

National Argon Map: an AuScope Initiative

⁴⁰Ar/³⁹Ar Geochronology Laboratory Sample Submission Form

This form must be completed and returned to Marnie Forster (Marnie.Forster@anu.edu.au) before any work can be commenced in the Argon Laboratories.

Person submitting samples: Anthony Reid
Affiliation: Senior Principal Geoscientist, Geological Survey of South Australia
Project Title: Dating of mineralisation-related alteration in the Olympic Cu-Au Province, Gawler Craton
Sample Number(s) (including IGSN if one exists): 2016087
Mineral separation required? Yes or No: Y
Date submitted: 20/03/2020

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Curnamona Province	
1:250k SHEET NAME: OLARY	NUMBER:
1:100k SHEET NAME: Olary	NUMBER:
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94) GDA2020	
ZONE: 52	
EASTING: 429158.71	NORTHING: 6444287.52
LATITUDE: -32.1355945	LONGITUDE: 140.2489042

STRATIGRAPHIC UNIT FORMAL NAME *: Bimbowrie Suite
STRATIGRAPHIC UNIT INFORMAL NAME: NA
LITHOLOGY: two mica granite

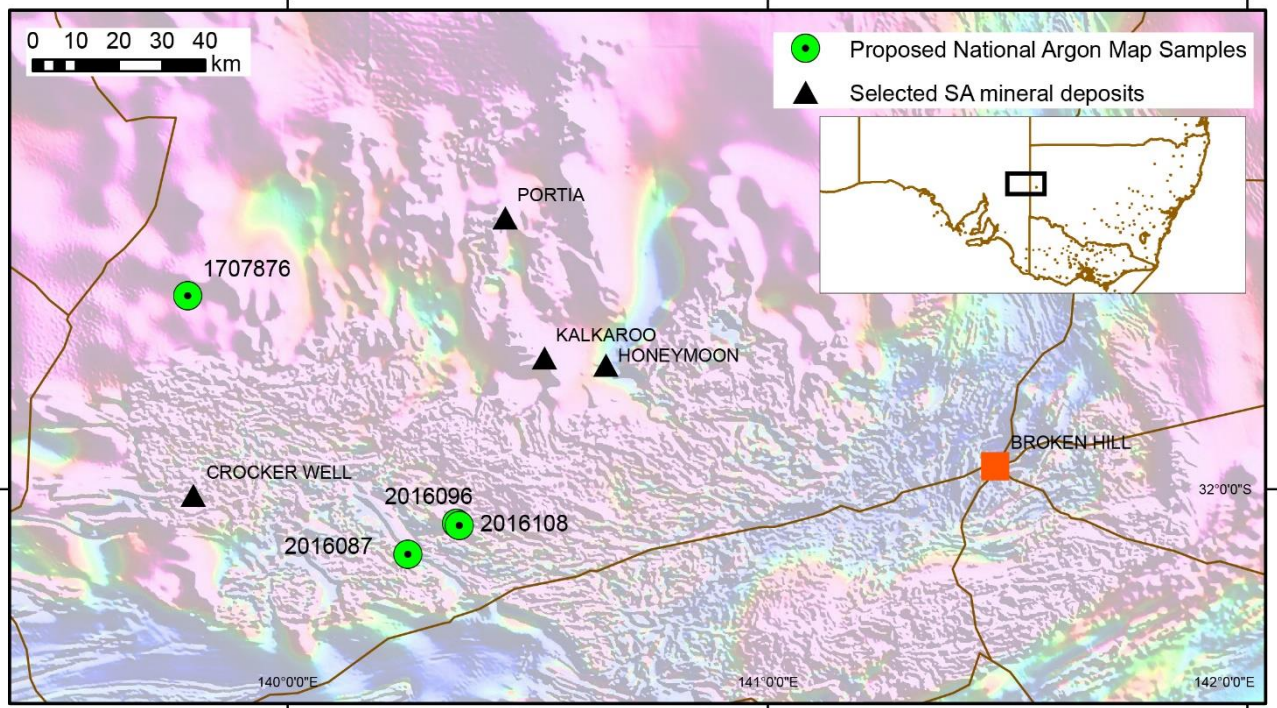
DRILLHOLE ID (if applicable):
PROSPECT (if applicable):
DEPTH FROM (metres):
DEPTH TO (metres):

* 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 ⁴⁰Ar/³⁹Ar analysis will address?

The Curnamona Province is host to one of the world's largest mineral deposits at Broken Hill and has prospectivity for IOCG mineral systems as witnessed by deposits such as Kalkaroo and Portia. There is however, very little argon geochronology from the Curnamona Province, in particularly the South Australian portion of the region. The samples selected are from the Bimbowrie region and from a regional drill hole that will assist with gaining baseline information on the thermal evolution of the Curnamona Province.



Location map of Curnamona Province samples. Backgroundlayer is national Total Magnetic Intensity image, Geoscience Australia.

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

Cooling age

Mineral target(s) for dating:

Biotite, muscovite

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

Mesoproterozoic

Sample Information

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

Granite within the Bimbowrie region.

Lithological characteristics (rock description):

Sample 2016087 is a granite of the Bimbowrie Suite. The granite contains biotite and muscovite. The granite is slightly weathered. K-feldspar may not be suitable for argon dating. The granite is a typical very late stage granite in the Bimbowrie Suite and having been emplaced subsequent to the Olarian Orogeny at c. 1585 Ma.



Photograph of sample 2016087.

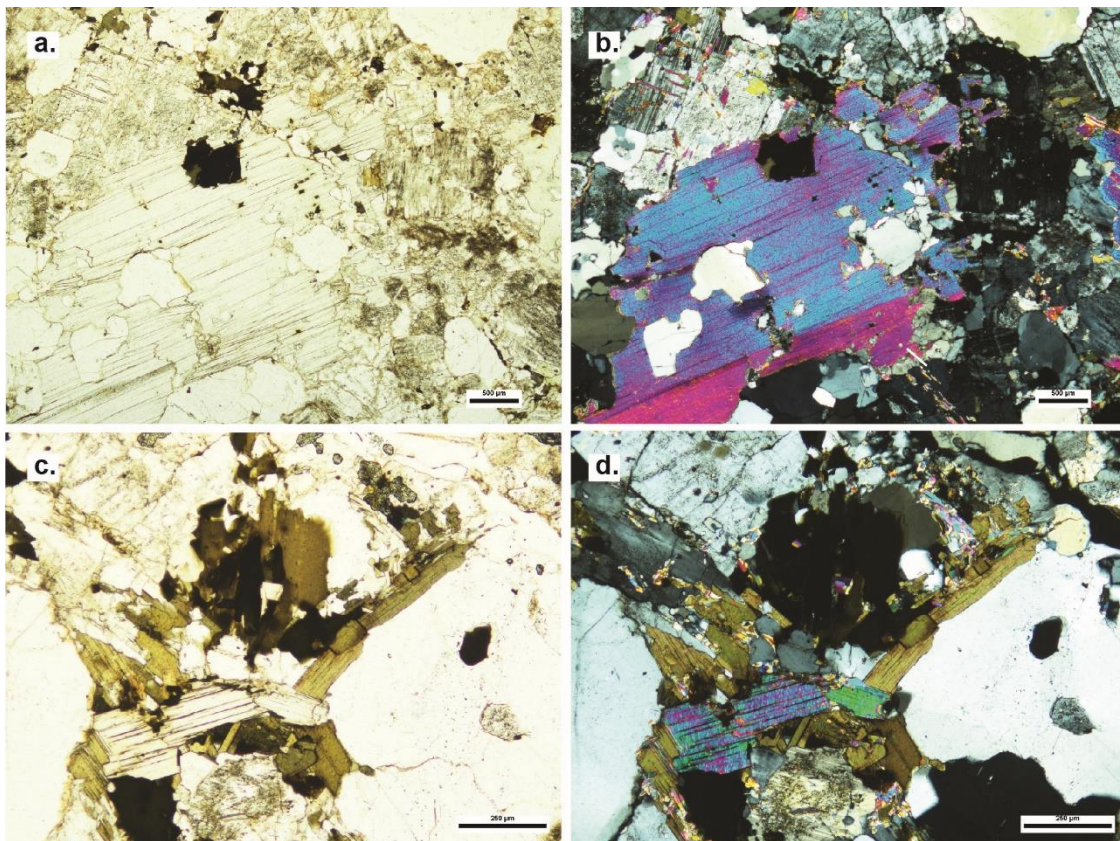
Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):

This granite has not been dated, however, Bimbowrie Suite granites similar to this were emplaced at c. 1585 Ma.

Thin section description (if available):

Coarse muscovite occurs within the sample that is predominantly composed of granoblastic textured quartz-feldspar. Biotite is green in colour and may have weak chlorite alteration. Plagioclase appears weakly sericite altered.

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



Photomicrographs of sample 2016087. a. Plain polarised light. b. Cross polars. c. Plain polarised light. d. Cross polars.

Relevant bibliographic references: