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Influence of Mafic Units on the Mineralising System Around the Redmoor Project, Cornwall

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Within Southwest England, it is understood that four stages of mineralisation have occurred, both pre- and syn-granite emplacement with mining of these mineral systems occurring since the 17th century. These magmatic-hydrothermal systems are host to multiple polymetallic minerals, including Sn, W, Cu, As, Ni, Co, Pb, and Zn. These include the Redmoor sheeted vein system (SVS) located in East Cornwall, which has been identified as a promising Sn, W, Cu deposit associated with the Kit Hill Granite intrusion. More recently however, research has been undertaken into the influence of mafic units identified within the system, a topic that is highly understudied within SW England.

This was undertaken through detailed core logging of mineralisation, alteration, and structures within the mafic units, creating a comparison of mafic mineralisation to the country rock and granite mineralisation, with specific detail to precipitation controls of Cu, Ni, Pb, Zn, and Co. Through integration of core logging, ore microscopy, and geochemical analysis of the mafic units, an understanding of whether these units may have contributed to controls on mineralisation at Redmoor could be interpreted. An in-depth petrographic study was conducted to understand relationships and microstructures within the unit to determine the role mafic mineralisation has on the wider deposit. Subsequently, a new mineral systems concept has been interpreted for the area to develop the geological model and further aid exploration.

This research has allowed for a better understanding of mineralisation that predates the emplacement of granite intrusions and the role mafic units have in potentially increasing economic grade of the deposit. Interpreting the system as polymetallic in nature has further expanded the scope of potential areas of economic interest and increased the opportunity for exploitation of multiple minerals needed for the energy transition.