Psammitic schist 243009

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): 243009
Mineral separation required? Yes or No: Yes
Date submitted: May 2020

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Kiwirkurra Community / West Arunta Orogen	
1:250k SHEET NAME: Wilson	**NUMBER:** SF 52-9
1:100k SHEET NAME: Top Up Rise	**NUMBER:** 4352
LOCATION METHOD: (GPS: GDA94)	
ZONE: 52	
EASTING: 338397	**NORTHING:** 7503072
LATITUDE: -22.57142	**LONGITUDE:** 127.42816

STRATIGRAPHIC UNIT FORMAL NAME *: No formal names as yet for the Top up Rise samples
STRATIGRAPHIC UNIT INFORMAL NAME: TBC, based on new U-Pb data in progress and geochemistry.
LITHOLOGY: Psammitic schist

DRILLHOLE ID (if applicable): TUR13DD004
PROSPECT (if applicable): Top Up Rise
DEPTH FROM (metres): 326.11
DEPTH TO (metres): 326.19

* 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?

The ages of metamorphism and deformation events; to compare to the Mundrabilla Shear Zone 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 foliation growth.

Mineral target(s) for dating:

K-feldspar and muscovite

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

Younger than c. 1870 Ma; likely younger than c. 1610 Ma.

Sample Information

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

Top up Rise samples come from the Top up Rise prospect drillcores, which were drilled approximately 41 km northwest of Kiwirkurra, in the Gibson Desert. These rocks lie beneath the Canning Basin, and no other information about them is available.

Lithological characteristics (rock description):

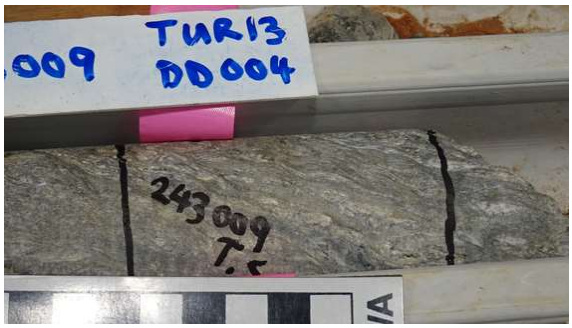
S–C fabric-bearing mylonitic schist. Grain size is ~2-3 mm, though grain aggregate muscovite + chlorite fish and porphyroclasts are larger, up to ≥ 1 cm. Although no lineation is present on the foliation surface the shear sense looks to be top up (reverse) on a foliation that dips ~60 degrees to the core length. There are some excellently developed S-C fabrics at 326.11 m and 327.72 m.

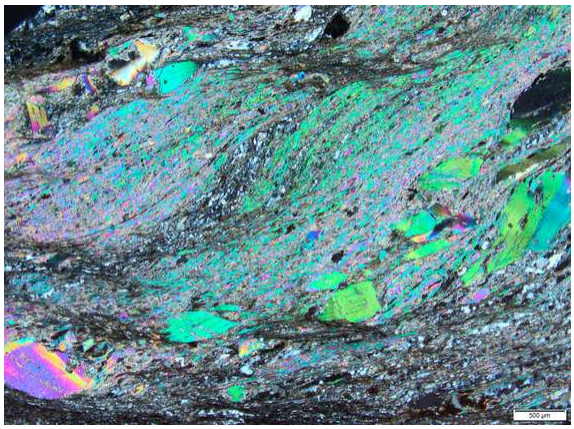
Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):

SHRIMP U-Pb dating is in progress. Preliminary data indicates 1880 ± 5 Ma and 1872 ± 5 Ma for magmatic crystallization of a granite protolith to granite gneiss, and c. 1610 Ma for high grade metamorphism.

Thin section description (if available):
Mylonitic foliation defined by chlorite, muscovite, quartz, feldspar. Biotite is minor. Excellent S-C fabrics defined by quartz and mica fish. Feldspar is partly weathered to sericite. Rare acicular to blocky (anhedral to euhedral) grains of clinozoisite occur that are aligned with the fabric and define trails in some layers. Some rarer, blockier clinozoisite-epidote (blue-yellow birefringence) grains occur where there are crenulations of the muscovite + chlorite fabric.

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





Relevant bibliographic references:
Top up Rise prospect:
Nothing published as yet. There is a company report on the drillcores:
Border Exploration, 2013, Geological Survey of Western Australia, Statutory mineral exploration report A099481, 29p.

Relevant information:
JA Hollis, CL Kirkland, CV Spaggiari, IM Tyler, PW Haines, MTD Wingate, EA Belousova, and RC Murphy, 2013, Zircon U-Pb-Hf isotope evidence for links between the Warumpi and Aileron Provinces, West Arunta Region: Geological Survey of Western Australia Record 2013/9, 30p.

Spaggiari, CV, Haines, PW, Tyler, IM, Allen, HJ, de Souza Kovacs, N and Maidment, D 2016, Webb, WA Sheet SF 52-10 (2nd edition): Geological Survey of Western Australia, 1:250 000 Geological Series.

Haines, PW, de Souza Kovacs, N, Spaggiari, CV, Eacott, G, Allen, HJ, Tyler, IM, Maidment, DW, and Murdie, RE 2018, MacDonald, WA Sheet SF 52-14 (2nd edition): Geological Survey of Western Australia, 1:250 000 Geological Series