

GSWA 225424: Mafic amphibolite, Fraser Shear Zone, FRASER RANGE

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): 225424
Mineral separation required? Yes or No:
Date submitted:

GEOGRAPHIC AREA/ PROVINCE/ BASIN : southern Western Australia/east Albany–Fraser Orogen	
1:250k SHEET NAME: FRASER RANGE	NUMBER: 3433
1:100k SHEET NAME: NORSEMAN	NUMBER: SI51-02
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94)	
ZONE: 51	
EASTING: 474311	NORTHING: 6453780
LATITUDE: -32.051893	LONGITUDE: 122.727877

STRATIGRAPHIC UNIT FORMAL NAME *: Snowys Dam Formation
STRATIGRAPHIC UNIT INFORMAL NAME:
LITHOLOGY: Mafic amphibolite

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 Fraser Shear Zone

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

Coarse hbl porphyroclasts define the M2-M3 shear fabric (8kar, 700°C) of the Fraser SZ. Ar/Ar date should represent cooling post D3

Mineral target(s) for dating:

Hornblende

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

Younger than c. 1300 Ma, likely around 1200 Ma

Sample Information

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

A mafic amphibolite sample, was collected from excavated boulders from a hill along the Eyre Highway, 6.7 km southwest of Fraser Range Station

Lithological characteristics (rock description):

Mylonitic, migmatitic, gt-cpx-hbl mafic gneiss containing coarse hbl porphyroblasts that define the M2-M3 shear fabric. This rock was also sampled for PT work and yielded conditions of 8kbar and 700°C for the M2-M3 fabric.

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

Quartz metasandstone sample (GSWA 177910) collected 14.5km northeast of GSWA 225424 yielded a U-Pb zircon metamorphic age of 1304 ± 7 Ma

A Hbl-bearing metagranite sample (EAF055B) and a biotite-bearing metadolerite (EAF054) collected 6.4 km east of 225424 yielded cooling ages of 1217 ± 8 and 1205 ± 4 Ma respectively.

A psammitic gneiss sample (GSWA 208647) collected 13.7 km south of GSWA 225424, yielded a U-Pb monazite metamorphic age of 1294 ± 7 Ma.

Thin section description (if available):

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



Figure 13. Mylonitic, migmatitic, gt-cpx-hbl mafic gneiss collected for Ar/Ar hbl, sample 225424

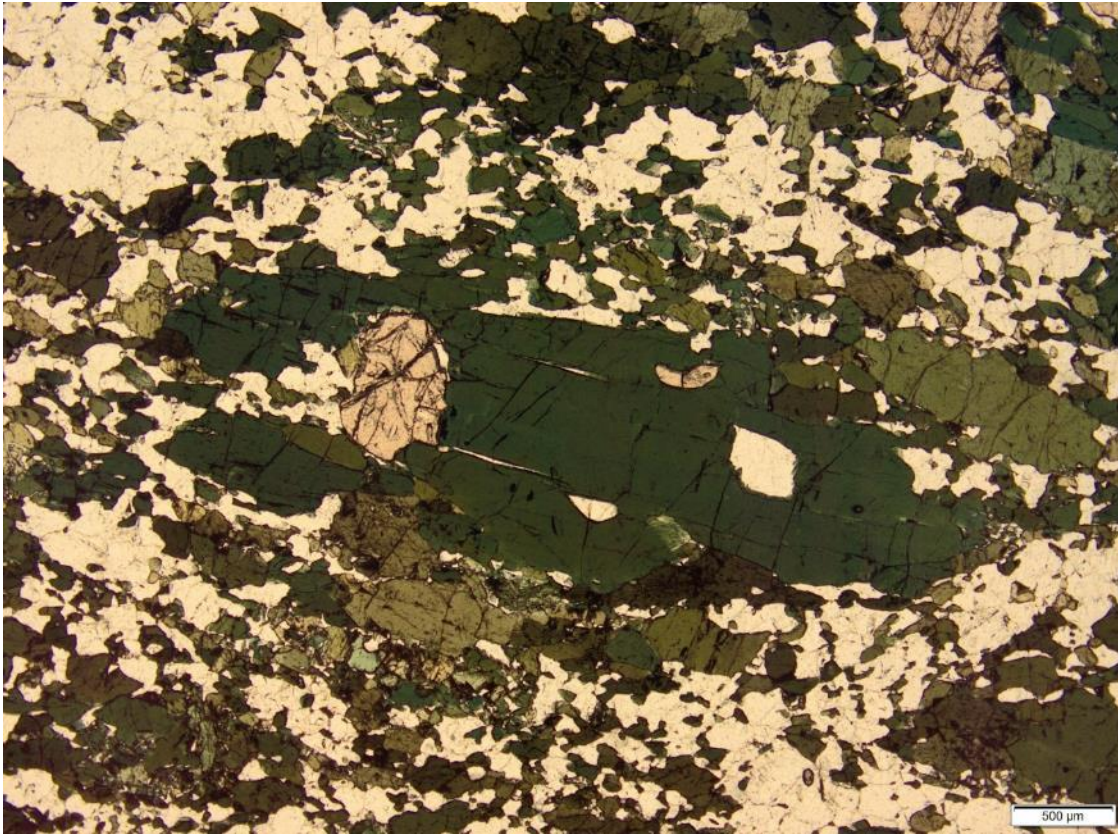


Figure 14. GSWA 225424: garnet-augite-hornblende-ilmenite mafic amphibolite