# GSWA 225461: Granitic gneiss, Biranup Zone, BURDETT

| |
|---|
| **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):** 225461 |
| **Mineral separation required? Yes or No:** |
| **Date submitted:** |

| | |
|---|---|
| **GEOGRAPHIC AREA/ PROVINCE/ BASIN :** southern Western Australia/east Albany–Fraser Orogen | |
| **1:250k SHEET NAME:** ESPERANCE | **NUMBER:** SI51-06 |
| **1:100k SHEET NAME:** BURDETT | **NUMBER:** 3331 |
| **LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94)** | |
| **ZONE:** 51 | |
| **EASTING:** 413792 | **NORTHING:** 6338673 |
| **LATITUDE:** -33.08714 | **LONGITUDE:** 122.07627 |

| |
|---|
| **STRATIGRAPHIC UNIT FORMAL NAME *:** |
| **STRATIGRAPHIC UNIT INFORMAL NAME:** Biranup Zone metagranitic unit |
| **LITHOLOGY:** Granitic gneiss |

| |
|---|
| **HOLE ID (if applicable):** |
| **PECT (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 $^{40}Ar/^{39}Ar$ analysis will address?***
Evolution of crustal structures of the east AFO - Exhumation history of the Biranup 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:***
Biotite

***Estimated $^{40}Ar/^{39}Ar$ age (e.g. Cenozoic, Mesozoic, Paleozoic, Proterozoic, Archean – provide estimated numerical age range if possible):***
Post high-temperature metamorphism dated at c. 1200 Ma, maybe c. 1150 Ma?

## Sample Information

***Location description (e.g. a sample of x was collected from y, z km from abc town):***
An oriented sample (L: 5/190) of granitic gneiss was collected from a small pavement within the Biranup Zone, 42 km east of Salmon Gums, WA.

***Lithological characteristics (rock description):***
Migmatitic, mesocratic orthogneiss, garnet-bearing, biotite up to 30%.

***Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):***
Two fold generations within the rock, both are HT fabrics, Ar/Ar biotite should date cooling post-F2 folds (AFO Stage 2?).

Three granitic gneiss samples (GSWA 225414, 194702 and 194701), collected 16 km northeast, 8 km east and 8 km southeast of GSWA 225461 yielded U-Pb zircon metamorphic ages of 1195 ± 8, 1201 ± 15 and 1203 ± 11 Ma respectively.

***Thin section description (if available):***

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

*Figure 24. Mesocratic garnet-bearing orthogneiss, containing tightly folded leucosomes. Two fold generations: F1 folds are refolded along moderately north-plunging F2 folds. Hammer head points north.*

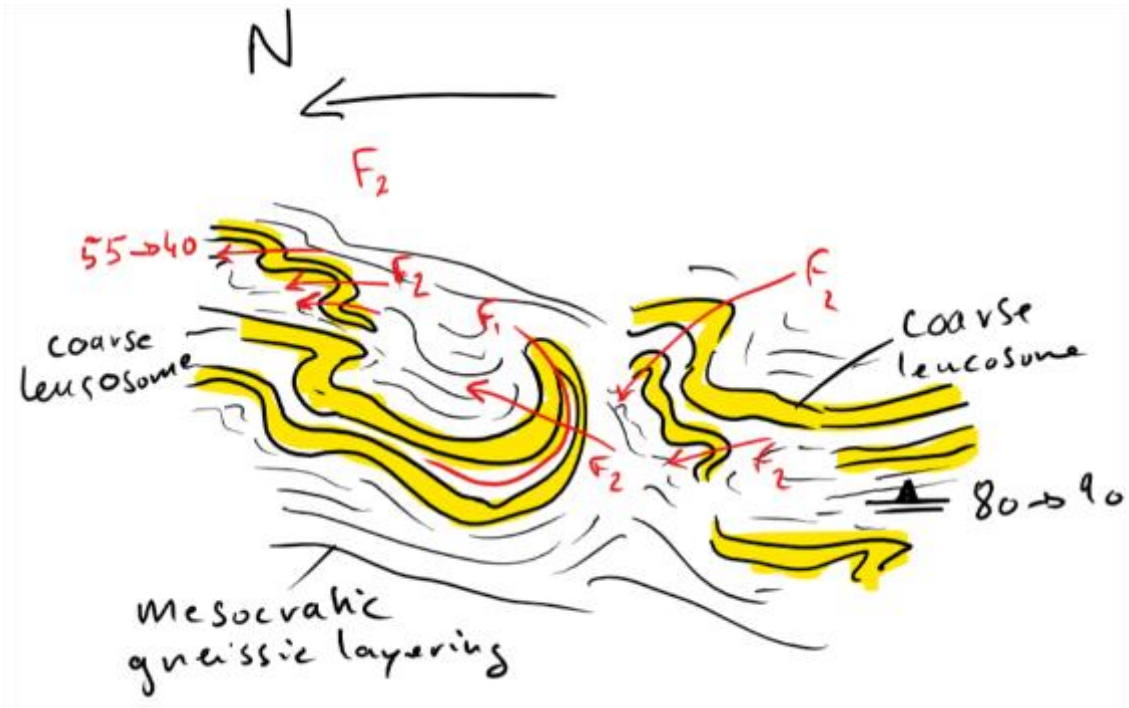


*Figure 25. Sketch of field relationships from locality of sample GSWA 225461*

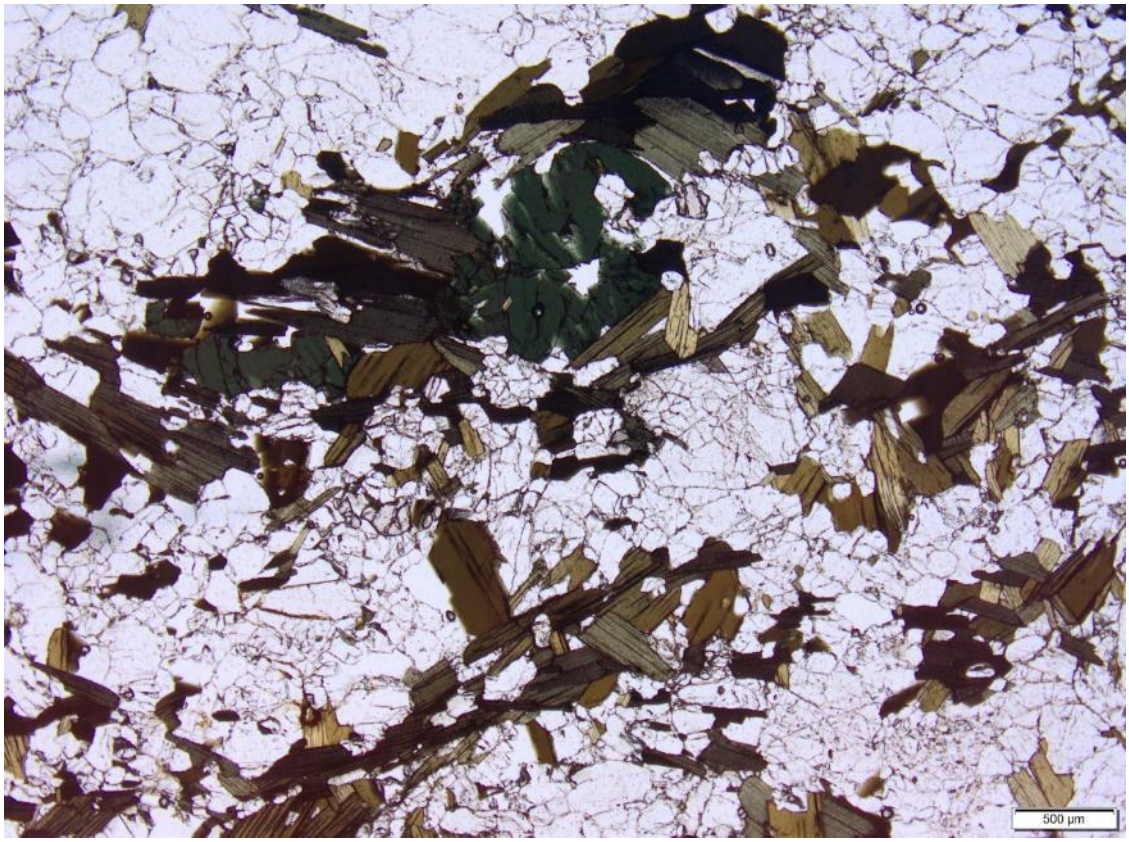

*Figure 26. 225461_Bi fabric, minor Hbl preserved, minor Gt, Q subgrains and GBM recrystallization - PPL*