

# Geoscience Australia

## Geochronology Laboratory Sample Submission Form

**This form must be fully completed before any work can be submitted to the Laboratory. It is a requirement that sample location and description data be entered into the GA databases before laboratory work begins.**

Person submitting samples:	A Clark		
Project Code:		Project Name:	
Sample Number (SITE ID):	MU12LJH003/2911541		
Date submitted:	29 Apr 2019		
GEOGRAPHIC AREA/ PROVINCE/ BASIN:	Murphy Province		
1:250k SHEET NAME:	Calvert Hills	NUMBER:	SE5308
1:100k SHEET NAME:	Seigal	NUMBER:	6462
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94)	GDA94		
ZONE:	53		
EASTING:	706514	NORTHING:	7994212
LATITUDE:		LONGITUDE:	
FORMAL NAME:	Murphy Metamorphics		
INFORMAL NAME:	Quartz-biotite-muscovite schist		
LITHOLOGY:	Schist		
DRILLHOLE ID:	MD3	DEPTH FROM:	73.3
PROSPECT:	Coanjula	DEPTH TO:	73.4

### **Dating Objective**

*What is the geological question Ar-Ar analysis will potentially solve?*

These rocks are part of the poorly characterised Murphy Metamorphics. Max. dep. ages from this unit, together with cross cutting and overlying relationships with the ~1850 Ma Nicholson Granite and Clifffdale Volcanics, imply that deformation and metamorphism occurred at ~1855 Ma. As the metamorphic grade of this sample is fairly low (greenschist-lowermost amphibolite facies), there is a good chance that the muscovite age will represent the timing of metamorphism and deformation of this sample.

*What type of age(s) are expected? (e.g. magmatic crystallisation, metamorphism, maximum depositional age, detrital age spectrum):*

Metamorphic age (muscovite)

*Mineral target for dating:*

Muscovite

### **Sample Information**

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

A sample of deformed heterogeneous metapsammopelite was collected from drill core drilled on 24 km south of the homestead on Benmara Station, on Benmara Station. As of 24/9/2012 the drill core was stored at 690022 mE, 8017456 mN, on Benmara Station.

*Lithological characteristics (rock description):*

Phyllite containing interlayered bands of quartz, carbonate and mica. Mica is predominantly muscovite. Very small grains of biotite may also be present. Highly strained. Psammitic and carbonate bands have been extensively fractured and faulted, whereas the mica-rich bands have accommodated strain via ductile shearing and folding. Muscovite growth and quartz/carbonate recrystallization probably accompanied this deformation.

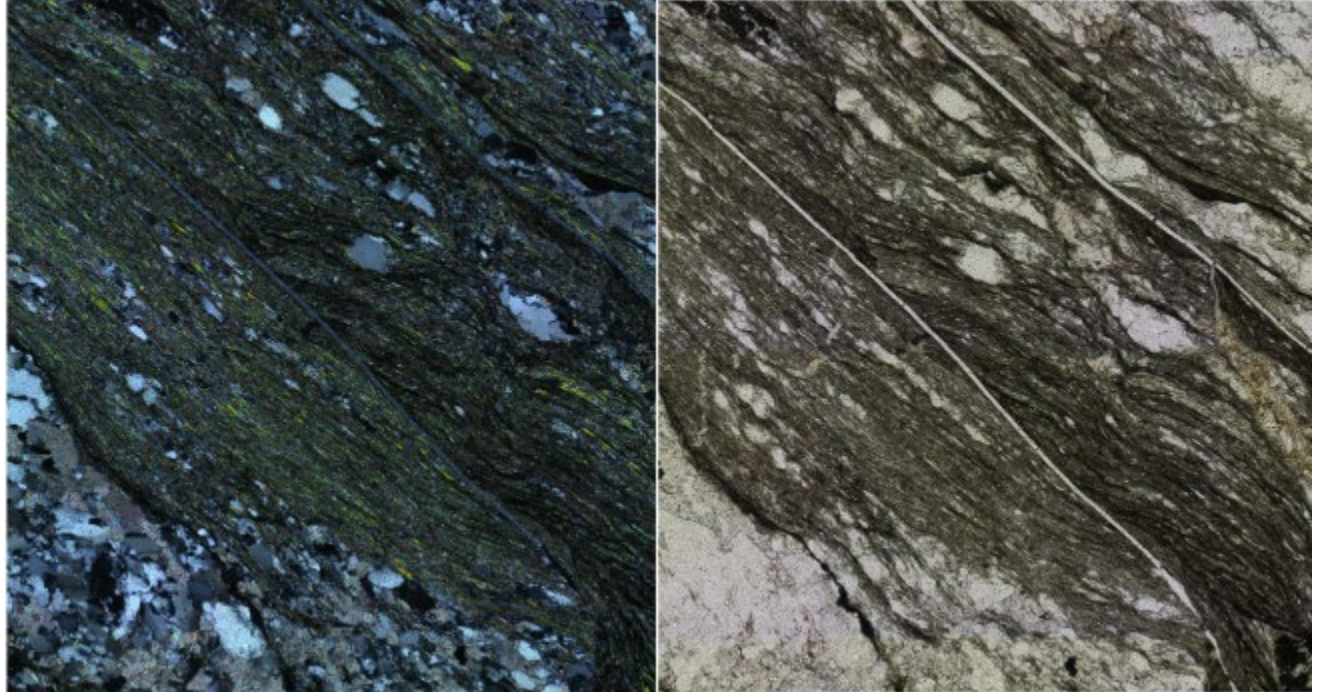
*Relative age constraints (pertinent geological relationships with surrounding units and any previous geochronology):*

Assigned to the Murphy Metamorphics which has a maximum depositional age of  $1864 \pm 5$  Ma (CH12LJH610; Kositcin et al 2014).

*Thin section description (if available):*

See sample description above.

*Photograph(s):*



*Figure 1: PPL and XPL image of sample showing sheared mica and quartz layers. FOV approx. 2mm across.*

*Relevant bibliographic references:*

Kositcin N, Whelan JA, Hallett L and Beyer EE, 2014. Summary of results. Joint NTGS–GA geochronology project: Amadeus Basin, Arunta Region and Murphy Province, July 2012–June 2013. Northern Territory Geological Survey, Record 2014-005.

**Confidential Data**

*Is this sample confidential? No*

*If so, until what date and reason?*