Heat production data for Australian Proterozoic felsic igneous rocks

All data are calculated from whole rock geochemical databases of Budd et al., (2001). Granite groupings are based on Supersuite terminology also from Budd et al., (2001). Note that in all tables average heat production is listed for the modern day, based on precent abundances of the heat producing elements. Average heat production in the Proterozoic would have been around 20-30% higher than the values listed in these tables due to the decay in heat producing elements with time. The percentage area occupied by each major granite group is an estimate only based on the accurate outcrop area of each granite (from Budd et al., 2001) and an estimated area of the entire inlier. Estimates of the total area of each inlier are likely to overestimate the area of outcrop, so the values shown in these tables are likely to be a minimum estimate of the percentage of granite *vs*. the total outcrop area.

Table DR1 *Heat Production in granites, granite gneisses and felsic volcanics: Arnhem Land*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Fagan Supersuite	1717 – 1707	I	368	3.7	39.5	7.38	10.6	**4.56**
Bickerton Suite	1814	I	15	4.5	32.7	3.11	7.3	**3.85**
Giddy Suite	~ 1835	I	359	5.0	36.8	5.96	7.4	**4.55**
Bradshaw Suite	~ 1875 – 1845	S	565	5.2	24.6	4.43	4.8	**3.57**
TOTAL			**1307**	**4.7**	**31.9**	**5.63**		**4.08**

Table DR2 *Heat Production in granites, granite gneisses and felsic volcanics: Arunta Inlier*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Alarinjela Suite	~ 1713	I	290	9.4	29.3	5.12	6.7	**3.76**
Ali Curung Suite	~ 1713	I	262	8.0	33.4	4.58	4.2	**4.97**
Barrow Creek Suite	~ 1713	S	244	12.4	31.8	4.99	2.6	**6.04**
Carrington Granite Suite	~ 1780		429	6.1	39.0	4.24	6.4	**4.84**
Entia Suite	~ 1770	I	539	1.3	6.5	3.90	5.2	**1.18**
Haverson Suite	~ 1820		945	7.3	38.7	5.25	5.3	**5.24**
Iwupataka Complex	~ 1615 – 1600	I	628	4.6	25.7	4.51	5.6	**3.50**
Jennings Suite	~ 1770	I	1153	2.2	22.0	4.15	9.9	**2.58**
Jervois Suite	~ 1770	I	880	2.7	19.0	4.12	6.9	**2.50**
Jinka Suite	~ 1713	I	1205	16.9	89.0	5.60	5.3	**11.43**
Madderns Yard Suite	~ 1680 – 1650	I	4001	2.2	20.2	3.03	9.3	**2.32**
Mount Webb Suite	~ 1615 – 1480	I	5623	10.0	39.7	4.46	4.0	**5.92**
Mount Zeil Suite	1760	I	108	1.8	13.8	4.58	7.6	**1.92**
Nabberby Suite	~ 1780 – 1775	I	6041	10.3	60.7	5.30	5.9	**7.61**
Narwietooma Suite	1880	I	1448	1.7	9.0	3.36	5.2	**1.43**
Southwark Granitic Suite	~ 1570	I	1996	7.7	51.1	5.00	6.6	**6.22**
Ungrouped		I	1401	5.0	40.4	4.11	8.0	**4.65**
TOTAL			**27233**	**7.2**	**40.1**	**4.46**		**5.24**

Table DR3 *Heat Production in granites, granite gneisses and felsic volcanics: Broken Hill-Olary region*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
1590 Suite	~ 1590	I	450	5.7	36.3	4.52	6.4	**4.56**
Potosi Suite	1700 – 1670	S	459	2.1	25.2	3.10	11.9	**2.68**
Himalaya Suite	1710 – 1700	I	911	5.2	11.1	1.26	2.1	**2.28**
Redan Suite	1820	I	99	3.4	8.4	0.67	2.5	**1.56**
TOTAL			**1920**	**4.5**	**20.2**	**2.44**		**2.88**

Table DR4 *Heat Production in granites, granite gneisses and felsic volcanics: Gawler Province*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Hiltaba Supersuite	1590 – 1580	I	19419	7.4	32.6	4.98	4.4	**4.79**
St. Peters Suite	1620 – 1615	I	73	4.2	12.4	3.28	3.0	**2.31**
Younger Lincoln S/Suite	1755 – 1655	I	496	10.6	37.9	4.28	3.6	**5.93**
Minbrie Gneiss	1800	I	899	4.6	36.9	5.27	7.0	**4.51**
TOTAL			**20888**	**7.4**	**32.8**	**4.94**		**4.79**

Table DR5 *Heat Production in granites, granite gneisses and felsic volcanics: Georgetown Inlier*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Esmeralda Supersuite	1560 – 1550	I	4664	10.5	28.8	5.08	2.8	**5.34**
Forest Home Supersuite	1550	I	31	1.3	2.4	2.00	1.9	**0.70**
Forsayth Supersuite	1550 – 1540	S	1681	6.7	31.1	4.59	4.6	**4.46**
Lighthouse Suite	1560	I	36	1.8	6.2	3.99	3.5	**1.29**
TOTAL			**6411**	**9.4**	**29.1**	**4.93**		**5.06**

Table DR6 *Heat Production in granites, granite gneisses and felsic volcanics: Kimberley Province*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Butchers Gully Suite	1860		100	6.1	46.6	5.58	7.6	**5.50**
Dougalls Suite	1850	I	44	1.2	5.0	1.18	4.3	**0.78**
Koongie Park Suite	1845	I	58	3.7	16.6	2.88	4.5	**2.45**
Paperbark Suite	1862 – 1852	I	9189	5.2	20.5	4.50	3.9	**3.28**
Sally Downs Supersuite	1827 – 1819	I	2502	3.3	18.7	3.41	5.7	**2.55**
Sophie Downs Suite	~ 1912	I	65	2.2	16.8	5.10	7.7	**2.29**
San Sou Suite	1800 – 1790	I	91	12.1	25.5	4.97	2.1	**5.51**
Ungrouped	1863 – 1850	I	24	2.0	9.2	3.22	4.6	**1.51**
TOTAL			**12073**	**4.8**	**20.2**	**4.26**		**3.15**

Note: The Kimberley Province includes the Halls Creek and King Leopold Orogens

Table DR7 *Heat Production in granites, granite gneisses and felsic volcanics: Mount Isa Inlier*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Argylla Suite	1790 – 1780	I	1815	6.2	28.8	5.28	4.7	**4.21**
Big Toby Suite		I	20	1.2	8.7	4.10	7.4	**1.33**
Burstall Suite	1745 – 1740	I	199	8.0	45.1	5.07	5.6	**5.86**
Cowie Suite	1500		15	17.4	76.2	4.52	4.4	**10.54**
Fiery Supersuite	1725 – 1698	I	537	4.8	27.4	8.85	5.7	**4.09**
Kalkadoon Supersuite	1860 – 1820	I	3478	4.4	25.0	4.46	5.7	**3.40**
Nicholson Suite	1850	I	1208	8.0	27.1	5.44	3.4	**4.59**
Sybella Suite	1678 – 1655	I	1098	7.1	37.6	5.26	5.3	**5.09**
Tommy Creek Suite	1762 – 1625	I	250	5.7	31.6	4.14	5.5	**4.19**
Ungrouped			120	6.9	24.7	3.93	3.6	**3.99**
Williams Supersuite	1520 – 1493	I	1864	13.4	55.5	3.90	4.1	**7.93**
Wonga Suite	1760 – 1740	I	332	9.4	53.1	5.39	5.6	**6.84**
TOTAL			**10935**	**7.2**	**33.9**	**4.93**		**4.82**

Table DR8 *Heat Production in granites, granite gneisses and felsic volcanics: Mount Painter Province*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Terrapinna granite	1557	I	99	10	58	5.2		**7.20**
Yerila granite	1556	I	30	116	423	5.7		**61.6**
Hot Springs Gneiss	1560	I	22	75	288	4.2		**41.0**
Petermorra Volcanics	1560	I	13	10	35	6.5		**6.7**
Box Bore granite	1560	I	40	44	131	6.4		**21.6**
Wattleowie granite	1560	I	18	6	33	5.8		**4.5**
Mount Neill granite	1570	I	189	21	74	3.6		**11.3**
TOTAL			**411**	**29**	**110**	**4.62**		**16.13**

Note: Data compiled from Neumann et al., (2000)

Table DR9 *Heat Production in granites, granite gneisses and felsic volcanics: Musgrave Inlier*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Kulgera Suite	1190 – 1150	I	3639	1.5	22.8	4.26	14.9	**2.47**
Winburn Suite	1078	I	1783	5.8	41.8	4.66	7.3	**5.00**
Ungrouped	1190 – 1150	I	77	0.7	18.8	4.04	28.1	**3.00**
TOTAL			**5499**	**1.3**	**21.8**	**4.19**		**2.68**

Table DR10 *Heat Production in granites, granite gneisses and felsic volcanics: Pine Creek Inlier*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Allia Suite	1845 – 1760	S	415	5.7	17.2	4.32	3.0	**3.15**
Cullen Supersuite	1860 – 1775	I	3160	10.1	39.4	4.98	3.9	**5.99**
El Sherana Supersuite	1870 – 1850		72	14.1	42.3	2.40	3.0	**6.99**
Gerowie Suite	1890 – 1885	I	1173	4.9	23.5	3.27	4.8	**3.30**
Jim Jim Suite	1863 – 1760	I	2234	7.7	34.1	5.09	4.5	**4.98**
Nimbuwah Suite	~ 1870	I	1109	2.8	22.7	3.68	8.1	**2.73**
Wagait Suite	~ 1850	I	333	6.7	25.8	4.77	3.9	**6.64**
Ungrouped	~ 1825		29	10.0	49.0	4.72	4.9	**4.08**
TOTAL			**8626**	**7.5**	**32.1**	**4.55**		**4.73**

Table DR11 *Heat Production in granites, granite gneisses and felsic volcanics: Tanami Inlier*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Browns Range Suite	~ 1820	I	6	2.1	3.3	2.20	1.6	**1.00**
The Granites Supersuite	1824 – 1795	I	784	11.7	31.0	5.20	2.6	**5.82**
TOTAL			**790**	**11.7**	**30.7**	**5.19**		**5.79**

Table DR12 *Heat Production in granites, granite gneisses and felsic volcanics: Tennant Creek Inlier*

Granite Suite	*Age*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Devils Suite	1720 - 1670	I	443	8.8	36.4	5.23	4.2	**5.45**
Treasure Suite	~ 1810 - 1820	I	1493	6.0	24.5	5.08	4.1	**3.84**
Tennant Creek Suite	~ 1840 - 1870	I	2195	5.5	23.5	4.60	4.2	**3.60**
TOTAL			**4131**	**6.1**	**25.2**	**4.84**	**4.2**	**3.89**

Granites within Proterozoic terranes outside the Central Australian Heat Flow Province (of McLaren et al., 2003) are also characterized by elevated heat production rates. Tables A.14, A.15 and A.16 (following) show average heat production data for the Albany-Fraser, Gascoyne and Paterson Orogens in Western Australia. These data support the elevated heat production rates reported throughout terranes within the CAHFP and suggest that a time dependent process, or source, or enrichment was active during much of the Palaeo-Mesoproterozoic growth of the Australian continent.

Table DR13 *Heat Production in granites, granite gneisses and felsic volcanics: Albany Fraser Belt*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Mount Andrew Migmatite	1670	I	297	3.3	13.4	4.03	4.1	**2.23**
Porongurup Suite	1330 – 1135	I	8079	3.9	35.4	4.53	9.0	**4.04**
Ungrouped	1692 – 1190	I	852	3.4	17.1	4.11	5.0	**2.53**
TOTAL			**9229**	**3.9**	**33.0**	**4.48**		**3.84**

Table DR14 *Heat Production in granites, granite gneisses and felsic volcanics: Gascoyne Province*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
Boolaloo Supersuite	1680	I	326	3.2	16.7	3.48	5.2	**2.39**
Chararoo Supersuite	1800	S	1812	4.0	44.0	4.90	10.9	**4.76**
Minnie Creek Supersuite	1800	I	9656	2.6	29.9	4.12	11.7	**3.24**
TOTAL			**11794**	**2.8**	**31.7**	**4.22**		**3.45**

Table DR15 *Heat Production of granites, granite gneisses and felsic volcanics: Paterson Inlier*

Granite Suite	*Age Range*	*Type*	*Area of outcrop (km^2)*	*U (ppm)*	*Th (ppm)*	*K (wt%)*	*Th:U*	*Average Q (μWm^{-3})*
O'Callaghans Supersuite	630 – 615	I	75	12.3	45.9	4.65	3.7	**7.01**
Krakatinny Supersuite	1310	I	63	3.6	16.8	3.41	4.7	**2.48**
Kalkan Supersuite	1780	I	598	7.0	33.8	5.15	4.8	**4.79**
TOTAL			**737**	**7.2**	**33.6**	**4.95**		**4.82**

REFERENCES

Budd, A.R., Wyborn, L.A.I., and Bastrakova, I.V., 2001, The Metallogenic Potential of Australian Proterozoic Granites, Geoscience Australia, Record 2001/12.