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: N1909
Date submitted:

GEOGRAPHIC AREA/ PROVINCE/ BASIN:	
1:250k SHEET NAME: Adelaide	**NUMBER:** S15409
1:100k SHEET NAME: Mannum	**NUMBER:** 6728
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94) WGS84	
ZONE:	
EASTING:	**NORTHING:**
LATITUDE: 34°53'35.17''S	**LONGITUDE:** 139°21'9.16''E

STRATIGRAPHIC UNIT FORMAL NAME: Mannum Granite
STRATIGRAPHIC UNIT INFORMAL NAME: Mannum Granite
LITHOLOGY: Basaltic/dioritic dyke intruding Mannum Granite

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?

The Ar-Ar analysis of this intrusion would help in identifying the cooling history of this intrusion along with any thermal resetting ages (if any) in the host granite.

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

Cooling ages.

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

The dioritic dyke is dominated by plagioclase crystals with approximate 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 intrusion is 450Ma.

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):

Sample was collected from Mannum Quarry (34°53’35.17’’S, 139°21’9.16’’E) near the town of Mannum.

Lithological characteristics (rock description):

The dioritic dyke is fine-grained, dark in color and dominated by plagioclase phenocrysts (visible under hand lens). The texture of the rock is aphanitic. The dyke intrudes the Mannum Granite and lacks chilled margins.

Thin section description (if available): No thin section available.

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:

Turner, S., & Foden, J. (1996). Magma mingling in late-Delamerian A-type granites at Mannum, South Australia. Mineralogy and Petrology, 56, 147-169.