



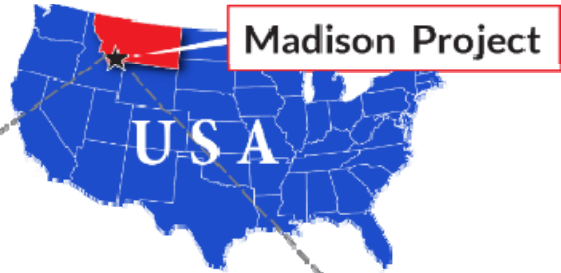
BROADWAY GOLD MINING

Exploration Tools Used for a New Porphyry Discovery at the Madison Copper-Gold Project

By Phil Mulholland, for Broadway Gold Mining Ltd
Contributing studies by John Childs, Rex McLachlin at Childs Geoscience
And Jarred Zimmerman, Broadway Gold Mining Ltd



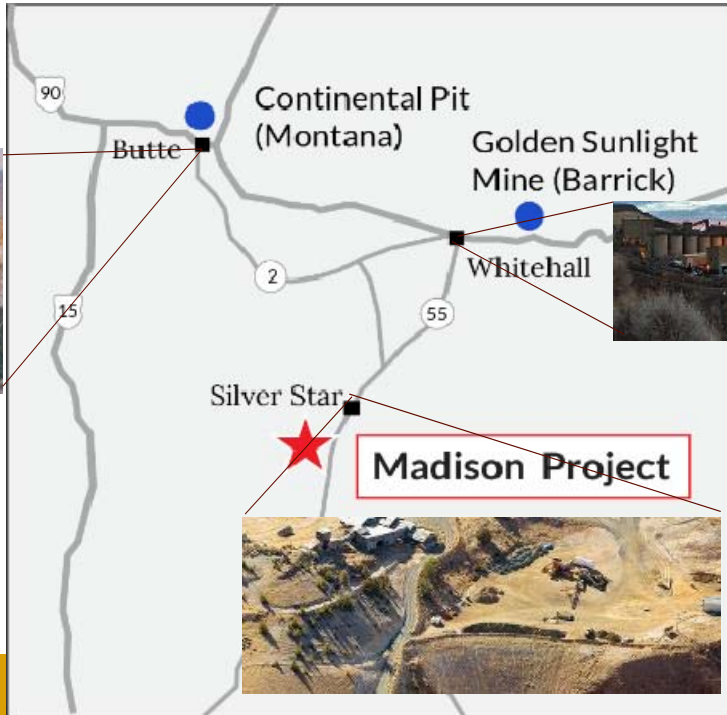
Mine Design, Operations & Closure Conference May 2018



 **Montana Resources**



Cu-Mo porphyry




BARRICK



Au-Ag breccia pipe

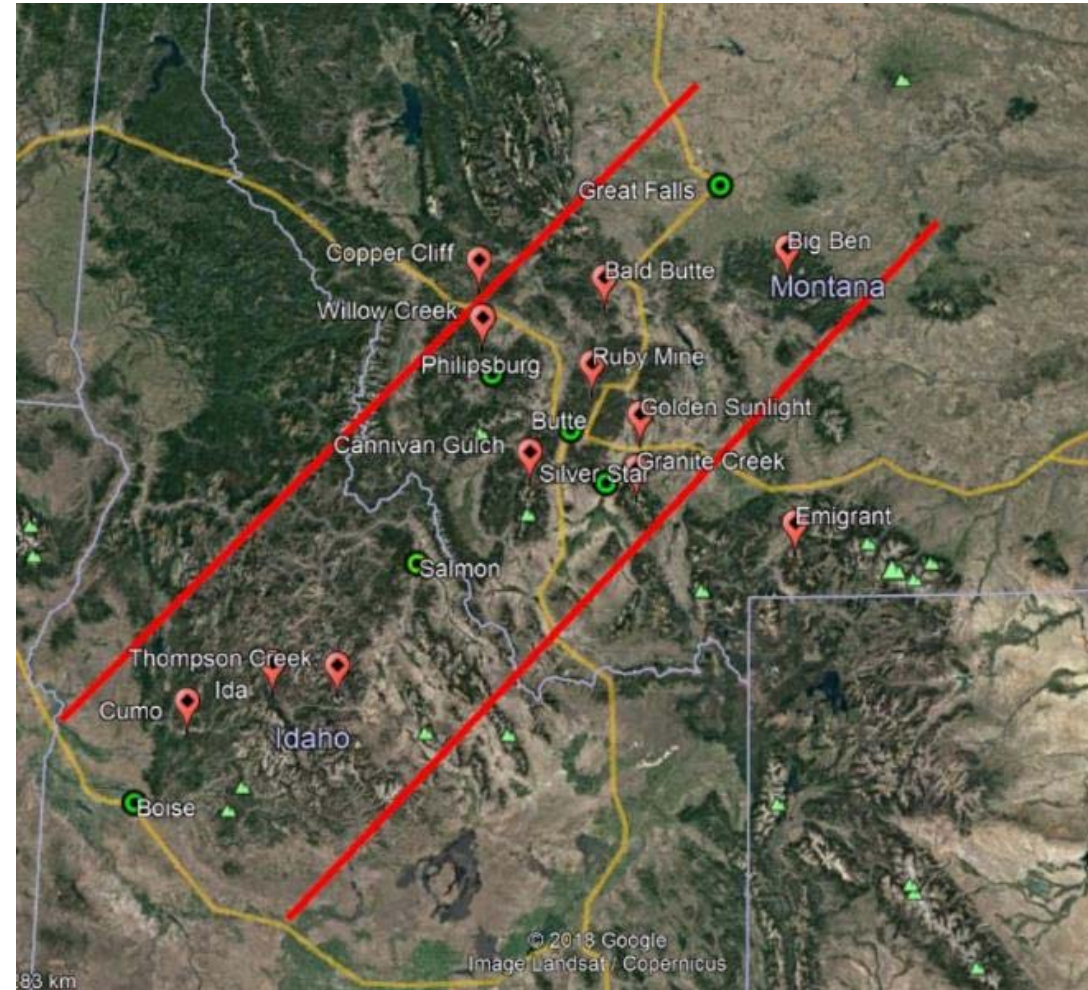



BROADWAY GOLD MINING
Au-Cu skarn



Great Falls Tectonic Zone - Porphyry Belt

- Diverse belt of northeast trending geologic features
- Boise Basin Idaho to southwestern Saskatchewan
- Continuous zone of high angle faults and shear zones
- Controls intrusive activity and related mineralization





Broadway / Madison History

Broadway Mine – UG gold mining 1880-1950s

Developed to a depth of 650 feet, and 2000 feet of lateral development, producing 144K ounces of gold

Berglynn 1983: 25 core holes 12,009 feet

Inspiration 1986: 19 core holes 5,004 feet; 15 RC holes 4,605 feet

Historic resource estimate of 1,406,400 tons averaging 0.102 opt Au
- First mention of deep porphyry target

Western Energy 1987: 2 core holes 1,589 feet; 4 RC holes 1,430 feet

Historic resource estimate of 1,125,000 tons averaging 0.090 opt Au
1988: 9 core holes 2,560 feet; 8 RC holes 3,191 feet

BMR Gold 1992: Historic resource estimate of 1,000,000 tons averaging 0.090 opt Au and 1,900,000 tons averaging 0.64% Cu. Again mention of a deep porphyry target

1994: 5 RC holes 2,945 feet



Coronado 2005-2016: 32 core holes 7,617 feet

2007: Underground mine development

2007-2012: Production 7,570 oz Au; 2.6 M lbs Cu

2012-2016: Care and Maintenance

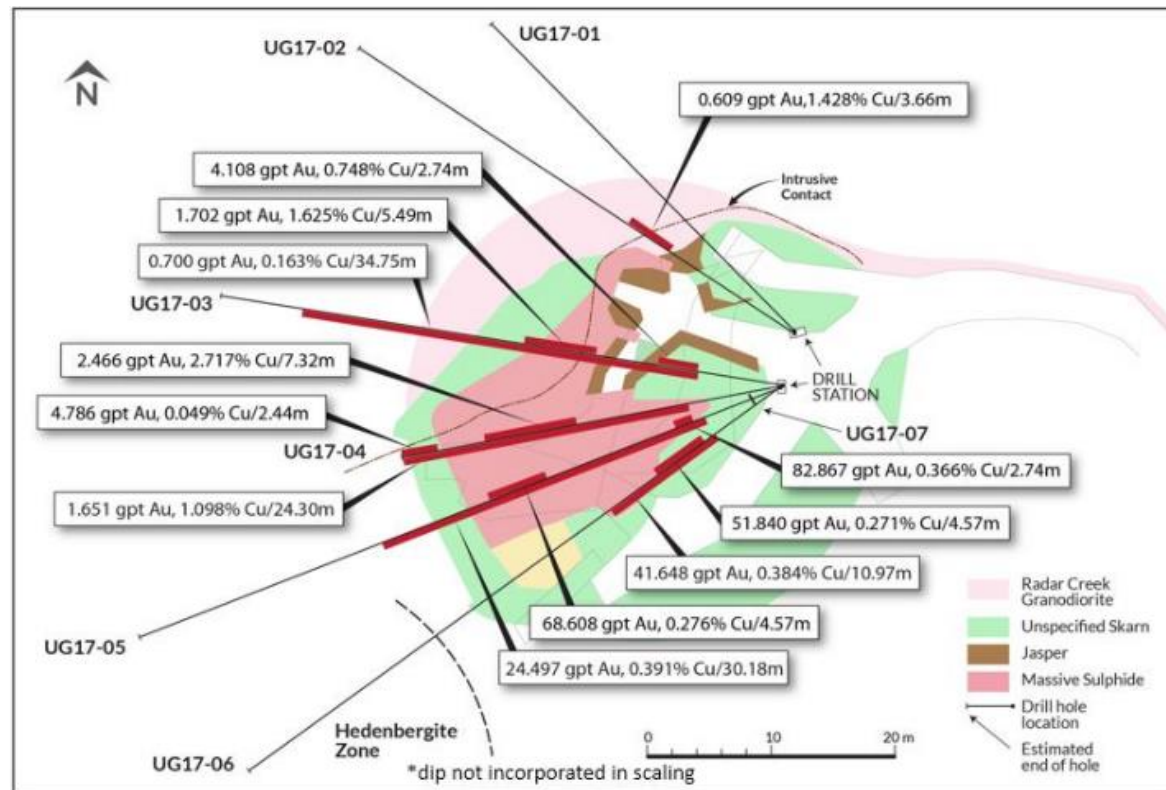


Broadway Exploration Program to Date

Broadway Gold Mining Ltd. – 2016-Present

- Surface mapping and sampling
- Underground rehab to 600 level (Jan. - March 2017)
- Phase 1&2 Surface drilling (Jan. - April 2017)
19 drill holes for 13,071 feet
- Underground drilling below 600 level (March - April 2017) 7 drill holes for 1,008 feet
- Data Compilation and 3D Vulcan Modeling
- Geophysics: Magnetics, IP, EM, Mise ala Masse
- Soil and Rock Geochemistry
- Identifying a 2-mile-long trend of geological, geophysical and geochemical anomalies
- Phase III Surface Drilling – Skarn Zones and Cu-Au Porphyry Target (August-Jan 2018)

600 Level Plan Map showing UG Drilling





Phase III Core Drilling

AK Drilling Inc., Butte, MT

Evaluate exploration targets along a two-mile geological, geophysical and geochemical trend. Four high priority targets: jasperoid skarn (Cu Zone), epidote skarn, massive sulfide and the initial test for a copper porphyry

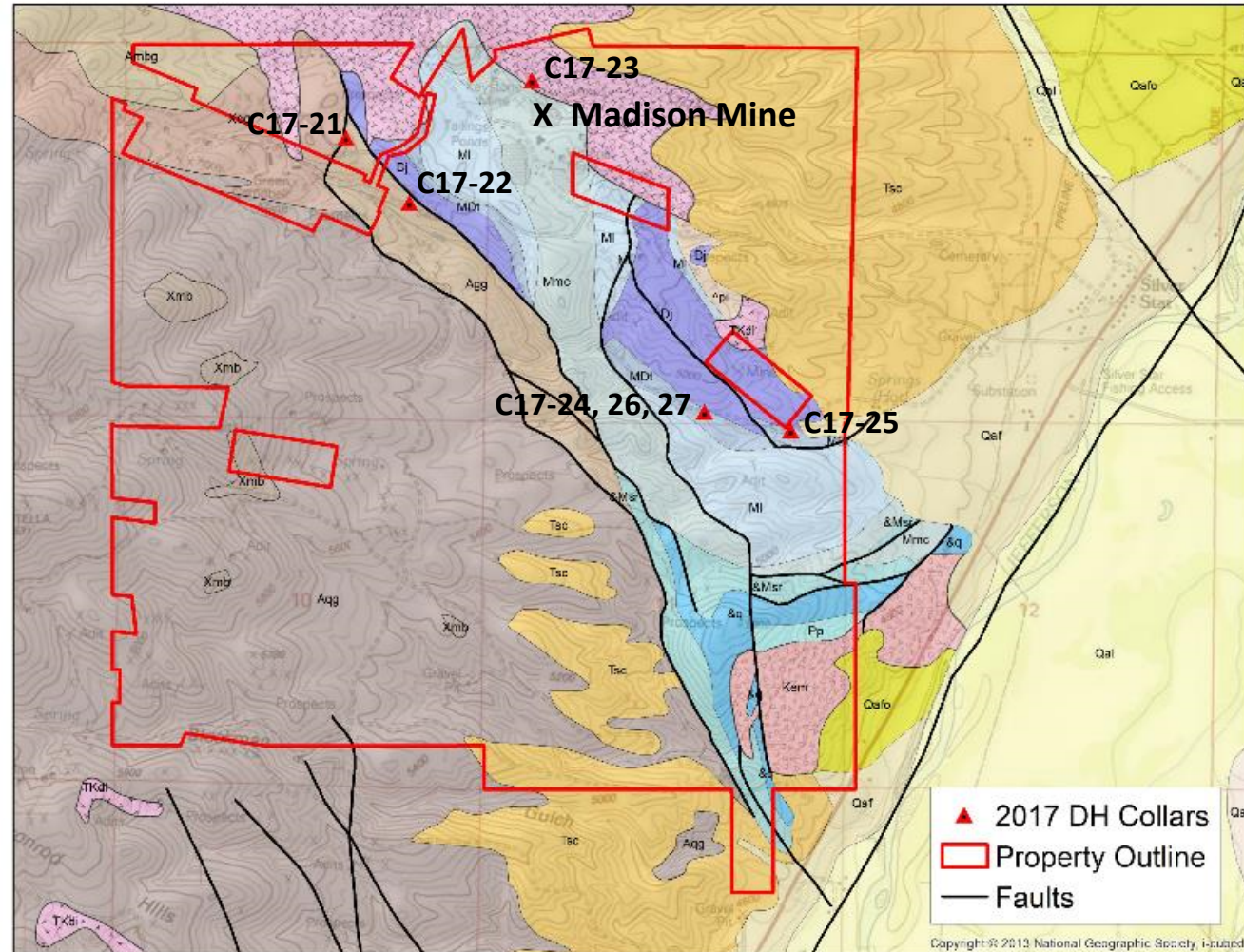
7 core holes 7,621 feet





Exploration Tools

- Understand regional and district geology
- Geologic mapping
- Soil and rock chip geochemistry
- Remote sensing
- Geophysical techniques: magnetics, EM, IP/Resistivity
- Drilling



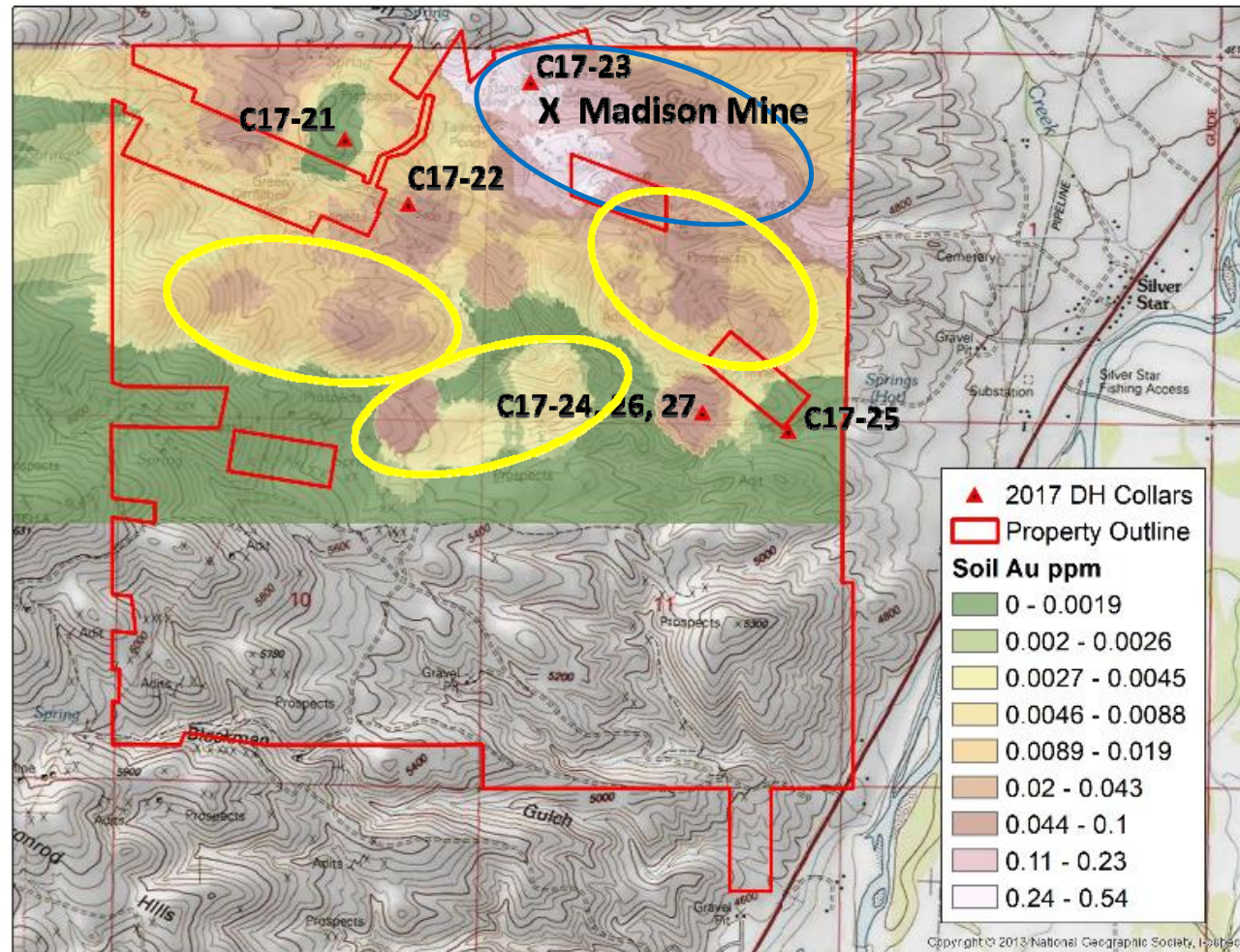
Geologic mapping by M. Foote, 1987 and MBMG Geology of Butte South, 2012
Slide prepared by R. McLachlin, Childs Geoscience



Soil Geochemistry

Work by Broadway identified extensive gold anomalies in soils

Some areas have been filtered out due to historic contamination

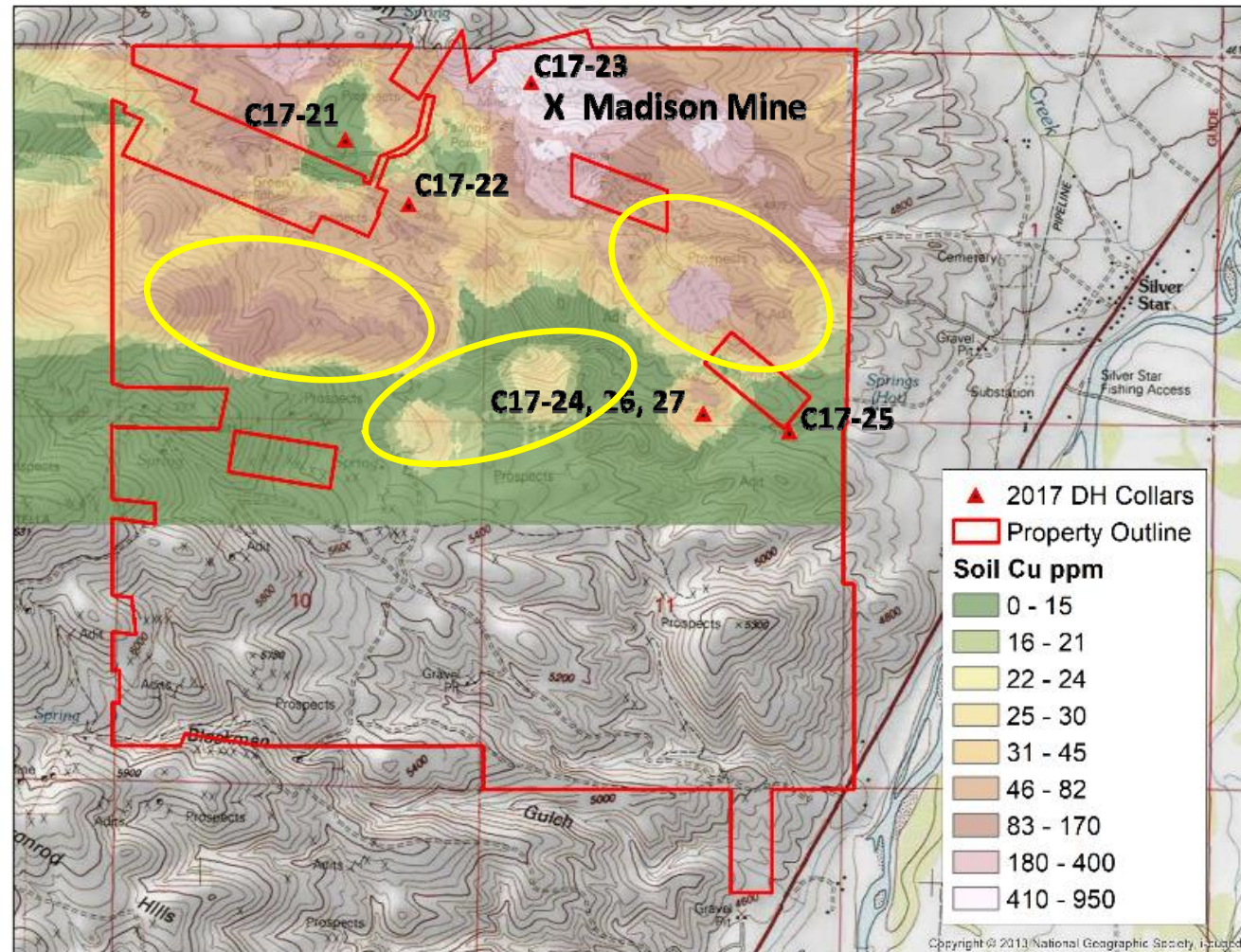


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Soil Geochemistry

The oval shapes define three areas consistently anomalous in elements associated with the upper levels of porphyry deposits – Sb, Bi, Ag, As, Au, Cu, Li, Mn, Mo, Pb, Rb, Se, Sr, Te, Tl, Zn

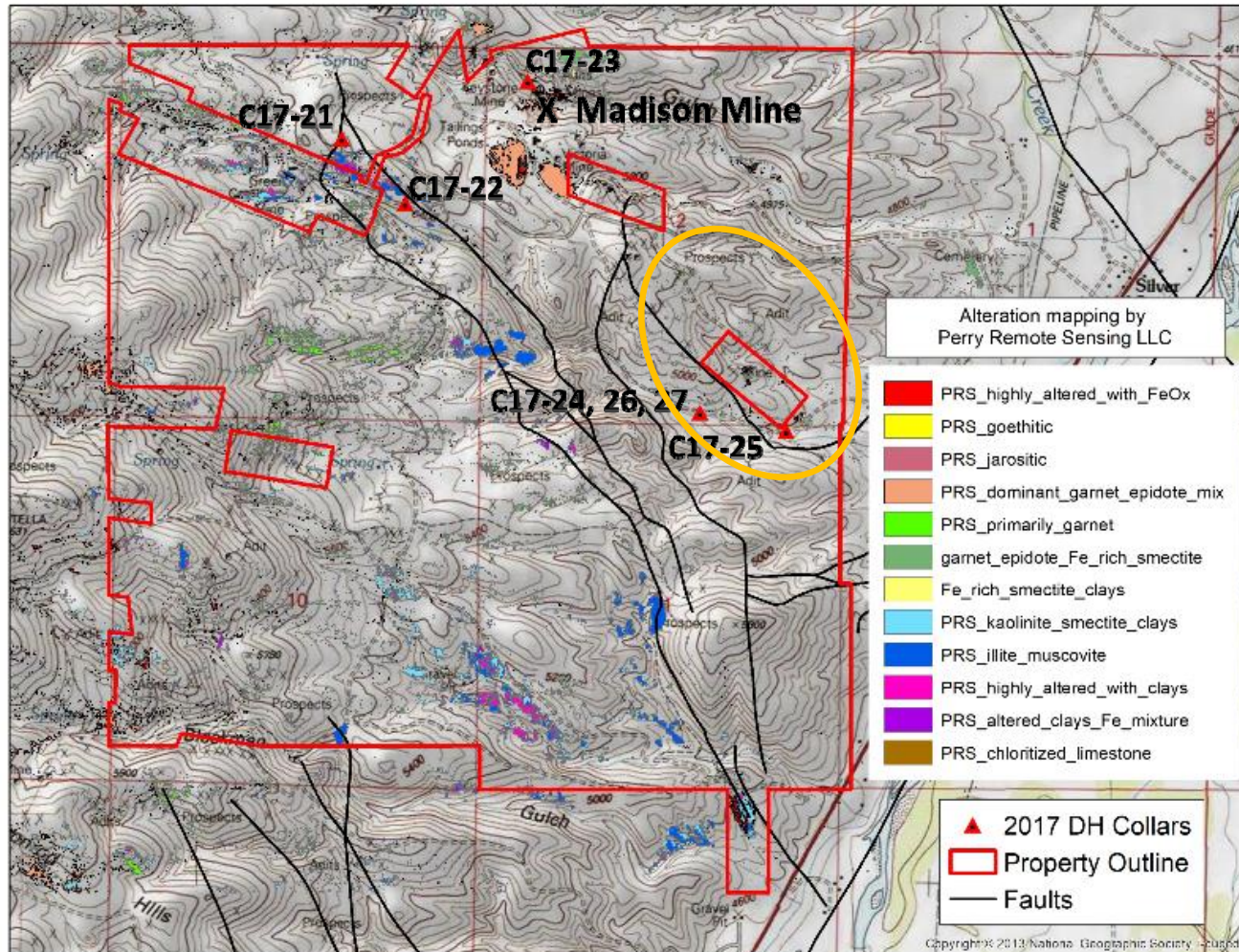




Remote Sensing

WorldView-3 Satellite Imagery using visible, near-infrared and shortwave-infrared wavelength bands

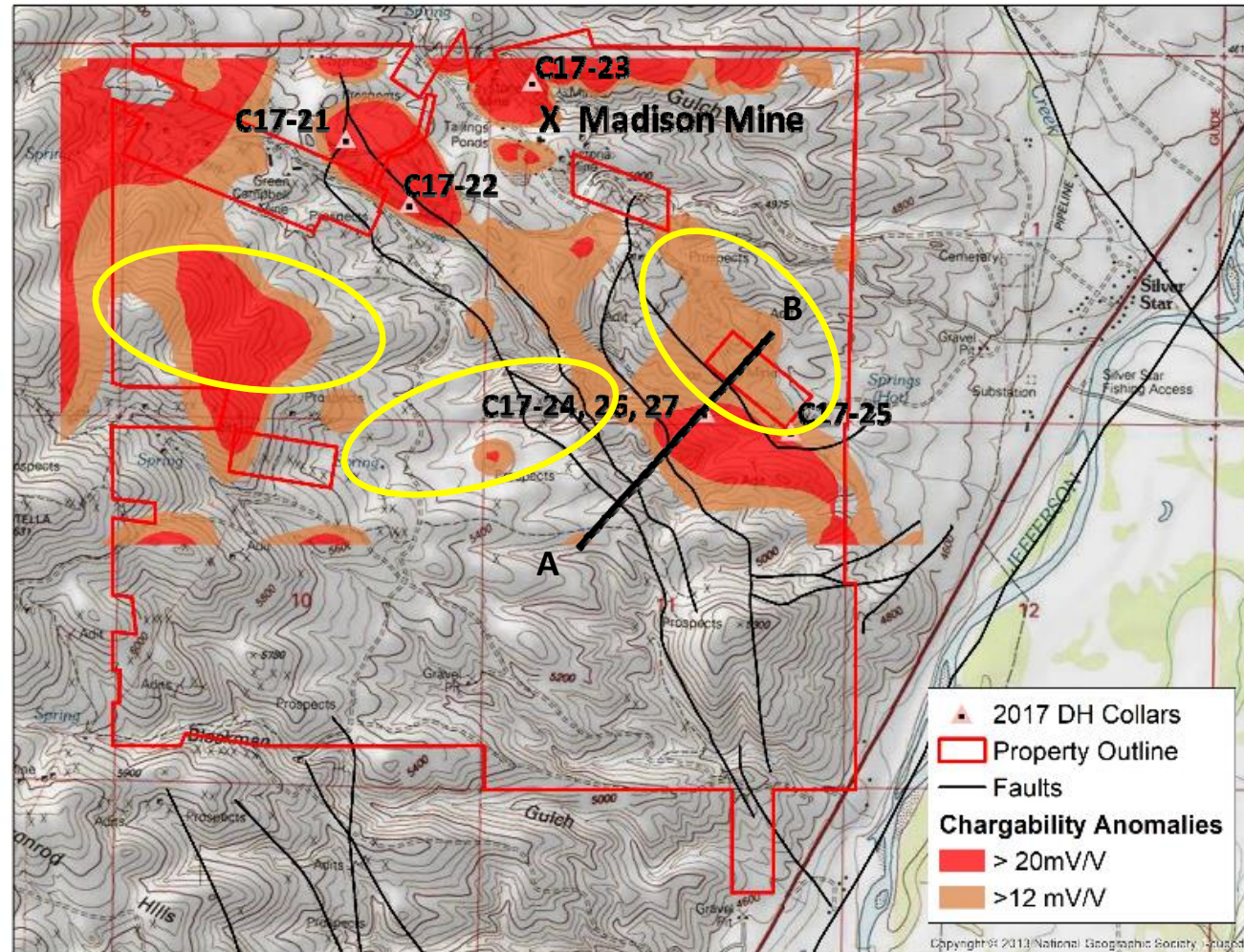
The Eastern soil anomaly shows abundant jasperoid pervasive chlorite and minor kaolinite/smectite clay alteration throughout the area. Again, consistent with the outer portions of a porphyry system.





Soil Geochem and IP Anomalies

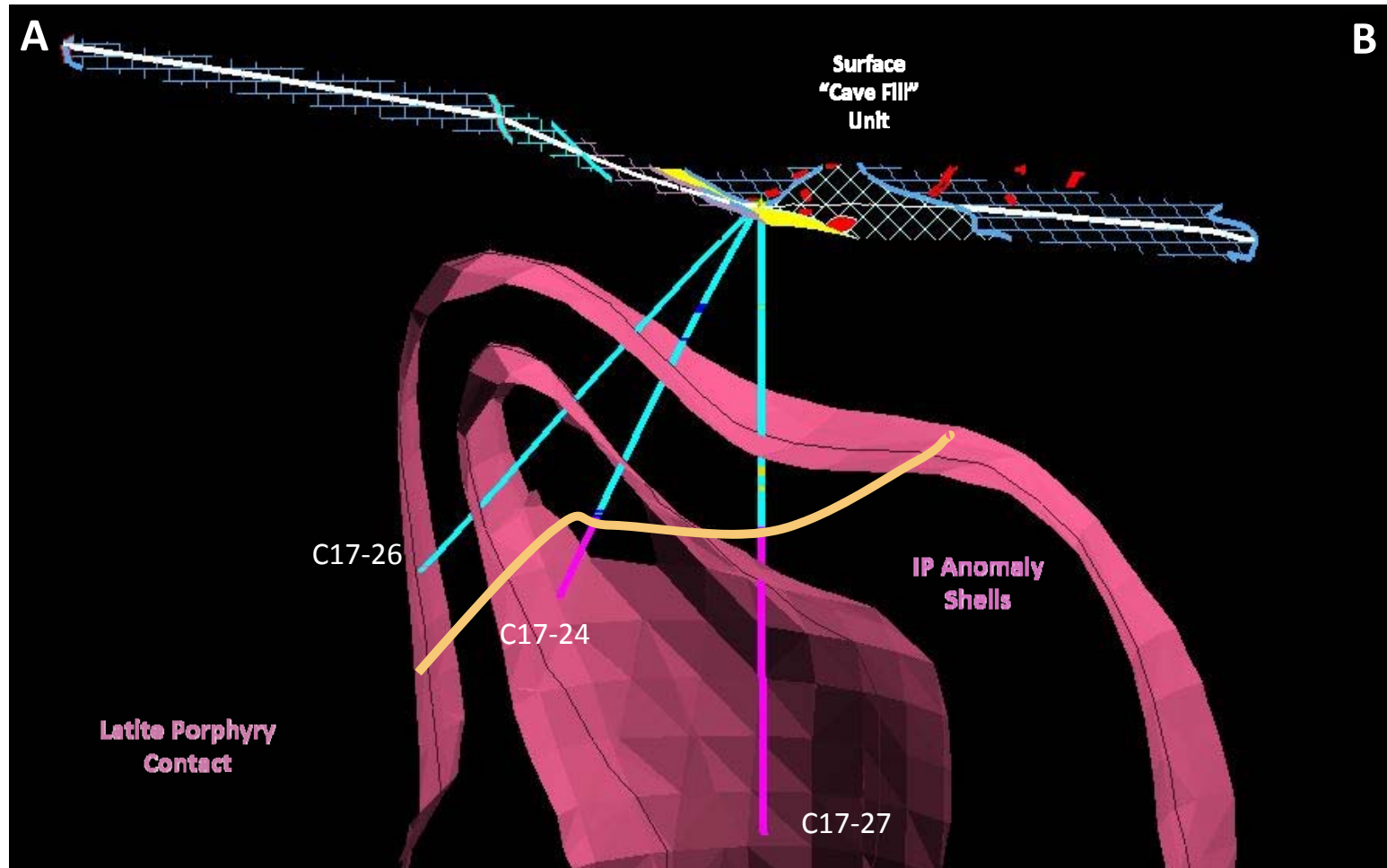
Two of the three geochem anomalies are associated with chargeability highs





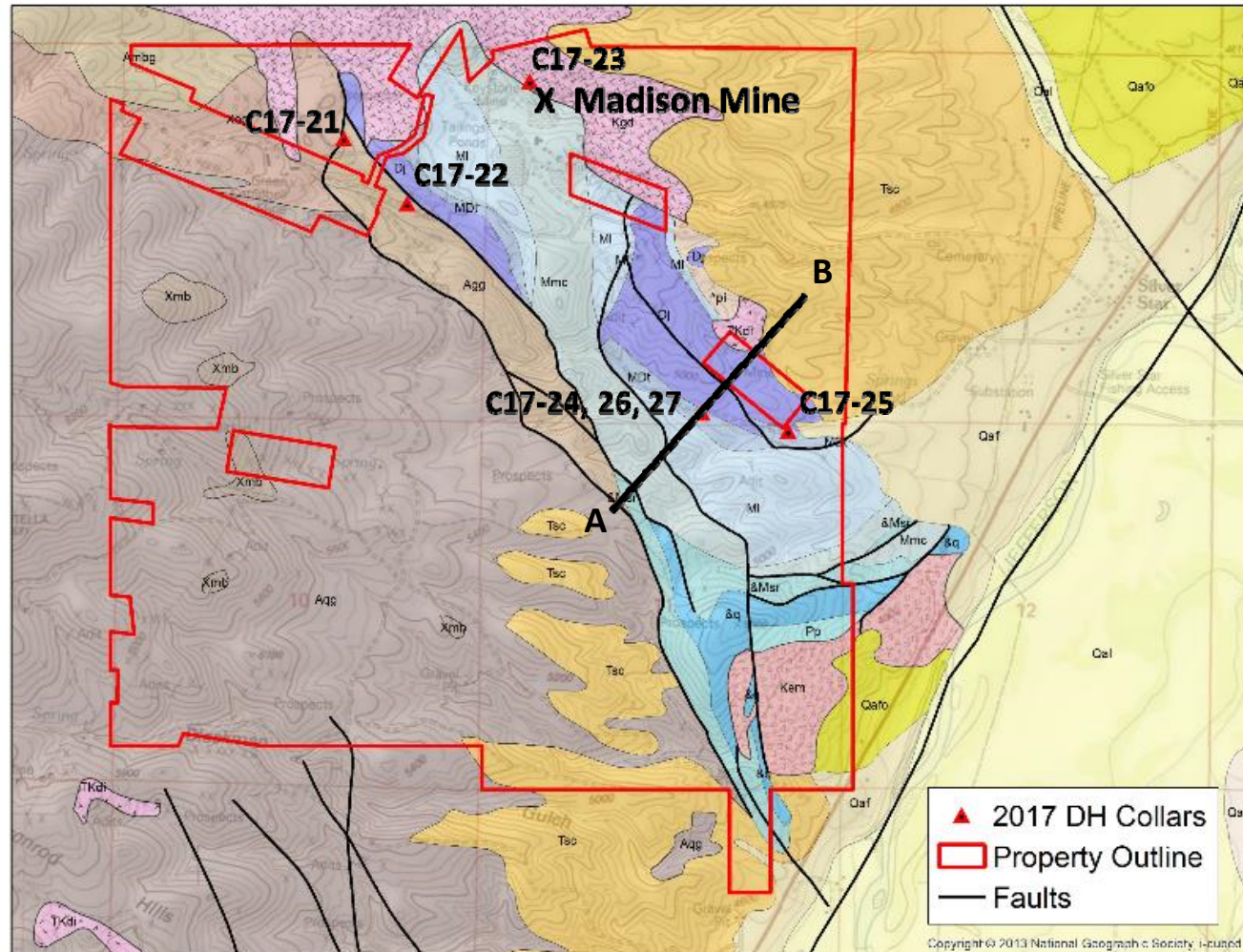
3D IP Anomaly Shells

- 12 and 20 mv/v





Cross-section A-B Through Porphyry Target



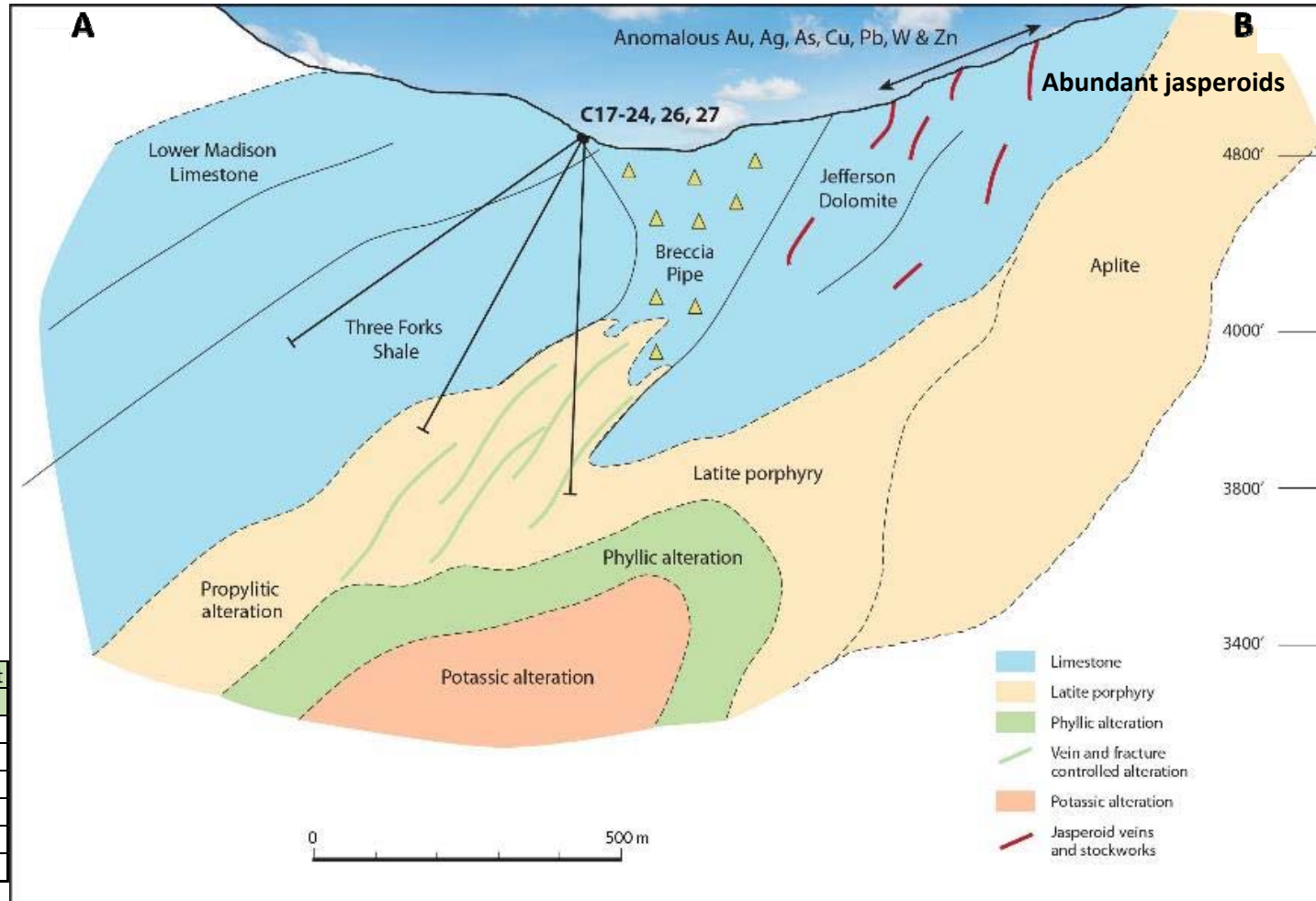


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Geochemistry in weighted averages

Core Geochemistry in C17-27	892 to 1,190 feet	1,190 to 1,676 feet
Alteration Zones	Propylitic (ppm)	Phyllic (ppm)
Gold	<0.001	0.026
Silver	<0.05	1.0 (4.7 high)
Copper	46	130
Manganese	657	1,100
Lead	20	91
Zinc	63	187





C17-24 carbonate latite porphyry contact



Latite porphyry showing phyllic alteration



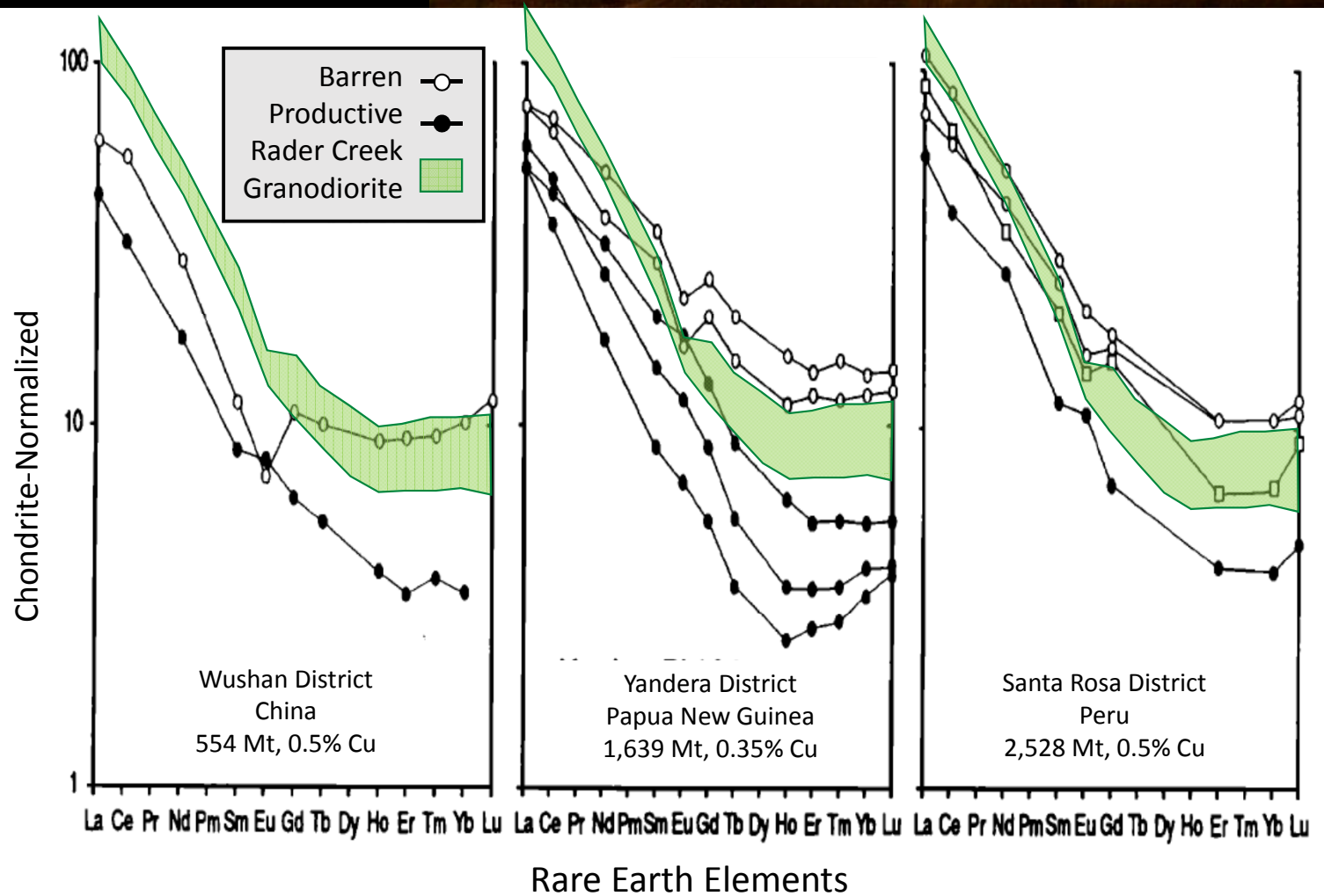
Latite porphyry showing propylitic alteration with phyllic alteration selvages around pyrite micro-veinlets



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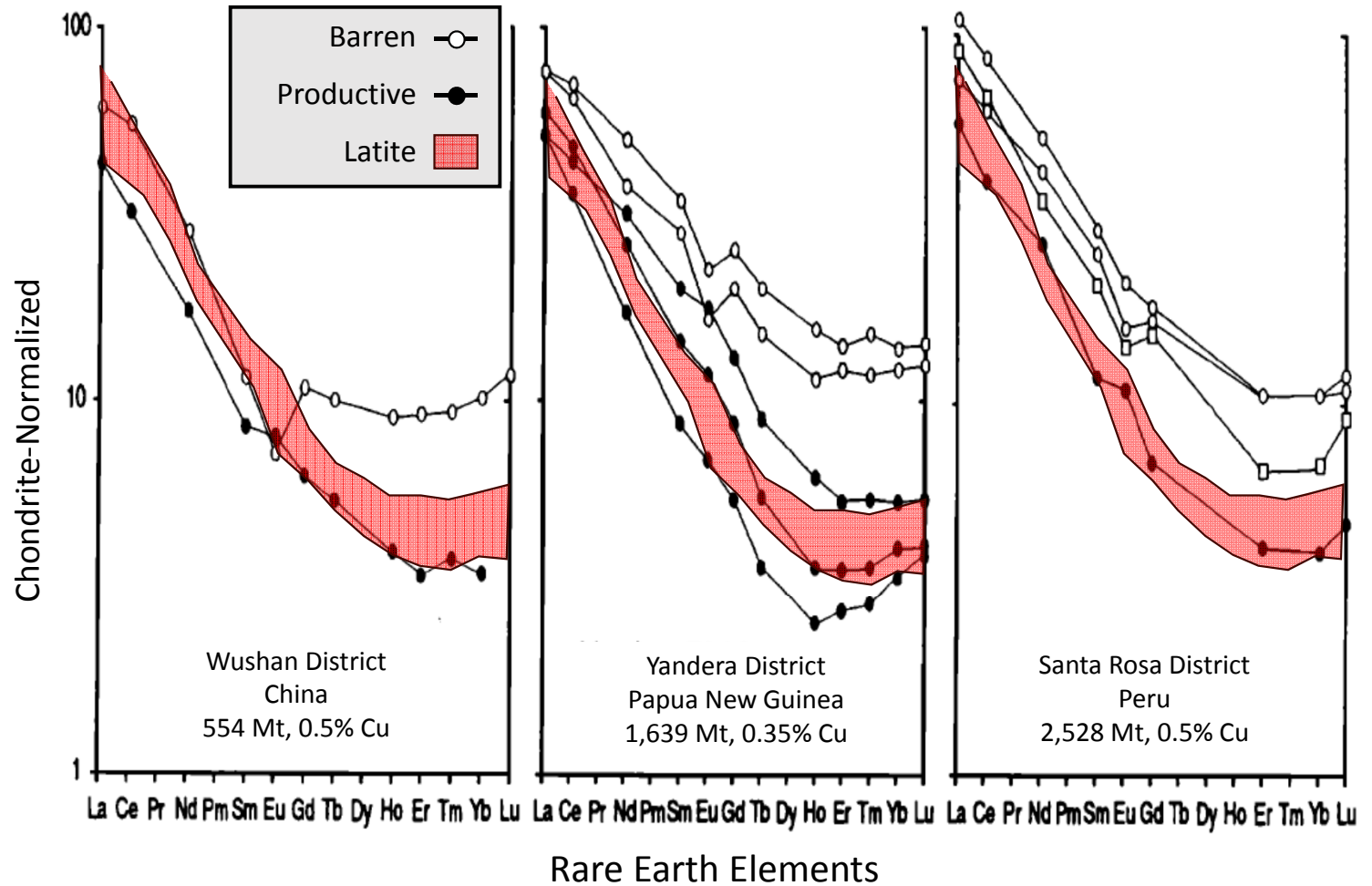
Many porphyry systems evolve from early, drier and barren magmas to water saturated productive systems over time

Early, barren intrusions feature flat HREE patterns and flat to negative Eu anomalies





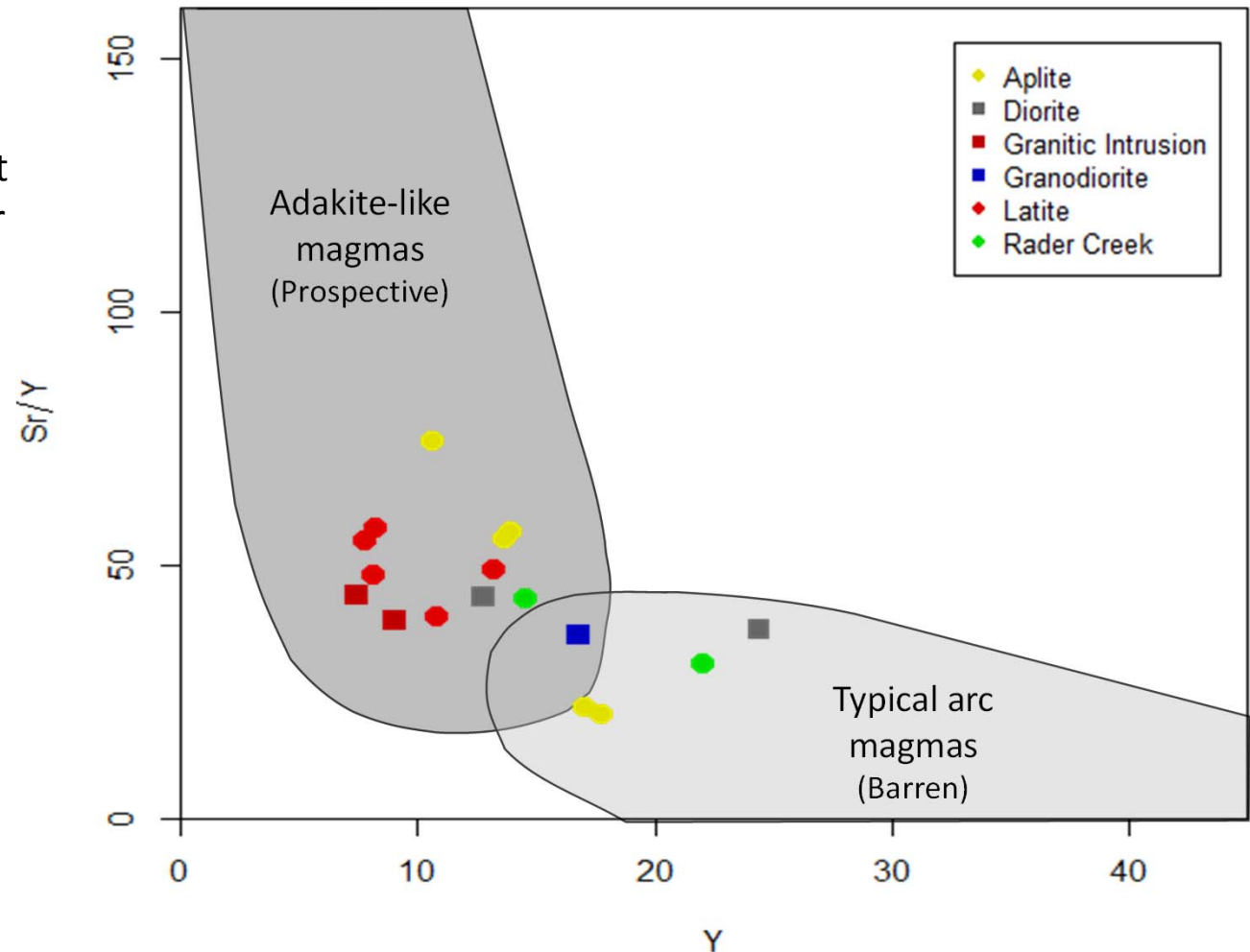
Later economic to sub-economic porphyries are less enriched in LREE, strongly depleted in HREE and lack europium anomalies





Whole Rock Geochemistry

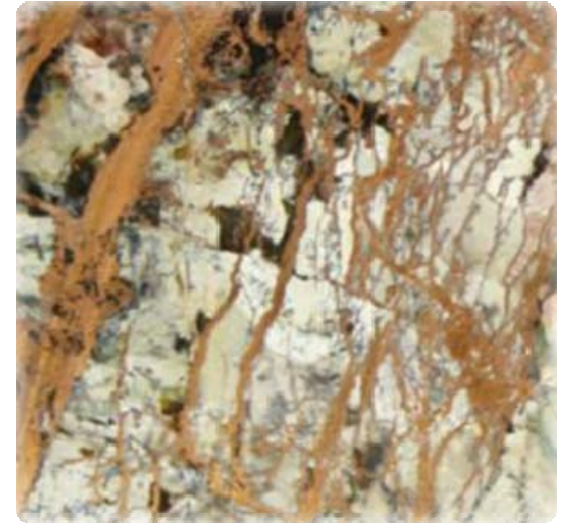
- Magmas emplaced in the lower crust stay partially molten long enough for repeated cycles of replenishment. This allows for the accumulation of magmatic H₂O and eventually volatile saturation.
- High magmatic water content and high pressure fractionation encourages hornblende crystallization and suppresses plagioclase. This will increase the Sr/Y ratio as the magma evolves
- Low Y and high Sr/Y ratio suggests a deep hydrous source and has potential to form large deposits





Conclusion

- Understand Regional and District Geology
- Geologic mapping, (historic and recent)
- Soil and rock chip geochemistry
- Remote Sensing (follow-up continues)
- Geophysical techniques: magnetics, EM,IP/Resistivity
- Drilling
- Commitment



Using a multiple tool approach and commitment to deep drilling has enabled us to re-interpret an old skarn district into a new porphyry district



Future Programs

Based on:

- We have identified multiple intrusive events and multiple mineralizing events
- Radar Creek Granodiorite is Cu rich – Skarn related
- Latite Porphyry is Au rich – jasperoid related, occurring later
- Supergene Cu-Au mineralization
- Exploration Implications, evidence for breccia pipes

Next Program:

- Deeper IP Survey based on depth to porphyry (200m dipole)
- Drill to identify the core of the system (potassic alteration) and the more mineralized section of the porphyry system
- Renewed exploration model based on evidence for breccia pipes

