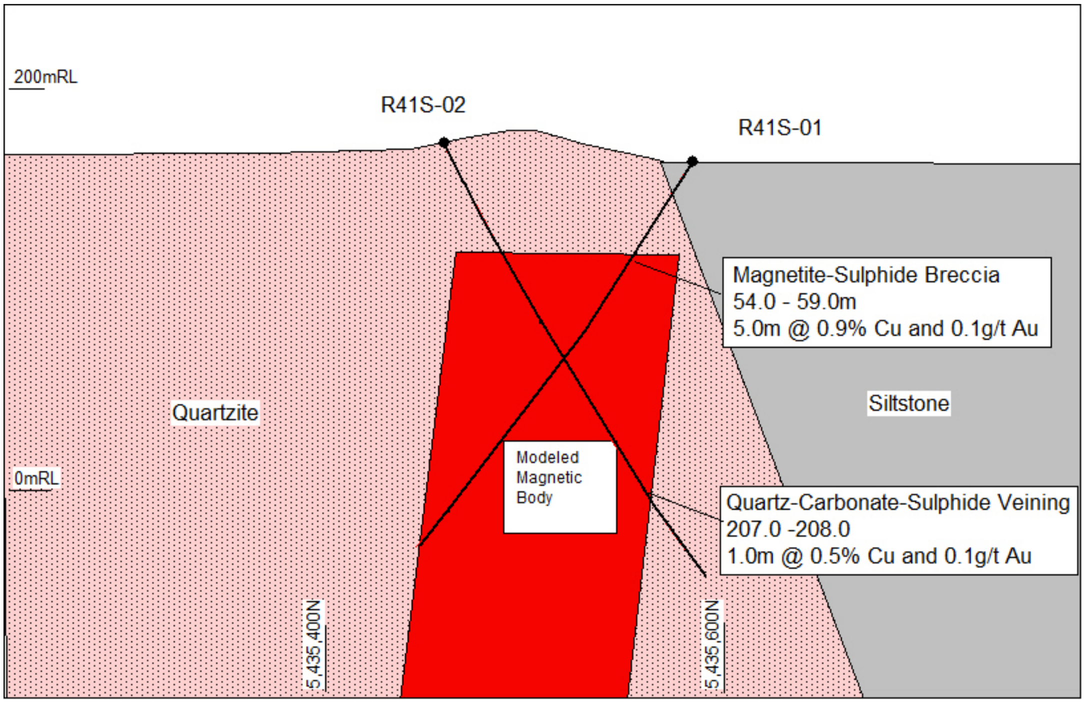


Figure 2.0: Drill holes projected onto cross section 317,900E. The modeled magnetic body, interpreted to contain 10% magnetite, is a rectangular cuboid plunging steeply SSW. (After: *DRAFT_ASX Announcement July 2010 BJV 2nd release v8.doc*)

These initial results support magnetite-copper-gold mineralization associated with a coincident gravity and magnetic susceptibility anomaly in Proterozoic rocks at the R41S target. It was decided to do down hole EM and Magnetics to delineate further targets ahead of follow up drilling.

Survey Planning and Specifications:

All maps and profiles presented in this review have coordinates in WGS84 Zone 55G Southern hemisphere.

Summary of DHEM Survey Planning:

The main objectives of the DHEM surveys is to determine the extent of known intercepts of Massive Sulphide (MS) bodies as well as to identify new MS bodies or lenses occurring off hole and hence provide follow up drill targets.

B-Field DHEM measures the total B-field response of an energized conductive body after transmitter turnoff. 3 components are measured – Axial and cross hole components U (equivalent to inclination) and V (equivalent to rotation). In the B-field data, the slowly decaying off drillhole response from a good conductor is able to be discriminated from the host response. This is especially the case in the cross-hole U and V components.

One important aspect of the DHEM surveys is inducing source (or transmitter loop) placement. Geological knowledge of an area is used to determine the position of the loop relative to the hole so that there is the maximum EM coupling with the probable conducting source.

If the expected conductive sources are thought to be relatively flat lying then the loop is centered on the area of interest (such as position of the sulphide intersection) on the other hand if the expected conductive sources are steeply dipping or vertical the loop center is offset such that the edge of the loop is over the area of interest. In the case of the of the Roaring 41 South project the geology hosting the magnetite-sulphide mineralization is interpreted to be near vertical (Figure 3.0) and as such the inducing source has been offset.

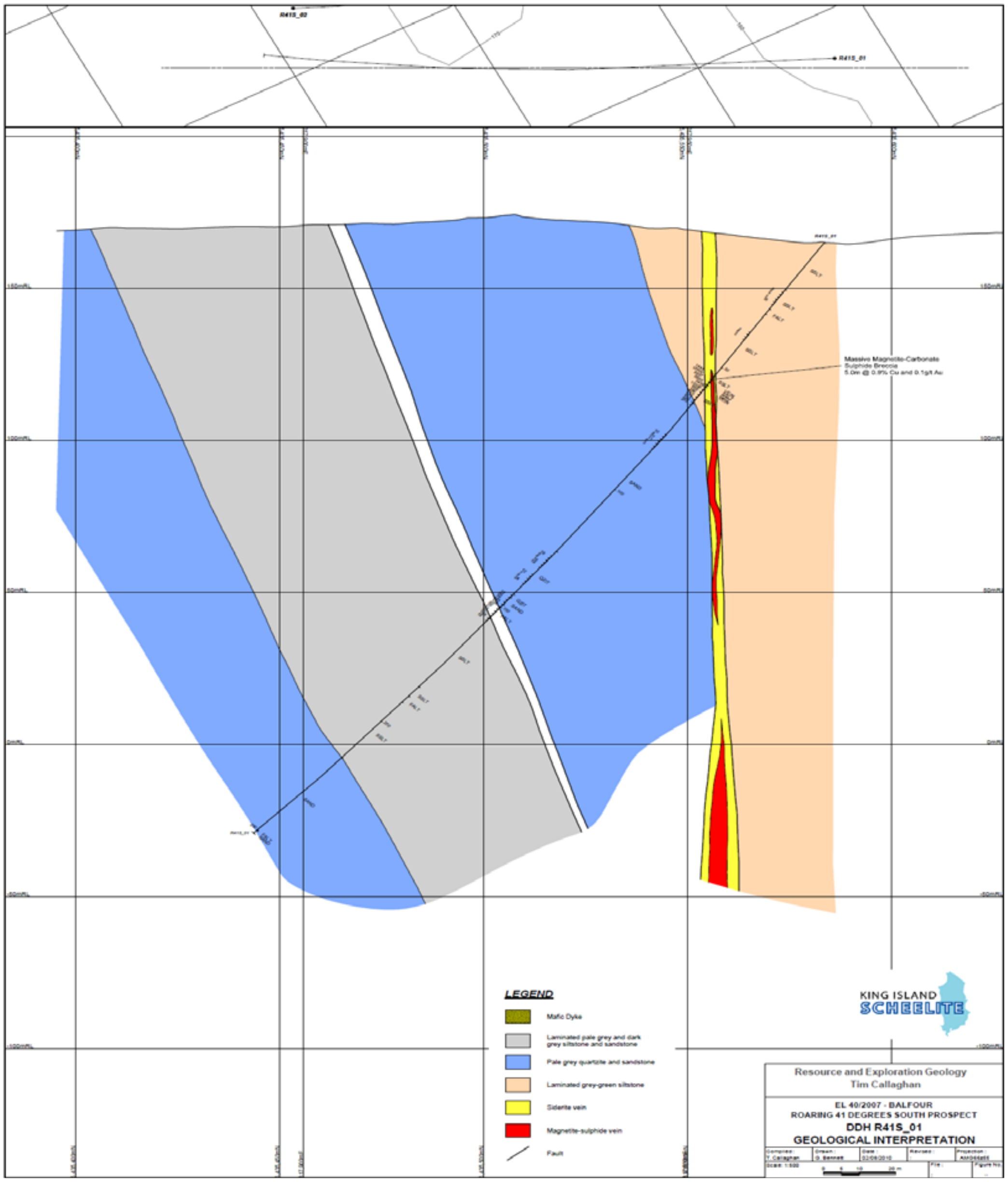


Figure 3.0: Drill hole R41S01 on interpreted geological profile. (Supplied by T. Callaghan)

A simple conductive plate forward model based on known intersects of and massive sulphides in hole R41S01 was used to generate the likely EM response returned from the DH EM surveys for varying body and transmitter loop configurations.

It was determined that the best coupling with the shallow known intersection of massive magnetite-sulphide on hole R41S01 as well as any possible deeper off hole sulphides will be achieved using a 300m by 300m loop centered on 317830E, 54355350N and oriented 30 degrees from north (Figure 4.0).

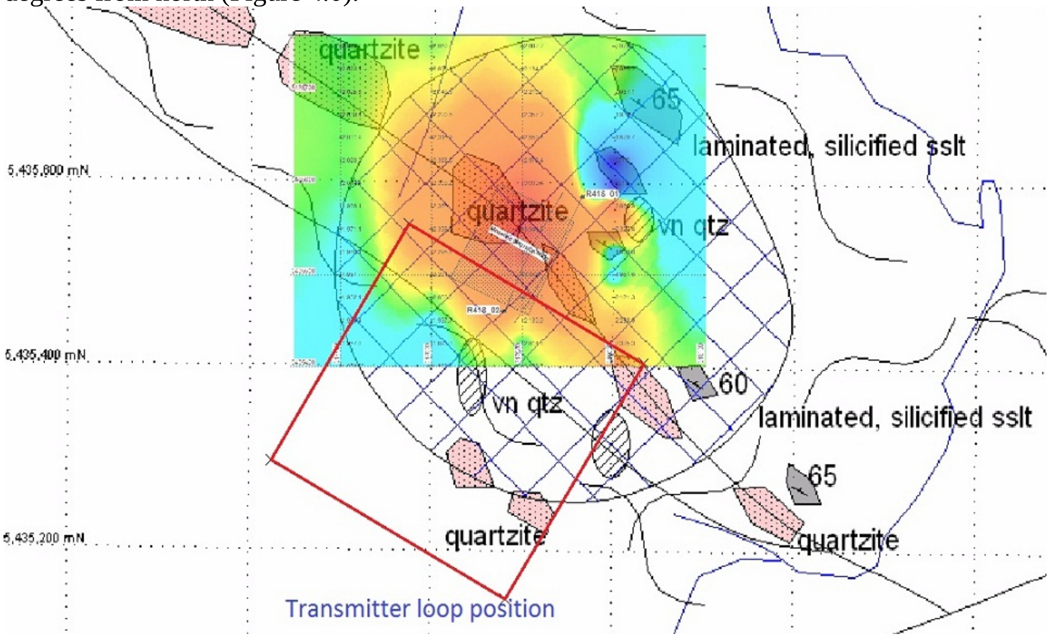


Figure 4.0: Planned EM transmitter loop superimposed on plan views of geology and ground magnetics TMI.

The forward modeling indicated this transmitter loop size and orientation would have good coupling characteristics and as such produce a significant EM response from a near vertical massive sulphide of reasonable extent striking approximately 210 degrees through the area (Figure 5.0).

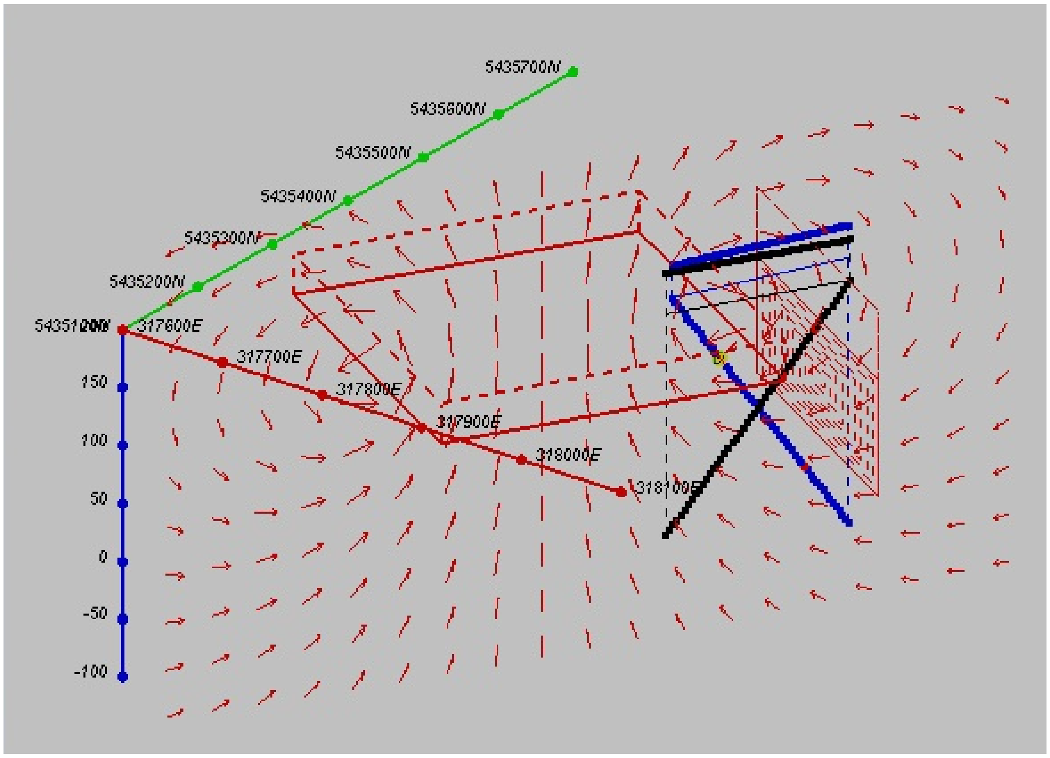


Figure 5.0: Transmitter loop orientation and primary field induced showing a strong coupling relationship with a vertical conductive plate.

Specifications Mag and EM Surveys:

The same magnetometer tool, Crones 3-Component B-field Tool or Rotation Angle Direction (RAD) Tool, is used to acquire the Downhole EM and magnetics. The Downhole EM was measured at intervals of 10m down the hole reduced to 2m over anomalous areas. The Downhole magnetics was measured using continuous profiling while the probe was brought back up the hole.

Summary of Specifications

Method: 3D Borehole PEM / Continuous Magnetic Profiling
Array: Downhole
Reading Spacing: 2m to 10 m

Receiver:

Components: A, U, V
Measurement Units: nano-Tesla per second (nT/s)
Receiver Areas: Axial = 7800m^2, Cross Components = 3090m^2
Base Frequency: 1.6667 Hz
Time Channels: 34

Transmitter:

Transmitter Loop: 300 x 300m Single turn
Transmitter Moment: 90000turn-m
Transmitter Current: 20 Amps
Transmitter Turn Off: 1.0 ms

Location information:

Coordinates: WGS84, Zone 55G Southern Hemisphere

Transmitter:

Loop Corners:	317625E, 5435295N
	317885E, 5435145N
	318035E, 5435405N
	317775E, 5435555N

Drillhole R41S01
Collar: 317965E, 5435585N, 165m
Depth: 240m

Drillhole R41S02
Collar: 317880E, 5435460N, 172m
Depth: 250m

Data Discussion and Forward Modelling Setup:

Downhole EM:

The observed EM data profiles are contained in the acquisition report Balfour JN 2438 produced by Outer-Rim Exploration Services and are not reproduced in this report. In all the EM data is of a good quality for both holes with a noise level less than 1.0 nT/s in all components for the majority of readings.

The EM response along drillhole R41S02 is lacking any real anomalous response; there is a mild overburden response near the top of the hole.

The EM response from drillhole R41S01 has a significant intersection response occurring in all components between the 40m and 55m depth mark. This response has an almost perfect conductor shape, with little noise at the very late times. The decay is also “delayed”. It is apparent that the earth induced magnetism associated with the magnetite is distorting the EM response producing a stronger than expected B-field EM response down to late times. As a result this will model as a much more intense conductor than the massive sulphide is in reality.

The model to be returned from DHEM surveys is generally a simple plate model of a given Conductivity-Thickness (CT). Conductivity-Thickness is the product of the conductivity and thickness given in Siemens. The very nature of EM response returned from conductive bodies makes it difficult to separate out the conductivity of a body from its thickness.

The determination of final thickness and shape of the conductive body has to be based on interpretation relating to known intercepts of Massive Sulphides and prior geological information.

Downhole Magnetics:

Observed magnetic data profiles for drillhole R41S01 (Figure 6.0) and R41S02 (Figure 7.0) indicate the data is of moderate to good quality for both holes.

The magnetic response from R41S01 has a complex intersection as well as off drillhole response occurring in all components between the 40m to 55m downhole depth mark.

The TMI response is extreme or very magnetic indicating the drillhole traverses through the centre of a highly magnetic body or series of bodies of limited off drillhole extent.

The total magnetic field response from a body of limited extent is distinctly different from that of an unlimited body. The depth limited body will exhibit a dipolar form with a local minima followed by local maxima associated with the boundaries of the source (Mueller et al, 1998). It is unlikely the magnetic body or bodies producing this complex response have a significant extent as the response would be expected to be broader with less defined edges.

The sharpness of the responses indicates near hole limited extent sources are dominating the response.

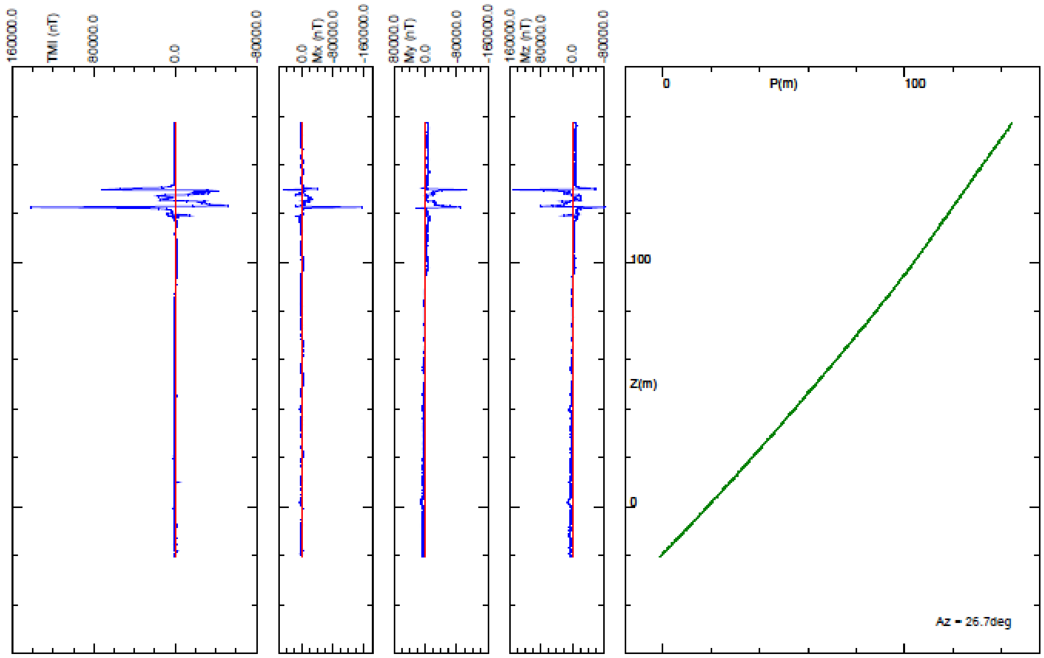


Figure 6.0: Downhole profiles of the TMI, X-component, Y-component and Z-component magnetic field strengths versus elevation as well as the drillhole trace for drillhole R41S01. An intense and complex magnetic response (160,000nT) is evident between elevation 120m and 135m (or downhole depths 40m to 55m)

The 3-component magnetic data profiles show evidence of passage through multiple magnetic sources as well as the possible presence of one or more off drillhole anomalies.

The direction of the magnetic vector changes by 180^0 at the boundary of magnetic bodies. The intense reversal in magnetic component data at elevations at around 135m and 122m is an indication that the drillhole passes through the magnetic source body's surface. There is also an underlying subtle dipole response between these indicating an off drillhole response from a source or sources of limited extent.

The magnetic response from R41S02 is lacking any real anomalous response; The TMI has a very subtle response near the top of the hole while the X and Y magnetic component data indicate an edge effect at an elevation of 150m.

There is a lack of any response at depth on drillhole R41S02 further indicating that the magnetic source or magnetite-sulphide body intersected in drillhole R41S01 is not extending to depth.

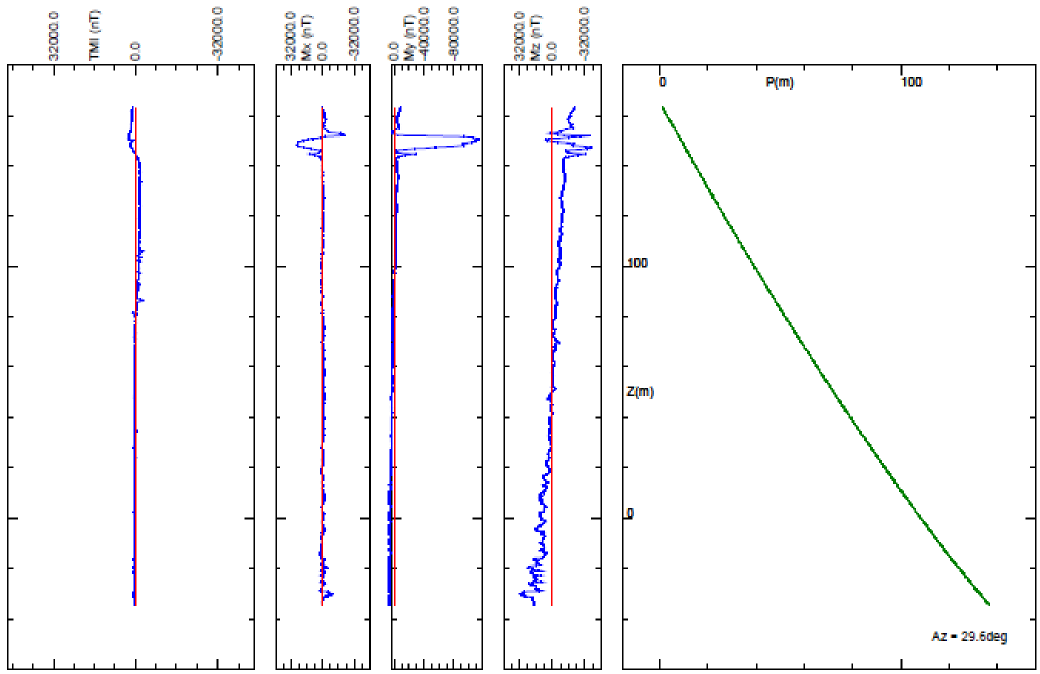


Figure 7.0: Downhole profiles of the TMI, X-component, Y-component and Z-component magnetic field strengths versus elevation as well as the drillhole trace for drillhole R41S02. The TMI has a very subtle response in the top 60m of the hole. The Mx and My component data indicate an edge effect occurring near the surface.

Magnetite Effects on Azimuth Calculation:

The azimuth calculation from the 3-Component B-filed probe or RAD tool is taken from the relationship of the B-field components with respect to the inducing magnetic field (or local earth magnetic field) and as such will be distorted by the magnetite-sulphide intersection, especially with concentrations of 10% magnetite or greater; as such the azimuth of the hole returned from gyro data is preferred.

The azimuth data used during the modeling of the EM and Magnetic data was that contained in the Downhole logs (R41S01_log.xls and R4101_log.xls) supplied by Tim Callaghan. Copies of these logs are contained in the digital data sent with this report. The inclination is obtained from the accelerometers in the RAD tool and as such is unaffected by the magnetite.

Modelling Results:

Downhole EM:

The modelling of the EM response is limited to drillhole R41S01 as drillhole R41S02 fails to return a significant EM response worthy of modelling.

Reasonable fit has been obtained for the mid to late time EM response (windows 15 to 25) using a model consisting of a single conductive body for drillhole R41S01 (Figure 8.0). The 'sharpness' of the Axial component was difficult to fit and is attributable to the magnetite distorting the EM response producing a stronger than expected response down to late times.

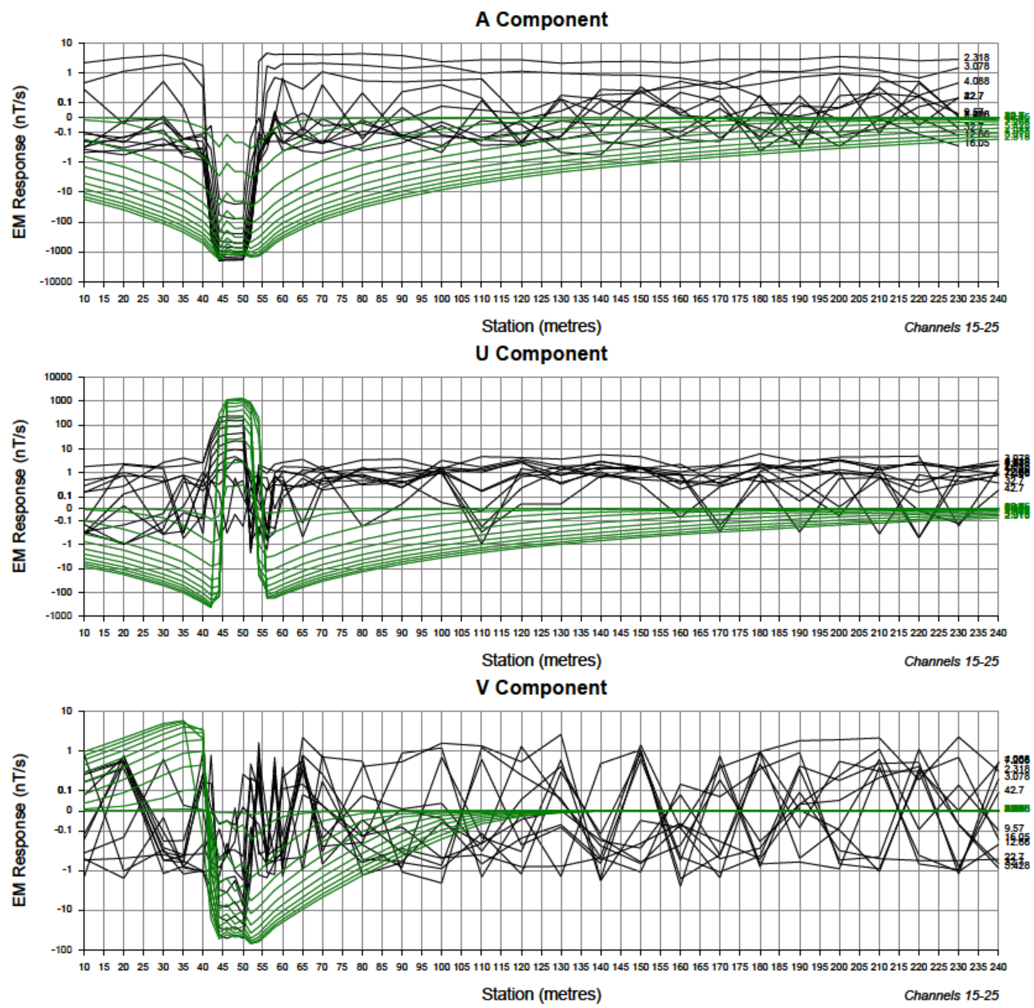


Figure 8.0: Observed EM response (black) and modelled EM response (green) for time windows 15 to 25 generated from a near vertical conductive slab of 4m thickness intersecting the hole at a depth between 44m to 52m.

While modeling the EM response for drillhole R41S01 the inversion has started with a body orientation which best fits the general trend of the known controlling structures in the Roaring 41 South prospect.

The final modeled body returned from the EM modeling is striking 296^0 (or -64^0), dipping approximately 87^0 towards 26.5^0 and had a plunge or rotation of 1.32^0. The conductivity-Thickness of the body is 3788.94 S/m which equates to a body of 947 Siemens and 4m thickness. The thickness of body is estimated based on the known intercept of magnetite-sulphide in drillhole R41S01.

Table 1.0a contains the model parameters of the EM model body returned from the modeling of the R41S01 EM data. Table 1.0b contains the location of the body centre in UTM WGS84 Zone 55G coordinate.

Name	*Length*	*Depth Extent*	*Dip*	*Dip Direction*	*Plunge*	*Conductivity*	*Thickness*
EM Model R41S01	36.2	13.7	86.78	26.53	1.32	947.235	4.0

Table 1.0a: Model parameters for the EM model body returned from anomalous late time EM responses in drillhole R41S01.

Name	*UTM East*	*UTM North*	*Elevation*
EM Model R41S01	317954.58	5435559.49	124.76

Table 1.0b: Body center in UTM WGS84 Zone 55G for the EM model returned from modeling anomalous late time EM responses in drillhole R41S01.

The parameters of the modeled body along with the body center and corner coordinates can be found in file *Model bodies data sheet.xls* of the accompanying digital data archive. The 3D model with drillhole traces and magnetite-sulphide intersection assays overlaid is contained in the 3D viewer file *Total Model Composite.bin* is also present in the accompanying digital data archive. Various views of the modeled bodies are also presented in Figure 9.0.

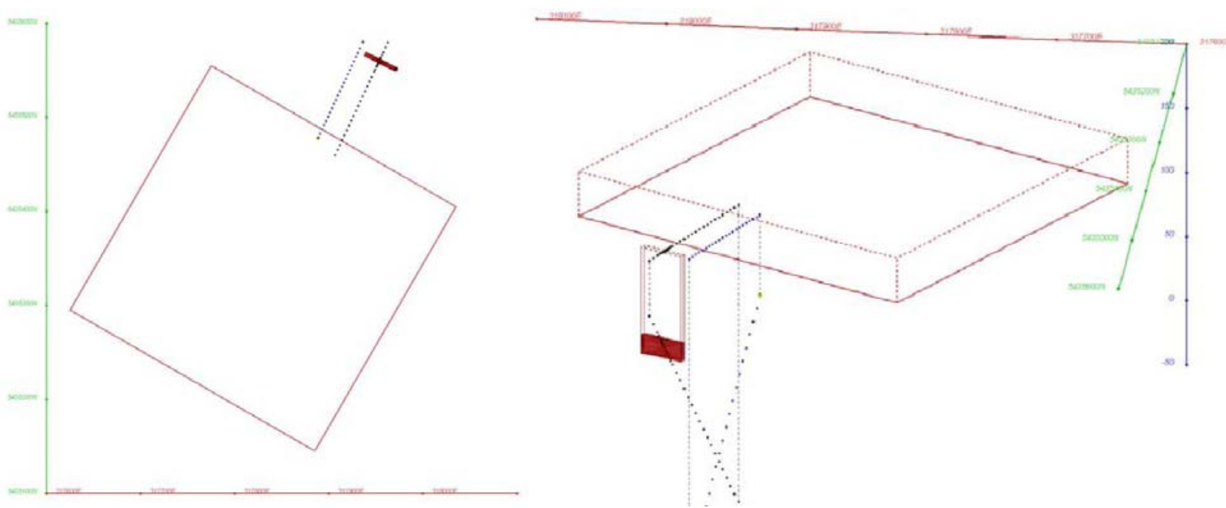


Figure 9.0: Top view and view from the North-northwest of the Conductivity-Thickness model returned from the anomalous EM responses generated in drillhole R41S01.

Downhole Magnetics:

The magnetics modelling carried out assumed the earth's local inducing magnetic field had an intensity of 61653nT, azimuth of 12.7^0 and inclination of -71.7^0.

To effectively fit the complex response seen at the top of drillhole R41S01 a series of four model lenses, intersected and off drillhole, were used in forward modelling to individually fit components of the response.

The initial susceptibility for each body used was set at 0.6 SI units based on the susceptibility measured at the magnetite-sulphide intersection and contained in the downhole susceptibility log R41S01_log.xls. A twostep inversion process was then employed to fit the combined TMI model response. First the susceptibility of the models was fixed and incremental adjustments to the position and orientation of the lenses was carried out through inversion to improve the fit. A second inversion run was then carried out fixing the position and orientation of the lenses and allowing the susceptibility and shape of the lenses to vary.

Using this twostep process a reasonable fit has been obtained for four individual lenses of magnetic material of varying shape and susceptibility (Figures 10.0 and 11.0).

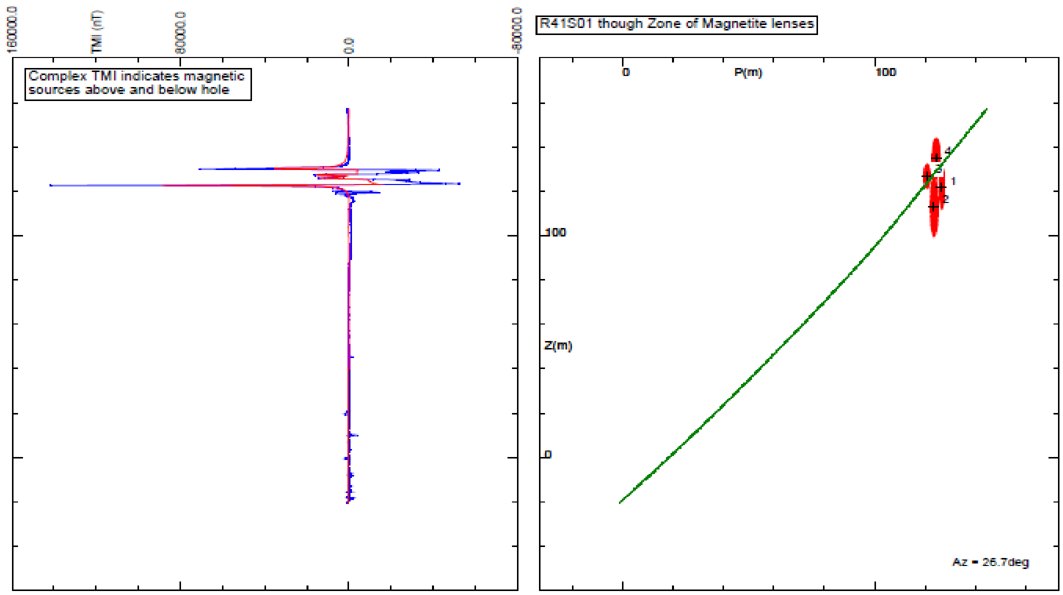


Figure 10.0: Downhole profiles of observed TMI (blue) and model TMI (red) highlighting the fit achieved using four individual magnetic lenses of varying shape and susceptibility.

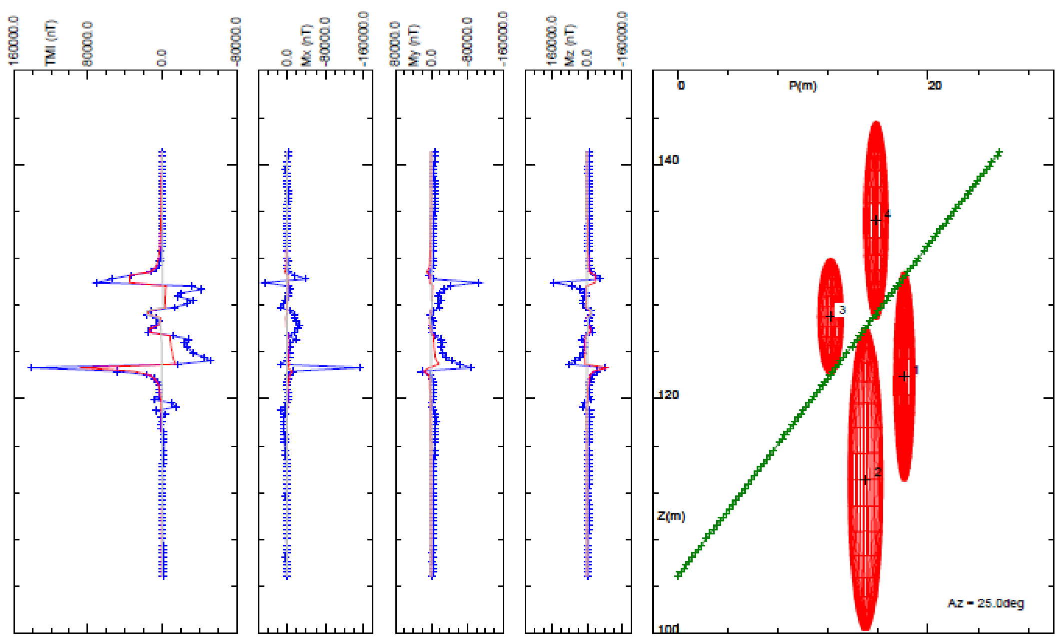


Figure 11.0: Downhole profiles of observed (blue) and model (red) TMI, X-component, Y-component and Z-Component magnetic response for drillhole R41S01. Four model lenses with the drillhole trace are displayed adjacent to the profiles.

These four lenses go a good way in fitting the main magnetic responses seen at the top of drillhole R41S01 between 45m and 53m downhole depth. These are related to the known sub-vertical massive magnetite-sulphide vein intersecting drillhole R41S01.

Comparison of the modeled susceptibility models and the known intersect of magnetite-sulphide in file *Total Model Composite.bin* reveal that the modeled intersects from the downhole magnetics and the susceptibility high in the log *R41S01_log.xls* is offset by up to 5 metres. It was noted that the final drillhole depth from the log *R41S01_log.xls* is 251m while that from the downhole magnetic and EM surveys is 240m. The offset could be an indication there was a problem with where the counter was started at the top of the hole.

There is also an inherent error in the accuracy of the downhole mag depth measurement as the depth is tagged or indexed at intervals while bringing the probe back up the hole. The operator key in depths as the probe passes certain depth intervals from which the depths between trigger points are estimated. This leaves a margin of error; firstly if the operator misses the trigger point and secondly if the probe is not brought up the hole smoothly which would generate offsets as the continuous profiling assumes constant ascent.

Drillhole R41S02 has a subtle off drillhole magnetic response evident near the top of the hole. The long 'tail' extending to depth indicates a greater depth extent to the source. This has been harder to model and is probably due to a dispersed magnetic zone or grouping of smaller bodies as improvement in the fit is not achievable using a single magnetic lens body (Figure 12.0).

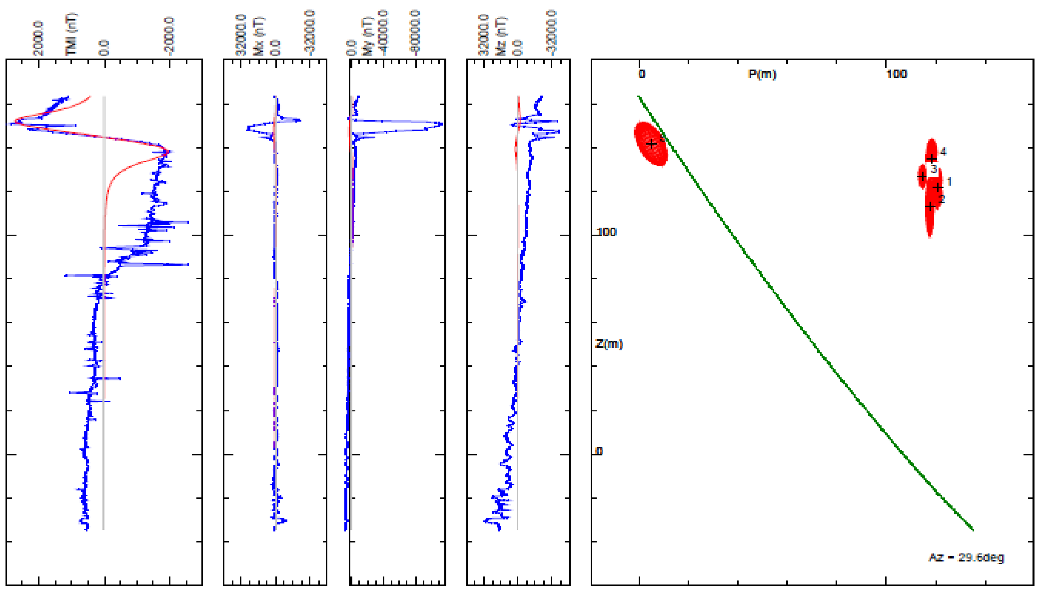


Figure 12.0: Downhole profiles of observed (blue) and model (red) TMI, X-component, Y-component and Z-Component magnetic response for drillhole R41S02. The long 'tail' extending to depth indicates a greater depth extent to the source. However, the modeling has failed to find an adequate model solution incorporating greater depth extent.

Table 2.0a contains the model parameters of the magnetic model lenses returned from the modeling of the R41S01 and RS4102 Magnetic data. Table 2.0b contains the location of the centre of the model lenses in UTM WGS84 Zone 55G coordinate.

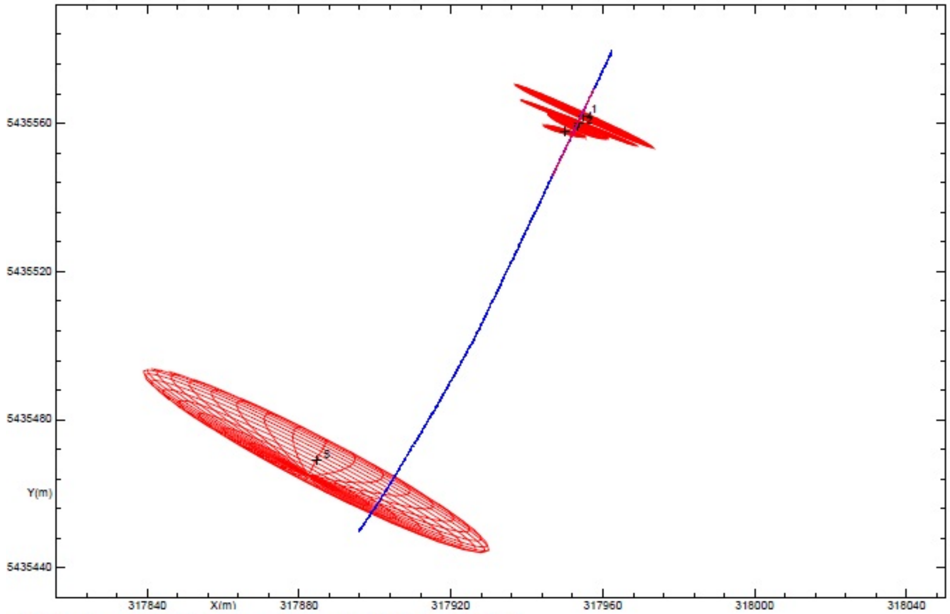
Name	*Length*	*Depth*	*Thickness*	*Dip*	*Strike*	*Plunge*	*Susceptibility*
Magnetic model_704e-3	40.00	18.00	1.70	90	-65.0	0.00	0.7040
Magnetic model_1699e-3	11.00	10.00	1.10	90.	-74.0	0.00	1.6990
Magnetic model_349e-3	17.00	26.00	2.70	88.5	-67.0	0.00	0.3490
Magnetic model_320e-3	33.00	17.00	0.95	89.0	-68.0	0.00	0.3200
Magnetic model_198e-3	103.0	21.00	10.00	25.0	-62.0	0.00	0.1980

Table 2.0a: Model parameters for the magnetic model Lenses.

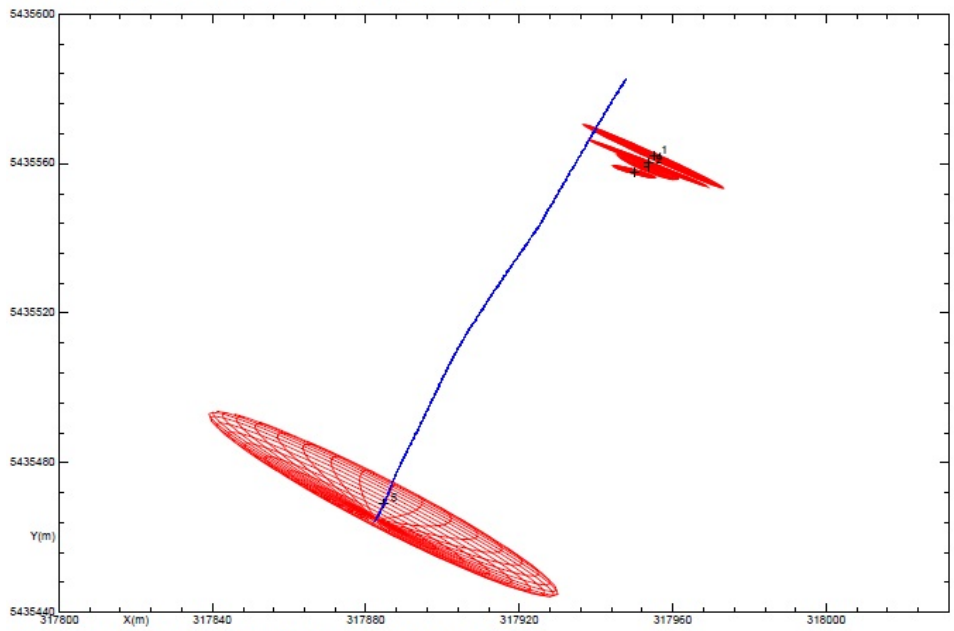
Name	*UTM East*	*UTM North*	*Elevation*
Magnetic model_704e-3	317955.00	5435562.00	121.90
Magnetic model_1699e-3	317949.95	5435557.86	127.00
Magnetic model_349e-3	317953.47	5435559.30	113.13
Magnetic model_320e-3	317953.60	5435560.16	135.20
Magnetic model_198e-3	317884.51	5435469.00	141.70

Table 2.0b: Body center in UTM WGS84 Zone 55G for the magnetic model Lenses.

Various views of the modeled lenses relative to the drillhole traces are presented in plan view (Figure 13.0).



a) Planview: Model bodies relative to drillhole R41S01



b) Planview: Model bodies relative to drillhole R41S02

Figure 13.0: Plan views of the modeled magnetic lenses relative to drillhole traces for holes R41S01 and R41S02.

The parameters of the modeled body along with the body center and corner coordinates can be found in file *Model bodies data sheet.xls* of the accompanying digital data archive. The 3D model with drillhole traces and magnetite-sulphide intersection assays overlaid is contained in the 3D viewer file *Total Model Composite.bin* is also present in the accompanying digital data archive.

3D inversion of Ground Magnetic Data

A 3D inversion of the ground magnetic TMI data was performed using the forward model bodies from the down drillhole survey as a starting model and produced a reasonable fit of the observed ground TMI data (Figure 14.0). Depth slices, in the form of PDF's, of the model susceptibility are included in the digital archive.

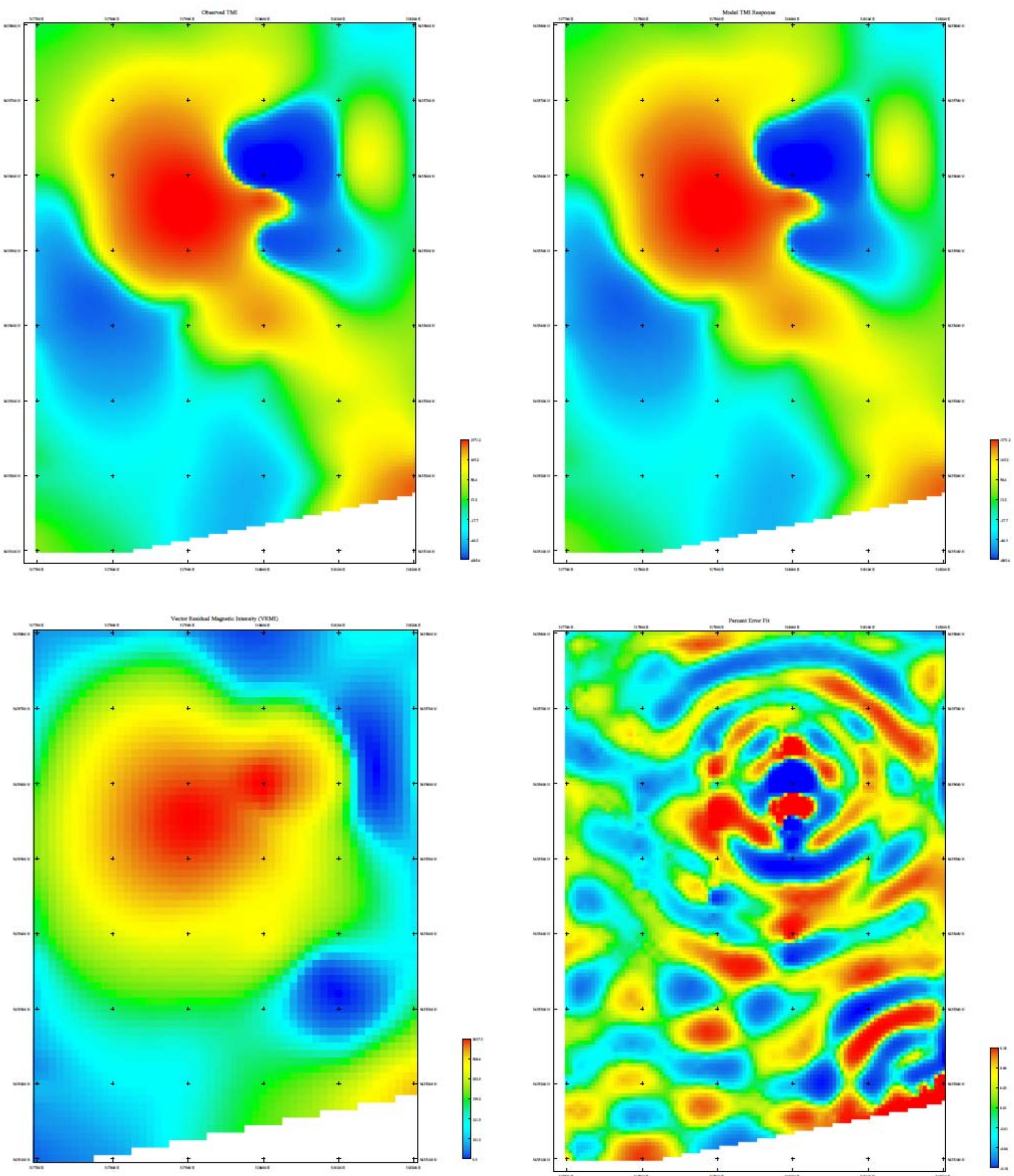


Figure 14.0: Observed TMI (top left), Model TMI (top right), Vector Residue Magnetic Intensity (bottom left) and the percent fitting error (range +/- 0.18) between the observed TMI and model TMI.

The inversion proved difficult to run to convergence because of the strong negative anomaly at the eastern side which adversely affects the inversion. Initially a simple inversion was run which returned a susceptibility model with a typical umbrella shape that indicates remnant magnetism is present in the underlying strata. The inversion was repeated using the Vector Residue Magnetic Intensity which removes the effects of remnant magnetism. This inversion was an improvement however the larger responses have dominated the model and the targets of interest were poorly resolved. Finally, the TMI data was inverted with no positivity and this was able to model both the large positive susceptibility body in the west and the large negative susceptibility body in the east and the smaller positive susceptibility body in the centre (Figure 15.0).

Using the forward model bodies to constrain the inversion is not easy in this context as the bodies are thin and of high susceptibility, so the smoothing component of the inversion tends to 'smear' the bodies out. While the cell size used for the 3D inversion is small the resolution of such thin high susceptibility bodies using surface data is not enough to prevent the smoothing component dominating the data fitting in the inversion.

The $15x10^{-3}$ SI iso-surface displayed in figure 15 has a pinched out section that is a close match with the high susceptibility forward models generated from drill hole R41S01, although the inversion has smoothed out the susceptibility to make the total iso-surface envelop a wider zone of raised, but consequently lowered susceptibility.

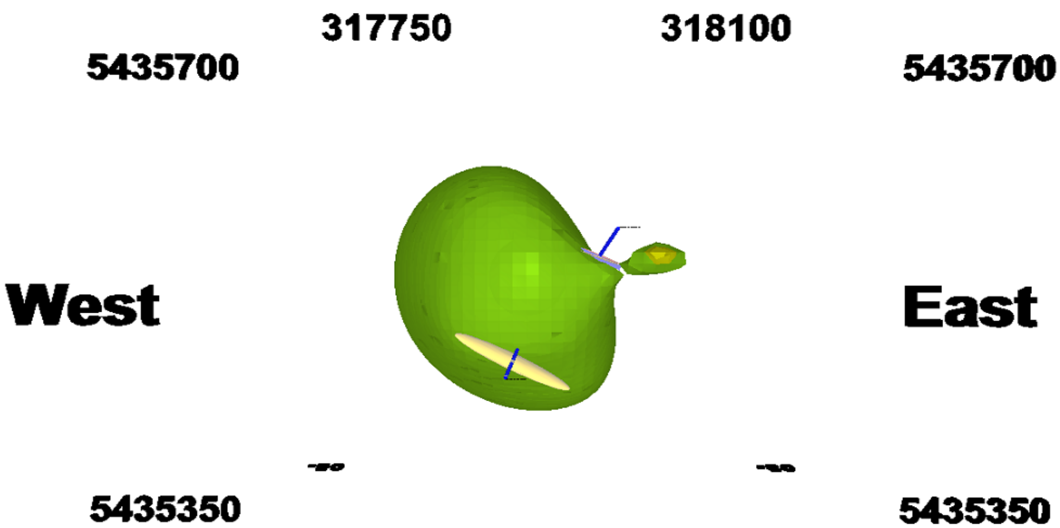


Figure 15.0: 3D inversion results from inverting the ground magnetic TMI with the DH magnetic forward model bodies as starting point. The $15x10^{-3}$ SI iso-surface encompassing the averaged and overall lowered susceptibility is shown in green with the forward model bodies shown as grey and yellow either side. The small body to the centre east is roughly along strike of the forward models.

What this 3D inversion of the ground magnetic TMI indicates is that the average susceptibility within the region between the drill holes is elevated compared to the surrounding areas. If the forward model bodies from the down drillhole magnetics were the only contributor to this zone of elevated susceptibility in the ground data then the inversion result would have returned a thinner and truncated zone of higher susceptibility.

The background susceptibilities returned from the logs of holes R41S01 and R41S02 are around $0.1x10^{-3}$ SI units. This indicates that further intersections of high susceptibility material are present within the larger zone defined by the$15x10^{-3}$ SI iso-surface. Also, of particular interest from the inversion of the ground Magnetic TMI is the eastern extension in the form of a smaller body which could indicate the extension of the high susceptibility zone to the east which is outcropping or close to the surface.

Summary and Recommendations:

The TMI response seen between downhole depths of 42m to 53m from drillhole R41S01 is extreme and very magnetic as the drillhole traverses through the centre of a highly magnetic series of bodies of limited off drillhole extent. The sharpness of the responses indicates near hole limited extent sources are dominating the response.

The 3-component magnetic data profiles show evidence of passage through multiple magnetic sources as well as the possible presence of one or more off drillhole anomalies. There is also an underlying subtle dipole response between these indicating an off drillhole response from a sources of limited extent.

The EM response from the same hole further indicates that the massive sulphide body has limited extent. This coupled with the lack of any EM or Magnetic response at depth near the known intersection of the siderite vein and Cu intersection on drillhole R41S02 indicates the magnetite-sulphide body is not extending to depth. If there was a significant source, similar to that intersected in drillhole R41S01, within 100m of drillhole R41S02 at depth then it would be apparent especially in the EM response at depth (less so in the magnetic response).

Comparison of the modeled susceptibility models and the EM conductivity model with the known intersect of magnetite-sulphide in file *Total Model Composite.bin* reveal that the models intersects from the downhole magnetics and EM are offset by up to 5 metres. Both the EM and magnetic models are offset from the known intersect indicating a possible error or offset between the measured log depths and the EM/Magnetic downhole depths recorded.

The intersection on R41S01 is relatively thin and intense relative to the broader anomaly modeled in the ground mag (Bisset 2010). The magnetic response seen in drillhole R41S01 would be more in line with the dipole response seen on line 318000E of the ground magnetic data.

The broad ground magnetic anomaly could indicate a separate deeper body of milder susceptibility or an extension of the thin body modeled in drillhole R41S01 into a broader zone of reduced susceptibility..

The 3D inversion of the ground magnetic TMI indicates that further intersections of high susceptibility material are present within the larger zone defined by the15x10^{-3} SI iso-surface. The eastern extension in the form of a smaller body could indicate the extension of the high susceptibility zone to the east and is of particular interest as it seems to be outcropping or close to surface.

Follow up drill holes targeting the same depth and along the general strike of the lenses modeled from the down drillhole magnetic survey is recommended.

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