

Samples from the Moodini prospect, Eucla basement, Mundrabilla Shear Zone

Metamonzogranite 192569

Person submitting samples: Catherine Spaggiari / Dave Kelsey
Affiliation: Geological Survey of Western Australia
Project Title: Project Manager / Senior Geologist
Sample Number(s) (including IGSN if one exists): 192569
Mineral separation required? Yes or No: Yes
Date submitted: May 2020

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Eucla region; Nullarbor Plain / Madura Province	
1:250k SHEET NAME: Madura - Burnabie	NUMBER: SH 52-13
1:100k SHEET NAME: Madura Pass	NUMBER: 4334
LOCATION METHOD: (GPS: GDA94)	
ZONE: 52	
EASTING: 350253	NORTHING: 6468291
LATITUDE: -31.911397	LONGITUDE: 127.416238

STRATIGRAPHIC UNIT FORMAL NAME *: Moodini Supersuite
STRATIGRAPHIC UNIT INFORMAL NAME: N/A
LITHOLOGY: Metamonzogranite

DRILLHOLE ID (if applicable): MORC001
PROSPECT (if applicable): Moodini
DEPTH FROM (metres): 518.30
DEPTH TO (metres): 518.40

* 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?

The ages of metamorphism and deformation events; to compare to the Top Up Rise samples.

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

Age or cooling age of deformation related to shearing.

Mineral target(s) for dating:

K-feldspar and biotite

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

Mesoproterozoic, or younger. Younger than c. 1130 Ma. Possibly c. 1070 Ma, or younger.

Sample Information

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

Mundrabilla Shear Zone samples come from Moodini prospect drillcores, which were drilled close to the Eyre Highway, 48 km east of Madura, and 142 km west of Eucla.

Lithological characteristics (rock description):

Mostly medium-grained seriate to porphyritic metagranite. Locally equigranular. Comprises K-feldspar, plagioclase, quartz, hornblende and biotite in variable proportions. Small mafic blebs occur towards the base of the core. Much of the drillcore is an L-S tectonite. S-type fabric dominant in this sample.

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

Two samples of metamonzogranite have SHRIMP U-Pb ages of 1132 ± 9 (GSWA 192566, MORCD002) and 1127 ± 7 (GSWA 192565, MORCD001).

Thin section description (if available):

Quartz is strongly deformed, towards ribbons. There are many porphyroclasts of plagioclase and K-feldspar and lesser porphyroclasts of hornblende and biotite. The matrix fabric, consisting mostly of quartz, biotite (and some ep) wraps the porphyroclasts. Some ilmenite grains have coronas of titanite. However, coarse blasts of titanite occur elsewhere in the sample, as do blasts of ilmenite. The rock is quite fresh, feldspar typically displays only a light dusting of alteration to ?sericite. Apatite occurs amongst the biotite-bearing parts of the rock.

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



Deformed quartz, feldspar and hbl porphyroclasts



Fsp porphyroclasts, Ttn-Ilm-Hbl-Bt-Ap-Ep-Qz

Relevant bibliographic references:

Spaggiari, CV, Smithies, RH, Kirkland, CL, Wingate, MTD, England, RN and Lu, Y 2020, Stratigraphic and co-funded drilling of the Eucla basement — the Proterozoic geology beneath the Nullarbor Plain: Geological Survey of Western Australia, Report 204, 147p.

Spaggiari, CV, Smithies, RH, Kirkland, CL, Wingate, MTD, England, RN and Lu, Y 2018, Buried but preserved: the Proterozoic Arubiddy Ophiolite, Madura Province, Western Australia: Precambrian Research, v. 317, p. 137–158.

Geochronology Records:

Wingate, MTD, Lu, Y, Kirkland, CL and Spaggiari, CV 2015b, 192565: metamonzogranite, Moodini prospect; Geochronology Record 1269: Geological Survey of Western Australia, 4p.

Wingate, MTD, Lu, Y, Kirkland, CL and Spaggiari, CV 2015c, 192566: metamonzogranite, Moodini prospect; Geochronology Record 1270: Geological Survey of Western Australia, 4p.

Company Reports:

Sasi, R 2011, Annual geological report for the period 12/03/2010 to 12/03/2011, Exploration Licence E69/22628: Venus Metals Corporation Ltd: Geological Survey of Western Australia, Statutory mineral exploration report A093851, 23p.

Sasi, R 2012, Annual geological report for the period 12/03/2011 to 12/03/2012, Exploration Licence E69/22628: Venus Metals Corporation Ltd: Geological Survey of Western Australia, Statutory mineral exploration report A093851, 31p.