Tri-Star Minerals Pty Ltd
EL 6757
Annual Technical Report

18 May 2022 to 17 May 2023

Year 1

Table 1. Titleholder contact summary

Titleholder	Tri-Star Minerals Pty Ltd ABN 55 631 733 161
Operator	Tri-Star Minerals Pty Ltd ABN 55 631 733 161
Titles / Tenements	EL 6757
Report Title	Annual Technical Report for Period Ending 17 May 2023
Date of Report	19 May 2023
Target Commodity	Uranium
Author	Katrina Macdonald, Tenures Advisor
Tenement Manager	Katherine Hobbins
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Contents

1. Summary

Tri-Star Minerals Pty Ltd (Tri-Star) Annual Technical Report for Exploration Licence (EL) 6757, provides a summary of the activities undertaken on the tenement for the reporting period ending 17 May 2023, including any results produced by these activities. Tri-Star is the sole titleholder and operator for EL 6757.

This report complies with the statutory reporting requirements prescribed in s 15AJ of the *Mining Act 1971* (SA) and s.78 of the Mining Regulation 2020 (SA).

EL 6757 was granted to Tri-Star Minerals Pty Ltd (Tri-Star) on 18 May 2022. A summary of the completed Program of Works for Year 1 is provided in Table 2 below.

During the Year 1 term, Tri-Star undertook a collation of geological and geophysical data which built on the initial assessment from public data. Tri-Star also undertook desktop studies and formed an exploration program for year two (2). Engagement with Native Title to progress Native Title Agreements and consultation with Landowners commenced around the exploration program planned for year 2.

Table 2. Completed vs. proposed activities for the Year 1 work program term

Tenure term	Proposed Program of Works	Completed Program of Works
Year 1	▪ Collation of geological and geophysical data (building on the initial assessment) ▪ Desktop mapping and development of an exploration program to test the exploration model and associated targets ▪ Field inspections (if suitable) and commence engagement of Native Title and Land Access Matters	▪ Reprocessing of open-file geophysics data. ▪ Completed desktop studies of existing information. ▪ Commenced Native Title engagement and negotiation of Native Title Agreements. ▪ Commenced Engagement with Land Owners. ▪ Completed data review based on geological and economic factors.

2. Tenure history

2.1 Term and area

EL 6757 was granted to Tri-Star Minerals Pty Ltd on 18 May 2022 and covers an area of approximately 925km^2. Tri-Star is currently in Year 1 of the tenure term for the tenement.

2.2 Location and general description

EL 6757 is located near the Quinyambie area, approximately 385km northeast of Port Augusta, as shown in Figure 1. This tenement is geologically located in the Lake Eyre Basin (Figure 2). EL 6757 is located on the Callabonna 1:250,000 map sheet.

2.3 Exploration rationale

Tri-Star's exploration rationale and objectives for EL 6757 is to explore for Uranium in the Lake Eyre Basin, and will focus on the following deposit models:

1. Paleochannel uranium e.g. Beverley, Honeymoon.
2. Roll-front uranium e.g.
3. Basal channel uranium e.g.

The Lake Eyre Basin, located in Australia, holds significant prospectivity for uranium mineralisation, particularly due to its paleochannel-hosted sedimentary uranium deposits. Some known uranium deposits in this basin include Beverley, Four Mile, and Honeymoon, which are all found in the Callabonna Sub-basin, a part of the larger Lake Eyre Basin system. These deposits are associated with paleochannels or stratigraphic units rich in carbonaceous material. It should be noted that the full prospectivity of the Lake Eyre Basin for uranium mineralisation may not be completely understood, as there may be other less known or unexplored uranium deposits in the region. Several uranium occurrences occur surrounding and within EL 6757 and Tri-Star's plan is to systematically review and explore the tenement area for paleochannel uranium mineralisation akin to the above-mentioned uranium deposits.

Exploration for uranium deposits in the Strzlecki Project began in 1972 when Union Corporation (Australia) Pty Ltd was granted two Exploration Licences (EL 5 and 6). In 1973, the company conducted a reconnaissance rotary mud drilling and wireline geophysical logging program, drilling a total of 95 holes using 6.4 km grid spacings and at depths ranging from 116-183 metres. Most of the drillholes intersected the Tertiary sequence (Callabonna Sub-basin) and ended in Bulldog Shale of the Marree Subgroup (Eromanga Basin). The drilling was too spaced out to delineate individual Tertiary palaeochannels, but some sands were identified in the Eyre Formation and the overlying strata. Only one hole, D10, reported anomalous radioactivity. Follow-up drilling in two areas (Hole d10 and F9) provided additional evidence of a palaeochannel, but Union Corp did not continue further exploration. Since 1973, the southern portion of the Strzlecki project has remained unexplored, and the northern part of the tenements has not been explored until now.

In 2007-2008, during the first year, Callabonna Uranium Limited conducted desktop reviews of historical drill holes from Union Corp (Australia) Pty Ltd. They also completed GIS studies of existing

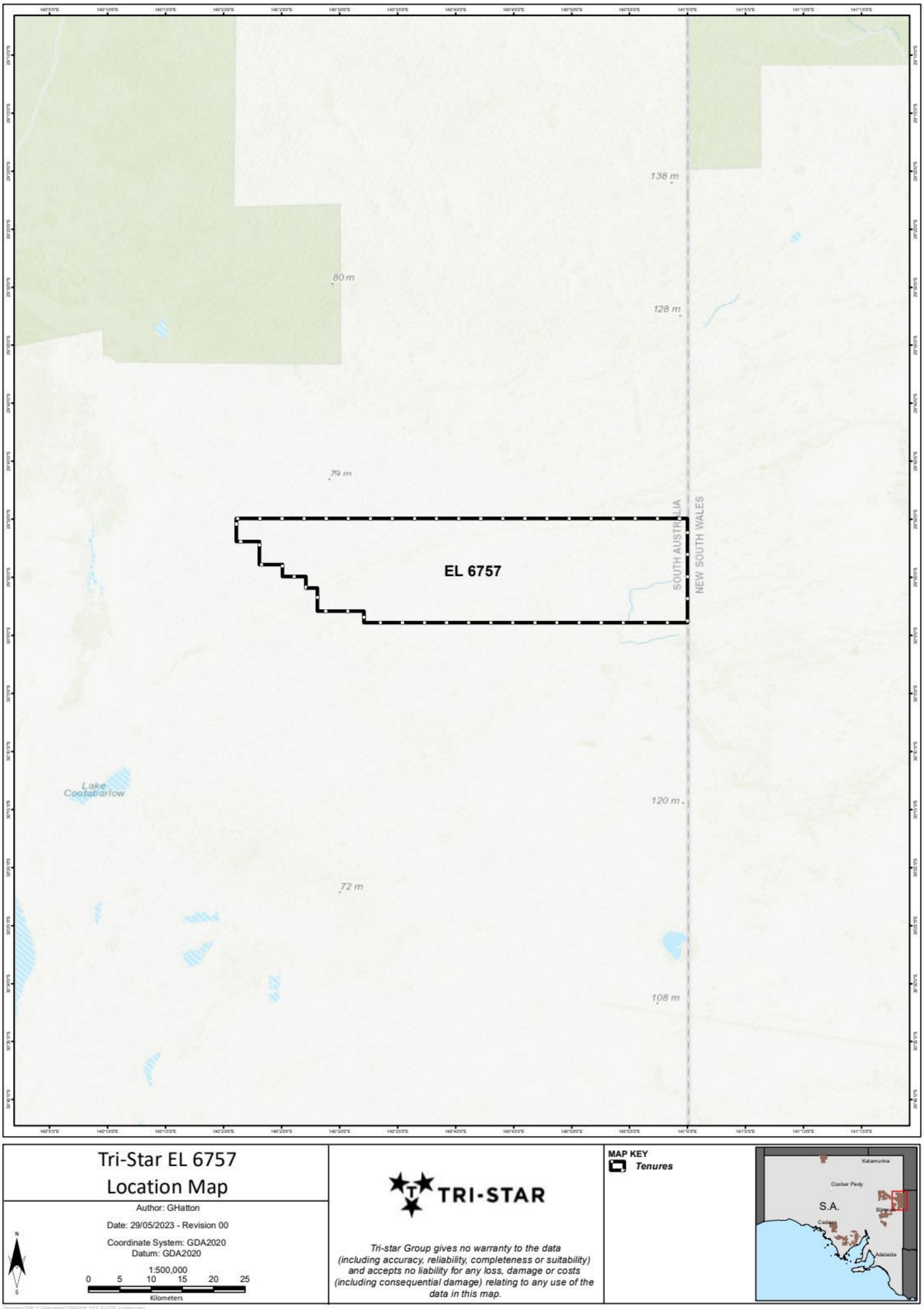

Figure 1. EL 6757 Location Map

geophysics and regional geology, and basement inversion studies of the Curnamona Basement using VPMG. Additionally, they completed a 3,684 line km airborne Electro-Magnetic (REPTEM) survey over the entire project area. Separate consulting groups performed a data quality analysis and converted the airborne TEM data to Conductivity Depth Image (CDI) format, using EMFlow. They continued with AEM data analysis into the second year. They used a quasi-layered model to derive conductivity distributions to aid with the geologic interpretation of palaeochannels within the surveyed area1.

In 2008-2009, Callabonna spent the second year preparing for the Phase 1 drilling program over palaeochannel targets defined from the April 2008 AEM Survey. This preparation involved initial site visits, discussions with contractors, and the preparation of an Exploration Work Approval (EWA). They also worked on gaining Native Title and Aboriginal Heritage Site Clearances.

In 2009-2010, a second AEM survey was completed over the Curnamona North Project as a part of Non Pace Grant Work. This AEM survey was sponsored by Geoscience Australia and funded by the Australian Government's Onshore Energy Security Program. The survey covered the entire Frome Embayment as part of the Airborne Electromagnetic Acquisition and Interpretation project designed to acquire AEM data at broad line spacing (5km) over relatively large areas considered to have potential for uranium and thorium mineralisation. The survey was conducted from May to November, and the final processed data was expected to be available in early 2011.

At the end of 2009, after the Exploration Work Approval (EWA) was approved on 22 September 2009, drilling commenced on 27 October 2009. A mud rotary rig completed 17 holes for 1,924 metres before hot summer weather led to the suspension of the drilling program.

3. Geology

The geology of the tenement area is dominated by the Lake Eyre Basin. The Lake Eyre Basin, located in the north-eastern part of South Australia, is one of the largest drainage systems in the world. The Lake Eyre Basin as we know it today began to form in the Cainozoic Era (66 Ma – present), particularly during the Tertiary period. This was a time of significant geological activity, including uplift and faulting, which led to the formation of the basin's current structure.

In the immediate tenement area are aeolian sand of inland dune fields, and includes associated alluvial and regolith materials (calcretes) in interdunal areas. Notable formations in the region are the Simpson Sand, Coonarbine, Wintrena and Woorinen Formations

The uranium source for Lake Eyre uranium deposits is thought to have been leached from silicic volcanic ashes and other uranium-rich rocks in the Mount Painter Province, which lies to the west of the Lake Eyre Basin. This uranium-bearing solutions then migrating east into the Lake Eyre Basin and deposited under reducing conditions in paleochannels of the Callabonna Sub-basin.

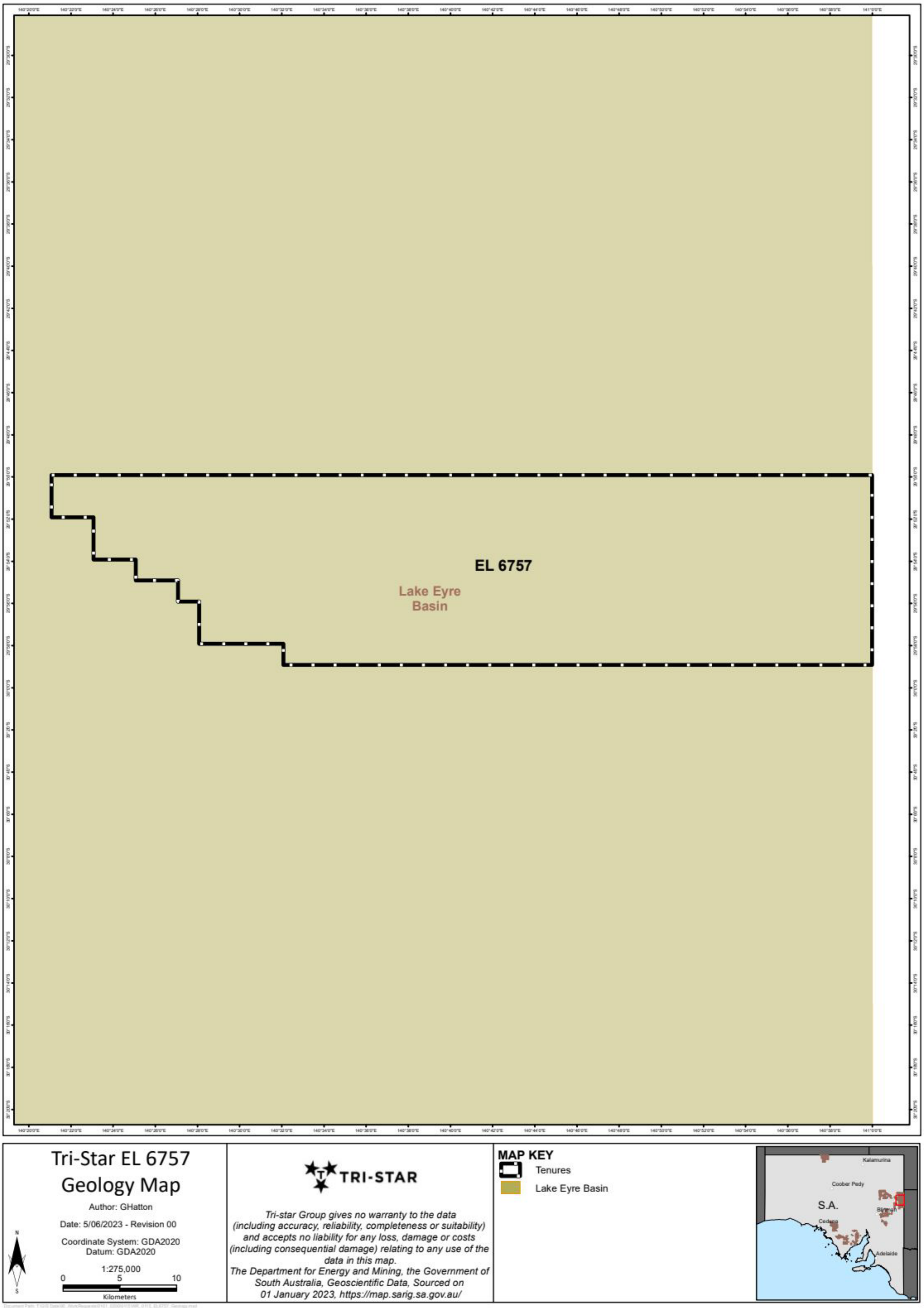

Figure 2. EL 6757 Geology Map

4. Geophysics

4.1 Airborne Surveys (excluding remote sensing)

No Airborne Surveys were undertaken during this reporting period.

4.2 Gravity Surveys

No Gravity Surveys were undertaken during this reporting period.

4.3 Airborne Surveys (excluding remote sensing)

No Airborne Surveys were undertaken during this reporting period.

4.4 Other Geophysical Surveys (including those conducted using a drone platform)

No Other Geophysical Surveys were undertaken during this reporting period.

5. Remote Sensing Data

No Remote Sensing Activities were conducted during the reporting period.

6. Surface Geochemistry

No Surface Geochemistry Activities were conducted during the reporting period.

7. Drilling

7.1 Drilling

No Drilling Activities were conducted during the reporting period.

7.2 Drilling Log Data

No Drilling Activities were conducted during the reporting period.

7.3 Analytical results

No Drilling Activities were conducted during the reporting period.

7.4 Downhole geophysical survey results

No Drilling Activities were conducted during the reporting period.

7.5 Core photographs/images

No Drilling Activities were conducted during the reporting period.

7.6 Other tests

No Drilling Activities were conducted during the reporting period.

7.7 Maps

No Drilling Activities were conducted during the reporting period.

8. Other Studies or work

Please refer to Appendix A for Geophysics reprocessing desktop study.

9. Environment

Tri-Star has not undertaken any ground disturbance activities during the reporting period and submits that it is in full compliance with Mining Regulation 77 (3) (b)). Tri-Star acknowledges that in accordance with Mining Regulation 77(8), a compliance report is not required if no on-ground exploration operations have been conducted or the operations are limited to those outlined in the generic PEPR.

10. Reporting on ore reserves and resources

EL 6757 is currently in the early exploration phase and activities undertaken to date and the associated results are not of a nature that would allow a resource to be estimated.

11. Conclusion

The magnetic data displays a generally quiet response in the AEM survey region indicative of non-magnetic rocks / sediments. The channel data displays a variably conductive response near surface over much of the survey with high conductivities recorded in the west. At early some resistive trends are mapped in the data. This may reflect more resistive lithology and / or non-saline ground water. Later time conductive responses are generally confined to the west.

The Conductivity Depth Imaging (CDI) and conductive volume generally depict a variably conductive response. The depth penetration of the survey is generally up to 125m, however, it is likely to be less than that in the west where more conductive lithology / thicker surficial cover is developed attenuating the signal.

In order to highlight regions of further interest, the positional details of the inferred palaeo-channels along with structural interpretations, high near surface uranium recorded in radiometric surveys, known mineral occurrences and basement conductors will be compiled in GIS environment. Where an area of further interest is defined, the 3D magnetic, density and conductivity models will be incorporated with geological models. 2D conductivity sections and line data will also be reviewed in more detail to identify potential target zones in cross-section and to determine if potential targets have been explained or provide scope for further assessment.

12. References

Bradshaw, J., Bradshaw, B. E., Murray, A. P., Needham, D. J. L., and Spencer, L. (n.d.). "Geology and Resource Potential of the Continental Margin of Western Australia."

Callabonna Uranium Limited. (2011). "Drilling Collaboration between PIRSA and Industry".

Dahlkamp, F.J. (2009). "Uranium Deposits of the World: Asia."

Drexel, J.F., Preiss, W.V., and Parker, A.J. (1993). "The Geology of South Australia: The Precambrian.", Geological Survey of South Australia.

Drexel, J.F., and Preiss, W.V. (1995). "Geology of South Australia.", Geological Survey of South Australia.

Appendix A: Geophysics Data Reprocessing Desktop Study

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Memo

To: Mick Tschaban

From: Kate Nelson

CC:

Date: 31 Jan 2023

Re: **Compilation, Enhancement Processing and modelling of open-file AEM and detailed magnetic data.**

INTRODUCTION

At the request of Tri-Star Group, the GeoDiscovery Group Pty Ltd (GD) has completed the processing, image enhancement and 3D conductivity modelling of eight open file Airborne Electromagnetic (AEM) surveys. One detailed open-file airborne magnetic survey flown over Els in the Lake Frome region of SA has also been image processed and modelled in 3D.

This memo documents the processing, image enhancement and modelling work undertaken and summarises the methods used. It is understood the output from this work will be used to determine potential Uranium and / or massive sulphide / gold exploration targets (intrusion related) targets.

The AEM data maps conductivity contrasts. Line spacing of the AEM surveys is generally regional (at 1000m plus), so whilst there is detailed conductivity information along line, the gridded scale of the survey is regional and best suited to mapping lithological changes. Figure 1 displays a map of the study region and Figure 2 displays the location of the available open file AEM surveys in the Frome Region.

The study area contains several working uranium mines including Beverley (a sandstone-hosted uranium deposit in the NW of the study region) and Honeymoon (a sandstone- hosted uranium in the south of Lake Frome). The Proterozoic and Paleozoic rocks forming the basement of the study area also host numerous metal deposits including White Dam (gold) and Kalkaroo (copper). Other mineral occurrences include copper-gold, lead-zinc-silver, iron, magnesium, manganese, nickel, cobalt and molybdenum. Mt Fitton (talc) and Leigh Creek (coal) are also located in the study region.

In general, magnetic, radiometric and electrical data provide useful information to assist with the identification of the different mineralisation styles which may be present in the study area.

These include:

- Uranium deposits (sediment or granite hosted) are often associated with an increased uranium radiometric response.

- Sandstone-hosted uranium deposits are generated by reduction-oxidation (redox) chemical reactions. Uranium is dissolved and transported in oxidised groundwaters and is reduced to form uranium oxides, generally formed in proximity to redox fronts within a sandstone aquifer. The AEM response generally maps the aquifer (resistive if fresh water and sand, and increased conductivity for more saline/ clay rich channels). Adjacent black shale / graphitic horizons, clays are mapped as conductive and lignite a resistive response. Structures that may be important in the development of mineralisation can also be inferred from the AEM, magnetic and gravity data.

- Bedrock gold mineralisation (intrusion related) can be associated with magnetic minerals such as magnetite and pyrrhotite (strong magnetic anomaly) and weakly magnetic minerals such as pyrite and hematite. Alteration may enhance or destroy the magnetic response.

- Magnetic data is useful in identifying major structural features in the form of faults, shear zones and folds which could host orogenic / hydrothermal gold mineralisation.

- Radiometric data, in particular the Potassium channel, can highlight regions of potassic alteration.

- Massive sulphides are likely to be conductive (discrete late time conductors), whereas more disseminated sulphides and gold mineralisation are generally resistive.

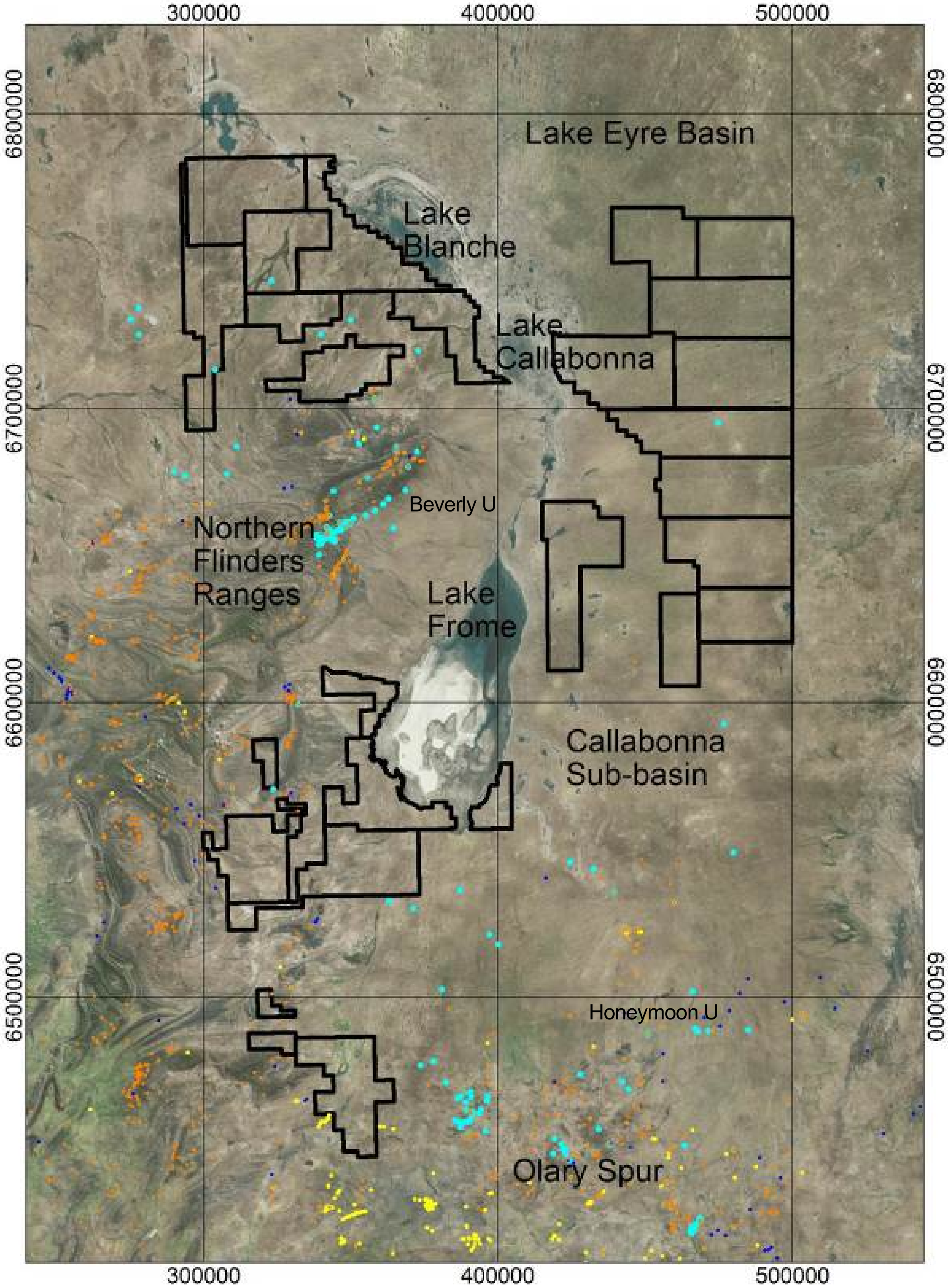


Figure 1: Tri-Star exploration leaves within the Frome Embayment Study Region. Aqua dots reflect known Uranium occurrences, yellow - gold, orange - copper and dark blue – zinc (from the SA Government online data portal).

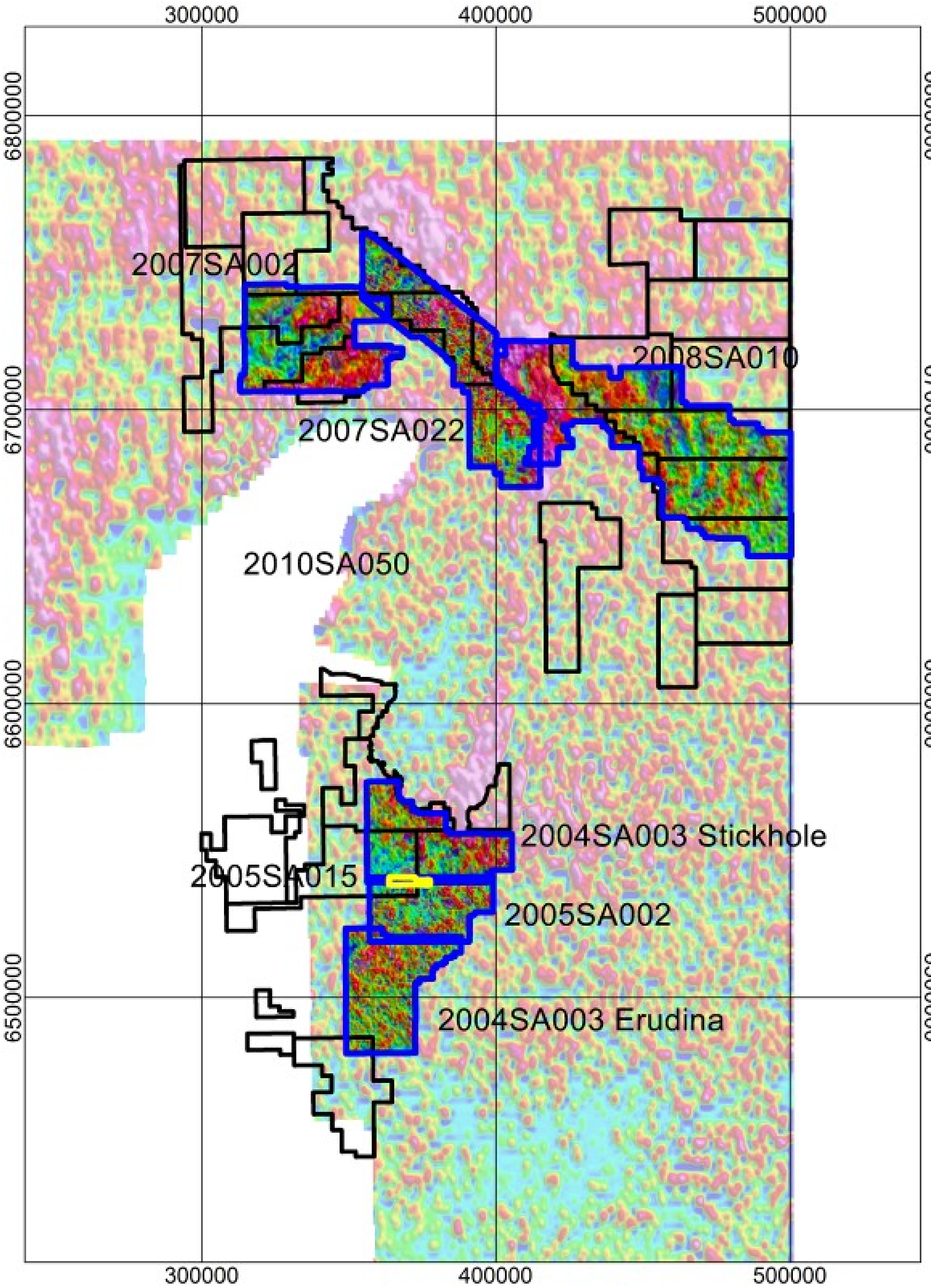


Figure 2: Location of Open file AEM surveys outlined in blue / yellow with the regional Geoscience Australia AEM survey as background. Tri-Star exploration licences outlined in black.

AIRBORNE ELECTROMAGNETIC DATA PROCESSING

For each of the eight AEM surveys, available line channel data has been gridded with a suitable cell size using a minimum curvature routine. Generally, the early time channel data display surficial trends and drainage and the later time channel data can be used to identify conductive sources at various depths.

The ratio of late-time conductivity to early-time conductivity preferentially enhances the responses of basement conductors lying below a resistive “cap”. This conductivity ratio approach can be useful highlighting zones (potentially mineralized) structures / trends in this regional survey. The survey is not of sufficient resolution to directly identify blind mineralisation. Some trends are noted in the ratio response may reflect structures and worthy of further investigations.

GD has found that the best way to identify discrete bedrock conductors is a methodical review of profile channel data, not gridded products. Grid products tend to smooth results and broaden anomalies so small discrete anomalies could be missed in a grid display – particularly with a survey with such broad line spacing.

EM responses interpreted to be generated by confined (discrete) bedrock conductors have been interpreted (where possible) exclusively using the off-time channel data for each of the surveys. It is recommended anomalies are ground truthed to check for a cultural source and then reviewed with respect to the local geology, structural mapping to prioritise.

AEM Conductivity Depth Imaging

Conductivity Depth Imaging (CDI) is a technique used to rapidly convert EM profile data into conductivity / resistivity - depth cross-sections. Their significant advantage over detailed 2D forward modeling is time. For most surveys, CDI profiles for each flight line have been produced using third party software such as EMFlow™ and EmaxAir™. The output CDI data was gridded to include topography and projected to real 3D space and supplied as an OMF. For the large regional Frome survey (2010SA050) inversions using GA-LEI have also been provided.

The conductivity section output has also been gridded in 3D to produce a 3D conductivity volume, displayed in real 3D space (applied topography). This volume is useful for mapping regional trends and mapping lithology.

A selection of depth slices through each 3D volume have been produced. This output will be useful broadly mapping different lithologies and identification of structures and faults (weakly conductive) and palaeochannels (fresh water / sandy resistive response or more saline / clays conductive response).

Strong conductive responses (warm colours) are likely to be associated with clays, shales or graphitic beds (especially when not displaying a magnetic response). Pyritic sandstones can display a weak magnetic response and may display a slight increase in conductivity. Weak to moderately conductive responses and/or responses with long strike length potentially reflects shears / faults / boundaries or palaeo-channels. Granites should give a resistive response and varying magnetic response. Broad conductive zones are interpreted to be lithological units and are not considered discrete targets.

Depth Slices in Geotif format have been provided. 3D voxel model and output files in OMF format are also supplied for all the models. It is recommended that the along line imaged depth section output is used when reviewing regions in detail as this output best preserves the along line resolution (rather than gridded 3D models / surfaces due to the increased line spacing).

INTEGRAGRATION OF DATA

It is suggested that the various AEM outputs produced be integrated with other available geophysical (magnetics, radiometrics and gravity) and geological data including drilling and structural interpretations to highlight regions of potential interest.

Regions of possible interest and their expected geophysical signatures are detailed below. These zones may occur in structurally favourable settings or areas of intrusion and alteration, and generally characterized by one or both of the following geophysical attributes:

- Uranium mineralisation:
    - Elevated U radiometric response reflecting alteration zones or direct U mineralization occurring near surface;
    - In some regions (not all) palaeo-channels may display a conductivity contrast with respect to surrounding basement. In these regions the palaeo-drainage pattern can be mapped. Uranium is dissolved and transported in oxidised groundwaters and is reduced to form uranium oxides, in proximity to reductants (including shales, graphitic horizons, lignite, charcoal and pyrite).
        - The AEM may be useful in mapping conductive shales and graphite and more resistive lignite where a conductivity contrast exists.
        - Magnetics, gravity and AEM may also assist in the mapping of structural controls.
- Massive sulphide mineralisation:
    - Discrete late – time basement conductive response:
        - with or without anomalous magnetic response (either strongly magnetic (positive or reverse), or with weak magnetic response as a result of alteration;

- Associated with faults / structures (magnetics, gravity and AEM can assist in the mapping of faults and structures).

Geoscience Australia discuss an example of the expected electrical response of a palaeo-channel in its report on the 2010SA050 regional Frome Survey *(The Frome airborne electromagnetic survey, South Australia: implications for energy, minerals and regional geology, Record 2012/40)* supplied in the data package and shown in Figure 3 below. In this case, the Eyre Formation palaeo-valley is incised into the more resistive Curnamona Province basement, displaying a mappable conductivity contrast.

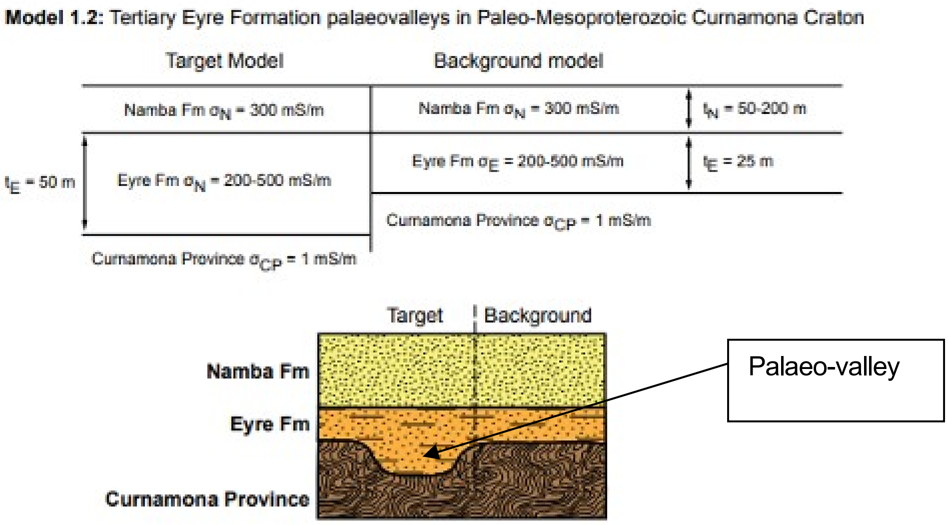


Figure 3: Expected electrical conductivities of palaeo-valley in Tertiary Eyre Formation (shown in cross section) – scenerio similar to that at Honeymoon Uranium Depositc, *taken from The Frome airborne electromagnetic survey, South Australia: implications for energy, minerals and regional geology, Record 2012/40.*

Figures 4 – 7 display some examples of available output in plan view in the NW Frome region, and detail how each may assist in defining target regions where further work may be warranted. Figure 4 displays a mid-time channel of the regional AEM survey high pass filter applied, with the aqua dots showing the locations of known uranium mineralisation. Noting the limited line spacing of 5000m in the north and 2500m in the south. Linear conductive responses may reflect palaeo-channel drainage incised into a more resistive basement response. It can be seen that a number of the known uranium responses (but not all) are associated with a mappable conductive linear response. These mappable linear responses associated with known uranium occurrences may be regions of interest particularly in structurally favourable regions. The three circled regions display a high near surface radiometric Uranium response (with respect to Thorium) which also are associated with linear conductive responses. These regions may also be of interest.

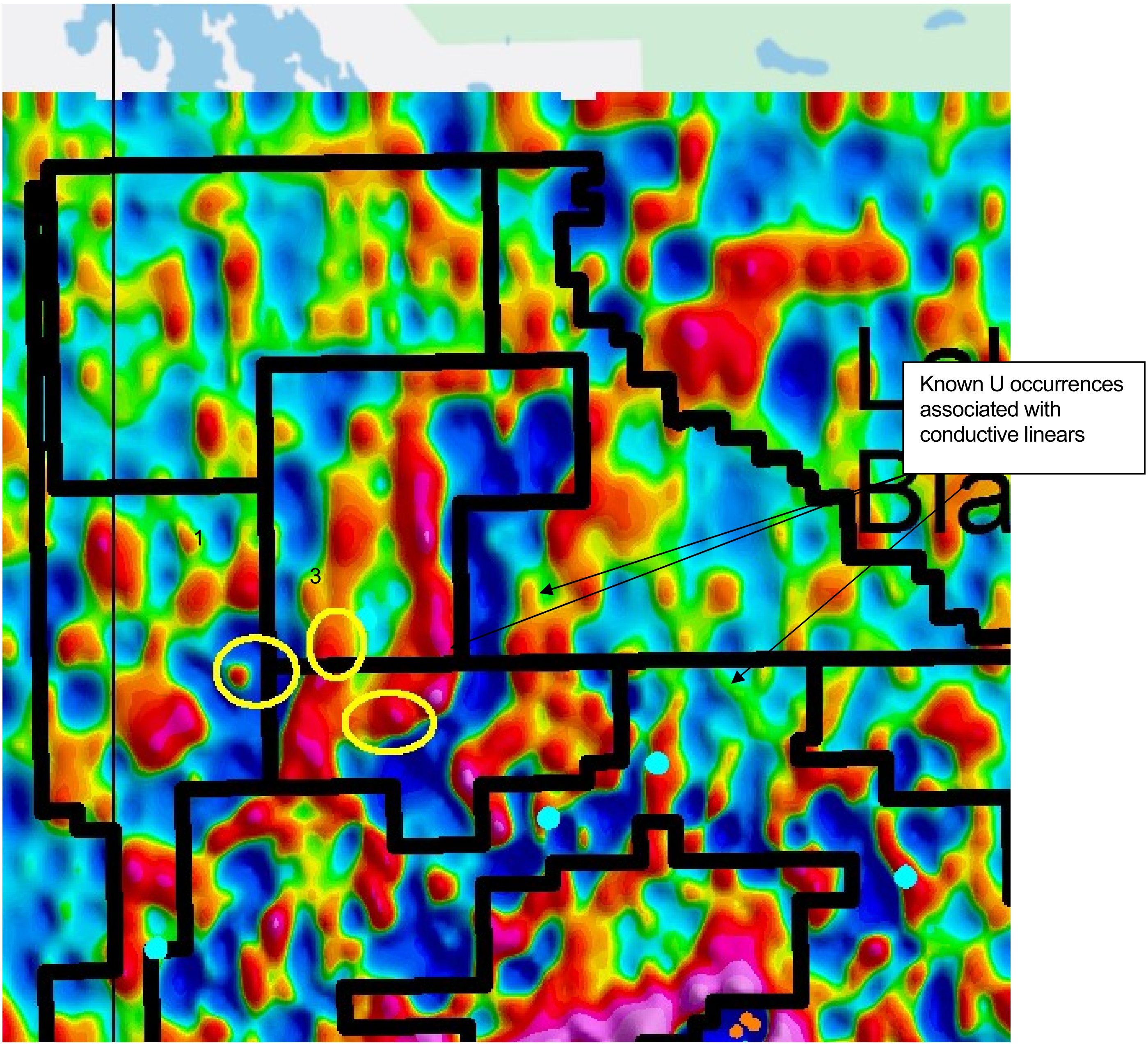


Figure 4: High Pass filter of mid-time channel enhancing possible linear palaeo-drainage signatures. Offsets of these linear trends may reflect faulting / structures. Blue dots show locations of known uranium occurrences. Yellow circles (labelled 1 – 3) are high radiometric Uranium responses (possible regions of interest).

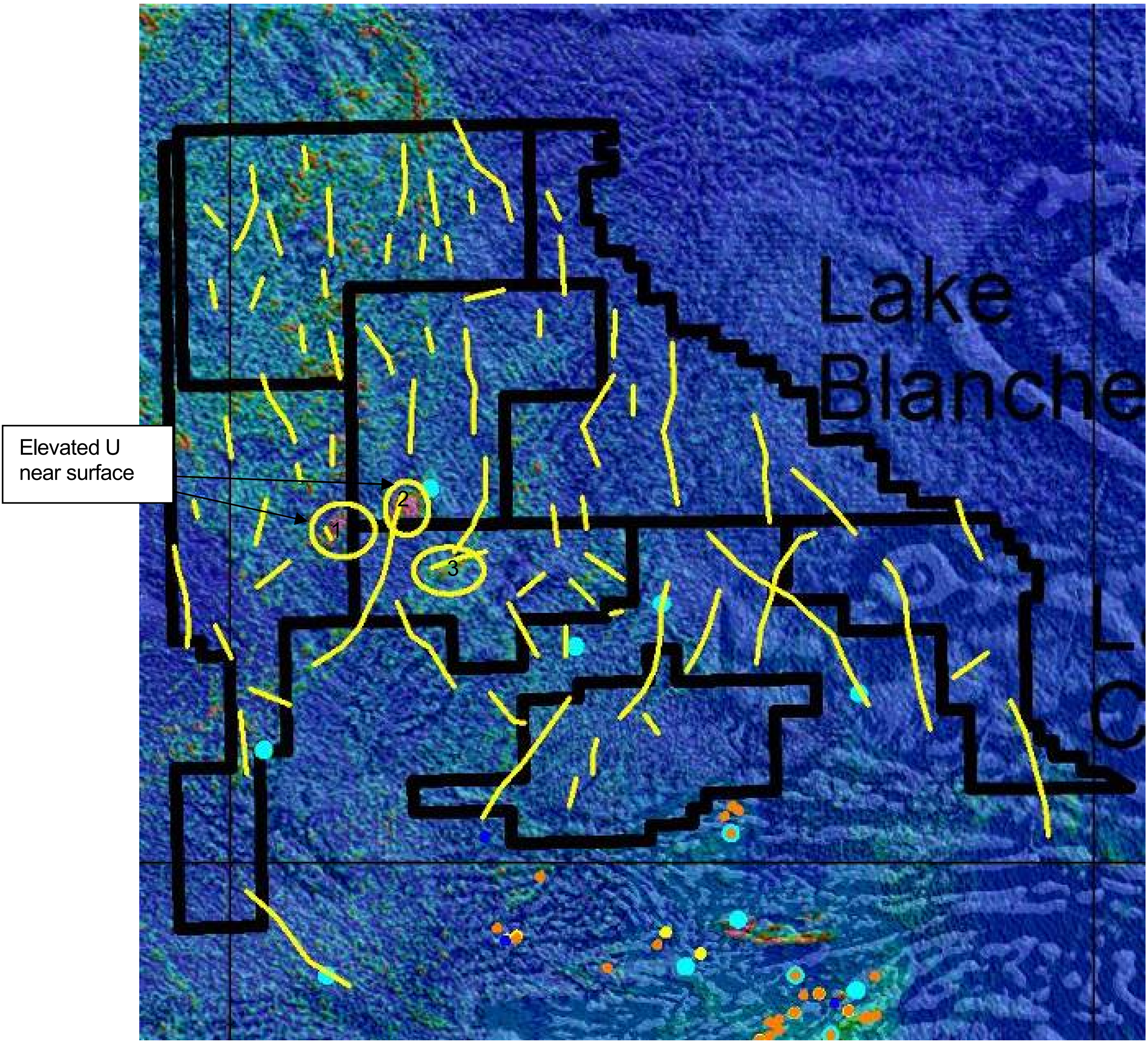


Figure 5: Radiometric ratio of U squared against Thorium, highlighting near surface regions of elevated Uranium. Yellow linears reflect linear conductive responses. Three regions of high response that are associated with linear conductive responses (potential palaeo-channels) are circled.

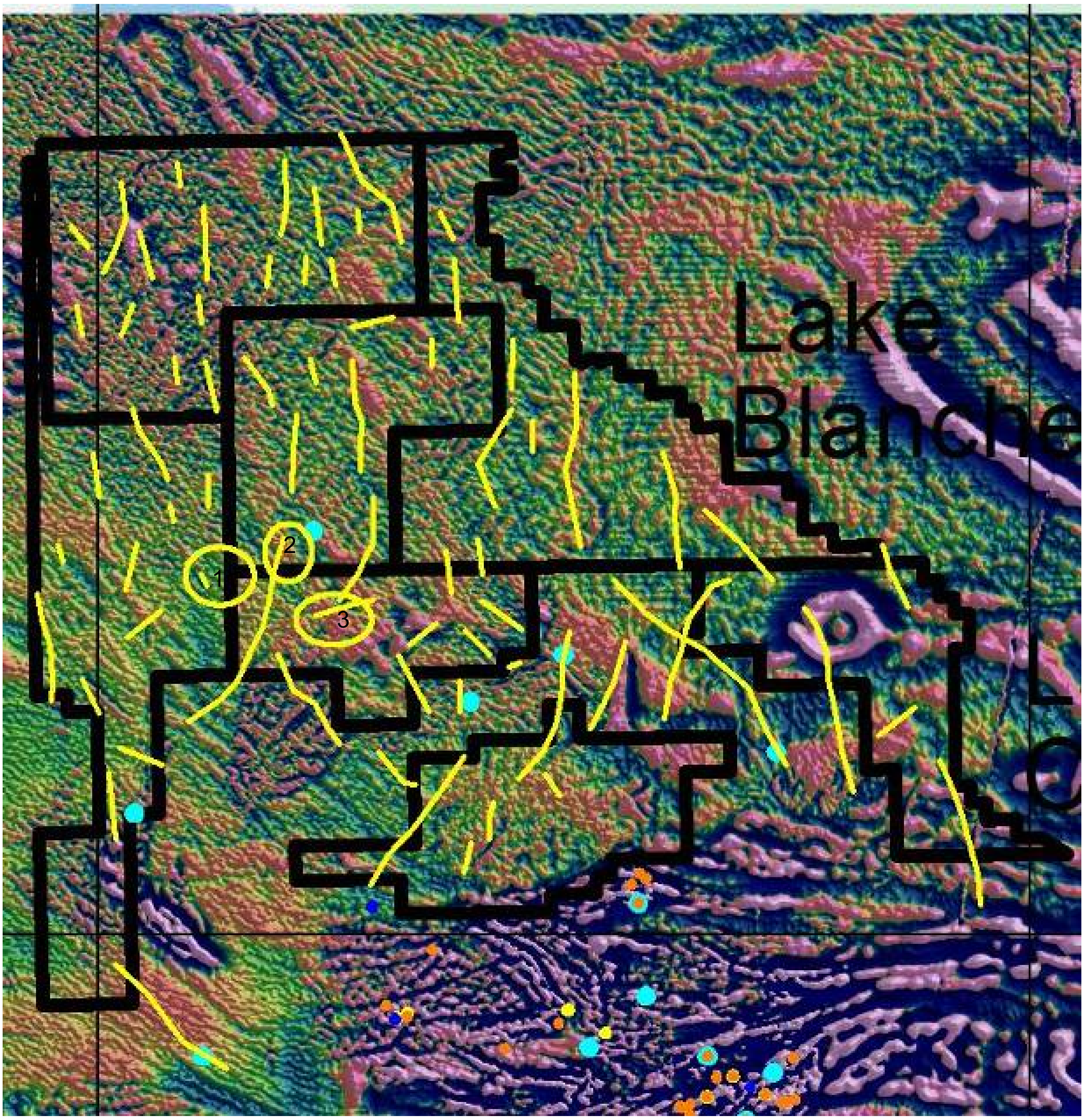


Figure 6: High Pass Magnetic Reduced to pole data which will be useful in the mapping of structures which may be important in determining structurally favourable regions along palaeo-channel responses. For example, high U region of interest 3 (circled) is associated NW and NE structures evident in the magnetic data. Yellow linears reflect linear conductive responses. Three regions of high response that are associated with linear conductive responses (potential palaeo-channels) are circled.

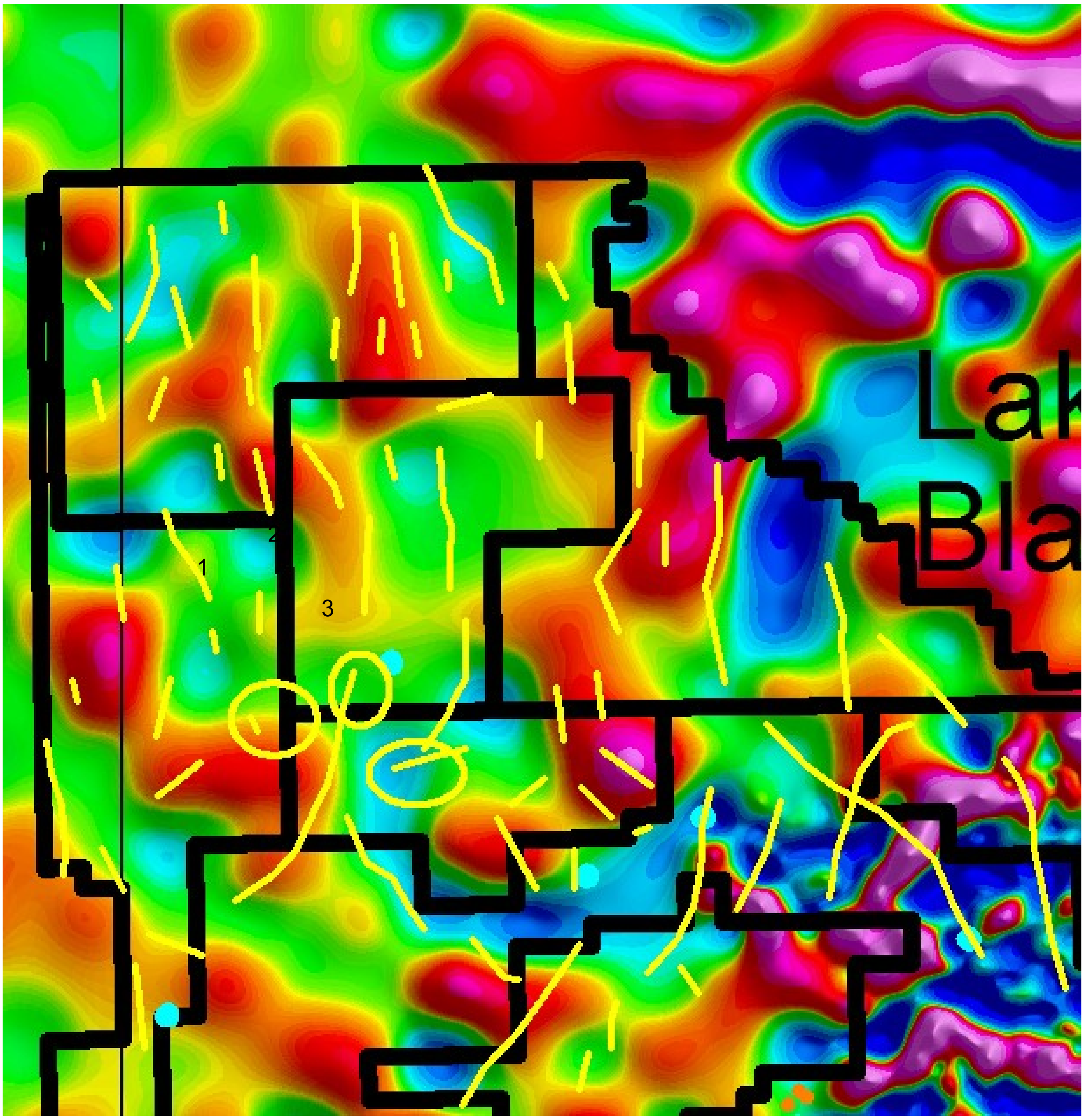


Figure 7: High Pass Bouguer Gravity data which will be useful in the broad mapping of structures which may be important in determining structural trends / blocks.

In order to highlight regions of further interest, it is recommended that the positional details of the inferred palaeo-channels along with structural interpretations, high near surface uranium recorded in radiometric surveys, known mineral occurrences and basement conductors be compiled in GIS environment. Where an area of further interest is defined, it is recommended that the 3D magnetic, density and conductivity models be incorporated with geological models. 2D conductivity sections and line data should also be reviewed in more detail to identify potential target zones in cross-section and to determine if potential targets have been explained or provide scope for further assessment.

AVAILABLE AEM SURVEY DATA OVERVIEW

The following section outlines the survey specifications, data quality and location of the each of the eight open-file AEM surveys located within the survey region including some representative figures outlining the processed output.

Regional 2010SA050

Tempest AEM Frome Embayment

- AEM and magnetic survey
- June 2005
- 25Hz TEMPEST
- Line Spacing: Regional 2500 - 5000m
- Line Direction: 90 degrees
- Flying Height: nominal 110m above ground level

This regional Airborne Electromagnetic (AEM) survey data were acquired by Geoscience Australia (GA) under the Australian Government's Onshore Energy Security Program (OESP) in areas considered to have potential for uranium mineralisation. The survey was designed to reveal new geological information at regional scale. The survey covers over 32 000 line km and an area of 95 450 km^2. More details on the survey and post-processing can be found in the *Frome Embayment TEMPEST AEM Survey: Inversion Report Geoscience Australia (GeoCat 72589) by D.K. Hutchinson, R.C. Brodie and M.T. Costelloe*, which has been included in the output package.

The Geoscience Australia report details the GA-LEI outputs and assesses the suitability for exploration with respect to:

- *Assist the mapping of basin architecture in the Lake Eyre Basin, Eromanga Basin and Murray-Darling Basin;*
- *Identification of Uranium-bearing palaeo-valley systems in the southern Lake Eyre Basin, northwestern Murray-Darling Basin and flanking the northern Flinders Ranges;*
- *Thickness of cover and depth to target information;*
- *Faults involved in the preservation of uranium deposits or faults associated with gold bearing fluids in the Nackara Arc; and*
- *Structures in the Neoproterozoic rocks associated with copper-gold and magnesite deposits in the Leigh Creek area.*

This regional survey provides almost complete coverage of the Frome Project region. GA indicates it allows explorers to put higher-resolution AEM surveys into a regional context. Although regional, it does provide a good base dataset mapping subsurface conductivity distribution to a depth of investigation of up to 150 – 200m (in conductive regions, the depth of investigation is likely to be less due to signal attenuation).

Data quality is reasonable, although in some conductive regions (including the lakes) the AEM depth penetration is likely to be limited. With lines 2500 - 5000m apart, the survey is of limited use at prospect scale exploration, but can be applied to broad regional-scale mapping and to assist in the mapping of palaeo-channels and depth to basement estimates. It is beyond the scope of this project to analyse every conductivity profile plot, but it is recommended that further analysis of the line data and conductivity profile plots be undertaken at a later stage of over key regions of particular interest.

The output created by Geo Discovery Group include channels grids, ratios and filtered products to enhance palaeo-channel mapping, 3D Conductivity models (over the same regions as the previous regional magnetic and gravity modelling) and depth slices as well as a location file mapping discrete, late time conductors.

The output may assist in the exploration of sandstone-hosted, breccia complex and vein-related uranium mineralisation. The output can be applied to the mapping of facies associated with uranium mineralisation, potential structures / faults that may be associated with uranium mineralisation as well as the identification of palaeo-channels (generally mappable weakly conductive drainage patterns incised into more resistive basement). Although not the aim of the survey, the line data can also be reviewed for late time discrete conductors (potential sulphide mineralisation) within the resistive basement response (where applicable due to survey depth penetration).

The channel data displays a variably conductive response at early to mid-times, generally trending to decreased conductivity at later times. The lake regions display a particularly strong and broad conductive response at later times (likely reflecting saline water and / or clays). The strong conductive response will attenuate the signal and limit depth penetration in these regions. Variably conductive drainage patterns are mapped in the channel data likely to reflect current drainage and palaeo-channels. Generally, the southern regions display a marked change in conductivity distribution, displaying a more resistive response likely to reflect a change in geology (decrease in cover over basement).

Figure 8 displays a late time channel (Ch14z) displaying the high conductive zones associated with the Lakes and the more resistive (bedrock?) response in the south (dark blue). Figure 9 displays an example of a mid-time channel with a high pass filter applied to enhance trends, discrete and linear responses. The high pass filter channel images may be useful for mapping of palaeo-valley architecture when there is a conductivity contrast (for example conductive drainage responses incised into more resistive basement).

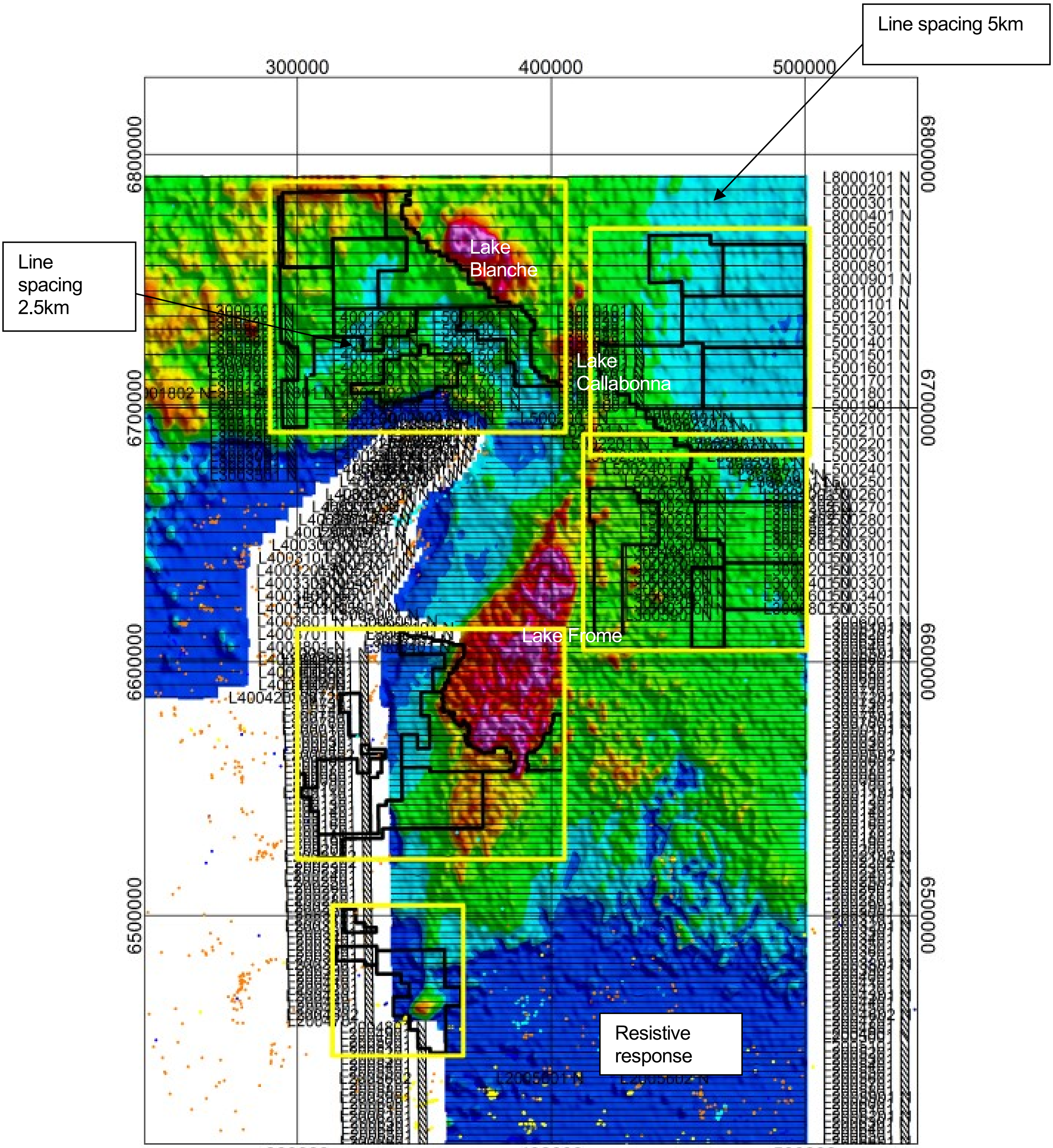


Figure 8: Gridded Late time response (200m cell size) displaying line locations with conductive responses shown in warm colours. The yellow polygons display the outlines used for 3D conductivity display (OMFs provided).

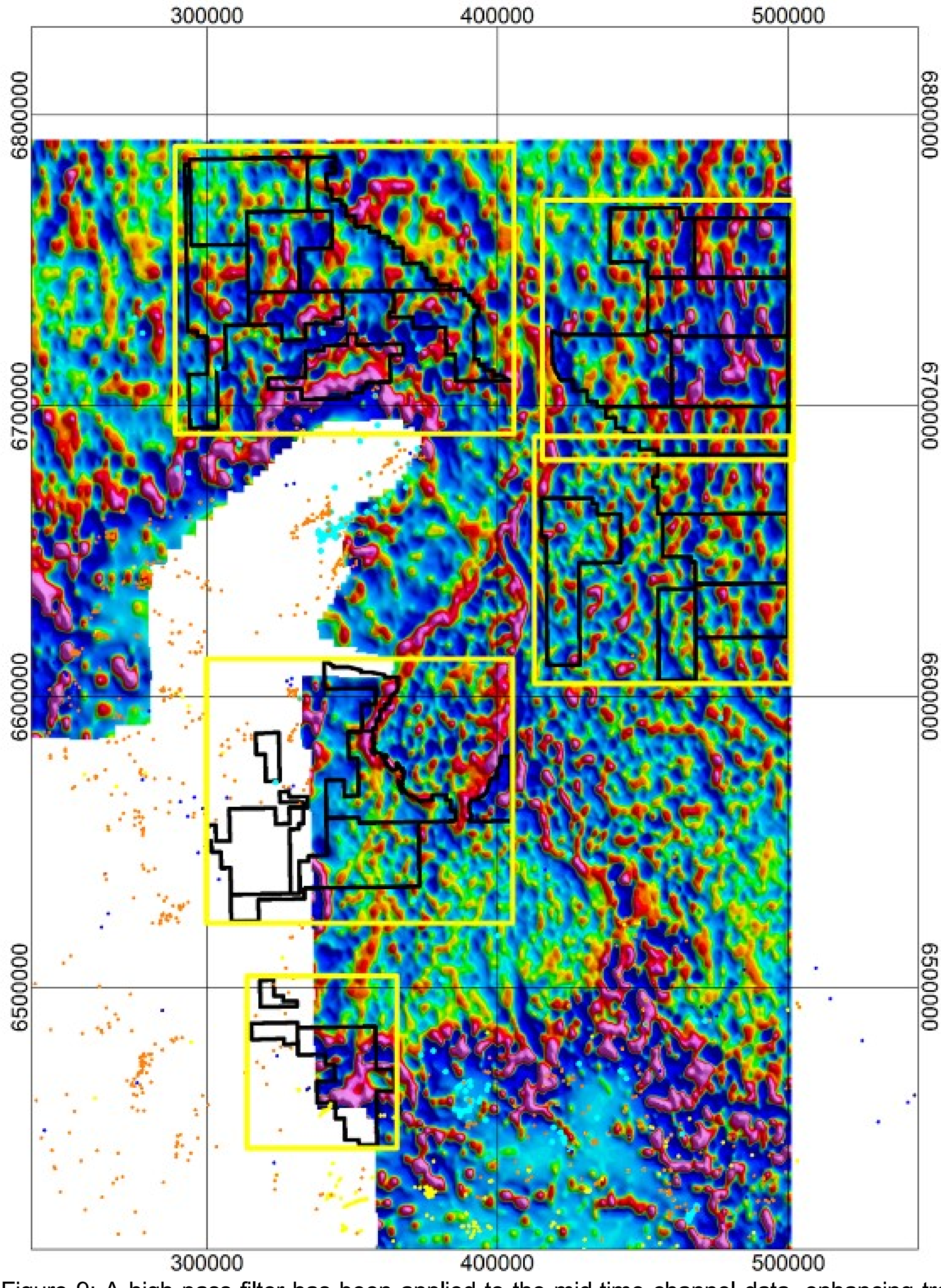


Figure 9: A high pass filter has been applied to the mid-time channel data, enhancing trends and linear responses which may reflect structures / geological boundaries and palaeo-channels.

The conductivity ratio shown in Figure 10 may be useful in mapping of geological units and define broad zones of similar conductivity response.

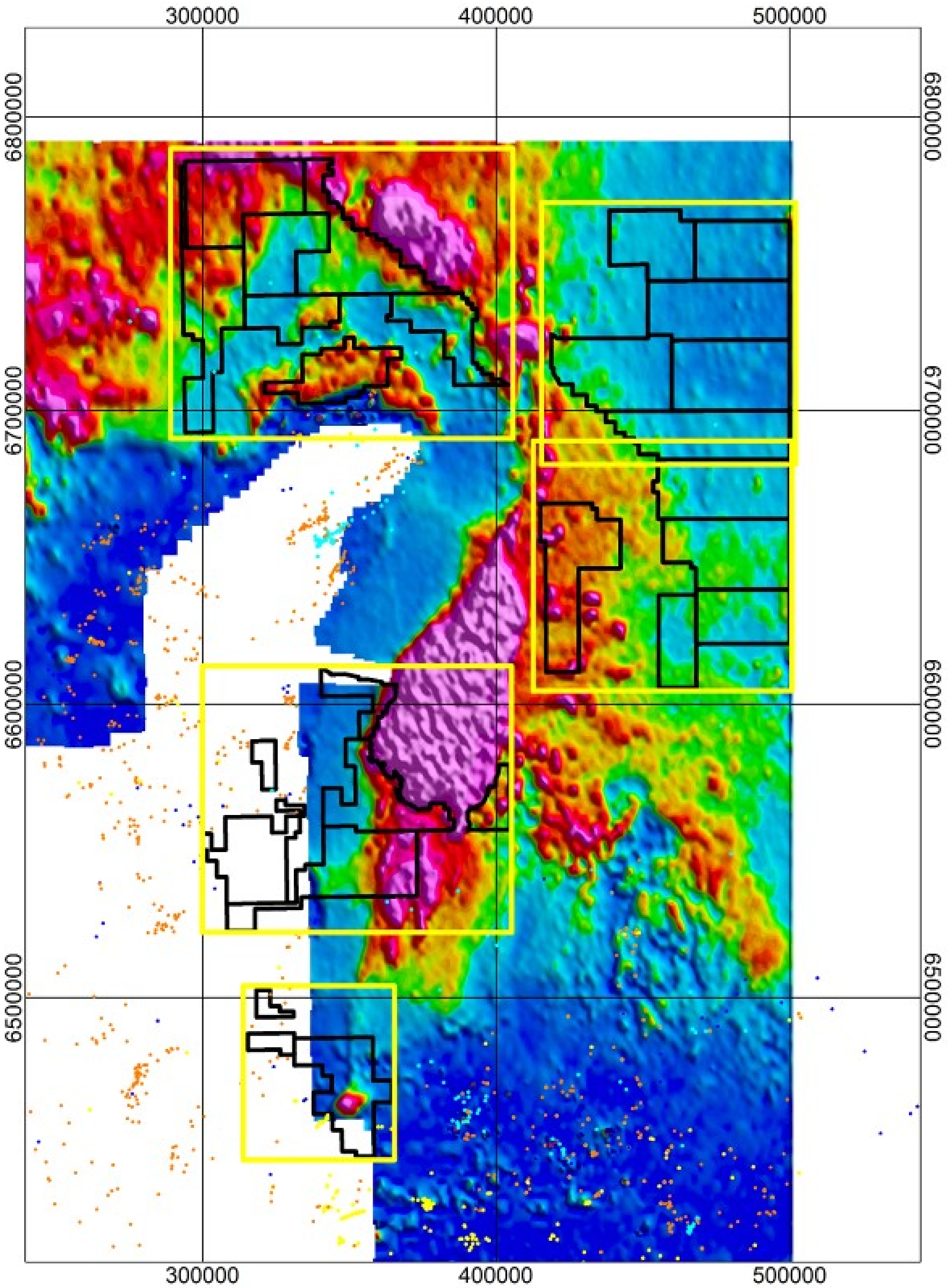


Figure 10: Ratio of early to late time channel responses which highlights areas of resistive early time response and conductive late time response. In some regions, this can assist in highlighting structures and in project scale detailed surveys may assist in mapping blind sulphide mineralisation.

Fugro supplied proprietary Conductivity Depth Imaging (CDI) profiles for each flight line using the industry standard algorithm EM Flow™. EMFlow rapidly transforms ground and airborne transient electromagnetic time decays into conductivity-depth pseudo-sections. CDI's rapidly generate reasonable conductivity-depth interpretations but they lack resolution and are principally used as a first pass tool for quickly identifying regions of interest and providing a broad quantitative view of the conductivity structure along line.

CDI outputs can be variable even on the same data due to the many input parameters that can be adjusted so it is instructive when interpreting the results to review all outputs. Certain outputs may resolve bedrock conductors, contacts or certain orientations (horizontal/steeply dipping) better than others and rarely one style of output suits all cases.

In addition, Geoscience Australia also undertook Layered-Earth Inversion using its inhouse developed software GA-LEI. In this technique, the total field (primary plus secondary) field data are inverted directly. The inversion solves not only for a layered earth conductivity model, but it also simultaneously solves for the horizontal and vertical separations between the TX and RX and the pitch of the receiver coils. By solving for the system geometry during the final inversion the method allows the information from both the X- and Z-components to be simultaneously fitted using a single common conductivity model.

GeoDiscovery has reviewed both conductivity section output (i.e. the EMFlow and GE-LEI). The regional gridded depth slice output from both is very similar. However, at prospect scale, the layered earth GA-LEI is the preferred layered earth output in sedimentary environments and can be used to determine depth of cover and map continuous layers and identify possible regions of interest for Uranium exploration (ie shale boundaries).

In areas of steeply dipping sources, it is recommended that the the site by site (SBS) version of GA-LEI is reviewed in conjunction with the EMFlow output. Detailed modeling of the multi-channel profile data using programs like Maxwell is the preferred method for interpreting depths, attitude and conductivity parameters of discrete (and steeply dipping) anomalous features identified in CDI / GA-LEI cross-sections and/or profile data.

Due to size restrictions, CDI and conductivity volumes were generated over five regions, each containing the Tri-Star exploration leases, rather than the entire survey. These are the same regions previously used for the 3D magnetic and gravity modelling to allow integration and assessment of each of the 3D volumes (conductivity, magnetic susceptibility and density) at a regional scale. The 3D conductivity volumes / CDIs generally depict a variably conductive layer (cover / sediments and / or oxidation layer), up to 200m thick, overlying a variably resistive basement (where depth penetration allows). The depth penetration of the survey is up to 150 - 200m, however, it is likely to be less than that in areas where more conductive lithology / thicker surficial cover is developed attenuating the signal. Figure 11 shows an example of some of the 3D conductivity output, with modelled high magnetic susceptibility shells.

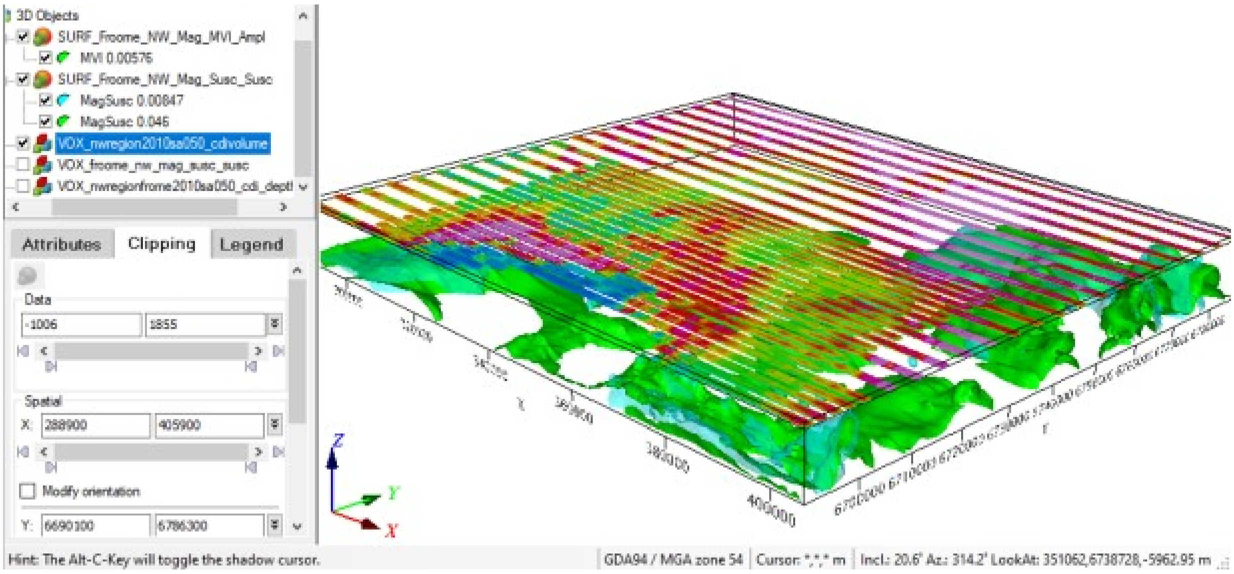


Figure 11: Example of one of the 3D views created, displaying conductivity depth imaging with other 3D data.

GD has found that the best way to identify discrete bedrock conductors is a methodical review of profile channel data, not gridded products. Grid products tend to smooth results and broaden anomalies so small discrete anomalies could be missed in a grid display – particularly with a survey with such broad line spacing.

In this case, EM responses interpreted to be generated by confined (discrete) bedrock conductors as well as possible linear responses when they occur on more than one line (palaeo-channels / structures) have been interpreted exclusively using the off-time channel data for each of the surveys. It is recommended anomalies of interest are ground truthed to check for a cultural source and then reviewed with respect to the local geology, structural mapping in order to prioritise. Figure 12 displays the location of discrete / linear conductors with respect to the magnetic data.

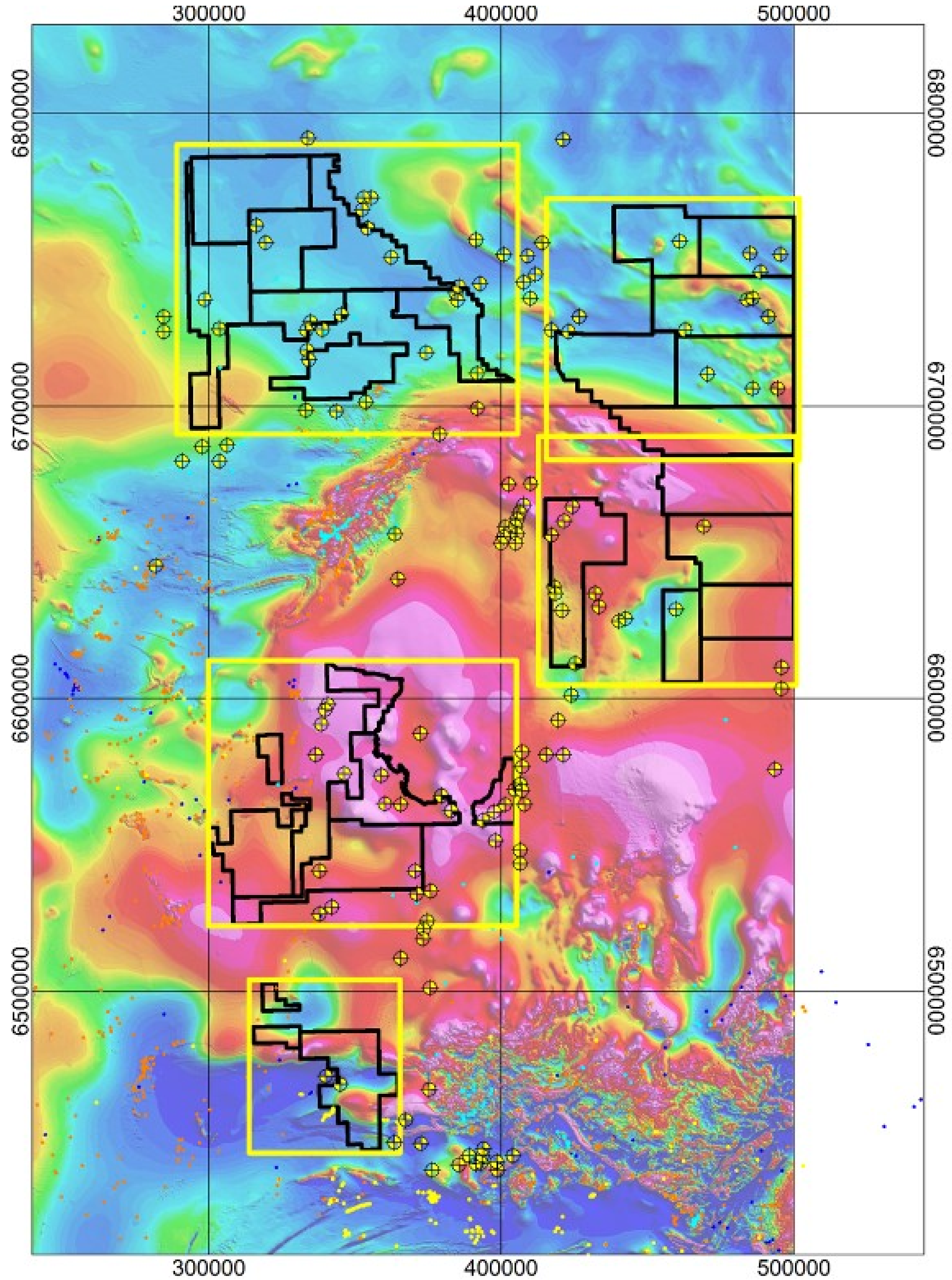


Figure 12: Discrete and linear conductors with respect to magnetic data.

Survey 2007SA002

RepTEM AEM Marree

- AEM and magnetic survey
- June 2007
- Transmitter : Geosolutions proprietary REPTEM transmitter.
- Receiver: Geosolutions proprietary REPTEM receiver, 24 bit A-D sampling at 1.25 microseconds
- Line Spacing: 1000m
- Line Direction: 90 degrees
- Flying Height: nominal 30m above ground level
- Speed 55 knots

Data quality is reasonable, although in some conductive regions the AEM depth penetration is likely to be limited. With lines 1000m apart, the survey is not suitable for prospect scale exploration, but can be useful for a broad regional-scale identification of areas of further interest.

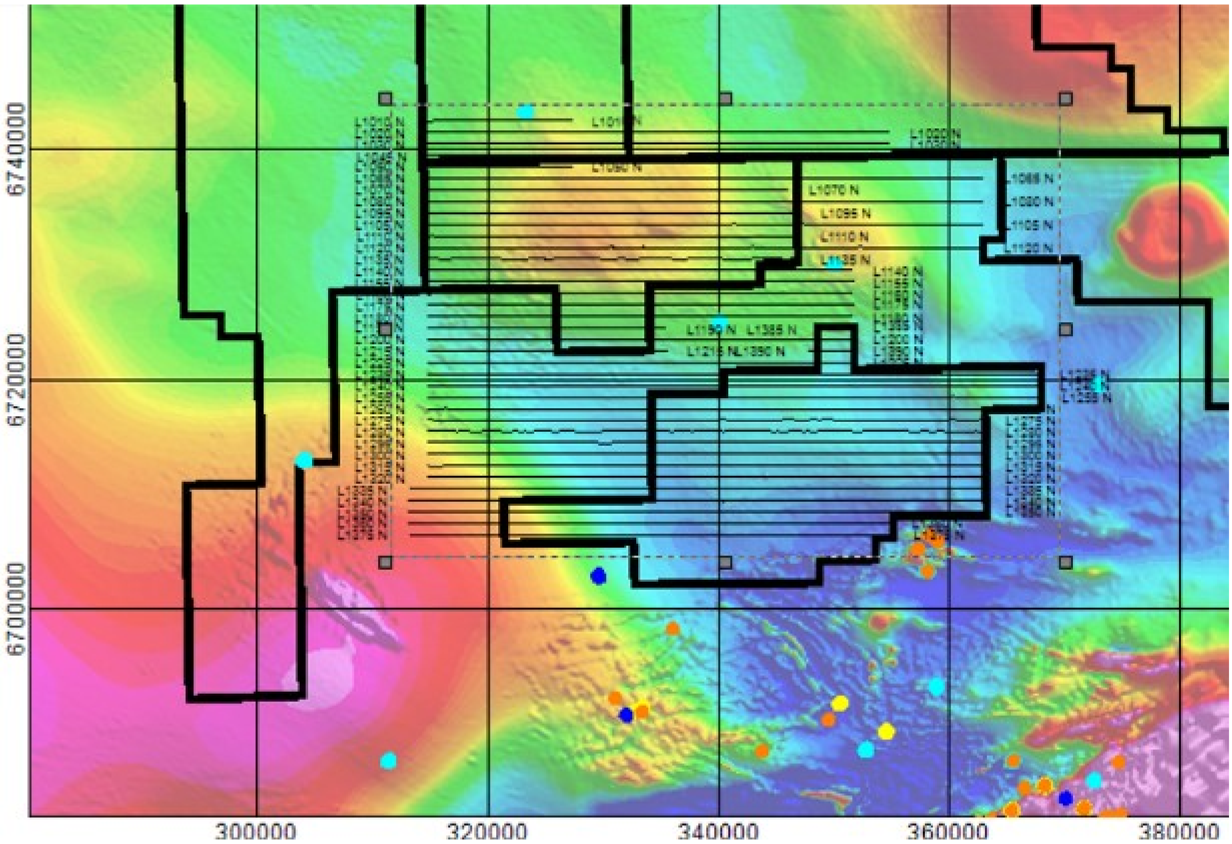


Figure 13: Survey location with Magnetic RTP data 2007SA002

The magnetic data (shown in Figure 13) in this region displays a quiet response indicative of sediments. Some broad features likely to reflect magnetic basement at depth are present in the north. The aqua dots indicate uranium mineral occurrence.

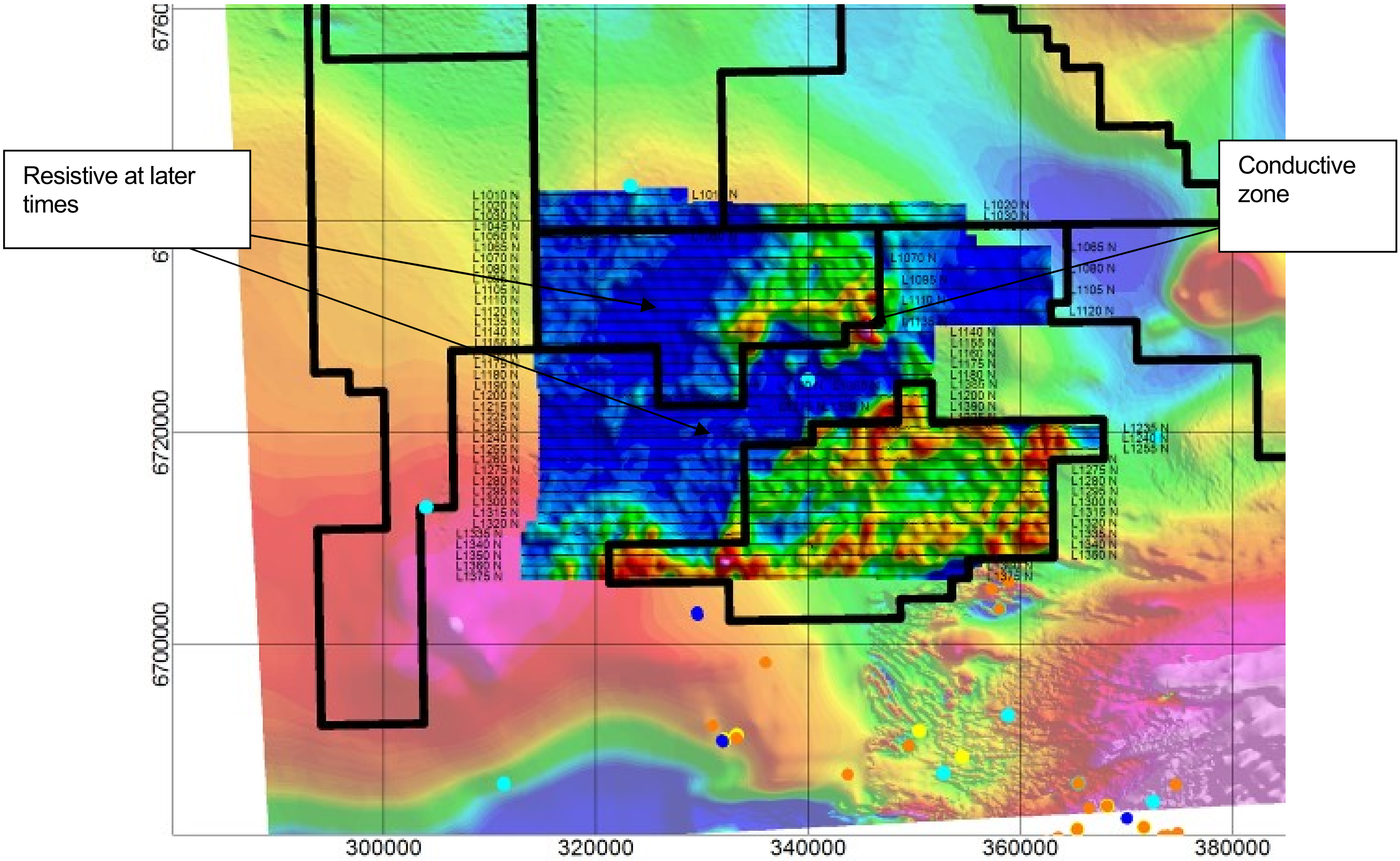


Figure 14: Late time Channel 2007SA002 (warmer colours increased conductivity)

The channel data displays a variably conductive response near surface, generally trending to increased conductivity at later times except in the central region (between the two EIs) and in the NW where the response is resistive (Figure 14). A conductive zone (from early to late times) is mapped in the east (on edge of the exploration lease).

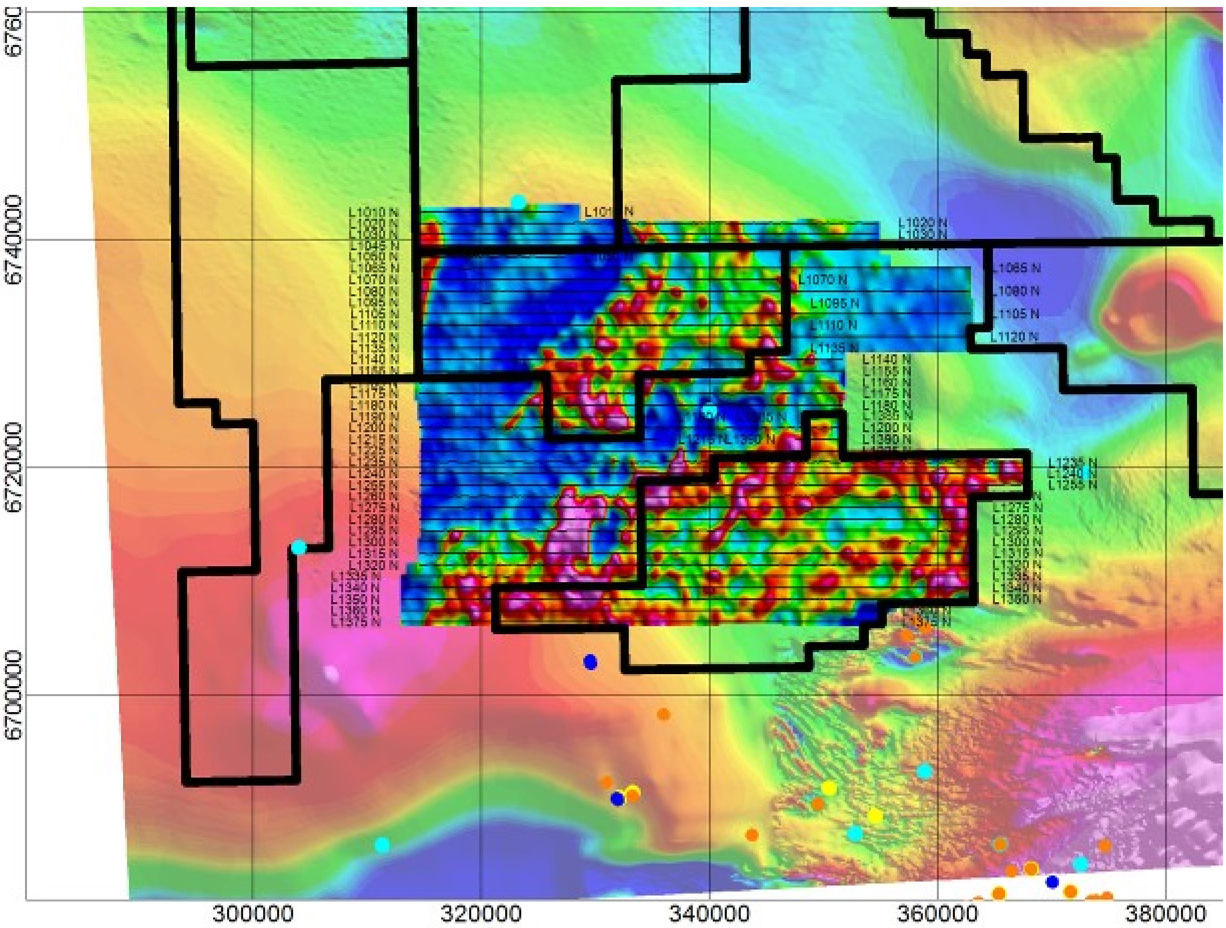


Figure 15: Conductivity Ratio 2007SA002

The conductivity ratio shown in Figure 15 maps the two conductive regions along with some possible NE trends.

The CDI and conductive volume generally depict a conductive near surface layer (overburden / oxidation layer), up to 50m thick, overlying a variably resistive basement in the central and NW regions of the survey. The depth penetration of the survey is generally up to 100 – 150m, however, it is likely to be less than that in areas where more conductive lithology / thicker surficial cover is developed attenuating the signal.

No discrete late time conductors were identified in the line data. Figure 16 displays a representative view of the supplied 3D output.

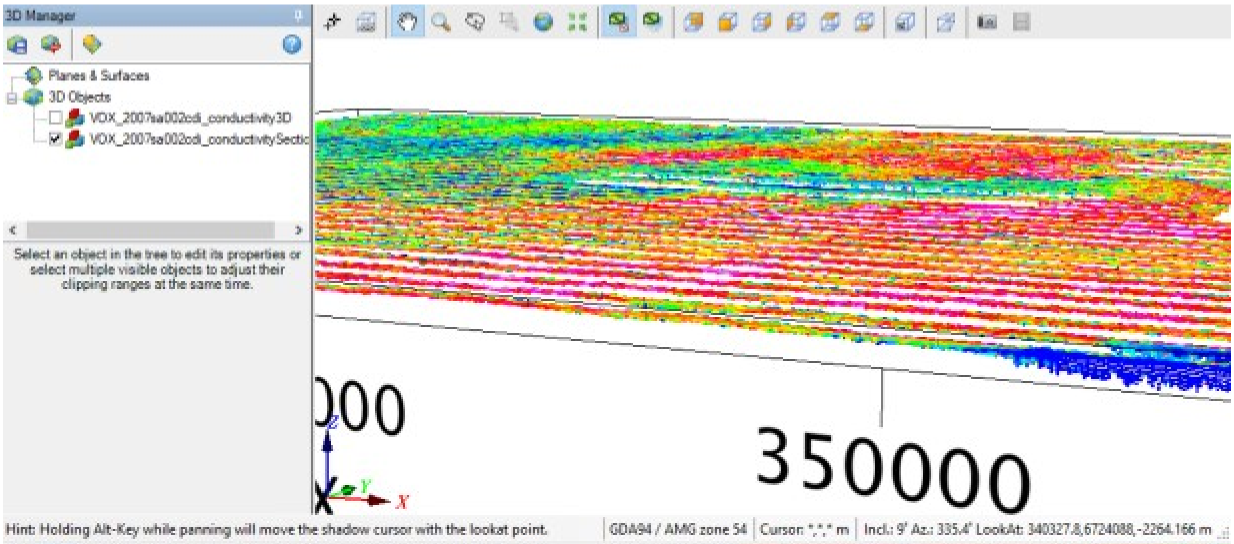


Figure 16: Representative view of 3D conductivity model (both sections and 3D volume).

Survey 2007SA022

RepTEM AEM Lake Callabonna

- AEM and magnetic survey
- 2008
- Transmitter : Geosolutions proprietary REPTEM transmitter.
- Receiver: Geosolutions proprietary REPTEM receiver, 24 bit A-D sampling at 1.25 microseconds
- Line Spacing: variable 500 - 2000m
- Line Direction: variable 0 - 120 degrees
- Flying Height: nominal 30m above ground level
- Speed 55 knots

Data quality is reasonable, although in some conductive regions the AEM depth penetration is likely to be limited. With lines 1000m apart, the survey is not suitable for prospect scale exploration, but can be useful for a broad regional-scale identification of areas of further interest.

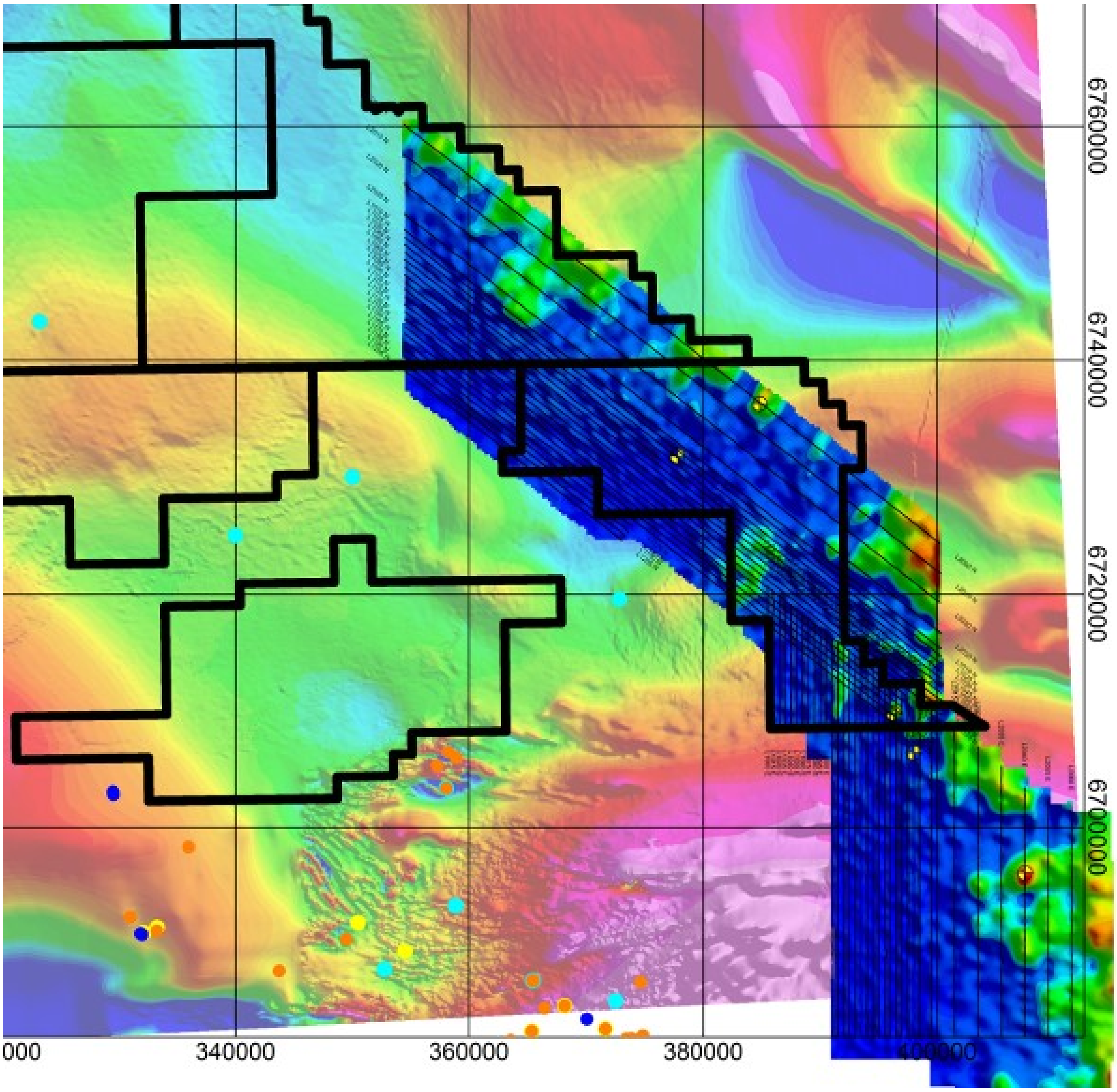


Figure 17: Survey location with late time channel and Magnetic RTP data background 2007SA022

The magnetic data (Figure 19) in this region displays a quiet response indicative of sediments in the north. An interesting circular magnetic feature is evident in the north. The magnetic data does display a higher frequency response in the south indicative of magnetic basement closer to surface. Location of discrete late time conductors shown with yellow dots on Figures 17 to 19.

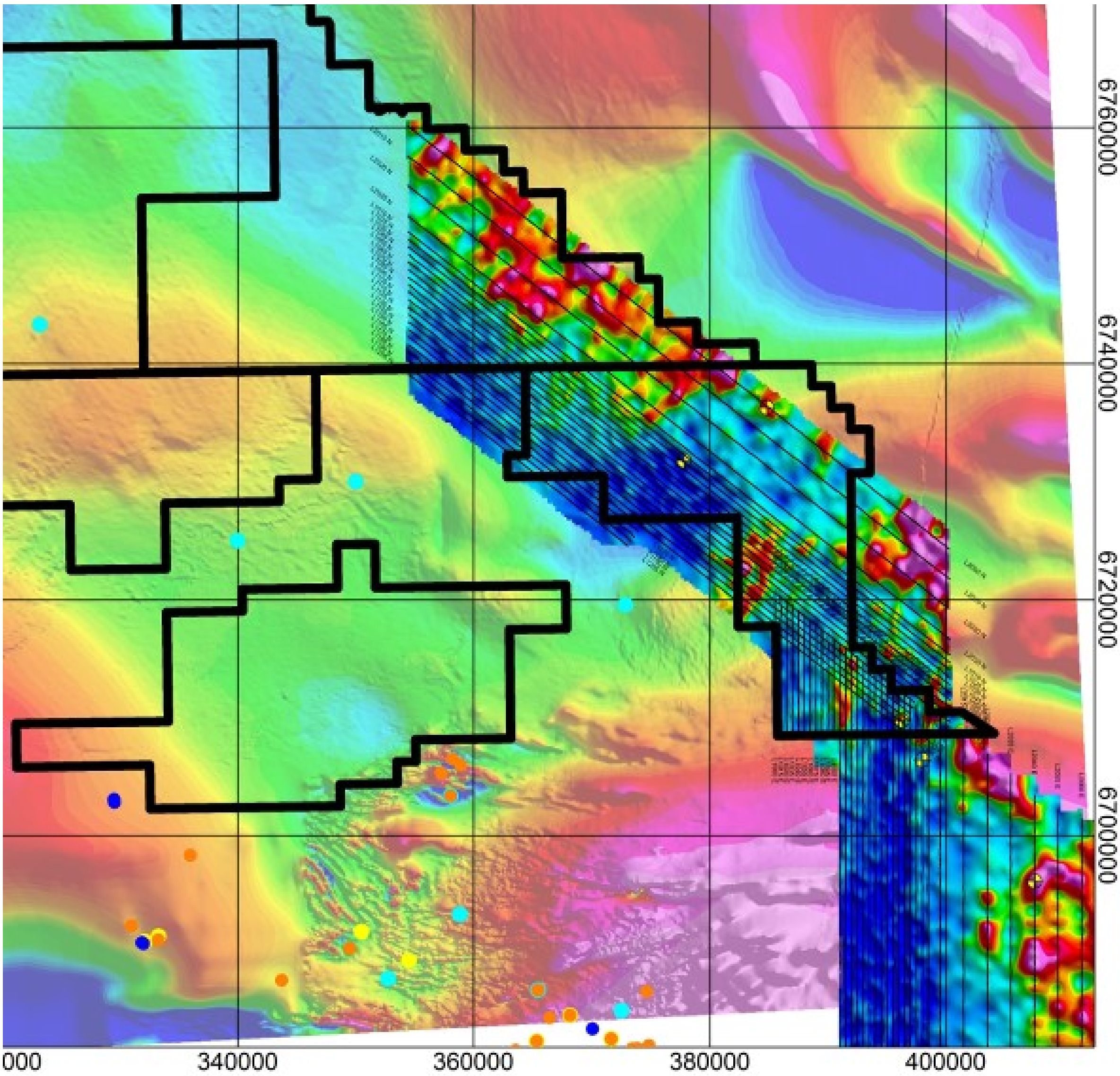


Figure 18: Conductivity Ratio 2007SA022

The channel data displays a variably conductive response near surface, generally trending to increased resistivity at later times in the western portion of the survey (in the region with more detailed line spacing). The conductivity ratio shown in Figure 18 maps some regions displaying higher conductivity at later times.

Figure 19 displays the location of discrete conductors with respect to magnetics, which may warrant further investigations. Interestingly, a discrete conductor is noted proximal to the circular magnetic feature.

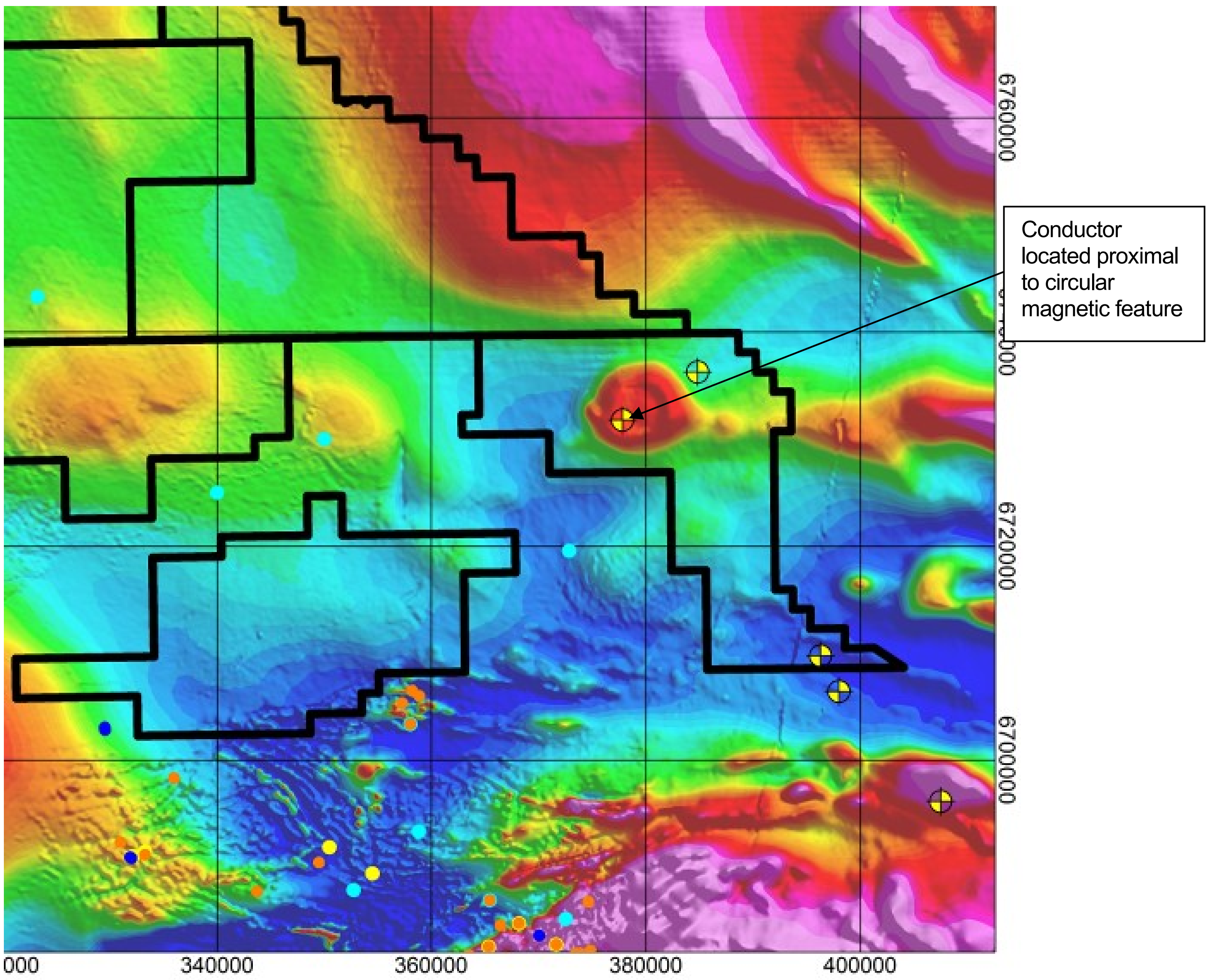


Figure 19: RTP Mag data with identified late time conductors from line data.

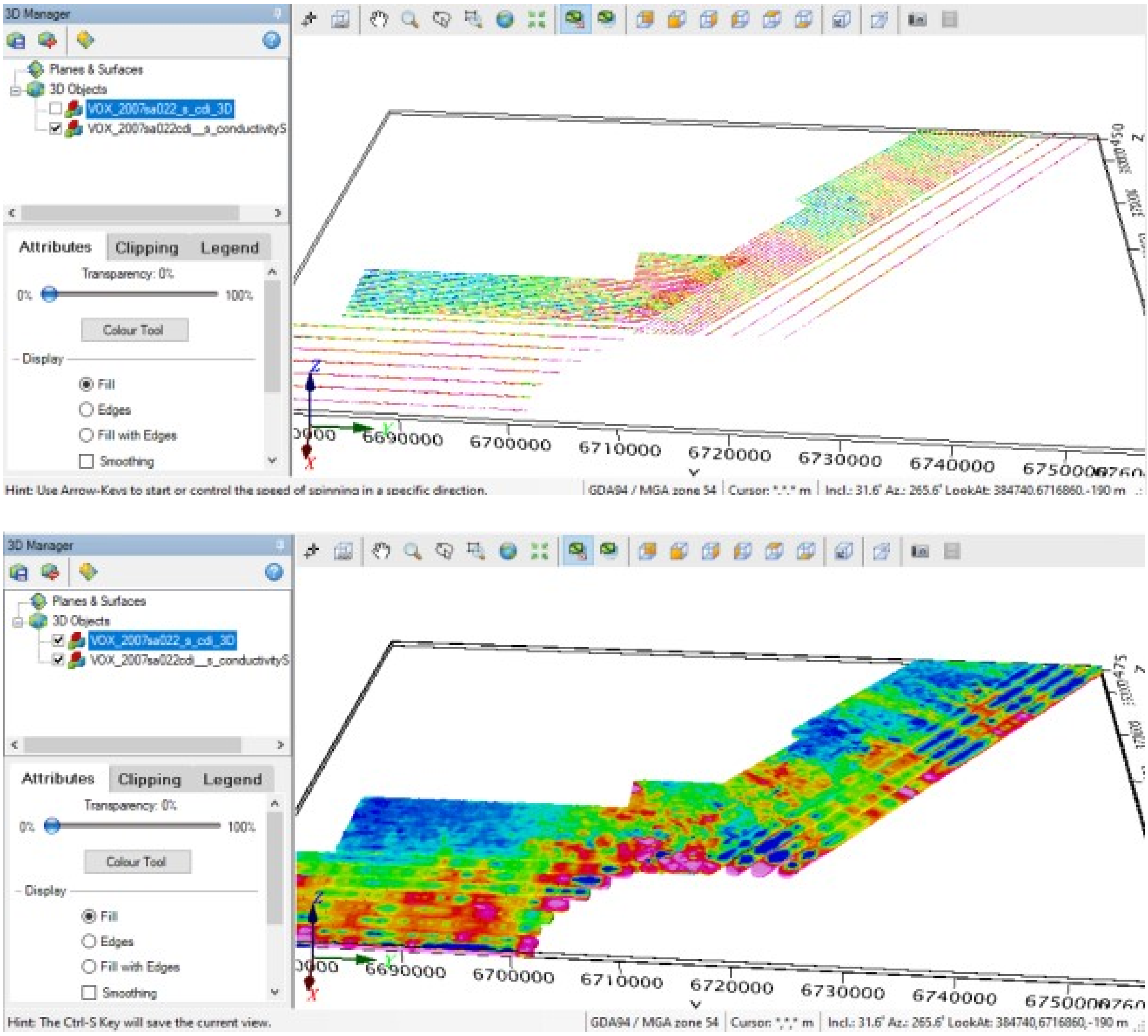


Figure 20: Representative view of 3D conductivity model (both sections and 3D volume).

The CDI and conductive volume generally depict a variably conductive response. The depth penetration of the survey is generally up to 100 – 150m, however, it is likely to be less than that in areas where more conductive lithology / thicker surficial cover is developed attenuating the signal.

Survey 2008SA010

RepTEM AEM Callabonna

- AEM and magnetic survey
- April 2008
- Transmitter : Geosolutions proprietary REPTEM transmitter.
- Receiver: Geosolutions proprietary REPTEM receiver, 24 bit A-D sampling at 1.25 microseconds
- Line Spacing: 1000m
- Line Direction: 90 degrees

- Flying Height: nominal 30m above ground level
- Speed 55 knots

Data quality is reasonable, but noisy at later times. In some conductive regions the AEM depth penetration is likely to be limited. With lines 1000m apart, the survey is not suitable for prospect scale exploration, but can be useful for a broad regional-scale identification of areas of further interest.

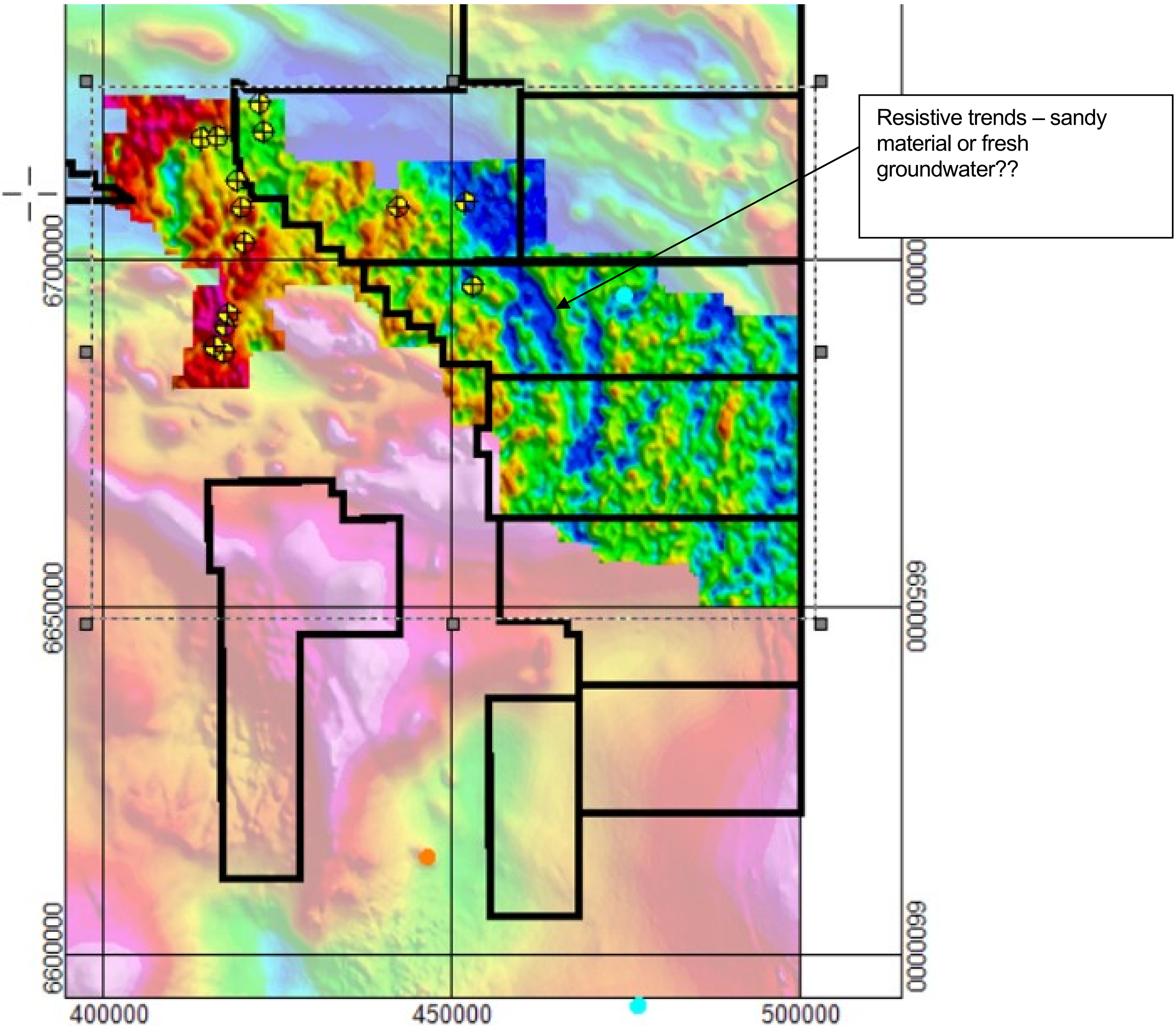


Figure 21: Survey location with early time channel and Magnetic RTP data background 2008SA010

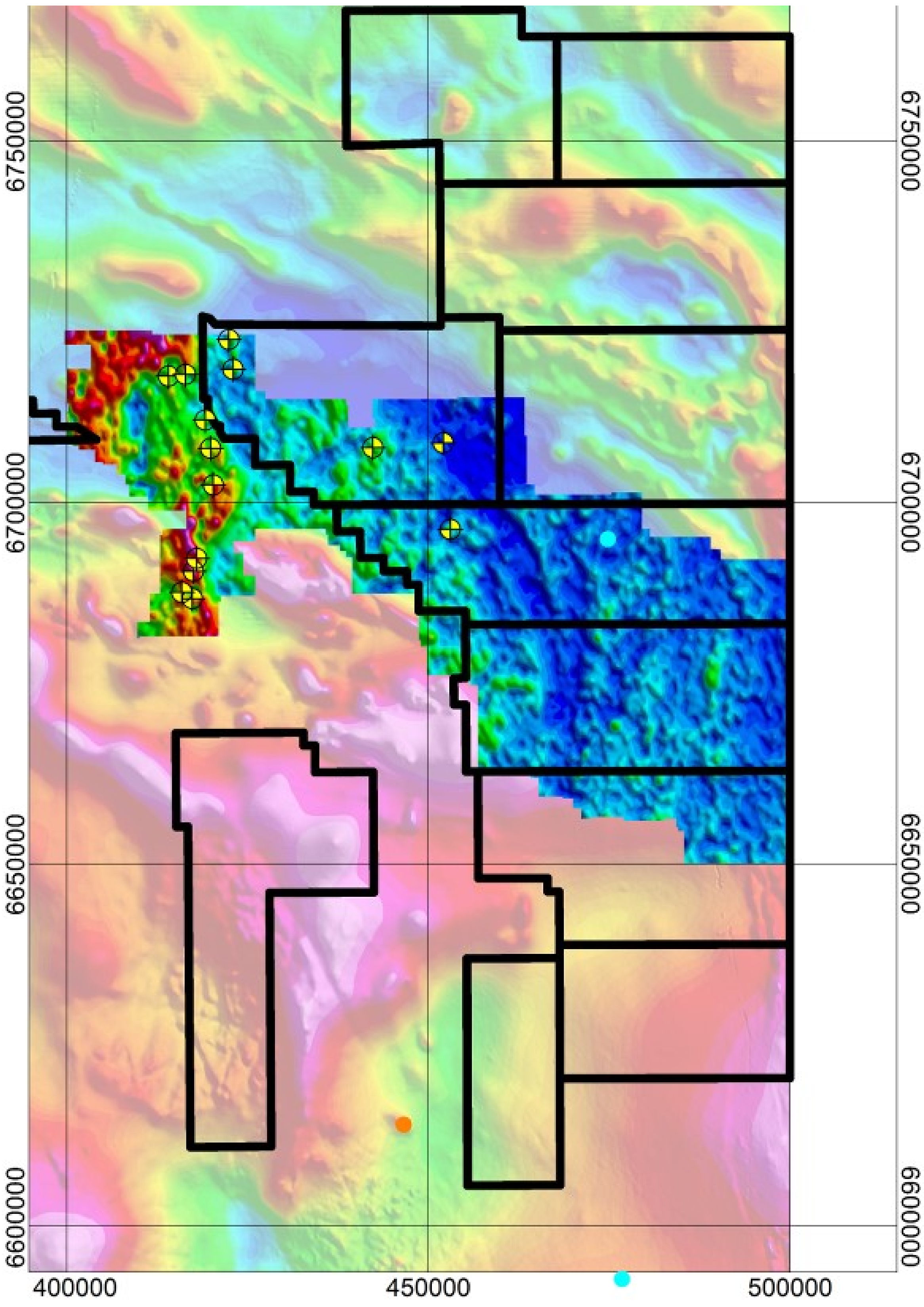


Figure 22: Survey location with late time channel and Magnetic RTP data background 2008SA010

The magnetic data (Figure 24) displays a generally quiet response in the AEM survey region indicative of non-magnetic rocks / sediments. The channel data displays a variably conductive response near surface over much of the survey with high conductivities recorded in the west. At early times (Figure 21) some resistive trends are mapped in the data. This may reflect more resistive lithology and / or non-saline ground water. Later time conductive responses are generally confined to the west. Location of discrete late time conductors identified in the line data is shown with yellow dots.

The conductivity ratio shown in Figure 12 is somewhat noisy – but some areas of higher conductivity at later times can be resolved.

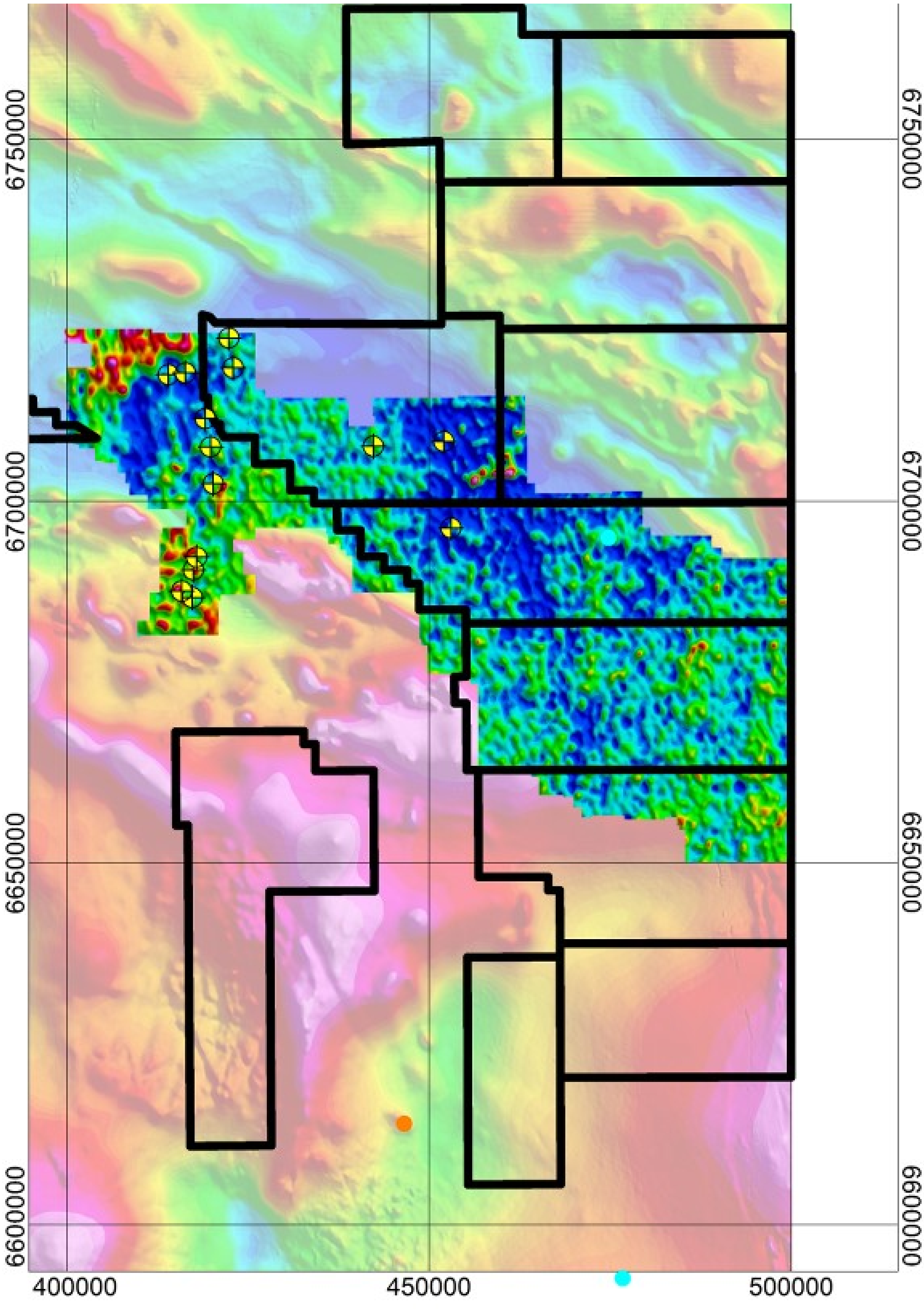


Figure 23: Conductivity Ratio 2008SA010

Figure 24 displays the location of discrete conductors with respect to magnetics. A high pass filter has been applied to the RTP data which may assist in mapping trends / structures. Of possible interest, some discrete conductors are noted on NW and cross-cutting NE magnetic trends which may indicate an association with structures.

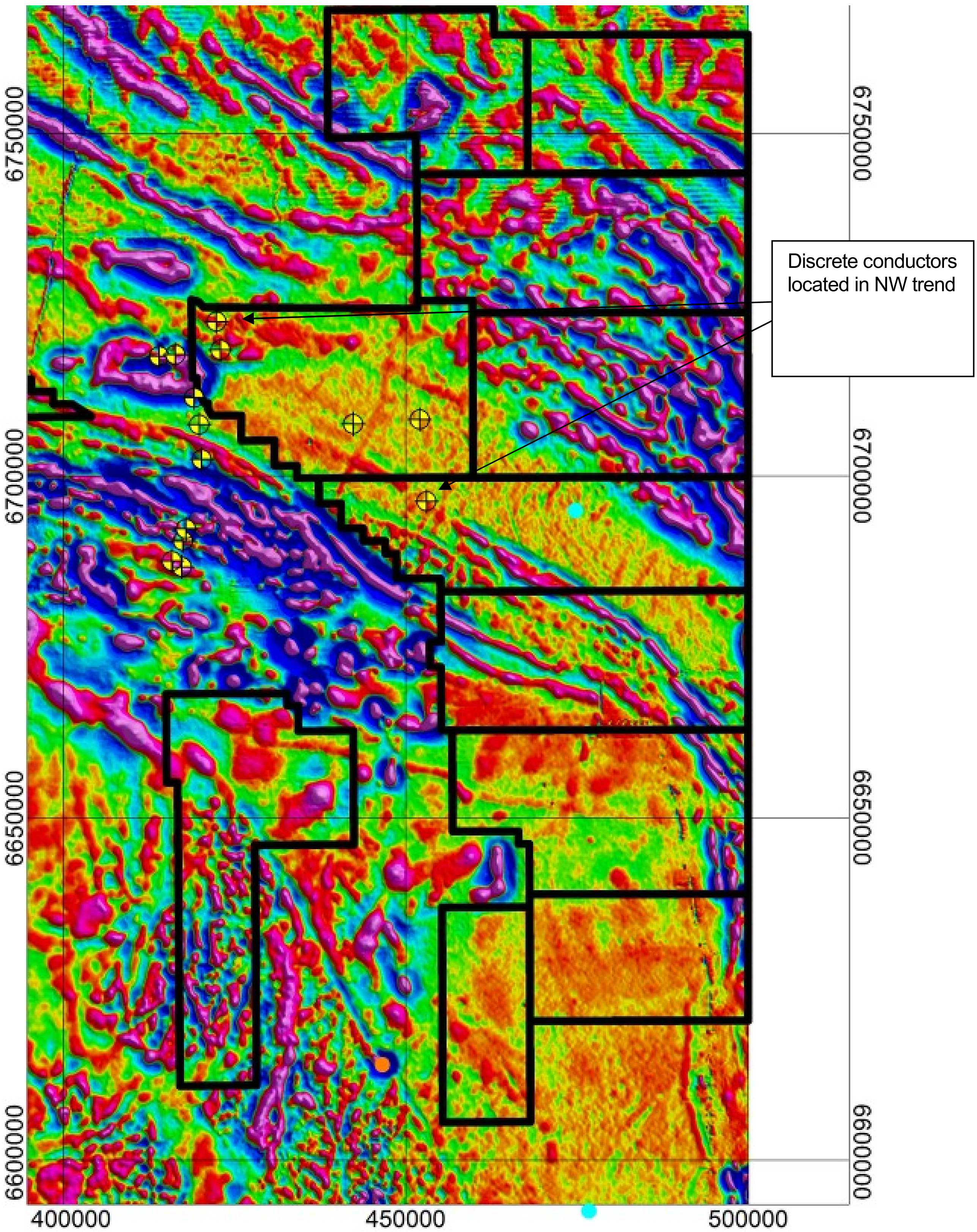


Figure 24: RTP Mag (high pass) data with identified late time conductors from line data

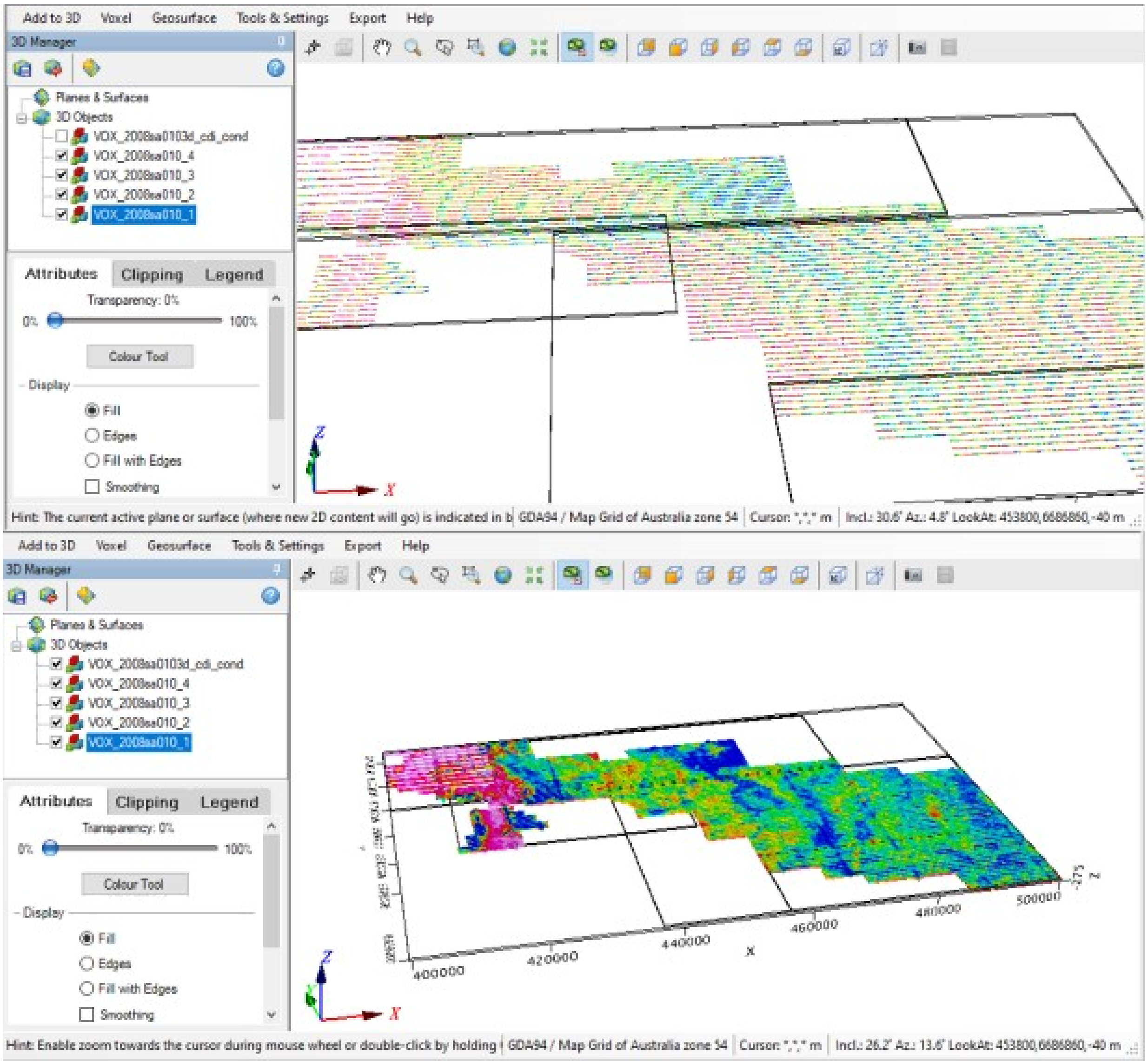


Figure 25: Representative view of 3D conductivity model (both sections and 3D volume).

The CDI and conductive volume generally depict a variably conductive response. The depth penetration of the survey is generally up to 125m, however, it is likely to be less than that in the west where more conductive lithology / thicker surficial cover is developed attenuating the signal.

Survey 2004SA003

Tempest AEM Stickhole (Area 3)

- AEM and magnetic survey
- Jul - Aug 2004
- 25Hz TEMPEST
- Line Spacing: 1000m
- Line Direction: 90 degrees
- Flying Height: nominal 110m above ground level

Data quality is reasonable, although in some conductive regions the AEM depth penetration is likely to be limited. With lines 1000m apart, the survey is not suitable for prospect scale exploration, but can be useful for a broad regional-scale identification of areas of further interest.

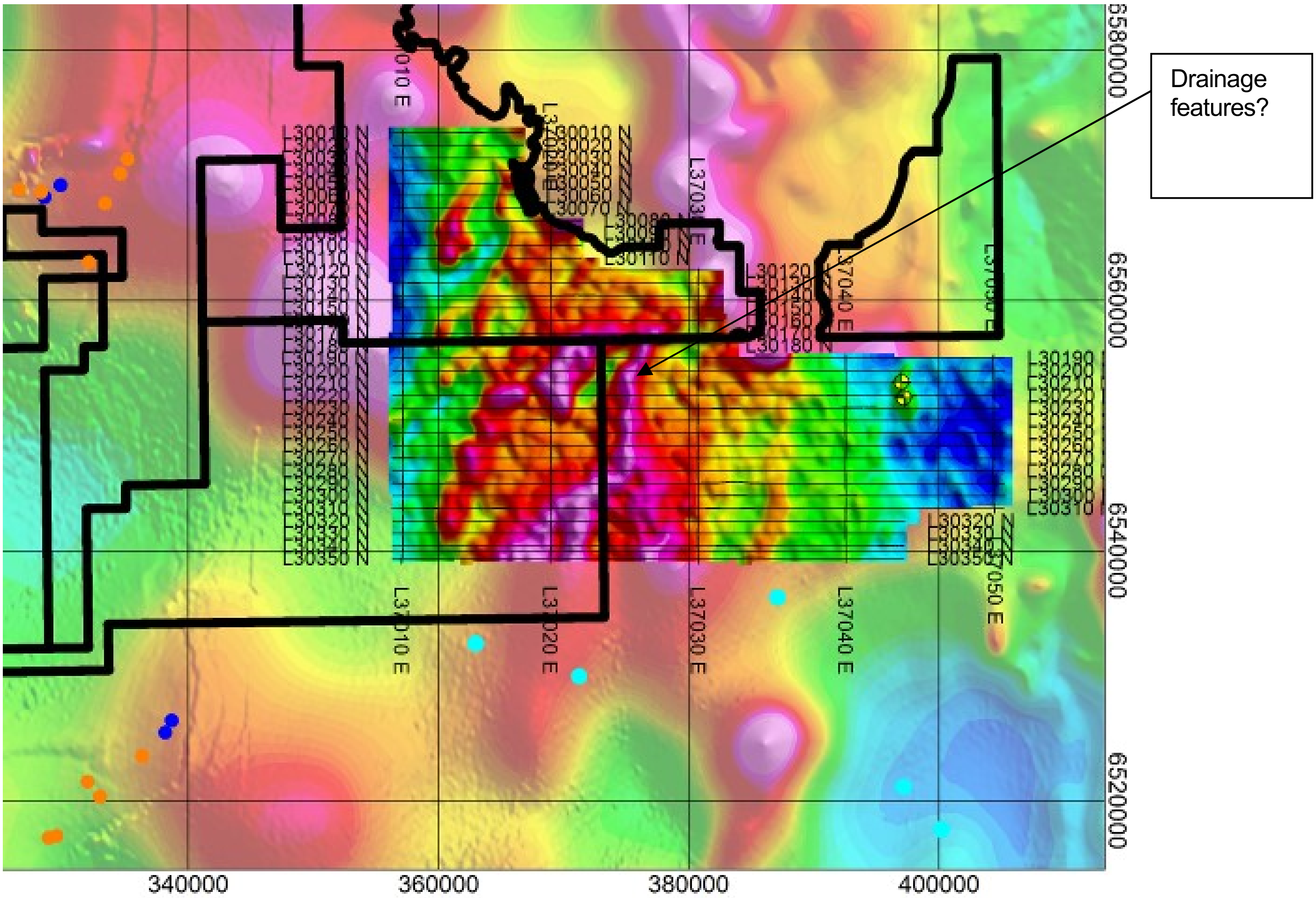


Figure 26: Survey location with late time channel and Magnetic RTP data background 2004SA003 Stickhole.

The magnetic data in this region displays a quiet response indicative of sediments. Location of discrete late time conductors identified from line data are shown with yellow dots – but occur outside the EL.

The channel data displays a conductive response near surface that is likely to reflect drainage or palaeo-channels (clay-rich). The conductivity ratio shown in Figure 16 maps some linear regions displaying higher conductivity at later times.

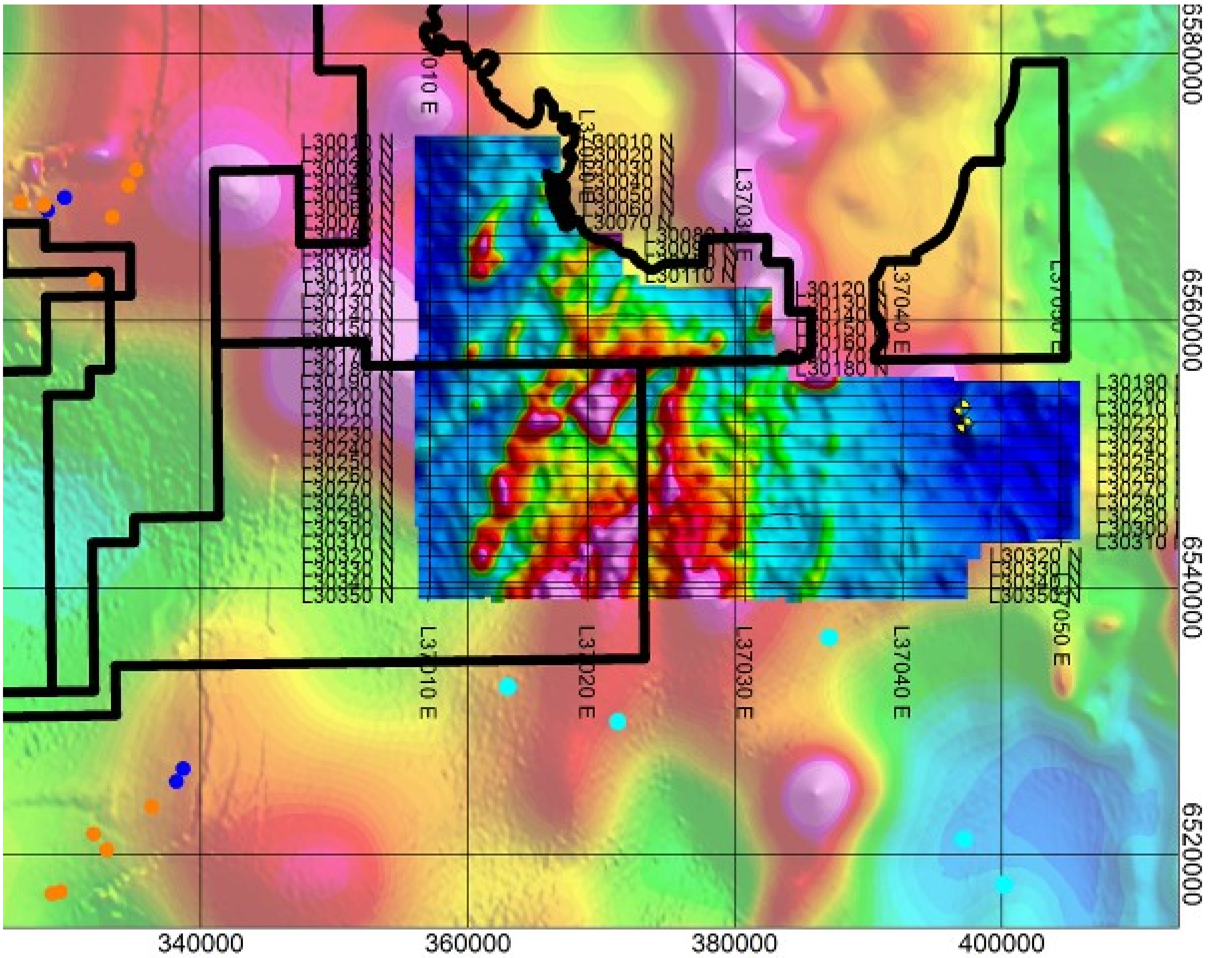


Figure 27: Conductivity Ratio 2007SA022

Figure 28 displays the location of discrete conductors to the east of the EL with respect to high pass magnetics.

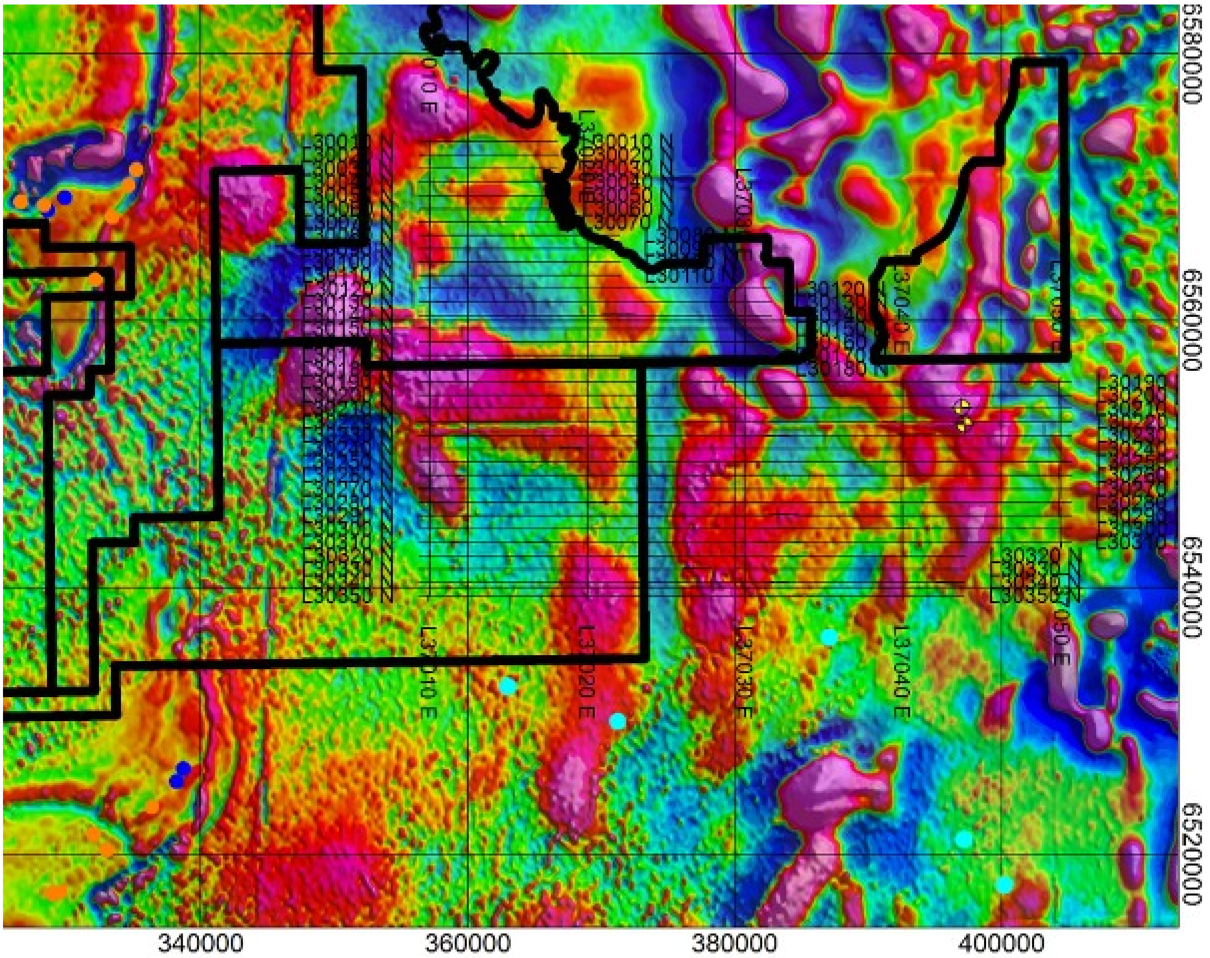
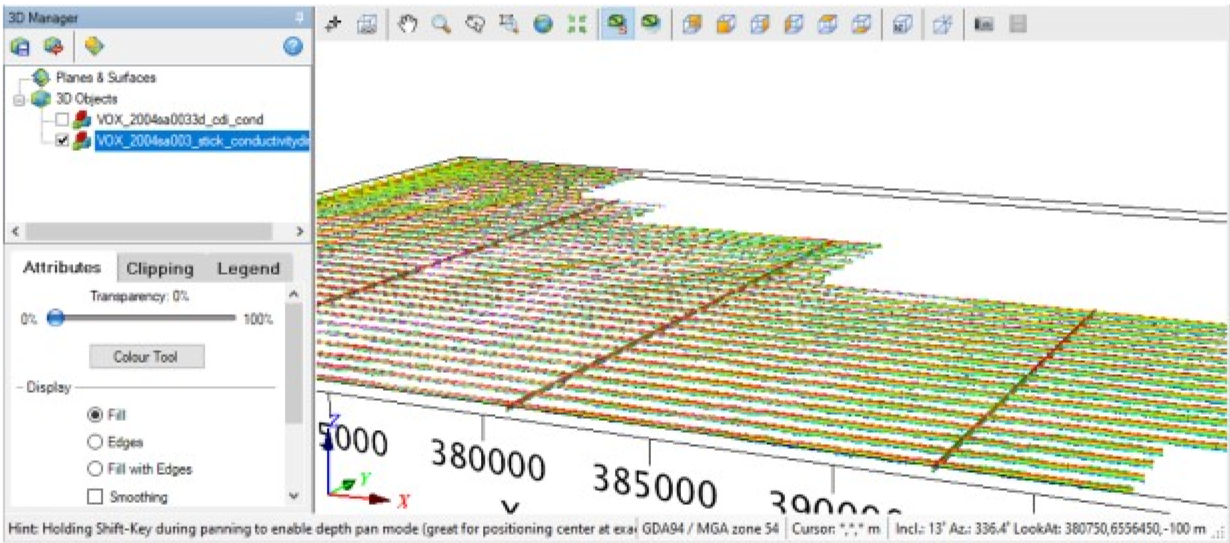


Figure 28 RTP Mag data with identified late time conductors from line data



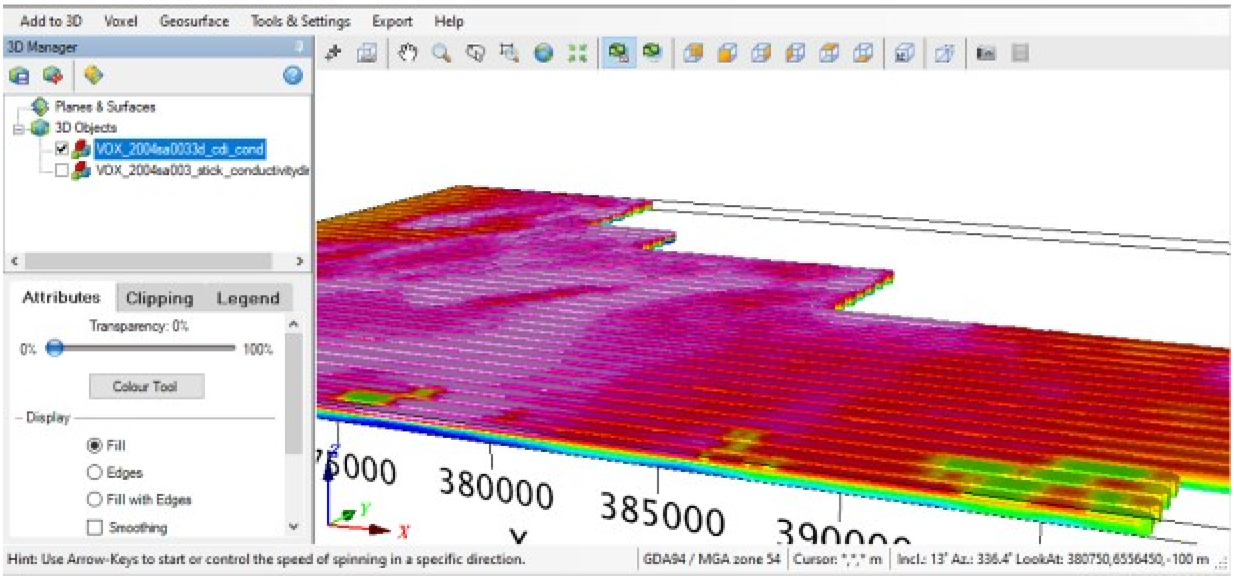


Figure 29: Representative view of 3D conductivity model (both sections and 3D volume).

The CDI and conductive volume generally depict a variably conductive response overlying a more resistive basement response. The depth penetration of the survey is generally up to 100 – 150m, however, it is likely to be less than that in areas where more conductive lithology / thicker surficial cover is developed attenuating the signal.

Survey 2004SA003

Tempest AEM Erudina

- AEM and magnetic survey
- Jul - Aug 2004
- 25Hz TEMPEST
- Line Spacing: 1000m
- Line Direction: 90 degrees
- Flying Height: nominal 110m above ground level

Only SW corner of survey within EL. Data quality is reasonable, although in some conductive regions the AEM depth penetration is likely to be limited. With lines 1000m apart, the survey is not suitable for prospect scale exploration, but can be useful for a broad regional-scale identification of areas of further interest. No discrete late time conductors or conductive trends of note occur within the exploration lease. A NNE trend in the conductivity data is noted to the north of the EL (Figures 30 and 31).

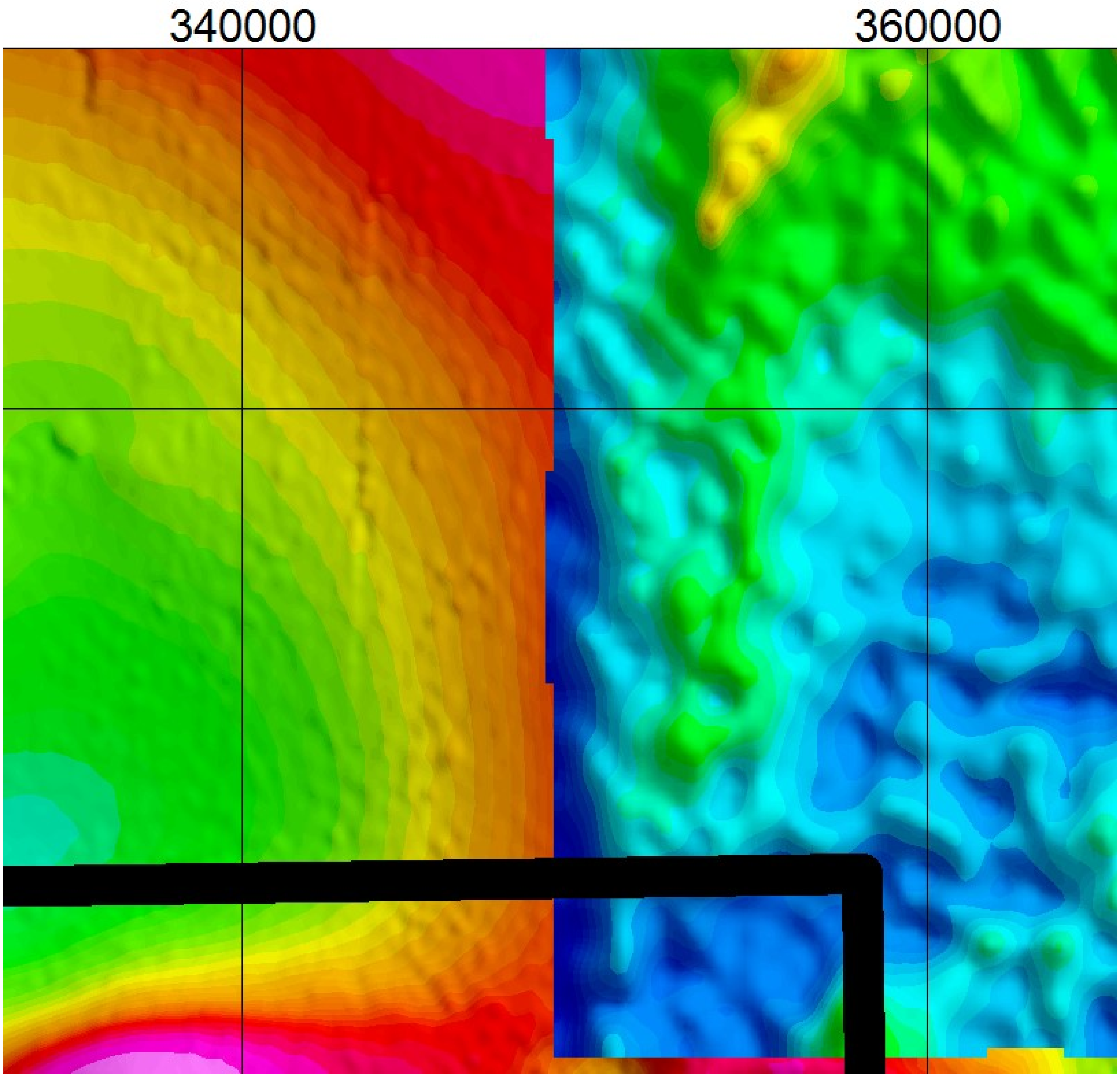


Figure 30: Late time channel Erudina 2004SA003

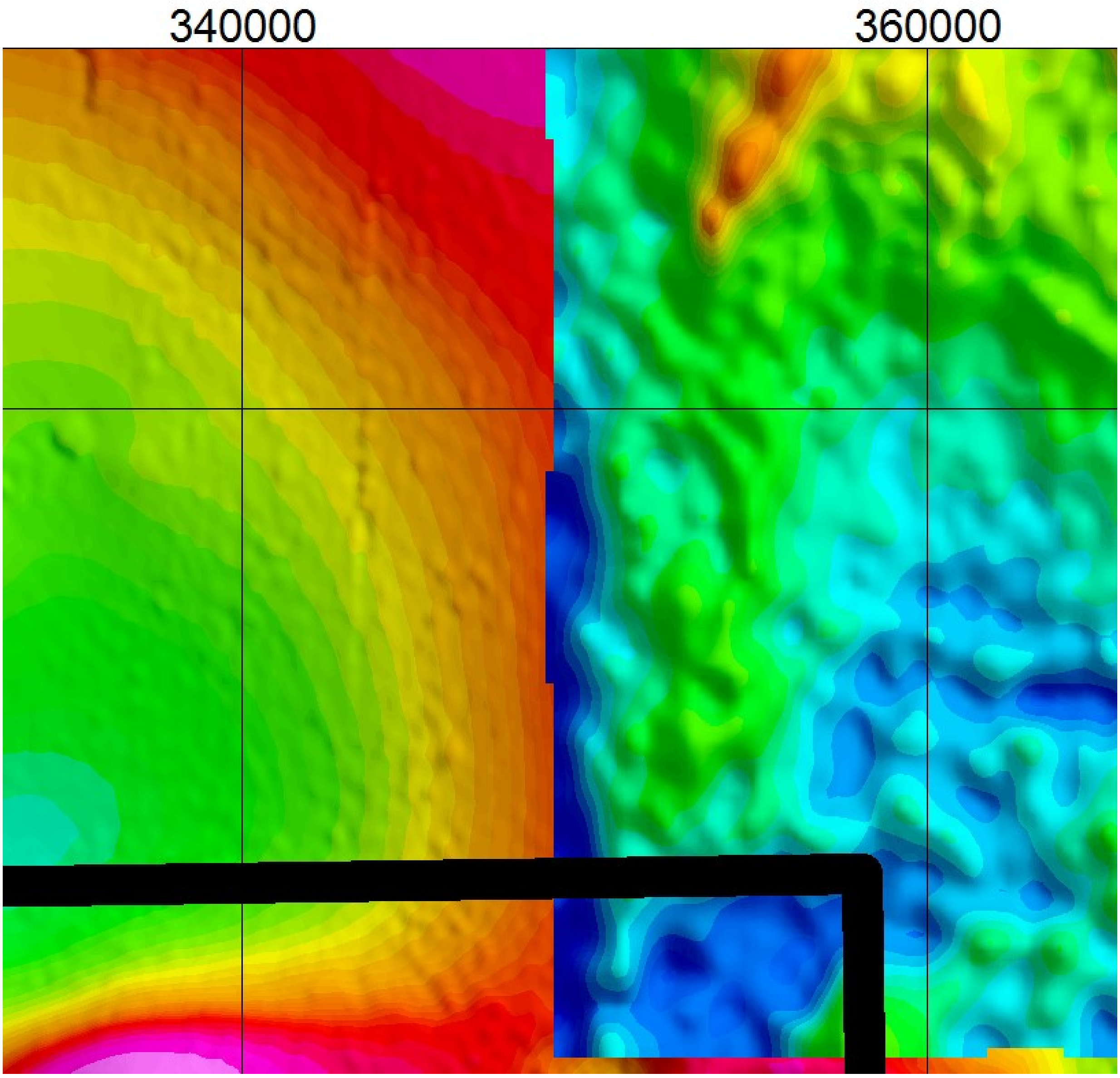


Figure 31: Conductivity Ratio of Erudina AEM survey.

Survey 2005SA002

Tempest AEM Sandyoota

- AEM and magnetic survey
- June 2005
- 25Hz TEMPEST
- Line Spacing: 1000m
- Line Direction: 90 degrees
- Flying Height: nominal 110m above ground level

Data quality is reasonable, although in some conductive regions the AEM depth penetration is likely to be limited. With lines 1000m apart, the survey is not suitable for prospect scale exploration, but can be useful for a broad regional-scale identification of areas of further interest.

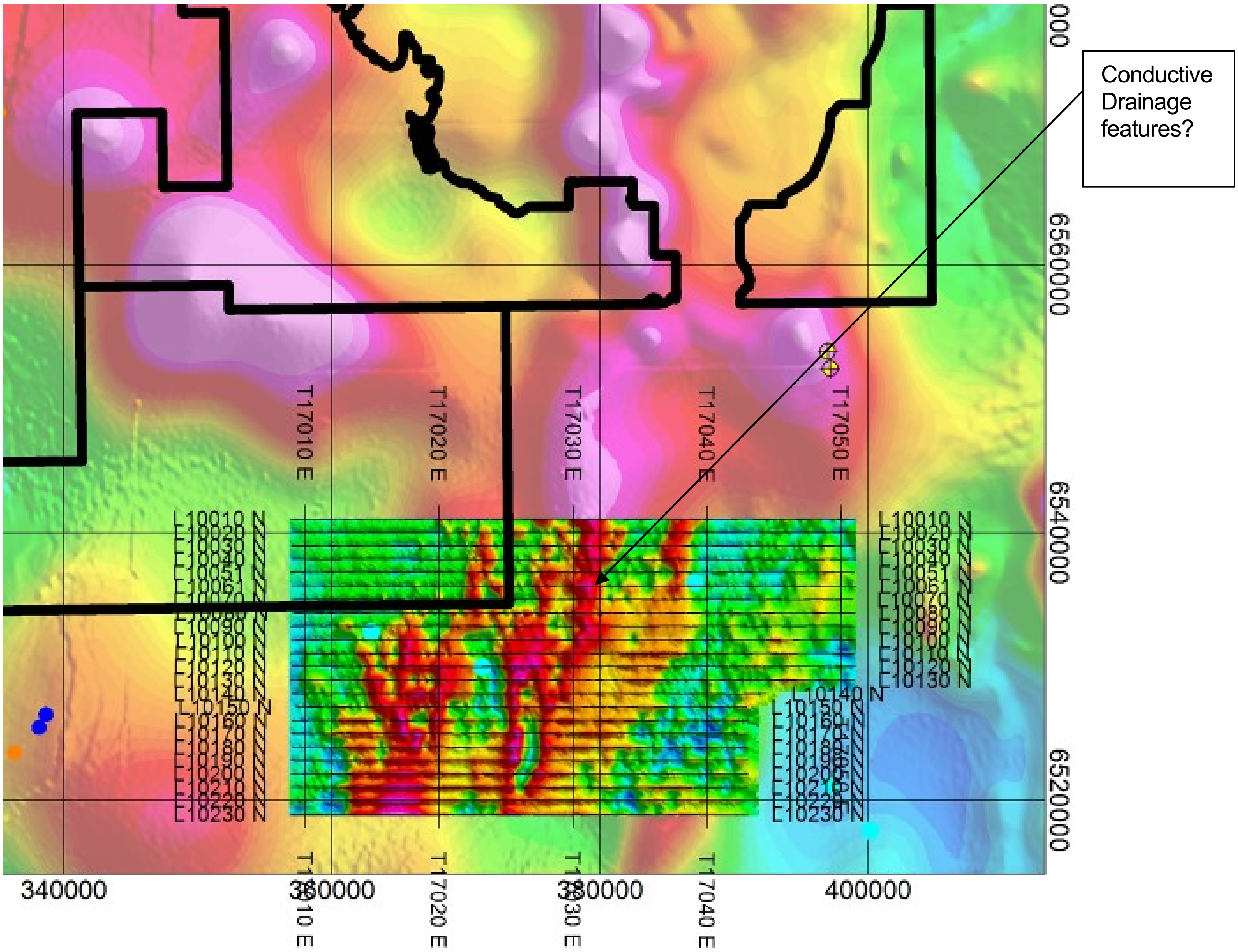


Figure 32: Survey location with 100m depth slice.

The magnetic data in this region displays a quiet response indicative of sediments. Location of discrete late time conductors identified from line data are shown with yellow dots – but occur outside the EL.

The channel data displays a conductive response near surface that is likely to reflect drainage or palaeo-channels (clay-rich). The conductivity ratio shown in Figure 33 maps some linear regions displaying higher conductivity at later times. Interestingly, one of these features is located proximal to a known Uranium occurrence. No discrete conductors were evident in the line data.

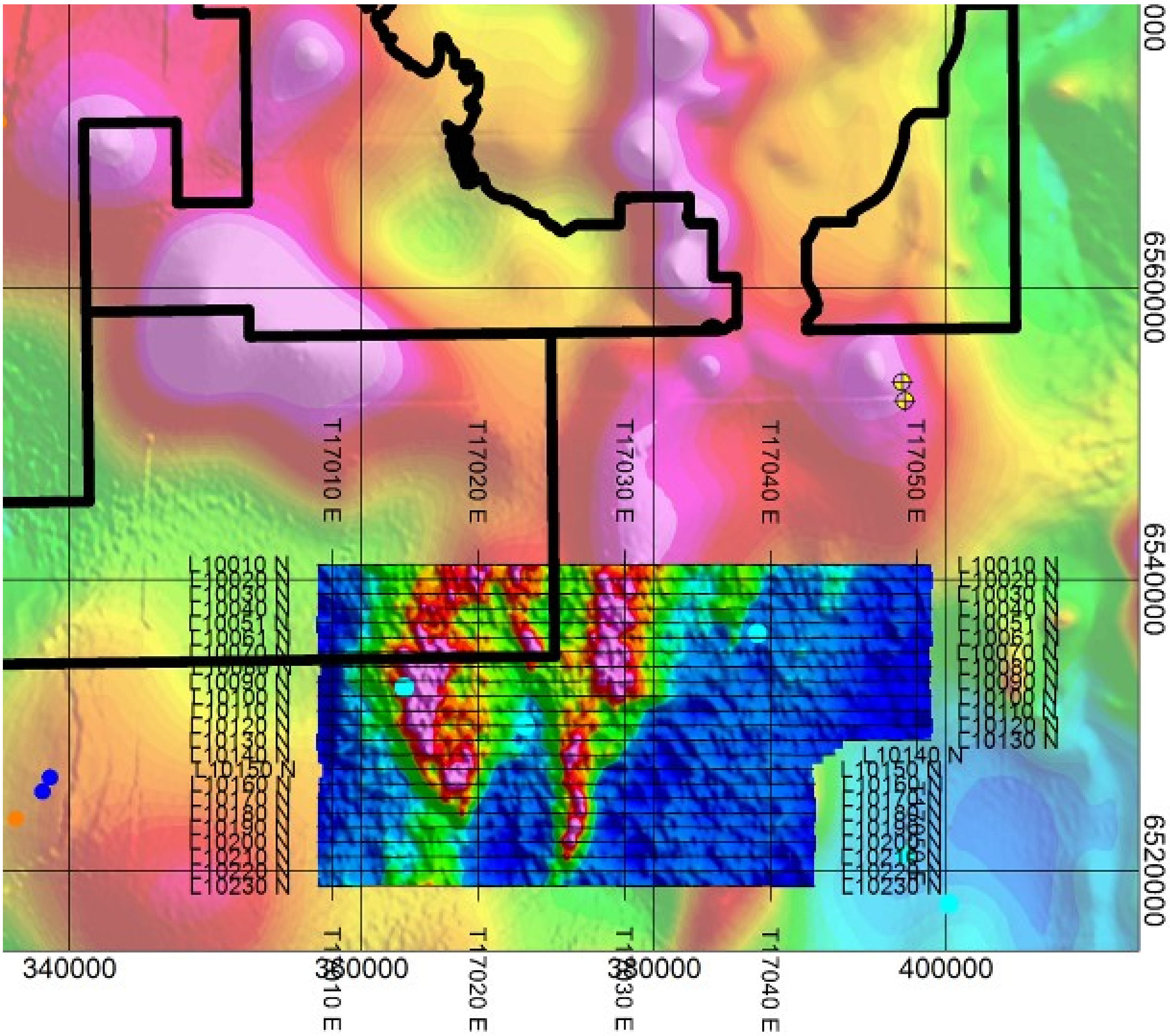


Figure 33: Conductivity Ratio 2005SA002

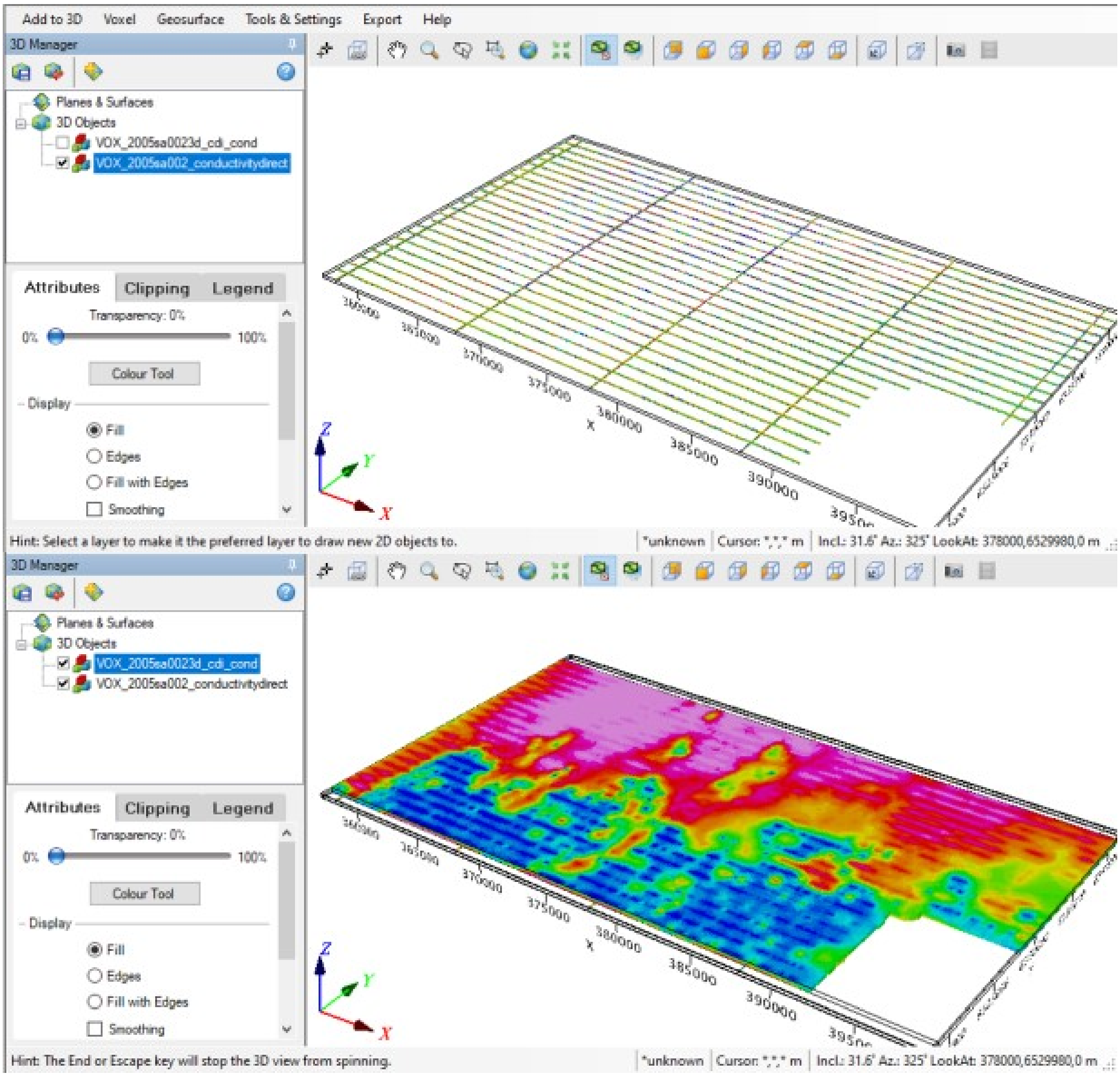


Figure 34: Representative view of 3D conductivity model (both sections and 3D volume).

The CDI and conductive volume generally depict a variably conductive response overlying a more resistive basement response. The depth penetration of the survey is generally up to 100 – 150m, however, it is likely to be less than that in areas where more conductive lithology / thicker surficial cover is developed attenuating the signal.

Survey 2005SA015 – 6 lines only
HoistEM AEM South Lake Frome

- AEM and magnetic survey
- April 2005
- Transmitter : Geosolutions proprietary REPTEM transmitter.
- Receiver: Geosolutions proprietary REPTEM receiver, 24 bit A-D sampling at 1.25 microseconds
- Line Spacing: 400m
- Line Direction: 90 degrees
- Flying Height: nominal 30m above ground level

Data quality is reasonable, although in some conductive regions the AEM depth penetration is likely to be limited.

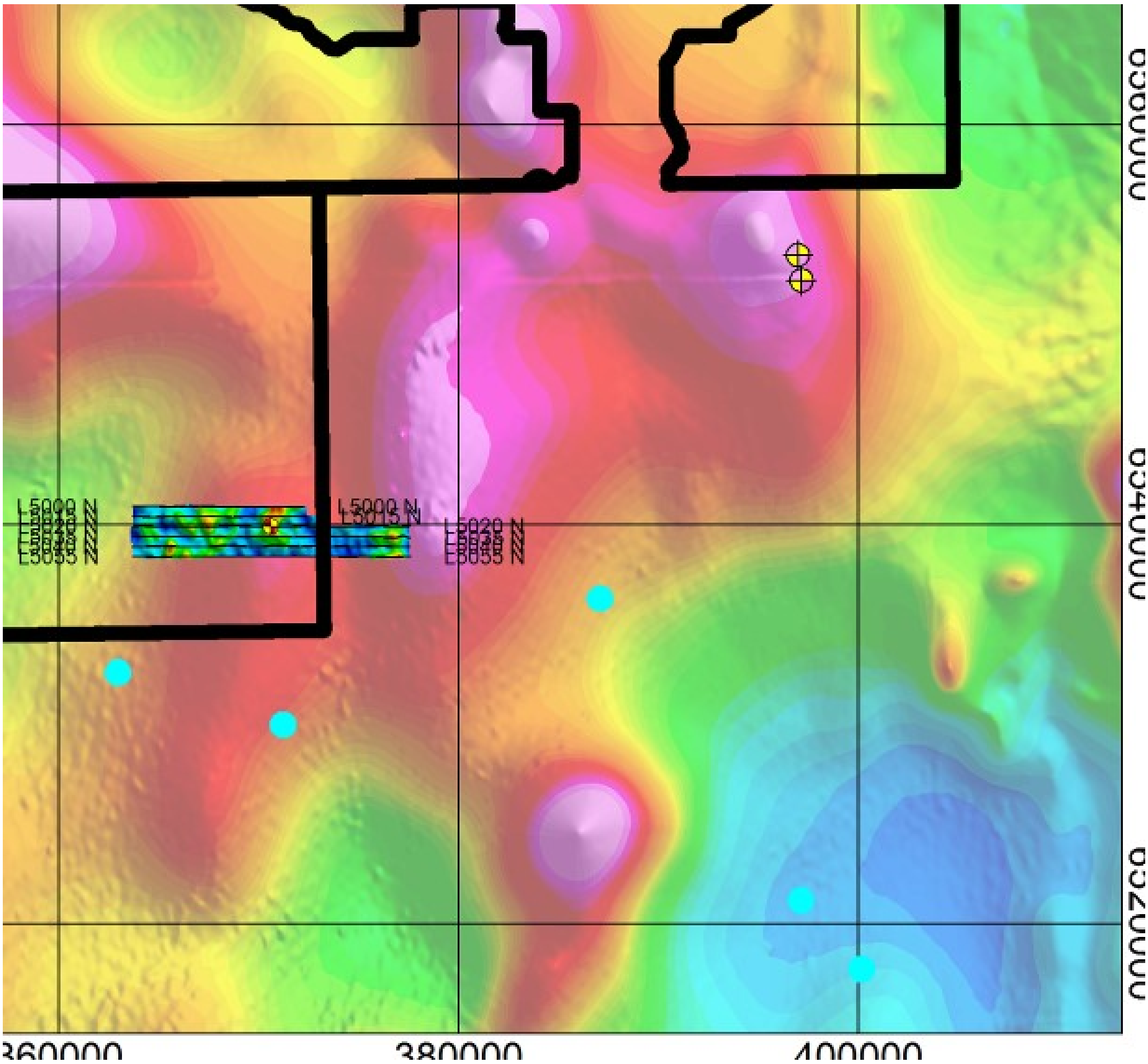


Figure 35: Survey location with late time channel.

The magnetic data in this region displays a quiet response indicative of thick sediments. The survey is centred over a broad magnetic feature (likely reflecting basement at depth). The location of a discrete late time (early to late time) conductor identified from line data is shown with a yellow dot, proximal to this feature.

The conductivity ration (Figure 25) highlights some possible trends in the data.

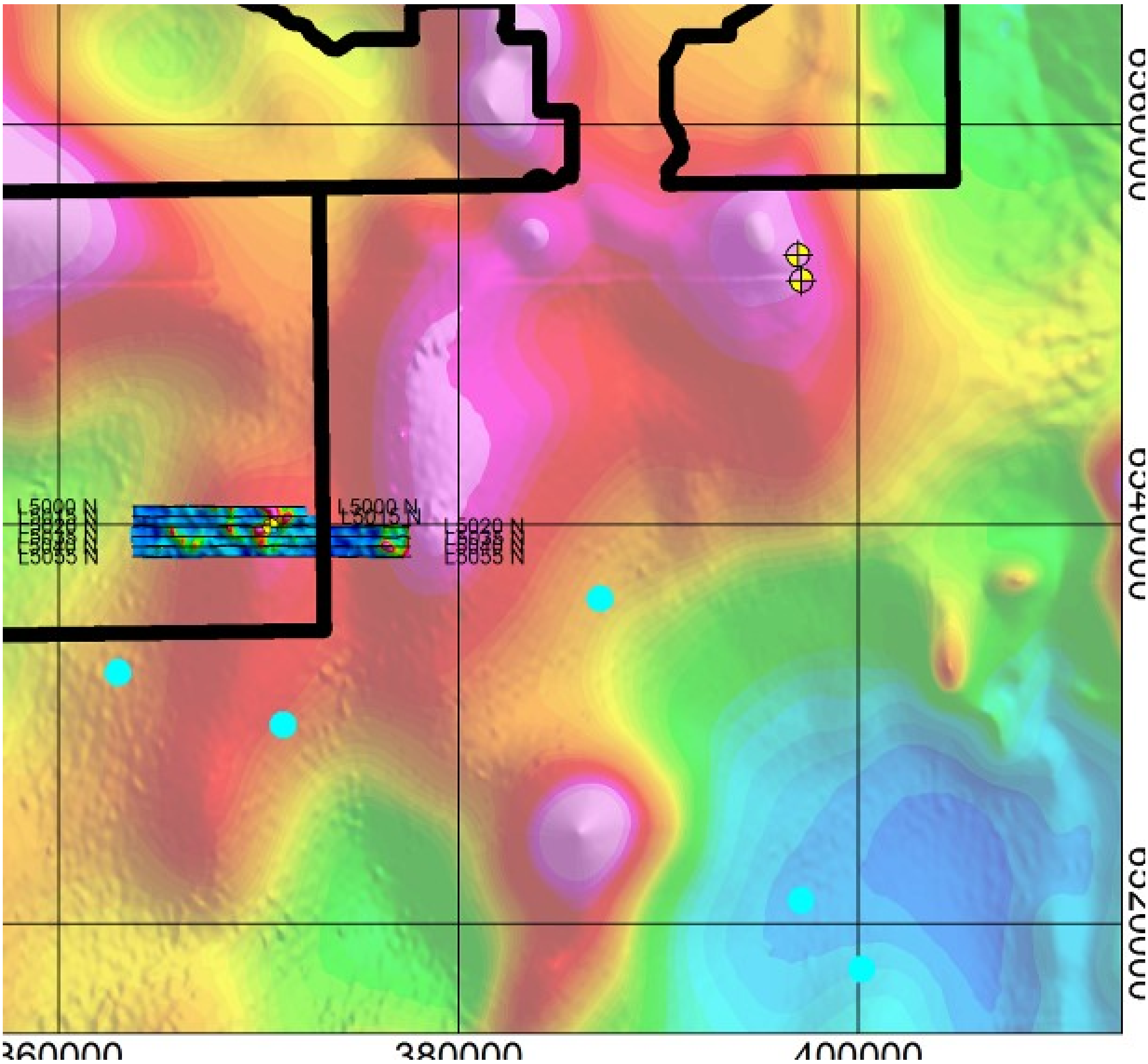


Figure 36: Conductivity Ratio 2005SA015

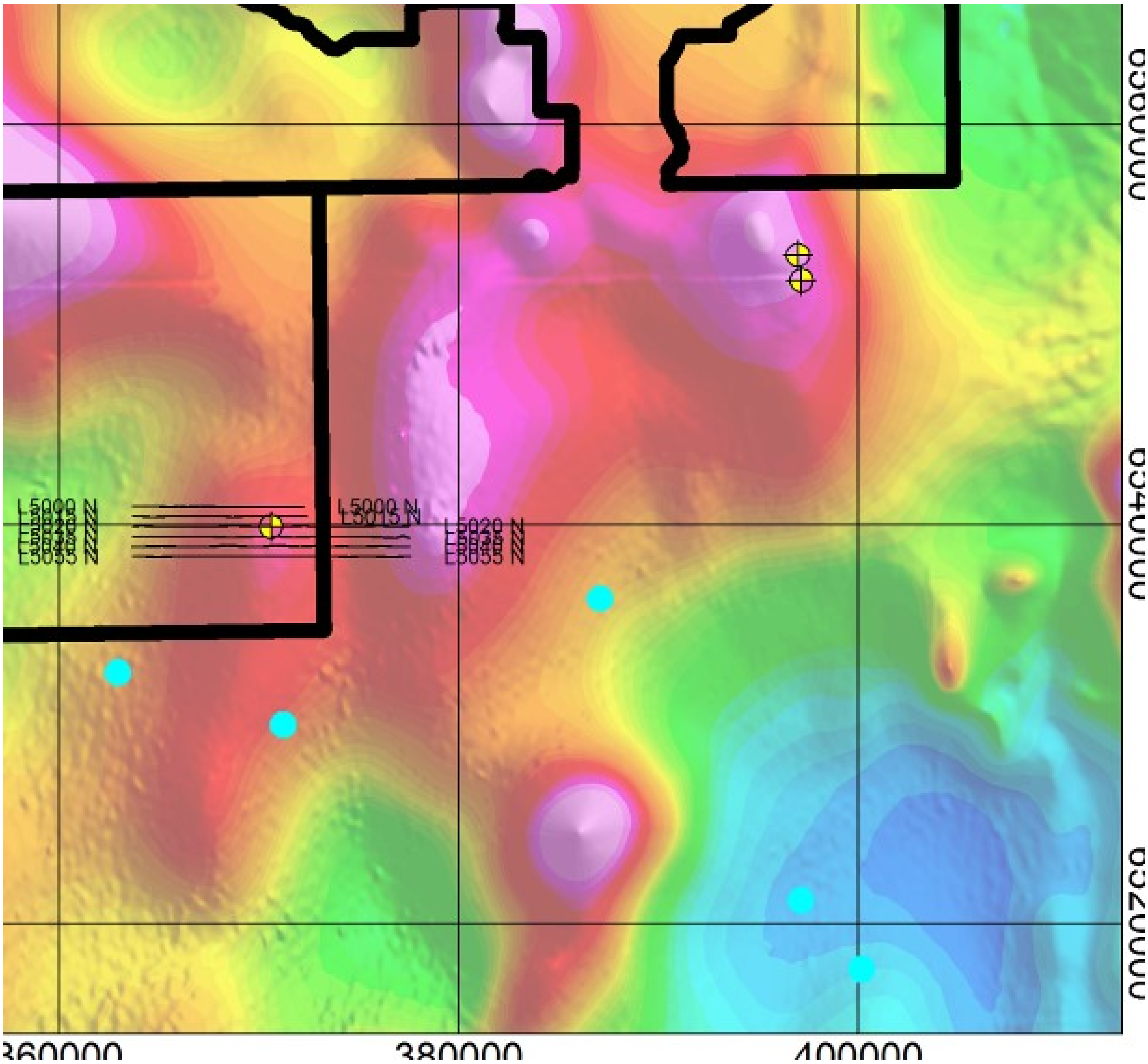


Figure 37: Discrete late time anomaly with respect to magnetic data.

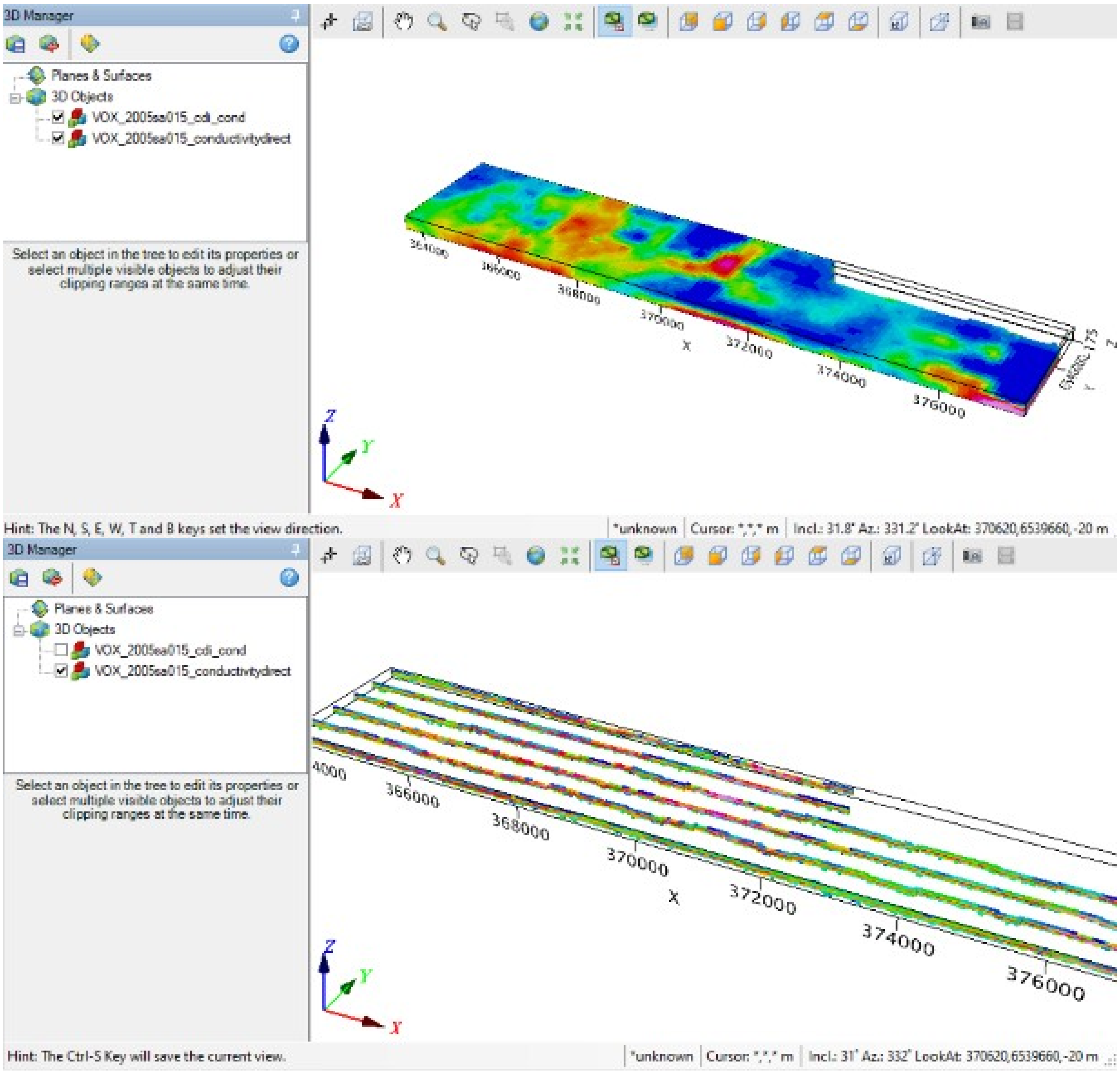


Figure 38: Representative view of 3D conductivity model (both sections and 3D volume).

The CDI and conductive volume generally depict a variably conductive response. The depth penetration of the survey is generally up to 100 – 150m, however, it is likely to be less than that in areas where more conductive lithology / thicker surficial cover is developed attenuating the signal.

1994SA008

Magnetic / Radiometric Survey – Emu Hill

- Flown by Kevron Geophysics July 1994
- 200m line spacing
- 70m height

Magnetic intensity varies from 4850 nT – 6,200 nT with a quiet magnetic response evident in the northwest of the survey (majority of the exploration lease) indicative of sediments (Figure 39). Higher intensity, more complex magnetic responses are noted in the southeast portion of the surface indicative of magnetic basement closer to surface.

AEM survey 2007SA002 (line spacing 1000m) partially covers this survey region and regional survey 20010SA050 cover this region (at 2500m).

Generally magnetic texture in the SE is predominately NW-ESE trending. The sediments in the SW portion of the survey display a NE-SW trend overprint (Figure 39). Four regions displaying an interesting magnetic response in the line data have been marked with a red dot on Figures 39 and 40). These may warrant further investigations, particularly where they located in structurally favourable regions.

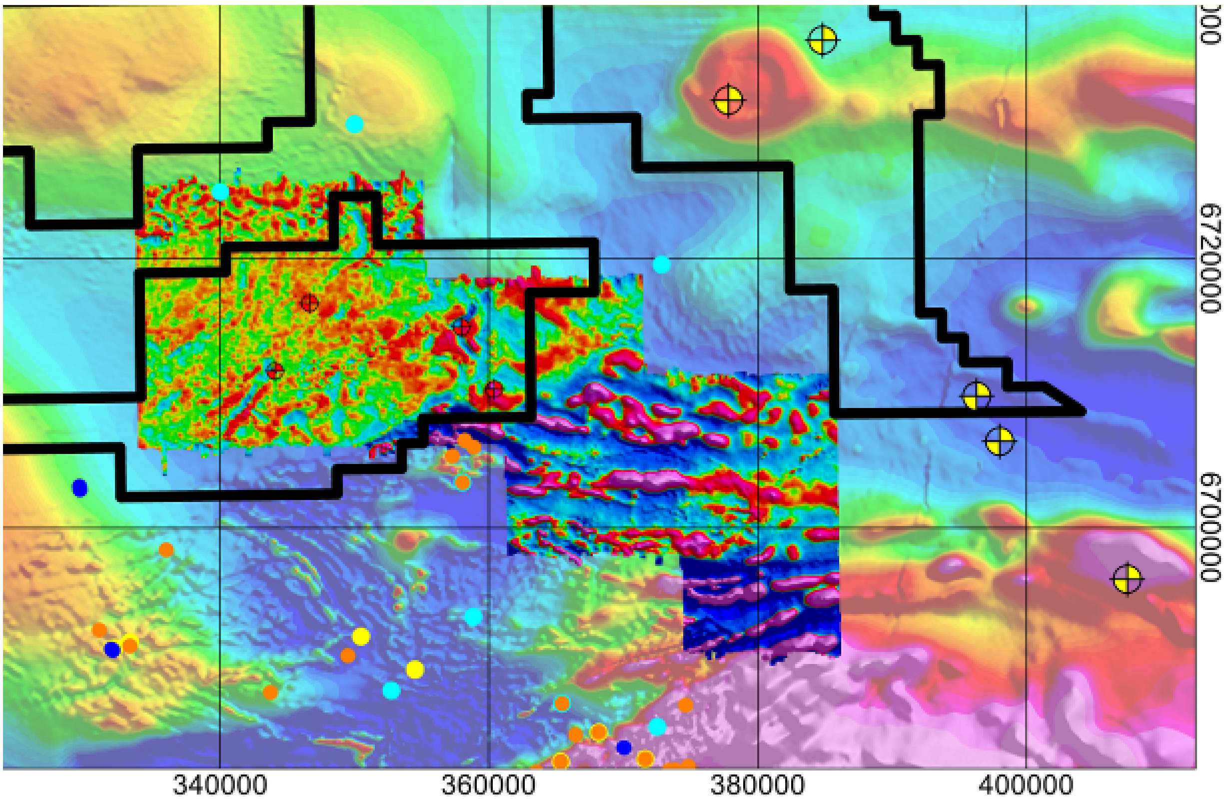


Figure 39: High Pass RTP Survey 1994SA008 with regional magnetic background. Red dots indicated interesting near surface magnetic response.

The radiometric signal reflects the near surface (top 30cm or so) and can be used to map the surface regolith. Much of the survey response appears to be associated with weathered regolith and drainage patterns, and no unique response is associated with the underlying magnetic basement. Elevated potassium responses are dominated by drainage responses and are unlikely to reflect areas of potassic alteration. The uranium channel is particularly noisy.

As there does appear to be some regions displaying signs of magnetic remanence (reversed magnetic features), two forms of magnetic modelling were undertaken:

- Standard 3D inversion of the TMI data (which does not take into account magnetic remanence); and
- 3D Magnetic Vector Inversion MVI (which does takes into account magnetic remanence).

The final gridded residual TMI data were input into the Geosoft Voxi inversion code and run as a sampled gridded dataset using cell sizes of 110m XY and 55m Z due to model size limitations. Note, in smaller areas of particular interest, it will be possible to increase the resolution.

The inversions were undertaken for magnetic susceptibility (and do not consider any remanence which may be present in some regions) as well as MVI (which do take into account remanence such as any magnetic responses formed when magnetic poles were reversed).

In order to enhance output resolution, the initial outputs have undergone a focussing technique using a factor of 2. Topography and flying height were incorporated into the model and has had some effect on the final result. The output from the inversions displays little surficial noise.

The total modelled susceptibility values of the modelled bodies range between around -0.002 – 0.026 SI (relatively low to moderate, the negative values indicative of magnetic remanence).

A depth slice through the model is shown in Figure 40 and selected perspective views of the 3D output are shown in Figure 41. On review of both model output, it does appear a degree of magnetic remanence may be present at depth in some regions – particular the east. The 3D modelling also shows a ridge of higher magnetic basement trending NW through the centre of the exploration lease.

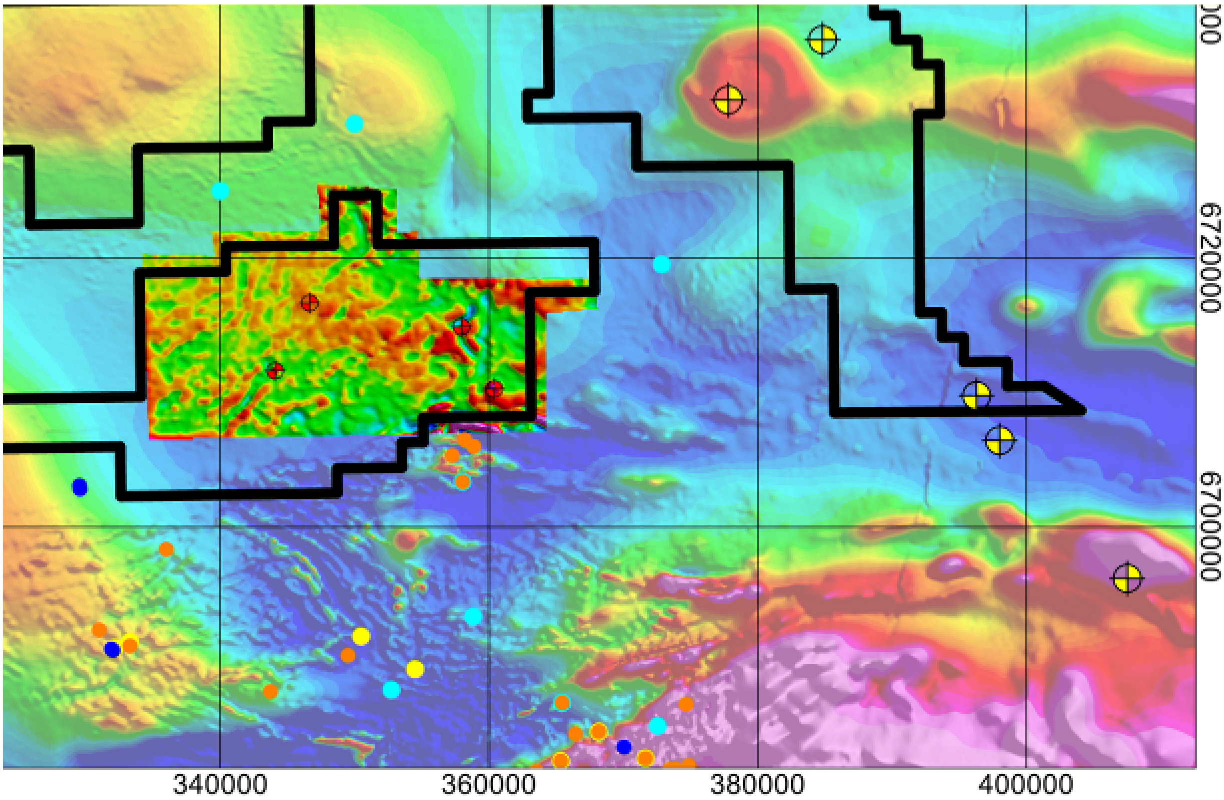


Figure 40: Mag Susc model -300mRL, red dots indication interesting near surface magnetic response.

GIS compatible high resolution Geotifs of the processed and enhanced geophysics have been produced. Along with depth slices through the 3D magnetic models and a 3D OMF file

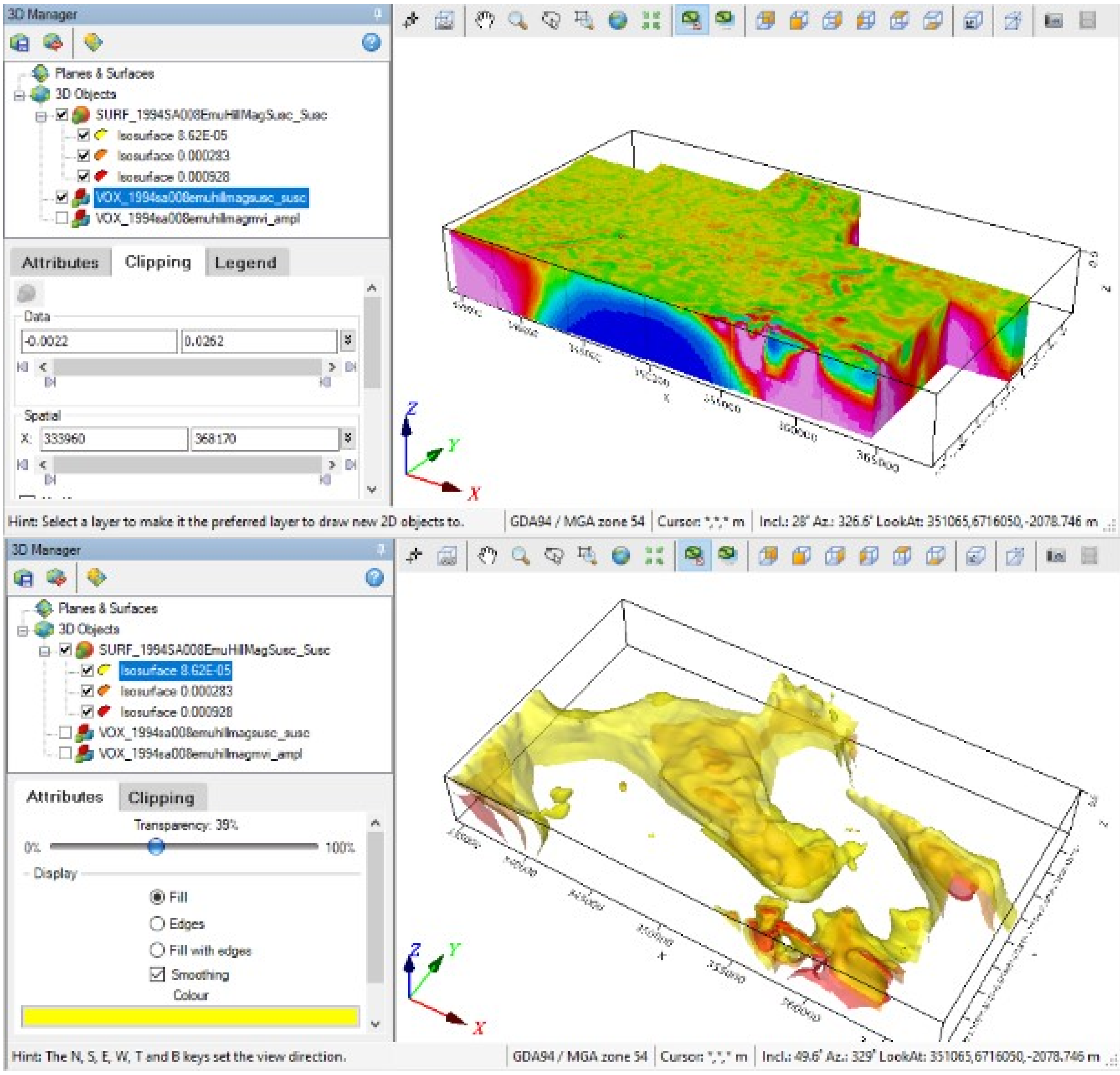


Figure 41: Representative 3d views of 1994SA008 Magnetic Susceptibility model.

DISCUSSION

The AEM conductivity data is complex and reflects a number of parameters including salinity, amount of clays and porosity. A palaeo-channel may give a resistive response if it involves sandy material and fresh water, but show increased conductivity with saline water and / or clays. Similarly, reductants such black shale / graphitic horizons and some clays are conductive, whereas lignite is likely to be resistive. Alteration (along structures) may enhance conductivity. An AEM survey generally provides value to the exploration program by:

- Assist in mapping palaeo-drainage where conductivity contrasts exist. It will also assist in the identification of conductive clays / black shales / graphite horizons (strong linear conductive responses without associated magnetic response) which may be relevant for uranium exploration. Pyrite-rich sandstones may display a weak increase in conductivity associated with a weak magnetic signature.

- Assist in identification of prospective structures. Some structures may control uranium movement and deposition. Some structures may influence other metal deposits in this region.
- Delineation of discrete bedrock conductors beneath areas of thin oxidation. These can potentially represent massive sulphide mineralisation, fluid-filled prospective shears and faults. These target zones may also display an associated magnetic response.

It should be noted that the resolution of these AEM surveys are limited by the broad line spacing. It should also be noted that strong conductive responses attenuates the EM response and in turn reduces the depth of investigation in these areas.

Disclaimer

The conclusions and recommendations based on any interpretations of geoscientific data contained in this report are provided at the request of the client. GeoDiscovery Group Pty Ltd accepts no liability resulting from any commercial decisions or actions taken by the client based on the recommendations presented in this report.