



## Santiago project— historical exploration and renaissance

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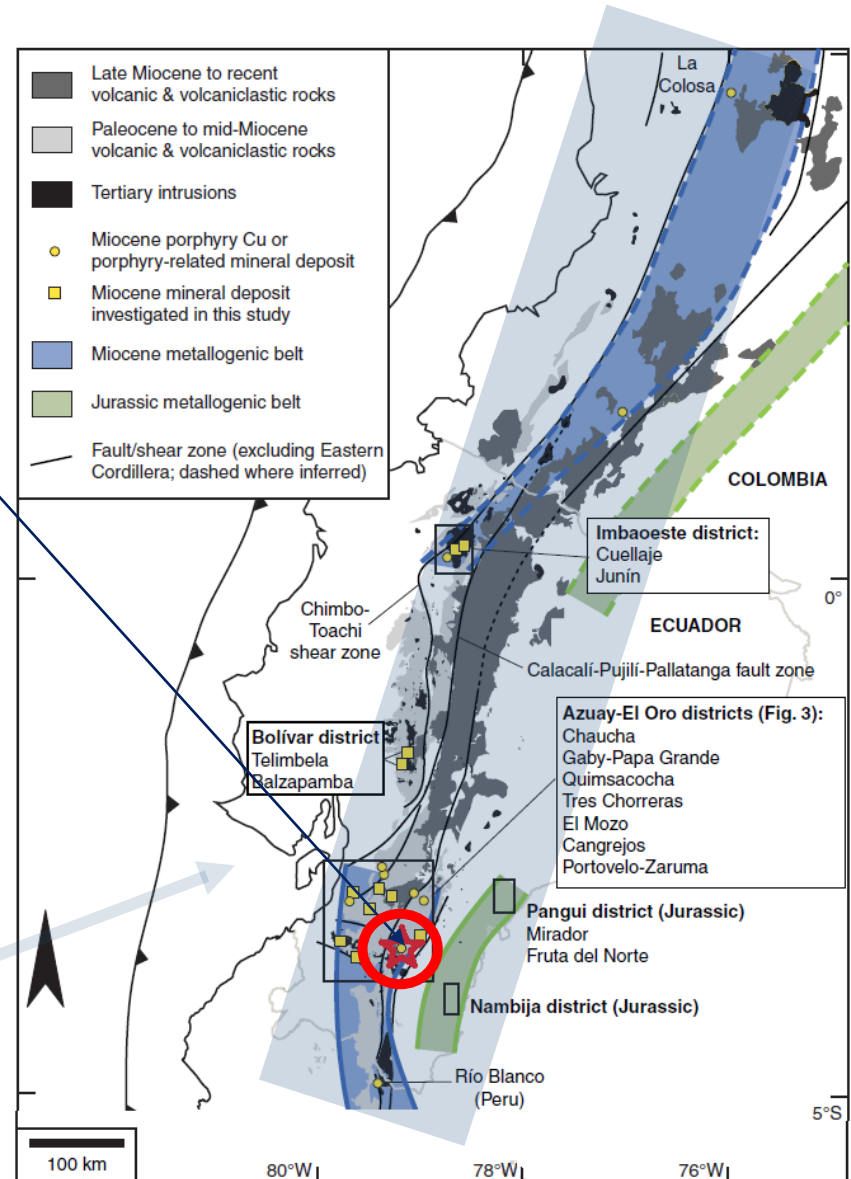
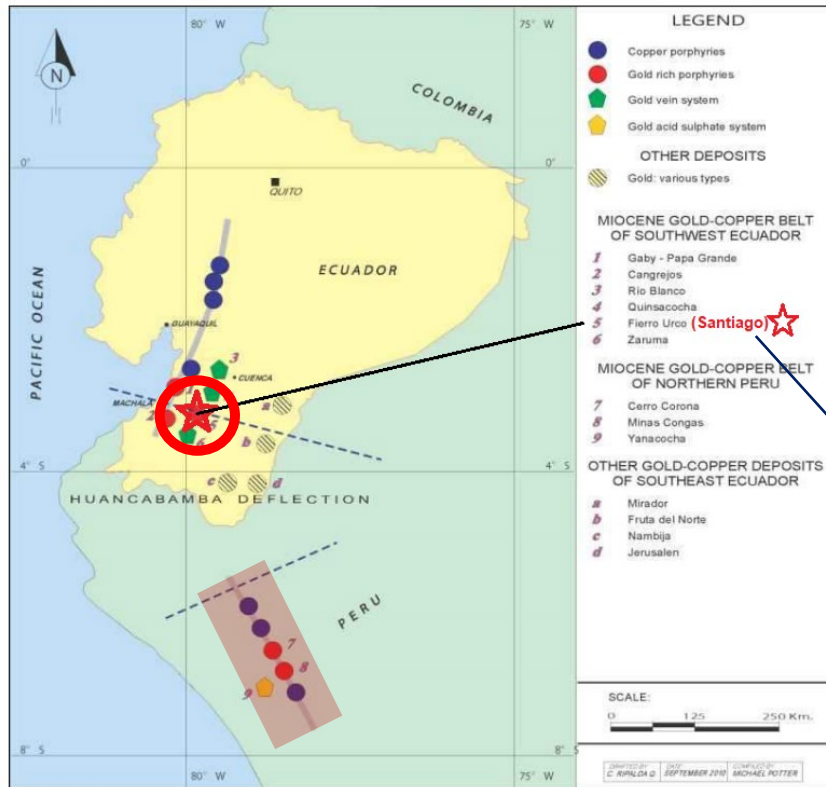


# Presentation Outline

- Santiago property – geographical position and geological setting;
- Exploration history of the property;
- Airborne EM&MAG MobileMT survey, results and perspectives;
- Conclusions and following plans.

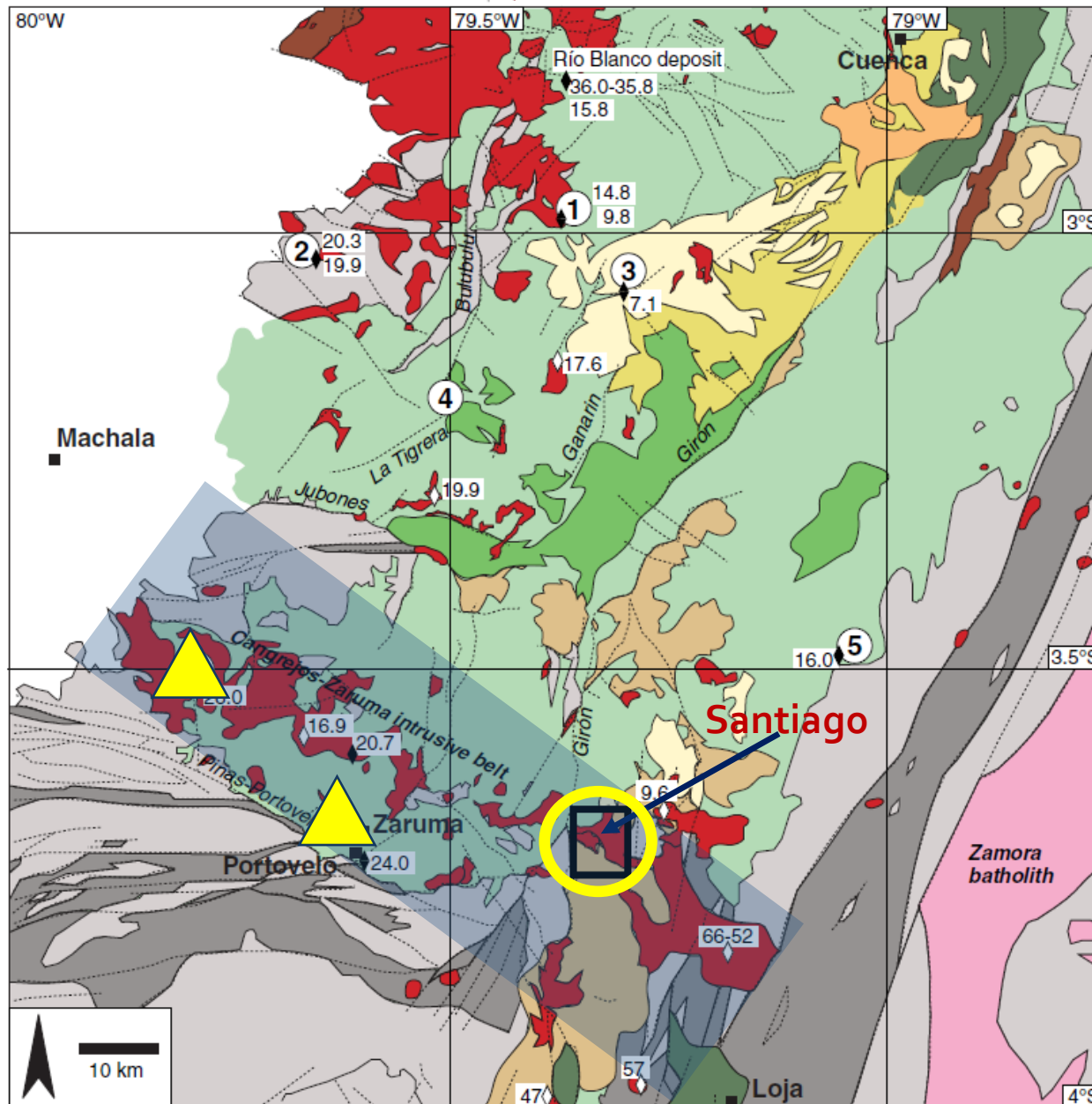


# Santiago Project geographical and geological position



Philip Schütte & Massimo Chiaradia & Fernando Barra & Diego Villagómez & Bernardo Beate (2012)





- 1-Chaucha (porphyry Cu-Mo)
- 2-Gaby-Papa Grande (porphyry Au)
- 3-Quimsacocha (epithermal Au-Ag-Cu)
- 4-Tres Chorreras (porphyry-related breccias, polymetallic veins, epithermal Au),
- 5-El Mozo (epithermal Au),
- 6- Cangrejos (porphyry Au-Cu),
- 7 Portovelo-Zaruma (epithermal Au, possibly genetically related to porphyry Cu system).

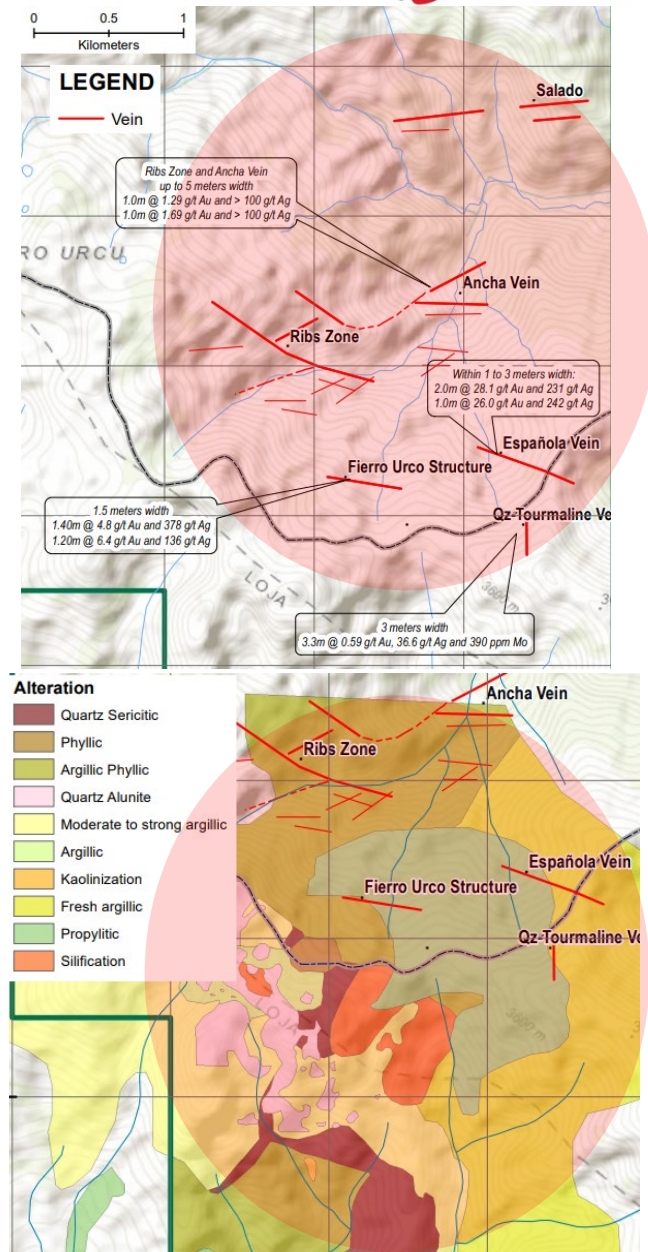
Dominant rock type

<b>Late Miocene to recent</b>	<b>Pre-Tertiary</b>
volcanic	Mesozoic (undifferentiated)
volcanoclastic	Paleozoic to Precambrian (undifferentiated)
sedimentary	
<b>Oligocene to mid-Miocene</b>	<b>Intrusive rocks</b>
volcanic	Tertiary
volcanoclastic	Jurassic to Cretaceous
sedimentary	fault or inferred fault
<b>Paleocene to Eocene</b>	<b>Intrusive age (in Ma)</b>
volcanic	K-Ar; zircon fission track
sedimentary	U-Pb zircon

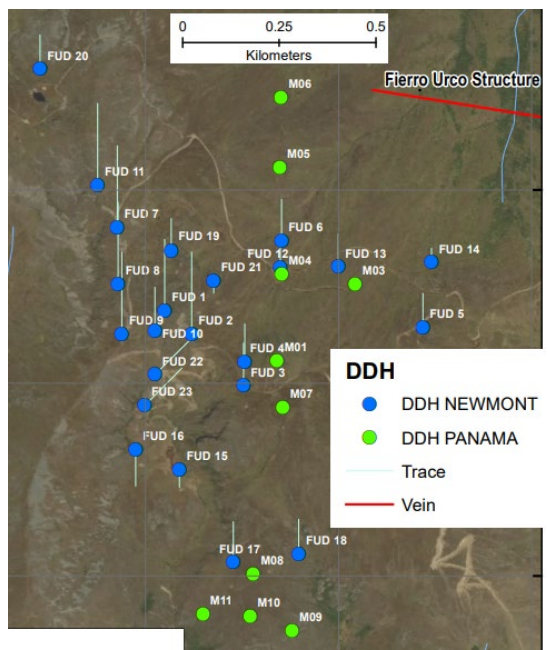
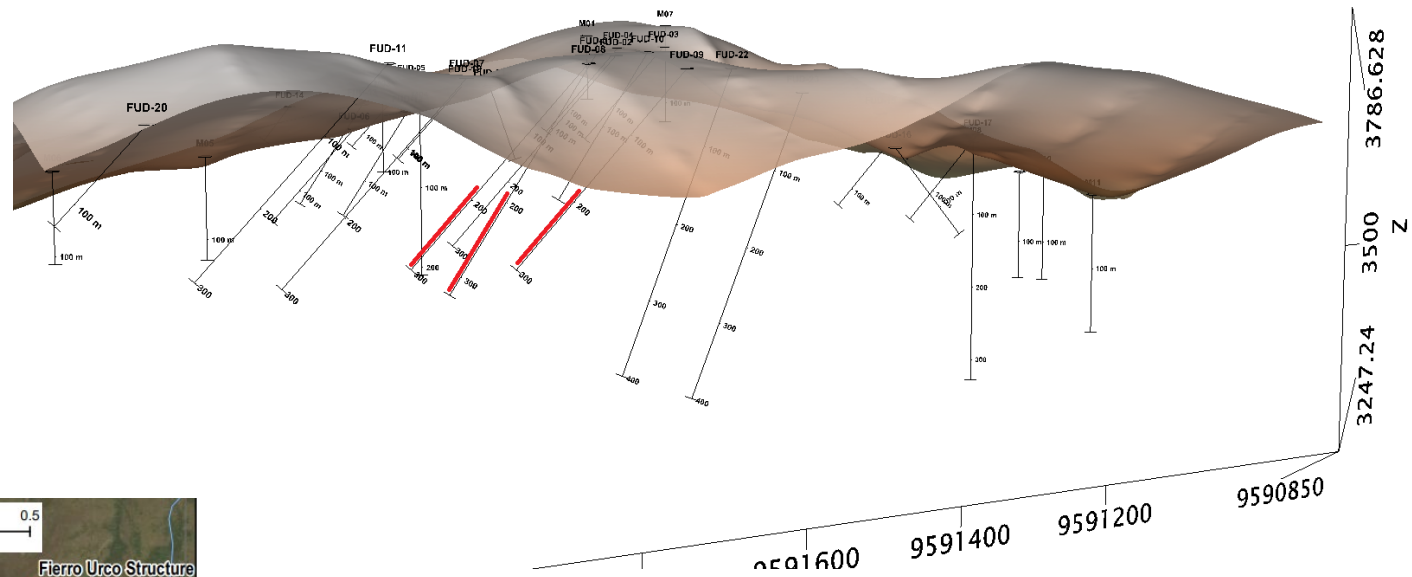
After: P.Schütte & M.Chiaradia & F. Barra & D.Villagómez & B.Beate (2012) Metallogenic features of Miocene porphyry Cu and porphyry-related mineral deposits in Ecuador revealed by Re-Os,  $^{40}\text{Ar}/^{39}\text{Ar}$ , and U-Pb geochronology. *Miner Deposita*, 47:383–410

# Exploration History

- **1964** - an agreement signed between the United Nations Development Programme – Operation #8 (“United Nations”) and the Government of Ecuador that allowed for access and the assessment of both metallic and non-metallic mineral deposits.
- **1970** - Initial exploration field work started over a large geographic area of 8,328 km<sup>2</sup>, which included Santiago (formerly known as Fierro Urco). In the area around Santiago, United Nations developed two copper-molybdenum stream sediment anomalies in creeks draining from the Fierro Urco ridge. An intrusive rock that was hosted in acid volcanic rocks with mineralized vein with gold, silver, and minor zinc and lead values was identified and mapped at Fierro Urco (United Nations).
- **1972-1981** - Follow-up field work and target generation. Regional prospecting, geochemical studies, and a ground magnetometer survey that led to a drilling program totaling **2,137 metres in 11 drill holes** (Prospection Panama S.A.).
- **1982-1991** - exploration directed towards discovery of a porphyry copper system. Field work included stream sediment sampling, detailed soil sampling, and both geological and alteration mapping. No geophysics, no drilling (PREDESUR).
- **1993-1994** – work program focused around a Yanacocha-style deposit model for discovery of an epithermal system. 244 rock chip samples and a further 1,564 rock/saprolite soil samples over a 2,200 by 1,500 metre area. 172 line-kilometres of ground IP data acquisition, ground magnetometer survey 3.2x2.7 km area. A **4,587.55-metre drilling program** was undertaken over **23 drill holes** with an average depth of 200 metres. Wide intercepts of low-grade copper and gold were intersected, but in Newmont’s interpretation, it did not constitute a Yanacocha-style system. (Newmont and Pactech)
- **2002-2005** – no exploration (IAMGold Ecuador S.A.)
- **2005-2009** – technical compilations were completed and field work recommenced to include geological mapping and 790 geochemical sampling including rock chip from mineralized locations (Mariana S.A. Comador/Silex Ecuador S.A.)
- **2009-2010** – no exploration (Mariana Comador S.A./Salazar Resources Ltd)
- **2010-2012** – Sulphide-bearing vein and breccia structures were sampled on surface, which yielded significant results for gold and silver (Salazar)
- **2018-Present** - Exploration Alliance (JV 80% ADZN 20% SRL)



# Historical drilling



All historical drilling, with average depth 200 m, appears to have stayed in quartz-alunite alteration and hydrothermal breccia units, and three of the holes results include:

- **FUD-01** intersected 323.09 metres of 0.23% copper and 0.40 g/t gold for 0.65% CuEq\*;
- **FUD-02** intersected 267.80 metres of 0.24% copper and 0.43 g/t gold for 0.70% CuEq\* including a higher-grade subinterval that intersected 170.95 metres of 0.33% copper and 0.55 g/t gold for 0.91% CuEq\*;
- **FUD-09** intersected 295.17 metres of 0.22% copper and 0.20 g/t gold for 0.42% CuEq\* including a higher-grade subinterval that intersected 67.86 metres of 0.79% copper and 0.27 g/t gold for 1.06% CuEq\*

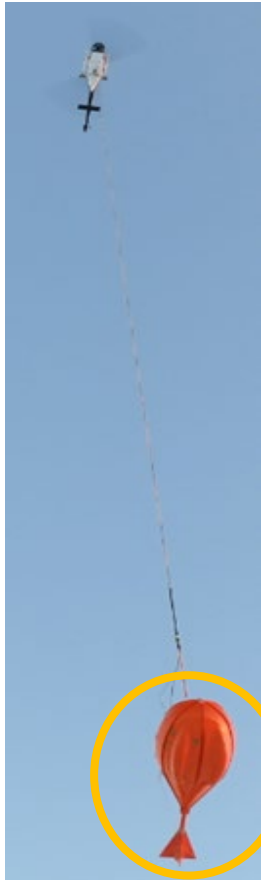
\*The CuEq estimation based on metal prices from April 16, 2020, meaning copper @ US\$2.36/lb (News release 20-10, June 15, 2020, ADZN-V, ADVZF-OTCQX, SRL-V, SEDAR.COM)



# Airborne MobileMT survey

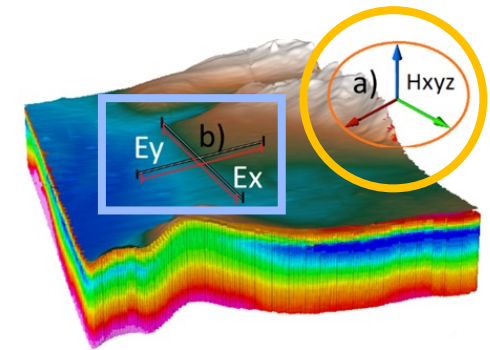
- **2019** – Adventus Mining in partnership with Salazar (80%/20%) completed an airborne Mobile MagnetoTellurics (“MobileMT”) geophysical survey that was flown over Santiago at 150-metre line spacing

The conductive geoelectric environment, mountainous topography at high elevation (2,680-3,790 m ASL, 3330 m average) are appropriate conditions for affordable measurements with the light-weight system based on the natural electromagnetic fields.



- Three-component measurement of magnetic field variations
- Sensitivity to any direction of geoelectrical boundaries
- 26Hz-21kHz frequency range data measurement
- Sensitivity to both near surface and deep geological structures
- The frequency range is divided into up to 30 windows
- High in-depth resolution and a wide range of data selection
- 74 kHz digitizing frequency, reference and signal base station
- Unbiased and denoised data

- Depth of investigation always exceeds capabilities of controlled source systems
- Much less dependence on terrain clearance – safe surveying in rugged terrain



**H** towed coils

$$H = \begin{bmatrix} H_x \\ H_y \\ H_z \end{bmatrix}$$

**E** base station

$$E = \begin{bmatrix} E_x \\ E_y \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} H_x \\ H_y \\ H_z \end{bmatrix} = \begin{bmatrix} Y_{xx} & Y_{xy} \\ Y_{yx} & Y_{yy} \\ Y_{zx} & Y_{zy} \end{bmatrix} \begin{bmatrix} E_x \\ E_y \end{bmatrix}$$

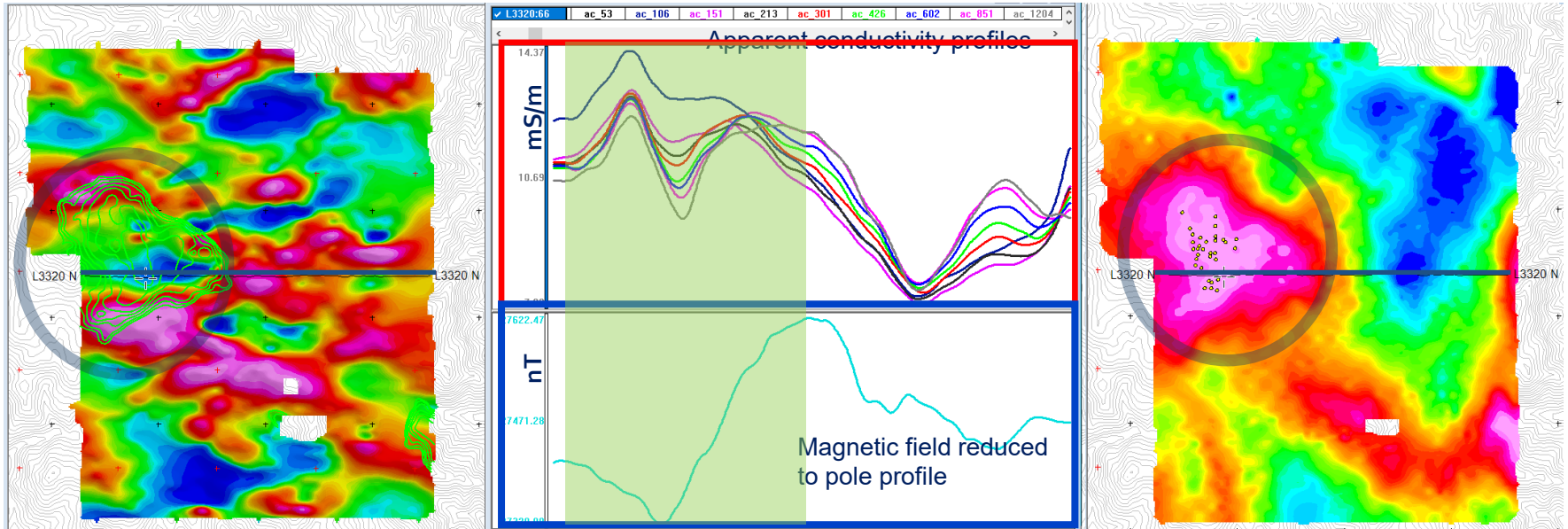
$$\sigma = \mu\omega |Y^2|$$

# MobileMT EM&MAG results

Magnetic field reduced to pole with contours of the EM anomaly

Geophysical profiles along 3320 survey line

Apparent conductivity, 106 Hz with historic drillholes positioning



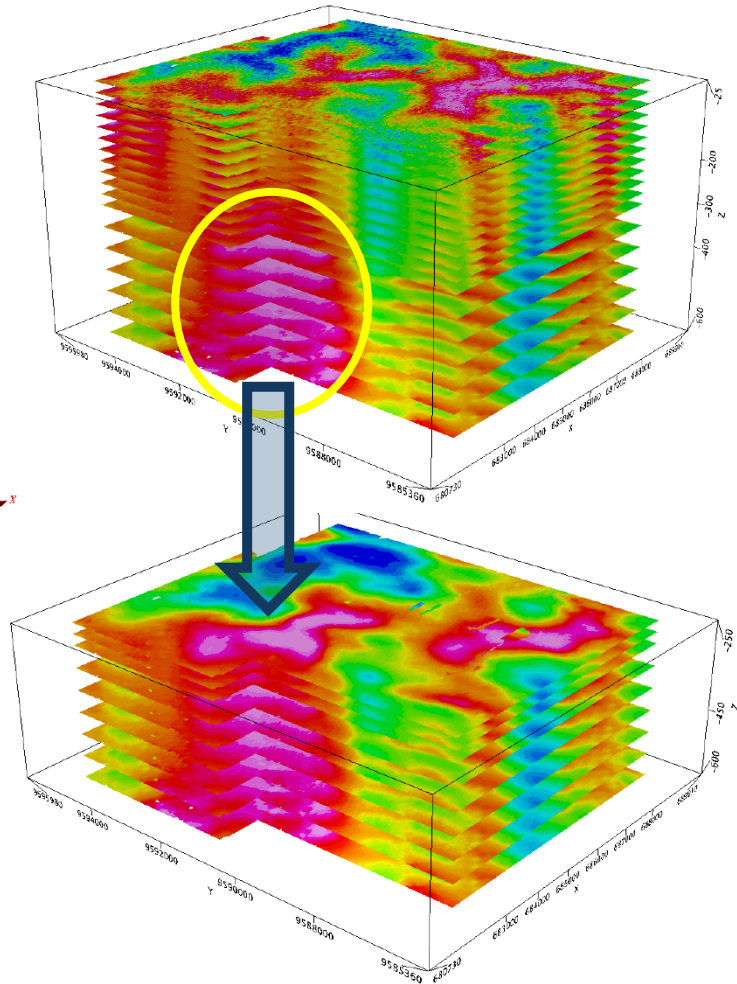
A principal target, prospective for porphyry, has been determined in the result of the survey – a large (3x2 km) conductivity anomaly in a depleted magnetic field zone with coincident a wide-spread hydrothermal alteration footprint and an extensive Cu and Au surficial geochemistry anomaly.



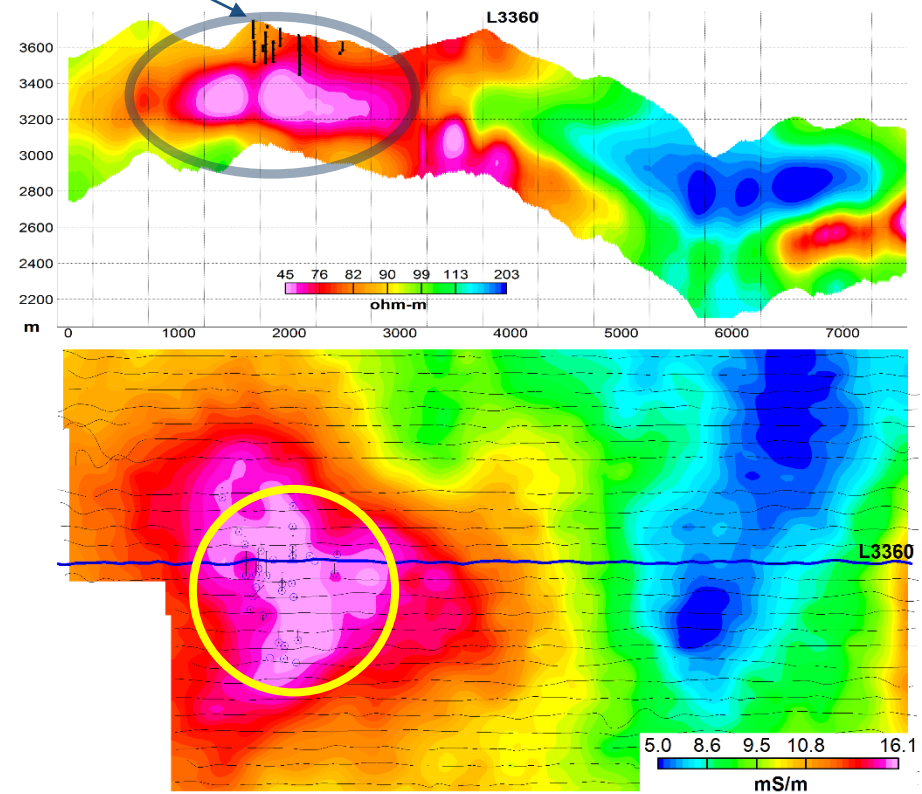
# MobileMT EM results

The fast Molochnov-Viet transformation of 18 apparent conductivity frequencies showed the strongest conductor in depth

The EM data inversions (1D&2D) have refined the conductor's depth position



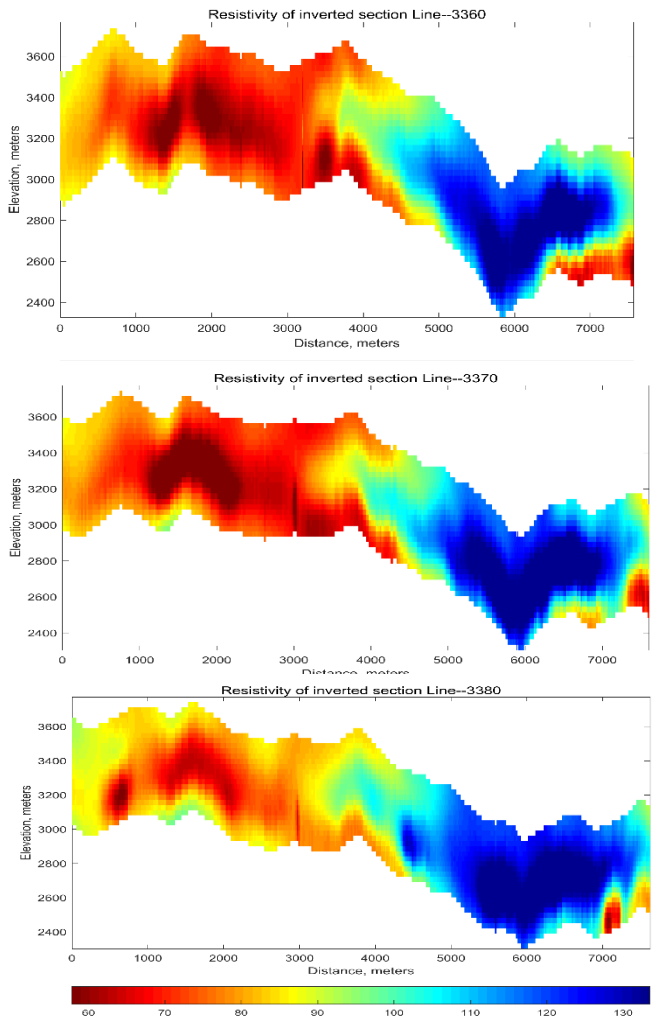
Projection of the historical DHs



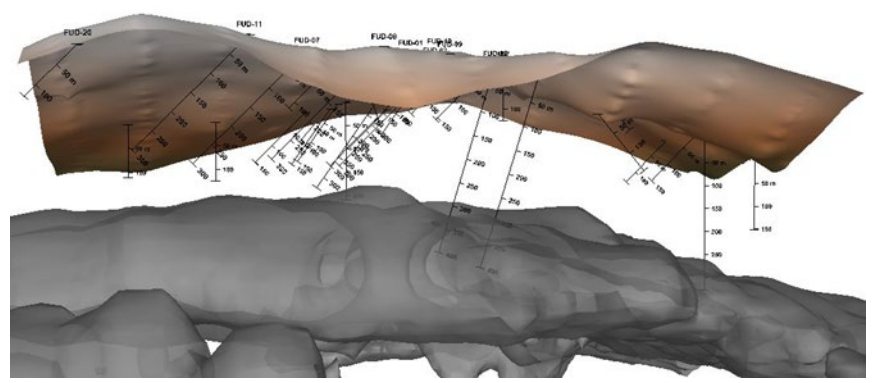


# MobileMT EM results

Other adjacent survey lines crossing the anomaly



Isosurface of the conductors with historical drilling in 3D view



# Conclusions

The case study demonstrates high potential of evaluation and revision of areas even with long and extensive exploration history. The case shows an importance of complex and critical analysis of comprehensive information for the exploration model development.

The current owner of the Santiago property (the alliance of Adventus (80%) and Salazar (20%)) made significant progress towards a new discovery by:

- Refocusing the results of previous work from the position of a reviewed exploration model
- Finding and applying methods that can obtain missing knowledge and evaluate the model to the next level.

The MobileMT survey results, in conjunction with the collected descriptive historical information (there is no available digital data), have led to the conclusion that the surface and the drilled depth range (approx. 200m) represent a lithocap above a high sulphidation porphyry system. The further exploration model development, in support of the petrophysical model and drilling planning, demands modern lithogeochemistry and hydrothermal alteration mapping.

Currently, field crews have restarted field work (geological mapping, geochemistry, alteration studies/Terraspec SWIR) in 2021 in advance of fully permitted drilling program in H2 2021 of approximately 3000 m.







Acknowledgements:



Source of geological information about the Santiago property: [SEDAR.COM](http://SEDAR.COM)

Thank you!