

GSWA 225475: Metapegmatite, Malcolm Metamorphics, hanging wall of the Daringdella Shear Zone, footwall of the Rodona Shear Zone, MALCOLM

Person submitting samples: Raphael Quentin de Gromard
Affiliation: Geological Survey of Western Australia
Project Title: Evolution of crustal structures in an inverted orogen, the east Albany–Fraser Orogen, Western Australia
Sample Number(s) (including IGSN if one exists): 225475
Mineral separation required? Yes or No:
Date submitted:

GEOGRAPHIC AREA/ PROVINCE/ BASIN : southern Western Australia/east Albany–Fraser Orogen	
1:250k SHEET NAME: MALCOLM	NUMBER: SI51-07
1:100k SHEET NAME: MALCOLM	NUMBER: 3630
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94)	
ZONE: 51	
EASTING: 564422	NORTHING: 6256834
LATITUDE: -33.82676	LONGITUDE: 123.69618

STRATIGRAPHIC UNIT FORMAL NAME *: Malcolm Metamorphics
STRATIGRAPHIC UNIT INFORMAL NAME:
LITHOLOGY: Metapegmatite

HOLE ID (if applicable):
DEPTH (if applicable):
H FROM (metres):
H TO (metres):

* Stratigraphic Unit names can be searched and checked within the Australian Stratigraphic Units Database via the following link: <https://asud.ga.gov.au/>

Dating Objective

What is the geological question $^{40}\text{Ar}/^{39}\text{Ar}$ analysis will address?

Evolution of crustal structures of the east AFO - Exhumation history of the Rodona Shear Zone

What type of age(s) are expected? (e.g. magmatic crystallisation, metamorphism, fluid alteration/mineralisation, cooling, shearing etc):

Cooling age

Mineral target(s) for dating:

Muscovite

Estimated $^{40}\text{Ar}/^{39}\text{Ar}$ age (e.g. Cenozoic, Mesozoic, Paleozoic, Proterozoic, Archean – provide estimated numerical age range if possible):

Muscovite should yield Ar/Ar cooling age younger than c. 1315 Ma U-Pb zircon metamorphic ages. Alternatively, younger than c. 1180 monazite metamorphic age.

Sample Information

Location description (e.g. a sample of x was collected from y, z km from abc town):

A metapegmatite sample was collected from an exposure by the Southern Ocean at Point Malcolm, 167 km east of Esperance, WA.

Lithological characteristics (rock description):

This exposure consists of tightly to isoclinally folded, sheared, interlayered psammitic and pelitic migmatitic gneiss itself interlayered with mafic amphibolite. The primary layering is cut by a megapegmatite vein up to 10 m wide containing large books (up to 10cm diameter) of muscovite. The

pegmatite is affected by the folding. Two fold generations: the overprinting folds are upright, northeast-trending, steeply plunging and form type 3 fold interference patterns with earlier folds.

Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):

Two psammitic schist samples collected 450 m and 7 km northeast of GSWA 225475 yielded U-Pb zircon metamorphic ages of 1308 ± 8 and 1315 ± 22 Ma respectively (GSWA 194869, 194867). These samples also yielded U-Pb monazite metamorphic ages of 1335 ± 11 and 1183 ± 7 Ma (194869) and 1313 ± 6 and 1178 ± 10 Ma (194867).

Thin section description (if available): NO THIN SECTION WAS MADE FOR THIS SAMPLE

Photograph(s) e.g. field site, hand-specimen, photomicrograph:



Figure 30. Pegmatite vein cross cutting primary layering in paragneiss but affected by the S3 foliation. Hammer head points north.