



3D Architecture over the Linda Exploration Lease, western Tasmania

By

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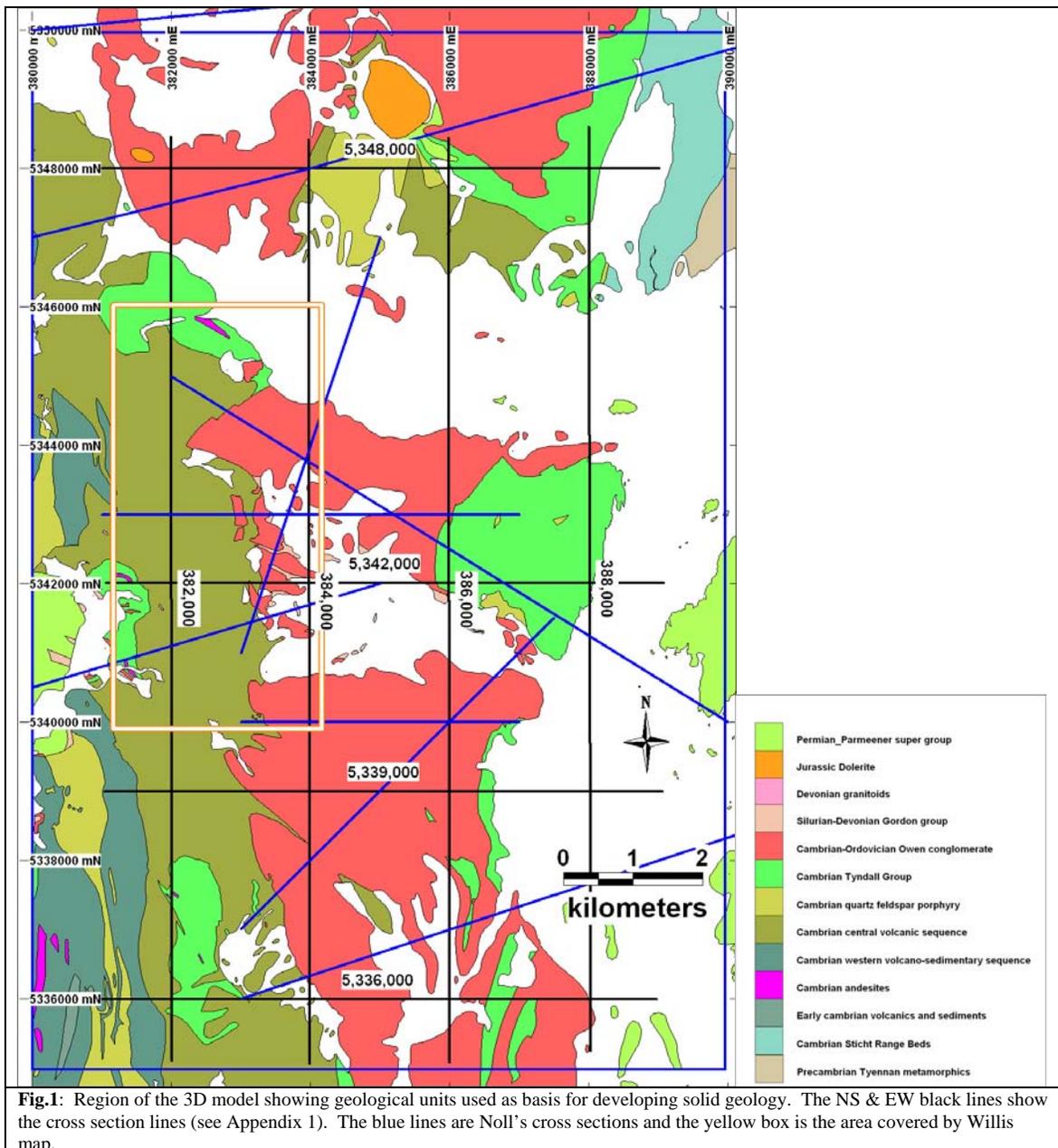
Project Aims

The aim of this project is to help drill targeting within the “Linda Exploration Lease” and especially around Gormanston. To do this, it was necessary to constrain the depth to the base of the Owen conglomerate (BOC) and the position of the Great Lyell Fault (GLF). A 3D model of the region was constructed to facilitate this objective (see 3D pdf attached at the end of this report).

Methodology

In order to construct a geometrically consistent 3D geological model of the BOC and the GLF, the following methodology was employed:

- i. A solid geology map was constructed using 1:25,000 maps published by the MRT (Fig. 1) , a 1:25,000 map from Mt Lyell Mines (Willis 1997) and from mapping by Noll (PhD 2004)
- ii. Four N-S and four E-W trending geological cross-sections were constructed at 12,500 scale (shown in Appendix 1), and these were augmented by existing sections from Noll’s work (Fig. 1), with the following units incorporated:
 - Silurian-Devonian sediments
 - Gordon Limestone, as three units – Lower, Middle and Upper
 - Owen Conglomerate Group
 - Central Volcanic Complex (CVC):
 - Yolande River Sequence
 - Stitch Range Beds
 - Proterozoic basement
- iii. The cross sections were then modeled and refined against potential field data, essentially magnetics as the gravity survey did not have an adequate spatial resolution. A number of forward modeled iterations were made to test the sensitivity of the model to the dip direction of the GLF and the size and shape of alteration envelopes (shown in Appendix 2).
- iv. The cross-sections were reconciled into a 3D model that was then used to predict depth below ground of the BOC in the Linda Valley and to design two drill holes to test the position.



Model intelligence

1. The two major regional-scale faults impact on the model area, the GLF and the Tyennan Margin Fault (TMF), a boundary to the Precambrian block to the east. These faults converge southwards (Fig. 2). They are cut by a series of W-NW trending faults and associated folds which are strongly developed in the south of the model area, and particularly through the Linda Valley. This complex series of W-NW faults is interpreted as a south dipping thrust stack, such as might be developed in a compressional fault bend geometry (Fig. 3).

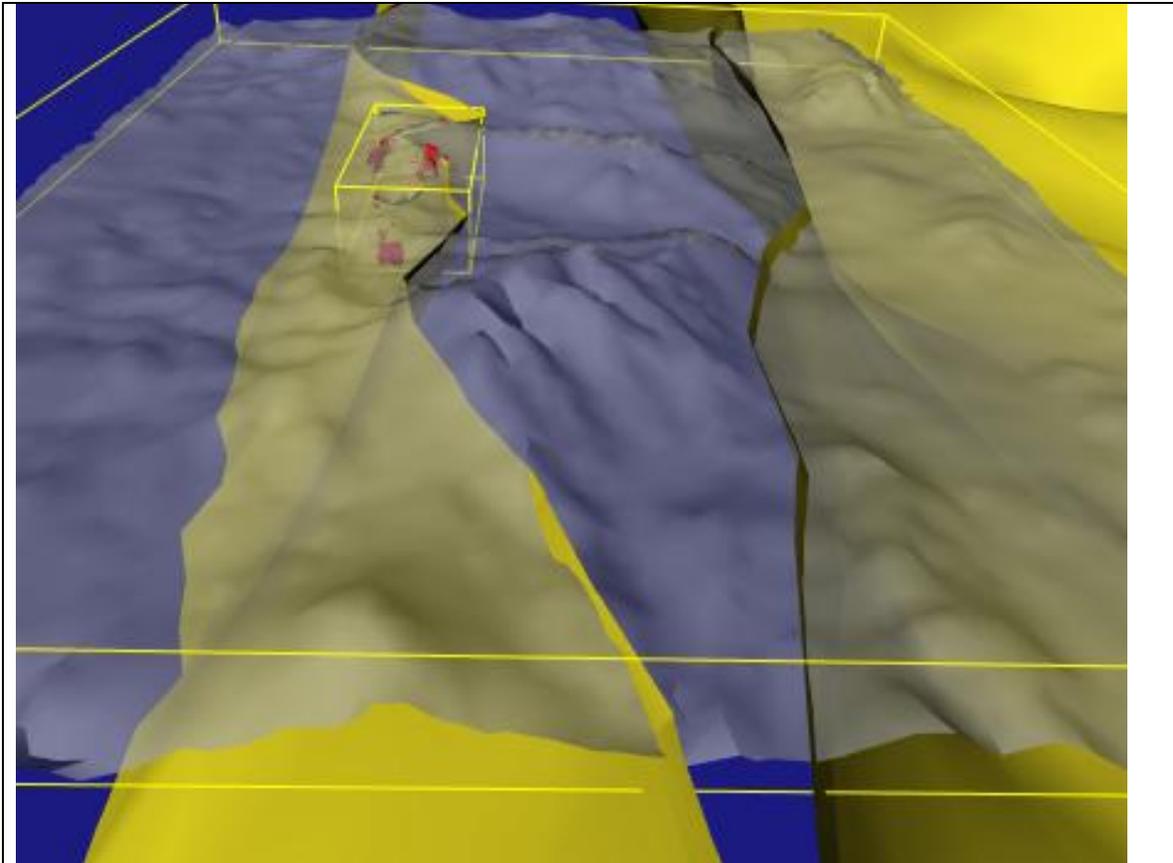


Fig.2: Perspective view from south showing the GLF (yellow, left) and the TMF (yellow, right) below Digital Elevation Model (transparent grey) and shells of 0.1% Cu of Mt Lyell deposits (red, boxed area). Fault and grade surfaces derived from MRT/pmd*CRC regional model.

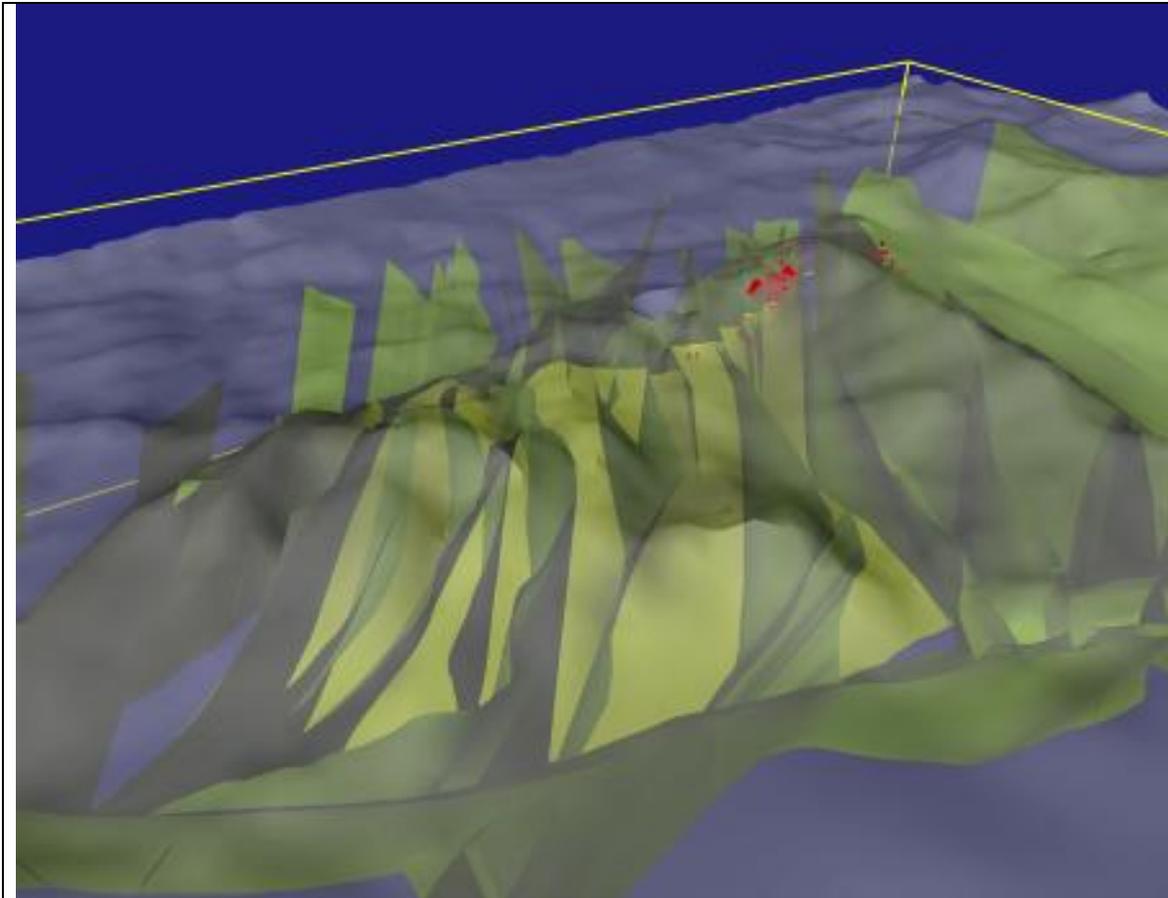
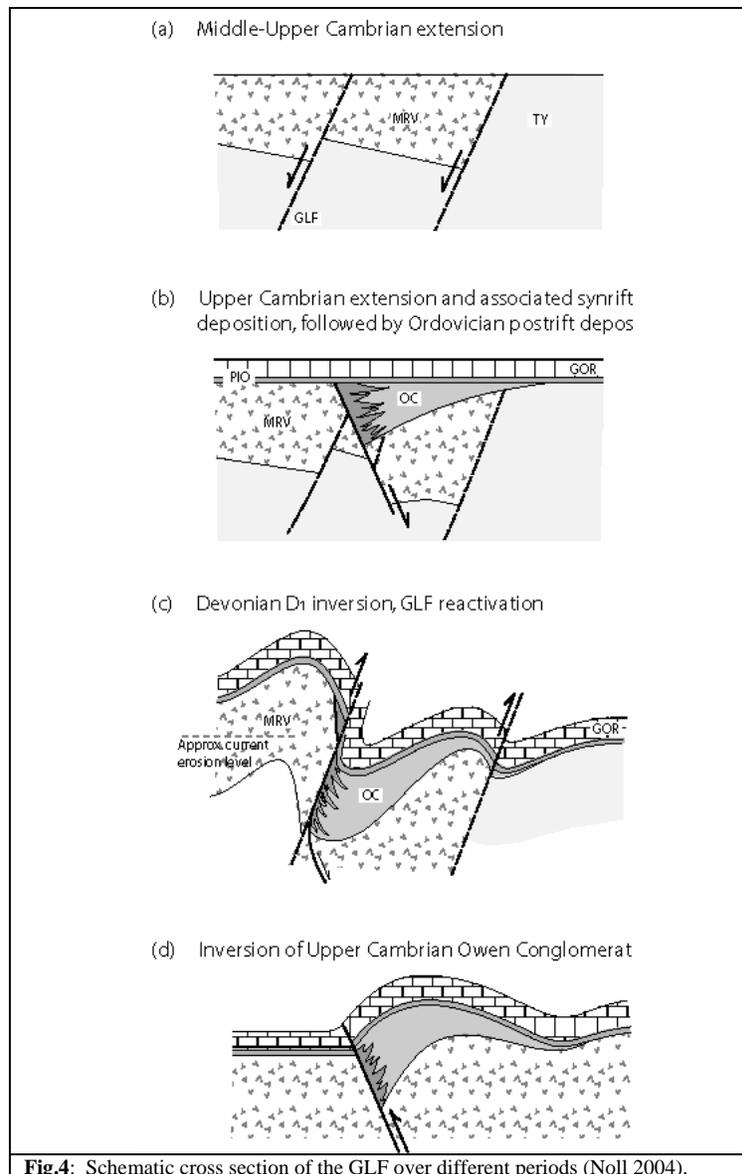


Fig.3: Perspective view from SE showing series of SW dipping high angle reverse faults below Digital Elevation Model (transparent grey) and shells of 0.1% Cu of Mt Lyell deposits (red, boxed area).

2. There is some uncertainty regarding the geometry and timing of the GLF, and its relationship to the Mt Lyell mineralisation. The MRT/pmd*CRC structural model shows a steep west dipping GLF as in Fig. 2, yet on a local scale in the Queenstown district, the GLF has a complex re-entrant geometry which is interpreted as a folded fault (folding event being of Devonian age). However, the earlier history of the GLF suggests that it was a growth fault partly controlling the deposition of the Owen Conglomerate, as expressed through the thickening of the Owen Conglomerate units westwards towards the GLF. This implies that the GLF should have been an east-facing growth fault in the late Cambrian-Ordovician (Noll, 2004; Fig. 4). Prior to this, in the Early to Middle Cambrian, the GLF is interpreted as a west dipping boundary (Fig. 4).



3. The GLF is evidently a very complex boundary and there is a lot of confusion when trying to define it at the surface and it is even more so when trying to map it out in 3D. It is, in part of the area, a growth fault controlling the deposition of the Owen Conglomerate. As such, it is co-located (in part of the model) with the BOC and should eventually step down into the basement. This geometry has not been modeled as there was no constraints as to what geometries should be involved. In the 3D model, reconciling the two interpretation was probably the hardest point and it was in places impossible. The GLF is located at the BOC in the east while it is predicted on the western side of the model as a highly folded, generally steeply west dipping fault. This is the GLF seen around the current mine and intersected in drill holes.

4. A number of iterations on the forward modeled sections were made, to determine sensitivities to changing the dip direction of the GLF and to including alteration haloes in the sections. These are shown in Appendix 2. The models were almost insensitive to variation of petrophysical properties within the alteration halo.

Drill holes design:

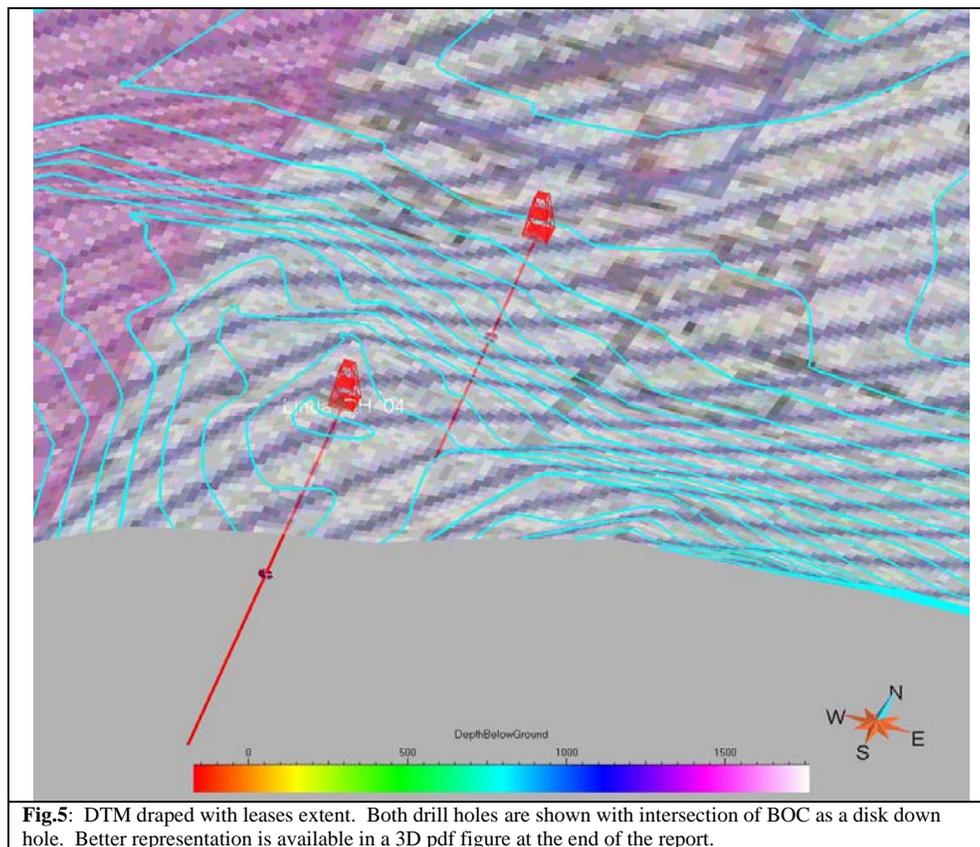
Two drill holes were designed to hit the BOC as shallow as possible and with collars close to current infrastructures (roads essentially). Fig. 5 shows their location, coordinates in AMG66, zone55.

Linda_DH_03:

Collar: 383813mE, 5340755mN, 389m asl
 Orientation: 75 towards 270.
 Total length: 400m
 Predicted intersection of BOC: 180m

Linda_DH_04:

Collar: 383762mE, 5340136mN, 571m asl
 Orientation: 75 towards 270.
 Total length: 600m
 Predicted intersection of BOC: 300m

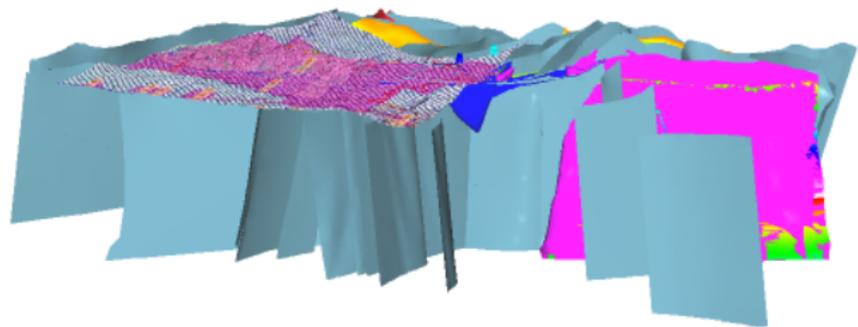


Acknowledgements

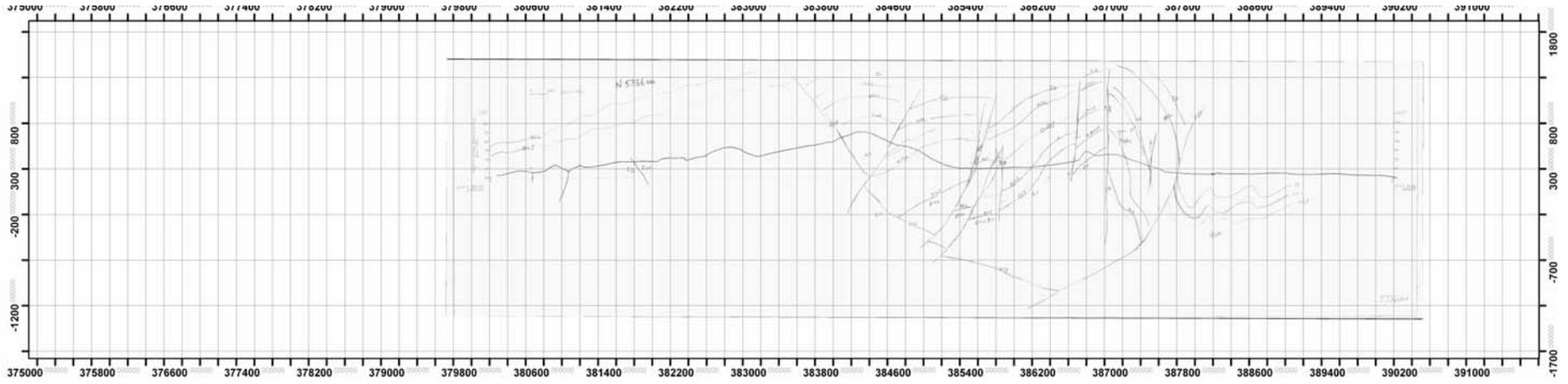
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References

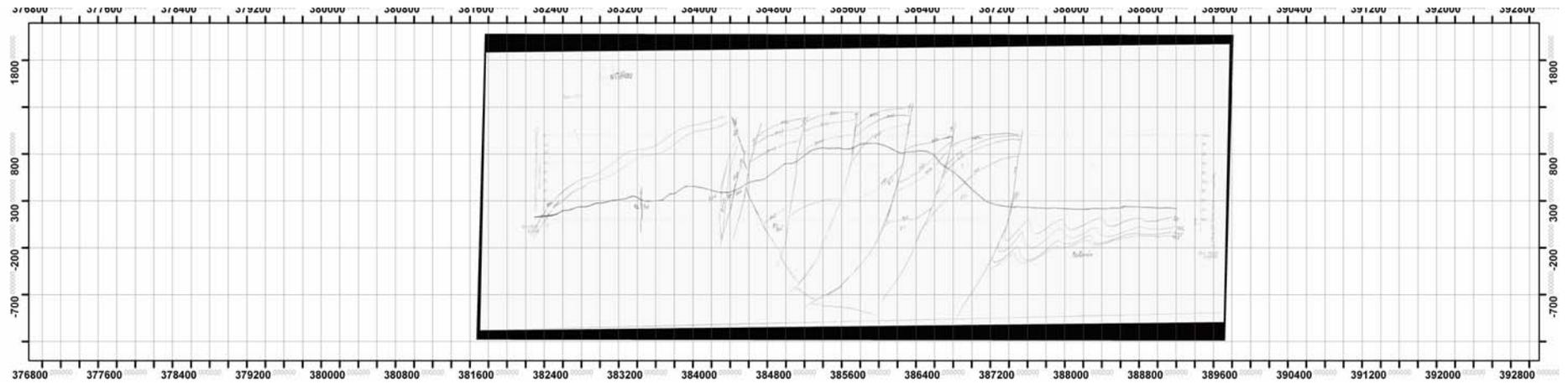
Noll, C. A. 2004. Structural and stratigraphic evolution of the Owen Conglomerate, West Coast Range, Western Tasmanian. Ph. D. Thesis, Monash University, 242pp.



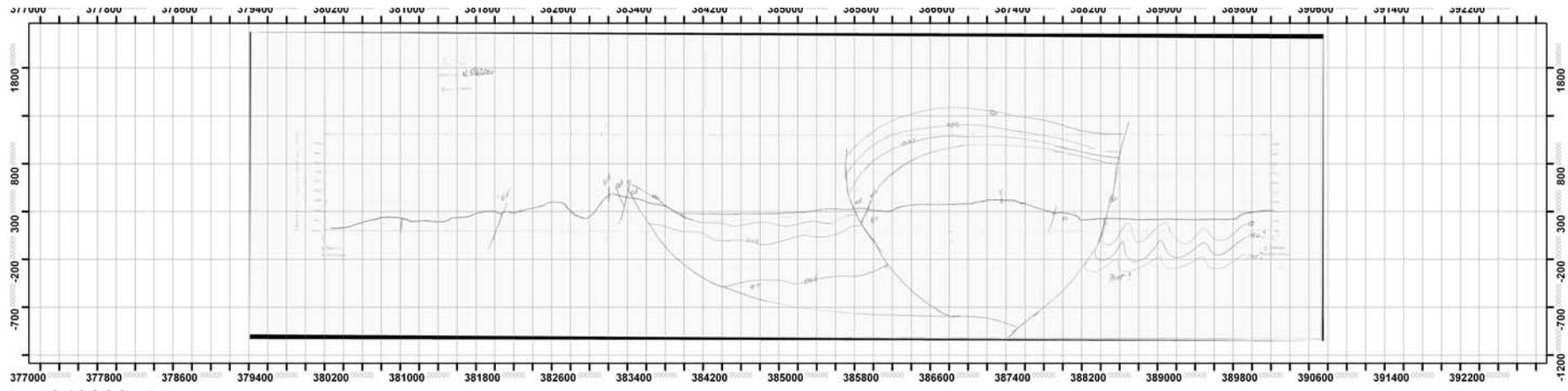
Appendix 1: Geological Cross sections



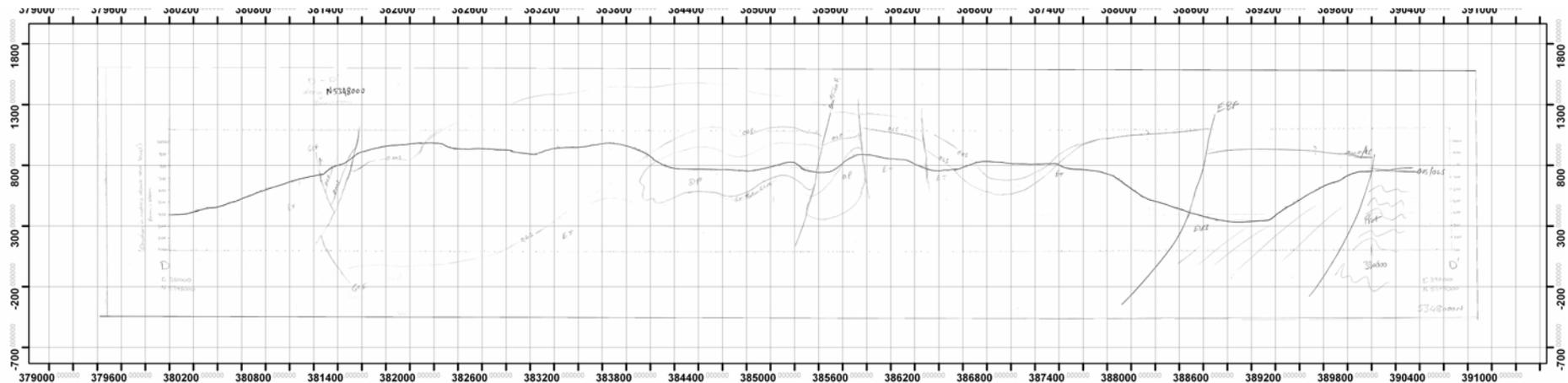
At 5336000mN



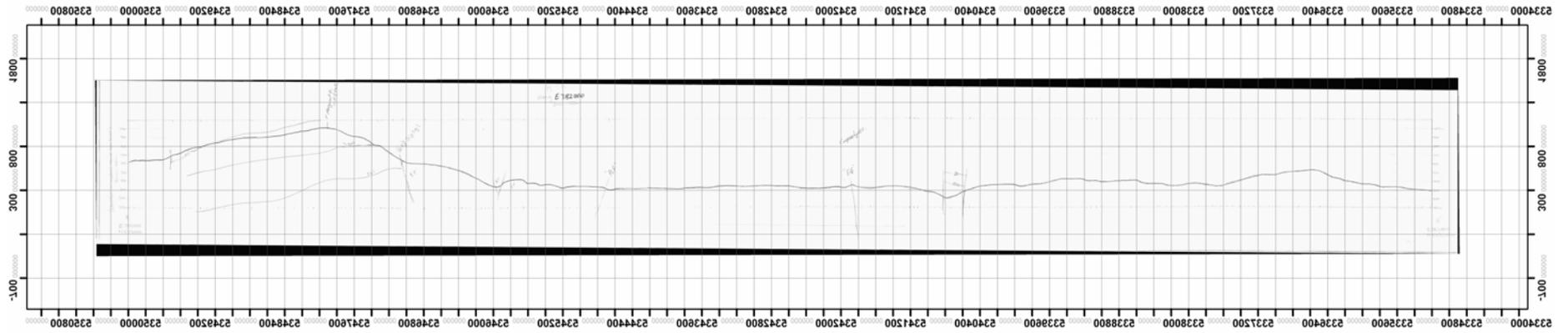
At 5339000mN



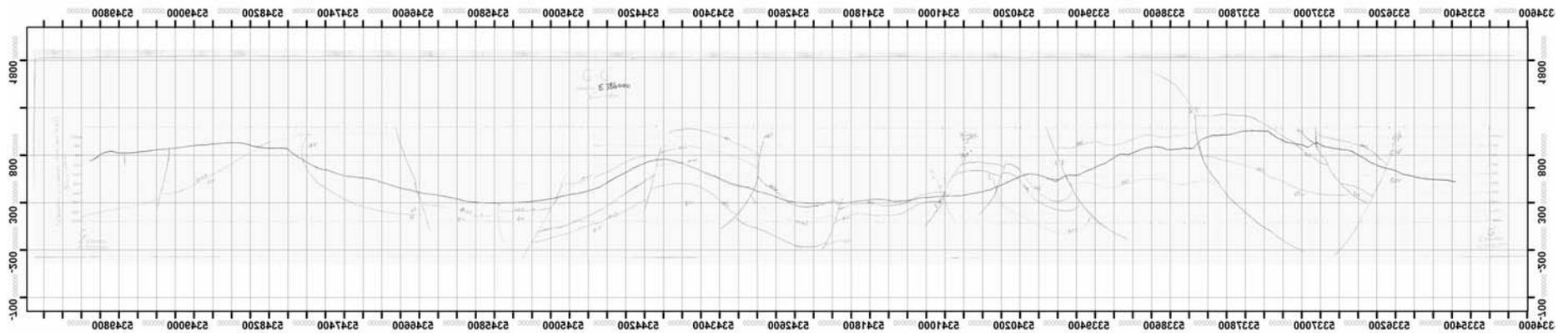
At 5342000mN



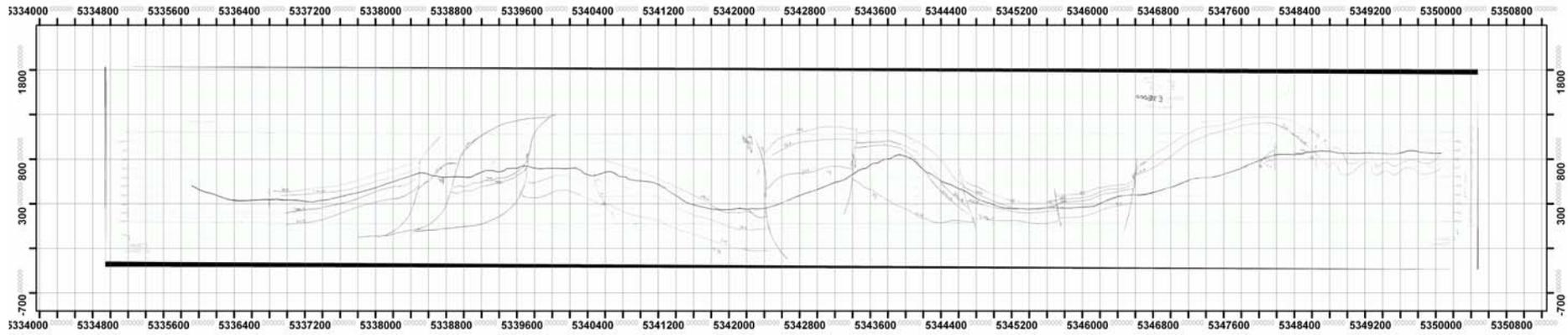
At 5348000mN



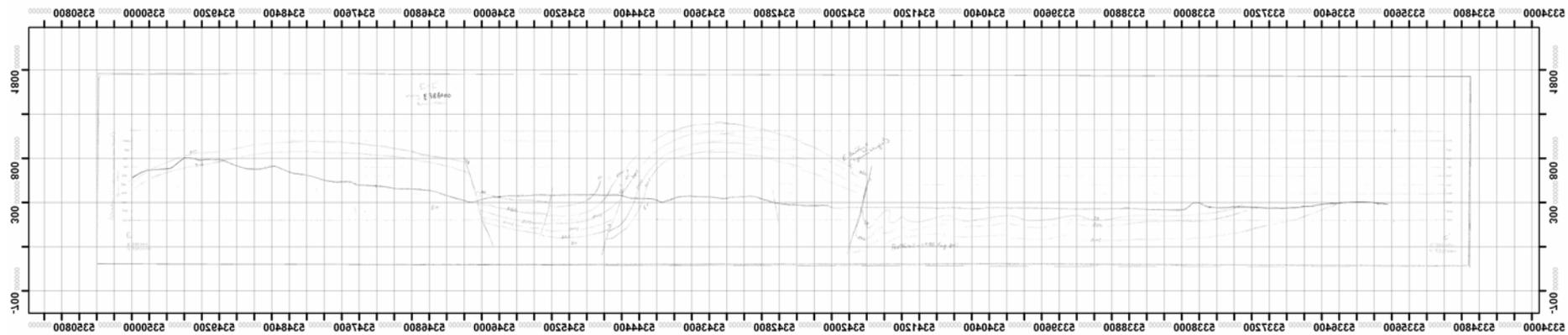
At 832000mE



At 384000mE

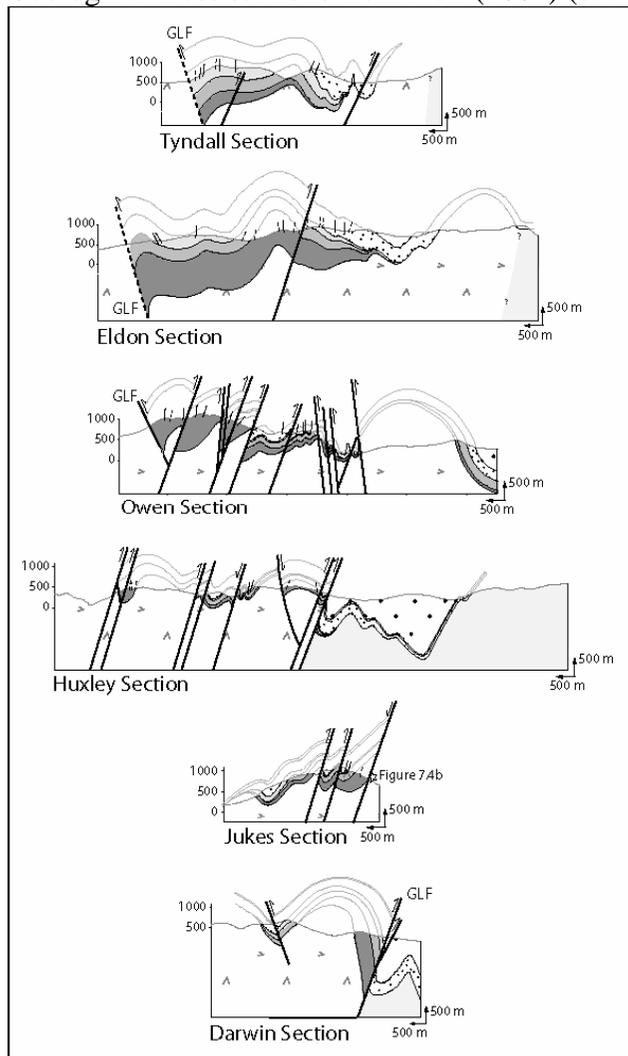


At 386000mE



At 388000mE

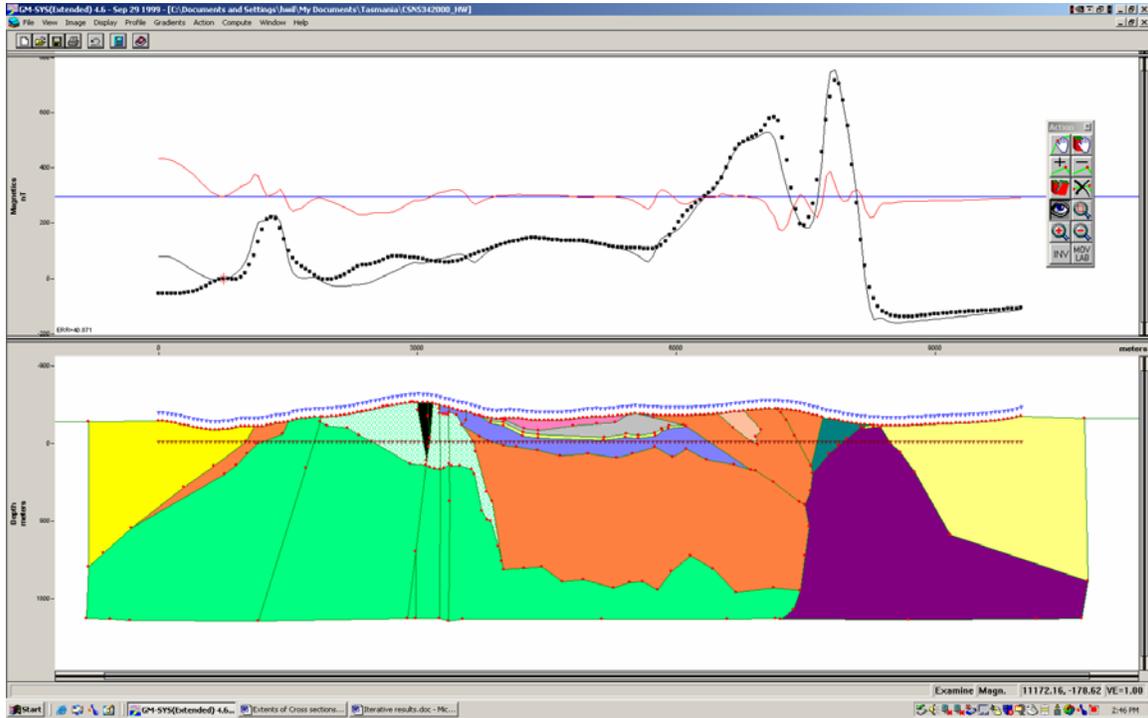
Geological cross sections from Noll (2004) (see Figure 3 for locations)



Appendix 2: Iterative results from forward modeling

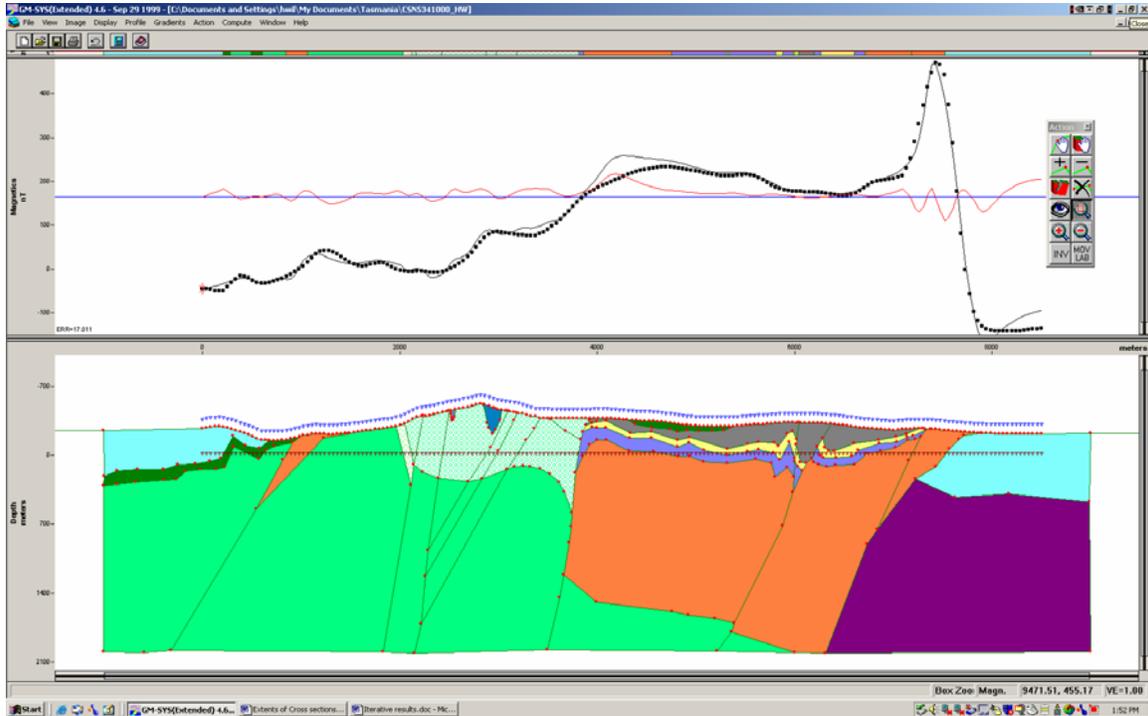
Cross section CSN5342000_HW

- 1) Thick zone of alteration (body of bright green pattern fill) with 0.008 SI magnetic susceptibility within volcanic unit (solid bright green fill) of ~ 0.01 SI. Indicates that alteration has similar susceptibility to the unaltered volcanics (ECV).

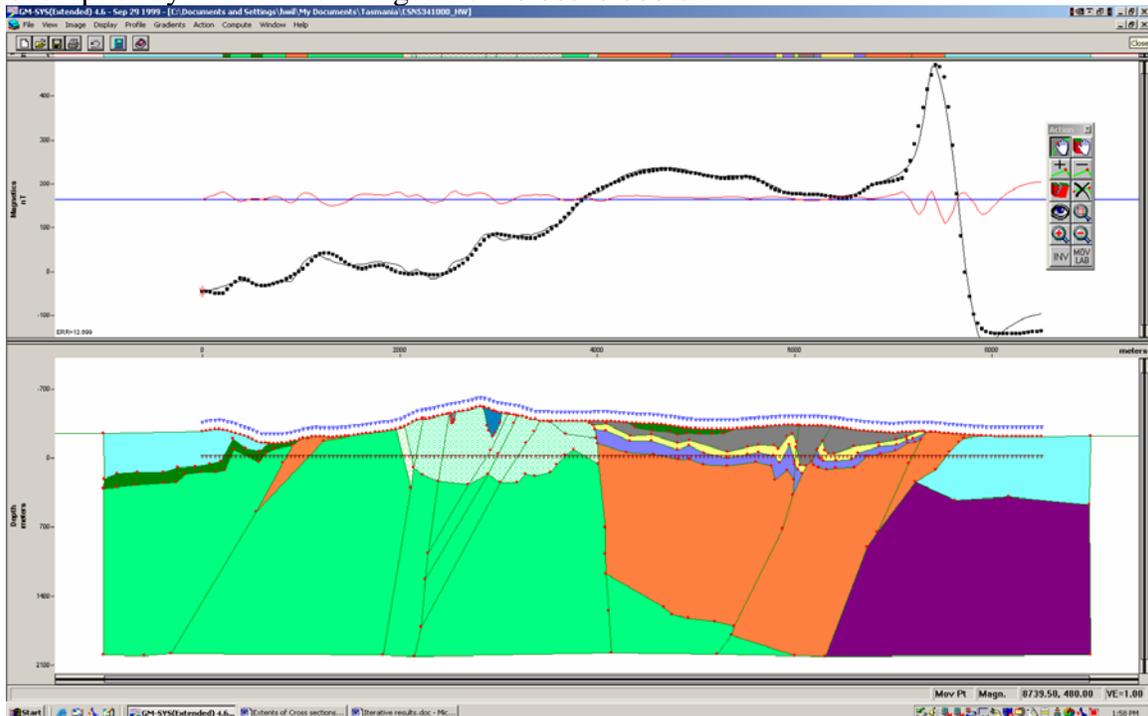


Cross section CSN5341000_HW

- 1) Alteration has magnetic susceptibility ranging from 0.006-0.008 SI. Great Lyell Fault dipping steeply westwards.

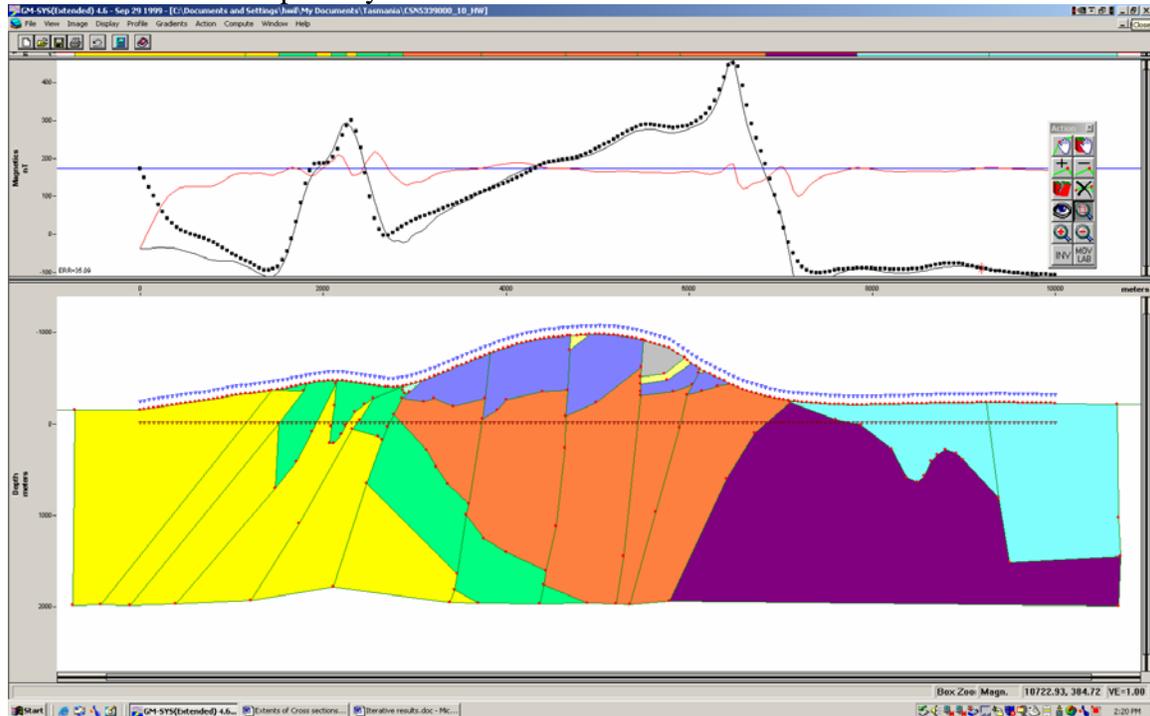


- 2) Great Lyell Fault dipping slightly to the east (almost vertical) provides better fit. Susceptibility of alteration ranges from 0.003-0.008 SI.

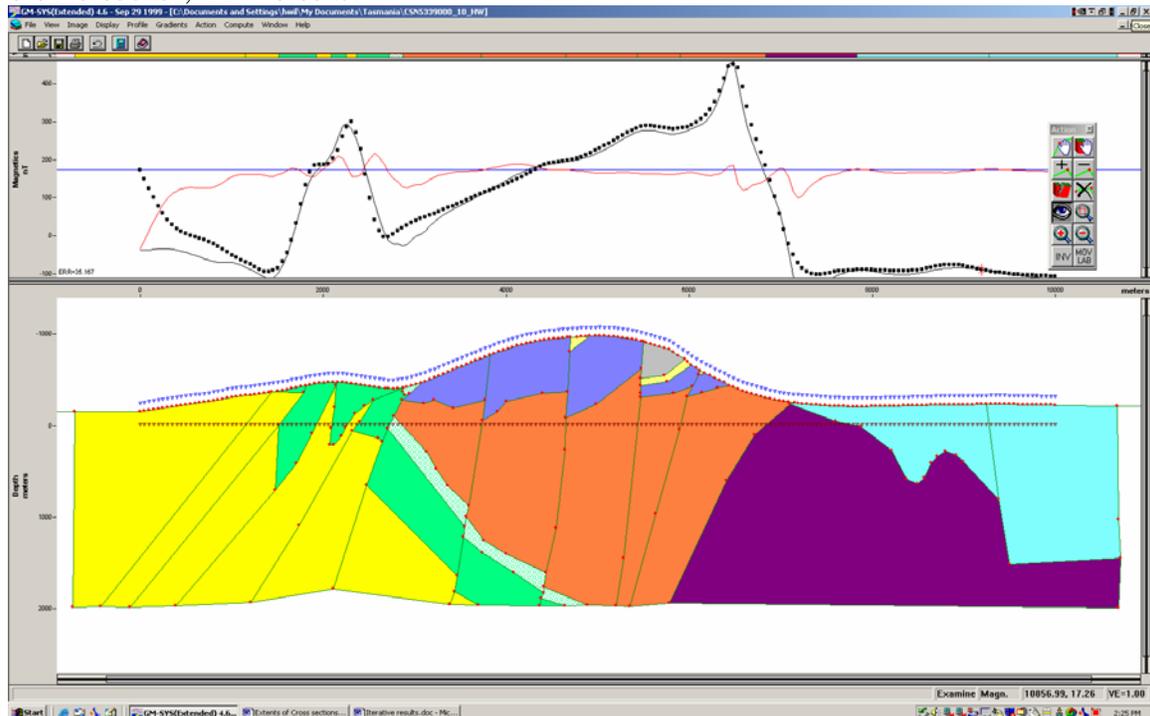


Cross section CSN5339000_HW

1) Changed from original section to include small (~1500m across at surface) alteration zone of 0.08 SI susceptibility.



(2) Alteration layer at included also at the contact between volcanics (ECV) and magnetic ET on the east side of the inferred Great Lyndell Fault. Magnetic susceptibilities: ECV = 0.01-0.035 SI; ET ~ 0.03 SI.



3) Changing the dip direction on the Great Lyell Fault to be towards the east causes the negative anomaly to increase (i.e. worse fit).

