

SEG 2023 Conference: Resourcing the Green Transition

Developing New Soil-Based Mineralogical and Geochemical Exploration Tools for Sn, W, and Li in SW England

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The UK government's target of net zero greenhouse gas emissions by 2050 will require huge quantities of "critical" raw materials, which include Li, mainly used in electric vehicle batteries, W for high-strength alloys and cutting tools, and Sn, which is used in solder and for plating. The SW England Cornubian granite batholith and world-class ore field has long been mined for Sn and W and hosts one of the largest Li resources in Europe. There is no current production of these metals, but there are mines in development for Sn and W and active exploration for all three metals. Such exploration is hampered by poor inland exposure and sometimes thick overburden.

The first author's Ph.D. project, which began in October 2022, aims to develop improved soil- and stream sediment-based exploration methodologies for Li, Sn, and W. The focus so far has been on a review of soil data from Tellus SW and local exploration companies to develop pathfinder and proxy elements for mineralisation. Based on geochemical analysis, multiple target areas have been identified as best suited to further development work. Samples will be collected for whole-rock analysis (including for Li which is absent from the Tellus data set) as well as automated mineralogical analysis to determine combined geochemical and mineralogical exploration criteria for Sn, W, and Li mineralisation.