



**Productora Copper Project**  
***Discovery History & Keys to Success***  
RIU – CET Discovery Day Presentation  
February, 2014  
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PRODUCTORA  
CHILE



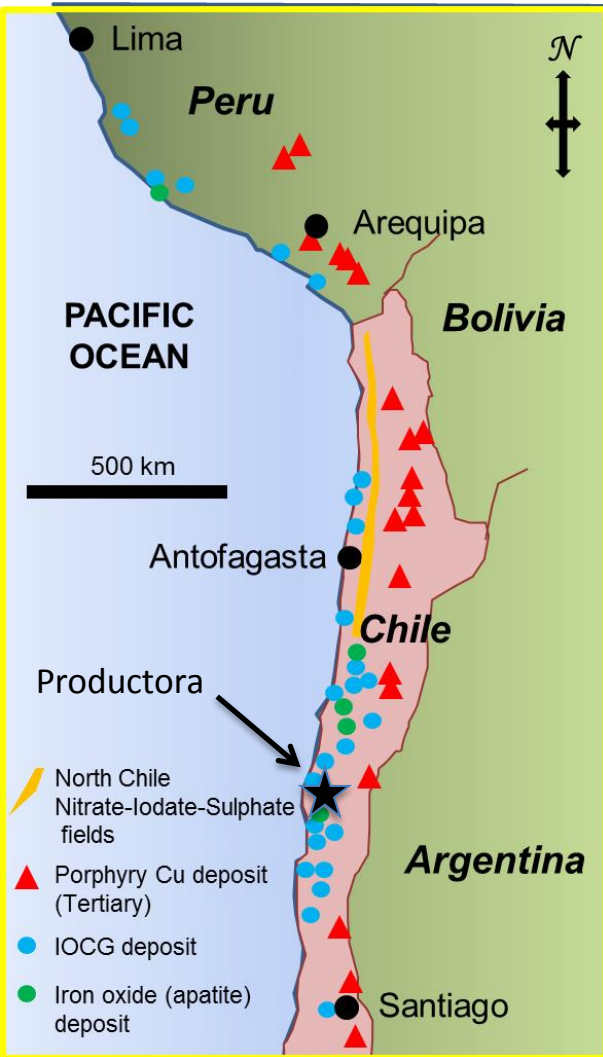
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Exploration Target Size and Target Mineralisation described in this presentation is conceptual in nature and should not be construed as a JORC compliant Mineral Resource. Target mineralisation is based on projections of established grade ranges over appropriate widths and strike lengths having regard for geological considerations including mineralisation style, specific gravity and expected mineralisation continuity as determined by qualified geological assessment. There is insufficient information to establish whether further exploration will result in the determination of a Mineral Resource.

# Location & Context



## Porphyry Belt

World class belt  
*Escondido, Chiquicamata, El Teniente, Mantos Blancos etc*

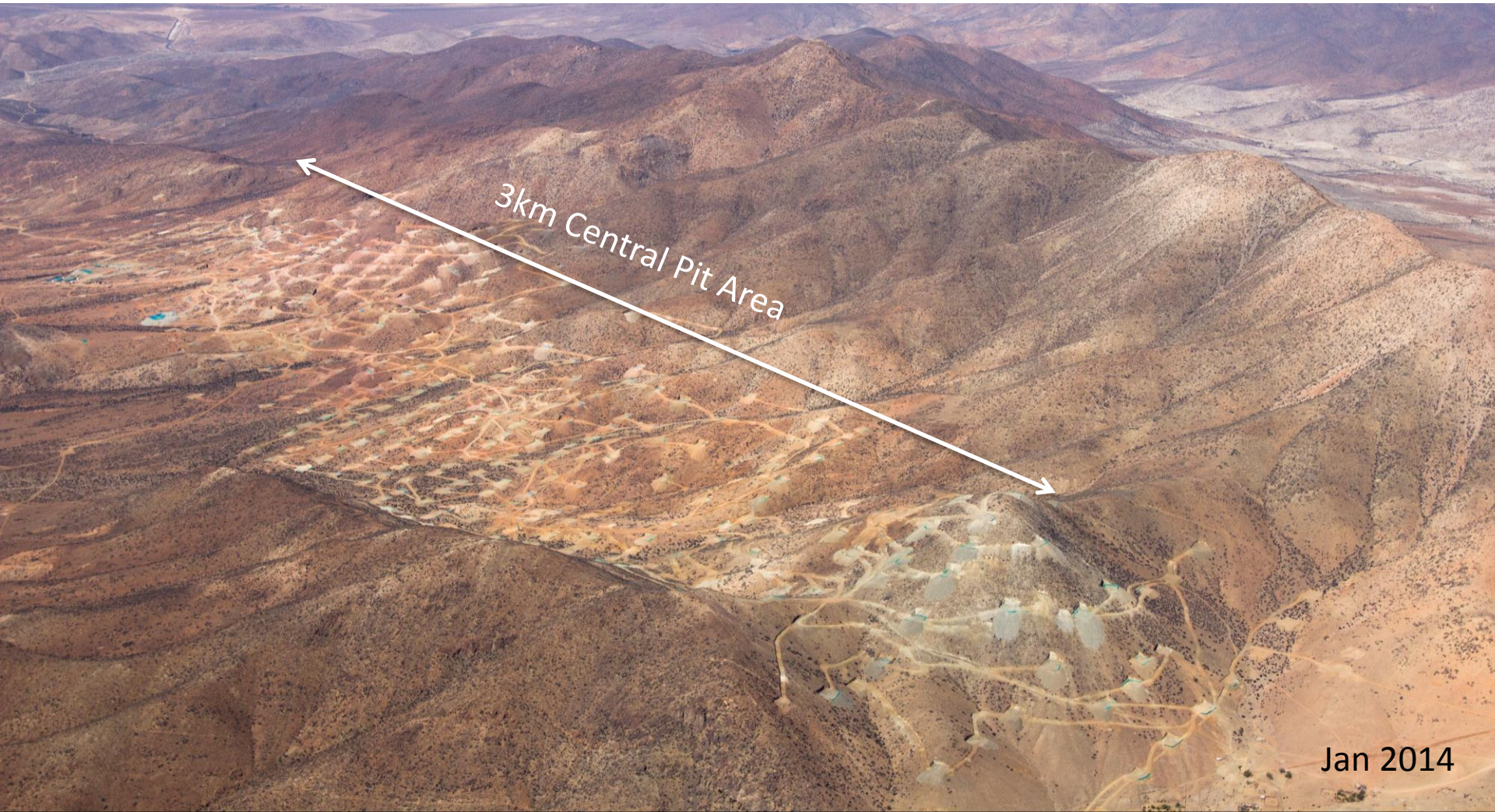
## IOCG belt

More recent interest and giant ore discoveries in coastal range belt: *Candelaria, Manto Verde, Carmen, El Romerel etc*



# Productora Resource Growth

Shallow, at-surface resources growing



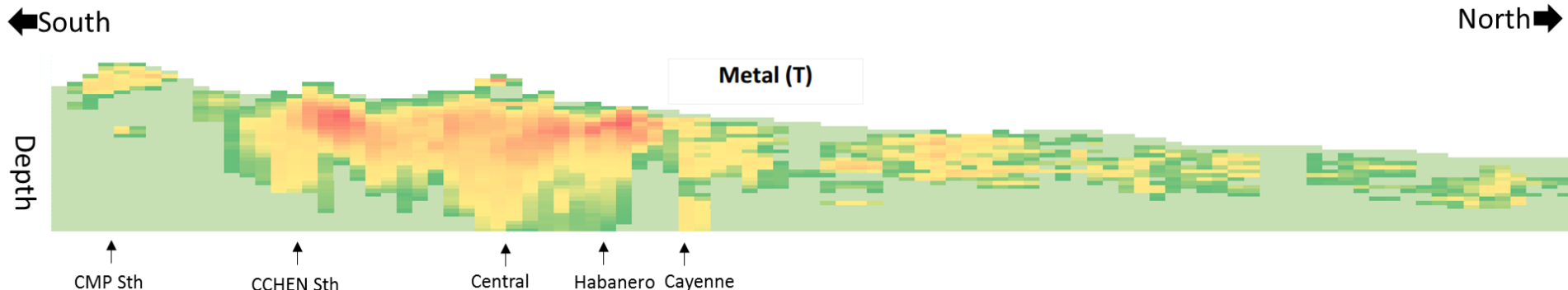
# Productora Resource Growth

## Shallow, at-surface resources growing

- Reported Resources (13 Feb 2013): **165Mt grading 0.6% copper, 0.1g/t gold and 132g/t molybdenum**
- **High grade component : 53Mt grading 0.8% copper and 0.2g/t gold**

(Note: The resources above are rounded and are reported to one significant figure in accordance with Australian JORC code 2004 guidance on mineral resource reporting. This information was prepared and first disclosed under the JORC Code 2004 edition. It has not been updated since to comply with the JORC Code 2012. JORC 2012 1<sup>st</sup> Reserve and Resource Revision due Q1 2014.)

- 102,000m drilling programme completed in 2013
- **First Reserve due Q1 2014**
- **Cu Discovery cost: ~2c/lb**



# Scoping Study Completed & Pre-Feasibility Advanced

## Concept/Scoping Study Parameters – Delivered in February 2013

<b>Processing Rate</b>	~11Mtpa (Open pit- copper and gold only)
<b>Strip Ratio</b>	3.5-4.5 : 1 (Target strip ration of 4:1)
<b>Metallurgical Recovery</b>	>90% Cu, ~80% Au, ~75% Mo (coarse 180um grind size)
<b>Flowsheet</b>	Sulphide processing plant- Conventional crush-grind-float
<b>Concentrate Production</b>	~220kt/a grading approx. >25% Cu and 6g/t Au
<b>Development Capex</b>	\$500-700M (contingent on off balance sheet options for mining and certain infrastructure)
<b>Opex (C1 including gold credits)</b>	US\$1.20/lb – US\$1.50/lb

- **Pre-feasibility study targeted for delivery in 2H 2014**
- **Opportunity** to capture:
  - First Reserve & next resource revision
  - Infrastructure, iron and copper oxide agreement terms
  - Throughput optimisation to assess ramp-up production scenarios

# Keys to success

## HCH did not “discover” Productora

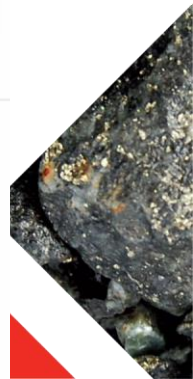
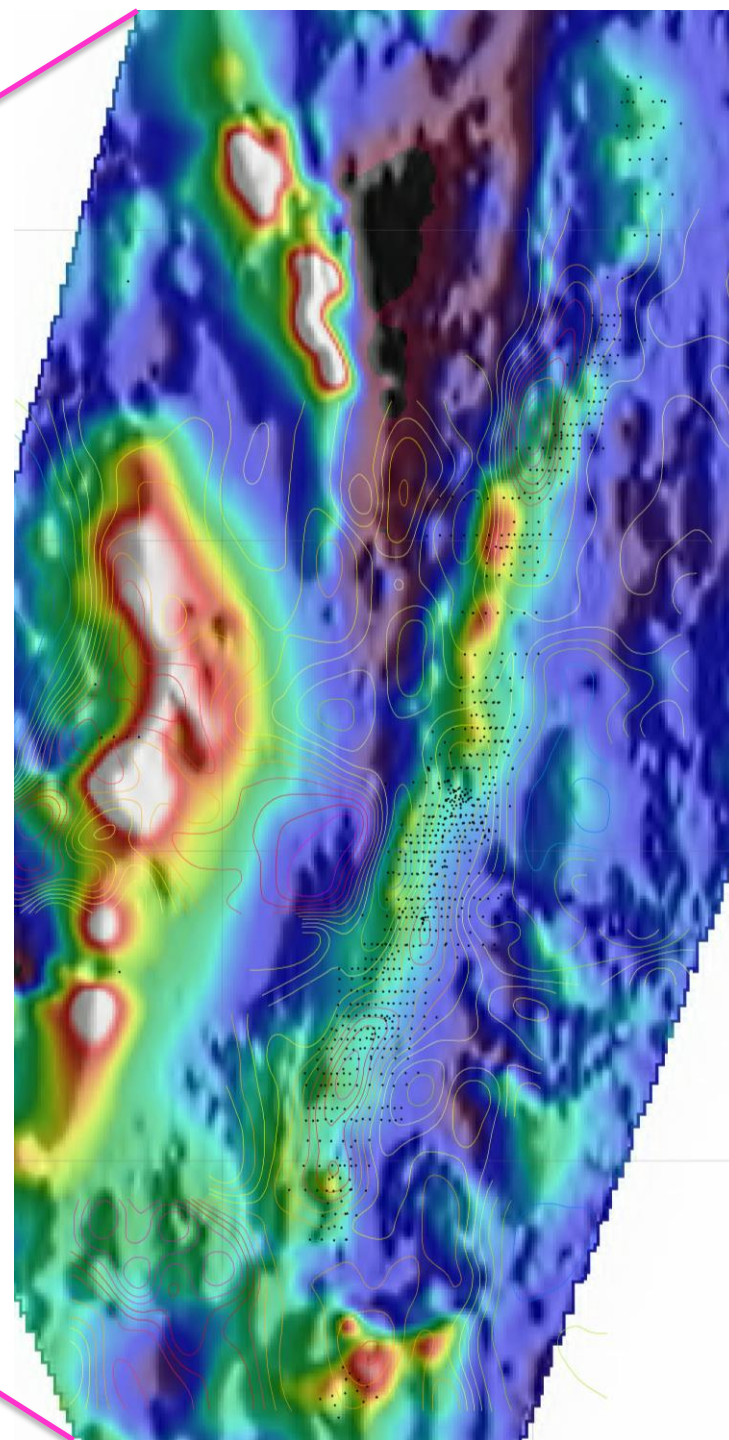
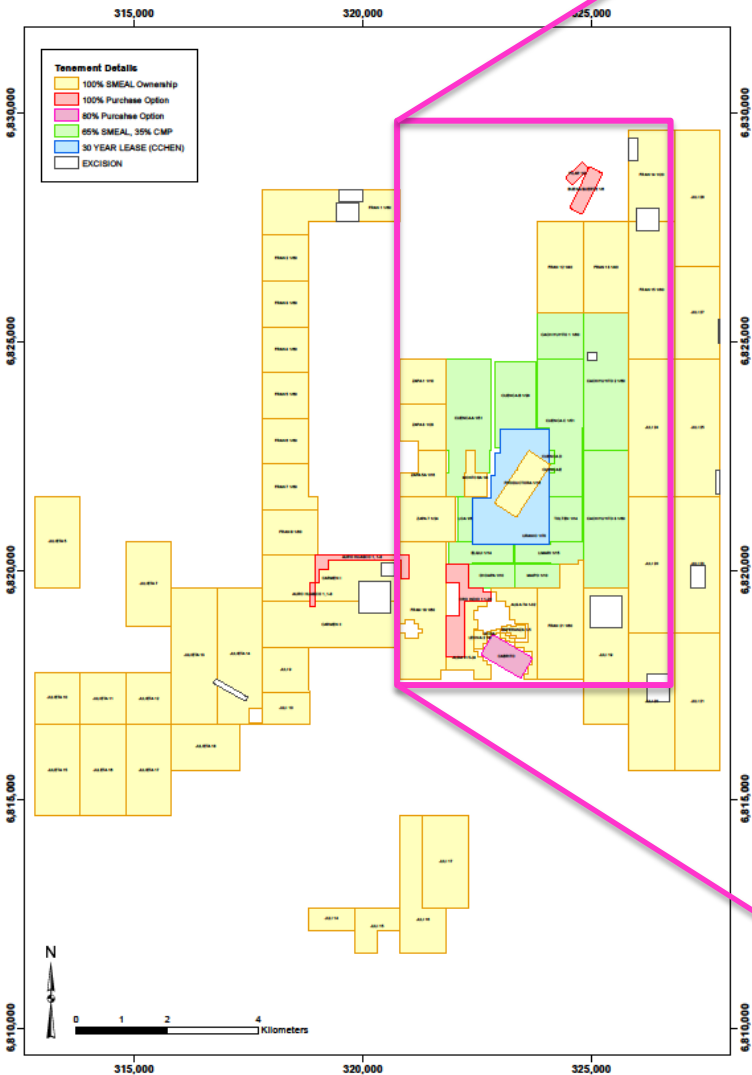
- Early work by Arnaldo Del Campo identified significant Cu/Au mineralisation in the area
- Chilean Nuclear Commission (CCHEN) work highlighted the IOCGU potential of a portion of the project
- Selective drilling by the Teck/General Minerals JV intersected sporadic high grade & width Cu/Au
- Kari Ann Fox PhD thesis (2000)
- Playa Brava: small-scale UG high grade Cu/Au mining activities
- However, due to the fractured ownership of the project area, and selective drill targeting, the mineralisation appeared discontinuous

## Consolidation was the “Key” to HCH unlocking Productora’s potential

- Project identified as “high potential” based on historical work
- HCH commitment to a 5 year tenement consolidation process
- Allowed HCH to systematically assess the entire mineral system



- Teck IP (Moderate IP Chargeability anomaly)
- HCH AirMag (footwall mag signature)
- UG access highlighted breccia controls
- Systematic drilling revealed continuity





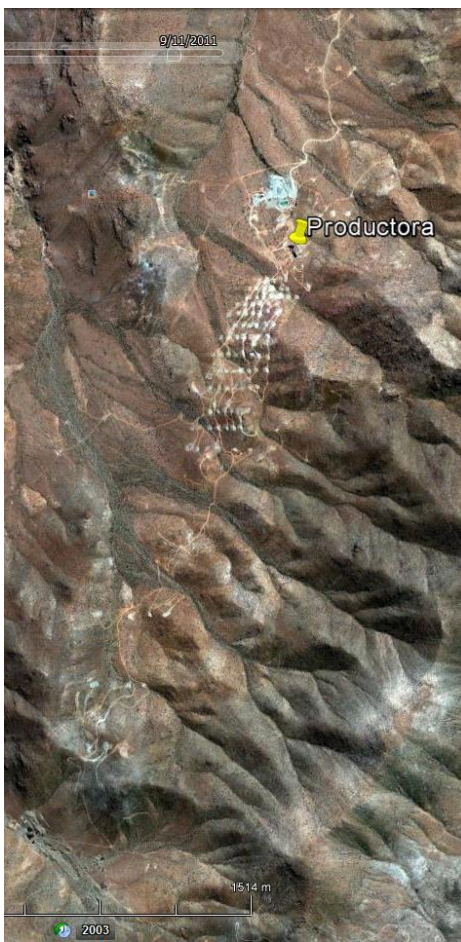
### ■ By Sept 2010

- 1<sup>st</sup> mapping & soils
- ASX listing (May 2010)
- Drilling commenced



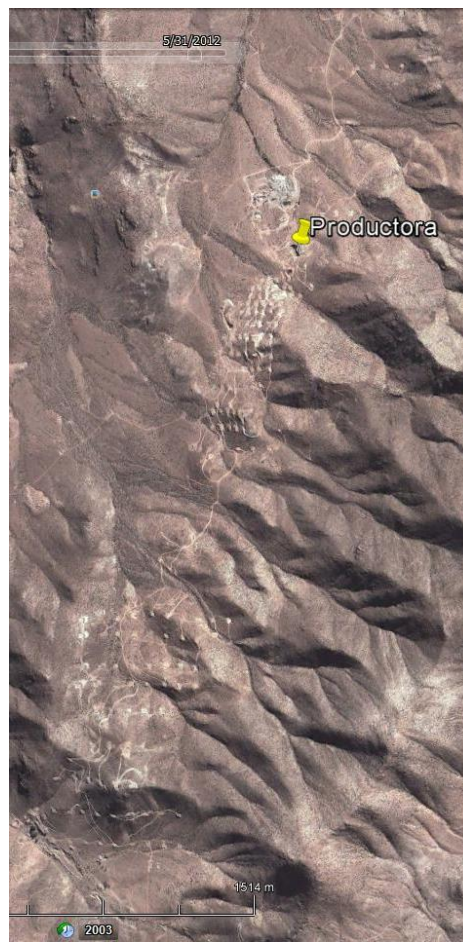
### ■ By Sept 2011

- Drilling focussed on Central Lease
- 1<sup>st</sup> Resource complete (Central Lease)
- Mag/Rad complete – key to systematic drill targeting
- 2<sup>nd</sup> Mapping & Soils



### ■ By June 2012

- CCHEN lease secured
- CCHEN Sth discovery
- 9.5km Mineral system length identified with Cu in drilling up to 5km Nth of Productora UG
- Ongoing tenement consolidation



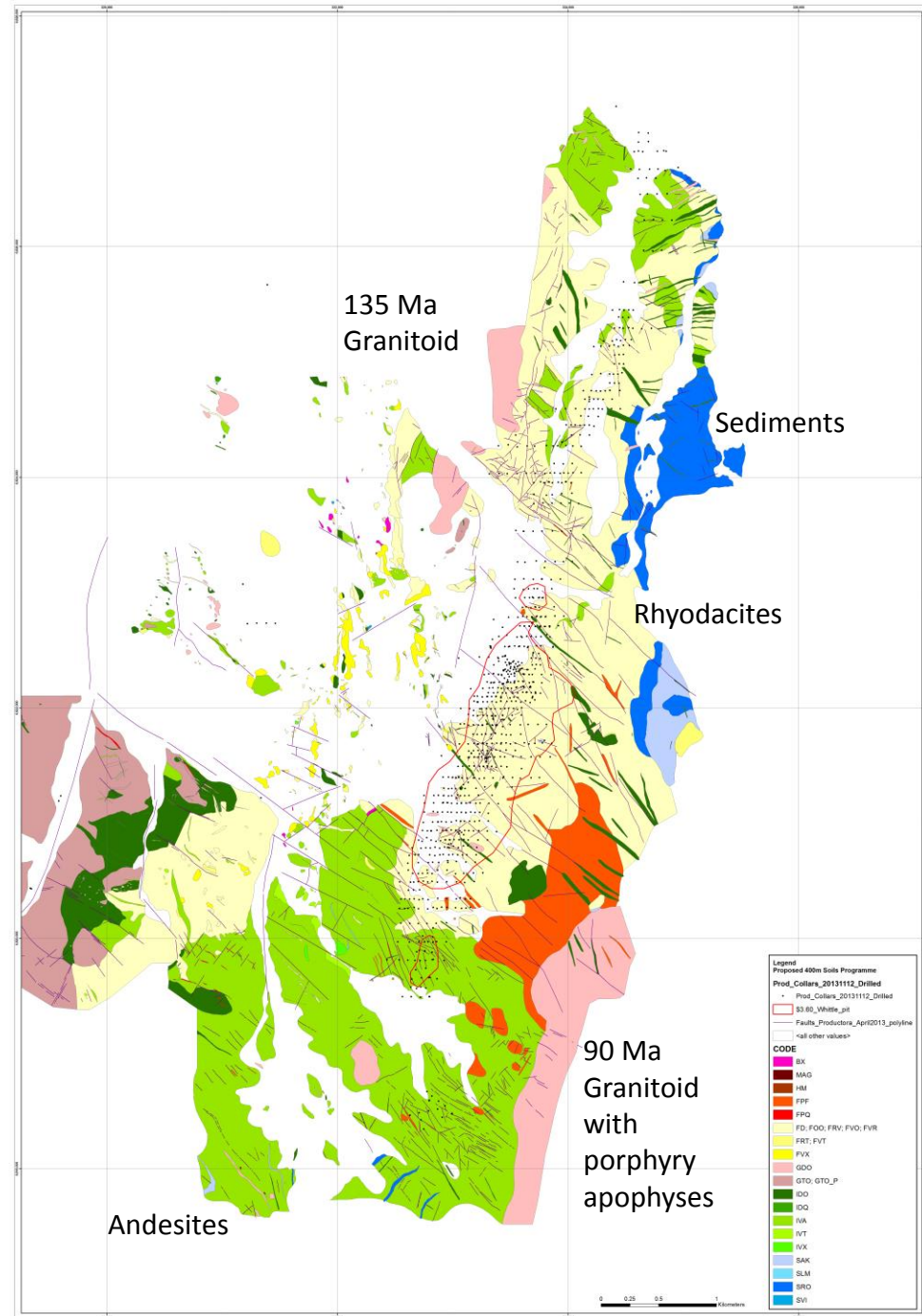
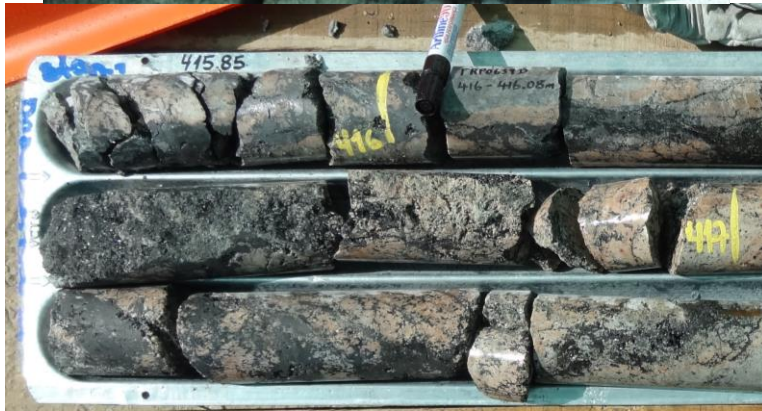
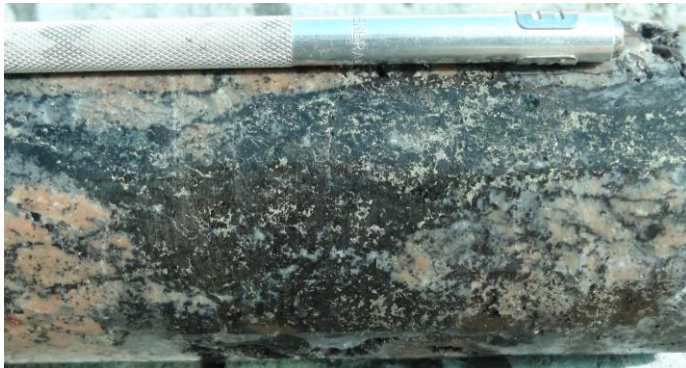
### ■ By June 2013

- Consolidation Complete
- 2<sup>nd</sup> JORC Resource
- Systematic 80x40m drill-out
- Surface mapping & project-scale lithostratigraphic model complete
- Technical focus evolves to structural & geochemical controls in areas of complexity



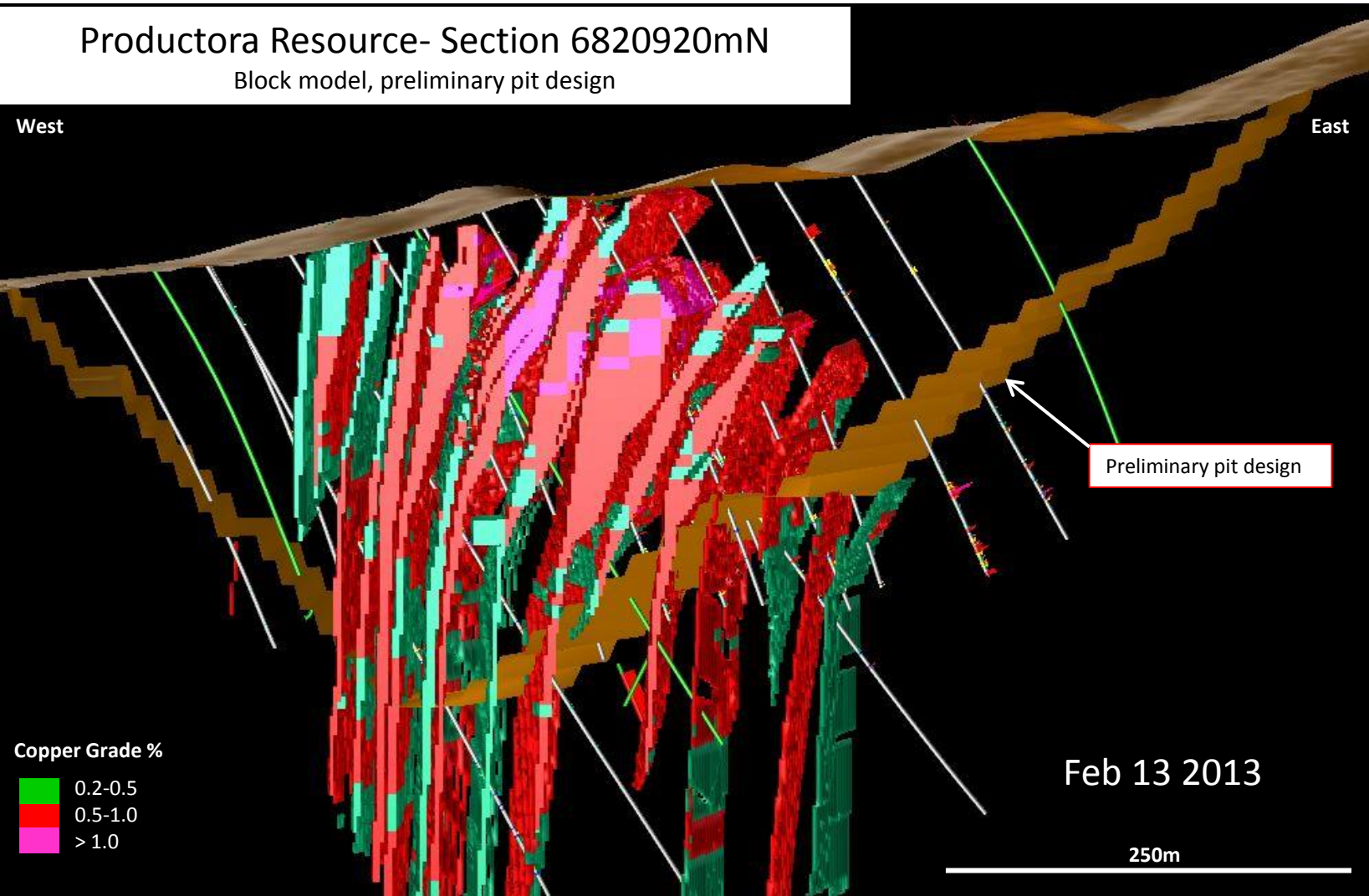
# Geology

- Mineralisation hosted by Felsic (Rhyodacitic) volcanics, sub-volcanic intrusives and volcaniclastics
- Hydrothermal tourmaline breccias are an important control on tonnes & grade
- Significant tonnes & grade near surface in large breccia chambers but rarely visible in outcrop



# Systematic drilling reveals resource geometry & continuity

Productora Resource- Section 6820920mN  
Block model, preliminary pit design



# Technical focus shifts



## Understanding mineral system complexity to unlock additional value

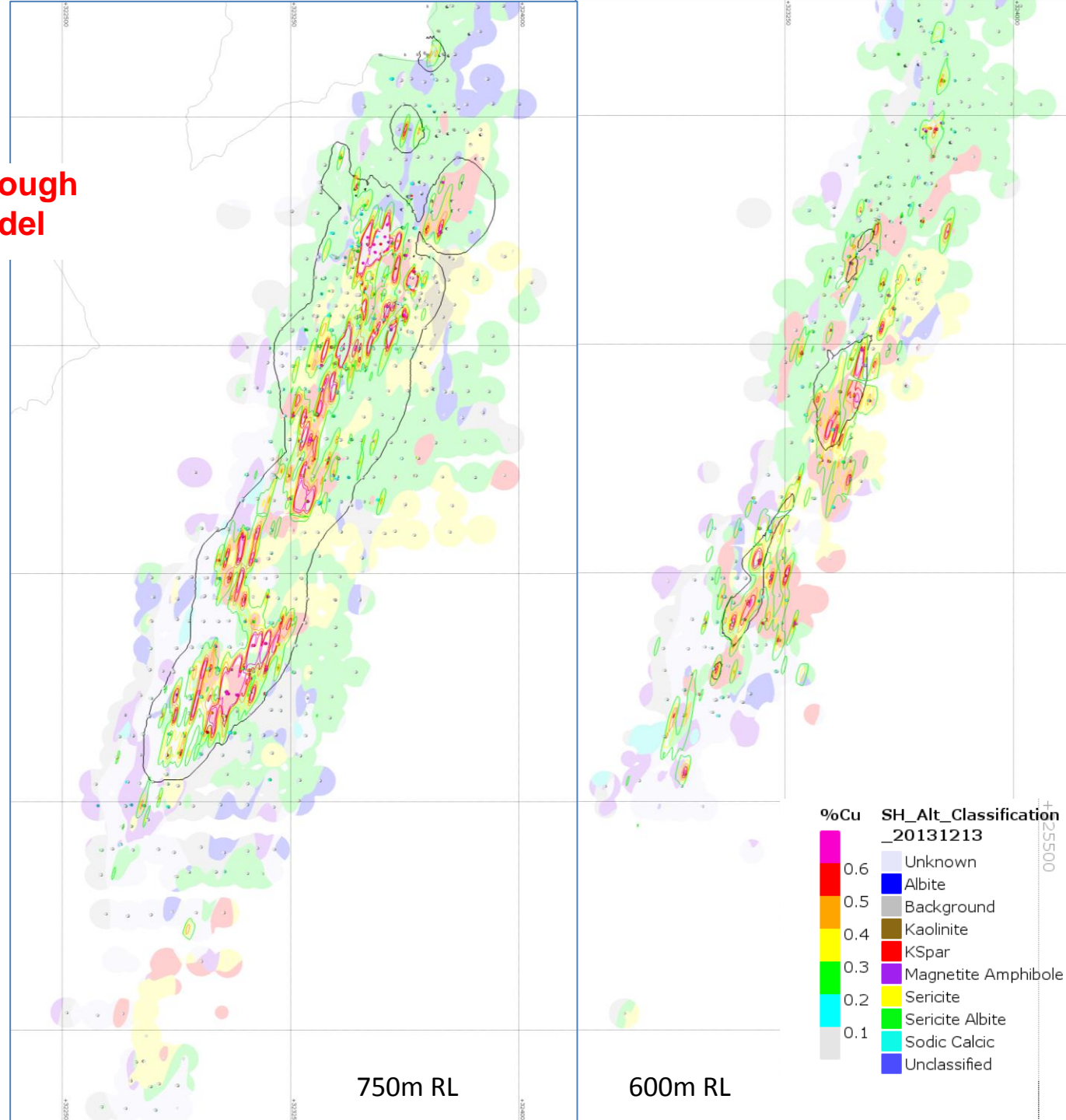
- 160,000 individual drill hole multi-element geochemical analyses (32 element)
- Alteration geochemistry characterisation (Scott Halley) identified 7 alteration groupings.
- These alteration indices were used to create a **3D alteration model for the entire Productora Mineral System** utilising Leapfrog
- The alteration model was **integrated with detailed drill core structural analysis and regional mapping**, and ground truthed against drill core logs and underground exposures.

### Result:

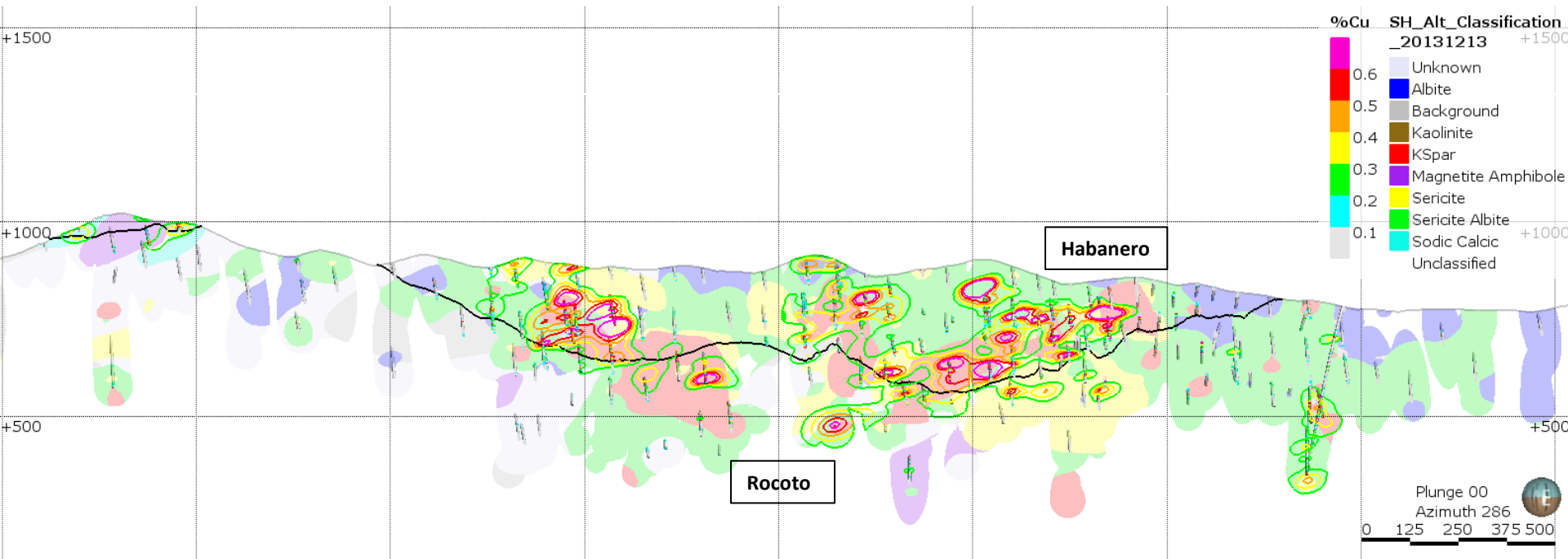
**A predictive targeting tool which indicated that: while lode-scale structural controls indicated a steeply West-dipping lode orientation, the domain-scale alteration model painted a very different picture.....**

## Horizontal slices through the 3D alteration Model

- Solid colours represent modelled alteration domains
- Contour lines represent Leapfrog interpolated isosurfaces of Cu grades (Note: these are not resource wireframe objects)
- Black contours represent a preliminary pit outline
- Red - Potassic K-spar alteration and Yellow – Sericite Alteration are both proximally associated with Cu.
- Green – Sericite Albite alteration is an intermediate alteration assemblage and potentially a very useful vectoring tool at the district-scale.



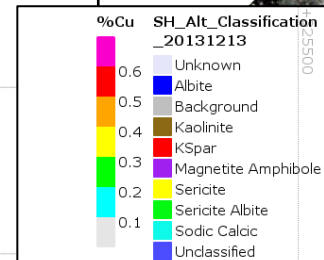
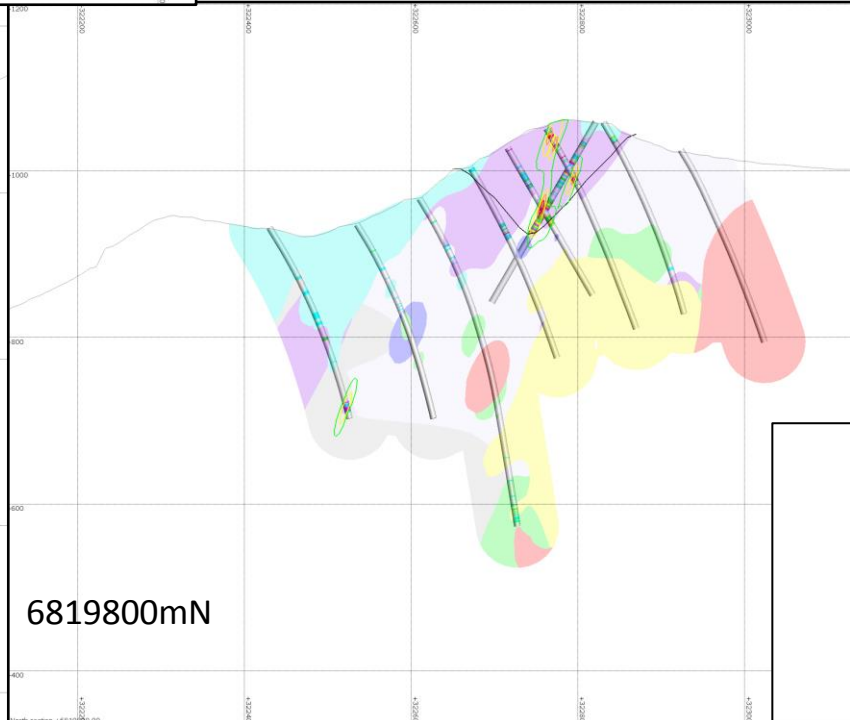
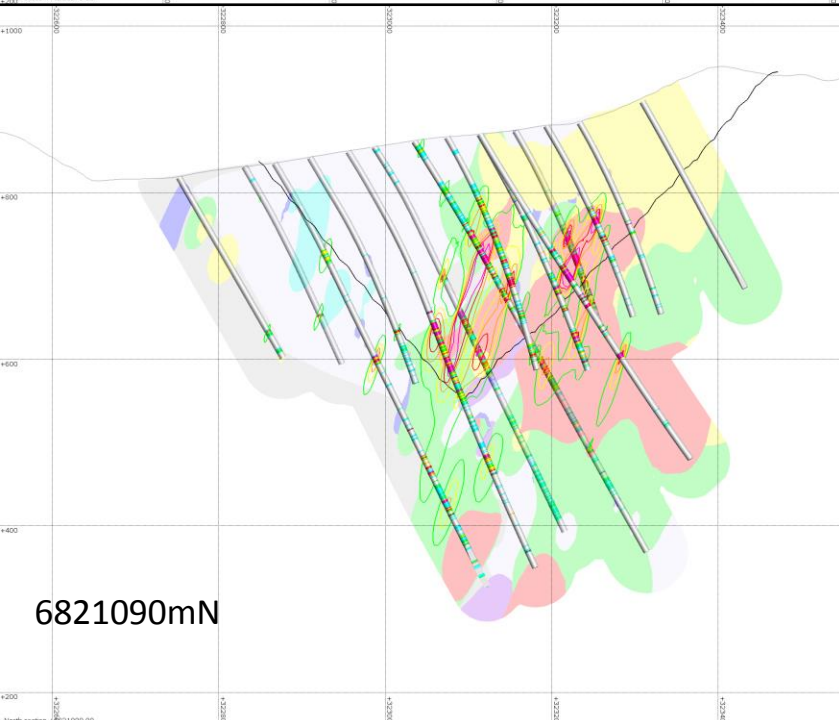
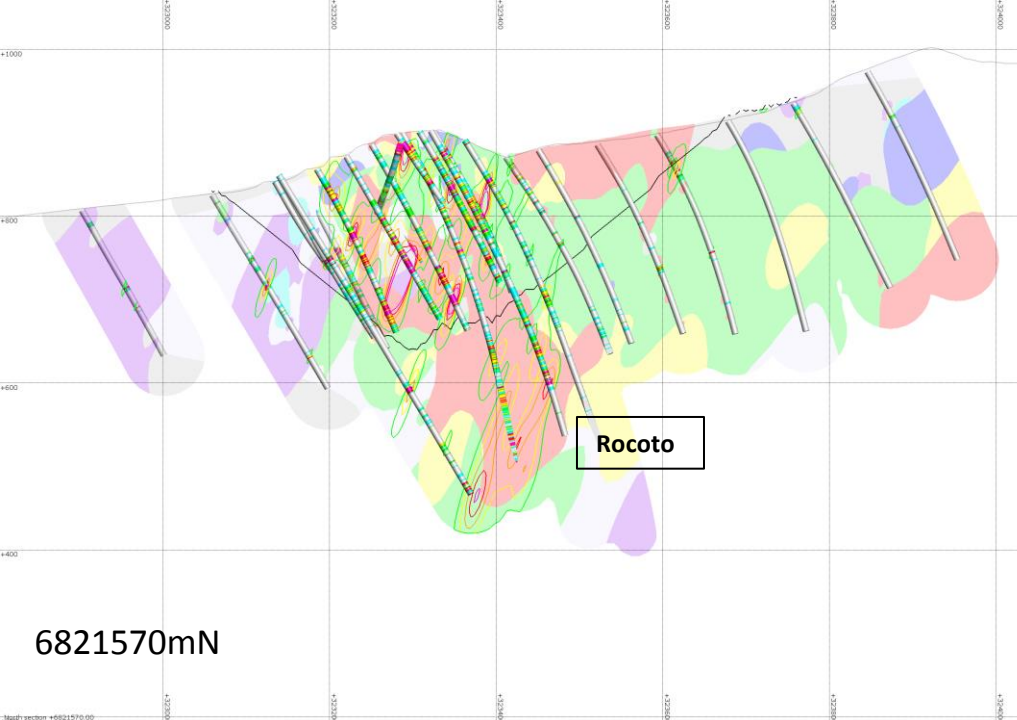
## Inclined long section slice through the 3D alteration Model



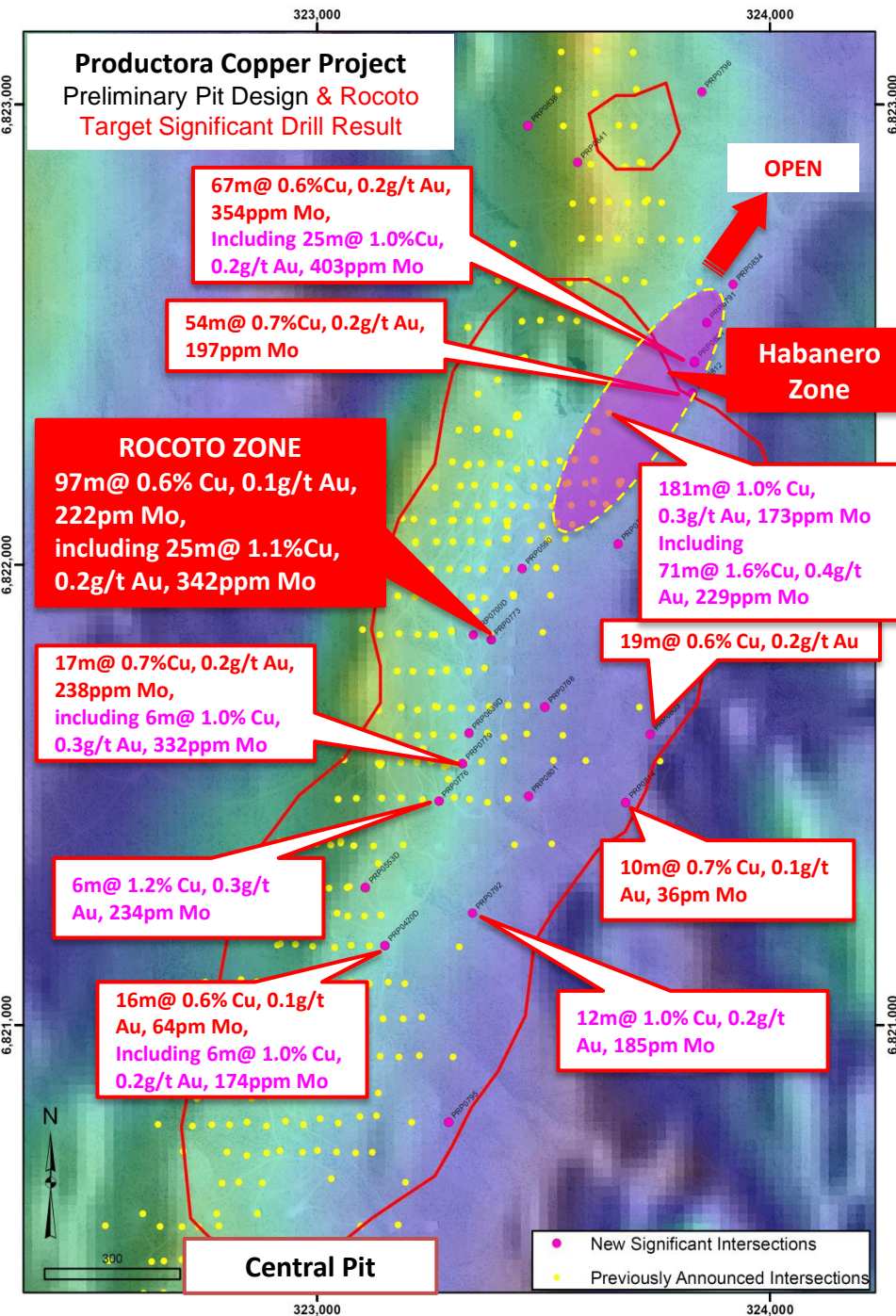
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## Cross-section slices through the 3D alteration Model

- Solid colours represent modelled alteration domains
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# Habanero & Rocoto Discoveries

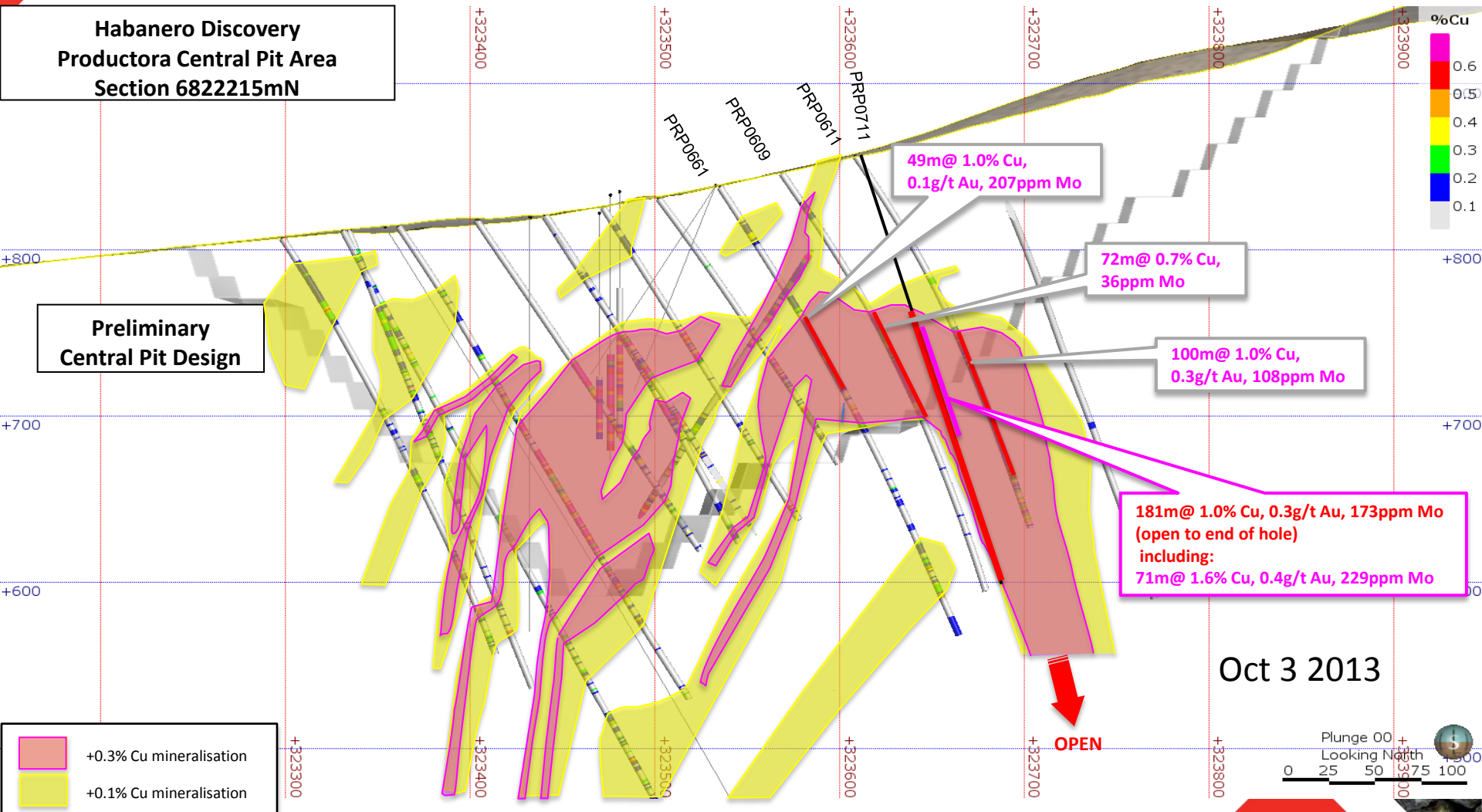


- Pre-May 2013 the **Habanero area was considered waste**
- 3D alteration model prompted infill drilling leading to the Habanero discovery**
- Follow-up **confirmed Easterly dip** and that Habanero is **open to the NE**.
- Significant potential for similar East-dipping Habanero-type lodes on the Eastern flank.**
- Rocoto discovery also a direct result of alteration model targeting in areas previously thought to be waste**



# Habanero Cross Section

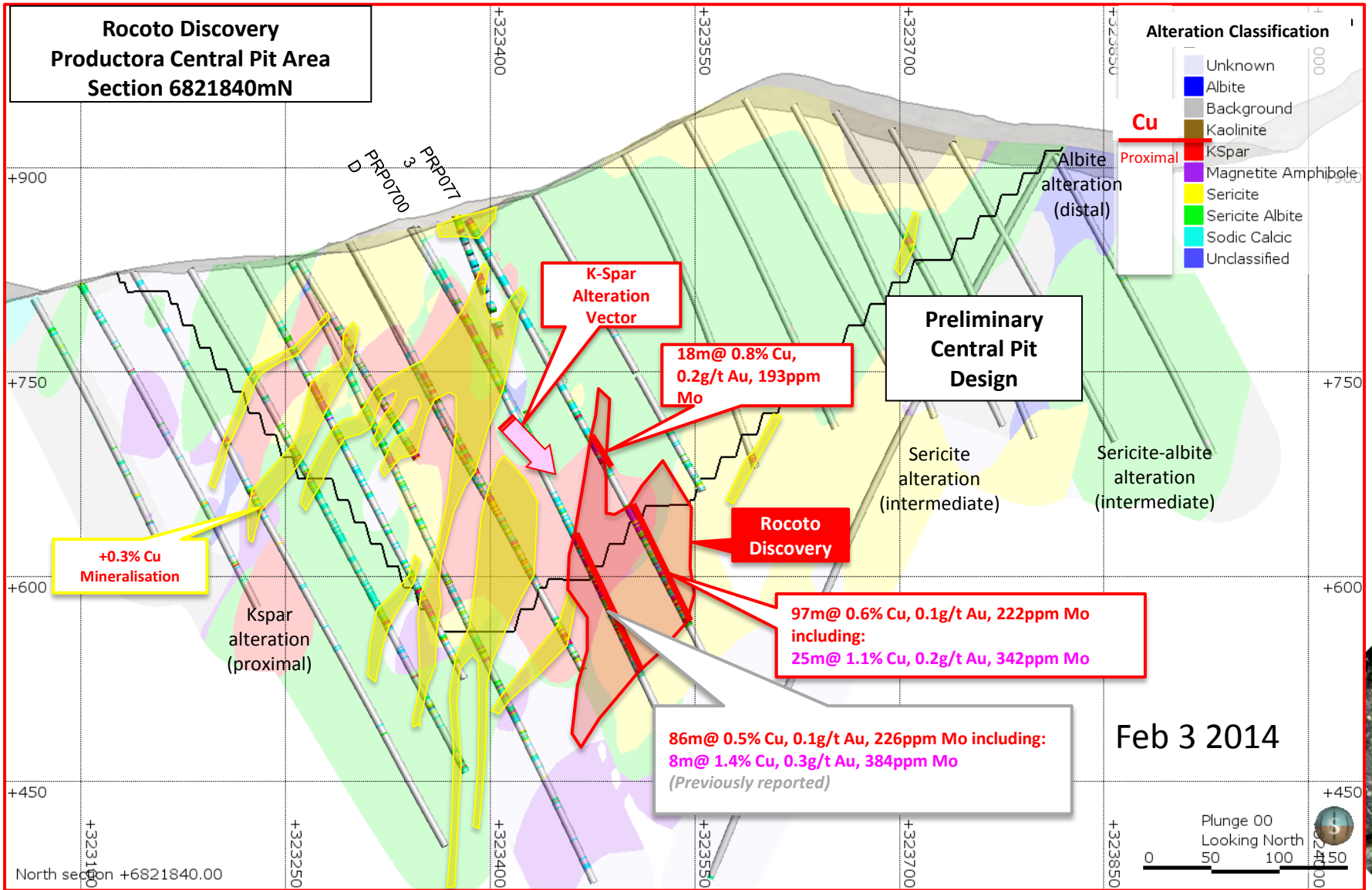
## Anomalous East-Dipping High Grade Ore Shoot



Oct 3 2013

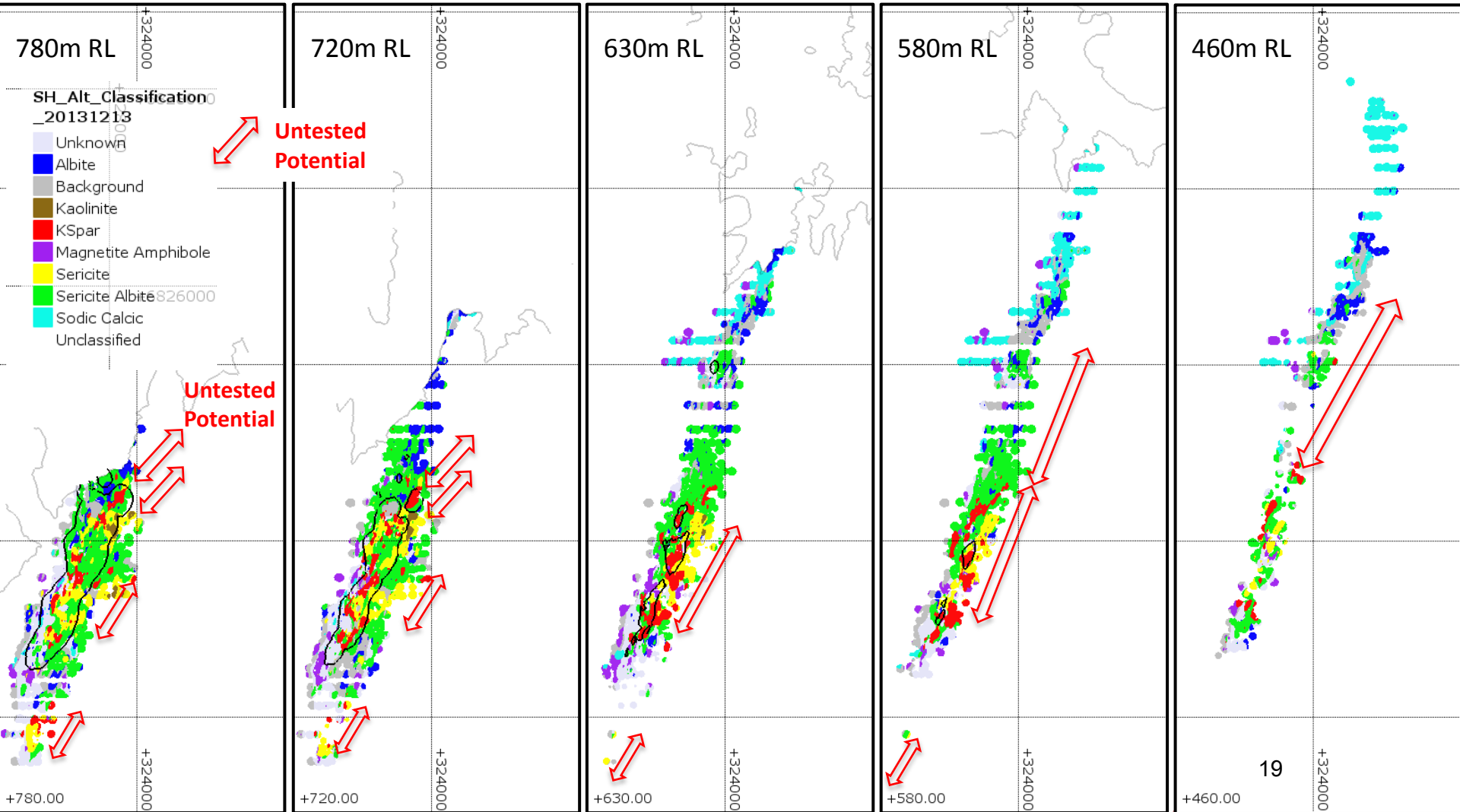
# Rocoto Cross Section

Successful targeting of East dipping Alteration



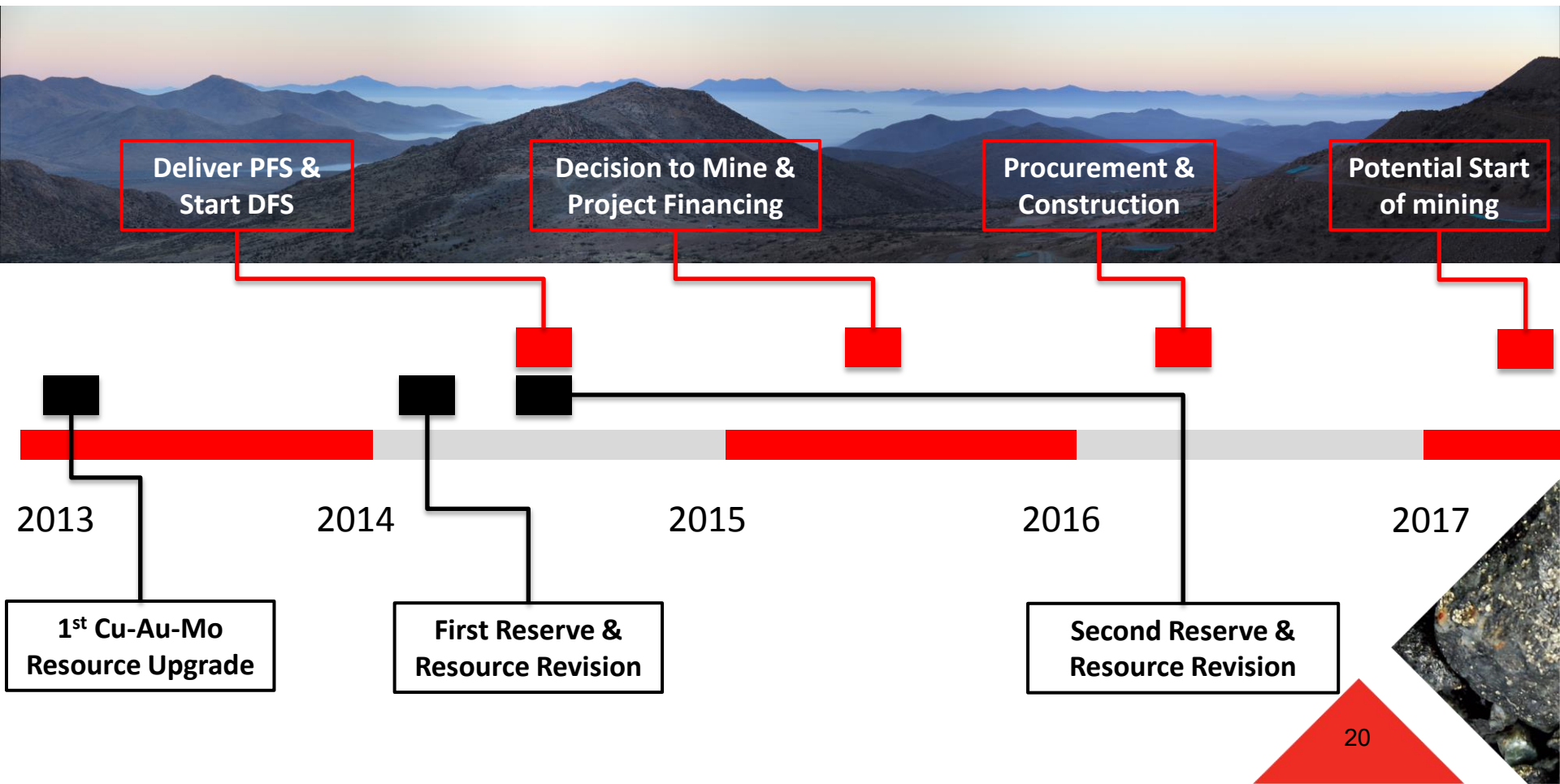
# Where is it taking us?

## Predictive drill targeting along the 9.5km Productora mineral system trend



# Productora Growth & Development Timeline

Delivering a rapid large-scale copper development



“ the company is positioned as one of leading ASX emerging copper producers”

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**ASX: HCH**

