

# Active Brazilian Critical Minerals Explorer

Bluebush Ionic Adsorption Clay (IAC) REE Investor Webinar

November 2023

### **Bluebush IAC REE Project Highlights**





Exceptional TREO grades- 6m @ 2,537ppm with +20% MREO's in preliminary Auger drilling
Results pending on >130 auger holes



Bluebush held privately since
2004. Serra Verde discovered in
~2011
Exploration Accelerating- Confidence
Growing



Large footprint of prospective ground (>120km²)

Agreement to earn-in into up to 100%, Bluebush- no Royalty



Same granite that hosts Serra Verdeonly operating IAC project outside of China



#### Bluebush:

- IAC Mineralisation- up to 83%
   MREO Extractions
- Saprolite depth up to 28m
- 6m@ 2,537ppm TREO
- High % of MREO's



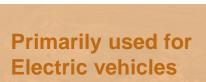
#### **Serra Verde:**

- Resource: 911Mt @ 1,200ppm
- Reserve: 350Mt @ 1,500ppm
- High % of valuable REE's
- Commencing production CY23

### **EV Permanent Magnets NEED Specific REEs**





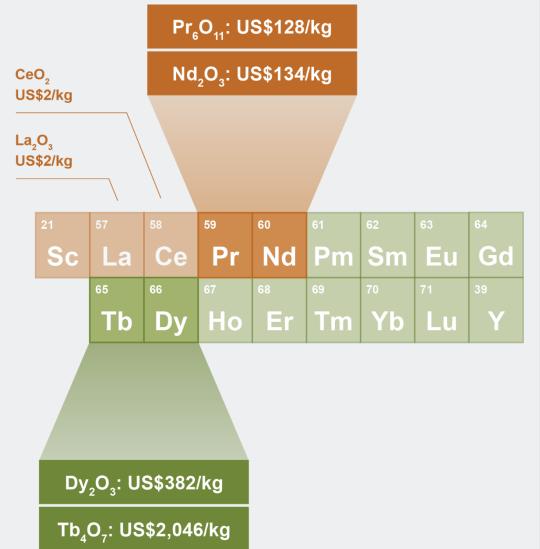


Highest efficiency and lowest cost: Battery costs reduced by 30% (lower lithium, cobalt & nickel content).

Compact: Lower size and weight.

Strength: Highest torque density.





**ASX:ALV** 

### **ALV – ASX Brazilian IAC Peers**

ALVO MINERALS

**ASX:ALV** 

Brazil is emerging as the most important IAC jurisdictions globally

Alvo is adjoining and in the same geological setting as Serra Verde, the only IAC REE project operating outside of China globally











Project	Bluebush	Serra Verde	Calderia	Monte Alto <sup>1</sup>	Colossus	
Mineral Reserve (IAC)	No	350Mt @ 1,500ppm TREO	No	No	No	
Mineral Resource Estimate (IAC)	No	911Mt @ 1,200ppm TREO	409Mt @ 2,626ppm TREO	485Mt @ 1,071ppm TREO	No	
Ionic Adsorption Clay Testwork Completed	Yes	Yes	Yes	Yes	Yes	
Feasibility Study Completed	No	Yes	No	No	No	
Operating	No	Yes	No	No	No	
Market Capitalisation (A\$M) <sup>2</sup>	23	N/A	505	313	60	



1. Based on IPO Pathfinder Prospectus (IAC) 2. Market capitalisations as at last close 8/11/2023

### **Bluebush IAC REE Project**

**Confirmed** ionic adsorption clay (IAC) using standard ammonium sulphate solution at pH4 (ambient temperature)-

Extractions up to 83% MREO (ave 56%)

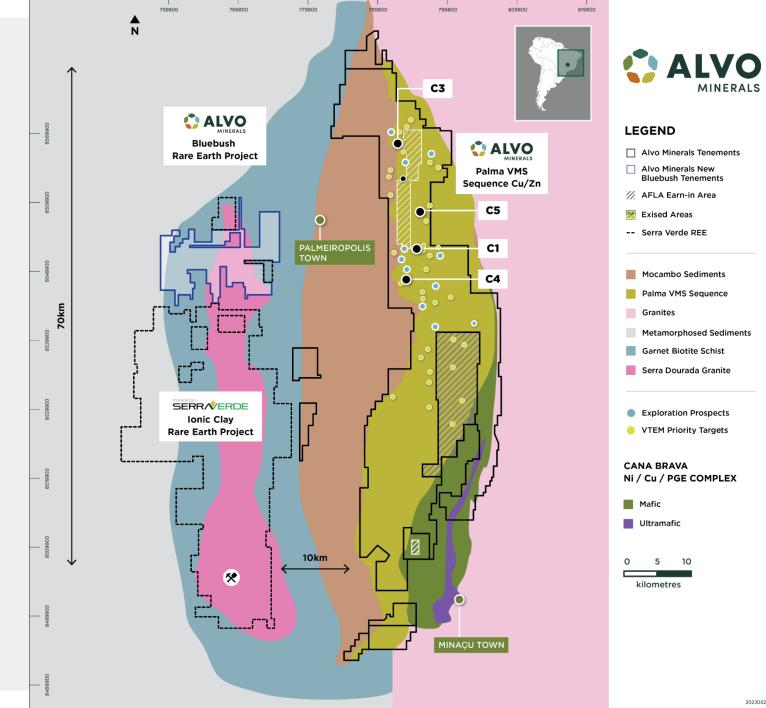
High-grade zone of 6m @ 2,537ppm TREO (21% MREO) inc. 3m @ 3,415ppm TREO (24%) to EOH

Saprolite depth profile confirmed up to 28m

120km² landholding adjoining Serra Verde (SV) and Alvo's Palma Project

- Bluebush is in the same geological setting as SV
- SV is only *commissioning* IAC\* project outside of China

Truck mounted auger drilling to rapidly progress exploration



### Bluebush IAC REE Project – Confirmed Ionic



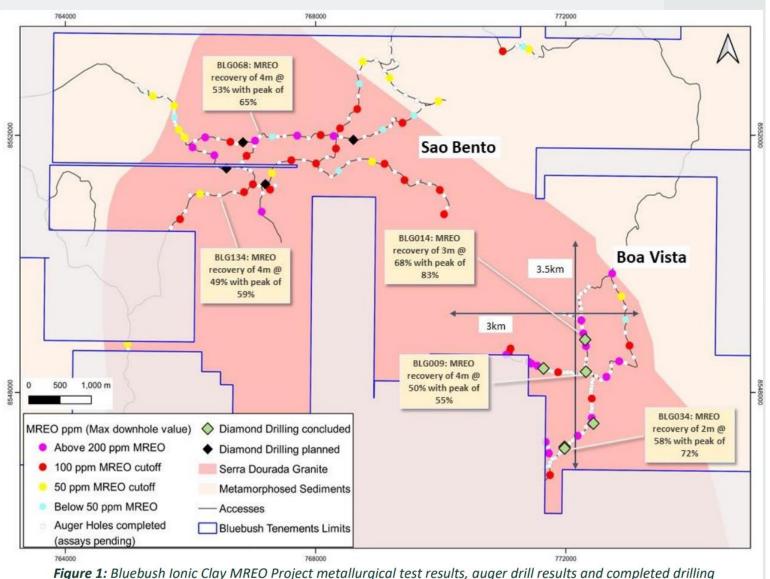
**Excellent extraction of REE using** industry standard dilute ammonium sulphate solution (AMSUL)

- pH 4 (less acidic than OJ)
- Ambient temperature

**High-value magnet rare earths** (MREO's) extracted:

- Nd: up to 89%, average 60%
- Pr: up to 86%, average 57%
- Dy: up to 53%, average 37%
- Tb: up to 69%, average 48%
- MRE: up to 83%, average 56%

Met samples will be tested to further optimise recovery ratios



### Bluebush IAC REE Project – Auger Drilling



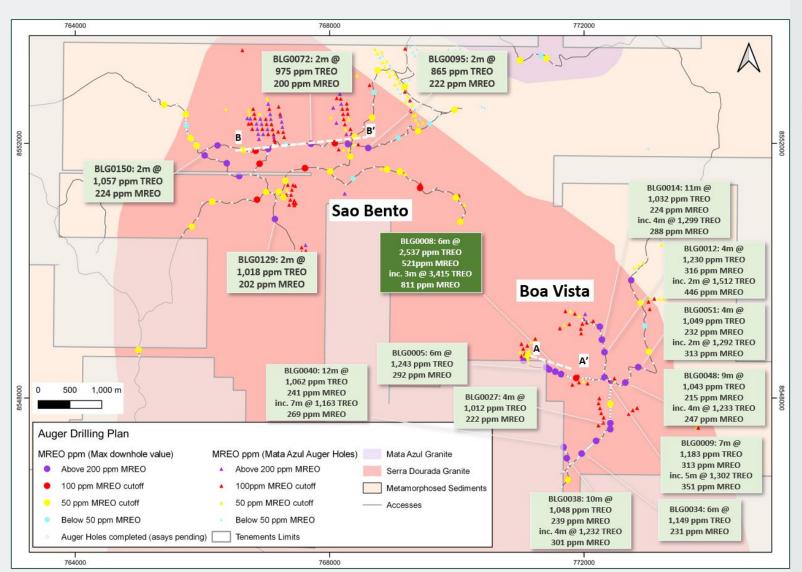
210 auger holes drilled to date >130 assays pending

**Exceptional MREO values so far;** 

- 6m @ 2,537ppm TREO (21%) to EOH from 0m; inc. 3m @ 3,415ppm TREO (24% MREO) to EOH from 3m
- 4m @ 1,230ppm TREO (26% MREO) to EOH from 0m; inc.
   2m @ 1,512ppm TREO (29% MREO) to EOH from 4m

Follow-up truck mounted auger drilling commenced targeting highest grade MREO zones

Hand-held auger drilling commenced targeting untested regional prospects towards the centre of the granite



### Bluebush IAC REE Project - Diamond Drilling

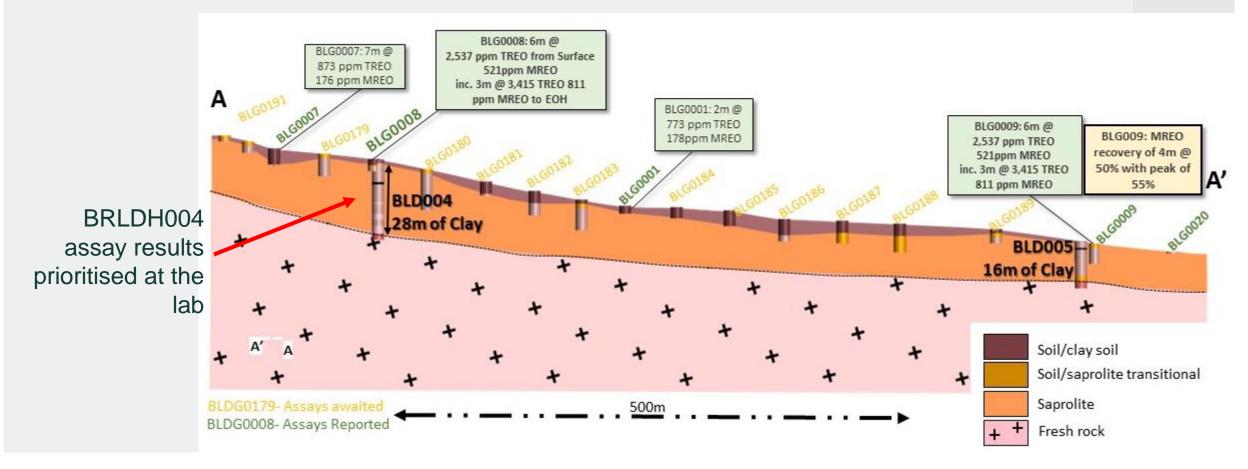


Diamond hole BLD004 hit 28m of clay

Drilled 4m east of Auger hole BLG008, started in mineralisation and ended in 3,779ppm TREO (26% MREO)

Diamond drilling significantly extended previously understood saprolite depth profile

Diamond drilling ongoing in combination with Loupe Portable Electromagnetic surveys -mapping the saprolite across Bluebush



### The Palma VMS Project



Palma Project is a high-grade, Cu-Zn rich VMS *district scale* opportunity in Brazil - largely idle for over 30 years (1970's)



VMS targets occur in clusters - *Dominant land position* (>850km²) with >70km of prospective strike – **new C4 VMS discovery** 

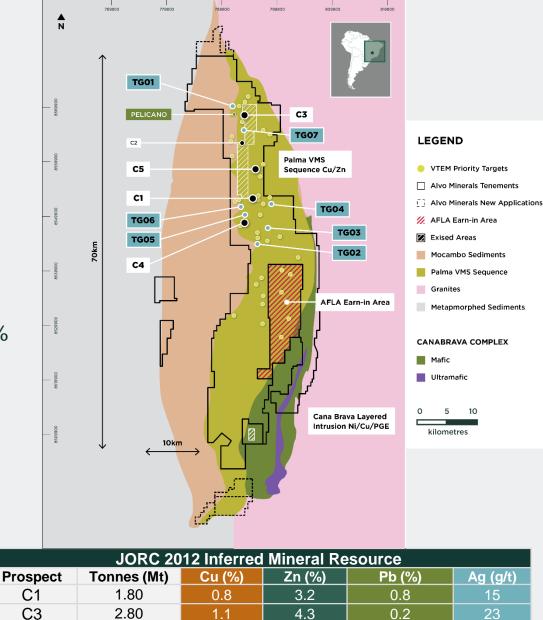


JORC MRE of 4.6Mt @ 1.0% Cu, 3.9% Zn, 0.4% Pb & 20g/t Ag - Historical drilling only to be updated in Q4 CY2023 (>23,000m of drilling)



Alvo's drill results continue to exceed expectations on grade and thickness compared to existing MRE:

- 36.0m @ 4.2% CuEq^ or 10.2% ZnEq^ C3
- 23.2m @ 5.5% CuEq or 13.4% ZnEq C3
- 19.7m @ 4.7% CuEq or 11.41% ZnEq C3
- 16.0m @ 6.4% CuEq or 15.57% ZnEq C3
- 21.8m @ 4.8% CuEq or 11.72% ZnEq C1



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9

1.0

Total

4.60

3.9

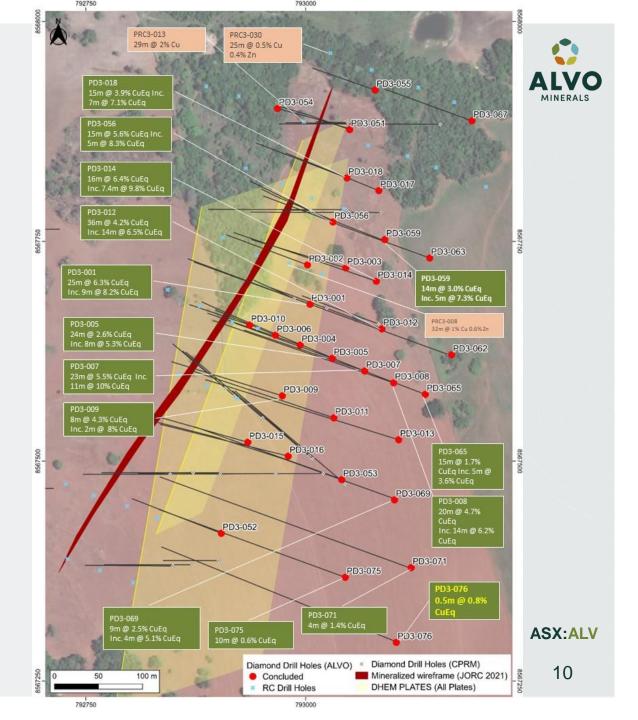
0.4

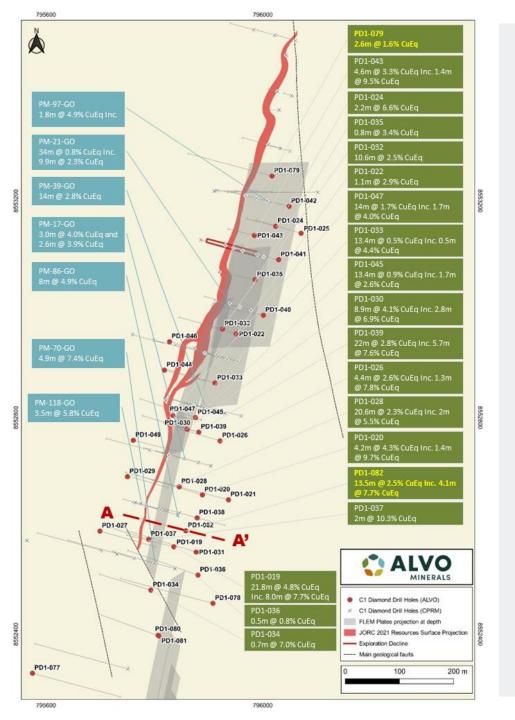
### C3 Deposit: High-grade Cu-Zn

JORC Resource of 2.8Mt @ 1.1% Cu, 4.3% Zn, 0.2% Pb & 23g/t Ag based on historic drilling only Exceptional intercepts will grow the resource

- PD3-001: 25.0m @ 6.3% CuEq or 15.34% ZnEq
- PD3-007: 23.2m @ 5.5% CuEq or 13.4% ZnEq
  - Inc. 10.6m @ 10.1% CuEq or 24.73% ZnEq
- PD3-008: 19.7m @ 4.7% CuEq or 11.41% ZnEq
- PD3-012: **36m** @ **4.2%** CuEq or **10.20%** Eq
- PD3-014: 16.0m @ 6.4% CuEq or 15.57% ZnEq
  - Inc. 7.4m@ 9.8% CuEq or 23.81% ZnEq
- PD3-018: 15.0m @ 3.9% CuEq or 9.51% ZnEq

**Updated MRE in Q4 CY2023** 





### C1 Deposit: Shallow, High-grade



JORC Resource of 1.8Mt @ 0.8% Cu, 3.2% Zn, 0.8% Pb & 15g/t Ag based on historical drilling only

1.2km mineralised strike – open at depth and along strike

Exceptional intercepts will grow the resource

- PD1-019: 21.8m @ 4.8% CuEq^ or 11.72% ZnEq from 142m
   Inc. 8.0m @ 7.7% CuEq or 18.80% ZnEq from 149m
- PD1-030: 8.9m @ 4.1% CuEq or 10.07% ZnEq from 64m
   Inc. 2.8m @ 6.9% CuEq or 16.76% ZnEq from 64m
- PD1-028: **20.6m @ 2.3% CuEq or 5.72% ZnEq** from 84m *Inc.* **2.1m @ 5.5% CuEq or 13.53% ZnEq** from 103m
- PD1-029: 6.2m @ 2.9% CuEq or 7.16% ZnEq from 105m
- PD1-082: **13.5m @ 2.5% CuEq or 6.17% ZnEq** from 112m

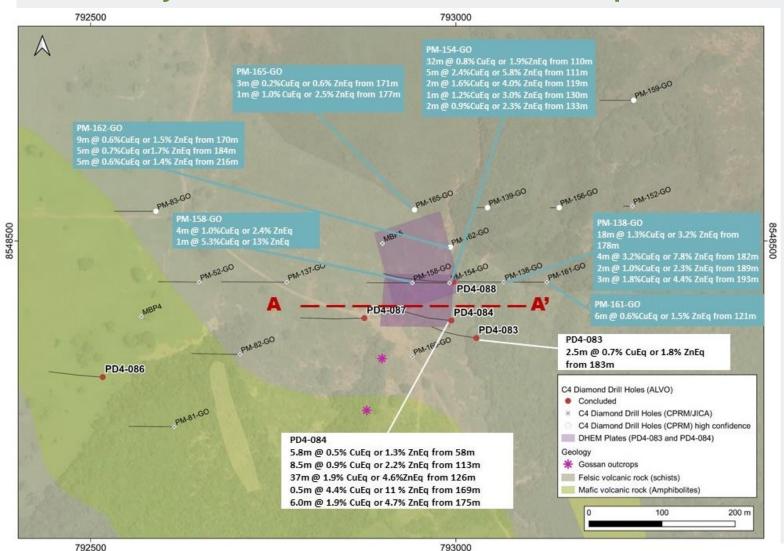
Updated MRE in Q4 CY2023

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### C4 - "Brownfields VMS Discovery"



#### Discovery hole PD4-084 is the widest Intercept ever at Palma



Discovery hole at C4 VMS Prospect

- PD4-084: 37m @ 1.9% CuEq or 4.6% ZnEq from 127m
  - Inc. 2m @ 3.6% CuEq or 8.8% ZnEq from 132m
  - Inc. 4m @ 2.8% CuEq or6.9% ZnEq from 157m
- PD4-084: 6m @ 1.9% CuEq or 4.7% ZnEq from 176m

5km SW of C1 Deposit

Drilling is ongoing using DHEM,
FLEM and IP to refine drill targets
Potential for near-term resource

### **Alvo: The Active Brazilian Explorer**





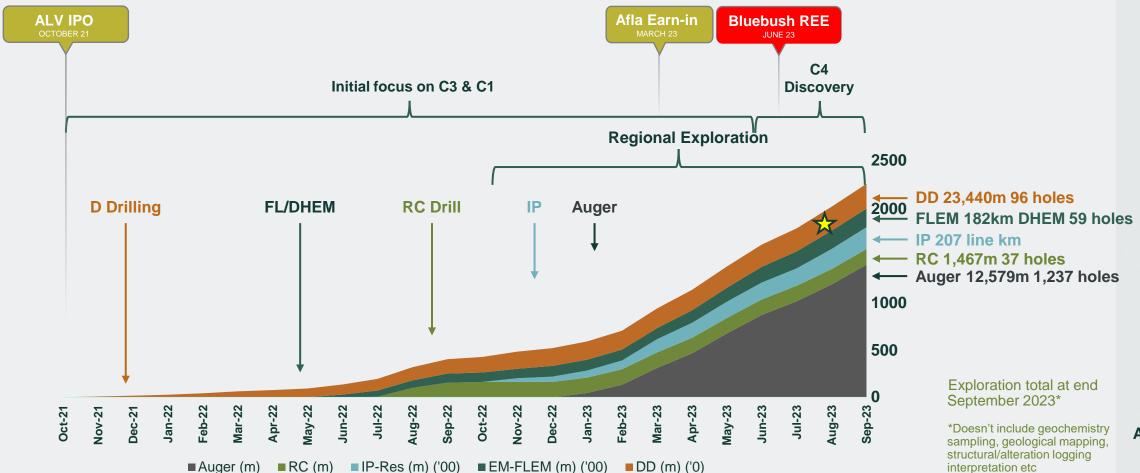
Over 23,000m of Diamond Drilling conducted since Oct 2021



Almost 10,000 core samples collected



Extensive geological logging, geophysical surveys & studies of physical properties



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interpretation etc

## **Advancing Critical Minerals in Brazil**



	Q4 23	Q1 24	Q2 24	Q3 24
BLUEBUSH REE				
Auger drilling				
Metallurgical Testwork				
Diamond drilling/Geophysics/Exploration				
Decision on Bluebush REE Due Diligence	*			
PALMA – C4 PROSPECT				
Maiden diamond drilling				
PALMA - C1 & C3 PROSPECT				
DHEM surveys on phase 1 & 2 drill holes				
PALMA REGIONAL EXPLORATION				
FLEM and IP to refine discovery targets				
Mapping, soil sampling and auger drilling at early-stage targets areas				
Cana Brava Ni Exploration Geochem and Geophysics				
Diamond drilling of mature regional targets				
TECHNICAL STUDIES				
Metallurgical test work – C1, C3, C4				
Geotech review of C3 + C1 diamond drilling				
Mineral Resource Expansion – C1, C3, C4??		C4?		

### **Corporate Overview- Framework for Discovery**





#### Low Shares On Issue

Exploration success can materially impact share price



#### **Funded for Exploration**

Addition of prospective ionic clay REE expanding the Project footprint



#### **Quality Share Register**

Held by Board (18%), RCF (9%), Paragon (6%), Strata (6%) & Lowell (5%)



#### **Attractive Enterprise Value**

For quality of the mineral resource base and exploration upside potential

#### **Board and Management**

Alvo's board has significant minerals exploration and mining experience in Brazil and around the world.



Graeme Slattery
Non-Exec Chairman
Lawyer



Rob Smakman Managing Director Geologist



Beau Nicholls
Non-Exec Director
Geologist

Experienced team in Brazil to manage exploration activities.



Julio Liz Exploration Manager



Luiz Noronha Administration Manager

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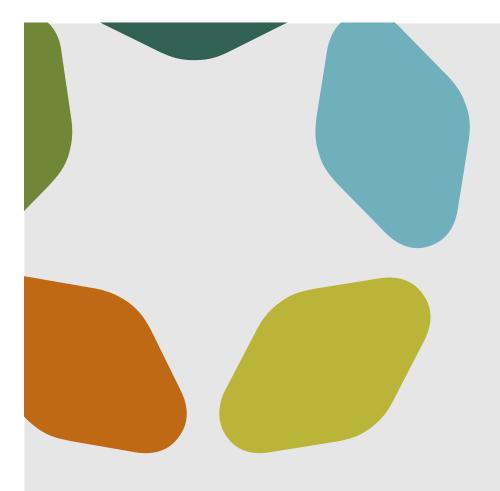
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Competent Persons Statement: The information in this presentation includes information that is based on or extracted from the Independent Geologists Report prepared by Target Latin America and others, which is included in full in Alvo's prospectus dated 30 July 2021 (the IGR). The information in this presentation is based on, and fairly represents, information and supporting documentation prepared by Dr Klaus Petersen a Competent Person and Member of the Australasian Institute of Mining and Metallurgy and, with respect to information attributed to or compiled from the 'Mineral Resource Estimate' included within Independent Geologists Report, is based on information compiled by Mr Simon Mortimer of Atticus Geoscience Consulting, a Competent Person and fellow of The Australian Institute of Geoscientists, and Mr Rob Smakman of Alvo Minerals Limited, a Competent Person and fellow of the Australasian Institute of Mining and Metallurgy. Dr Petersen is a full time employee for Target Latin America. Dr Petersen has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and the activities being undertaken to qualify as a Competent Person defined in the "Australasian Code for Reporting of Mineral Resources and Ore Reserves" (JORC Code 2012).

Mr Mortimer has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the JORC Code 2012. Mr Mortimer is responsible for the geological modelling and resource evaluation sections of the Mineral Resource Estimate. Mr Smakman is a full-time employee of Alvo Minerals and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the JORC Code 2012. Mr Smakman is responsible for the site visit report and sampling sections of the Mineral Resource Estimate. Alvo confirms that it is not aware of any new information or data that materially affects the information included in the original IGR. Alvo confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the original IRG. All material assumptions and technical parameters underpinning the estimates in the report continue to apply and have not materially changed. The IGR referred to above may be viewed and downloaded from the Company's website <a href="https://www.alvo.com.au">www.alvo.com.au</a>.

^Copper & Zinc Equivalent Calculation: The copper & zinc equivalent grades (CuEq & ZnEq) are based on copper, zinc, silver, lead and gold prices of US\$7,782/t Copper, US\$3,189/t Zinc, US\$1,980/t Lead, US\$19.30/oz Silver, and US\$1,696/oz ((price deck based on 3-month LME as 7/11/22) Recoveries of 81%, 83%, 70%, 50% and 50% respectively, (recoveries based on ASX Metallurgical testwork released 9 November 2022). The copper (and zinc) equivalent calculation is as follows: Cu Eq = Cu grade% \* Cu recovery + ((Pb grade % \* Pb recovery % \* (Pb price \$/t/Cu price\$/t)) + (Zn grade % \* Zn recovery % \* (Zn price \$/t/Cu price \$/t)) + (Ag grade g/t /31.103 \* Ag recovery % \* (Ag price \$/oz/Cu price \$/t). For ZnEq swap Cu and Zn in previous equation. Reported on 100% Basis.





# Thank you

#### **Rob Smakman**

**Managing Director** 

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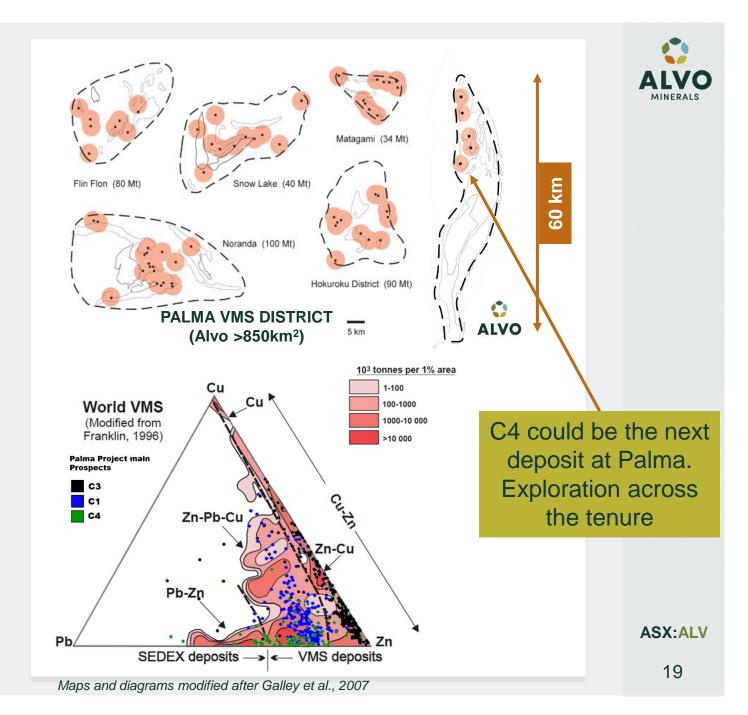
### **Two Highly Prospective Projects in Brazil**





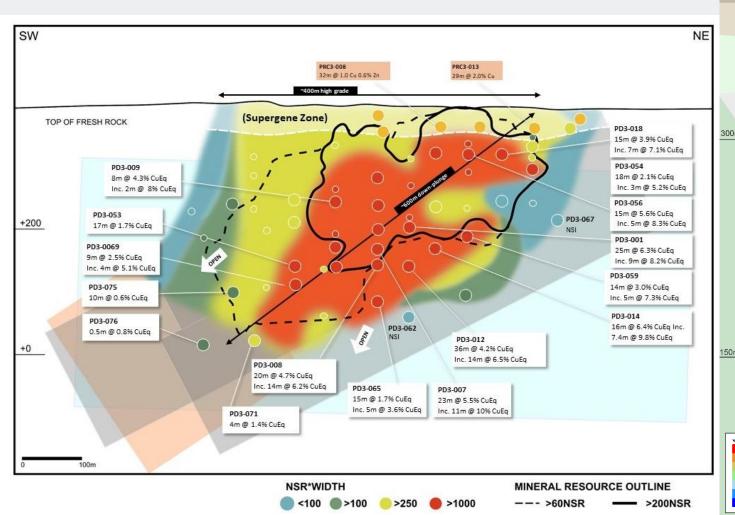
### Palma: A new VMS camp

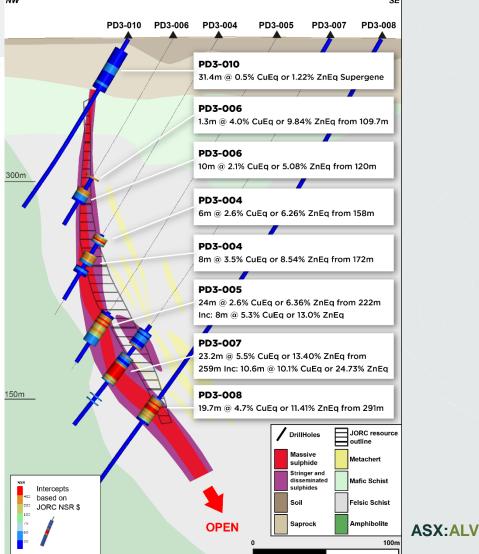
- Volcanogenic Massive Sulphide (VMS) deposits occur in clusters that define MAJOR mining camps
- VMS are important global sources of Cu, Zn, Pb, Ag and Au
- Palma has the right rocks to become a new VMS camp – new discoveries only possible with Exploration- ALVO is ACTIVE Geophysics, Geochem + Drilling Underway
- Only outcropping mineralisation was drilled in the 1980s- multiple areas to be tested
- Alvo has a dominant land position in the district with >850km<sup>2</sup>
- Palma is defined as Bi-Modal Mafic- the most common of the VMS styles
  - Common examples include Kidd Creek, Flin Flon, Noranda, San Nicholas (Mexico) and Preiska (RSA)



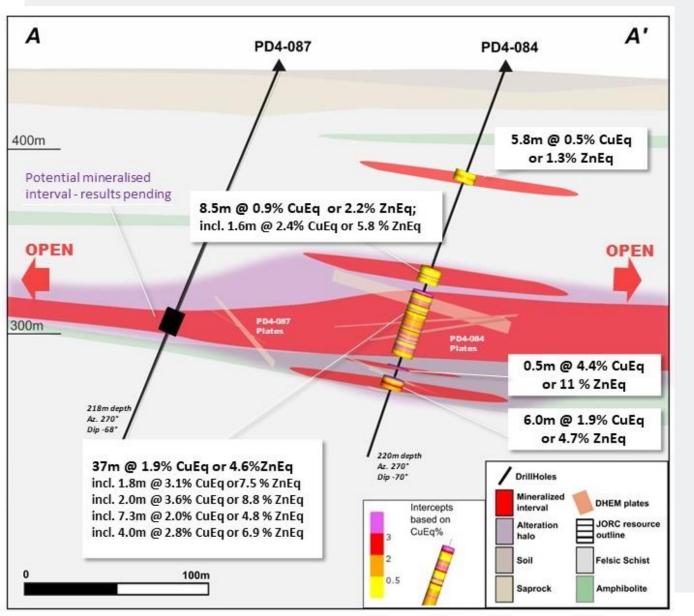
### C3 Prospect: Thick and High Cu Grades







### C4- "Brownfields VMS Discovery"



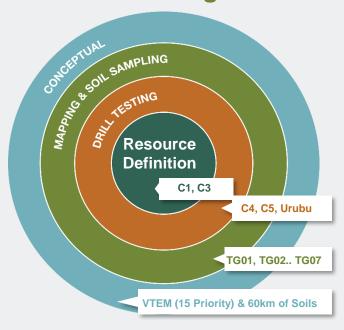
# Mineralisation within a Broad Alteration Halo



- C4 located only 5km SW from C1
- If drilling continues to intercept broad mineralised zones, C4 could be quickly added to an updated MRE (currently underway at for C1 and C3)
- Drilling at PD4-088 (results pending) has intercepted multiple, potentially mineralised horizons within a 160m alteration envelope
- Interpreted horizontal mineralisation- interpreted as 'true width'
- Drilling is ongoing- DHEM and FLEM and IP ongoing to refine targeting

### **Palma Exploration**

Multi-Discipline, Multi-Target-Driving towards Diamond drill testing



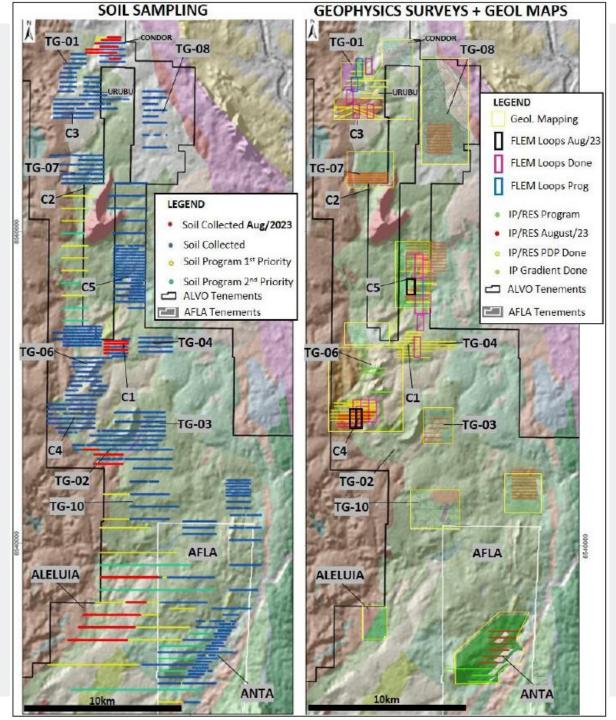
Resource Definition

Drill Testing

Mapping, Geochem, Geophysics

Conceptual

Alvo VTEM Targets

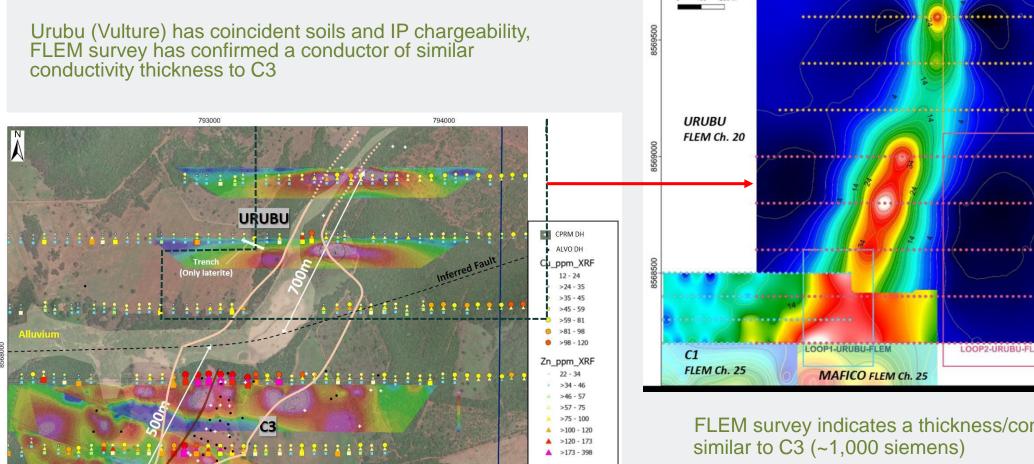






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### **Urubu Prospect- extension of C3?**



IP (Chargeability)

Pseudo-sections

Pb\_ppm\_XRF

>11 - 12

>12 - 14 >14 - 17 >17 - 22

>22 - 43

C3\_JORC

793000

LOOP3-URUBU-FLEM

FLEM survey indicates a thickness/conductivity

Additional Soils and Auger drilling planned before drill decision

Inversion of FLEM underway – conductive plate mapping and potential to map the E-W fault

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### **C5: Exploration**

C5 exploration is one of multiple advanced prospects

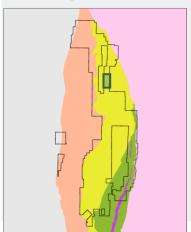
- CPRM completed soils and a single (mineralised) drillhole (not located)
- 3 coincident elongated Cu/Zn/Pb anomalies- each > 1km

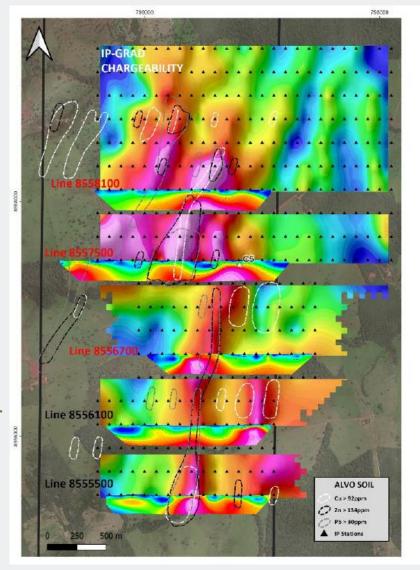
Alvo completed 800 x 50m soils- infill to 400 x 50m confirmed soil anomalies

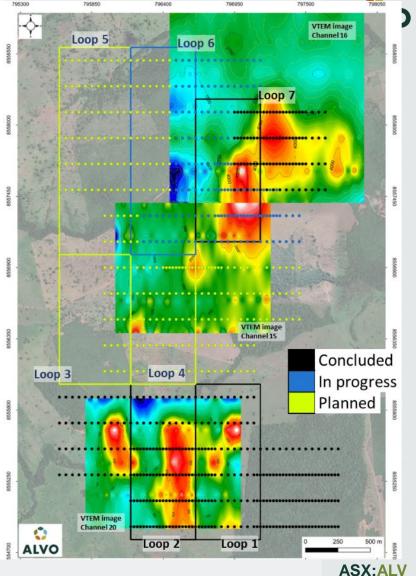
IP survey complete strong coincident chargeability/resistivity anomalies on southern and northern soils

FLEM underway 5 loops for 15km

Drilling to be planned based on results...







### Notes

