

THERMOCHRONOLOGICAL AND GEOCHEMICAL FOOTPRINTS OF FLUID ALTERATION, RECORDED IN APATITE

MINEX CRC PROGRAM 3

National Drilling Initiative

PHD PROJECT

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RESEARCH PROJECT

This project aims to date and map distal footprints of fluid alteration/metasomatism using a multi-method thermochronological and geochemical approach. Apatites (and other accessory minerals) will be separated from basement rocks within central Australia (both under cover through the MinEx CRC national drilling program and from outcrops) and 'double-dated' using the fission track and U-Pb methods.

Simultaneously acquisition of trace element concentrations during U-Pb isotope measurements, will provide a data-set that provides information on mid to low-temperature (<450 degrees Celsius) post-magmatic metamorphism / metasomatism as well as exhumation (cooling below <120 degrees Celsius).

Resulting alteration and exhumation maps will jointly evaluate mineralisation prospects (e.g. Glorie et al., 2019, Gondwana Research in press). In addition, limited calcite U-Pb dating will be tested on suitable calcite veins (particularly those in association with mineralising systems) as a novel method to potentially date ore deposit genesis.