



**MANTLE**  
MINING CORPORATION LTD

# **GOLD MINERALISATION IN THE WOODS POINT DISTRICT, VICTORIA – REGIONAL AND LOCAL CONTROLS**

**Rick Valenta<sup>1</sup>, Tom Evans<sup>2</sup>, Nick Oliver<sup>3</sup>, Vic Wall<sup>4</sup>, Hassan Baghian<sup>5</sup>, and Ron Cuneen<sup>5</sup>**

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- **Morning Star JORC Compliance Statement:** For information on the existing resource, please refer to the report entitled “910,000 Ounces Gold JORC Resource” created on 30 July 2008, which is available to view at [www.asx.com.au](http://www.asx.com.au) under ASX code MCO. The information in this report is extracted from the report entitled "910,000 Ounces Gold JORC Resource" created on 30 July 2008 and is available to view at [www.asx.com.au](http://www.asx.com.au) under ASX code MCO. The Mineral Resource estimate is not Mantle's estimate and Mantle has not done sufficient work to report the estimate in accordance with the 2012 edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (JORC Code). Mantle is not aware of anything to suggest that the assumptions underpinning the estimate have materially changed and will commence work to validate the Mineral Resource and disclose it in accordance with the 2012 edition of the JORC Code. Investors should treat the estimate with caution until validated
- **Competent Person Statement:** The information in this report that relates to Exploration Results is based on information compiled by Dr Richard Valenta, Executive Director of Mantle Mining Corporation Ltd. Dr Valenta is a Fellow of the Australasian Institute of Mining and Metallurgy and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Dr Valenta consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.



# About Mantle Mining



- Owner of Morning Star (95%) and Rose of Denmark (49%) gold mines, with large associated land position
- Morning Star
  - Past production 830k Oz at 26.5g/t gold
  - Significant remaining resource (Goodz et al, 2008)
  - Shaft refurbished to 300m, operating plant and paste fill (\$30m prior expenditure)
  - Dominant 667 km<sup>2</sup> land holding in the region
  - Recently completed purchase of assets
- Rose of Denmark
  - Past producer 85k Oz from various mines on ML
  - Refurbished adit and identified exploration targets
- Management and board with strong mining and exploration track record



# Corporate Snapshot



**Matthew Gill**

**Non – Executive Director**

Mining Engineer – key leadership roles in the successful construction, commissioning and operation of 3 important underground gold mines.



**Rick Valenta (PhD)**

**Non – Executive Director**

Over 30 years executive experience in geology, exploration and development and development, mergers and acquisitions, mine and corporate management.



**Ian King**

**Non – Executive Director**

Director & Founder of corporate advisory, BBB Capital, with more than 25 years experience in investment banking.

## Capital Structure (as at 02/06/2017)

ASX Codes:	MNM MNMOC
Shares on Issue	1,292M
Options on Issue	MNMOC 153M U/L 159M
Market Cap	A\$10.3M (0.8c)



**Tom De Vries**

**Chief Executive Officer**

Mining engineer, MBA - Over 25 years in key leadership roles. Extensive handheld and mechanised Victorian Gold mining experience including processing at Centennial Mining Limited (formerly A1 Consolidated Gold Limited) Maldon plant, Bendigo Mining; WMC Limited; MIM Limited.

## Mantle Mining Share price (as at 02/06/17)



## Top Shareholders (as at 31/05/17)

Top 40

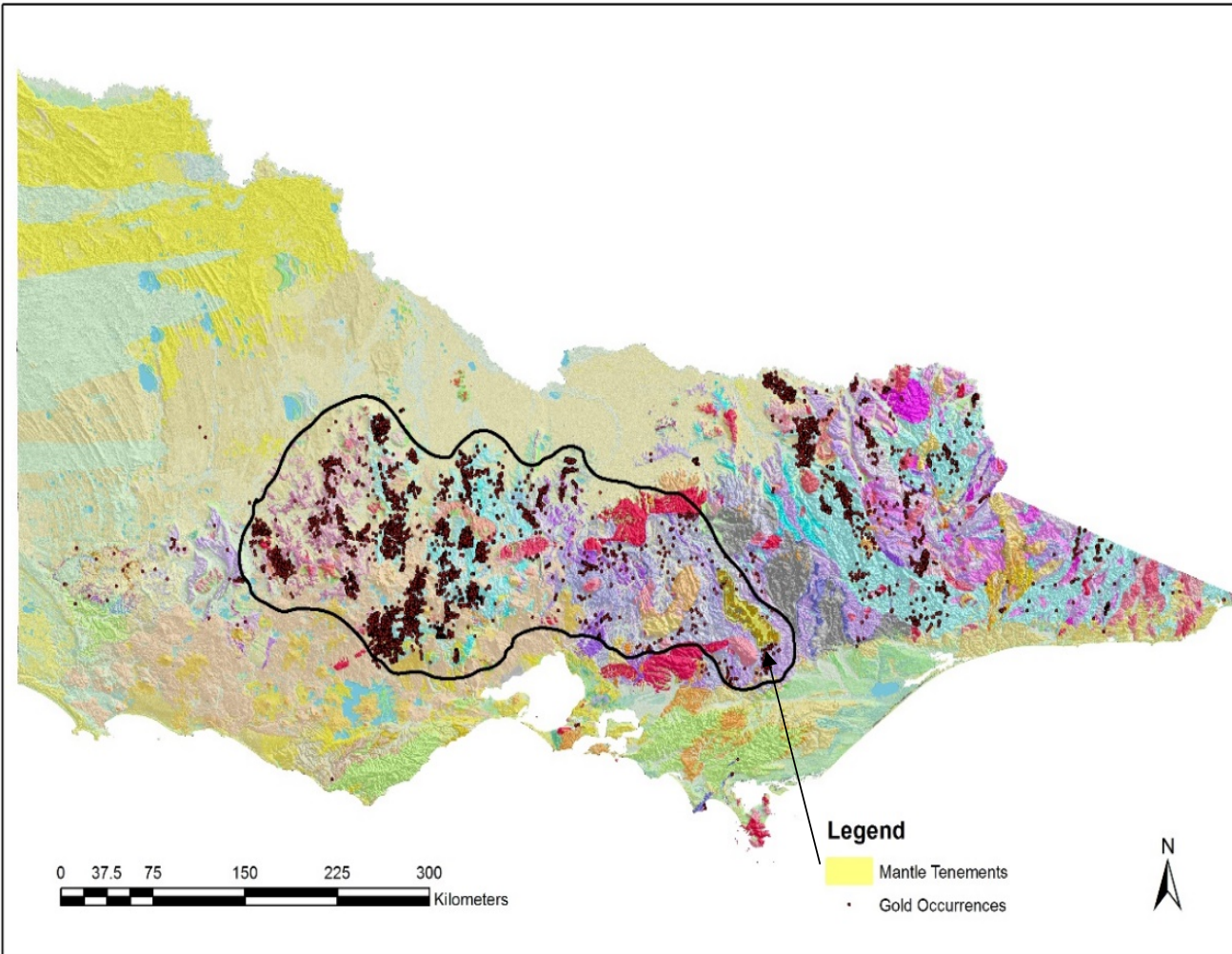
60%



# MORNING STAR GOLD MINE



# Gold Production in Victoria – Global Comparison

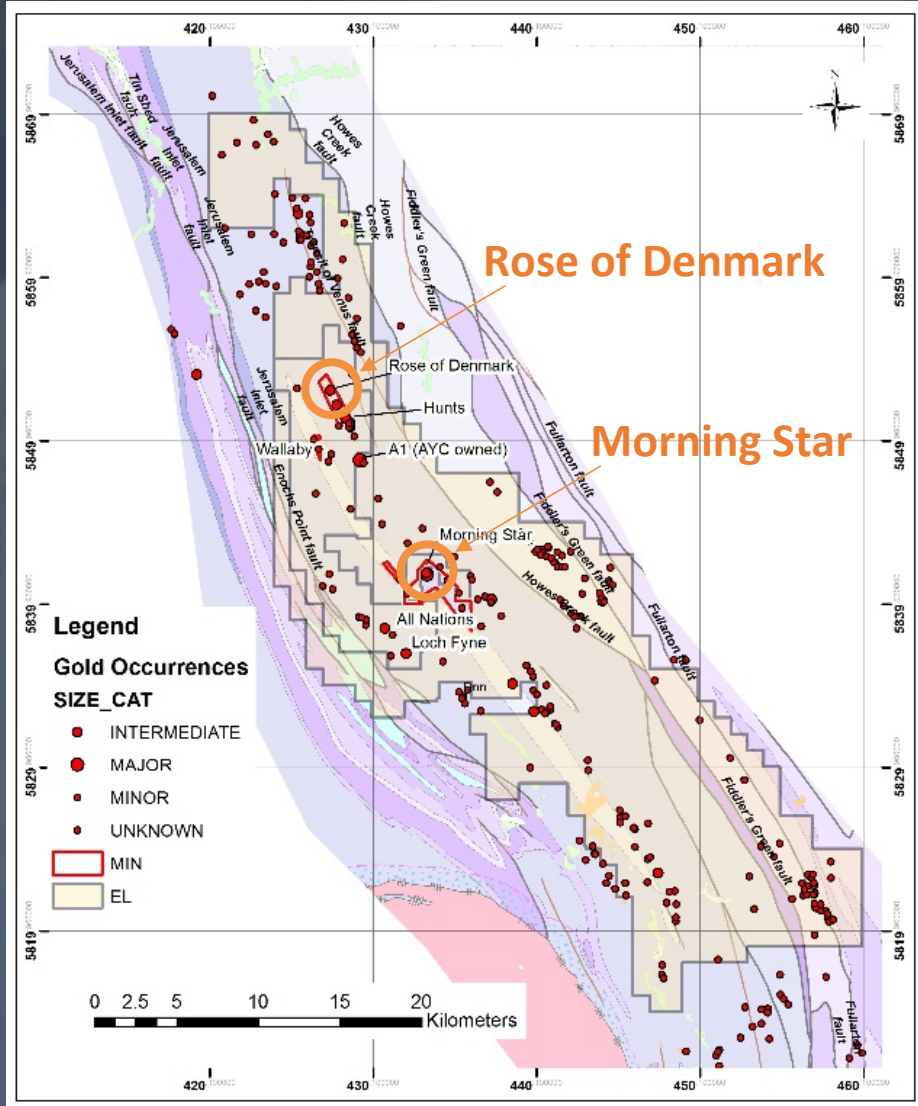


World gold production is approx. 165,000 tonnes Gold  
**Victoria:**

- Produced approx. 2,500 tonnes of gold since 1850 (80 million Oz), which is **1.5%** of all world's gold
- Victoria goldfield geology: **2 Orders of Magnitude (100x) richer in gold** than the global average\*
- Geological Survey of Victoria indicates several multi-million Oz gold deposits remain undiscovered
- Woods Point-Walhalla has produced ~6 million oz and is third largest hard rock gold field in Eastern Australia
- Mantle has a dominant tenement holding in this region

\* Extract from Ross Cayley, GSV presentation, Melbourne Mining club, Cutting edge series 16 May 2007

# Morning Star Gold Mine and Surrounds



Approx 200km or three hours from Melbourne

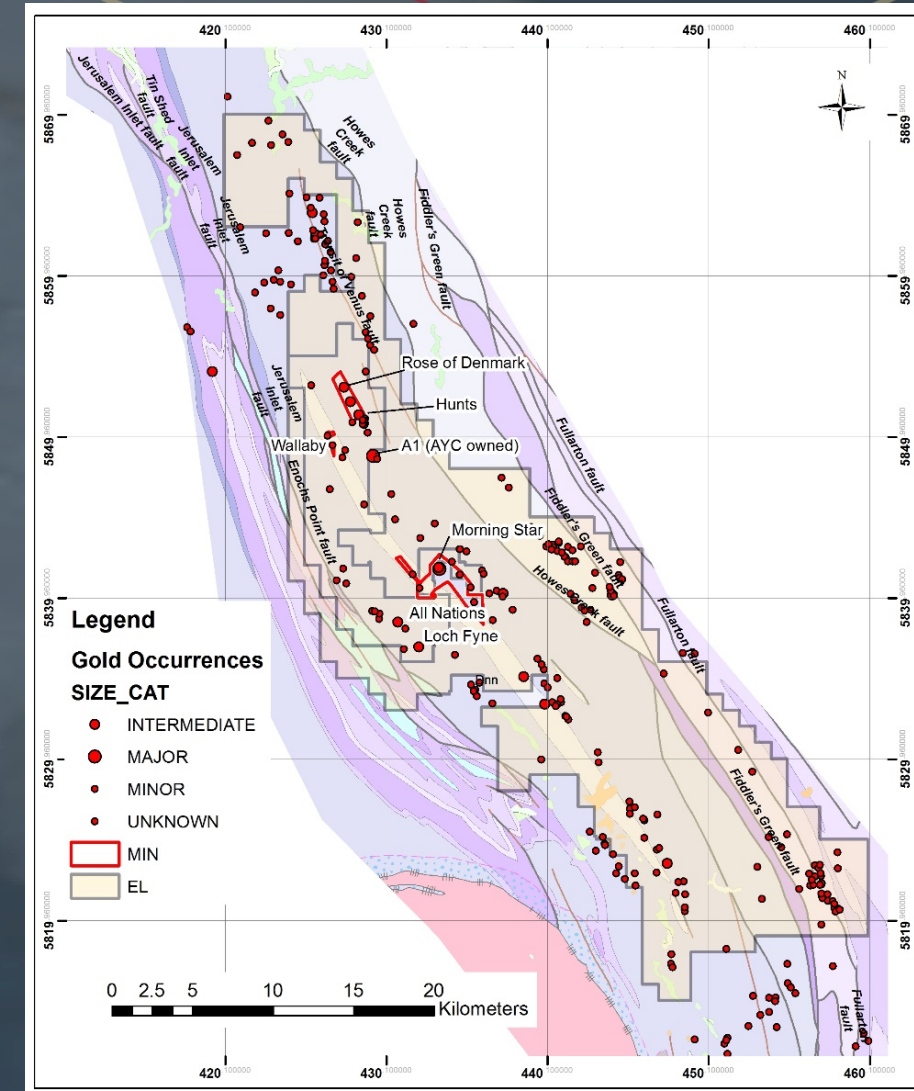


# Extensive Regional Holdings

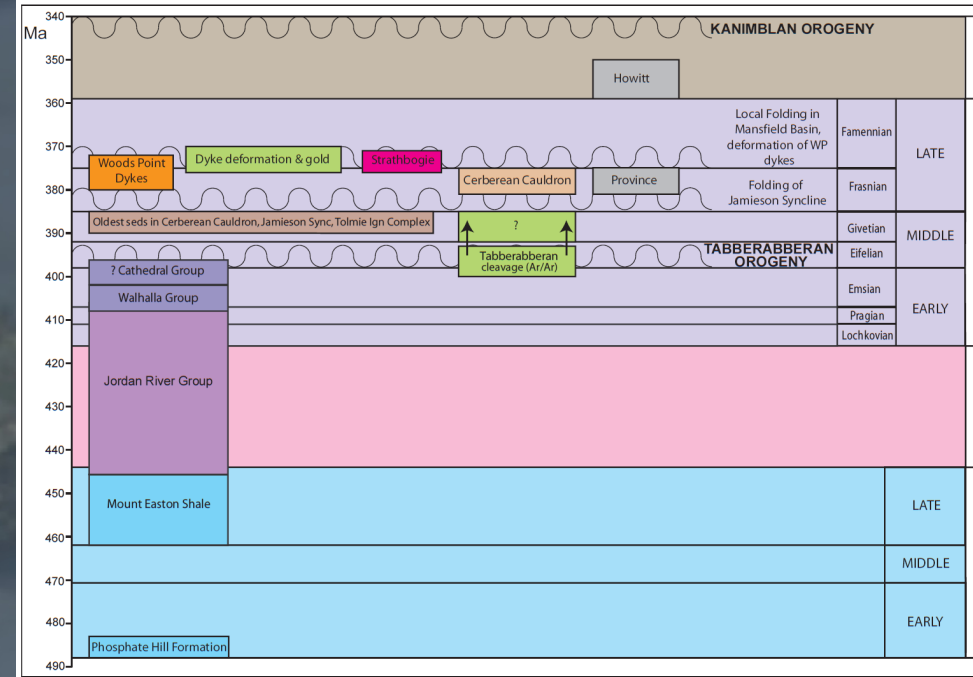


- Mantle controls extensive mining and exploration titles central to Woods Point Dyke Swarm:
  - Three granted Mining Licences (MINs 5009, 5299 and 5241)
  - Large exploration licences encompass circa 667 Km<sup>2</sup> (EL's 6321, 6364, 5560)
  - Some of these mines have extensive production history
- Mantle controls Min 5009 (the Morning Star mine and Process Plant), providing an advanced exploration platform, +500 t bulk sample processed without issue, ready for focussed exploration along with Rose of Denmark (MIN 5299)
- Mantle has recently re-engaged with JV partner on MIN 5299, Minjar/ Shandong, a major gold producer & explorer, to re-commence exploration activities
- Regional Review to provide extensive exploration program at Rose of Denmark, Wallaby, Alhambra, Hunts, Loch Fyne

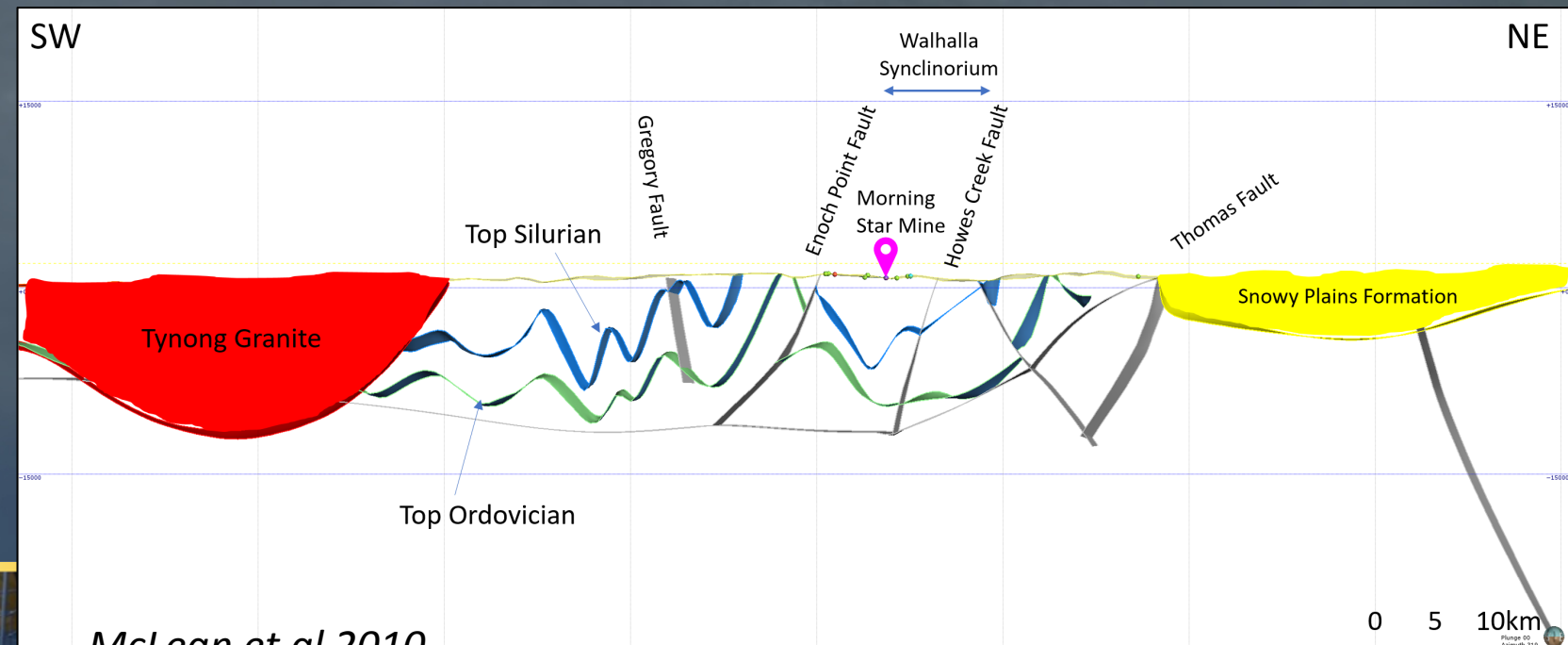
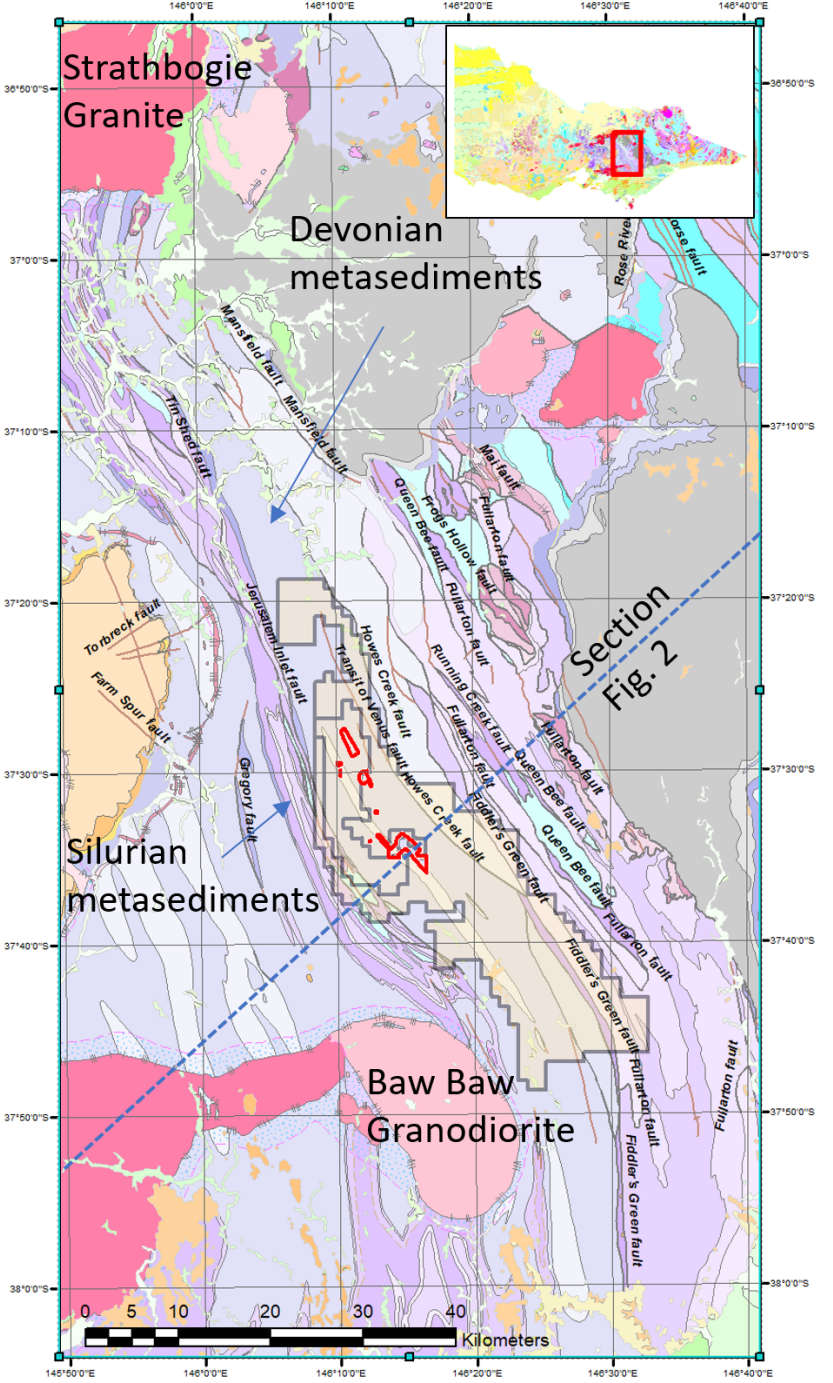
Becoming a Significant Regional Player





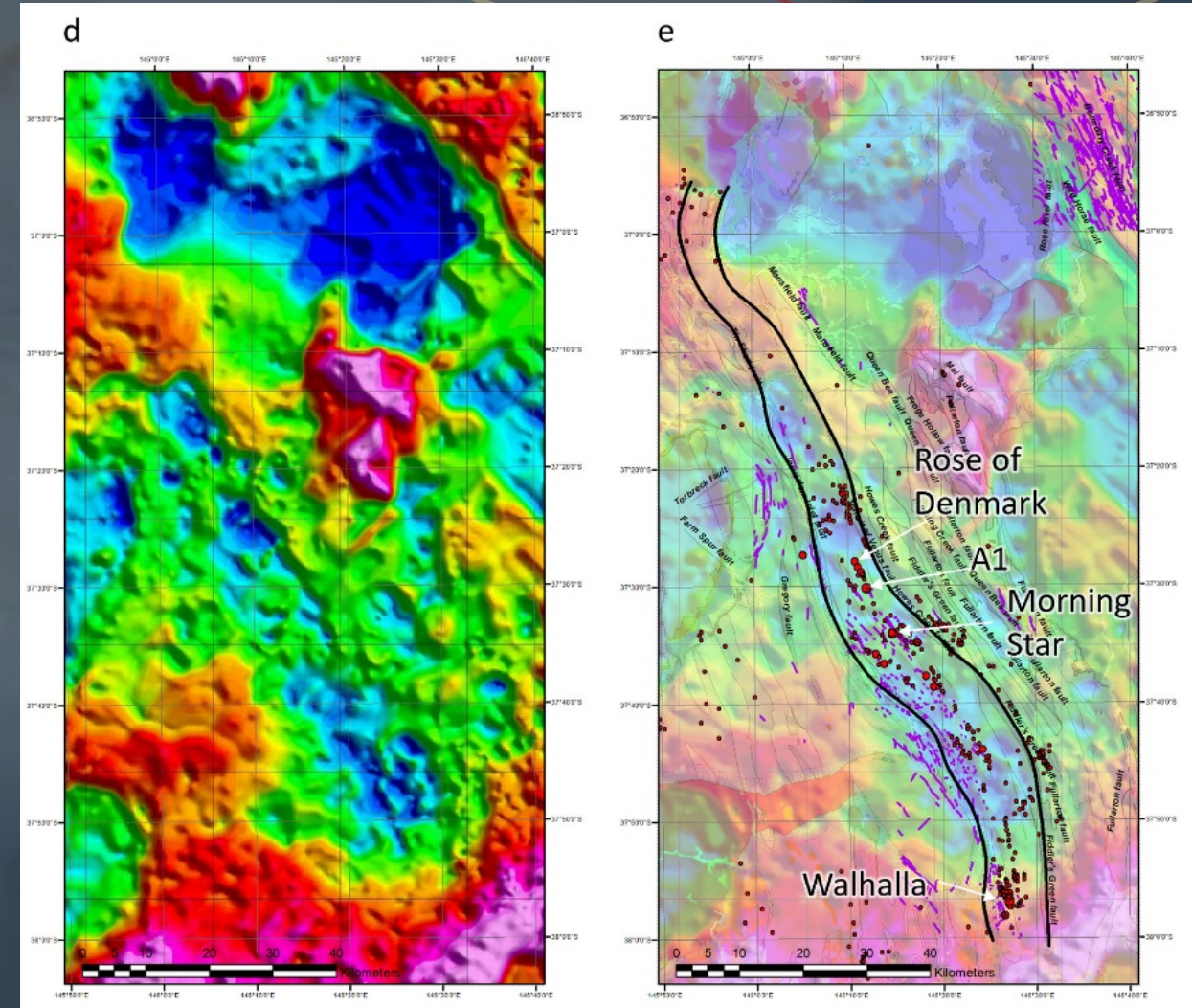
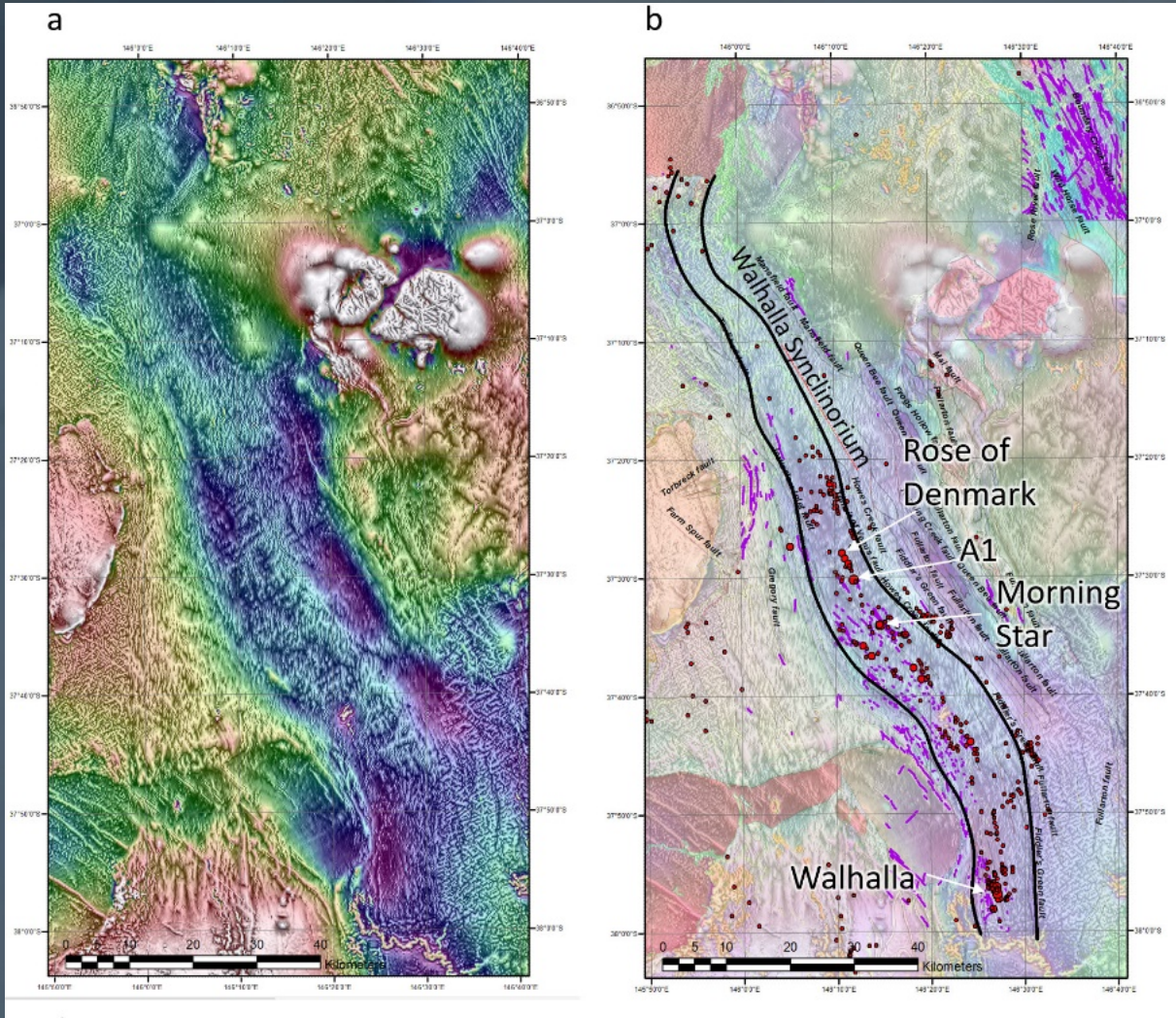


VandenBerg et al 2006

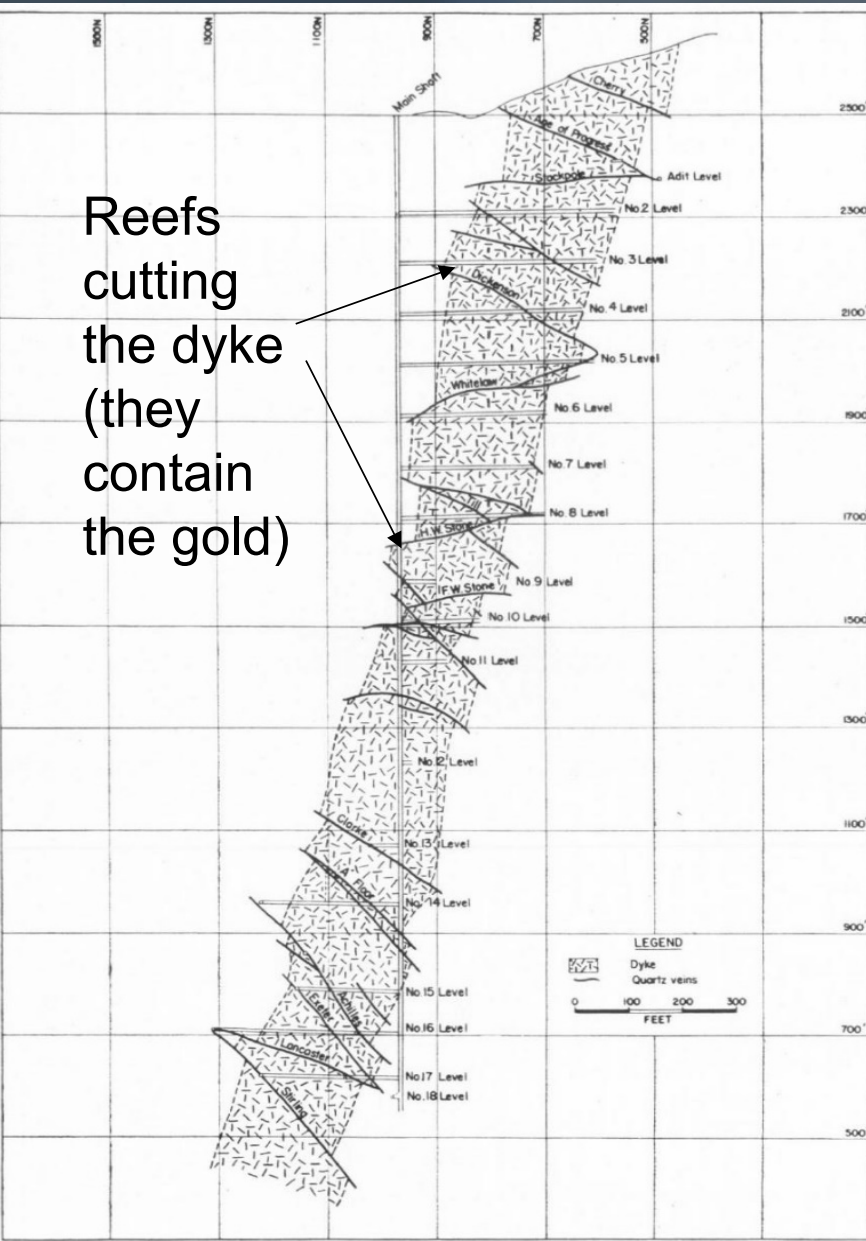


McLean et al 2010

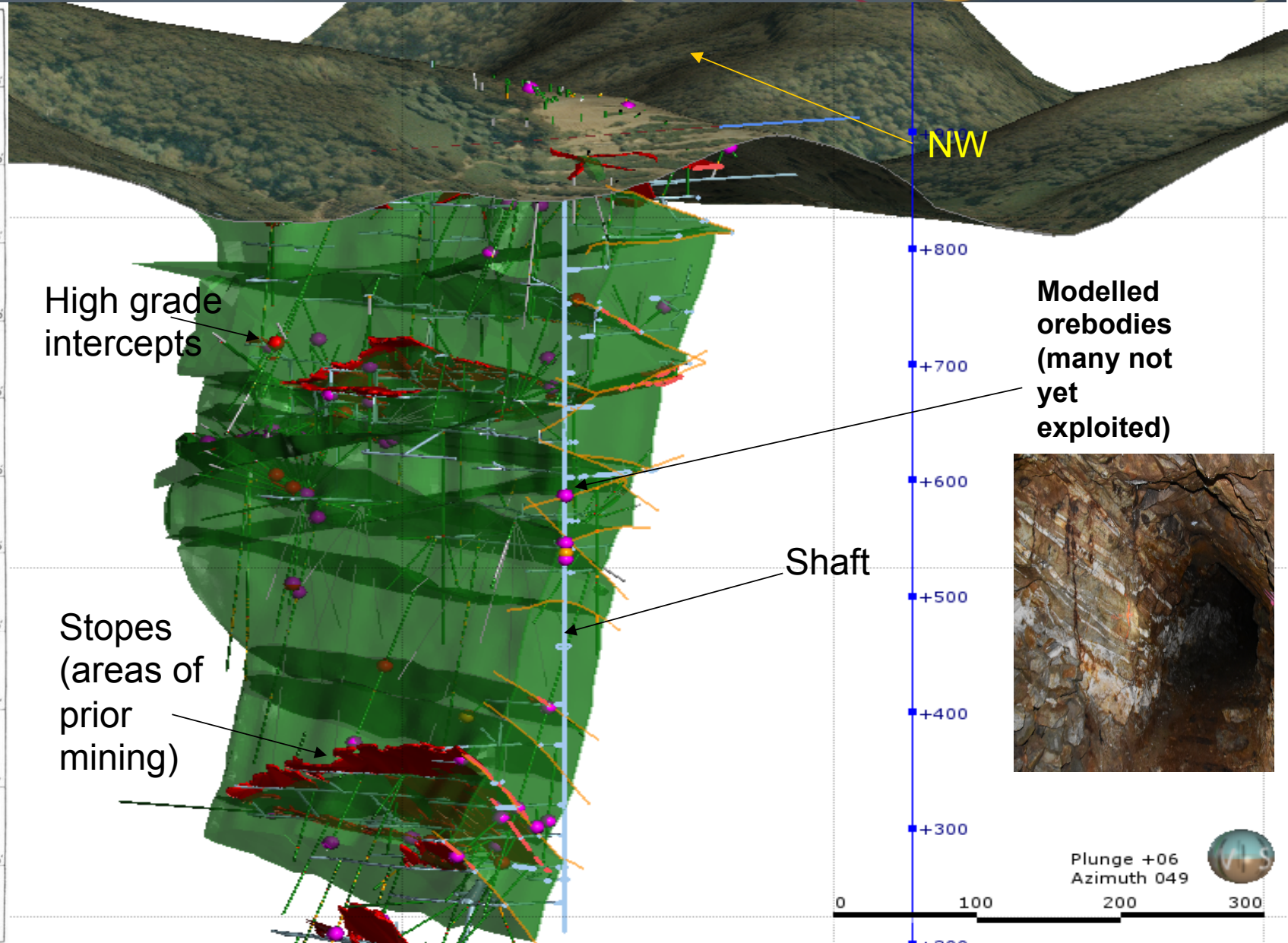
# Magnetic and Gravity Signature



# Morning Star Reef Geometry



Reefs cutting the dyke (they contain the gold)



Modelled orebodies (many not yet exploited)

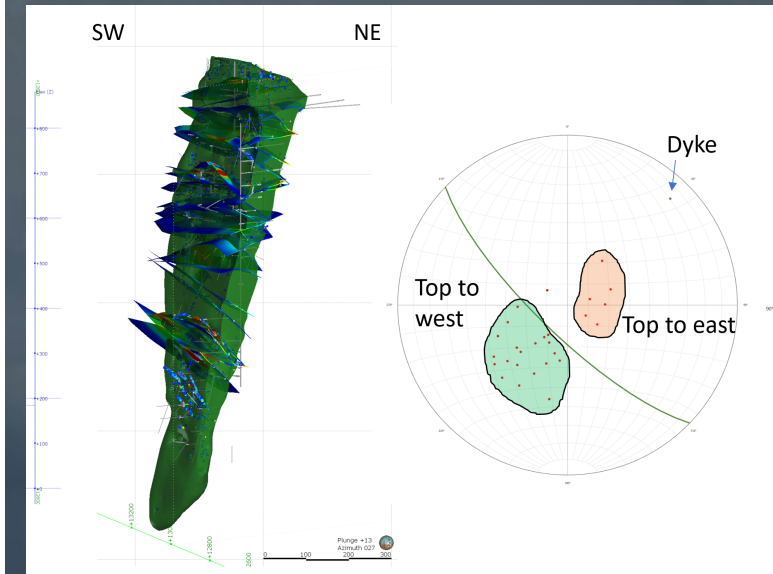
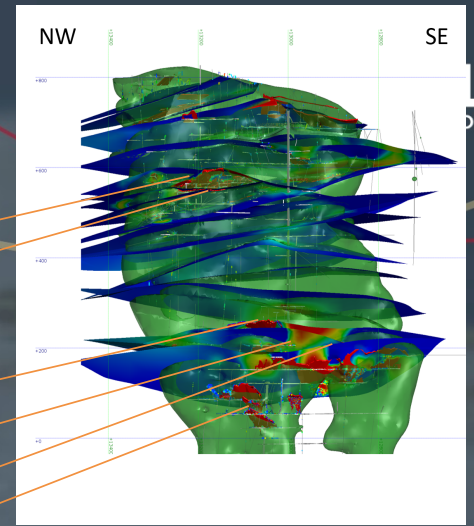
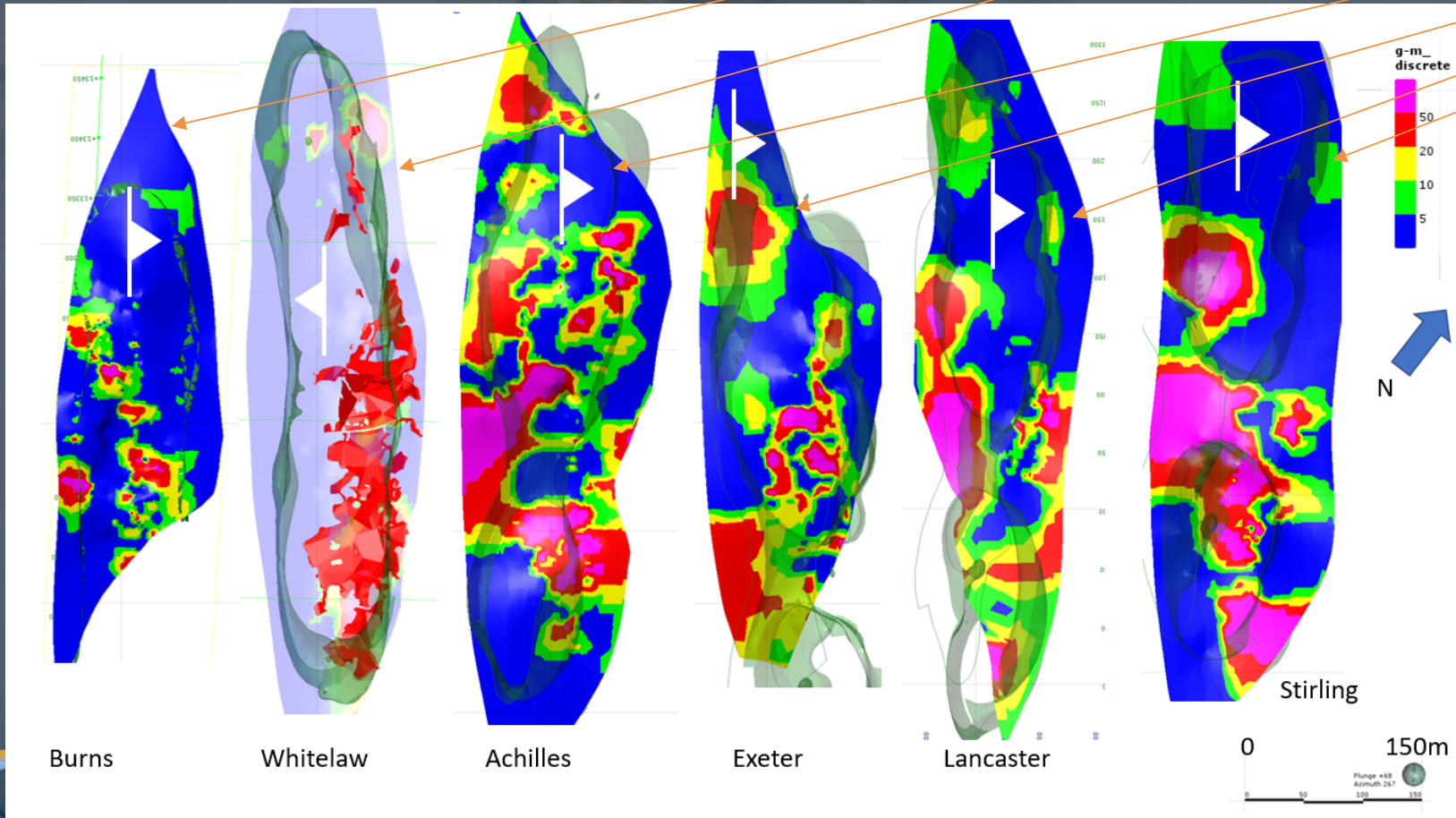


Plunge +06  
Azimuth 049



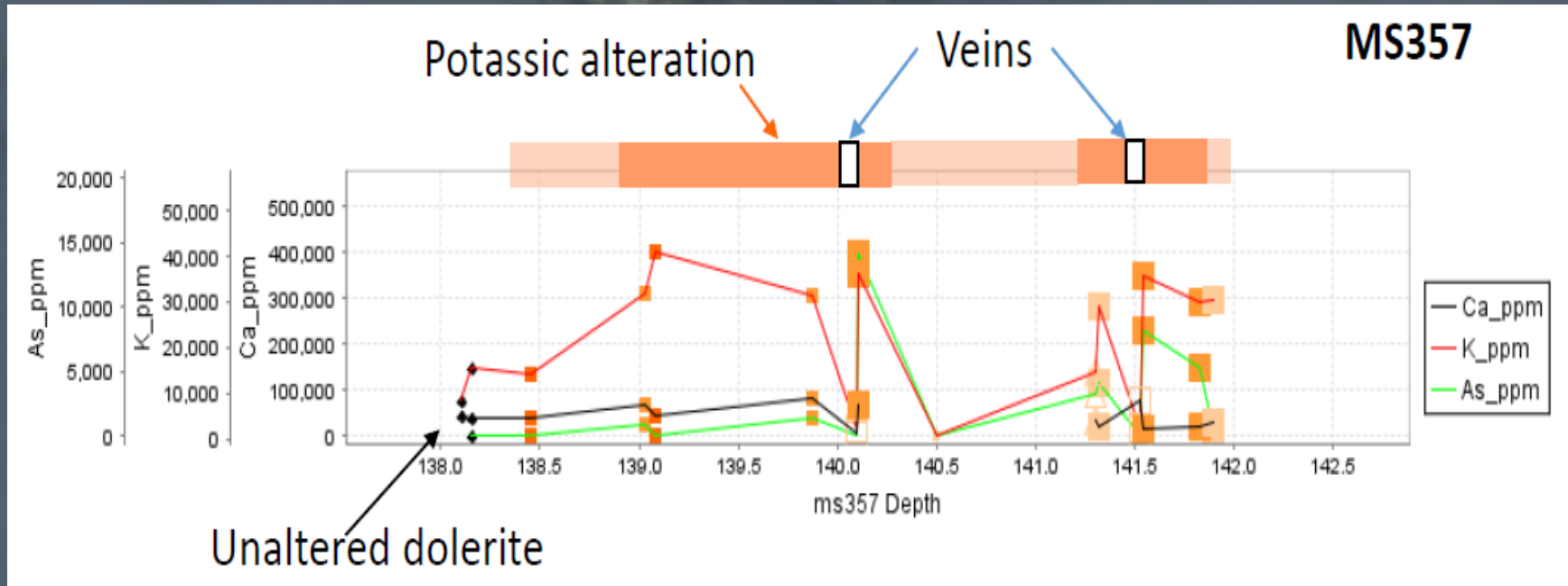
# Grade Distribution on Reefs

- Updip intersection of structure and dyke margin
- Intersections of structures

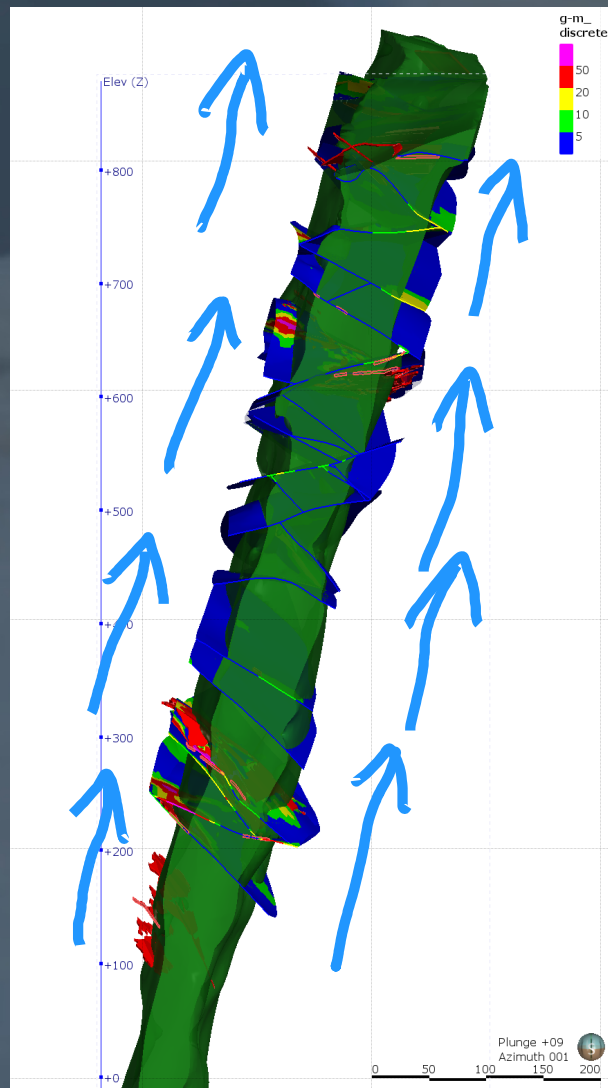


# Alteration

- increased K, Rb, and As, +/-Ca; slight depletion in Fe
- Low grade Au and sulphides in alteration margins



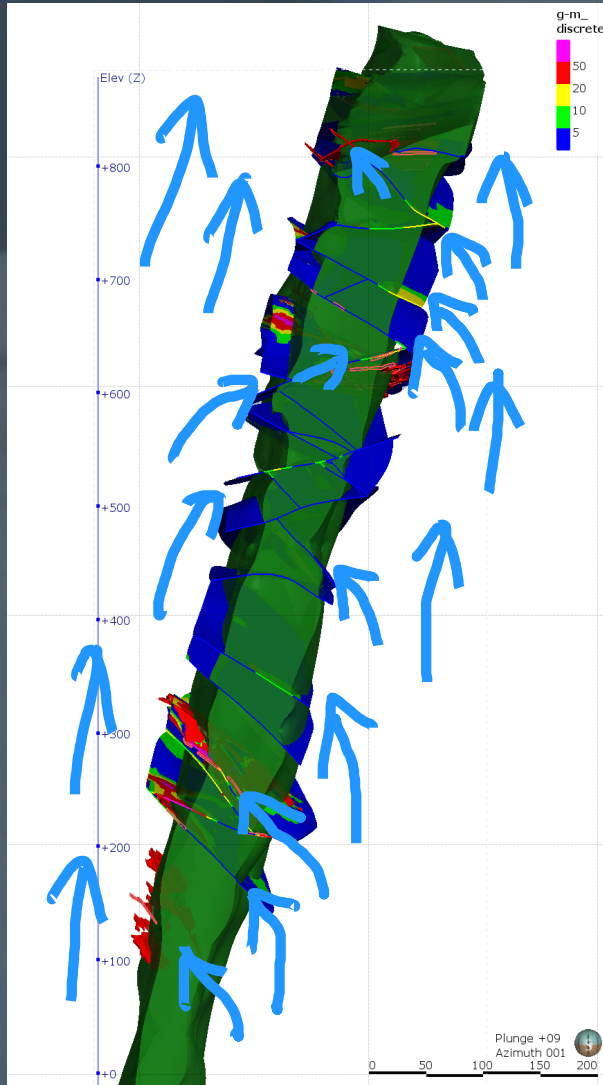
# Simple model



- Gold-bearing fluids rising under lithostatic gradients



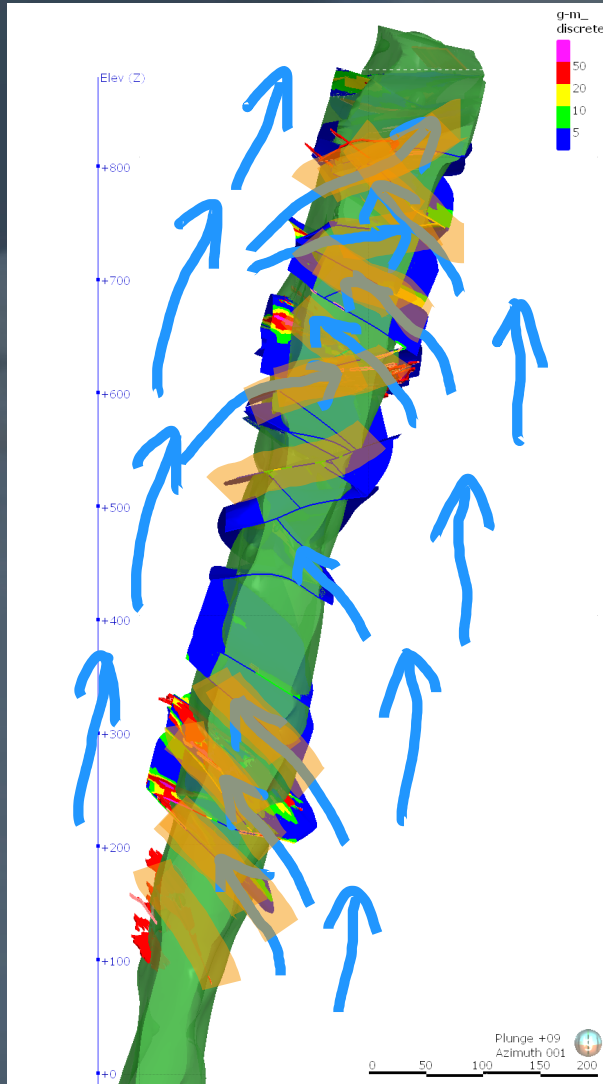
# Simple model



- Gold-bearing fluids rising under lithostatic gradients
- Increased fracture permeability in dyke driven by competency contrast



# Simple model

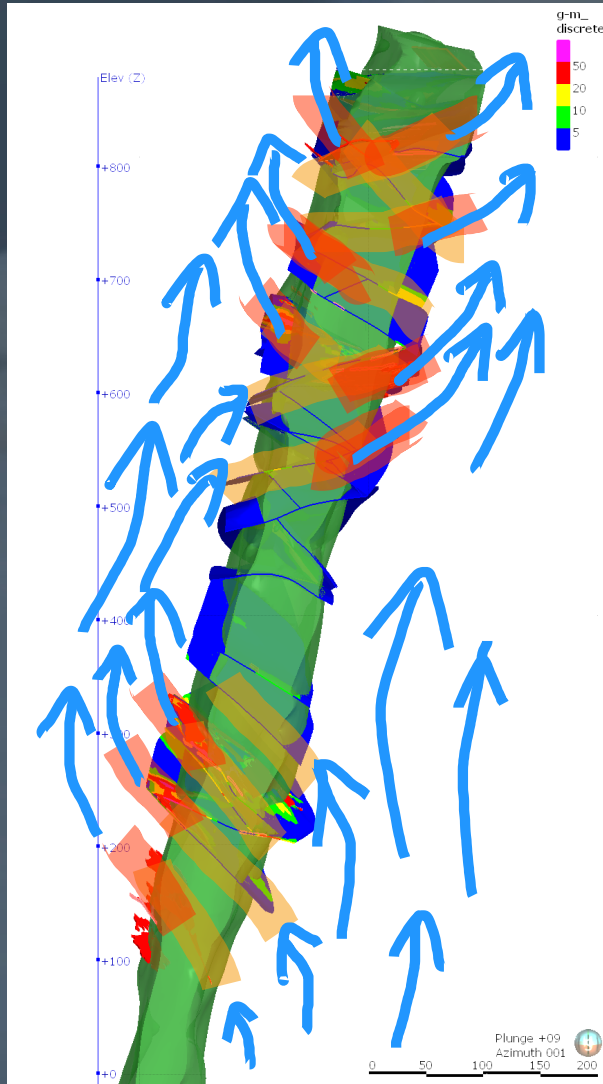


- Gold-bearing fluids rising under lithostatic gradients
- Increased fracture permeability in dyke driven by competency contrast
- Sulphidisation and potassic alteration in haloes





# Simple model



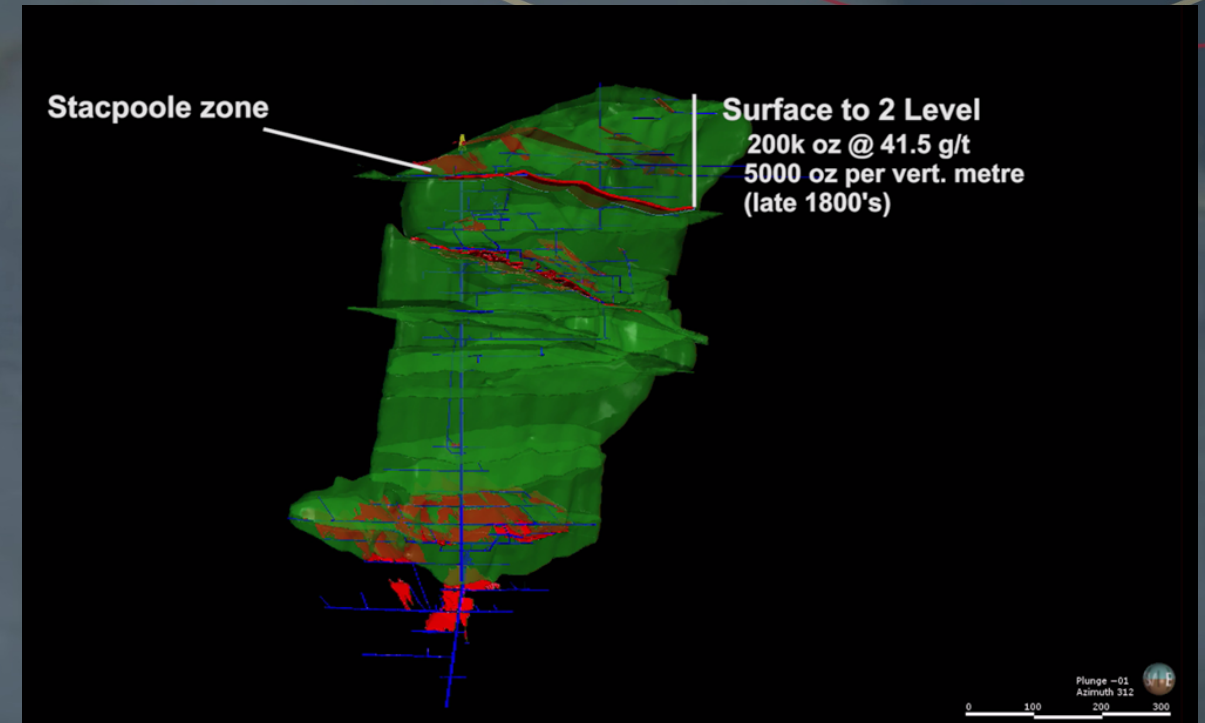
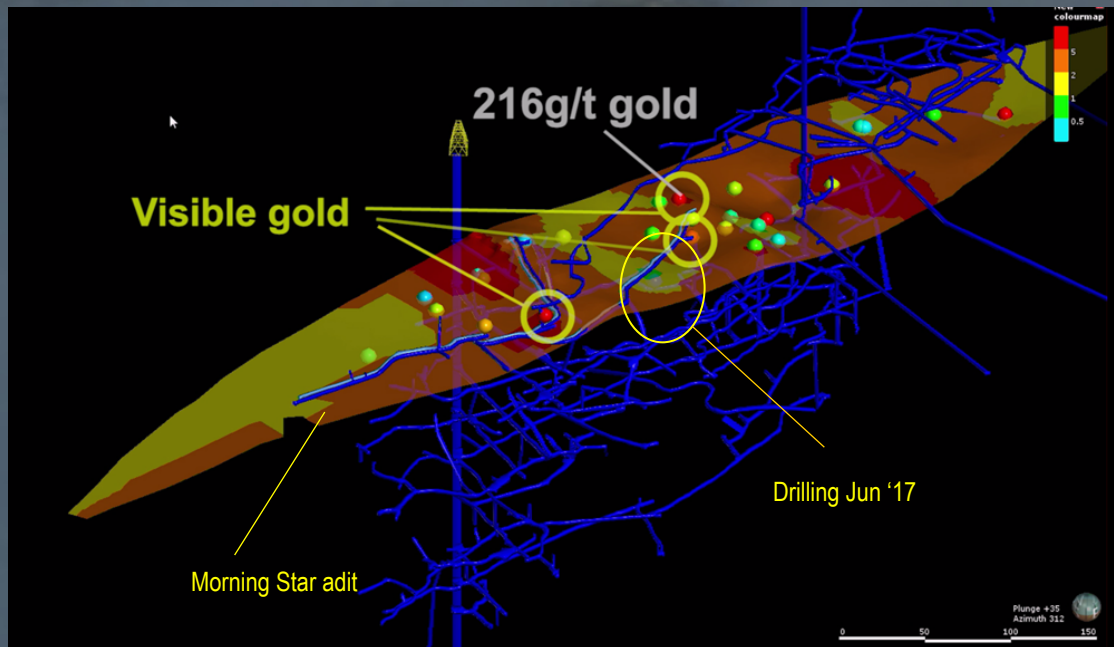
- Gold-bearing fluids rising under lithostatic gradients
- Increased fracture permeability in dyke driven by competency contrast
- Sulphidisation and potassic alteration in haloes
- Mineralisation focused in outflow zones or highly permeable fault intersection zones



# Stacpoole Zone

## Below:

- Morning Star adit provides an excellent and immediate platform for drilling
- Colours show gm. metre based upon available information
- There are gaps where information is less dense
- Aim is to test continuity of the zone as well as build confidence
- Other adits available if required



## Above:

- Stacpoole zone
- Reefs in the Upper area of mine have been very productive
- Area of highest gold ounces per vertical metre



# Work in Morning Star Adit



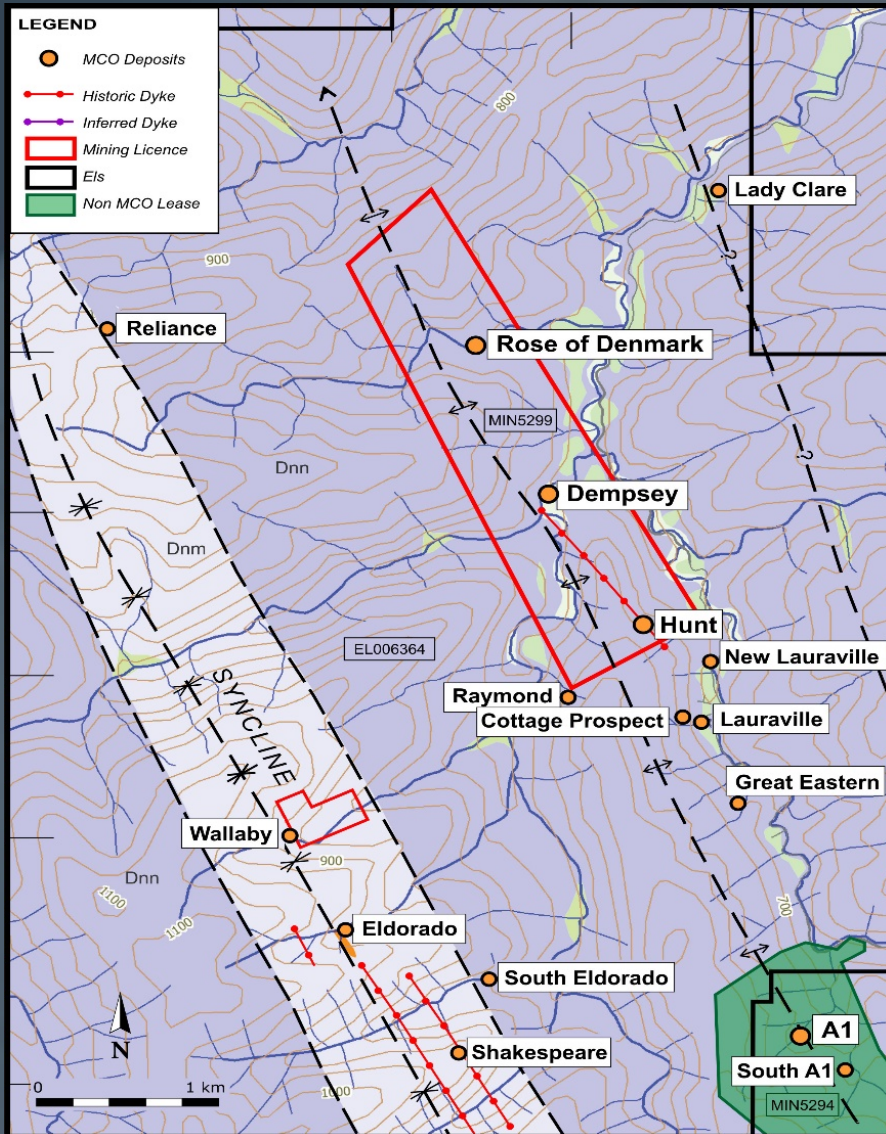
**Above:** Morning Star adit has been rehabilitated to allow diamond drilling to occur. May 2017

3D link to Mantle Mining website  
<https://mantlemining.com/projects/morning-star-gold/>

**Below:** Diamond drill in morning star adit, drilling the Stacpoole zone. June 2017



# MIN 5299 – Rose of Denmark, Dempsey, Hunts (JV with Shandong)



## Rose of Denmark

- 99,158 tonnes for 39,794 oz (12.5 g/t)
- Level opened for diamond drilling
- Multiple visible gold samples during development
- Amenable processing at Morning Star

## Dempsey Mine

- 7,457 tons for 1,656 Oz (6.91 g/t)
- New Dempsey (15 g/t) – H/W parallel reef
- Drilled in the 80's, data being reviewed

## Hunts

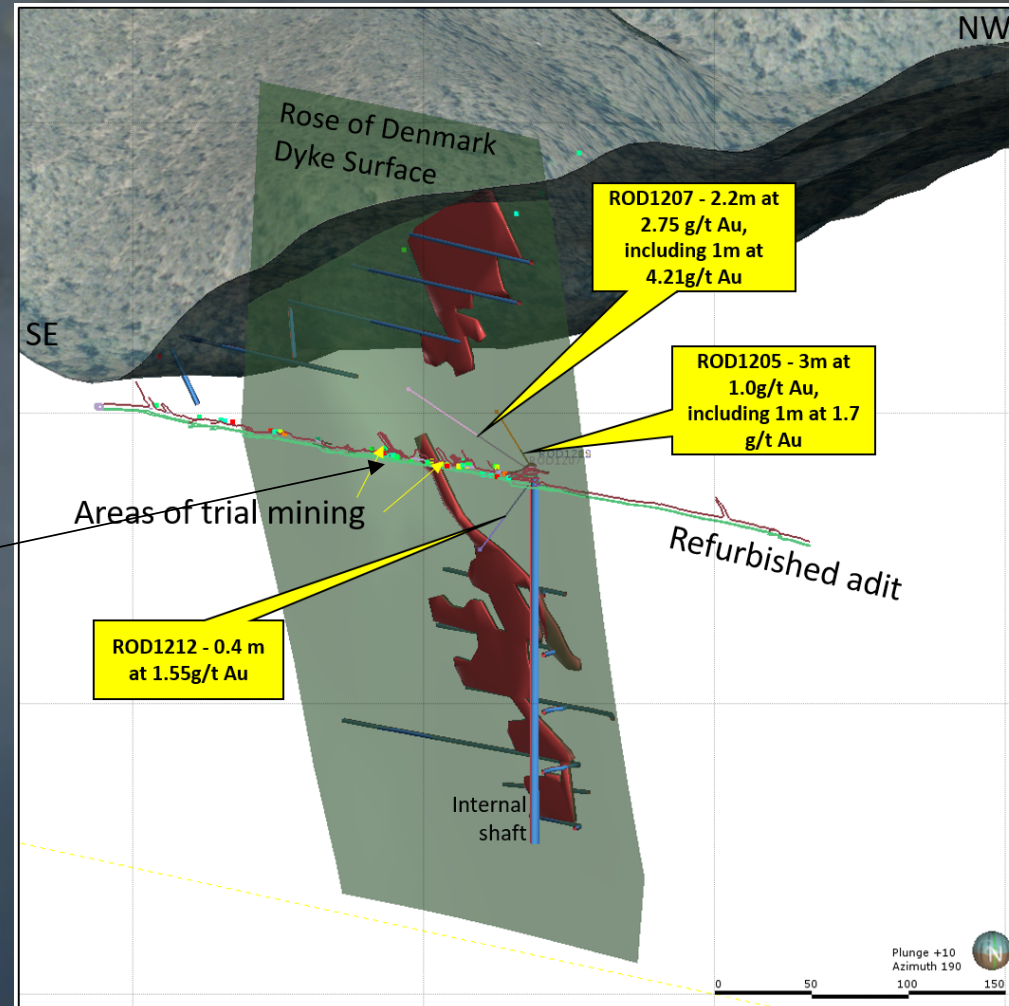
- 54,625 tons for 14,691
- Hole HDH1 drilled ~2004 +135 g/t

• Sjørberg C.W. Dept Earth Sciences, Latrobe Uni, Bundoora, Sept. 2004

# Rose of Denmark – accessible now, favorable mining geometry



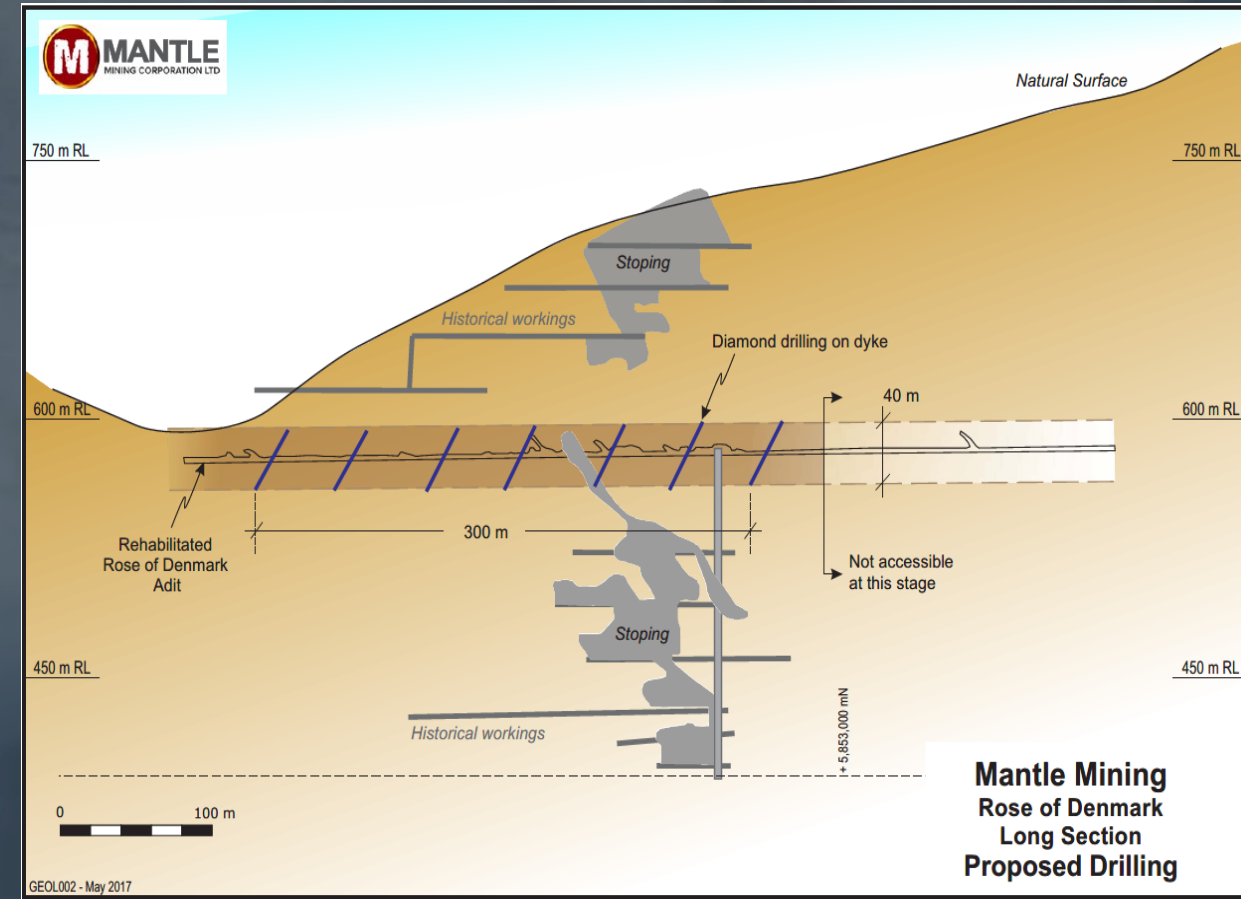
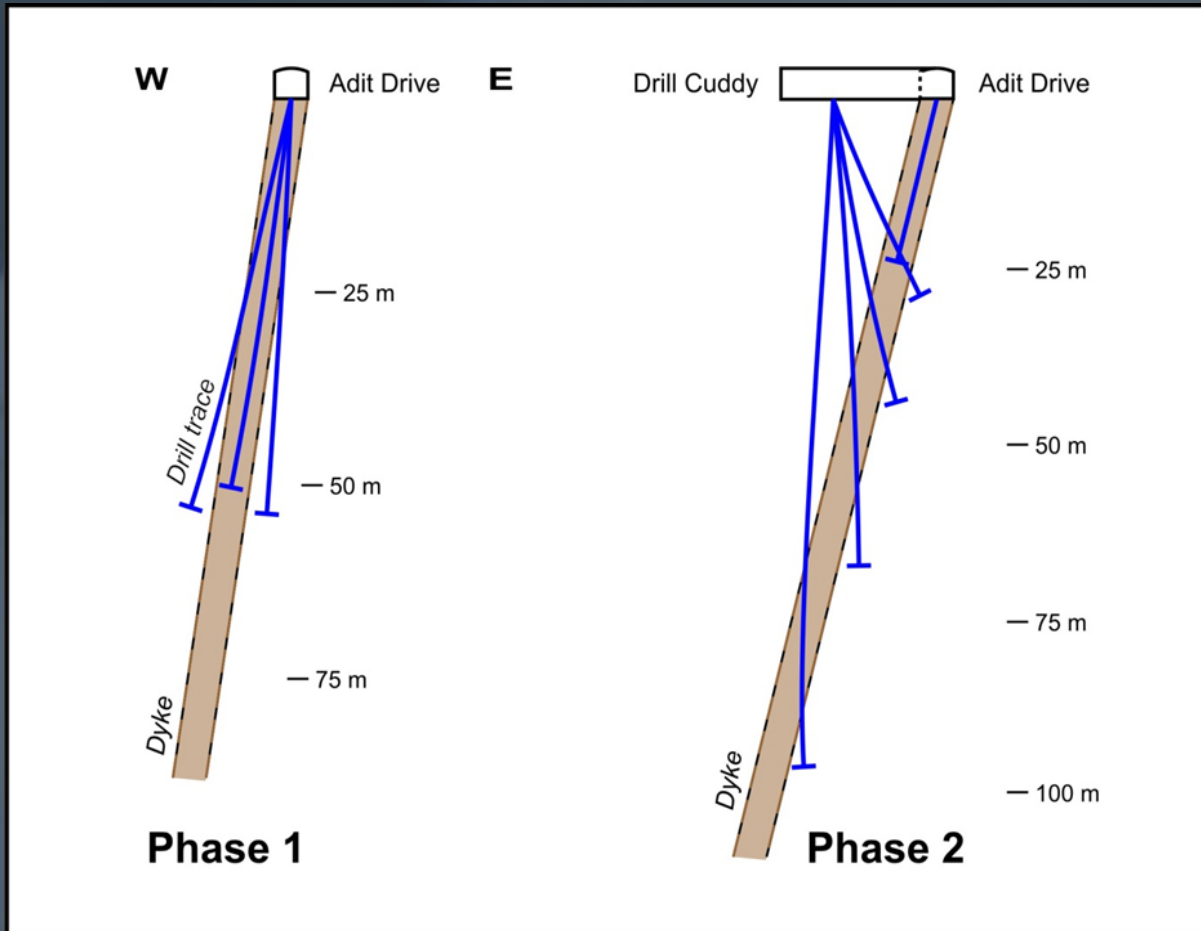
SE



NW



# Drilling concept – Find the ore shoots and follow



## ***Growth Potential***

### **Morning Star Gold Mine**

- Onsite Gravity Gold Processing plant has through-put upside
- Shallow ore bodies identified
- Large amount of data with exceptional high grades, in the upper levels to be fully tested
- Gap zone available for testing

### **Rose of Denmark & Regional Development**

- Virtually unexplored – no drilling below adit level
- Predictable dyke zone
- Number of historic mines with limited production below water table.
- Large local mine with successful, deep production (A1 mine, Centennial Mining)

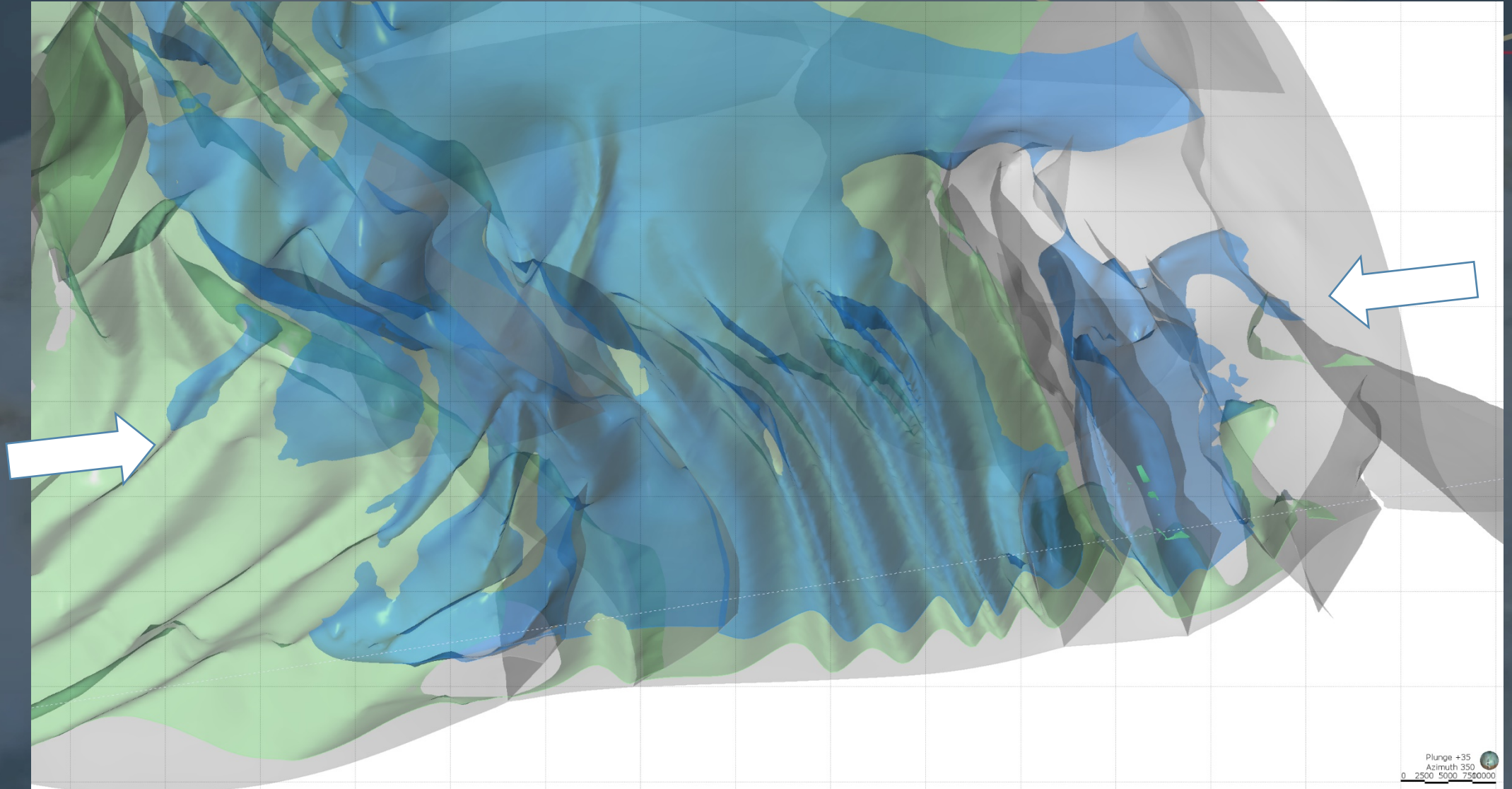


# Potted History...

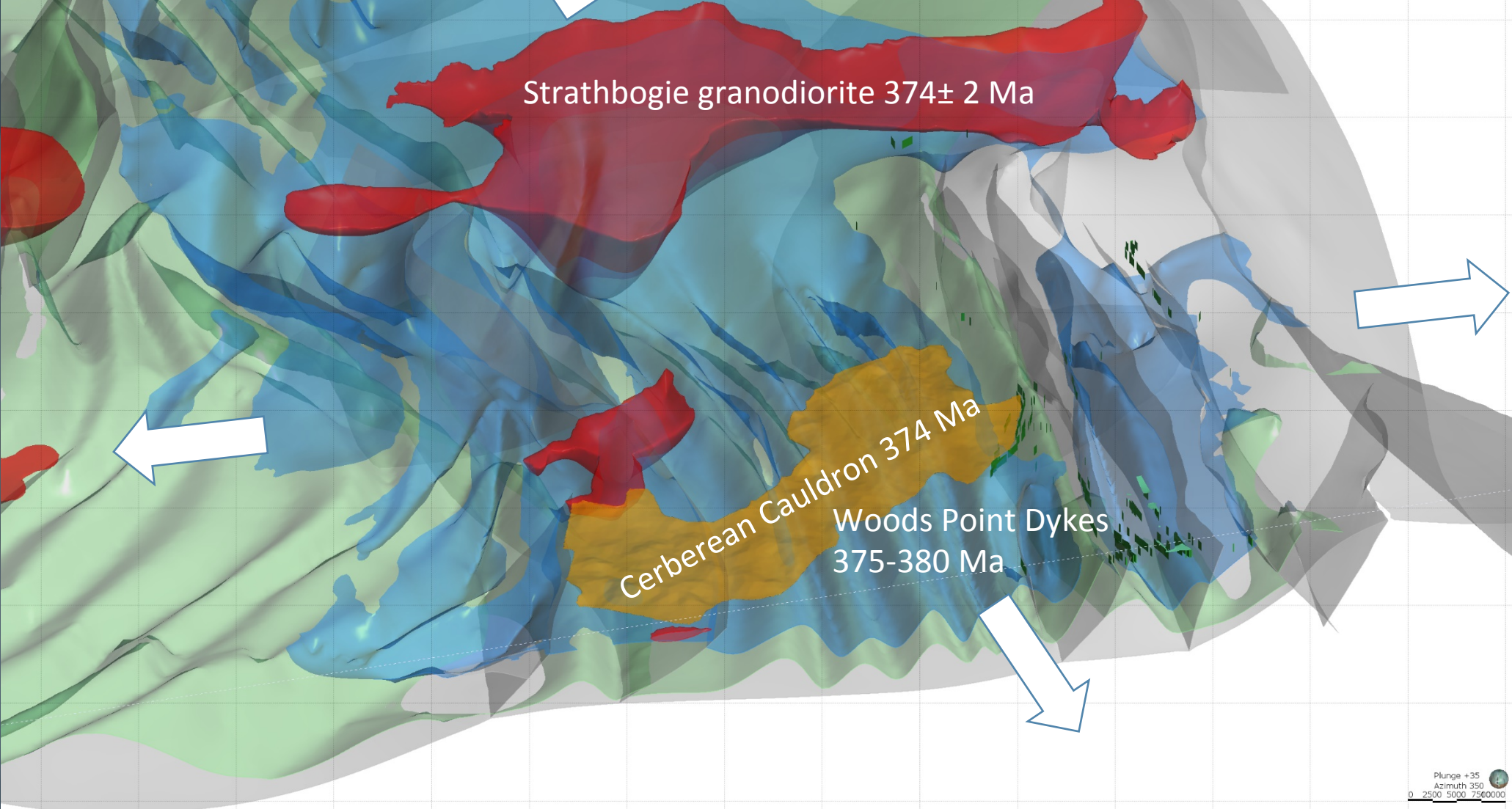




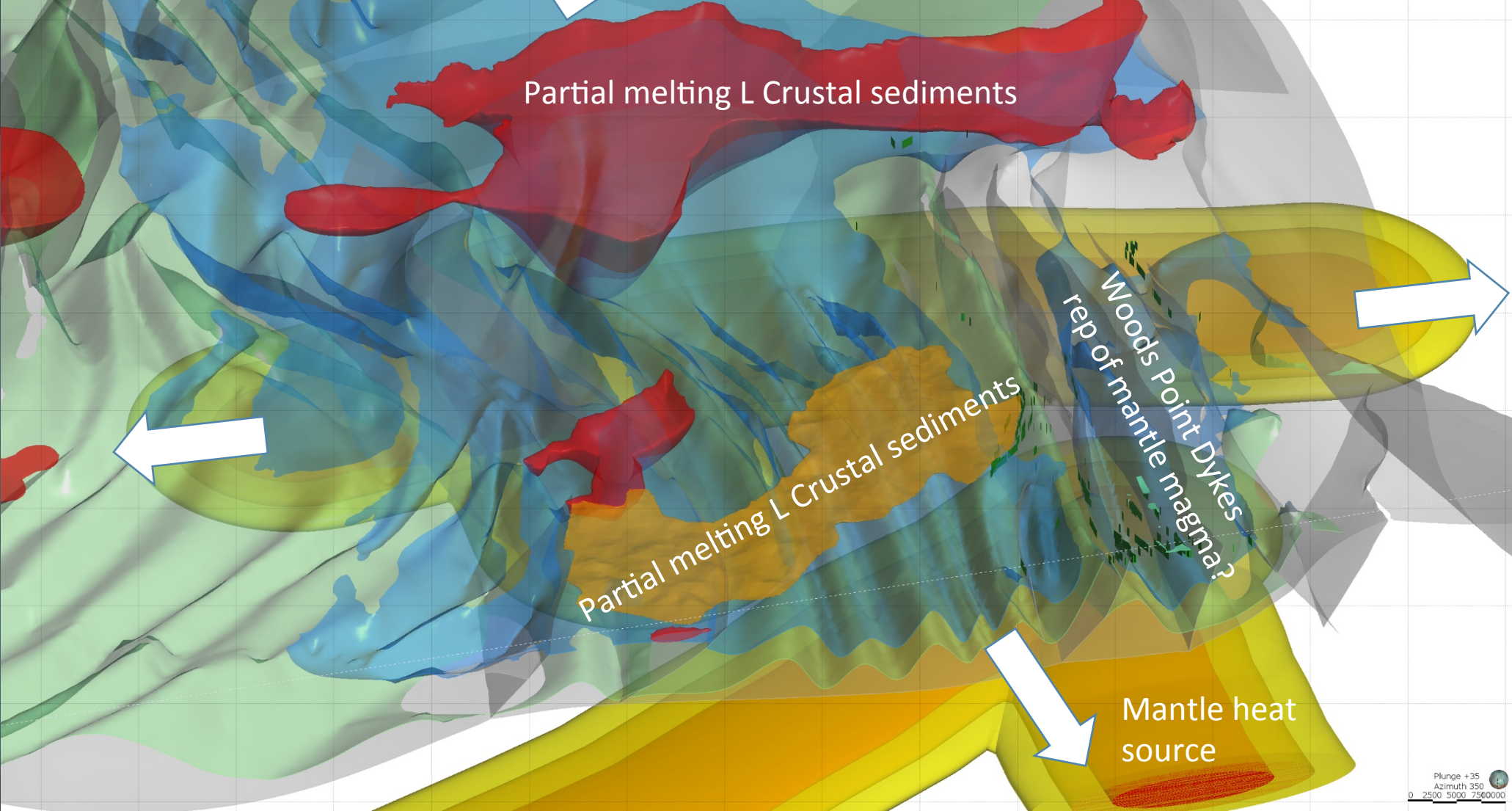
# Tabberabberan (396±4)



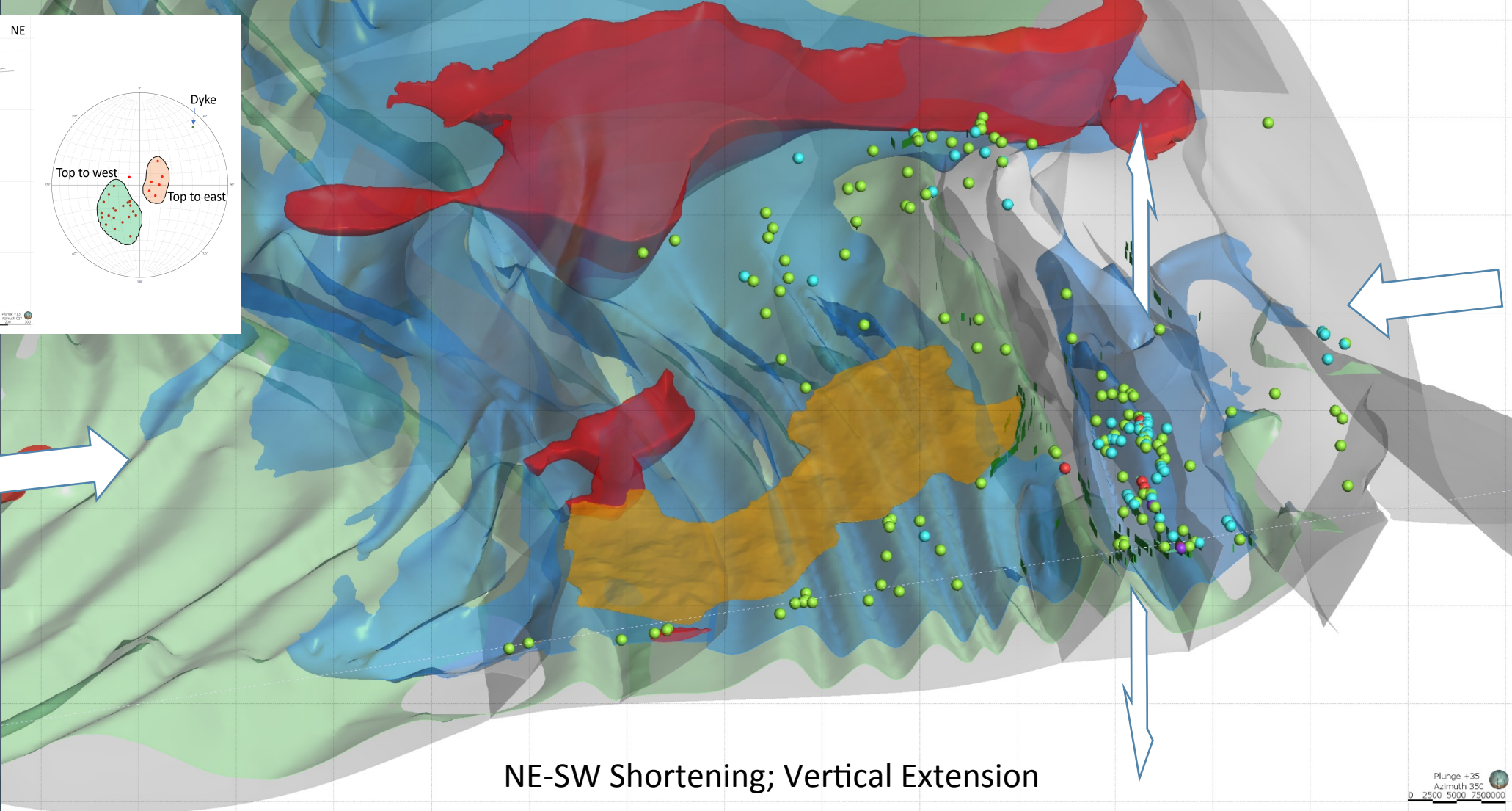
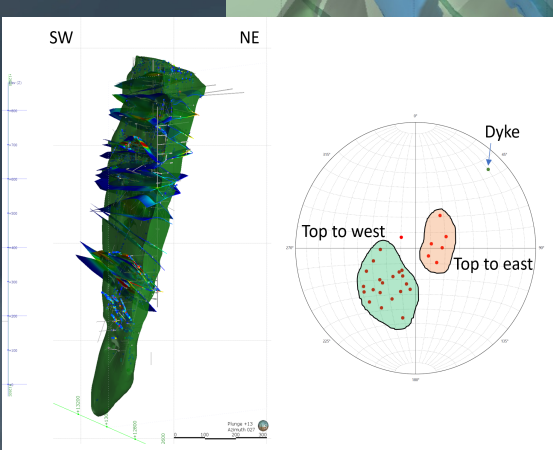
# 375Ma Igneous Event



# 375Ma Igneous Event



# 6m Oz+ Au 374± 2 Ma (virtually synchronous)

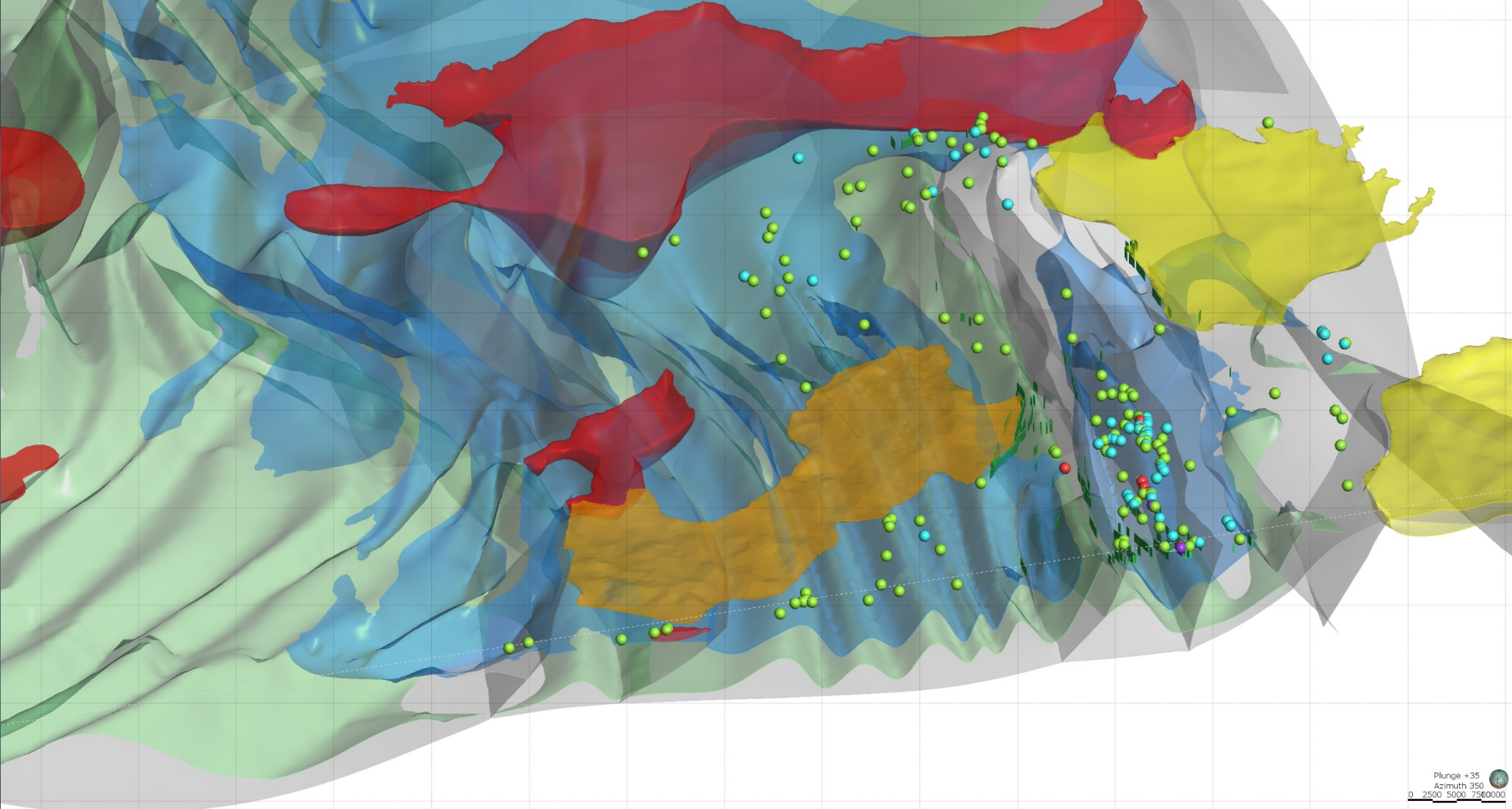


NE-SW Shortening; Vertical Extension

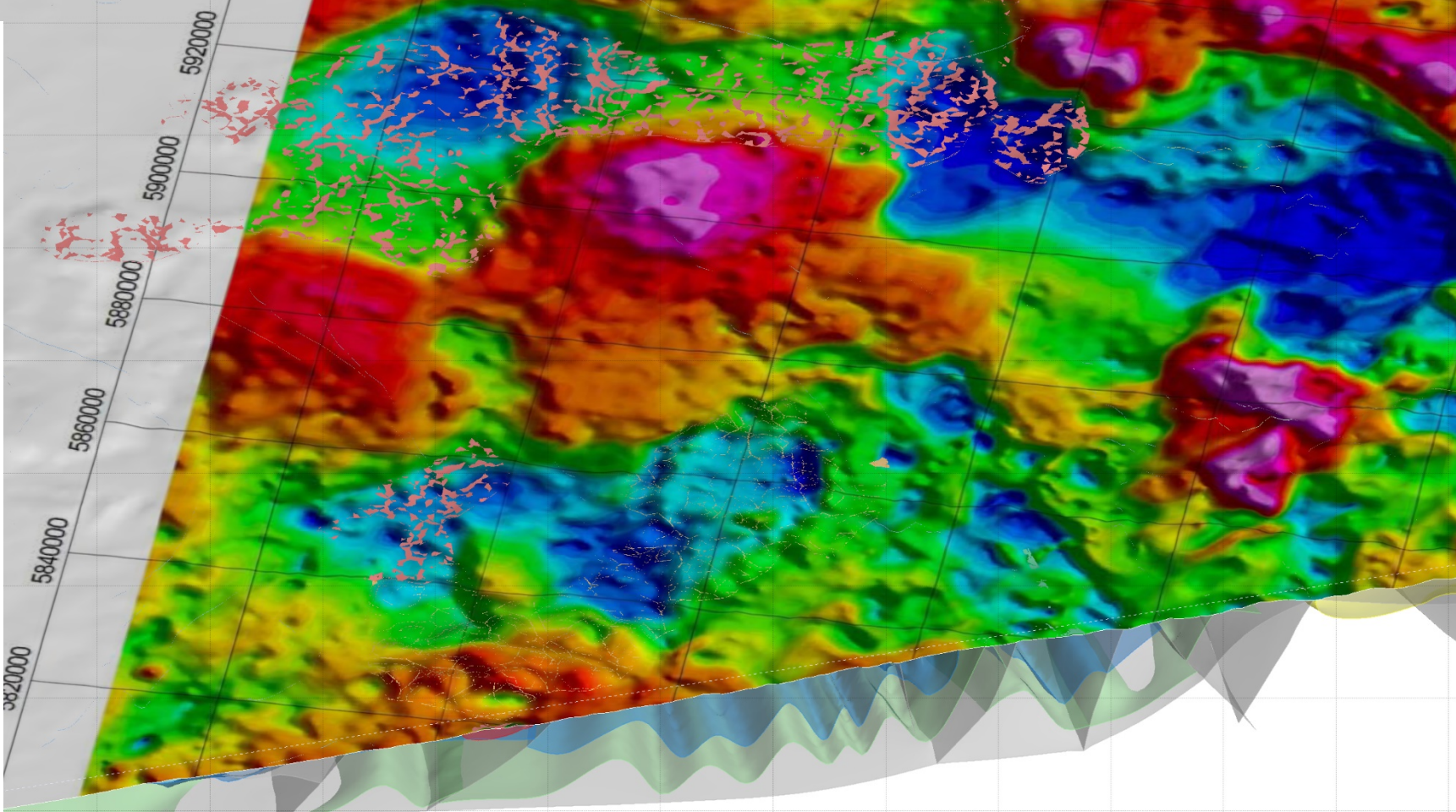
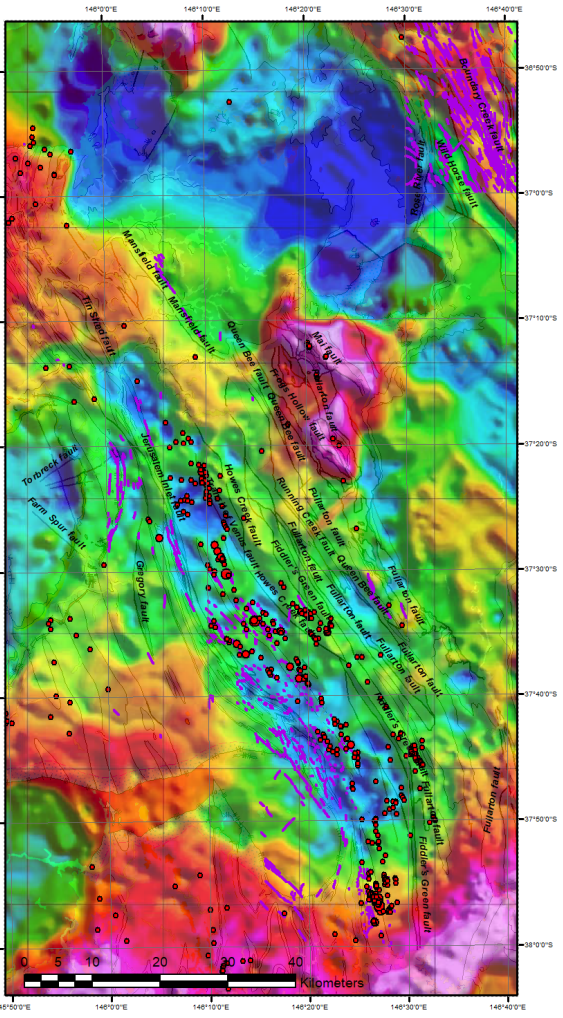
Plunge +35  
Azimuth 350  
0 2500 5000 7500000



# Carboniferous basins



# Gravity low coincident with dykes and deposits

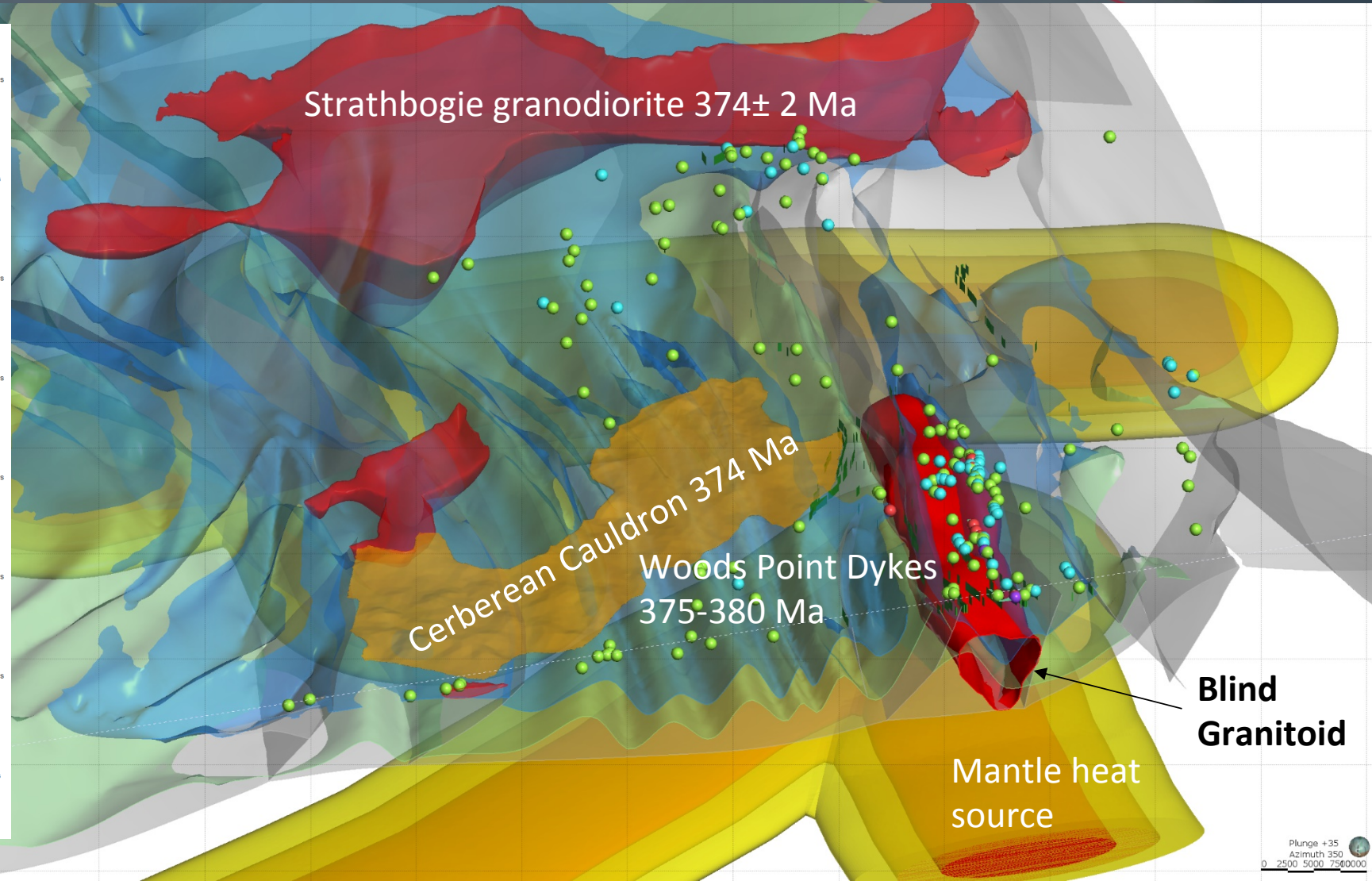
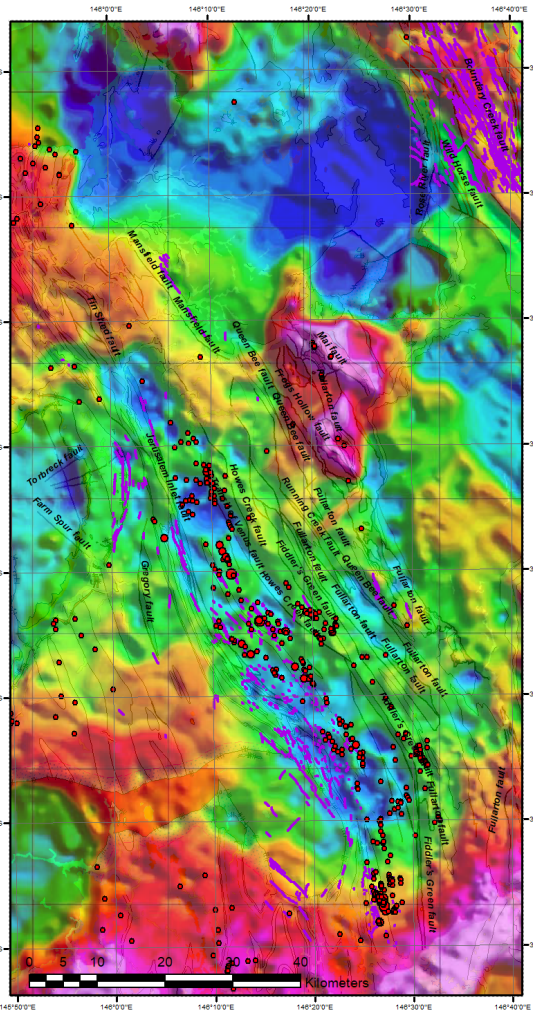


Specific Gravities (source, # samples)  
Granites – 2.62 (pub); Walhalla metaseds – 2.70 (28); Dykes – 2.84 (11)

Plunge +35  
Azimuth 350  
0 2500 5000 7500000



# Blind granitoid – Walhalla Synclinorium



# Conclusions

- Dyke control on mineralisation – both structural and geochemical control
- Spatial association between 6m Oz gold district, Woods point dyke swarm, and gravity low suggestive of underlying granitoid intrusive
- Strong temporal association between Woods Point dyke swarm, felsic volcanics and plutons, and gold mineralisation, all potentially driven by a 375Ma deep crustal mantle magma intrusive event







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