

# 142902: foliated biotite monzogranite dyke, No. 2 Bore

## Location and sampling

ROBINSON RANGE (SG 50-7)  
Sampled on 8 October 1997

AMG Zone 50, 544070E 7170960N

The sample was taken from a 5 m diameter, 1 m high whaleback located about 50 m south of the site of sample 142901, 300 m south of a fence and about 2 km east of No. 2 Bore.

## Tectonic unit/relations

This sample is of a weakly foliated even, medium-grained biotite monzogranite. This is interlayered with, and has been intruded by, veins of a foliated sparsely porphyritic biotite monzogranite, of which sample 142901 is representative.

## Petrographic description

The major minerals present in this sample are plagioclase (30 vol. %), microcline (43 vol. %), quartz (25 vol. %), biotite (2 vol. %) and myrmekite. Plagioclase is irregular in grain shape and ranges from coarse grained to fine or medium grained. The plagioclase is probably oligoclase, or albite degraded from oligoclase, but its composition was not directly determined. It has been heavily saussuritized. Microcline also has a bimodal grain size distribution, coarse and fine. Grain shape is irregular to round. Biotite is evenly distributed in grains that are variable in size within the finer size classes. There is some myrmekite. Accessory minerals include opaque grains, apatite, possible metamict allanite, and zircon. Secondary minerals include epidote, mainly associated with biotite. Epidote also occurs with sericite as saussurite in plagioclase. Chlorite is rare. The rock has a bimodal texture with coarse grains sitting in a fine groundmass. There may be some weak foliation. Coarse feldspar grains are porphyroclasts whereas the fine feldspar and much of the quartz has been recrystallized from a poorly developed mortar. The mortar developed probably during dynamothermal metamorphism. This rock is a lightly deformed and metamorphosed biotite monzogranite.

## Zircon morphology

The zircons extracted from this sample are generally euhedral to rounded in shape, straw-brown, dark-brown or black in colour, and are typically  $100 \times 150 \mu\text{m}$  but range up to  $400 \times 250 \mu\text{m}$  in size. Many show euhedral internal zonation, are mottled, and have dark cracks, suggesting extensive internal recrystallization.

## Analytical details

This sample was analysed on 8 December 1997. The counter deadtime was 32 ns. Eight analyses of the CZ3 standard obtained during the analysis session indicated a  $\text{Pb}^*/\text{U}$  calibration error of 0.939 (1 $\sigma$ %). Common-Pb corrections were made assuming Broken Hill common Pb for all unknown analyses with the exception of analyses 4.1, 11.1, 12.1, 14.1, 15.1, 19.1, 21.1 and 26.1, for which Pb isotopic compositions determined using the method of Cumming and Richards (1975) were assumed.

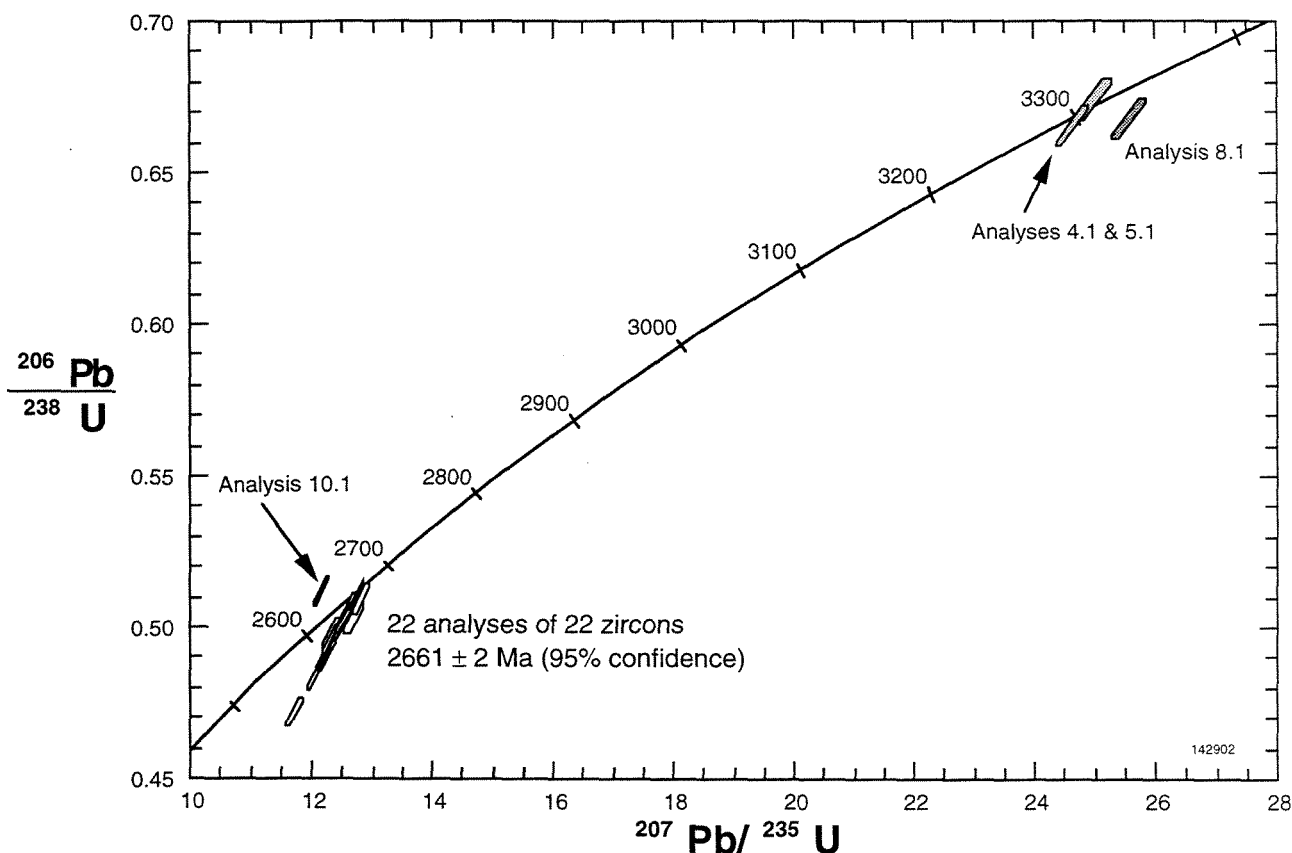


Figure 66. Concordia plot for sample 142902: foliated biotite monzogranite dyke, No. 2 Bore

## Results

Twenty-six analyses were obtained from 26 zircons. Results are given in Table 65 and shown on a concordia plot in Figure 66.

## Interpretation

Twenty-two concordant and variably discordant analyses of 22 zircons (1.1, 2.1, 5.1, 6.1, 7.1, 10.1, 11.1, 12.1, 13.1, 14.1, 15.1, 19.1, 20.1, 23.1, 24.1, 25.1 and 26.1) have a weighted mean  $^{207}\text{Pb}/^{206}\text{Pb}$  ratio corresponding to a date of  $2661 \pm 2$  Ma (chi-squared = 1.68). This date is interpreted to provide the time of igneous crystallization of the granite dyke. Analyses 4.1, 5.1 and 8.1 indicate significantly higher  $^{207}\text{Pb}/^{206}\text{Pb}$  ratios and are interpreted to be of xenocryst zircons. Reversely discordant analysis 10.1 indicates a lower  $^{207}\text{Pb}/^{206}\text{Pb}$  ratio and the radiogenic Pb at this analysis site is interpreted to have undergone some redistribution.

**Table 65. Ion microprobe analytical results for sample 142902: foliated biotite monzogranite dyke, No. 2 Bore**

<i>Grain .spot</i>	<i>U (ppm)</i>	<i>Th (ppm)</i>	<i>Pb (ppm)</i>	<i>f206%</i>	<i><sup>207</sup>Pb/<sup>206</sup>Pb</i>	<i>± 1σ</i>	<i><sup>208</sup>Pb/<sup>206</sup>Pb</i>	<i>± 1σ</i>	<i><sup>206</sup>Pb/<sup>238</sup>U</i>	<i>± 1σ</i>	<i><sup>207</sup>Pb/<sup>235</sup>U</i>	<i>± 1σ</i>	<i>% concordance</i>	<i><sup>207</sup>Pb/<sup>206</sup>Pb Age</i>	<i>± 1σ</i>
1.1	816	62	428	0.130	0.18081	0.00039	0.02643	0.00040	0.5028	0.0048	12.534	0.126	99	2 660	4
2.1	325	206	192	0.095	0.18080	0.00059	0.17110	0.00087	0.5056	0.0049	12.605	0.134	99	2 660	5
3.1	568	79	299	0.134	0.18031	0.00044	0.03661	0.00046	0.5007	0.0048	12.447	0.127	99	2 656	4
4.1	349	231	292	0.465	0.26950	0.00069	0.17028	0.00101	0.6656	0.0065	24.734	0.257	100	3 303	4
5.1	131	113	114	0.134	0.27000	0.00103	0.22716	0.00140	0.6740	0.0070	25.092	0.288	100	3 306	6
6.1	112	59	65	0.157	0.18299	0.00108	0.14542	0.00163	0.5030	0.0052	12.690	0.160	98	2 680	10
7.1	239	284	159	0.033	0.18273	0.00069	0.32896	0.00135	0.5092	0.0050	12.830	0.141	99	2 678	6
8.1	195	171	170	0.098	0.27880	0.00084	0.23065	0.00107	0.6675	0.0067	25.660	0.277	98	3 356	5
9.1	479	88	255	0.271	0.18027	0.00053	0.05474	0.00072	0.4963	0.0048	12.335	0.128	98	2 655	5
10.1	765	291	429	0.026	0.17228	0.00040	0.10010	0.00042	0.5121	0.0049	12.164	0.124	103	2 580	4
11.1	598	105	315	0.367	0.17952	0.00047	0.03483	0.00067	0.4981	0.0048	12.328	0.126	98	2 648	4
12.1	669	61	349	0.280	0.17988	0.00042	0.03063	0.00054	0.4960	0.0047	12.301	0.125	98	2 652	4
13.1	632	55	330	0.087	0.18108	0.00041	0.02290	0.00037	0.5025	0.0048	12.547	0.127	99	2 663	4
14.1	653	109	354	0.755	0.18030	0.00052	0.03685	0.00088	0.5062	0.0048	12.583	0.130	99	2 656	5
15.1	570	93	300	0.819	0.18082	0.00057	0.04952	0.00099	0.4840	0.0046	12.067	0.126	96	2 660	5
16.1	736	80	376	0.051	0.18108	0.00039	0.02980	0.00034	0.4901	0.0047	12.237	0.123	97	2 663	4
17.1	672	62	351	0.062	0.18102	0.00039	0.02520	0.00032	0.5025	0.0048	12.542	0.126	99	2 662	4
18.1	636	321	359	0.226	0.18117	0.00045	0.12678	0.00065	0.4978	0.0048	12.434	0.127	98	2 664	4
19.1	1 898	413	1 038	0.112	0.18121	0.00023	0.06065	0.00025	0.5102	0.0048	12.748	0.124	100	2 664	2
20.1	547	61	286	0.068	0.18103	0.00044	0.02992	0.00040	0.5017	0.0048	12.523	0.128	98	2 662	4
21.1	446	320	231	0.851	0.18035	0.00066	0.06416	0.00118	0.4717	0.0045	11.728	0.126	94	2 656	6
22.1	459	75	241	0.175	0.18056	0.00050	0.04586	0.00056	0.4953	0.0048	12.332	0.128	98	2 658	5
23.1	620	58	320	0.039	0.18120	0.00041	0.02513	0.00031	0.4970	0.0048	12.417	0.125	98	2 664	4
24.1	708	87	364	0.065	0.18115	0.00039	0.03213	0.00034	0.4909	0.0047	12.261	0.123	97	2 663	4
25.1	505	90	266	0.097	0.18085	0.00047	0.04973	0.00050	0.4957	0.0048	12.361	0.127	98	2 661	4
26.1	643	112	338	0.379	0.18035	0.00046	0.04941	0.00067	0.4905	0.0047	12.197	0.124	97	2 656	4

STRATIGRAPHIC REFERENCE:

OCCHIPINTI, S. A., SHEPPARD, S., TYLER, I. M., and MYERS, J. S., 2002, Robinson Range, W.A. Sheet SG50-7 (2nd edition): Western Australia Geological Survey, 1:250 000 Geological Series.

Recommended reference for this publication:

NELSON, D. R., 1998, 142902: foliated biotite monzogranite dyke, No. 2 Bore; in Compilation of SHRIMP U–Pb zircon geochronology data, 1997: Western Australia Geological Survey, Record 1998/2, p. 215–217.

OR

NELSON, D. R., 1998, 142902: foliated biotite monzogranite dyke, No. 2 Bore; Geochronology dataset 344; in Compilation of geochronology data, June 2006 update: Western Australia Geological Survey.

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