

Supplementary Materials: Chlorite-White Mica Pairs' Composition as a Micro-Chemical Guide to Fingerprint Massive Sulfide Deposits of the Bathurst Mining Camp, Canada

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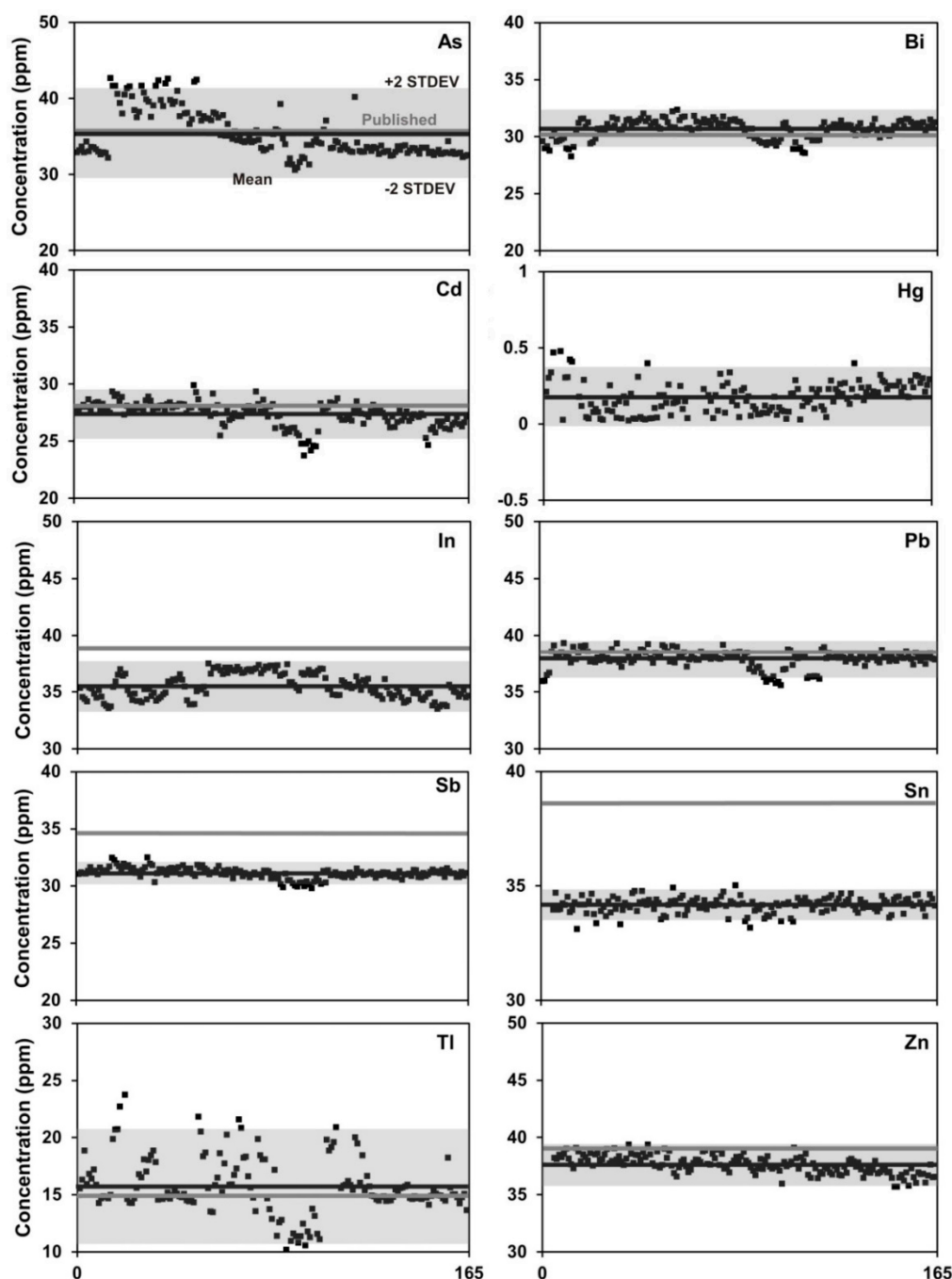


Figure S1. Assessment of the accuracy of NIST612 standard analyzed by LA-ICP-MS. Comparison was done with the published mean values (grey line) from GeoReM database (Jochum et al. [1]). The grey area presents ± 2 standard deviation of the obtained data. The black line is mean of obtained

elemental values in this study. X axis is the standard analytical position based on the order of analysis.

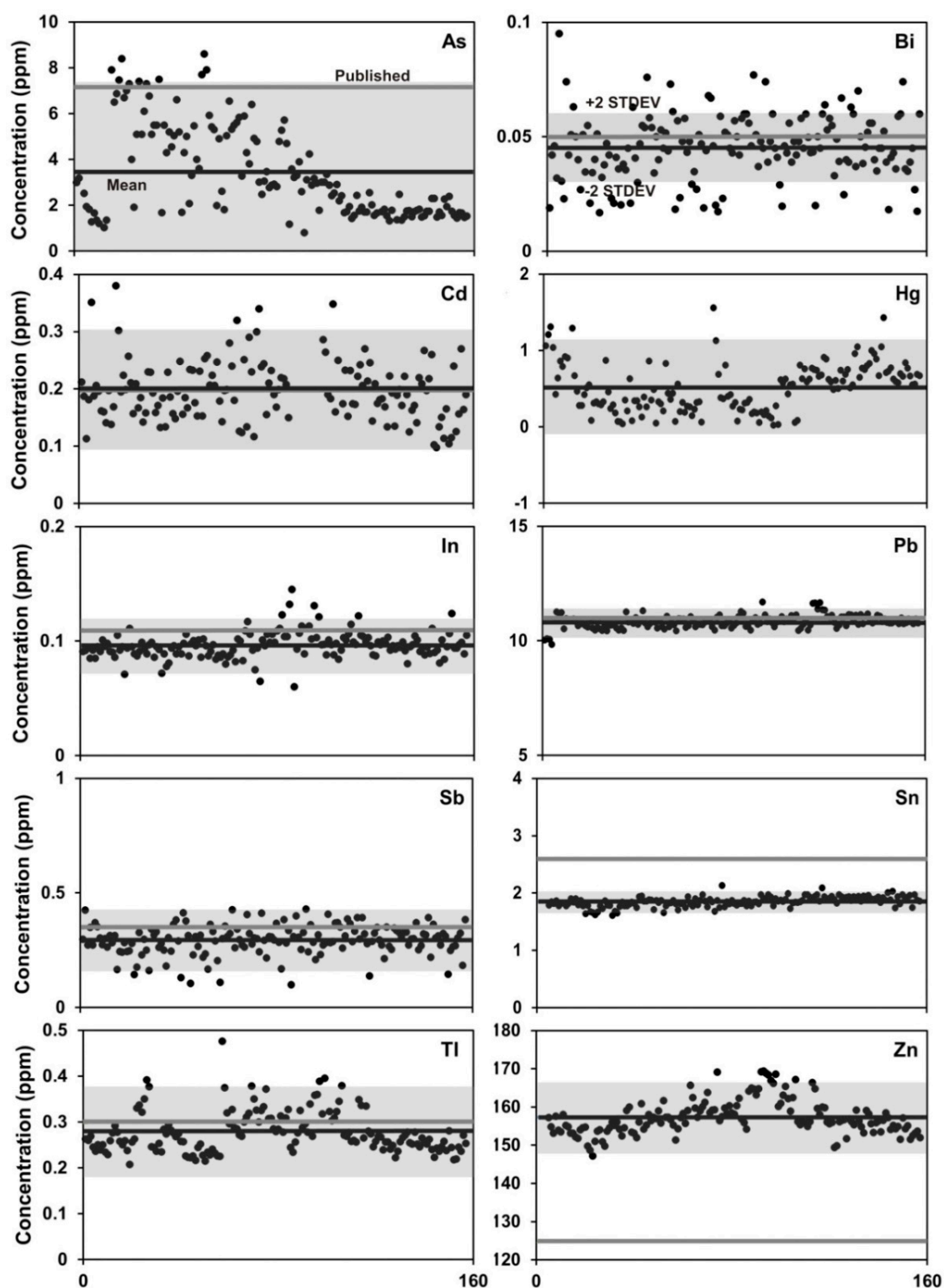


Figure S2. Assessment of the accuracy of BCR-2G standard analyzed by LA-ICP-MS. Comparison was done with published mean values from complied values (grey line) from GeoReM database. The grey area presents ± 2 standard deviation of the obtained data. The black line is mean of obtained elemental values in this study. X axis is the standard analytical position based on the order of analysis.

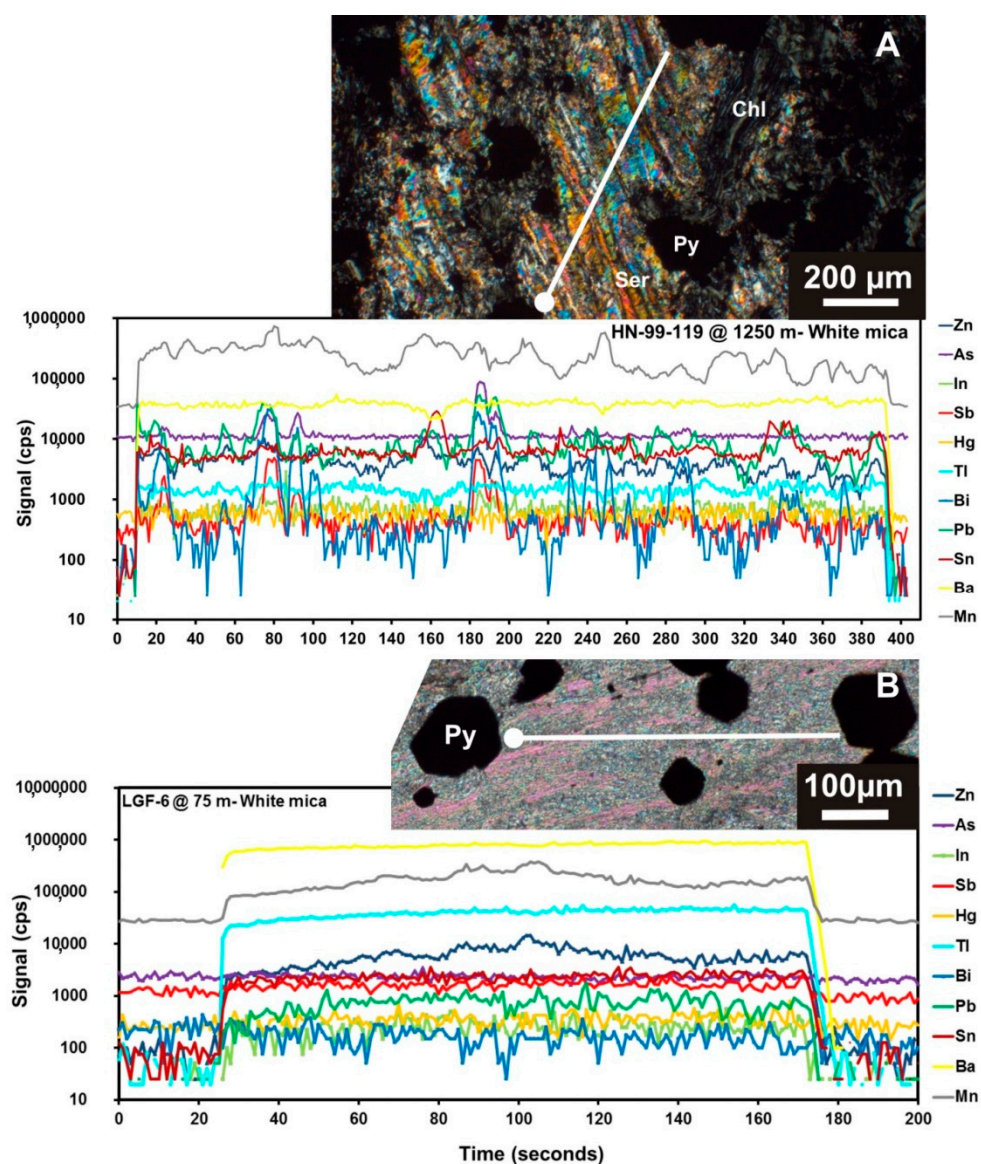


Figure S3. Raster LA-ICP-MS spectra for selected elements in white mica from: (A) Halfmile Lake Deep zone, and (B) Louvicourt deposits, showing the distribution of fluid-mobile elements, as well as Zn, Pb, Ba, and Mn along the raster line.

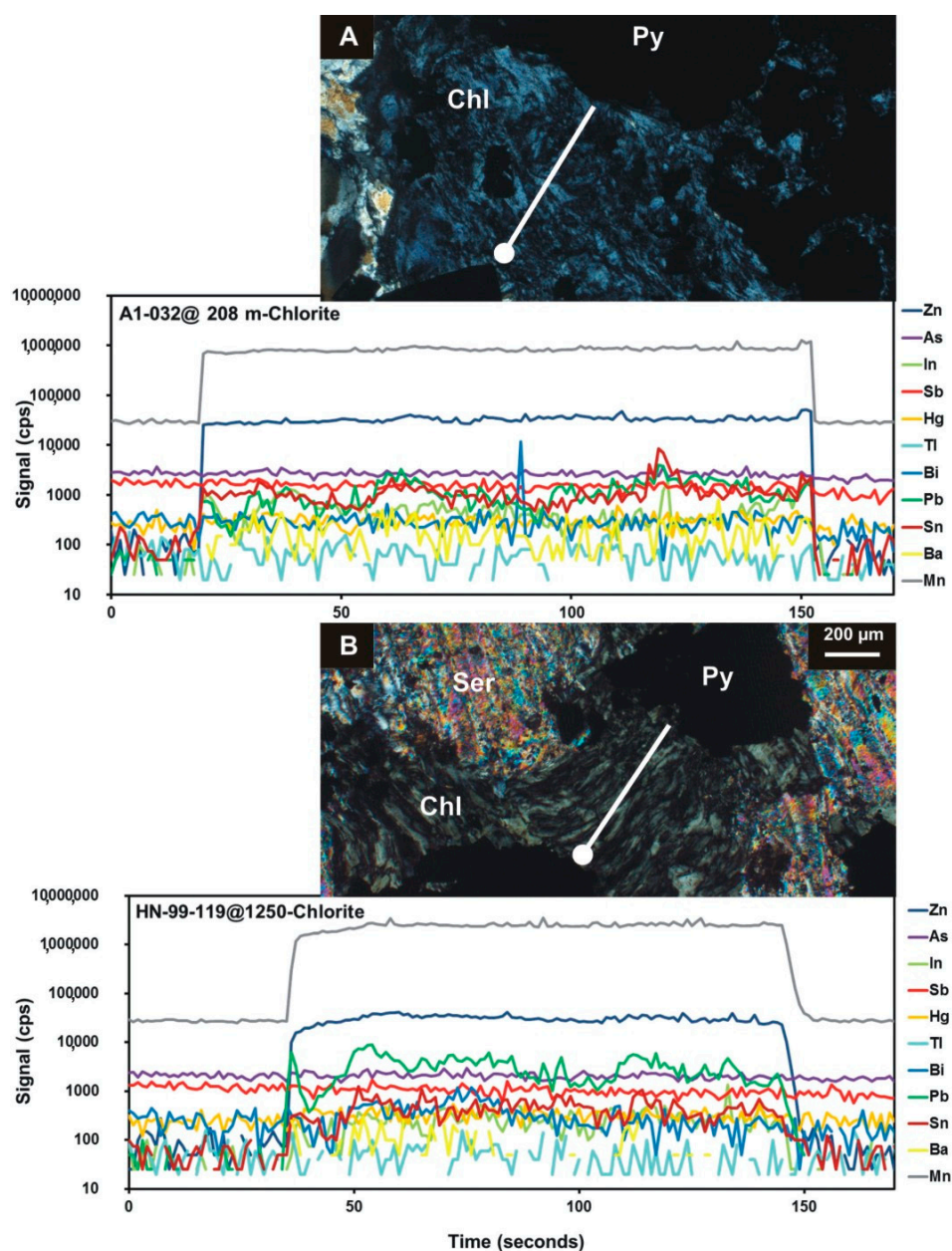


Figure S4. Raster LA-ICP-MS spectra for selected elements in chlorite from (A) Brunswick No. 12, and (B) Halfmile Lake Deep zone deposits, showing the distribution of fluid-mobile elements as well as Zn, Pb, Ba, and Mn along the raster line.

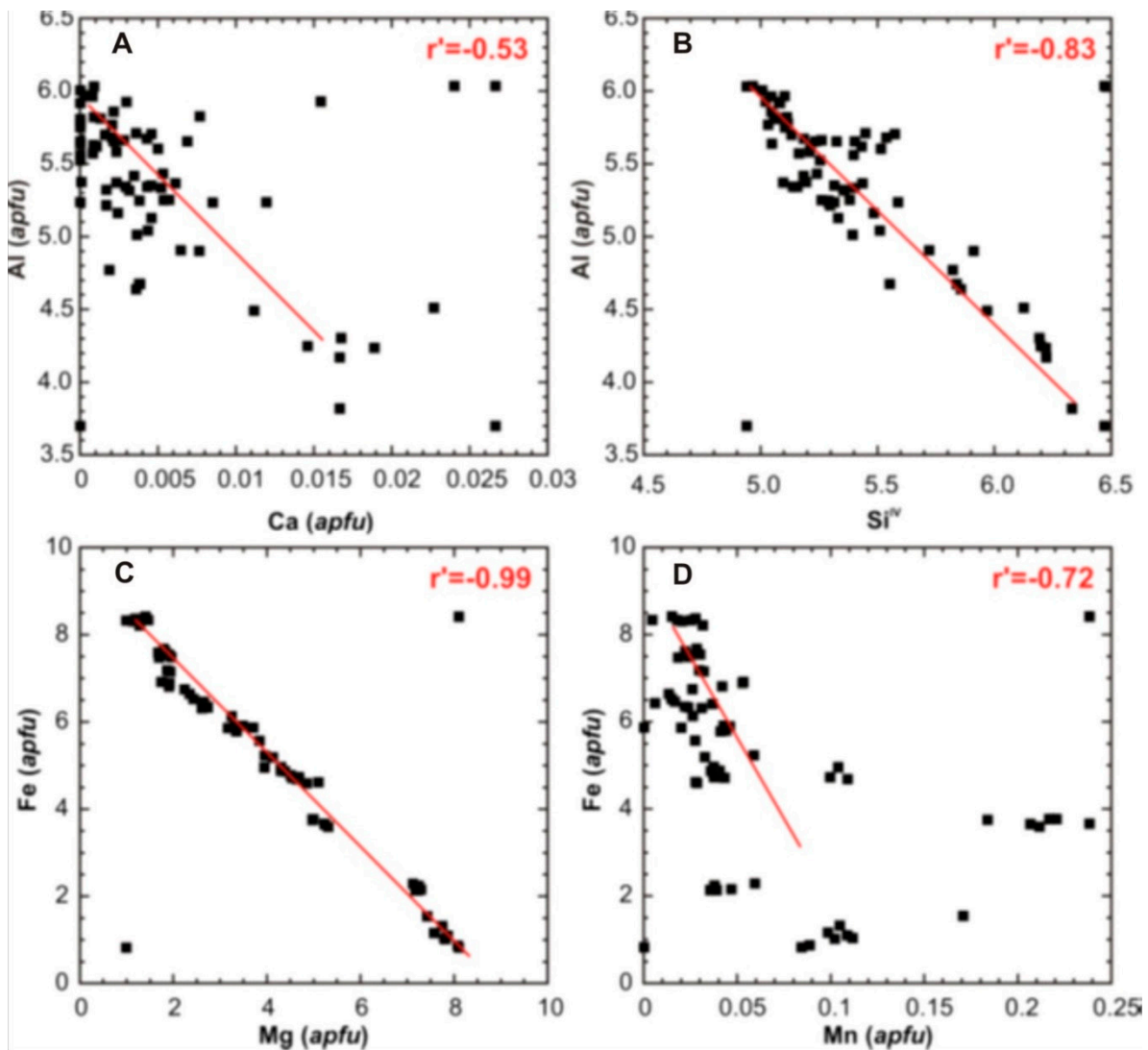


Figure S5. Bivariate plots of selected trace and major elements exhibiting Spearman Rank correlations for 68 electron-microprobe analyses of chlorite (see Supplementary Table S1). A negative Al correlation with Ca and Si^{IV} suggests a Tschermak substitution mechanism. Negative correlations between Fe, Mg, and Mn indicate simple exchange within the chlorite structure. Spearman Rank correlation coefficients are displayed with each binary plot (99% confidence interval, $r' = 0.28$).

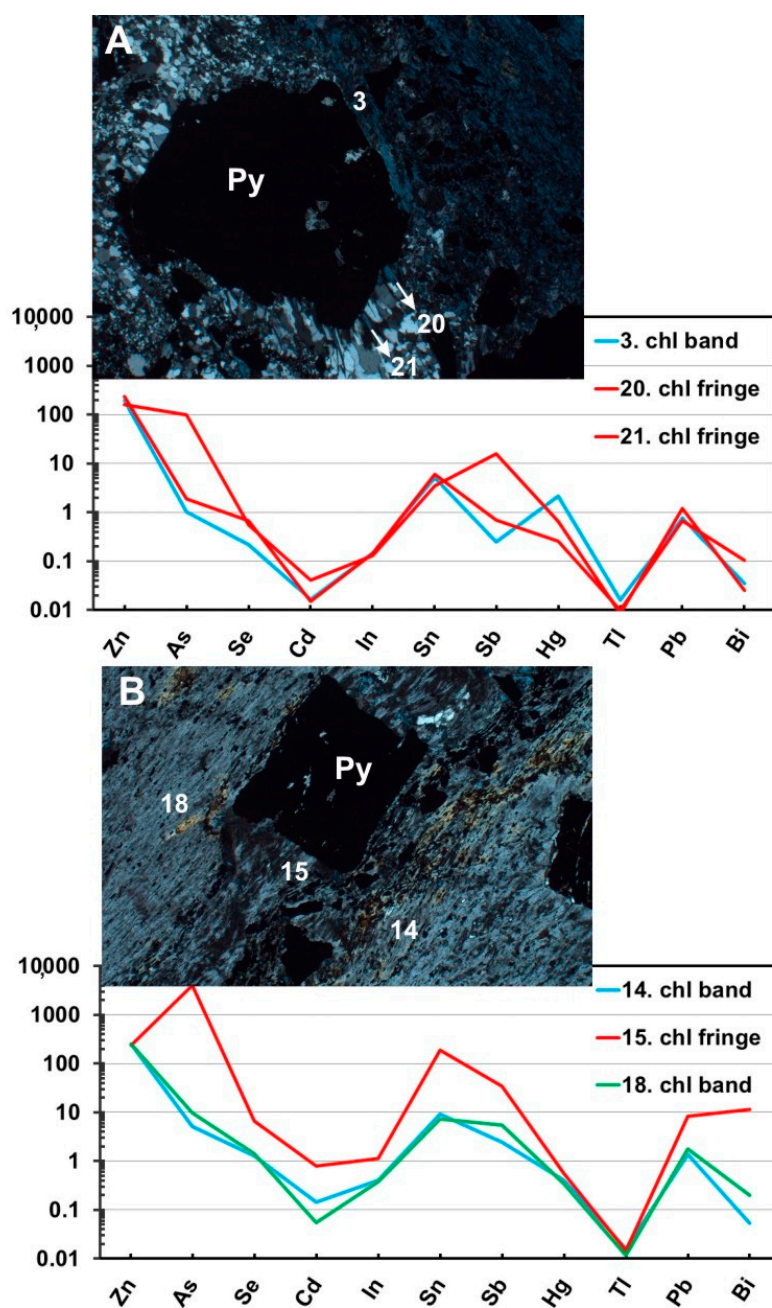


Figure S6. Variation in the fluid-mobile element content (ppm) between two generations of chlorite from the Heath Steele B zone deposit (sample 95-LPA-17 at 405 m). Neo-crystallized chlorite on the margin of pyrite grains contains higher As, Se, and Sb in both examples (A,B). In contrast, higher Cd, In, Sn, and Bi contents are associated with chlorite fringes relative to chlorite bands in (B).

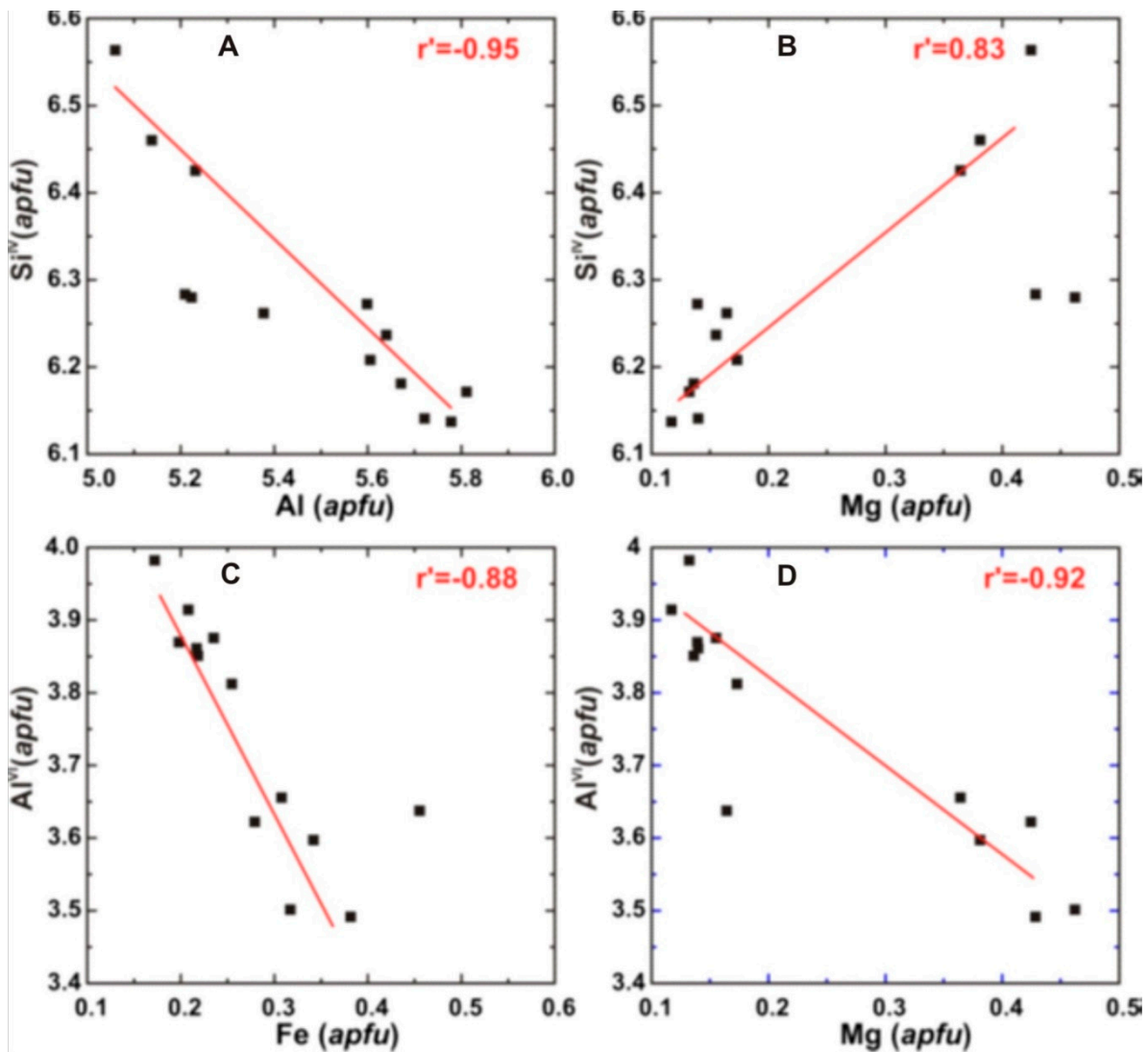


Figure S7. Bivariate plots of selected trace and major elements exhibiting Spearman Rank correlations for 13 electron-microprobe analyses of muscovite from the BMC (see Supplementary Table S2). Relationship between Si, Al, Fe, and Mg indicate coupled Tschermak substitution in the octahedral sites of muscovite. Spearman Rank correlation coefficients (r') are displayed with each binary plot (99% confidence interval, $r' = 0.63$).

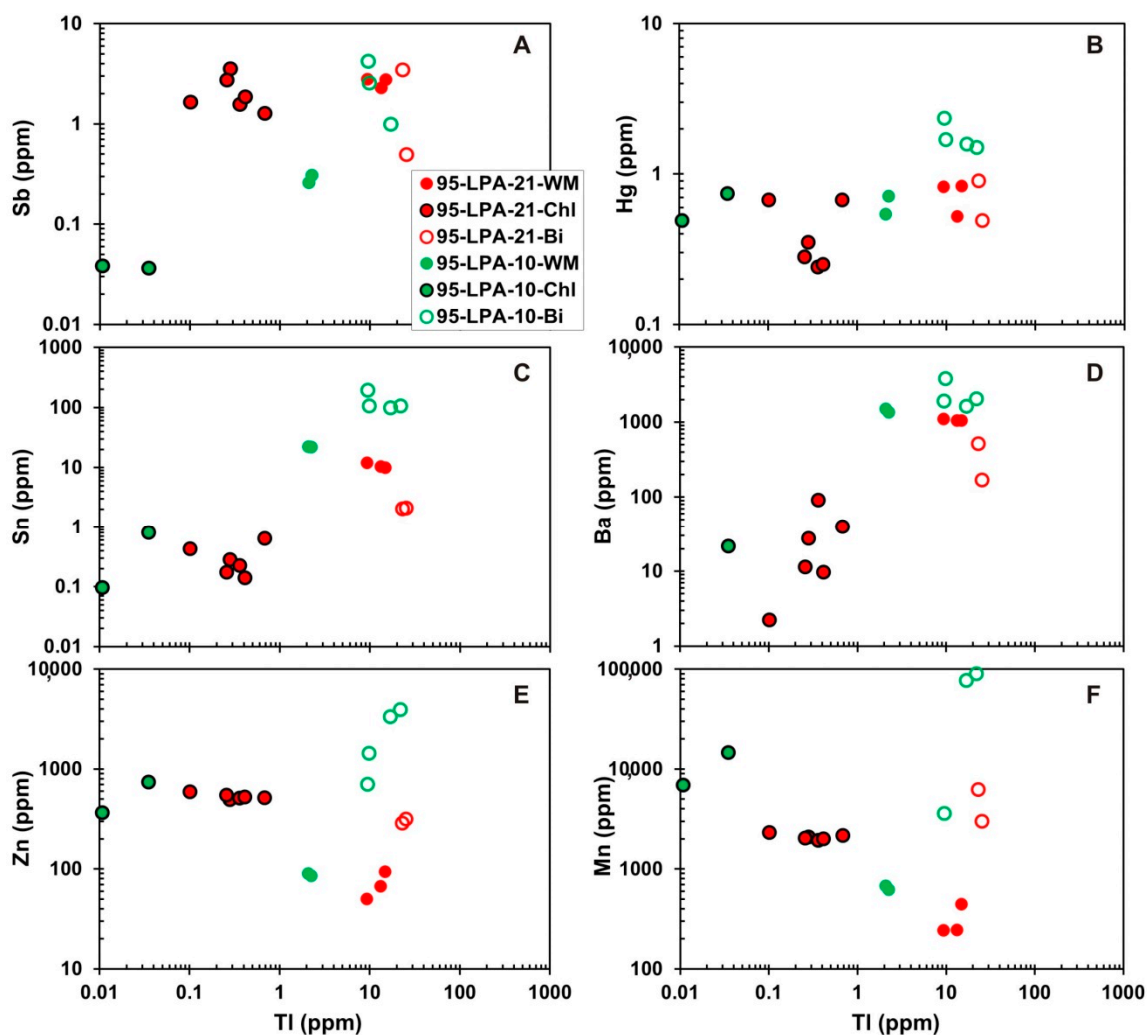


Figure S8. Binary discrimination diagrams showing Tl vs. (A) Sb, (B) Hg, (C) Sn, (D) Ba, (E) Zn and (F) Mn (see Supplementary Tables S3, S4, S5). Distribution of fluid-mobile elements among coexisting biotite-chlorite-white mica from Heath Steele B zone (samples 95-LPA-10 at 239 m and 95-LPA-21 at 466 m). WM—White Mica, Chl—Chlorite, Bi—Biotite.

References

1. Jochum, K.P.; Weis, U.; Stoll, B.; Kuzmin, D.; Yang, Q.; Raczek, I.; Jacob, D.E.; Stracke, A.; Birbaum, K.; Frick, D.A., et al. Determination of Reference Values for NIST SRM 610–617 Glasses Following ISO Guidelines. *Geostand. Geoanalytical Res.* **2011**, *35*, 397–429.



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