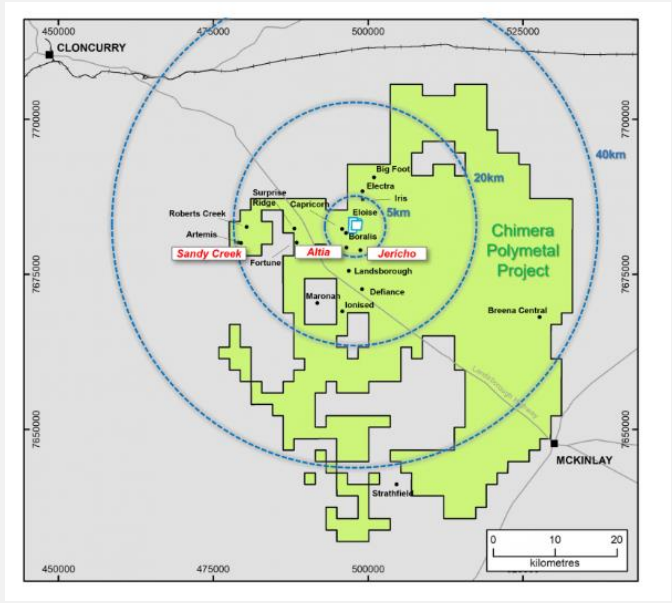
“The Discovery of the Jericho ISCG Deposit Following the breadcrumbs”

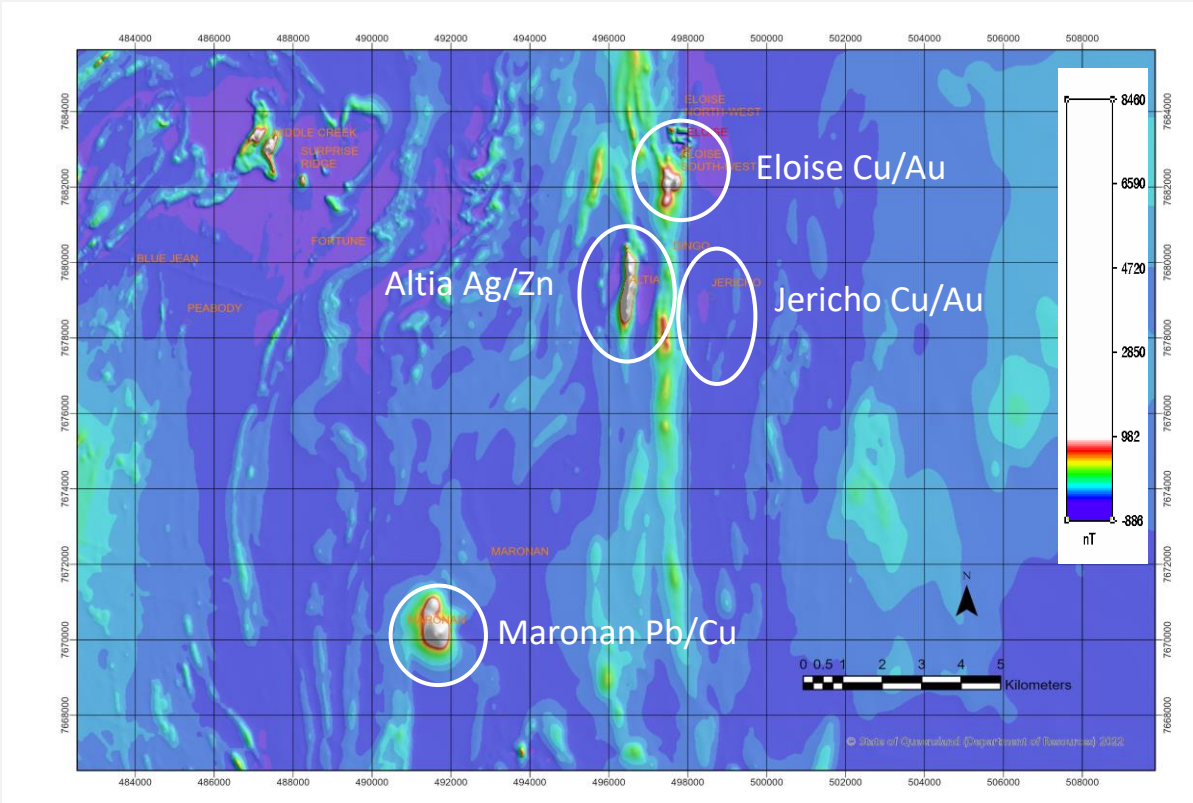
Andrew Thompson

MAG22

Introduction

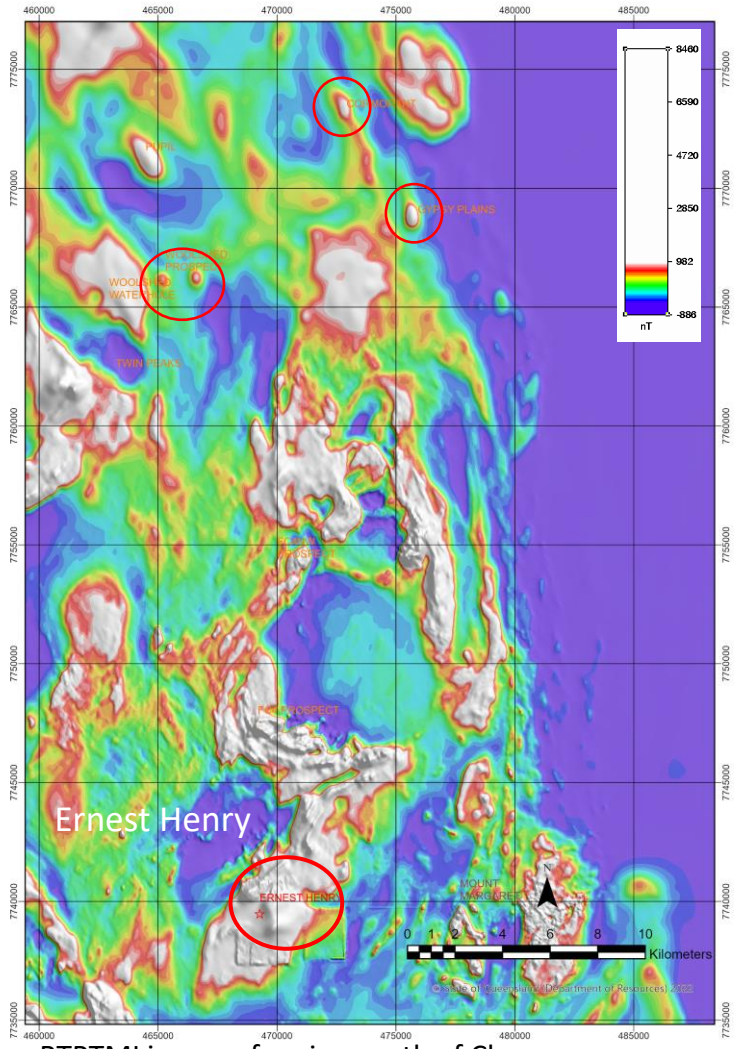
- The Jericho discovery was made by Minotaur Exploration and OZ Minerals in October of 2017. It is an pyrrhotite rich copper gold deposit also termed Iron Sulphide Copper Gold (ISCG)
- Jericho lies within the Eloise project area in the Cloncurry area in NW Queensland and was part of a Joint Venture between Minotaur and OZ Minerals which was formed in 2016.
- The area contains a number of deposits including Eloise, Maronan and Altia deposits of which only the Eloise mine is operational.
- Each of these deposits is clearly associated with magnetic features





Lead up to discovery

- Minotaur Exploration was exploring north of Ernest Henry from 2010-2017 for Cloncurry style IOCG mineralization
- Conducting routine EM surveys in the area identified a number of high conductance responses that were in the vicinity of the magnetic anomalies but were not coincident with the magnetic anomalies
- Drilling of these conductors intersected pyrrhotite rich breccias with generally low-grade copper but with occasional high-grade intervals.
- Minotaur decided to widen its search for these types of deposit and they focused on the premier example of these ISCG deposits which was the Eloise deposit located southeast of Cloncurry
- In 2013 MEP successfully made a friendly take over bid for Breakaway Resources who held the ground around the Eloise mine and began exploring in the area



RTPTMI image of region north of Cloncurry

IOCG – ISCG Physical Properties- Cloncurry

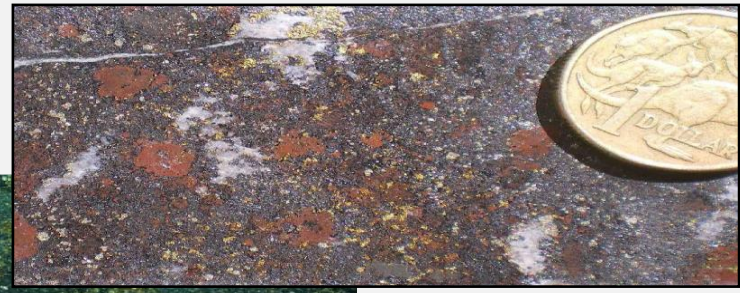
IOCG deposits (**magnetite-rich**; disseminated)
(Ernest Henry, Osborne, Mt Elliott-Swan):

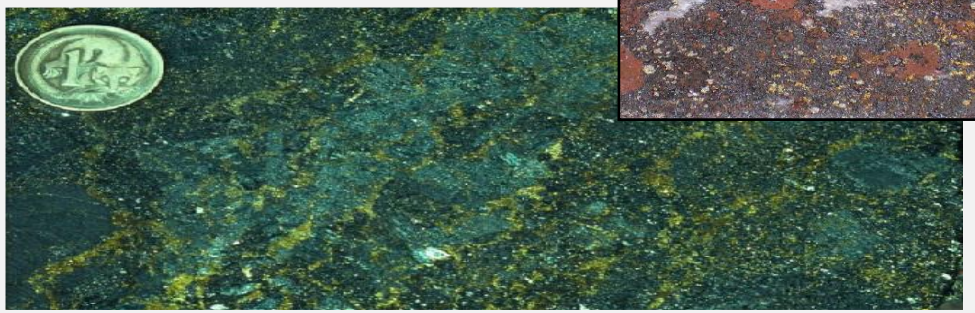
- Significant positive magnetic anomalies
- Positive gravity anomalies
- Strong IP chargeability anomalies
- Oxidised host rock terrane
- Weak to no EM anomalies
- *Broad alteration haloes*

ISCG deposits (**pyrrhotite-rich**; high grade)
(Cormorant, Eloise, Artemis, Kulthor, East Osborne, Greenmount):

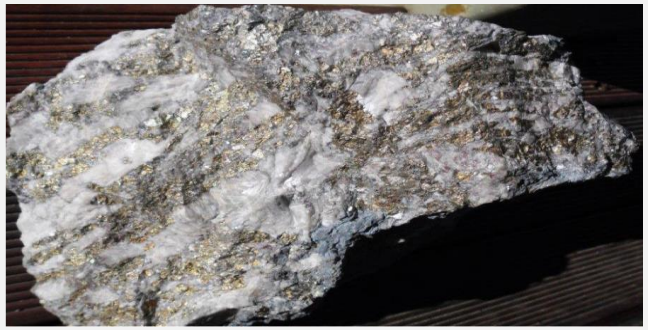
- Limited positive magnetic anomalies
- No or limited gravity anomalism
- Positive IP chargeability anomalies
- Reduced host rock terrane (carbonaceous and graphitic shales)
- Strong ground EM anomalies
- *Limited alteration haloes*

Ernest Henry



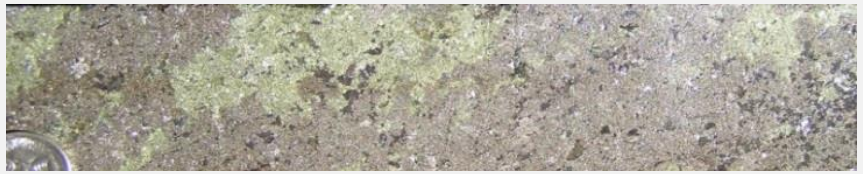


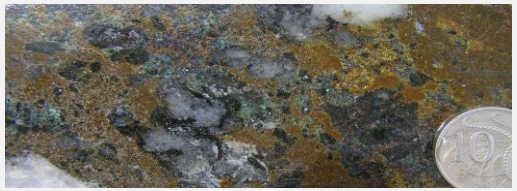
Osborne



Kulthor

Artemis

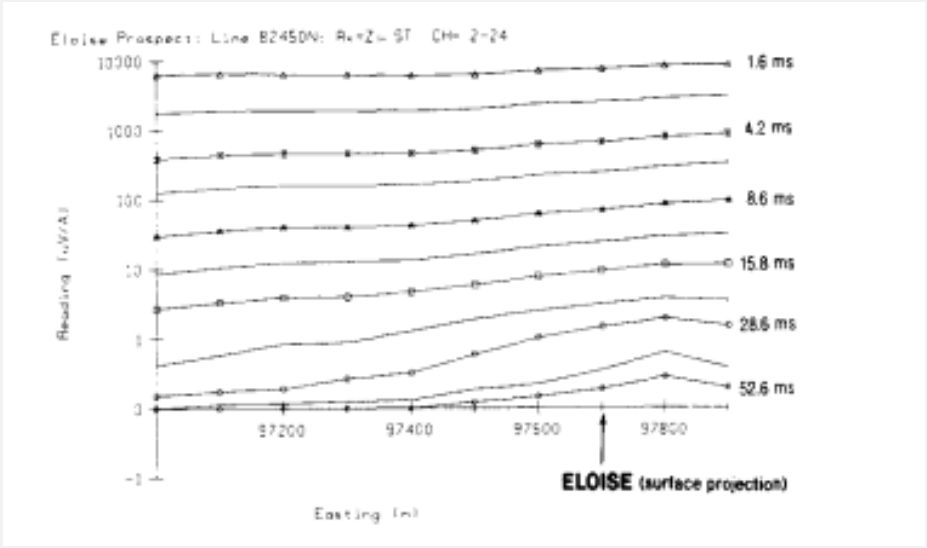




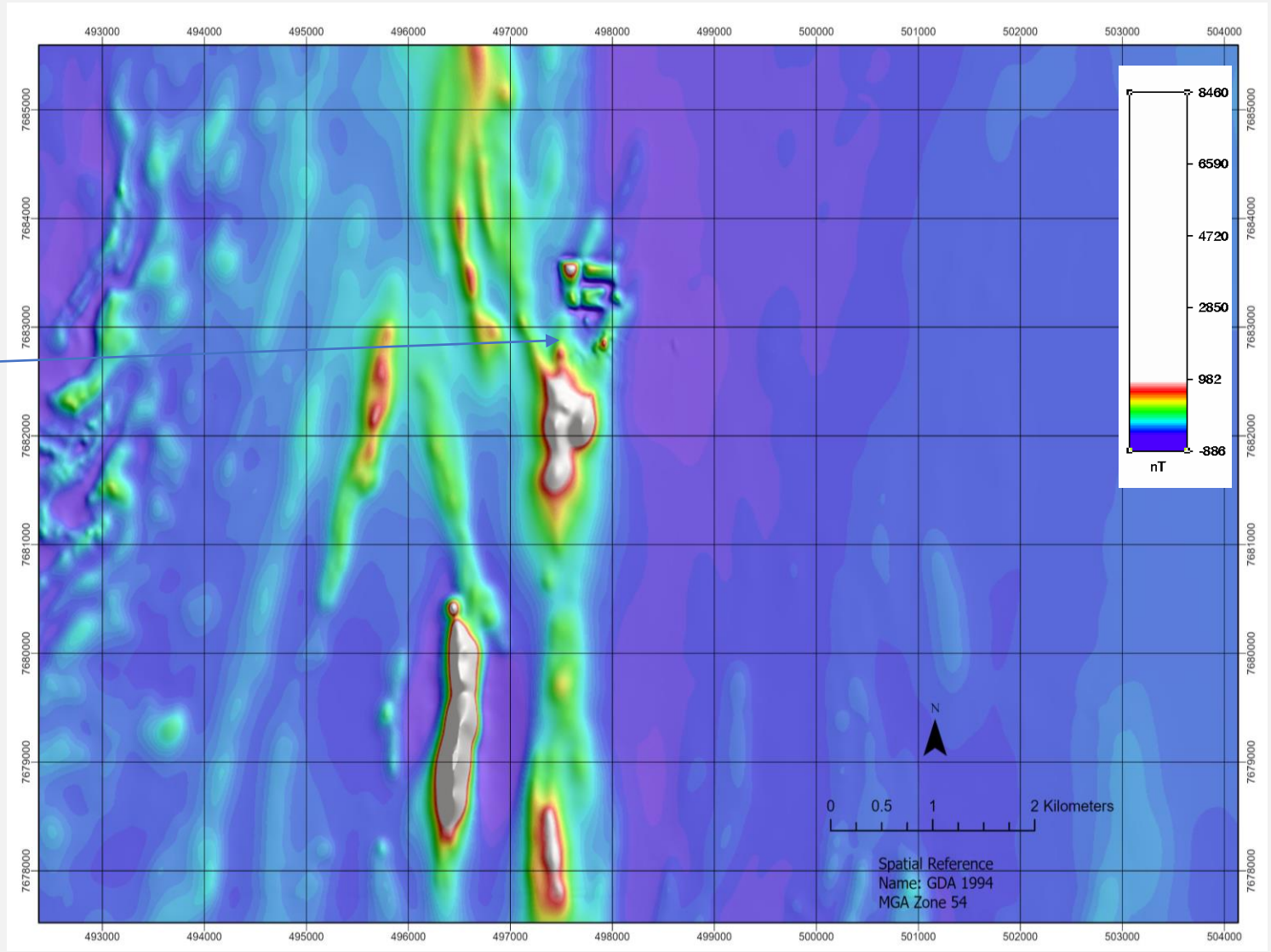
Eloise

Eloise

- Eloise is one of the best examples of ISCG deposits in the Cloncurry area and was discovered in 1987 by BHP using ground EM beneath some 50-70m of conductive Mesozoic sediments.
- Eloise was commissioned in 1996 and has mined 12.5 Mt grading 2.8%Cu and 0.8 g/t Au (source AIC Mines)



Z Component moving loop EM profile (source Brescianini,Asten and Mclean, 1992)



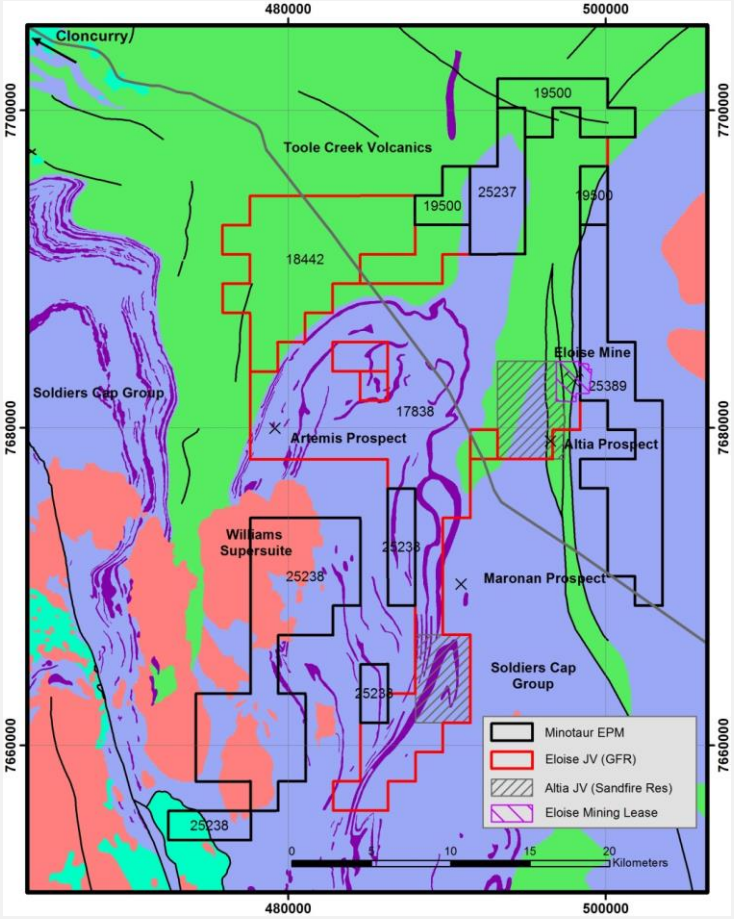
RTPTMI image over Eloise deposit

Exploration Approach

Due to presence of Pyrrhotite rich mineralisation EM is the primary tool for exploring for ISCG deposits

Minotaur and Demetallica Exploration approach for ISCG mineralisation is as follows:

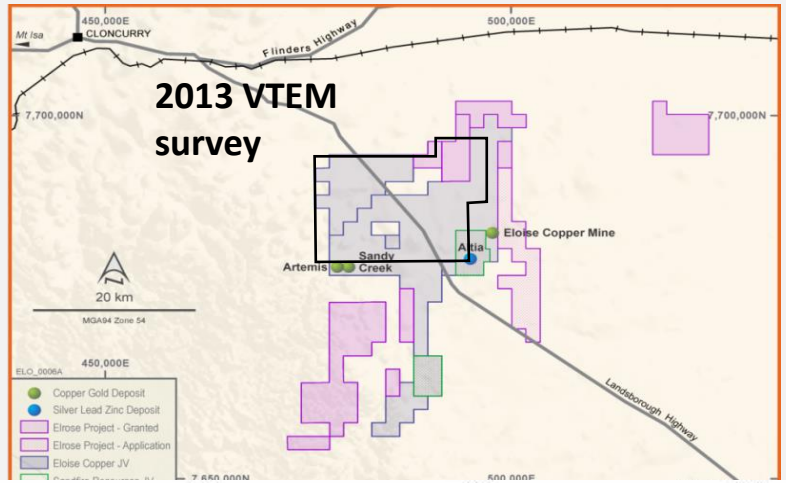
- to identify prospective geology for hosting ISCG mineralisation
- to conduct airborne EM surveys over prospective areas where conductive cover is not present or limited in depth
- Follow up airborne EM conductors with fixed loop ground EM surveys prior to drill testing
- In areas covered by overburden, conduct regional moving loop ground EM surveys, generally at 800m spacing along prospective stratigraphy
- Infill regional ground EM surveys with more detailed EM surveys
- Drill testing based on ground EM interpretation
- In this way the EM drives the search for prospective mineralisation and is not biased by where we think or assume the mineralisation should be



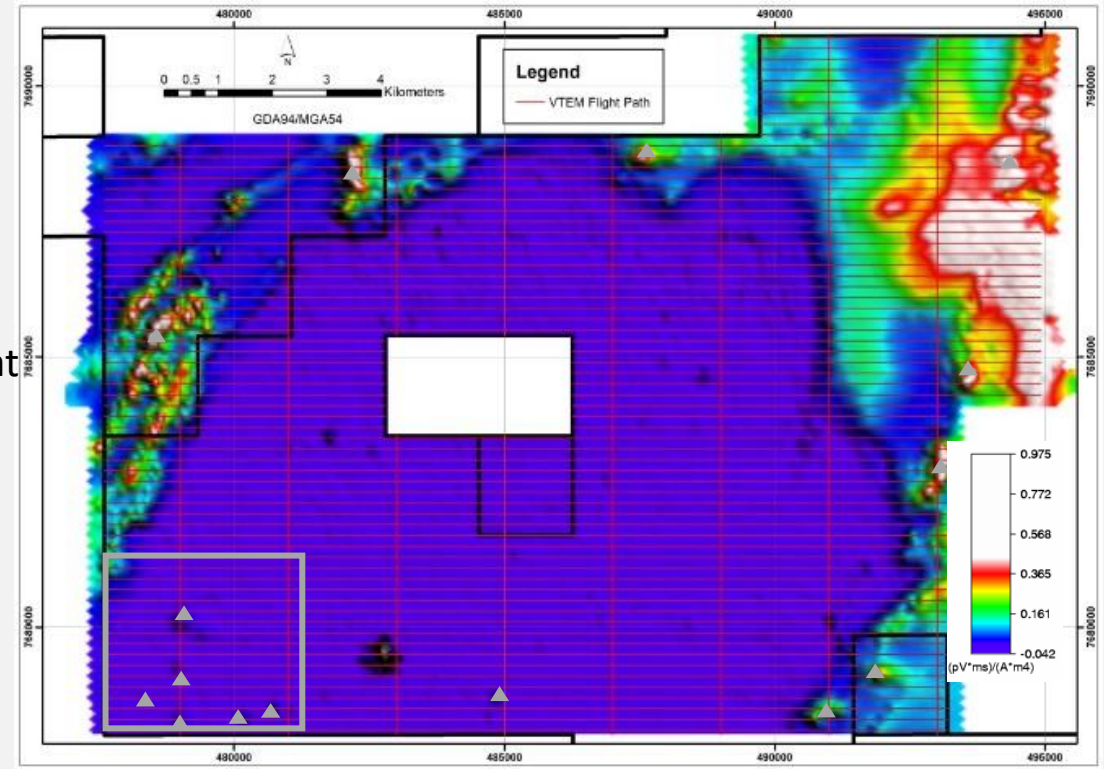
Geology consists of abundant basalt in the Toole Creek Volcanics of the Upper Soldiers Cap Group and psammites in the Mount Norna Quartzite and Llewellyn Creek Formation (Lower Soldiers Cap Group)

Eloise 2013 AEM Survey

- MEP flew a 1,000km VTEM survey using the VTEM Max helicopter system
  - 200m line spacing
  - VTEM Max Helicopter AEM system
  - Peak dipole moment of 881,192 NIA



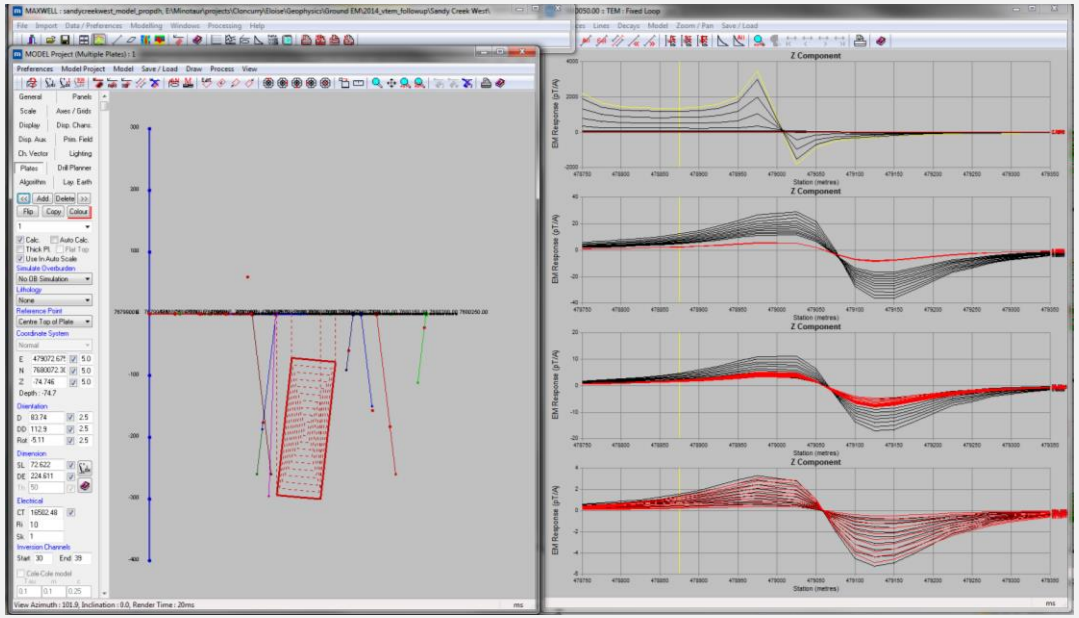
- Targets were selected based on their conductivity and strike length. Isolated targets were prioritised over long strike length formational conductors
- The AEM targets were followed up with fixed loop B Field ground EM.
- Note on the eastern margin of the survey the AEM system was ineffective at penetrating through the thicker Mesozoic cover



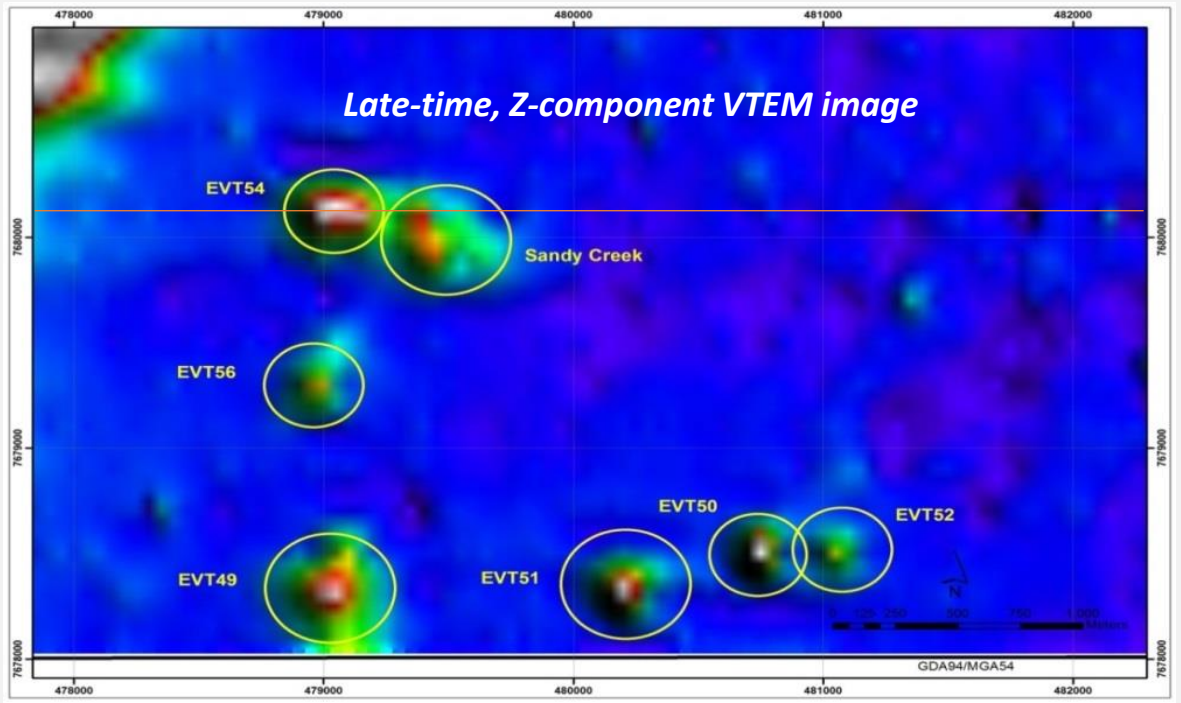
Late time Z Component VTEM image

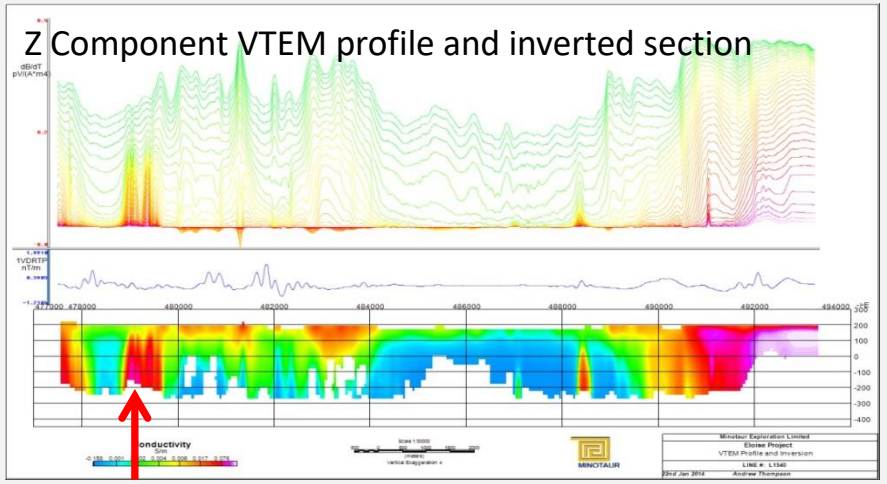
Artemis EM Response – “Breadcrumb”

- Minotaur drilled 10 targets of which target EVT54 was by far the most conductive
- Almost all of the other targets were due to graphite
- VTEM target EVT54 was located ~350m west of the Sandy Creek known resource
- EVT54: Discovery hole EL14D09:
  - ***22m @ 27.5% Fe, 3.02% Cu, 3.81 g/t Au, 6.64% Zn, 1.35% Pb, 112 g/t Ag, 0.11% Co*** *from 157 to 179 m*



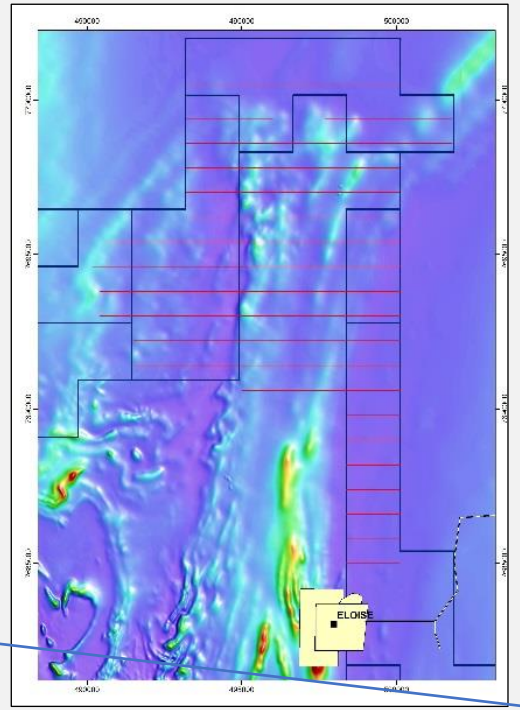
Ground EM model and observed(black) and model (red) Z Component Ground EM B Field profile @ Artemis (Thompson and Flint 2016)





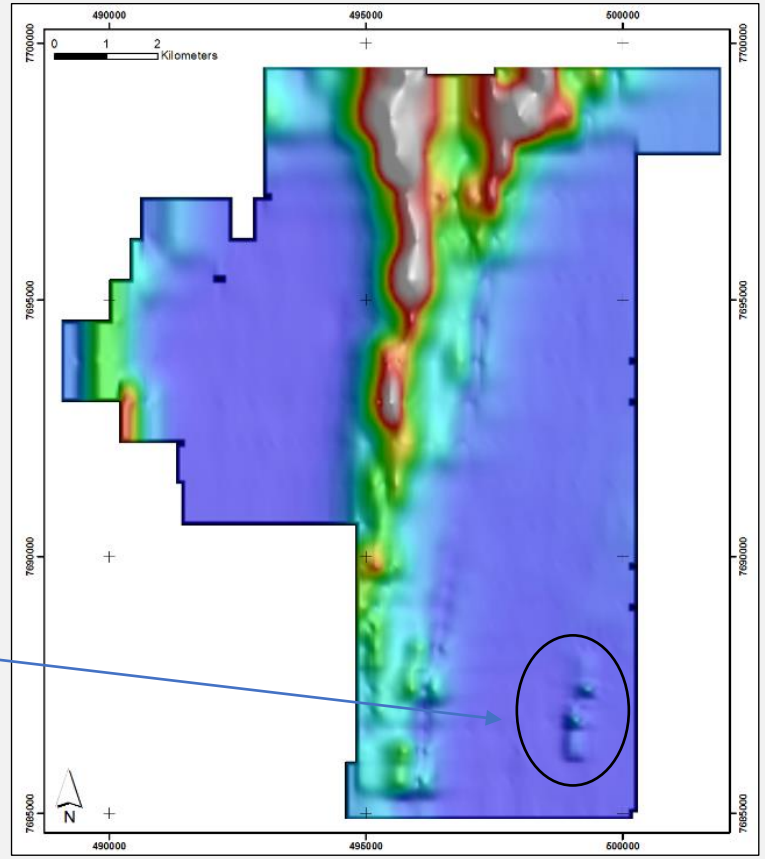
Eloise JV 2016 EM Survey

- Artemis was a success but it was not big enough to exploit and Minotaur formed a new JV with OZ Minerals and began to explore further to the east
- In 2016, Minotaur and OZ conducted a regional, moving loop EM survey along 800m spaced lines and 100m stations, north of the Eloise mine along the Levuka Shear with the aim of identifying massive sulphide mineralisation beneath the Mesozoic shales where it was deemed airborne systems would not be effective.
- Due to a new interpretation of the location of the upper Mount Norna Quartzite unit the survey was extended to the east of the Levuka Shear over a magnetically quiet area that had not been previously drilled
- From this survey Minotaur and OZ Minerals identified a number of stratigraphic conductors within the Toole Creek Volcanics but also several isolated conductors to the NE of Eloise



2016 ground geophysical program over RTP1VD Mag

- 137 line km ground EM where cover negates airborne EM

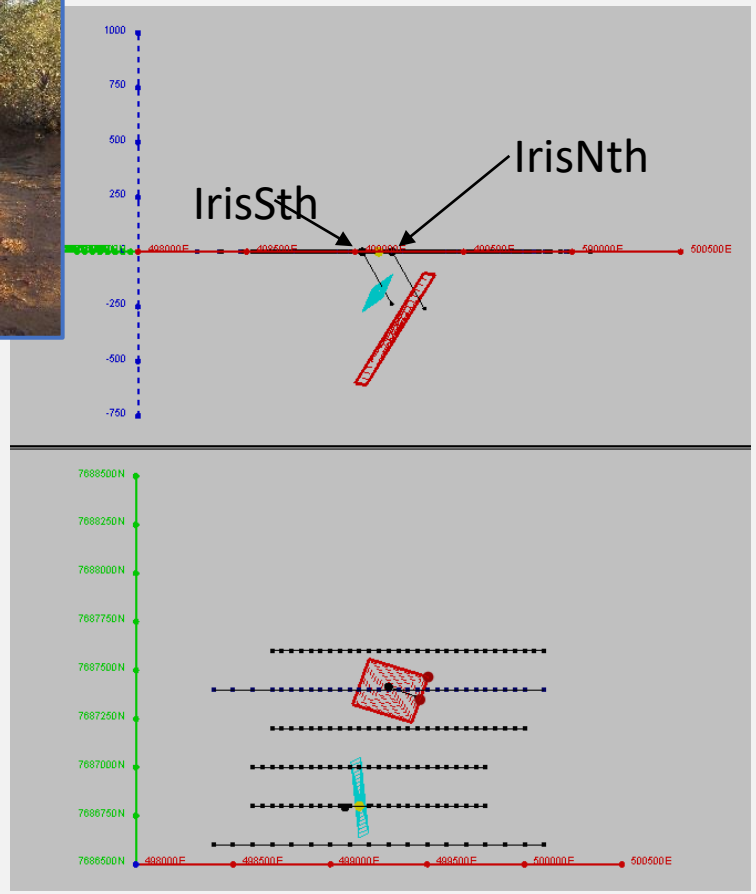


Late Time Moving Loop Z Component image

Iris target – Infill Ground EM

- Approximately 4km north-northeast of Eloise mine 2 separate targets were identified from regional EM
- Infill lines were surveyed at 200m
- Within interpreted Mt Norna Quartzite under ~120m of cover
- No historical drilling in vicinity

Photograph of Iris South



Iris EM model with proposed drill holes

Iris Nth

Time constant1	44msec
Depth to top	100m
Conductance	1500S
Strike Length	250m
Depth extent	600m
Dipping to the WNW at 60 degrees	

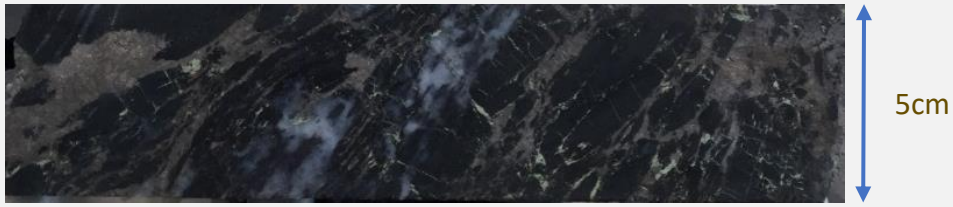
Iris Sth

Time constant	48msec
Depth to top	135m
Conductance	3200S
Strike Length	400m
Depth extent	120m
Dipping to the west at 65 degrees	

Ground EM Application - Iris South Drill Results – “Breadcrumb”

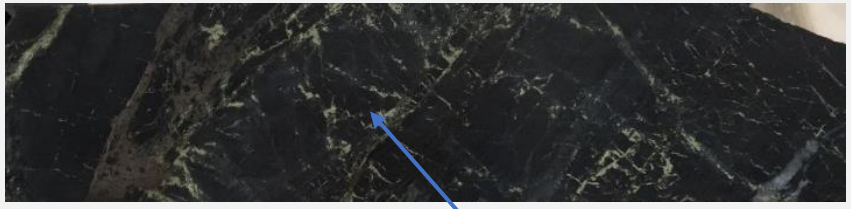
- EL16D05

Bt psammite with early qtz veins, fractured/filled with po-cpy:198.1m



Bt psammite with early qtz veins, fractured/filled with po-cpy:197.2m

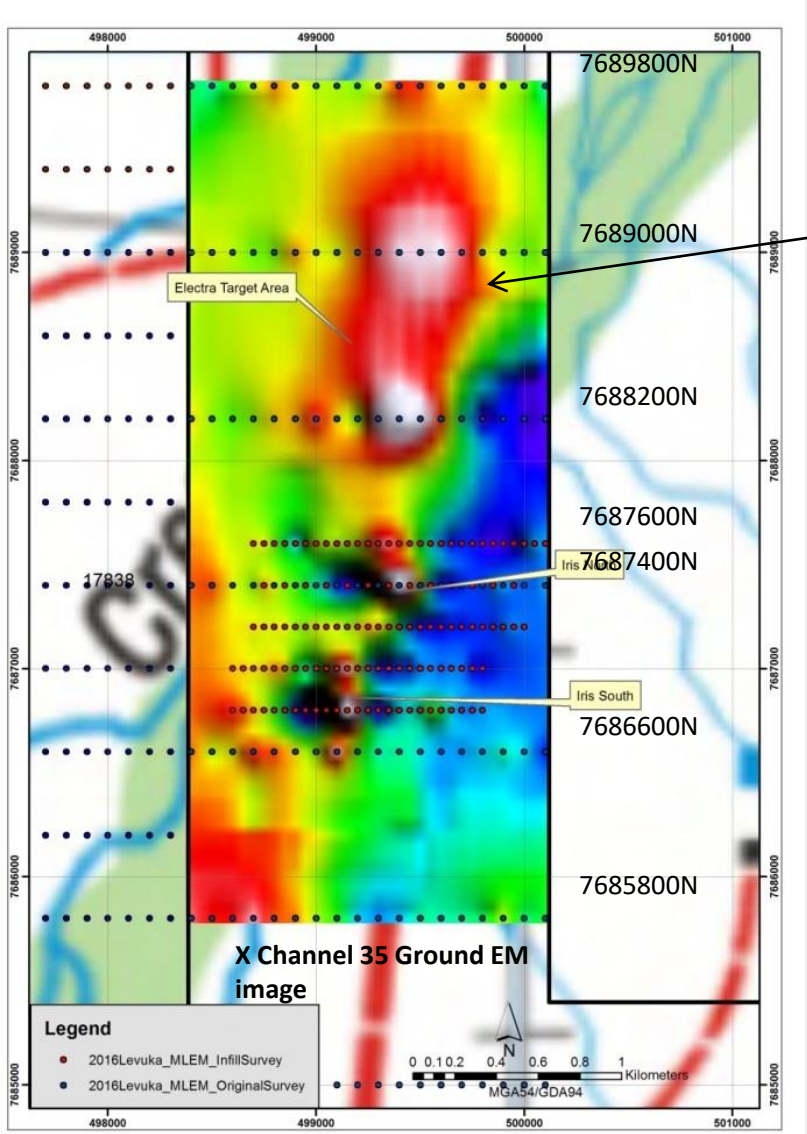
Bt psammite with early qtz veins, fractured/filled with po-cpy:198.4m



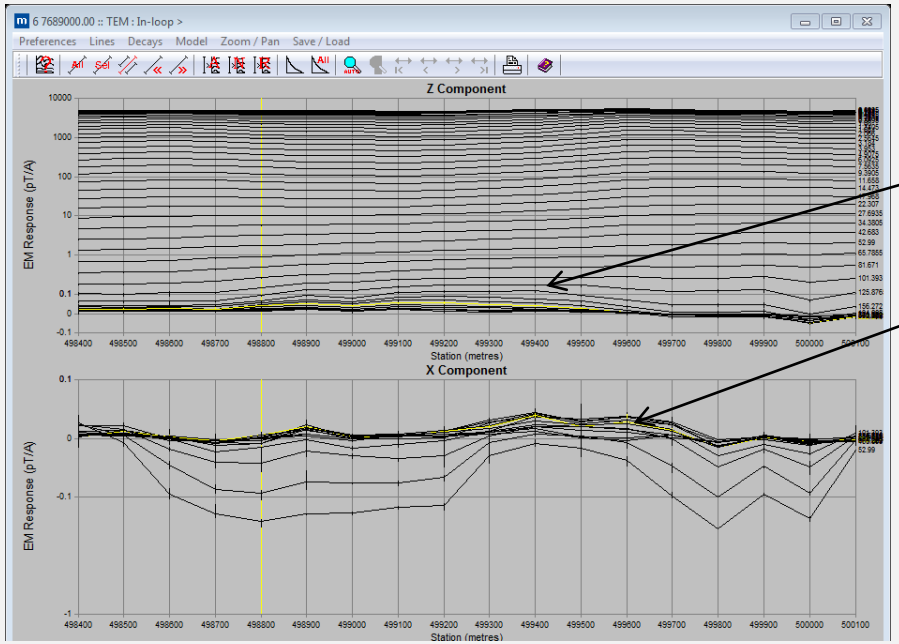
EL16D05 195.12-199.63m:
Breccia zone with fractured early qtz veins filled with po-cpy

- Best intercept - 38m @ 0.47% Cu and 0.08 g/t Au inc 4m @ 1.65% Cu and 0.2 g/t Au

Analysis of Ground EM data to the north of Iris



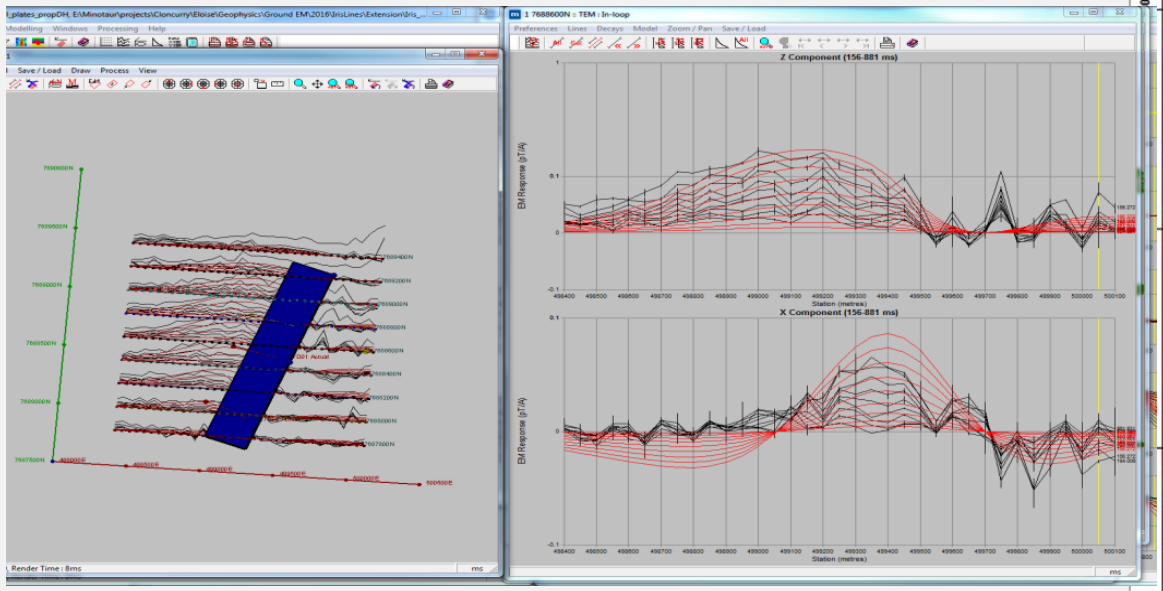
- Analysis of forward modelling of potential deeper conductors beneath the cover (in light of the current positive drill results at Iris) led to a re-processing of the lines north and south of the Iris target
- The closer analysis showed subtle conductive trends on the two original 800m spaced lines to the north of the Iris target



Z Component (top) and X Component (bottom) ground EM profiles showing subtle response from deep target

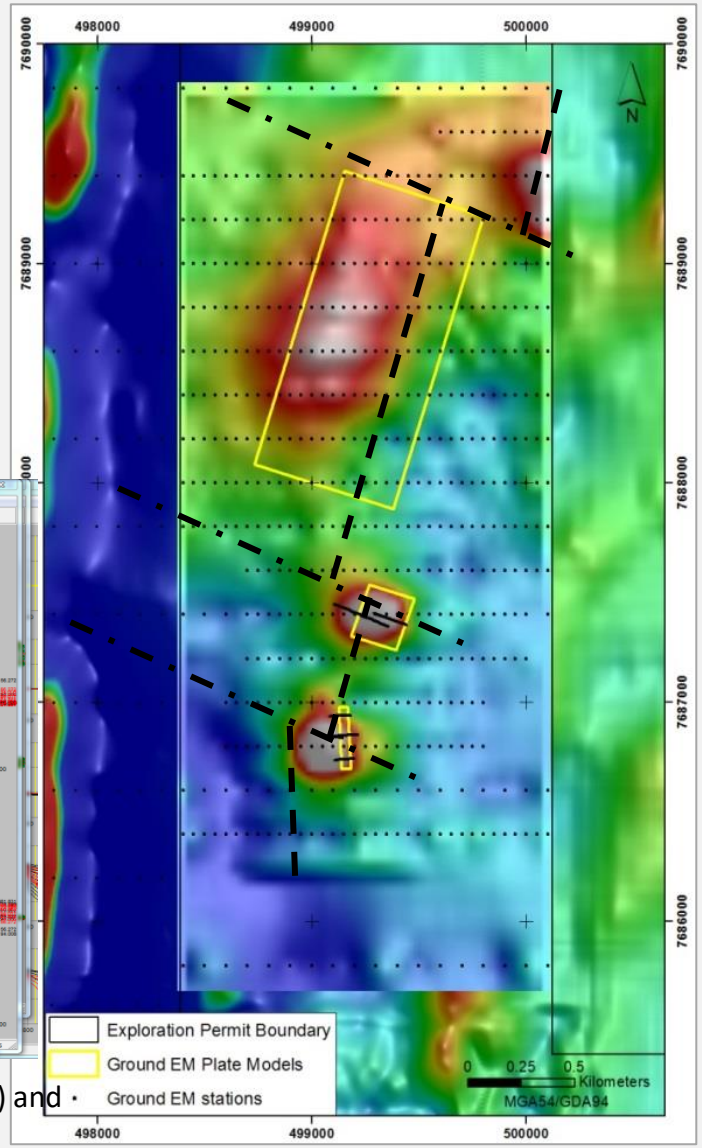
Electra Infill ground EM

- Interpreted lineament linking Electra-Iris-Eloise-Altia with conjugate faults
- Modelling of this response indicates a 3000 S target at a depth of 550m beneath some 120m of Mesozoic cover

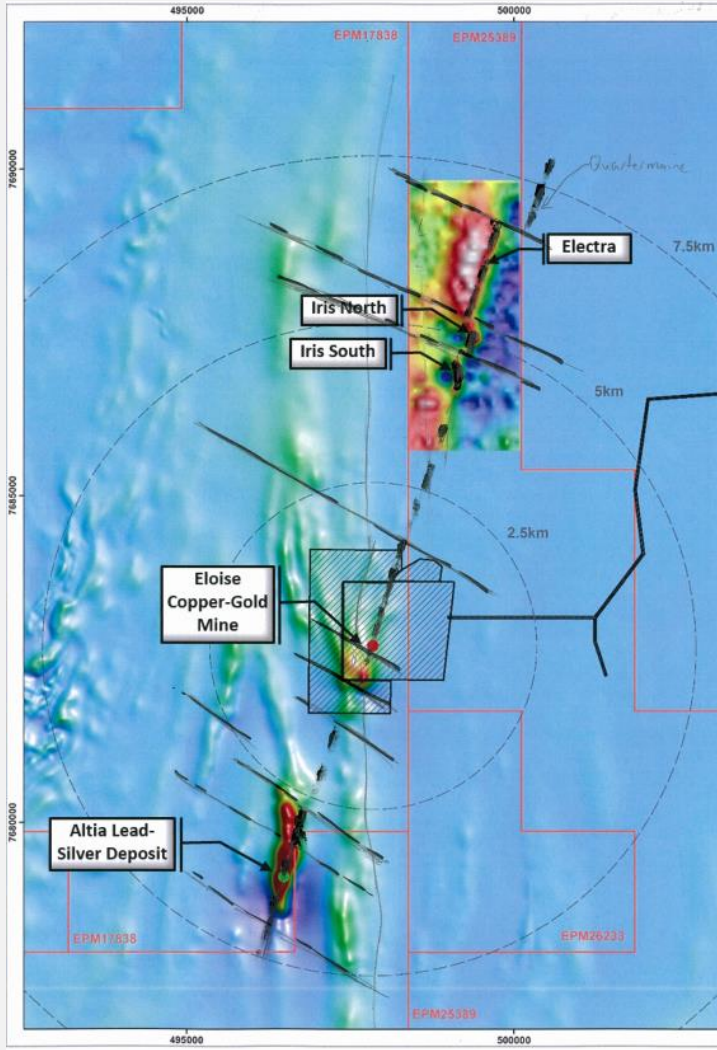


Plan view of Electra Ground EM Model

Late time Z (top) and X (bottom) modelled (red) and observed (black EM Profiles



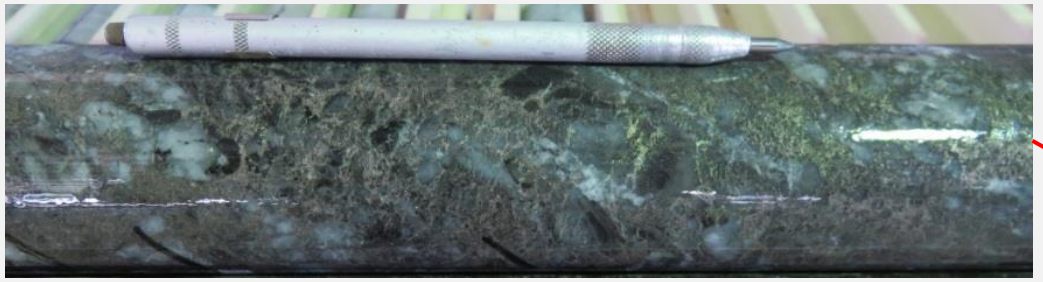
Late time Z Component Data



Late time Z Component Data over RTPTMI image

2017 - Electra Drilling EL17D01 – “Breadcrumb”

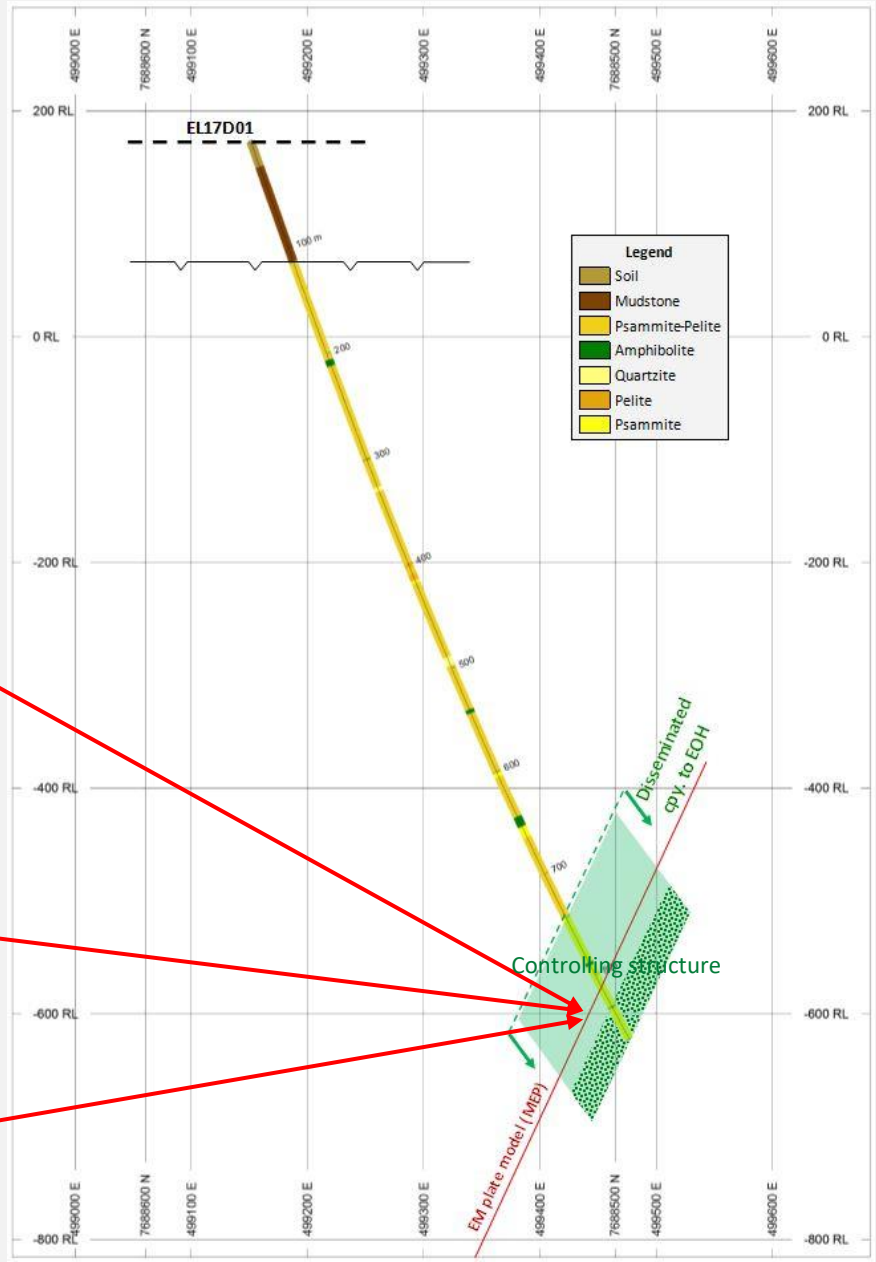
Silicification (+/- albitisation) of psammites with crackle breccia and associated low-grade pyrrhotite-chalcopyrite+/- ?pyrite fill from 832m associated with controlling structure. The network of po veining likely explains the EM feature seen at surface



841.4m – po grading to cp dominant fill

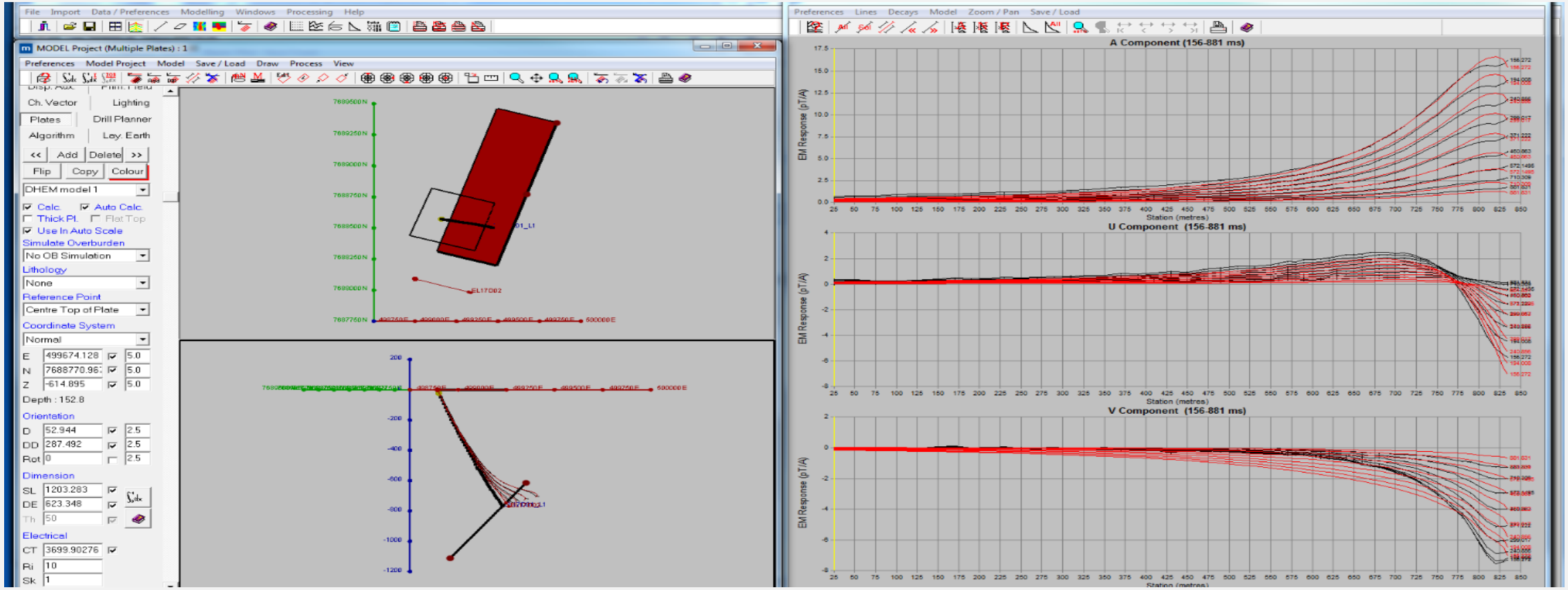
846.6m – cp dominant fill and massive po vein

852.9m – po-qz vein



DHEM at Electra– EL17D01

DHEM confirmed that source of EM conductor was in fact due to sulphides



Note profile incomplete due to hole blocked at 837m

Plan (top) and section view (bottom) with 3 Component observed (black) and model (red) B Field DHEM profiles

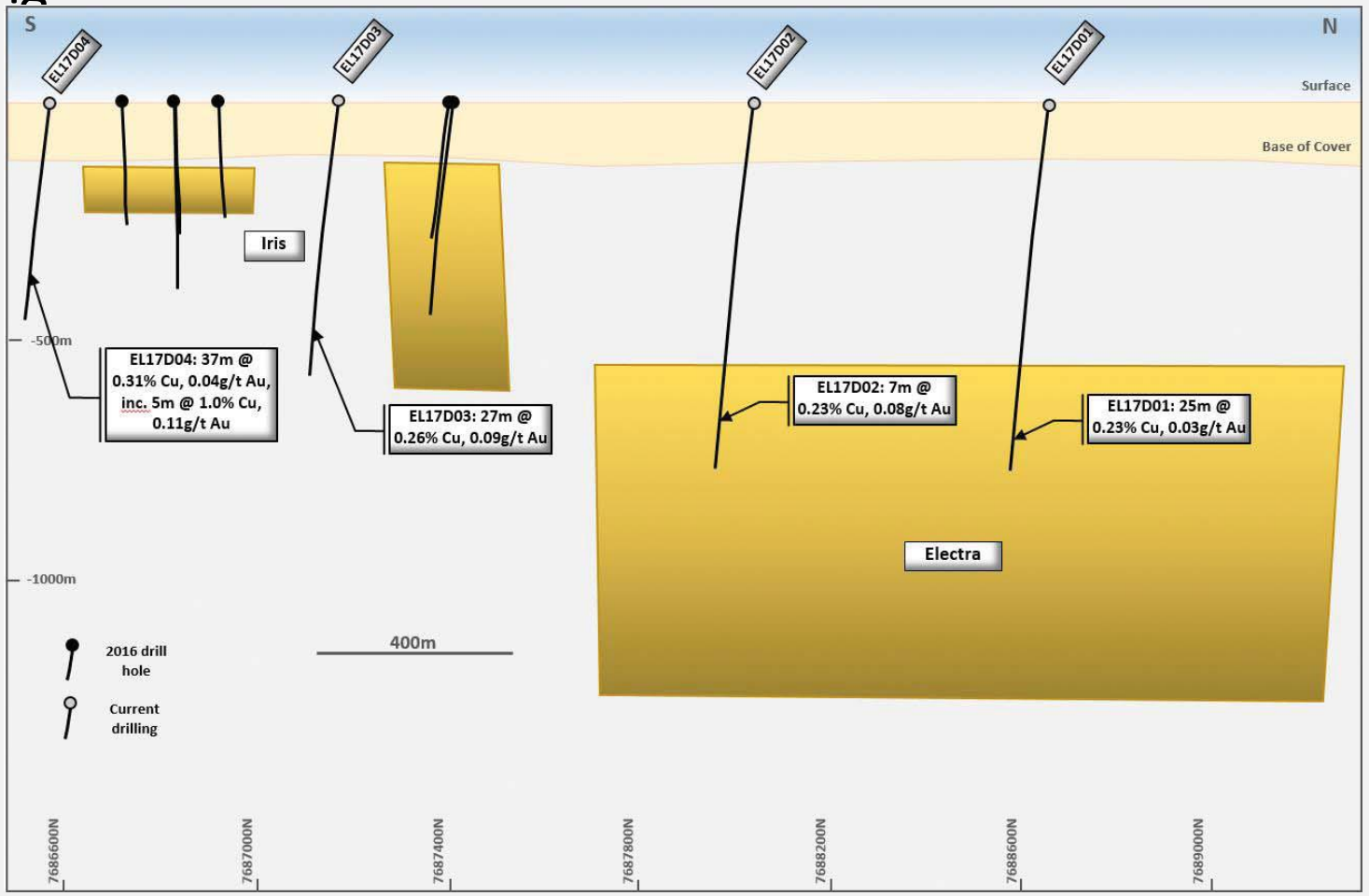
2017 Iris and Electra Drilling

Initial Work encouraging including intersections of :

- 25m @ 0.23% Cu and 0.03 g/t Au at Electra and
- 37m @ 0.31% Cu and 0.04 g/t Au at Iris

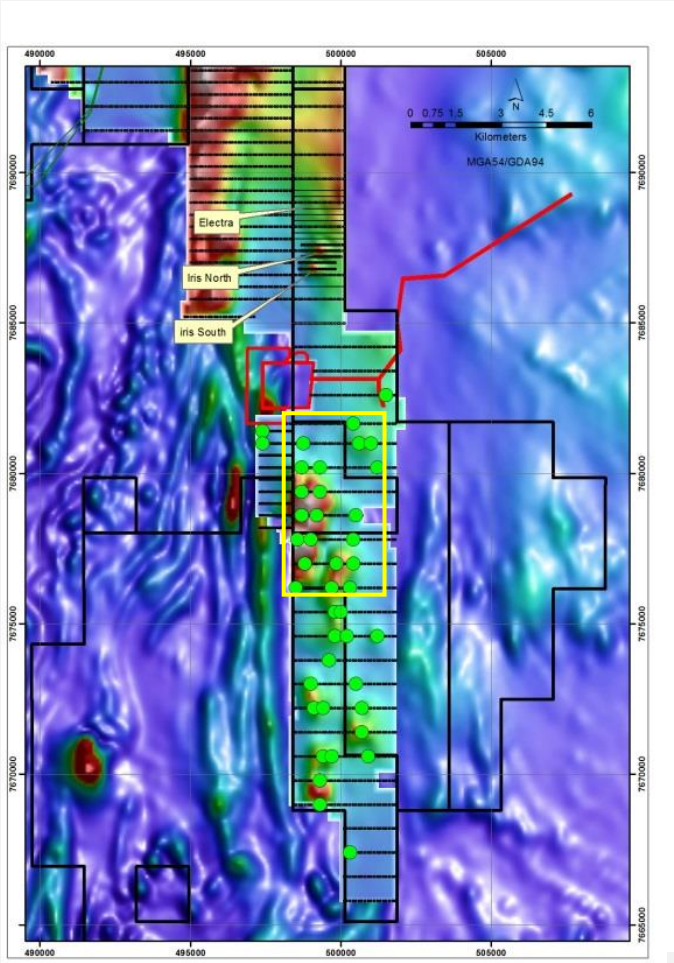
Where to from here?

Where are the breadcrumbs leading us?



Interpreted long section through Iris and Electra

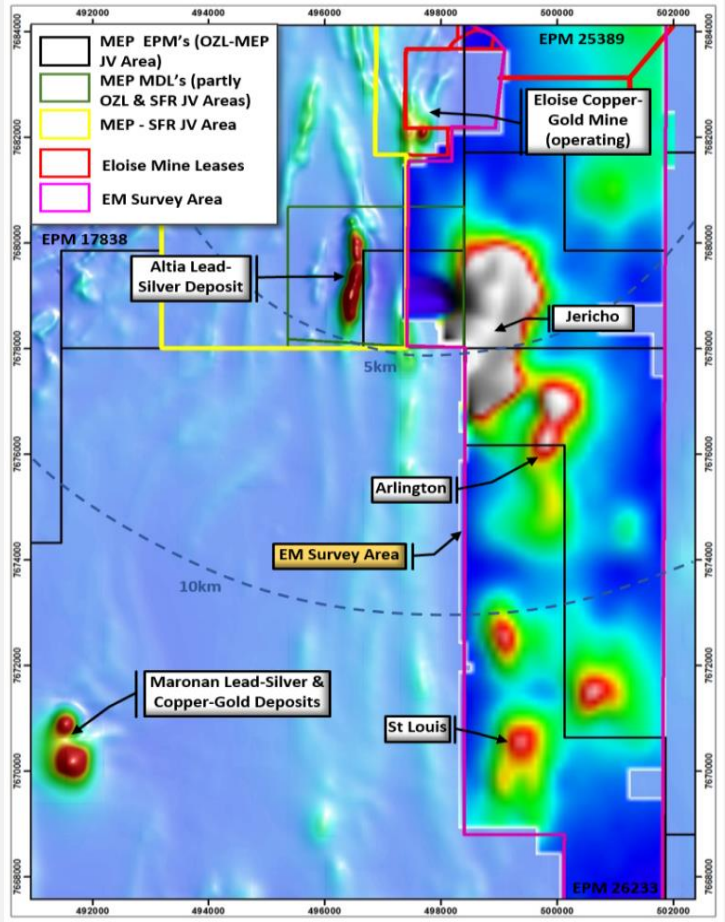
2017 Regional Ground EM Program



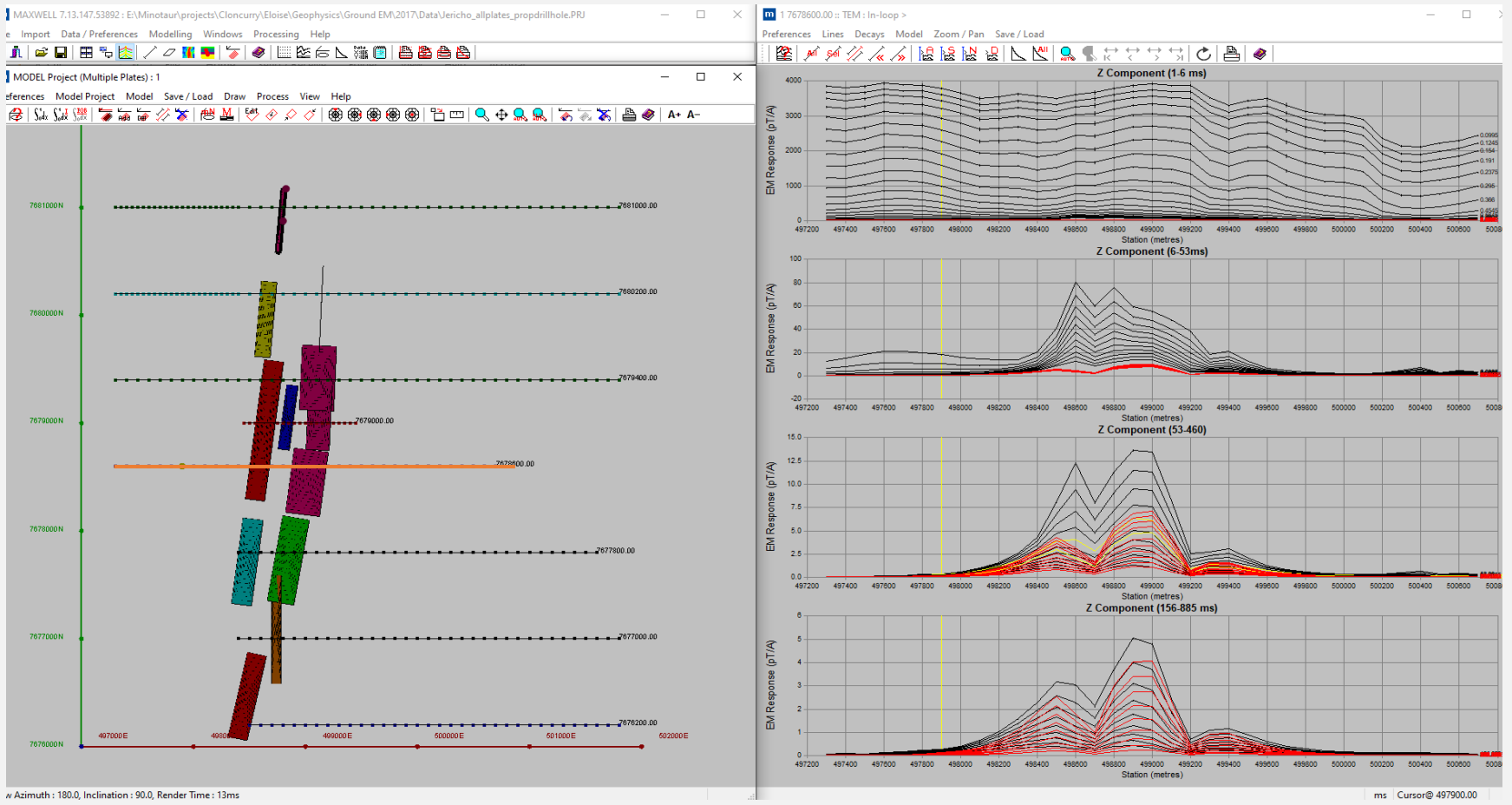
Late time Z Component EM image over RTP1VD Magnetic image

- In 2017 given the encouraging results at Iris and Electra Minotaur and OZ decided to extend the ground EM survey south of the existing coverage
- A total of 86.4 line km of ground EM were collected along 800m spaced lines
- The area had very few drill holes due primarily to the lack of any significant magnetic responses in this area
- In particular the Jericho conductive trend stands out as the primary conductor in this area

Jericho Ground EM Response



Late time Z Component EM image over RTP1VD image



Plan view of modelled EM plates at Jericho(left) and observed (black) and model (red) Z Component Bfield EM profiles (right)

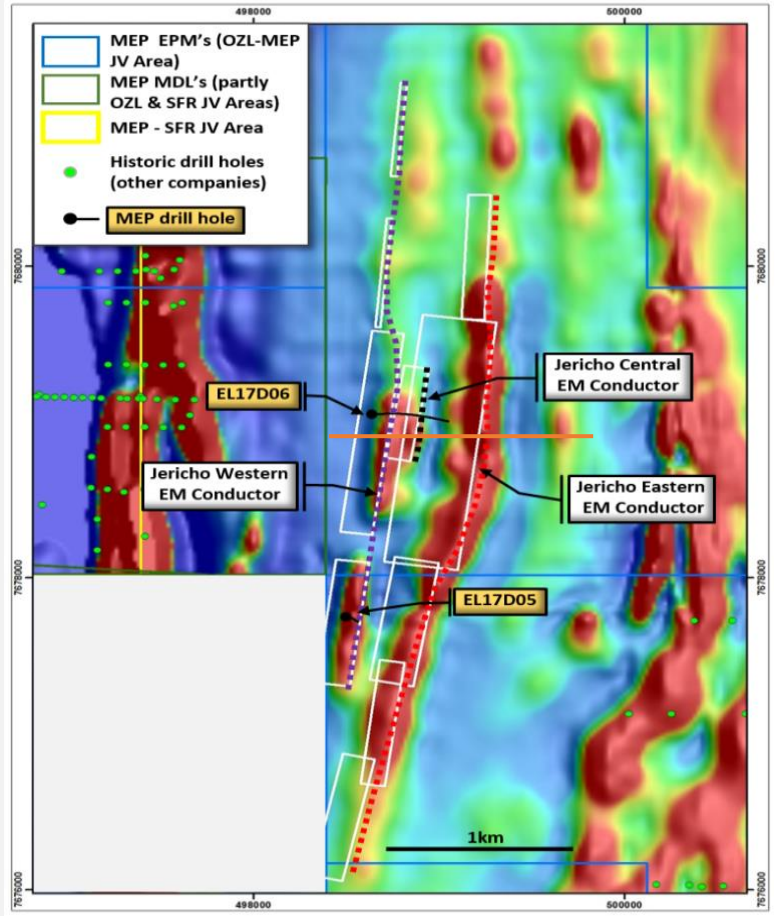
- Jericho target consist of three parallel, steeply west dipping conductors at depths of between 100-130m and conductances of between 3000-5000 S over a strike length of ~ 5 km

Jericho Magnetic Response – “Another breadcrumb”

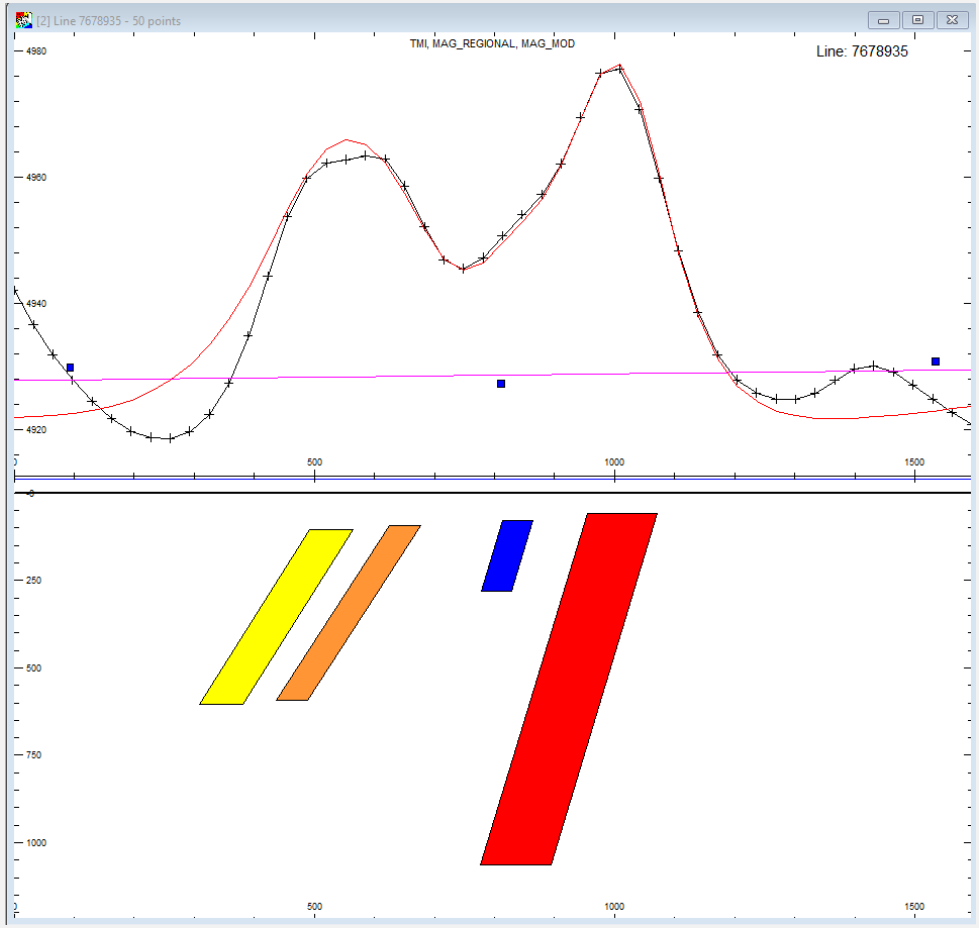
The Jericho EM plate models are generally coincident with subtle magnetic features of ~ 50 nT

The magnetic anomalies are have modelled susceptibilities of ~ 0.012 SI

The magnetic models match the EM models well



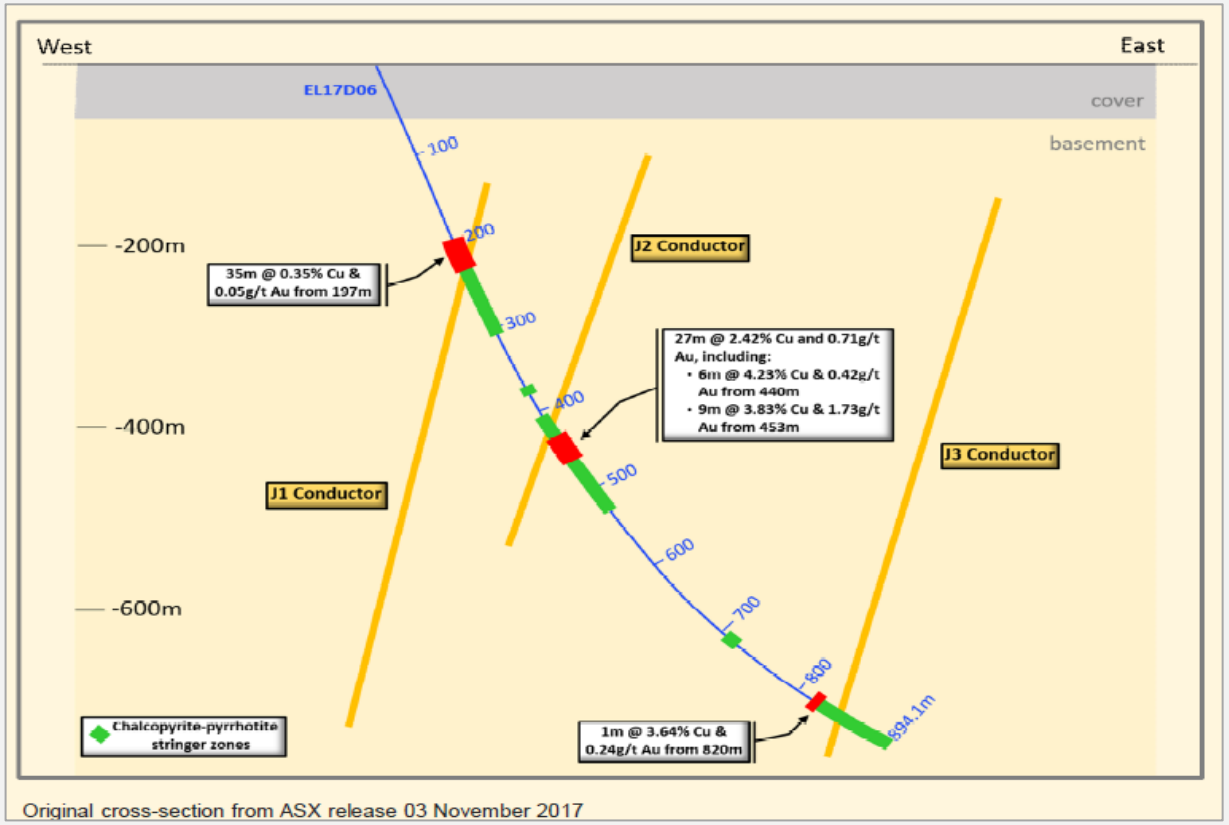
Modelled EM plates (in white) over enhanced RTP1VD Mag image



Profile showing observed (black) and model (red magnetic response

Jericho Drilling

All three plates are due to sulphides and in particular plates J1 and J2 have significant chalcopyrite mineralisation

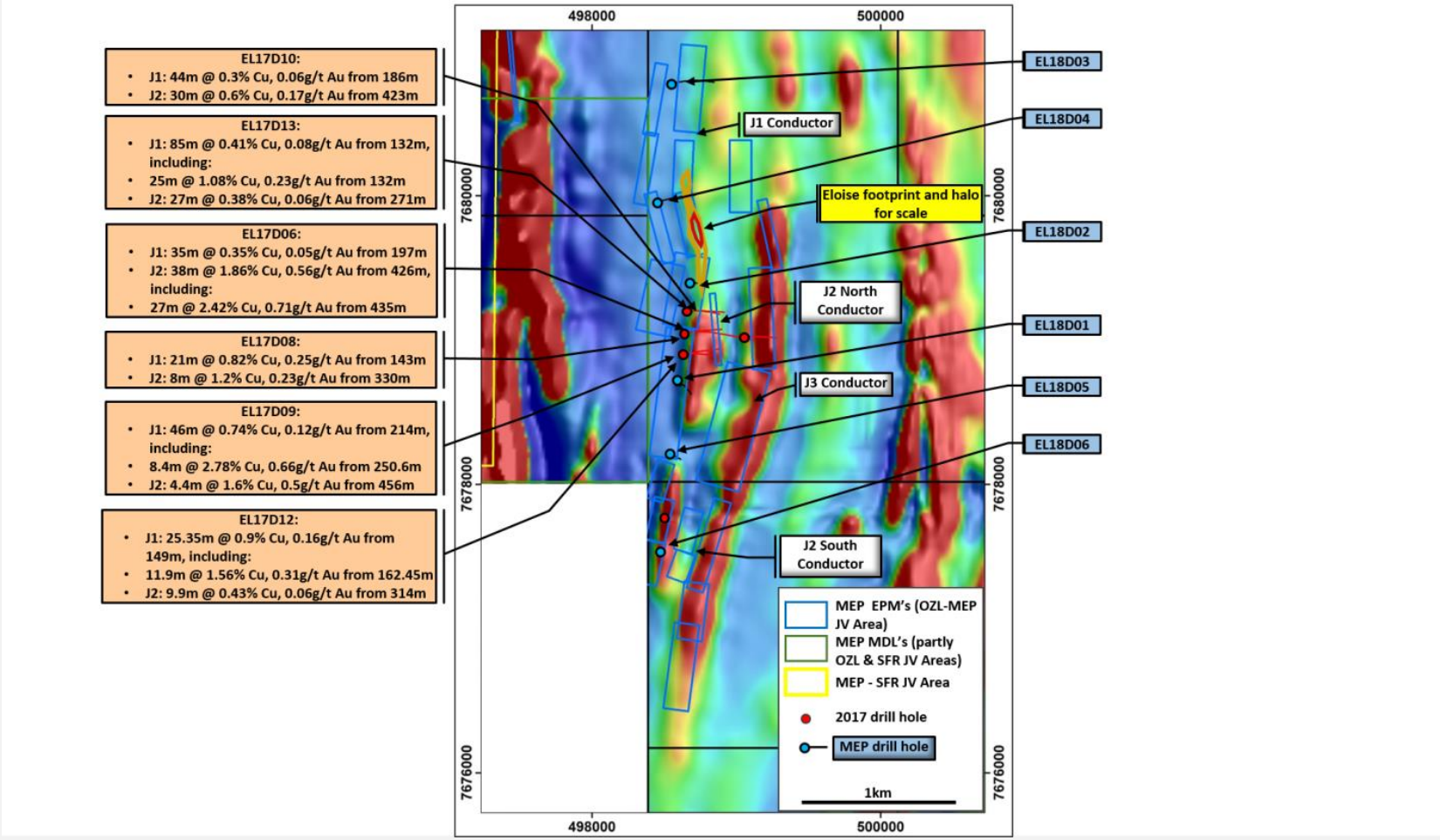


Original cross-section from ASX release 03 November 2017

- EL17D06 intersected 35m @ 0.35% Cu and 0.05 g/t Au from 162m and 38m @ 1.86% Cu and 0.56 g/t Au from 426m

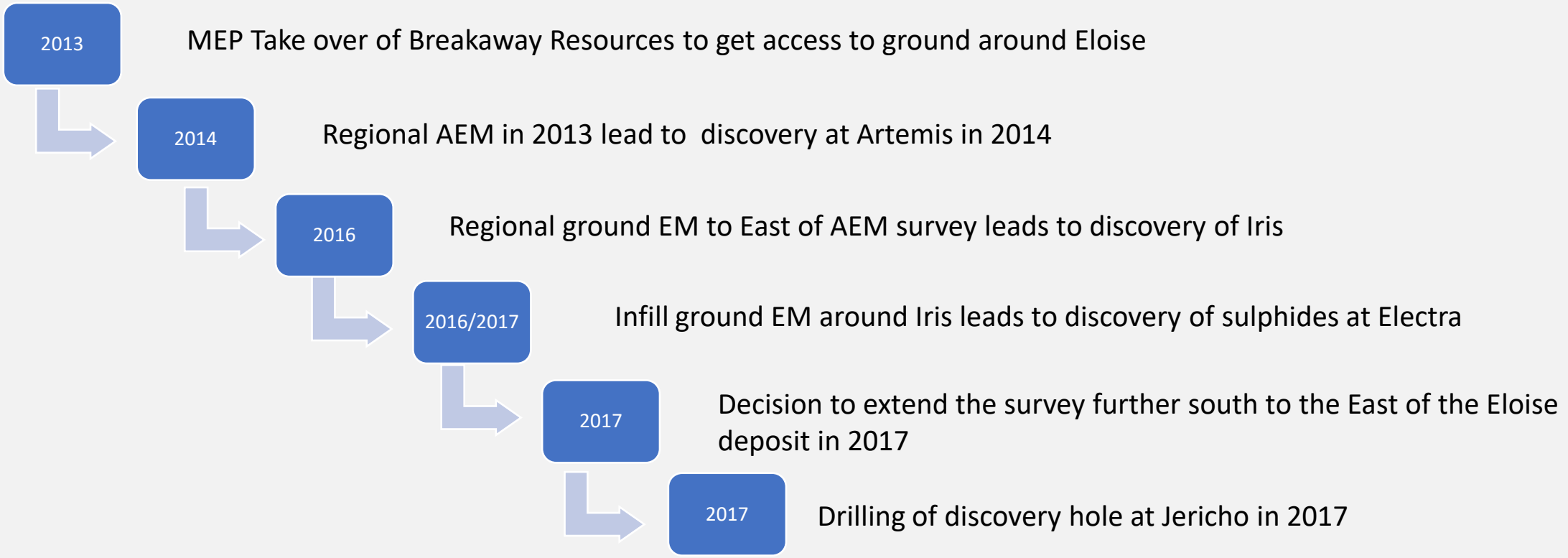
Jericho Drilling

- 2017 drilling, best intercept in hole EL17D06 of 38m @ 1.86% Cu and 0.56 g/t Au from 426m
- 2018 Drilling, best intercept 44m @ 1.05% Cu and 0.22 g/t Au from 159m
- Western and Central lodes consist of Po and Cpy whilst the eastern and largest of the 3 lodes is predominantly Po with little Cpy.
- Current resource is 14.1 MT @ 1.46% Cu and 0.29 g/t Au and 1.6 g/t Ag (source DRM ASX release 24 Oct 2022)



RTP1VD magnetic image showing location of early drillholes and drill intercepts

Timeline to Discovery



Summary

- Exploration for ISCG mineralisation is primarily driven by EM
- Airborne EM where there is no or little cover, followed by ground EM prior to drill testing
- Regional Ground EM in all other cases
- The conductivity of the Po in the ISCG mineralisation (an order of magnitude more conductive than cpy) is the key to discovery and a lack of this mineral creates difficulties in detecting sulphides beneath cover as with IOCG
- It is not necessary for the EM conductor to have an associated magnetic response although subtle responses may be indicating the presence of pyrrhotite
- ISCG mineralisation consists of Po +- Cpy and as such as with Electra there may be some Po only mineralisation – technical successes
- Using large regional surveys, we let the ground EM dictate where to find the sulphides and not letting any pre conceived ideas or models get in the way. In this way we are making discoveries in areas that other companies have not considered prospective
- Its important to follow the breadcrumbs. Success was achieved after incremental advances from 2013 through to 2017 not a one hole discovery

Acknowledgements

- I would like to thank Demetallica Ltd and OZ Minerals for allowing me to present these results
- I would also like to thank Glen Little, Louise L'Oste-Brown and Kate Wittwer for their contribution to this work.


Thanks for listening