

Nuevas franjas metalogenéticas: Perspectivas y potenciales áreas para la exploración

Jonas Mota

JUNTOS POR MÁS
OPORTUNIDADES Y
BIENESTAR PARA TODOS



Content

Porphyries in the backarc
Pucará basin - Cu and Zn
Lithium in Peru
Ni-Cu-PGE in Peru
Critical minerals
Public geophysical data
Red tape



Jonas Mota

*SNMPE Exploration
Working Group*

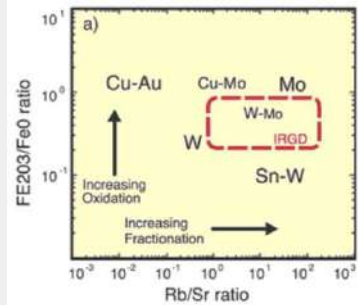
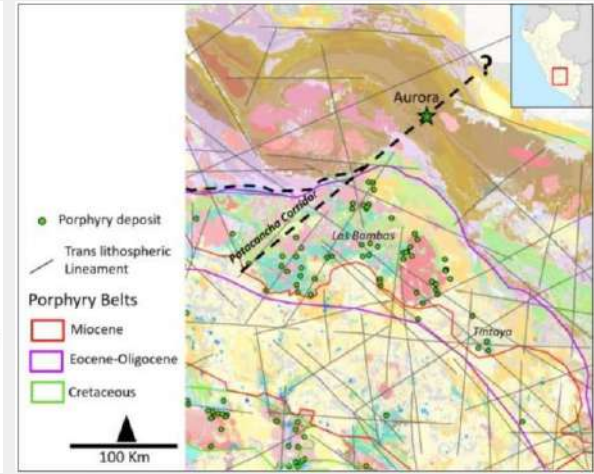
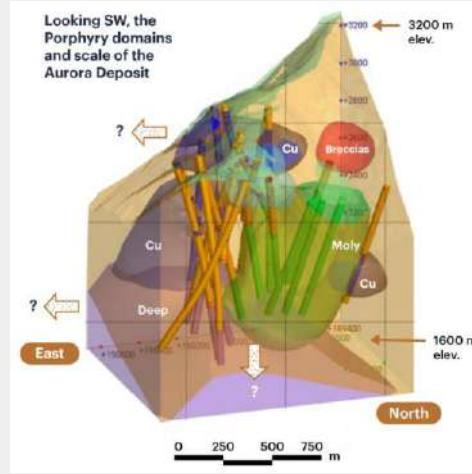
*Rio Tinto Exploration
Manager in Peru*

**opinions are my own*



Porphyries in the backarc, the case of Aurora Mo-Cu

- DLP Resources
- Re-Os age dating of 6.4Ma
- Hundreds of kilometers to the east of Miocene arc
- Patacancha major structure?

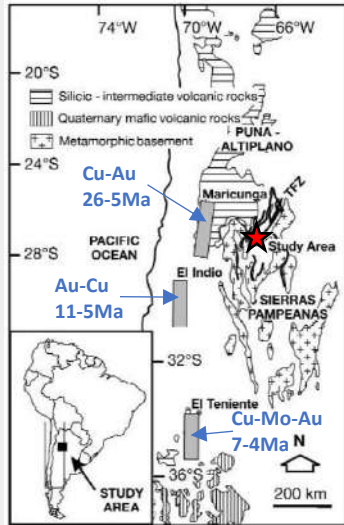


Cut-off (NSR)	Resource Category	Tonnage (Mt)	CuEQ (%)	Cu (%)	Mo (%)	Ag (g/t)	Cu Metal (Mlb)	Mo Metal (Mlb)	Ag Metal (Moz)
\$5.75/t	Inferred	1,050	0.44	0.20	0.05	2.4	4,650	1,110	80



Large porphyries displaced from the main magmatic arc

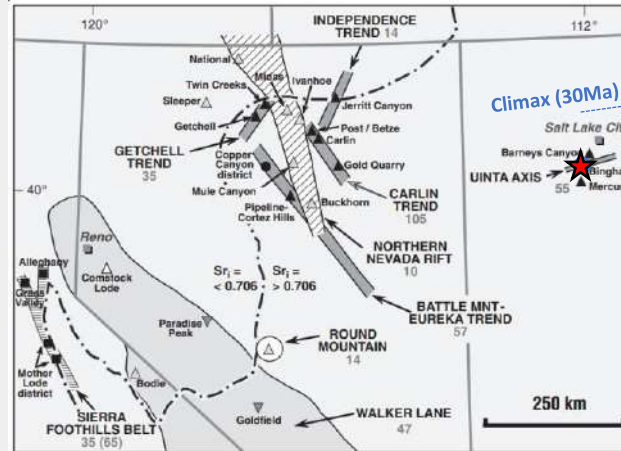
- 7Ma Bajo de la Alumbreira porphyry
- 39-37Ma Bingham Canyon porphyry



*Tucumán
Fault Zone**

Endowment:
605Mt
0.54% Cu
0.64 g/t Au

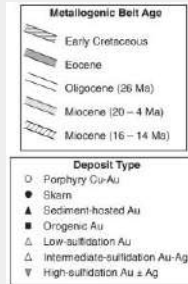
Harris et al. (2017)



Sillitoe (2008)

*Uinta-Cortez axis**

Endowment:
2,500 Mt
0.60% Cu
0.35 g/t Au

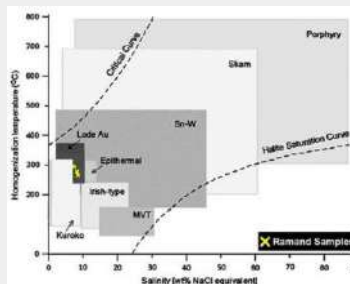


** Major crustal weakness*

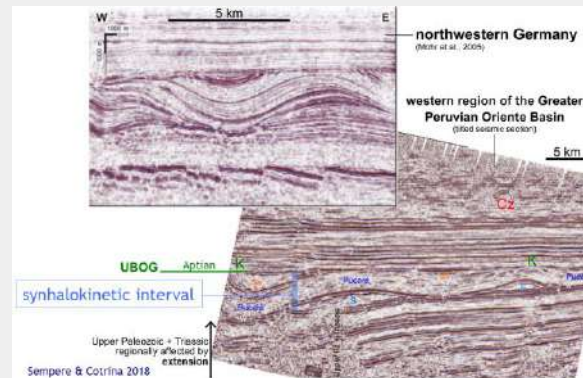
Pucará, one the most salt-rich basins in the world



- Pucará basin accumulated an average of 400 meters (up to 1,000 meters) of salt in the stratigraphy
- Zn-Pb needs salt to form MVT and Sedex deposits, and large sedimentary-hosted Cu deposits requires lot's of salt!



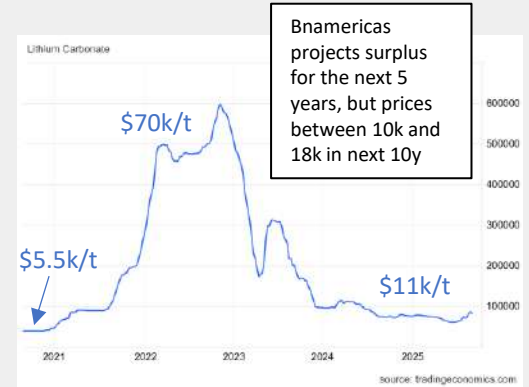
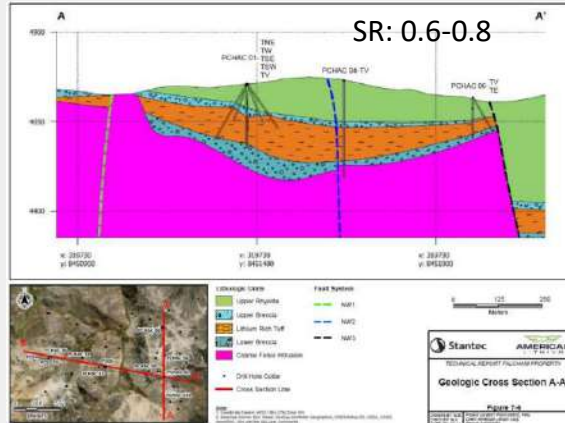
Wilkinson chart (2001)



Sempere & Cotrina 2018

Lithium in Peru?

- Comparison between Pegmatite and Brines
- Ponds versus Direct Lithium Extraction (DLE)
- Falchani ash-flow tuff project located in Puno features a 95°C sulfuric acid tank leach. The PEA estimates a life cycle cost of US\$ 5,000 to 6,000 per ton



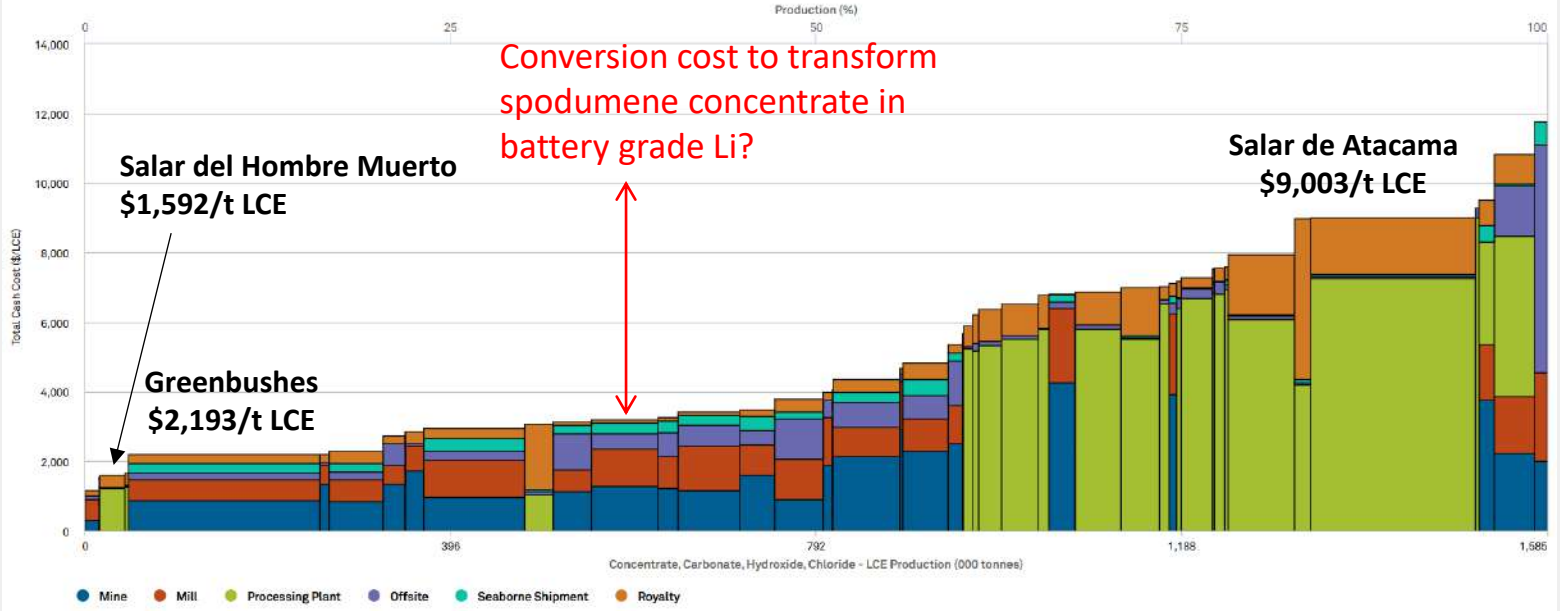
Lithium-rich tuff

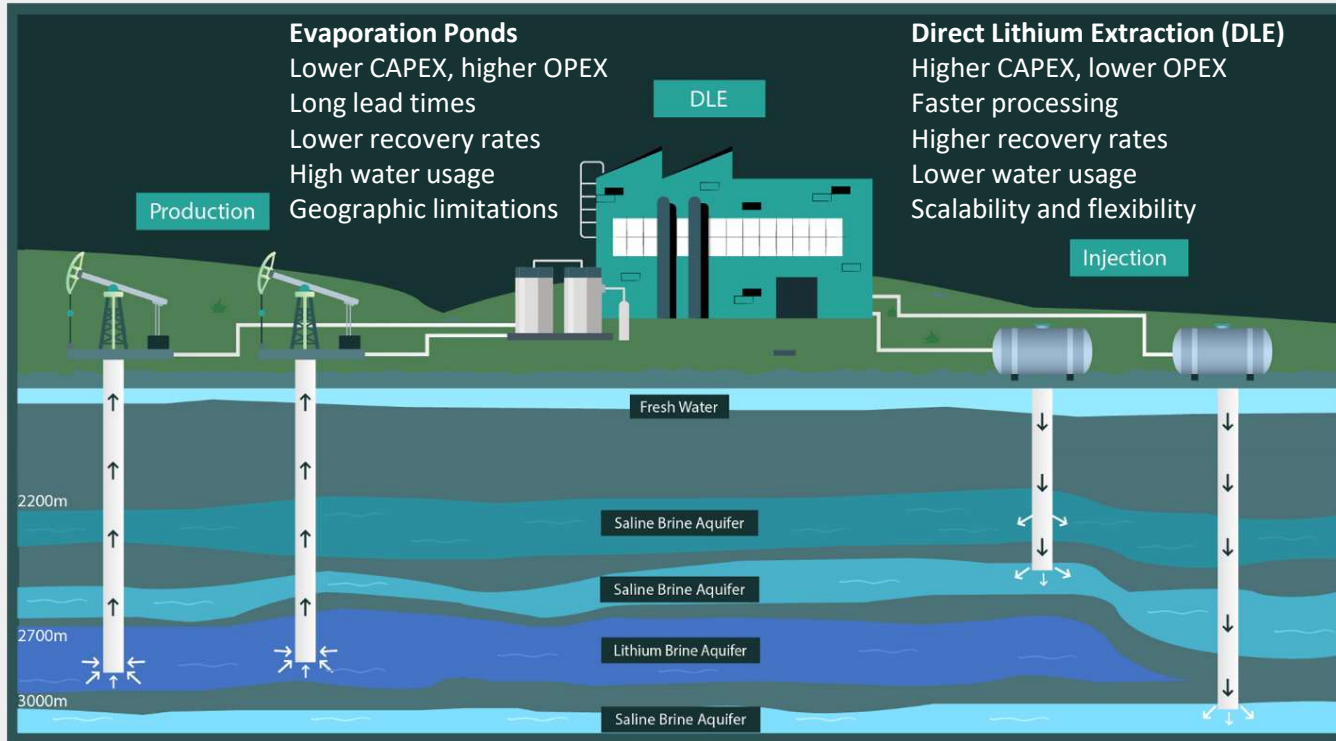
better
↑
Brines DLE
Brines Ponds
Integrated Spod
Non-integrated Spod
Lepidolite
↓
worse



2025 Lithium Production Ranked on Total Cash Cost*

Scenario: Market Intelligence 2024 Constant USD





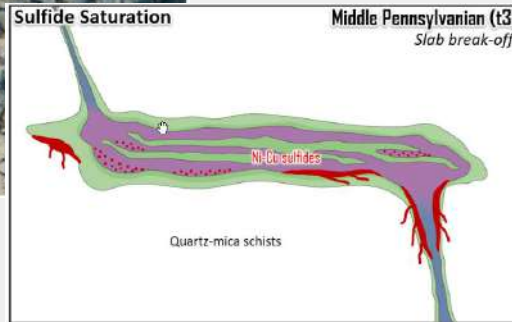
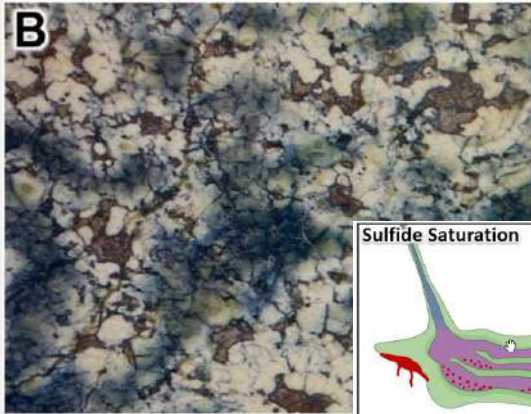
Source:
<https://ceo.ca/@GlobeNewswire/boardwalk-hydrogeology-capable-of-long-term-consistent>

Climate, volcanism, tectonics, and sedimentation in southern Peru:

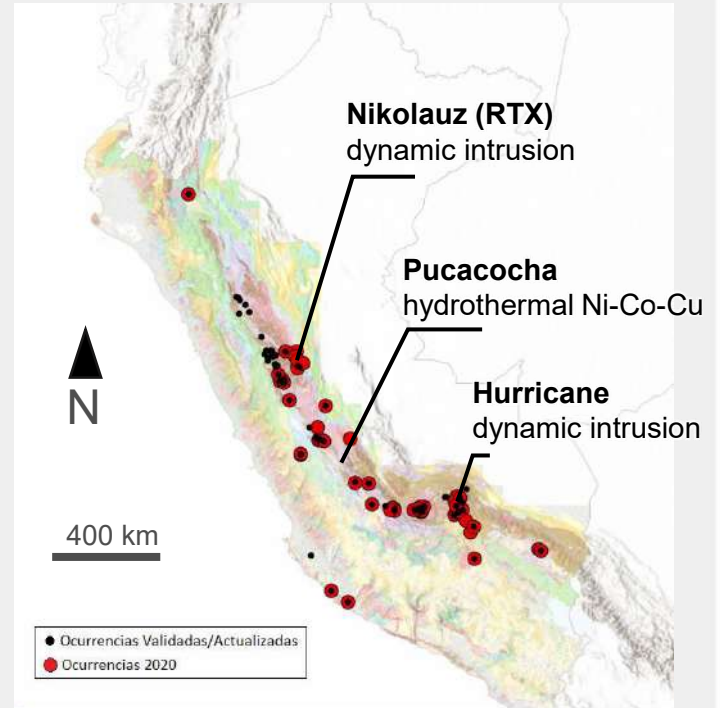
Barroso volcanics (7Ma – 0.01Ma)

Feature	Eocene (56–34 Ma)	Oligocene (34–23 Ma)	Miocene (23–5.3 Ma)	Pliocene–Present (5.3 Ma–Now)
Climate	Warm, semi-humid	Cooler, increasingly arid	Arid to hyper-arid, especially post-Middle Miocene	Persistently arid; intensified droughts in Holocene
Volcanism	Active, widespread (flat-slab arc)	Reduced, localized	Reactivated arc volcanism (e.g., Ubinas, Ticsani)	Episodic volcanism; active centers like Sabancaya
Tectonics	Uplift, crustal rotation	Continued deformation	Major uplift of Andes; Altiplano basin formation	Ongoing crustal shortening; basin subsidence
Sedimentation	Marine and coastal (Otuma Fm)	Restricted, evaporitic in places	Closed basins, lacustrine and evaporitic deposits	Continued evaporite cycles; lake and salars evolution

Ni-Cu-PGE-Co potential in Eastern Cordillera



Abraham Arana in prep.



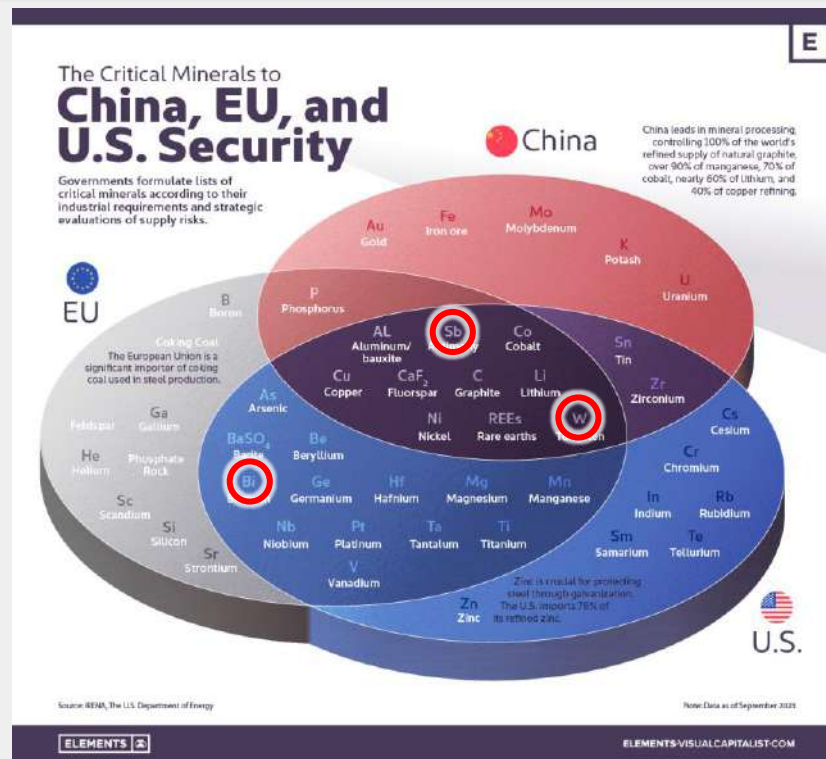
Critical Minerals

They are essential elements for society that could encounter supply disruptions caused by limited mining availability or geopolitical issues.

Each nation or area has its own unique list of minerals deemed Critical.

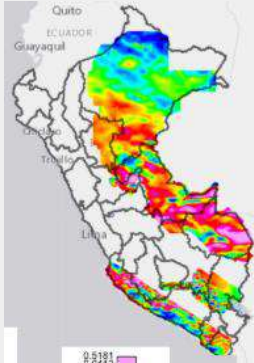
Sb, Bi, and W

Epithermal environment, polymetallic veins, periphery of porphyry systems, intrusion-related systems, (existing operations and cons?, existing tailings?)



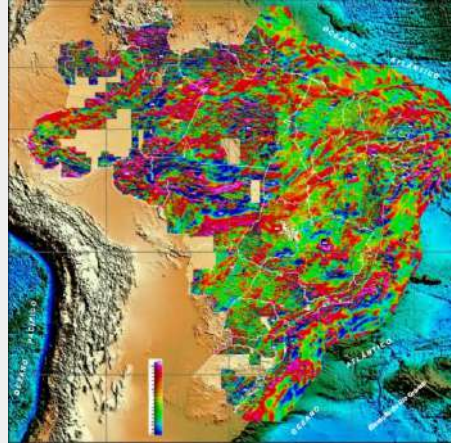
*It's best to speak with **Lisard Torró**, who is attending the conference and is an expert in this area

Public Geophysical Data

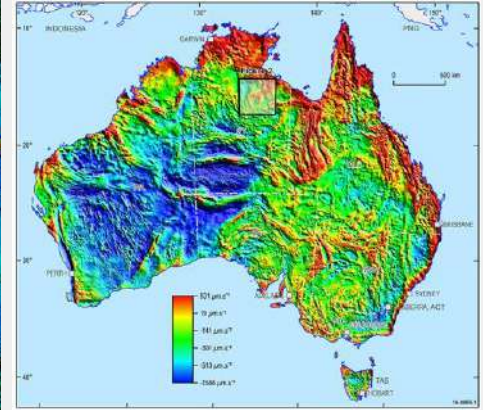


*SAMMP project
1975*

Peru – magnetics (1,000m)

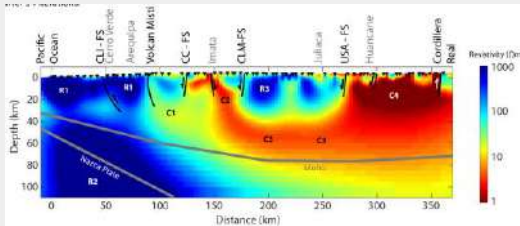


*Brazil – rad/magnetics
(500m)*



The Bouguer Gravity Anomaly Grid of Australia shows the density distribution of the continent and is a key dataset for minerals and energy exploration.

Australia – gravity (400m)



*Great, but 1
line?*

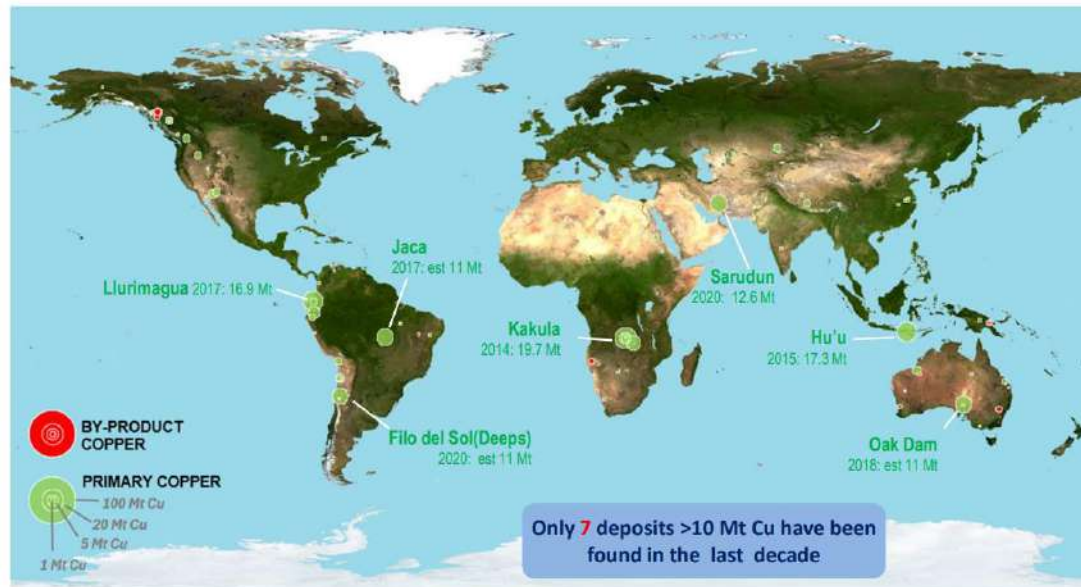
Peru - MT

- Geocatmin performs effectively
- Geophysical coverage is quite limited
- Exploration data produced by companies is not utilized optimally



What are
the recent
significant
Greenfield
copper
discoveries
in Peru?

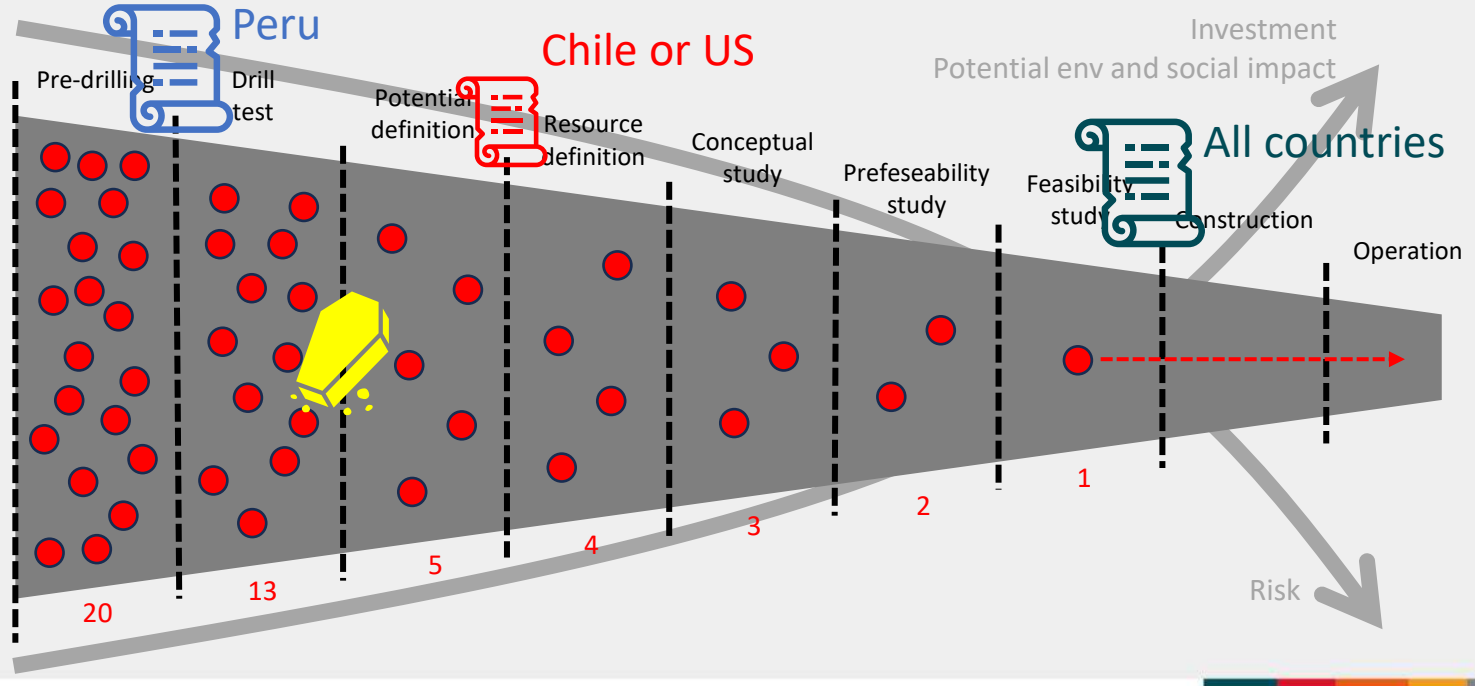
Copper discoveries : 2014-2023



Note: Based on deposits containing a pre-mined resource >100 kt Cu
analysis excludes unreported discoveries and/or likely growth in reported resources

Source: MinEx Consulting © August 2024

Disproportionate permitting during the initial phases of exploration in Peru?



Take aways

The Eastern Cordillera faces challenges such as insufficient infrastructure, environmental sensitivity, and security issues.

However, the region offers significant advantages, including a large salt-rich basin with potential deposits of copper and zinc, as well as back-arc porphyries, intrusion-related mineralization, and nickel-copper-PGE deposits.

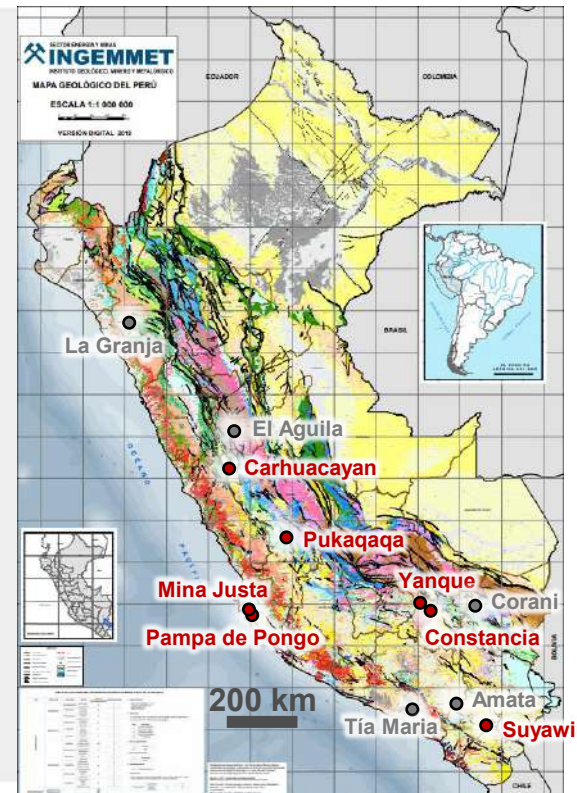
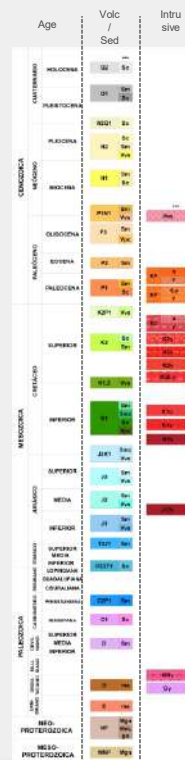
The lithium sector struggles to compete with brine sources from the lithium triangle.

Peruvian explorers, particularly miners, should remain vigilant for valuable co-products within the Critical Minerals sector.

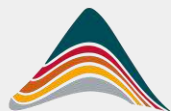
There is a lack of comprehensive geophysical data and underutilization of existing exploration information.

Permitting procedures in Peru tend to be excessively long during the initial phases of exploration.

Despite these challenges, promising geological potential persists, especially amid the ongoing Copper rush.



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Hannanmetals



**Exploration for Large Gold - Copper Systems in
Peruvian Frontiers: Exploration Opportunities
and Social Engagement in the Back Arc**

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Zac Turschwell – Exploration Manager

26/09/2025



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Qualified Person: The qualified person for Hannan’s projects, Michael Hudson, Executive Chairman & CEO for Hannan, and a Fellow of the Australasian Institute of Mining and Metallurgy, has reviewed and verified the contents of this presentation.



Overview

A gold-copper focused exploration company operating in untapped regions

- Focus on new frontiers – **alkaline epithermal gold discovery:**
- 135.2m @ 1.3g/t Au and 9 g/t Ag including:
 - 26.0 m @ 5.4 g/t Au and 27 g/t Ag
- Momentum – first drill permits, drilling now
- Building a pipeline of drill ready porphyry- alkaline epithermal targets over the next five years
- JOGMEC (JV – San Martin) and TECK (9.9% equity) partnerships



Valiente (Peru): multiple (up to 18) major copper-gold porphyry, skarn, epithermal systems located in a new, unexplored Miocene belt (100% owned)

San Martin (Peru): high-grade sediment hosted copper-silver analogous to the Central African copper belt (JOGMEC JV)



Hannan's story

A gold-copper focused exploration company operating in untapped regions

1990's

- Hannan Founders with strong Peruvian database background

Minimal Past Exploration

- Some majors and juniors tested the ground
- Lack of infrastructure, safety were issues

2021-23 Discovery

- Grassroots Prospecting
- Stream sediments, reconnaissance, aeromag, IP, soils
- Valiente - Brave

New Belt

- 150 km Miocene alkaline porphyry epithermal belt

Key Advances

- Large scale data collection
- Social licence
- Multiple prospects
- Drilling now



03.11.2024

ESG FRAMEWORK

- **Environmental Stewardship:**
 - Low-impact prospecting,
 - Programs in compost, biopesticides, biofertilizers
- **Governance:**
 - Valiente project council
 - Transparent communication
- **Social & Shared Value:**
 - Local workforce engagement; priority hiring and training
 - Repair and maintenance of infrastructure
 - Support for schools, roads, bridges



Peru: Targeting Giant Metal Districts

Big company land position

Hannan Tenure in Peru: 1,430 km²

Valiente 910 km²

Discovery of 18 Miocene-age porphyry copper-gold belt hosting multiple mineralizing systems

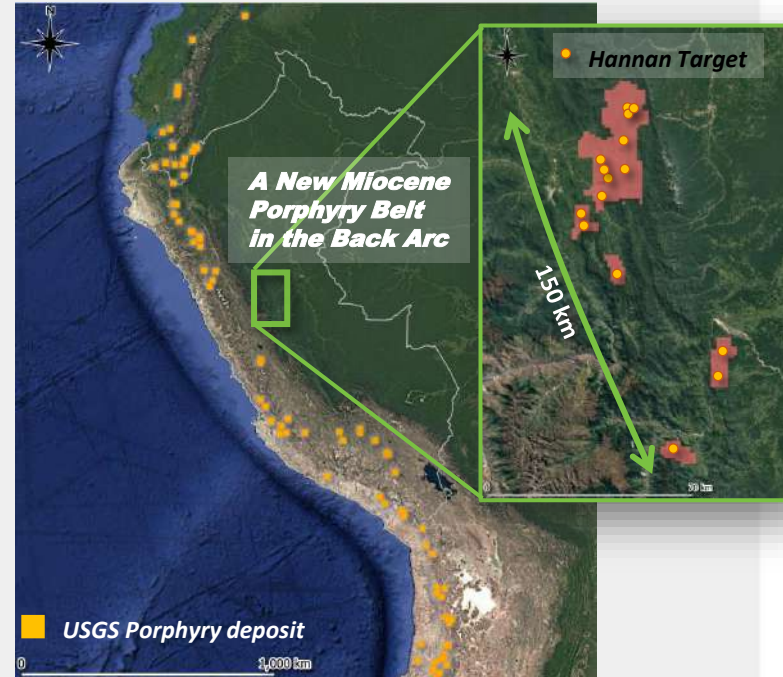
San Martin 520 km²

Unexplored sediment-hosted copper-silver with key features analogue to the Central African Copper Belt



WHY THE BACK ARC?

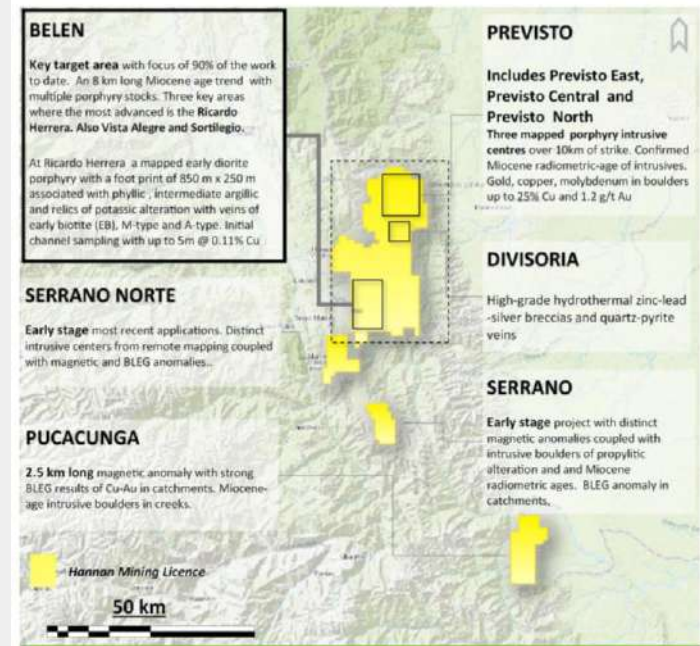
- 1. Untapped Discovery Potential:** Back-arc basins remain significantly under-explored, unlike mature districts where most near-surface deposits have been identified.
- 2. Favorable Metallogenic Setting:** The unique geodynamic environment of back-arc regions creates ideal conditions for developing large, high-grade deposits.
- 3. First-Mover Advantage:** Low competition for ground, ability to secure district-scale position. Higher risk-reward profile than mature, fragmented districts.



Peru: Valiente Alakaline Au-Cu Cluster

A giant metal district in pre-discovery stage

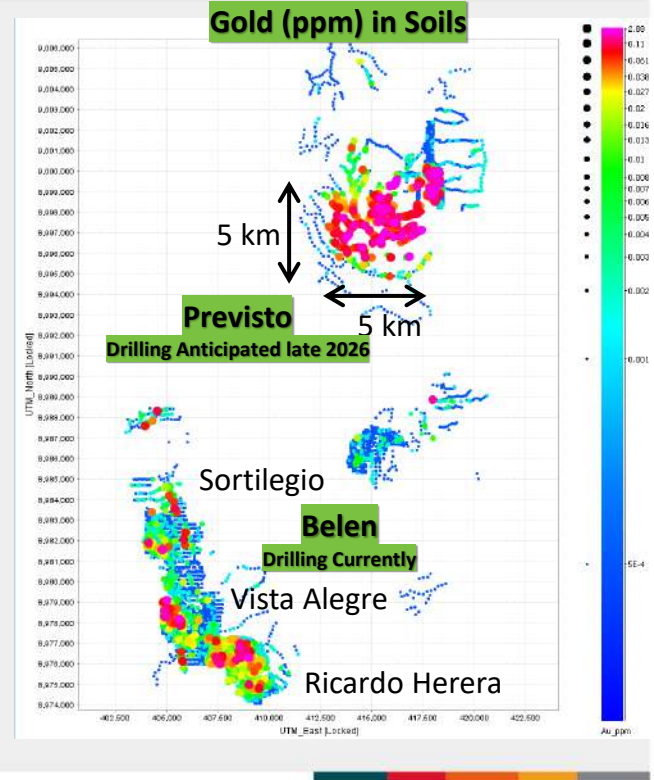
- ✓ Footprint comparable to giant mineralized districts in the Andes: Cajamarca, Moquegua
- ✓ Multiple intrusive events peaking at 21 Ma, 15 Ma and 11 Ma (Miocene-age – key timing in Andes)
- ✓ Mineralized porphyry/skarn/epithermal targets identified in at least 18 areas across the whole belt.
- ✓ Pipeline of exploration targets that will deliver sequential drill results over multiple targets over many years.





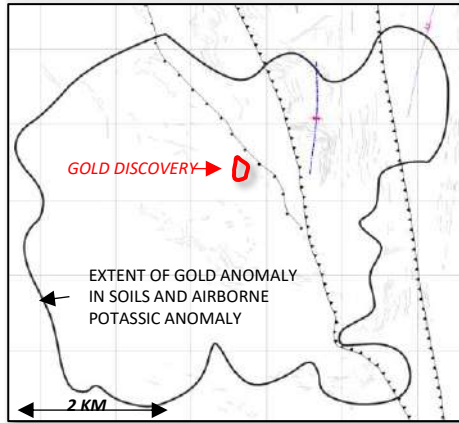
Previsto: a Giant Gold Target

- ✓ Large-scale target 5 km x 5 km
- ✓ Discovery - alkaline epithermal gold channels:
 - 69.1 m @ 2.4 g/t Au and 13 g/t Ag, including:
 - 26.0 m @ 5.4 g/t Au and 27 g/t Ag
- ✓ Outcropping copper target over 750m x 200m :
 - 126 m @ 0.22 % Cu
 - 192 m @ 0.11 % Cu
- ✓ In 2024/25 Hannan completed
 - Top ridge soil survey (infill is ongoing)
 - IP orientation survey over 15-line km
 - High resolution LiDAR survey
 - Detailed mapping and channel sampling (ongoing)
 - Mapping and prospecting of creeks (ongoing)



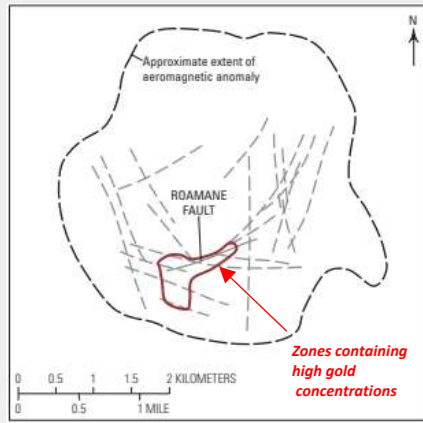
Previsto Compared to Major Deposits

HANNAN ALKALINE EXPLORATION TARGET:
PREVISTO INTRUSIVE COMPLEX



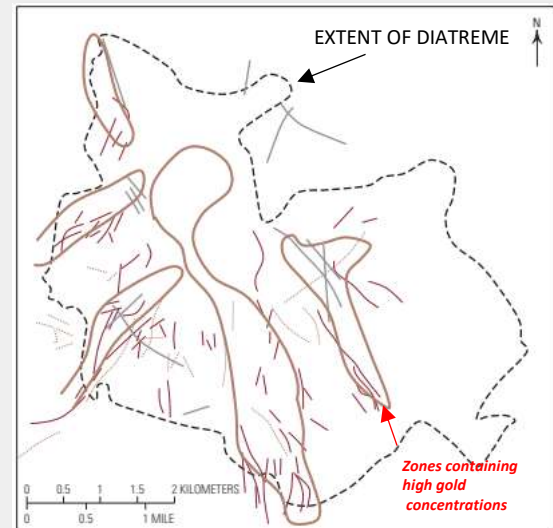
DISCOVERED DEC 2024

PORGERA INTRUSIVE COMPLEX:
EST. GOLD ENDOWMENT 33-37MOz



BREAKTHROUGH 1982

CRIPPLE CREEK DISTRICT HISTORIC
EST. GOLD ENDOWMENT 27-30MOz

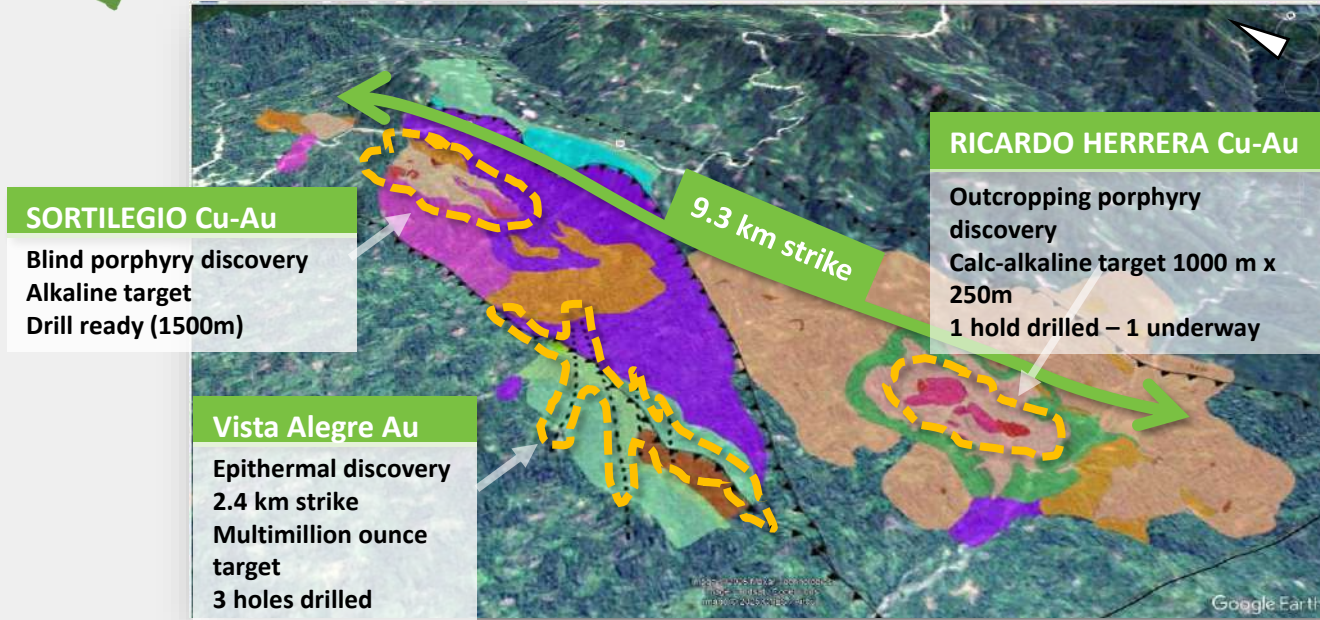


DISCOVERED IN 1890





Belen Overview – 3 targets - now drilling

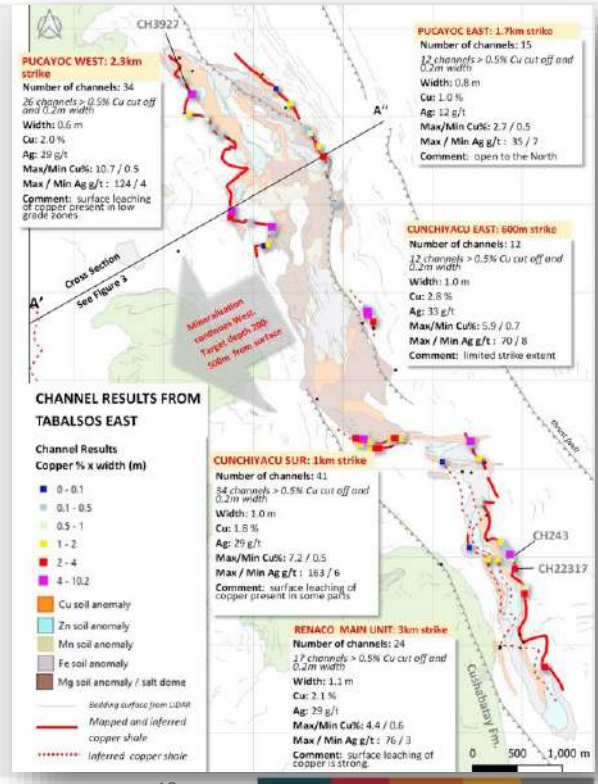




Peru – San Martin

Sediment Hosted Cu-Ag

- Stratabound: hosted in reduced shales and sandstones
- Outcropping Cu-Ag mineralization over 7 km strike
- 121 channels average 2.05% Cu and 30 g/t Ag over 0.9 m (0.5% Cu cut-off)
- LiDAR extremely useful in mapping outcropping formlines
- 2D Seismic from 1990's used to map fluid pathways and basin structures





Unveiling a new chapter in Peru's metallogenic evolution while setting the standard for community-partnered exploration

- **Discovery of multiple mineralization styles in a new Miocene back-arc metallogenic belt** - 150 km strike length, 910 km² tenure, 18 porphyry-epithermal-skarn systems identified
 - **Previsto Alkaline Complex** - Flagship discovery, 135.2 m @ 1.3 g/t Au including 26.0 m @ 5.4 g/t Au, 5 km x 5 km footprint
- **First-mover advantage in unexplored back-arc setting**
 - District-scale land position (1,430 km² total Peru)
 - JOGMEC joint venture validation (San Martin)
 - Teck Resources 9.9% strategic investment
- **Community-Integrated Development Model, 100% local workforce engagement, Infrastructure co-investment, Agricultural diversification programs, Proactive stakeholder councils**
- **Pipeline Development with 3 drill-permitted targets** currently active
- **Sequential target advancement** - 5-year drill pipeline



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Exploration for Large Gold - Copper Systems in
Peruvian Frontiers: Exploration Opportunities
and Social Engagement in the Back Arc

 **Hannanmetals**

TSXv: HAN

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