Hay Mountain: a large, undrilled Cu-Mo-Au Porphyry – Skarn target in the Laramide Copper Province, AZ, USA

Liberty Star Minerals

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The Opportunity

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SIZE

- TARGET 1: 4 X 2 km Cu-Au-Mo geochem – EM – mag anomaly
- District-scale potential

LOCATION

- Laramide Copper Province, AZ
- Multiple Tier 1 mines and projects
- Safe jurisdiction, active mining and project development

EASY EXPLORATION

- Road accessible, year-round exploration possible
- Drill-ready with valid drill permits in hand

UNTESTED TARGETS

- Exposed mineralization but no previous drilling
- Additional undrilled targets in district

SWUS Copper Province: A Land of Giants

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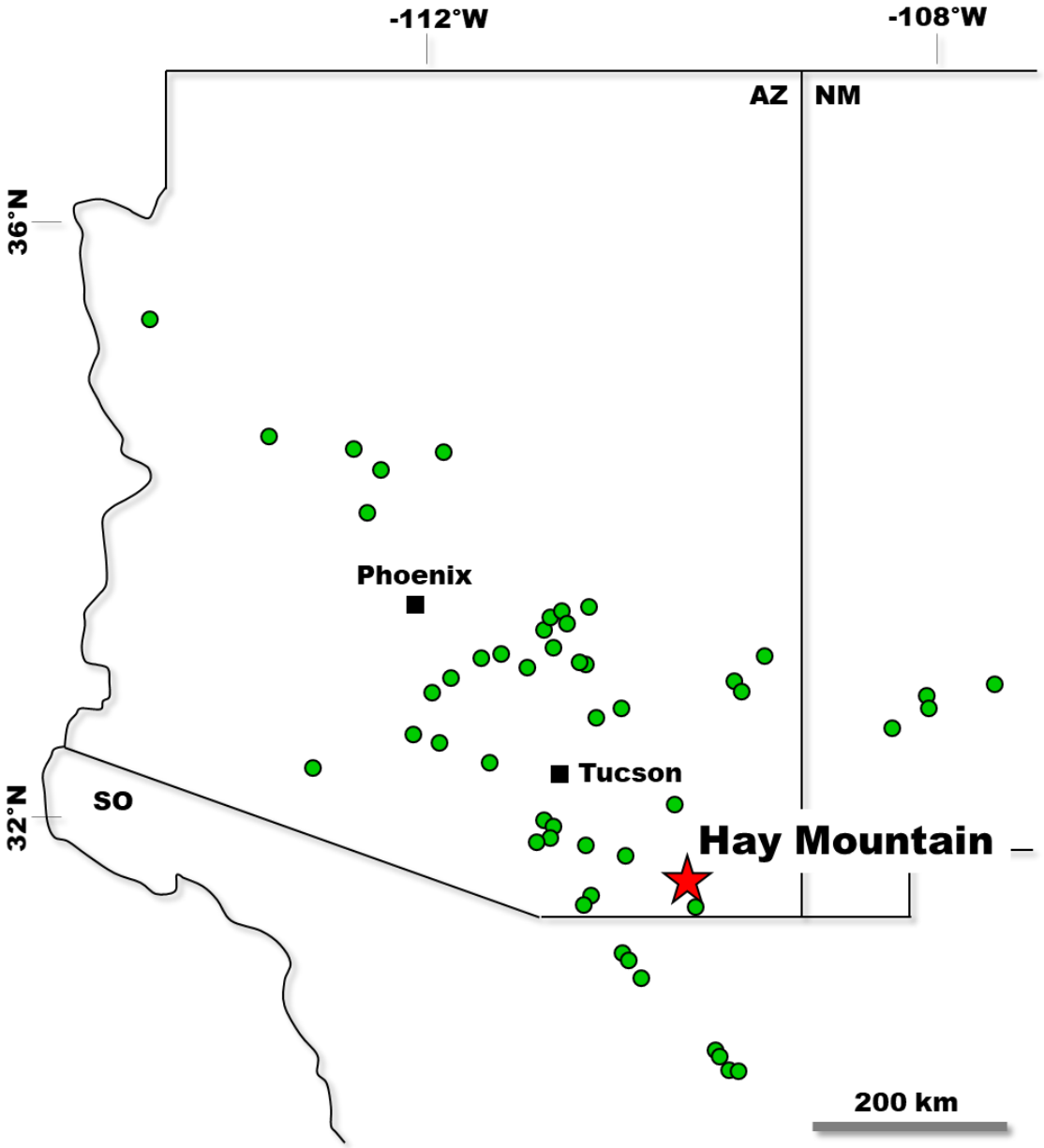
- Globally significant province with over 270Mt contained copper
- Porphyry, skarn and carbonate replacement deposits (CRD)
- Active mining and project development
  - Morenci (Freeport)
  - Resolution (Rio Tinto – BHP)
  - Taylor (South 32)
- Hay Mountain ideally located in remote Cochise County



What is Hay Mountain?

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- A large (4 x 2km) undrilled porphyry – skarn – CRD target
- Analogous to nearby Bisbee skarn (4.58Mt Cu*) and Tombstone CRD districts
- 55km^2 property 100% controlled by LS
  - 50.57km^2 State MEPs
  - 4.43km^2 Federal Claims
- Target supported by:
  - Geology: surface Cu mineralization
  - Geochemistry: zoned Cu-Au-Mo-Zn-Mn anomaly
  - Geophysics: coincident EM – mag
- Drill ready and permitted

View looking to the north with surrounding low, rolling hills of Naco Group limestone

*Leveille and Stegen, 2012

District-scale Geophysics

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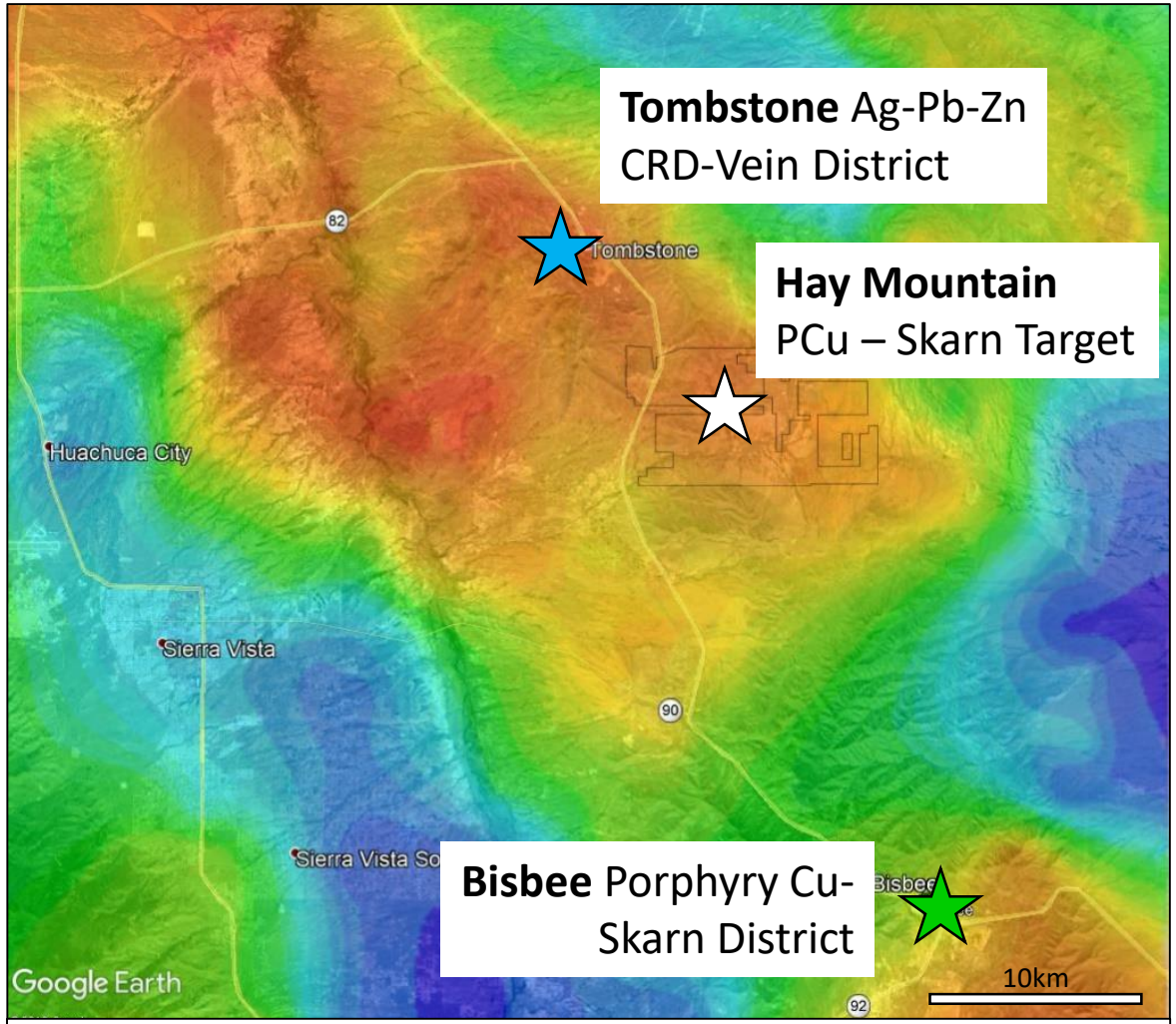
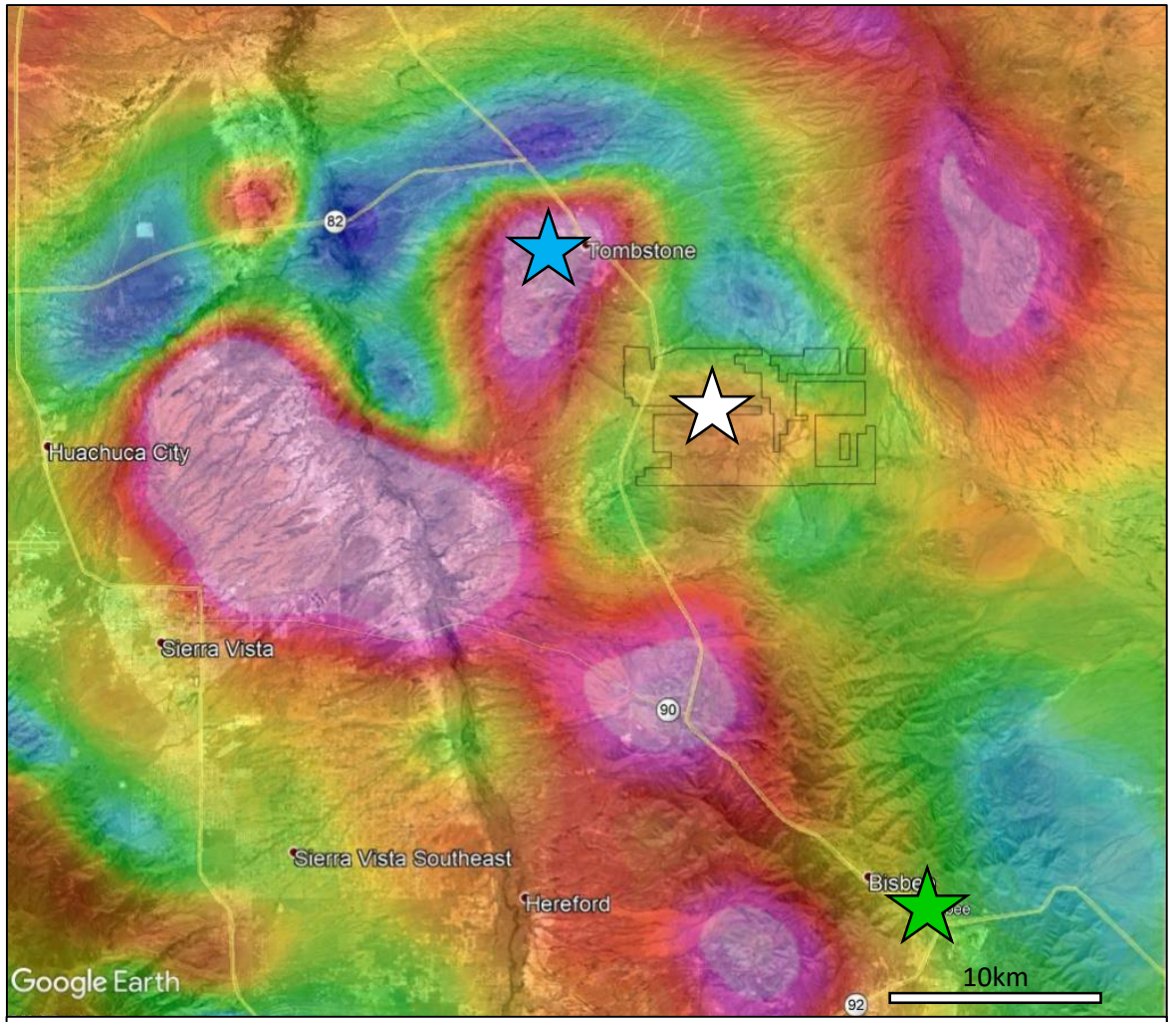


RESIDUAL GRAVITY

Strong NW-trend to regional gravity features highlighting long-lived structural control



RESIDUAL MAGNETICS

Magnetic highs underlying Tombstone Caldera and adjacent to the Bisbee porphyry – skarn district

Hay Mountain Tenure & Access

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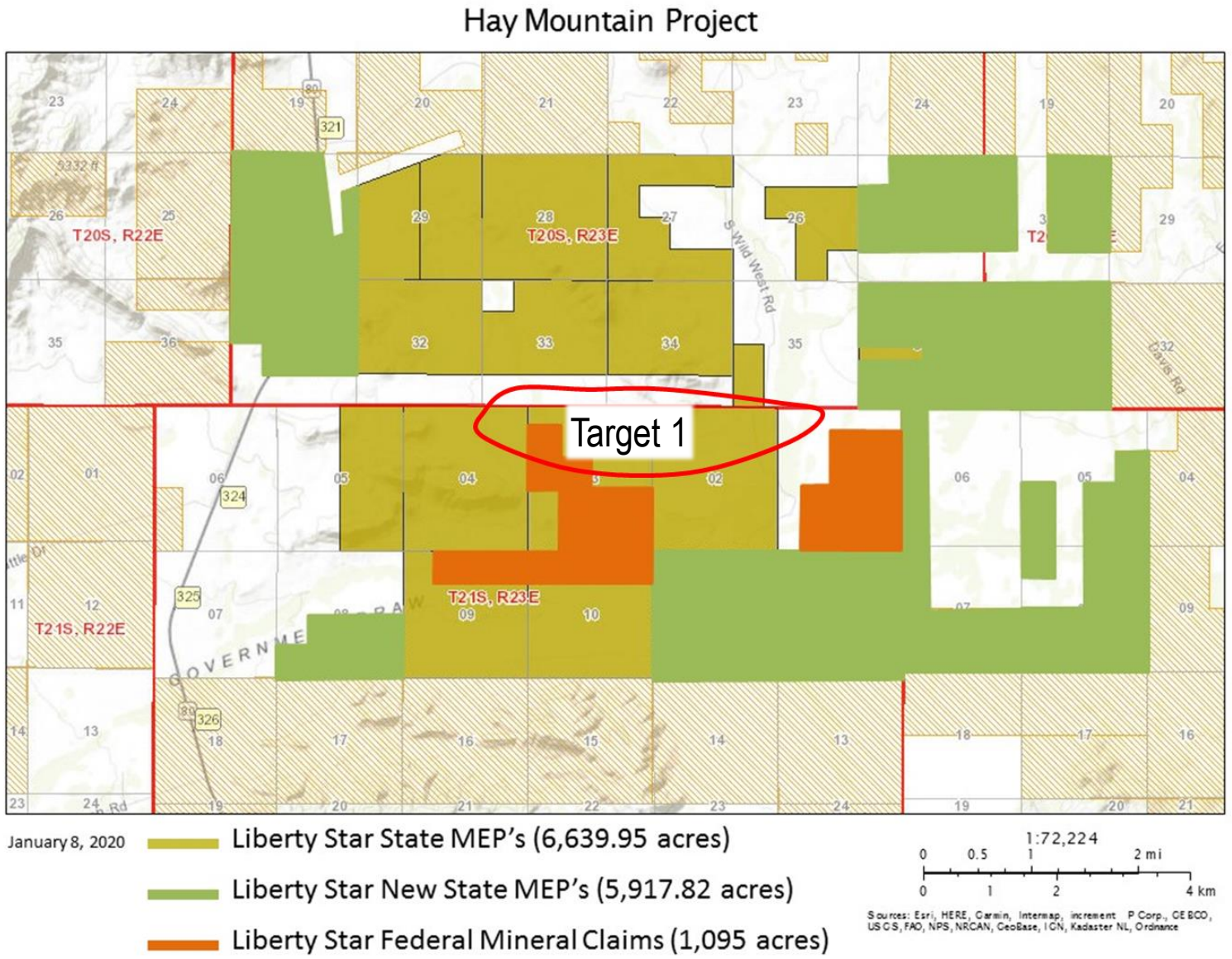

- Tenure not currently controlled by Liberty Star is Private Surface and Mineral rights, owned by local ranchers
- Property access is currently through private land to the east of Target 1
- New State MEPs secure property access from US Highway 80 to the west

Exploration History

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- 2005: Biogeochemical sampling & multi-element analysis – 162 samples
- 2011: Staking, geological prospecting and mapping
- 2011: Biogeochemical sampling & multi-element analysis – 609 samples
- 2013: Geotech heliborne ZTEM and airmag survey, 432 line km and interpretation
- 2019:
  - Drill target definition:
    - 3D ZTEM and 3D Magnetic inversion and interpretation by Geotech
    - 3D data integration and modelling by Alan King
    - Biogeochemical review by Dr. Pim van Geffen

Hay Mountain Geology

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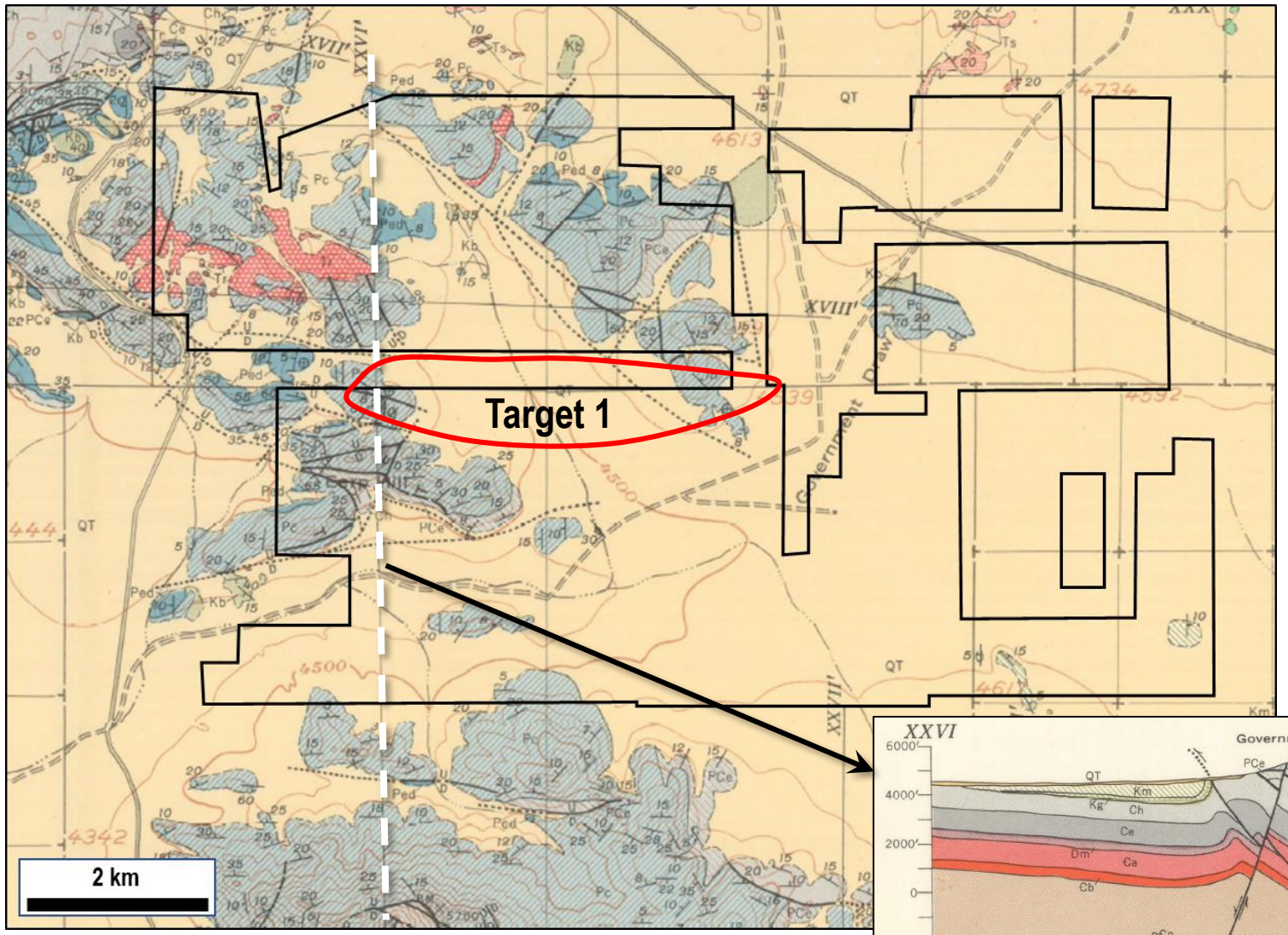
110°W

31°40'N



110°W

QT Alluvium & Gila conglomerate

Ti Intrusive rhyolite (Laramide)

Ped Epitaph Dolomite

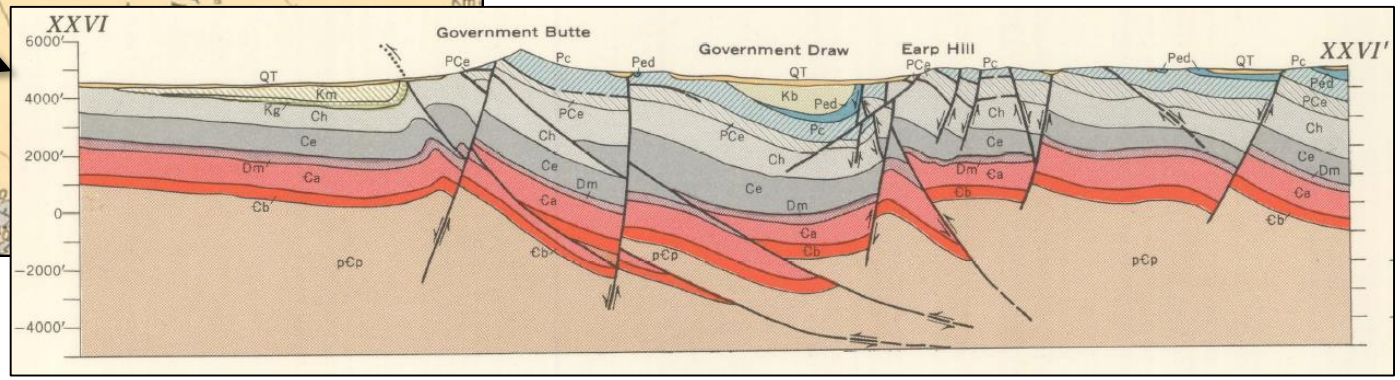
Pc Colina Limestone

PCe Earp Formation

Naco Group (Carboniferous)

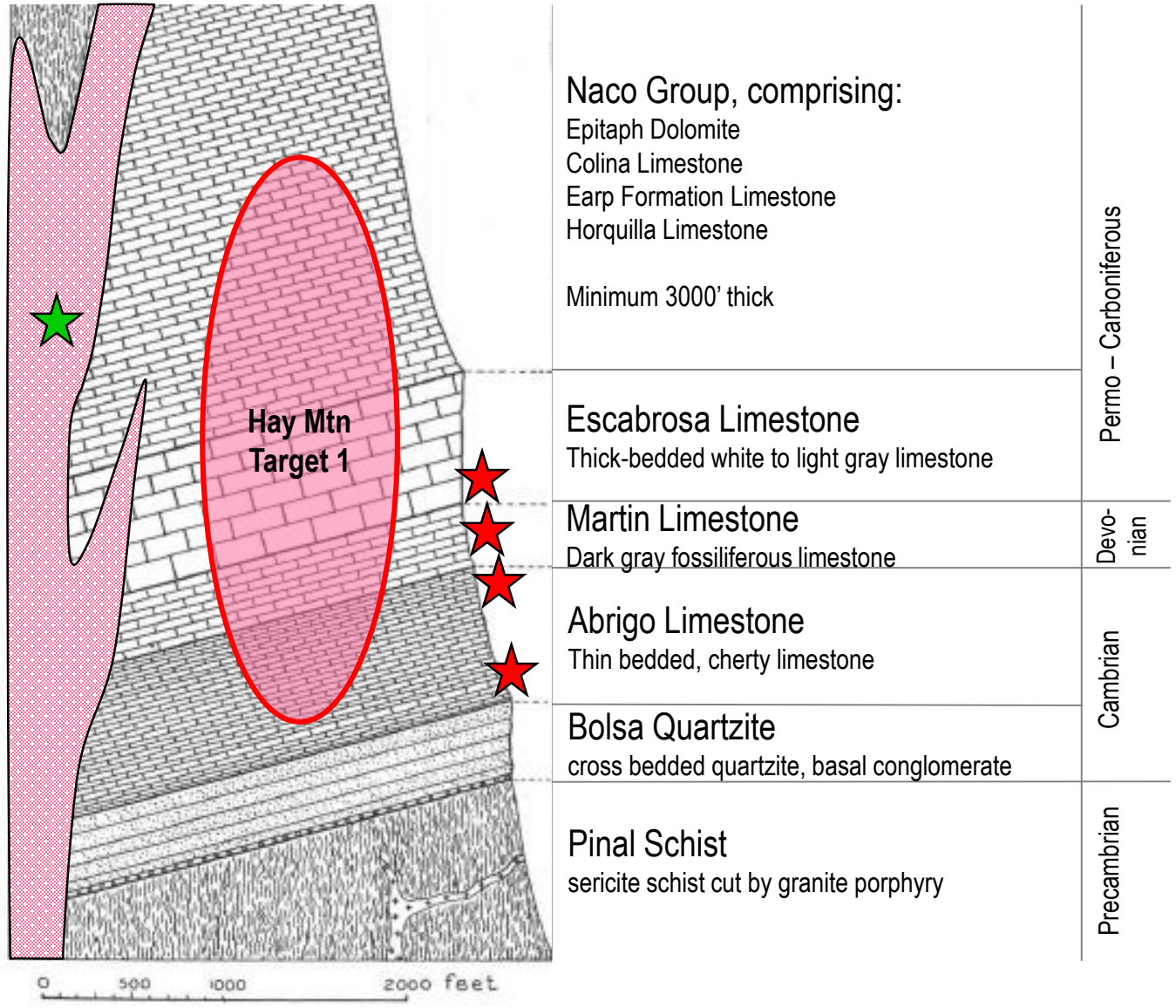
LS Tenure

Target 1 in structurally complex zone of intersecting NW and NE striking faults



Geology from Gilluly, 1956

Stratigraphy & Mineralization



Modified from Ransome, 1904

Porphyry Copper Ore

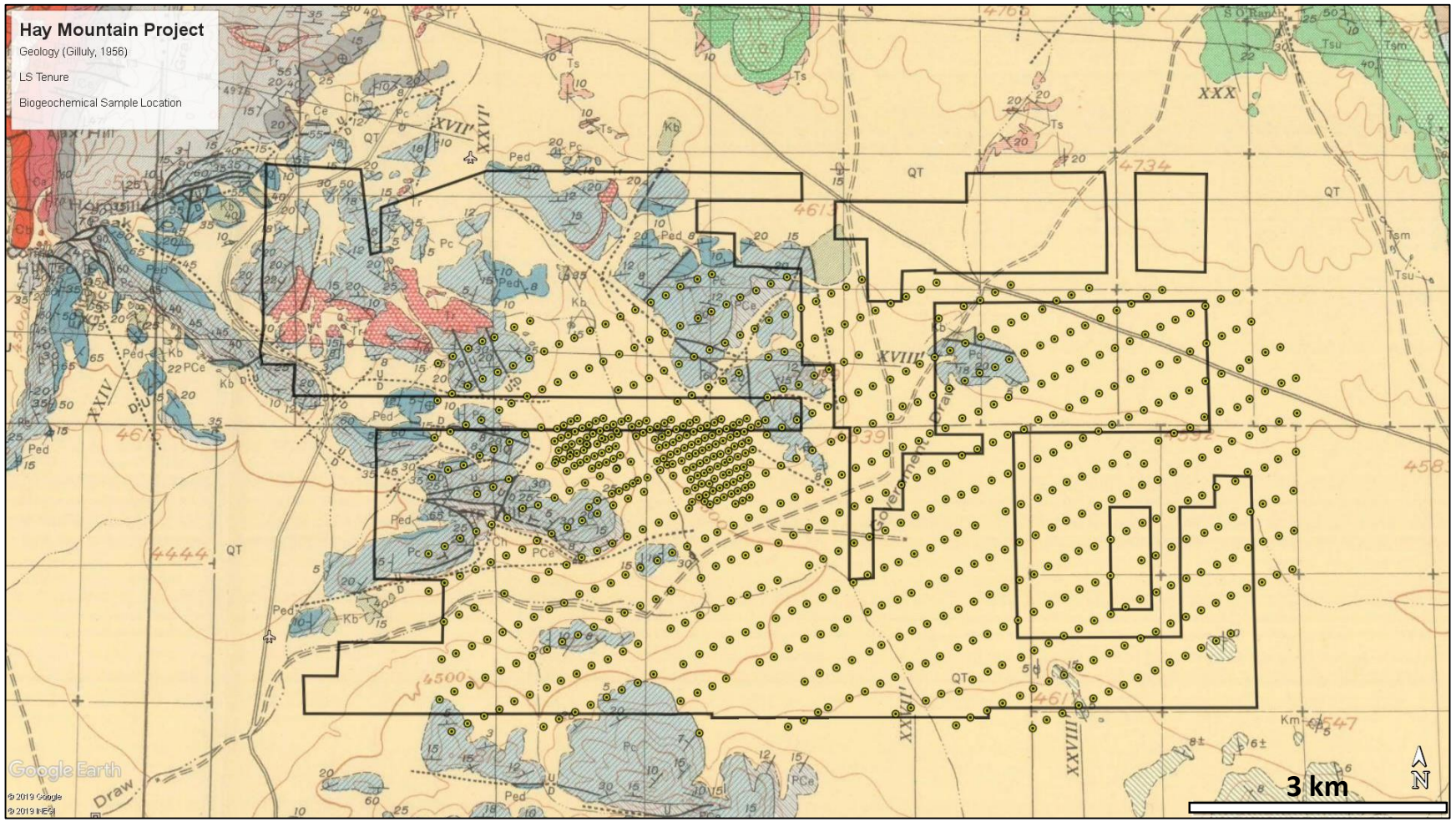
Manto / Chimney Ore

- Hay Mountain stratigraphy equivalent to, and above, Bisbee ore hosts
- Two main ore types at Bisbee:
  - Porphyry copper
    - Mined in the Lavender Pit
    - Estimated production*: 92.6Mt @ 0.81% Cu
  - Replacement
    - Bedding parallel "mantos" and structurally controlled "chimneys"
    - Aggregate production*: 53Mt @ 6% Cu
- Target at Hay Mountain is high grade replacement ore and related blind porphyry copper mineralization

* Stegen et al, 2005

Surface Geochemistry

- 772 vegetation samples collected
- Aqua regia digest, ICP-MS analysis
- QAQC and Z-score normalization completed
- Cu response corrected for root uptake of Mg
- Robust, multi-element anomalies evident in data



Target 1 Geochemical Summary

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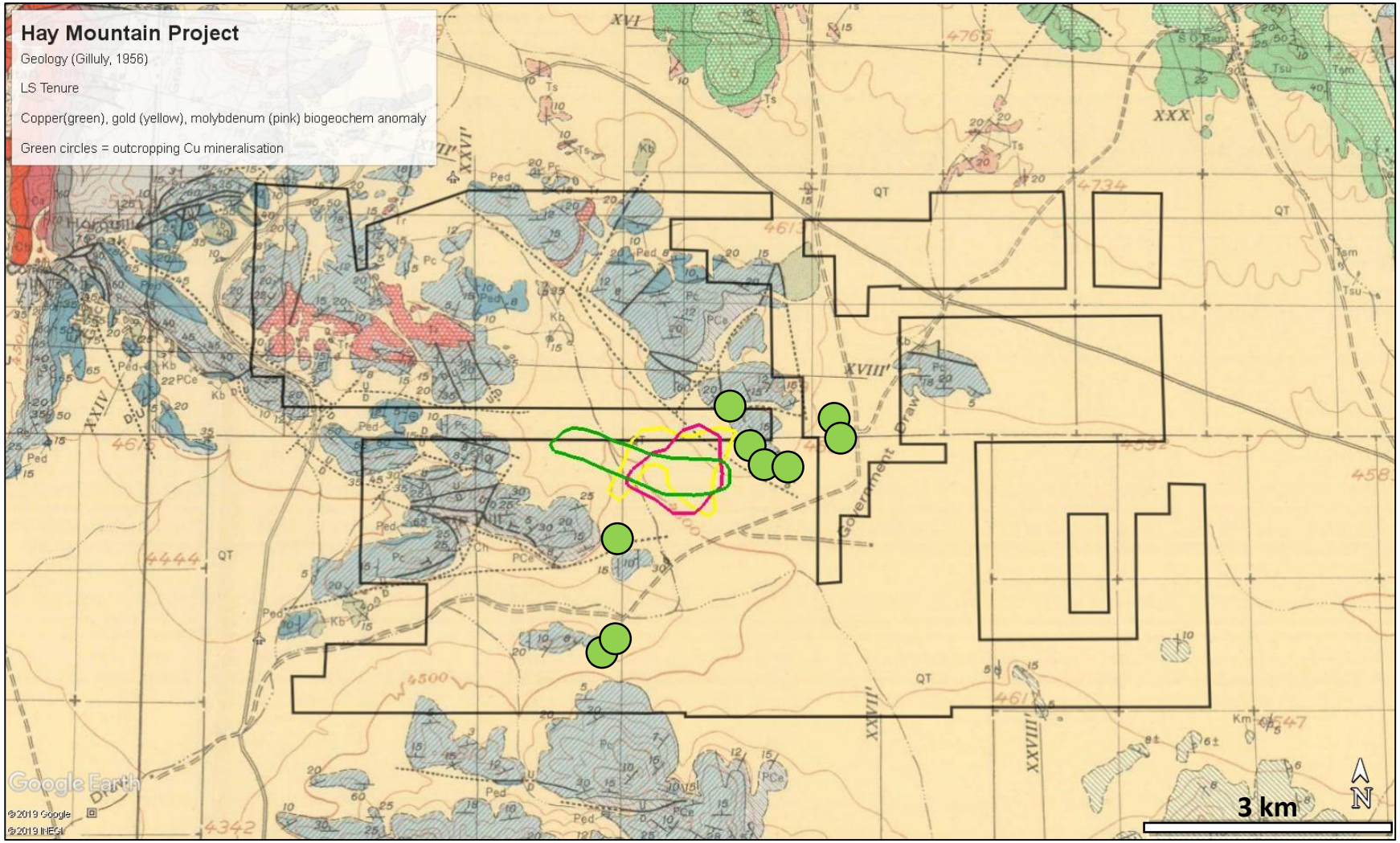
- Coherent and coincident copper – gold – moly anomaly defines Target 1
- Additional targets in dataset currently under evaluation
- Surface copper mineralization also evident at Target 1
  - Malachite – goethite – calcite - quartz on “leakage structures” within limestone
  - Stylolitic calcite veins
  - Similar style of mineralization found distal to skarn / CRD deposits in Central Peru



Outcropping Mineralization

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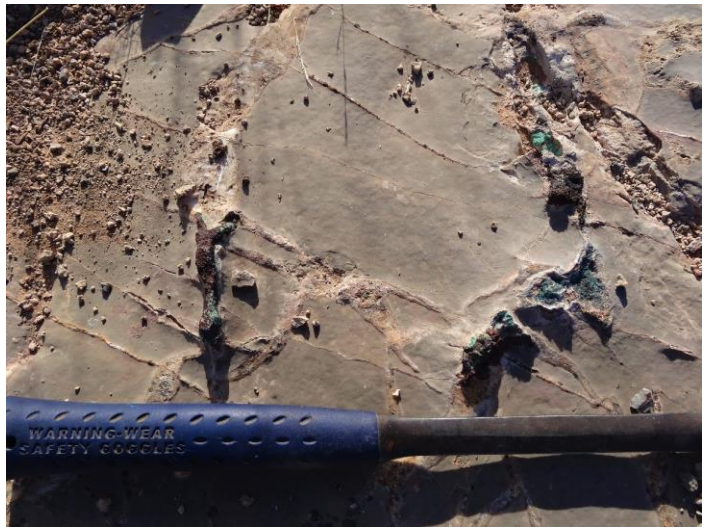
Hay Mountain

- “Leakage structures” present on surface, indicating an untested source of hydrothermal fluids at depth



Fracture-controlled calcite – malachite – goethite mineralization after carbonate – sulfide veins

Stylolitic calcite fracture fill in weakly calcite-veined limestone

Carbonate-hosted deposits, Peru

- By comparison, similar subtle indications of mineralization lies distal to major Cu-Zn polymetallic deposits in central Peru

Stylolitic calcite veins in weakly recrystallized limestone

Photos courtesy of R Tosdal

Geophysics

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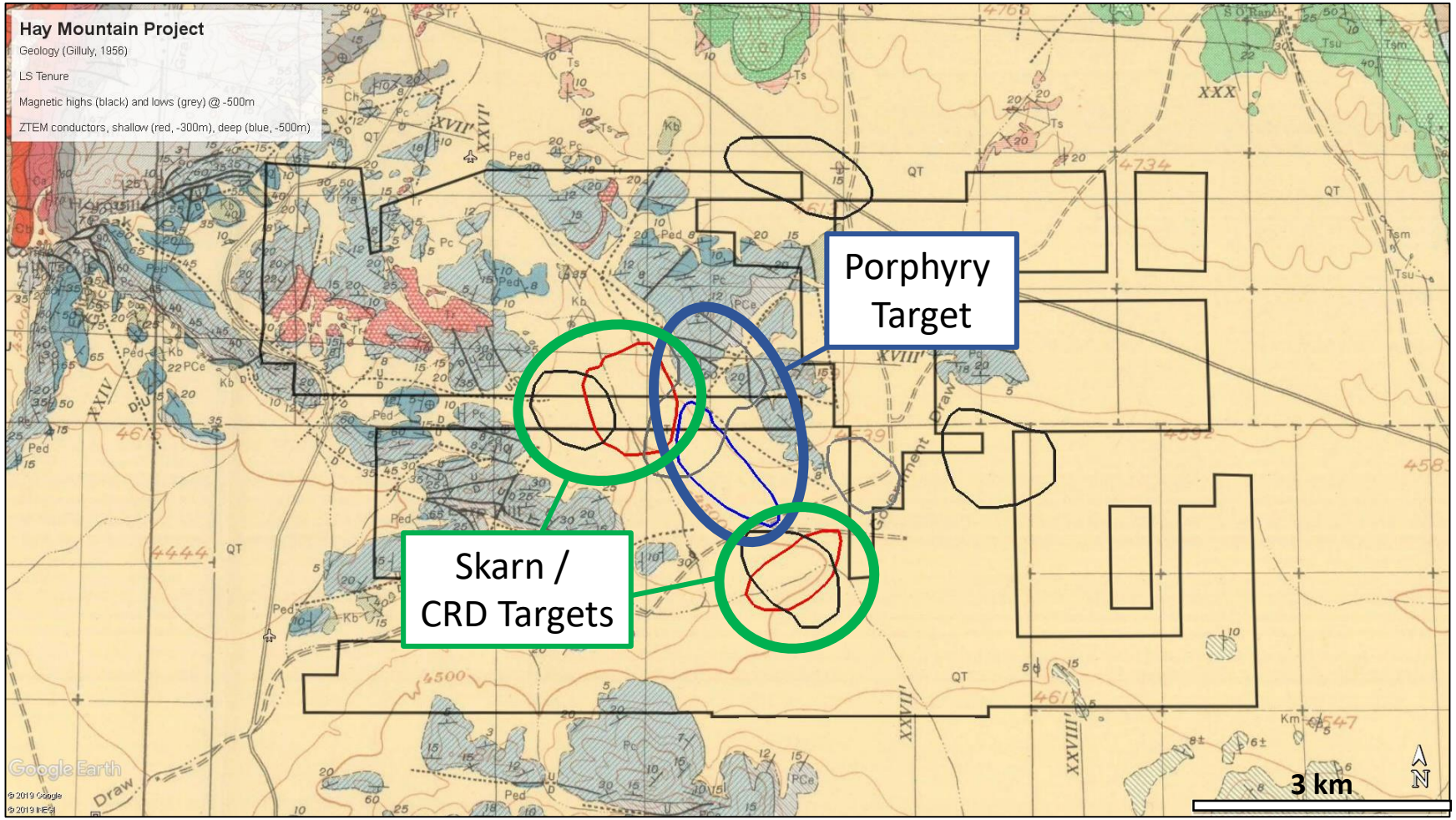
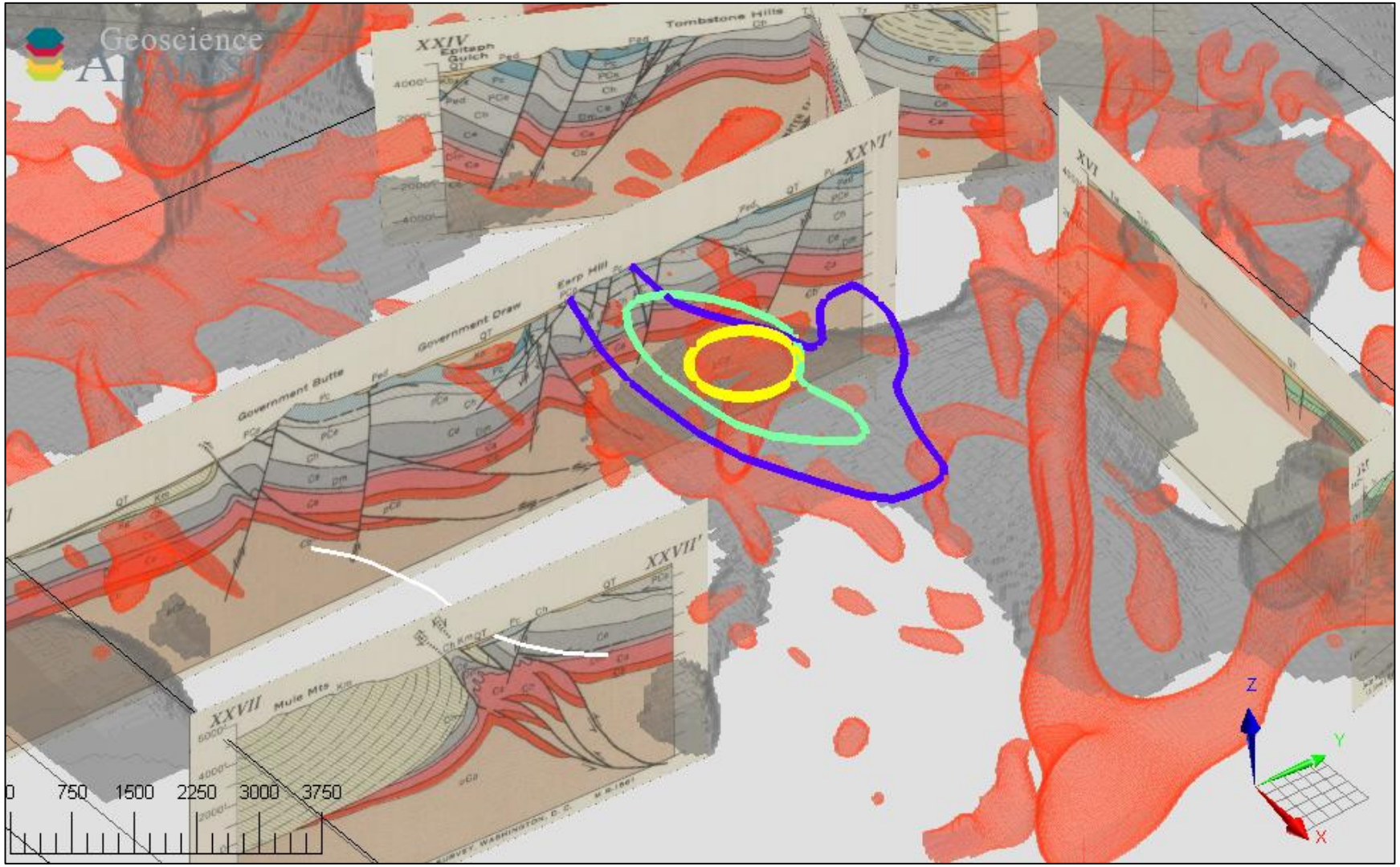
- Heliborne ZTEM & airmag survey completed by Geotech in 2013
  - 432 line km
  - 200m line spacing in south, 400m line spacing in north
- 3D inversion of ZTEM data and 3D magnetization vector inversion (MVI) completed in 2019
- Coincident ZTEM conductors and mag highs within and adjacent to Target 1
  - Skarn / CRD Targets
- Central mag low with ZTEM conductor at depth – Porphyry Target



3D Modelling

- 3D view from above, looking to NW
- ZTEM conductors (red) and MVI mag inversion (grey) show coincidence with Target 1 Cu (green) – Au (yellow) – Mo (blue) bio-geochem anomaly
- Cross sections illustrate structural complexity, with target aligning with mapped major NW-trending faults



3D Modelling

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- 3D view from below, looking towards the west
- This view shows the vertical continuity of a ZTEM conductor below the central gold (yellow) biogeochem anomaly
- Alignment of the biogeochem and ZTEM anomaly with major WNW striking normal and reverse faults is also apparent

Geological & Exploration Context

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- Multiple datasets indicate presence of a robust target that has never been drilled
  - Surface mineralization, akin to that above major carbonate-hosted deposits in Peru
  - Biogeochemistry – coincident multi-element anomalies
  - Geophysics
    - Magnetic highs, potentially indicating magnetite-bearing copper mineralization and intrusive source
    - ZTEM conductors, potentially indicating well-developed sulfide-bearing mineralization
- Region known to host porphyry and carbonate-replacement / skarn mineralization in same host rocks
  - Bisbee porphyry / skarn deposits (Freeport, exhausted)
  - Tombstone Ag-Au-Pb-Zn vein and CRD deposits (Aztec Minerals, active exploration)
  - Taylor – Hermosa Pb-Zn-Ag CRD deposit (South 32, mine development)
- High grade targets, easily tested by drilling

Forward Strategy in 2020

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- Corporate restructuring to optimize JV opportunities
- Secure JV partner for drill testing of Hay Mountain
  - Q1:
    - Discussions initiated with several potentially interested major mining companies
    - Execute NDAs and provide data access for detailed due diligence by interested major mining companies
  - Q2:
    - Conduct field reviews and negotiate JV terms
    - Execute commercial agreement
  - Q3-4:
    - Drill testing of priority targets
- Leverage proprietary data sets to develop pipeline of targets in broader Hay Mountain district for Liberty Star

Corporate Overview

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Liberty Star Uranium & Metals Corp.

(d/b/a Liberty Star Minerals)

2 E Congress St, Ste 900

Tucson, AZ 85701

Website: www.lbsr.us

Share Information: https://www.libertystaruranium.com/investors/xbrlfinancial-statements/share-structure/