

# National Argon Map: an AuScope Initiative

## $^{40}\text{Ar}/^{39}\text{Ar}$ Geochronology Laboratory Sample Submission Form

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

<b>Person submitting samples:</b> Naina (PhD student- MinEx CRC), ANU
<b>Project Title:</b> Cambro-Ordovician magmatism and deformation at the eastern margin of Gondwana, South Australia: Insights into tectonic processes and mineral potential
<b>Sample Number:</b> N1905
<b>Date submitted:</b>

<b>GEOGRAPHIC AREA/ PROVINCE/ BASIN:</b>	
<b>1:250k SHEET NAME:</b> Barker	<b>NUMBER:</b> S15413
<b>1:100k SHEET NAME:</b> Mobilong	<b>NUMBER:</b> 6727
<b>LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94)</b>	
<b>ZONE:</b>	
<b>EASTING:</b>	<b>NORTHING:</b>
<b>LATITUDE:</b> 35°06'04"S	<b>LONGITUDE:</b> 138°59'56"E

<b>STRATIGRAPHIC UNIT FORMAL NAME:</b> Kanmantoo Group
<b>STRATIGRAPHIC UNIT INFORMAL NAME:</b> Kanmantoo Group
<b>LITHOLOGY:</b> Sandstones, siltstones, occasionally sulphidic; metamorphosed. Boudinaged quartz vein intruding andalusite mica-schist of Kanmantoo Group

<b>DRILLHOLE ID (if applicable):</b>
<b>PROSPECT (if applicable):</b>
<b>DEPTH FROM (metres):</b>
<b>DEPTH TO (metres):</b>

### Dating Objective

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

Ar-Ar of the Kanmantoo metasediments would give a detailed history of the thermal events and metamorphic history of meta-sediments of the group

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

Metamorphic, cooling ages etc

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

Biotite (9% K).

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

The estimated age for the intruding quartz vein is Early Cambrian (510Ma).

**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 near the Kanmantoo Mine area (35°06'04"S, 138°59'56"E)

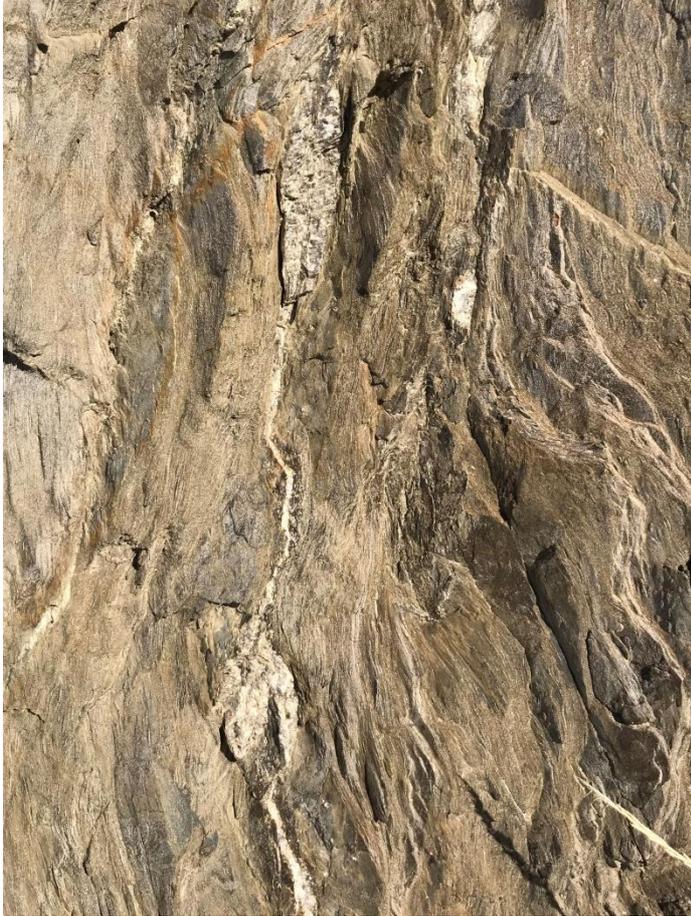
**Lithological characteristics (rock description):**

Andalusite mica schist with andalusite porphyroblasts. Regions of mica schist present absent andalusite. Schistosity prominent in mica schist. Fold like structures present (hard to infer) in mica schist layer with axial

planar fabric. Late stage faults present displacing qtz veins (boudinaged + non boudinaged). Some qtz veins (possibly late stage) not displaced by the faults.

**Thin section description (if available):** Description not 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:**

Jago, J. B., Gum, J. C., Burt, A. C., & Haines, P. W. (2003). Stratigraphy of the Kanmantoo Group: A critical element of the Adelaide Fold Belt and the Palaeo-Pacific plate margin, Eastern Gondwana. *Australian Journal of Earth Sciences*, 50(3), 343-363.