Role of granites in genesis of Archean VHMS systems, WA examples

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The Archean VHMS-style mineralisation shows a strong spatial association to coeval HFSE granites [1]. To continue to investigate the role of these granites in ore genesis, we examine Pb isotope signatures for Archean examples from the Pilbara and Yilgarn cratons. In the case of *ca*. 3.5 Ga old North Pole deposit, syngenetic pyrite was deposited before the emplacement of an adamellite massif (Fig. 1). However, Pb from epigenetic galena corresponds to initial ratios determined from a Pb-Pb isochron for adamellite. In a case of the *ca*. 3.2 Ga old Sulphur Spring deposit, ore galena Pb is derived solely from the local granite and ore-hosting volcanic pile, as displayed by concordance with a Pb-Pb isochron. In the Teutonic Bore camp, the local granite massif is slightly younger than the lower ore-bearing stratigraphy, but remains as the potential heater necessary to fuel the hydrothermal system. For these Archean hydrothermal systems, the granites could be a fuel/source of metals of primary syngenetic and/or later epigenetic mineralisation. The Pb isotope data from these three Archean hydrothermal systems continue to display the dynamic role of granites in their formation.

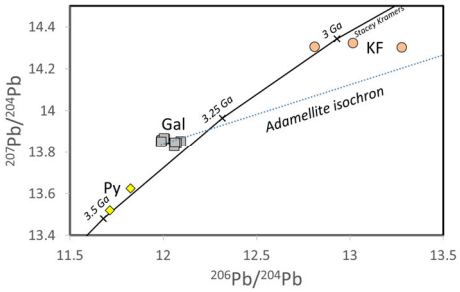

Figure 1. ^{206}Pb-^{204}Pb vs $^{207}Pb/^{204}Pb$ plot of ore pyrite (Py) and galena (Gal [2]), as well as adamellite and K-feldspat (KF) form North Pole area, Pilbara Craton.

[1] Hollis *et al* (2015) *Precambr Res* **260**, 113-135. [2] Richards *et al* (1981) *Miner Depos* **16**, 7-30.