

National Argon Map: an AuScope Initiative

$^{40}\text{Ar}/^{39}\text{Ar}$ 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: Ian Terence Graham
Affiliation: UNSW Sydney
Project Title: Age of mineralisation within the Drake Goldfield
Sample Number(s) (including IGSN if one exists): RRDD003-221.55
Mineral separation required? Yes
Date submitted:

GEOGRAPHIC AREA/ PROVINCE/ BASIN: New England Orogen, Drake Volcanics	
1:250k SHEET NAME: Grafton 1:250k Geological Map	NUMBER: 188
1:100k SHEET NAME: Drake 1:100k Geological Map	NUMBER: 94
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94) WGS84	
ZONE: 56J	
EASTING: 434000.00 m E	NORTHING: 6810000.00 m S
LATITUDE: 28° 50.158'S	LONGITUDE: 152° 19.407'E

STRATIGRAPHIC UNIT FORMAL NAME *: Drake Volcanics
STRATIGRAPHIC UNIT INFORMAL NAME: Drake Volcanics
LITHOLOGY: Complexly interbedded rhyodacitic to andesitic flows, tuffs, breccias and volcanolithic sediments; including porphyritic lava, rhyolitic to andesitic crystal-lithic tuff, breccia and agglomerate. Also epiclastic sediments and subvolcanic intrusives.

DRILLHOLE ID (if applicable): RRDD003
PROSPECT (if applicable): Red Rock
DEPTH FROM (metres): 221.55
DEPTH TO (metres): 221.7

* 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 $^{40}\text{Ar}/^{39}\text{Ar}$ analysis will address?

The age of mineralisation within the Drake Goldfield, does it differ across the widely spaced deposits and is it different from the magmatic age of crystallisation of the host volcanics?

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

Alteration/Mineralisation

Mineral target(s) for dating:

Illite/muscovite

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

Palaeozoic-Mesozoic, younger than 265.3 Ma (U-Pb zircon age of host volcanics)

Sample Information

Location description (e.g. a sample of x was collected from y, z km from abc town):
The drillcore sample was taken fro the Red Rock prospect, some 11.32 km from Drake village

Lithological characteristics (rock description):

Dacitic lithic-vitric crystal tuff

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

U-Pb zircon geochronology gave an age of 265.3 ± 1.5 Ma for the host volcanic tuffs at Red Rock (Waltenberg et al., 2016).

Thin section description (if available):

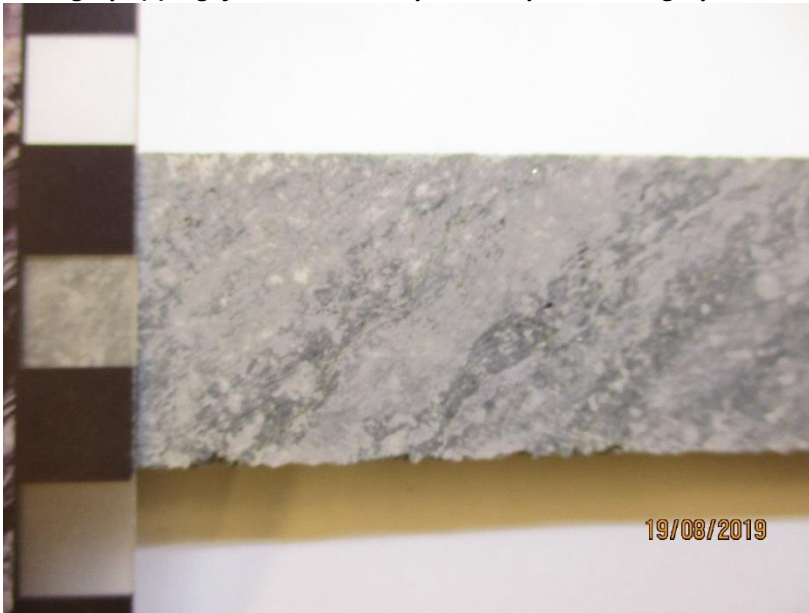
Dacitic vitric lithic crystal tuff

Phenocrysts: quartz, altered feldspar

Groundmass: Pervasive illite alteration in feldspathic fine-grained matrix

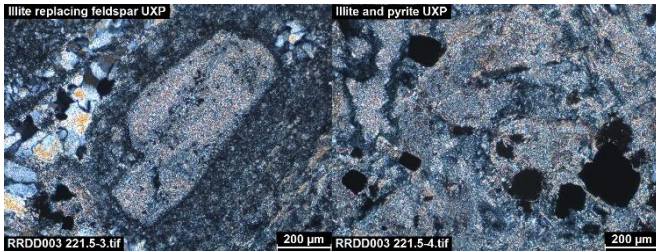
Quantitative XRD: 65.1 wt% quartz, 13.5 wt% illite, 8.4 wt% chlorite, 7.6 wt% muscovite, 4.4 wt% albite and 1 wt% pyrite.

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



HAND-SPECIMEN IMAGE OF RRDD003 - 221.55





Photomicrographs for RRDD003 221.5

Relevant bibliographic references:

1. **White Rock Minerals. Mt Carrington Project: overview, geological setting, resources, development, exploration gold and silver, and exploration copper. 2020 [cited 2019 07/08/2019]; Available from: <https://www.whiterockminerals.com.au/mt-carrington-overview>.**
2. **Andrews, E.C., Report on the Drake Gold and Copper Field by EC Andrews, Geol. Surveyor. 1908: WA Gullick.**
3. **Perkins, C. The Red Rock deposit: a late Permian submarine epithermal precious metal system in North-eastern New South Wales. in Pacific Rim 87. International congress on the geology, structure, mineralisation and economics of Pacific Rim. 1987.**
4. **White Rock Minerals, Exceptional Updated Gold Pre-Feasibility Result, in ASX Announcement 19th August 2020. 2020.**
5. **White, V., Volcanic facies and its relationship to silver mineralisation, White Rock and White Rock North epithermal deposits, Drake Goldfield, NE NSW. 2017, University of New South Wales, Sydney, Australia.**
6. **Zhang, H., Relationship between alteration assemblages, alteration intensity and mineralisation and grade for the Lady Hampden epithermal Au-Ag deposit, Drake, north-eastern NSW,. 2016, University of New South Wales, Sydney, Australia.**
7. **Chomiszak, G., Relationship between alteration assemblages, their intensity and mineralisation and grade at the White Rock Epithermal Ag deposit, Drake, northeastern NSW. . 2016, University of New South Wales, Sydney, Australia.**
8. **Lay, A., A comparative study of the mineralogy and geochemistry of ore minerals from silver-rich polymetallic deposits of the Lachlan and Southern New England Orogens, New South Wales, Australia. 2019, University of New South Wales. p. 261.**
9. **Murray, C., Tectonic evolution and metallogenesis of the New England Orogen. New England Orogen-tectonics and metallogenesis (Kleeman, JD Ed.). University of New England, Armidale, Australia, 1988: p. 204-210.**
10. **Cummings, G., New geological constraints for the Drake Volcanics, Drake Area, Northern NSW. 2011: Internal Report for White Rock Minerals Ltd.**
11. **Waltenberg et al. New SHRIMP U-Pb zircon ages from the Lachlan orogen and the New England Orogen, New South Wales. Geoscience Australia Record 2016/28 and Geological Survey of New South Wales Report GS2016/0810, 2016.**