

# SEG 2024 Conference: Sustainable Mineral Exploration and Development

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## Heemskirk Tin Project, Western Tasmania, Australia: Characterization of Severn-Queen Hill Tin Deposits

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Western Tasmania hosts several Devonian granite-related Sn-W deposits, including (1) sulfide-bearing skarns and carbonate-replacement deposits (e.g., Renison Bell, Severn-Queen Hill, Mount Bischoff, Razorback), (2) silicate skarns (e.g., St. Dizier), (3) magnetite skarns (e.g., Mount Lindsay), (4) vein deposits (e.g., Pieman), and (5) greisen deposits (e.g., Federation). There is also one unusual skarn/hydrothermal Ni deposit (Avebury).

The Heemskirk Tin project is located near the town of Zeehan, western Tasmania, Australia. With a mineral resource estimate of 7.4 Mt at 1.04% Sn, Heemskirk Tin is the highest-grade undeveloped tin project in Australia and ranks as the third-highest globally. The project area consists of four Devonian granite-related sulfide skarn and vein deposits: Severn, Queen-Hill, Montana, and Oonah. Heemskirk Tin is primarily hosted within the Neoproterozoic to Cambrian sedimentary and volcanoclastic rocks of the Zeehan sub-basin within the Dundas Trough. Tin principally occur as cassiterite, with subordinate stannite. Fine-grained cassiterite grains are hosted in pyrite-pyrrhotite veins and disseminations, associated with pervasive siderite-sericite-chlorite-tourmaline  $\pm$  fluorite  $\pm$  topaz alteration. Tin mineralisation at Severn and Queen Hill is predominantly stratabound, occurring as stockwork/veins and replacement styles of pyrite-siderite  $\pm$  pyrrhotite  $\pm$  chalcopyrite  $\pm$  galena  $\pm$  sphalerite, closely associated with faults. Mineralisation is strongly zoned with late-stage galena-sphalerite-silver fissure veins located toward the periphery of the tin mineralisation zone.

Our ongoing study aims to aid near-mine exploration by understanding the controls on fluid flow and mineralisation at the Heemskirk Tin project through detailed geological, mineralogical, and geochemical characterisation. This will ultimately improve the understanding of the genesis of carbonate-hosted Sn mineralisation at Heemskirk and the deportment of critical and strategic metals at the project.