National Argon Map: an AuScope Initiative
$^{40}Ar/^{39}Ar$ Geochronology Laboratory Sample Submission Form

This form must be fully completed before any work can be submitted to the Laboratory.

Person submitting samples: Naina (PhD student- MinEx CRC), ANU
Project Title: Cambro-Ordovician magmatism and deformation at the eastern margin of Gondwana, South Australia: Insights into tectonic processes and mineral potential
Sample Number: N1907
Date submitted:

GEOGRAPHIC AREA/ PROVINCE/ BASIN:	
1:250k SHEET NAME: Renmark	**NUMBER:** S15410
1:100k SHEET NAME: Swan Reach	**NUMBER:** 6828
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94)	
ZONE:	
EASTING:	**NORTHING:**
LATITUDE: 34°52'15.75''S	**LONGITUDE:** 139°32'37.83''E

STRATIGRAPHIC UNIT FORMAL NAME: Teal Flat Volcanics
STRATIGRAPHIC UNIT INFORMAL NAME: Teal Flat-Marne River Volcanics
LITHOLOGY: Basalt to andesite lava flows, highly sheared resulting in mylonitisation, low T alteration

DRILLHOLE ID (if applicable):
PROSPECT (if applicable):
DEPTH FROM (metres):
DEPTH TO (metres):

Dating Objective

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

As the Teal Flat Volcanics are highly sheared, the Ar-Ar analysis would help in constraining the timing of shearing and/or alteration event.

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

Shearing and/or alteration ages

Mineral target(s) for dating (provide approximate K content if known):

The plagioclase in the mafic volcanic is the key target with 0.5% K content.

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

Estimated age for this unit is 525Ma.

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

Sample Information

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

The sample was collected from Old Teal Flat near Mannum (34°52'15.75''S, 139°32'37.83''E).

Lithological characteristics (rock description):

The outcrop consisted to sheared dacitic to andesitic volcanics, very fine-grained. At some places, very weathered protoliths were also present.

Thin section description (if available):
Minerals observed: Quartz+plagioclase+opaques+microcline+white mica. Microcline exhibits cross-hatched twinning. Shearing observed. Foliation is defined by mineral alignment ofwhite micas, quartz and plagioclase. Static overgrowth of microcline + plagioclase (sanidine?)+ quartz phenocrysts over foliation is observed. Quartz lath aggregates present. The mineral grains are subhedral to anhedral with foliation fabric wrapping around the phenocrysts. The rock has a mylonitic texture.***Photograph(s) e.g. field site, hand-specimen, photomicrograph:***
Below is a outcrop view highlighting the dyke intruding Mannum Granite. This image was captured during my PhD field trip in June 2019.

Relevant bibliographic references:
Burtt, A.C., Abbot, P.J., Fanning, C.M., 2000, Definition of Teal Hill and Marne River Volcanics and associated shear zone, MESA Journal, 17, p37-43