

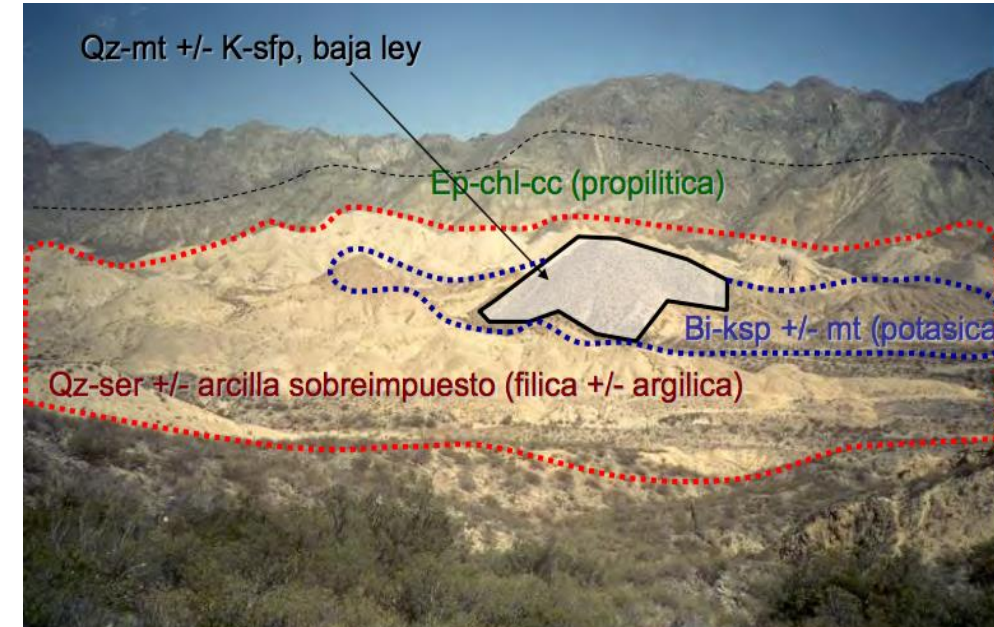
WHITE MICA GEOCHEMISTRY OF THE COPPER CLIFF PORPHYRY CU DEPOSIT: INSIGHTS FROM A VECTORING TOOL APPLIED TO EXPLORATION.

WHITE MICA



X (large)	Y (oct)	Z (tet)
Large ions (A)	Octahedral sites (A)	Tetrahedral sites (A)
K ⁺ = 1.33	Al ³⁺ = 0.51	Si ⁴⁺ = 0.42
Na ⁺ = 0.97	Fe ²⁺ = 0.74	Al ³⁺ = 0.51
Ca ²⁺ = 0.99	Mg ²⁺ = 0.66	
Ba ²⁺ = 1.34	Ti ⁴⁺ = 0.68	
Sr ²⁺ = 1.12	Cr ³⁺ = 0.63	
	V ³⁺ = 0.74	
	Zn ²⁺ = 0.74	
	Li ⁺ = 0.68	
	Fe ³⁺ = 0.64	

Modified from Deer et al (2003)



Modified from Bissig (2014) after Ulrich and Heinrich (2002)

Camilo A. Uribe Mogollon

Ph.D. Geology Candidate

Earth and Environmental Science Department

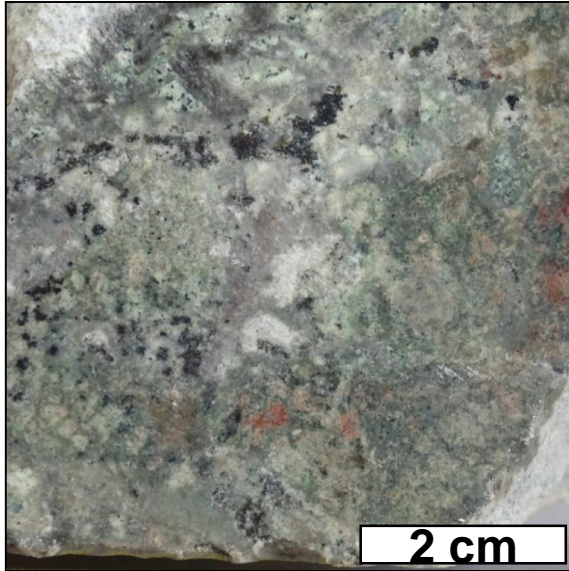
New Mexico Institute of Mining and Technology

Camilo.uribe@student.nmt.edu

RioTinto

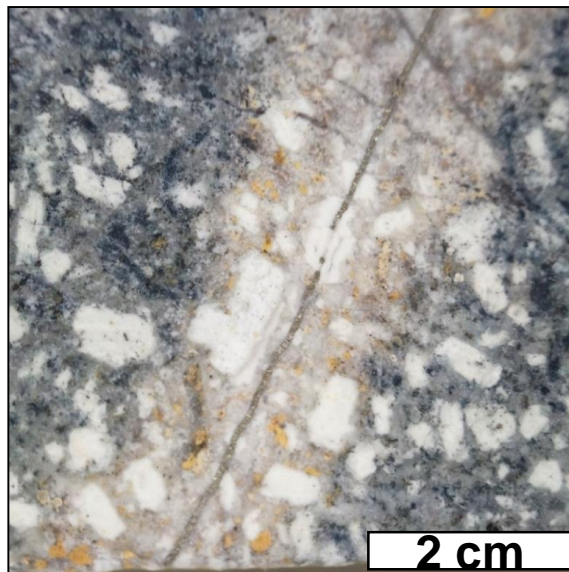
NEW MEXICO TECH
SCIENCE • ENGINEERING • RESEARCH UNIVERSITY

TWO STYLES OF PHYLIC ALTERATION



Early Green Phyllic Alteration

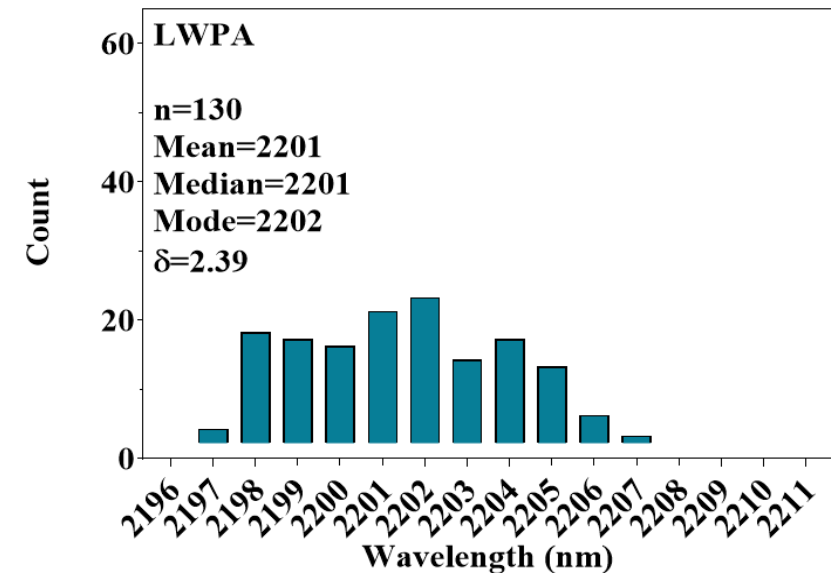
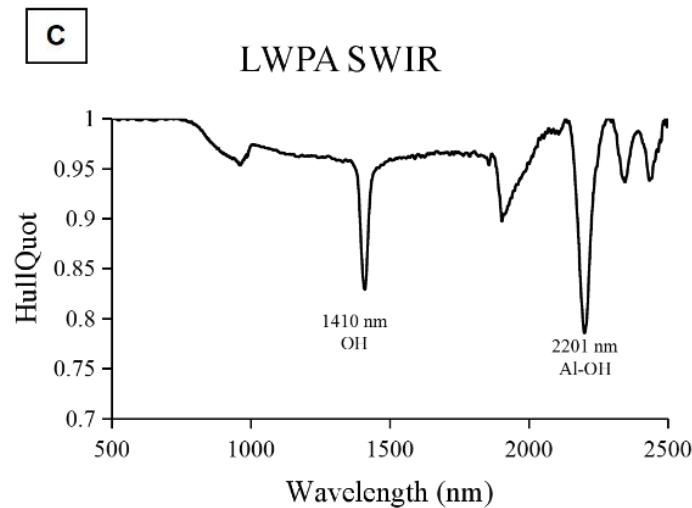
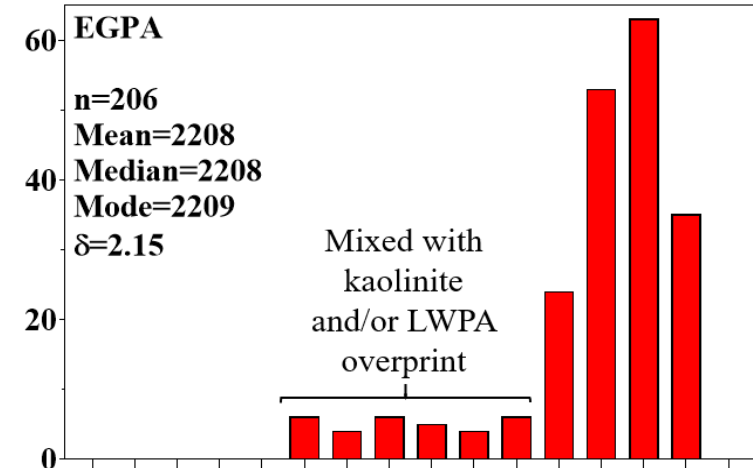
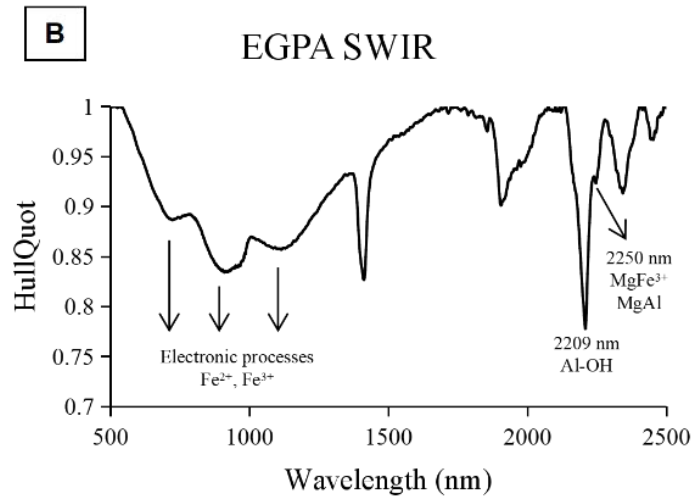
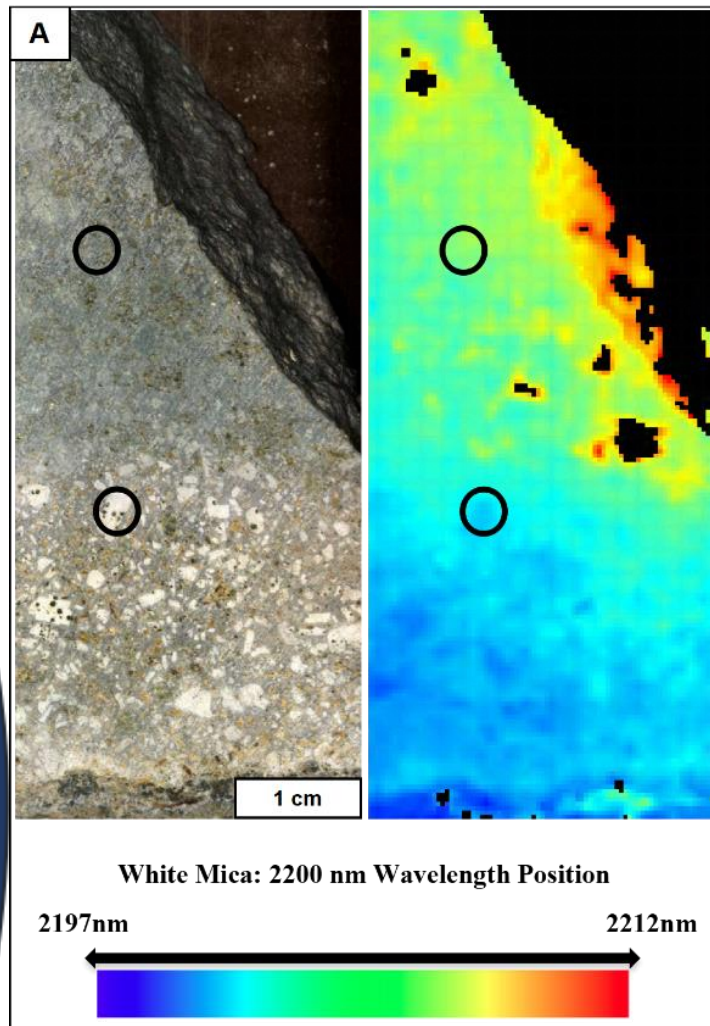
- Mineral assemblage = Green colored mica + Quartz + Fe-Oxides (hematite / magnetite). Locally chlorite, anhydrite, and calcite.
- High-grade copper mineralization: chalcopyrite + bornite.
- Pervasive and texturally destructive / Overprinting the potassic alt.



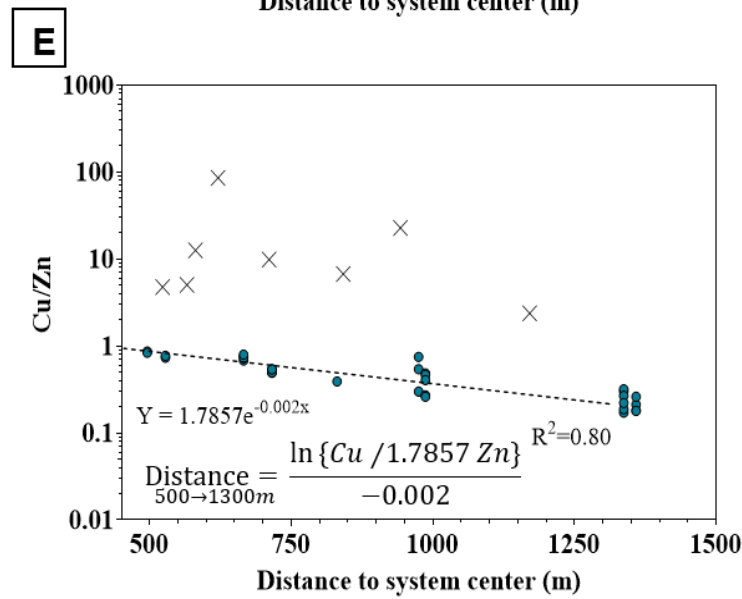
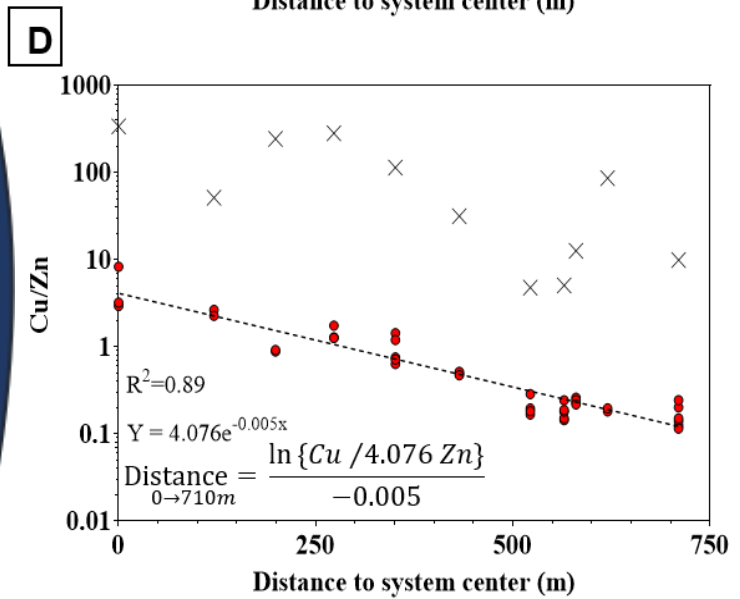
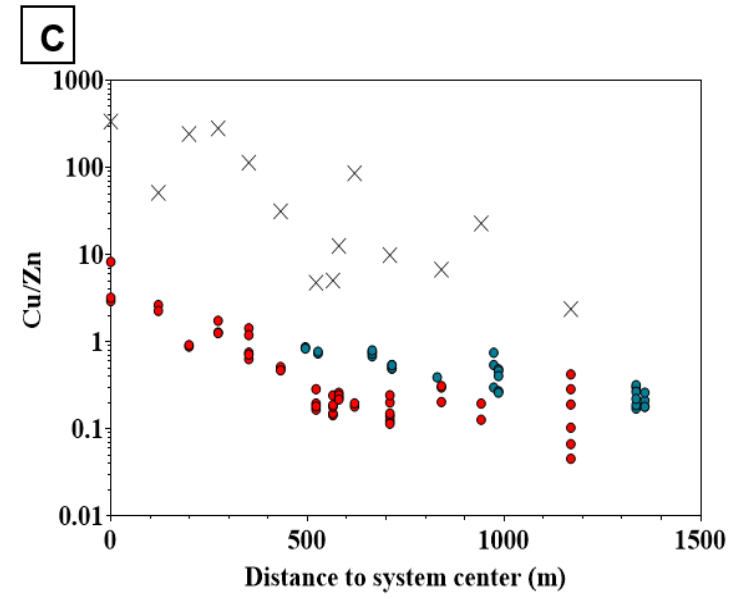
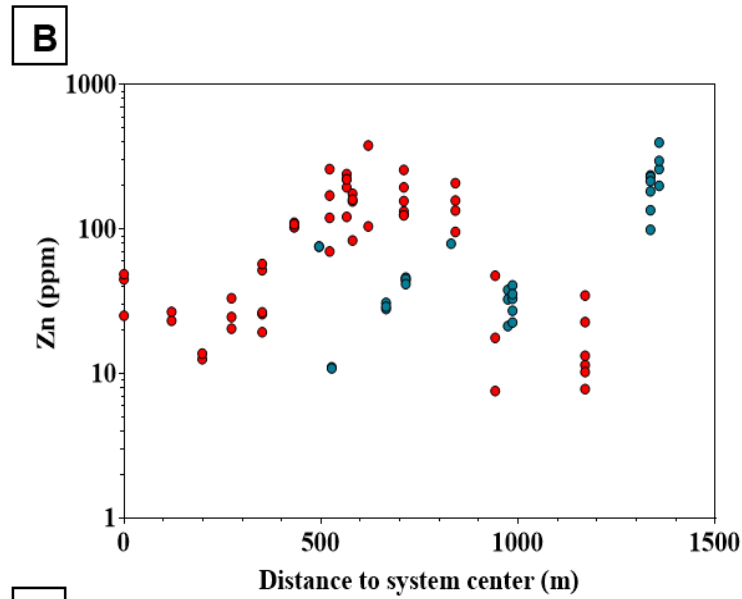
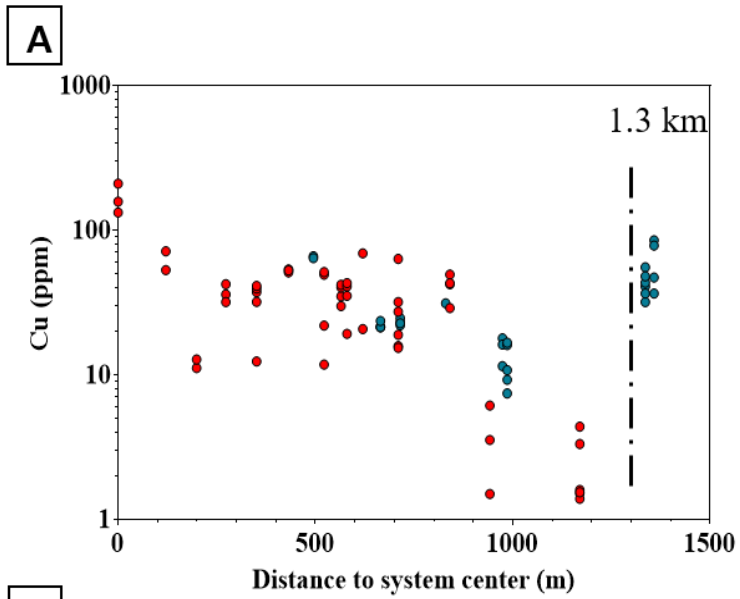
Late White Phyllic Alteration

- Mineral assemblage = White colored mica + Quartz + Pyrite.
- Mafic phenos are yellow colored – produced by residual Ti-oxides, such as rutile.
- No copper mineralization associated.
- Structural controlled, and rock texture preserved.

CHARACTERIZATION OF THE WHITE MICA SWIR SPECTRA

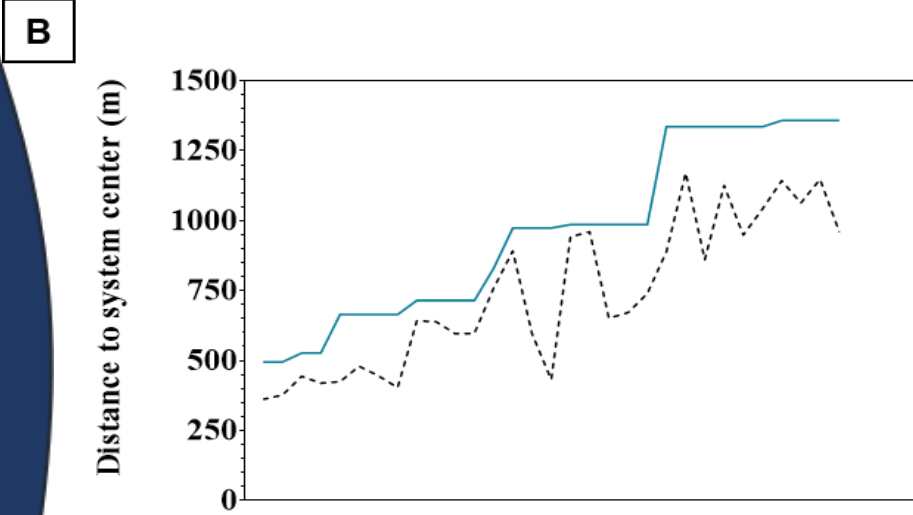
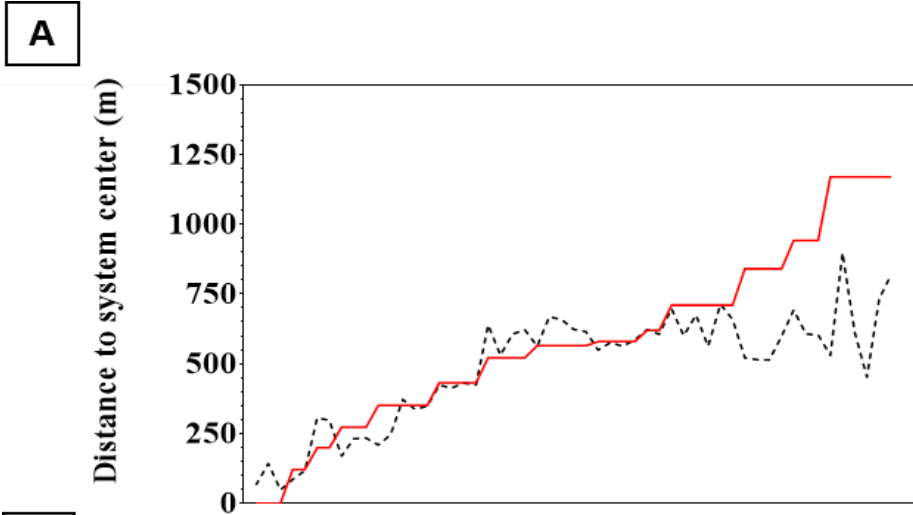


WHITE MICA "PROXIMITOR"



- Early Green Phyllic Alteration (EGPA) ●
- Late White Phyllic Alteration (LWPA) ●
- Whole Rock data ×

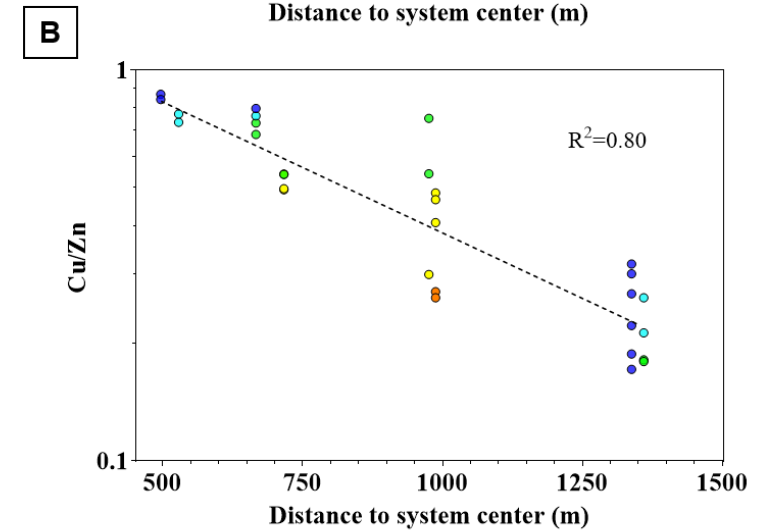
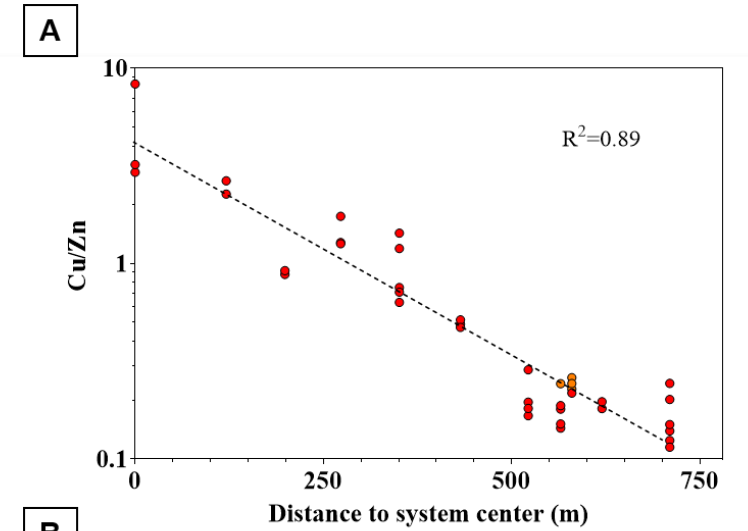
ACCURACY OF THE WHITE MICA “PROXIMITOR”



	EGPA	LWPA
Real distance	—	—
Estimated distance	- - - -	- - - -

- EGPA within a 710 m radius of the deposit center, predicts the distance to center within ± 50 m radius error.

- LWPA within a radius between 500 and 1,300 m of the deposit center, underestimates distances to center within ± 200 m radius error.



White mica wavelength position (nm)

● 2,198 – 2,200 nm	● 2,202 – 2,204 nm	● 2,206 – 2,208 nm
● 2,200 – 2,202 nm	● 2,204 – 2,206 nm	● 2,208 – 2,210 nm