

Queensland Exploration Council

Technology Applied to Exploration of the Greenvale Project North Queensland

Ken Harvey

*Queensland Exploration Council
Technologies for Future Minerals and Energy
17 February 2017*

Ken Harvey

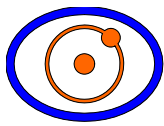
*The Greenvale Project
is held by
Superior Resources Limited*

Presentation

- ▶ There are two elements to this presentation:
 - ❖ The technology (**software**) which is the principal reason for the presentation and
 - ❖ The exploration **project**.
- ▶ The software program is **BlockViewer** which is one of two software programs I have developed over the last 20 years or so.
- ▶ The Greenvale Exploration Project is held by Superior Resources Limited and I thank Superior for permission to present information on the project. I am a non-executive Director of Superior Resources Limited.

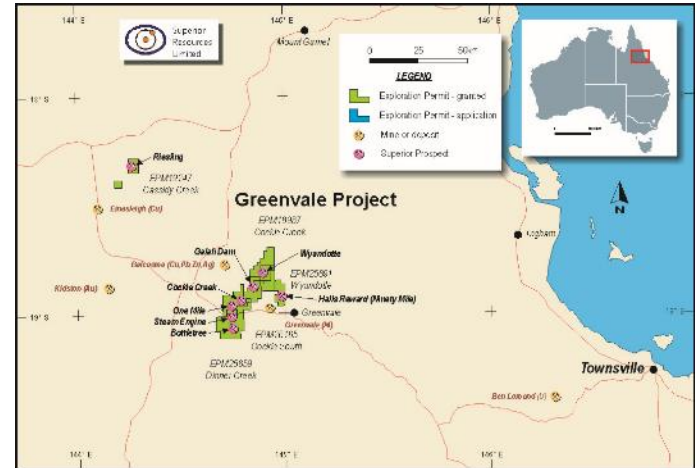
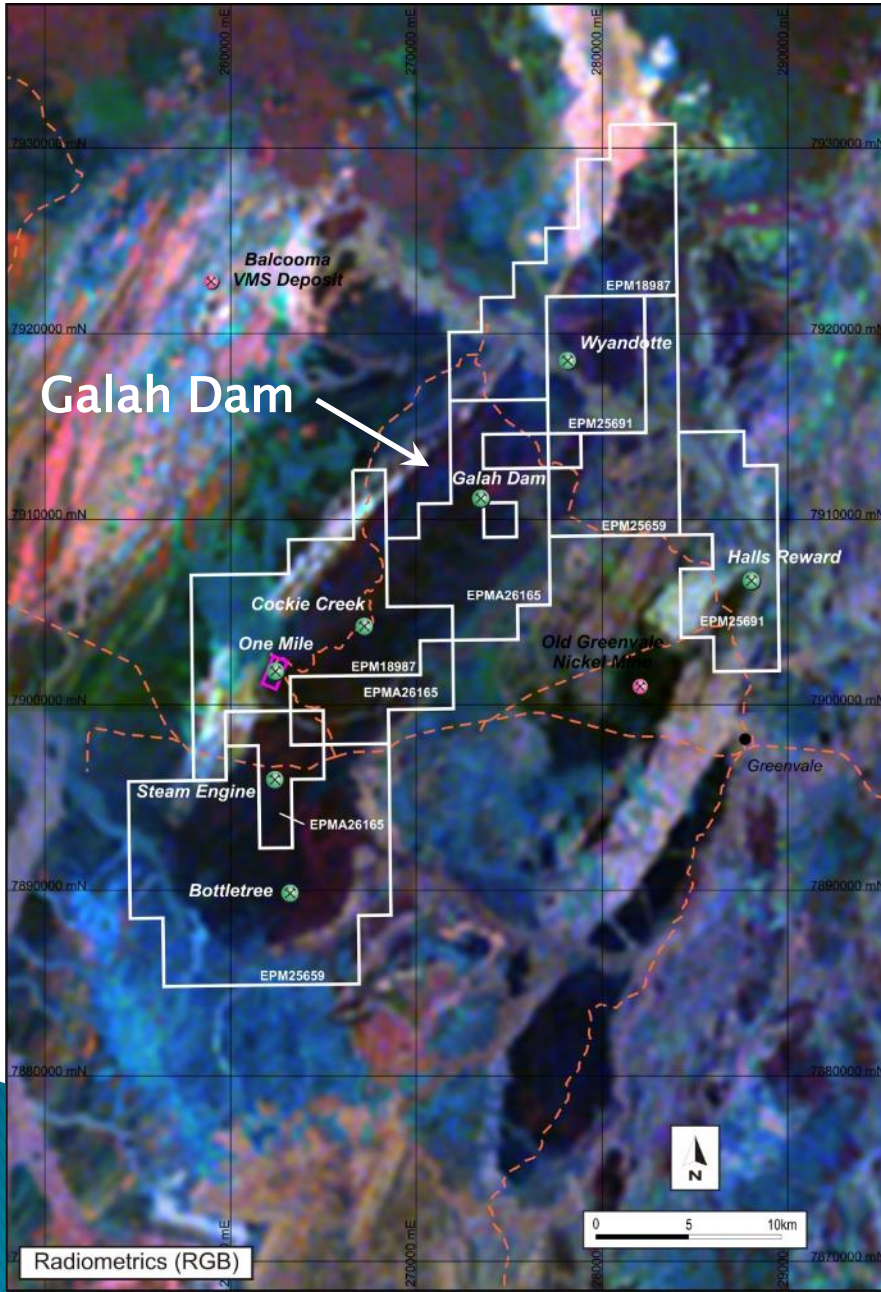
The Software

- ▶ BlockViewer allows the on-screen **3D visualisation** of block modelled data such as geophysical survey data (eg. IP data), drill hole data and other data to improve the spatial understanding and interpretation of the data.

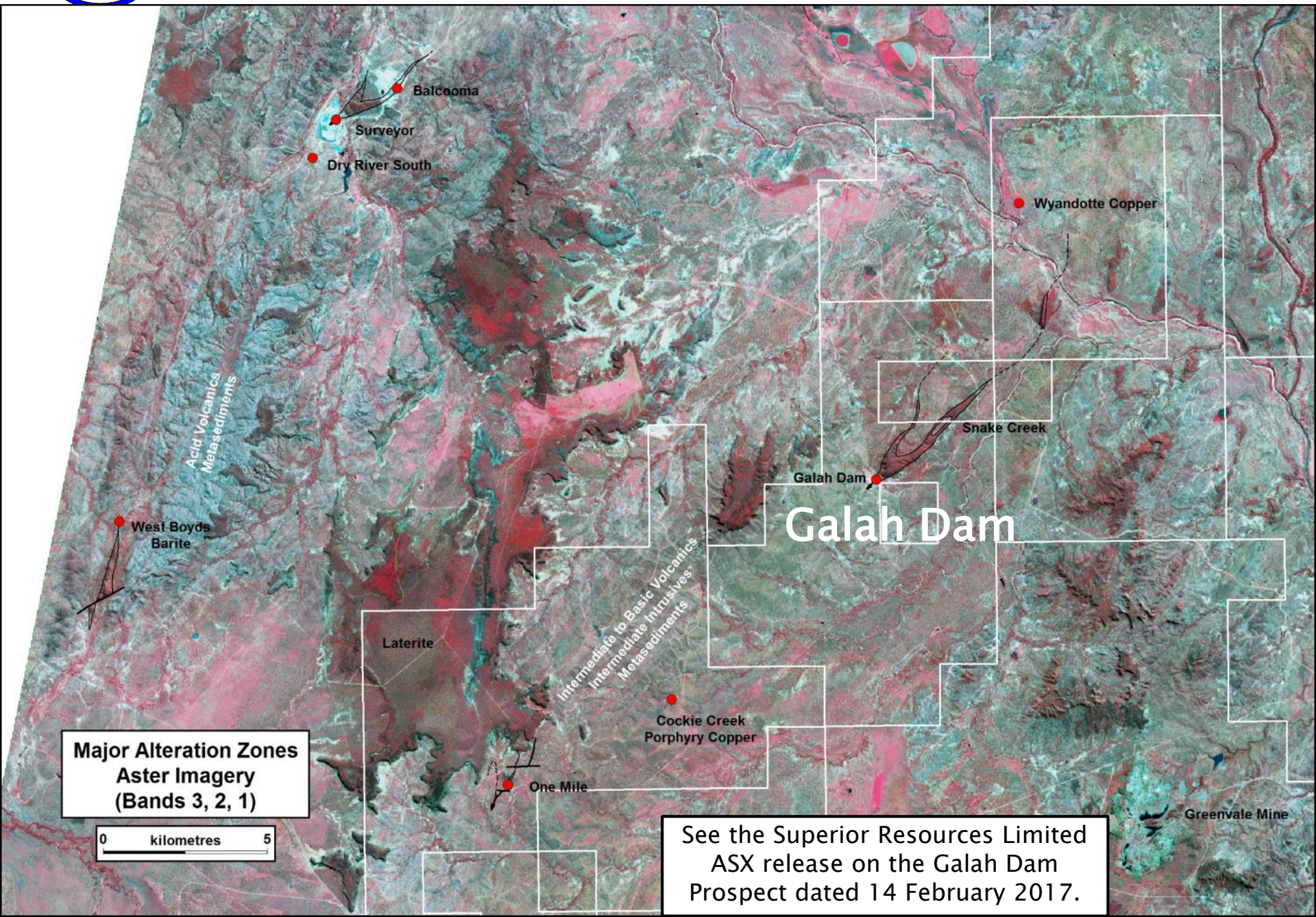
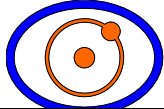


The Greenvale Project

Tenements and Prospects Radiometrics (RGB)



- ▶ The rocks of interest are:
 - ❖ Metamorphosed Ordovician intermediate to basic volcanics, intrusives and sediments which are probably equivalent to rocks in the Macquarie Arc in NSW and
 - ❖ Hosts to a variety of mineralisation styles including VMS, Porphyry Copper and Lode Gold deposits.
- ▶ In contrast, the Balcooma VMS deposit to the northwest is hosted by an acid volcanic sequence.

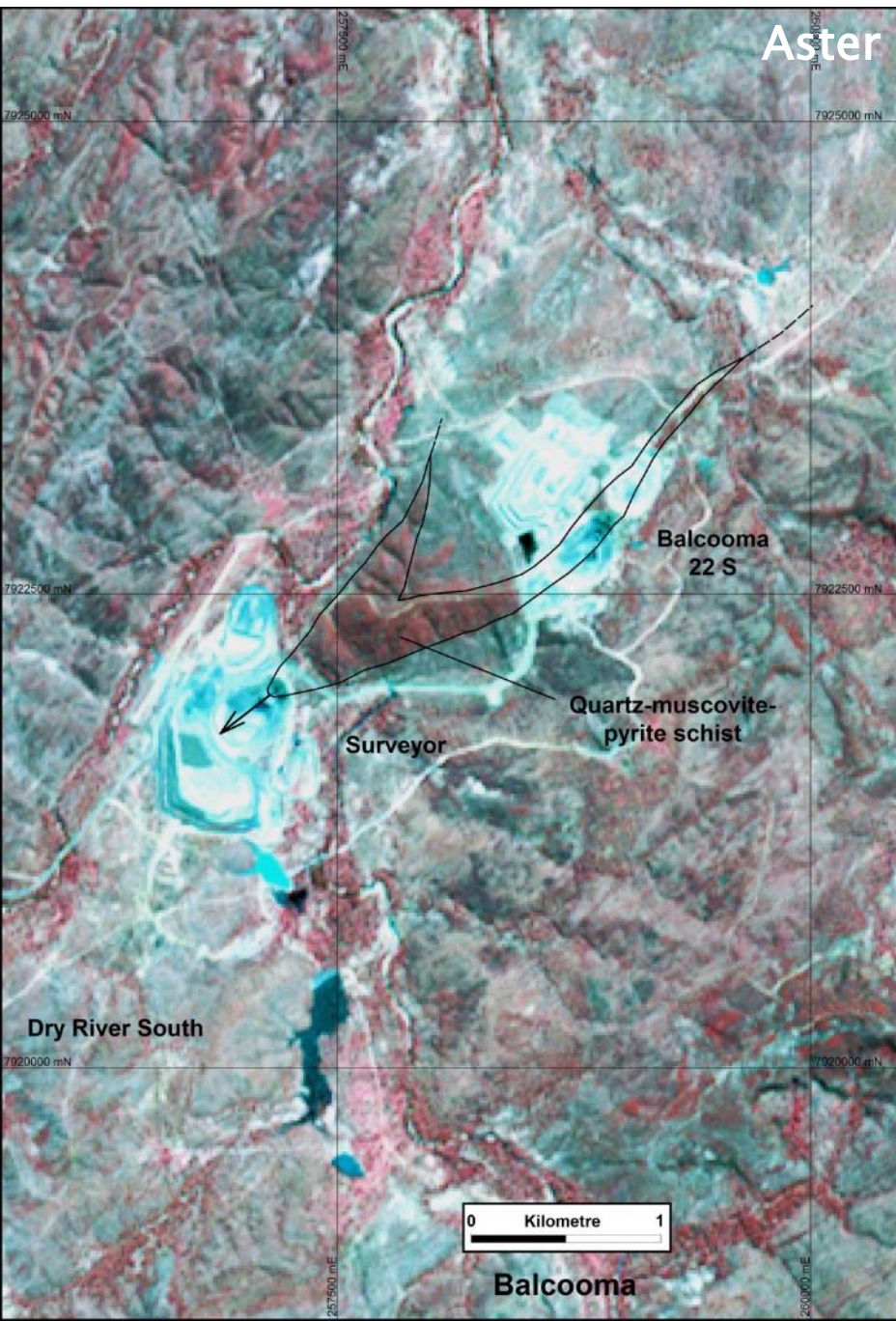


Major Alteration Zones
Aster Imagery
(Bands 3, 2, 1)

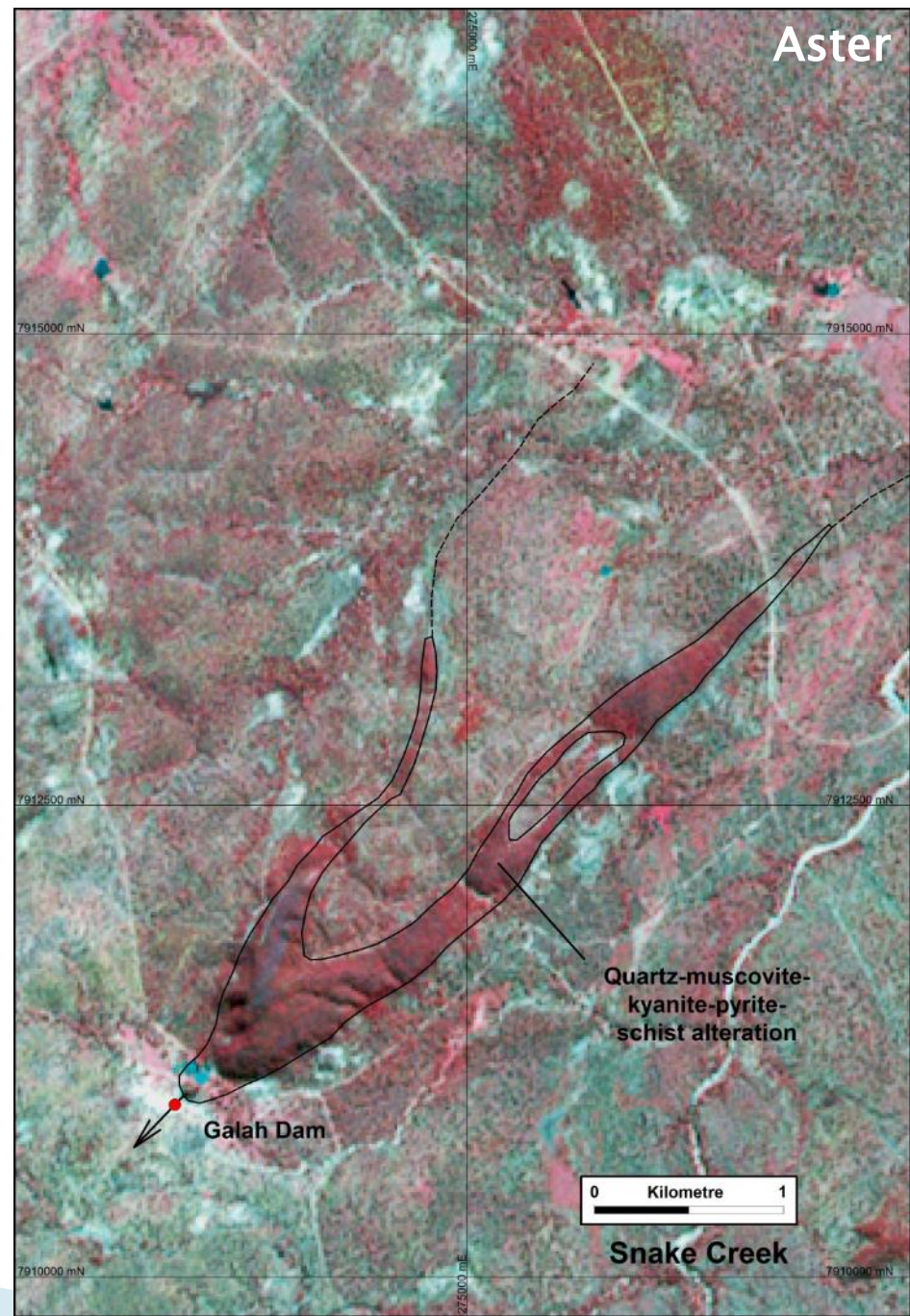
0 kilometres 5

See the Superior Resources Limited
ASX release on the Galah Dam
Prospect dated 14 February 2017.

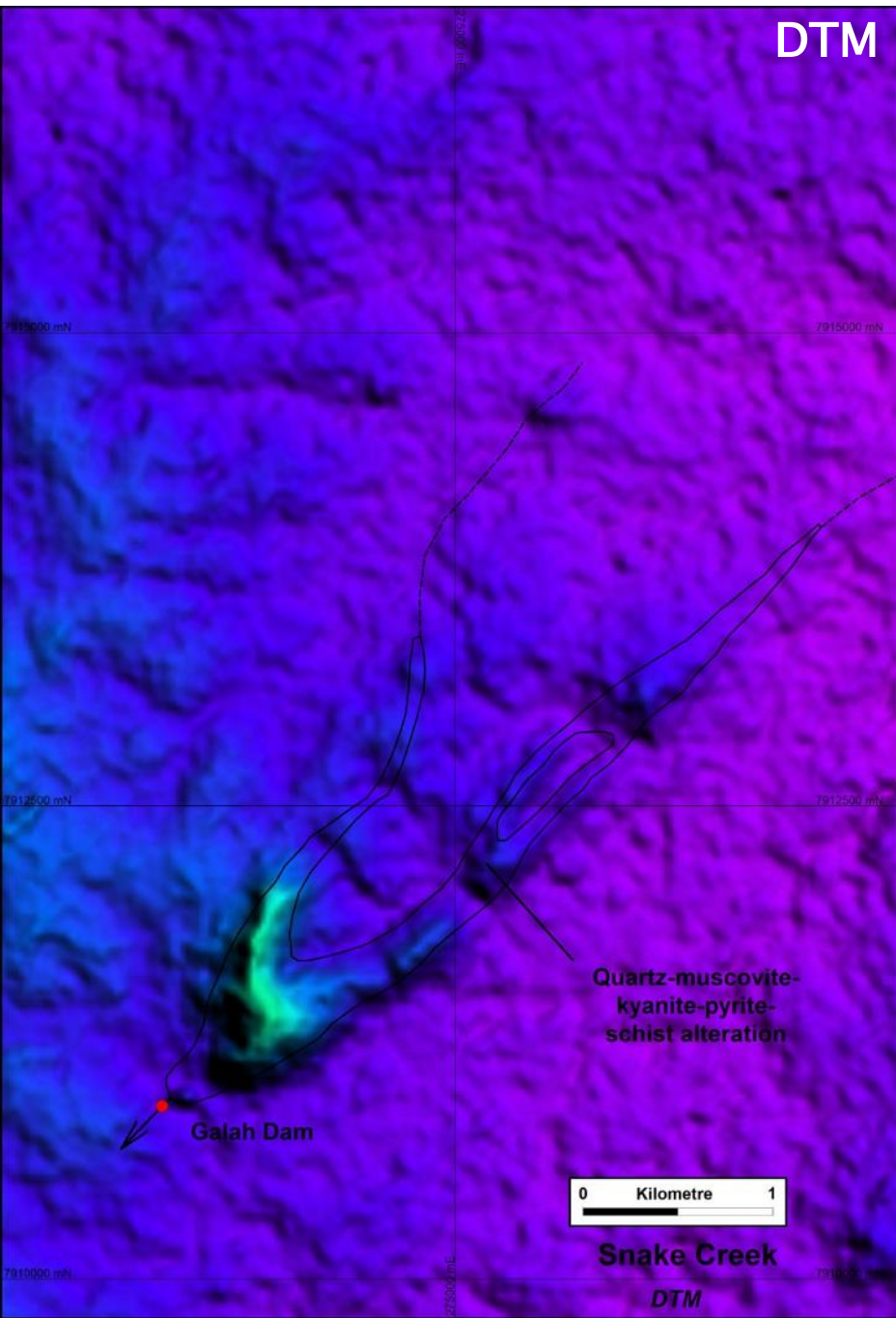
Balcooma



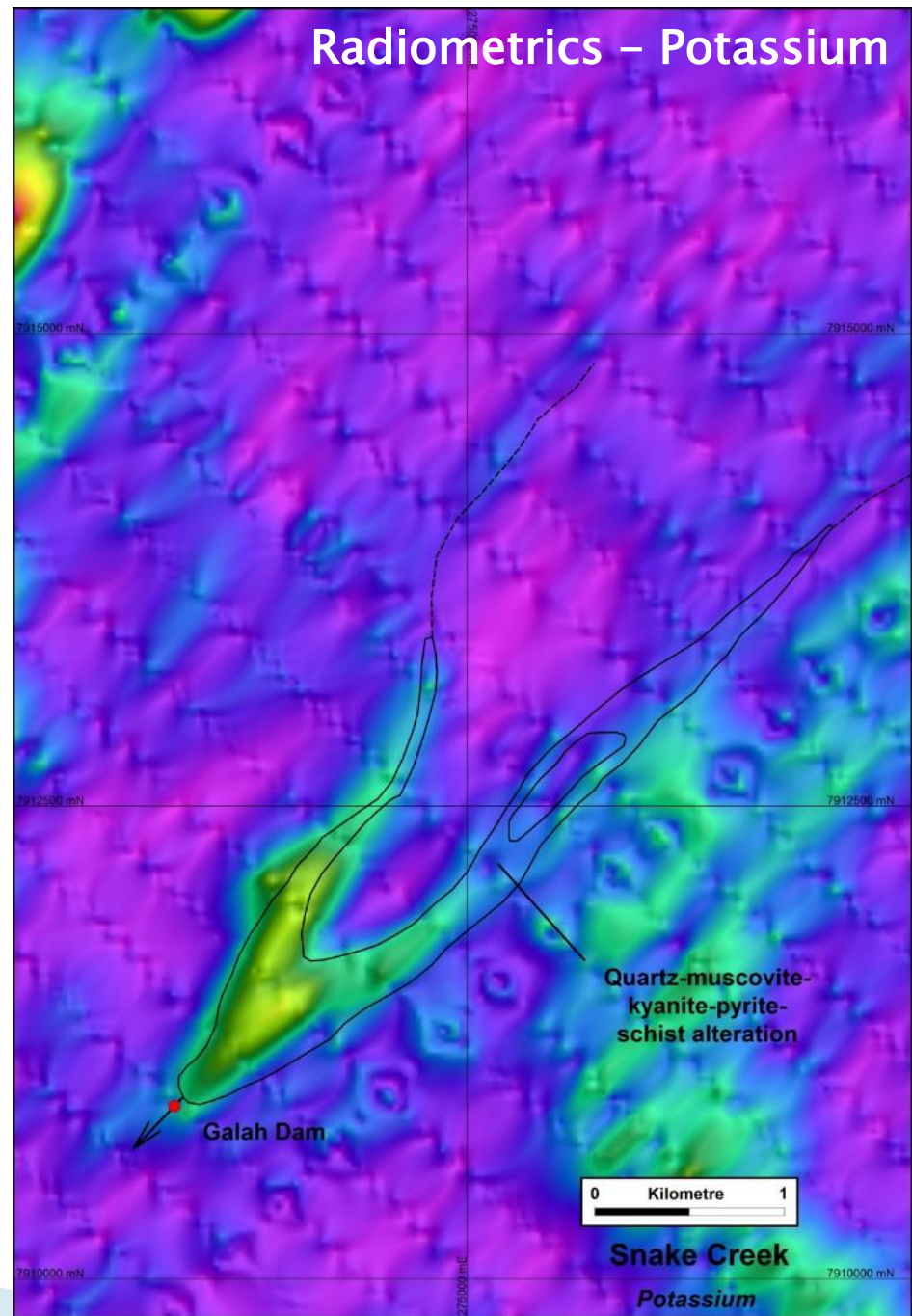
Snake Creek - Galah Dam



Snake Creek – Galah Dam



Snake Creek – Galah Dam





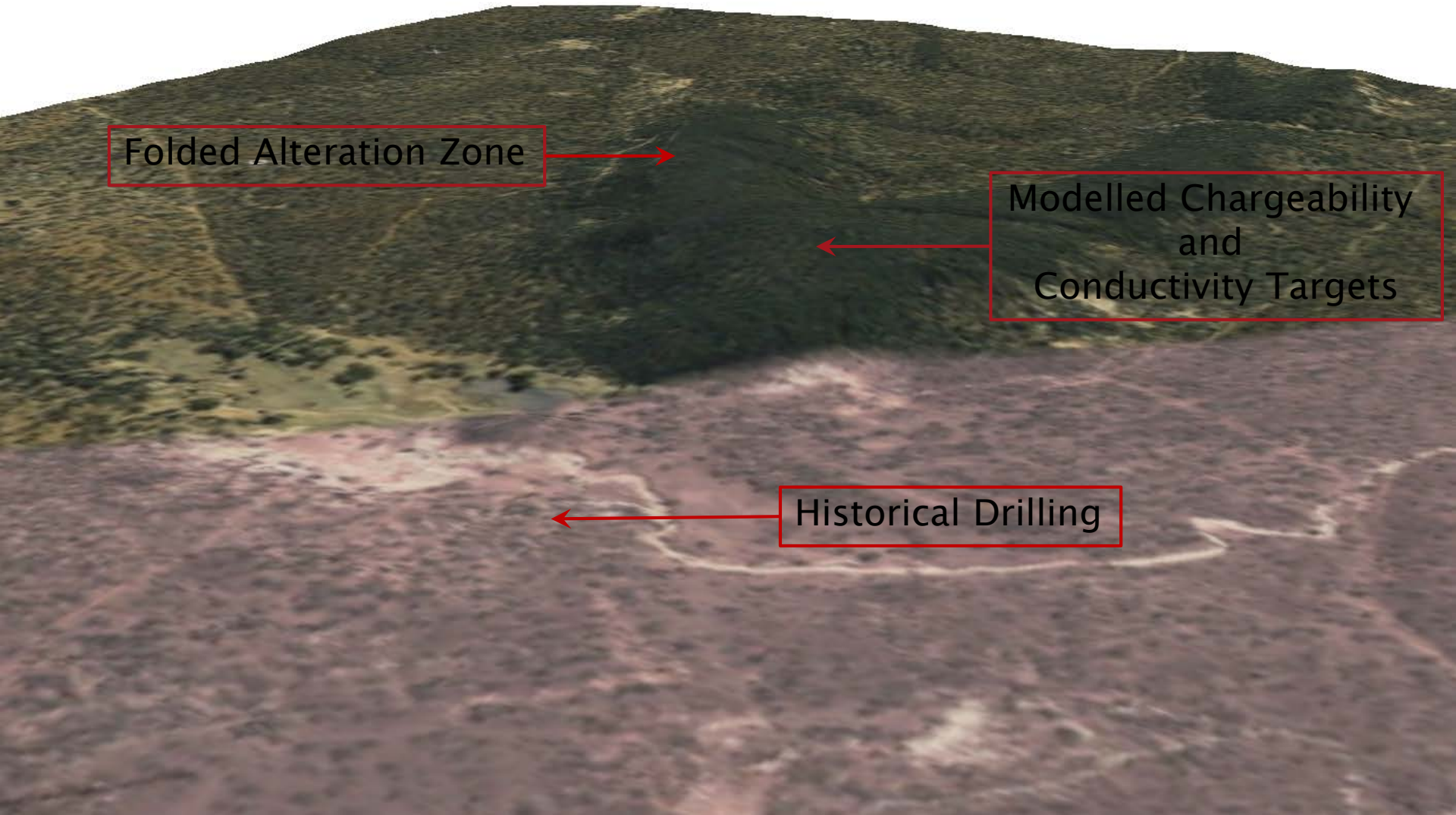
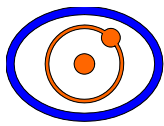
Photograph Looking
West Across Fold Axis



Photograph Looking
South Along Fold Axis

3D Visualisation of Modelled IP Survey Data, Drill Hole Data and Other Data at Galah Dam using BlockViewer

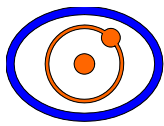
- ▶ 3D Modelling of an historical IP survey was completed by Peter Rowston of GRS using the UBS 3D software.
- ▶ 3D block models for chargeability and conductivity (resistivity).
- ▶ The exploration permit covering Galah Dam has only recently been granted to Superior.
- ▶ All drill hole data shown has been compiled from historical records.
- ▶ The following slides have been taken directly from BlockViewer with additions and annotations in PowerPoint



Folded Alteration Zone

Modelled Chargeability
and
Conductivity Targets

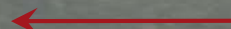
Historical Drilling



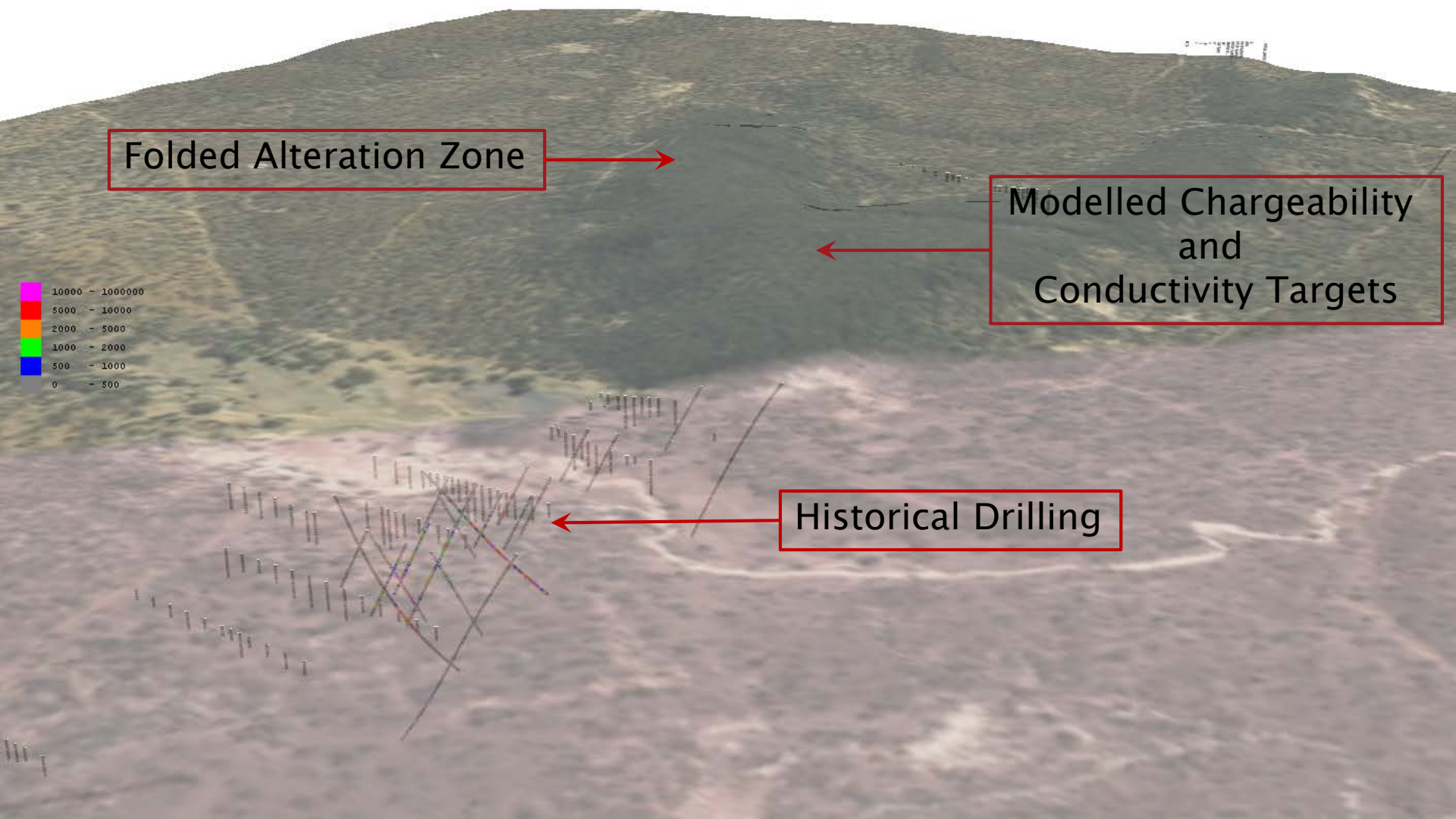
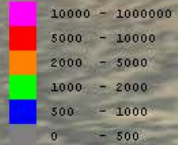
Folded Alteration Zone

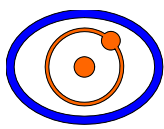


Modelled Chargeability
and
Conductivity Targets



Historical Drilling

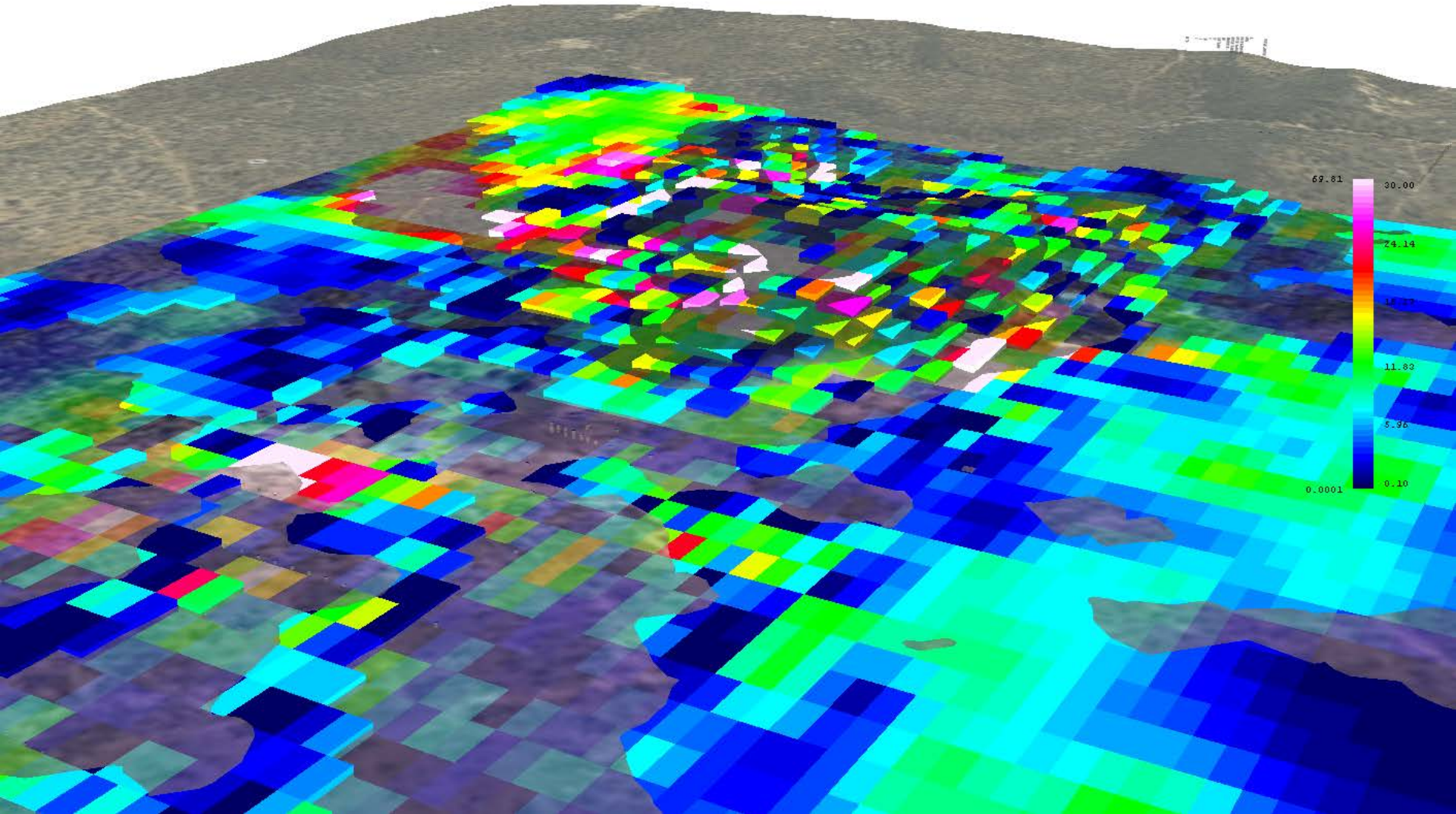


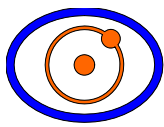


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Galah Dam 3D Chargeability Block Model

View Centre: 10000E; 96750N; 450RL
Looking: -20° to 330° Grid

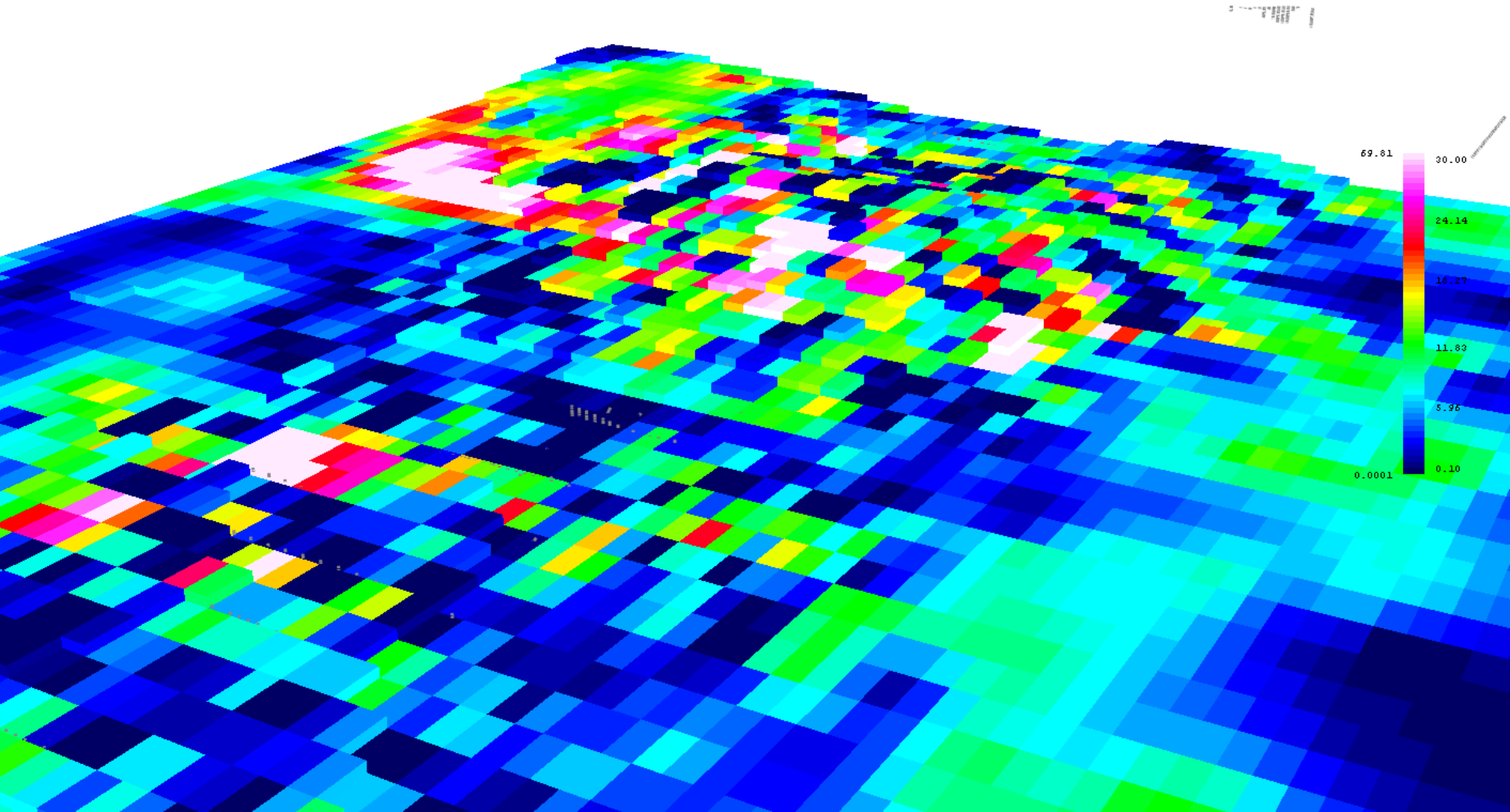


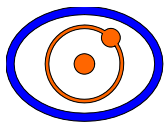


Superior Resources Limited

Galah Dam 3D Chargeability Block Model

View Centre: 10000E; 96750N; 450RL
Looking: -20° to 330° Grid

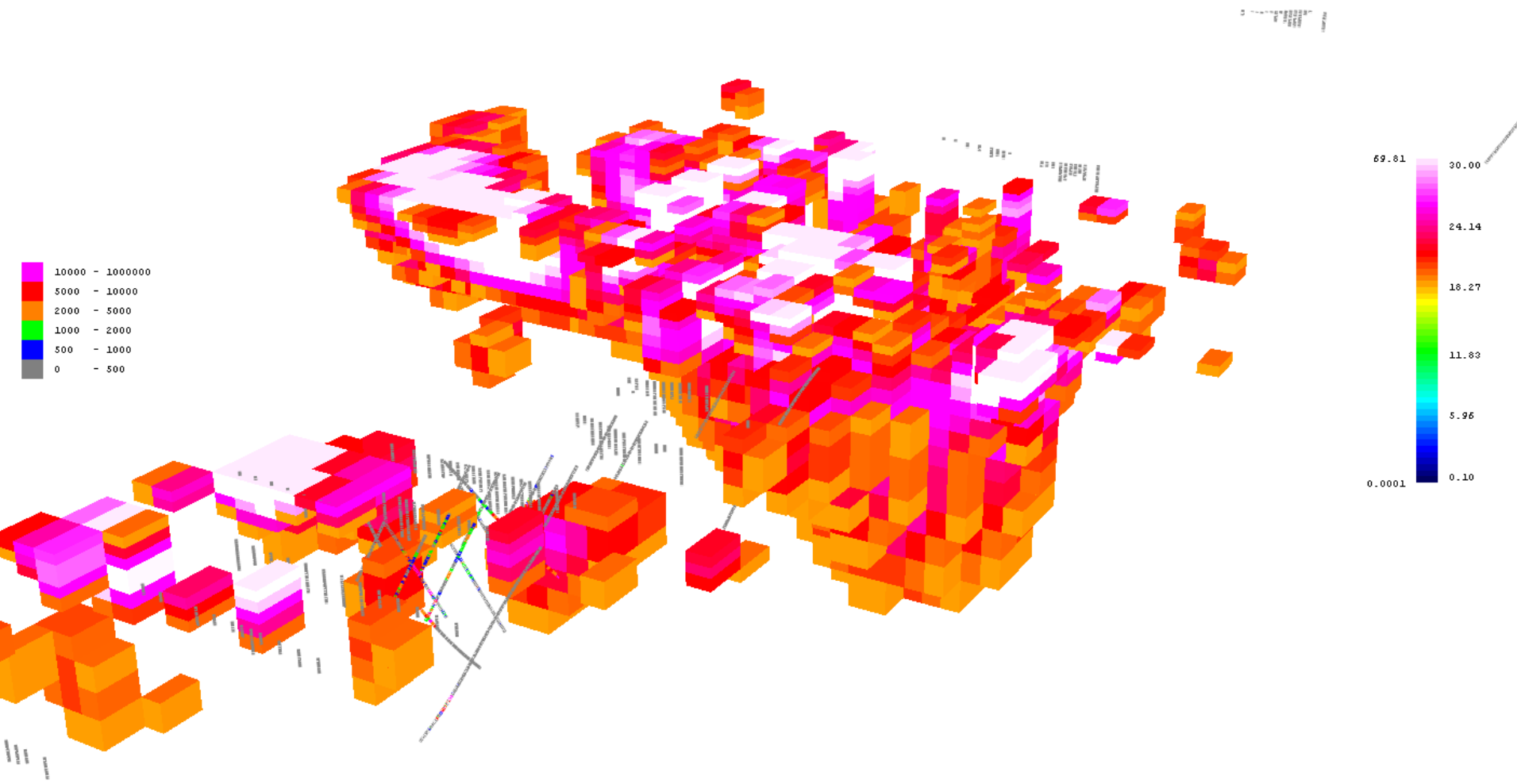


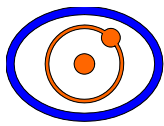


Galah Dam 3D Chargeability Block Model

20 mV/V Block Cutoff

View Centre: 10000E; 96750N; 450RL
Looking: -20° to 330° Grid





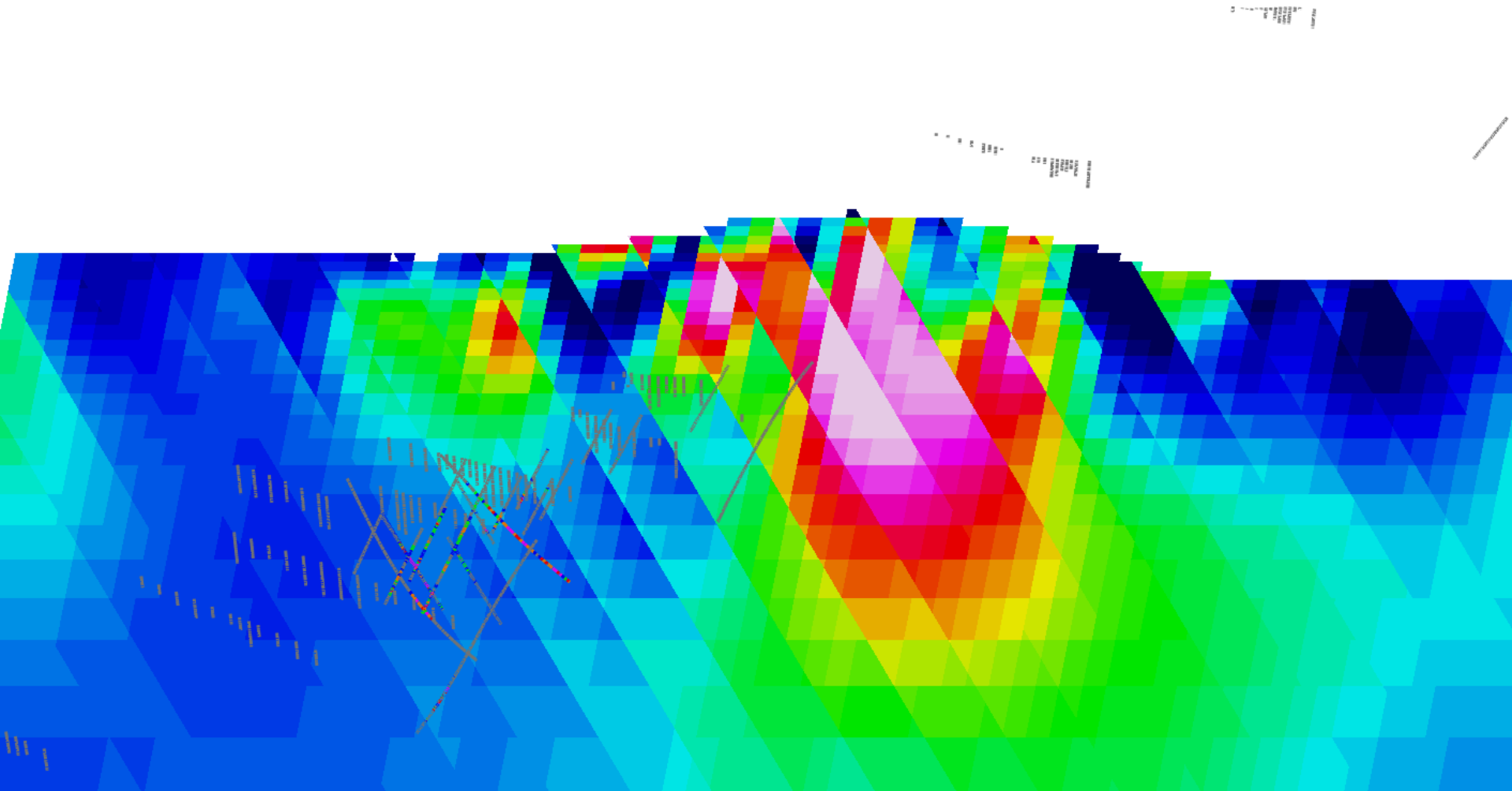
Superior Resources Limited

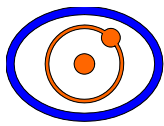
Galah Dam 3D Chargeability Block Model

Planar Section at View Centre

View Centre: 10000E; 96750N; 450RL

Looking: -20° to 330° Grid



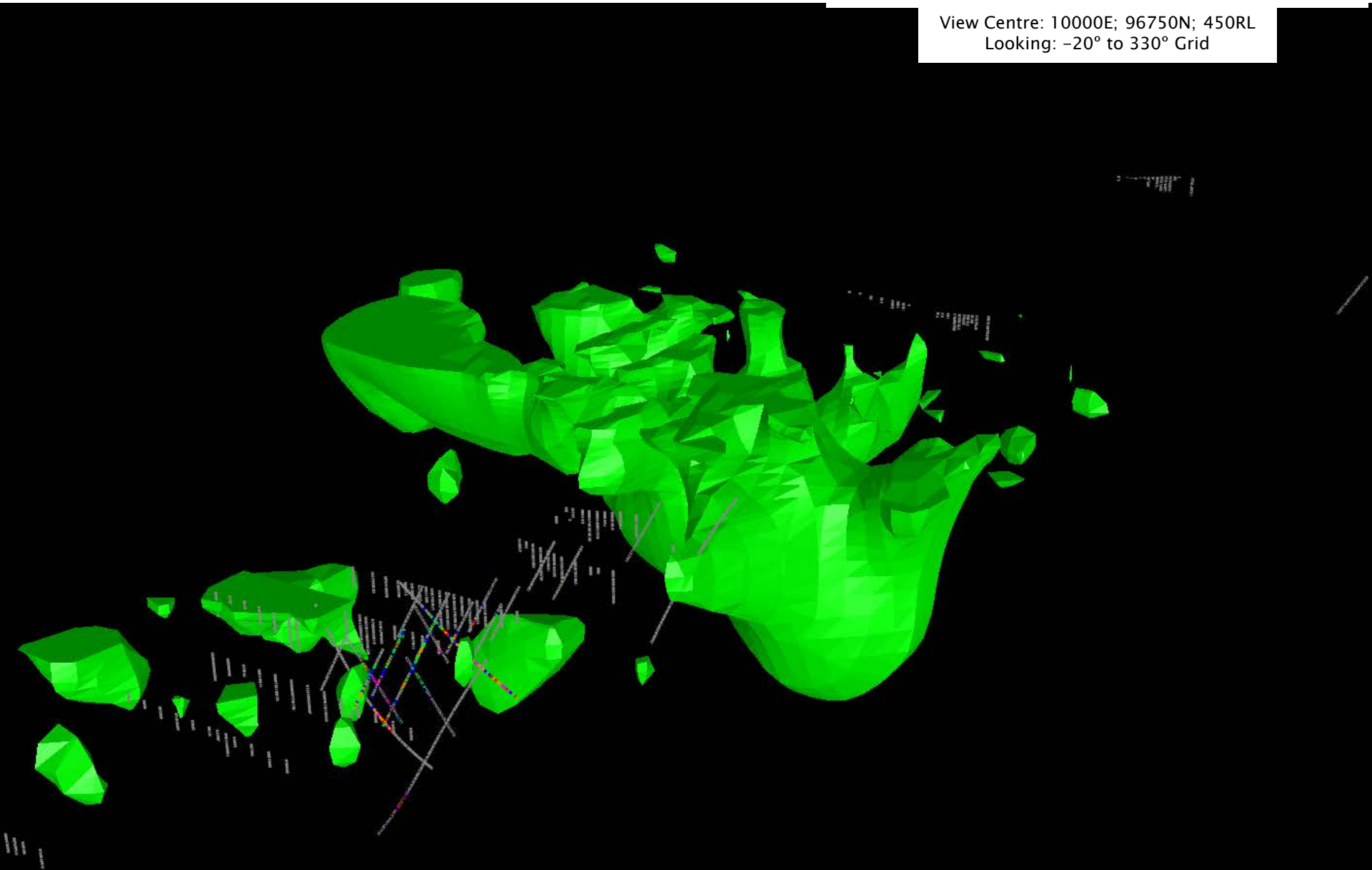


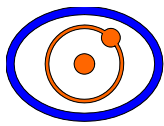
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Galah Dam 3D Chargeability Block Model

3D Contour at 20 mV/V

View Centre: 10000E; 96750N; 450RL
Looking: -20° to 330° Grid





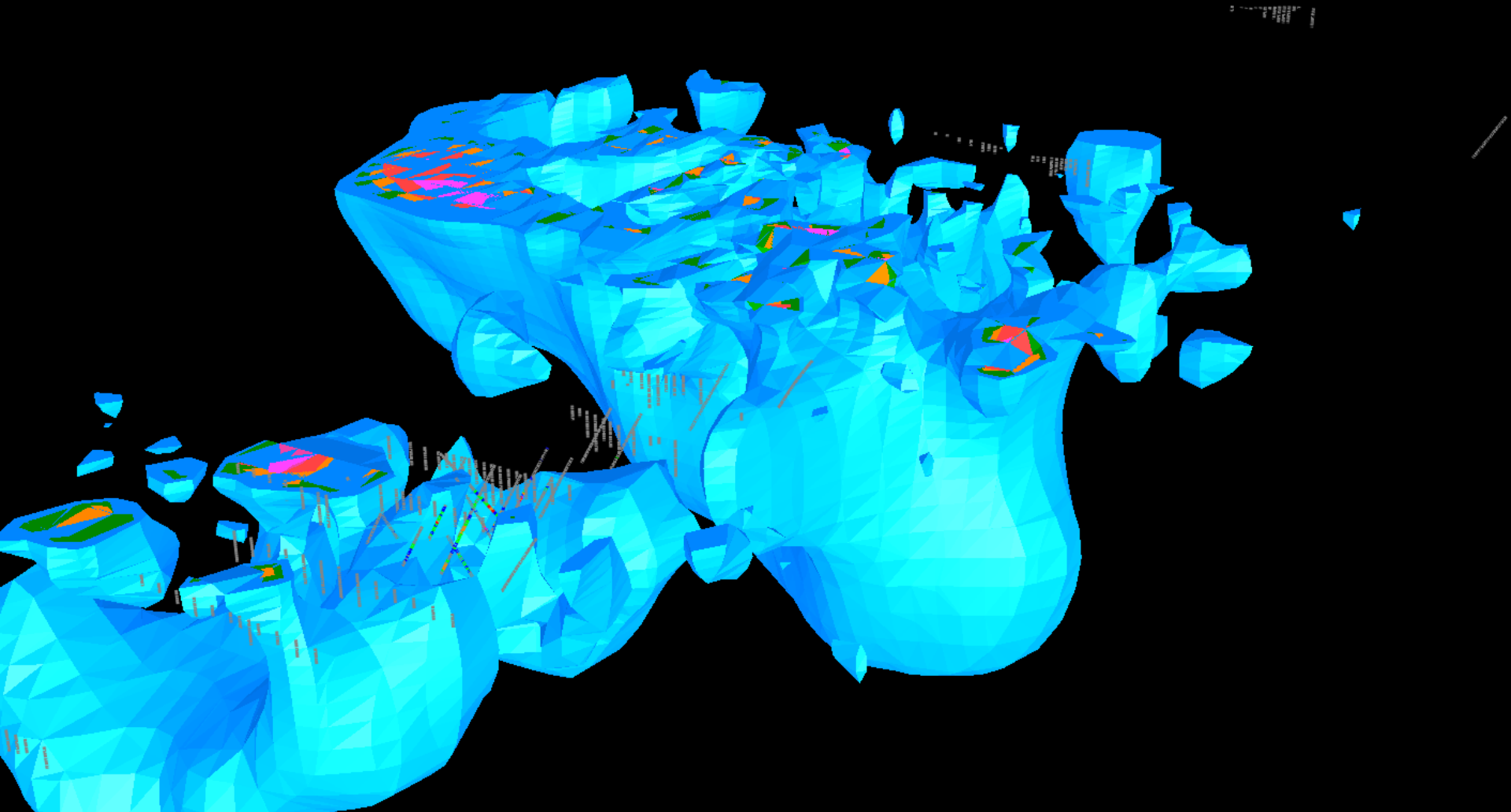
Superior Resources Limited

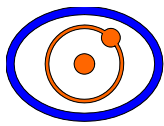
Galah Dam

3D Chargeability Block Model

3D Contours at 15, 20, 25, 30, 35 & 40 mV/V

View Centre: 10000E; 96750N; 450RL
Looking: -20° to 330° Grid



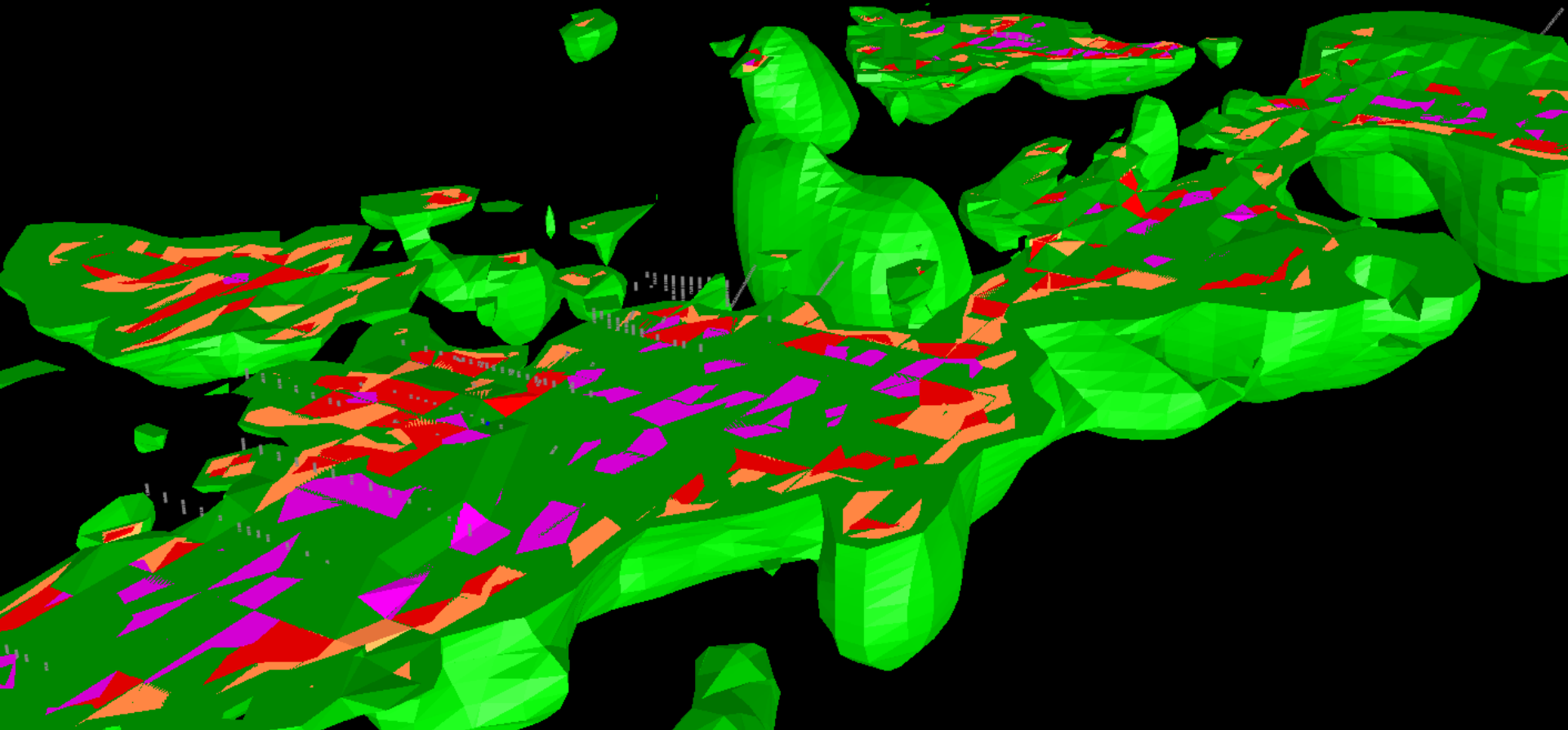


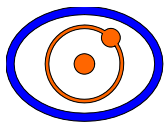
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Galah Dam 3D Conductivity Block Model

3D Contours at 20, 30, 40 & 80mS/m

View Centre: 10000E; 96750N; 450RL
Looking: -20° to 330° Grid





Superior Resources Limited

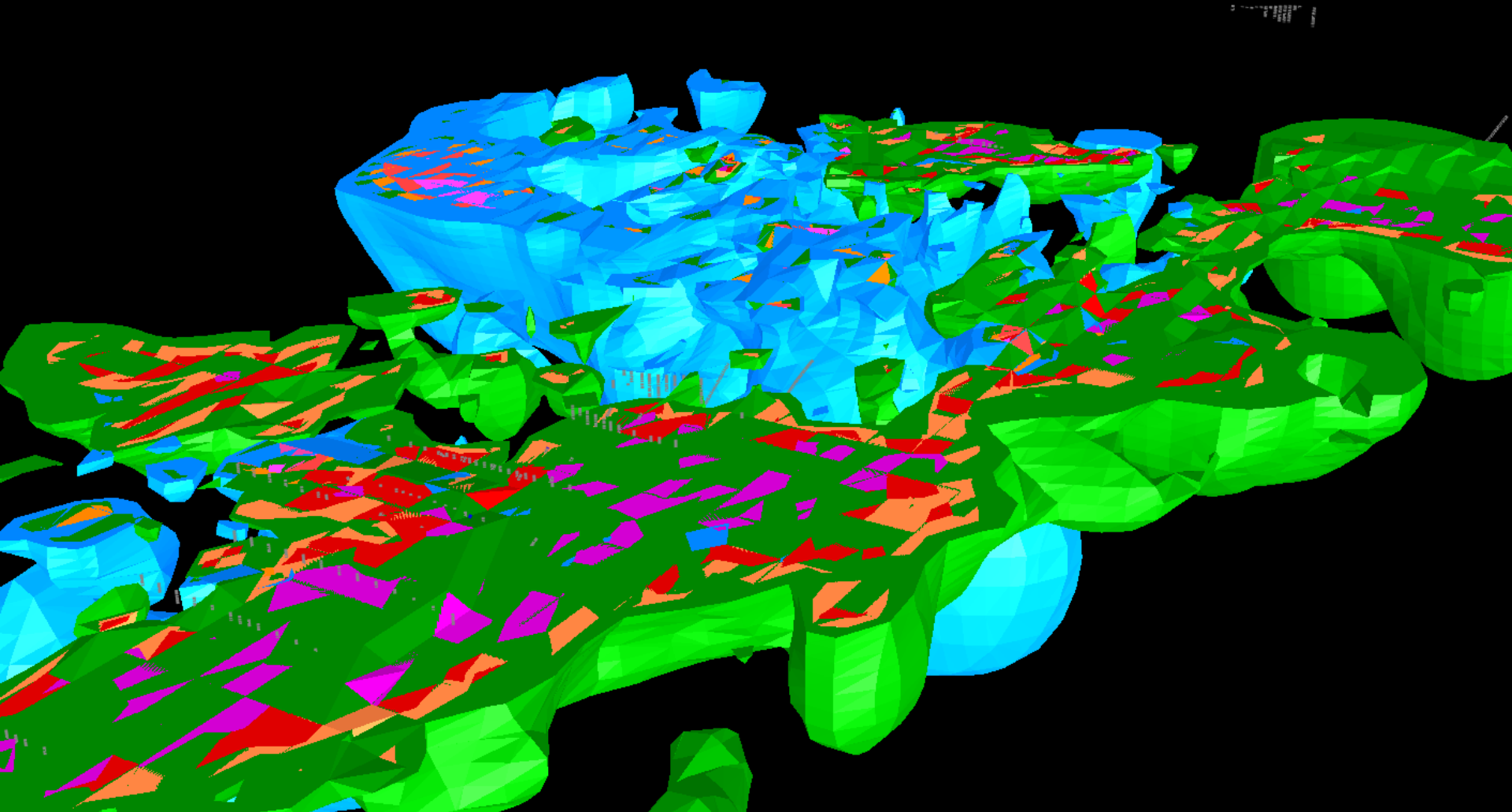
Galah Dam

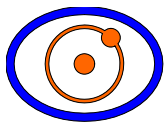
3D Chargeability Block Model

3D Conductivity Block Model

3D Contours

View Centre: 10000E; 96750N; 450RL
Looking: -20° to 330° Grid





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Galah Dam

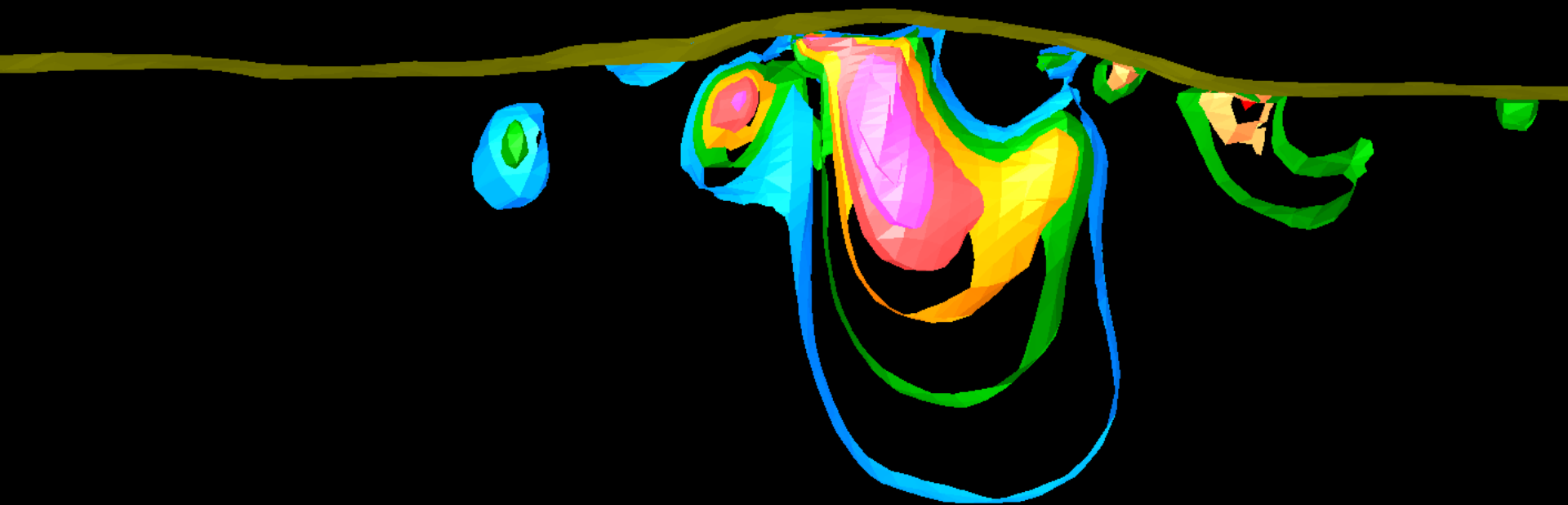
3D Chargeability Block Model

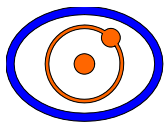
3D Conductivity Block Model

50m Slice through 3D Contours at View Centre

View Centre: 10000E; 96750N; 450RL

Looking: -20° to 330° Grid





Galah Dam

3D Chargeability Block Model

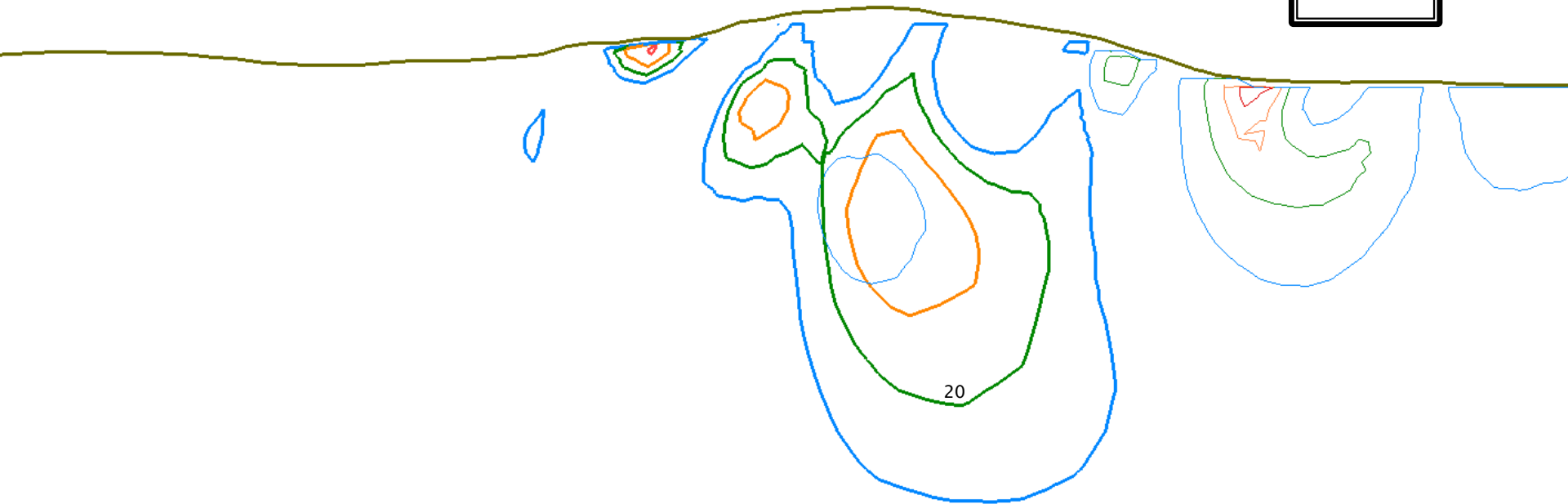
3D Conductivity Block Model

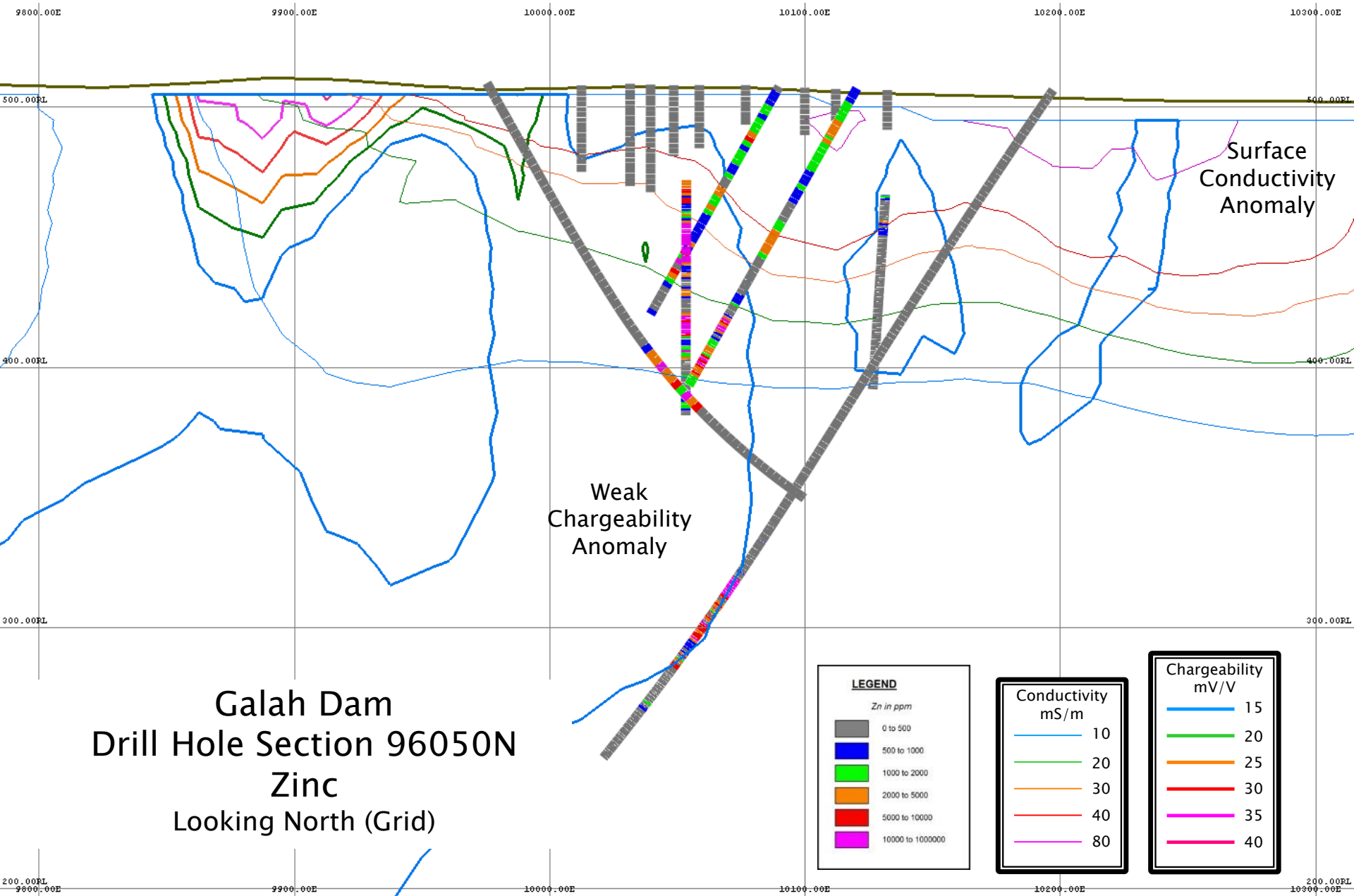
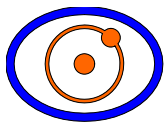
Contours on Section through View Centre
Thick Lines - Chargeability; Thin Lines Conductivity

View Centre: 10000E; 96750N; 450RL
Looking: -20° to 330° Grid

Conductivity mS/m	
10	Blue
20	Green
30	Orange
40	Red
80	Pink

Chargeability mV/V	
15	Blue
20	Green
25	Orange
30	Red
35	Pink
40	Magenta





Galah Dam
Drill Hole Section 96050N
Zinc
Looking North (Grid)

LEGEND

Zn in ppm

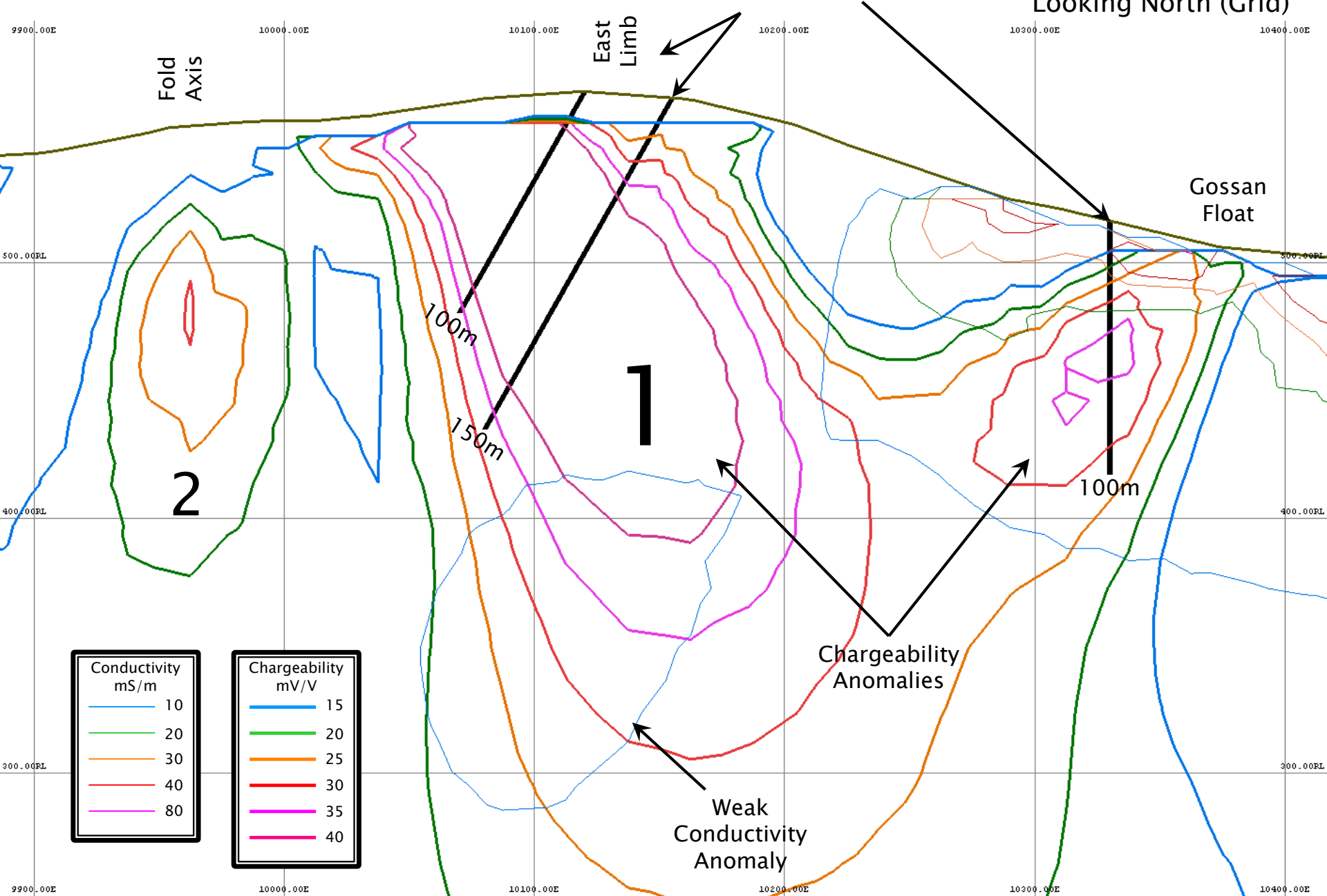
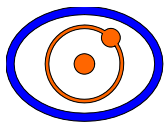
Grey	0 to 500
Blue	500 to 1000
Green	1000 to 2000
Orange	2000 to 5000
Red	5000 to 10000
Pink	10000 to 1000000

Conductivity
mS/m

Blue	10
Green	20
Orange	30
Red	40
Pink	80

Chargeability
mV/V

Blue	15
Green	20
Orange	25
Red	30
Pink	35
Magenta	40



Fold Axis

East Limb

Suggested Drill Hole Locations

Gossan Float

2

1

100m

150m

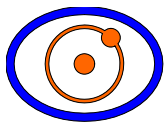
100m

Chargeability Anomalies

Weak Conductivity Anomaly

Conductivity mS/m	
10	Blue
20	Green
30	Orange
40	Red
80	Magenta

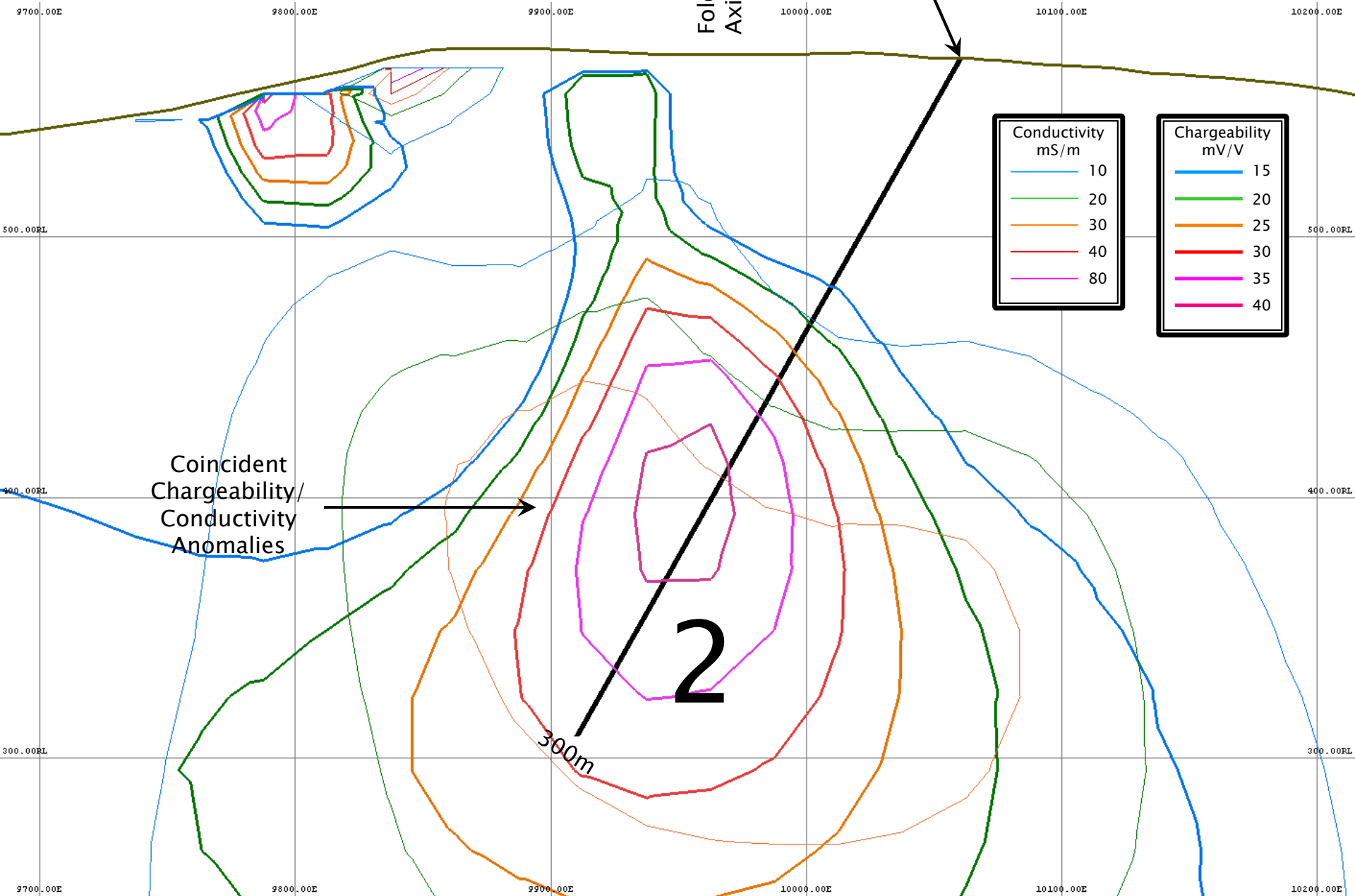
Chargeability mV/V	
15	Blue
20	Green
25	Orange
30	Red
35	Magenta
40	Pink



Superior Resources Limited

Suggested
Drill Hole
Location

Galah Dam
Section 96930N
Looking North (Grid)



Fold
Axis

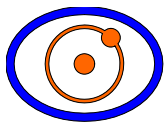
Conductivity mS/m	
10	20
30	40
80	

Chargeability mV/V	
15	20
25	30
35	40

Coincident
Chargeability/
Conductivity
Anomalies

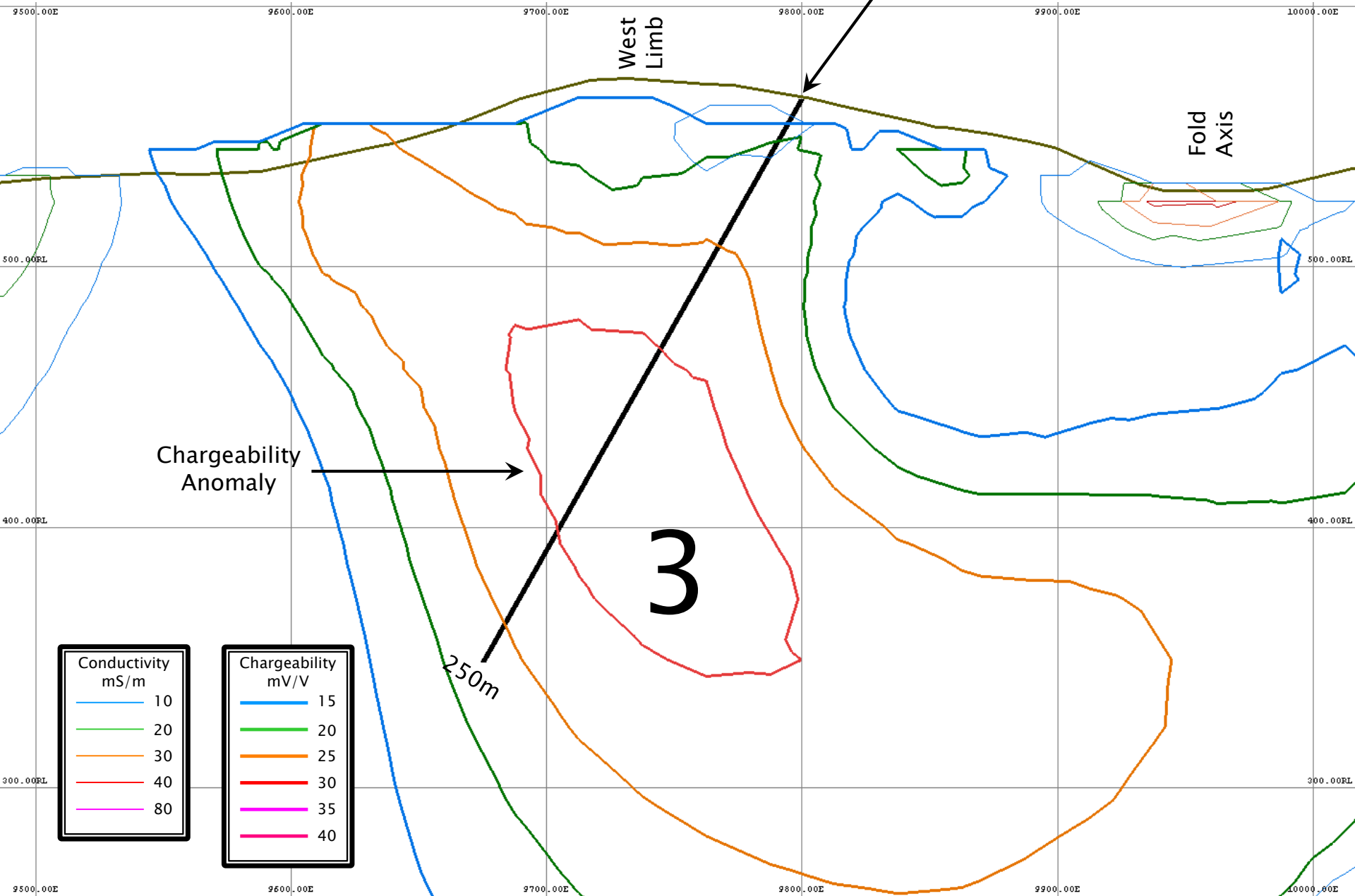
2

300m



Suggested
Drill Hole
Location

Galah Dam
Section 97090N
Looking North (Grid)



West
Limb

Fold
Axis

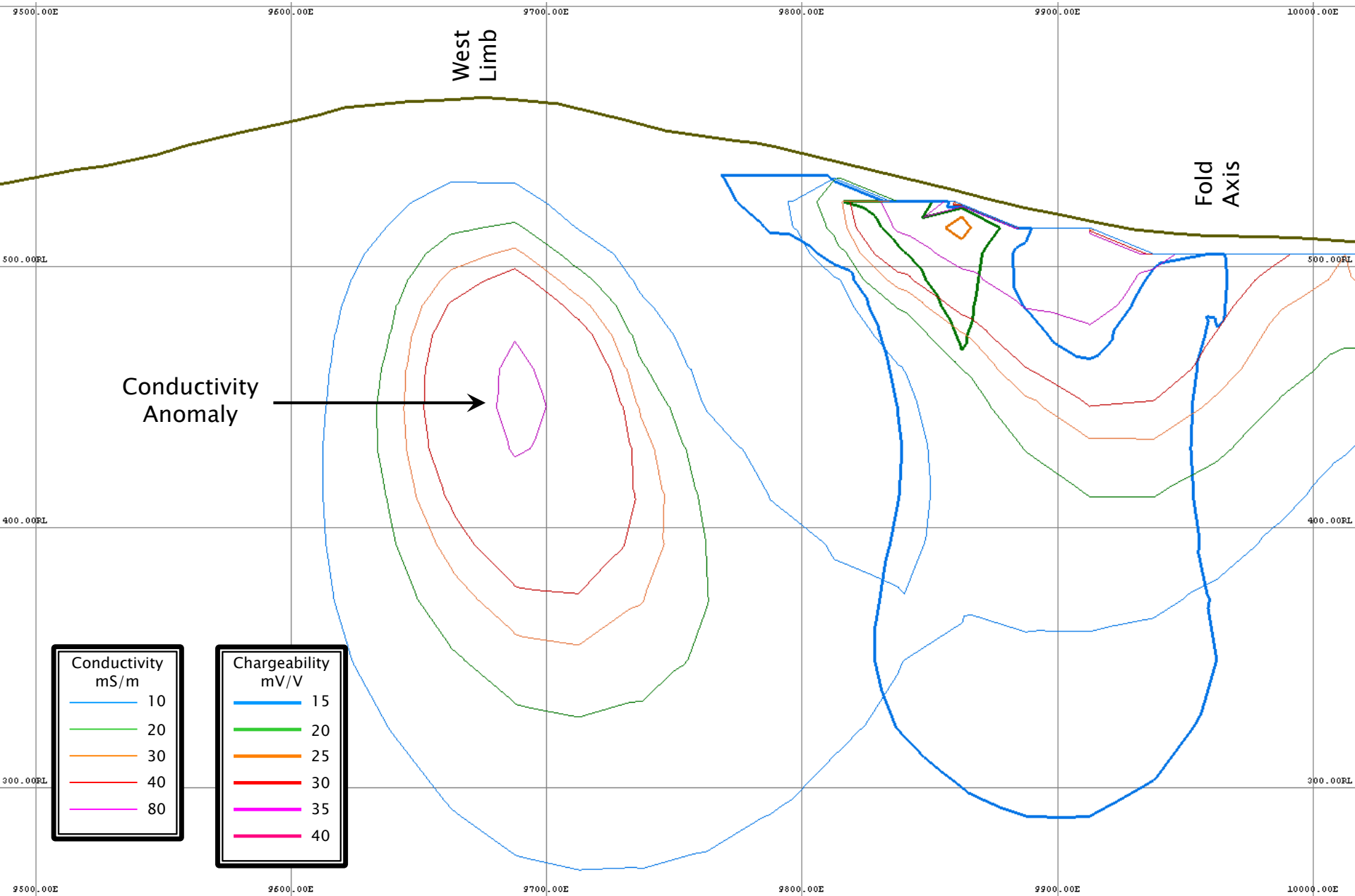
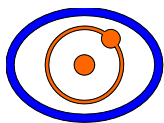
Chargeability
Anomaly

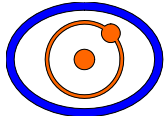
3

250m

Conductivity mS/m	
10	Blue
20	Green
30	Orange
40	Red
80	Pink

Chargeability mV/V	
15	Blue
20	Green
25	Orange
30	Red
35	Pink
40	Magenta





3D Chargeability Block Model
3D Conductivity Block Model

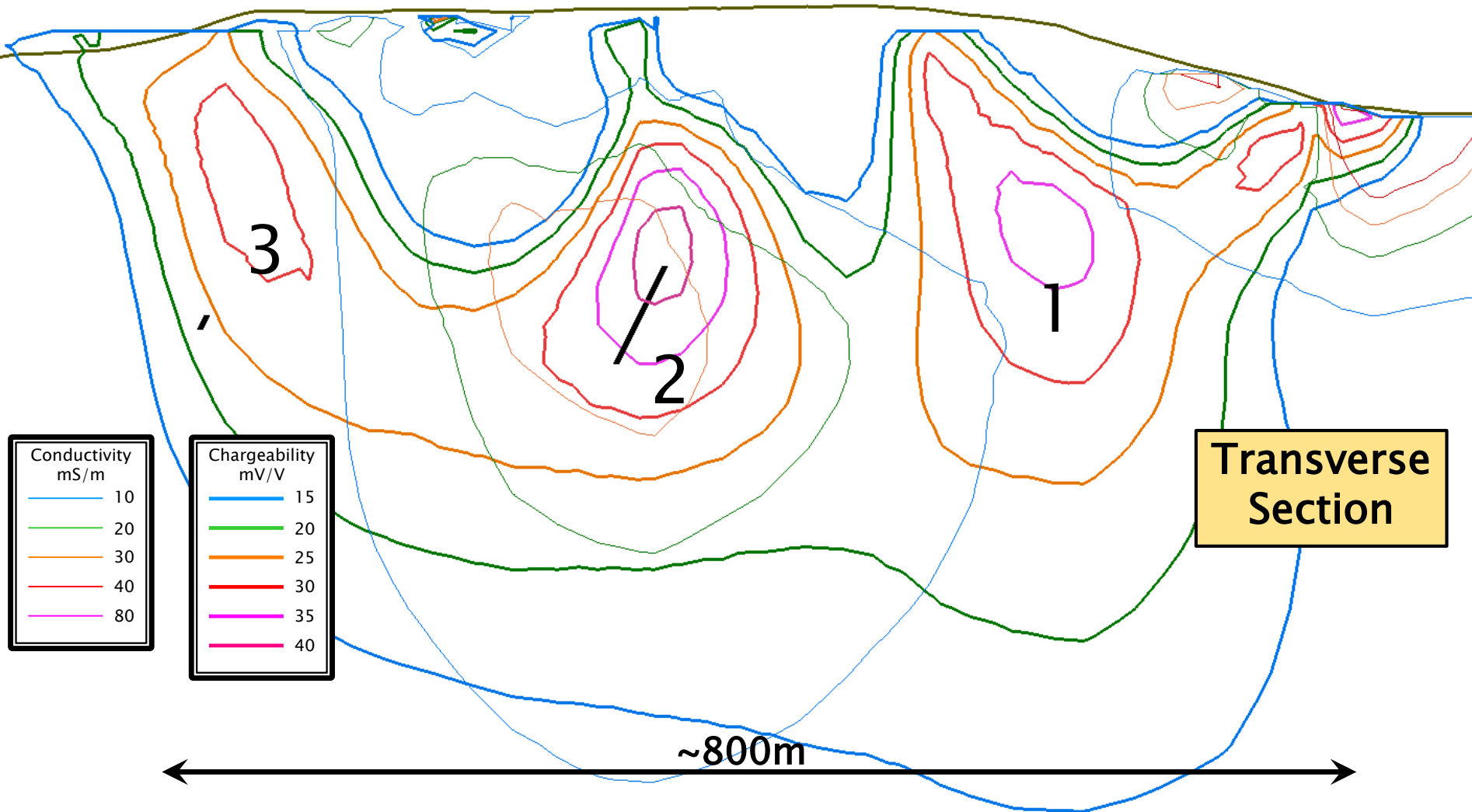
Contours on Section through View Centre
Thick Lines - Chargeability; Thin Lines Conductivity

View Centre: 9990E; 96900N; 340RL
Looking: 0° to 30° Grid

West
Limb

Fold
Axis

East
Limb

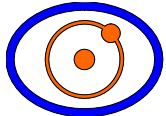


Conductivity mS/m	
Blue	10
Green	20
Orange	30
Red	40
Purple	80

Chargeability mV/V	
Blue	15
Green	20
Orange	25
Red	30
Purple	35
Pink	40

**Transverse
Section**

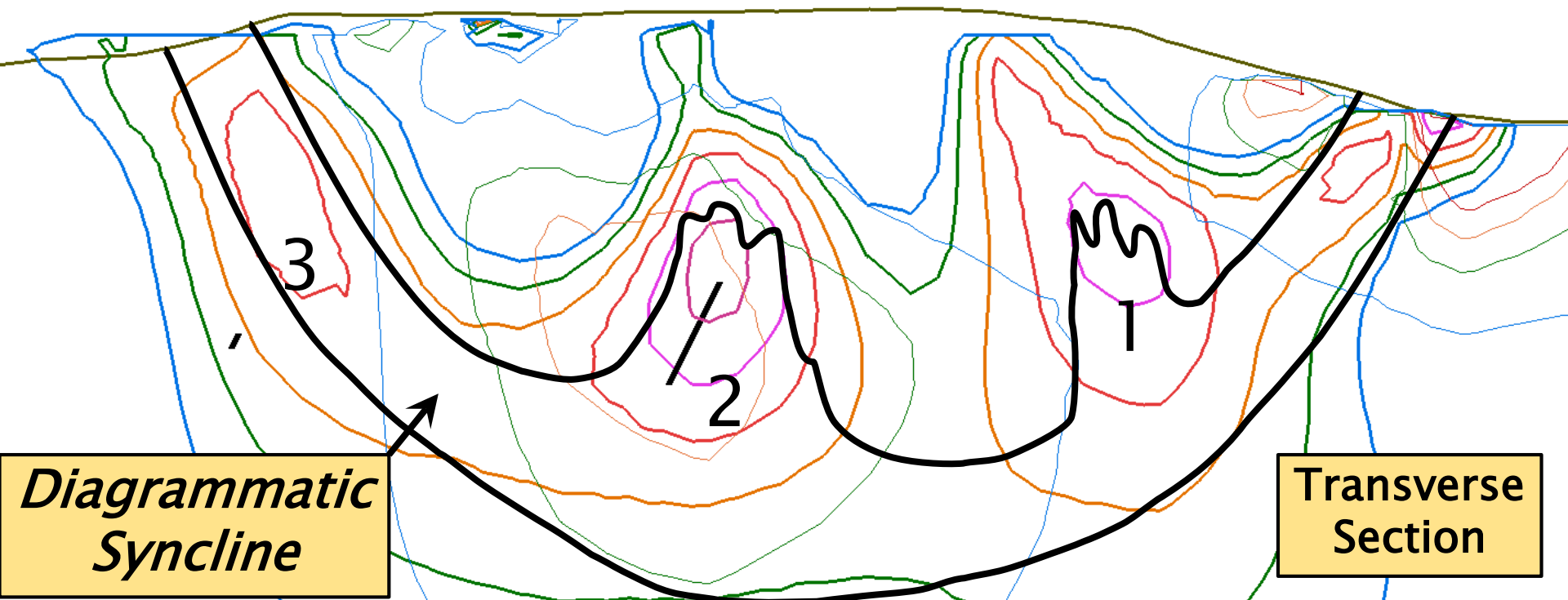
~800m



West
Limb

Fold
Axis

East
Limb



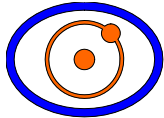
**Diagrammatic
Syncline**

**Transverse
Section**

Conductivity mS/m	
—	10
—	20
—	30
—	40
—	80

Chargeability mV/V	
—	15
—	20
—	25
—	30
—	35
—	40

Speculation:
*Is the fold a Syncline
with sulphide remobilisation
up the fold axis?*



LEGEND

Modelled Conductivity Contours (mS/m)

- 10
- 20
- 30
- 40
- 80

LEGEND

Modelled Chargeability Contours (mV/V)

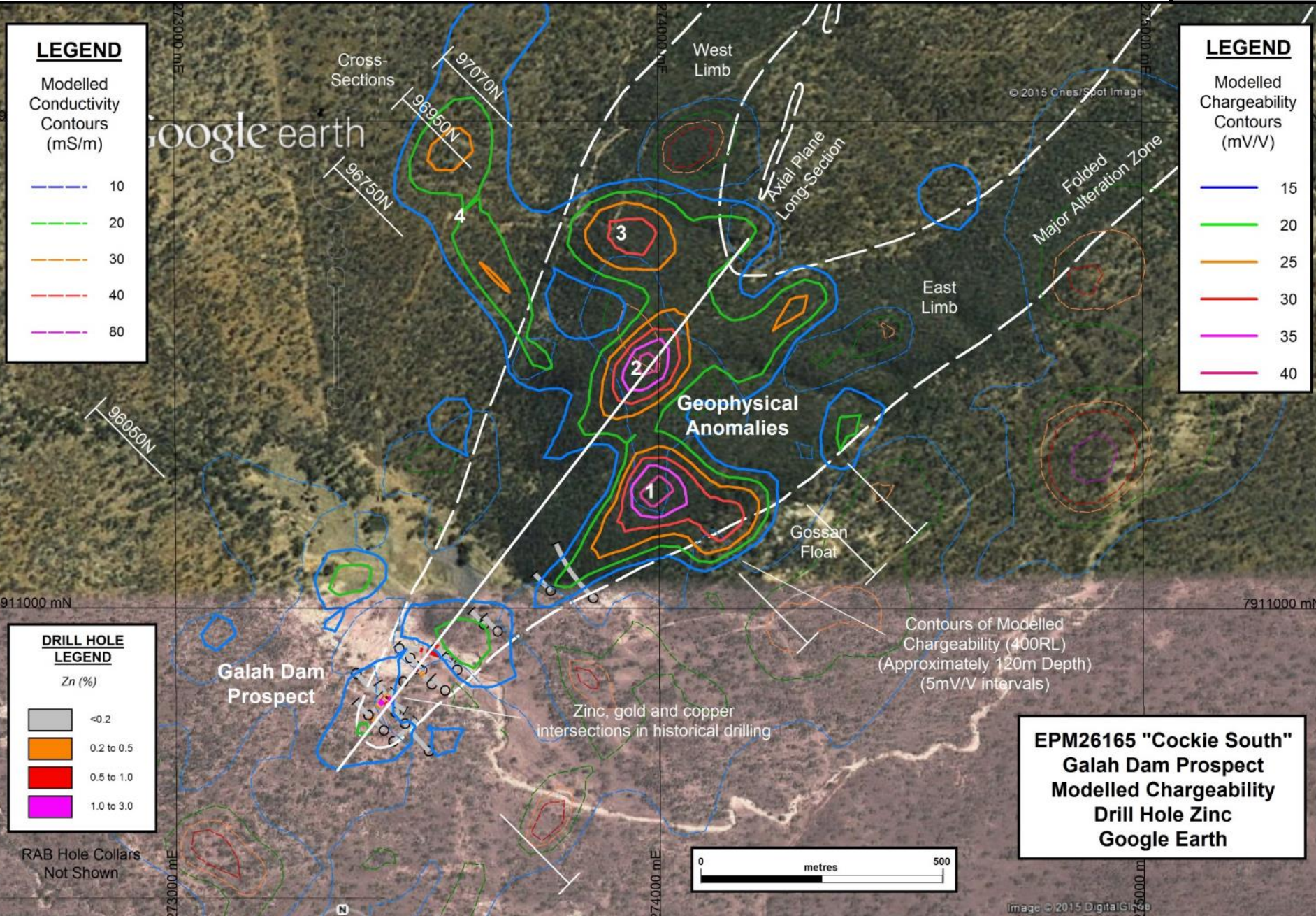
- 15
- 20
- 25
- 30
- 35
- 40

DRILL HOLE LEGEND

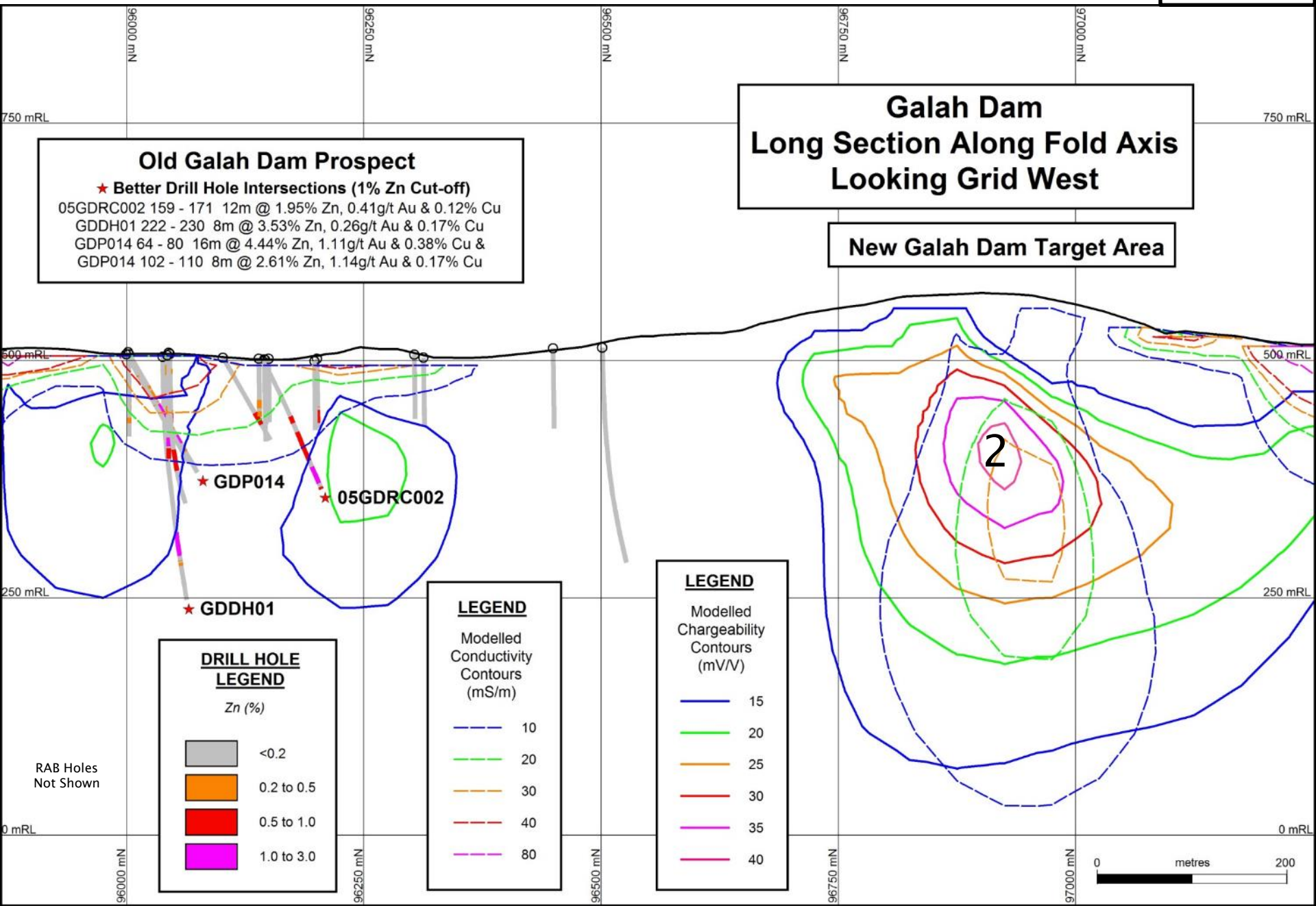
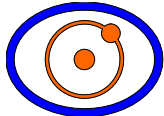
Zn (%)

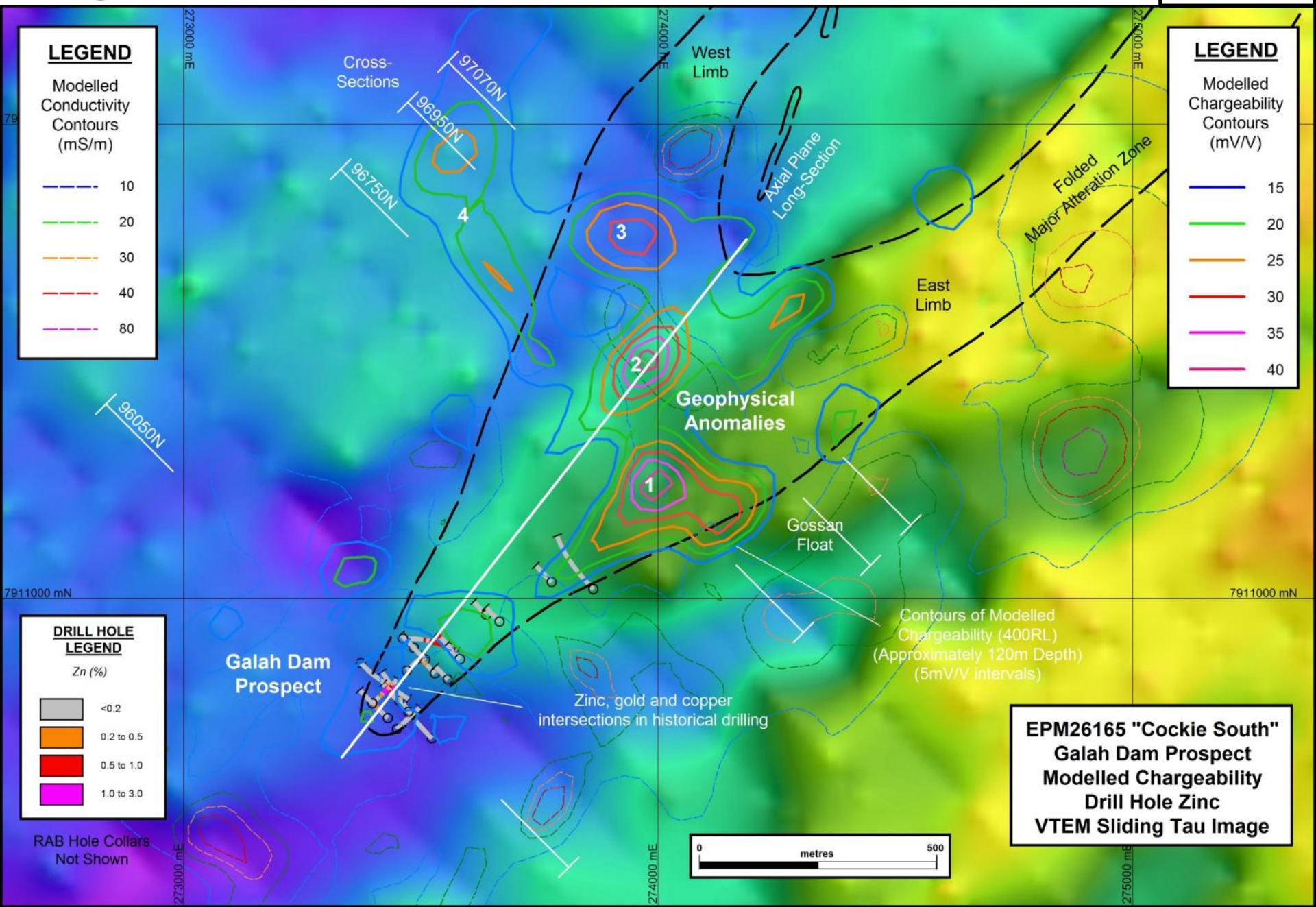
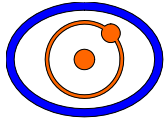
- <0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 3.0

RAB Hole Collars Not Shown



EPM26165 "Cockie South"
Galah Dam Prospect
Modelled Chargeability
Drill Hole Zinc
Google Earth





LEGEND

Modelled Conductivity Contours (mS/m)

- 10
- 20
- 30
- 40
- 80

LEGEND

Modelled Chargeability Contours (mV/V)

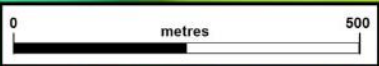
- 15
- 20
- 25
- 30
- 35
- 40

DRILL HOLE LEGEND

Zn (%)

- <0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 3.0

EPM26165 "Cockie South"
Galah Dam Prospect
Modelled Chargeability
Drill Hole Zinc
VTEM Sliding Tau Image



RAB Hole Collars Not Shown

Zinc, gold and copper intersections in historical drilling

Contours of Modelled Chargeability (400RL) (Approximately 120m Depth) (5mV/V intervals)

