

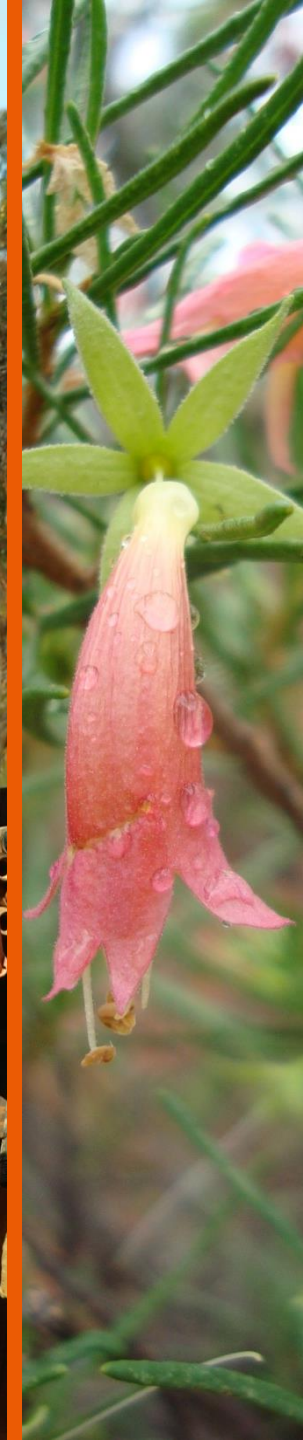


**Tropicana Joint Venture**

## Tropicana

An integrated approach to understanding granulite-hosted gold

Mark Doyle  
9th April 2014



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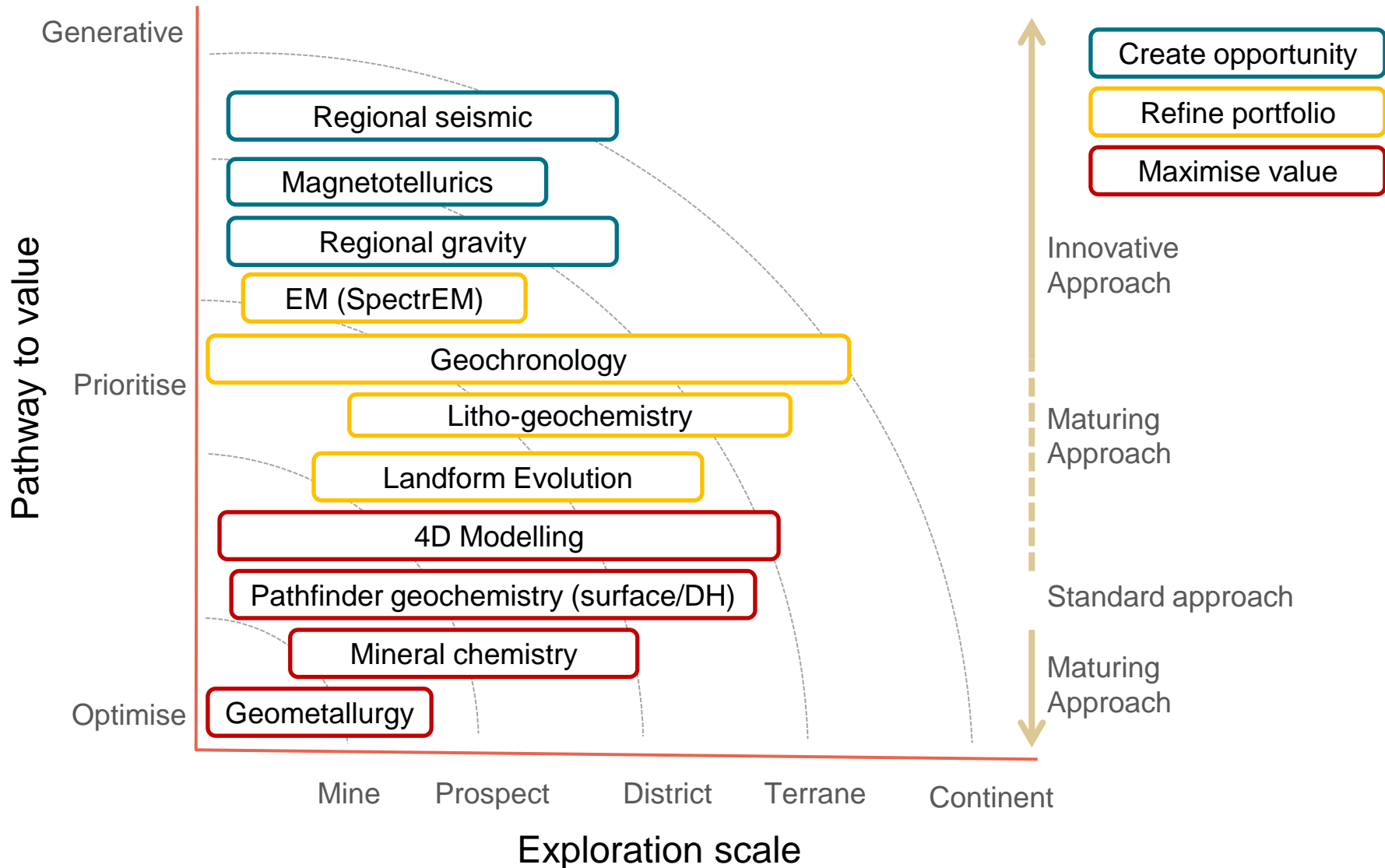
The Company disclaims any intent or obligation to update any forward-looking statements, whether as a result of new information, future events or results or otherwise. All forward-looking statements made in this presentation are qualified by the foregoing cautionary statements. Investors are cautioned that forward-looking statements are not guarantees of future performance and, accordingly, not to put undue reliance on such statements.

**Independence Group NL**

**ABN 46 092 786 304**

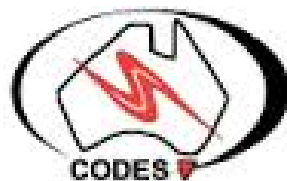
# Applied research for accelerated mineral deposit discovery

- A virtually blank canvas in terms of exploration and geoscience research



## Co-authors and partner institutions

- Tom Blenkinsop
- Tony Crawford
- Ian Fletcher
- Jeff Foster
- Laura Fox
- Ross Large
- Ryan Mathur
- Neal McNaughton
- Sebastian Meffre
- Janet Muhling
- Sandi Occhipinti
- Birger Rasmussen
- Jeni Savage



## Tropicana Project – 100%

**Location:** 330 km east-north east of Kalgoorlie in Western Australia

**Ownership:** AngloGold Ashanti Australia Ltd 70% and manager; Independence Group NL 30%

**Discovered:** 2005

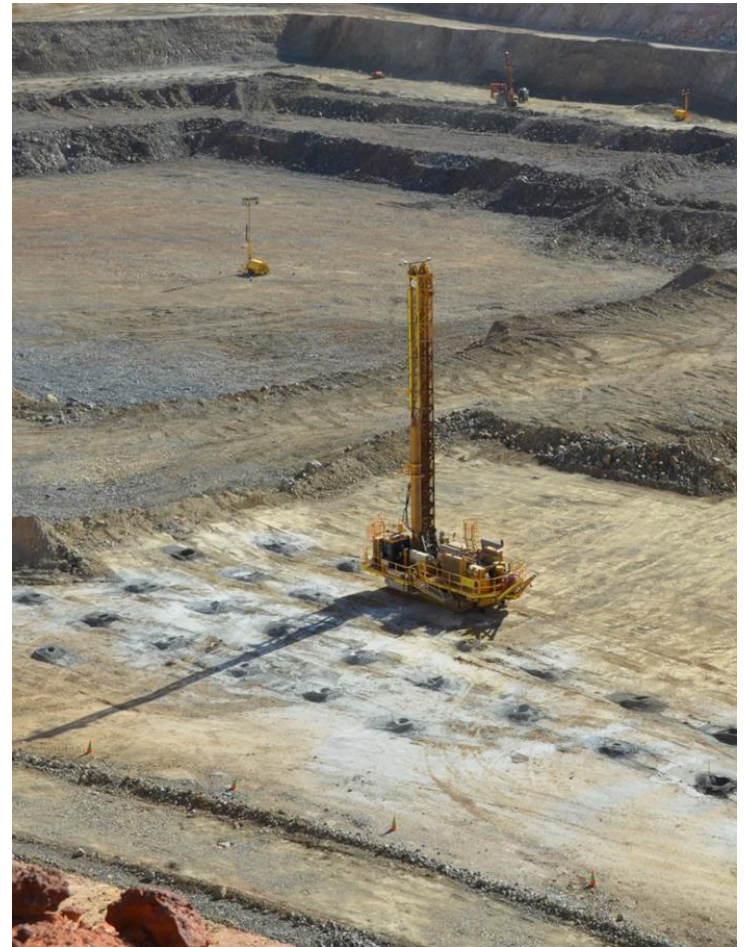
**Approved:** November 2010

**First Gold Production:** September 2013

**Forecast production 2014:** 485,000 – 528,000 oz

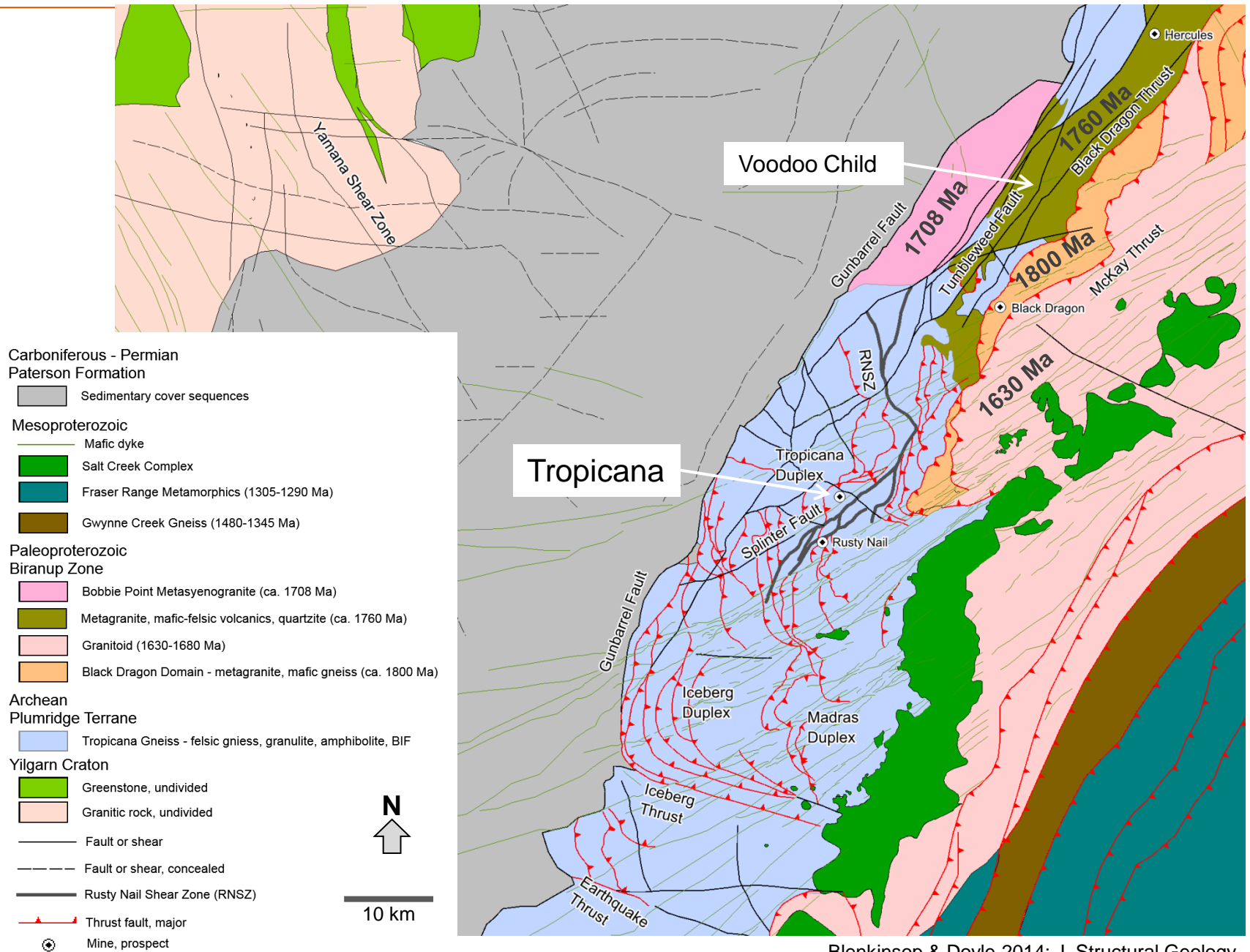
**Production December 2013 quarter:** 95,050 oz

**LOM cash cost:** A\$710/oz-730/oz



**Mine Life:** 11+ years

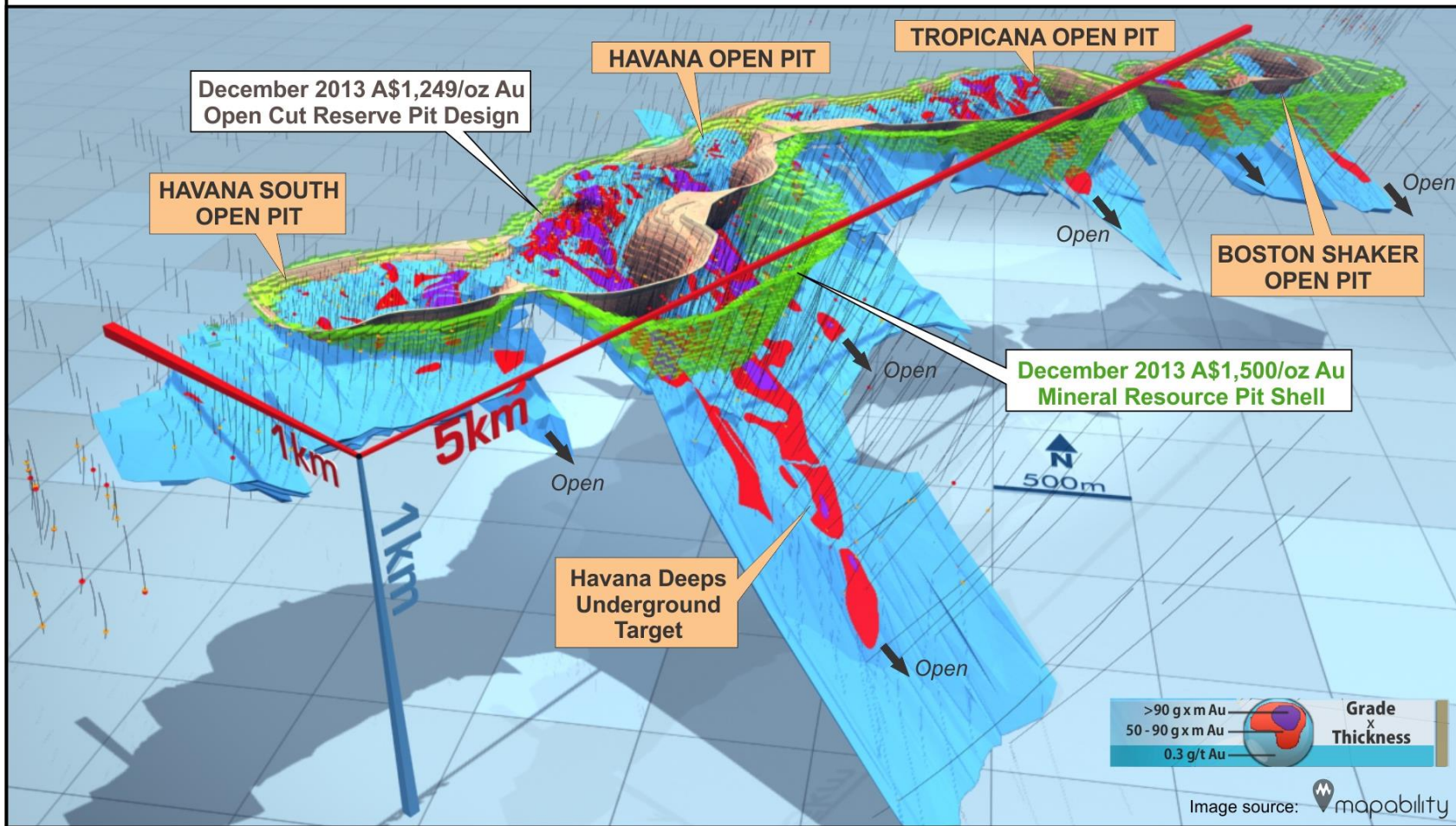
# A world-class gold discovery in the wrong rocks



# Resource

100% Project - December 2013 Mineral Resource\*: 116.8Mt @ 2.1g/t Au - 7.72Moz (A\$1,500/oz)  
December 2013 Ore Reserve: 54.8Mt @ 2.1g/t Au - 3.76Moz (A\$1,249/oz)

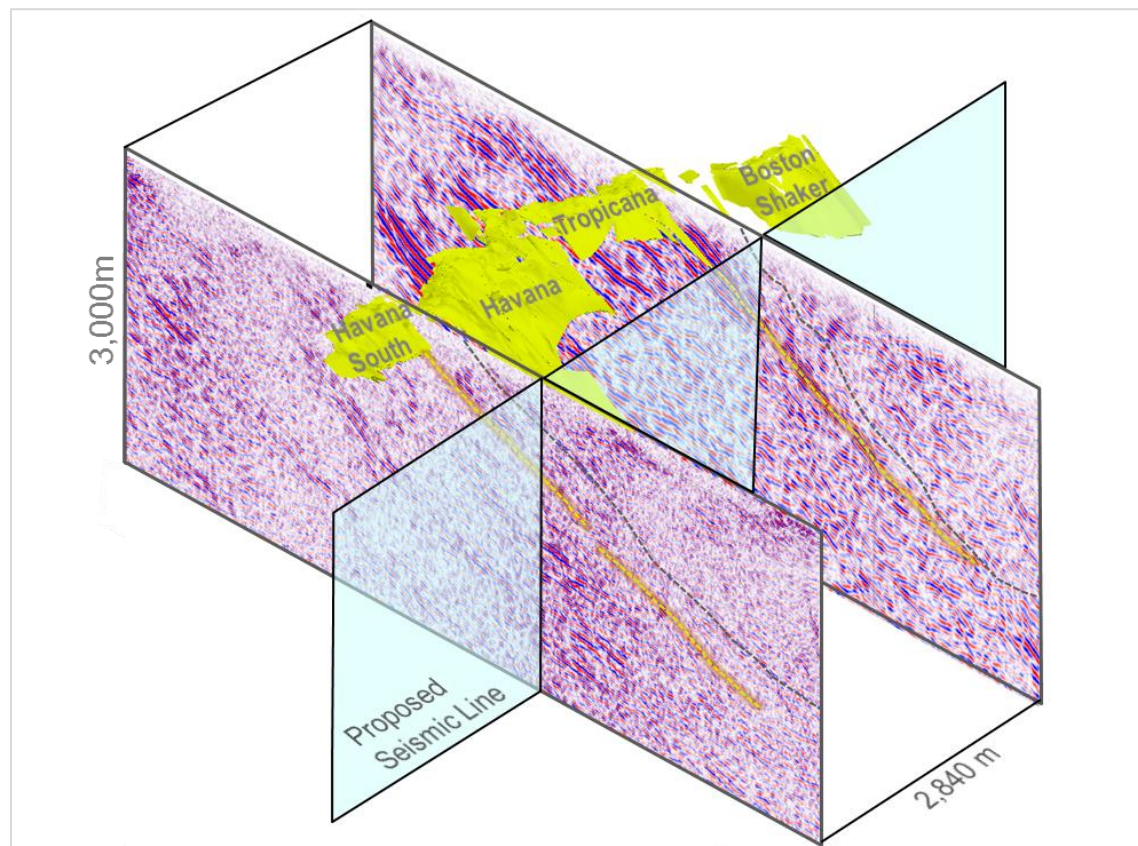
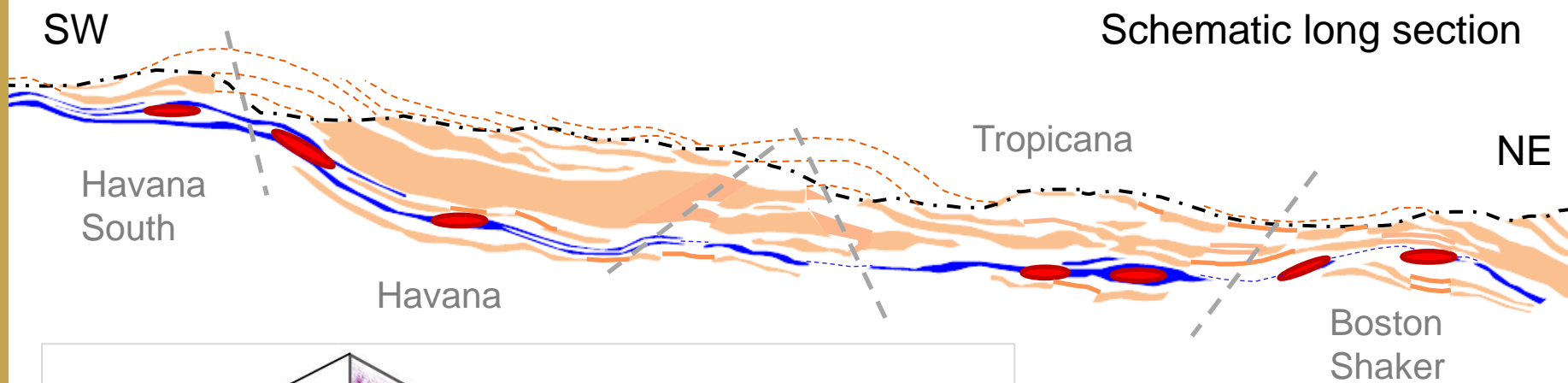
\* Resources are inclusive of Reserves






Reference : IGO ASX Release 28/02/2014 Mineral Resources and Ore Reserve Estimates for Tropicana Gold Project



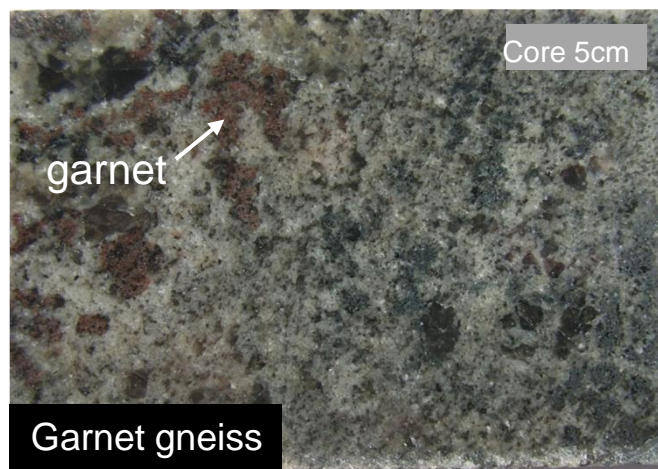
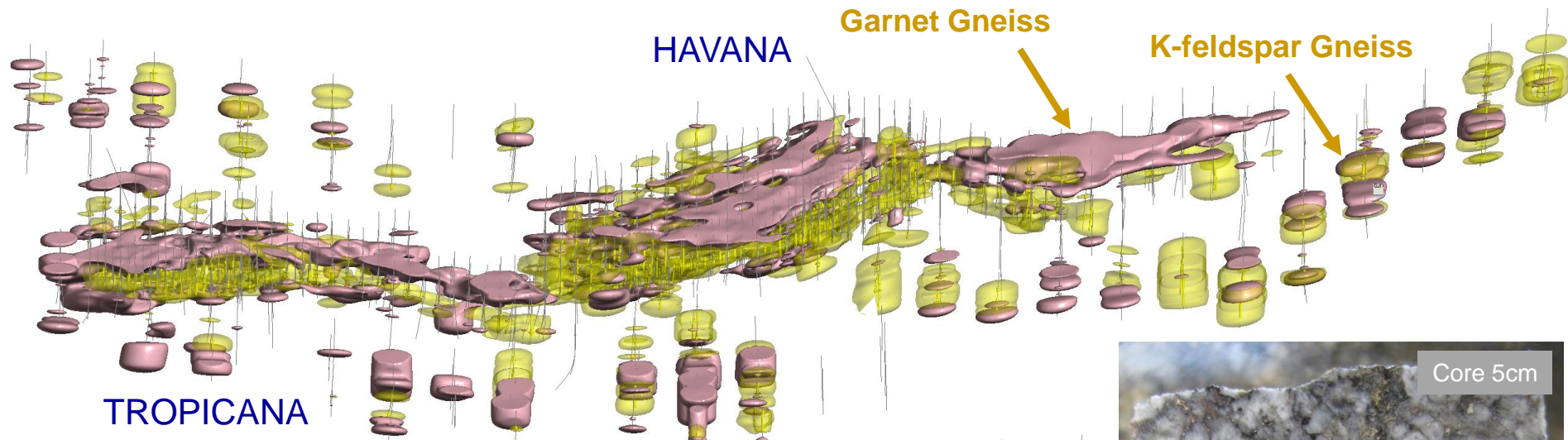
# Geometry and architecture



-  Garnet-bearing gneiss
-  Ore ( $\geq 0.3$  g/t Au)
-  High-grade shoot

# Lithofacies – upper amphibolite to granulite facies

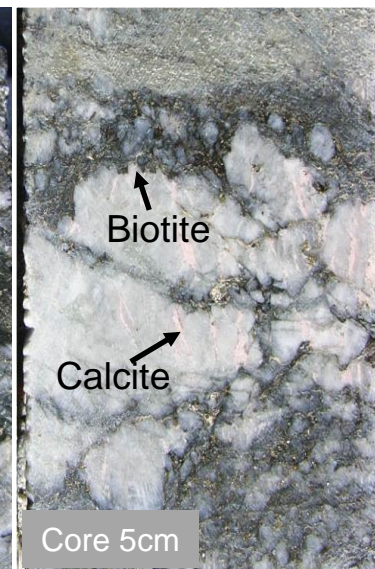
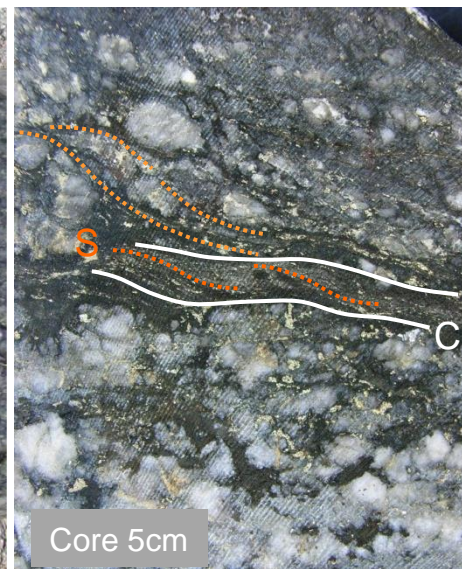
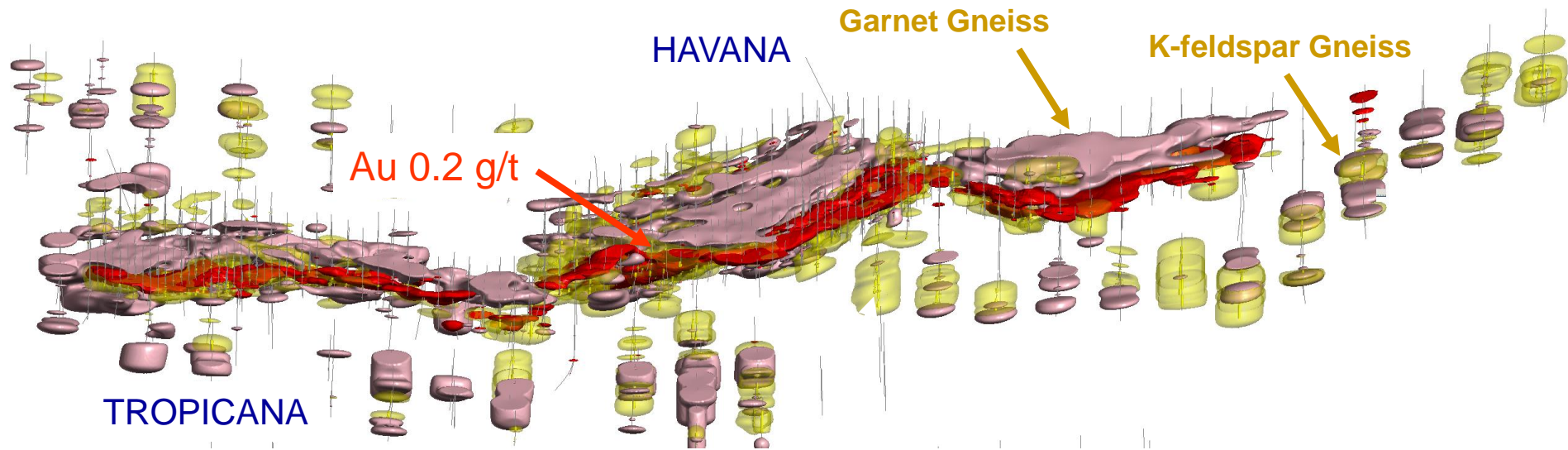
Long Section (viewing 30/090)



# Mineralisation – greenschist facies

Long Section (viewing 30/090)

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## Lithogeochemistry

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- Unmineralized host rocks amphibolite-granulite facies Kspar-poor (plagioclase dominant) diorites and tonalites.
- Mineralised syenites and syeno-granites (SiO<sub>2</sub> contents: andesites to rhyolites).
- Favourable horizon – andesite-rhyolite protolith akin to the host rock package.
- Alteration: enrichments in K and S, 'dilution-type' depletions in Ti, Mn, Mg, Ca and Na, and little or no change in Al and Fe.
- Trace element budget
  - expected strong enrichments in Ba, Rb and Pb,
  - unusual enrichment immobile high field strength elements Zr, Hf, Th, U and LREE, but not Y, Nb, Ta and the HREE.
  - enriched metals Te, Ag and Mo, with weak enrichments in As, Bi and W, and no enrichments in the base metals, Cu and Zn.



# Mineralisation – post granulite-facies events

## Lower-Grade



- Selective replacement
  - Mafic minerals / bands
  - Principally biotite/ amphibole
- Grain boundaries
- Fractures

## Higher-Grade



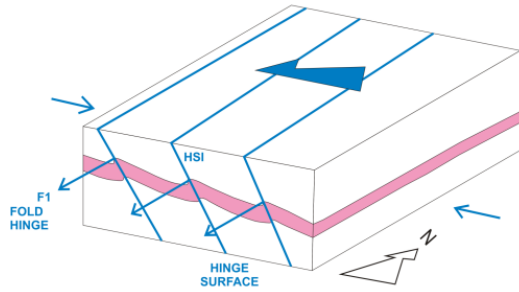
- Crackle-breccia textures
- Stylolitic fractures
- Veins (biotite-pyrite)
- Extensional veins (calcite)
- S-C fabrics

## Visible Au



- Quartz veins, anatexite
- Late fractures (muscovite)
- Proterozoic remobilisation

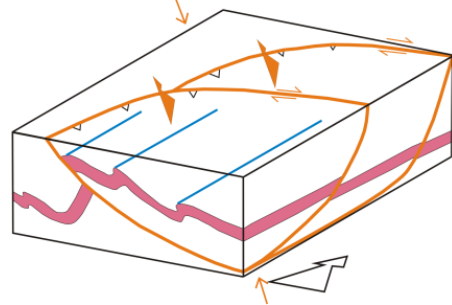
# Structural history



D1

Fundamental disposition of the gneissic layering was established in D1, and exerted a major control on the location of the geochemically favourable K-feldspar dominant gneiss. F1 fold hinges, plunging SE, may also have played a role.

Au?

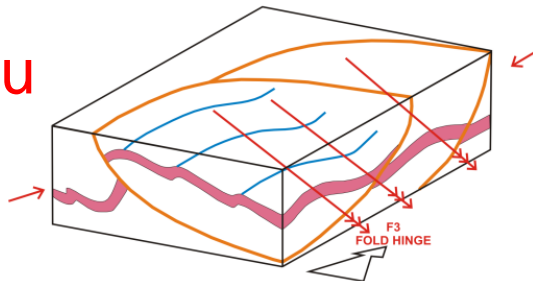


D2



Duplication of the gneissic stratigraphy on SE dipping thrusts occurred in D2 – greenschist facies. Plumridge detachment?

Au

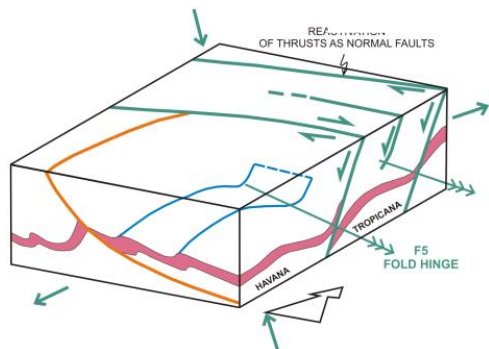


D3



Reverse and strike-slip S to E dipping, low displacement biotite-pyrite shears. Open D3 hinges, plunging SE, are a primary control on ore shoots.

Au



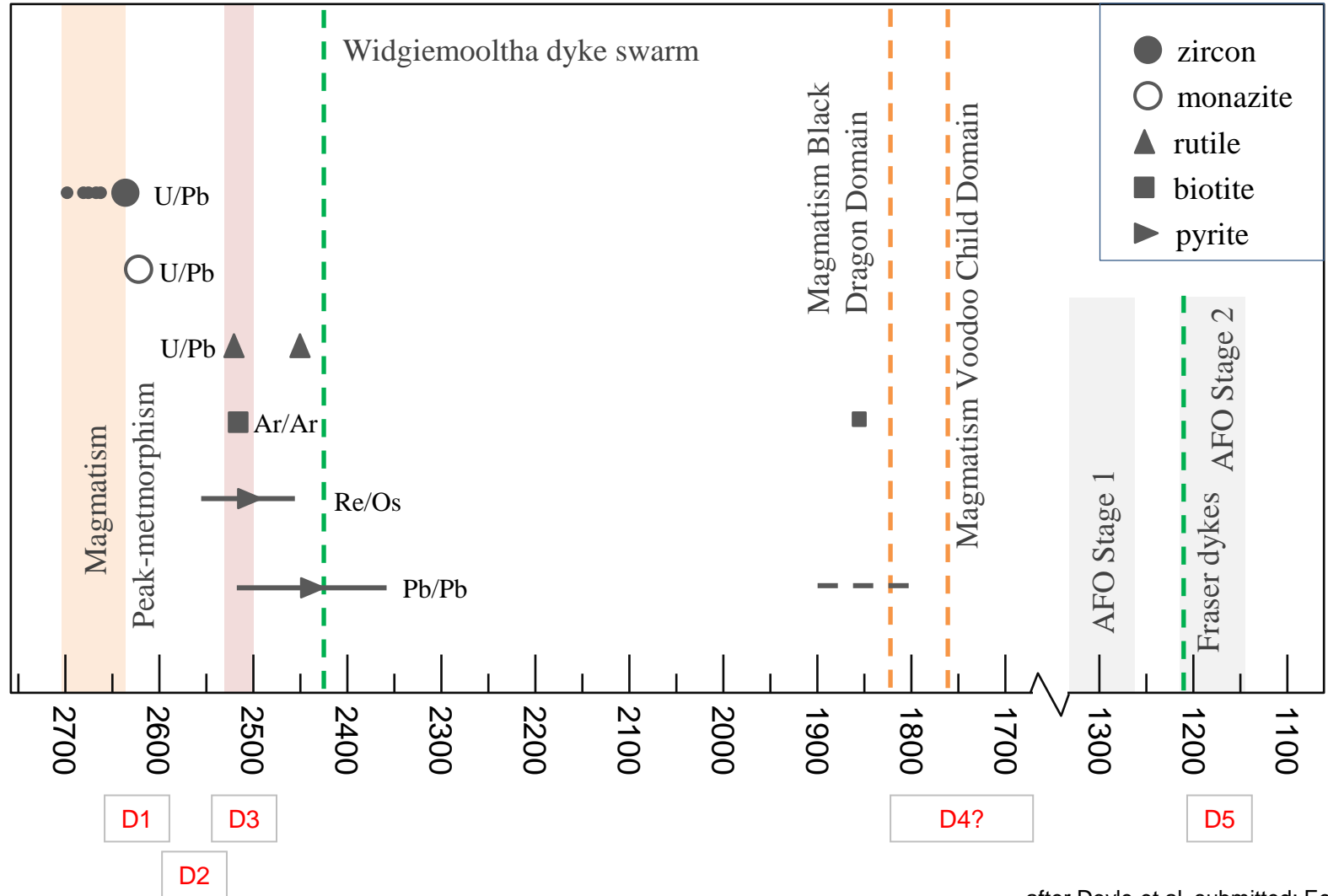
D5



Mineralization was disrupted and Au remobilised by sinistral-normal and dextral shearing in D4-5, which also introduced NE trends parallel to D5 fold hinges in Tropicana. Displacement of ore zones (270m).

# Geochronological constraints

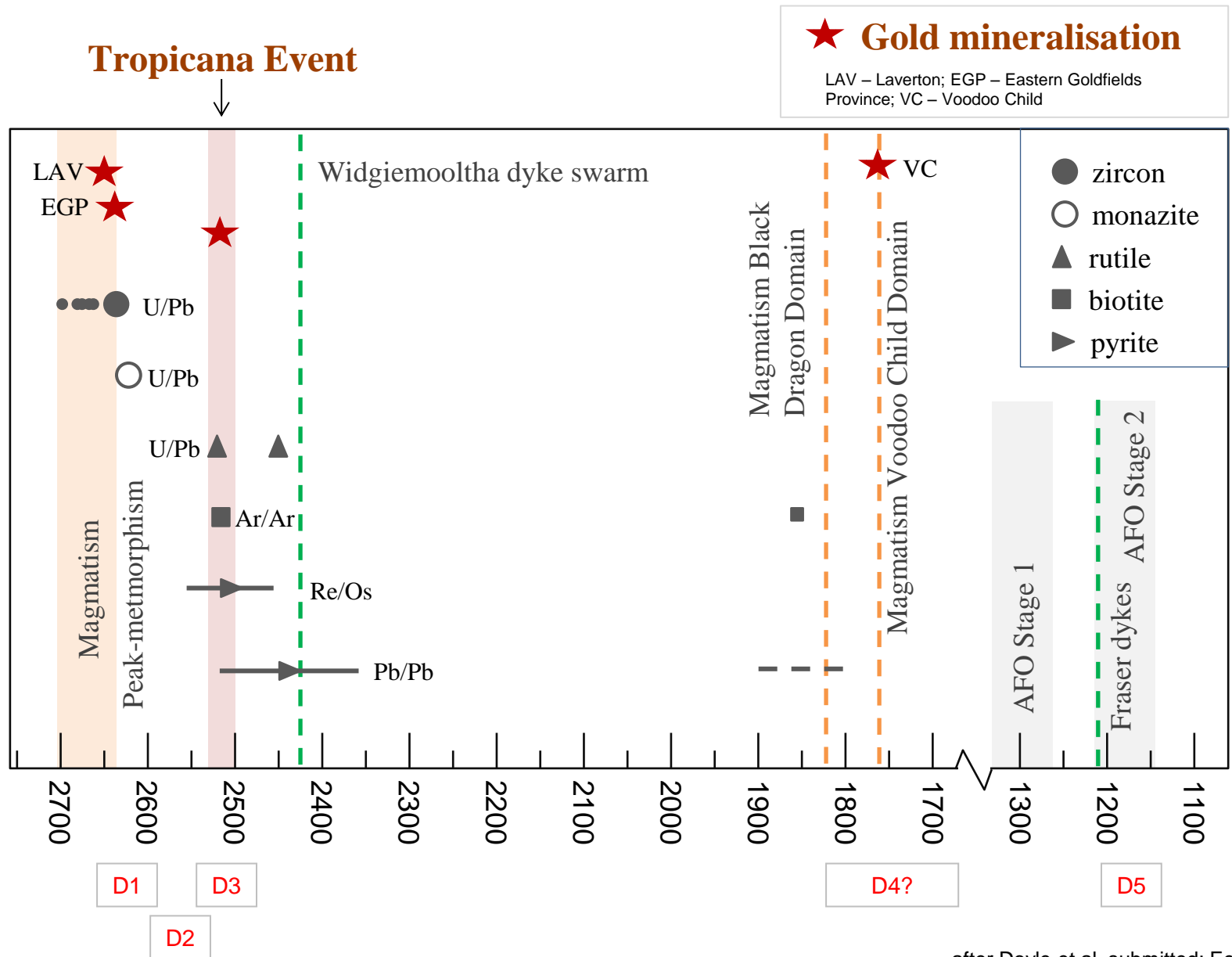
## Tropicana Event



after Doyle et al, submitted: Econ. Geol.

# Geochronological constraints

## Tropicana Event



after Doyle et al, submitted: Econ. Geol.



## Conclusions

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- Post-metamorphic gold deposit (cf. Renco, Zimbabwe)
  - Granulite terranes marginal to adjacent craton
  - Ore bodies dip moderately away from craton
  - Late orogenic structurally controlled style
  - Shear zones and mineralised breccia
  - Retrograde path (amphibolite; greenschist)
- Causative tectono-thermal event (Tropicana event)
- Neoproterozoic and Proterozoic Au
  - Yilgarn (limited evidence for disturbance at c. 2500Ma)
  - Eastern Dharwar Craton, India (e.g. Hutti, 800 t Au, 2547 Ma)
  - ~100 My after global peak orogenic gold mineralisation
  - Subordinate peak in juvenile continental crustal production and gold deposit formation



# TROPICANA GOLD MINE



Independence Group



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## Table 1: Tropicana Gold Project (100%) December 2013 Mineral Resources

		<b>Mineral Resource – 31 December 2013</b>		
	<b>Classification</b>	<b>Tonnes (Mt)</b>	<b>Au g/t</b>	<b>Contained Au (M Oz)</b>
<b>Open Pit</b>	Measured	28.6	2.06	1.89
	Indicated	74.0	1.88	4.48
	Inferred	5.8	2.57	0.48
	<b>Sub-Total</b>	<b>108.4</b>	<b>1.97</b>	<b>6.85</b>
<b>Underground</b>	Measured	-	-	-
	Indicated	2.4	3.58	0.27
	Inferred	6.1	3.07	0.60
	<b>Sub-Total</b>	<b>8.5</b>	<b>3.21</b>	<b>0.87</b>
<b>Total Tropicana</b>	Measured	28.6	2.06	1.89
	Indicated	76.4	1.94	4.75
	Inferred	11.9	2.83	1.08
<b>GRAND TOTAL</b>		<b>116.8</b>	<b>2.06</b>	<b>7.72</b>

**Notes:**

*For the Open Pit Mineral Resource estimate, mineralisation in the Havana, Havana South, Tropicana and Boston Shaker areas was calculated within a US\$1,550/oz pit optimisation at an AUD:USD exchange rate of 1.03 (A\$1,500/oz).*

*The Open Pit Mineral Resources have been estimated using the geostatistical technique of Uniform Conditioning, using cut-off grades of 0.3g/t Au for Transported and Saprolite material, 0.4g/t Au for Transitional and Fresh material.*

*The Havana Deeps Underground Mineral Resource estimate has been reported outside the US\$1,550/oz pit optimisation at a cut-off grade of 1.73g/t Au, which was calculated using a gold price of US\$2,000/oz (AUD:USD 1.05) (A\$1,896/oz). The Havana Deeps Underground Mineral Resource was estimated using the geostatistical technique of Ordinary Kriging using average drill hole intercepts.*

*Resources are inclusive of Reserves.*

*The Competent Persons statement is incorporated in the JORC Code Statements which follow Table Two. JORC (2012) Table 1 Parameters are set out in the IGO website at [www.independencegroup.com.au](http://www.independencegroup.com.au)*

## Table 2: Tropicana Gold Project (100%) – December 2013 Ore Reserve

Ore Reserve – 31 December 2013				
	Classification	Tonnes (Mt)	Au g/t	Contained Au (M Oz)
Open Pit	Proved	24.9	2.26	1.81
	Probable	29.9	2.02	1.95
<b>GRAND TOTAL</b>		<b>54.8</b>	<b>2.13</b>	<b>3.76</b>

### Notes:

*The Proved and Probable Ore Reserve (31 December 2013) is reported above economic break-even gold cut-off grades of 0.4 g/t for Transported/Upper Saprolite material, 0.5 g/t for Lower Saprolite material, 0.6g/t for Sap-Rock (Transitional) material and 0.7g/t for Fresh material at nominated gold price US\$1,100/oz, and exchange rate 0.88 AUD:USD (A\$1,249/oz Au).*

*The estimate is based on the actual survey position for the end of September 2013 with Resource models depleted by the monthly forecast production for the remainder of CY2013.*

*The Competent Persons statement is incorporated in the JORC Code Statements below.*

*JORC (2012) Table 1 Parameters are set out on the IGO website at [www.independencegroup.com.au](http://www.independencegroup.com.au).*

### JORC Code Statements - Tropicana Gold Project Mineral Resource and Ore Reserve estimates

The information in this report that relates to Mineral Resources estimates was based on information compiled by Mr Mark Kent, a full-time employee of AngloGold Ashanti Australia Limited, who is a member of the Australasian Institute of Mining and Metallurgy. Mr Kent has sufficient experience relevant to the type and style of mineral deposits under consideration, and to the activity which has been undertaken, to qualify as a Competent Person as defined in the 2012 edition of the JORC Code. Mr Kent consented to the release of the Mineral Resource estimate, based on the information in the form and context in which it appears in this report.

The information that relates to Ore Reserves estimates was based on information compiled by Dr Salih Ramazan, a full-time employee of AngloGold Ashanti Australia Limited, who is a member of the Australasian Institute of Mining and Metallurgy. Dr Ramazan has sufficient experience relevant to the type and style of mineral deposit under consideration, and to the activity which has been undertaken, to qualify as a Competent Person as defined in the 2012 edition of the JORC Code. Dr Ramazan has consented to the release of the Ore Reserve estimate, based on the information, in the form and context in which it appears in this report.

## JORC Code Competent Person Statement for Exploration Results

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The information in this presentation that relates to Exploration Results is based on information reviewed by Mark Doyle, a full-time employee of AngloGold Ashanti Australia Ltd, who has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mark Doyle consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears.