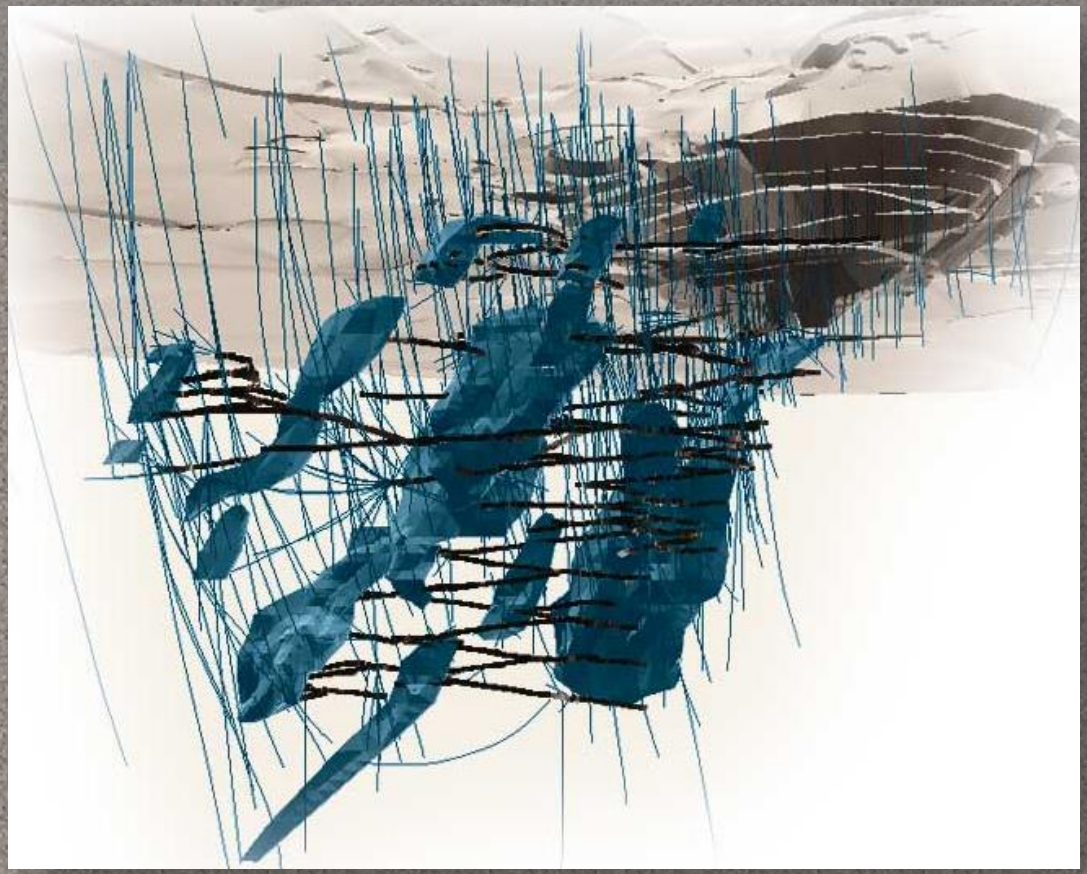
Downhole Geophysics Surprises at Woodlawn



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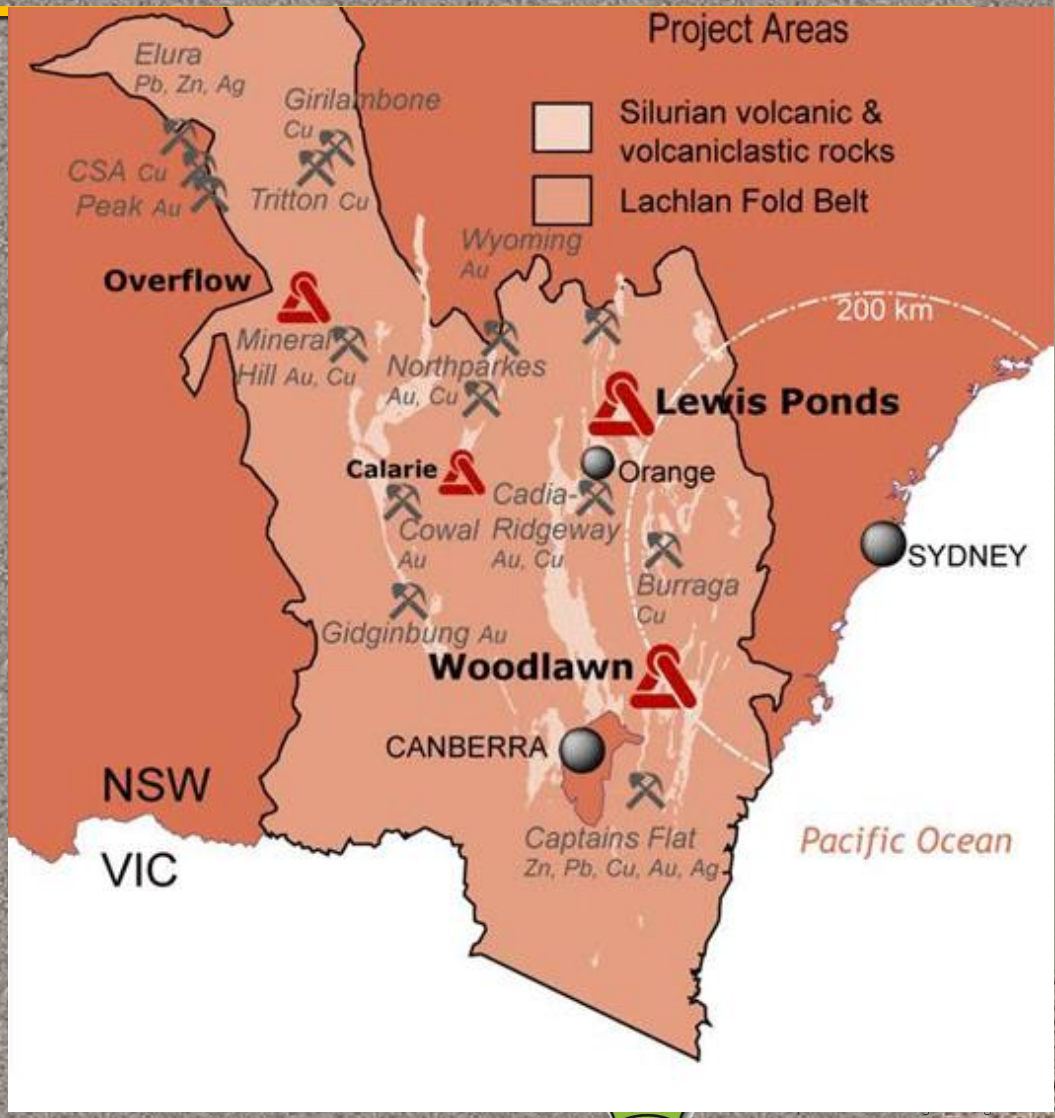
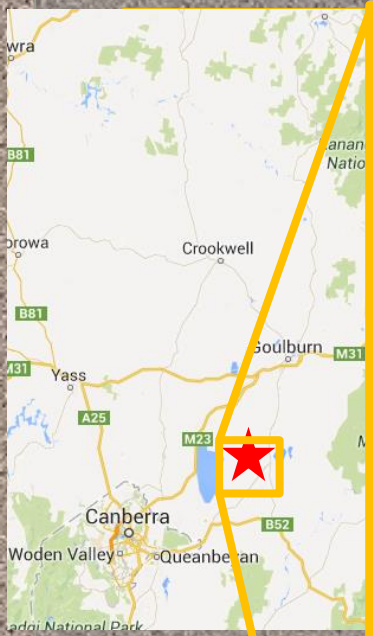
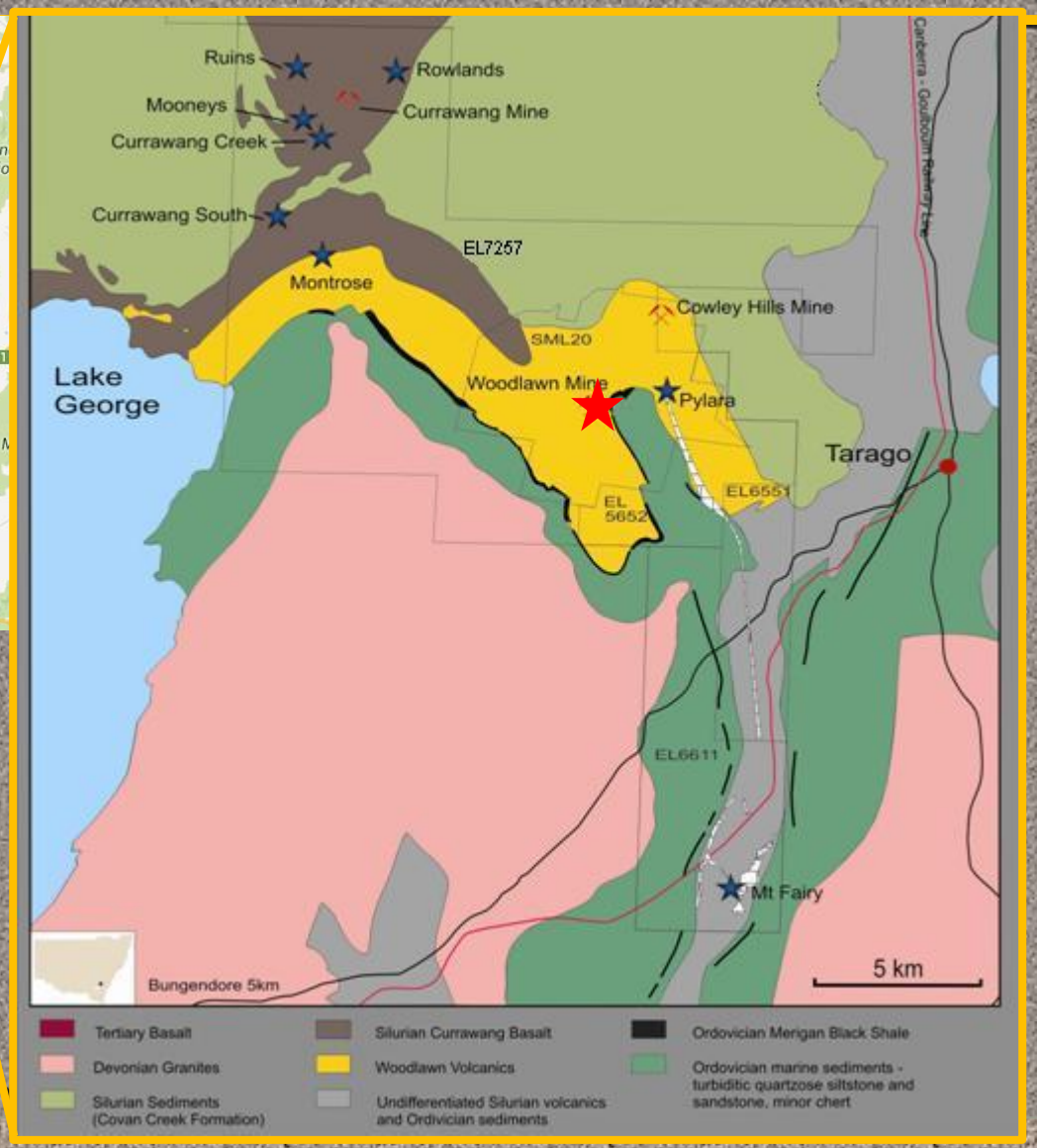
Woodlawn regional

- Lachlan Fold Belt – late Silurian felsic volcanics
- Deposit comprises one large and several smaller lenses of polymetallic Pb-Zn-Ag massive sulphides with an associated zone of copper mineralisation.
- Other VHMS include Captains Flat and Wilga, both South of Woodlawn



Woodlawn – Location and geology





- Mined between 1978-1998.
- Historical production 13.4 Mt of high grade zinc, lead and copper ore.
- Indicated current JORC Resource of 8.6 Mt @ 10.3% Zn, 4.0% Pb, 1.8% Cu, 84 g/t Ag and 0.5 g/t Au
- 1.5 Mt inferred JORC Resources @ 9.6% Zn, 4.1% Pb, 1.7% Cu, 87 g/t Ag and 0.6 g/t Au

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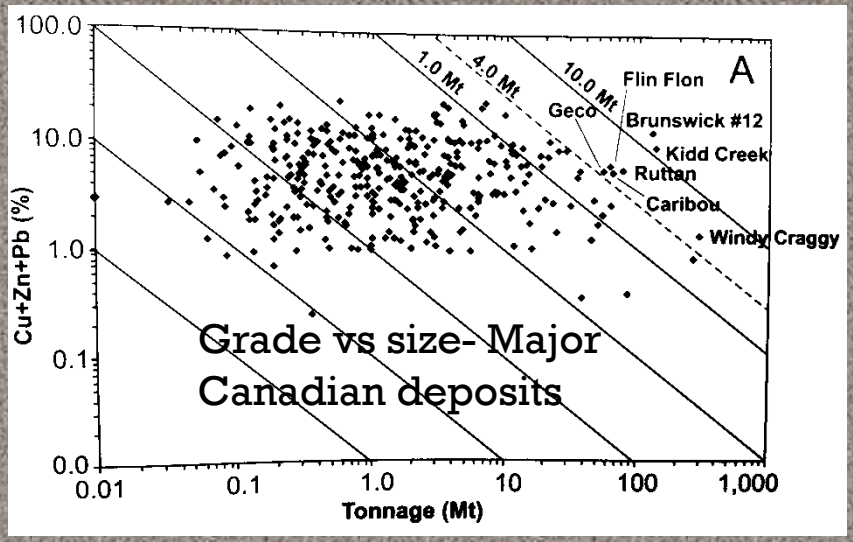
Geophysics and VHMS

- Wilga, Currawong, Que River, Hellyer, Dry River South and Woodlawn all relied heavily on geophysics.
- Geophysics worldwide has played a large role in VHMS
- Good deposits to target because 'keep on giving'
- Polymetallic so naturally hedged
- Roseberry keeps finding new lenses after 75 years of mining – mine recently extended to 25 years
- Kidd Creek



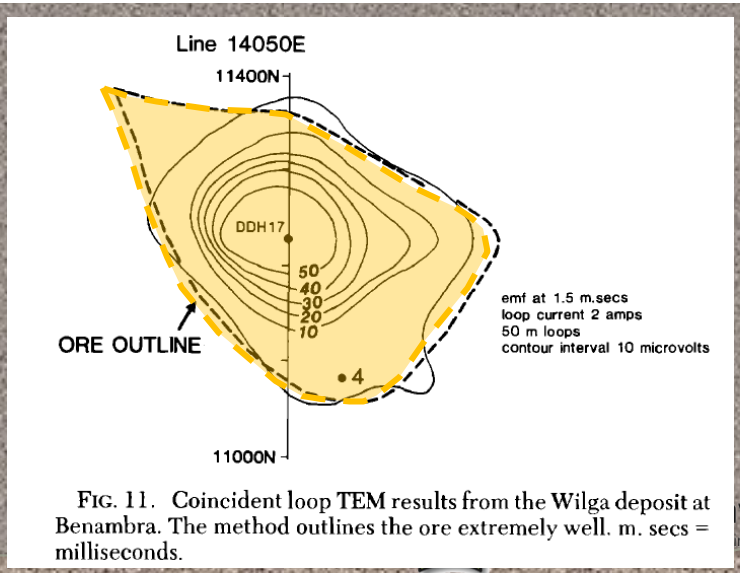


FIG. 11. Coincident loop TEM results from the Wilga deposit at Benambra. The method outlines the ore extremely well. m. secs = milliseconds.

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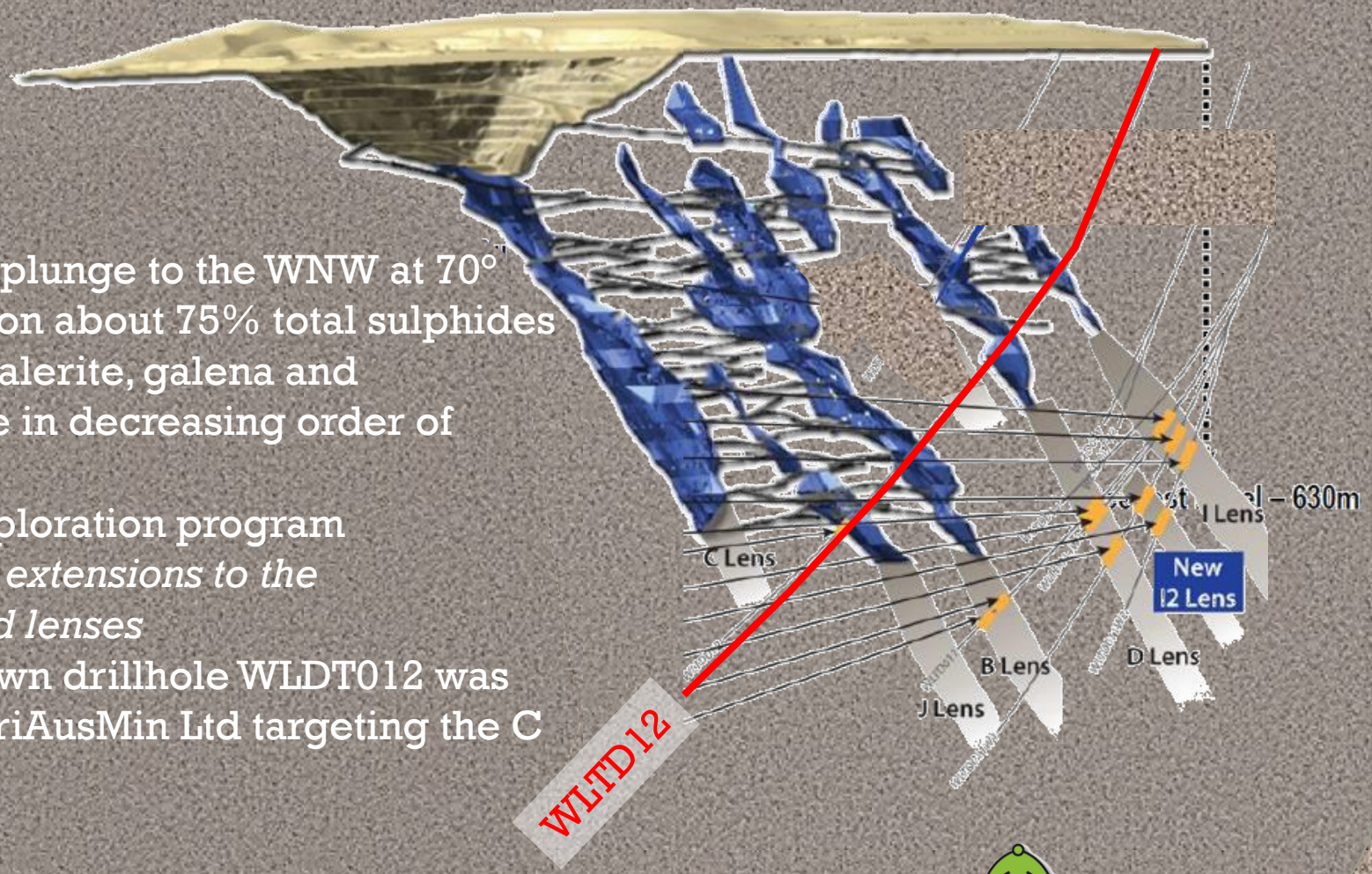
Geophysics at Woodlawn

Geophysical Method	Nature of geophysical response	Comments
Magnetics air&ground		Ore is non-magnetic. Deposit is actually located in an area of weak reverse magnetism
Gravity		1mGal response BUT this anomaly would disappear if the deposit was 80m deeper. The mafics are dense = bigger response than ore
Ground EM		Good strong response to the shallow minz. Black shales always a problem i.e. small loop EM may be more effective. EM found the nearby Montrose deposit
SP&Resistivity		Simple, strong response which closely outlined the shallow massive sulphides
Airborne EM		Dighem showed a strong-ish complex anomaly…..modern AEM would give better results. Black shales always a problem
DHEM		Some ore lenses are conductive – others are quite low conductivity. Coil or Bfield probe??
DHMMR		Never tried *however* could be very useful.
IP/MIP		Complex responses due to fw pyritic black shales. IP response ore = IP response black shales also.

Exploration 2012: Targeting deep extensions to Woodlawn

-Ore lenses plunge to the WNW at 70°
Mineralisation about 75% total sulphides - pyrite, sphalerite, galena and chalcopyrite in decreasing order of abundance.
-Current exploration program
Find deeper extensions to the underground lenses
The Woodlawn drillhole WLDT012 was drilled by TriAusMin Ltd targeting the C ore lens.



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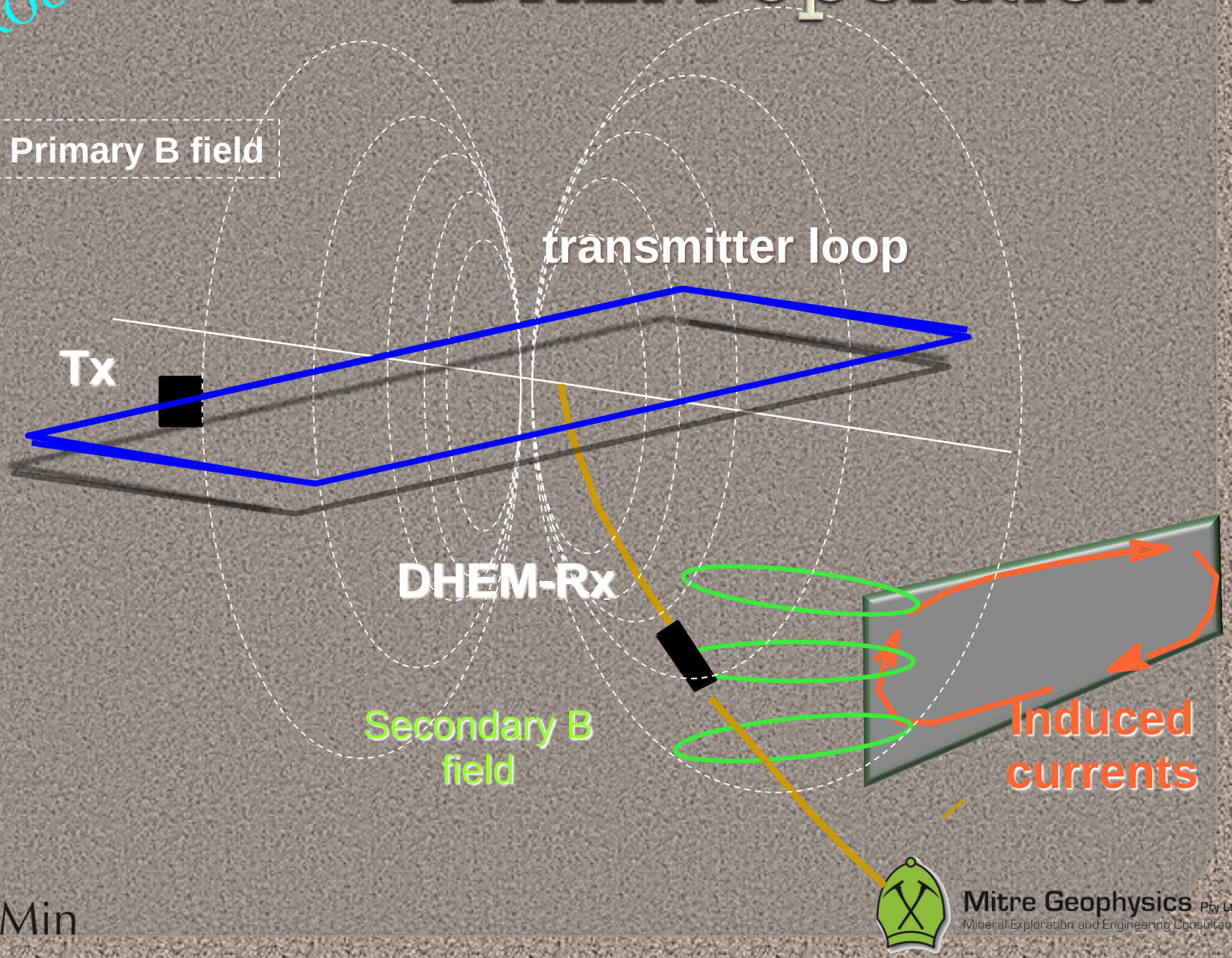
BACKGROUND

DHEM operation



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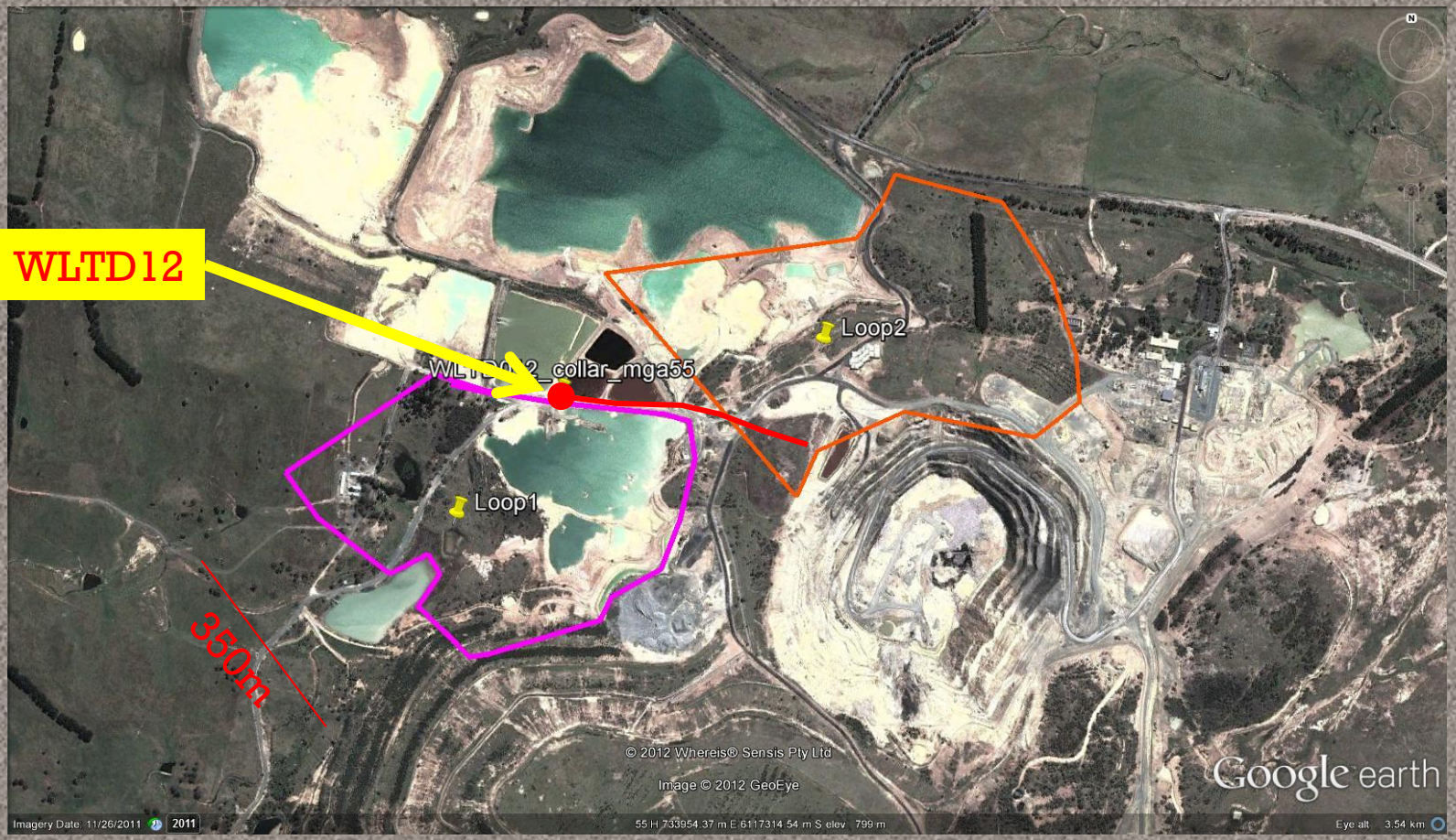
DHEM Surface transmitter loops



- The loop locations were constrained by the tailings dams and open cut.
- Primary loop, Loop1, was designed to optimally couple with the target.
- Loop2 was designed to be approximately null coupled with the target
- Two loops means a) mineralisation in all orientations is energised and b) more data for better models i.e. less bad drillholes.

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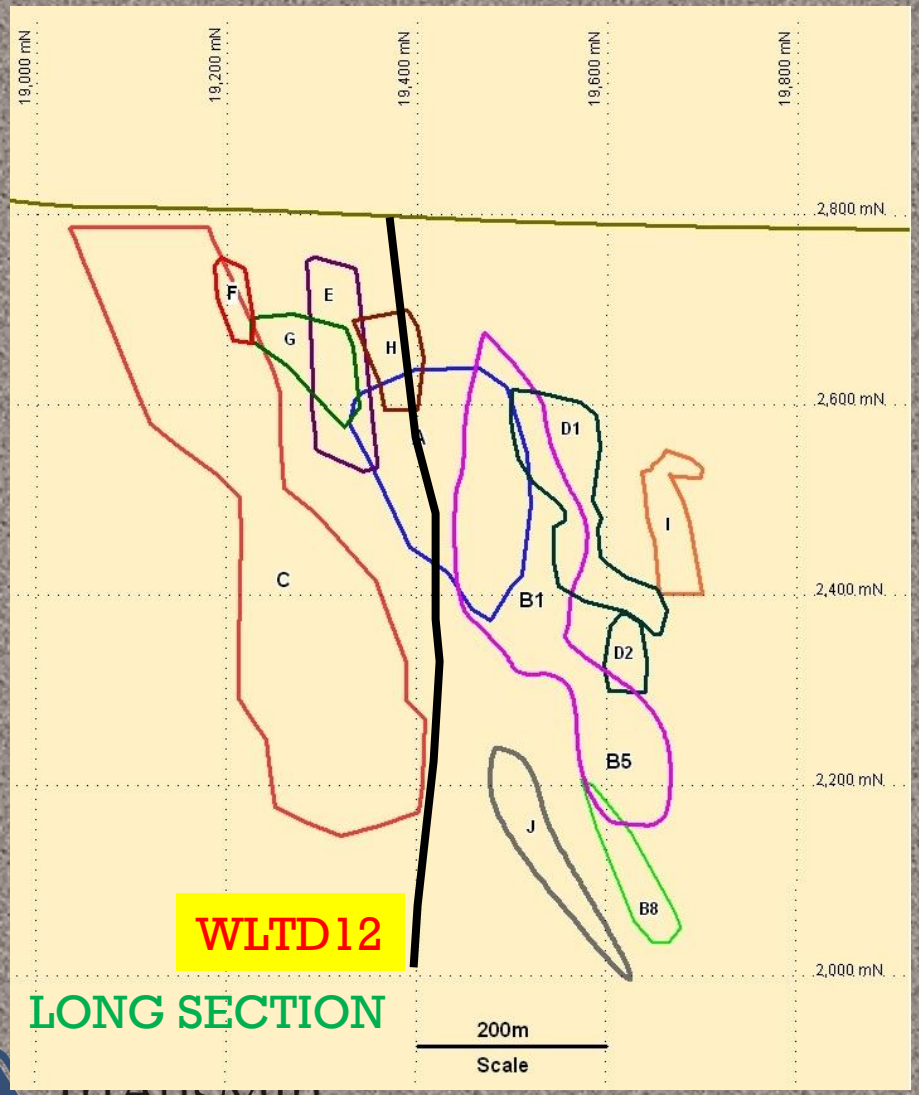
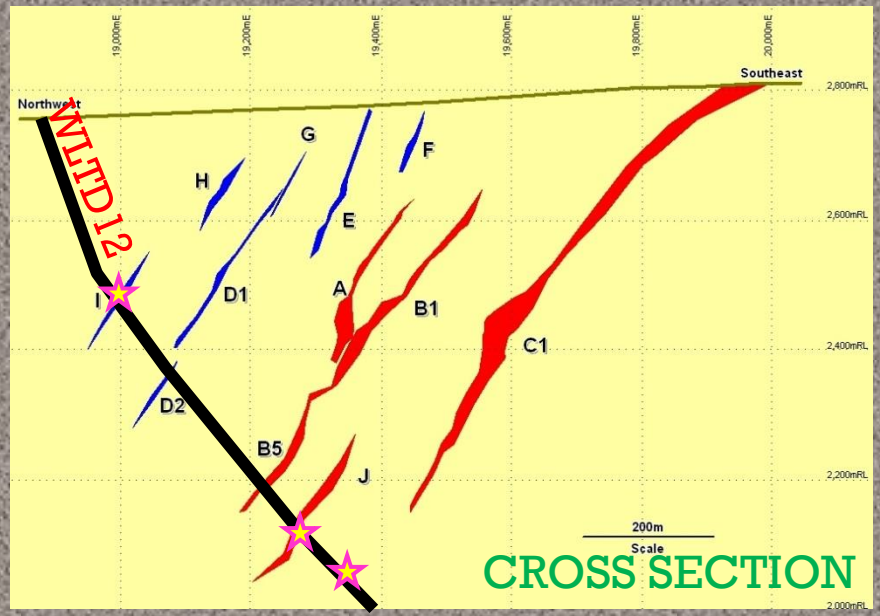
Exploration 2012: Targetting deep extensions to C lens



LONG SECTION

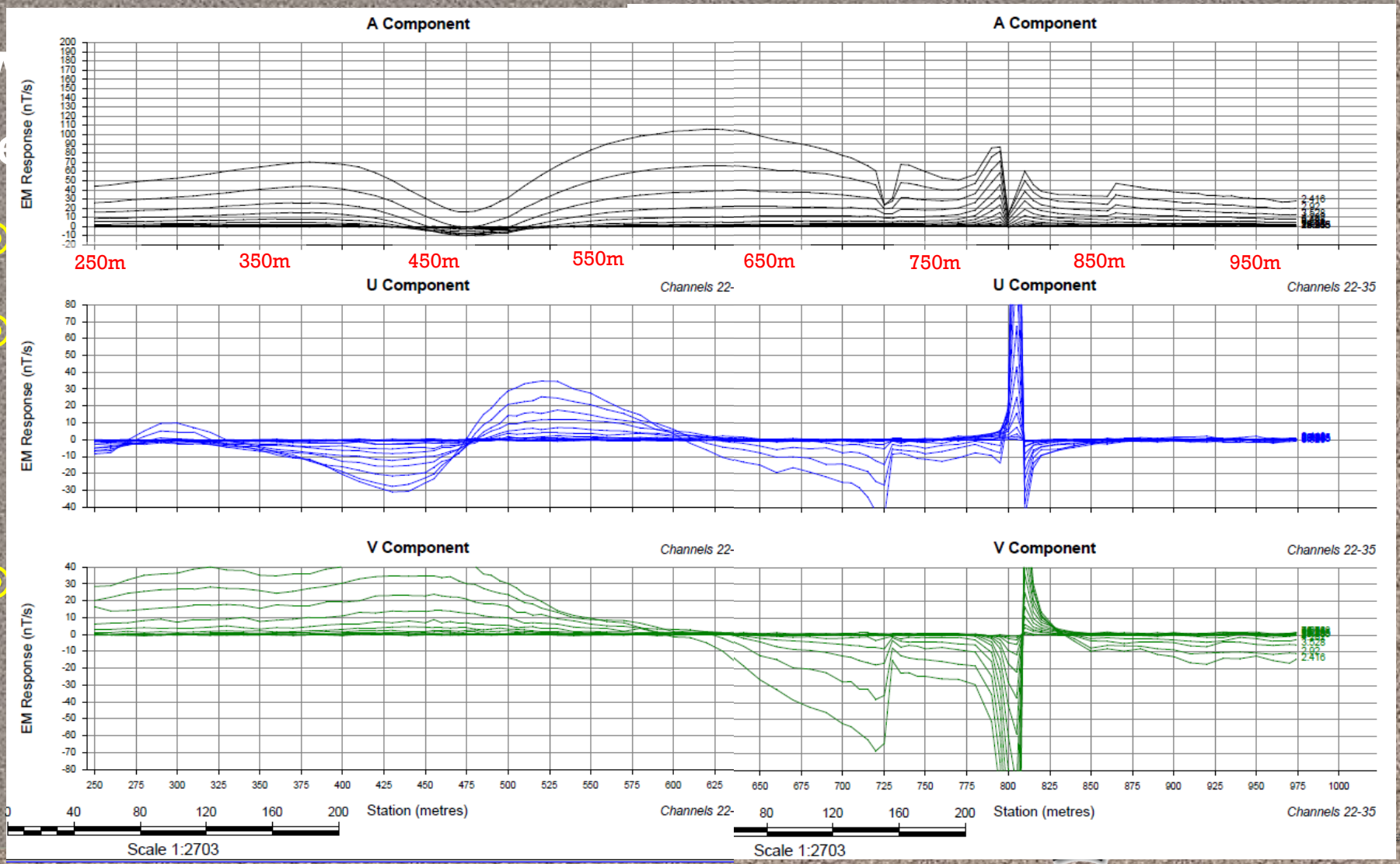


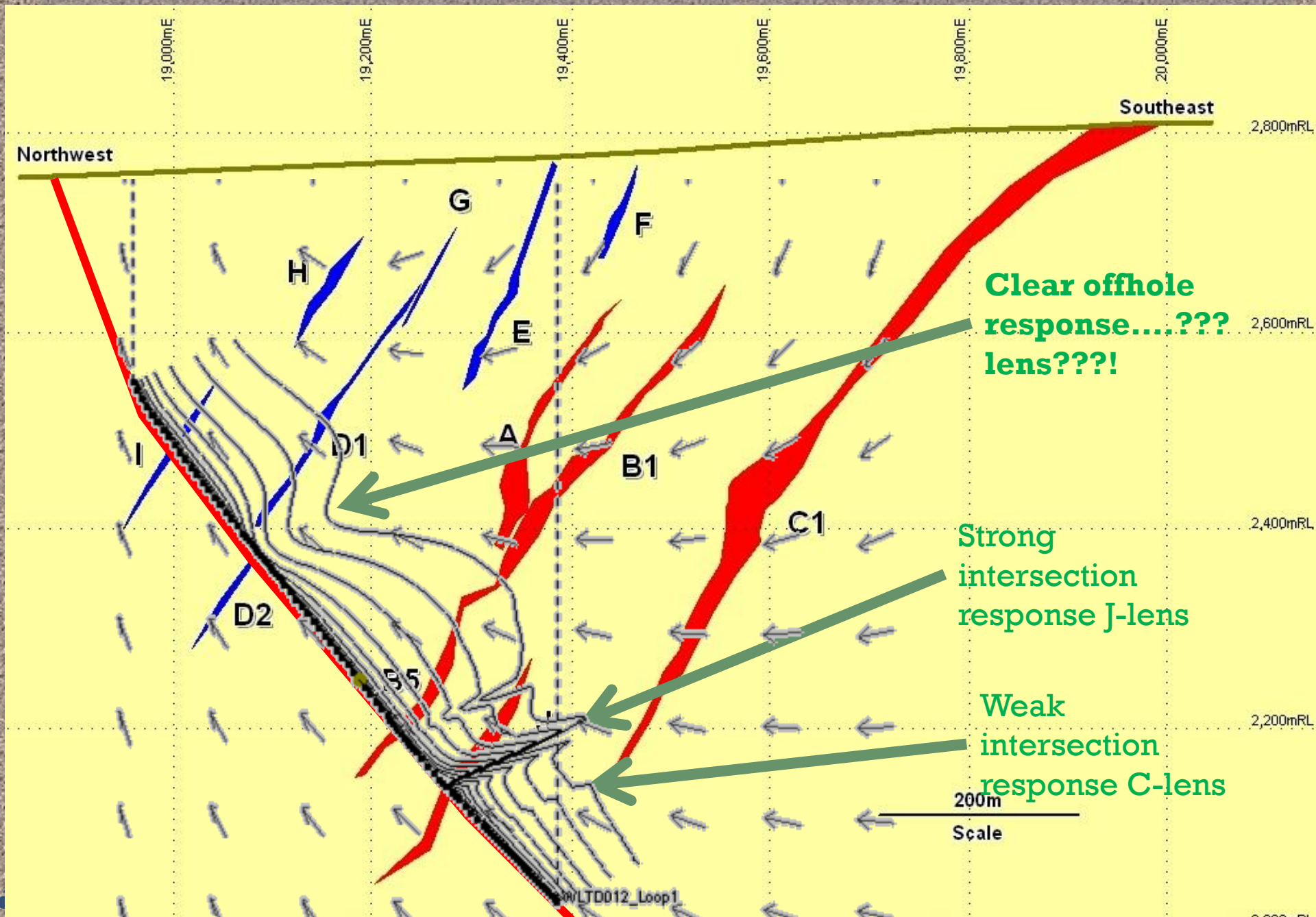
CROSS SECTION

WLTD012 significant intersections

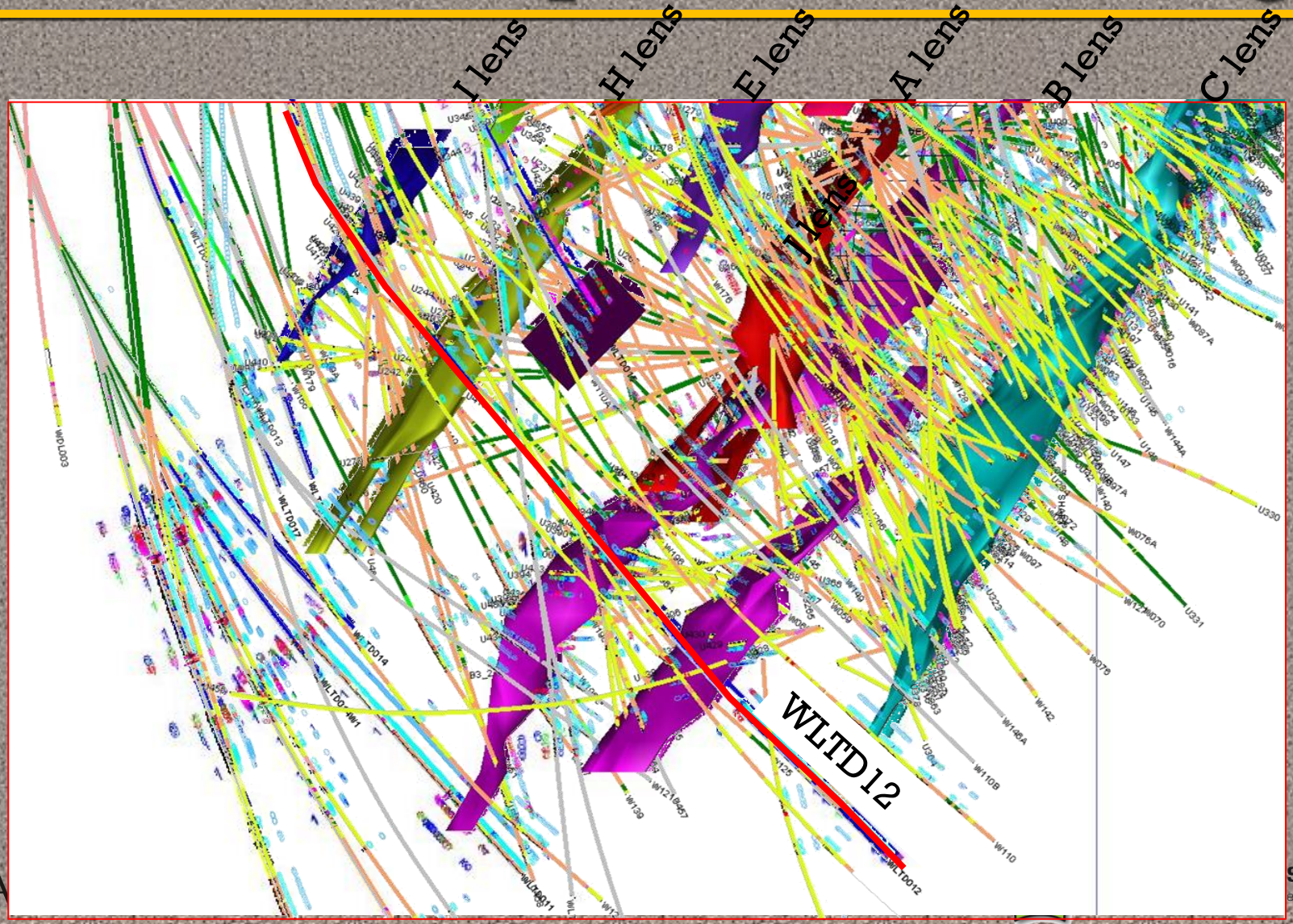
- I Lens?: Intersected 438 to 453m, very weak base metals sulphide
- J Lens: Possibly intersected from 804 to 808m, 4m at 3% Cu!
- C Lens: in-hole from about 890 to 950m as base metal sulfide veins/stringers, most abundant sulphides 900 to 940m.

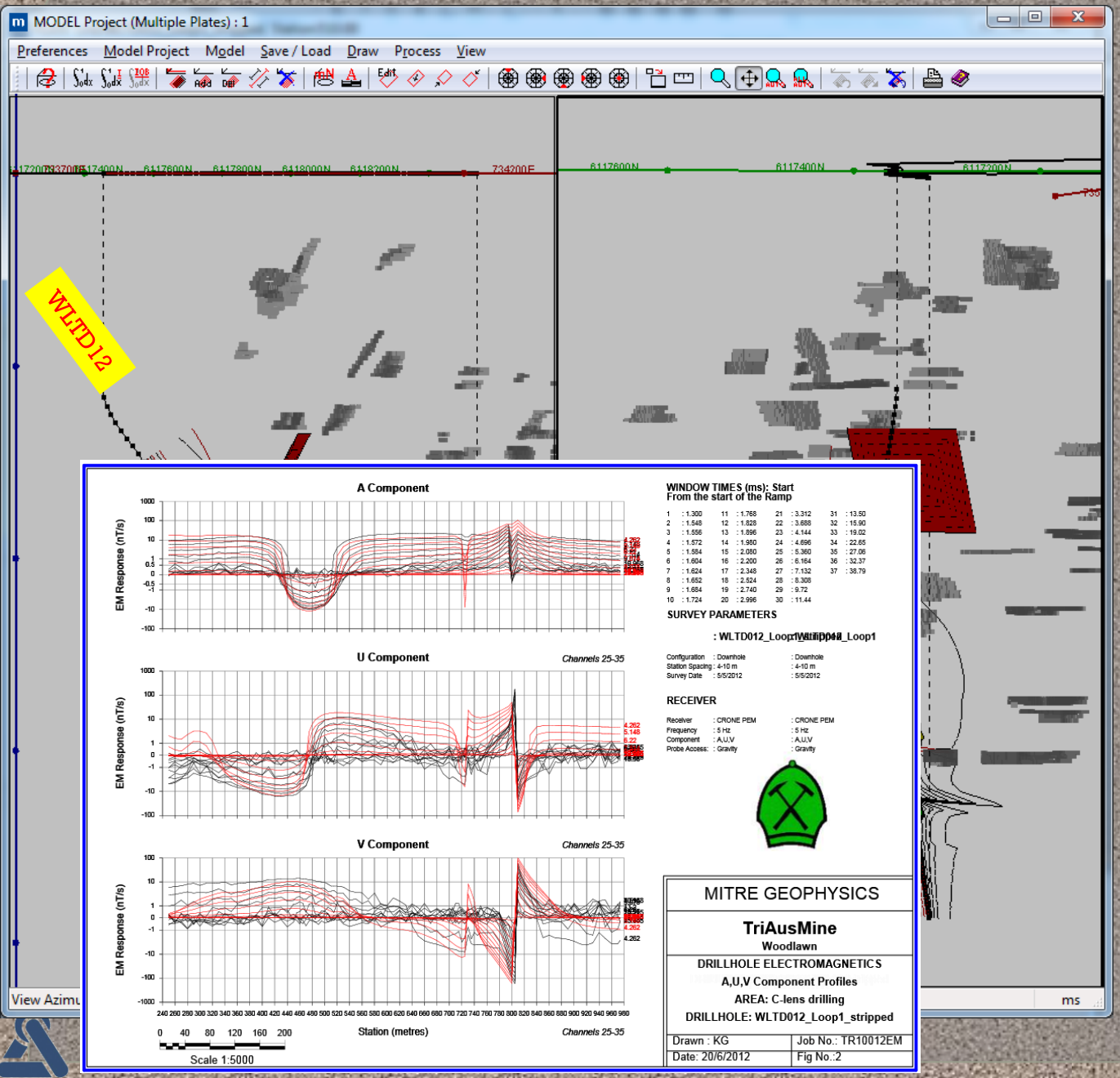
DHEM Results




19,000mE
19,200mE
19,400mE
19,600mE
19,800mE
20,000mE
Northwest
Southeast
2,800mRL
2,600mRL
2,400mRL
2,200mRL
G
F
H
E
I
D1
A
B1
C1
D2
S5
Clear offhole response....??? lens???!
Strong intersection response J-lens
Weak intersection response C-lens
200m
Scale
W/LTD012_Loop1

Lots of previous drilling





Best fit model:
125x125m
Dip ~60 °
Depth to top 280m
Strike 345°
Conductance 150S

Not high conductance – moderate conductance as we expect for Pb-Zn-Cu VHMS.....

Looks promising

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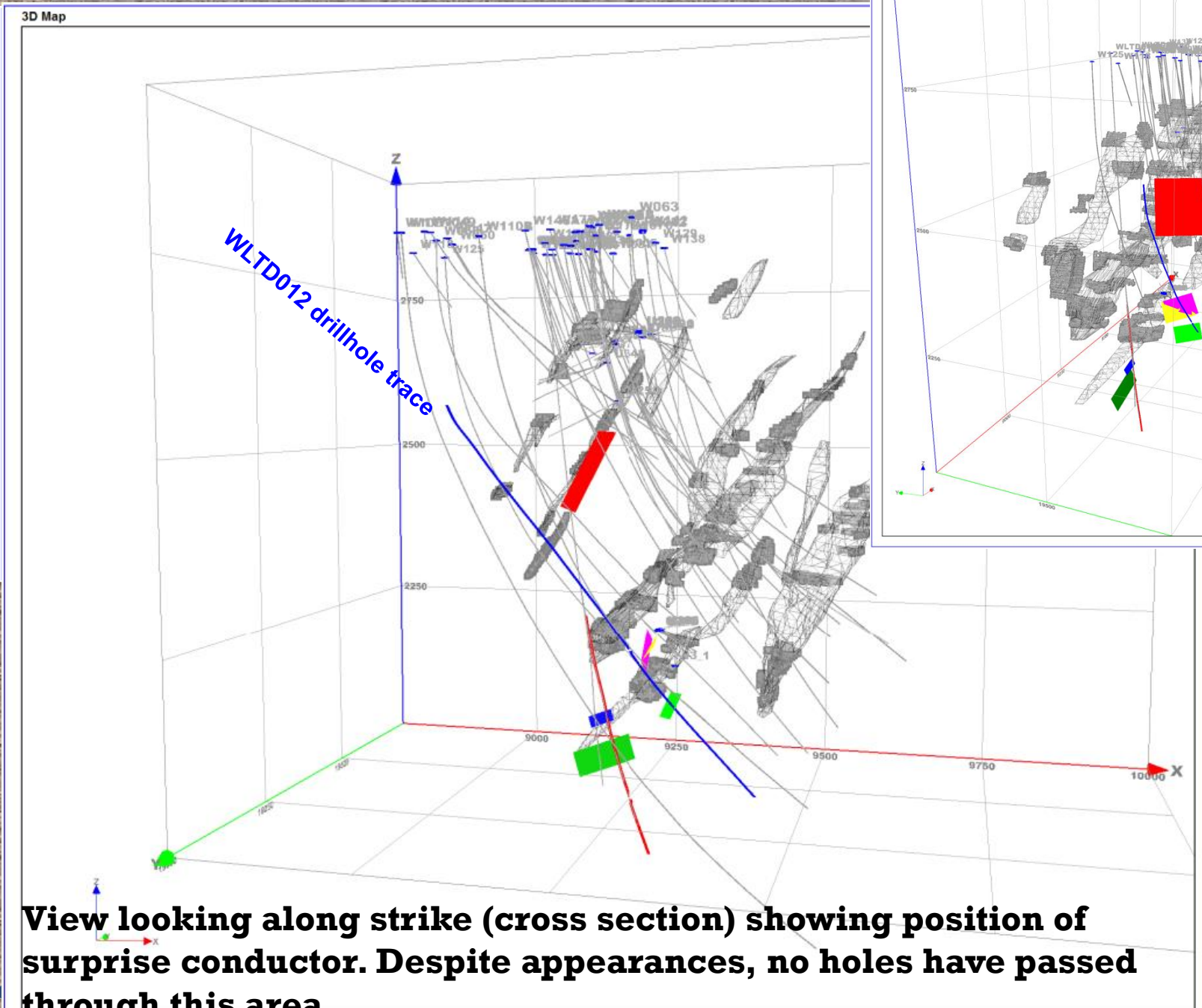
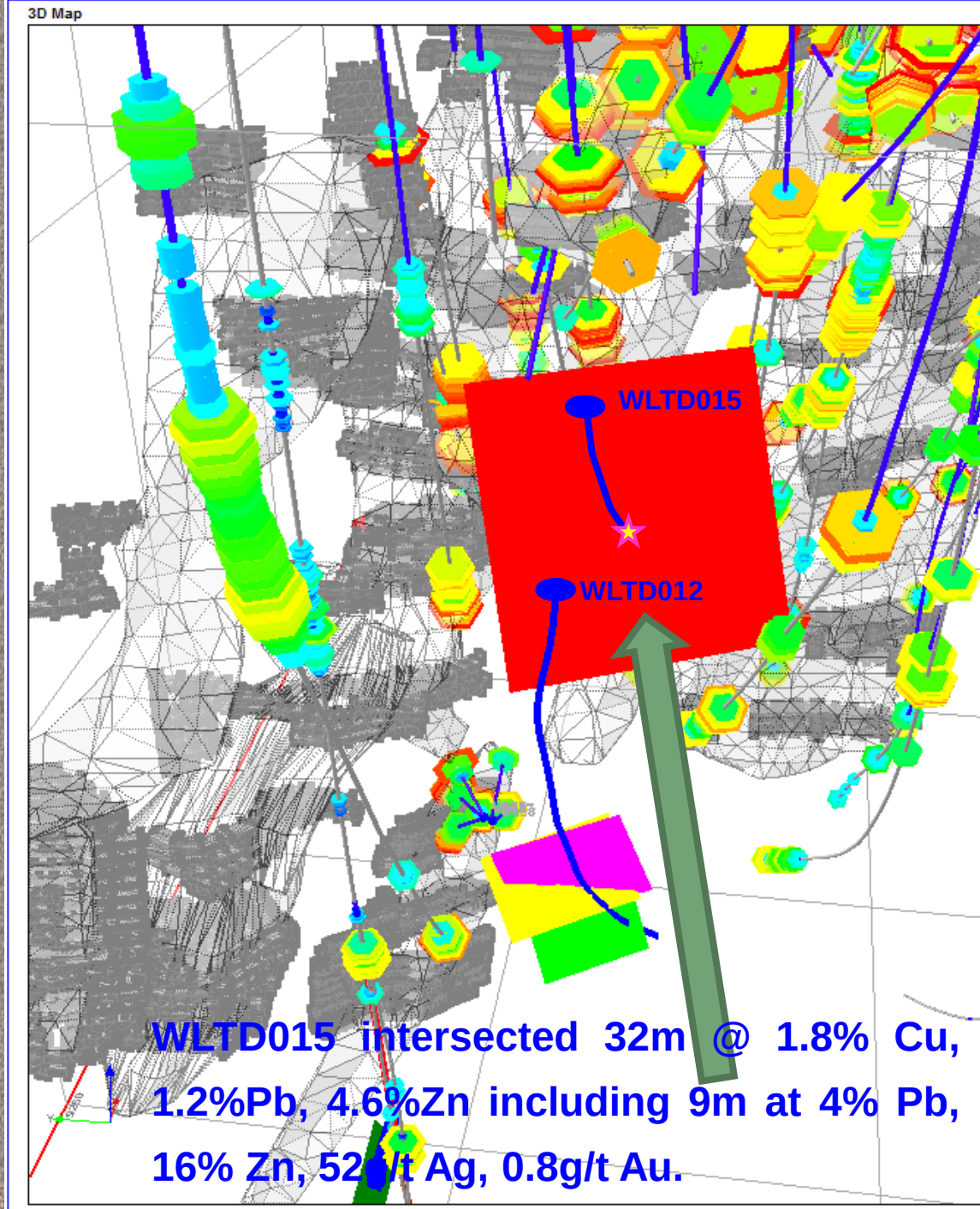


View looking along strike (cross section) showing position of surprise conductor. Despite appearances, no holes have passed through this area

Perspective of the DHEM models showing the close correlation between the mineralisation intersection in WU059 and the ‘surprise conductor’

Total potential tonnage = 0.5Mt



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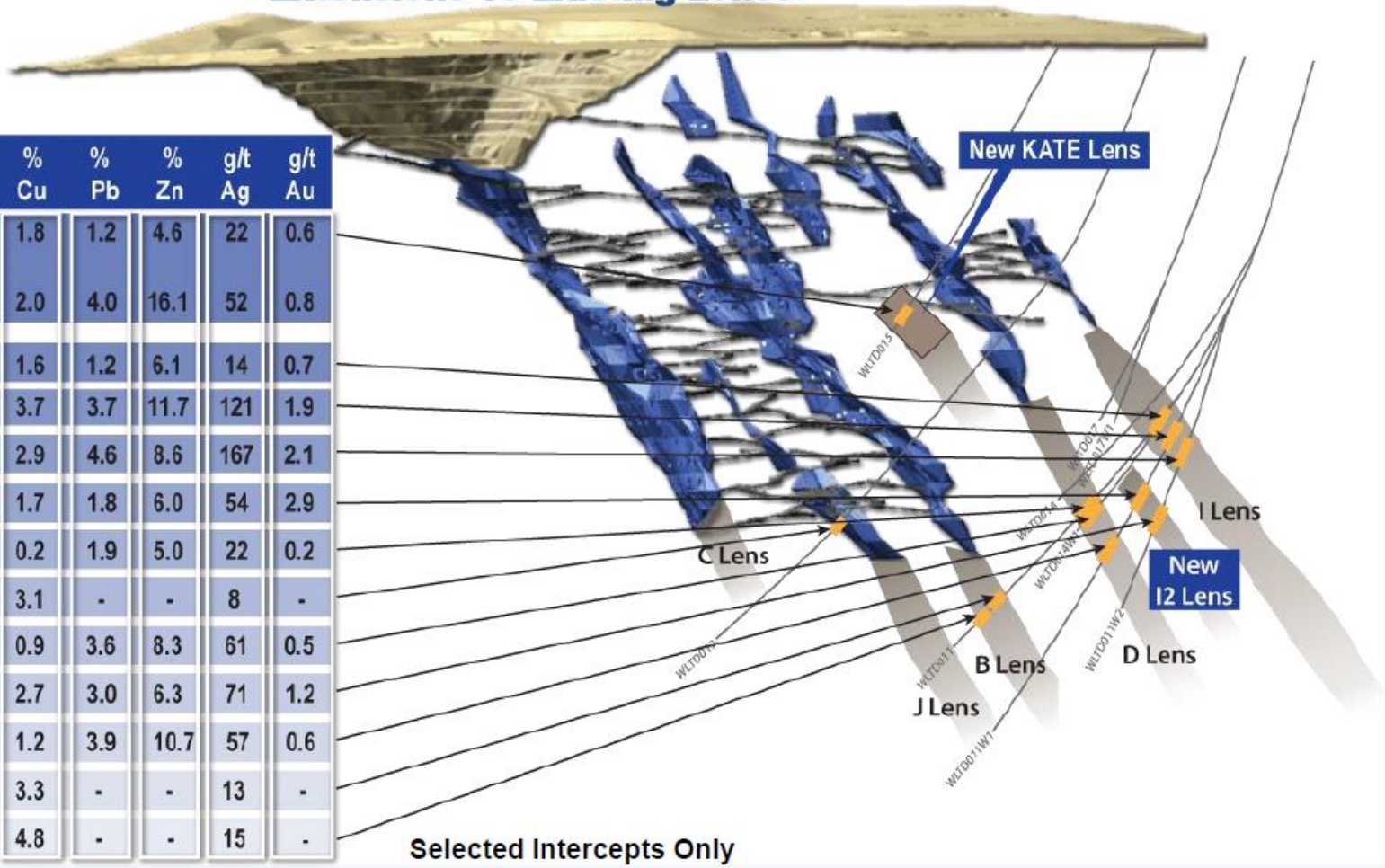
Selected 2012 & 2013 Drilling Intercepts

New High Grade Lenses & Extensions To Existing Lenses

Metres @	% Cu	% Pb	% Zn	g/t Ag	g/t Au
32.0	1.8	1.2	4.6	22	0.6
Incl. 9.0	2.0	4.0	16.1	52	0.8
9.9	1.6	1.2	6.1	14	0.7
14.5	3.7	3.7	11.7	121	1.9
9.0	2.9	4.6	8.6	167	2.1
7.3	1.7	1.8	6.0	54	2.9
15.0	0.2	1.9	5.0	22	0.2
4.0	3.1	-	-	8	-
11.1	0.9	3.6	8.3	61	0.5
8.9	2.7	3.0	6.3	71	1.2
8.0	1.2	3.9	10.7	57	0.6
4.0	3.3	-	-	13	-
12.1	4.8	-	-	15	-



Selected Intercepts Only

Summary

- DHEM is a small investment compared to the potential returns
- 'Kate lens' would have been discovered much earlier if DHEM was used routinely at Woodlawn
- DHEM increases 'radius of investigation' up to 100-200m (depending on size/conductance of ore)
- I would like to see DHMMR trialed at Woodlawn.

Questions?

Acknowledgements

- Wayne Taylor and TriAusMin for their generous permission to allow me to present this paper.
- Rod Arnold, Senior Woodlawn Geologist for his help and support
- Erik Conaghan for time on the phone
- OuterRim Exploration Services for pulling out all stops to get a crew to site on short notice.

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