GR461_2019_GA_04_App3_MagInterp.pdf

EL25566 - MAG ANOMALY #1

Magnetic anomaly - Interpretation Report

Executive Summary

Detailed airborne magnetic data on Gempart (NT) Pty Ltd's EL25566 has defined a distinct magnetic anomaly in the Mesoproterozoic Musgraves Province in the extreme southwest corner of the Northern Territory. Rare outcrop in the general area comprises Mesoproterozoic granitoids and felsic/mafic gneiss. Detailed modelling shows the source of the anomaly is a localised concentration of up to 15% magnetite at shallow depth in unknown lithologies.

The interpreted anomaly source may well represent a skarn type of deposit, with potential for various commodities including copper, gold, lead, zinc, molybdenum, tungsten, etc.

It is recommended a detailed ground magnetic survey be completed. Following this, options include acquisition of ground EM data or interpretation of the ground magnetic data to define drillsite(s) to test for mineralisation.

Introduction

The Mag Anomaly #1 prospect is located in the south-central part of granted EL25566, in the extreme southwest corner of the Northern Territory on land administered by the Petermann Land Trust. The prospect can be identified as a distinct magnetic anomaly of 1,700 nT amplitude as recorded on helicopter-borne traverses at 60 metres altitude. It is about 500 x 800 metres in extent, elongate in the WNW direction. There is no response in any of the radiometric channels. General location is shown at Figure 1, and the geophysical response is shown at Figure 2.

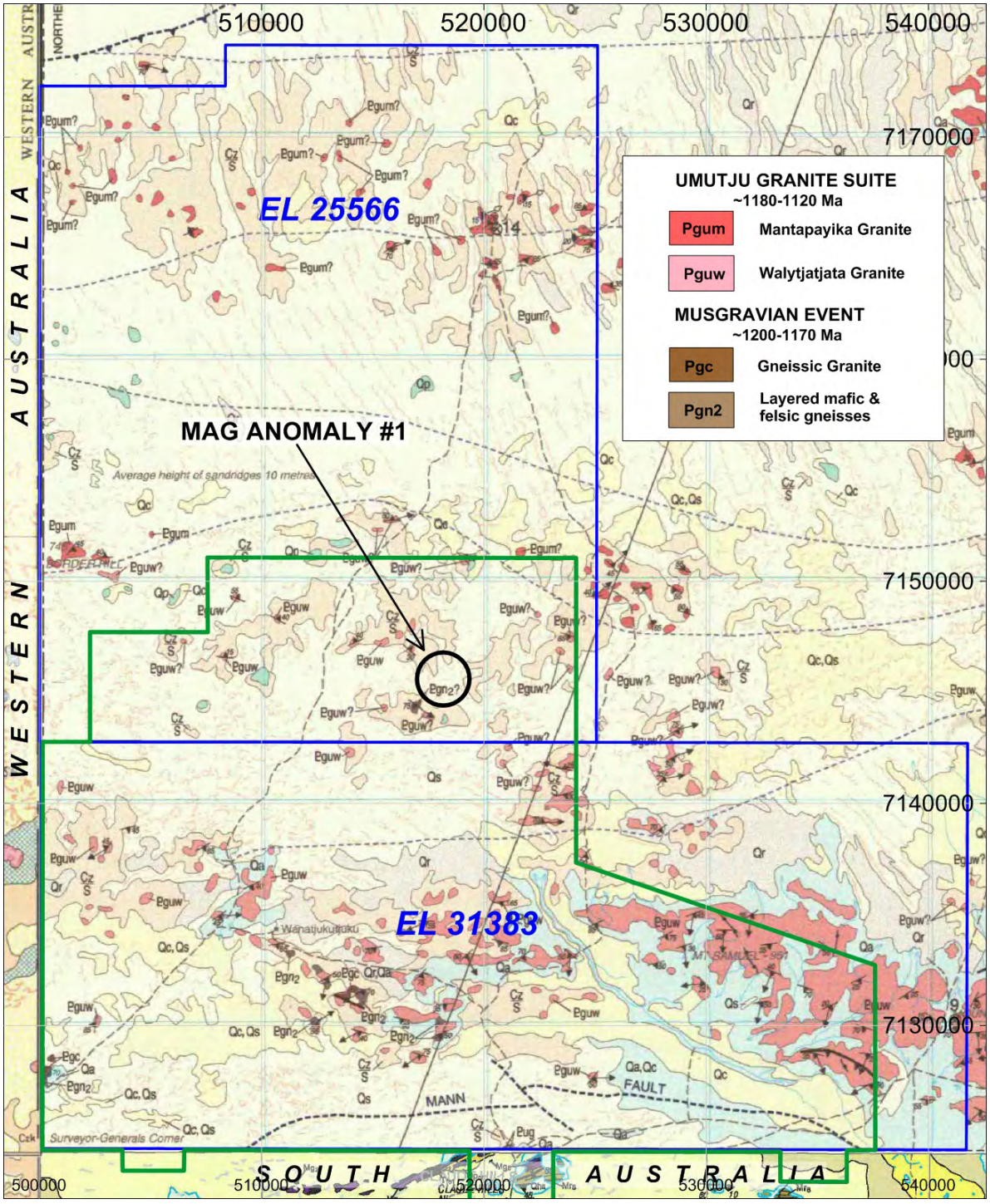

Figure 1. Location Map showing Mag Anomaly #1 prospect on published 250,000 scale geology (Petermann Ranges sheet).

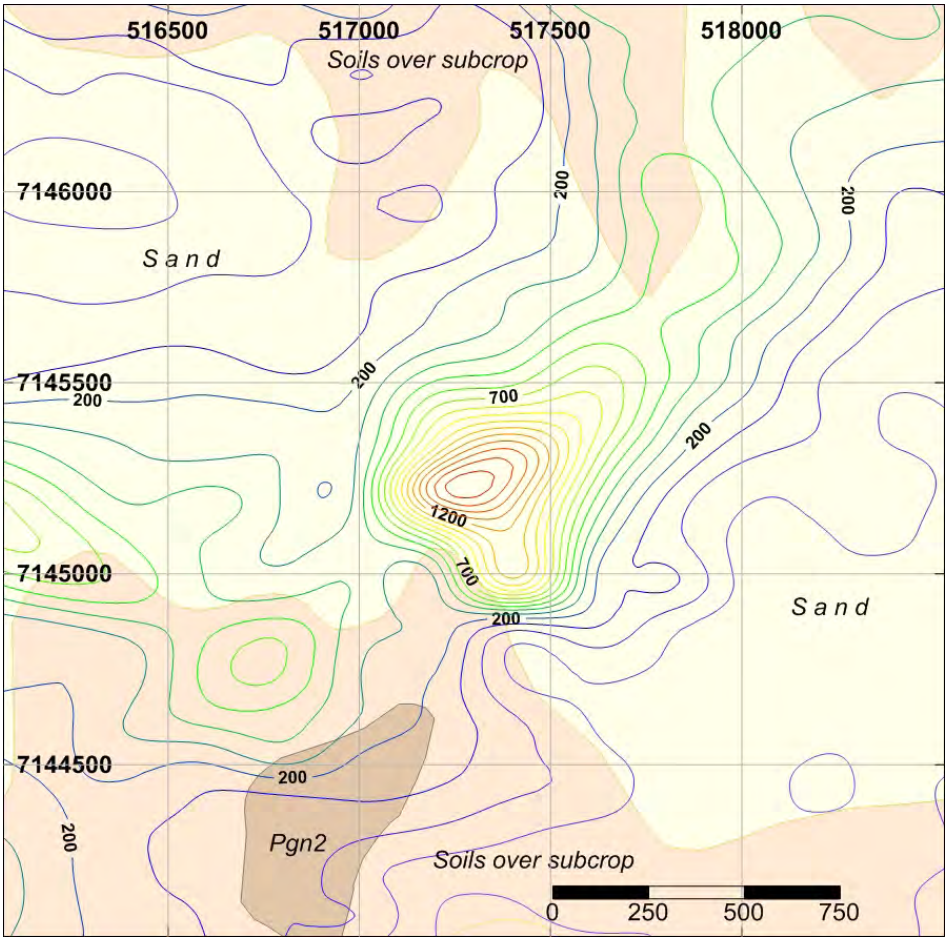

Figure 2. Mag Anomaly #1 prospect - contours of RTP aeromagnetics.

Geology

The latest available published geology is from the Petermann 1:250,000 mapsheet published in 1999. On a regional scale there is scattered outcrop of Walytjatjata Granite (Pguw) of the Mesoproterozoic Umutju Granite Suite, with rare outcrop of un-named layered and felsic gneisses (Pgn2) assigned to the Mesoproterozoic Musgravian Event. The Walytjatjata Granite is described as porphyritic clinopyroxene granite with rounded blue-grey phenocrysts of K-feldspar, locally megacrystic or coarse grained equigranular; variably deformed and recrystallised to garnet-bearing assemblages; rare migmatite.

The geology in the vicinity of the magnetic anomaly is mapped as Quaternary sands (Qs). North and south of the anomaly soils over subcrop are developed. About 500 metres south of the anomaly is outcrop of Musgravian Event rocks (Pgn2).

There are no recorded deposits, mineral occurrences or drillholes. No mineralisation of economic potential has been recorded within rocks of the Umutju Granite Suite or Musgravian Event, although the area has been virtually unexplored.

Previous Exploration

Within the general area of the Mag Anomaly #1 prospect, no historical exploration has been carried out. An airborne magnetic and radiometric survey on 500 metre flight lines, called Petermann survey, was conducted on behalf of the NTGS in 1985. Surface mapping by government agencies was last published about 20 years ago.

Exploration by Gempart 2018

A helicopter-borne magnetic and radiometric survey, called Claude Hills North survey, was completed over an area encompassing the southern part of EL25566 by Aerosystems Australia in March 2019. Data were acquired on 200 metre north-south flight lines at a terrain clearance of 60 metres.

Interpretation of aeromagnetics

Synthetic north-south profiles of TMI at 100 metre intervals were derived from the gridded 200 metre line-spaced helimag data. The profile data were forward modelled on a line-by-line basis to determine approximate source geometry. In the absence of petrophysical data, normal induced magnetization has been assumed. The model parameters and results are summarised below, and shown in plan form at Figures 3 and 4, and cross-section format at Figures 5 to 8.

Depth to top: This is reasonably well constrained in the modelling. Depth to fresh rock as source of the primary magnetic anomaly is interpreted to vary from 36 to 86 metres below ground level.

Dip: Interpreted dips are typically 70 to 80 degrees to the north.

True width: Magnetic modelling can only calculate a susceptibility x width product; the individual parameters cannot be independently resolved. For this exercise most thickness's were fixed at 100 metres. Interpreted susceptibilities of the main part of the anomaly are 0.25 to 0.3 SI units, roughly equivalent to 15% magnetite.

Depth extent: Except for shallow, depth-limited sources, modelling is not very sensitive to depth extent. Vertical depth extent was arbitrarily set to 1,000 metres.

The final model of magnetite distribution resolves as three separate sub-parallel units of 400 to 700 metre strike length, striking east-west or WNW. It is shallowest at the western end, where fresh rock is interpreted to be at a depth of about 35 metres. Dips vary between 60 and 80 degrees north. A simplified outline of the model is shown at Figure 4.

Economic Potential

Results of modelling indicate a localised development of magnetite in Mesoproterozoic rocks of indeterminate composition.

The Mag Anomaly #1 response is consistent with that observed over skarn type deposits. Examples in the Northern Territory include Johnnies Reward, a magnetite-copper-lead-zinc-gold metamorphic skarn, and Molyhil, an iron-rich molybdenum and tungsten skarn. The Cairn Hill iron-copper-gold deposit in the Mesoproterozoic Gawler Craton in South Australia is another example. All these deposits occur in different geological provinces in older rocks. However given the paucity of hard geological knowledge or exploration data in the area, possibilities of mineralisation models are a blank canvas.

Recommendations for further work

It is recommended that a detailed ground magnetic survey be completed to further define the anomaly. Interpretation of the data would define drillsite(s) to test for alteration/mineralisation. Alternatively, a moving loop ground EM survey could be carried out to test for the presence of bedrock conductor anomalies possibly representing sulphides.

G. Bubner AsIs International

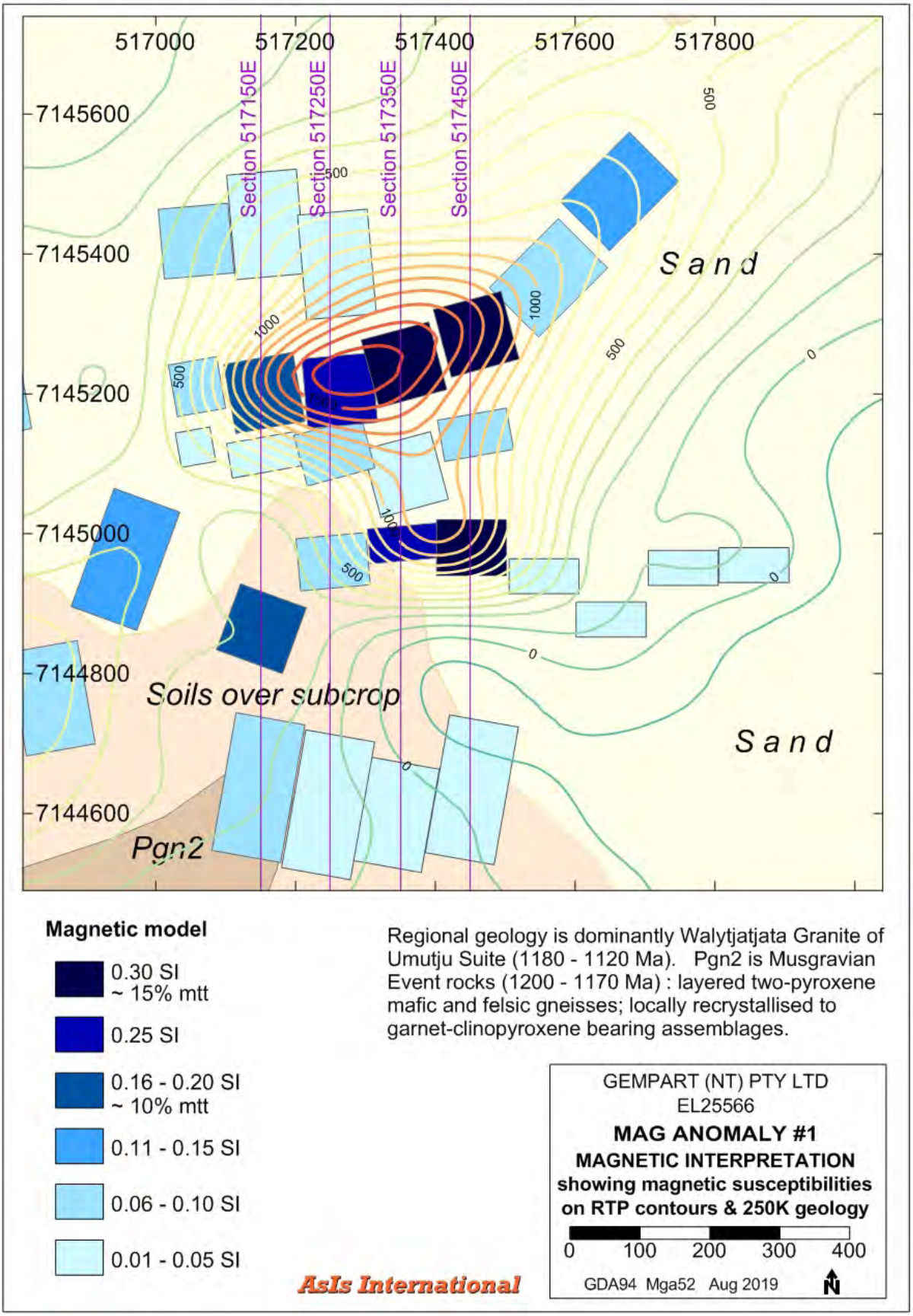

Figure 3. Mag Anomaly #1 prospect. Interpretation of aeromagnetics on RTP magnetic contours.

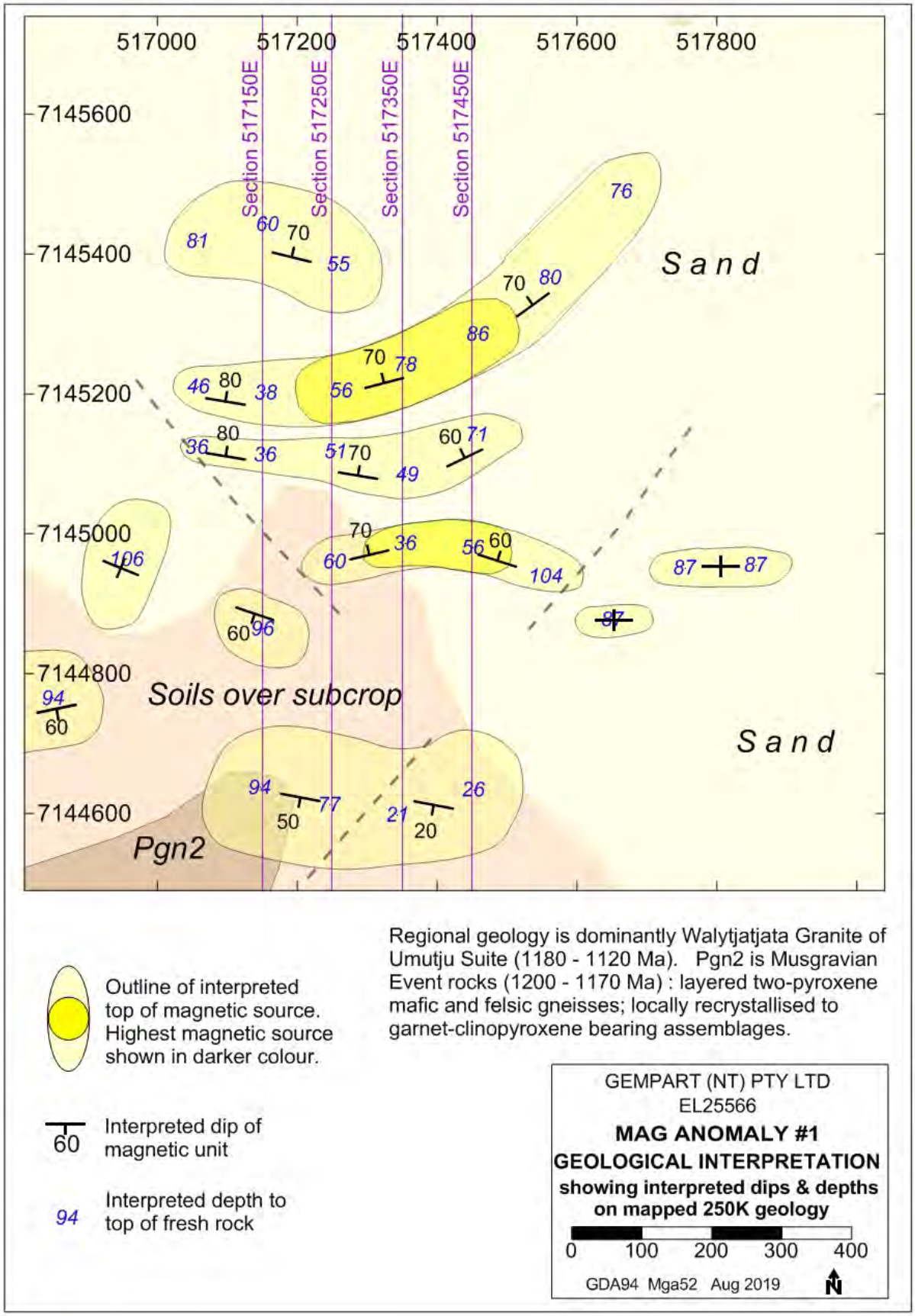

Figure 4. Mag Anomaly #1 prospect. Geological interpretation of magnetic model.

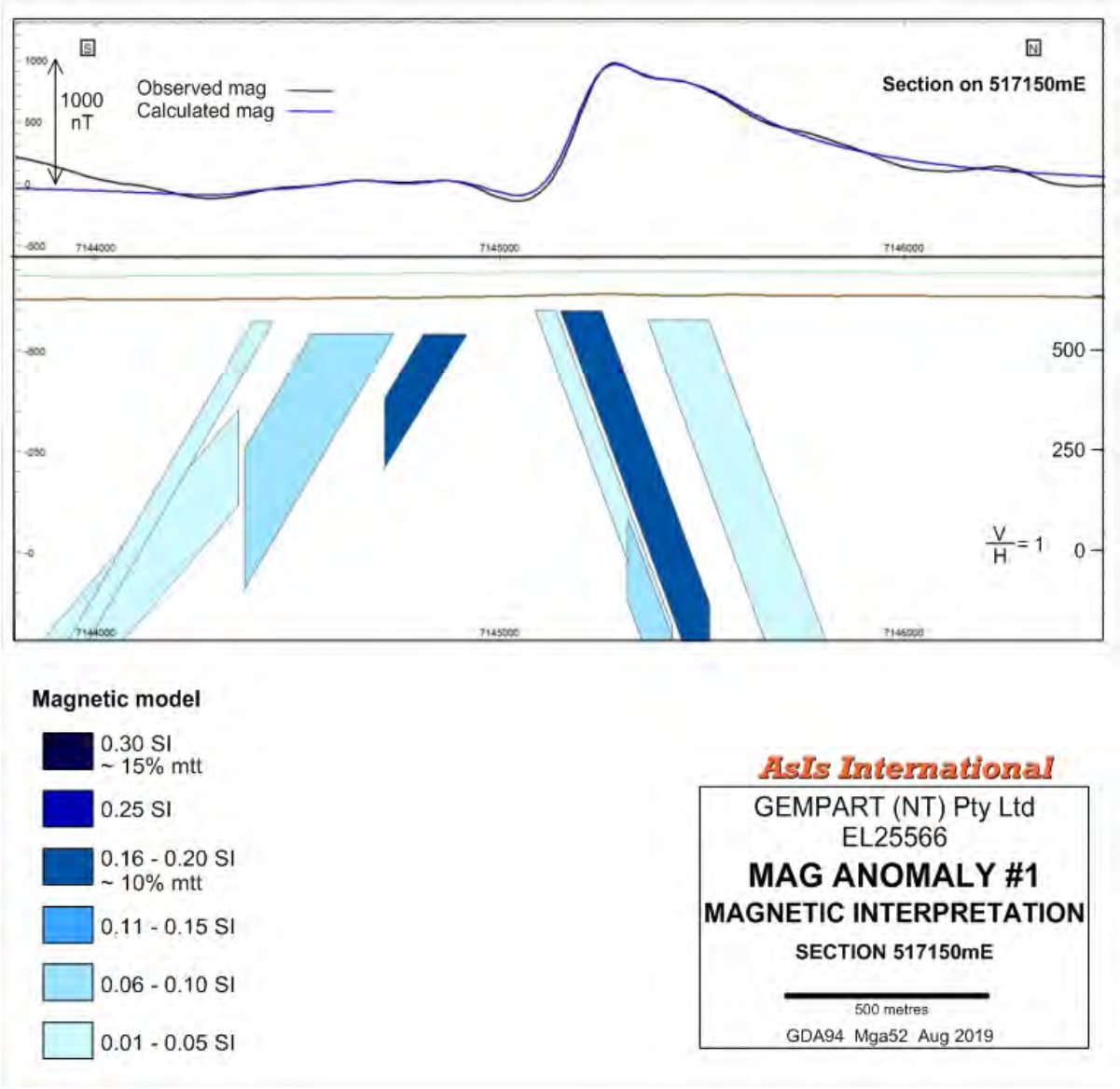

Figure 5. Mag Anomaly #1 prospect - interpretation of magnetics on section 517150E.

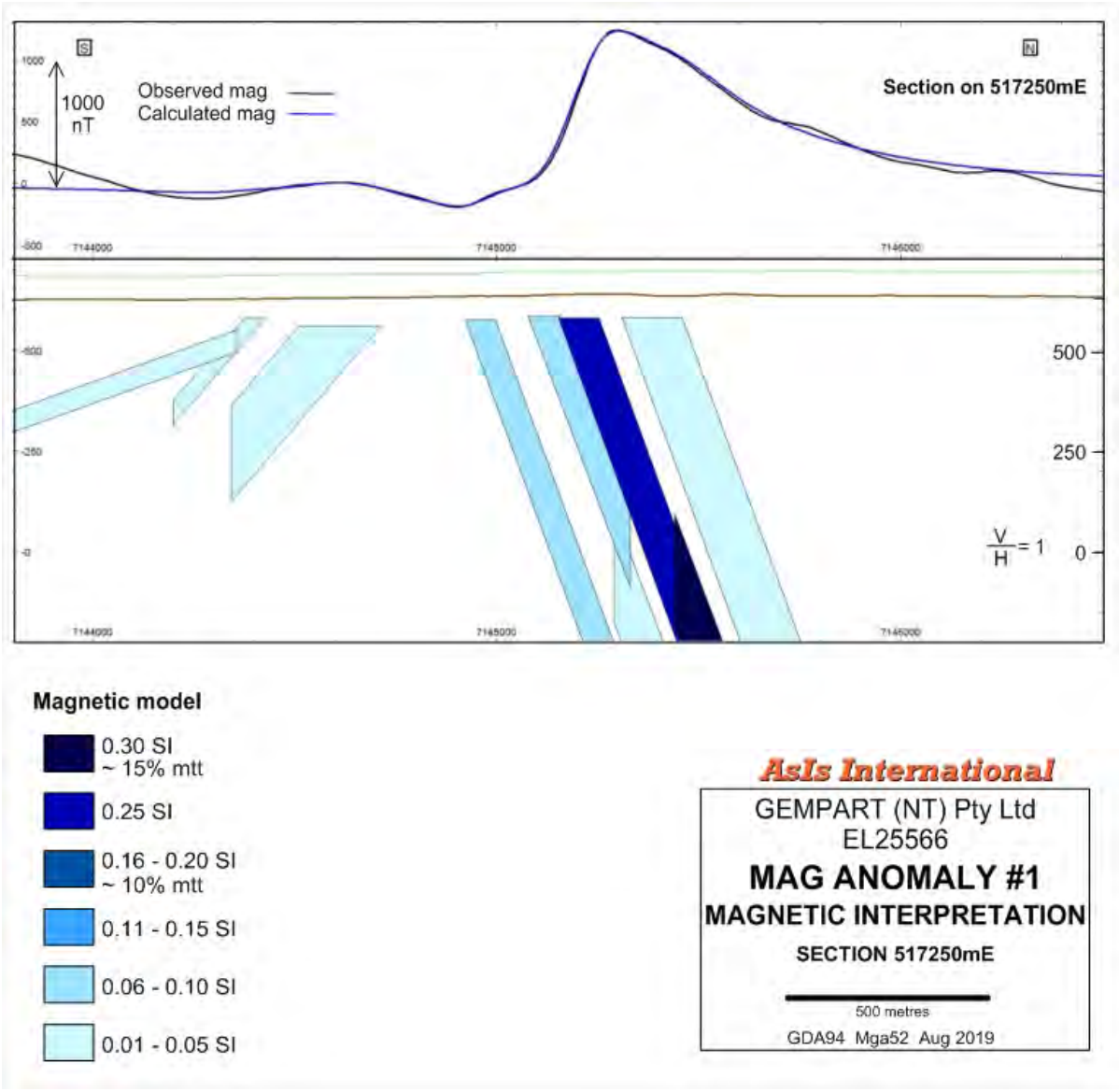

Figure 6. Mag Anomaly #1 prospect - interpretation of magnetics on section 517250E.

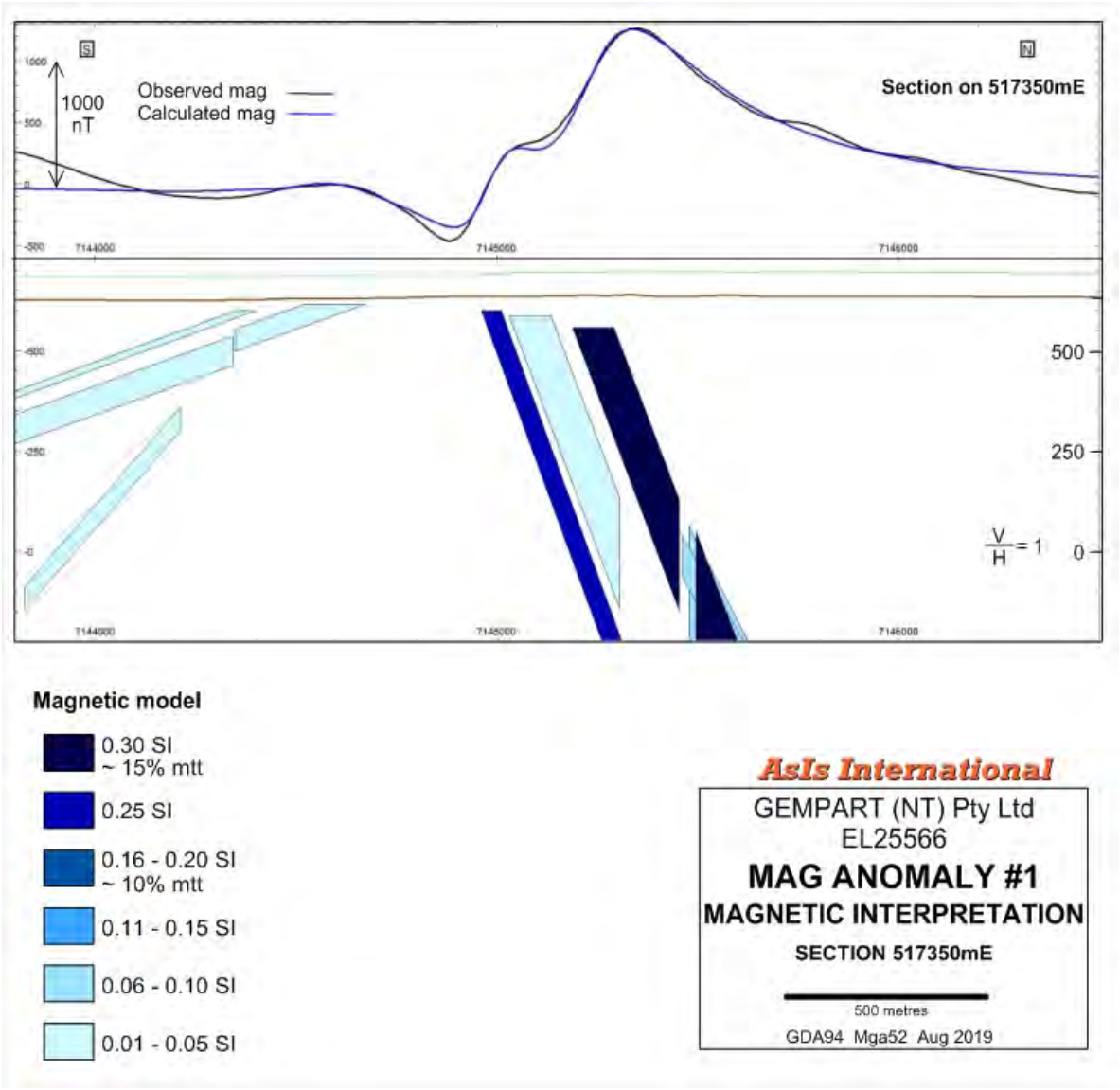

Figure 7. Mag Anomaly #1 prospect - interpretation of magnetics on section 517350E.

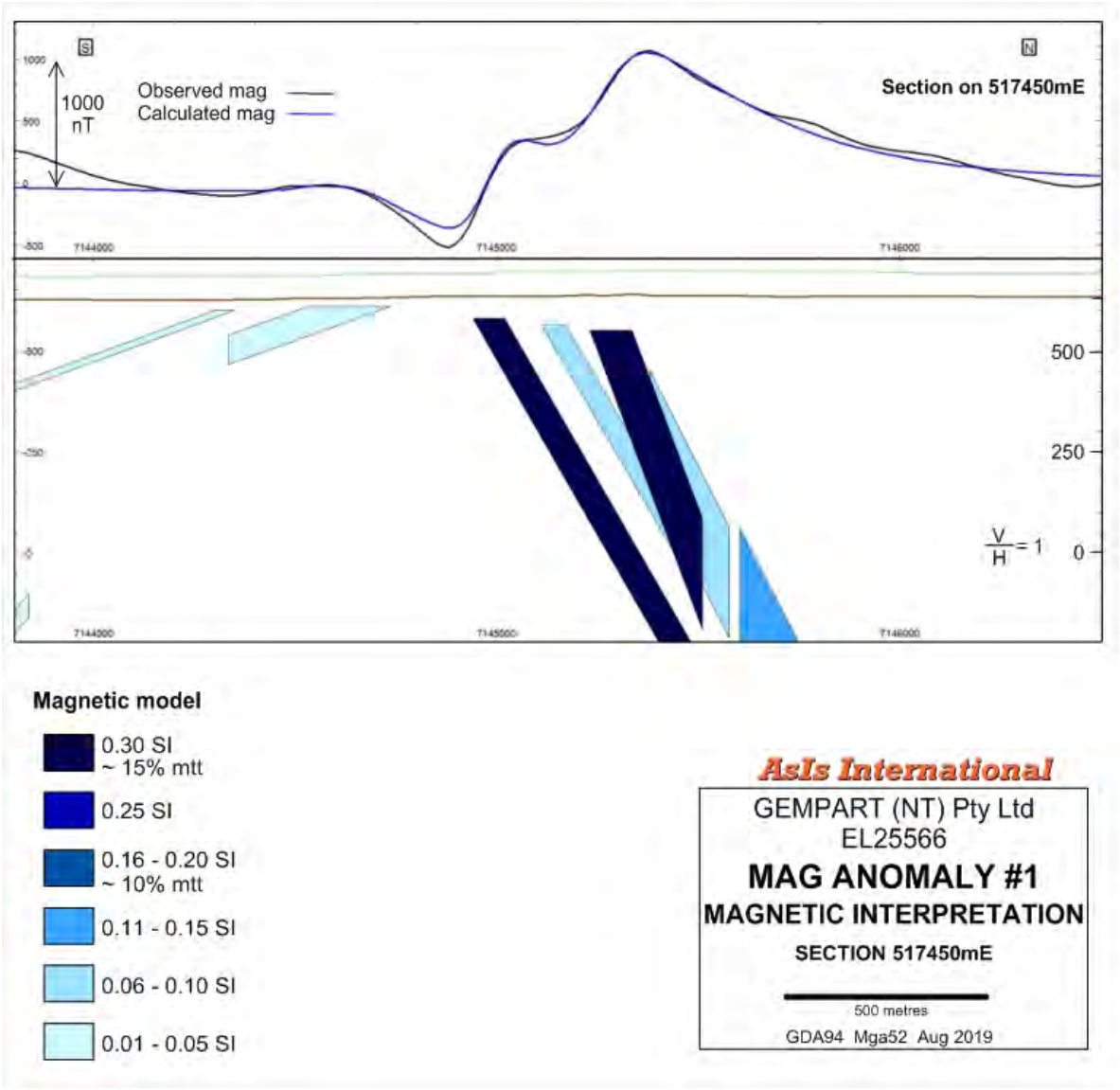

Figure 8. Mag Anomaly #1 prospect - interpretation of magnetics on section 517450E.

References

Scrimegour, I., Close, D.F. and Edgoose, C.J., 1999. Petermann Ranges SG52-7 Explanatory Notes. Northern Territory Geological Survey.